HKIA

Study Guide for HKIA Professional Assessment

Paper 5
Building Materials and Technology

The Hong Kong Institute of Architects
香港建築師學會

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Note:
As the Study Guide is based on current standards on building technology in Hong Kong 2022. This should not be taken as inclusive of all syllabi for HKIA Professional Assessment which may be updated from time to time in the PA Handbook.

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INTRODUCTION, SCOPE OF STUDY AND REFERENCE LITERATURE

INTRODUCTION TO THIS STUDY GUIDE

This is a guide to candidates not only for taking the HKIA Paper 5 Professional Assessment but also for the application of the knowledge of Building Technology in actual professional practice. The content of this Study Guide is based on a comprehensive review of the design and construction of actual projects. Details for reference of technology are based on different types of building works which include non-domestic buildings, domestic buildings and works related to building services. References to relevant literature are quoted.

Examples of drawings from actual practice are employed as much as appropriate. These technical drawings are the basis of communication among the Project Team. When the technology involved is related to the building code, reference is made to the relevant regulations or practice notes. Readers are advised to look for these documents which would be updated from time to time. Though we cannot cover everything in actual practice, we believe this Study Guide together with the other Guides serves to provide the first principle in the application of Building Technology for good professional practice.

BUILDING TECHNOLOGY IN PROFESSIONAL PRACTICE

Building Technology is one of the fundamentals of architecture. The production of modern architecture cannot be separated from technology. Both the visual and functional performance of buildings depends on the appropriate application of materials and technology, taking into account local practices and statutory requirements. The successful construction of a building relies on the architect's competence in understanding materials and technology with proper coordination with the building structure and building services.

To have a comprehensive understanding of building technology, it is a continuous effort in referencing technical literature, specification and building codes supported by experience in actual design and construction. Candidates are advised to learn and experience the application of building technology through actual site visits and supervision. It will be a great benefit if their seniors can share their experiences with them.

OBJECTIVES OF PAPER 5, HKIA PROFESSIONAL ASSESSMENT (Extract from HKIA PA Handbook)

To ascertain that the candidate has acquired the basic knowledge of the properties and performance of materials, components and finishes and the elements of construction.

To test the candidate's ability to analyze the properties required of a material or product for a particular situation, and to make a good selection from the sources available.

To test the candidate's understanding of the principles that govern the design or the selection of appropriate construction technique for a variety of situations, various building systems and components.

To test the candidate's knowledge of local construction techniques and practices, including his understanding of the local statutory restraints, construction programming and sequencing of works, and the performance of the component systems through the life of buildings.

SCOPE OF STUDY

1. Application of building techniques and materials

2. Local construction trade practices

3. Detailing and selection of building components and systems

4. Application and statutory requirements for design and construction including the design for the physically challenged and fire safety

5. Principles and applications of construction specifications in the Hong Kong context

6. Building defects – diagnosis, remedial works and prevention

Important Note: *The Sections of this Study Guide are co-related with each other hence cross-references should be made to the different sections as well as to the relevant reference literature as stated.*

Note: *Though focuses on building materials and technology, the examination paper of this subject may overlap with other papers such as building services, structure, building regulations and contracts since in professional practices these issues are all co-related. For example, hoarding plans shall be submitted to the Building Authority for approval and issuance of permit. This is also included in the building contract usually as preliminaries. Technically, a hoarding will involve lighting standards and structure to anchor on the ground.*

REFERENCE LITERATURE

The following Core Reading List and Recommended Reading List are extracted from the PA Handbook. Please refer to the Handbook for the update List.

Core Reading List

1. General Specification for Building, Architectural Services Department
2. Building (Construction) Regulations, Buildings Department
3. Practice Notes for Authorised Persons, Buildings Department
4. Building (Energy Efficiency) Regulations, Buildings Department
5. Building (Refuse Storage and Material Recovery Chambers and Refuse Chutes) Regulations, Buildings Department
6. Code of Practice for Overall Thermal Transfer Value in Buildings, Buildings Department
7. Code of Practice for Fire Safety in Buildings, Buildings Department
8. Building (Standards of Sanitary Fitments, Plumbing, Drainage Works & Latrines) Regulations, Buildings Department
9. Building (Planning) Regulations, Buildings Department

Recommended Reading List

10. Building Materials and Technology in Hong Kong, HKU Press, 2018, Wong Wah Sang, Chan Wing Yan Alice, Wai Chui Chi Rosman, Kee Yee Chun Tris
11. Building Enclosure in Hong Kong, HKU Press, 1998, Wong Wah Sang
12. Building Failures: A Guide to Diagnosis, Remedy and Prevention; Lyall Addieson; 1987
13. Architectural Graphic Standards; Ramsay Sleeper, American Institute of Architects
14. Building Construction Illustrated, FDK Ching, 2nd Edition, 1991, VNR
15. Construction Technology, Vol. 1, 2, 4; R Chudley
16. AJ Metric Handbook
17. Mitchell's Building Construction: Materials, Alan Everett, BT Batsford Ltd., London
18. Mitchell's Building Construction: Structure & Fabric, Part 1 (5th Edition), Part 2 (5th Edition), J S Foster, B T Batsford Ltd., London
19. Building Hong Kong: Environmental considerations, HKU Press, 2000, edited by Wong Wah Sang and Edwin Chan
20. Professional Practice for Architects in Hong Kong, Pace Publications, 1998, Wong Wah Sang

Reference Literature related to Legislative Control:

CAP123
Buildings Ordinance
CAP123A
Building (Administration) Regulations
CAP123C
Building (Demolition Works) Regulations
CAP123F
Building (Planning) Regulations
CAP 123G
Building (Private Streets and Access Roads) Regulations
CAP123H
Building (Refuse Storage and Material Recovery Chambers and Refuse Chutes) Regulations
CAP123M
Building (Energy Efficiency) Regulations
CAP123Q
Building (Construction) Regulations

Practice notes for authorized persons, registered structural engineers and registered geotechnical engineers (abbreviated as PNAP)

Design Manual – **Barrier-free Access**

Code of Practice for **Fire Safety in Buildings**
Code of Practice for **Overall Thermal Transfer Value in Buildings**
Code of Practice for **Demolition of Buildings**
Code of Practice for **Site Supervision**
Code of Practice for **Structural Use of Glass**
Code of Practice for **Structural Use of Concrete**

Literature on Specification:

General Specification for Building – Architectural Services Department
https://www.archsd.gov.hk/en/publications-publicity/general-specification-for-building.html

SPECIAL RECOMMENDATION on Materials and Technology:

Building Materials and Technology in Hong Kong: Wong Wah Sang, Chan Wing Yan Alice, Wai Chui Chi Rosman, Kee Yee Chun Tris; 2018 HKU Press

Note: *This book has been particularly prepared for the reference of young architects with chapters on –*
Trades of materials and technology (preliminaries, demolition, excavation, concrete, foundation, brickwork and blockwork, masonry and granite, roofing, waterproofing, expansion joints, carpentry, ironmongery, staircases, windows, glazing, curtain wall and cladding, finishes, plasterwork, painting, builders' works and external works etc.),
Case studies (examples of various building types like commercial buildings, residential buildings and GIC buildings)
Drawing Practices (from design sketches to tender drawings)
Construction Specifications (role, format, organization and contents of specifications)

Building Enclosure in Hong Kong: Wong Wah Sang, 1998 HKU Press

Note: *This book has been prepared for the record of construction details in Hong Kong with reference to design. Design drawings, details, isometric projections and photographs are used to illustrate the tectonics behind architecture with examples of various types of buildings*

SAMPLE QUESTIONS

This examination consists of multiple-choice questions only. The candidate is expected to select one out of four choices to be the answer.

Sample questions can be found at the following link:

https://www.hkia.net/hk/pdf/PA/Sample_Questions.pdf

Note: *Most questions are set to ask for a straightforward answer such as,*

18. As a defect of plasterwork, efflorescence is

A. inevitable due to the nature of the plaster.
B. caused by water absorption in the background.
C. due to relative movement between different plaster coats.
D. caused by water transmitting the soluble salts from the background.

Ans. : D

Some questions look at the negation side such as,

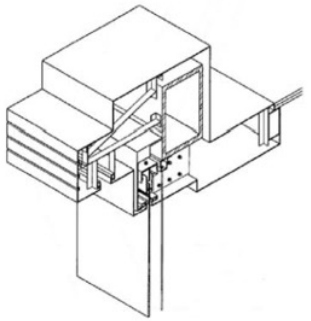
19. Which of the following does ***not*** require submission to the Buildings Department for approval?

A. Glass shop front at ground floor with design span of 8m.
B. Window wall system with a structural opening of 2m x 1.2m.
C. Window at a location where the design wind pressure is greater than 2.86kPa.
D. Stone cladding works at external walls of a ground floor with area 4m high x 6m long.

Ans. : D

Some are based on drawings such as,

20. Which of the following is represented by the following isometric diagram?



A. Skylight
B. Suspension glass details
C. Environmental screen for windows
D. Unitized glazing panels in curtain wall

Ans. : B

Questions can be based on work sequence, such as,

27. Arrange the following tasks in the ***most*** appropriate sequence for top-down construction of a 3-level basement.

(1) Pile test
(2) Construction of ground beam
(3) Superstructure construction and top-down basement construction simultaneously
(4) Construction of vertical structural members from pile cap to ground slab level
(5) Construction of piles
(6) Pile cap construction

A. (3), (5), (4), (6), (1), (2)
B. (5), (6), (1), (4), (3), (2)
C. (5), (1), (6), (4), (2), (3)
D. (3), (5), (6), (1), (4), (2)

Ans. : C

SECTION B

STATUTORY REQUIREMENTS & CONSTRUCTION SPECIFICATIONS

B1. STATUTORY REQUIREMENTS

The Hong Kong Buildings Ordinance and subsidiary regulations, codes of practices and design manuals as well as the Practice Notes for Authorized Persons, Registered Engineers and Registered Geotechnical Engineers (PNAP) are the basis of statutory control for architectural practice in Hong Kong.

***Note**: These statutory requirements will be best comprehended when the architect tackles actual issues associated with them. However, one should have an overview of these requirements so that the relevant documents can be referred to easily.*

***Note:** The scope of this Paper on Building Technology lays more emphasis on the technical and design aspects of the statutory control than the associated administrative procedure. Notwithstanding that, candidates are reminded of the principal duties of an Authorized Person under the Buildings Ordinance.*

The building codes more specific for control of building materials and technology are listed as follows:

CAP123
Buildings Ordinance

CAP123A
Building (Administration) Regulations

CAP123C
Building (Demolition Works) Regulations

CAP123F
Building (Planning) Regulations

CAP123G
Building (Private Streets and Access Roads) Regulations

CAP123H
Building (Refuse Storage and Material Recovery Chambers and Refuse Chutes) Regulations

CAP123M
Building (Energy Efficiency) Regulations

CAP123Q
Building (Construction) Regulations

Practice notes for authorized persons, registered structural engineers and registered geotechnical engineers

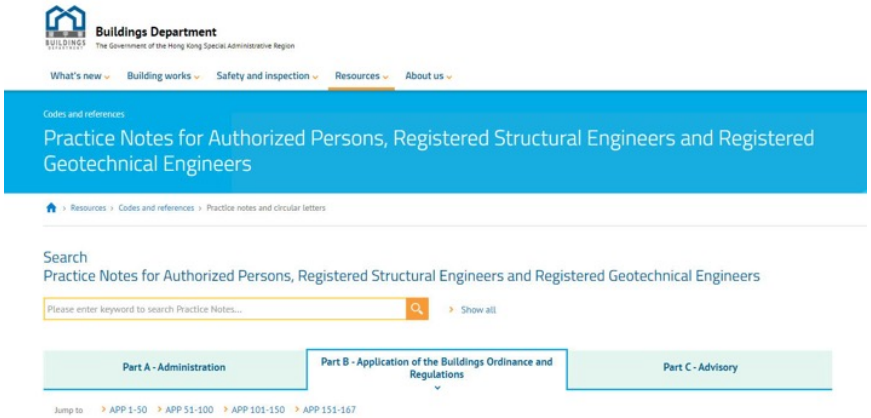
Design Manual – **Barrier-free Access**

Code of Practice for **Fire Safety in Buildings**
Code of Practice for **Overall Thermal Transfer Value in Buildings**
Code of Practice for **Demolition of Buildings**
Code of Practice for **Site Supervision**
Code of Practice for **Structural Use of Glass**

***For example,** in the Building (Construction) Regulations, there are relevant clauses in various parts such as:*

Part 4 Requirements for Design and Construction
Part 5 Requirements for Site Investigation
Part 6 Requirements for Foundations
Part 7 Requirements for Site Formation Works
Part 8 Requirements for External Wall, Cladding and Curtain Wall
Part 9 Protection against Moisture Penetration
Part 10 Requirements for Fire Safety
Part 11 Requirements for User Safety
Part 12 Miscellaneous

Note: *The PNAP (available and updated online) contains 3 parts. Part B and C contain relevant clauses on building technology.*



An overview of PNAP relevant to building materials and technology are summarized as follows:

Part B: Application of the Buildings Ordinance and Regulations

APP-4 Water Supply and Wells
APP-8 Chimneys and Flues
APP-15 Site Formation
APP-21 Demolition Works
APP-22 Dewatering
APP-23 Hoardings
APP-26 Pouring of Concrete against Adjoining Walls
APP-27 Gas Water Heaters
APP-33 Pulverized Fuel Ash
APP-35 Refuse Storage and Collection
APP-37 Curtain Wall
APP-45 Testing of Reinforcement
APP-49 Site Investigation
APP-53 Building (Construction) Regulations
APP-66 Metal Refuse Chutes
APP-70 Plastic Sheet on Scaffolding
APP-80, 83 and 106 Code of Practice for Fire Resisting Construction
APP-85 Revised Fire safety Codes
APP-93 Planning and Design of Drainage Works
APP-110 Protective Barriers
APP-116 Aluminium Windows
APP-118 Testing of materials
APP-120 Concrete Batching Plant
APP-126 Signboards
APP-127 Contractor's Sheds
APP-129 Recycled Aggregates
APP-143 Precast Concrete Construction
APP-144 Run-in and run-out
APP-146 Metal Gates
APP-152 Sustainable Building Design
APP-166 Metal Grille and Louvre
APP-167 Insitu Concrete

Part C: Advisory

Some PNAP (also listed in Section C) relevant to this assessment are listed as an overview:

ADV-1 Asbestos
ADV-5 Tropical Hardwood Timber
ADV-10 Lift Shaft Platforms
ADV-11 Suspended Working Platforms
ADV-14 Facilities for External Inspection and Maintenance of Buildings
ADV-19 Construction and Demolition Waste
ADV-22 Felling or Transplanting of Trees
ADV-27 Protection of Natural Streams / Rivers from Adverse Impacts arising from Construction Works
ADV-31 Building External Finishes – Wet-fixed Tiles
ADV-34 Building Information Modeling
ADV-35 Greening in Buildings
ADV-36 Modular Integrated Construction

For example: *PNAP ADV-1 on Asbestos discusses Control and Abatement Works.*

Asbestos

Exposure to asbestos is hazardous to health. As a general rule, all persons involved in the design, construction, and maintenance of buildings must avoid the use of asbestos containing material (ACM) and ensure that the removal of ACM from **existing buildings** will be carried out only by registered asbestos personnel.

B2. CONSTRUCTION SPECIFICATIONS

Construction specifications serve as documented requirements of products, materials and works for the Contractor. It will form part of the contract document. For each of the building materials, products, components and technology to be employed, it is stated in writing within the construction specifications about the standard required for the contractor to comply. This is to be read in conjunction with the technical drawings.

Specifications range from **performance specifications** (which is open to further design by the contractor) to **prescriptive specifications** (which is closed where the design is already complete). It is common to adopt both types of specifications in combination to achieve the best quality. (Reference to the NBS specifications of RIBA).

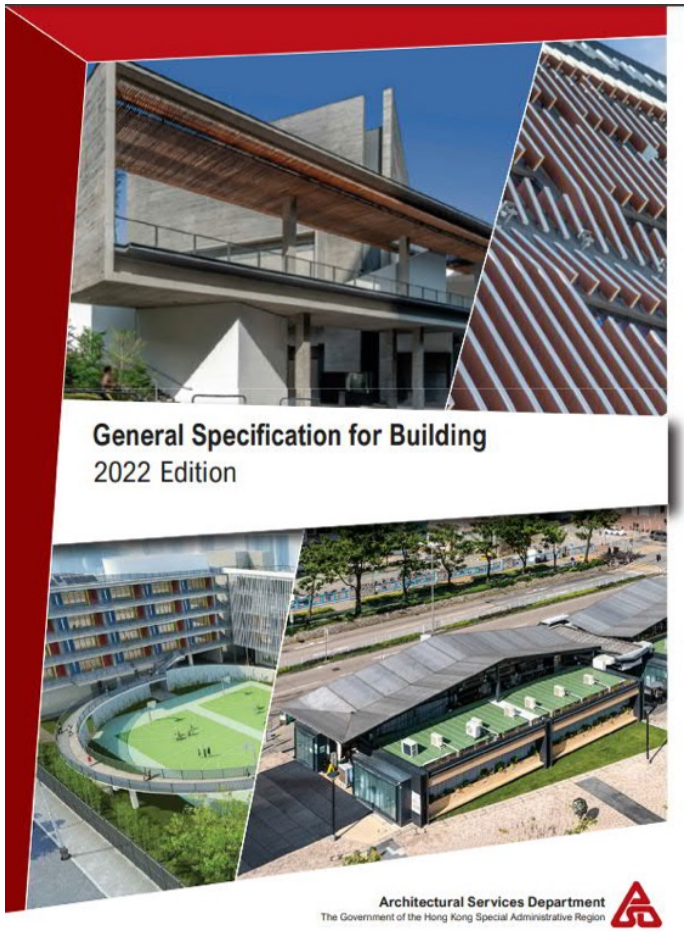
Question: What should be specified?

-Scope of work
-Standards and code compliance
-Performance requirement for purpose-made materials (composition, origin)
-Workmanship
-Submission and approval procedures
-Testing and commissioning
-Guarantee/ warranty
-Tolerance
-Alternatives

Specifications usually are documents in substantial volumes which can take a long time to read and use. There is a wide-spread desire to keep them as concise as possible. For example:

-Not to repeat contents covered in the contract.
-Not to repeat information already specified by reference to another document.
-Use generic description in preference to exhaustive examples.
-Not necessary to emphasize on particular contents.
-Leave out needless 'justificatory' explanation; however, where the objective of an instruction may not be clear to the contractor, it may be helpful to state it.

Note: *The specification is usually prepared by experienced architects who are technically competent with ample experience in actual professional practice. Most architectural firms have their own copy of specifications which have been fully verified and tested since any mistakes or discrepancies in the specification may create contractual variation or disputes which are not welcomed.*



Reference: *The General Specification for Building prepared by the Technical Information Committee of the Architectural Services Department (available online) may serve as a good reference for understanding of the specification. However, it should be noted that Architectural Services Department is a government body and the administrative procedure for the building projects is different from most private practices.*

The contents of this General Specification are as follows:

CONTENTS

Section No.	Title of Section	Pages
1	Preliminaries	1-1 ~ 1-23
2	Demolition, Site Clearance and Alterations	2-1 ~ 2-12
3	Excavation and Earthwork	3-1 ~ 3-15
4	Steel Sheet Piling Work	4-1 ~ 4-4
5	Piling Work	5-1 ~ 5-43
6	Structural Concrete Work	6-1 ~ 6-36
7	Prestressed Concrete Work	7-1 ~ 7-9
8	Concrete for Minor and Non-structural Work	8-1 ~ 8-4
9	Brickwork & Blockwork	9-1 ~ 9-6
10	Masonry	10-1 ~ 10-5
11	Tanking	11-1 ~ 11-4
12	Roofing	12-1 ~ 12-13
13	Carpentry and Joinery	13-1 ~ 13-13
14	Ironmongery	14-1 ~ 14-14
15	Structural Steel Work	15-1 ~ 15-22
16	Curtain Walls	16-1 ~ 16-41
17	Metal Work	17-1 ~ 17-13
18	Finishes	18-1 ~ 18-46
19	Sanitary Appliances	19-1 ~ 19-5
20	Glazing	20-1 ~ 20-12
21	Painting	21-1 ~ 21-24
22	Internal Fittings and Fixtures	22-1 ~ 22-11
23	Plumbing and Drainage	23-1
24	External Works	24-1 ~ 24-7
25	Landscape Work	25-1 ~ 25-67
26	Geotechnical Works on Soil and Rock Slopes	26-1 ~ 26-45
27	Modular Integrated Construction	27-1 ~27-18

SECTION C

REFERENCES TO TRADES IN CONSTRUCTION

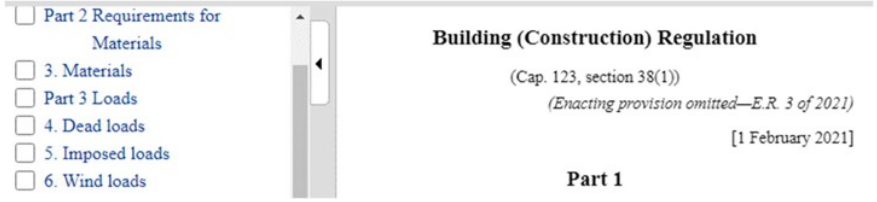
Materials should generally comply with all relevant legislation, Building Regulations, Codes of Practices and Practice Notes for Authorized Persons. In this section, key issues are stated with the trades in construction and relevant literature is listed for easy reference. This section should be read together with the subsequent sections which contain examples of working details.

Reference literature is abbreviated as follows:

The General Specification for Building (ArchSD): **GSA**
The Building (Construction) Regulations: **BCR**
The Practice Notes for Authorized Persons, Registered Engineers and Geotechnical Engineers (Application): **PNAP**
Building Materials and Technology in Hong Kong: **BMT**
Building Enclosure in Hong Kong: **BEHK**
Code of Practice: **CP**

Note: *BCR Part 2 clause 3 states general requirements on Materials.*

For example, in the Building (Construction) Regulations, Part 2, Requirements for Materials:



Clause 3. Materials says:

(1) All materials used in building works or street works must be—
(a) of a nature and quality suitable for their intended use or purpose;
(b) adequately mixed or prepared; and
(c) applied, used or fixed so as to perform adequately their intended functions.
(2) To ensure that subsection (1) is complied with, the materials used must be adequately tested by recognized tests.

Comments: *This refers to the knowledge of the characteristics of any material used in the construction including the ingredients, method of application, tests required (if any) and the appropriateness of the materials in terms of their application.*

The functional characteristics of a material would include structural serviceability, safety, habitability, durability, compatibility and aesthetics (though it is not a statutory requirement to make buildings look pleasant).
Take glass for instance. A glass construction should be adequately supported, allowing for movement and catering to stand its loading whether it is from external natural forces or from human action (structural serviceability). This construction should be safe in case of breakage or fire (safety). It should serve to withstand or transmit the natural elements such as water, wind, heat, light or sound to meet its design objectives (habitability). It should be durable and stand fair wear and tear in normal use for certain period of time (durability). The make of the glass should be appropriate with the other materials in its vicinity and not affect nor be affected to cause chemical changes (compatibility). Also, the texture, colour, thickness and coating of the glass is chosen for its appearance (aesthetics). There may be corresponding specifications, certifications or tests to ascertain these characteristics.

Note: *BCR Part 4 states General Requirements for Design and Construction.*

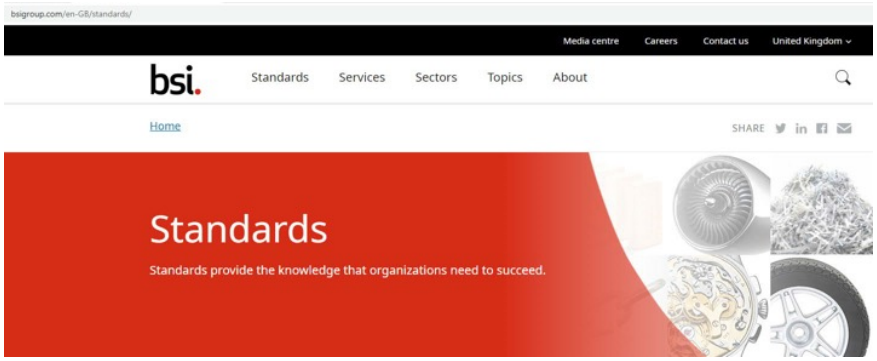
For example*: GSA Section 1 on Preliminaries have stated general requirement for materials and quality:*

Material	**1.56**	Materials for inclusion in the permanent works shall be new unless otherwise specified.
Quality generally	**1.57**	Materials and workmanship shall generally be consistent with good building practice in Hong Kong and shall comply with the Regulations and the relevant BS, BS EN or CP unless otherwise specified and/or approved.

Also, Section 1 on Preliminaries has included international standards referred to in the corresponding material. Also, equivalent standards may be accepted in certain cases.

Reference: *PNAP*
APP-53 Building (Construction) Regulations
APP-118 Testing of Materials
APP-152 Sustainable Building Design

Equivalent standards and imperial sizes	**1.15**	When products or materials to the appropriate standards are not available, products or materials conforming with equivalent standards (or performance) shall be acceptable subject to approval. When a material is available in metric size, an imperial size equivalent shall not be acceptable. If a material is unobtainable in metric size, a material of the nearest equivalent imperial size which will fully meet the specification may be substituted if prior approval has been obtained, but the rates will not be changed from those submitted for the materials specified.



Note: *Knowledge to the exact details of the contents in the different standards such as BS, BSEN, CS etc is not required in HKIA PA.*

Other issues are the general obligations of the contractor, temporary works and services, scaffold system, administration and attendance as well as general requirements on materials and workmanship.

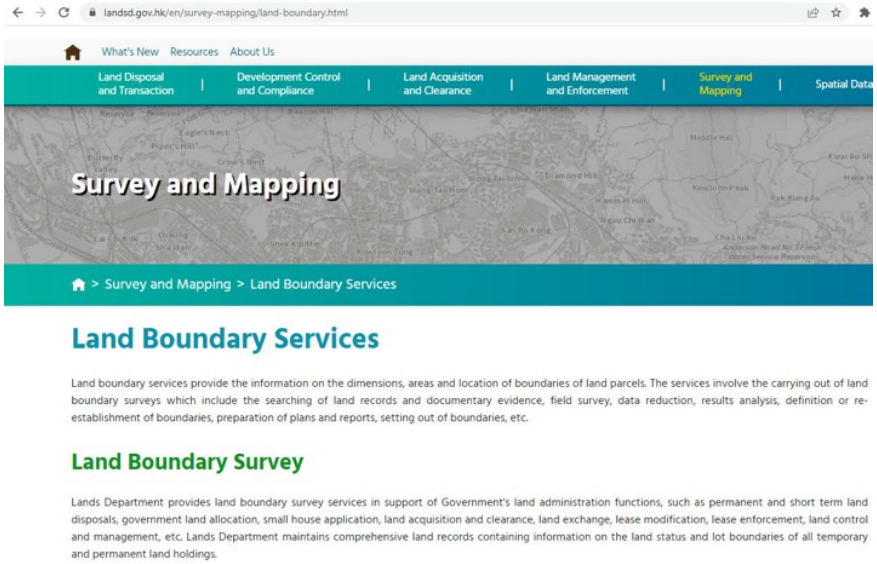
CX. TEMPORARY WORKS

Temporary works for construction are those works that are used for a certain period of time and in certain locations during construction but will not remain after the completion of the building. Examples are setting out, hoardings, fencing, scaffolding, signboards, contractor's sheds and accommodation, storage sheds and temporary offices. However, these are included in the contractor's works and are required to conform to the building code.

Reference: *Section 1 Preliminaries, General Specification for Buildings, ArchSD*

CX.1. SETTING OUT

Setting out is the first task the contractor will perform on-site for a new building but usually not particularly specified with materials and workmanship in the contract documents. It transfers the information on the location of the building from the drawings to the actual construction site with reference to its site boundary and horizontal levels (based on the principal datum). Setting out is usually repeated from time to time as the building is constructed gradually to upper levels to determine the accuracy of configuration. Also, information regarding the site boundary can be obtained from the Lands Department.



CX.2. HOARDINGS

Hoardings, covered walkways and gantries are covered in Part IX of the Building (Planning) Regulations.

Reference: *Maintenance of hoardings, etc. are the responsibility of the building owner. Requirements of maintenance and safety are stated in clause 66 and clause 68 of the Building (Planning) Regulations.*

Reference: *PNAP APP-23 on hoardings, covered walkways and gantries gives design requirement, lighting standard, use and maintenance of hoardings.*

Reference: Hoarding Plans, no. 9711/C/A01 to no. 9711/H2/S05, from Architectural Standard Drawings by ArchSD,
https://www.archsd.gov.hk/media/publications-publicity/standard-drawings/Architectural%20Standard%20Drawings_20210129.pdf

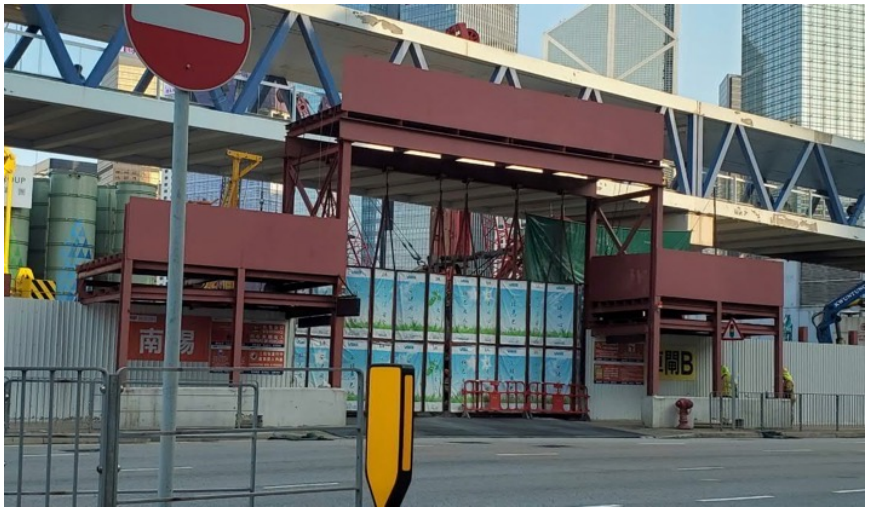
For example: *APP-23 on Hoardings, Covered Walkways and Gantries describes the technical and design requirements as well as the administrative procedure for the Hoarding Permit.*

9. A minimum clear width of 1.1 m is required for hoardings / covered walkways sited on a carriageway. As regards hoardings / covered walkways on a footpath, the clear width should be related to the existing pavement width as follows:-

Existing Pavement Width	Clear Width in Walkway
2.5 m or less	Normally 1.5 m minimum. Exemption may be considered if the pavement is of insufficient width
over 2.5 m to 3 m	Width of the pavement minus 0.8 m subject to a maximum of 2m
over 3 m	2 m

The required clear width must not be obstructed in any manner e.g. by traffic signs, scaffold poles, supports for formwork or the like. The vertical clearance inside the covered walkway should be 2.3 m minimum.

On the technical aspect, this explains the construction of hoardings/covered walkways, lighting standards, temporary accesses via gantry for construction vehicles as well as the proper use and maintenance. An appendix of the PNAP explains the standard requirements for Highways Department and Transport Department. Another appendix shows the details for temporary run-in construction.



Reference: *PNAP APP-126 Signboards*
APP-144 Run-in and run-out

Note: *Water-filled barriers made of recyclable plastic materials are often used by contractors for the delineation of temporary lanes and protection of construction sites during road construction works. These need to follow Highways' standards.*

Reference: *Drawing H6166 and H6167 of the Standard Details from Highways Department.*

CX.3. CONTRACTOR'S SHED

Contractor's sheds are temporary buildings usually designed and constructed by the contractor for use during the construction period.

Reference: *Part VII of the Building (Planning) Regulations is on Temporary Buildings which includes contractor's sheds. Clause 50 states the definition of temporary buildings and the materials allowed to be used. Clause 53 specifically states the requirements for the contractor's sheds.*

Reference: *PNAP APP-127 Contractor's Sheds which allows self-certification by RGBC/RSC or AP and RSE. A Permit would be issued upon application with fulfillment of criteria set out in the PNAP*

CX.4. MISCELLANEOUS CONSTRUCTION MATTERS

There are also items, though directly responsible by the contractor, that the architect as the site supervisor should be aware.

Reference: *PNAP*

APP-15 Site Formation,
APP-21 Demolition Works,
APP-22 Dewatering,
APP-49 Site Investigation,
APP-70 Plastic Sheet on Scaffolding

ADV-11 Suspended Working Platforms
ADV-19 Construction and Demolition Waste
ADV-22 Felling or Transplanting of Trees
ADV-27 Protection of Natural Streams/Rivers from Adverse Impacts arising from Construction Works

For example: *PNAP ADV-11 on Suspended Working Platforms discusses Construction, Maintenance, Installation and Tests.*

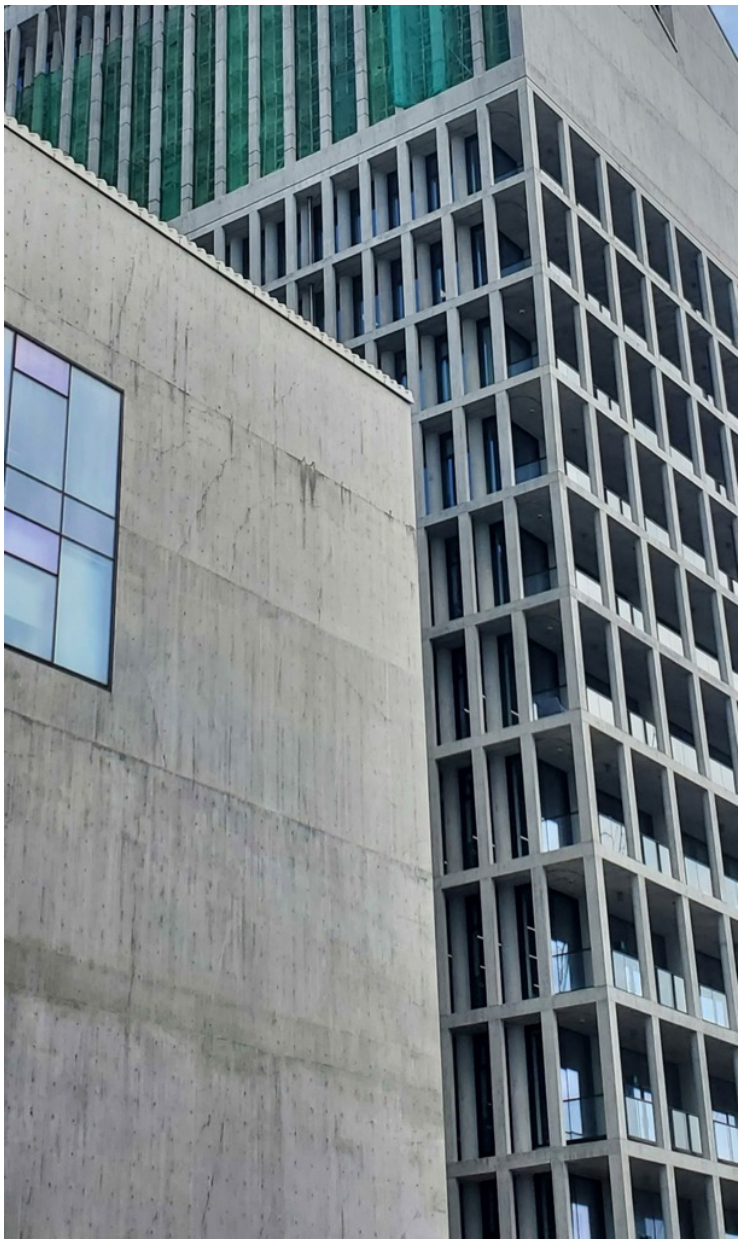
Suspended Working Platforms

A 'suspended working platform' is a scaffold or a working platform suspended from a building or structure by means of lifting gear and capable of being raised or lowered by lifting appliances and includes all lifting appliances, lifting gear, counterweights, ballast, outriggers, other supports and the whole of the mechanical and electrical apparatus required in connection with the operation and safety of such a scaffold or working platform.

For example: *PNAP ADV-19 on Construction and Demolition Waste discusses Waste Minimization and Waste Management.*

3. As a Waste Management Plan (the Plan) is a useful tool in ensuring that measures are taken during the construction stage to reduce C&D materials, it is recommended that you advise your client to require the contractor to submit such a plan to you for agreement. The following are the areas that may be covered in the Plan :

i) the types of waste and their estimated quantities;
ii) the timing of waste arising;
iii) measures for reducing waste generation;
iv) on-site waste separation;
v) on-site and off-site material reuse;
vi) areas for waste storage;
vii) quantities of waste requiring off-site disposal;
viii) disposal outlets;
ix) monitoring and auditing programme;
x) organisation structure for waste management;
xi) a list of materials to be reused or recycled with estimated quantities;
xii) implementation of the trip ticket system (see paragraph 5 below for reference);
xiii) method of processing, storing and disposal of hazardous waste; and
xiv) method of dealing with packaging material.



C1. CONCRETE

C1.1. Formwork
-Falsework, formwork, permanent or left-in formwork
-Props and bracing
-Striking of formwork

C1.2. Steel Reinforcement
-Steel reinforcement
-Chairs, supports, spacers, tying wire for reinforcement
-Test certificates
-Cutting and bending of steel reinforcement
-Welding
-Epoxy coatings to reinforcement
-Concrete cover
-Cleaning

C1.3. Concrete
-Ingredients of concrete
-Cement
-Pulverized-fuel ash (PFA)
-Concrete tests
-Water
-Water/cement ratio
-Aggregates (fine and coarse)
-Admixtures/additives
-Delivery & storage of materials
-Recycled aggregates

C1.4. Concrete Mix
-Standard Mixes
-Designed Mixes
-Trial Mixes
-Ready Mixes
-Workability and Slump Test

C1.5. Mixing & Placing
-Mixing
-Transportation and placing
-Compaction

-Construction joints
-Concrete curing
-Concrete cube test
-Test cores
-Concrete failures/defects

C1.6. Finishes for Concrete
-Fair-faced concrete
-Rough board finish
-Worked surface finish
-Applied surface finish

C1.7. Miscellaneous items
-Movement joints
-Watertight construction
-Water tanks
-Insitu concrete slabs
-Lintels
-Grouts

Reference: *GSA –*
Section 6 Structural Concrete Work,
Section 7 Prestressed Concrete Work,
Section 8 Concrete for Minor & Non-structural Work

Reference: *BCR*
Part 2 Requirements for Materials
Part 4 Requirements for Design and Construction
Part 9 Protection against moisture and water
-Clause 32 Walls
-Clause 33 Floor and adjoining ground surface
-Clause 34 Roof
Part 10 Requirements for Fire Safety

Reference: *CP for Structural Use of Concrete -*
Section 1 General – Glossary
Section 2 Basis of Design
Section 3 Materials
Section 4 Durability and Fire Resistance
Section 7 Serviceability Limit States
Section 10 General Specification, Construction and Workmanship
Section 11 Quality Assurance and Quality Control

Reference: *CP for Fire Safety in Buildings 2011 (October 2015 version)*
Part C-Fire Resisting Construction

Reference: *PNAP*
APP-26 Pouring of Concrete against Adjoining Walls
APP-33 Pulverised Fuel Ash
APP-45 Testing of Reinforcement
APP-66 Metal Refuse Chutes
APP-80, 83 and 106 Code of Practice for Fire Resisting Construction
APP-85 Revised Fire safety Codes
APP-118 Testing of materials
APP-120 Concrete Batching Plant
APP-129 Recycled Aggregates
APP-143 Precast Concrete Construction
APP-167 Insitu Concrete

Reference: *BMT-*
Chapter 2.3 Concrete Work

C2. BRICKWORK & BLOCKWORK

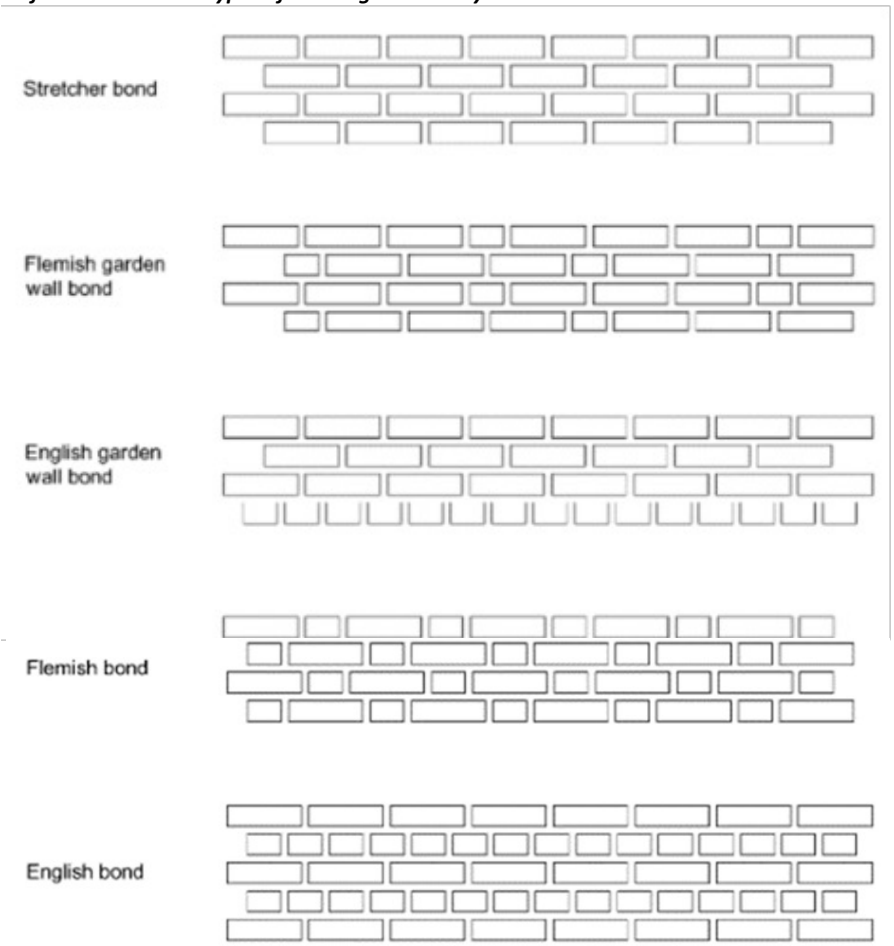
C2.1. Types of Bricks
-Bricks
-Facing bricks
-Engineering & loadbearing bricks
-Concrete blocks
-Hollow blocks
-Glass blocks

C2.2. Materials
-Wall ties
-Mortars

C2.3. Workmanship
-Mix Proportions
-Mixing
-Testing

-Uniformity
-Limitations
-Tolerances
-Cavity walling
-Finishing of joints
-Holes and chases
-Types of Bonding

Reference: Common types of bonding in masonry wall construction:



Reference: *GSA –*
Section 9 Brickwork and Blockwork
Reference: *BMT-*
Chapter 2.5 Brick and Blockwork

C3. MASONRY

C3.1. Materials
-Stone
-Mortar
-Wall ties

C3.2. Workmanship
-Tolerances
-Rubble Walling
-Ashlar Walling
-Walling built against concrete
-Maintenance and cleaning

Reference: *BMT-*
Chapter 2.6 Masonry and Granite/Marble Works

Reference: *GSA –*
Section 10 Masonry

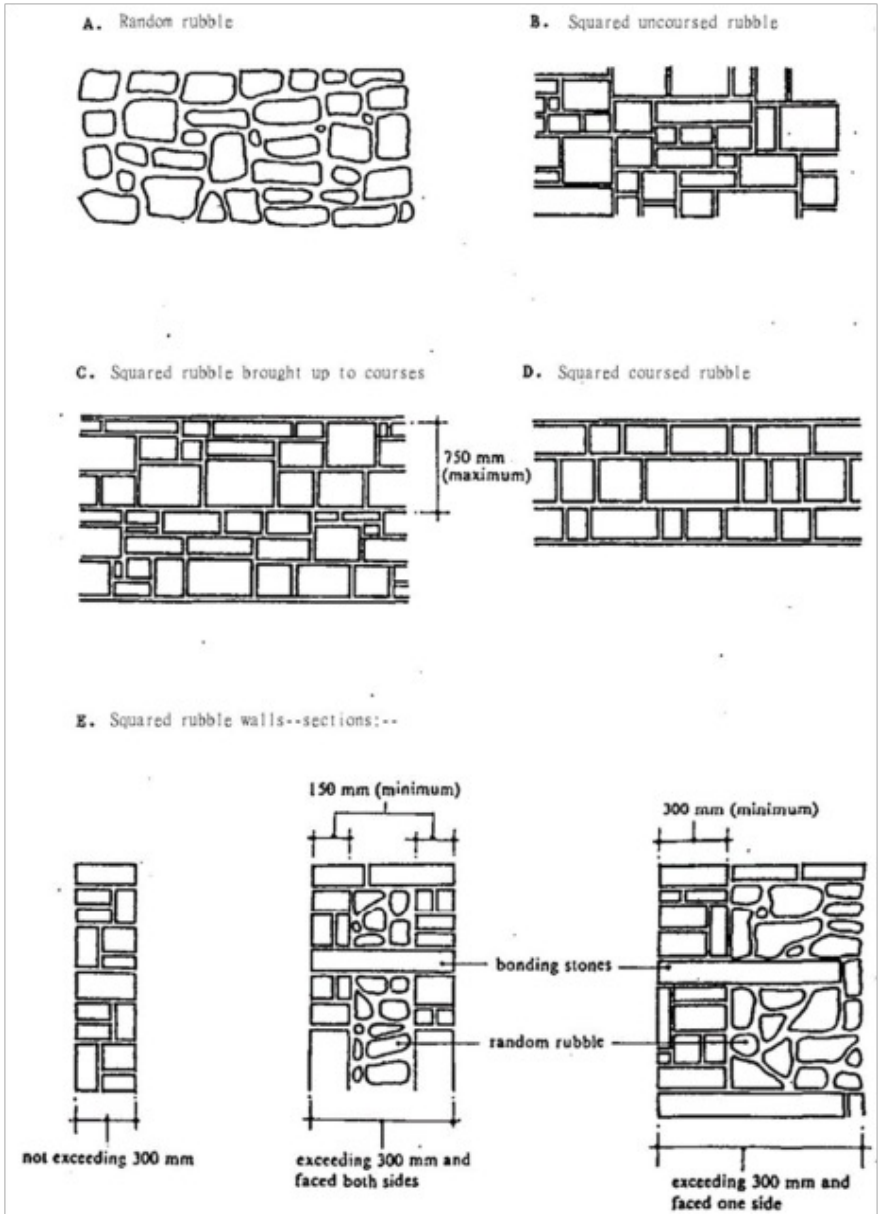
For Example: *GSA Section 10 on Masonry has a general requirement that the stone (granite) shall be free from defects and comply with the relevant standards (e.g. BS EN, British Standards European Norm). Related materials including mortar, damp proof course and wall ties are specified. Tolerance is an important part of the specifications as workmanship and natural movement will cause minor deviations in construction.*

TABLE 10.1

Tolerance (+ or - mm)

	Rubble Walling	Ashlar Walling
Thickness of bed joints	5 - 15	5 - 10
Position on plan	25	15
Length	25	15
Height	25	10
Level of bed joints (in any 5000 mm)	25	10
Straightness (in any 5000 mm)	25	15
Verticality (in any 3000 mm)	20	15

Mock up sample, walling types, preparation, laying and jointing, building against concrete, maintenance and cleaning etc. are specified.



C4. STONE CLADDING

C4.1. Materials
-Types of stone, marbles, granites
-Stone with honeycomb backing

C4.2. Workmanship
-Stone cladding
-Open-joint, wet-fixing and dry-mount fixing
-Sealants

Reference: *BMT-*
Chapter 2.6 Masonry and Granite/Marble Works
Chapter 3.9 Case Study of Granite and Glass Technology

C5. TANKING

C5.1. Materials
-Mastic asphalt
-Flexible sheet membrane
-Liquid applied membrane
-Testing

C5.2. Workmanship
-Surface preparation
-Laying, application and protection

Reference: *GSA –*
Section 11 Tanking

C6. ROOFING & WATERPROOFING

C6.1. Roofing
-Coverings and flashing
-Bitumen felt built-up roofing
-Bituminous emulsion roofing
-Mastic asphalt roofing
-Tile roofing
-Metal sheet roofing and cladding
-Profiled unreinforced rigid PVC sheets
-Compressed particle sheets
-Proprietary roofing systems
-Tests and warranty

C6.2. Waterproofing
-Waterproofing materials
-Expansion joints
-Sealants

Reference: *BCR-*
Part 9 Protection against moisture and water
Clause 32 Walls
Clause 33 Floor and adjoining ground surface
Clause 34 Roof

Reference: *GSA –*
Section 12 Roofing

Reference: *BMT-*
Chapter 2.7 Roofing, Waterproofing and Expansion Joints

Reference for good practice: *BD-Guidelines on Prevention of Water Seepage in New Buildings*
https://www.bd.gov.hk/doc/en/resources/codes-and-references/code-and-design-manuals/GWS.pdf

C7. CARPENTRY & JOINERY

C7.1. Materials
-Timber for external use
-Moisture content
-Softwood and hardwood
-Types of flooring
-Plywood
-Blockboard, hardboard, insulating board, chipboard
-PVC sheet, laminated plastic sheet
-Acoustic tiles
-Proprietary ceiling systems

-Nails, screws, plugs, adhesive
-Wood preservative

For example: *PNAP ADV-5 on Tropical Hardwood Timber discusses about less use of timber in Hoarding, alternative materials for Temporary Formwork, Reuse of Timber and Renewable Sources, etc. for environmental awareness.*

C7.2. Workmanship
-Framed joinery
-Fixing, nailing, screwing
-Wood preservative
-Types of flooring
-Suspended ceilings
-Types of doors
-Fire resisting doors
-Smoke and intumescent seals
-Architraves

C7.3. Internal Fittings and Fixtures
-Partitions
-Framework and lining panels
-Glass for glazed panels
-Skirtings
-Pinboards
-Finishings and colours
-Studding and fixing
-Demountable partitions
-Venetian blinds
-Cubicle systems
-Lockers
-Folding/sliding partitions

Reference: *GSA –*
Section 13 Carpentry & Joinery
Section 22 Internal Fittings and Fixtures

Reference: *BMT-*
Chapter 2.8 Carpentry, Joinery & Ironmongery

Reference: *PNAP ADV-5 Tropical Harwood Timber*

C8. IRONMONGERY

C8.1. Door Ironmongery
-Certification
-Fire and smoke control
-Manufacturer's instructions
-Materials and finishes
-Keys
-Hinges and pivots
-Door closers
-Floor springs
-Barrier free access
-Electromagnetic fire-hold closers
-Locks
-Door furniture and plates
-Panic exit devices
-Bolts
-Door stops
-Door guard
-Door viewer

C8.2. Furniture Ironmongery
-Fittings to drawers and cupboards
-Materials and finishes

C8.3. Ironmongery Sundry
-Dowels for door frames
-Fixing bolts
-Water bar
-Curtain track and rail
-Towel rail

Reference: *GSA –*
Section 14 Ironmongery

Reference: *BMT-*
Chapter 2.8 Carpentry, Joinery & Ironmongery

C9. STEEL WORKS

C9.1. Materials
-Mechanical properties and chemical composition
-Steel sheets, bolts and nuts
-Testing of materials

C9.2. Workmanship
-Handling, transportation and storage
-Cutting, sawing, drilling and forming holes
-Curving and shaping
-Anchor bolts
-Fabrication, erection, bolting, welding
-Painting and corrosion protection
-Fire protection

C9.3. Fencing and Gates
-Fencing wire
-Steel fence posts and gates

Reference: *GSA –*
Section 15 Structural Steel Work

C10. METAL WINDOWS & GLAZING

C10.1. Metal Windows & Doors

-Materials for window frames: aluminium, steel, associated hardware
-Construction for steel windows and doors
-Construction for aluminium windows and doors
-Fixing windows and doors
-Louvres and frames
-Roller shutters and doors
-Fire resisting shutters

C10.2. Materials for Glazing

-Types of glass: float glass, sheet glass, translucent & obscured glass, fire rated glass, mirror glass, heat strengthened glass, fully tempered glass, tinted glass, coated glass, laminated safety and security glass
-Insulating glass
-Vision glass and spandrel glass
-Flatness
-Performance requirements
-Plastic glazing
-Glazing materials and compounds
-Gaskets and structural sealants
-Setting blocks
-Edge quality

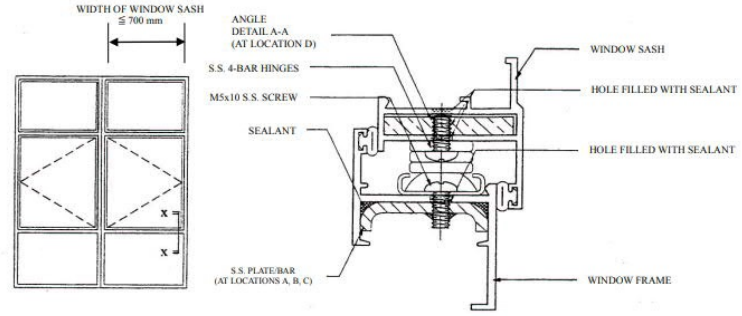
C10.3. Workmanship

-Installation of different glass types
-Glass orientation
-Structural sealant
-External glazing
-Edge clearance
-Bedding & tooling
-Glazing with putty
-Glazing beads
-Aluminium windows
-Cleaning and making good

Reference: *BCR-*
Part 9 Protection against moisture and water
-Clause 32 Walls

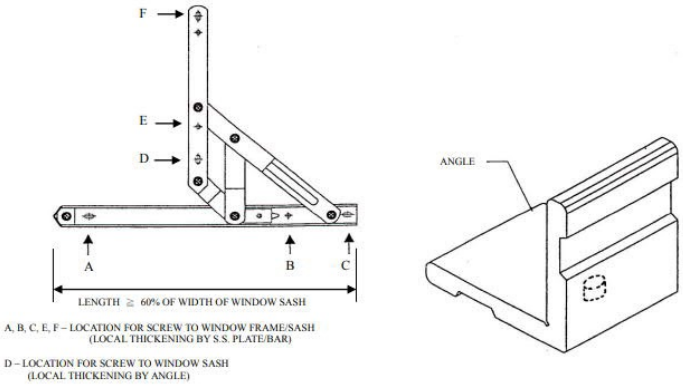
Reference: *PNAP*
APP-116 Aluminium Windows
For example: *The PNAP APP-116 on the technical requirements of Aluminium Windows describes design and installation requirements, window stay, cleaning, water seepage and water penetration test. The appendix in this PNAP gives guidelines on fixing of 4-bar hinges and includes drawings for illustration:*

Annex I to Appendix A
(PNAP APP-116)



ELEVATION

SECTION X - X
SIDE HUNG WINDOW WITH S.S. PLATE/BAR AND ALUMINIUM ANGLE INSERTED FOR FIXING SCREWS



S.S. 4-BAR HINGE

DETAIL A - A

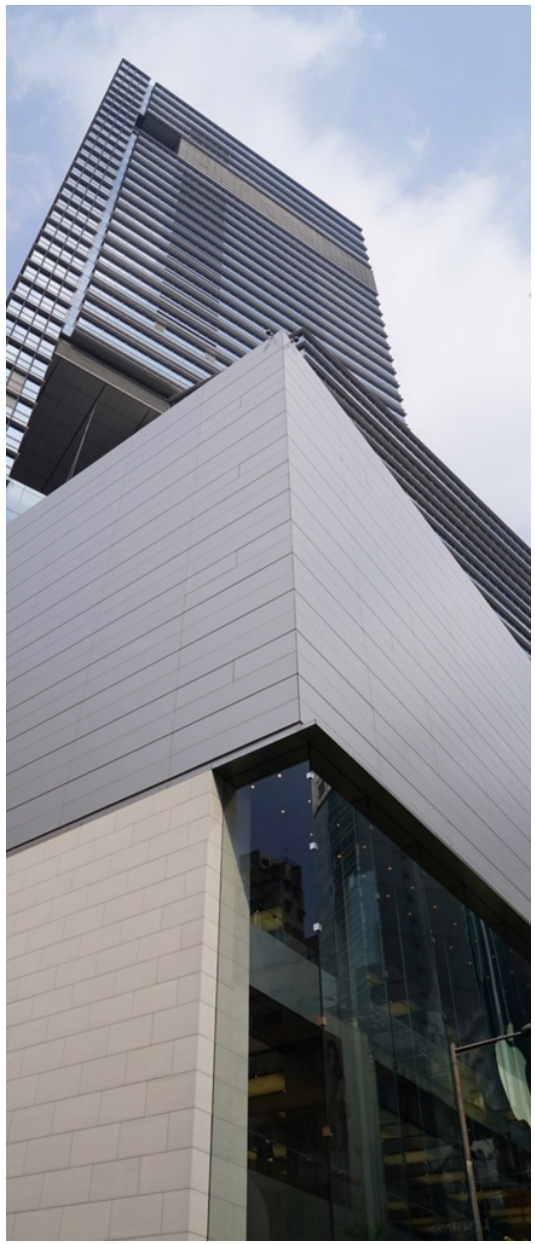
This APP-116 also refers to APP-37 and APP-53 for standards commonly used for construction of windows.

Reference: *GSA –*
Section 17 Metalwork
Section 20 Glazing

Reference: *BMT-*
Chapter 2.10 Metal Windows and Doors

Reference: *BD-*
Code of Practice for Structural Use of Glass

For example: *GSA Section 20 on Glazing specifies both materials and workmanship. On materials, there are general standards for glass, different types of glass, criteria for glass, glazing materials, various fixing components etc. On workmanship, there are also general applicable standards and installation for different types of glass as well as cleaning and making good.*



C11. CURTAIN WALLS & CLADDING

C11.1. Scope of work
-Included work and related work
-Submissions by the contractor

C11.2. Materials
-Steel, aluminium, glass, stone, anchors, glazing materials, sealants
-Thermal and fire insulation
-Operable windows
-Composite and honeycomb panels
-Flashings
-Fasteners

C11.3. Finishes
-Protective treatment
-Anodic coating and testing
-Organic coating
-Aluminium finish at structural silicone

C11.4. Workmanship
-Joints in curtain wall
-Corrosion protection
-Metal-to-metal contact
-Welding
-Sealant and gasket
-Installation and erection
-Glazing
-Stone fabrication

C11.5. Design and Performance Requirements
-Framing members and anchors
-Fasteners
-Cyclic test
-Structural silicone
-Glass
-Stone
-Movement joints
-Water leakage
-Glass replacement
-Operable windows
-Panels
-Fire resistance
-Lightning protection
-Mock-ups and Tests

C11.6. Protection and Cleaning
-Protection
-Cleaning
-Maintenance manual and maintenance access

Reference: *BCR-Part 8 Requirements for External Wall, Cladding and Curtain Wall*
-Clause 26 Interpretation
-Clause 27 External Wall
-Clause 28 Cladding
-Clause 29 Curtain wall-design
-Clause 30 Curtain wall-materials
-Clause 31 Curtain wall-fixing of supports and maintenance

Reference: *PNAP-*
APP-37 Curtain Wall
APP-118 Testing of Materials

Reference: *GSA –*
Section 16 Curtain Walls

Reference: *BMT-*
Chapter 2.11 Glazing, Curtain Wall and Cladding

C12. METAL WORKS

(Refer Metal Windows and Doors in C10)

C12.1. Materials
-Galvanized steel
-Steel mesh
-Slotted steel angle
-Cast iron
-Brass rods and sections
-Stainless steel
-Fixings
-Metal grille and louvre

C12.2. Workmanship
-Fabrication
-Welding
-Finishes to metal
-Metal gates
-Contact with different materials
-Fixing steel mesh
-Completion

Reference: *PNAP-*
APP-66 Metal Refuse Chutes
APP-146 Metal Gates
APP-166 Metal Grille and Louvre

Reference: *GSA –*
Section 17 Metalwork
Section 24 External Works

C13. PLASTERWORK

C13.1. Rendering
-Cement, sand, water, lime, lime putty
-Bonding agent
-Mixing and application
-Preparation of various background
-Spatterdash
-Surface finishes
-Movement joints
-External render

C13.2. Plastering
-Steel lathing
-Gypsum plasters
-Joint reinforcement
-Plasterboard
-Acoustic plaster
-Stone chippings
-Joints
-Internal lime
-Metal beads
-Exposed aggregate rendering or “Shanghai” plaster
-Acoustic spray plaster

C13.3. Premixed Plaster
-Cement based and gypsum based
-Mixing, handling and storage
-Substrate preparation
-Spatterdash
-Application

C13.4. Screeds
-Light-weight screeds
-Vapour barrier
-Mixes and thickness
-Laying
-Bay sizes
-Surface finishes
-Pipes through roofs

C13.5. Plasterwork Defects
-Bond failure, cracking, crazing, efflorescence, grinning, irregularities, popping, recurrent dampness, staining, chalkiness

Reference: *GSA –*
Section 18 Finishes

Reference: *BMT-*
Chapter 2.13 Plasterwork

C14. PAINTING

C14.1. Materials
-Priming paints on different surfaces
-Sealers
-Limewash
-Emulsion paint
-Multi-colour paint
-Cement paint
-External textured paint
-Fire retardant paint
-Synthetic paint
-Epoxy paint
-Polyurethane paint
-Bitumen coating
-Marking paint
-Fluorescent paint
-Reflecting paint
-Metallic paint
-Heat resisting paint
-Chemical resisting paint
-Black enamel
-Non-toxic paint
-Pesticidal coating
-Wood preservative
-Stain
-Varnish
-Wax polish
-Chalkboard paint

C14.2. Workmanship
-General application of paint
-Protection and cleaning
-Preparatory work
-Preparation of different surfaces
-Existing surfaces
-Priming and undercoating
-Finishing coat
-Application of coatings/preservatives
-Number of different paint coats on new surfaces or redecoration of existing surfaces
-Supply, delivery, storage and laying of road marking materials
-Colour banding identification of B.S. Pipelines
-Cleaning of stonework, plaster, tiling, flooring, paintwork, sanitary fittings, water tanks
-Environmental green requirements

C14.3. Quality control
-Quality tests
-Surveillance tests for multi-layer acrylic paint
-On-site delivery tests for different paints

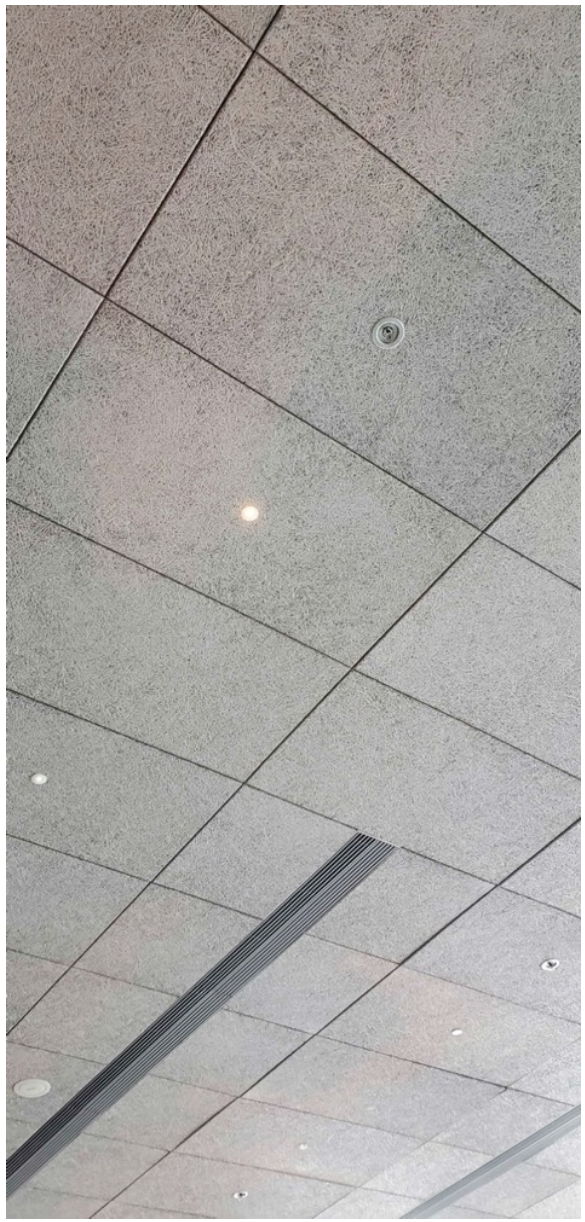
Reference: *GSA –*
Section 21 Painting

Reference: *BMT-*
Chapter 2.14 Painting

C15. FINISHES

Also refer to Sections C13 Plasterwork and C14 Painting.

C15.1. Finishes
-In situ floor finishes
-Applied floor finishes
-Timber floor finishes (also refer to C7)
-Wall finishes: tiles
-Wall finishes: Marble and granite slabs
-Wall finishes: Dry lining techniques
-Ceiling finishes



Reference: *GSA –*
Section 18 Finishes

Reference: *BMT-*
Chapter 2.12 Floors, Walls and Ceiling Finishes

Reference: *BD-*
PNAP ADV-31 Building External Finishes – Wet-fixed Tiles

Reference: *PNAP ADV-14 Facilities for External Inspection and Maintenance of Buildings*

For example: *PNAP ADV-31 on Building External Finishes – Wet-fixed Tiles discusses design, construction and maintenance of the external tiles.*

Building External Finishes - Wet-fixed Tiles

Building external finishes protect external building elements from weathering and, at the same time, enliven the aesthetic outlook of buildings. There are a variety of systems and forms of such external finishes. Ceramic or mosaic tiles wet-fixed on cement-sand mortar rendering are one of such systems/forms, which are commonly used in Hong Kong.

2. Incidents of tile detachments in the past had highlighted the importance of proper installation of external finishes to the concrete substrate. This practice note promulgates guidelines and good practices for the design and construction of wet-fixed tiles for building external finishes. Authorized persons (APs), registered structural engineers (RSEs), registered general building contractors (RGBCs) and registered minor works contractors (RMWCs) are strongly advised to follow these guidelines and practices if wet-fixed tiles are used for external finishes to their buildings, so as to achieve a minimum safety standard with a view to minimising detachment.

C16. EXTERNAL WORKS

C16.1. Road, Carparks and Paved Areas
-In situ concrete paving
-Precast concrete paving
-Bituminous materials
-Tack coat
-Wearing courses
-Fine cold asphalt
-Surface dressing

C16.2. Workmanship
-Temperature requirements for bituminous materials
-Preparation of surfaces
-Machine laying
-Compaction
-Hand laying and consolidation
-Jointing
-Laying of asphalt
-Surface dressing
-Cleaning off

C16.3. Fencing and Gates
Refer to Section C12 Metalworks
-Fence wall of brickwork/blockwork

Reference: *Building (Private Streets and Access Roads) Regulations*
Part II Planning of Private Streets and Access Roads
-clauses 3 to 15
Part III Construction of Private Streets, Access Roads and Service Lanes
-clauses 16 to 25

Reference: *GSA –*
Section 24 External Works

Reference: *BMT-*
Chapter 2.16 External Work and Landscape Work

C17. LANDSCAPE WORKS

Note: *Elaborate details on knowledge of the soft landscape are not required in this section.*

C17.1. Earthwork and Soiling
-Decomposed granite, topsoil, subsoil, fabricated soil mix
-Sand, lightweight soil mix, stone chips
-Test for topsoil
-Test for fabricated soil mix
-Fertilizer
-Boulders

C17.2. Workmanship
-Clearing ground
-Soil grading
-Drainage and filter layers
-Planting
-Pruning and undercutting
-Grass and hydroseeding

Reference: *GSA –*
Section 25 Landscape Work

Reference: *BMT-*
Chapter 2.16 External Work and Landscape Work

Reference: *PNAP ADV-35*
Greening in Buildings

C18. BUILDERS' WORK RELATED TO BUILDING SERVICES

Note: *Coordination with building services is a basic requirement for the architect. Details in the subsequent Sections are most relevant to this part of architectural detailing. Reference can also be made to finishes, metal doors, roof construction and waterproofing.*

C18.1. Drainage and Plumbing
-Pipework
-Manholes
-Roof Drainage
-Pipe through roofs

C18.2. Lifts and Escalators
-Lift car
-Lift machine room
-Lift pit
-Escalator Installation

C18.3. Fire Services Installation
-Hose reel, smoke vent, exit signs, fire shutters
-F S Inlet and sprinkler Inlet
-Fire-rated ceiling

C18.4. Other M&E Related Items
-Transformer Room
-M&E pipes and openings
-Acoustical installations

C18.5. Refuse Collection Room
-Refuse Collection Room
-Hopper Room

Reference: *BMT-*
Chapter 2.15 Builders' Work in Relation to Plumbing, Drainage and M&E Services

Reference: *PNAP-*
APP-4 Water Supply and Wells
APP-8 Chimneys and Flues
APP-27 Gas Water heaters
APP-35 Refuse Storage and Collections
APP-66 Metal Refuse Chutes
APP-80, 83 and 106 Code of Practice for Fire Resisting Construction
APP-85 Revised Fire safety Codes
APP-110 Protective Barriers
ADV-10 Lift Shaft Platforms

C19. MODULAR INTEGRATED CONSTRUCTION

BD states, "Modular Integrated Construction (MiC) refers to a construction whereby free-standing integrated modules (completed with finishes, fixtures and fittings) are manufactured in a prefabrication factory and then transported to site for installation in a building."

Reference: *PNAP ADV-36 on Modular Integrated Construction design requirements*

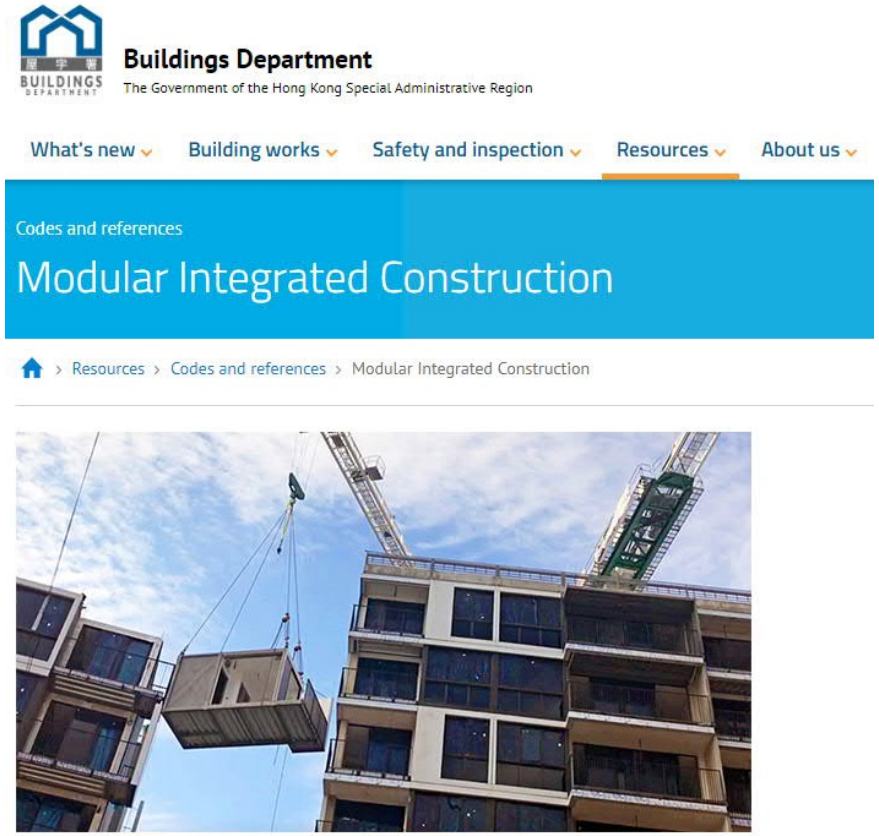
Modular Integrated Construction

Introduction

Modular Integrated Construction (MiC) is a construction method that employs the technique of having freestanding volumetric modules (with finishes, fixtures, fittings, etc.) manufactured off-site and then transported to site for assembly. Proven benefits include improved site safety, more efficient and better quality control, shortened construction period, less construction waste, less demand for on-site labour, less disturbance and nuisance to the neighbourhood, etc., not just contributing to the quality and sustainable built-environment but also help ease some of the challenges of the local construction industry. To encourage MiC, the Buildings Department (BD) has formulated streamlined measures and guidelines to facilitate the industry in meeting the relevant standards and requirements under the Buildings Ordinance (BO).

Considerations Unique to MiC
Pre-submission Enquiry
Pre-acceptance of MiC Systems or Prototypes
Design Requirements fo MiC
Quality Control and Supervision of MiC
Minimum Requiremnets of the AP's On-site Quality Audit Check on MiC Elements Delivered to the Building Site
Pre-acceptance Application Checklist for MiC

Reference: *GSA Section 27 on Modular Integrated Construction (MiC) gives a definition of MiC and the contractor's responsibilities. This states the responsibilities of MiC designers and the provision for construction programmes, drawings and construction method statements. Architectural and structural requirements are listed. This section also gives the specifications on delivery, storage, transportation, quality control, supervision, installation and maintenance. Appendix I in this Section prescribes grouting works for structural joints.*



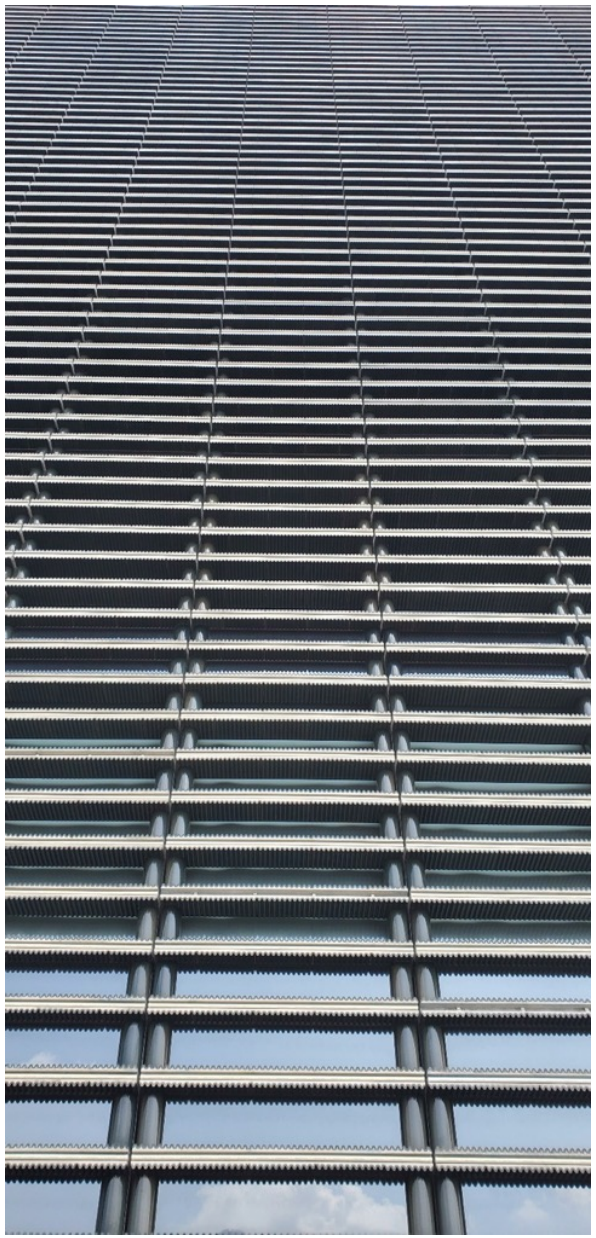
Pre-acceptance Mechanism

Reference: *MiC Pre-accepted Systems can be found in BD web*

Pre-accepted Modular Integrated Construction Systems / Components - Buildings Department (bd.gov.hk)

List of Steel MiC Systems

List of Concrete MiC Systems



SECTION D

GENERAL DETAILS: NON-DOMESTIC BUILDINGS

Technology can always be improved with the advancement of society and innovative design. The architectural details shown in this Section D as well as the subsequent Sections E and F are taken from completed projects which were specifically designed to serve particular purposes. As these are already built projects, there could be further improvements to these working details based on feedbacks and advancement in technology or changes in Codes and Regulations. They only serve to demonstrate the essence of the construction technology.

This Section D covers general details with focus on non-domestic buildings which would mean mainly commercial buildings, shopping centres as well as government/institutional/community (GIC) buildings.

Cross-reference should be made to the corresponding parts in Section C also.

The Reference Literature is abbreviated as follows:

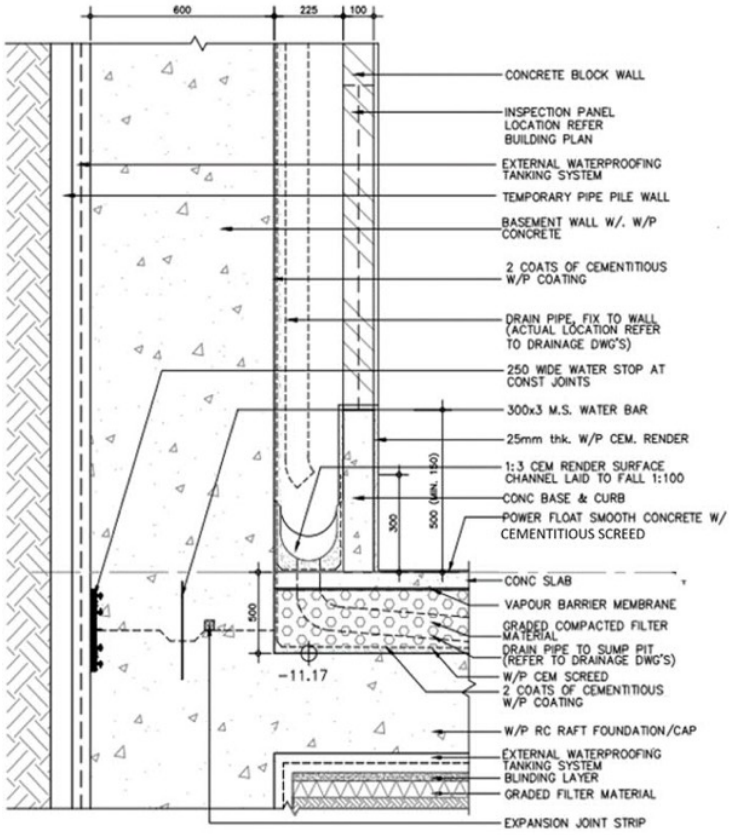
The General Specification for Building (ArchSD): ***GSA***
The Building (Construction) Regulations: ***BCR***
The Practice Notes for Authorized Persons (BD): ***PNAP***
Building Materials and Technology in Hong Kong: ***BMT***
Building Enclosure in Hong Kong: ***BEHK***
Code of Practice: ***CP***

D1. BASEMENT

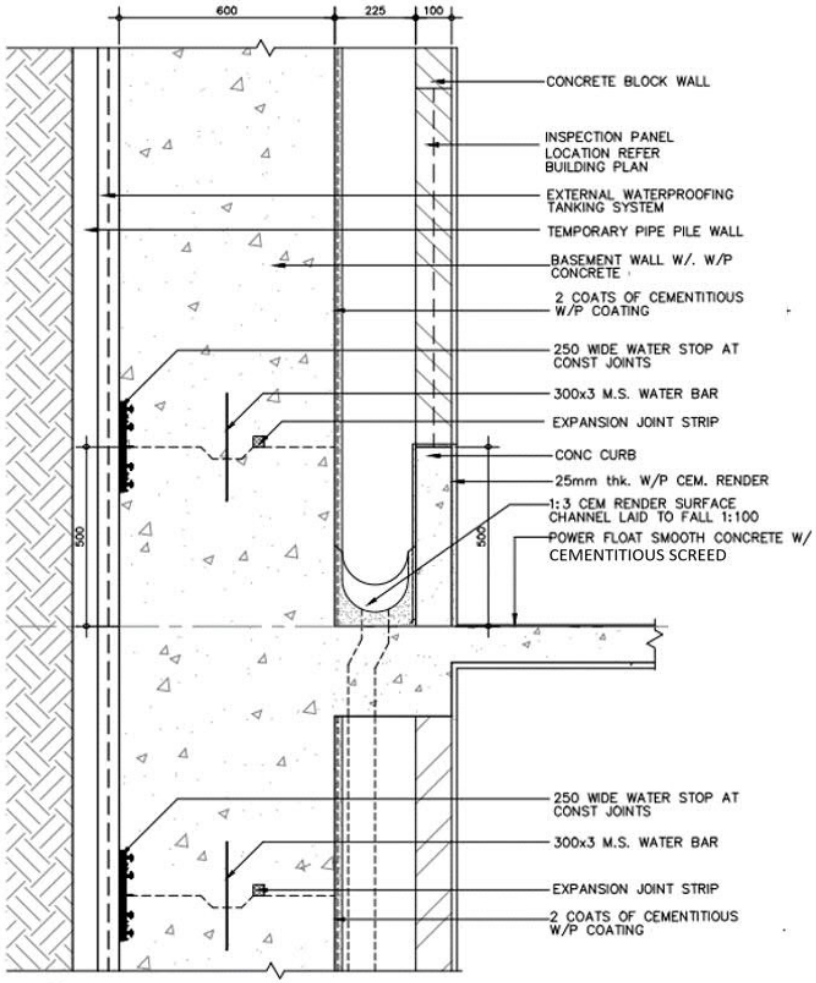
Reference: *BMT*
-Chapter 3.15. Case study of Central Plaza: Top down method for basement construction

-D1.1. Basement Wall and Waterproofing

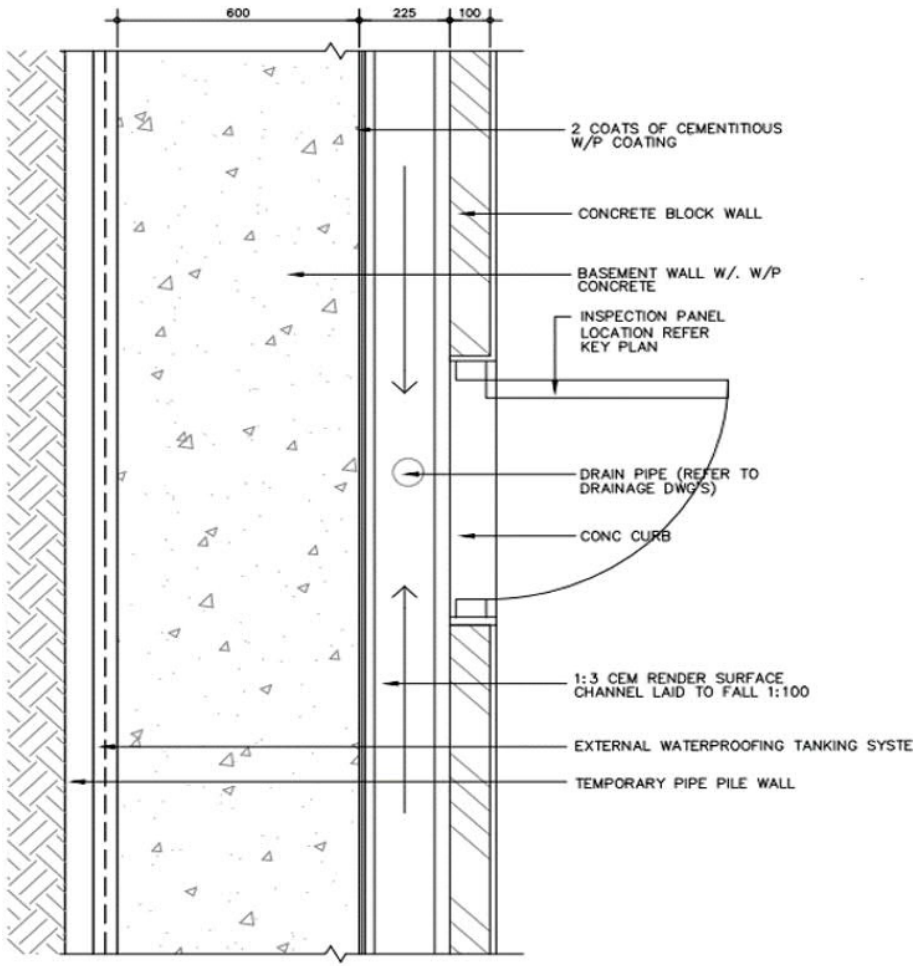
The basement cavity wall is sometimes adopted for high risk of water penetration which serves as a double wall construction to cater for possible water leakage from outside. A drainage system is formed to carry away any water from outside.

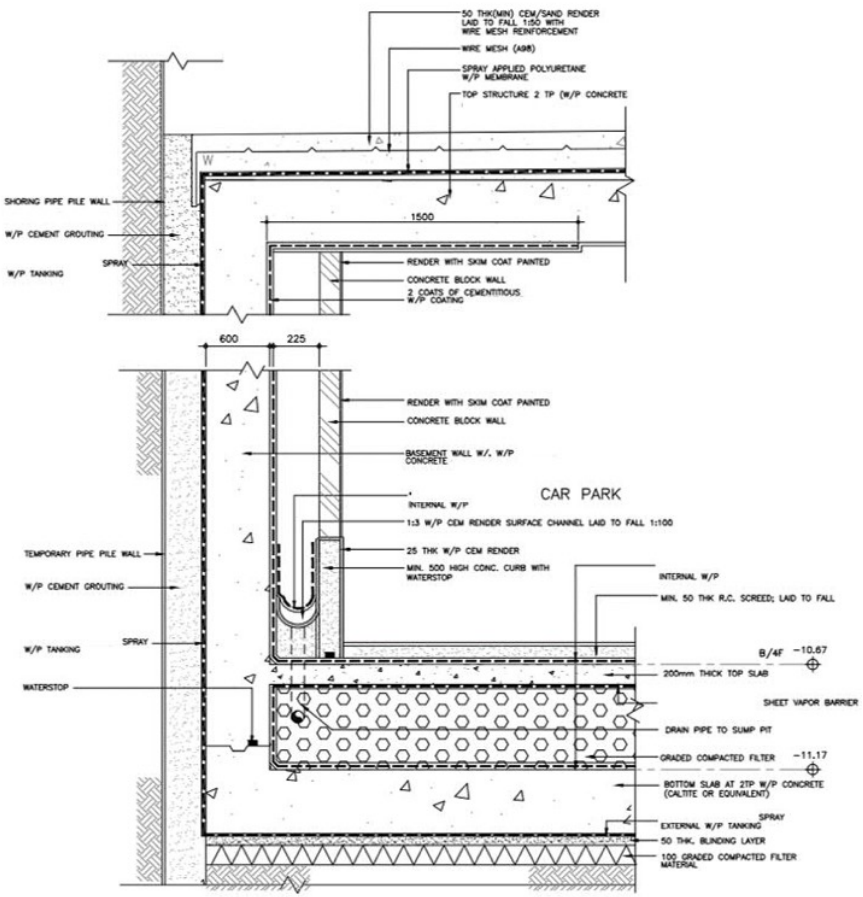


SECTION FOR BASEMENT SLAB AND CAVITY WALL



01 SECTION FOR BASEMENT SUSPENDED SLAB
SCALE 1:10





04 PART-PLAN OF BASEMENT CAVITY WALL

D2. GROUND FLOOR

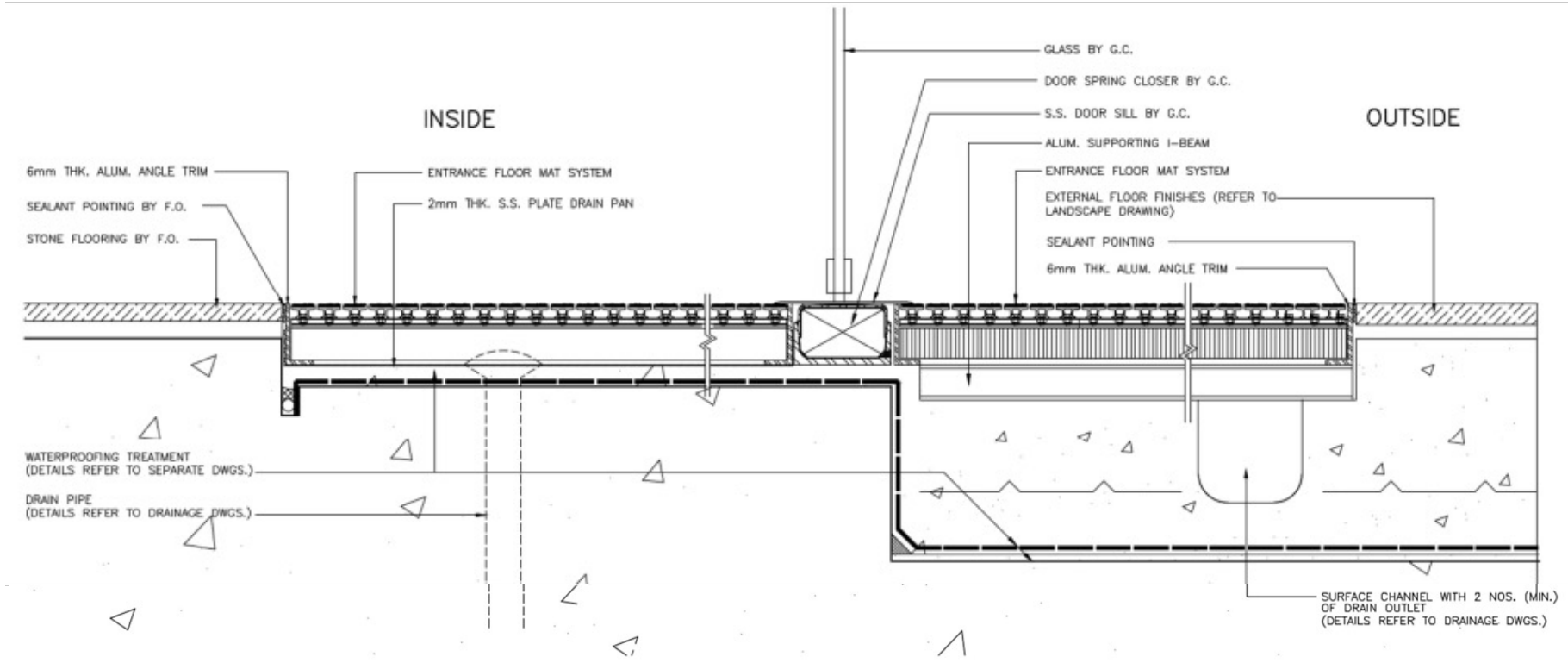
Check:
-Materials and workmanship
-Waterproofing
-Drainage and accessibility for physically challenged people at G/F Entrance

-D2.1. Ground Floor Entrance

This construction is applicable to the ground floor entrance when the outside area and the interior are on the same level. The key point is to avoid possible flooding into the interior in case of rain and wind. Hence ground floor drainage is provided.

Reference: BCR 33, 34 & PNAP APP-125

Note: APP-125 requires the external ground to be laid to fall at a gradient of not less than 1 in 80 away from the adjoining internal floor. If the level difference between the internal & the adjoining external areas is less than 150mm, additional drainage is required such as the following details.



SECTION THRO' FLOOR MAT & GLAZED DOOR THRESHOLD
SCALE 1:5

D3. EXTERNAL WALL

External walls of commercial buildings are usually associated with the curtain wall installation, cladding (metal or stone) and windows are related with factors such as structure, waterproofing, spread of fire and OTTV (Overall thermal transfer value) of the building.

-D3.1. Curtain Wall

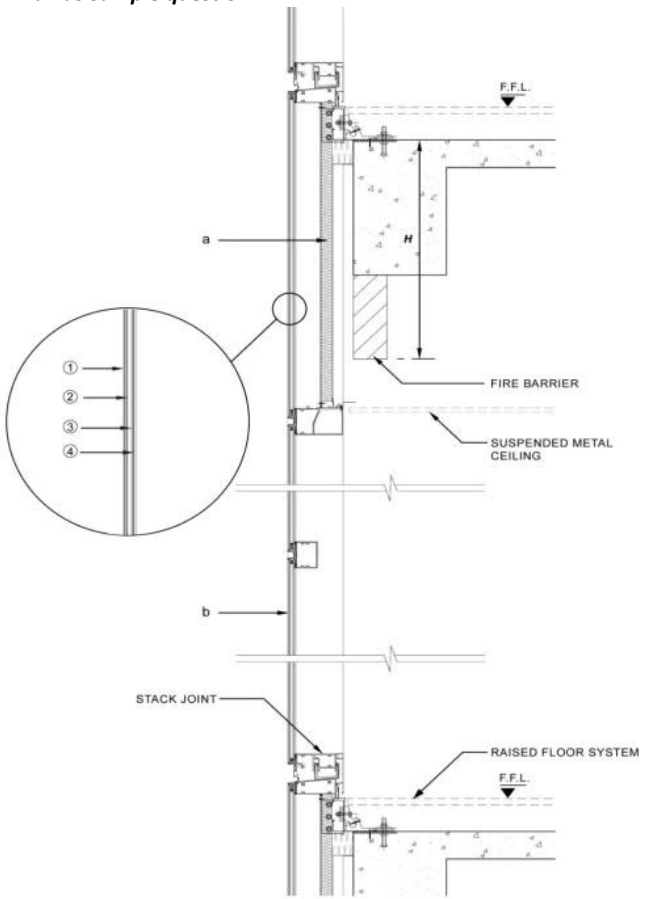
Check:

-Materials and workmanship
-Vision and spandrel glass
-Fire stop
-Tests
-Modular design

Reference: *BMT-*
Chapter 3.1. The Forum
Chapter 3.10. St. John's Building
Chapter 3.15. Central Plaza

Reference: *BEHK-*
Chapter 9. The Lee Gardens
Chapter 10. The Centre
Chapter 11. Titus Square

Curtain Wall as sample question



4. What is the system for building enclosure as shown in the drawing?

A. Window-wall system
B. Stick curtain-wall system
C. Unitized curtain-wall system
D. Suspended glass-wall system

Ans. : C

5. What does the annotation "***a***" represent?

A. Durasteel panel
B. Thermal insulation
C. Waterproofing board
D. Metal honeycomb panel

Ans. : B

6. Which surface of the insulated glass unit is ***most*** suitable and effective for application of the low-e coating?

A. 1
B. 2
C. 3
D. 4

Ans. : B

7. In consideration of wind load and safety, what is the ***most*** appropriate glass type for the outer glass panel of the insulated glass unit annotated "***b***"?

A. Float glass
B. Acrylic glass
C. Laminated glass
D. Heat strengthened glass

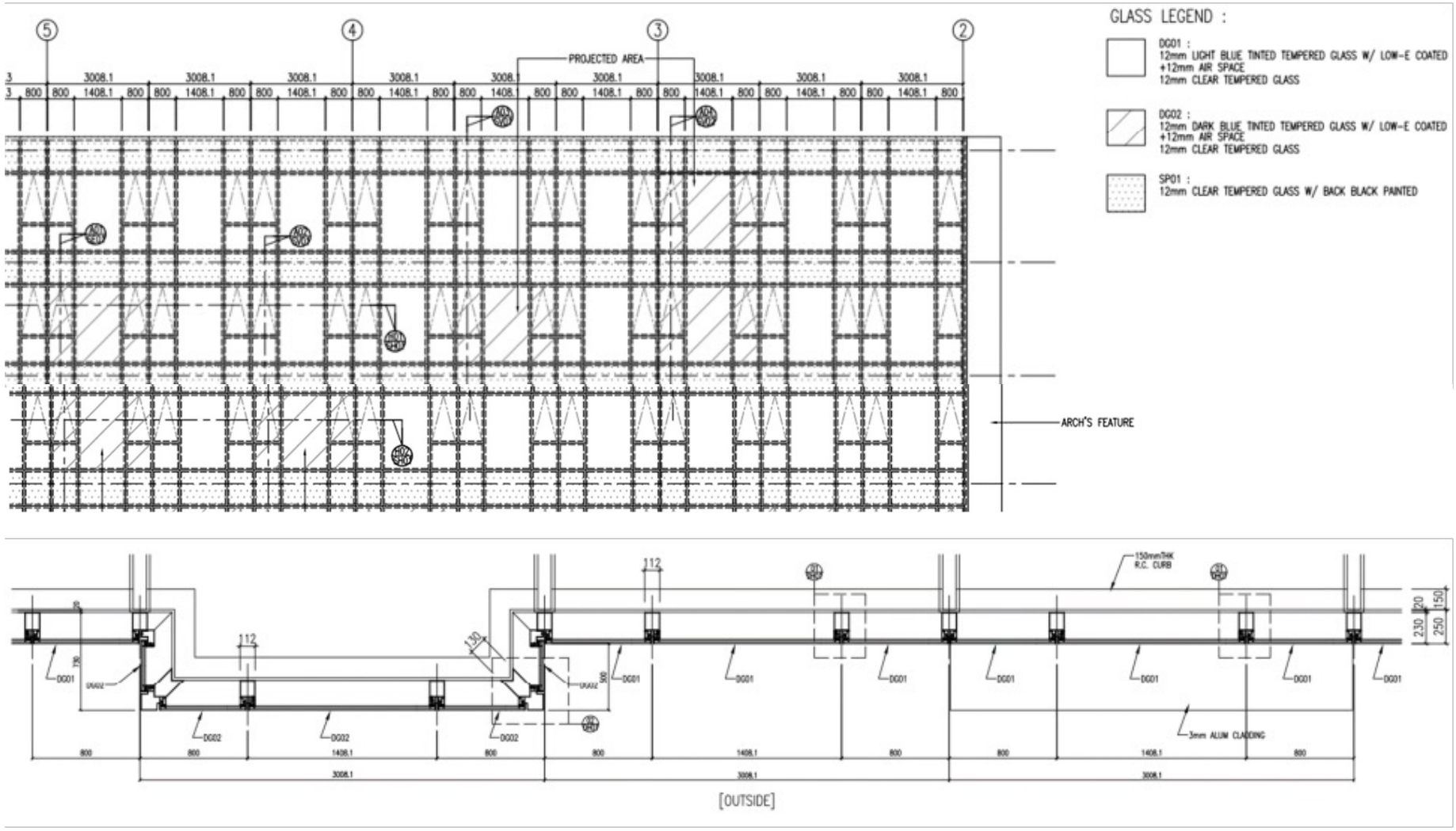
Ans. : D

8. What is the minimum dimension annotated "H" for fire safety?

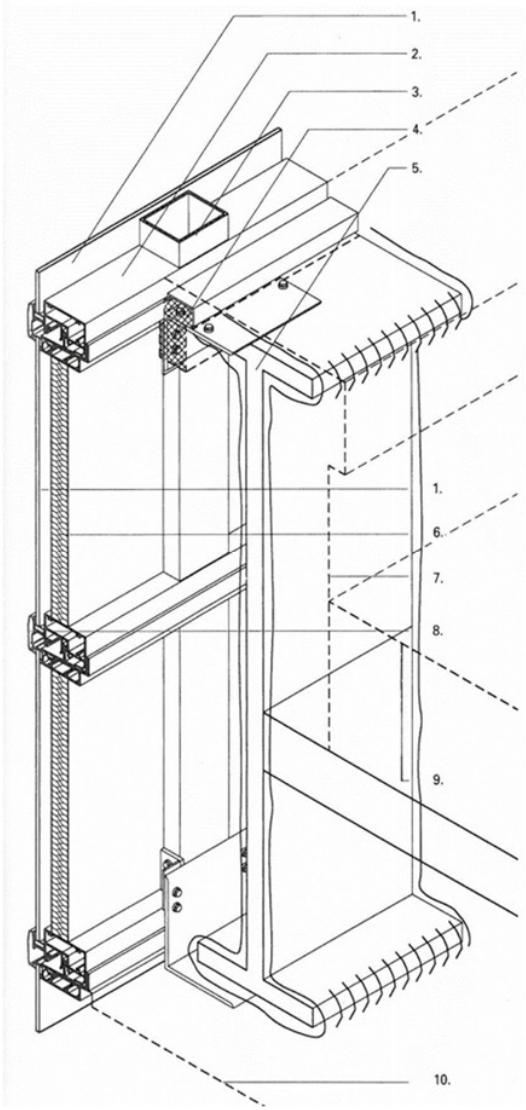
A. 600mm
B. 750mm
C. 900mm
D. 1100mm

Ans. : C

Example: Configuration of curtain wall on façade
Note that the thickness of glass is subject to structural calculations which depends on size of glazing, glazing method, building height and wind factor.



Example: BEHK Case Studies on Curtain Wall
-Isometric of Curtain Wall Details showing spandrel glass supported by structural steel for the building structure



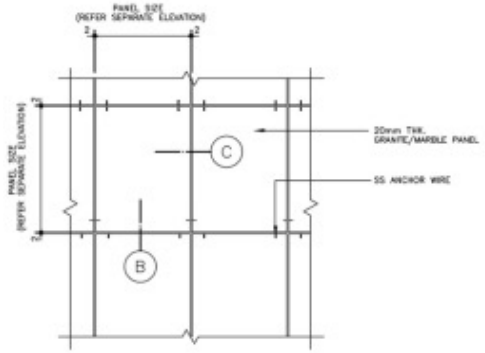
Legend

1. **12mm thick tempered glass panel**
2. **Extruded aluminium transom section**
3. **Extruded aluminium mullion section**
4. **Fire and smoke stop**
5. **Structural steel I beam with fire proofing spray**
6. **50mm thermal insulation**
7. **Finish for cill**
8. **Aluminium transom section with facing plate outside**
9. **Finished floor**
10. **Suspended ceiling**

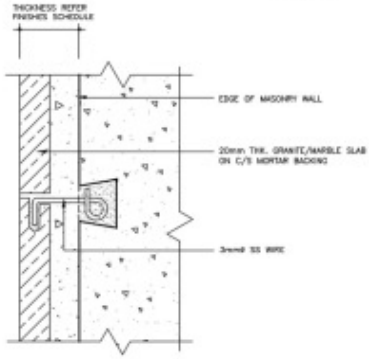
-D3.2. Stone Cladding

Example of Wet Fixing

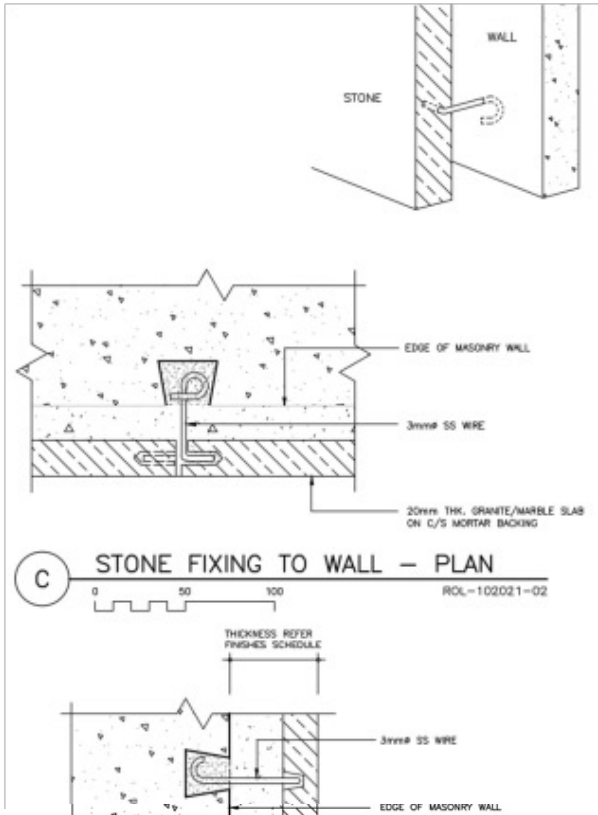
Wet fixing for stone, e.g. granite, is applicable to internal walls. Low external walls below one storey high can also be applicable. For heights over 6m, dry fixing would normally be employed with structural submission (to Buildings Department) required.



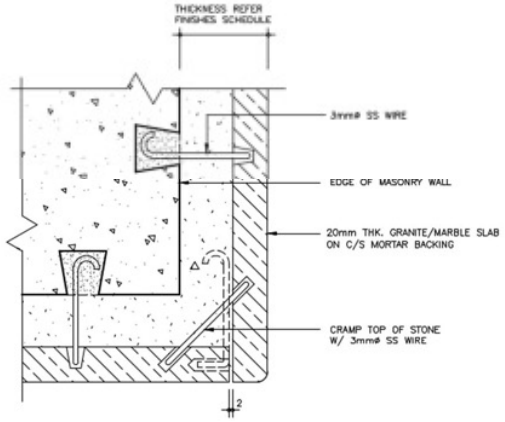
A TYPICAL ELEVATION (FOR WET FIXING)
NO SCALE A102020-01



B STONE FIXING TO WALL – SECT
0 50 100 ROL-102021-01



C STONE FIXING TO WALL – PLAN
0 50 100 ROL-102021-02



D PLAN AT CORNER
0 50 100 ROL-102023-01

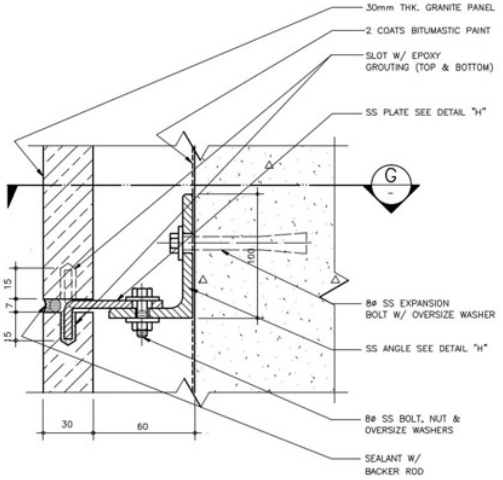
In this detail, SS wire is added as good practice for safety.

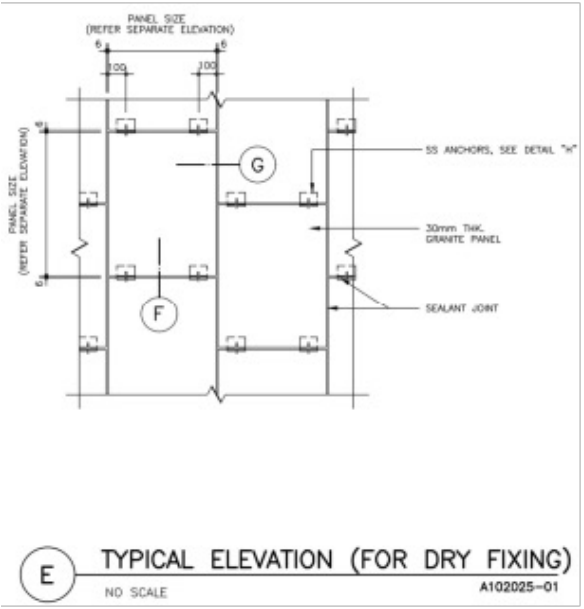
Example of Stone Cladding with Dry Fixing

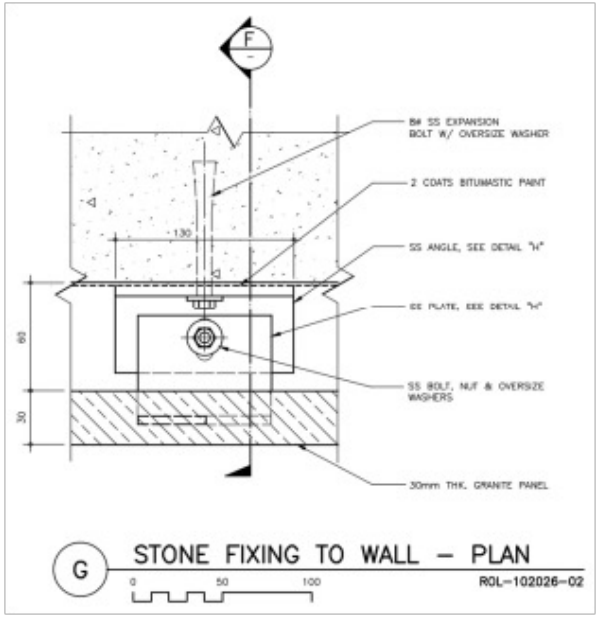
Dry fixing for stone, e.g. granite, is applicable to external walls and can be constructed as stone cladding. Structural submissions to the Buildings Department are required as per Building (Construction) Regulations and PNAP-16 due to safety reasons. Separate waterproofing has to be applied on the surface of the external wall before the cladding is fixed. Since the stone, usually granite in context of Hong Kong, is a very hard and rigid material, flexible joints are required to allow for movement.

Check:
-Materials and workmanship
-Waterproofing
-Flexible joint
-Open Joint

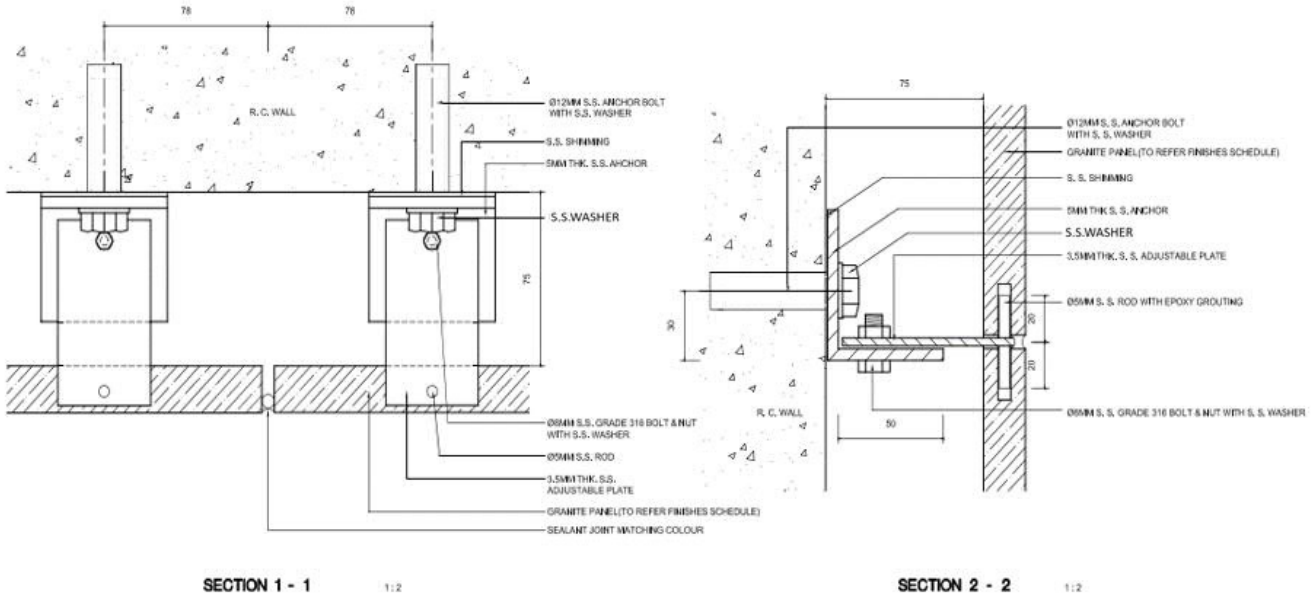
Reference: *BMT-*
Chapter 3.9. The Heung's Residence
Reference: *BEHK-*
Chapter 12. The British Consulate-general

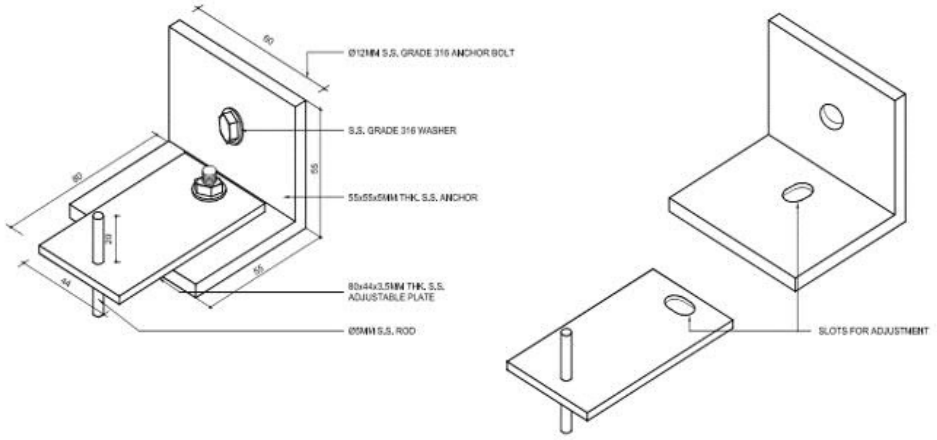






Stone fixing anchor



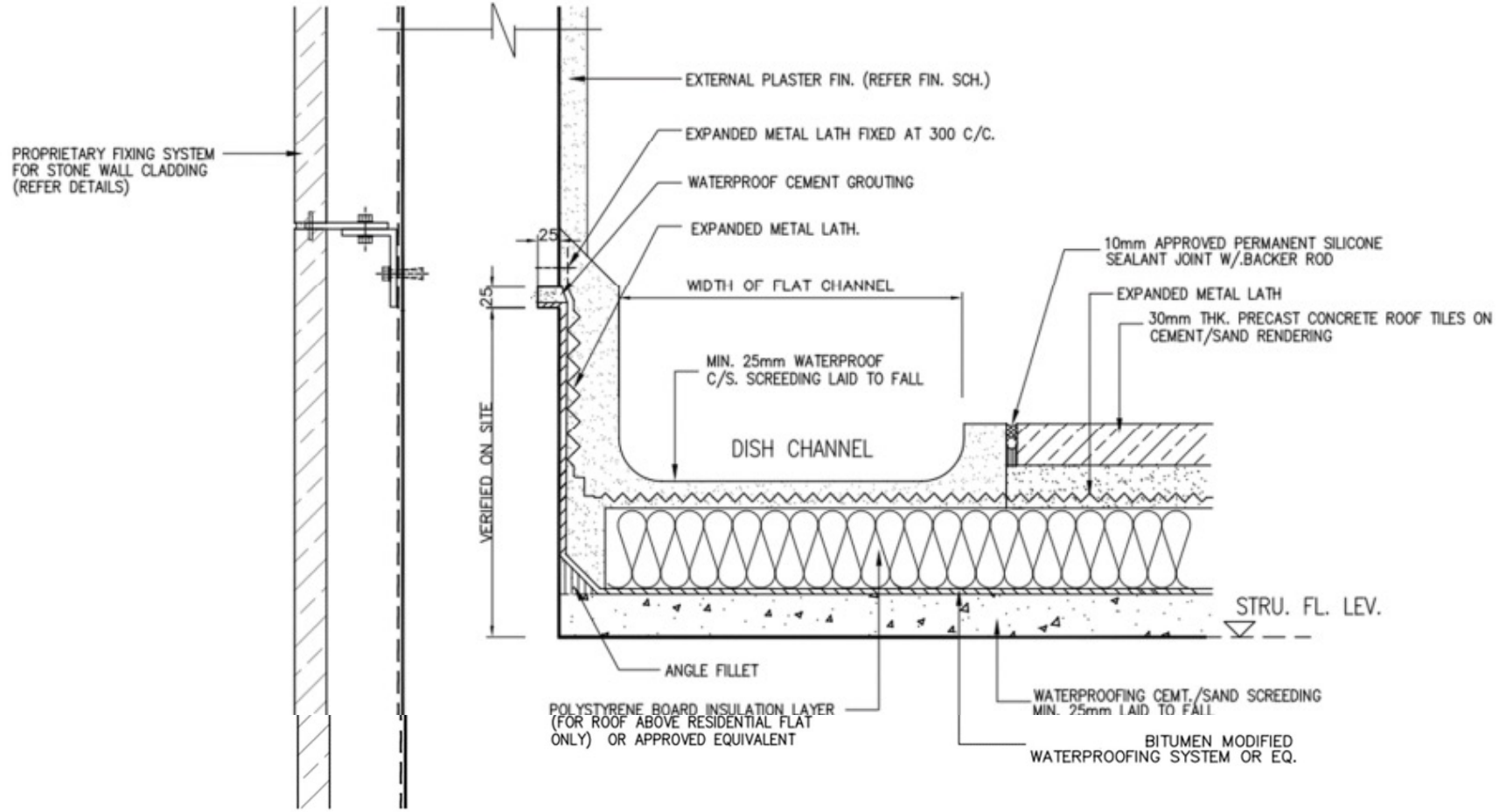


D4. ROOF

Check: *-Function of every material in the roof construction*
Reference: *BMT-Chapter 2.7. Roofing*

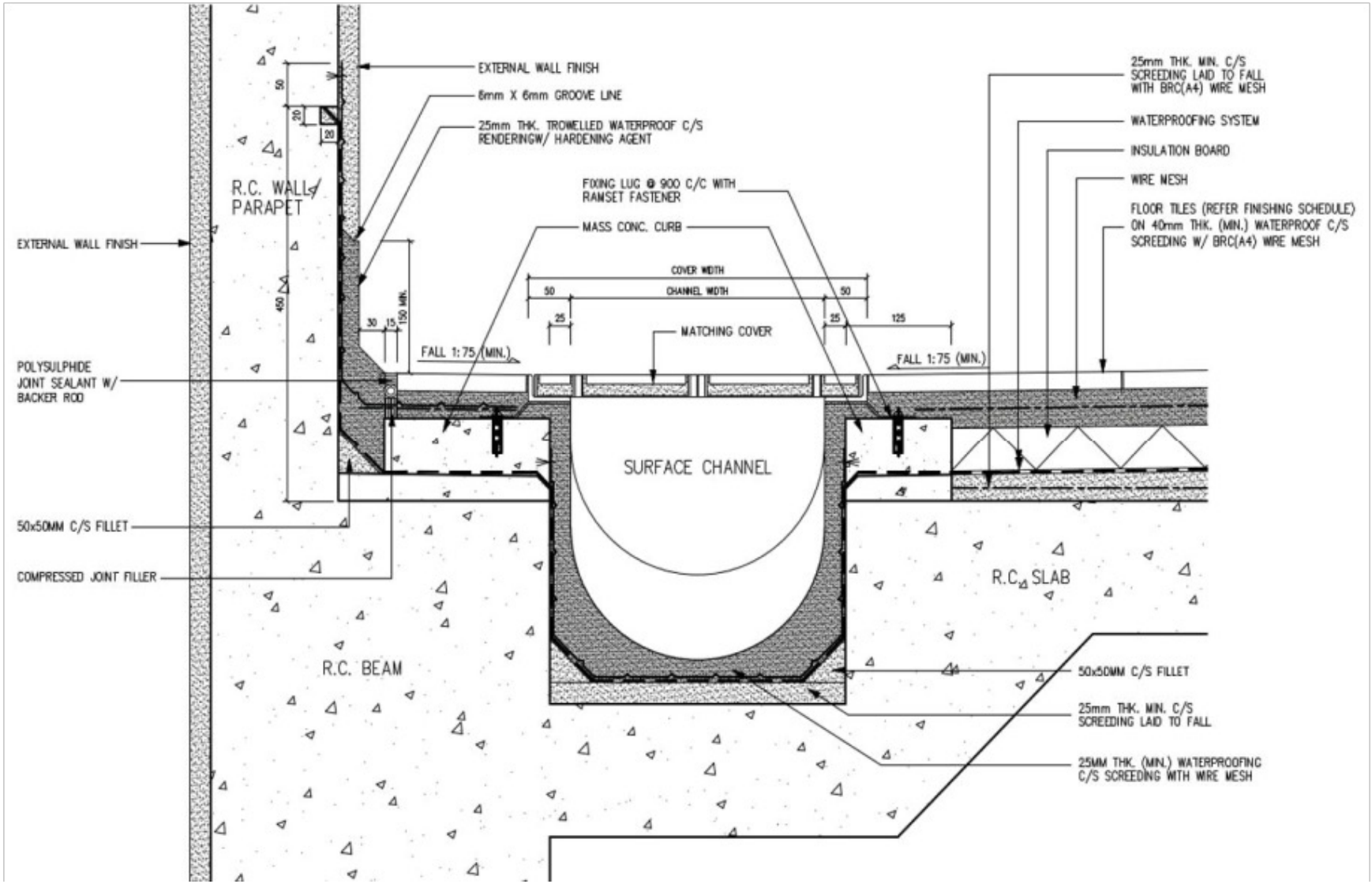
-D4.1. Flat Roof

Example 1 General roof construction



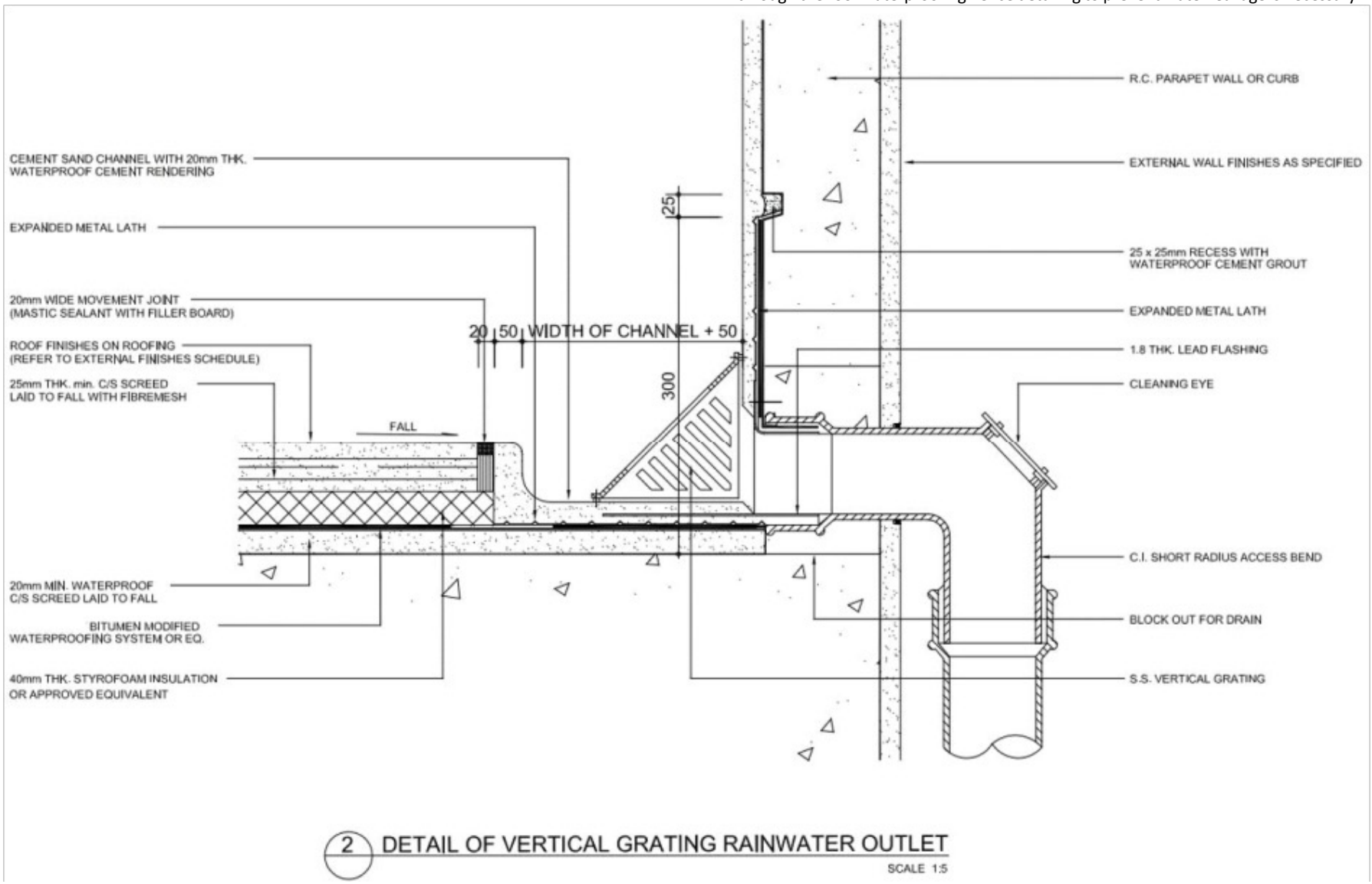
TYPICAL ROOFING DETAIL

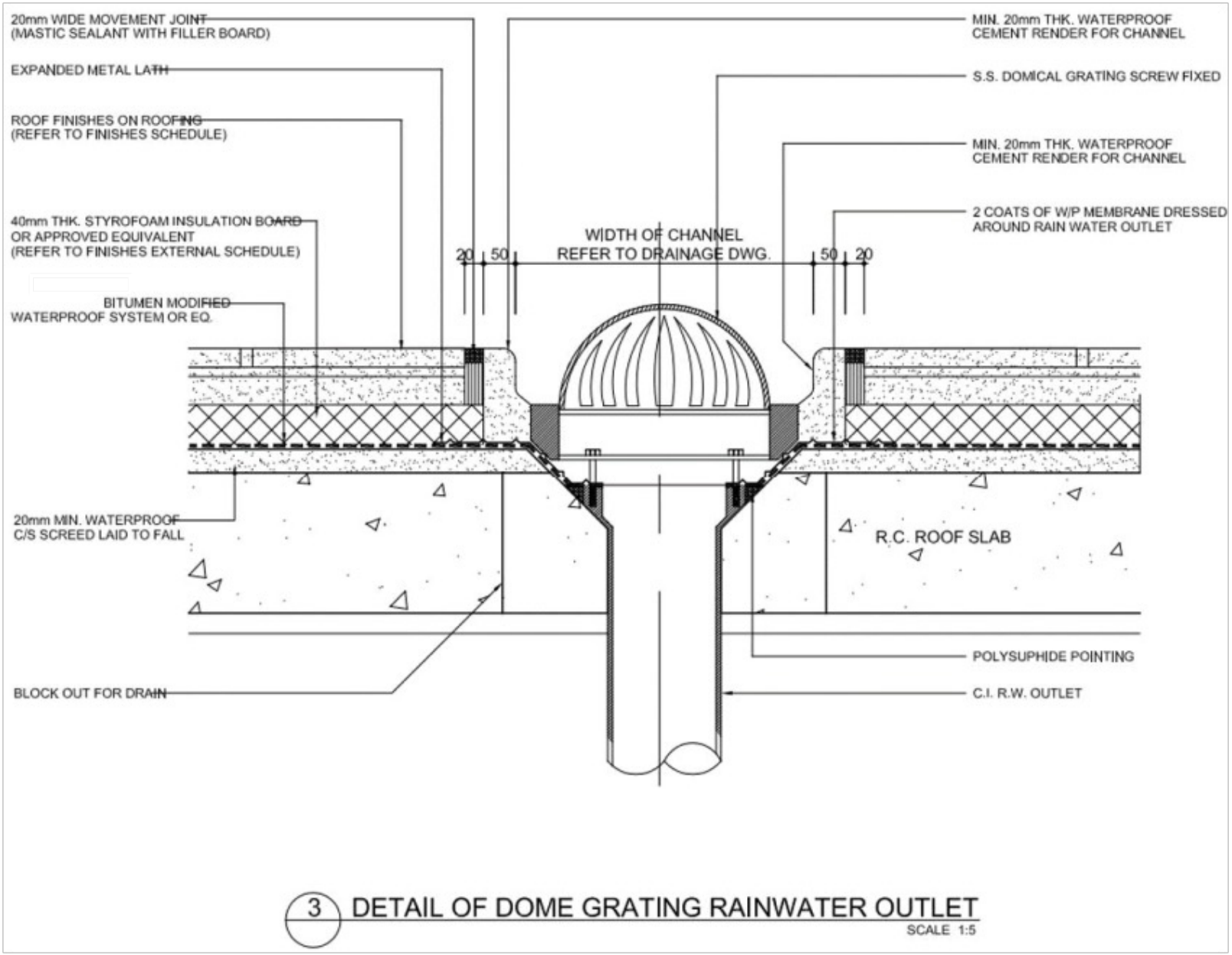
Example 2 Roof construction with surface channel and cover



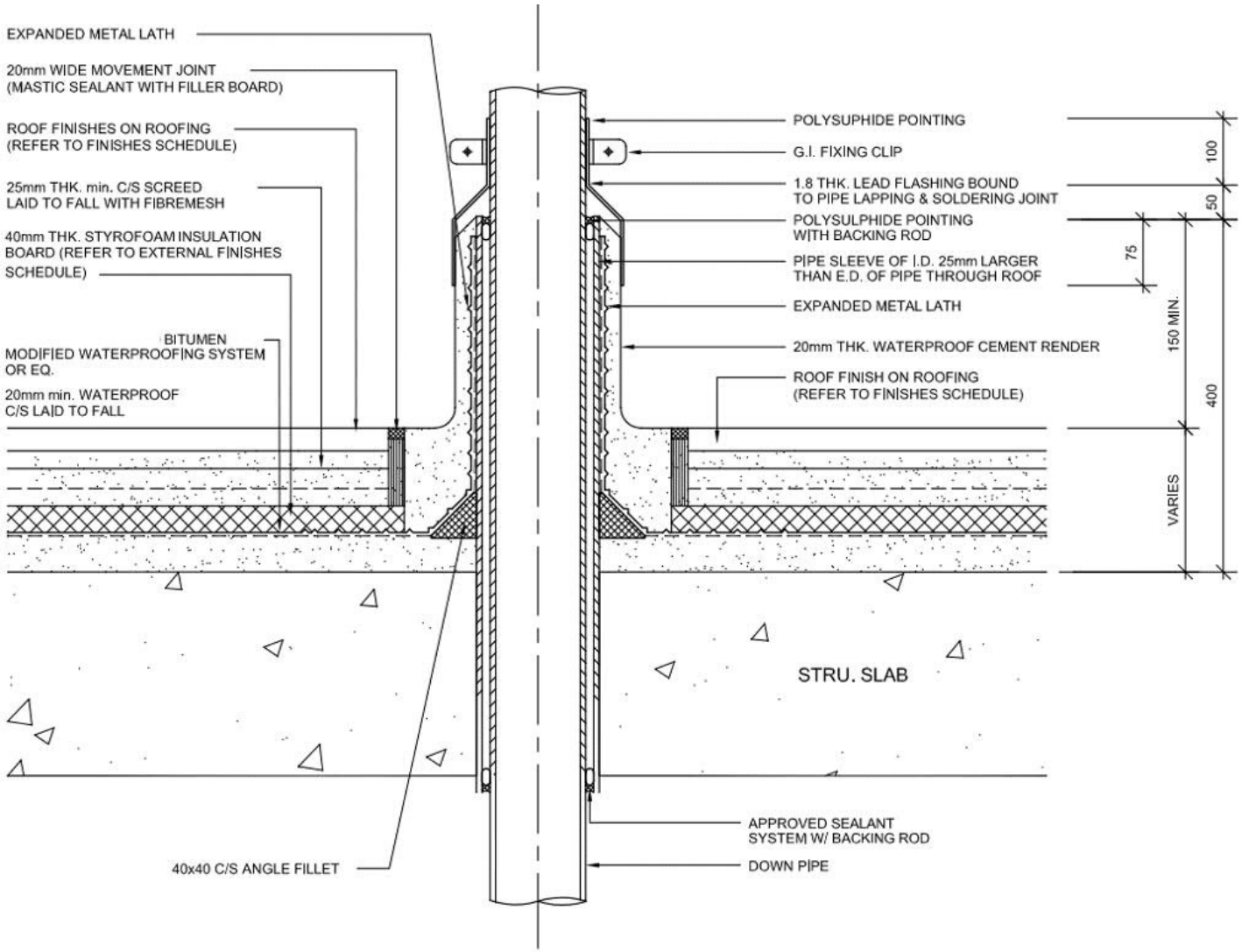
-D4.2. Roof with Intersection of Service Pipes

Service pipes such as ventilating pipes, drainage pipes or overflow pipes often have to pass through the roof waterproofing hence detailing to prevent water leakage is necessary here.





3 DETAIL OF DOME GRATING RAINWATER OUTLET
SCALE 1:5



4 DETAIL OF PIPE THROUGH ROOF SLAB

SCALE 1 : 4

D5. CONCRETING CYCLE

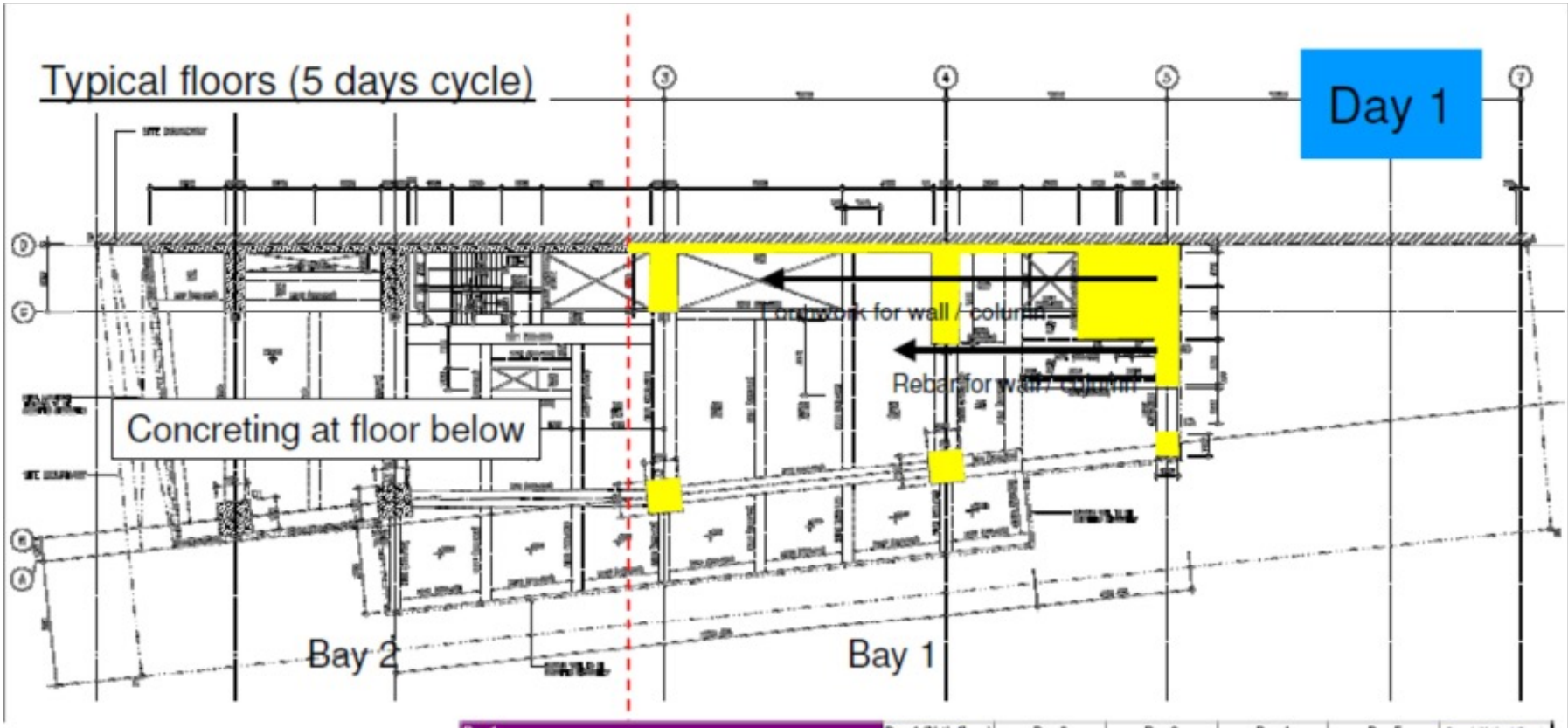
-D5.1. TYPICAL FLOOR CONSTRUCTION FOR HIGH-RISE BUILDINGS

Typical Floor Construction – Concreting Cycle

This refers to a cycle of construction sequence from making the formwork, laying the reinforcement to placing concrete which is applicable to high-rise buildings with typical floors (both commercial and residential). This procedure usually forms part of the critical path for a construction programme and requires careful planning and thorough management to enable an efficient working result.

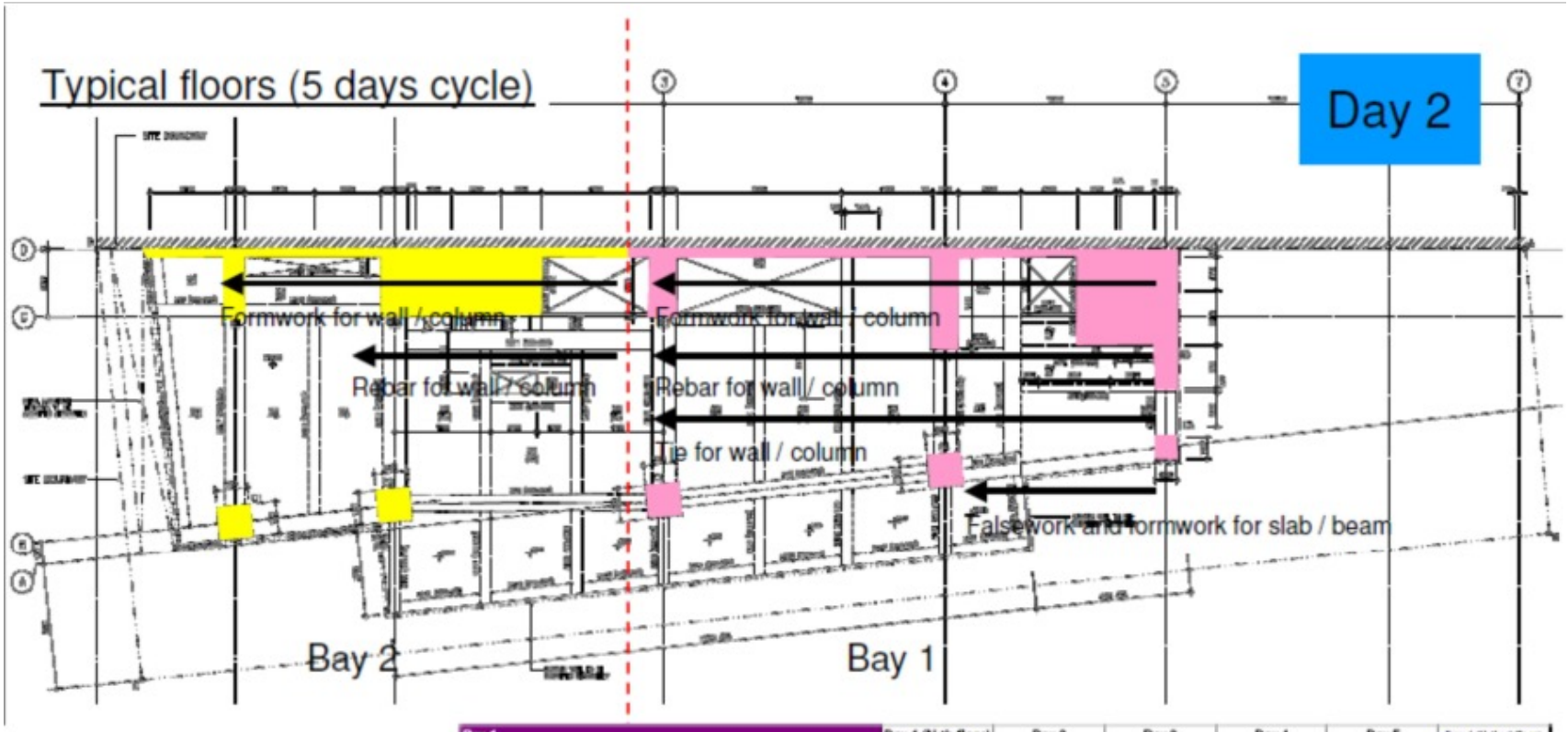
Example

This is the **5-day concreting cycle** for a commercial building in a tight construction site amidst the urban area.



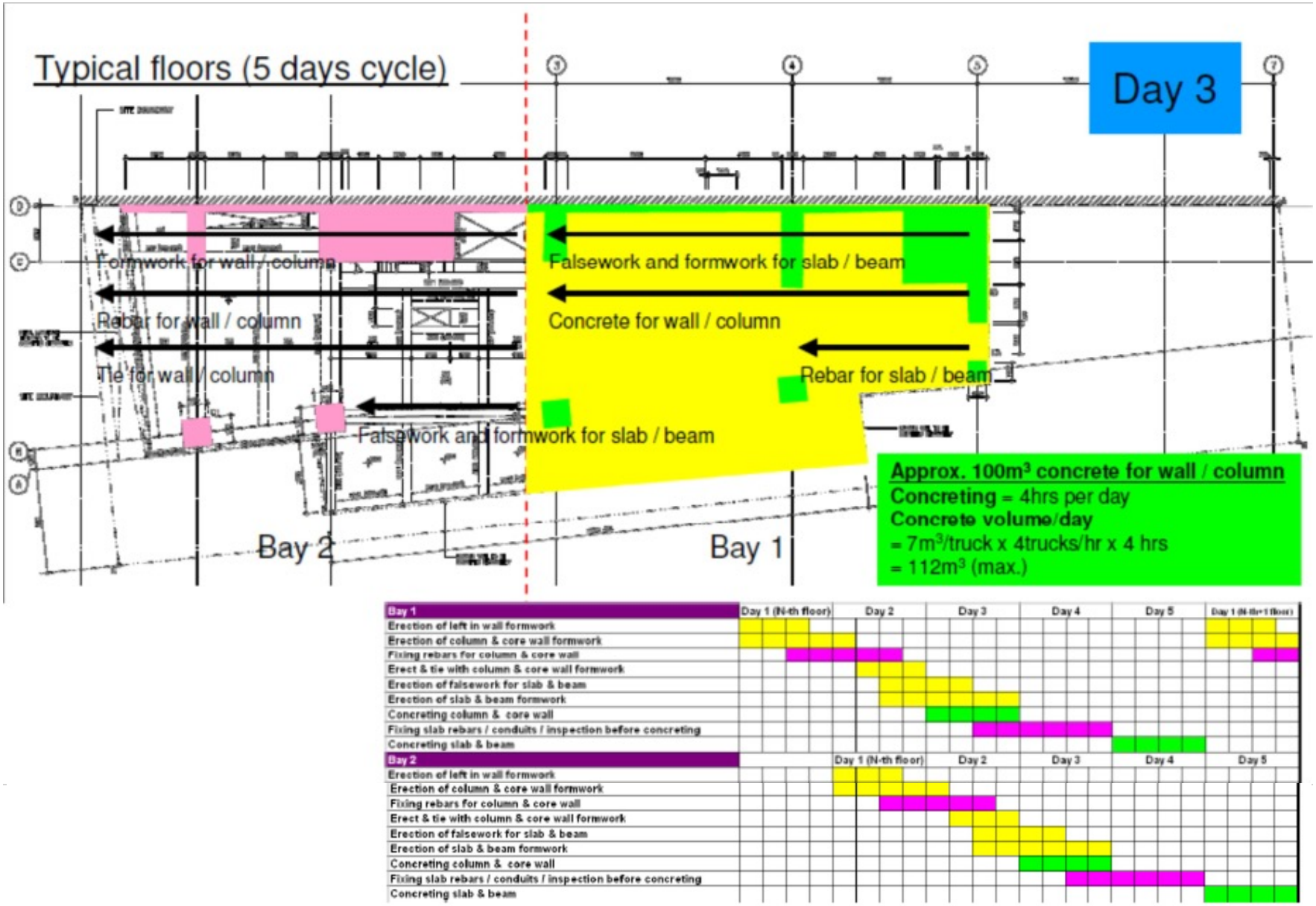
Bay 1	Day 1 (N-th floor)	Day 2	Day 3	Day 4	Day 5	Day 1 (N-th+1 floor)
Erection of left in wall formwork						
Erection of column & core wall formwork						
Fixing rebars for column & core wall						
Erect & tie with column & core wall formwork						
Erection of falsework for slab & beam						
Erection of slab & beam formwork						
Concreting column & core wall						
Fixing slab rebars / conduits / inspection before concreting						
Concreting slab & beam						

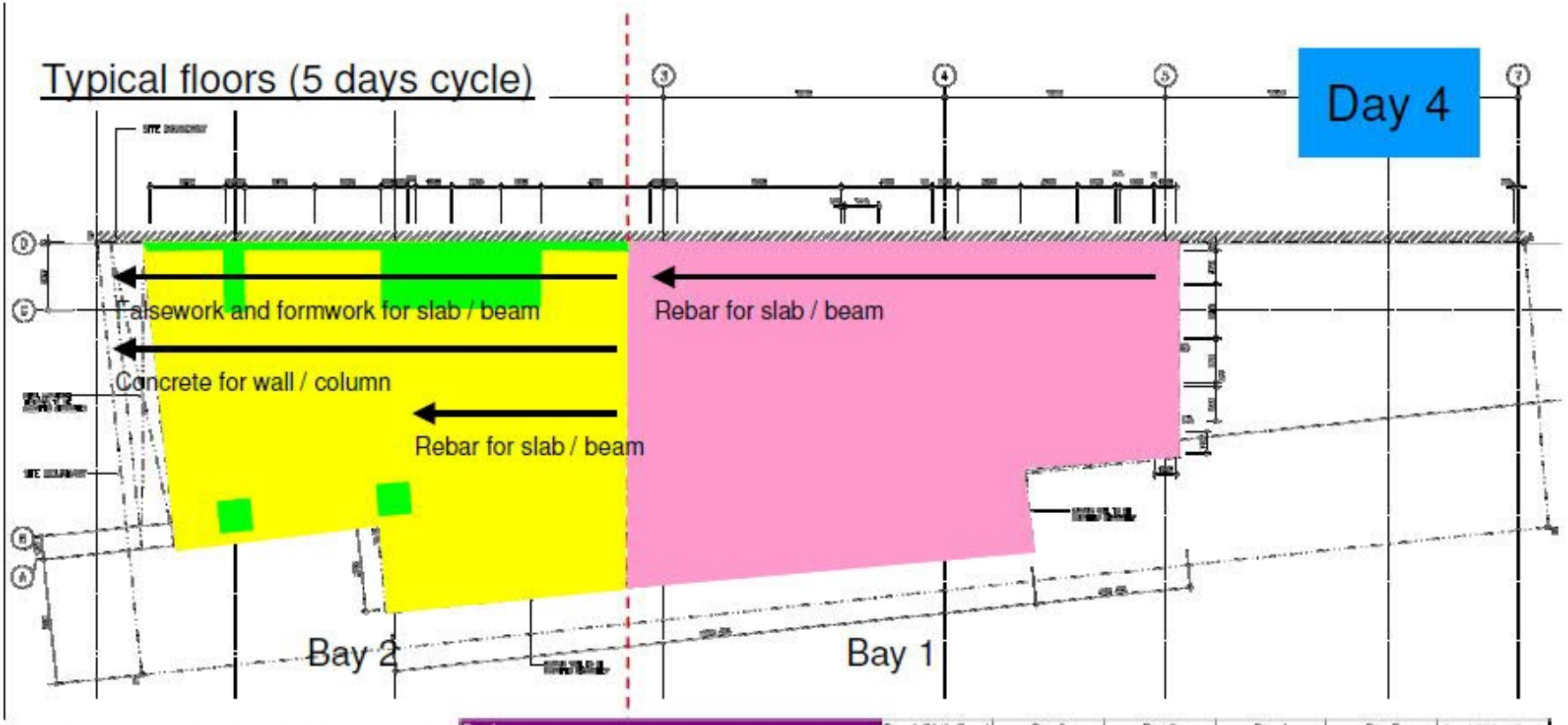
Bay 2	Day 1 (N-th floor)	Day 2	Day 3	Day 4	Day 5
Erection of left in wall formwork					
Erection of column & core wall formwork					
Fixing rebars for column & core wall					
Erect & tie with column & core wall formwork					
Erection of falsework for slab & beam					
Erection of slab & beam formwork					
Concreting column & core wall					
Fixing slab rebars / conduits / inspection before concreting					
Concreting slab & beam					



Bay 1	Day 1 (N-th floor)	Day 2	Day 3	Day 4	Day 5	Day 1 (N-th+1 floor)
Erection of left in wall formwork						
Erection of column & core wall formwork						
Fixing rebars for column & core wall						
Erect & tie with column & core wall formwork						
Erection of falsework for slab & beam						
Erection of slab & beam formwork						
Concreting column & core wall						
Fixing slab rebars / conduits / inspection before concreting						
Concreting slab & beam						

Bay 2	Day 1 (N-th floor)	Day 2	Day 3	Day 4	Day 5
Erection of left in wall formwork					
Erection of column & core wall formwork					
Fixing rebars for column & core wall					
Erect & tie with column & core wall formwork					
Erection of falsework for slab & beam					
Erection of slab & beam formwork					
Concreting column & core wall					
Fixing slab rebars / conduits / inspection before concreting					
Concreting slab & beam					


Typical floors (5 days cycle)
Day 3
Formwork for wall / column
Rebar for wall / column
Tie for wall / column
Falsework and formwork for slab / beam
Falsework and formwork for slab / beam
Concrete for wall / column
Rebar for slab / beam
Bay 2
Bay 1
Approx. 100m³ concrete for wall / column
Concreting = 4hrs per day
Concrete volume/day
= 7m³/truck x 4trucks/hr x 4 hrs
= 112m³ (max.)
Bay 1
Day 1 (N-th floor)
Day 2
Day 3
Day 4
Day 5
Erection of left in wall formwork
Erection of column & core wall formwork
Fixing rebars for column & core wall
Erect & tie with column & core wall formwork
Erection of falsework for slab & beam
Erection of slab & beam formwork
Concreting column & core wall
Fixing slab rebars / conduits / inspection before concreting
Concreting slab & beam
Bay 2
Day 1 (N-th floor)
Day 2
Day 3
Day 4
Day 5
Erection of left in wall formwork
Erection of column & core wall formwork
Fixing rebars for column & core wall
Erect & tie with column & core wall formwork
Erection of falsework for slab & beam
Erection of slab & beam formwork
Concreting column & core wall
Fixing slab rebars / conduits / inspection before concreting
Concreting slab & beam



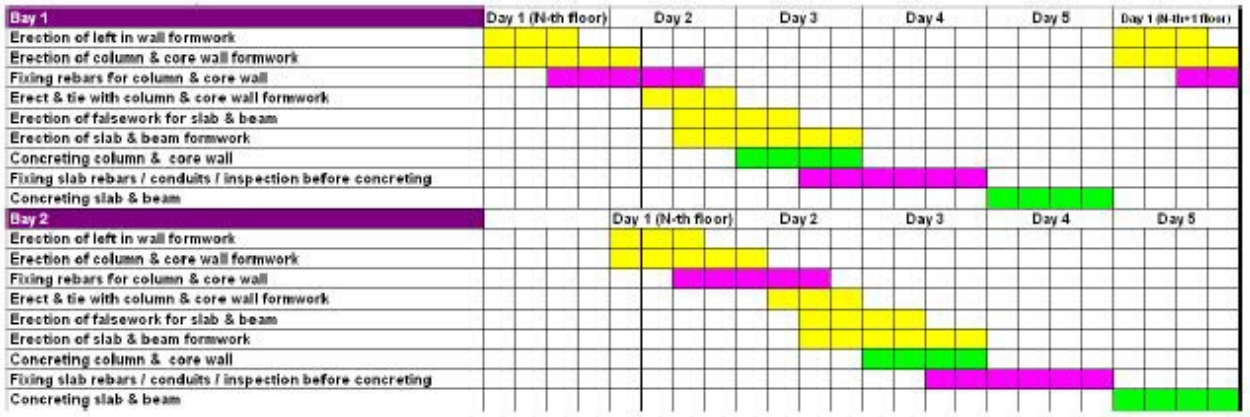
Approx. 100m³ concrete for wall / column

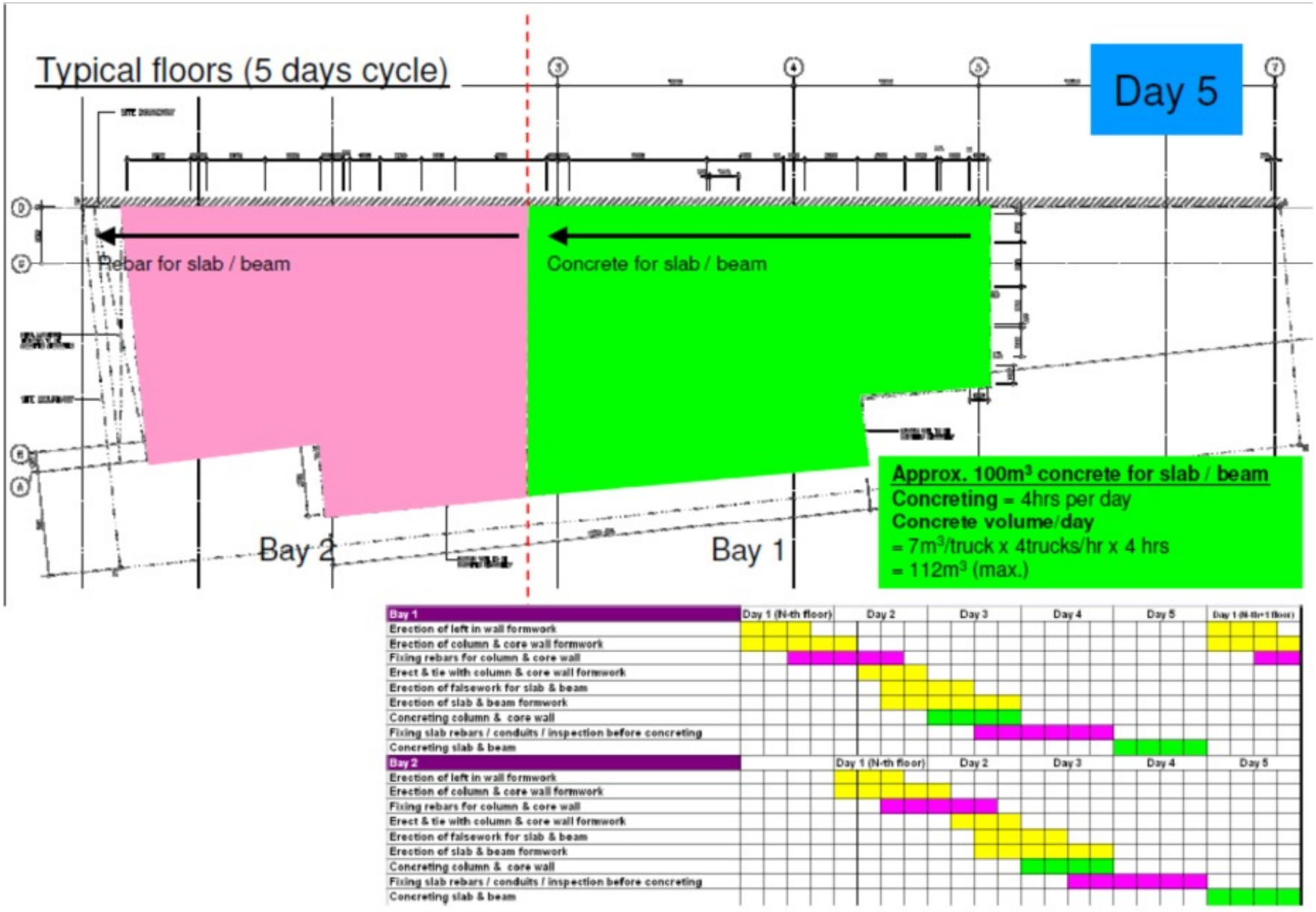
Concreting = 4hrs per day

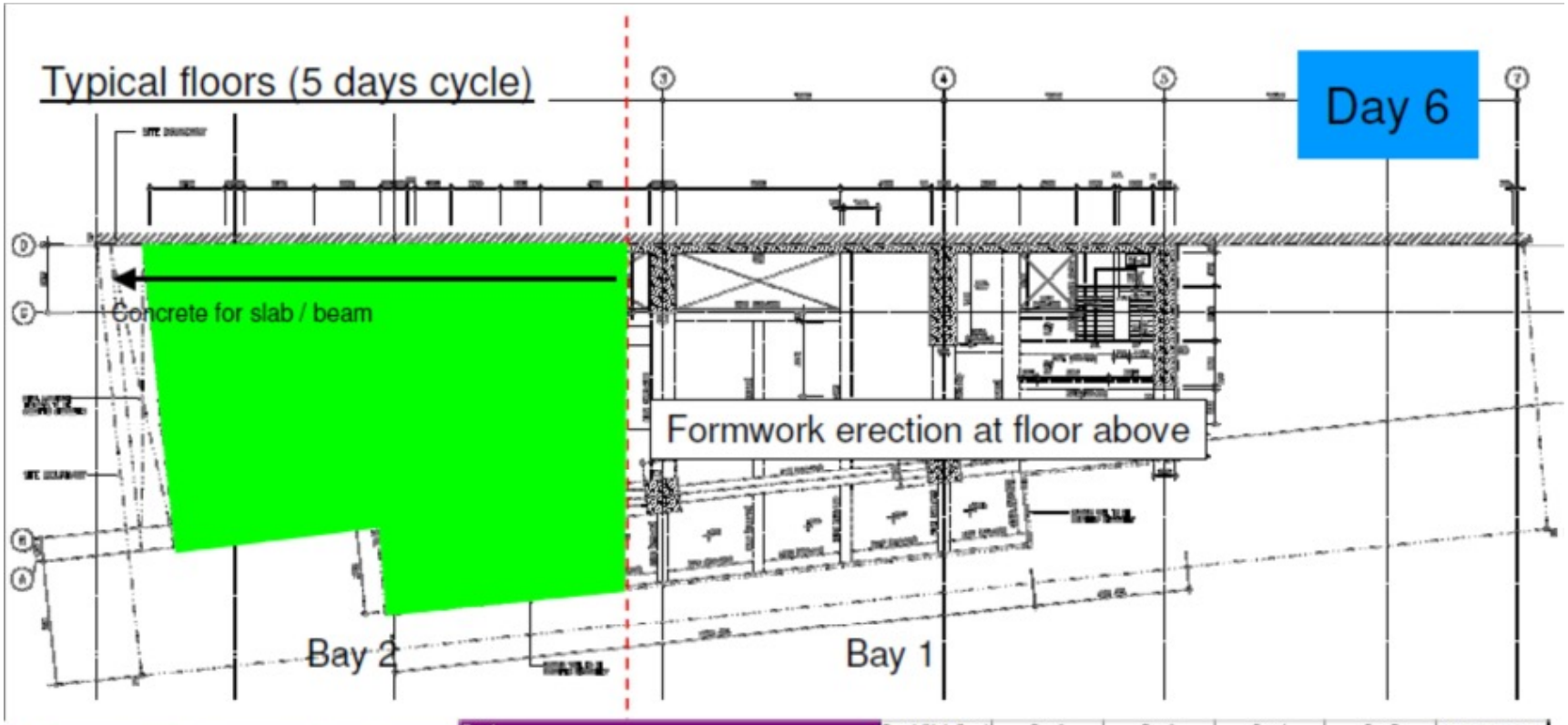
Concrete volume/day

= 7m³/truck x 4trucks/hr x 4 hrs

= 112m³ (max.)




Typical floors (5 days cycle)
Day 5
Rebar for slab / beam
Concrete for slab / beam
Bay 2
Bay 1
Approx. 100m³ concrete for slab / beam
Concreting = 4hrs per day
Concrete volume/day
= 7m³/truck x 4trucks/hr x 4 hrs
= 112m³ (max.)
Bay 1
Day 1 (N-th floor)
Day 2
Day 3
Day 4
Day 5
Erection of left in wall formwork
Erection of column & core wall formwork
Fixing rebars for column & core wall
Erect & tie with column & core wall formwork
Erection of falsework for slab & beam
Erection of slab & beam formwork
Concreting column & core wall
Fixing slab rebars / conduits / inspection before concreting
Concreting slab & beam
Bay 2
Day 1 (N-th floor)
Day 2
Day 3
Day 4
Day 5
Erection of left in wall formwork
Erection of column & core wall formwork
Fixing rebars for column & core wall
Erect & tie with column & core wall formwork
Erection of falsework for slab & beam
Erection of slab & beam formwork
Concreting column & core wall
Fixing slab rebars / conduits / inspection before concreting
Concreting slab & beam



Approx. 100m³ concrete for slab / beam

Concreting = 4hrs per day

Concrete volume/day

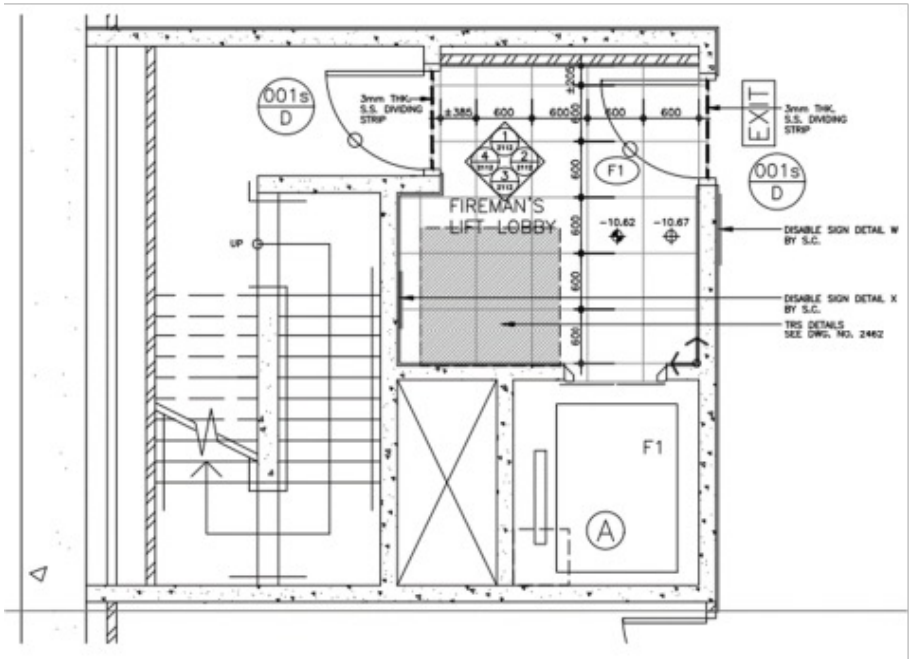
= 7m³/truck x 4trucks/hr x 4 hrs

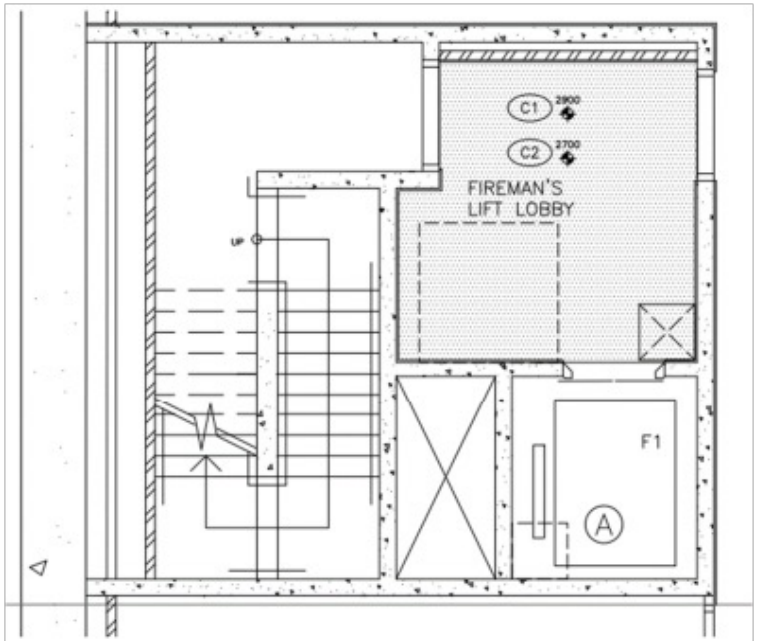
= 112m³ (max.)

D6. SERVICE LOBBIES

-D6.1. Fireman's Lift Lobby

Note the fire resisting requirements for the fireman's lift lobby.
Also check the finishes for the floor, wall and ceiling. The "disable sign" is required if the lift also serves as a "disable lift".





FIREMAN'S LIFT LOBBY
REFLECTED CEILING PLAN

600x600 ACCESS PANEL

FLOOR

F1 300 x 300mm x 10mm THK. EUROPEAN HOMOGENOUS TILES ON 40mm THK. C/S SCREEDING

SKIRTING

S2b 300 x 100mm H. HOMOGENOUS SKIRTING (MATCH WITH FLOOR TILE)

WALL

W2 15mm THK. INTERNAL PLASTER W/ ACRYLIC RESIN TEXTURED PAINT

CEILING

C1 PROMAT BOARD (FRR) W/ ACRYLIC RESIN PAINT

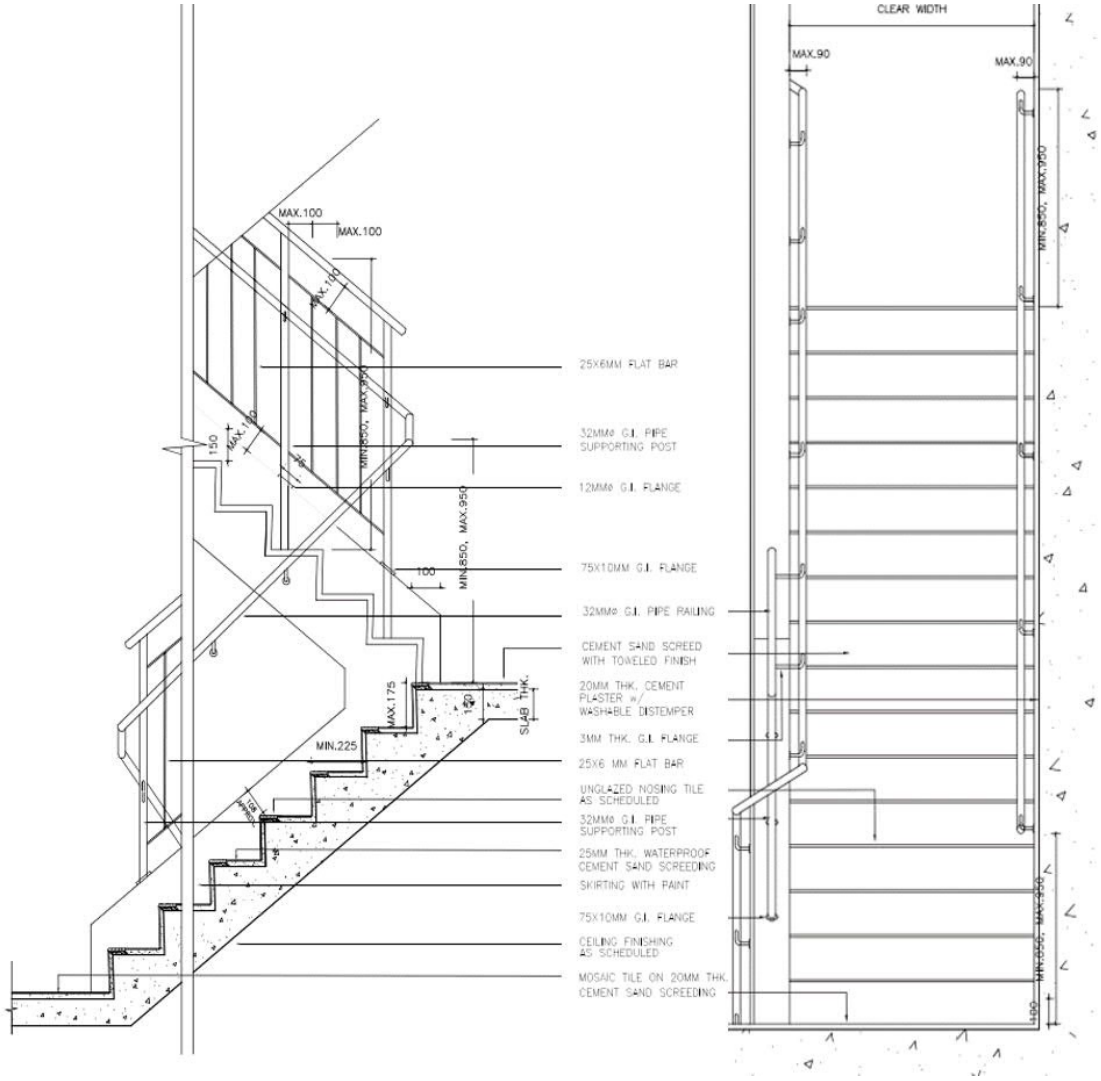
C2 12mm THK. GYPSUM BOARD CEILING WITH SEMI-GLOSS EMULSION PAINT

D7. STAIRCASES

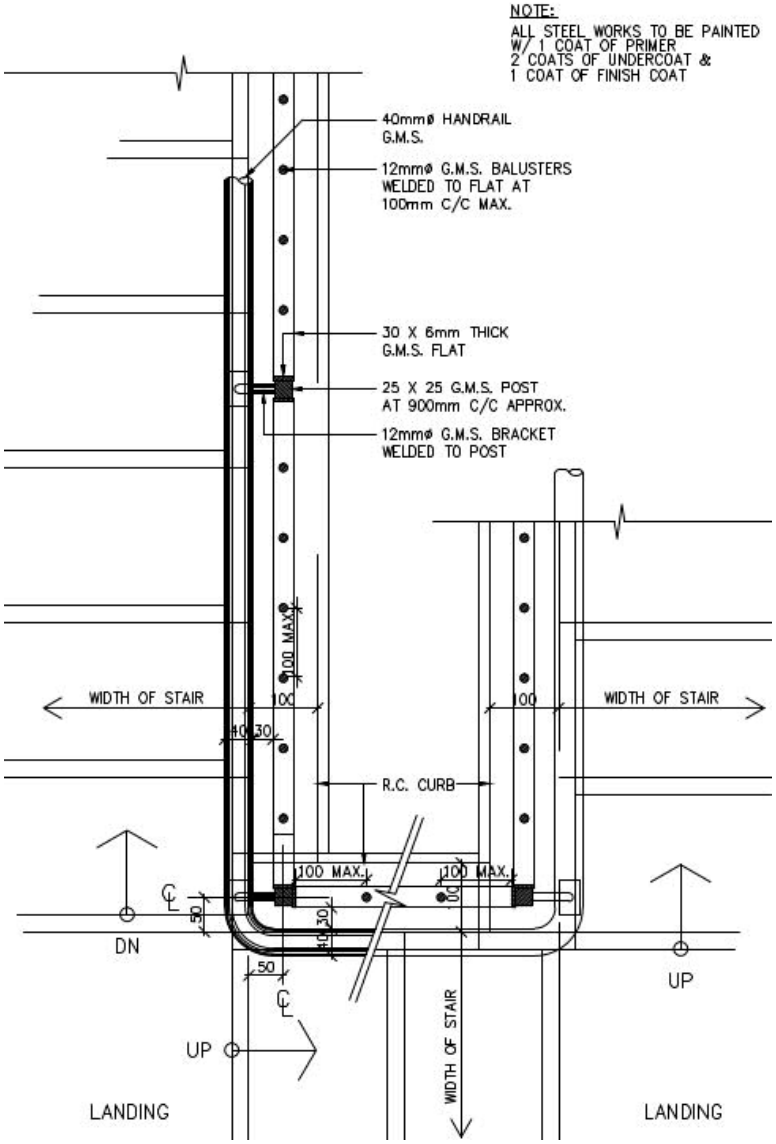
Note the provisions and details for universal accessibility and compliance with the building regulations.

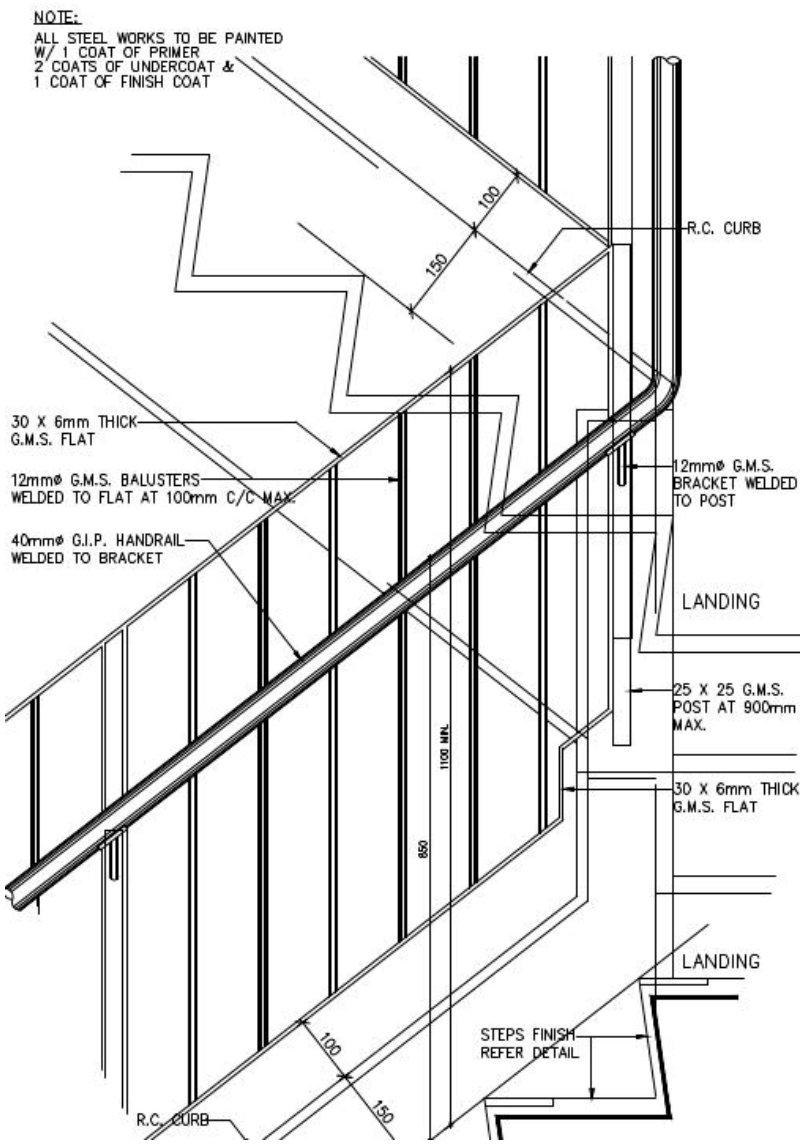
Reference: *BMT-Chapter 2.9. Staircases, steps and handrails*

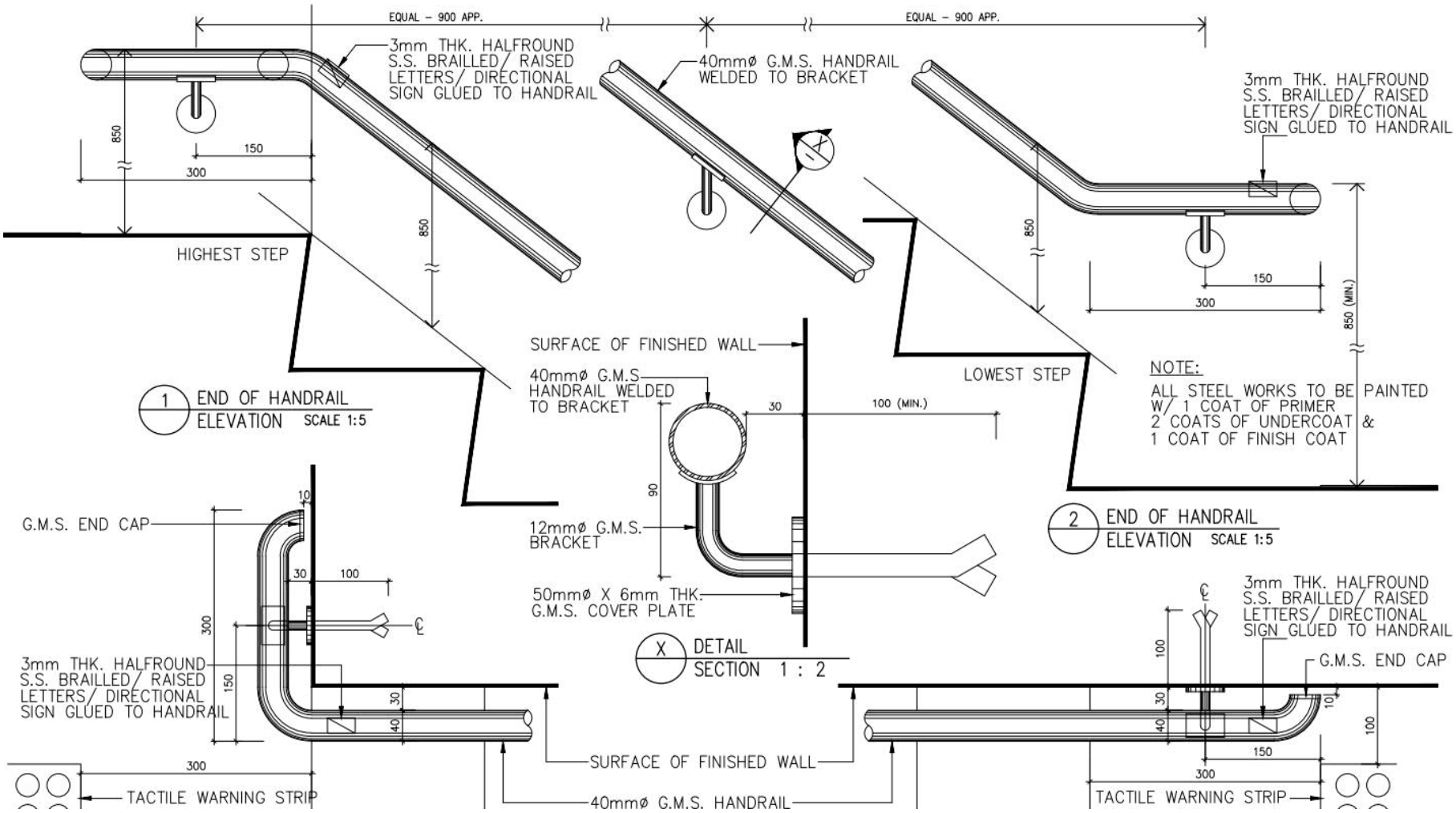
-D7.1. Fire Escape Staircase

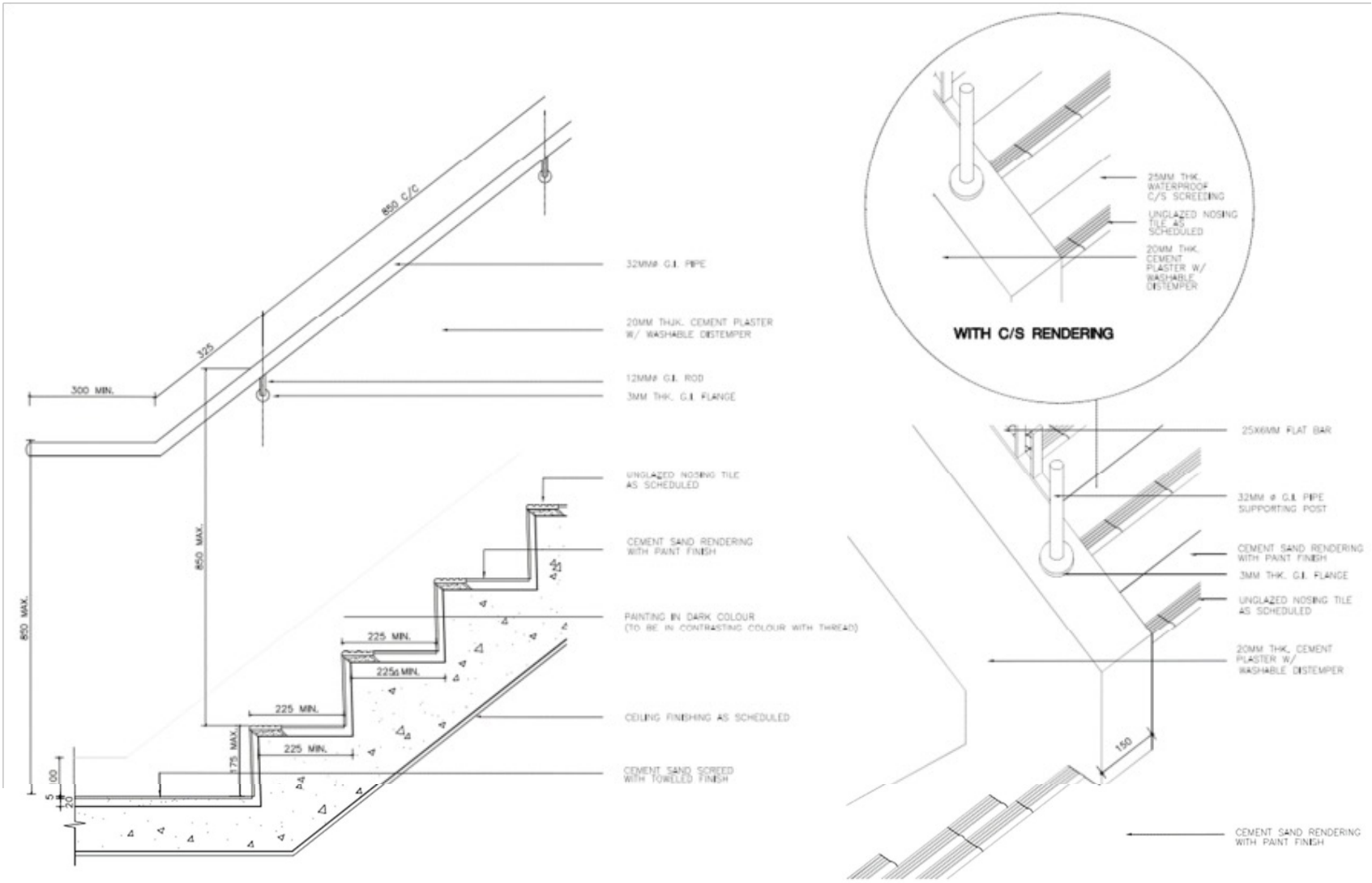


-D7.2. Stairs and Railings



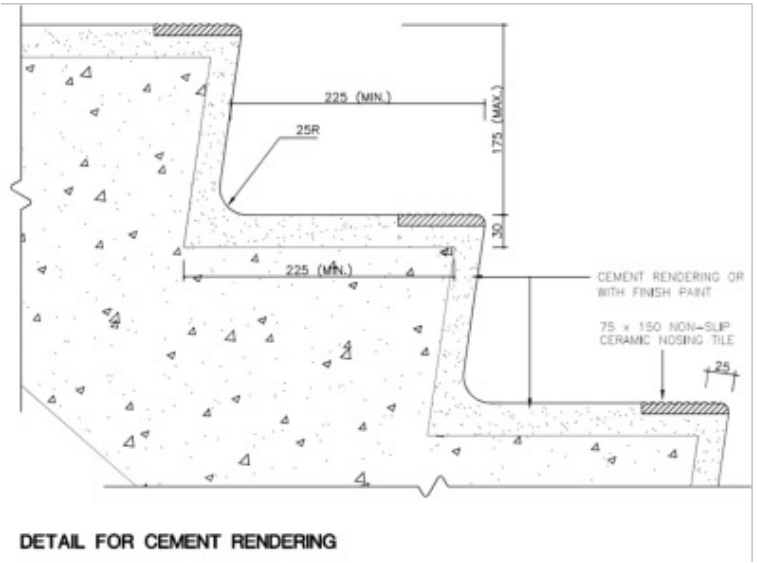



EQUAL – 900 APP.
EQUAL – 900 APP.
3mm THK. HALFROUND S.S. BRAILLED/ RAISED LETTERS/ DIRECTIONAL SIGN GLUED TO HANDRAIL
40mmø G.M.S. HANDRAIL WELDED TO BRACKET
3mm THK. HALFROUND S.S. BRAILLED/ RAISED LETTERS/ DIRECTIONAL SIGN GLUED TO HANDRAIL
850
150
300
HIGHEST STEP
LOWEST STEP
850 (MIN.)
1 END OF HANDRAIL ELEVATION SCALE 1:5
SURFACE OF FINISHED WALL
40mmø G.M.S HANDRAIL WELDED TO BRACKET
30
100 (MIN.)
90
12mmø G.M.S. BRACKET
50mmø X 6mm THK. G.M.S. COVER PLATE
X DETAIL SECTION 1 : 2
NOTE:
ALL STEEL WORKS TO BE PAINTED W/ 1 COAT OF PRIMER 2 COATS OF UNDERCOAT & 1 COAT OF FINISH COAT
2 END OF HANDRAIL ELEVATION SCALE 1:5
G.M.S. END CAP
10
100
300
3mm THK. HALFROUND S.S. BRAILLED/ RAISED LETTERS/ DIRECTIONAL SIGN GLUED TO HANDRAIL
40
TACTILE WARNING STRIP
SURFACE OF FINISHED WALL
40mmø G.M.S. HANDRAIL

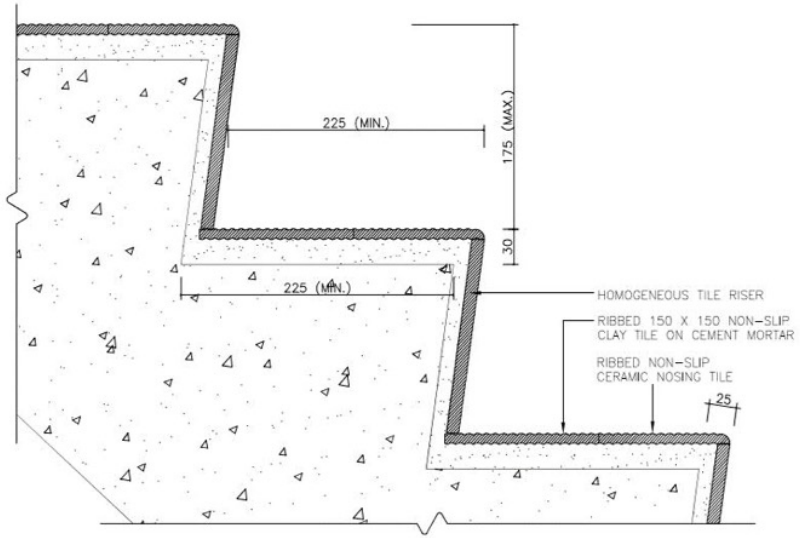


TYPICAL STAIRCASE DETAIL (ON WALL SIDE)

ISOMETRIC OF HANDRAIL AROUND LANDING



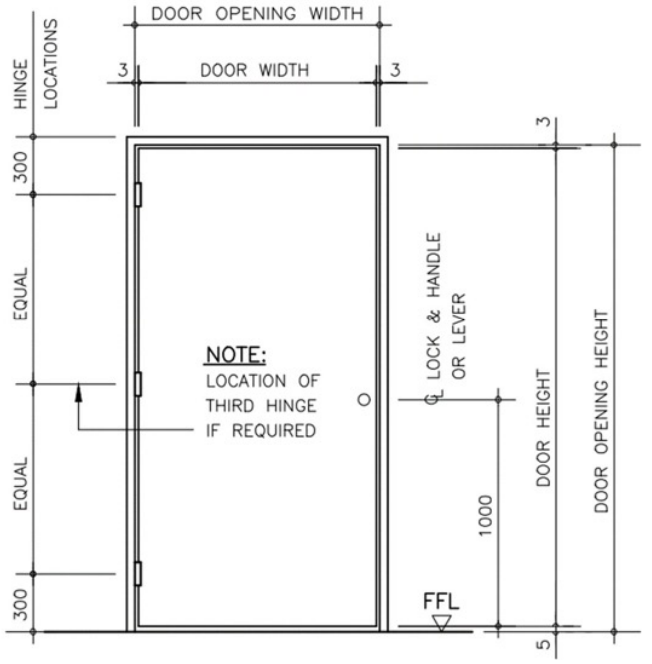
DETAIL FOR CEMENT RENDERING

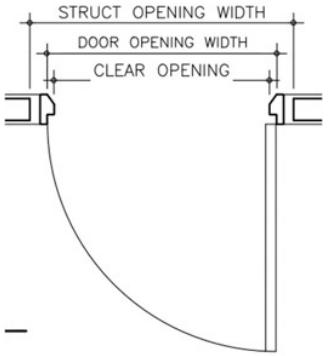


DETAIL FOR HOMOGENEOUS TILES APPLIED ON STAIRCASE

D8. CARPENTRY, JOINERY AND IRONMONGERY

Doors are designed and built based on different functional requirements for their location. Appropriate choice of ironmongery is selected to serve the particular function.





-D8.1. Door Marks and Schedule

LEGEND – FOR DOOR TYPE

SELF-CLOSING EXIT DOOR WITH TRANSPARENT UPPER PANEL AND F.R.R. (–/30/30) W/ SMOKE SEAL

SELF-CLOSING FIRE DOOR WITH F.R.R. (–/30/30)

SELF-CLOSING FIRE DOOR AND DOOR PANEL ALL HAVING F.R.R. (–/30/30)

SELF-CLOSING EXIT DOOR WITH TRANSPARENT UPPER PANEL AND F.R.R. (–/60/60) W/ SMOKE SEAL

SELF-CLOSING DOUBLE-LEAF EXIT DOOR WITH TRANSPARENT UPPER PANEL AND F.R.R. (–/60/60) W/ SMOKE SEAL

SELF-CLOSING FIRE DOOR WITH F.R.R. (–/60/60) AND SMOKE SEAL

SELF-CLOSING FIRE DOOR WITH F.R.R. (–/60/–) AND SMOKE SEAL

SELF-CLOSING FIRE DOOR WITH F.R.R. (–/60/60)

SELF-CLOSING DOUBLE-LEAF FIRE DOOR WITH F.R.R. (–/60/60)

SELF-CLOSING FIRE DOOR WITH F.R.R. (–/60/–)

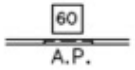
SELF-CLOSING FIRE DOOR WITH F.R.R. (–/120/120) AND SMOKE SEAL

SELF-CLOSING FIRE DOOR WITH F.R.R. (–/120/120)

SELF-CLOSING FIRE DOOR WITH F.R.R. (–/240/240)

SELF-CLOSING FIRE DOOR WITH F.R.R. (–/240/240) AND SMOKE SEAL

SELF-CLOSING ACCESS PANEL WITH F.R.R. (–/60/60)



SELF-CLOSING ACCESS PANEL WITH F.R.R. (–/60/–)

SELF-CLOSING ACCESS PANEL WITH F.R.R. (–/120/120)

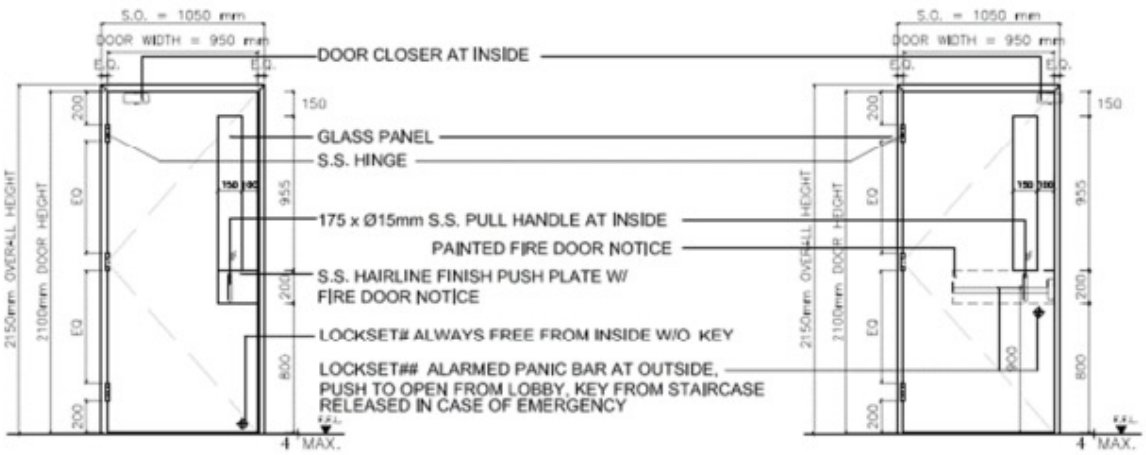
DOOR WITH PANIC BOLT

METAL DOOR

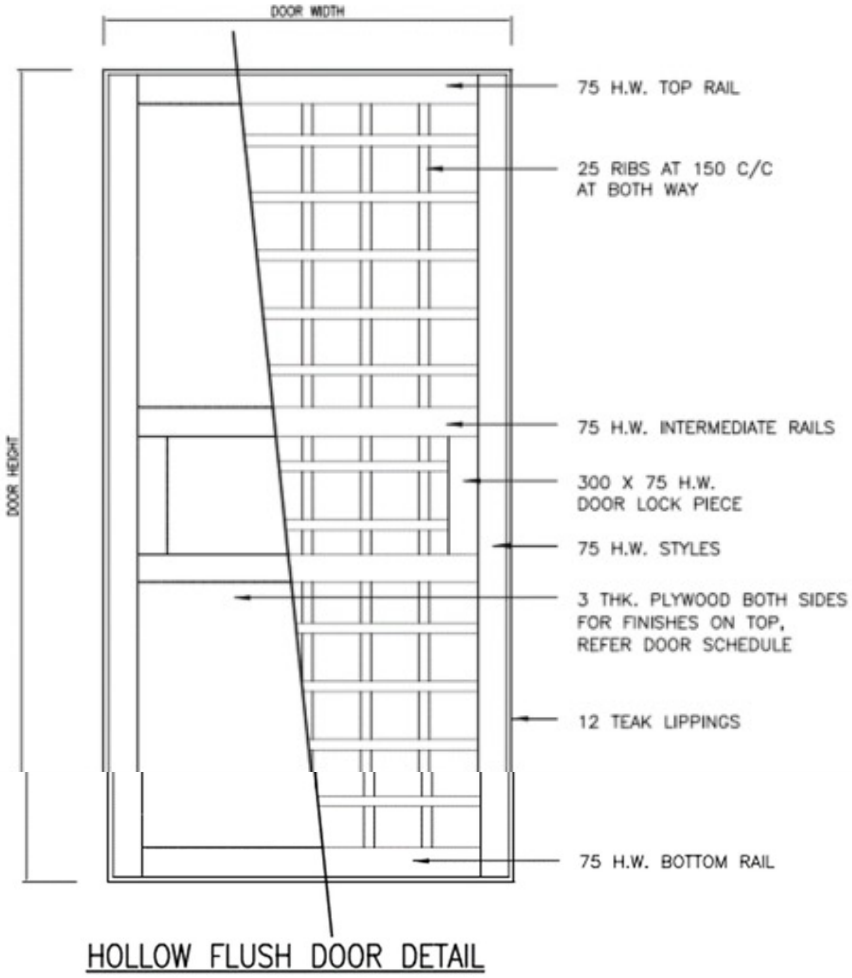
DOOR W/ CLEAR GLASS UPPER PANEL

SELF-CLOSING DOOR WITH SMOKE SEAL

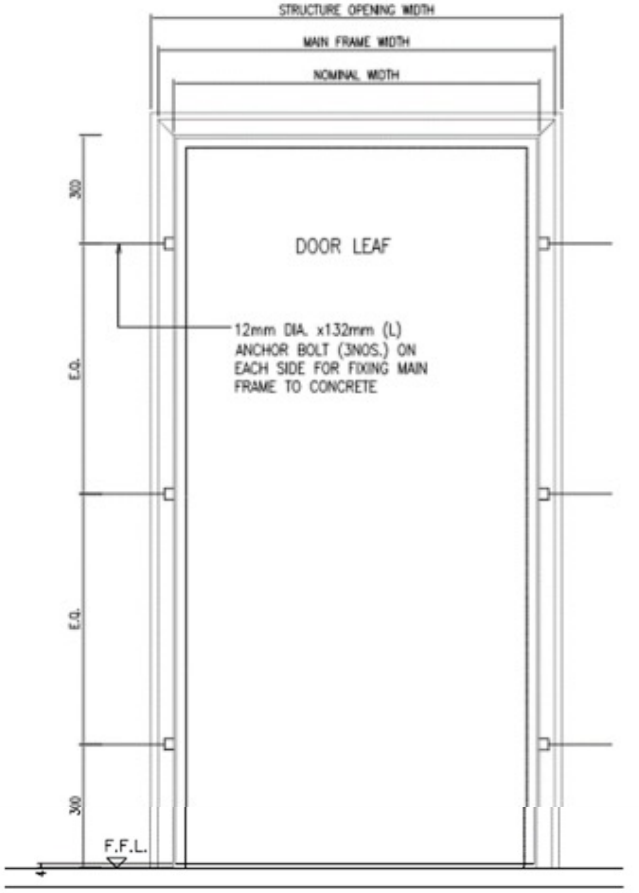
Example: Door Schedule

OUTSIDE ELEVATION	
DOOR MARK	D1
FIRE RATING	F.R.R. -/30/30 WITH SMOKE SEALS
DOOR TYPE	44MM MIN. THK HARD WOOD SOLID CORE FLUSH DOOR
DOOR LEAF	1mm GREY COLOUR PLASTIC LAMINATE SHEET
DOOR FRAME	47 X 130mm WITH ARCHITRAVE 12X47mm WITH FINISH PAINTING
GLAZING	GLASS W/ MIN. 30 MINS FRR
LOCATION	ST-1 & ST-2 AT 9/F; DUCT ROOM AT 9/F
REMARK	1 NO. DOOR STOP

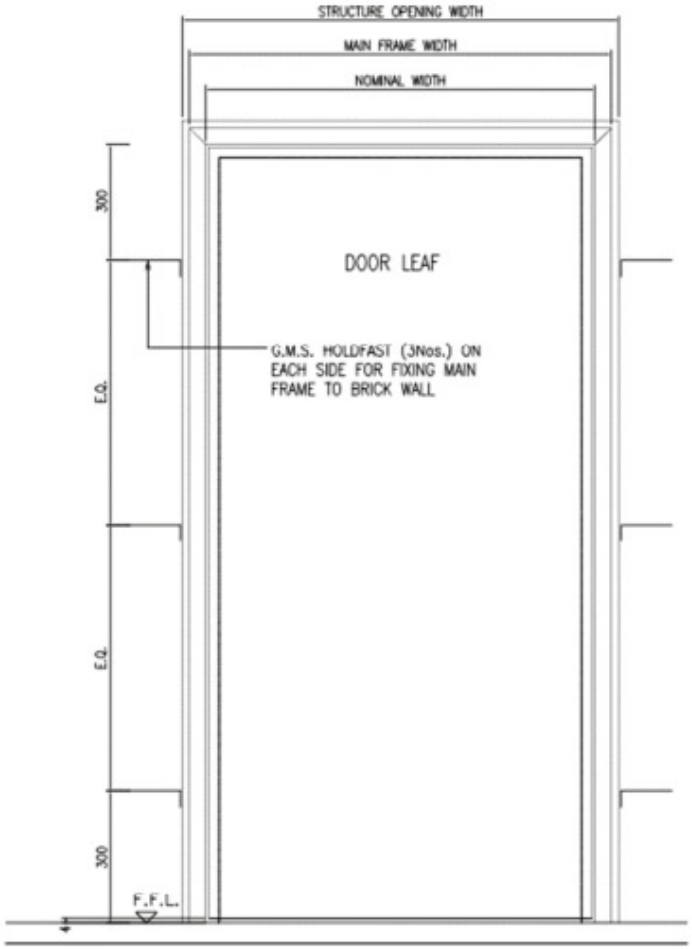
-D8.2. Construction of Doors



HOLLOW FLUSH DOOR DETAIL

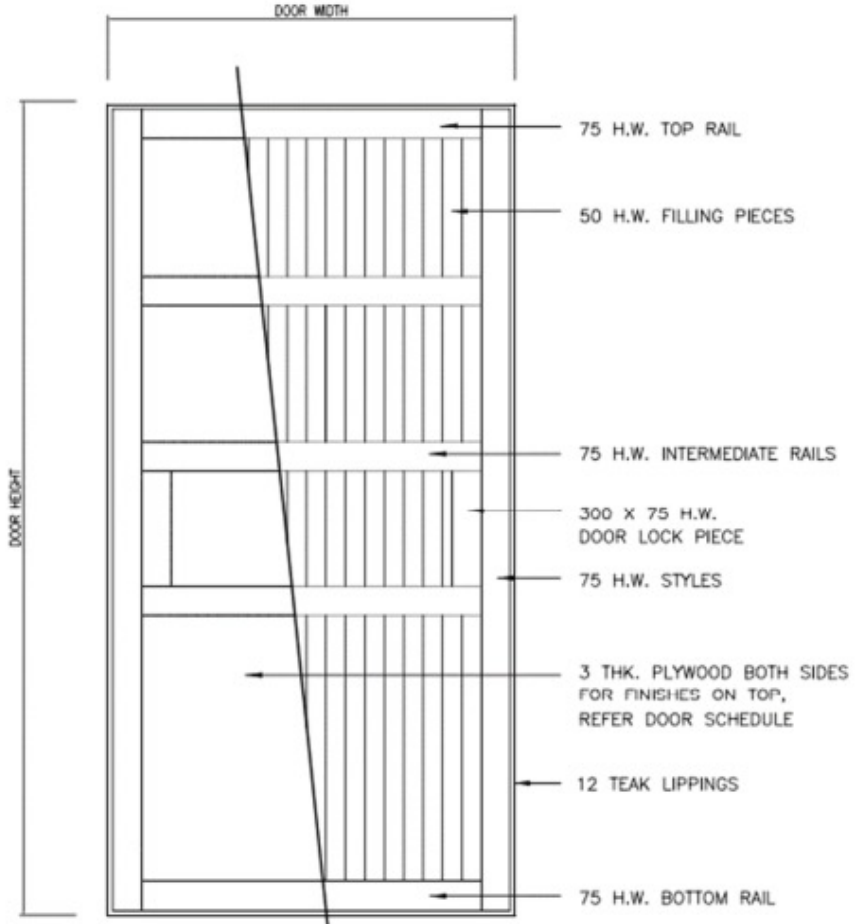


TYPICAL FIXING OF TIMBER DOOR FRAME ON CONCRETE WALL
SCALE 1:20



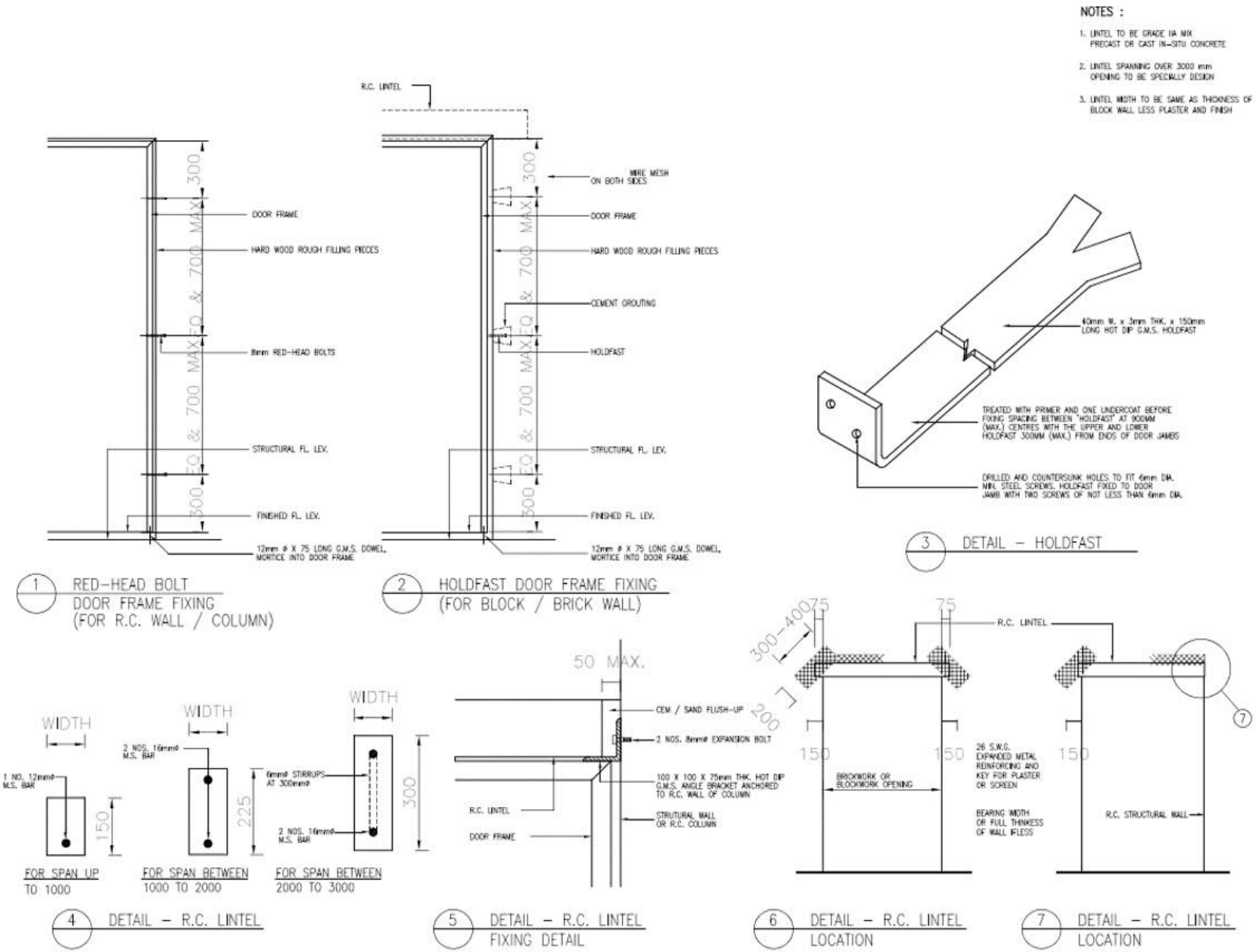
TYPICAL FIXING OF TIMBER DOOR FRAME ON BRICK WALL

SCALE 1:20



SOLID FLUSH DOOR DETAIL

SCALE 1:20


NOTES :
1. LINTEL TO BE GRADE IIA MIX PRECAST OR CAST IN-SITU CONCRETE
2. LINTEL SPANNING OVER 3000 mm OPENING TO BE SPECIALLY DESIGN
3. LINTEL WIDTH TO BE SAME AS THICKNESS OF BLOCK WALL LESS PLASTER AND FINISH
R.C. LINTEL
DOOR FRAME
HARD WOOD ROUGH FILLING PIECES
8mm RED-HEAD BOLTS
STRUCTURAL FL. LEV.
FINISHED FL. LEV.
12mm ø X 75 LONG G.M.S. DOWEL, MORTICE INTO DOOR FRAME
300
500 EQ. & 700 MAX.
WIRE MESH ON BOTH SIDES
CEMENT GROUTING
HOLDFAST
40mm W. x 3mm THK. x 150mm LONG HOT DIP G.M.S. HOLDFAST
TREATED WITH PRIMER AND ONE UNDERCOAT BEFORE FIXING SPACING BETWEEN "HOLDFAST" AT 900MM (MAX.) CENTRES WITH THE UPPER AND LOWER HOLDFAST 300MM (MAX.) FROM ENDS OF DOOR JAMBS
DRILLED AND COUNTERSUNK HOLES TO FIT 6mm DIA. MIN. STEEL SCREWS. HOLDFAST FIXED TO DOOR JAMB WITH TWO SCREWS OF NOT LESS THAN 6mm DIA.
1 RED-HEAD BOLT DOOR FRAME FIXING (FOR R.C. WALL / COLUMN)
2 HOLDFAST DOOR FRAME FIXING (FOR BLOCK / BRICK WALL)
3 DETAIL – HOLDFAST
WIDTH
1 NO. 12mmø M.S. BAR
2 NOS. 16mmø M.S. BAR
6mmø STIRRUPS AT 300mmø
150
225
300
FOR SPAN UP TO 1000
FOR SPAN BETWEEN 1000 TO 2000
FOR SPAN BETWEEN 2000 TO 3000
4 DETAIL – R.C. LINTEL
50 MAX.
CEM / SAND FLUSH-UP
2 NOS. 8mmø EXPANSION BOLT
100 X 100 X 75mm THK. HOT DIP G.M.S. ANGLE BRACKET ANCHORED TO R.C. WALL OF COLUMN
STRUTURAL WALL OR R.C. COLUMN
R.C. LINTEL
DOOR FRAME
5 DETAIL – R.C. LINTEL FIXING DETAIL
300-400
75
200
150
BRICKWORK OR BLOCKWORK OPENING
26 S.W.G. EXPANDED METAL REINFORCING AND KEY FOR PLASTER OR SCREEN
BEARING WIDTH OR FULL THINKESS OF WALL IF LESS
6 DETAIL – R.C. LINTEL LOCATION
R.C. STRUCTURAL WALL
7 DETAIL – R.C. LINTEL LOCATION

-D8.3. Ironmongery

Reference: *BMT-Chapter 2.8 Carpentry, Joinery & Ironmongery*

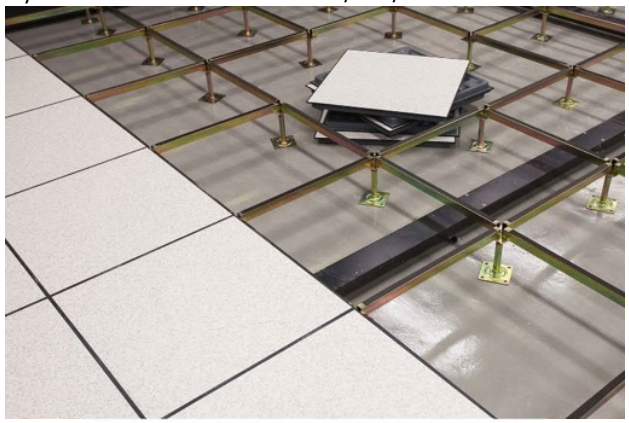
Closely associated with doors are items of ironmongery. These include locksets (for different purposes), latches, hinges, door closers, hooks, doorstops etc. The selection of ironmongery depends on the level of security, user requirements of passage and special needs during emergency such as fire escape route and bathroom doors. Different materials (usually metal) with choices of texture and colour as well as price range are available for selection.

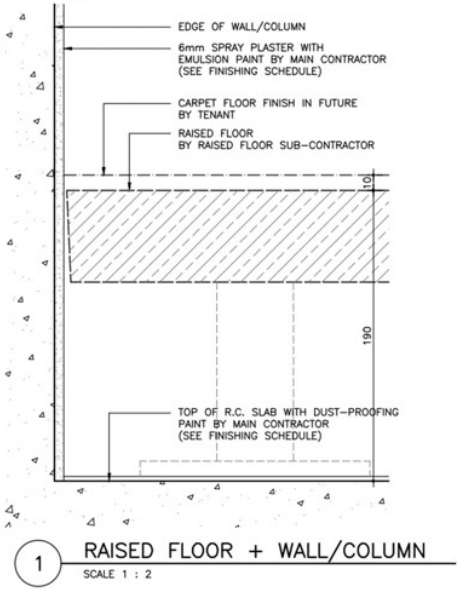
D9. FINISHES

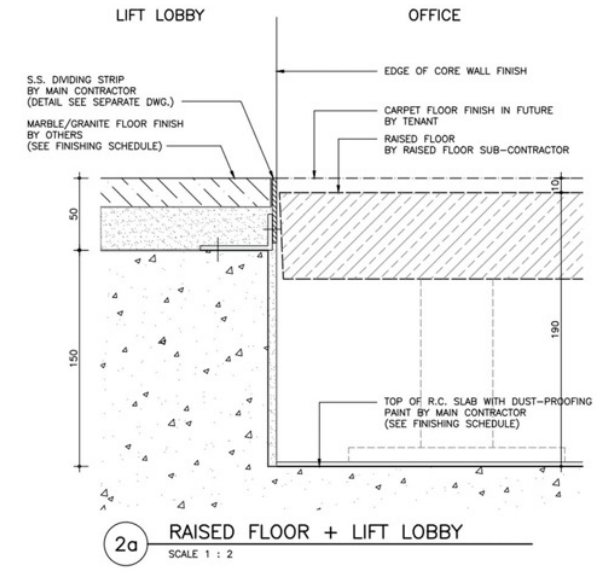
Reference: *BMT-Chapter 2.12 Floors, walls and ceiling finishes*

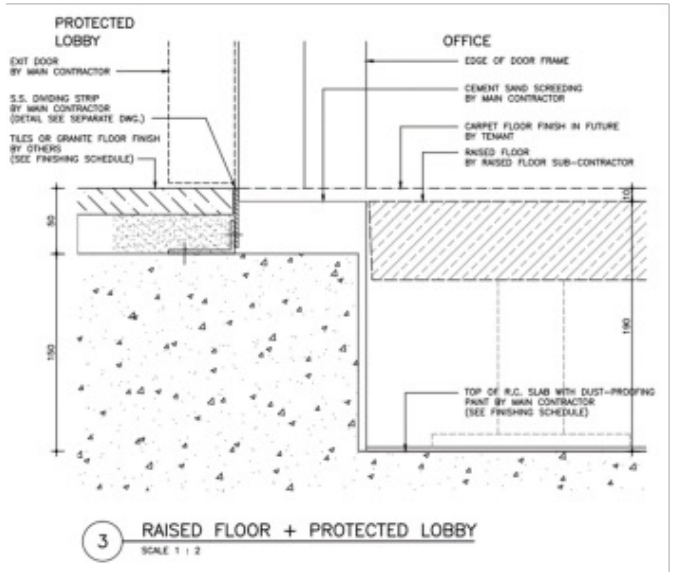
-D9.1. Raised Flooring

This allows easy access of electrical conduits and/or A/C ducts underneath.

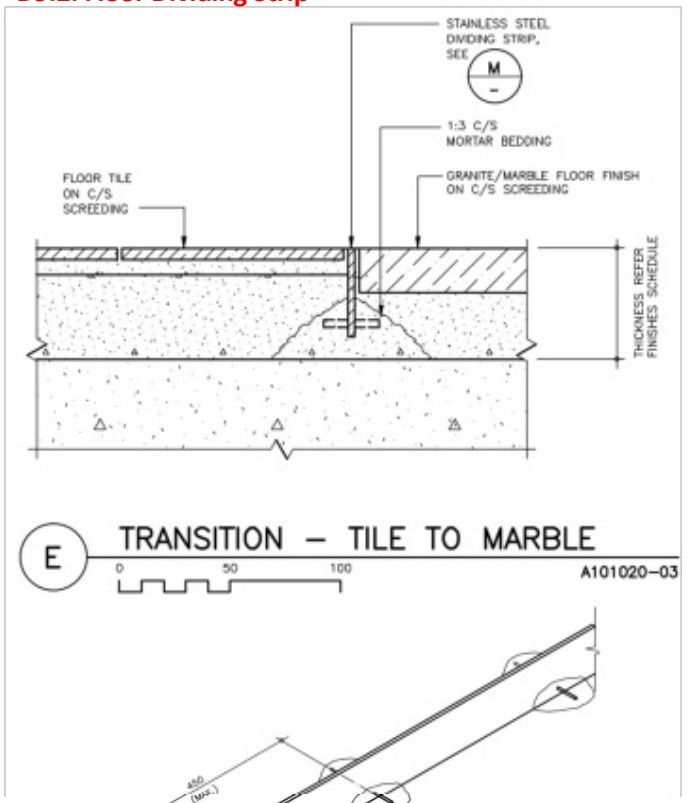




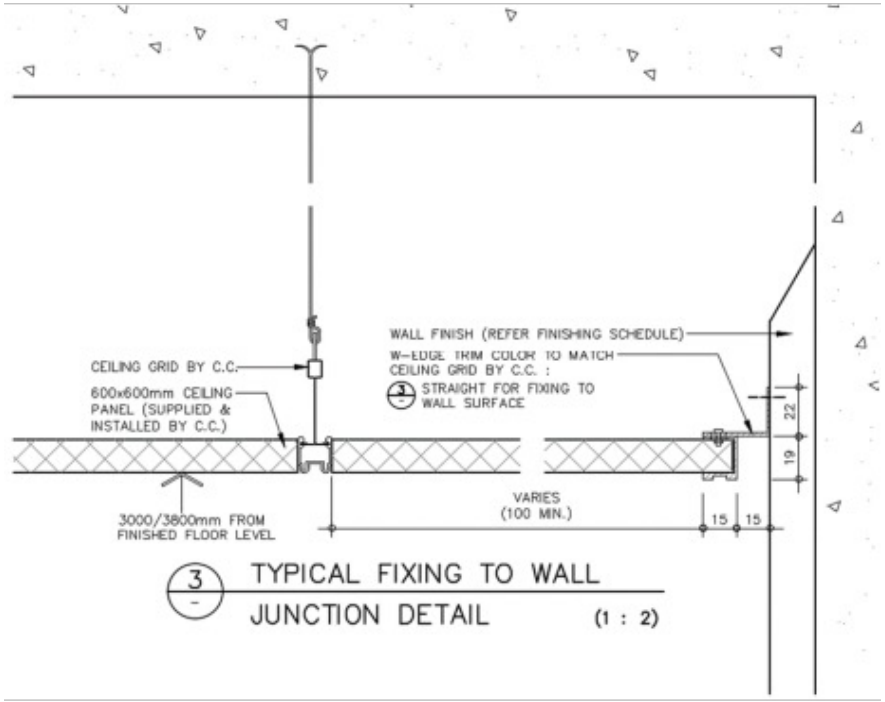


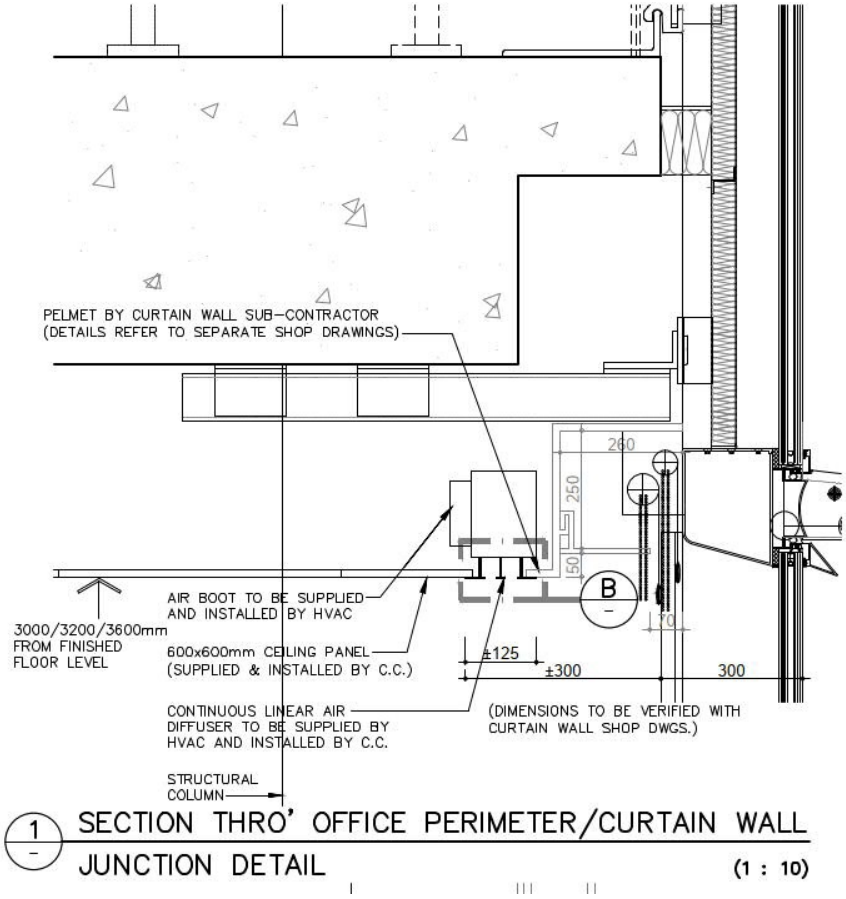


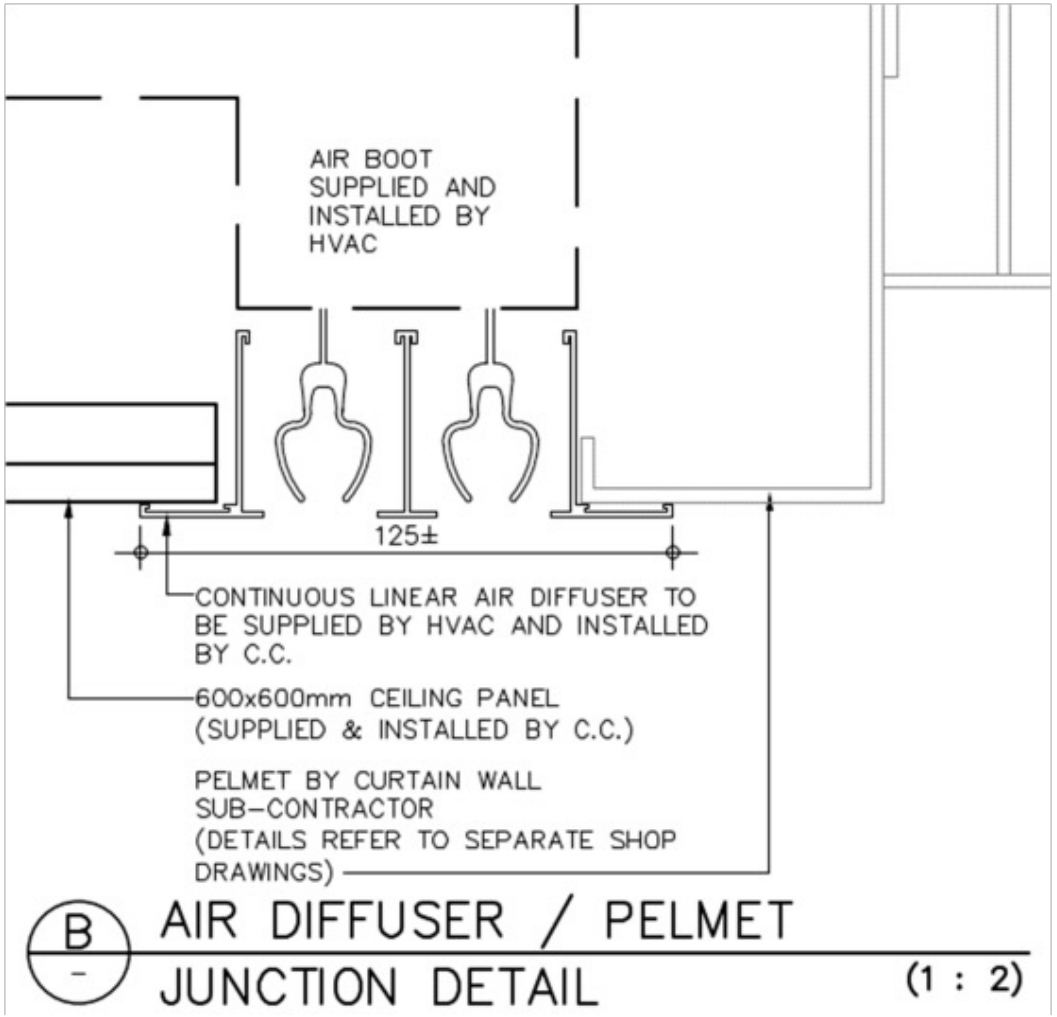
-D9.2. Floor Dividing Strip

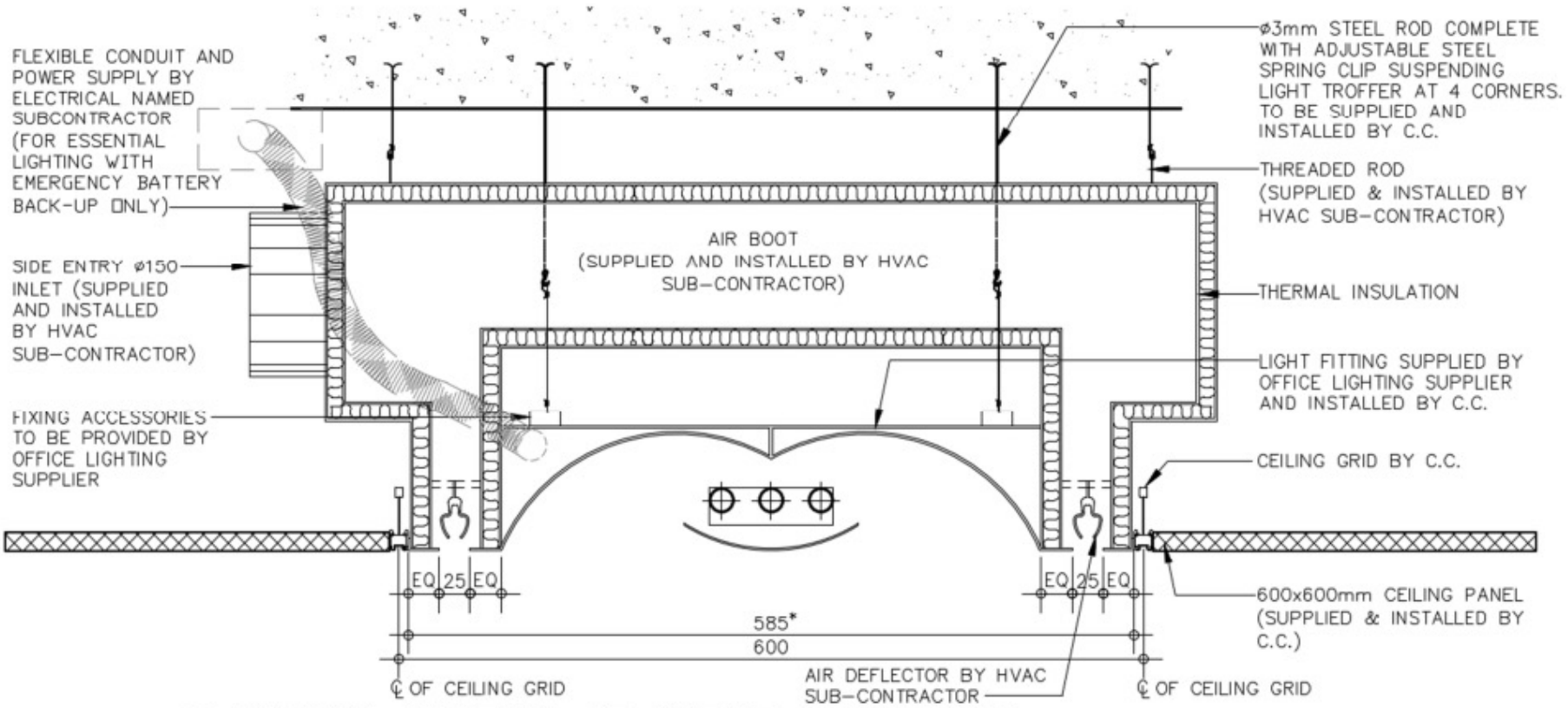


-D9.3. Suspended Ceiling Junctions






AIR BOOT
SUPPLIED AND
INSTALLED BY
HVAC
125±
CONTINUOUS LINEAR AIR DIFFUSER TO
BE SUPPLIED BY HVAC AND INSTALLED
BY C.C.
600x600mm CEILING PANEL
(SUPPLIED & INSTALLED BY C.C.)
PELMET BY CURTAIN WALL
SUB-CONTRACTOR
(DETAILS REFER TO SEPARATE SHOP
DRAWINGS)
B
-
AIR DIFFUSER / PELMET
JUNCTION DETAIL
(1 : 2)



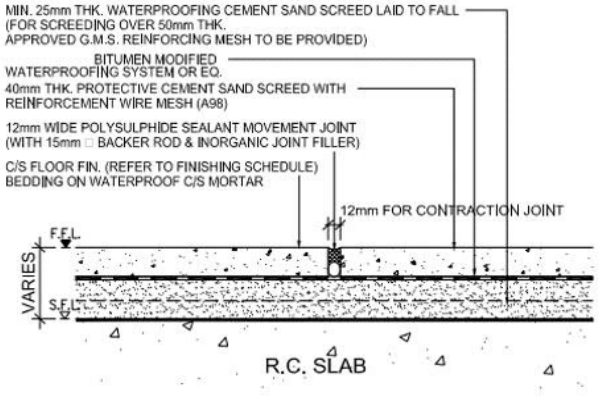
C - TYPICAL SECTION OF OFFICE LUMINARIES WITH SIDE INLET DOUBLE SIDE LIGHT TROFFER DIFFUSER (NTS)

*DIMENSION TO BE COORDINATED BETWEEN OFFICE LIGHTING SUPPLIER & C.C.

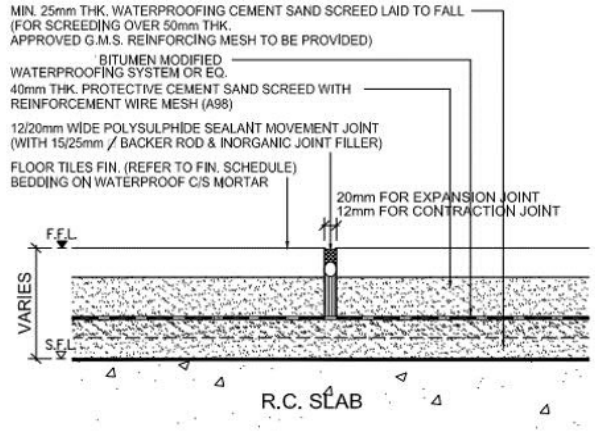
-D9.4. Movement Joints

Movement Joints on Roof

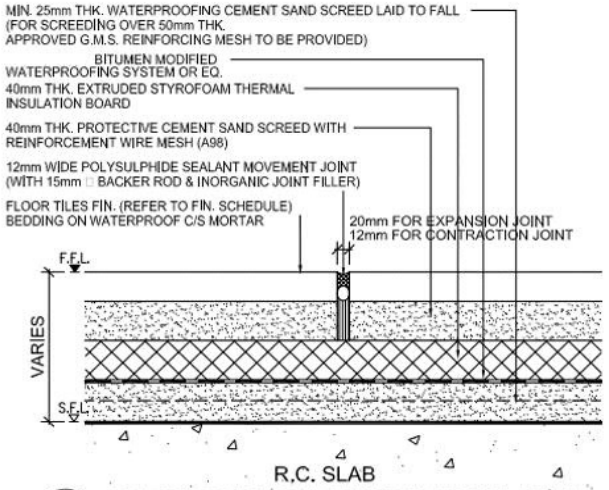
Note: The spacing of the joints depends on the finishing materials and other factors such as usage and orientation. The setting out of the joints needs to be worked out in consideration of the specific geometry of the roof area.



1 DETAIL SECTION OF MOVEMENT JOINT
(WITHOUT INSULATION)

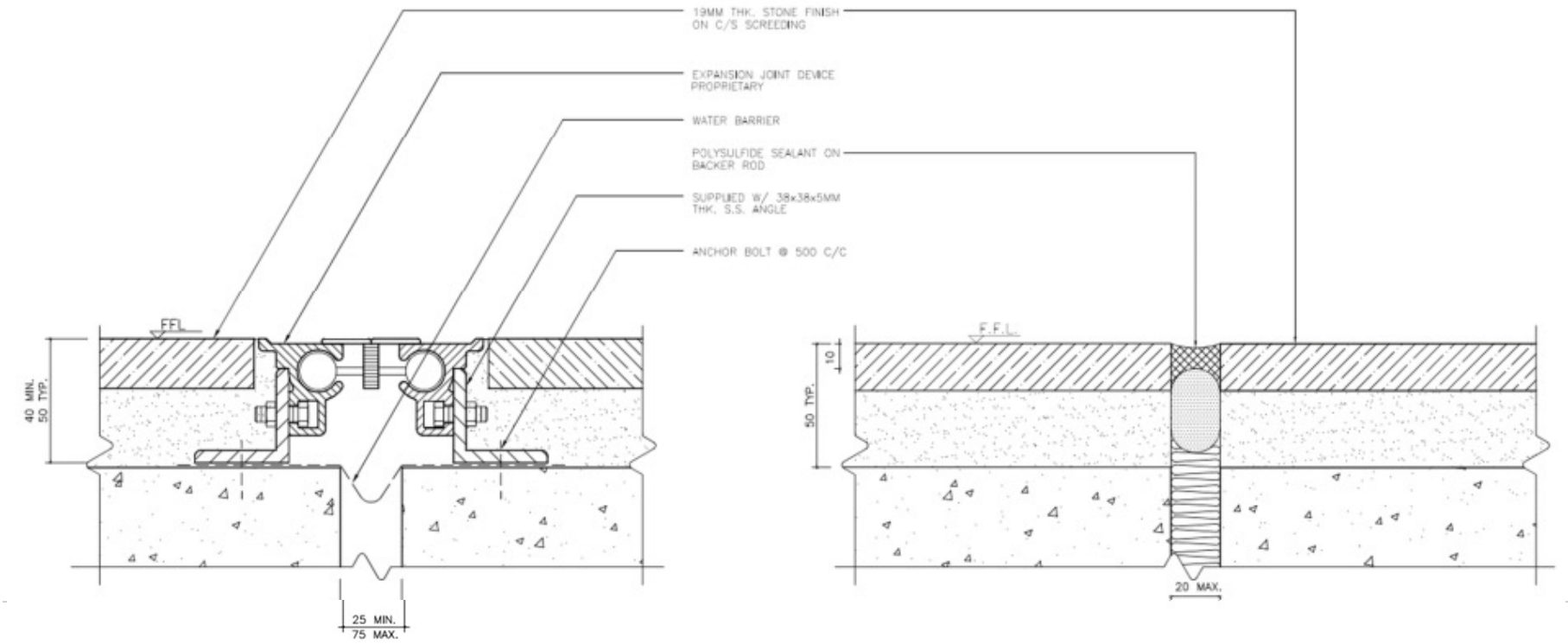


2 DETAIL SECTION OF MOVEMENT JOINT
(WITHOUT INSULATION)



3 DETAIL SECTION OF MOVEMENT JOINT
(WITH INSULATION - FLAT ROOF ABOVE RESIDENTIAL)

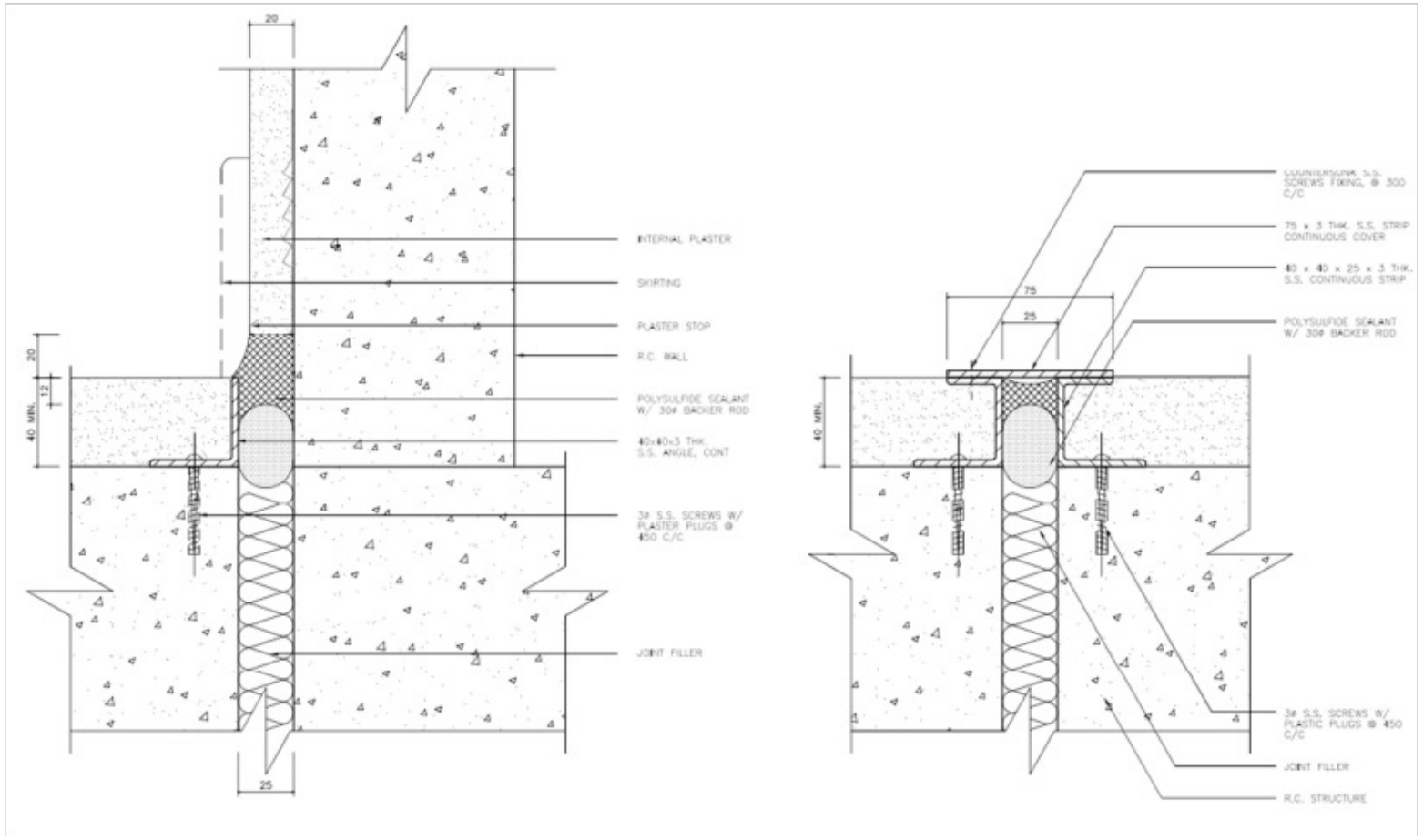
Movement/expansion Joints for Stone Finish



DETAIL OF EXTERIOR LARGE EXPANSION JOINT AT FLOOR (STONE FLOOR FINISH)

INTERIOR TYPICAL FLOOR EXPANSION JOINT DETAIL (STONE FLOOR FINISH)

Movement/expansion Joint for Tile Flooring



DETAIL OF INTERIOR EXPANSION JOINT AT FLOOR / WALL
(SCREED OR TILE FLOOR FINISH)

INTERIOR EXPANSION JOINT DETAIL AT FLOOR
(SCREED OR TILE FLOOR FINISH)

-D9.5. Schedule of Finishes

Example: Format of Finishing Schedule designed for an office building with podium shops and basement

FINISHING SCHEDULE						REMARKS
LOCATION		FLOOR	SKIRTING	WALL/ COLUMN	CEILING	
BASEMENT FLOOR (CARPARK)	CARPARK LIFT LOBBY	F4	S3	(*)W2	C6	TWO SIDES OF WALL ARE TEMPERED GLASS FACING PARKING AREA
	SERVICE LIFT LOBBY	F4	S3	(*)W2	C5	
	FIRE ESCAPE STAIRCASE	F2	S5	W4	C2	
	STAIRCASE PROTECTED LOBBY (1ST LOBBY)	F4	S3	(*)W2	C2	
	CARPARK & DRIVEWAY	F8	S7	W5	C8	EXTENT FOR FINISH REFER TO DWG NO. D8-201-1 TO D8-201-5
	CAR RAMP	PT05	ST01	ST01	(#)MT08	INTERIOR FINISHES SCHEDULE REFER TO DWG NO. D7-306 EXTENT FOR FINISH REFER TO DWG NO. D8-201 TO D8-205
	SPINKLER PUMP ROOM FLUSHING & POTABLE WATER SUMP TANK & PUMP ROOM CLEANSING WATER PUMP ROOM WATER PUMP ROOM FOR A/C UPFEED TANK AND PUMP GREASE TRAP ROOM	F7	S4	W12	C4	100mm THICK RC WALL (FSTC 48)
	PLANT ROOM CORRIDOR EL ROOM	F7.3	S4	W11	C4	
	POTABLE WATER TANK	F6	---	W9.2	C3	
	FLUSHING WATER TANK CLEANSING WATER TANK A/C UPFEED TANK	F6	---	W9.2	C3	
	LIFT SHAFT & PIT	F12	----	W14	C4	
	BASEMENT SLAB	F8	S7	W5	C8	150mm THK. WEARING SLAB WITH PERFORATED PIPE BELOW, C/S SCREEDING LAID TO FALL
GROUND FLOOR (LOBBY)	OFFICE ENTRANCE LOBBY OFFICE LIFT LOBBY (LOW ZONE & HIGH ZONE)	UNDER FITTING-OUT PACKAGE				LIFT SHAFT WALL MIN. 100mmTHICK RC WALL (FSTC 48)
	SECURITY GUARD COUNTER	F4	S3	(*)W4	C6	EXTENT OF CHECKER PLATE REFER TO D12-301
	SERVICE LIFT LOBBY	F4	S3	(*)W2	C5	
	FIRE ESCAPE STAIRCASE	F2	S5	W4	C2	
	STAIRCASE PROTECTED LOBBY (1ST LOBBY)	F4	S3	(*)W2	C2	
	FIREMAN ACCESS POINT (CORRIDOR)	F4	S3	(*)W2	C5	FIREMAN ACCESS POINT WALL FINISHES WITH CHECKER PLAT 1500mm(H) FROM OTHER FINISH FLOOR LEVEL.
	LOADING/UNLOADING AREA AND CARPARKING AREA	HT02	HT01	ST01	MT08	TO REFER INTERIOR DRAWING PACKAGE D8-201 TO 206
	REFUSE STORAGE & MATERIAL RECOVERY CHAMBER	F7.2	S3	W9	C4	
	F.S. CONTROL ROOM	F7	S4	W12	C4	
	SPRINKLER TANK ROOM	F7	S4	W12	C4	100mm THICK RC WALL (FSTC 48)
	TEL. LEAD-IN GAS LEAD-IN	F7.3	S4	W11	C4	
	EL. ROOM ELV. ROOM H.V. CABLE CHAMBER	F7.3	S4	W11	C4	
	EXTERNAL WALL	REFER TO FINSC DRAWINGS				
	SECURITY ROOM & STAFF ROOM	F4	S3	W4	C6	

D10. BRICK WORK/BLOCK WORK JOINTS

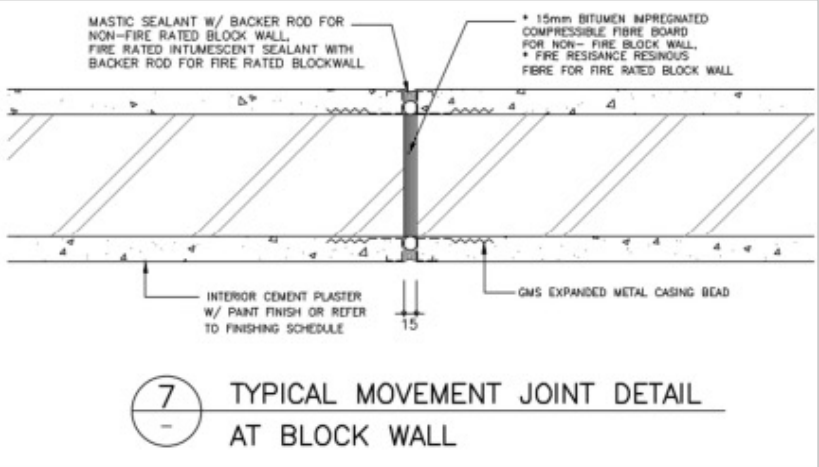
Note: Steel sub-frame may be required for excessive height and width of walls.

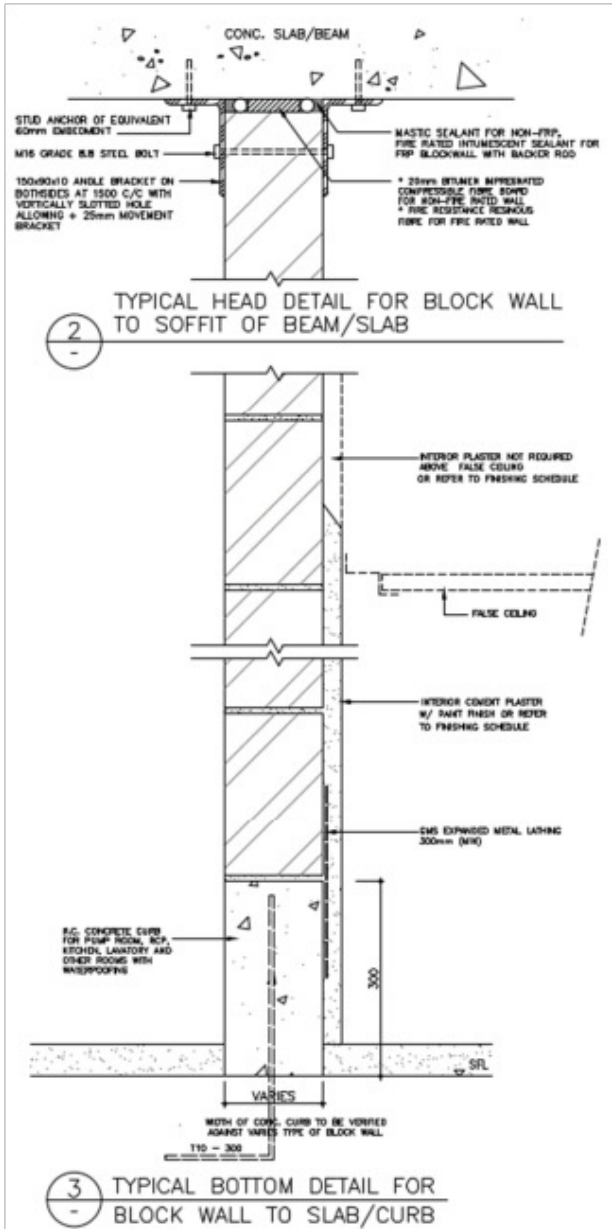
Check: *Type of materials and workmanship*

Reference: *BMT*
-Chapter 2.5. Brickwork and blockwork
-Chapter 3.8. The French International School
-Chapter3.13. Hong Kong Science Museum

-D10.1. Joints of Block Works

Note the junction of the blocks with other materials.

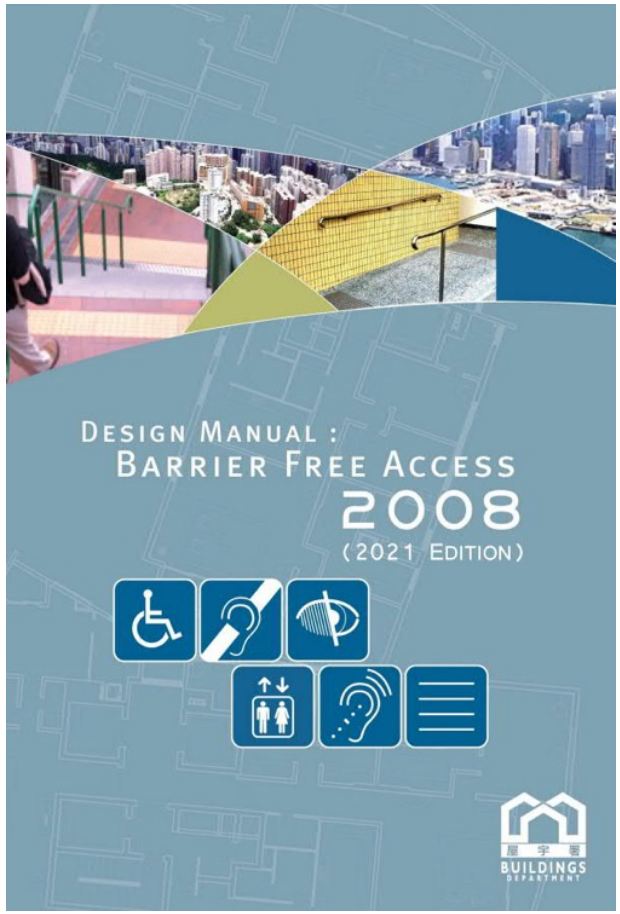




D11. BARRIER FREE DETAILS

Reference: Design Manual – Barrier Free Access (BD)

The comprehensive design requirements for the obligatory provision and good practices are laid down here in this online Design Manual: Barrier Free Access.



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1.4 To ensure effective enforcement, the following obligatory design requirements of this Manual are put into the following legislation:

Legislation	Obligatory Design Requirements
Building (Planning) Regulations	Division 1 auditorium and related facilities Division 2 hotels, hostels and guesthouses Division 3 carparks Division 4 access route Division 5 ramps Division 6 dropped kerbs Division 7 steps and staircases Division 8 handrails Division 9 corridors, lobbies and paths Division 10 doors Division 11 toilets and W.C. cubicles Division 12 bathrooms and shower compartments Division 13 signs Division 14 special obligatory design requirements to assist persons with visual/hearing impairment to various uses of buildings in Table 2 Division 15 public information or service counters Division 16 illumination Division 17 emergency call bell in accessible toilets Division 18 assistive listening systems Division 19 lifts, indication and notification Division 20 escalators and passenger conveyors

For those obligatory design requirements which are not put into the above legislation, it is intended to incorporate them into the following codes of practice:

Code of Practice	Obligatory Design Requirements
COP for Minimum Fire Service Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment deemed to satisfy the requirements of the Director of Fire Services for the purpose of complying with Section 16(1)(b) of the Buildings Ordinance (Cap. 123)	Visual alarm and audible alarm in paragraph 5.2 in Chapter 5.
COP on the Design and Construction of Lifts and Escalators and COP for Lift Works and Escalator Works deemed to satisfy Lifts and Escalators (Safety) Ordinance (Cap. 327)	Emergency call buttons in lifts in Division 19.

CATEGORY OF BUILDINGS & EXTENT OF THE APPLICATION OF DESIGN MANUAL	
Category of Buildings	Extent of application of this Manual
Domestic buildings	- All common areas of buildings of more than four (4) storeys. - Main entrance and common area of the ground floor and means of access to buildings which do not exceed four (4) storeys. Excluding the parts of the building stated in paragraph 2.2.2 in Chapter 2.
Non-domestic buildings	- All parts of such buildings. Excluding the parts of the building stated in paragraph 2.2.2 in Chapter 2.
Composite buildings	- Non-domestic parts of such buildings. - All common areas of the domestic parts of such buildings, if the domestic parts exceed four (4) storeys. - Main entrance and common area of the ground floor and means of access thereto, if the domestic parts do not exceed four (4) storeys. Excluding the parts of the building stated in paragraph 2.2.2 in Chapter 2.

Further reference: Universal Accessibility
Best Practices and Guidelines (ArchSD)

Universal Accessibility

Best Practices and Guidelines

Architectural Services Department

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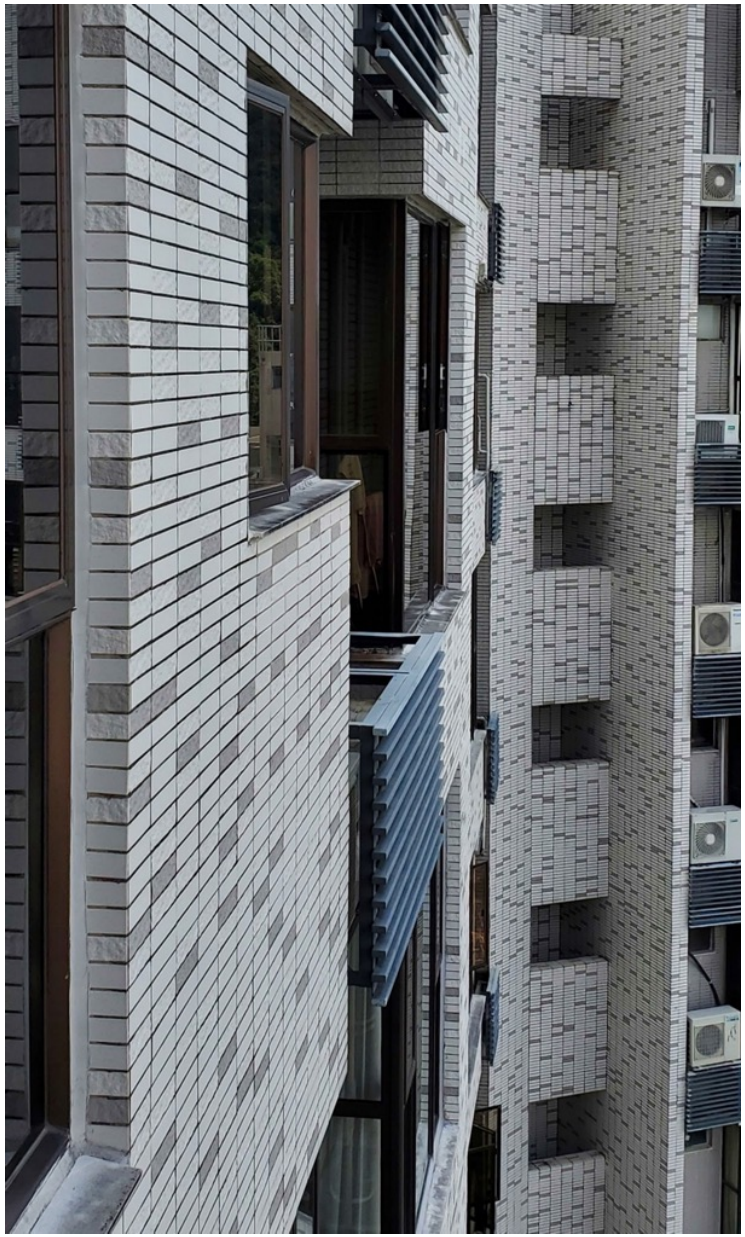
SECTION E

SUPPLEMENTARY DETAILS: DOMESTIC BUILDINGS

This section focused on domestic buildings.
Reference can be made to Section D and other reference literature stated in this Study Guide for common construction details.



E1. SETTING OUT AND DIMENSIONS

-E1.1. Site Boundary

The site boundary is set out by connecting setting out points located with cardinal reference. The data for the setting out points can be obtained from the lease conditions, the government surveying office or through qualified land surveyors.

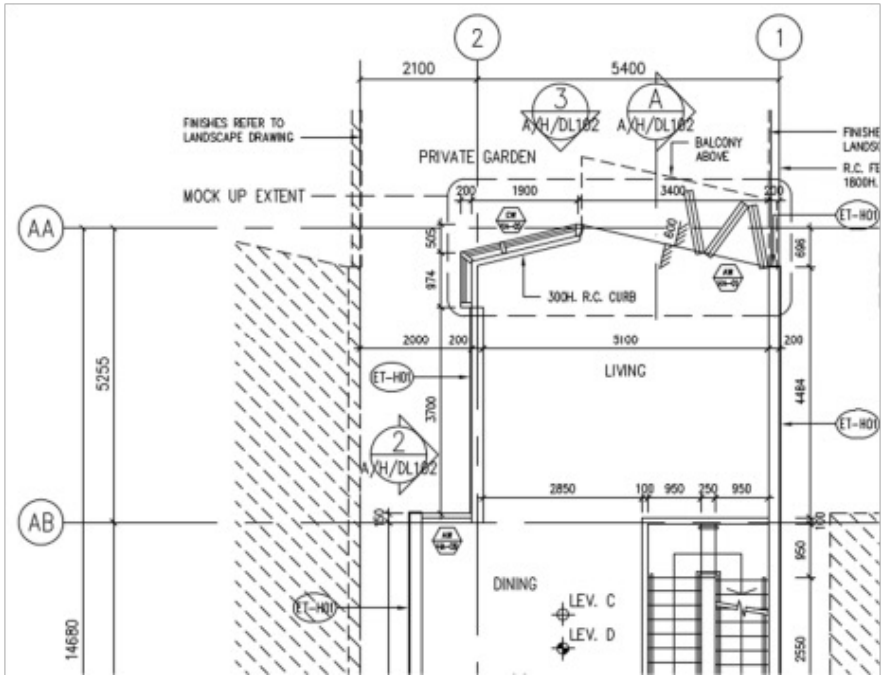
Point	Hong Kong 1980 Grid Coordinates	
	N (m)	E (m)
A	823483.666	831521.612
B	823458.342	831532.419
C	823453.052	831536.974
D	823431.101	831544.091
E	823412.439	831541.184
F	823409.623	831539.973
G	823403.255	831531.905
H	823383.194	831526.414
J	823376.583	831528.966
K	823357.522	831531.643
L	823341.072	831527.094
M	823346.176	831491.154
N	823347.430	831491.326
P	823353.316	831496.978
Y	823475.082	831513.670
Q	823478.837	831514.457
ARC CENTRE		
A-B	823488.017	831566.880
C-D	823433.599	831514.383
D-E	823442.320	831410.671
E-F	823414.338	831532.889
G-H	823389.503	831542.758
K-L	823336.898	831574.207

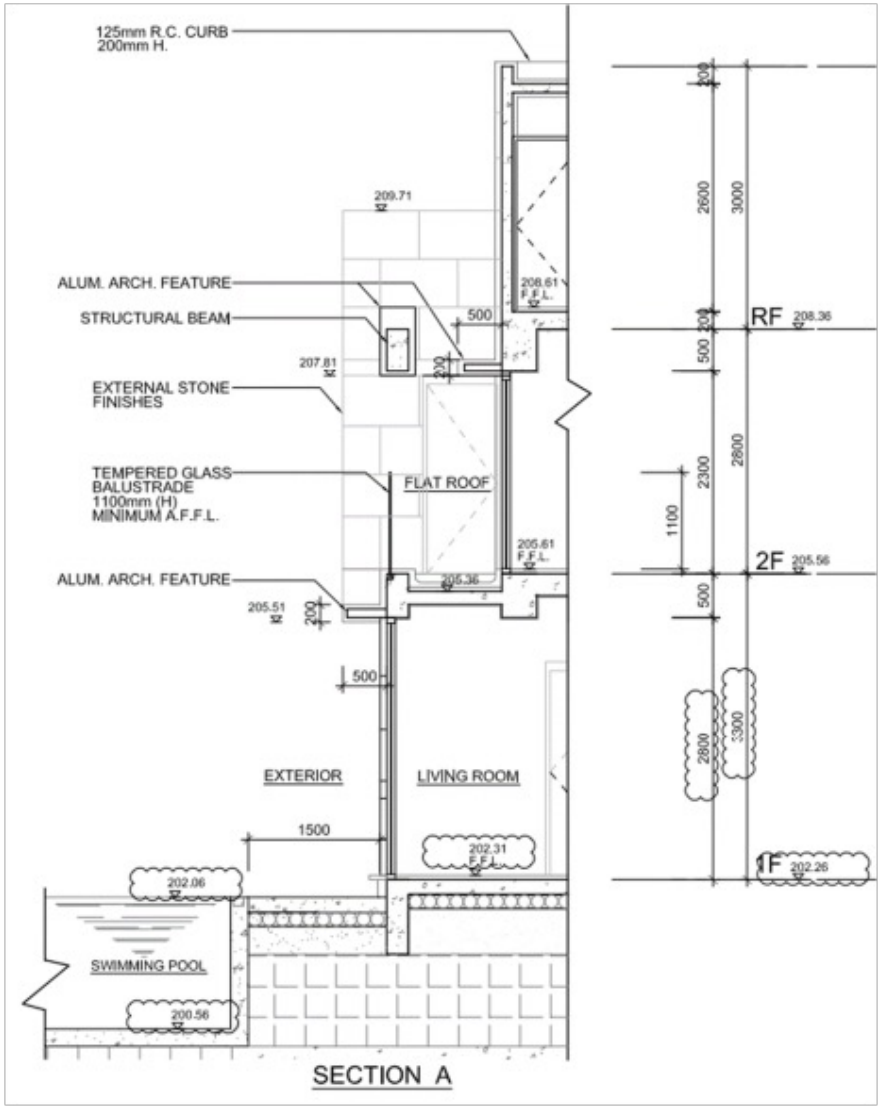
-E1.2. Setting Out for the Building

Setting out of the building is usually based on the location of the structure i.e. columns and walls (structural or non-structural). A grid system with designated rectilinear gridlines is constructed for the setting out of building plan. This will be modified for curvilinear plans. Horizontal levels are marked with two numbers – one is the structural floor level and the other the finished floor level – based on the principal datum of Hong Kong. Sections and elevations are mainly marked with vertical dimensions.

Reference: Chapter 4 BMT showing preparation of drawing list for construction and tender.

Note: Data in the drawings are only used for the specific project e.g. levels, detail marks and grid lines.

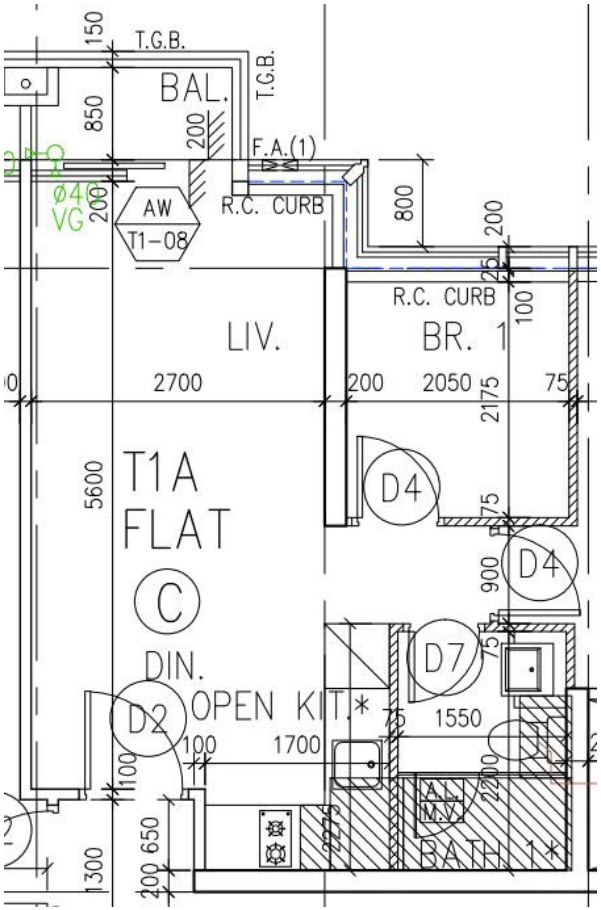




-E1.3. Reference Marks to other Construction Details

The floor plans are used as master layout plans to refer to other drawings for details such as the doors and windows etc.

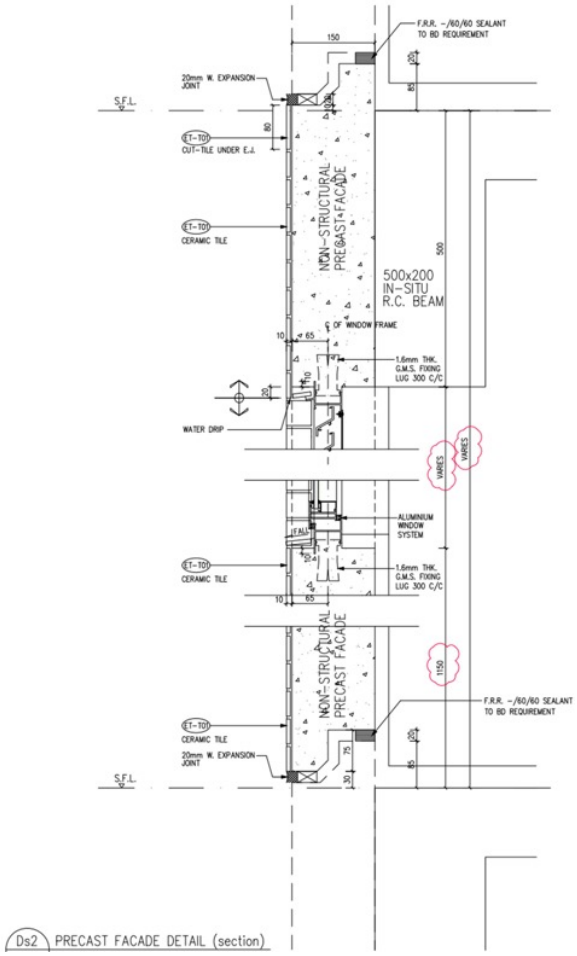
Note: *Details should not be repeated on different drawings. Only reference marks are repeated. The reason is to avoid confusion caused after hundreds of details are drawn and may have to be amended during the course of design development and construction. Otherwise, discrepancies will arise during construction and lead to undesired variations or even disputes with the contractor.*



E2. EXTERNAL WALL

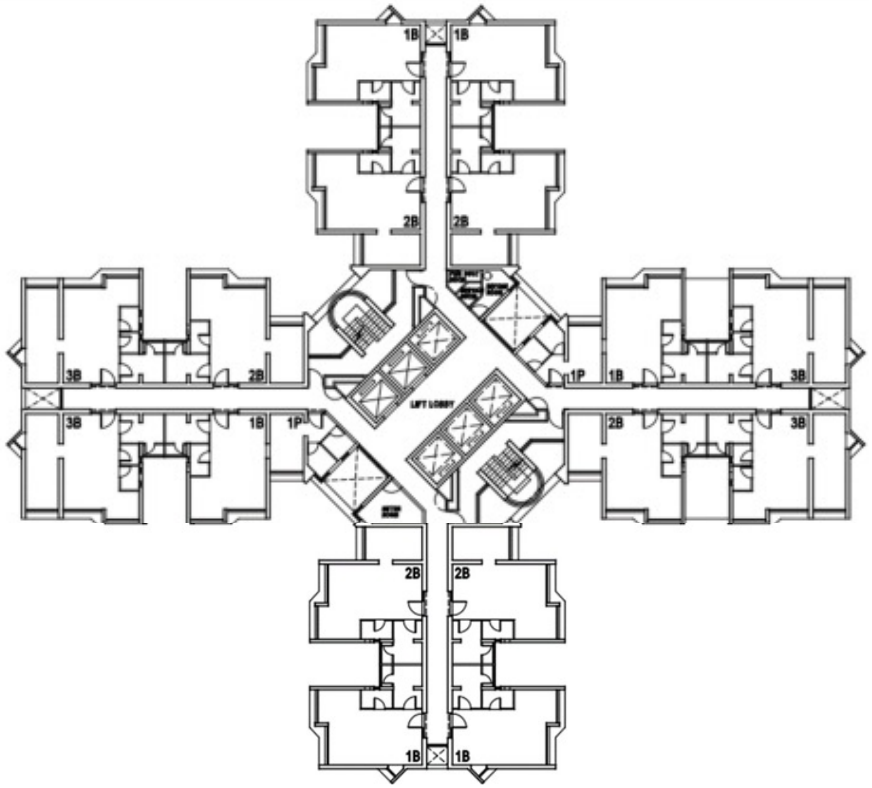
-E2.1. Prefabricated Façade (Private Projects)

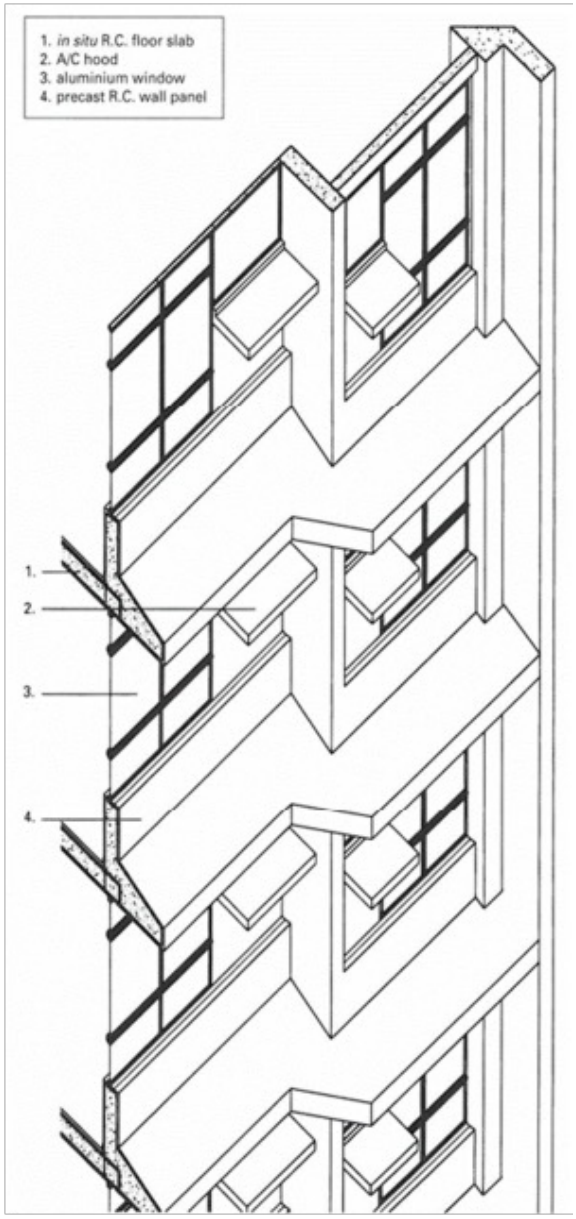
Study the construction sequence: completion of concreting for the floor slabs below the prefabricated facade, concreting the wall/column, placing the precast façade with temporary support/bracing, concreting the upper floor, applying sealant/grouting for the joints and removal of temporary support.

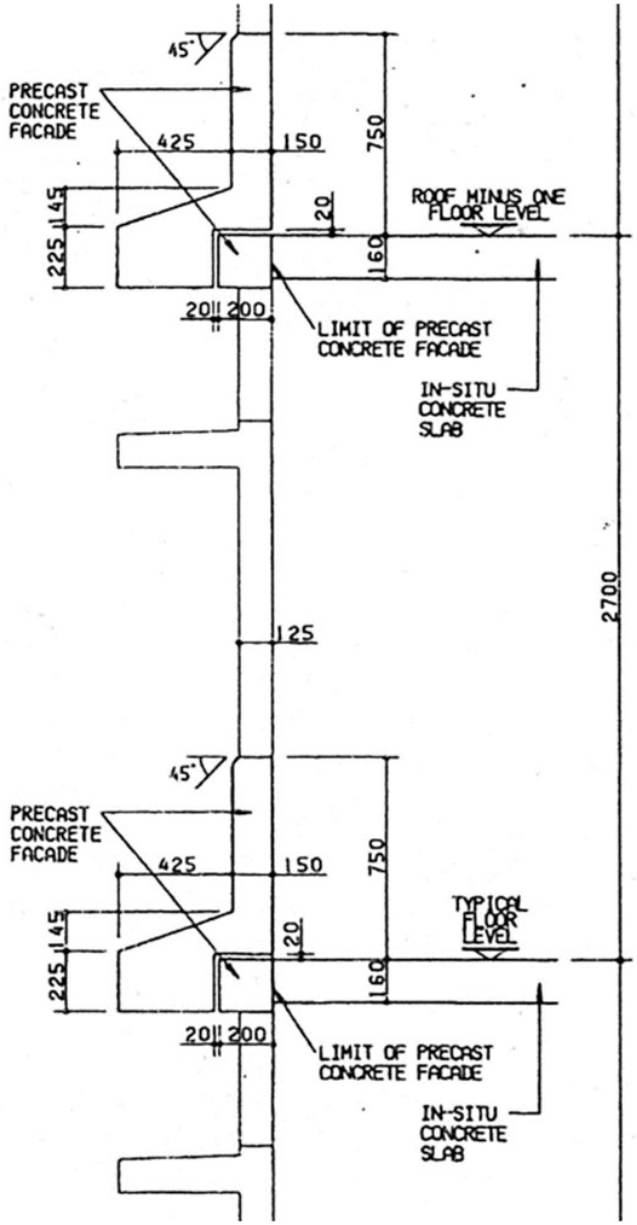


-E2.2. Prefabricated Façade (Public Housing)

Plan and façade of Harmony Block



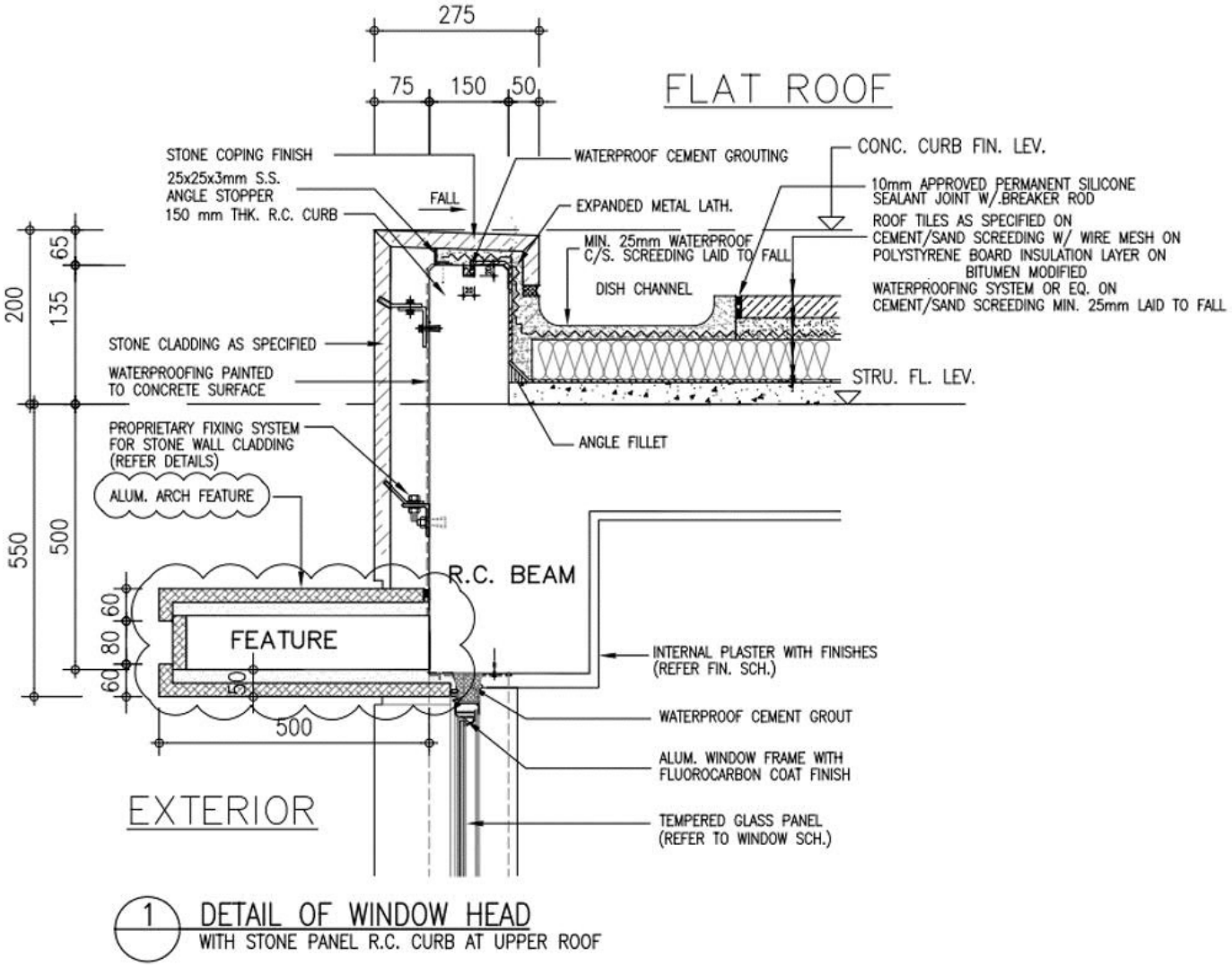


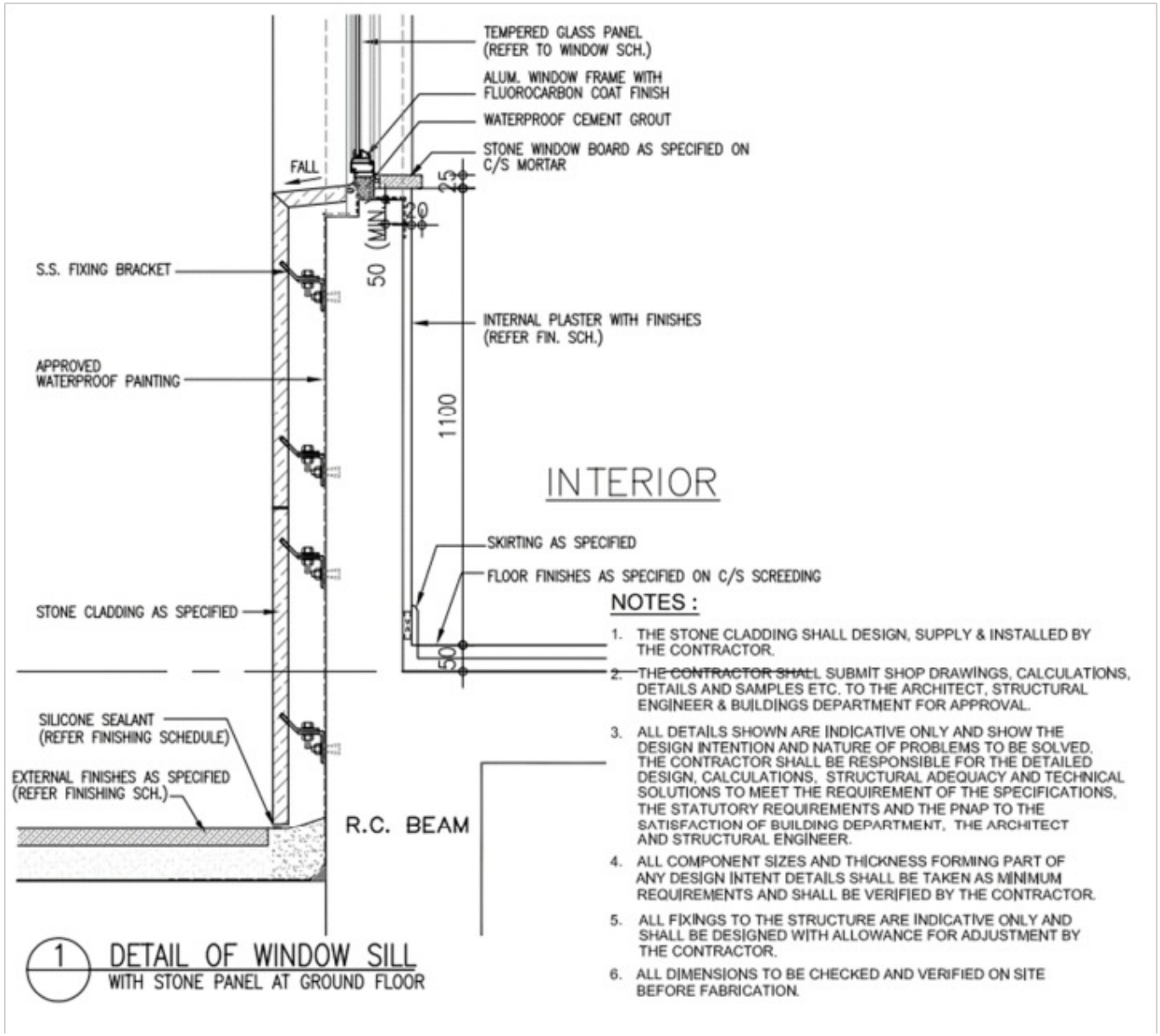

45°
PRECAST CONCRETE FACADE
425
150
750
145
225
20
160
ROOF MINUS ONE FLOOR LEVEL
20
200
LIMIT OF PRECAST CONCRETE FACADE
IN-SITU CONCRETE SLAB
125
2700
45°
PRECAST CONCRETE FACADE
425
150
750
145
225
20
160
TYPICAL FLOOR LEVEL
20
200
LIMIT OF PRECAST CONCRETE FACADE
IN-SITU CONCRETE SLAB

-E2.3. Wall Section from Roof to Grade

These wall sections for a house cuts from roof to grade level. Note the waterproofing layers and the details designed for prevention of water leakage around the building enclosure.

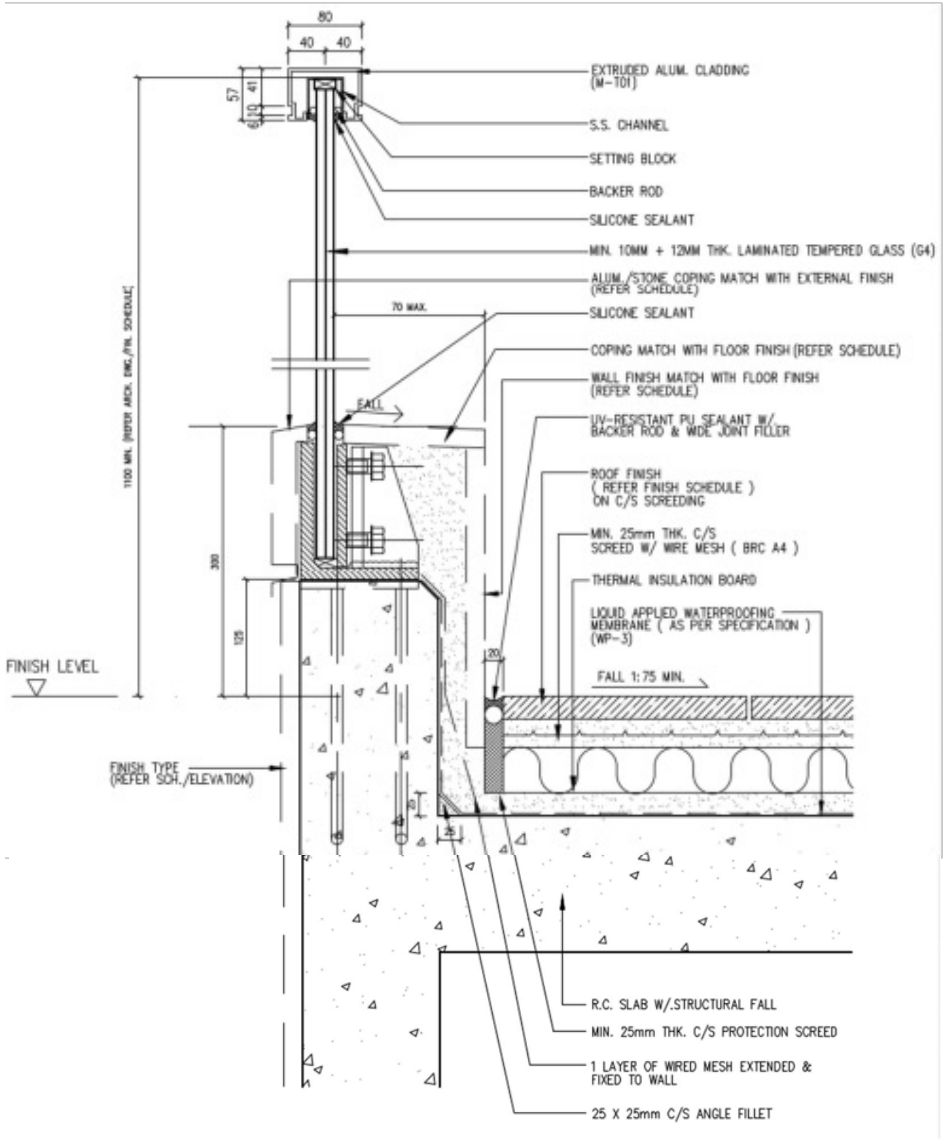
Also note that protective barrier may be required for access to external maintenance under current regulations.




TEMPERED GLASS PANEL
(REFER TO WINDOW SCH.)
ALUM. WINDOW FRAME WITH
FLUOROCARBON COAT FINISH
WATERPROOF CEMENT GROUT
STONE WINDOW BOARD AS SPECIFIED ON
C/S MORTAR
FALL
25
20
50 (MIN.)
S.S. FIXING BRACKET
INTERNAL PLASTER WITH FINISHES
(REFER FIN. SCH.)
APPROVED
WATERPROOF PAINTING
1100
INTERIOR
SKIRTING AS SPECIFIED
FLOOR FINISHES AS SPECIFIED ON C/S SCREEDING
STONE CLADDING AS SPECIFIED
50
SILICONE SEALANT
(REFER FINISHING SCHEDULE)
EXTERNAL FINISHES AS SPECIFIED
(REFER FINISHING SCH.)
R.C. BEAM
NOTES :
1. THE STONE CLADDING SHALL DESIGN, SUPPLY & INSTALLED BY THE CONTRACTOR.
2. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, CALCULATIONS, DETAILS AND SAMPLES ETC. TO THE ARCHITECT, STRUCTURAL ENGINEER & BUILDINGS DEPARTMENT FOR APPROVAL.
3. ALL DETAILS SHOWN ARE INDICATIVE ONLY AND SHOW THE DESIGN INTENTION AND NATURE OF PROBLEMS TO BE SOLVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DETAILED DESIGN, CALCULATIONS, STRUCTURAL ADEQUACY AND TECHNICAL SOLUTIONS TO MEET THE REQUIREMENT OF THE SPECIFICATIONS, THE STATUTORY REQUIREMENTS AND THE PNAP TO THE SATISFACTION OF BUILDING DEPARTMENT, THE ARCHITECT AND STRUCTURAL ENGINEER.
4. ALL COMPONENT SIZES AND THICKNESS FORMING PART OF ANY DESIGN INTENT DETAILS SHALL BE TAKEN AS MINIMUM REQUIREMENTS AND SHALL BE VERIFIED BY THE CONTRACTOR.
5. ALL FIXINGS TO THE STRUCTURE ARE INDICATIVE ONLY AND SHALL BE DESIGNED WITH ALLOWANCE FOR ADJUSTMENT BY THE CONTRACTOR.
6. ALL DIMENSIONS TO BE CHECKED AND VERIFIED ON SITE BEFORE FABRICATION.
1 DETAIL OF WINDOW SILL
WITH STONE PANEL AT GROUND FLOOR

-E2.4. Balcony with Glass Balustrade

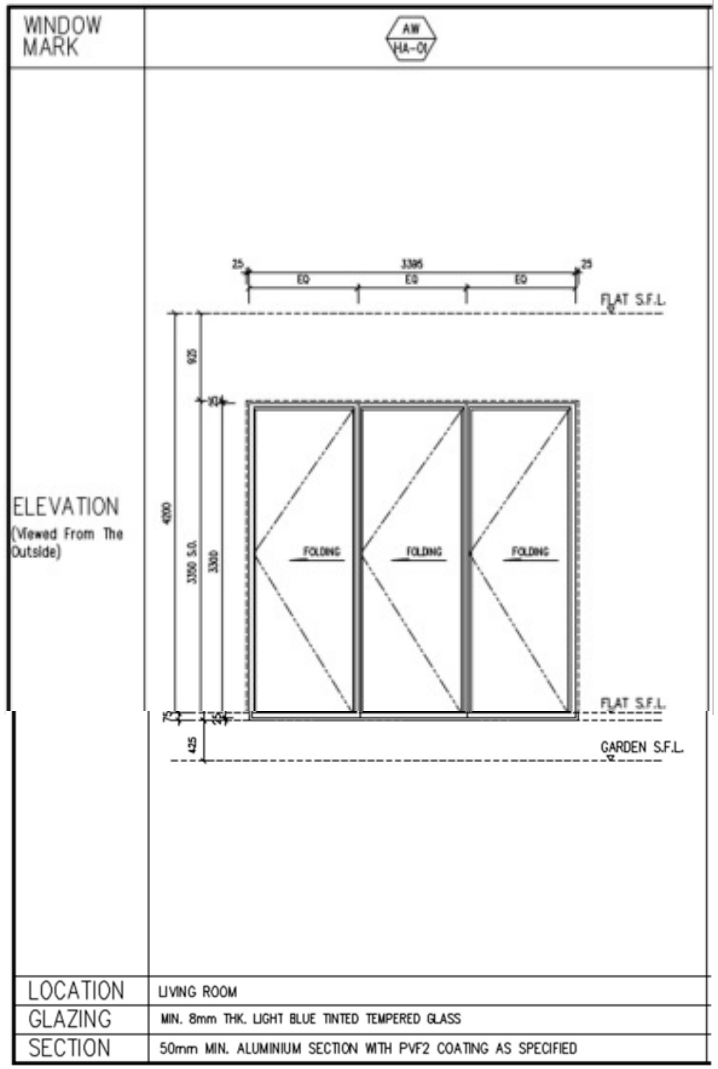
Balcony with glass balustrade and waterproofing



E3. WINDOWS

-E3.1. An Example of Window Schedule

-Sliding doors



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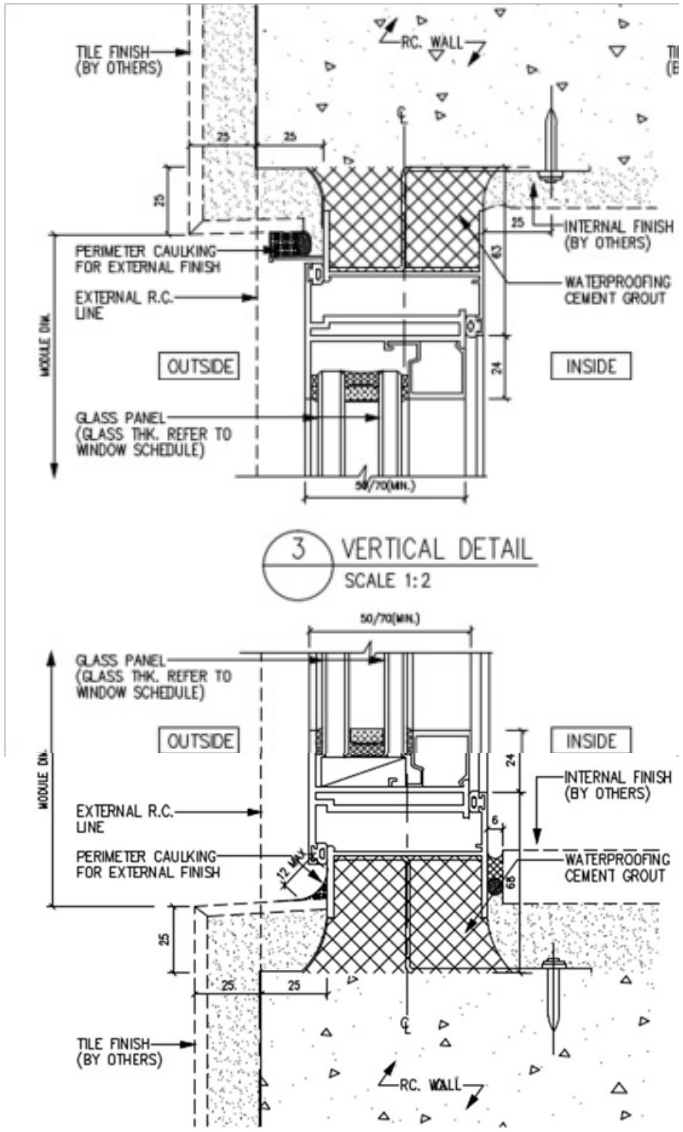
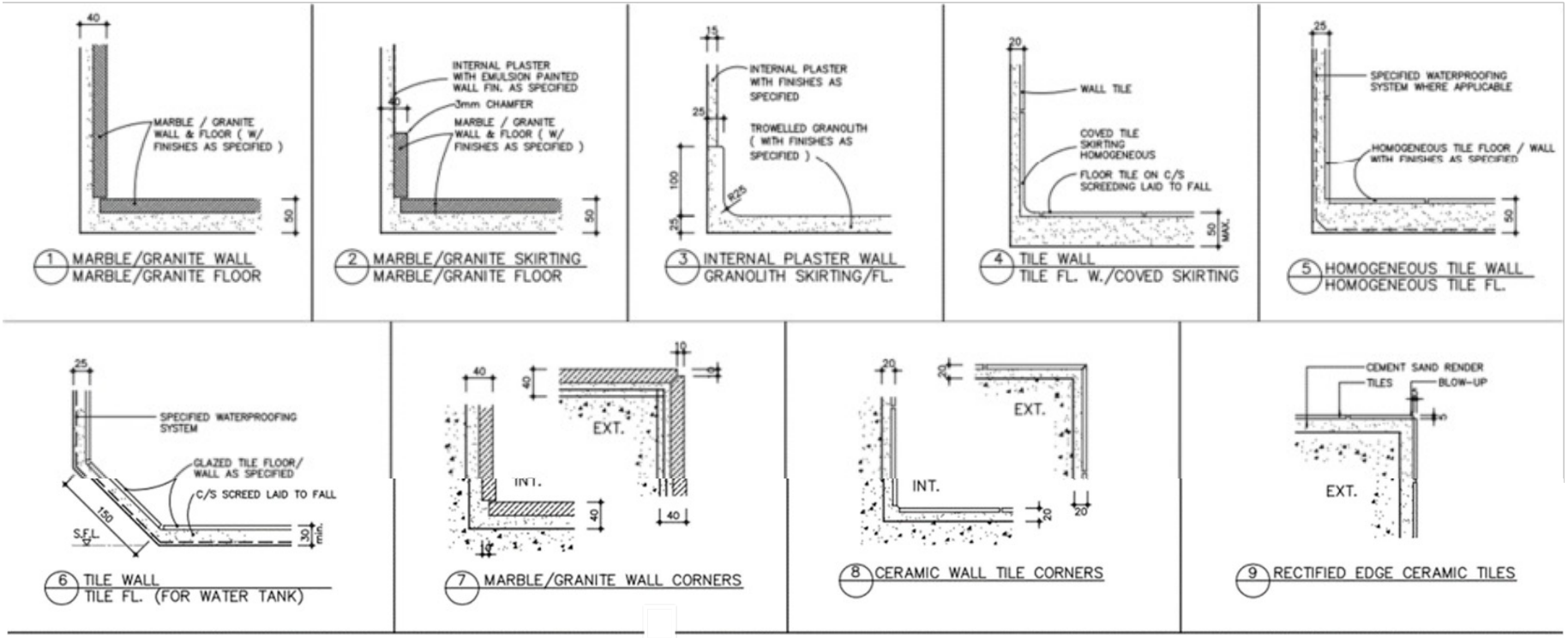
-E3.2. Window Details

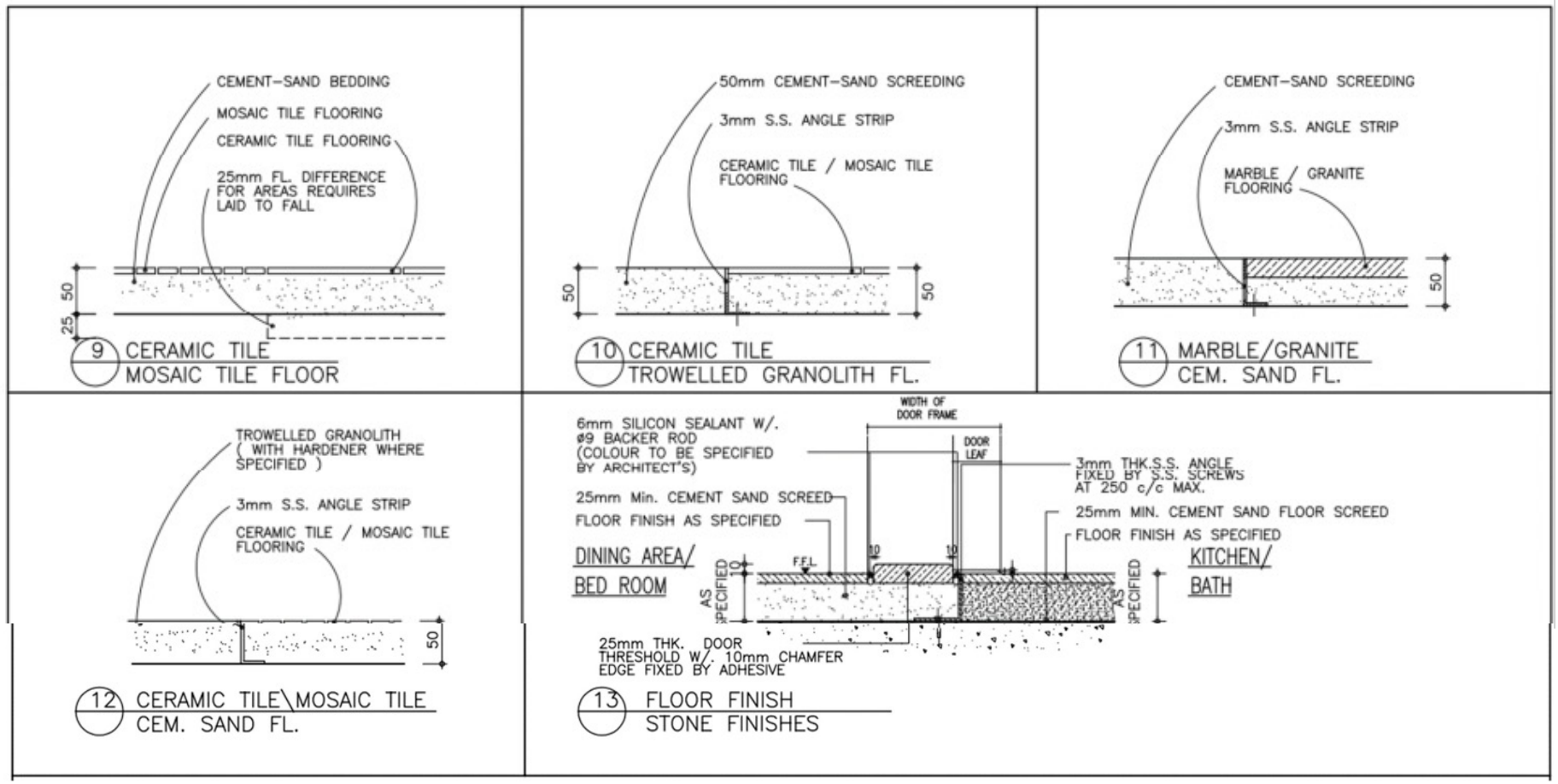
Aluminium windows with double glazing



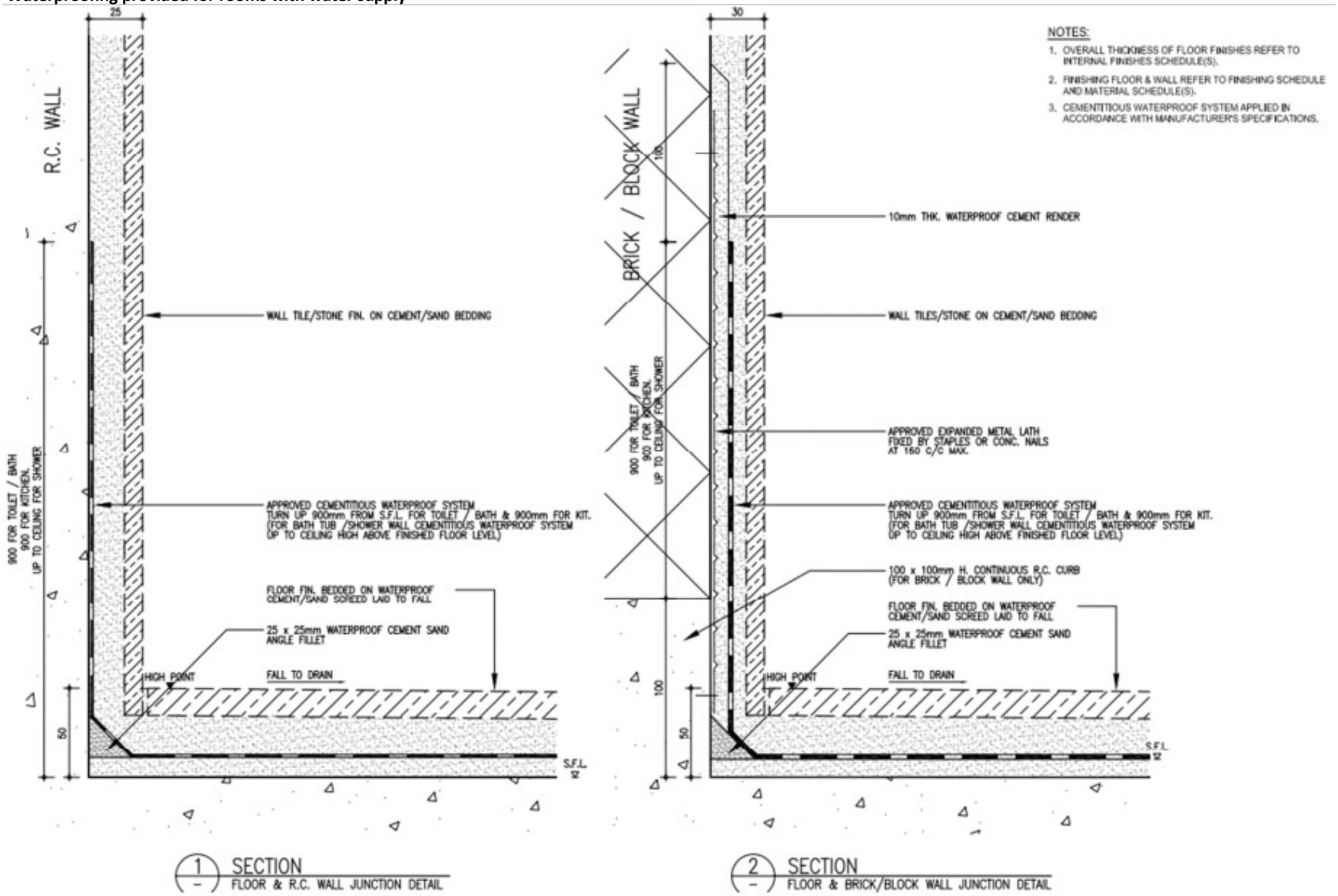
E4. FINISHES
-E4.1. Floor and Wall Junctions

These are examples of different materials at the floor and wall junctions.




CEMENT–SAND BEDDING
MOSAIC TILE FLOORING
CERAMIC TILE FLOORING
25mm FL. DIFFERENCE FOR AREAS REQUIRES LAID TO FALL
50
25
9 CERAMIC TILE MOSAIC TILE FLOOR
50mm CEMENT–SAND SCREEDING
3mm S.S. ANGLE STRIP
CERAMIC TILE / MOSAIC TILE FLOORING
50
50
10 CERAMIC TILE TROWELLED GRANOLITH FL.
CEMENT–SAND SCREEDING
3mm S.S. ANGLE STRIP
MARBLE / GRANITE FLOORING
50
11 MARBLE/GRANITE CEM. SAND FL.
TROWELLED GRANOLITH (WITH HARDENER WHERE SPECIFIED)
3mm S.S. ANGLE STRIP
CERAMIC TILE / MOSAIC TILE FLOORING
50
12 CERAMIC TILE\MOSAIC TILE CEM. SAND FL.
6mm SILICON SEALANT W/. ø9 BACKER ROD (COLOUR TO BE SPECIFIED BY ARCHITECT'S)
25mm Min. CEMENT SAND SCREED
FLOOR FINISH AS SPECIFIED
DINING AREA/ BED ROOM
AS SPECIFIED
10
F.F.L.
WIDTH OF DOOR FRAME
DOOR LEAF
3mm THK.S.S. ANGLE FIXED BY S.S. SCREWS AT 250 c/c MAX.
25mm MIN. CEMENT SAND FLOOR SCREED
FLOOR FINISH AS SPECIFIED
KITCHEN/ BATH
AS SPECIFIED
25mm THK. DOOR THRESHOLD W/. 10mm CHAMFER EDGE FIXED BY ADHESIVE
13 FLOOR FINISH STONE FINISHES

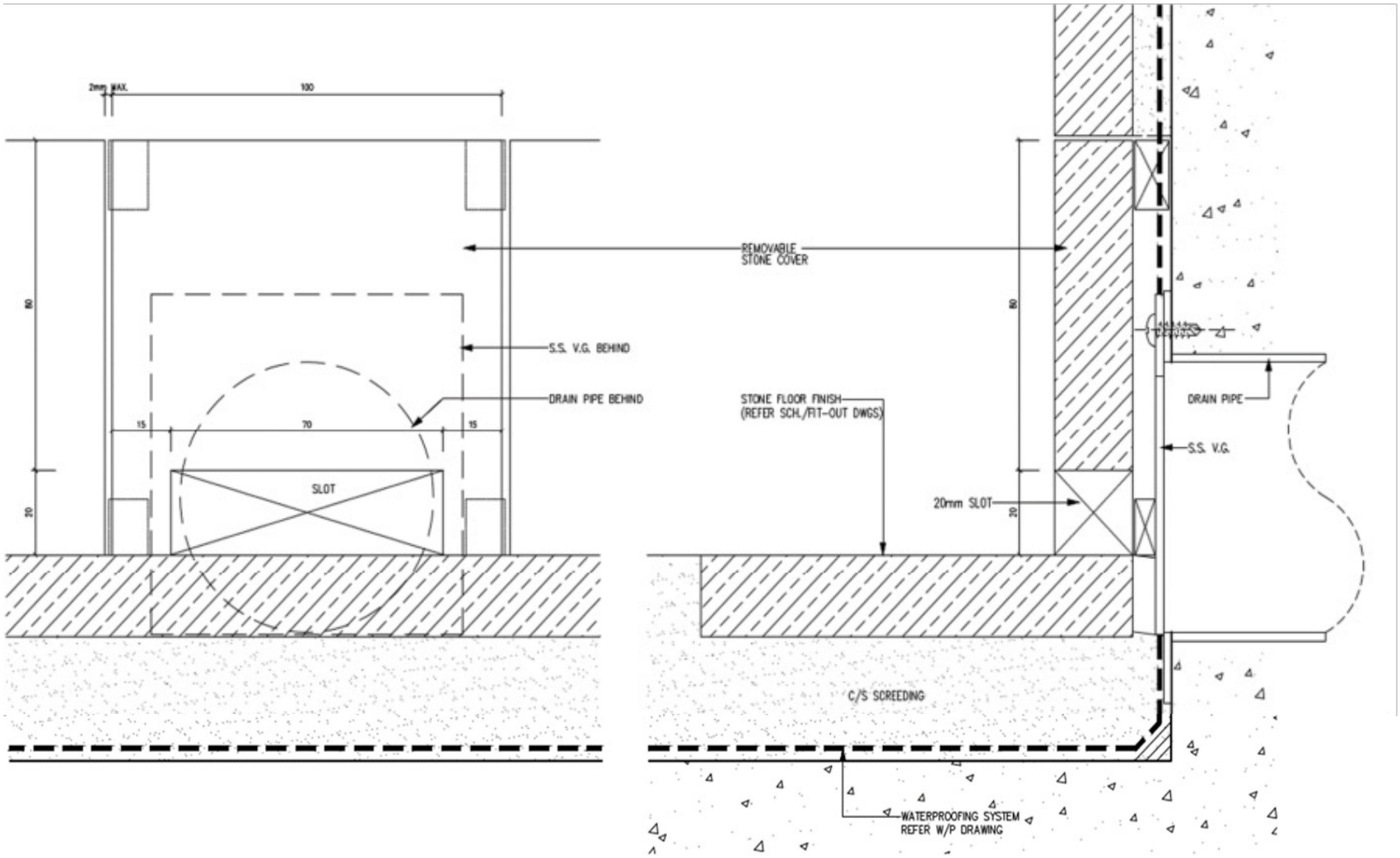
Waterproofing provided for rooms with water supply



-E4.2. Waterproofing for Bathrooms

Waterproofing is provided for bathrooms to prevent water leakage to the ceiling at the floor below.

Vertical grating allows the discharge of water on the floor.

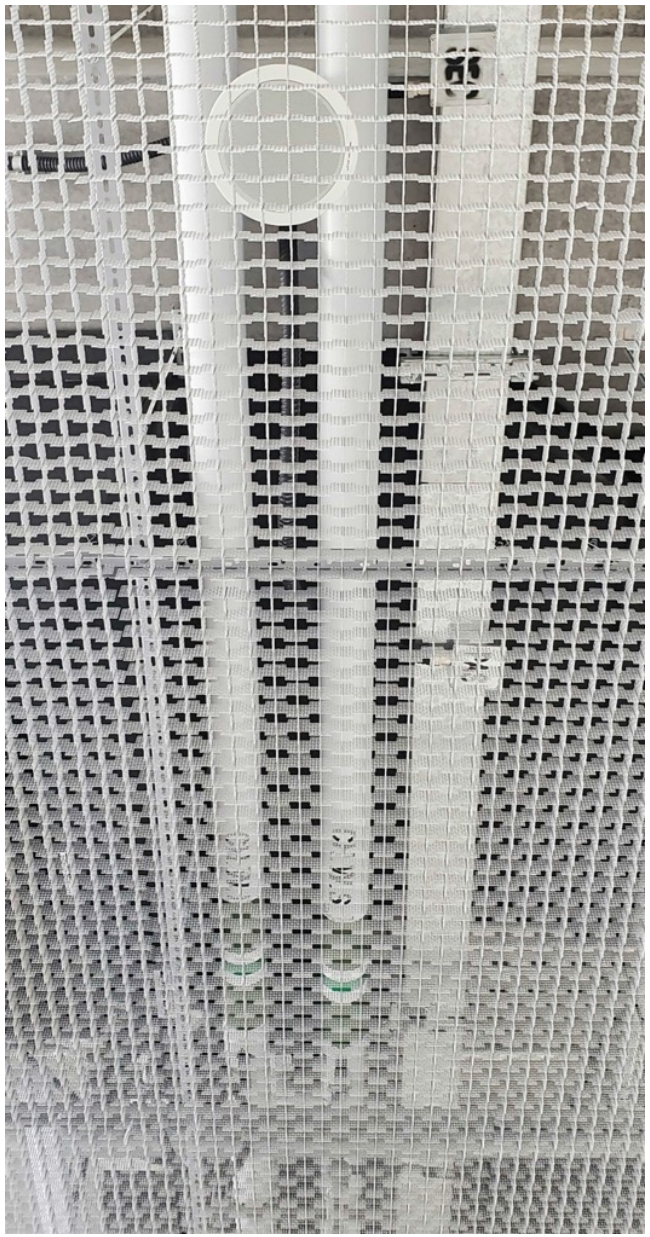


SECTION F

BUILDING SERVICES RELATED WORKS

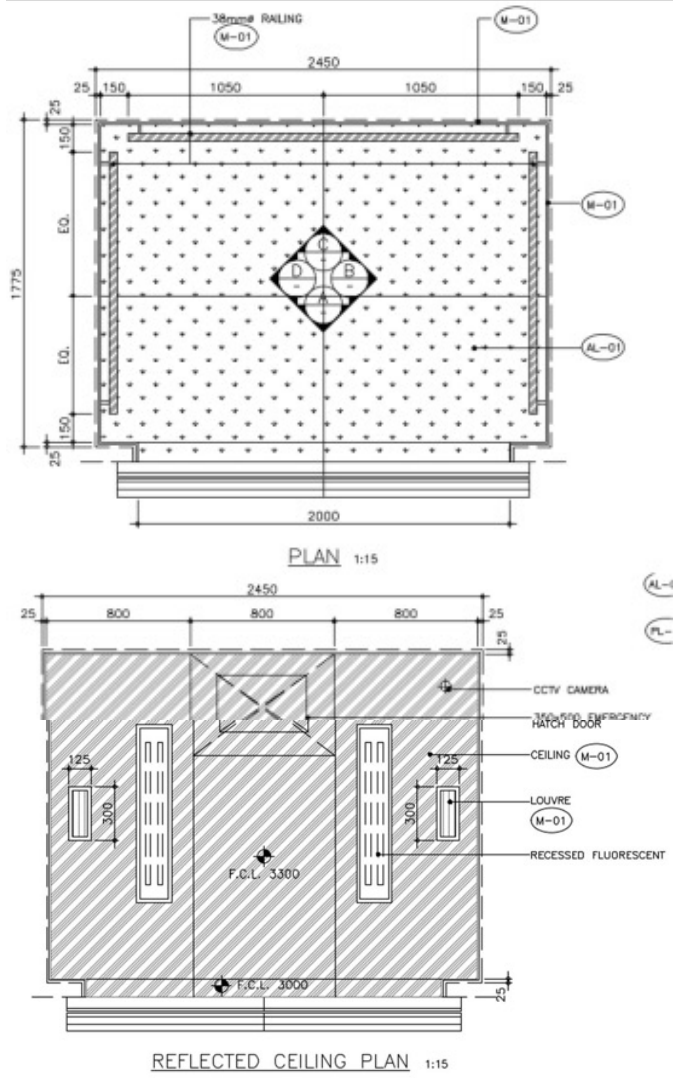
The construction details in this Section F are related to the coordination with Building Services are common to most buildings in Hong Kong. These include builder's work related to lifts, escalators, electrical installation, mechanical ventilation, fire services, plumbing and drainage. Good practices of these detailing will improve comfort to the inhabitants, maintenance for the building, avoidance of building defects as well as aesthetical appreciation of architecture.

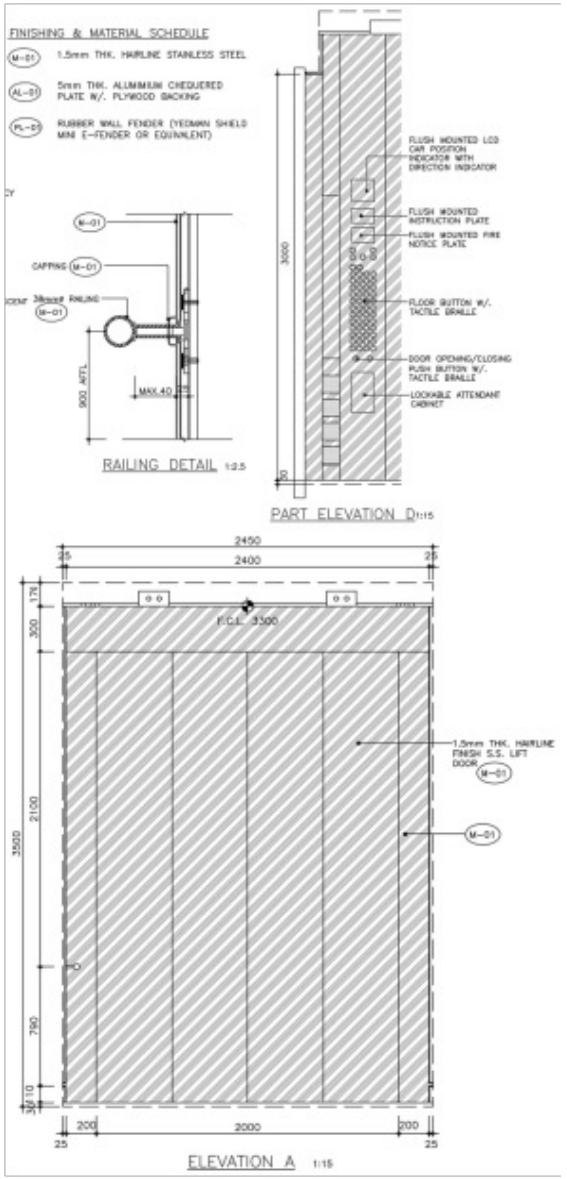
Further reference can be made to the HKIA Guide Book on Building Services.

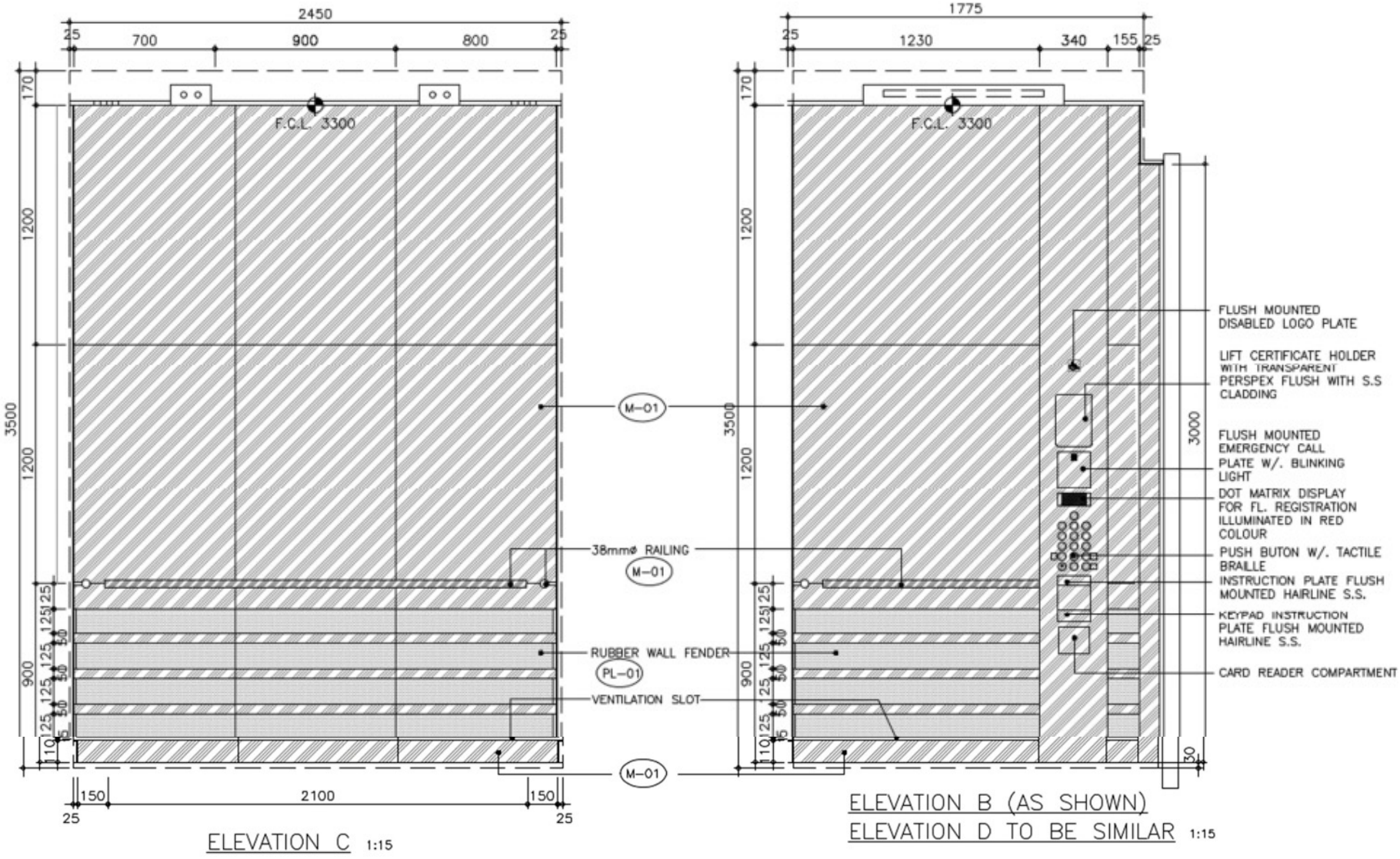


F1. LIFTS AND ESCALATOR RELATED DETAILS

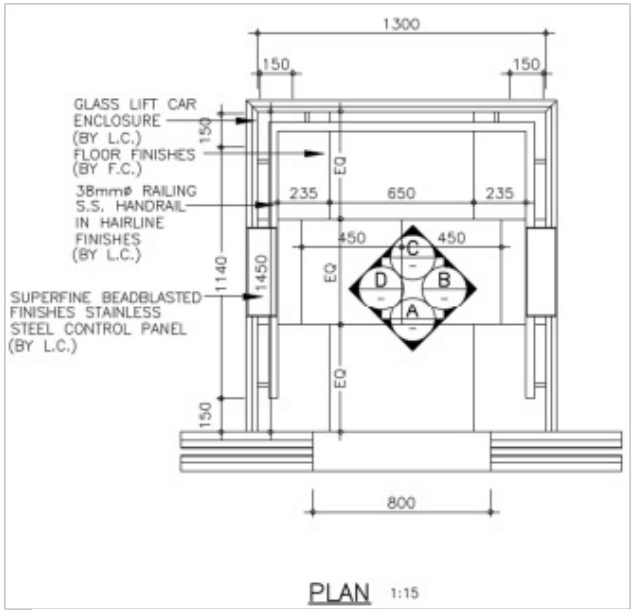
-F1.1. Service Lift Car



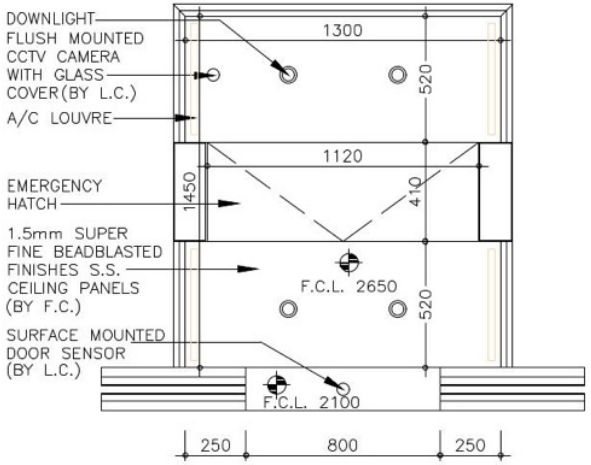



2450
25
700
900
800
25
F.C.L. 3300
170
1200
1200
3500
M-01
38mmø RAILING
M-01
RUBBER WALL FENDER
PL-01
VENTILATION SLOT
M-01
900
125
50
110
150
2100
150
25
25
ELEVATION C 1:15
1775
25
1230
340
155
25
F.C.L. 3300
3000
FLUSH MOUNTED DISABLED LOGO PLATE
LIFT CERTIFICATE HOLDER WITH TRANSPARENT PERSPEX FLUSH WITH S.S CLADDING
FLUSH MOUNTED EMERGENCY CALL PLATE W/. BLINKING LIGHT
DOT MATRIX DISPLAY FOR FL. REGISTRATION ILLUMINATED IN RED COLOUR
PUSH BUTON W/. TACTILE BRAILLE
INSTRUCTION PLATE FLUSH MOUNTED HAIRLINE S.S.
KEYPAD INSTRUCTION PLATE FLUSH MOUNTED HAIRLINE S.S.
CARD READER COMPARTMENT
30
ELEVATION B (AS SHOWN)
ELEVATION D TO BE SIMILAR 1:15

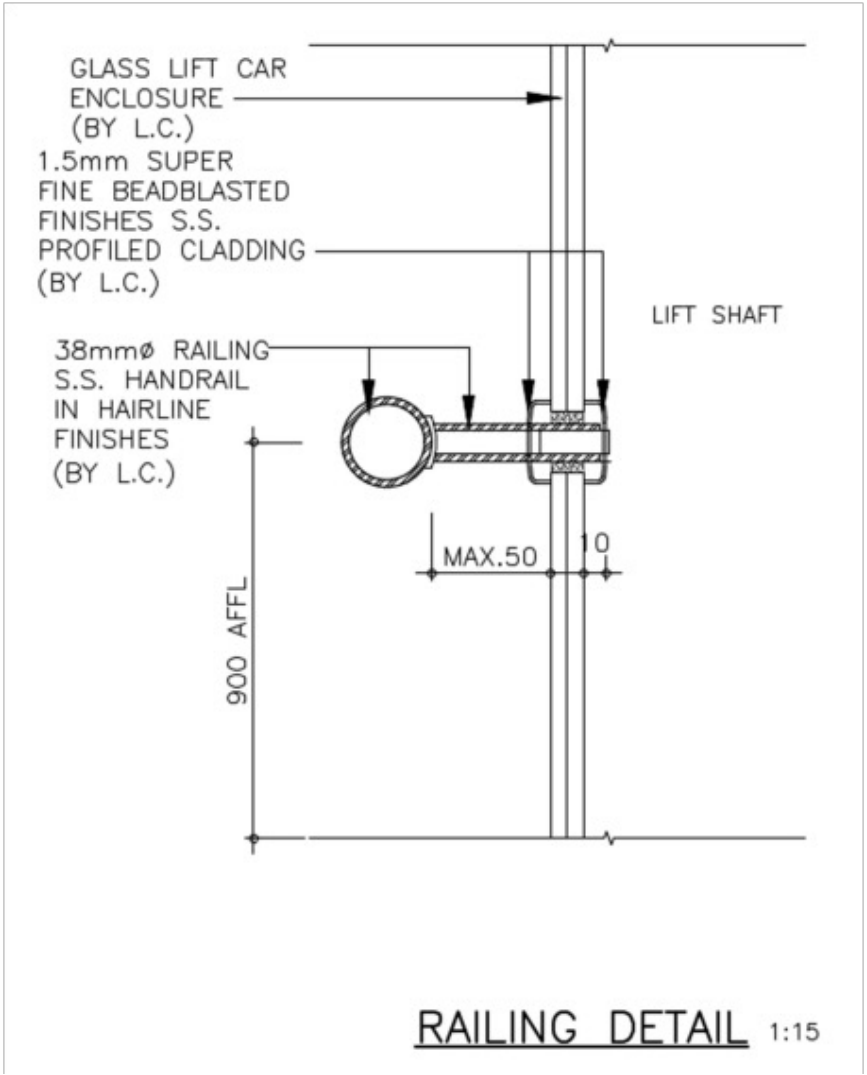
-F1.2. Lift Car with Glass Enclosure



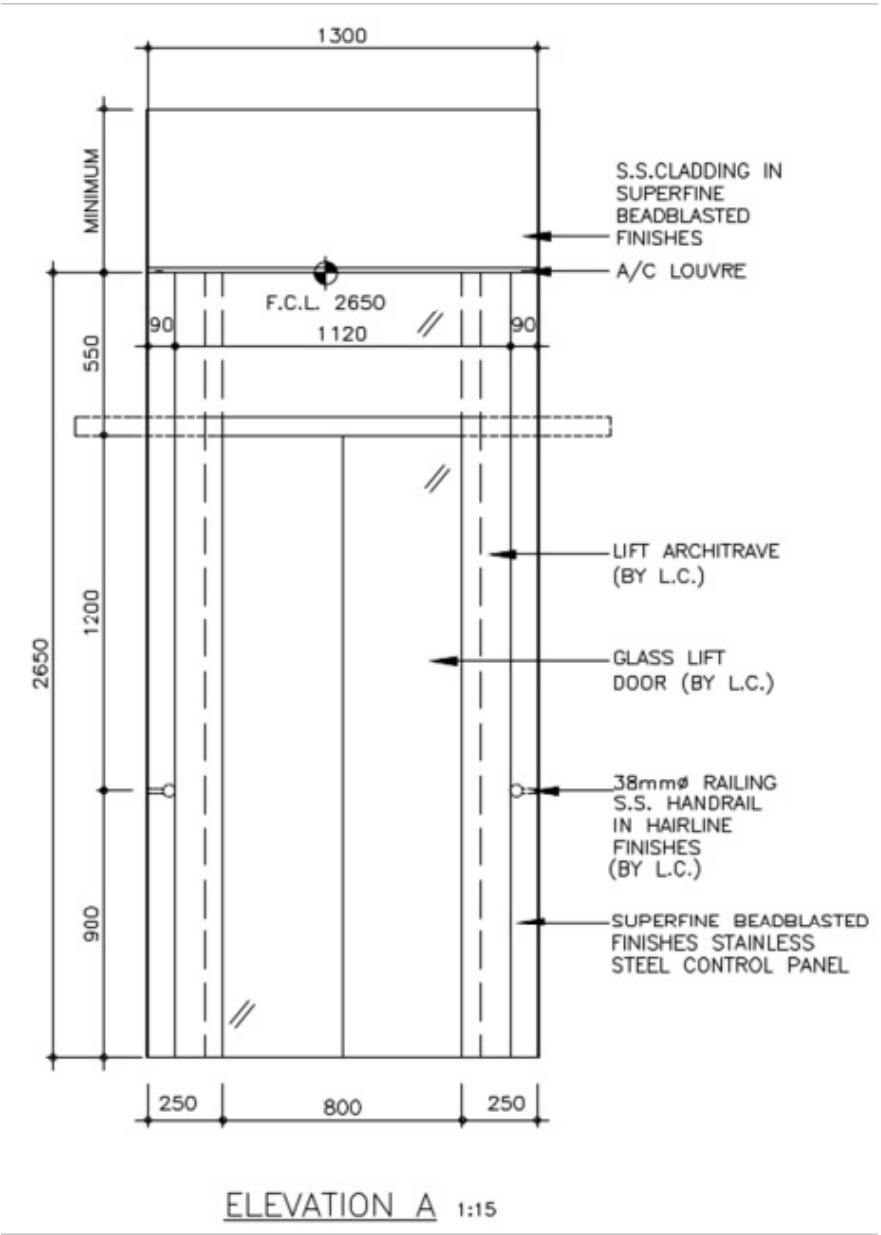
PLAN 1:15



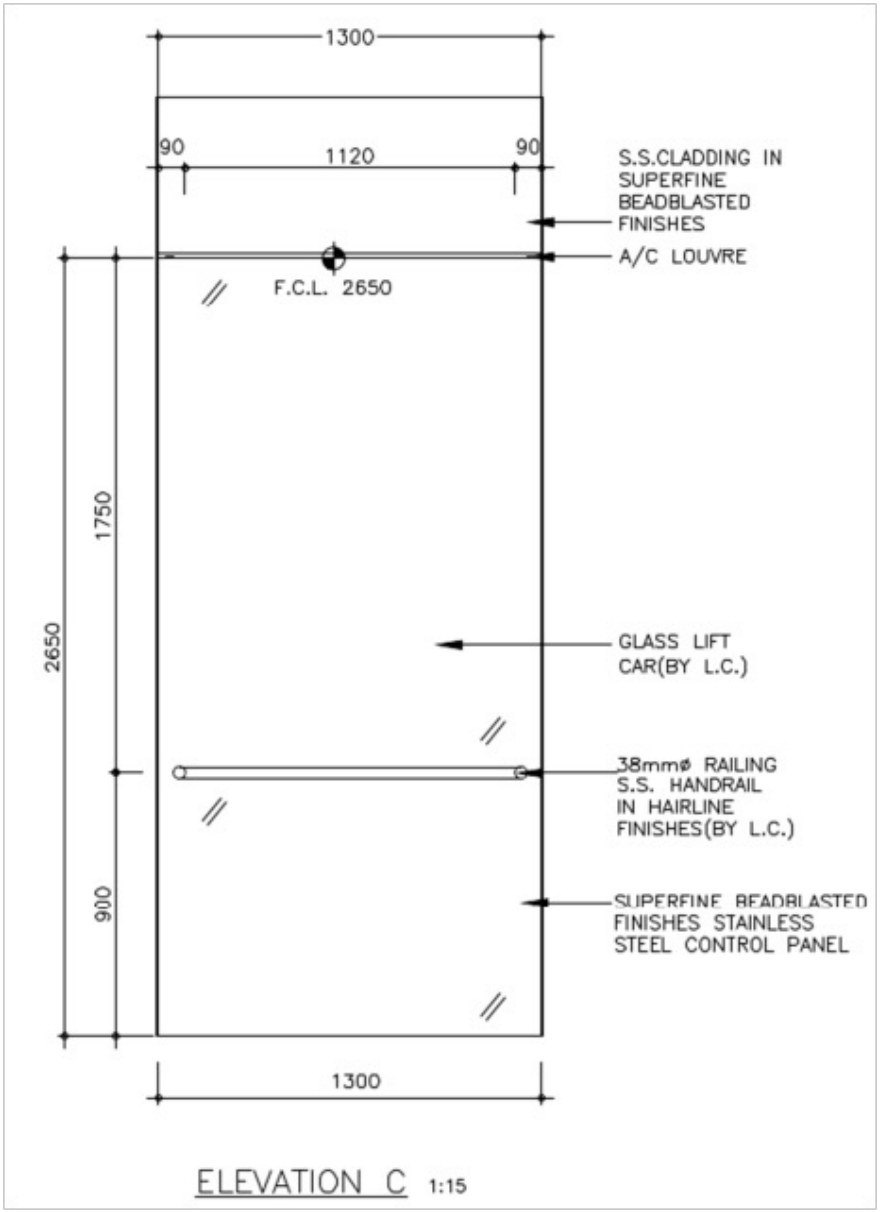
REFLECTED CEILING PLAN 1:15



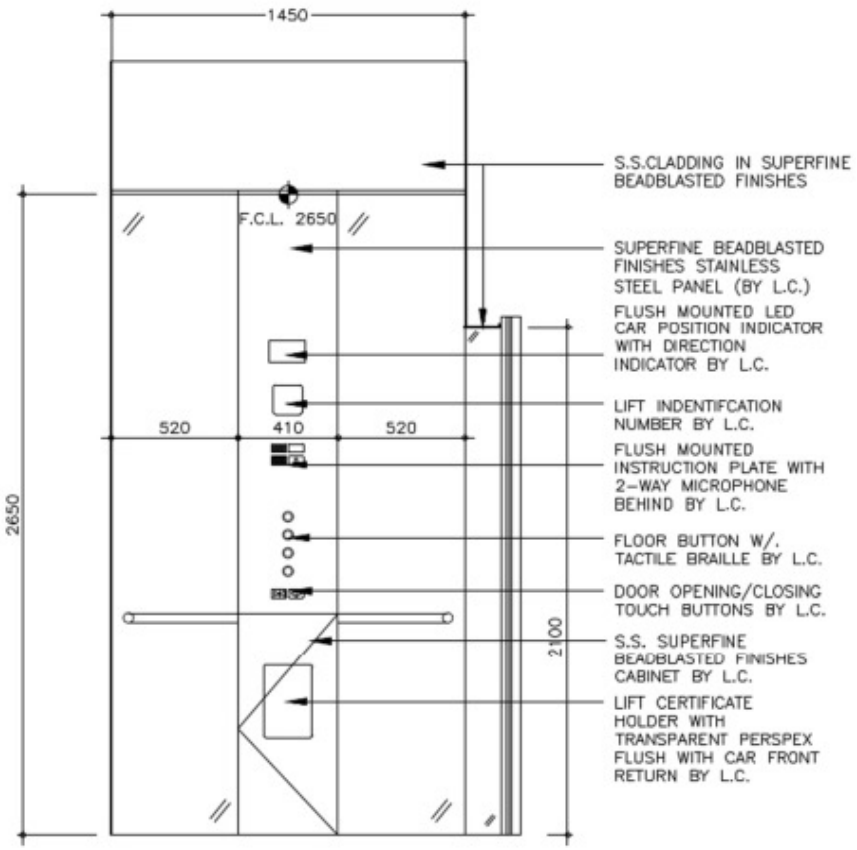
RAILING DETAIL 1:15



ELEVATION A 1:15



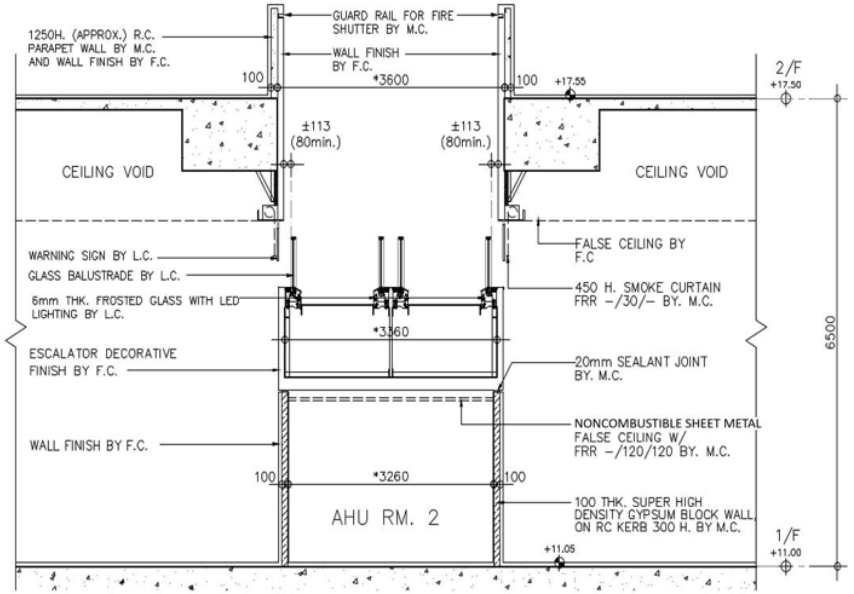
ELEVATION C 1:15



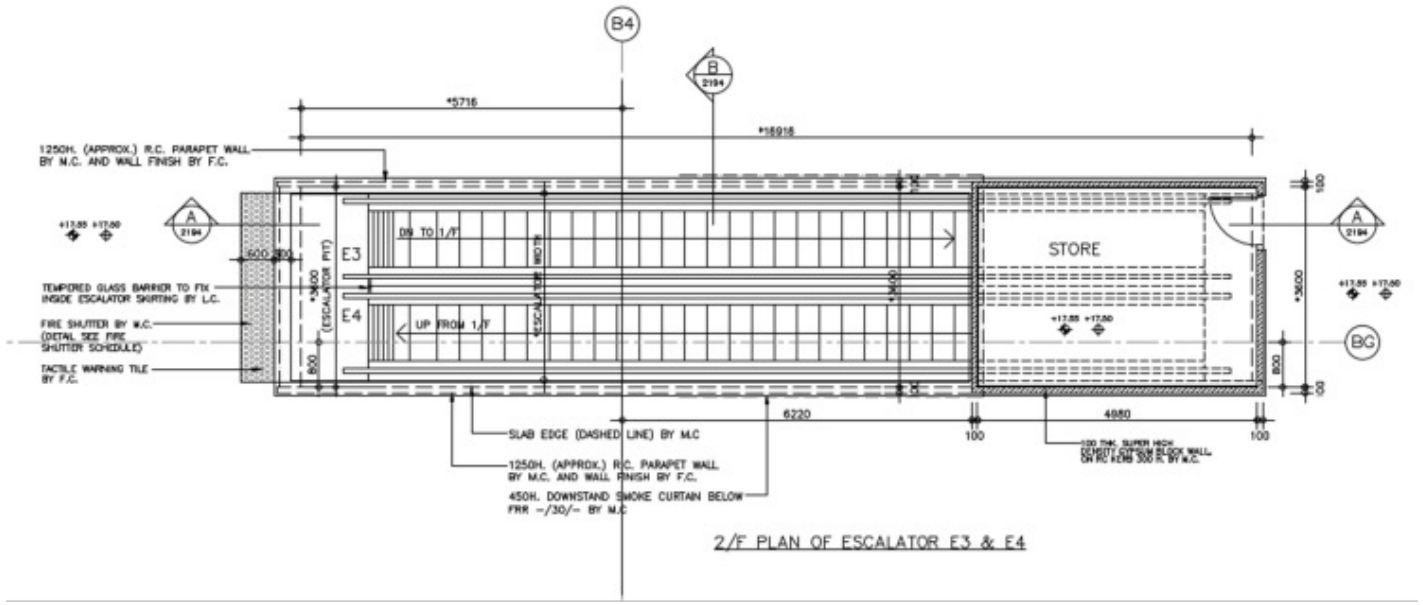
ELEVATION B (AS SHOWN)
ELEVATION D TO BE SIMILAR 1:15

-F1.3. Escalator

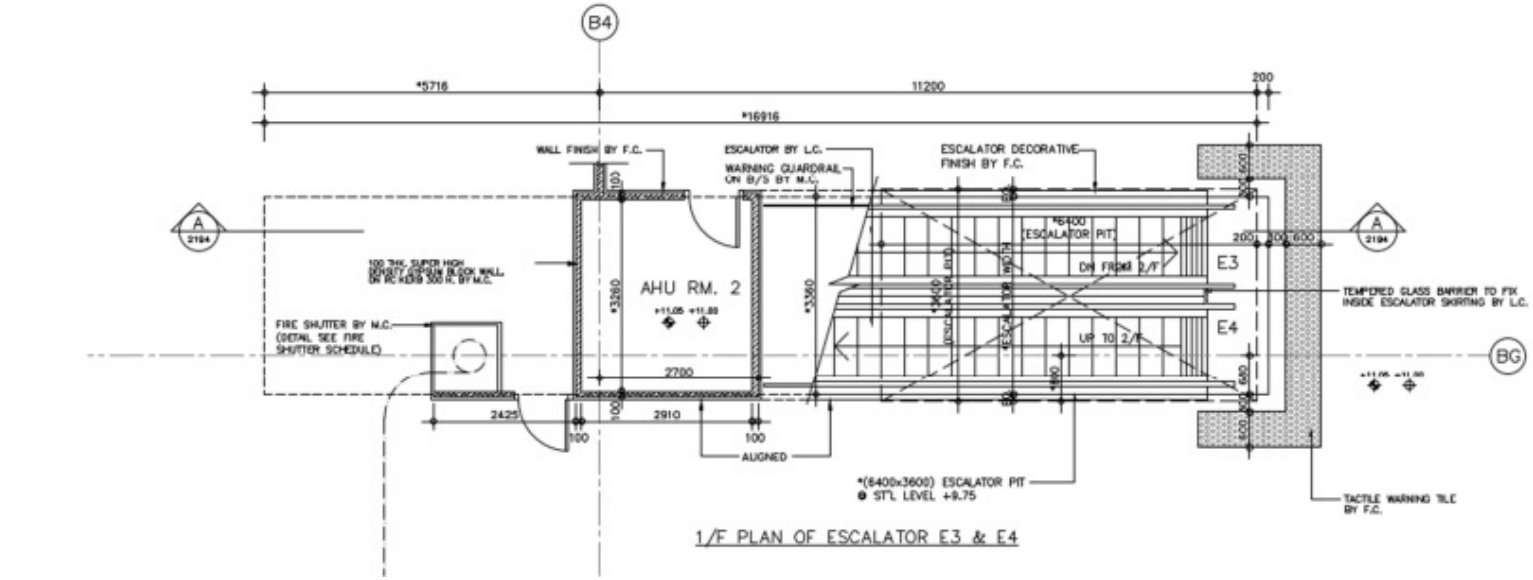
Check: Structural support and size of opening for installation of escalator.



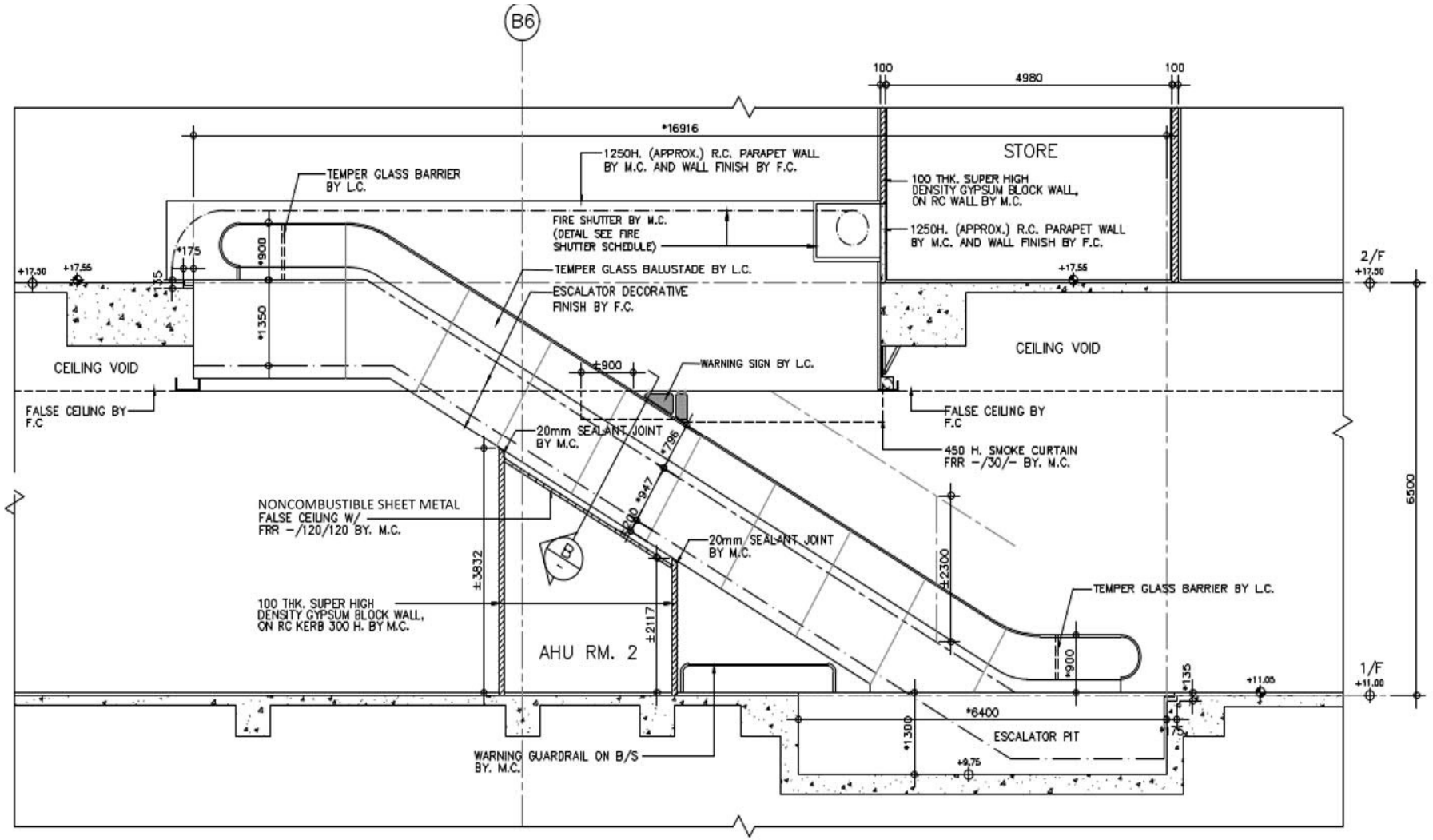
SECTION B-B



2/F PLAN OF ESCALATOR E3 & E4

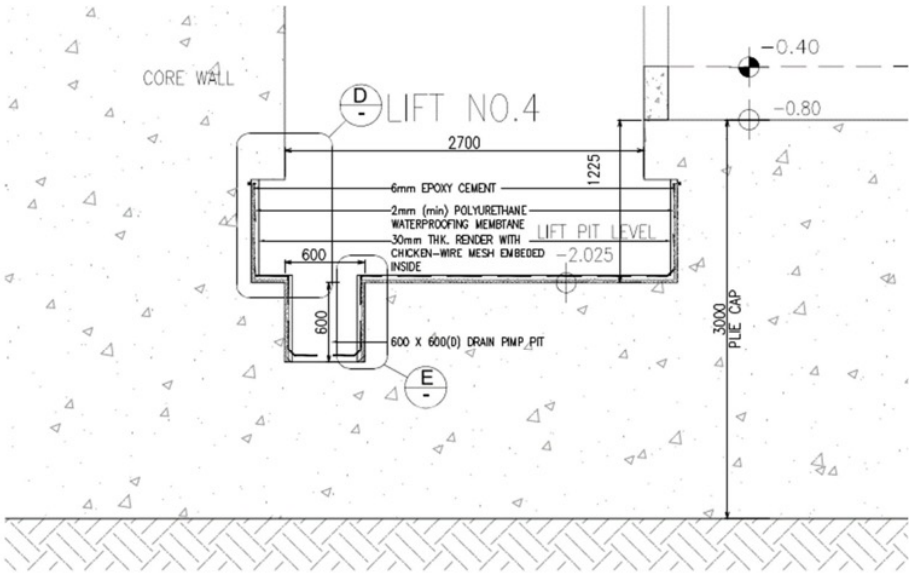


1/F PLAN OF ESCALATOR E3 & E4

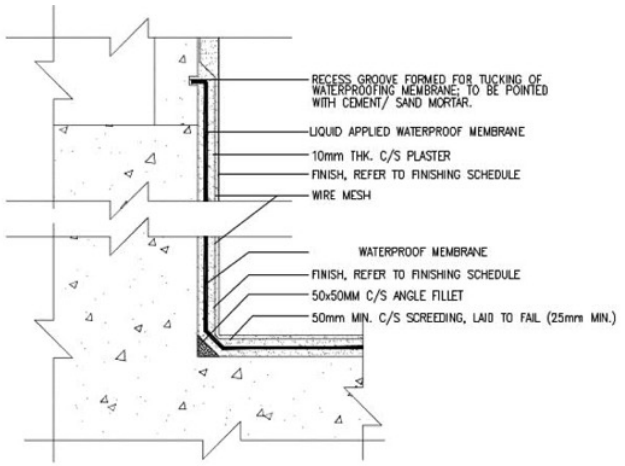

B6
100
4980
100
*16916
1250H. (APPROX.) R.C. PARAPET WALL BY M.C. AND WALL FINISH BY F.C.
STORE
TEMPER GLASS BARRIER BY L.C.
100 THK. SUPER HIGH DENSITY GYPSUM BLOCK WALL, ON RC WALL BY M.C.
FIRE SHUTTER BY M.C. (DETAIL SEE FIRE SHUTTER SCHEDULE)
1250H. (APPROX.) R.C. PARAPET WALL BY M.C. AND WALL FINISH BY F.C.
TEMPER GLASS BALUSTADE BY L.C.
ESCALATOR DECORATIVE FINISH BY F.C.
2/F
+17.50
+17.55
CEILING VOID
CEILING VOID
WARNING SIGN BY L.C.
FALSE CEILING BY F.C
FALSE CEILING BY F.C
20mm SEALANT JOINT BY M.C.
450 H. SMOKE CURTAIN FRR -/30/- BY. M.C.
NONCOMBUSTIBLE SHEET METAL FALSE CEILING W/ FRR -/120/120 BY. M.C.
20mm SEALANT JOINT BY M.C.
TEMPER GLASS BARRIER BY L.C.
100 THK. SUPER HIGH DENSITY GYPSUM BLOCK WALL, ON RC KERB 300 H. BY M.C.
AHU RM. 2
*6400
ESCALATOR PIT
WARNING GUARDRAIL ON B/S BY. M.C.
1/F
+11.00
+11.05
+9.75
6500

SECTION A-A

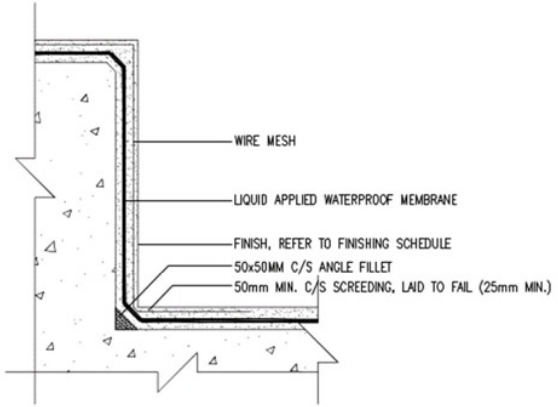
-F1.4. Lift Pit and Ladder



C — PASSENGER LIFT AT BASEMENT
1:25

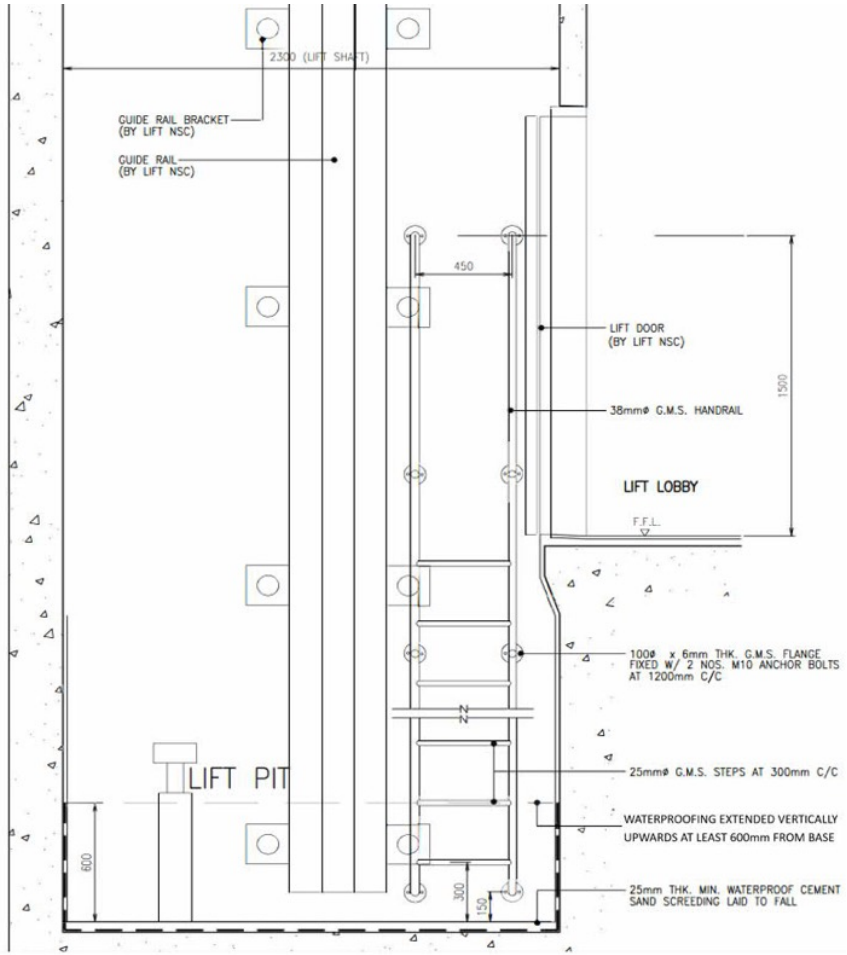


D — WALL IN LIFT PIT
1:10

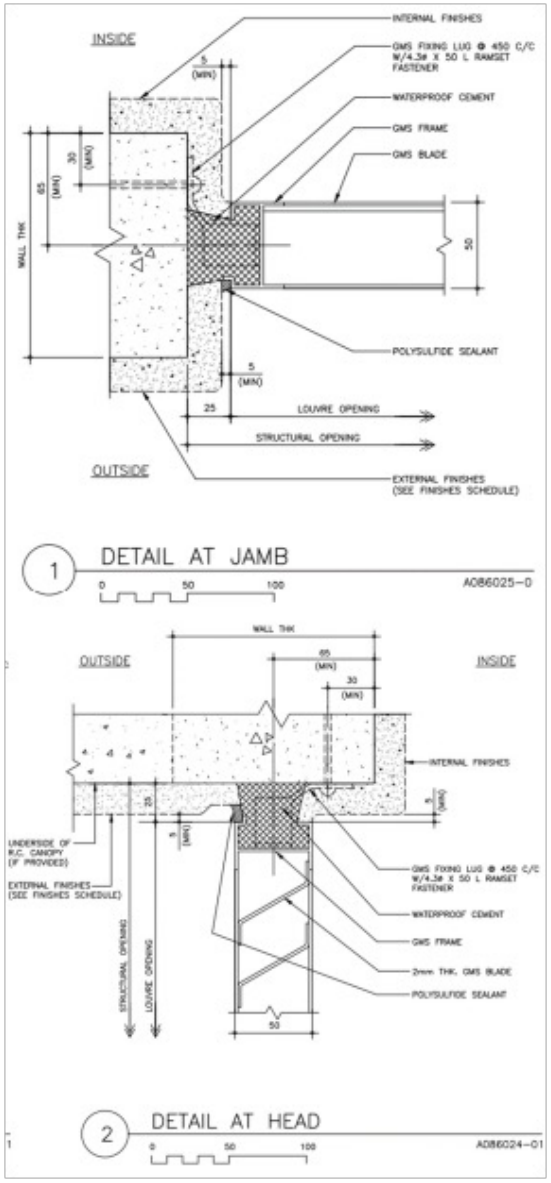


E — TYPICAL SUMP PIT IN LIFT PIT
1:10

Further Example

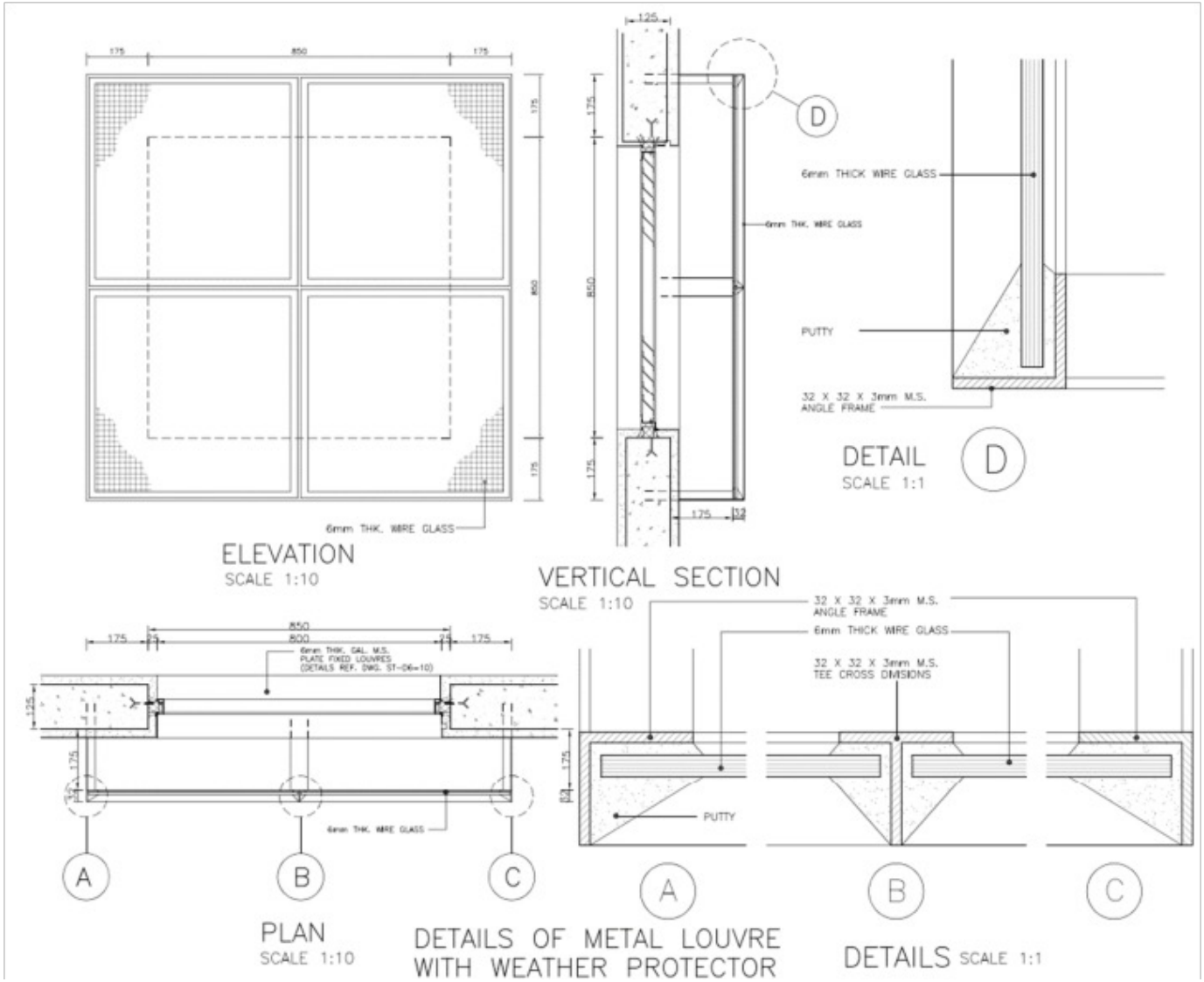


-F1.5. Wind Guard at Lift Machine Room

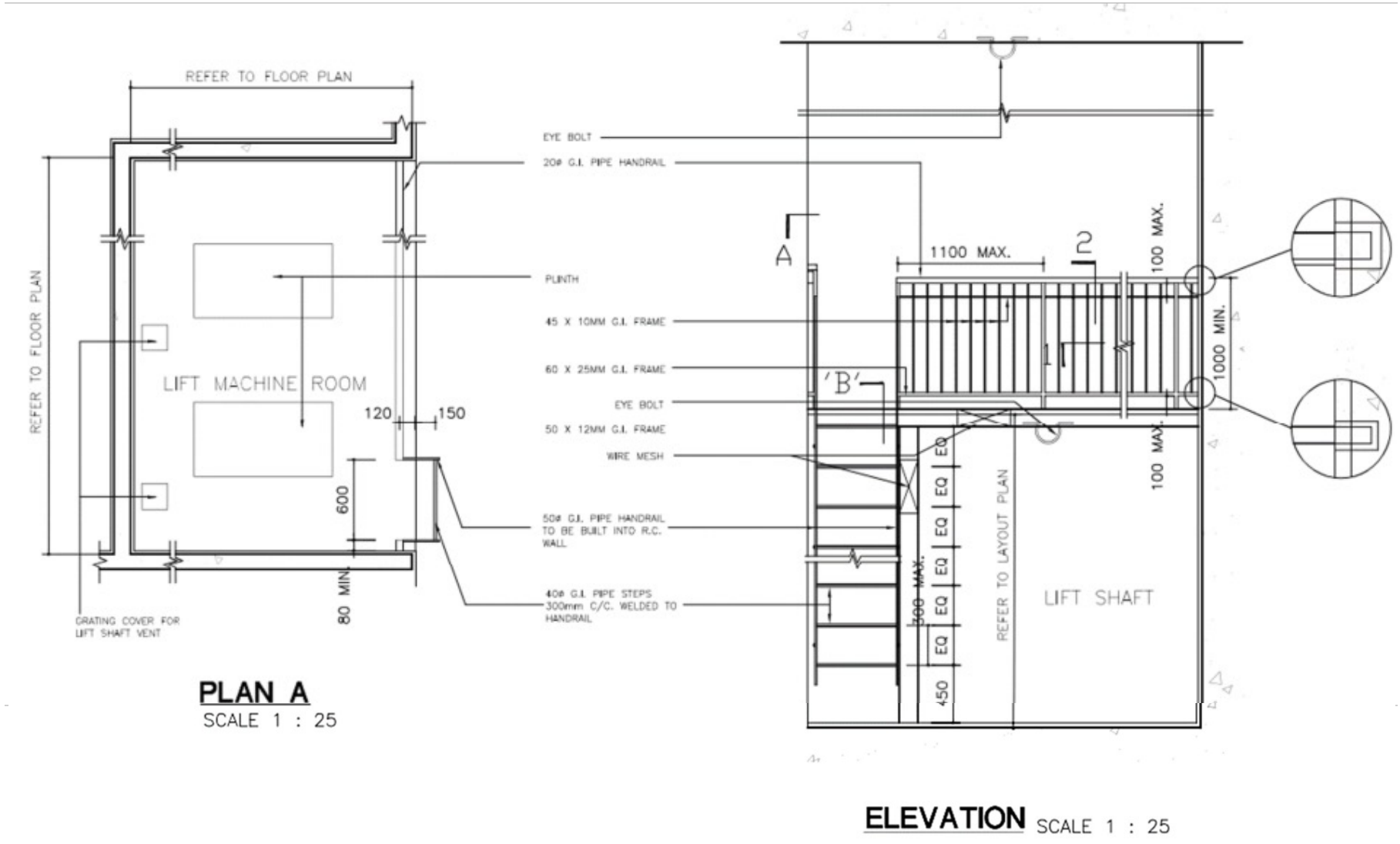


Example of Metal Louvre with Weather Protector on the External Wall of Roof Machine Room

Note: The wind guard may be replaced by double louvres with similar performance of weather protection.



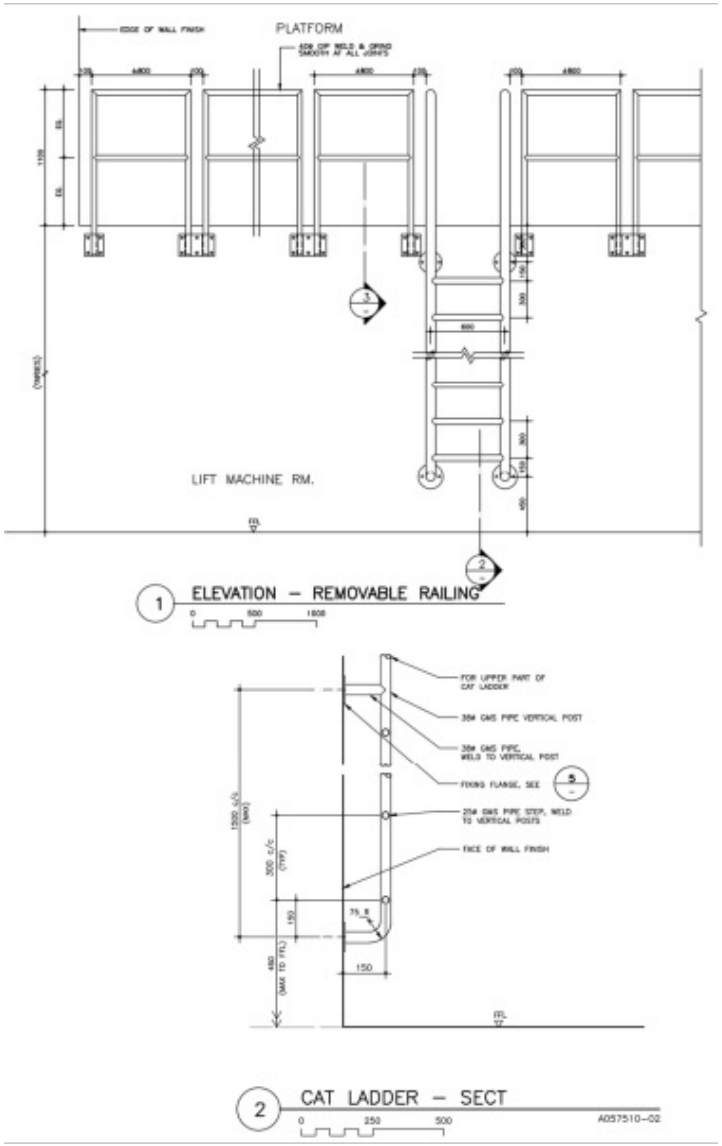
-F1.6. Lift Machine Room

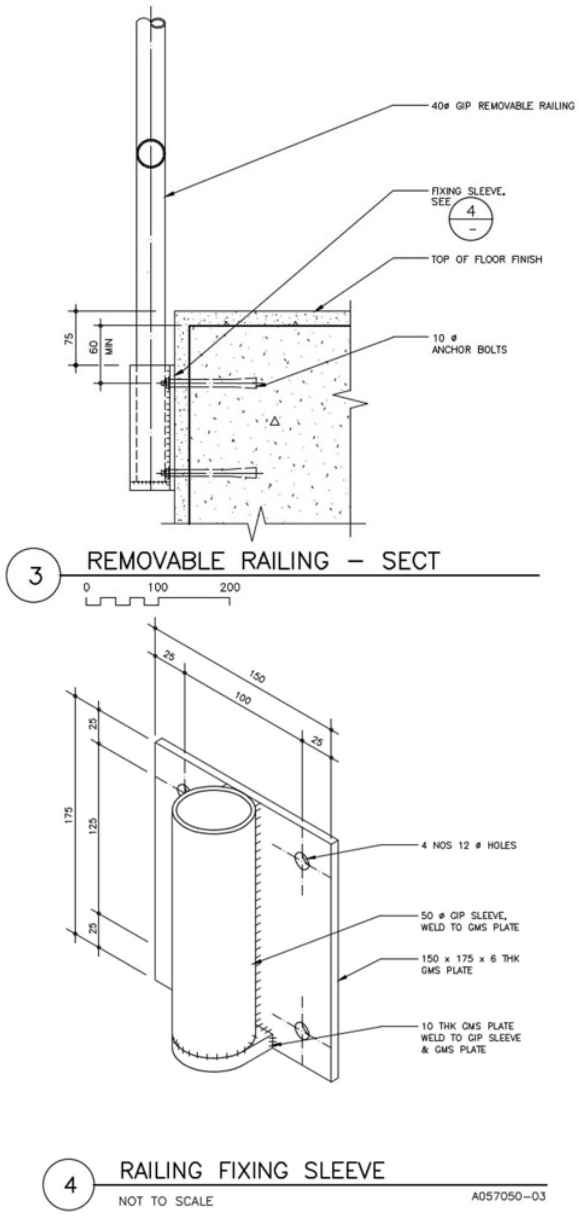


PLAN A
SCALE 1 : 25

ELEVATION SCALE 1 : 25

Removable Railings



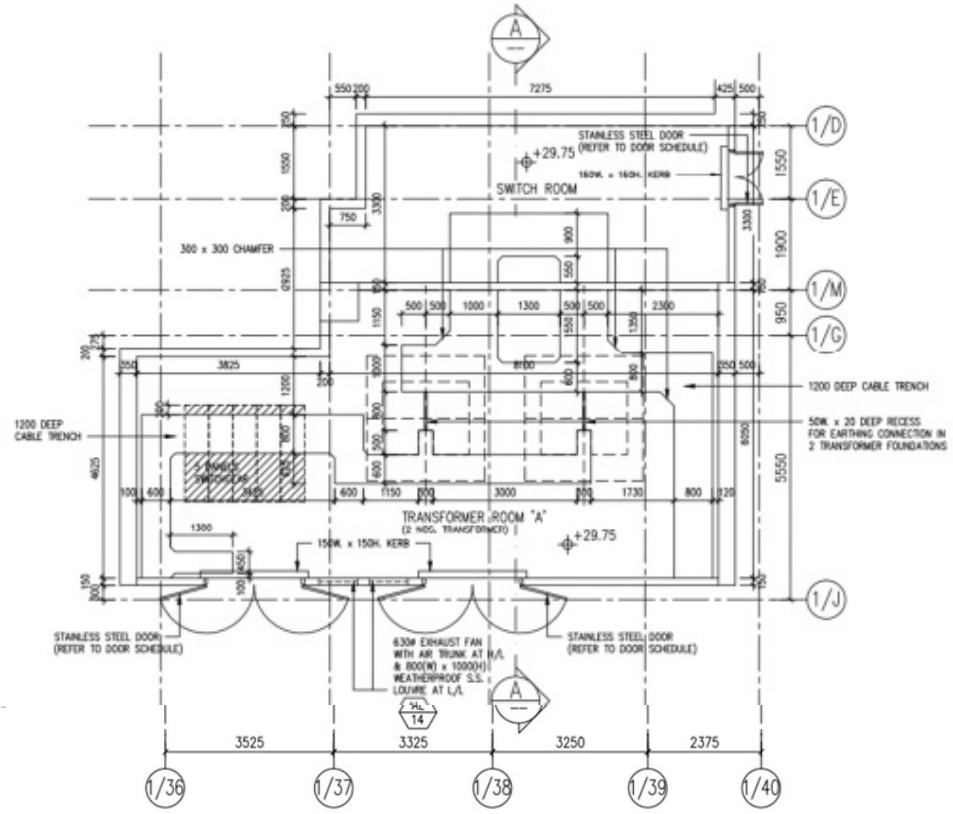


F2. M&E RELATED DETAILS

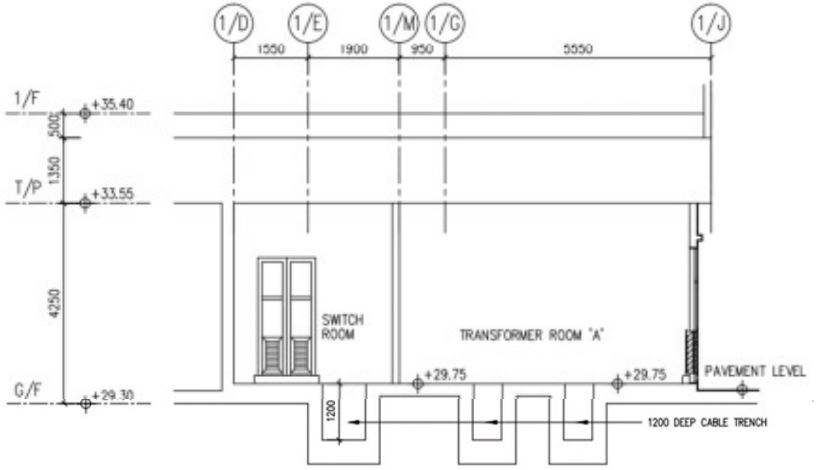
-F2.1. Transformer Room Details

Reference: Standard Substation Stainless Steel Door, P239/93/R-6, The Hong Kong Electric Co., Ltd.

Note: The details of the transformer room are often provided by the utility companies. For special design or concealment of the doors, co-ordination with special approval by these companies are required.



TRANSFORMER ROOM FLOOR PLAN (TOWER 1)

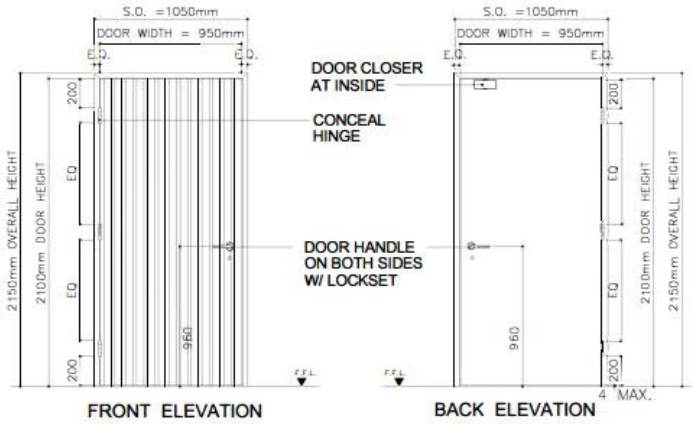


SECTION A – A (TOWER 1)

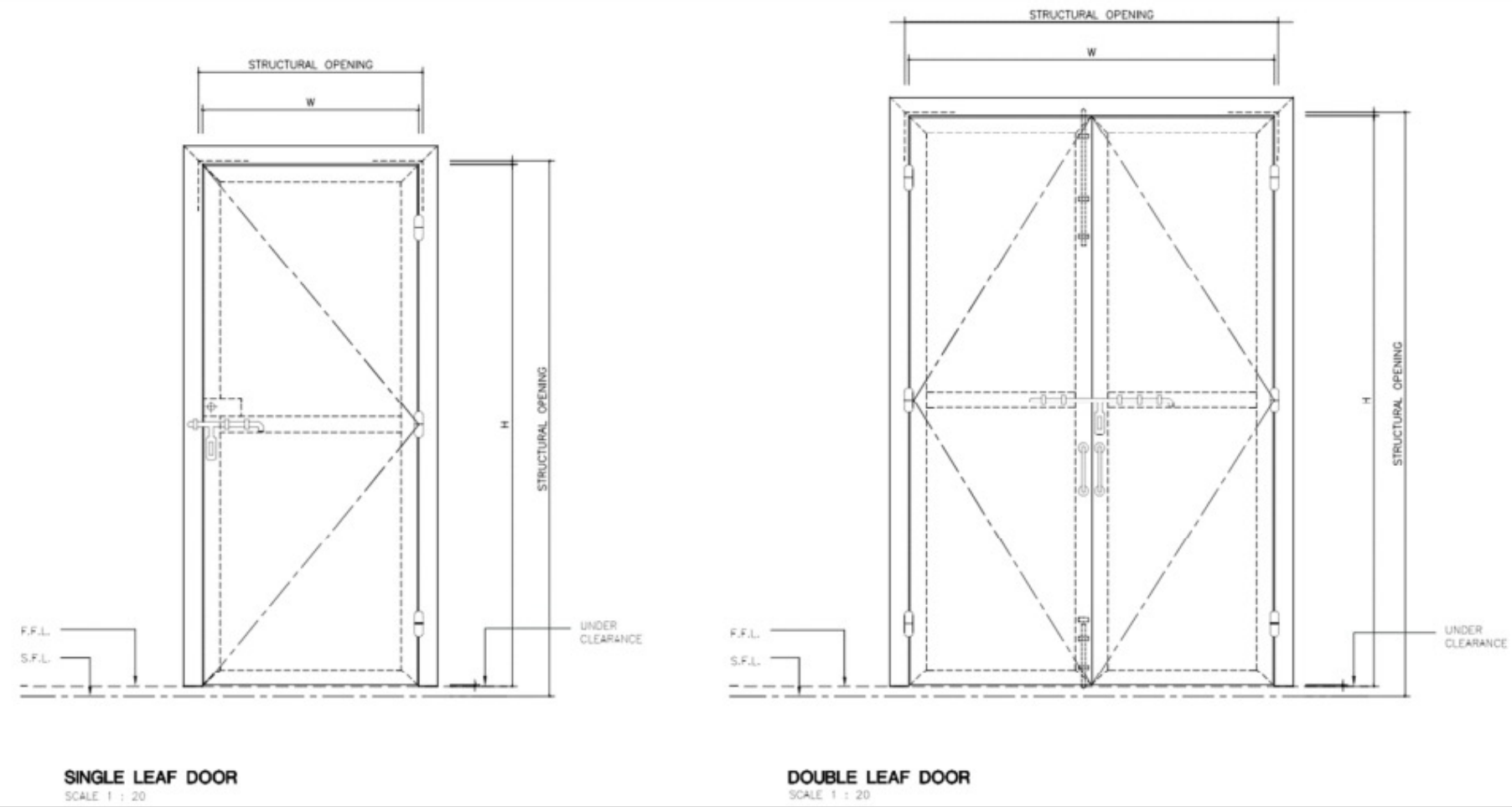
-F2.2. Steel Door for M&E Services Areas

Example: Steel Door Schedule

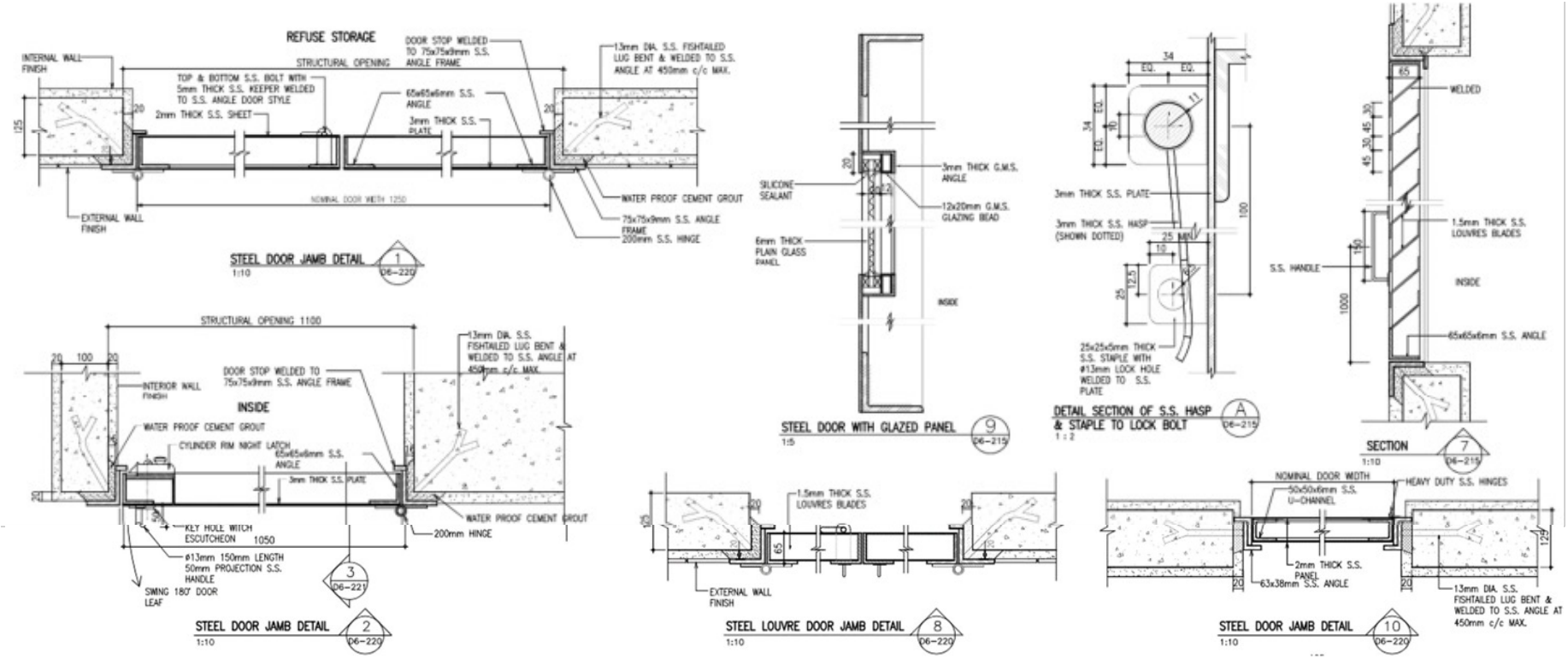
Note: The steel doors are often used for doors facing external air where there is minimal weather protection.

OUTSIDE ELEVATION	
DOOR MARK	M1 — B
FIRE RATING	F.R.R. -/-/-
DOOR TYPE	50X50X5MM MIN. GMS DOOR WITH ALUMINIUM FINISH
DOOR LEAF	CLAD WITH ALUMINUM VERTICAL GRILLE IN (M1) FINISHES
DOOR FRAME	ALUMINIUM CLAD WITH GMS FRAME
GLAZING	---
LOCATION	F.S. CONTROL ROOM AT G/F, H.V. CABLE LEAD-IN NO. 2 ROOM(*)
REMARK	- 1 NOS. OF DOOR STOPS - *180° OPENABLE - THIS DRAWING TO BE READ IN CONJUNCTION WITH FACADE ENGINEER'S DRAWING NO. AFE-P109

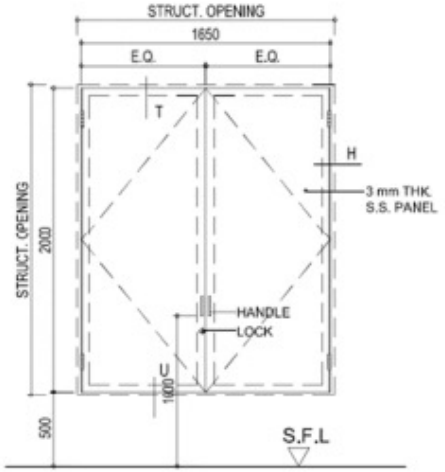
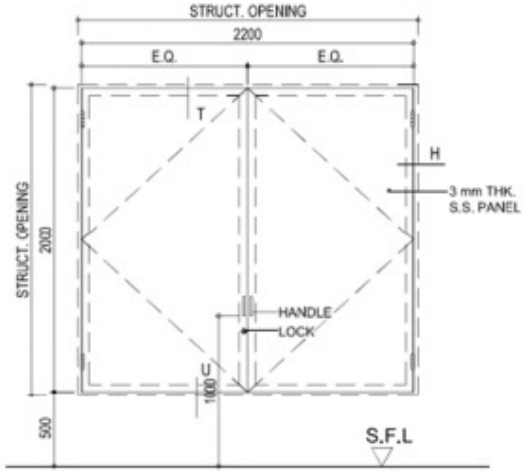
Example of Steel Doors for M&E Services Rooms such as Pump Rooms or Air Conditioning Machine Rooms



Steel Louvre Doors (for Machine Rooms that require ventilation)

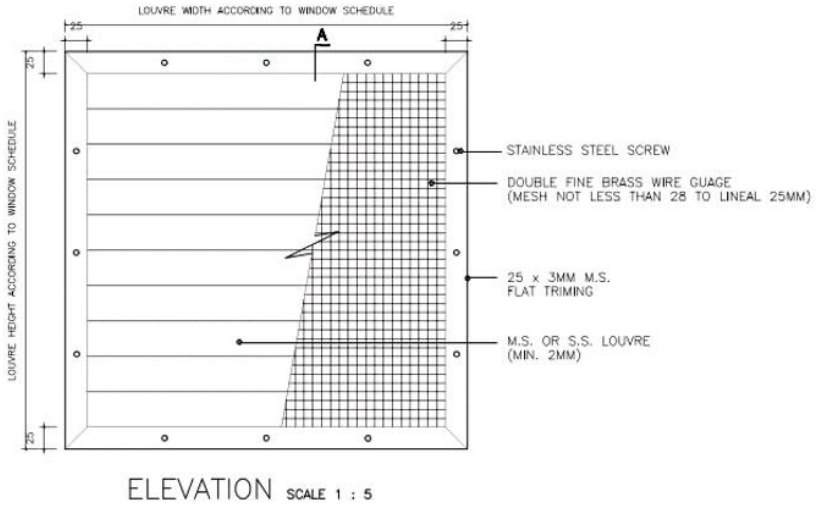


Example: Schedule of Steel Access Doors with Ironmongery (Panic Bolts can be considered to be used)

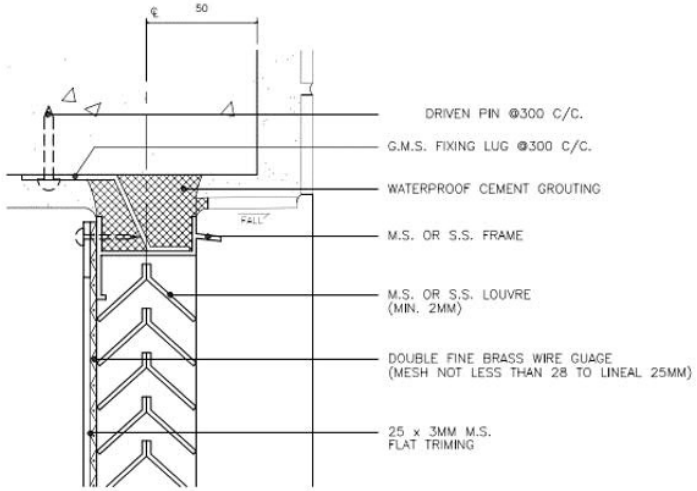
ELEVATION		
DOOR MARK	AP06	AP07
LOCATION	B/F (EL PANEL CABINET) G/F(OFFICE LOBBY) 3/F(KITCHEN WATER TRANSFER TANK & PAMP RM) 4/F & 6/F(TBE ROOM)	BETWEEN G/F-1/F(AHU. RM) 2/F(F&B 1) 9/F(MCC SW. RM)
CONSTRUCTION	50X50X5mm S.S.	50X50X5mm S.S.
FRAME	60X60X6mm S.S. ANGLE	60X60X6mm S.S. ANGLE
REMARKS	- RECESS TYPE SINGLE PULL HANDLE	- RECESS TYPE SINGLE PULL HANDLE
IRONMONGERY	- MORTISE DEAD LOCK - 2 PAIRS OF S.S. BALL BEARING HINGE	- MORTISE DEAD LOCK - 2 PAIRS OF S.S. BALL BEARING HINGE

-F2.3. Metal Louvre for M&E Rooms

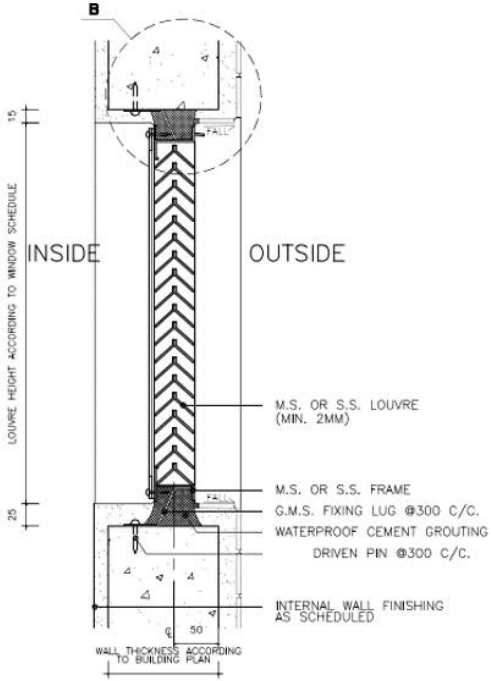
Note: This is an example of a "weatherproof" louvre only. Water seeping through the louvre slots is to be collected for discharge. For better protection against rain, double bank/triple bank louvres may be considered.



ELEVATION SCALE 1 : 5

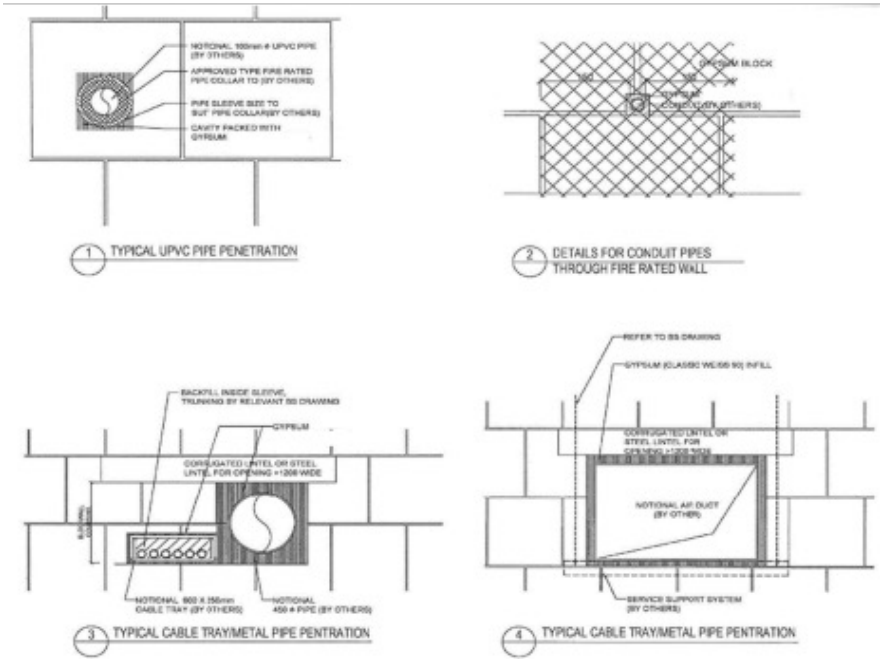


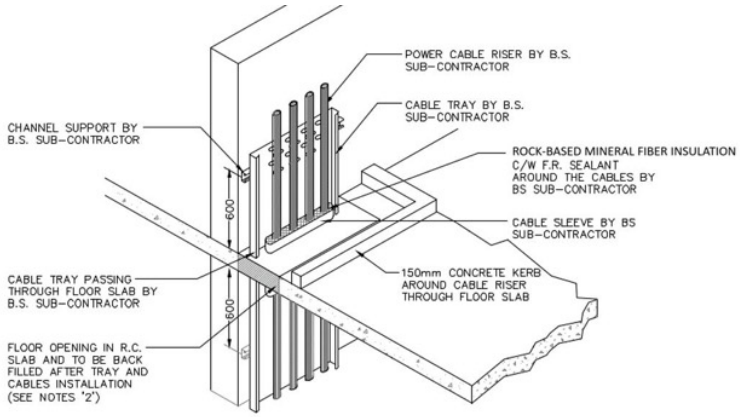
DETAIL 'B' SCALE 1 : 2



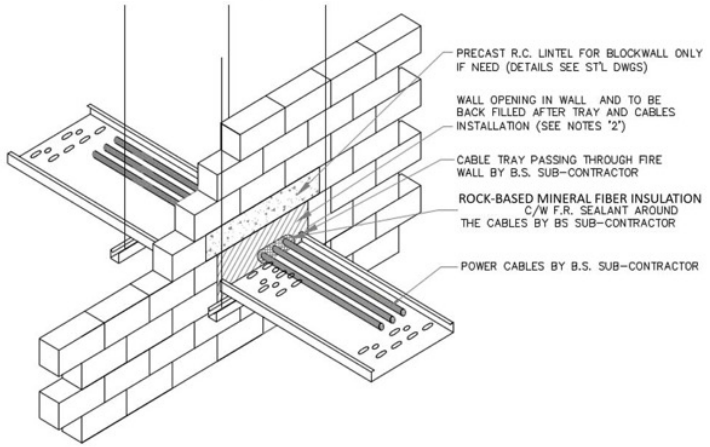
DETAIL 'A' SCALE 1 : 5

-F2.4. M&E Service Openings

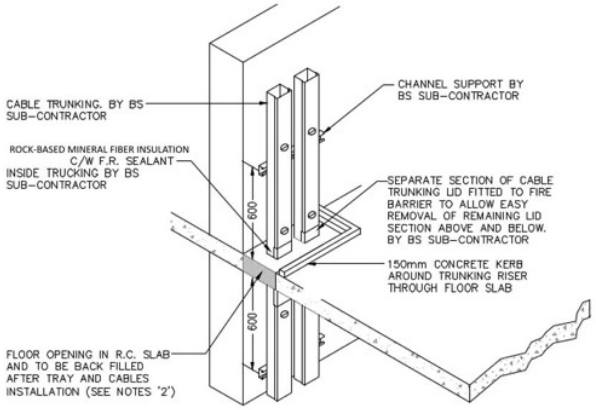




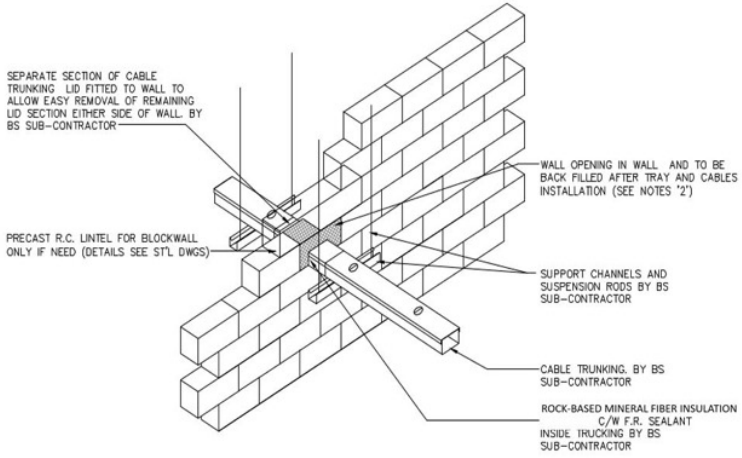
DETAIL OF CABLE TRAY PASSING THROUGH SLAB



DETAIL OF CABLE TRAY PASSING THROUGH WALL

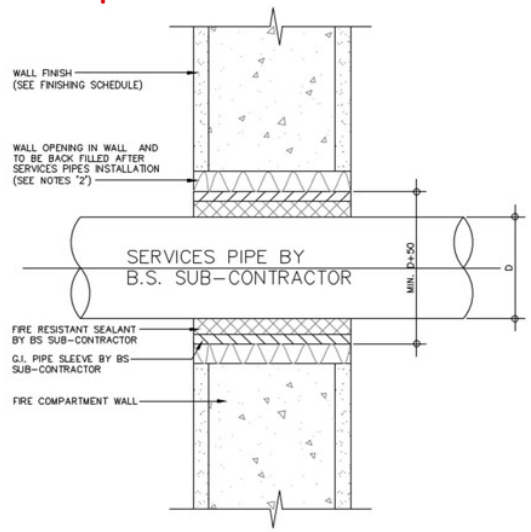


DETAIL OF TRUNKING PASSING THROUGH SLAB



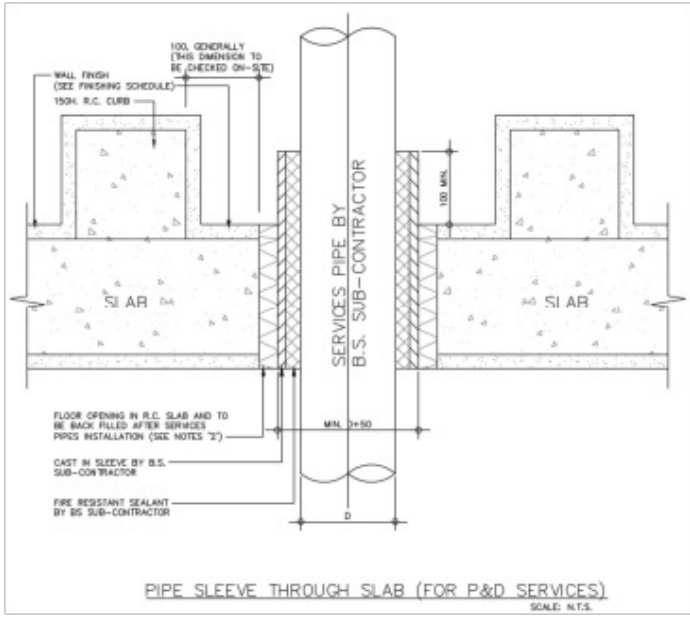
DETAIL OF TRUNKING PASSING THROUGH WALL

-F2.5. Pipe Sleeves



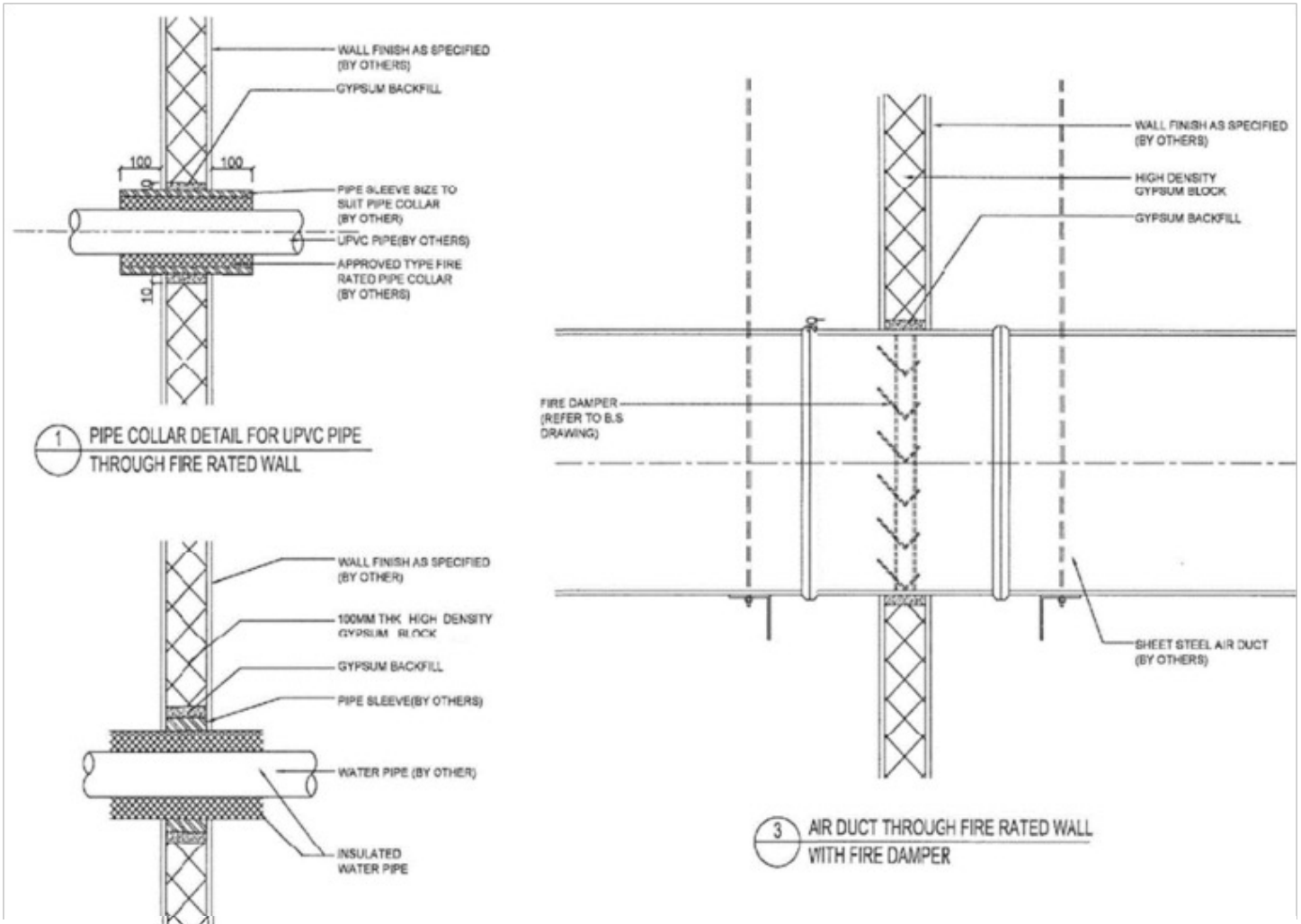
PIPE SLEEVE THROUGH WALL(FOR P&D SERVICES)

SCALE: N.T.S.

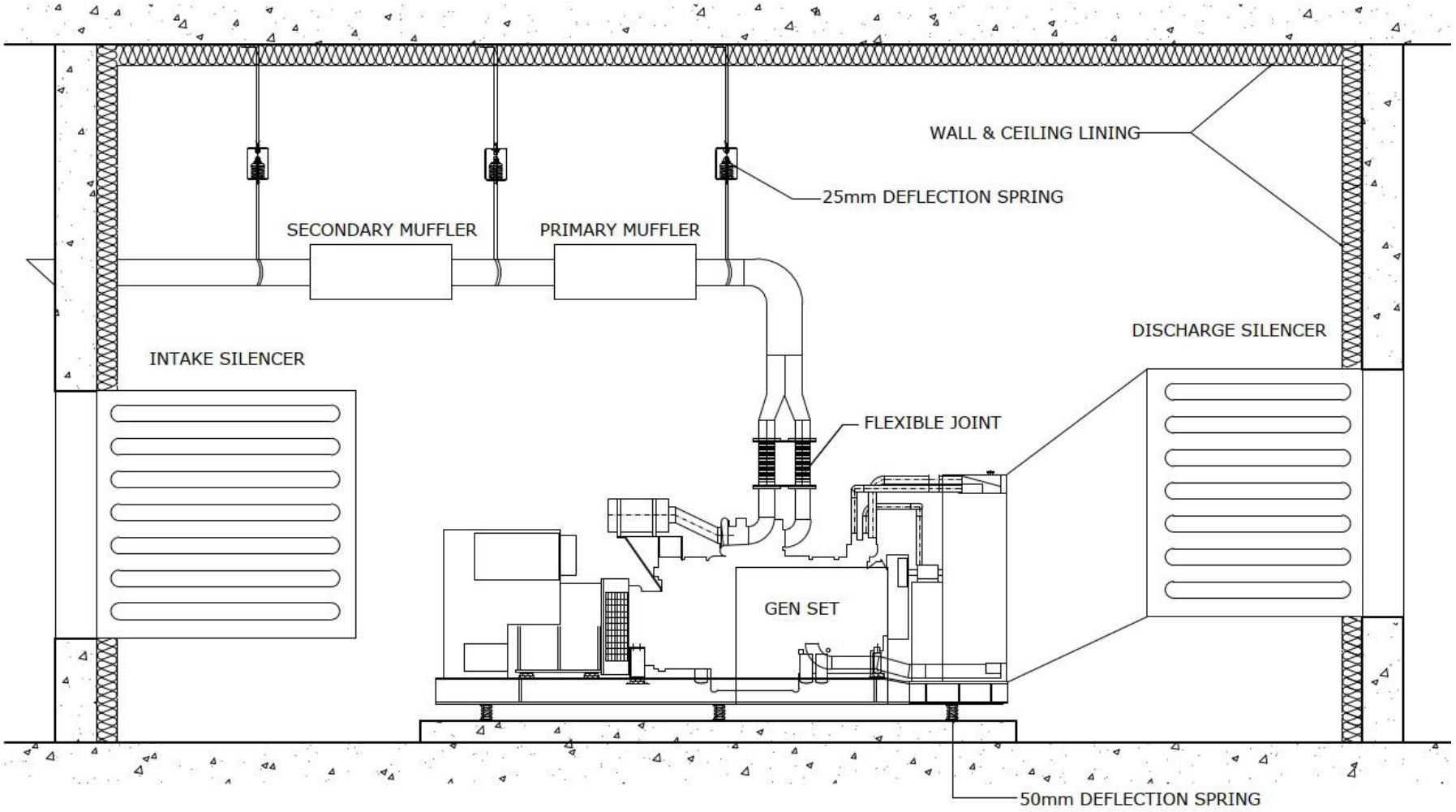


PIPE SLEEVE THROUGH SLAB (FOR P&D SERVICES)

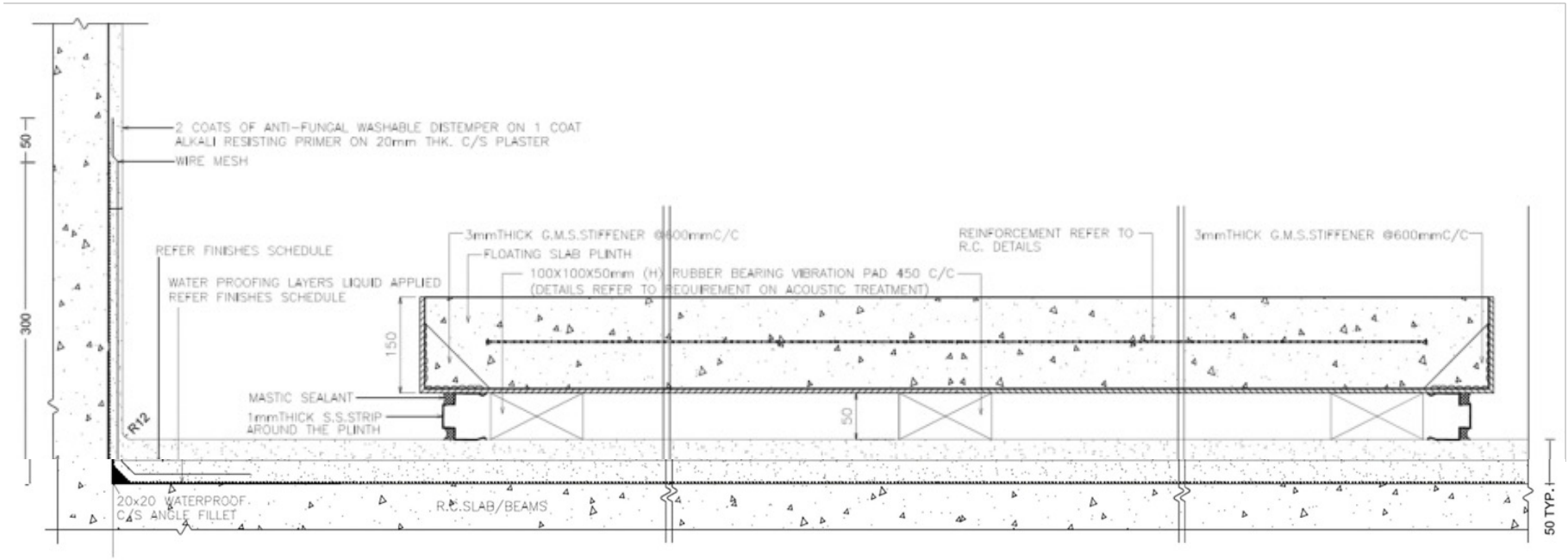
SCALE: N.T.S.


WALL FINISH AS SPECIFIED (BY OTHERS)
GYPSUM BACKFILL
100
100
PIPE SLEEVE SIZE TO SUIT PIPE COLLAR (BY OTHER)
UPVC PIPE(BY OTHERS)
APPROVED TYPE FIRE RATED PIPE COLLAR (BY OTHERS)
10
1 PIPE COLLAR DETAIL FOR UPVC PIPE THROUGH FIRE RATED WALL
WALL FINISH AS SPECIFIED (BY OTHER)
100MM THK HIGH DENSITY GYPSUM BLOCK
GYPSUM BACKFILL
PIPE SLEEVE(BY OTHERS)
WATER PIPE (BY OTHER)
INSULATED WATER PIPE
2 INSULATED WATER PIPE THROUGH FIRE RATED WALL
WALL FINISH AS SPECIFIED (BY OTHERS)
HIGH DENSITY GYPSUM BLOCK
GYPSUM BACKFILL
FIRE DAMPER (REFER TO B.S DRAWING)
SHEET STEEL AIR DUCT (BY OTHERS)
3 AIR DUCT THROUGH FIRE RATED WALL WITH FIRE DAMPER

-F2.6. Acoustic Treatment for Generator Room



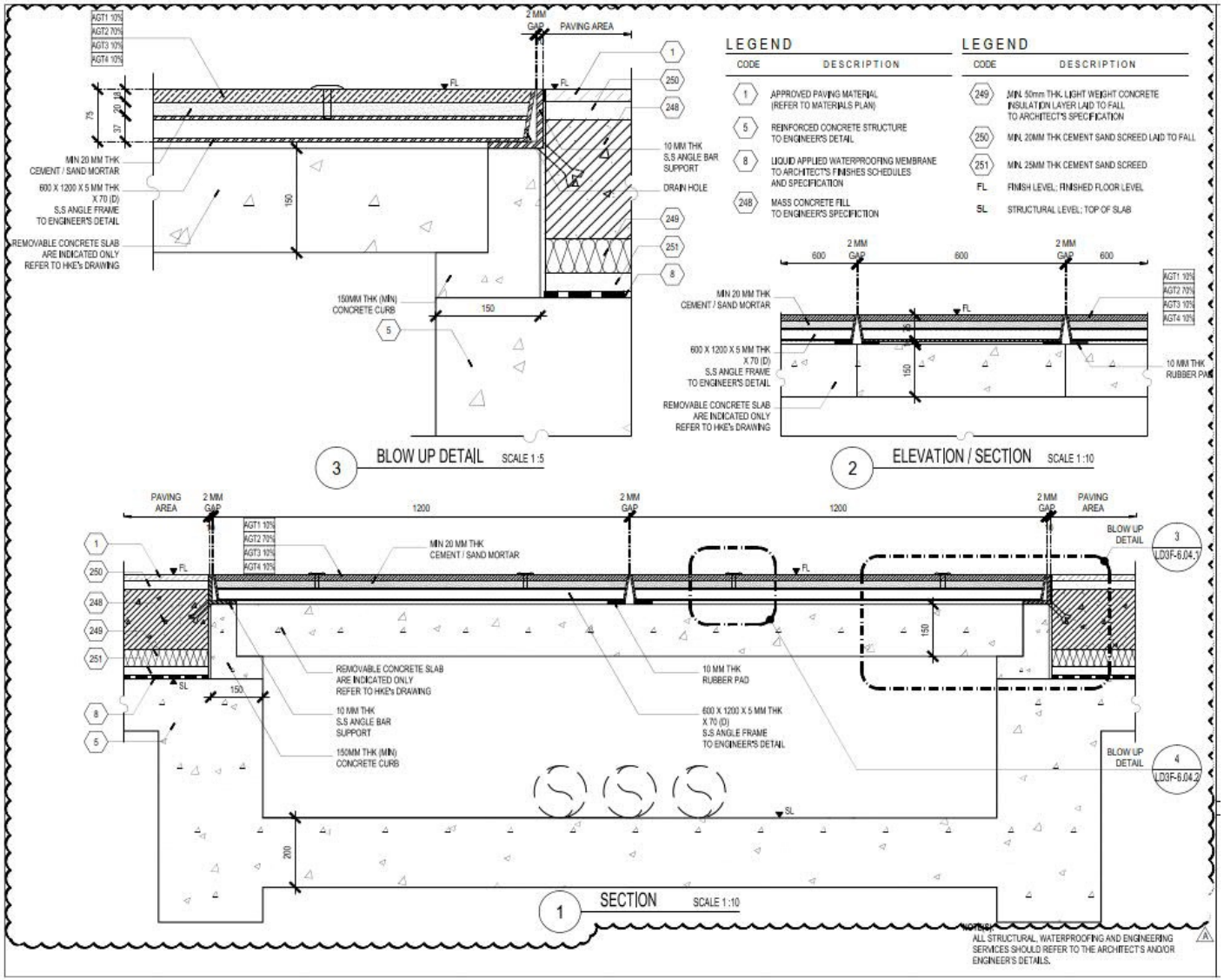
Note: The following example of the concrete plinth is designed for abatement of both noise and vibration besides structural support.

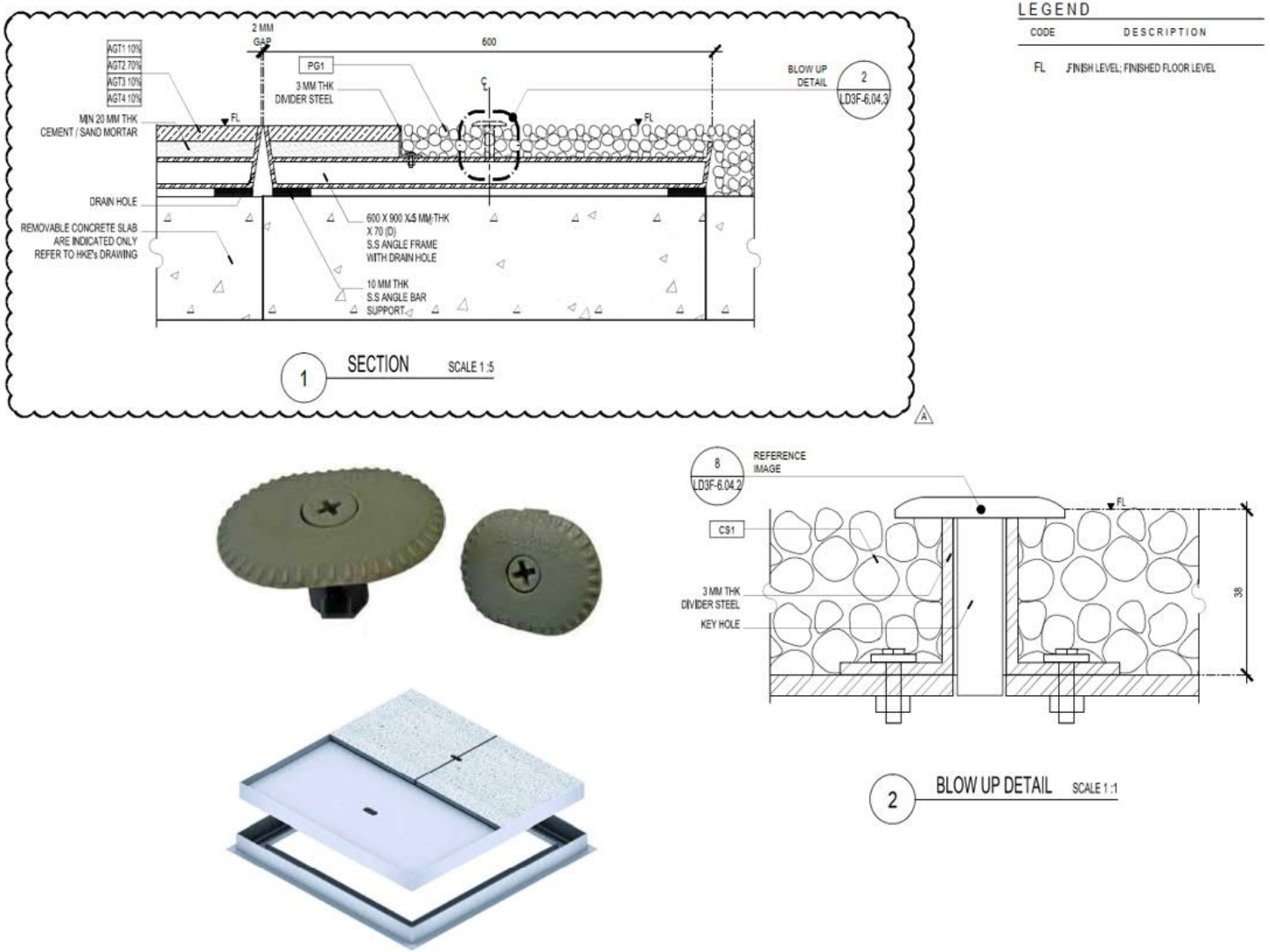


CONCRETE PLINTH DETAILS FOR PLANTROOM

-F2.7. Cable Trench Matching Cover in Landscaped Ground

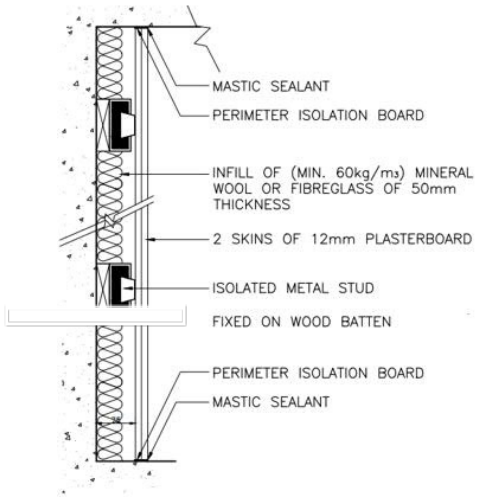
The example shows a landscaped ground with Green Roof modular Planting Tray System.



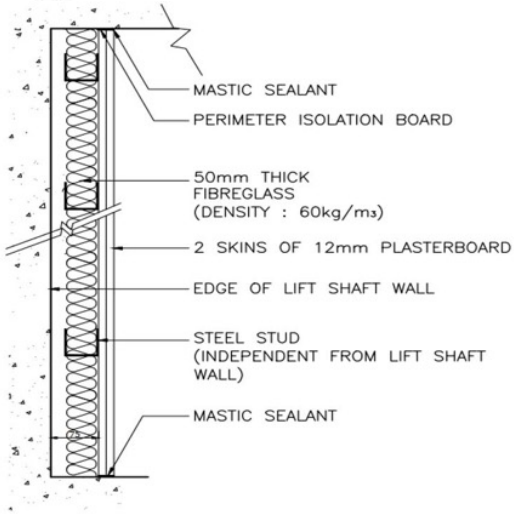


Green roof modular planting tray system

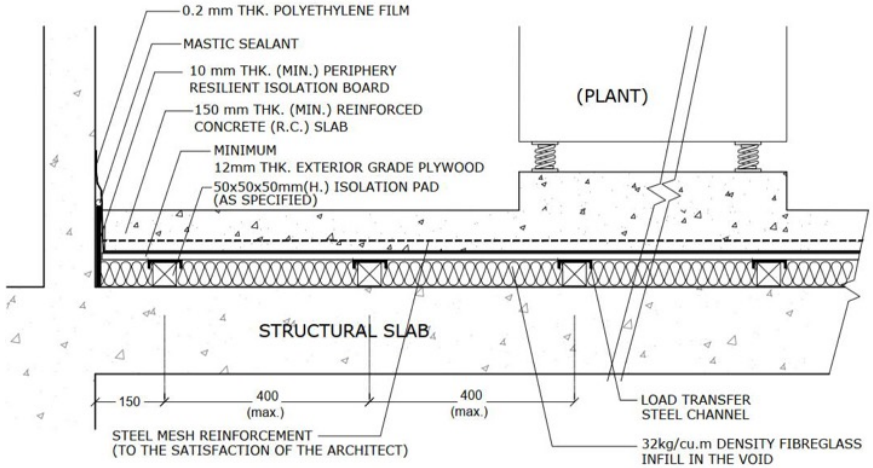
-F2.8. Acoustic Lining



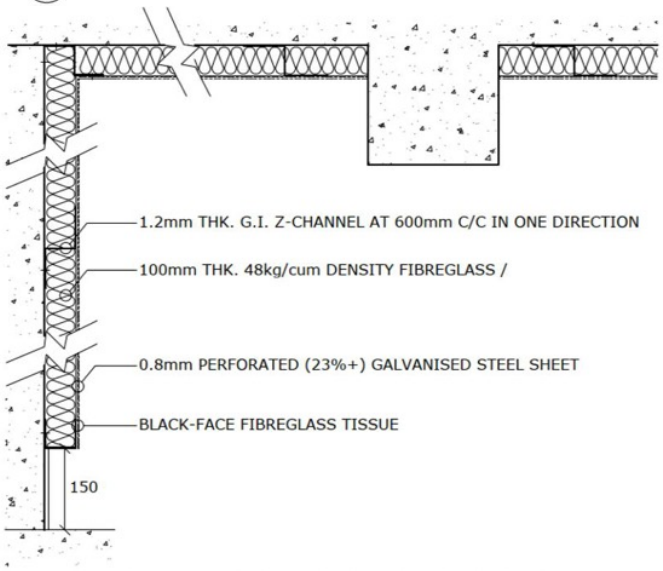
1 ACOUSTIC FURRING ON WALL



2 ACOUSTIC LINING FOR LIFT SHAFT WALL



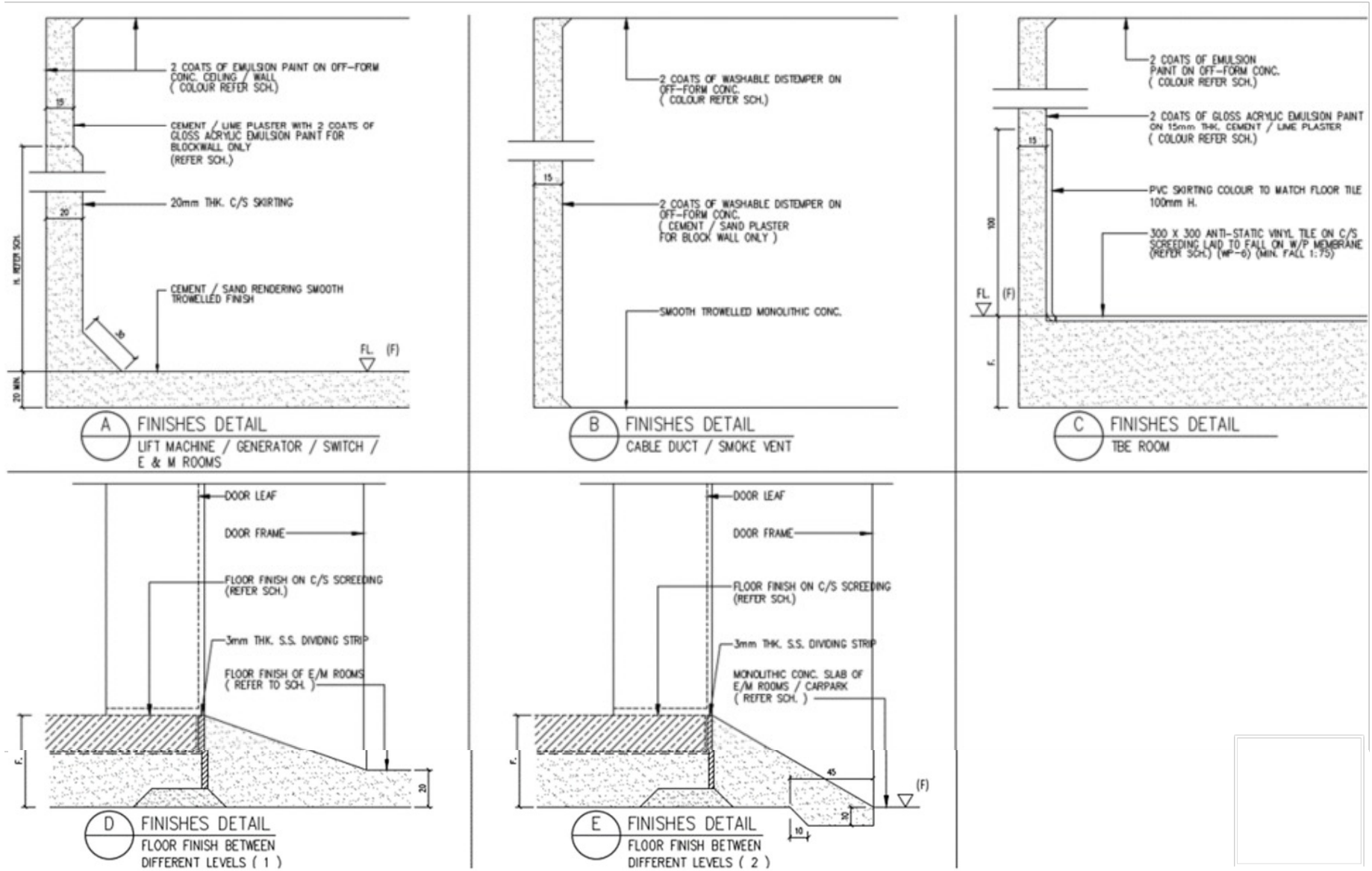
4 FLOATING FLOOR DETAIL

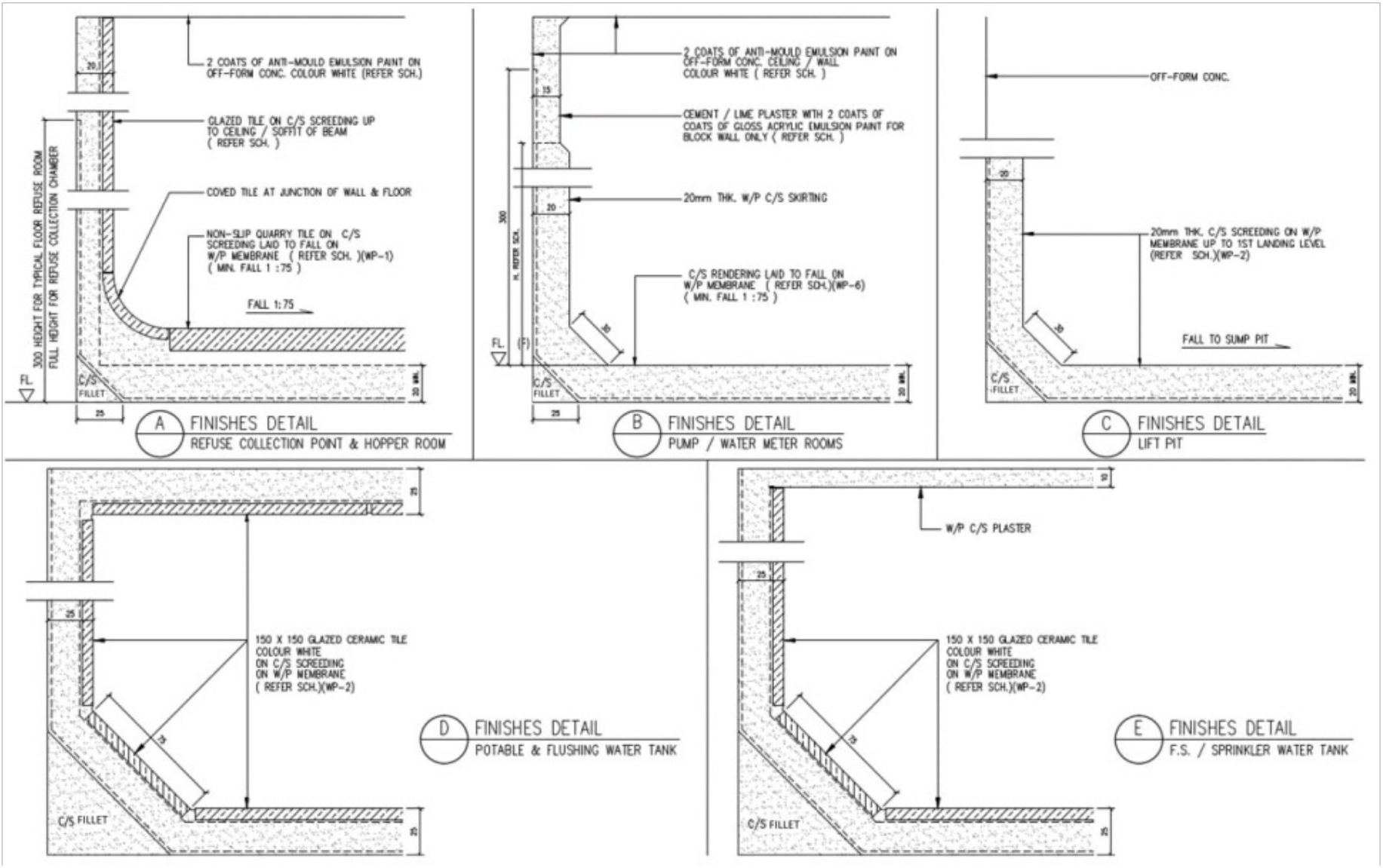


6 ACOUSTIC LINING AT WALL/ CEILING

-F2.9. Floor/Wall Finishes

These are various finishes suitable for different M/E rooms at junctions of floor and wall.




2 COATS OF ANTI-MOULD EMULSION PAINT ON OFF-FORM CONC. COLOUR WHITE (REFER SCH.)
GLAZED TILE ON C/S SCREEDING UP TO CEILING / SOFFIT OF BEAM (REFER SCH.)
COVED TILE AT JUNCTION OF WALL & FLOOR
NON-SLIP QUARRY TILE ON C/S SCREEDING LAID TO FALL ON W/P MEMBRANE (REFER SCH.)(WP-1) (MIN. FALL 1 :75)
FALL 1:75
300 HEIGHT FOR TYPICAL FLOOR REFUSE ROOM
FULL HEIGHT FOR REFUSE COLLECTION CHAMBER
FL.
C/S FILLET
A FINISHES DETAIL
REFUSE COLLECTION POINT & HOPPER ROOM
2 COATS OF ANTI-MOULD EMULSION PAINT ON OFF-FORM CONC. CEILING / WALL COLOUR WHITE (REFER SCH.)
CEMENT / LIME PLASTER WITH 2 COATS OF COATS OF GLOSS ACRYLIC EMULSION PAINT FOR BLOCK WALL ONLY (REFER SCH.)
20mm THK. W/P C/S SKIRTING
C/S RENDERING LAID TO FALL ON W/P MEMBRANE (REFER SCH.)(WP-6) (MIN. FALL 1 :75)
300 H. REFER SCH.
B FINISHES DETAIL
PUMP / WATER METER ROOMS
OFF-FORM CONC.
20mm THK. C/S SCREEDING ON W/P MEMBRANE UP TO 1ST LANDING LEVEL (REFER SCH.)(WP-2)
FALL TO SUMP PIT
C FINISHES DETAIL
LIFT PIT
150 X 150 GLAZED CERAMIC TILE COLOUR WHITE ON C/S SCREEDING ON W/P MEMBRANE (REFER SCH.)(WP-2)
D FINISHES DETAIL
POTABLE & FLUSHING WATER TANK
W/P C/S PLASTER
150 X 150 GLAZED CERAMIC TILE COLOUR WHITE ON C/S SCREEDING ON W/P MEMBRANE (REFER SCH.)(WP-2)
E FINISHES DETAIL
F.S. / SPRINKLER WATER TANK

F3. FIRE SERVICES (FS) RELATED DETAILS

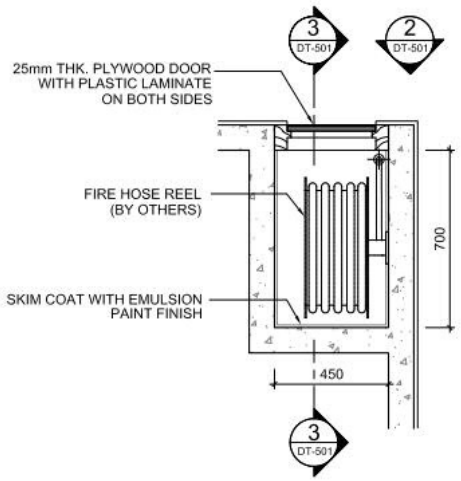
Reference: CP for Fire Safety in Buildings

Note: Requirements on finishes are in the CP Part E on Fire Properties of Building Elements and Components:
Subsection E12 – External Facades
Subsection E13 – Linings of Internal Wall and Ceiling
Subsection E14 – Linings and Coverings of Floors
Subsection E15 – Acoustic and thermal Insulation

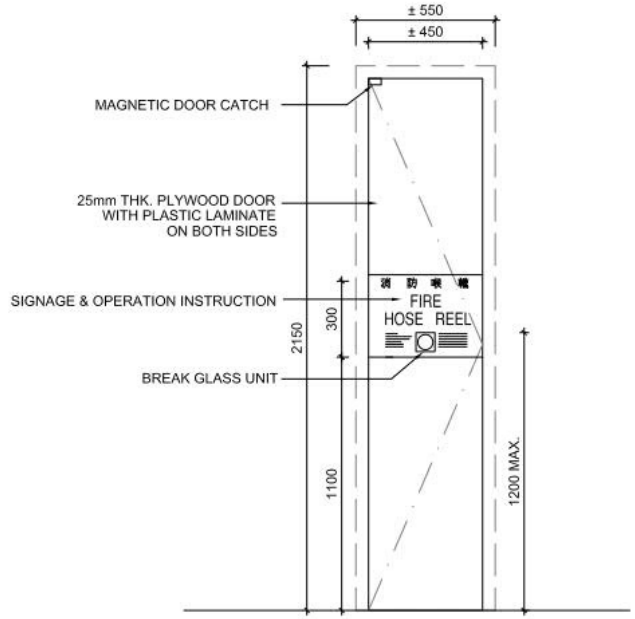
Reference: Code of Practice for Minimum Fire Service Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment (2022, FSD)

-F3.1. Hose Reel

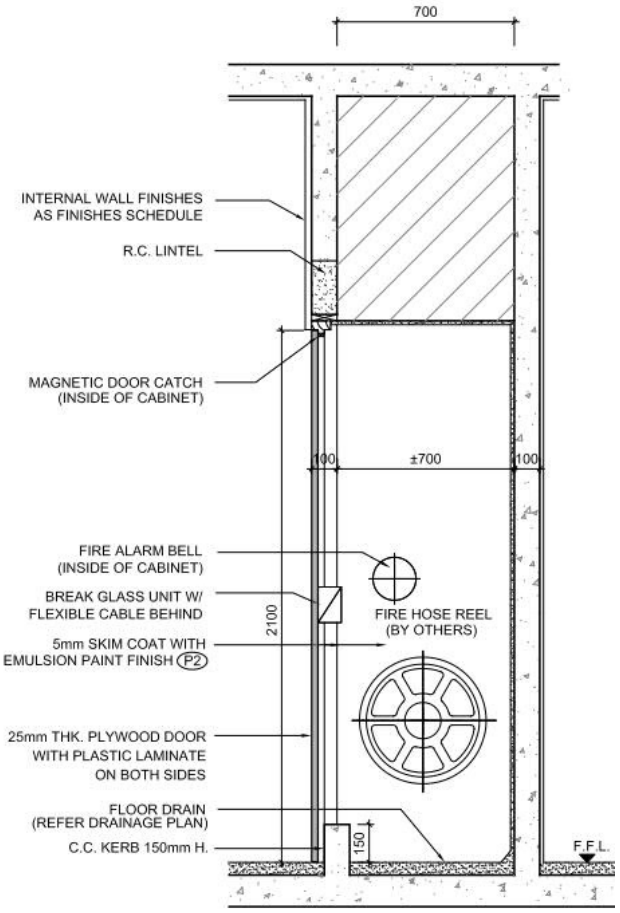
Note: This is installed in the common areas of every floor of the building in accordance with FSI requirements.



1 PLAN OF HOSE REEL
SCALE 1:20

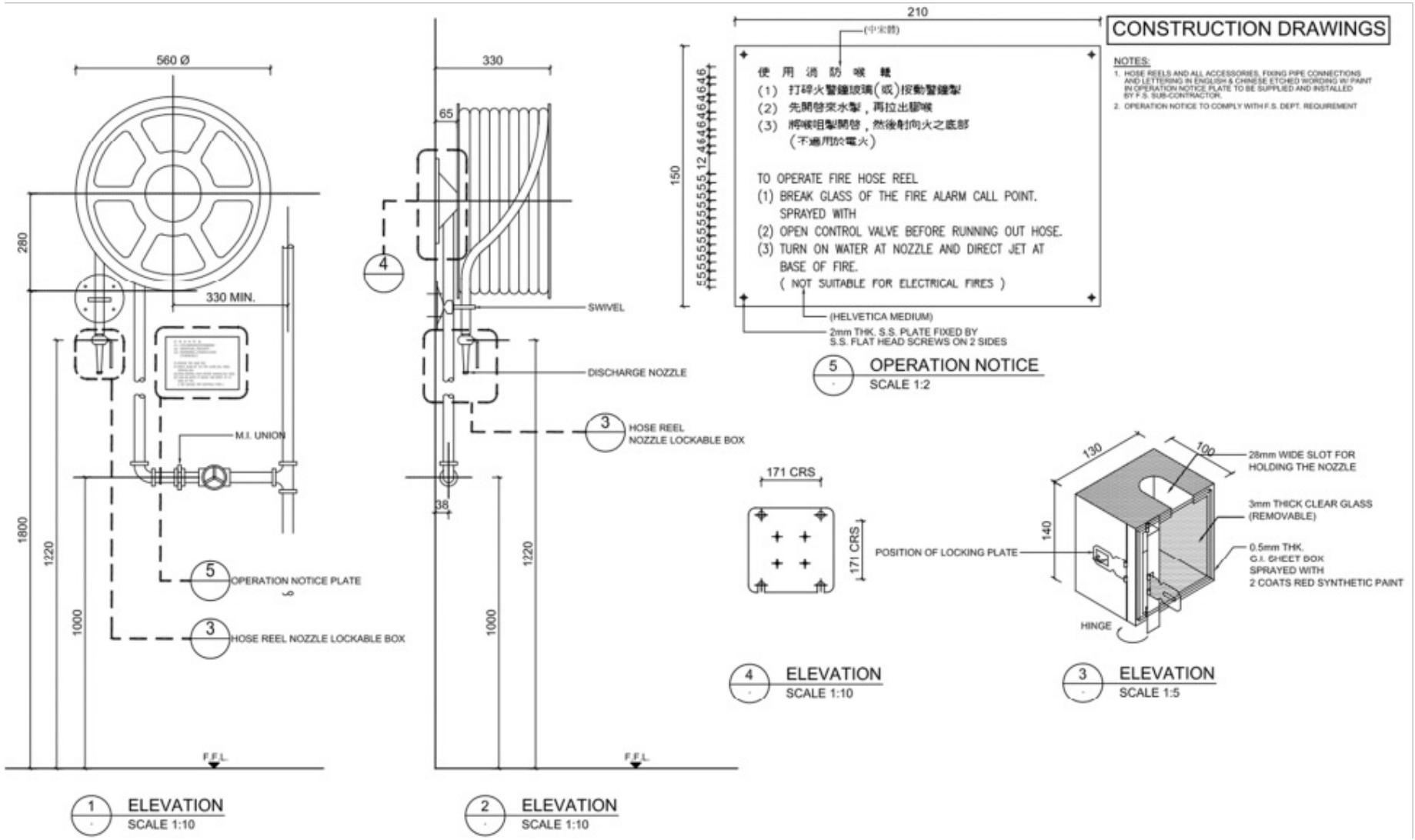


2 ELEVATION
SCALE 1:20



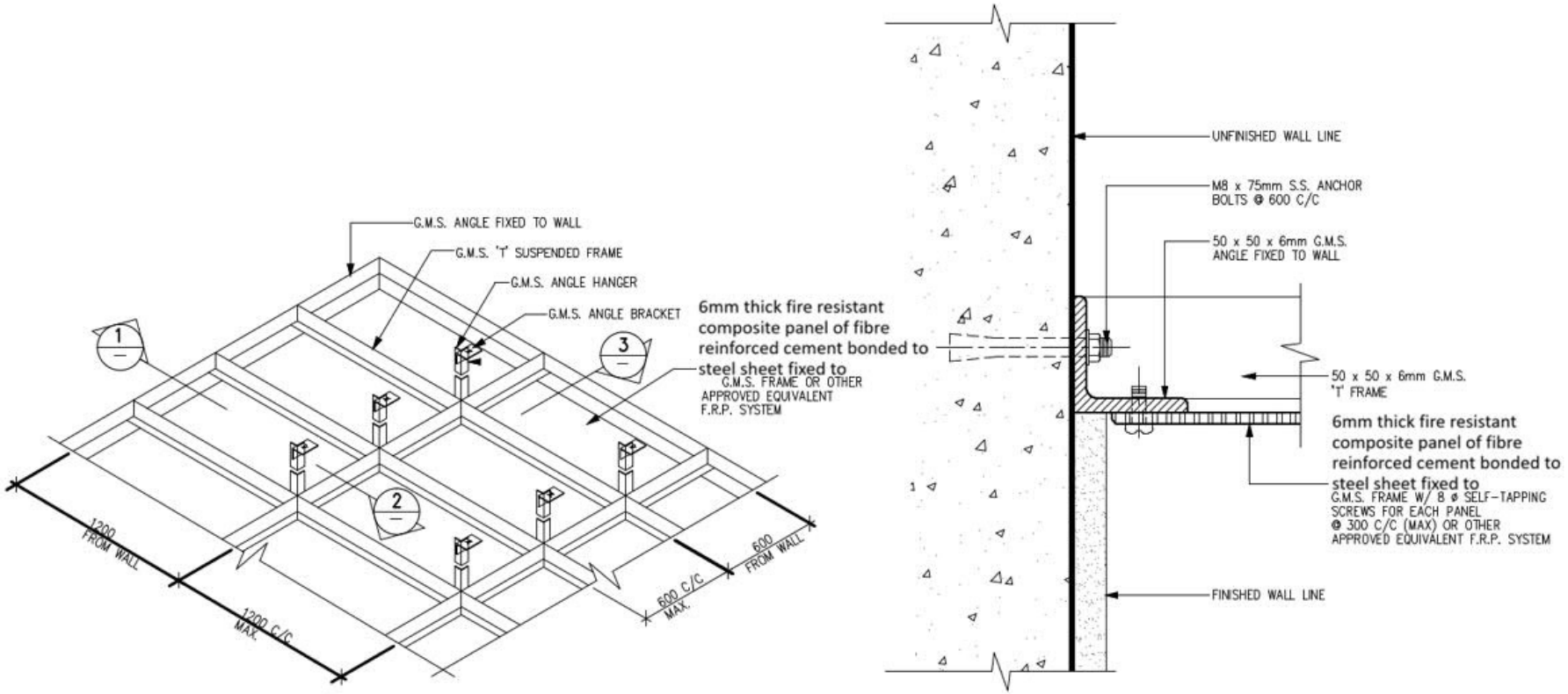
3 SECTION
SCALE 1:20

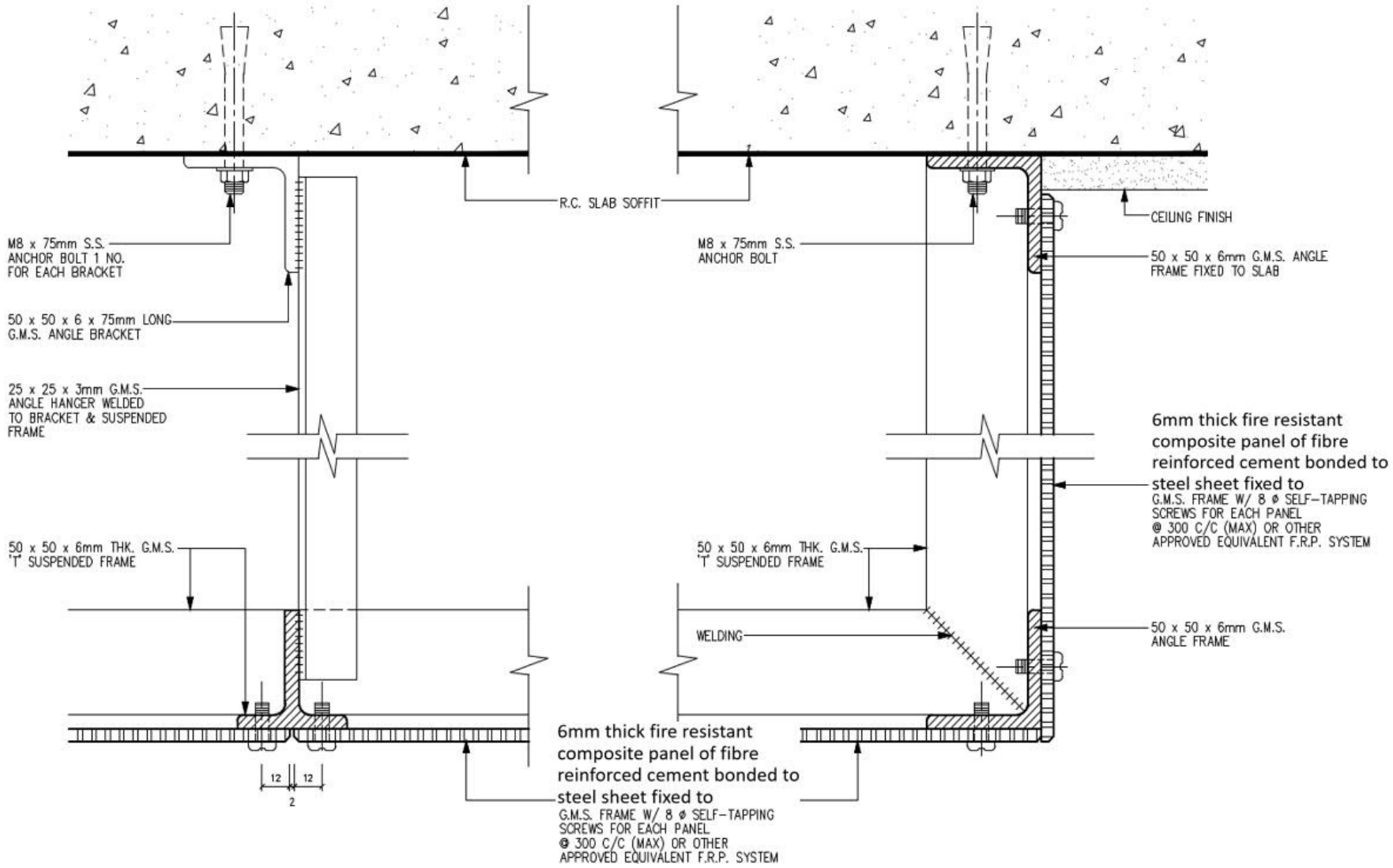
Wall Mounted Hose Reel

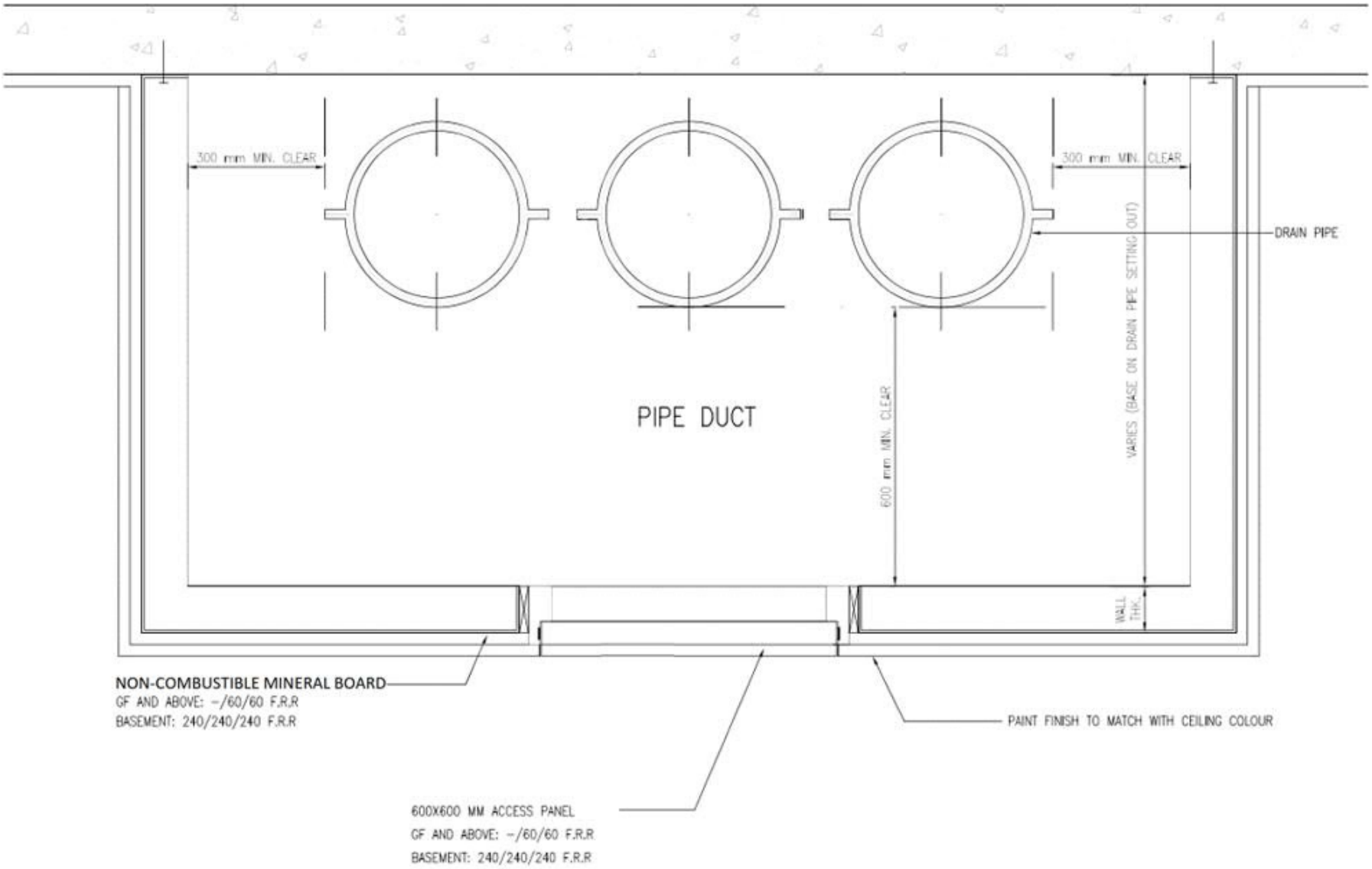


-F3.2. Fire Rated Ceilings

This is used for the protection of building services such as electrical conduits and ventilation air ducts which pass through fire-rated enclosure.



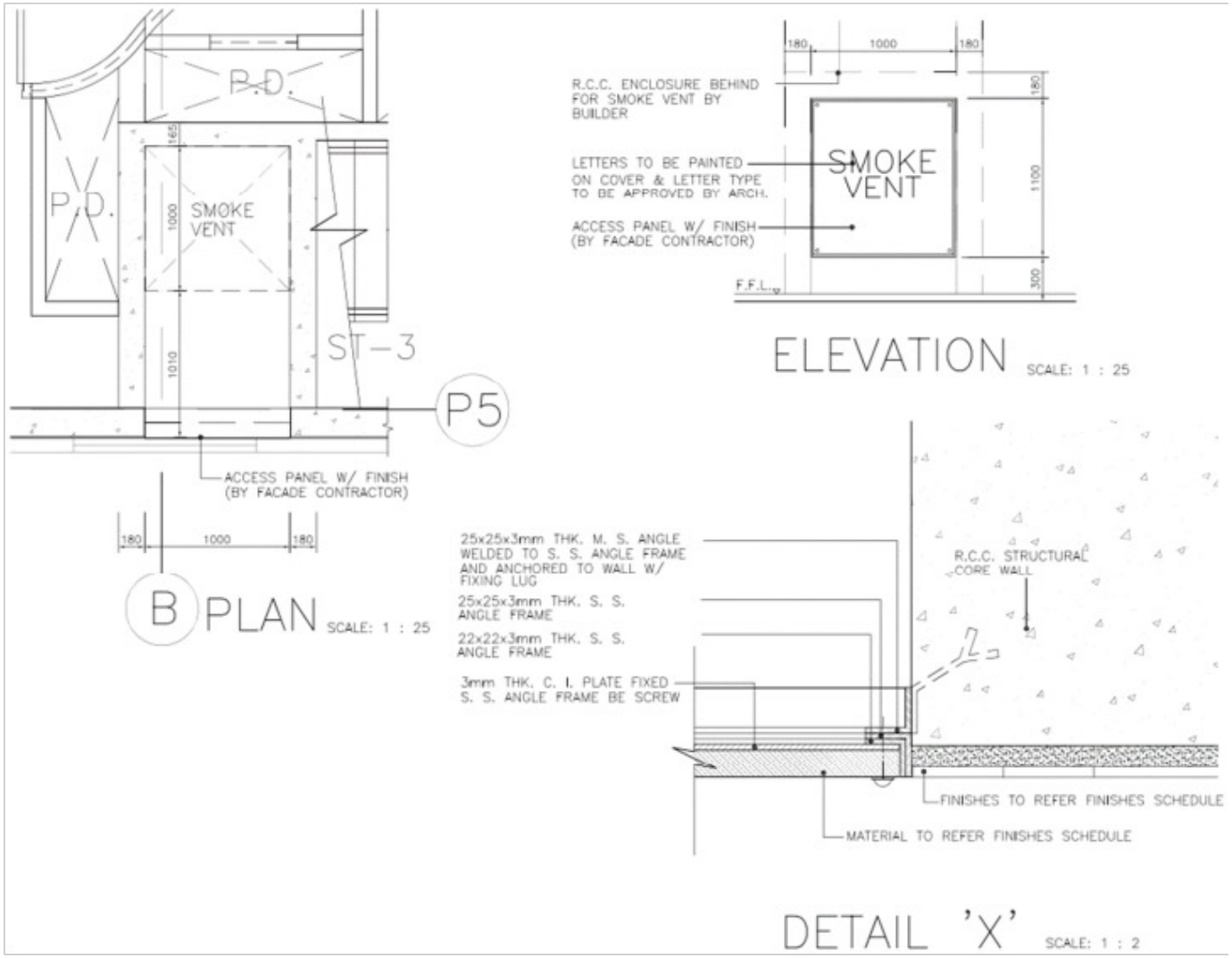

R.C. SLAB SOFFIT
M8 x 75mm S.S.
ANCHOR BOLT 1 NO.
FOR EACH BRACKET
50 x 50 x 6 x 75mm LONG
G.M.S. ANGLE BRACKET
25 x 25 x 3mm G.M.S.
ANGLE HANGER WELDED
TO BRACKET & SUSPENDED
FRAME
50 x 50 x 6mm THK. G.M.S.
'T' SUSPENDED FRAME
12
12
2
6mm thick fire resistant
composite panel of fibre
reinforced cement bonded to
steel sheet fixed to
G.M.S. FRAME W/ 8 ø SELF-TAPPING
SCREWS FOR EACH PANEL
@ 300 C/C (MAX) OR OTHER
APPROVED EQUIVALENT F.R.P. SYSTEM
M8 x 75mm S.S.
ANCHOR BOLT
CEILING FINISH
50 x 50 x 6mm G.M.S. ANGLE
FRAME FIXED TO SLAB
6mm thick fire resistant
composite panel of fibre
reinforced cement bonded to
steel sheet fixed to
G.M.S. FRAME W/ 8 ø SELF-TAPPING
SCREWS FOR EACH PANEL
@ 300 C/C (MAX) OR OTHER
APPROVED EQUIVALENT F.R.P. SYSTEM
50 x 50 x 6mm THK. G.M.S.
'T' SUSPENDED FRAME
WELDING
50 x 50 x 6mm G.M.S.
ANGLE FRAME


300 mm MIN. CLEAR
300 mm MIN. CLEAR
DRAIN PIPE
PIPE DUCT
600 mm MIN. CLEAR
VARIES (BASE ON DRAIN PIPE SETTING OUT)
WALL THK.
NON-COMBUSTIBLE MINERAL BOARD
GF AND ABOVE: -/60/60 F.R.R
BASEMENT: 240/240/240 F.R.R
PAINT FINISH TO MATCH WITH CEILING COLOUR
600X600 MM ACCESS PANEL
GF AND ABOVE: -/60/60 F.R.R
BASEMENT: 240/240/240 F.R.R

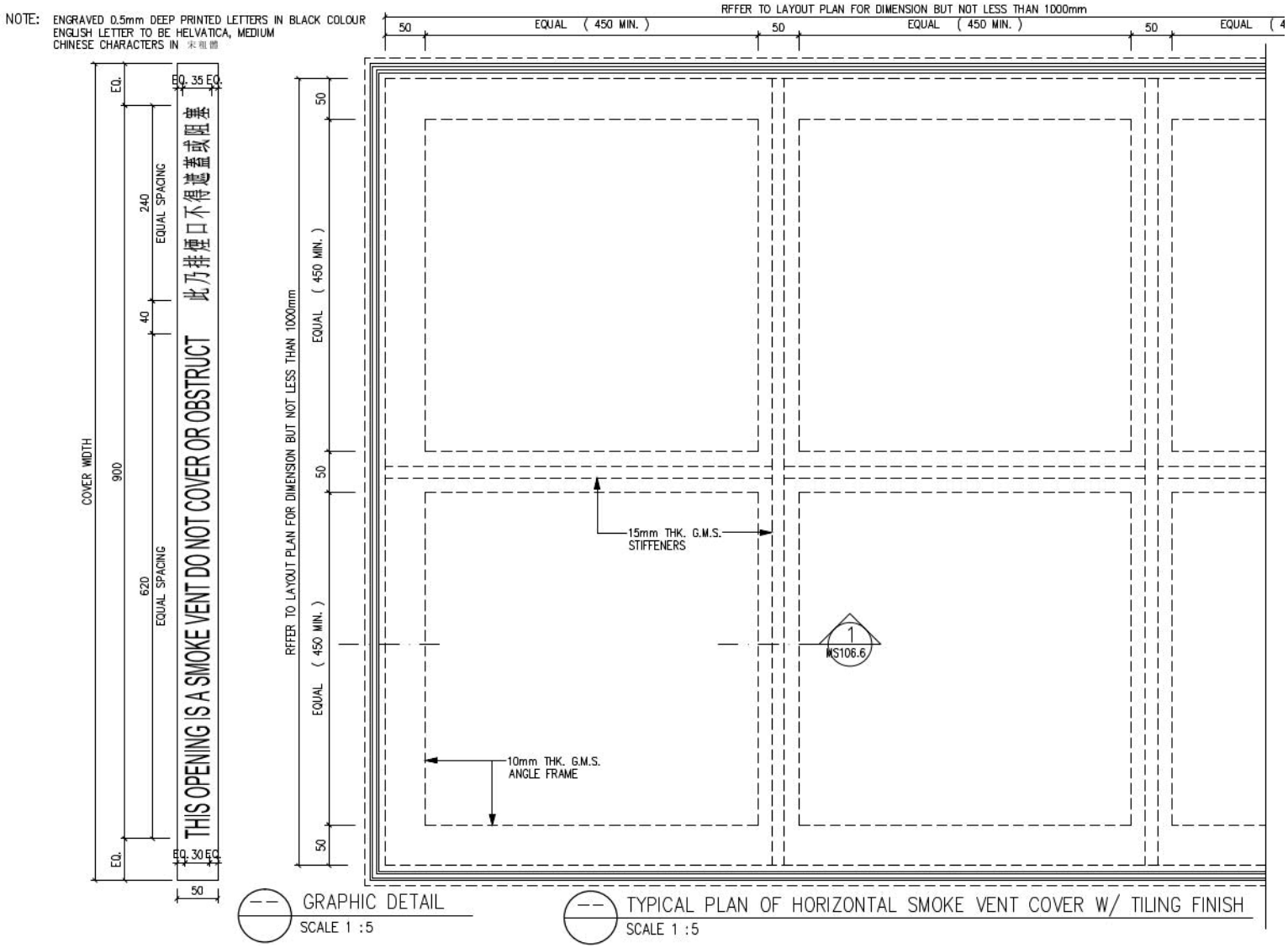
-F3.3. Smoke Vent

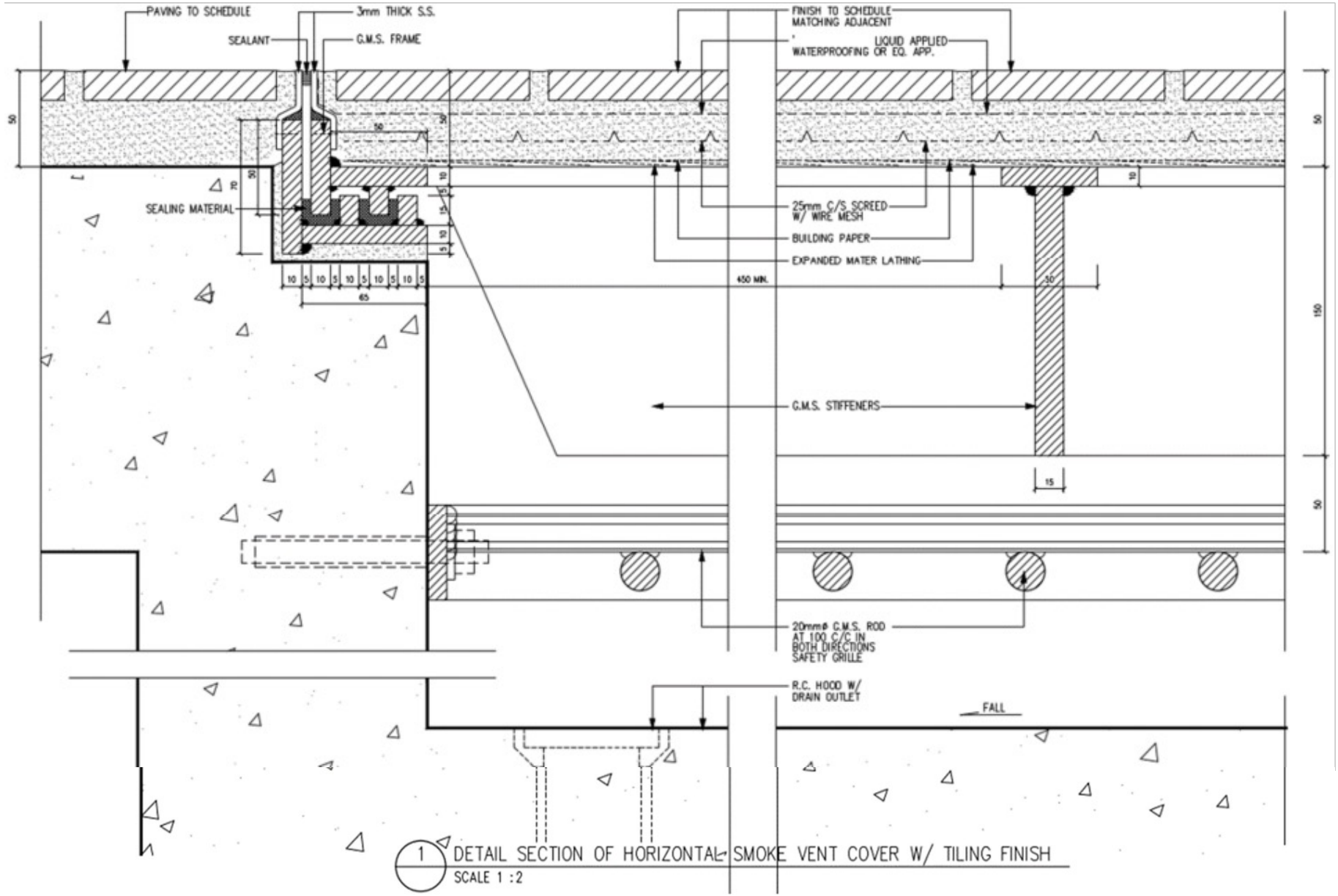
Smoke vents/some outlets are provided to release smoke in case of fire at basements.

Reference: Requirements for Smoke Outlets are stated in Clause C14.2, Subsection C14-Protection of Basements, Section 2-Provisions for Fire Resisting Construction, Part C – Fire Resisting Construction, Code of Practice for Fire Safety in Buildings 2011 (October 2015 version)



Further example

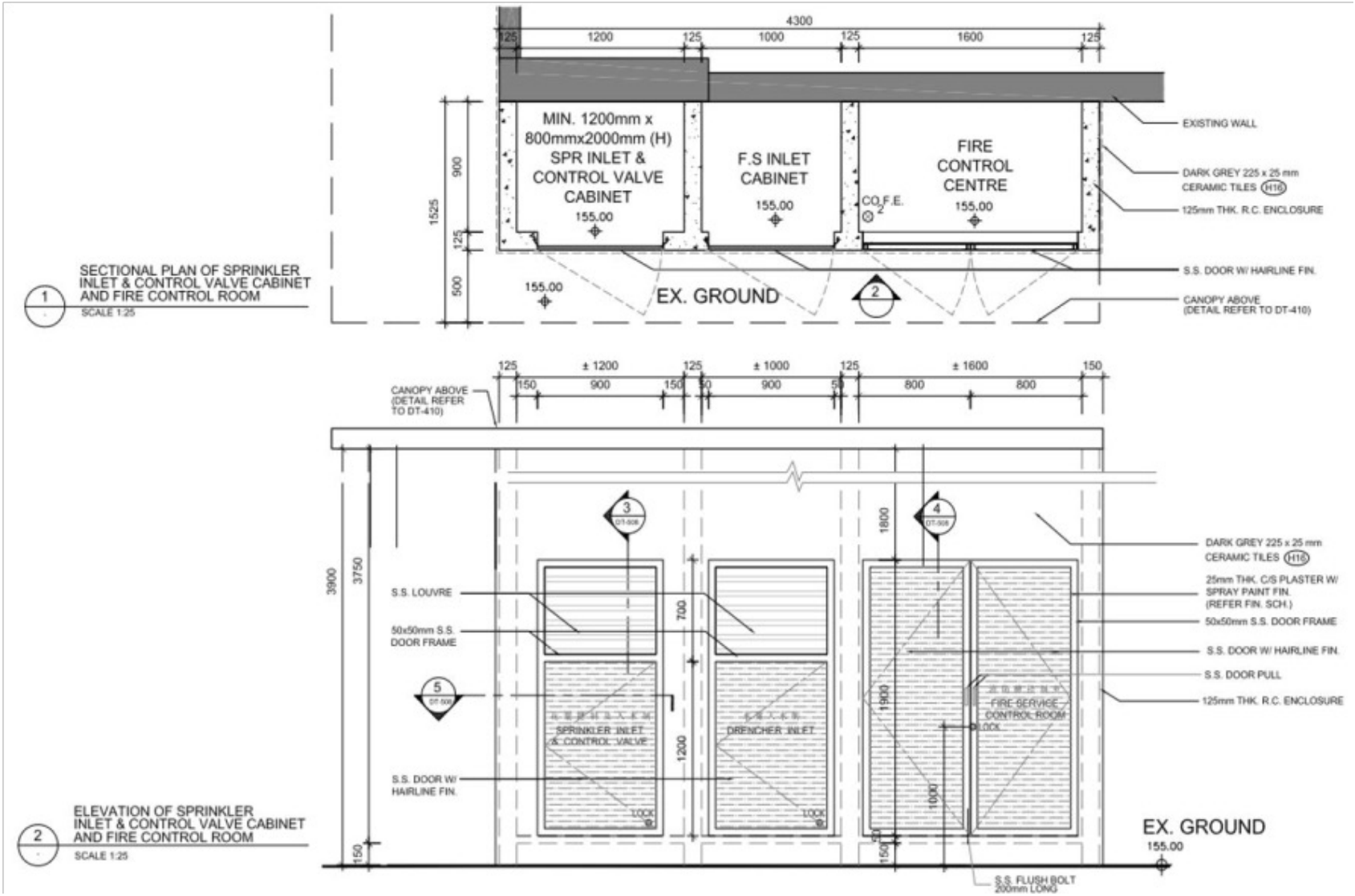


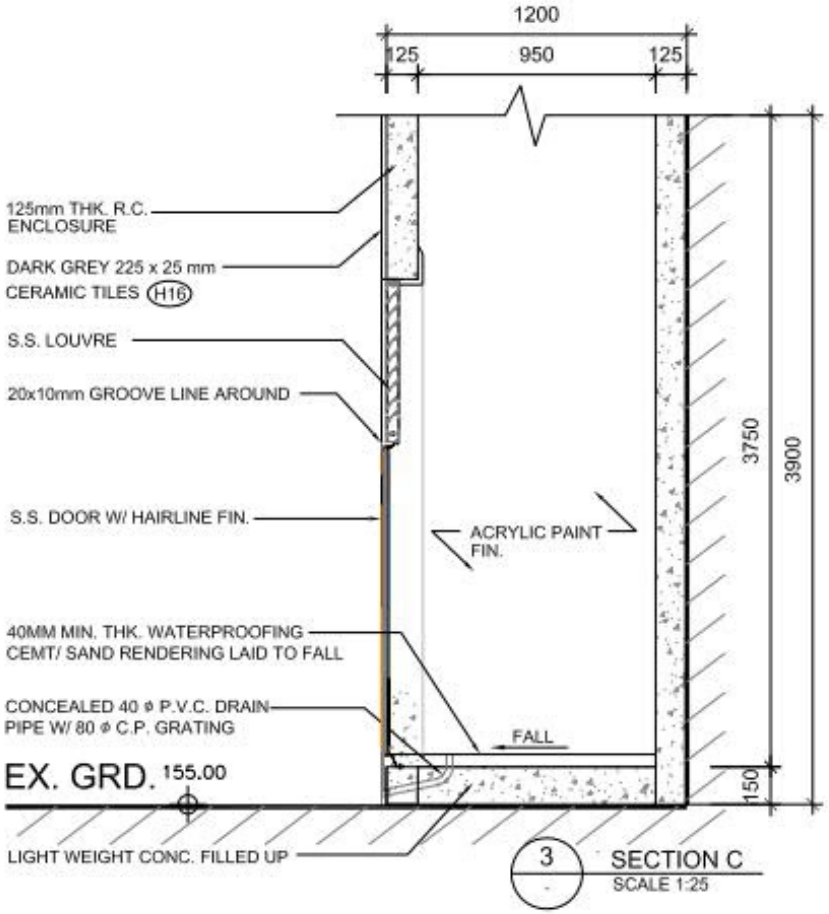

PAVING TO SCHEDULE
3mm THICK S.S.
SEALANT
G.M.S. FRAME
FINISH TO SCHEDULE MATCHING ADJACENT
LIQUID APPLIED WATERPROOFING OR EQ. APP.
SEALING MATERIAL
25mm C/S SCREED W/ WIRE MESH
BUILDING PAPER
EXPANDED MATER LATHING
450 MIN.
G.M.S. STIFFENERS
20mmø G.M.S. ROD AT 100 C/C IN BOTH DIRECTIONS SAFETY GRILLE
R.C. HOOD W/ DRAIN OUTLET
FALL
1 DETAIL SECTION OF HORIZONTAL SMOKE VENT COVER W/ TILING FINISH
SCALE 1 : 2

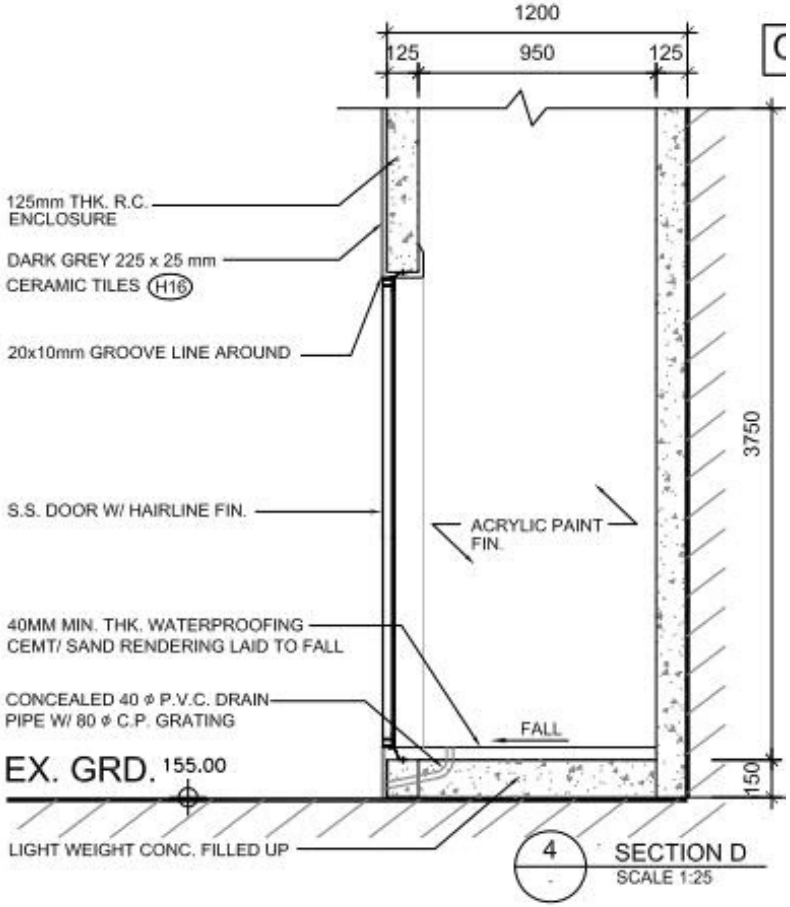
-F3.4. F S Inlet and Sprinkler Inlet

Example showing Sprinkler Inlet

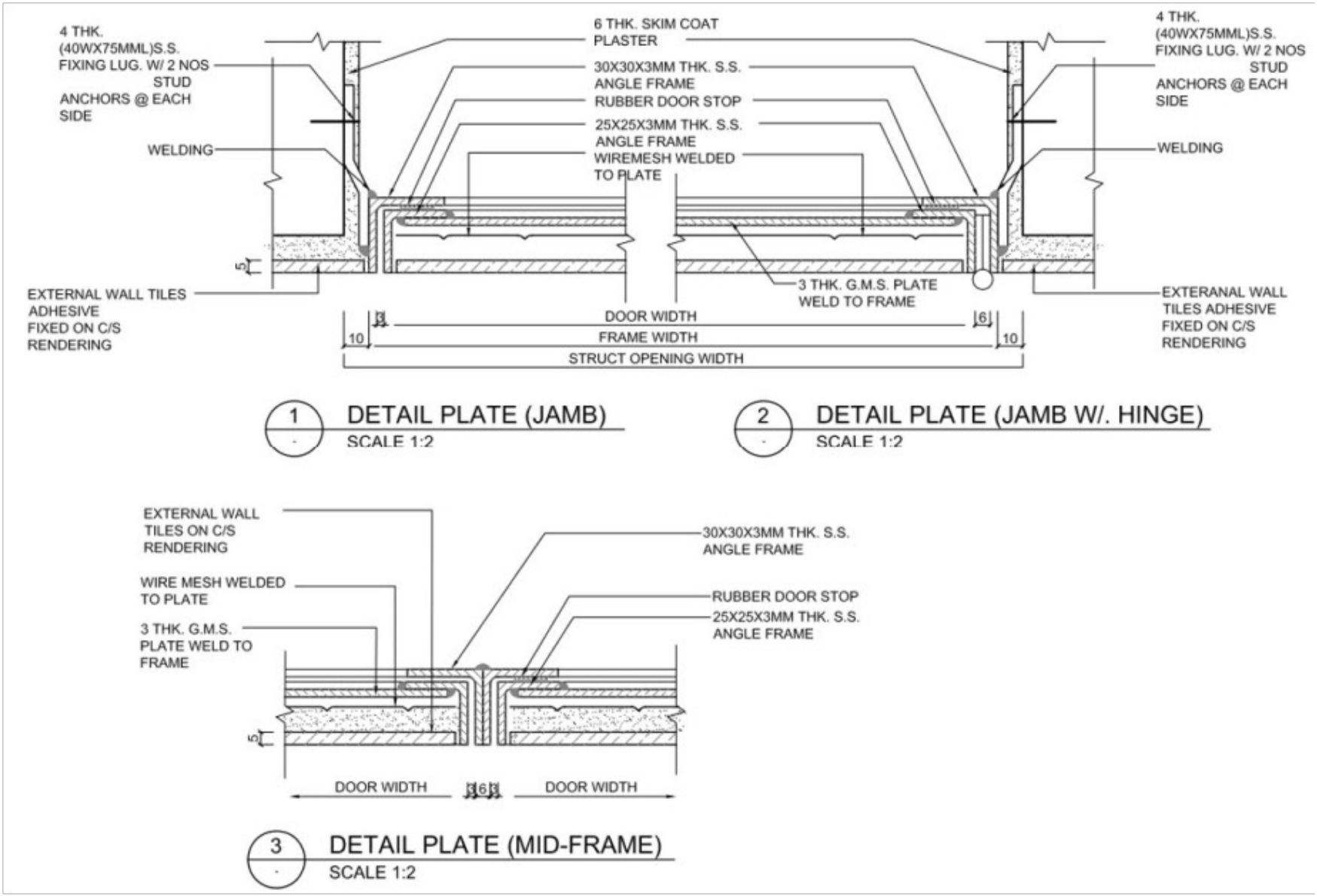
Note: The doors should stay within the site boundary when open.




1200
125
950
125
125mm THK. R.C. ENCLOSURE
DARK GREY 225 x 25 mm CERAMIC TILES H16
S.S. LOUVRE
20x10mm GROOVE LINE AROUND
S.S. DOOR W/ HAIRLINE FIN.
ACRYLIC PAINT FIN.
40MM MIN. THK. WATERPROOFING CEMT/ SAND RENDERING LAID TO FALL
CONCEALED 40 ϕ P.V.C. DRAIN PIPE W/ 80 ϕ C.P. GRATING
FALL
EX. GRD. 155.00
LIGHT WEIGHT CONC. FILLED UP
3750
3900
150
3
SECTION C
SCALE 1:25

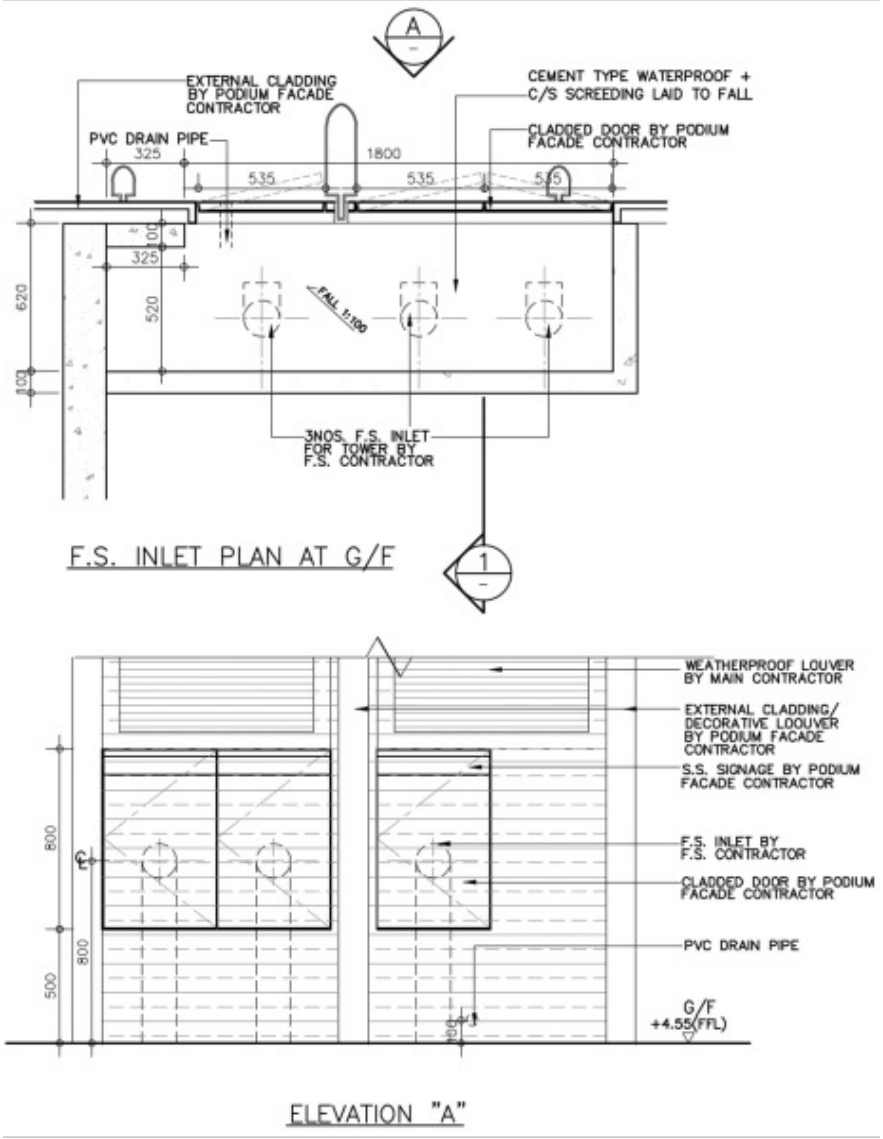

1200
125
950
125
125mm THK. R.C. ENCLOSURE
DARK GREY 225 x 25 mm CERAMIC TILES H16
20x10mm GROOVE LINE AROUND
S.S. DOOR W/ HAIRLINE FIN.
ACRYLIC PAINT FIN.
40MM MIN. THK. WATERPROOFING CEMT/ SAND RENDERING LAID TO FALL
CONCEALED 40 ϕ P.V.C. DRAIN PIPE W/ 80 ϕ C.P. GRATING
FALL
EX. GRD. 155.00
LIGHT WEIGHT CONC. FILLED UP
3750
150
4
SECTION D
SCALE 1:25

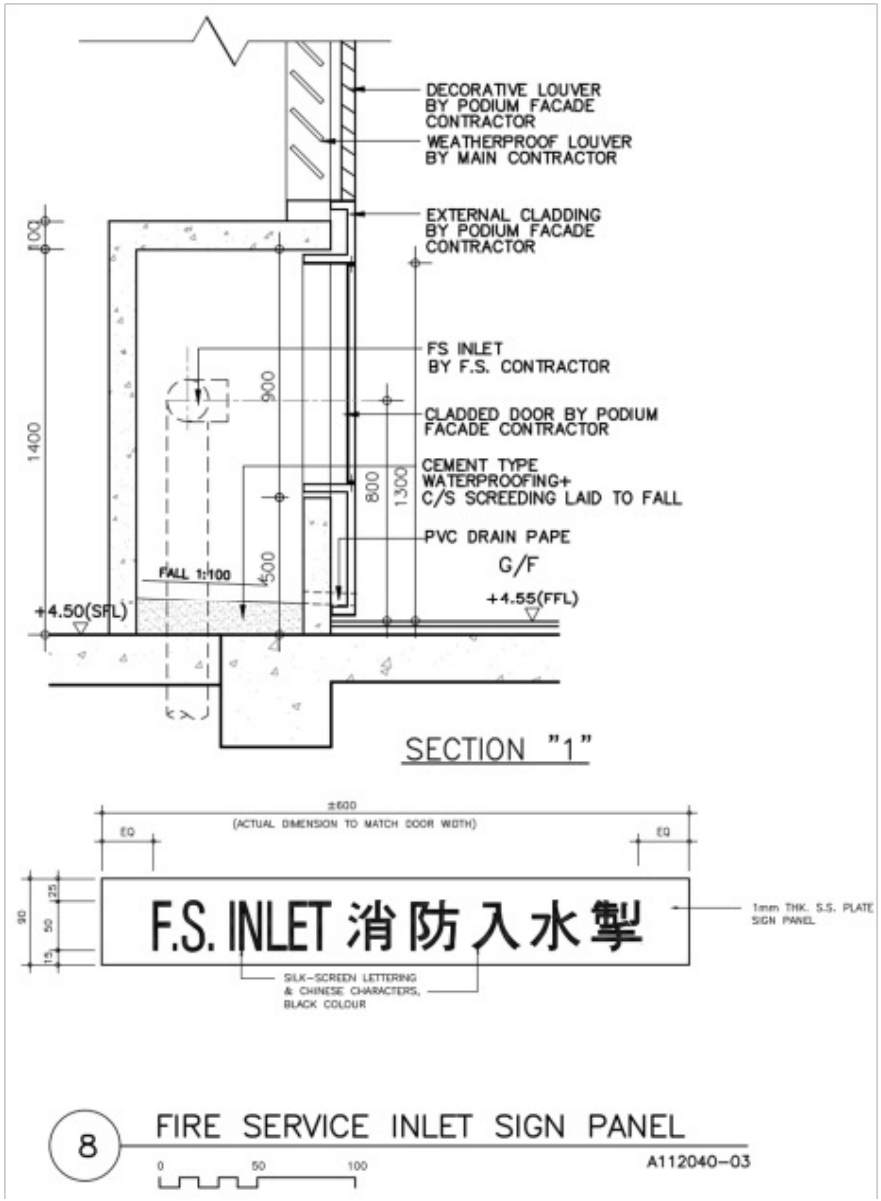
F S Inlet


4 THK. (40WX75MML)S.S. FIXING LUG. W/ 2 NOS STUD ANCHORS @ EACH SIDE
WELDING
EXTERNAL WALL TILES ADHESIVE FIXED ON C/S RENDERING
6 THK. SKIM COAT PLASTER
30X30X3MM THK. S.S. ANGLE FRAME
RUBBER DOOR STOP
25X25X3MM THK. S.S. ANGLE FRAME
WIREMESH WELDED TO PLATE
3 THK. G.M.S. PLATE WELD TO FRAME
DOOR WIDTH
FRAME WIDTH
STRUCT OPENING WIDTH
5
3
6
10
4 THK. (40WX75MML)S.S. FIXING LUG. W/ 2 NOS STUD ANCHORS @ EACH SIDE
WELDING
EXTERANAL WALL TILES ADHESIVE FIXED ON C/S RENDERING
1 - DETAIL PLATE (JAMB)
SCALE 1:2
2 - DETAIL PLATE (JAMB W/. HINGE)
SCALE 1:2
EXTERNAL WALL TILES ON C/S RENDERING
WIRE MESH WELDED TO PLATE
3 THK. G.M.S. PLATE WELD TO FRAME
30X30X3MM THK. S.S. ANGLE FRAME
RUBBER DOOR STOP
25X25X3MM THK. S.S. ANGLE FRAME
DOOR WIDTH
DOOR WIDTH
3 - DETAIL PLATE (MID-FRAME)
SCALE 1:2

Further Example of F S Inlet

Note: The doors should stay within the site boundary when open.





F4. PLUMBING AND DRAINAGE RELATED DETAILS

Note: PNAP APP-93 Planning and Design of Drainage Works states

Where pipe-ducts or pipe wells are proposed to house common soil and waste stacks, they shall satisfy the following criteria respectively : -

(i) Pipe Ducts

(1) These pipe-ducts shall be accessible from the common parts of the building;

(2) An unobstructed working space, of not less than 700 mm in front of the pipes, shall be provided for maintenance and repair of the pipeworks; and

(3) The doors or panels providing access to the pipe-ducts shall not be less than 600 mm wide by 2000 mm high and shall comply with Part C of the Code of Practice for Fire Safety in Buildings 2011.

(ii) Pipe Wells

(1) The size of pipe well shall not be less than 1200 mm x 1500 mm;

(2) No opening will be allowed in a pipe well other than access points for inspection and maintenance, which shall be from the common parts of the building. Access points shall be provided to the pipe well at not more than 21 storeys apart;

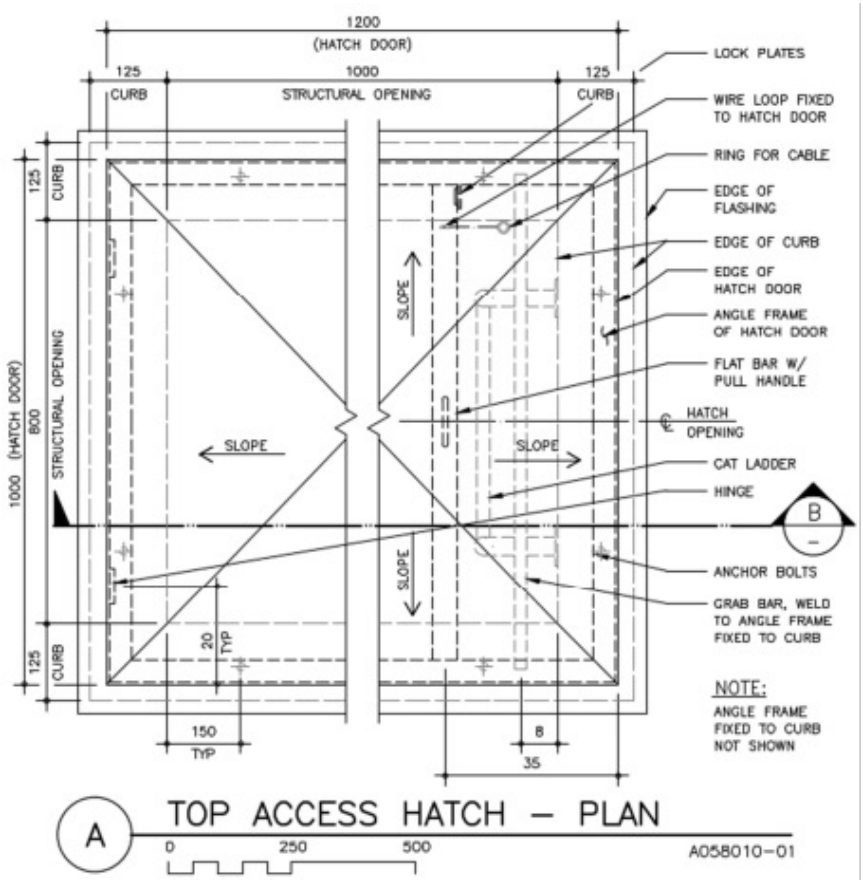
(3) Cat ladder with proper guard rings shall be installed in the full height of the pipe well for inspection and maintenance purposes;

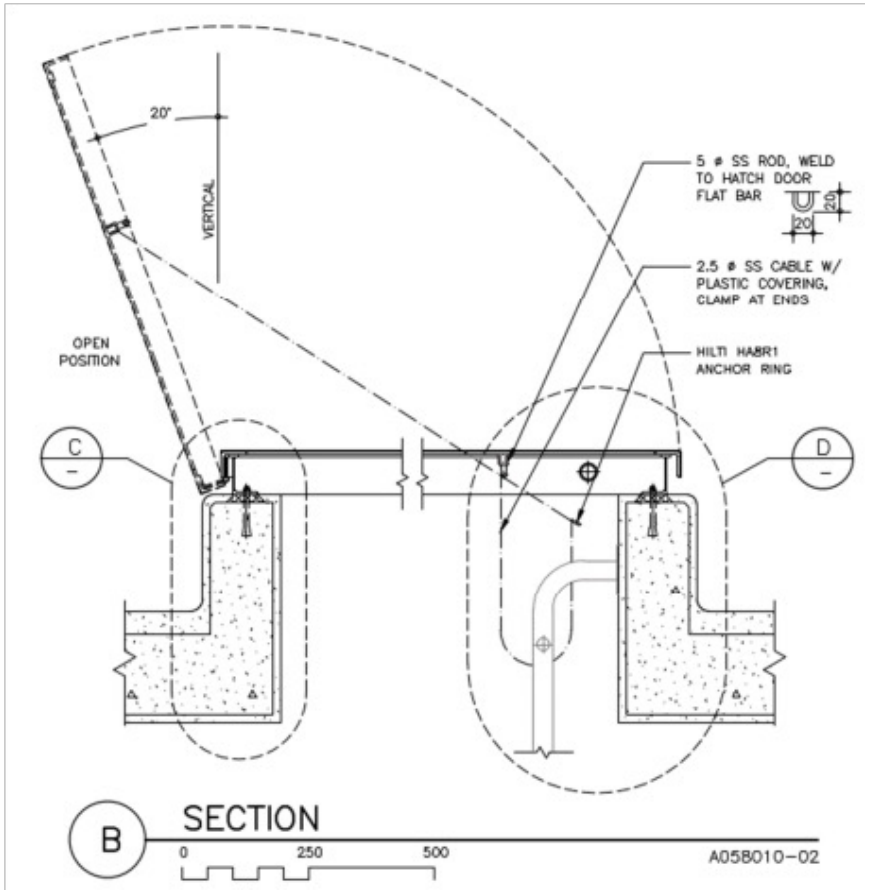
(4) Grating platforms shall be provided at intervals of not more than 4 storeys;

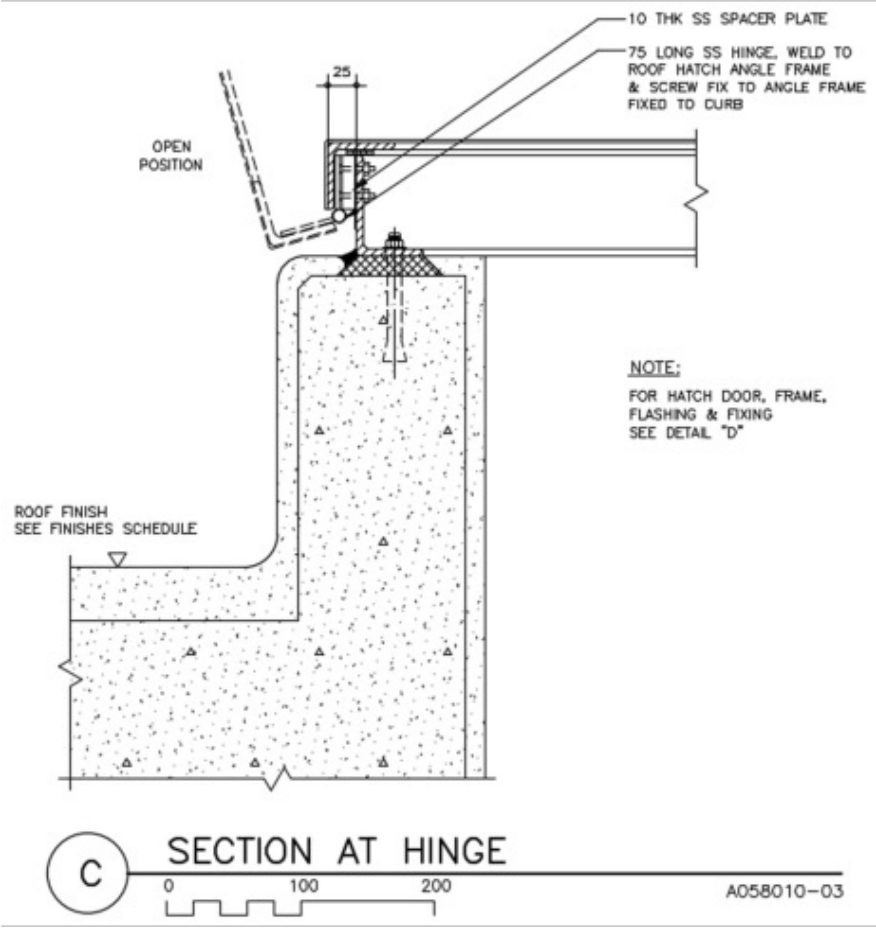
(5) The opening at every access point shall not be less than 600 mm wide by 2000 mm high and shall comply with Part C of the Code of Practice for Fire Safety in Buildings 2011; and

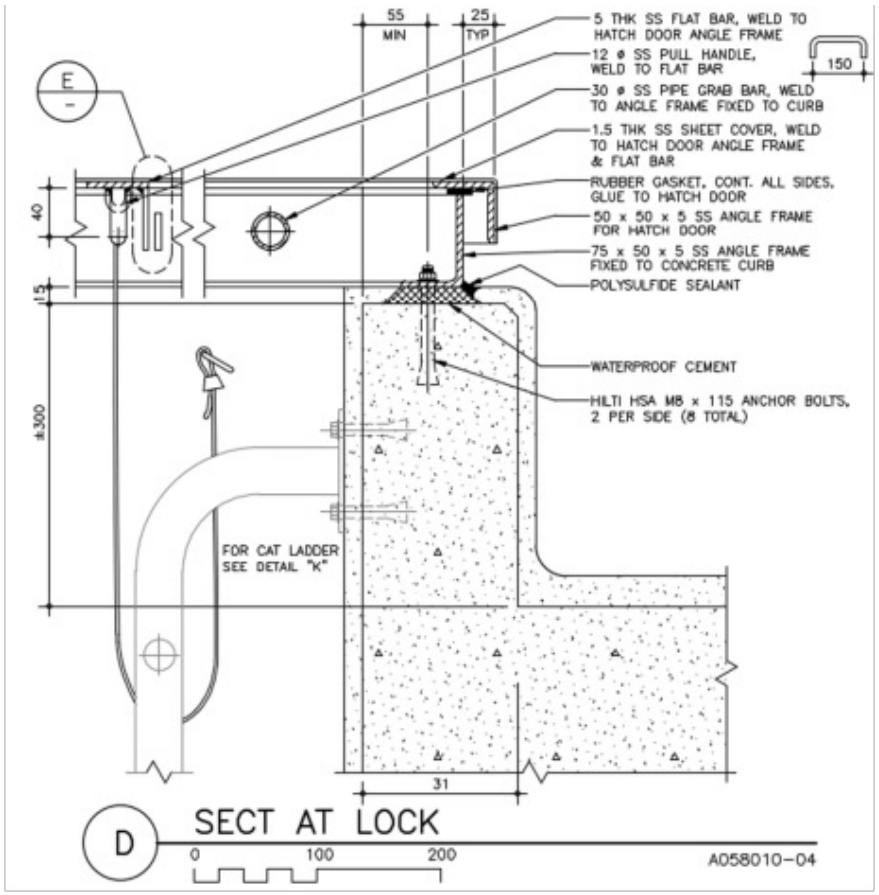
(6) A ventilation opening having a minimum net area of $1/10^{th}$ of the horizontal area of the pipe well shall be provided at both the top and bottom of the pipe well;

-F4.1. Hatch Door for Water Tank



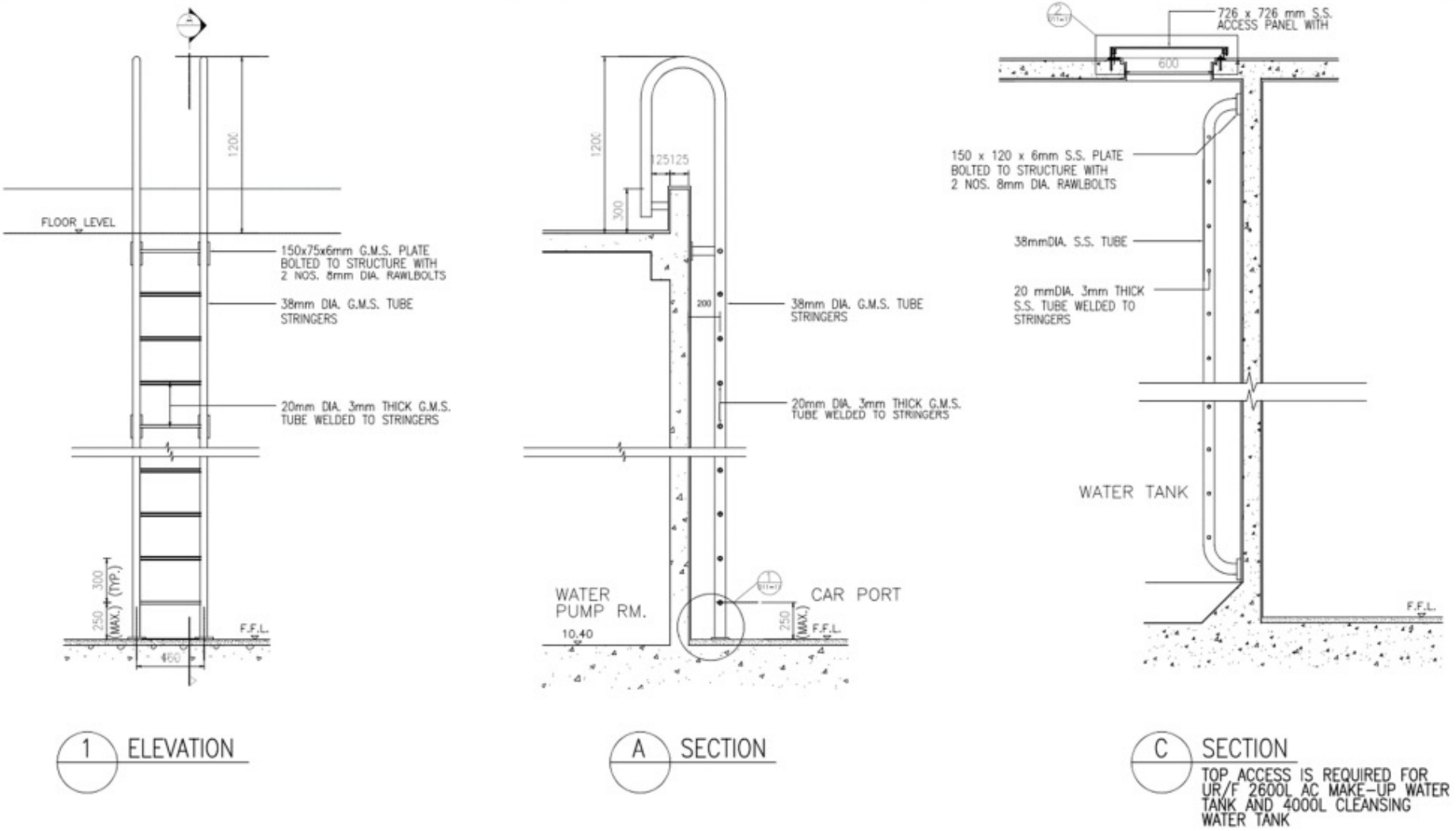


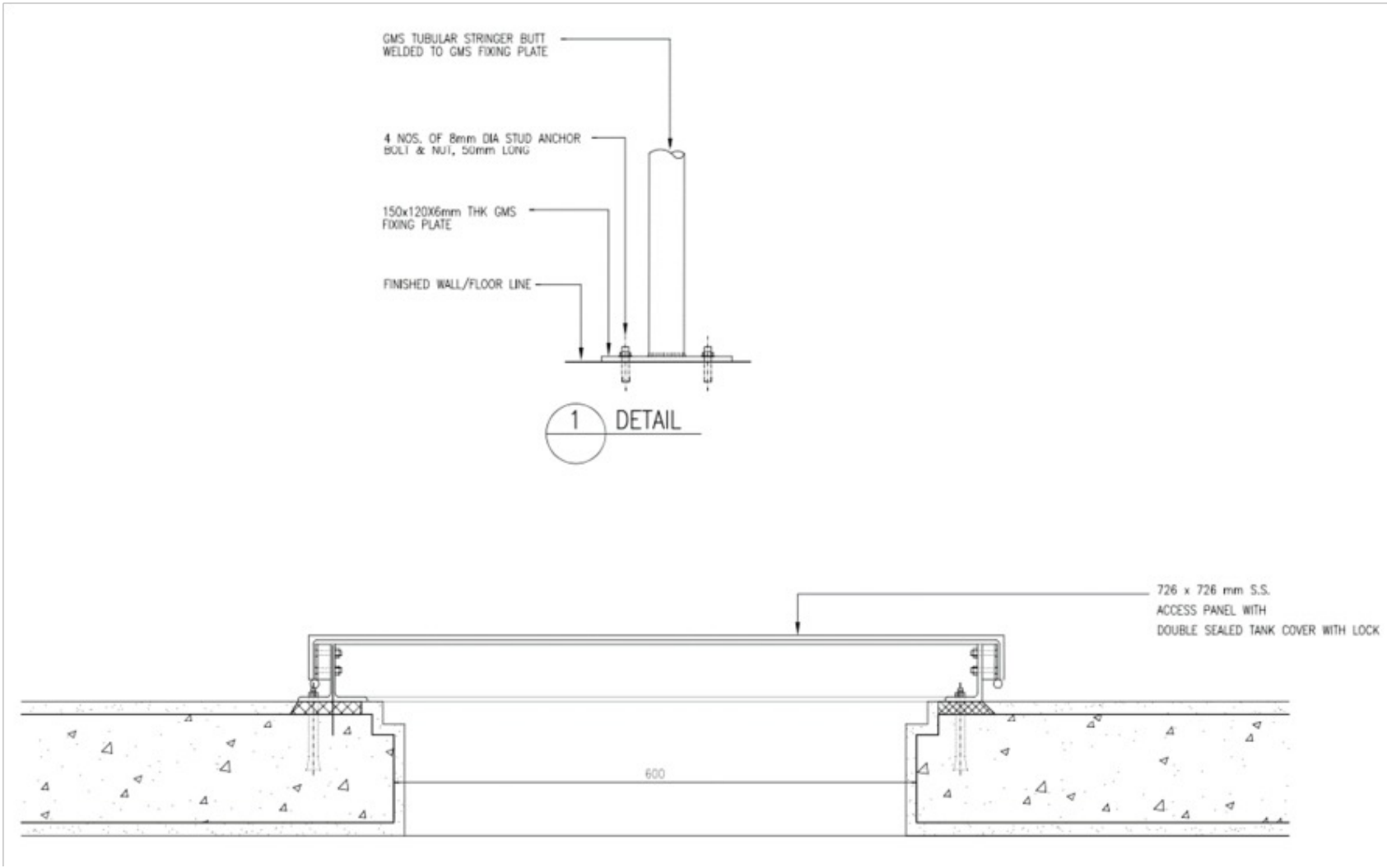

10 THK SS SPACER PLATE
75 LONG SS HINGE, WELD TO ROOF HATCH ANGLE FRAME & SCREW FIX TO ANGLE FRAME FIXED TO CURB
25
OPEN POSITION
NOTE:
FOR HATCH DOOR, FRAME, FLASHING & FIXING SEE DETAIL "D"
ROOF FINISH SEE FINISHES SCHEDULE
C
SECTION AT HINGE
0
100
200
A058010-03


55 MIN
25 TYP
150
E
5 THK SS FLAT BAR, WELD TO HATCH DOOR ANGLE FRAME
12 ø SS PULL HANDLE, WELD TO FLAT BAR
30 ø SS PIPE GRAB BAR, WELD TO ANGLE FRAME FIXED TO CURB
1.5 THK SS SHEET COVER, WELD TO HATCH DOOR ANGLE FRAME & FLAT BAR
RUBBER GASKET, CONT. ALL SIDES, GLUE TO HATCH DOOR
50 x 50 x 5 SS ANGLE FRAME FOR HATCH DOOR
75 x 50 x 5 SS ANGLE FRAME FIXED TO CONCRETE CURB
POLYSULFIDE SEALANT
WATERPROOF CEMENT
HILTI HSA M8 x 115 ANCHOR BOLTS, 2 PER SIDE (8 TOTAL)
40
15
±300
FOR CAT LADDER SEE DETAIL "K"
31
D
SECT AT LOCK
0
100
200
A058010-04

-F4.2. Cat Ladder at Water Tank

Note: The use of stainless steel for metal work within the water tank

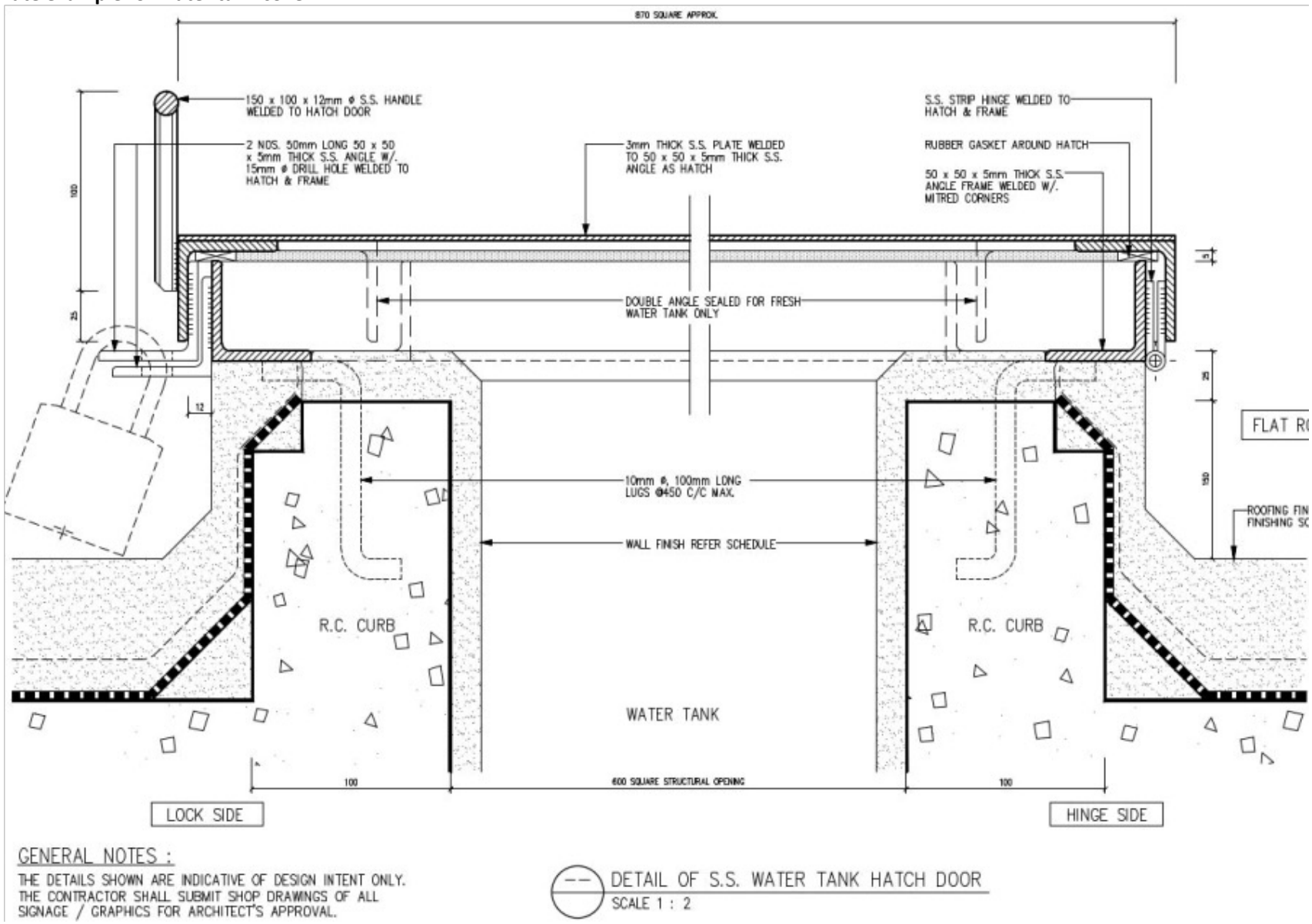




2 WATER TANK TOP ACCESS SECTION

TOP ACCESS IS REQUIRED FOR UR/F 26000L AC MAKE-UP WATER TANK AND 40000L CLEANSING WATER TANK

Alternate example for water tank cover



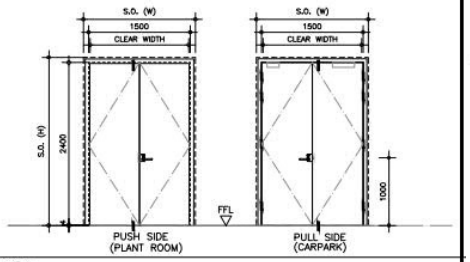
F5. REFUSE COLLECTION ROOM

-F5.1. Refuse Room Door

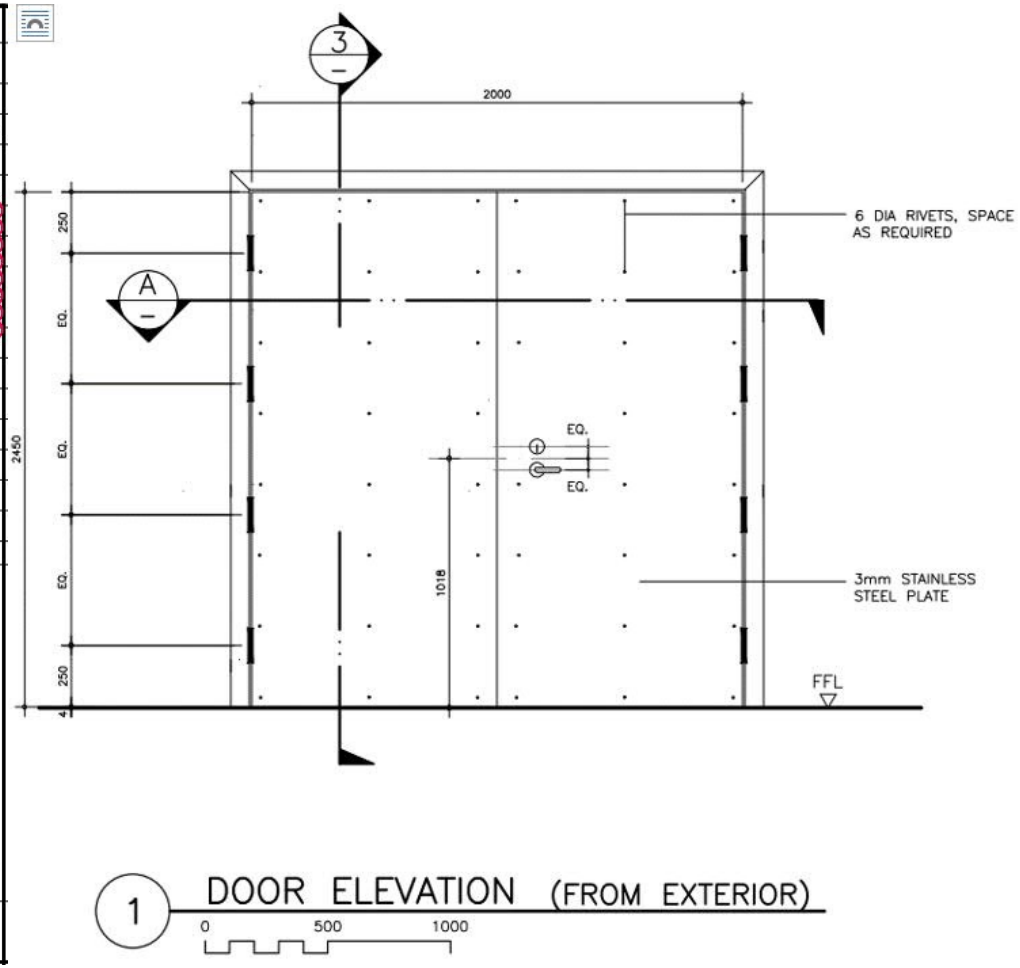
With reference to CAP 123H, the building regulations state requirements for the refuse collection room including that the access door to refuse storage should be a close-fitting steel door and its internal surface should not have any projections.

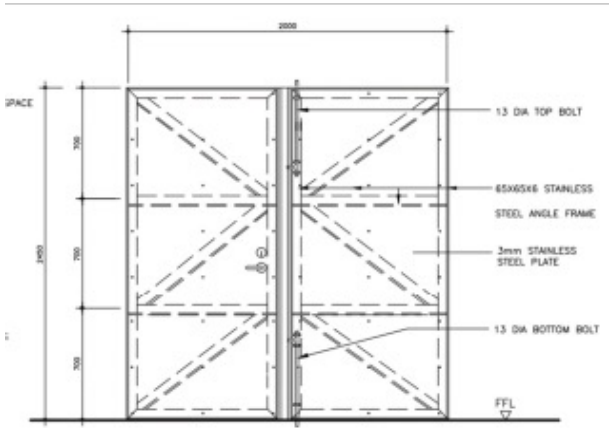
DOOR NO.	301 D				
REFUSE ROOM ON B2/F					
CLEAR (mm) WIDTH & HEIGHT(WxH)		1400	IRONMONGERY		
DOOR LEAF (mm)		750 X 2400 X 2		CODE	NOS.
STRUCTURAL OPENING (mm)		1660 X 2485	HINGES	H1A	8
DOOR THICKNESS (mm)		62mm	CLOSER	C2	2
F.R.R.		–/120/120	LOCK	L7C	1
CORE		FIRE RATED BOARD	FLUSH BOLT	FB2B	1
DOOR FINISH	PULL	S.S. 316 HAIRLINE FINISH	PANIC BOLT		
	PUSH	S.S. 316 HAIRLINE FINISH	DOOR STOP	DS1	2
FRAME FINISH		S.S. 316 HAIRLINE FINISH	SELECTOR		
SMOKE CONTROL		–	HANDLE		
VISION PANEL		–	KICK PLATE		
ACOUSTIC		–	PUSH PLATE		
DOOR CONTACT			BREAK GLASS		
FS SIGNAL			PUSH BUTTON		
			CARD READER		

ELEVATION



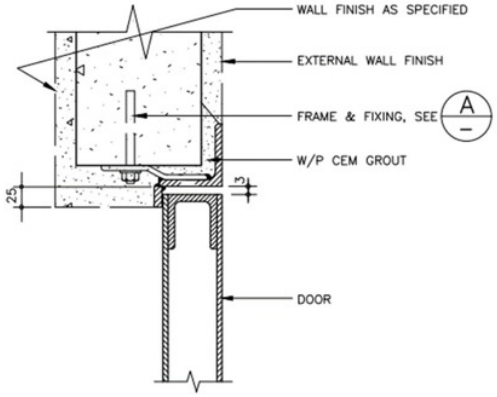
REMARK





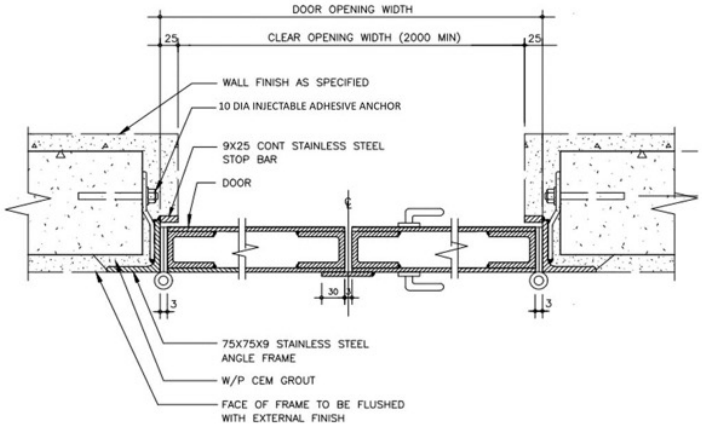
2 DOOR ELEVATION (FROM INTERIOR) 3

0 500 1000



HEAD DETAIL

0 125 250



A JAMB DETAIL

0 125 250

SECTION G

MISCELLANEOUS WORKS

G1. DEMOLITION

-Demolition Plan and Stability Report
-Method Statement
-Disposal of Demolition Waste
-Preliminary Works and Precautionary Measures
-Safety Measures
-Tree Preservation
-Asbestos Removal
-Party Walls
-Shoring

Reference: *GSA Section 2 Demolition, Site Clearance and Alterations*
Reference: *BMT Chapter 2.2. Demolition and Excavation Works*
Reference: *PNAP-APP23 Hoardings*
Reference: *PNAP-APP21 Demolition Works for Public Safety with drawings on Raking Shores, Flying Shores, Covered Walkways and Hoarding as well as Checklist on Site Preparation Works.*

Find out the type of shoring on the following photo:

G2. EXCAVATION AND EARTHWORKS

-Ground Investigation
-Earthwork
-Excavation
-Tolerance for Excavation and Filling
-Surfaces of Cutting
-Filling and Compaction
-Dewatering
-Adjoining Buildings
-Underpinning

Reference: *GSA Section 3 Excavation and Earthwork*

Reference: *BMT Chapter 2.2. Demolition and Excavation Works*

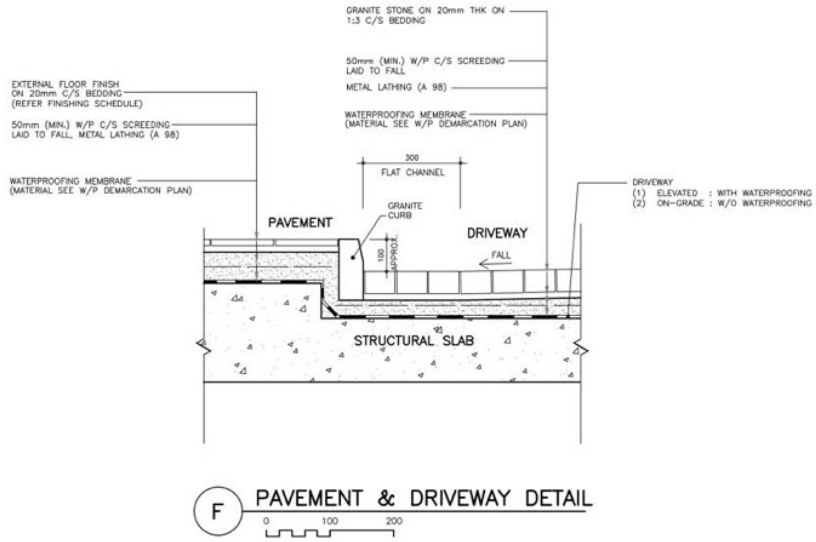
Reference: *PNAP*
-APP15 Site Formation
APP22 Dewatering

G3. ROAD WORKS/CARPARKS

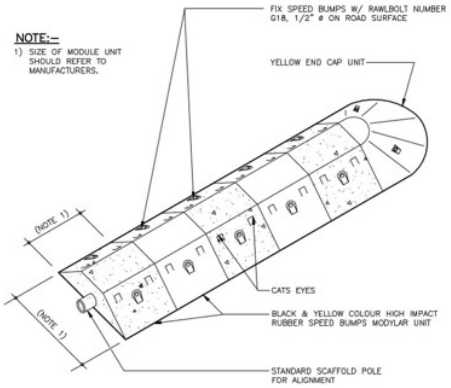
Reference: *CAP 123G* ***Building (Private Streets and Access Roads) Regulations Clauses 2 to 25***

-Accessible streets
-Footpaths
-Width of streets
-Width of access roads
-Pedestrian ways
-Kerb radius
-Right angle junctions
-No undulation
-Gradients
-Horizontal curves
-Vertical curves
-Widening of streets on curve
-Turning space
-Surfacing of streets
-Surfacing of pedestrian ways
-Surfacing of footpaths
-Kerbstones
-Height of kerbs
-Camber and crossfall
-Drainage and channels

-G3.1. Road Works



F PAVEMENT & DRIVEWAY DETAIL
0 100 200



D SPEED BUMPS – ISO A111612-01
0 25 50

G3. ROAD WORKS/CARPARKS

Reference: *CAP 123G* ***Building (Private Streets and Access Roads) Regulations Clauses 2 to 25***

-Accessible streets
-Footpaths
-Width of streets
-Width of access roads
-Pedestrian ways
-Kerb radius
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-Horizontal curves
-Vertical curves
-Widening of streets on curve
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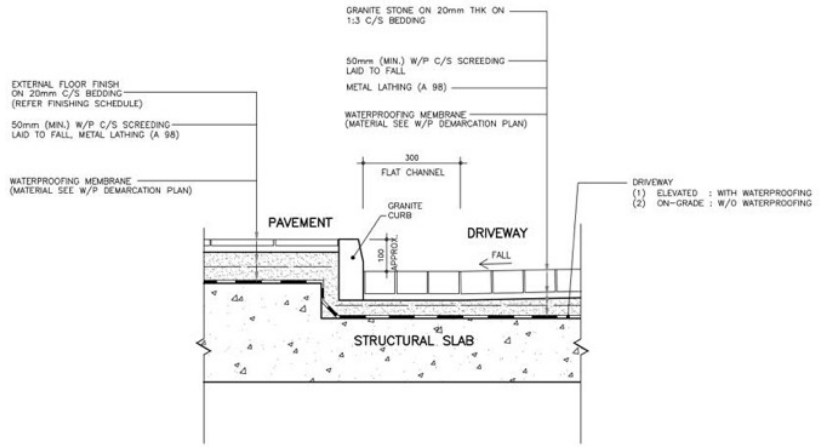
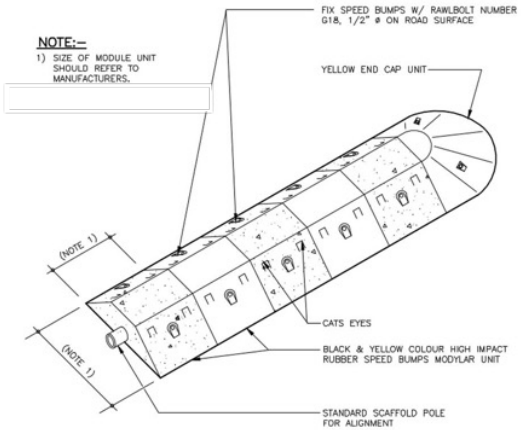
-Surfacing of pedestrian ways
-Surfacing of footpaths
-Kerbstones
-Height of kerbs
-Camber and crossfall
-Drainage and channels

-G3.1. Road Works

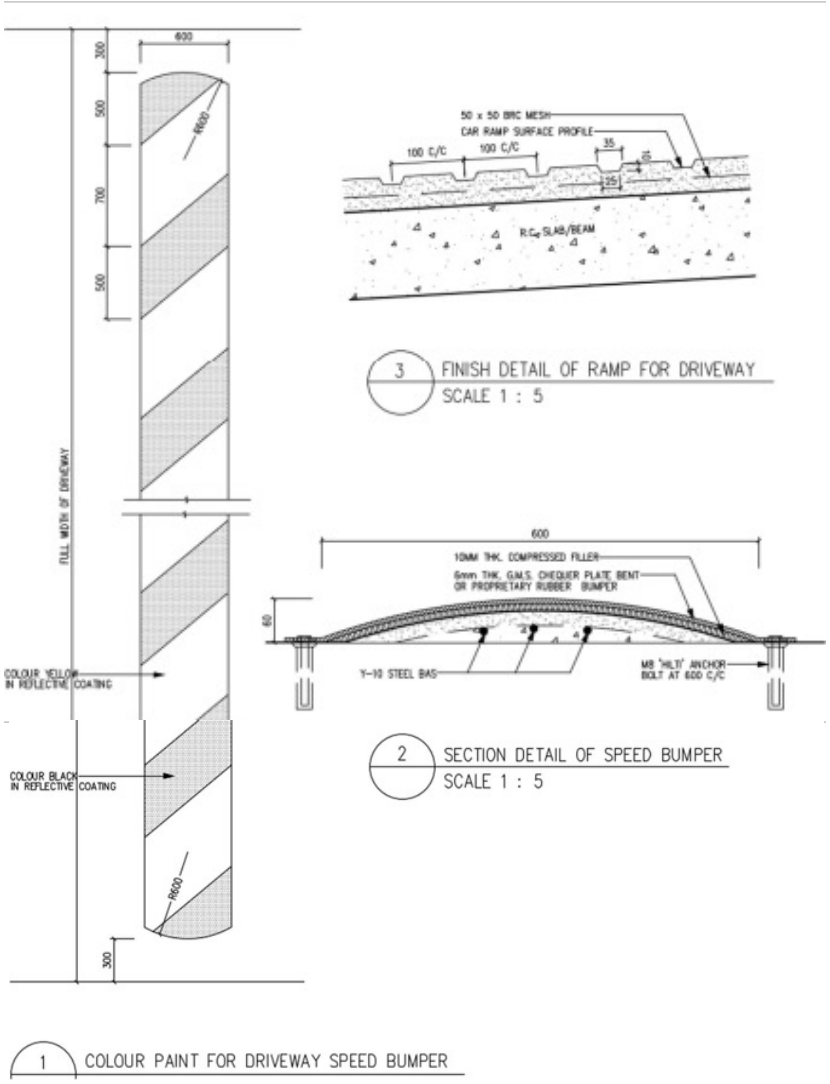


F PAVEMENT & DRIVEWAY DETAIL
0 100 200

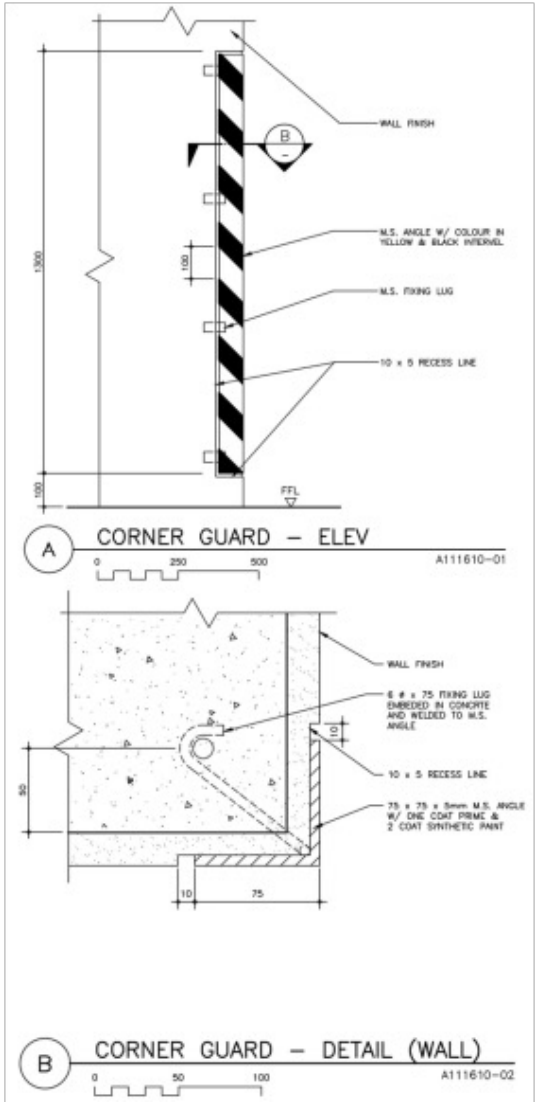


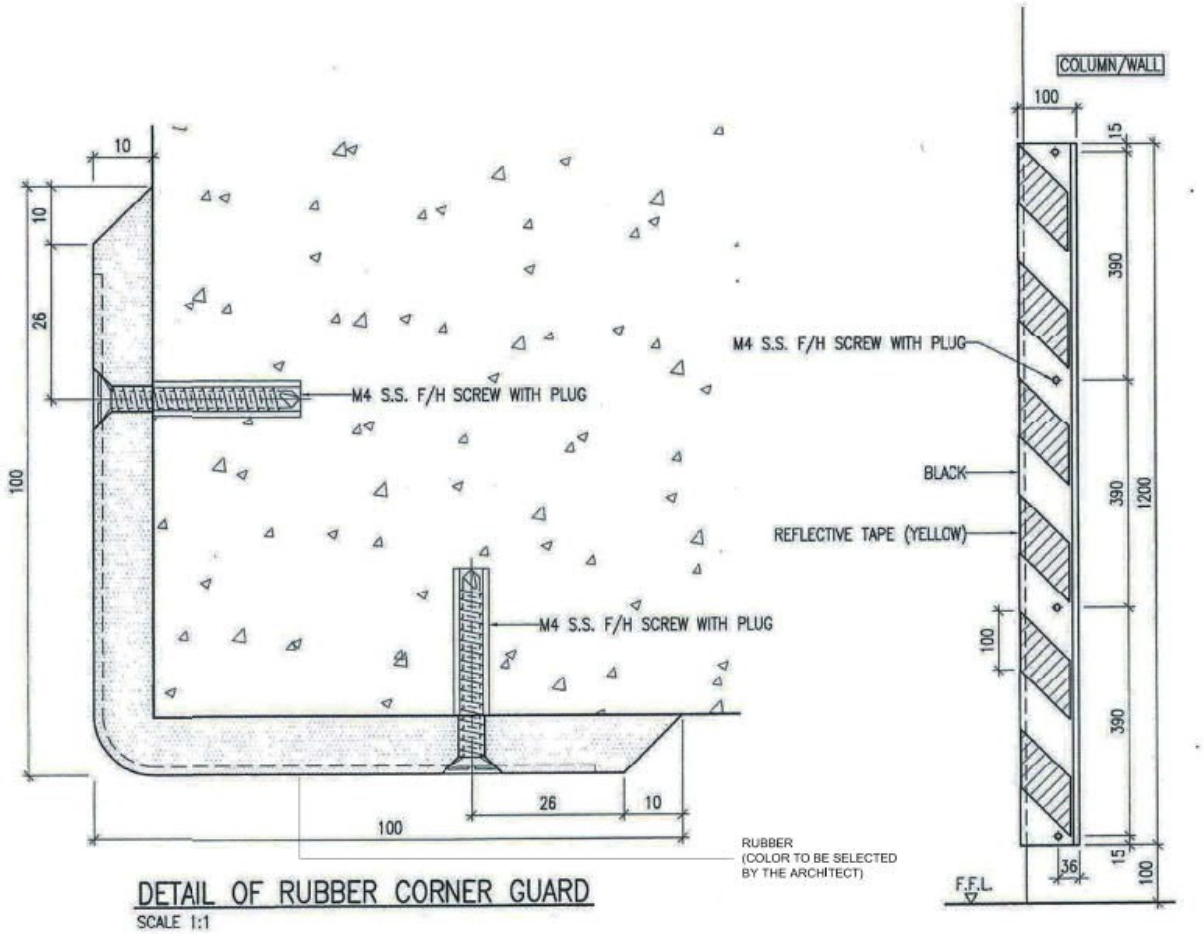
D SPEED BUMPS – ISO
0 25 50
A111612-01

-Speed Bumper in Driveway



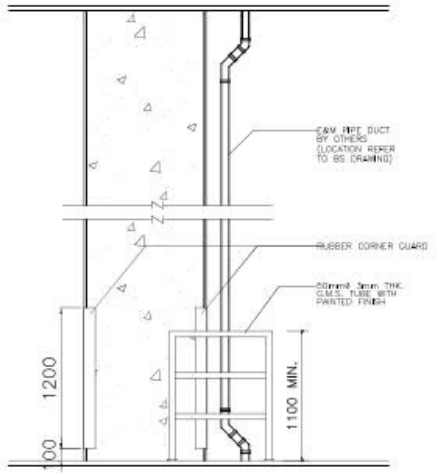
-G3.2. Car Parks



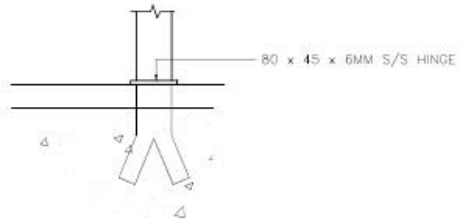


DETAIL OF RUBBER CORNER GUARD
SCALE 1:1

ELEVATION
SCALE 1:10

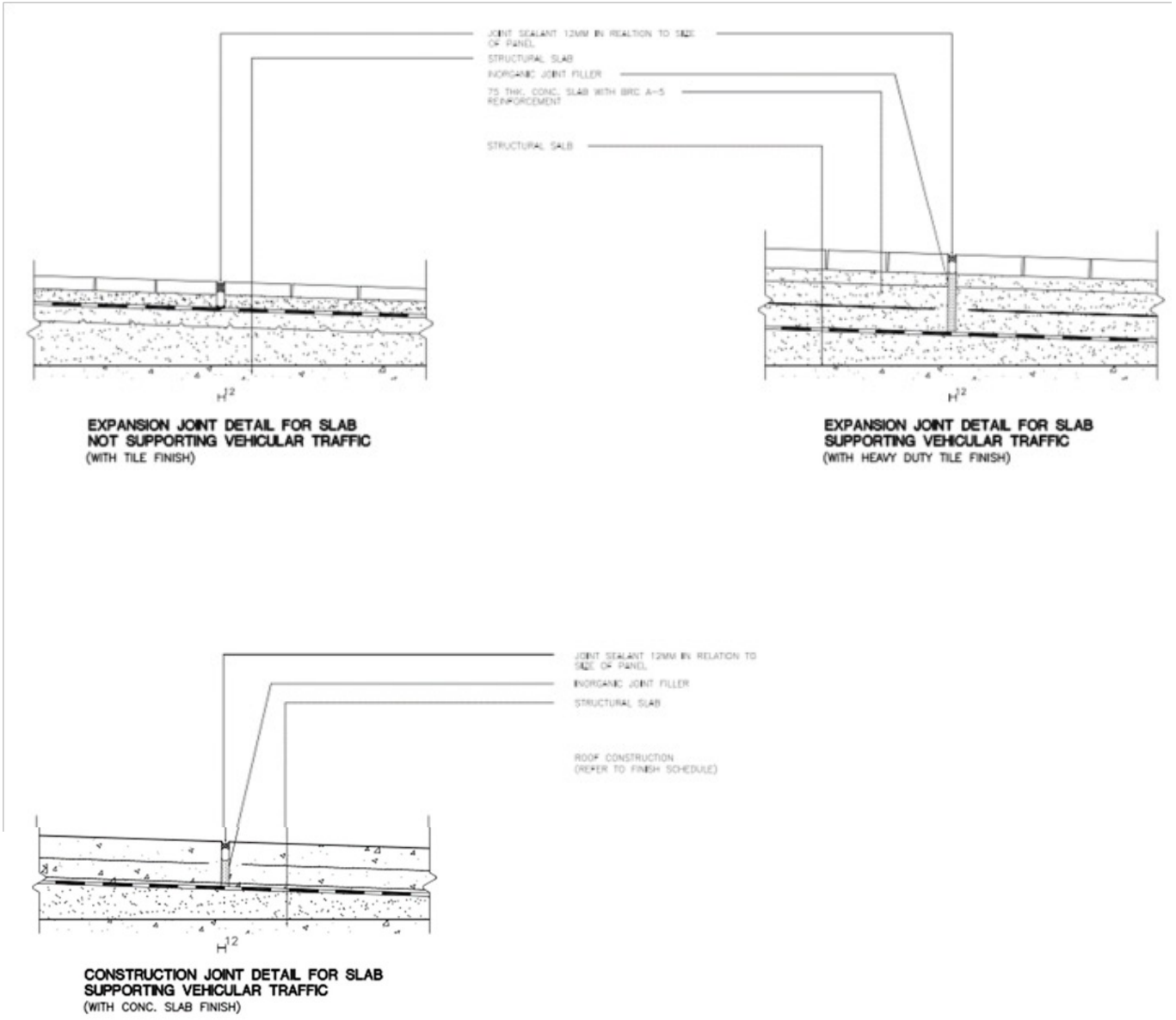


CARPARK BS
INSTALLATION PROTECTION
SCALE 1 : 25



CARPARK BS
INSTALLATION PROTECTION
FIXING GROUND SLAB

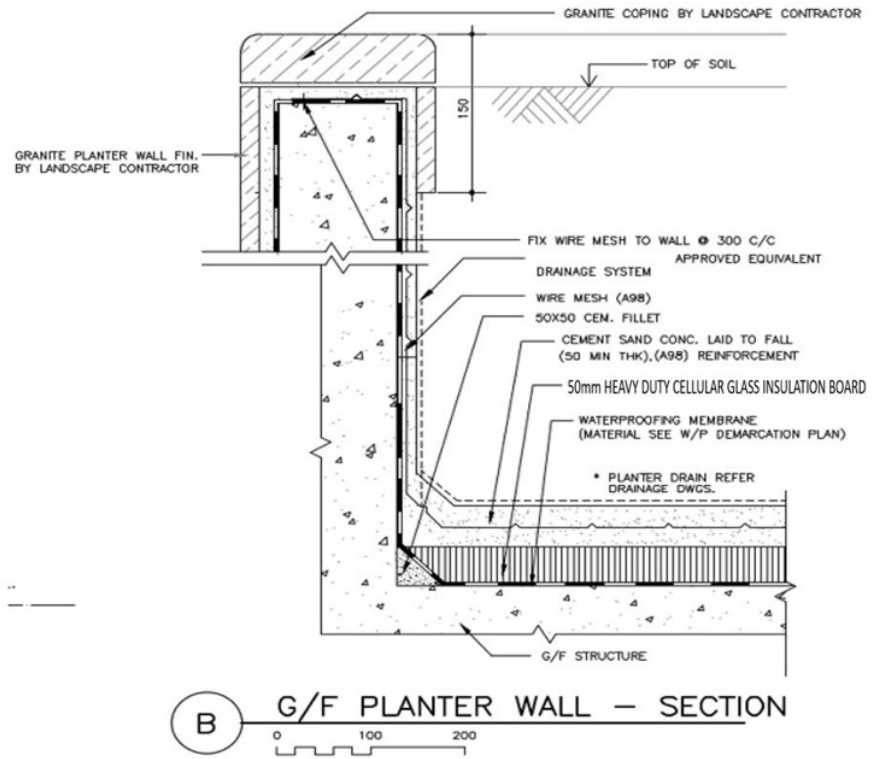
Construction Joint for Slab with Traffic



G4. LANDSCAPE AND EXTERNAL WORKS

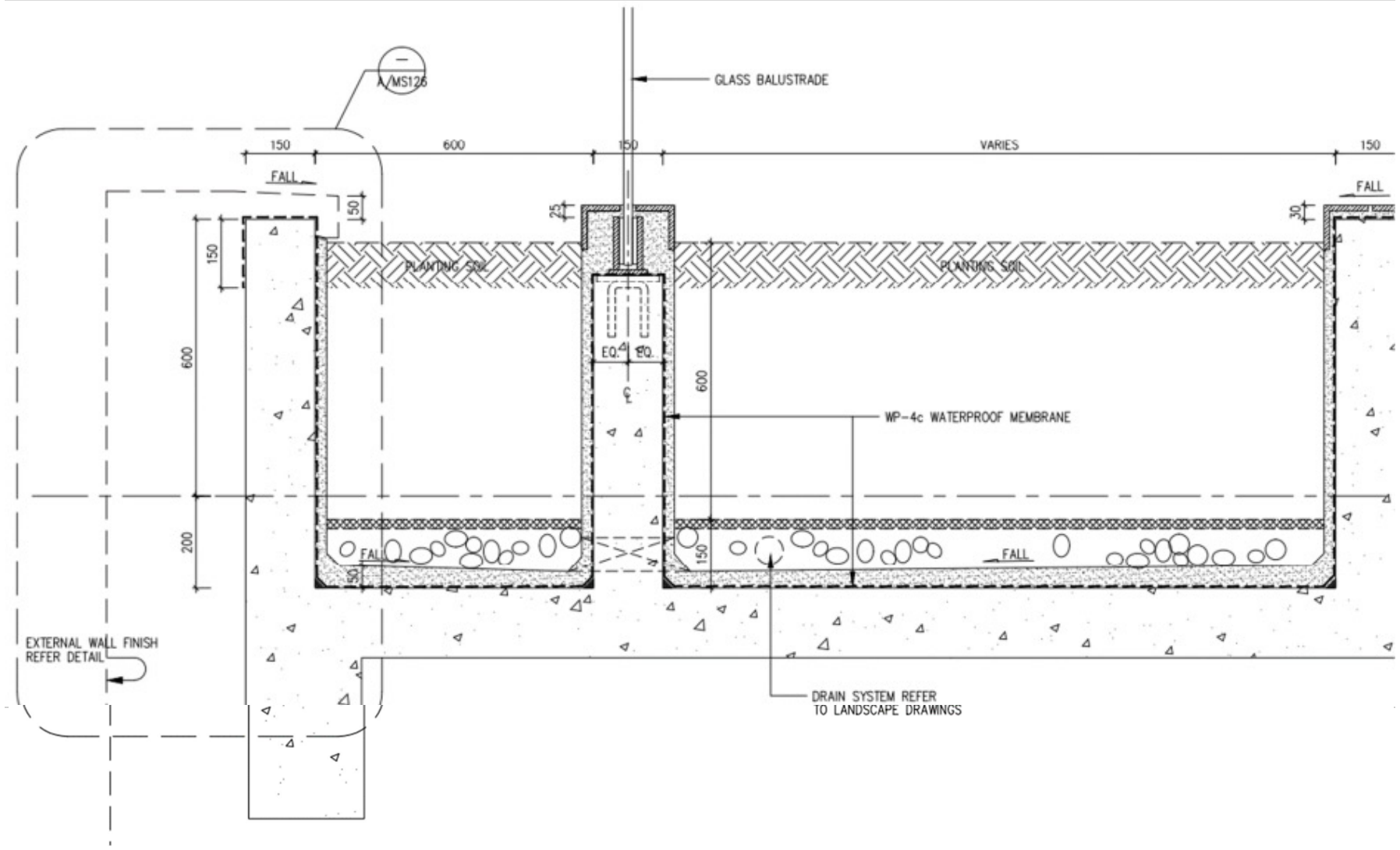
-G4.1. Planter Details

Reference: *BMT Chapter 3.16 Sam Tung Uk Museum*

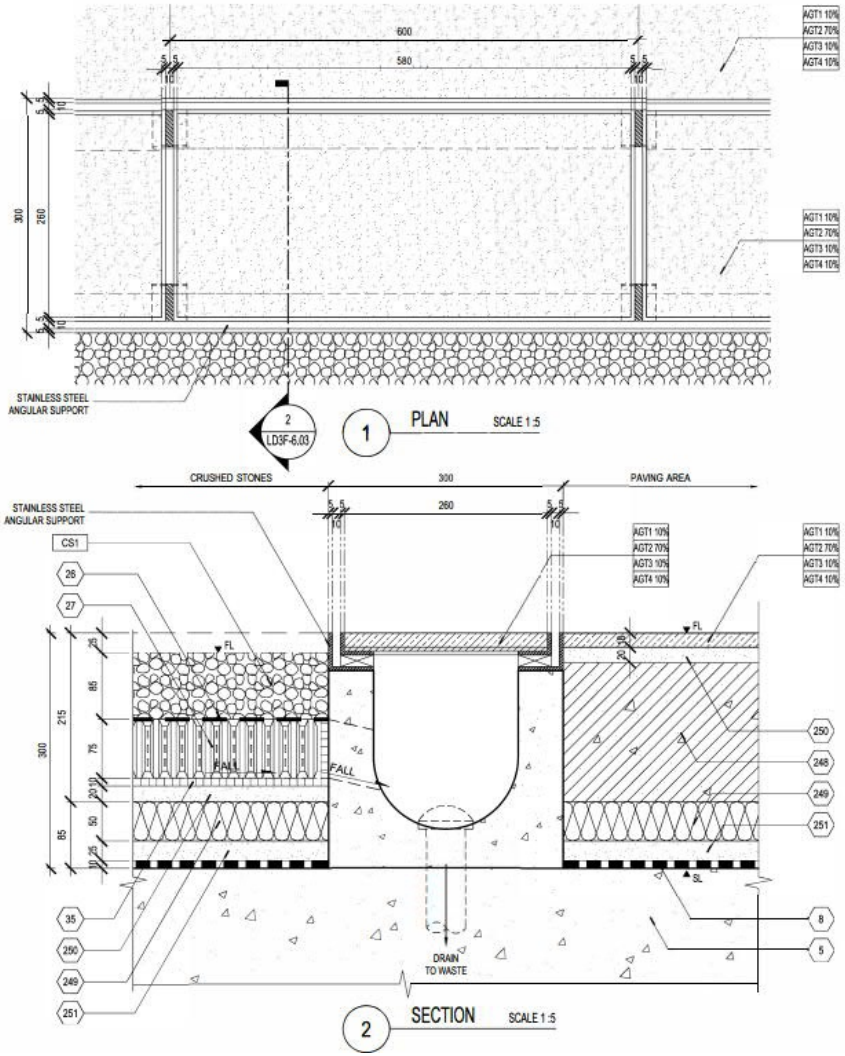


External Planter with Waterproofing

This detail is suitable for podium gardens with planters.



-Trench Drain Detail at Pavement with Matching Cover



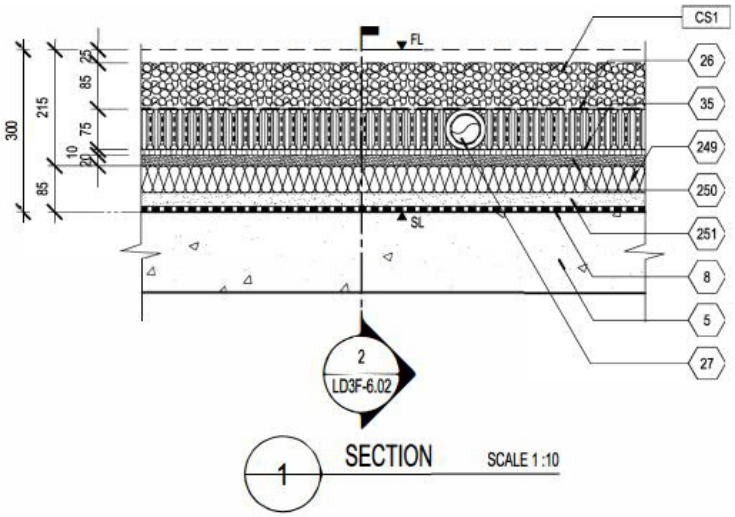
Note: For the use of drainage of water through designed slots, the width and length of the slots should be checked against the estimated water discharge.

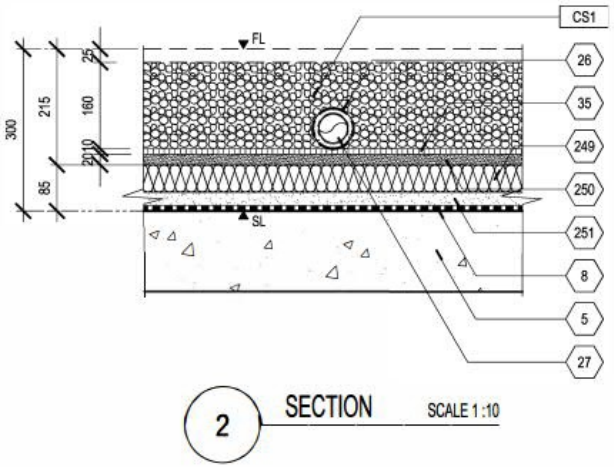
LEGEND

CODE	DESCRIPTION
5	REINFORCED CONCRETE STRUCTURE TO ENGINEER'S DETAIL
8	LIQUID APPLIED WATERPROOFING MEMBRANE TO ARCHITECT'S FINISHES SCHEDULES AND SPECIFICATION
26	GEO-TEXTILE FILTER FABRIC BY SPECIALIST
27	75 MM DIA PERFORATED PVC DRAINAGE PIPE; CONNECT TO ADJACENT STORMWATER SYSTEM; REFER TO ENGINEER'S DETAIL
35	COMPOSITE DRAINAGE SYSTEM OR APPROVED EQUAL
248	MASS CONCRETE FILL TO ENGINEER'S SPECIFICTION
249	MIN. 50mm THK. LIGHT WEIGHT CONCRETE INSULATION LAYER LAID TO FALL TO ARCHITECT'S SPECIFICATION
250	MIN. 20MM THK CEMENT SAND SCREED LAID TO FALL
251	MIN. 25MM THK CEMENT SAND SCREED
FL	FINISH LEVEL; FINISHED FLOOR LEVEL
SL	STRUCTURAL LEVEL; TOP OF SLAB

-G4.2. Subsoil Drain

Note: This example shows subsoil drain through permeable finish/paving such as soil and planting.



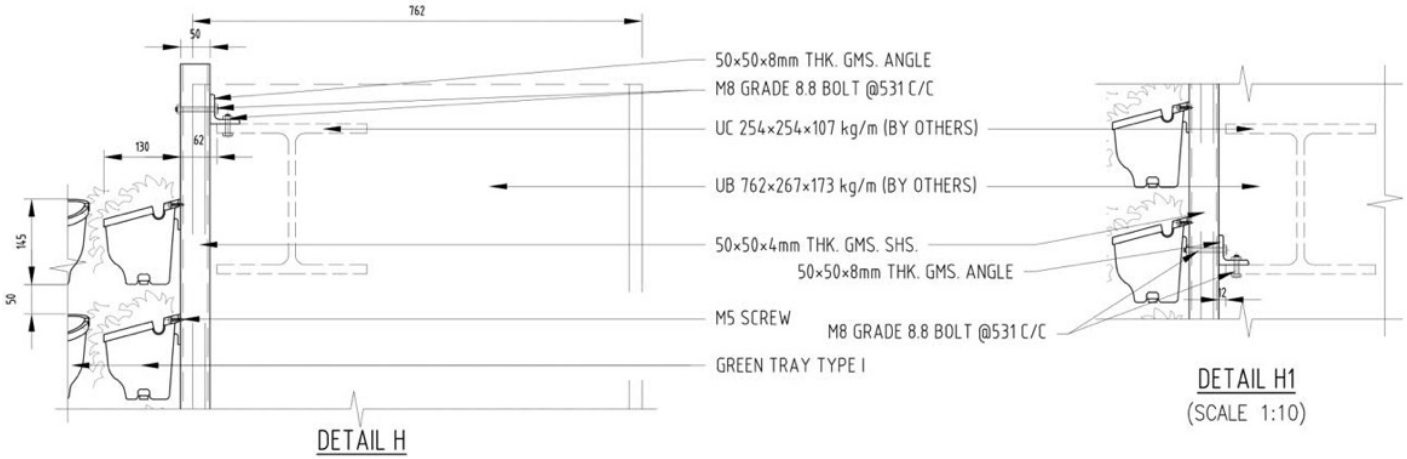


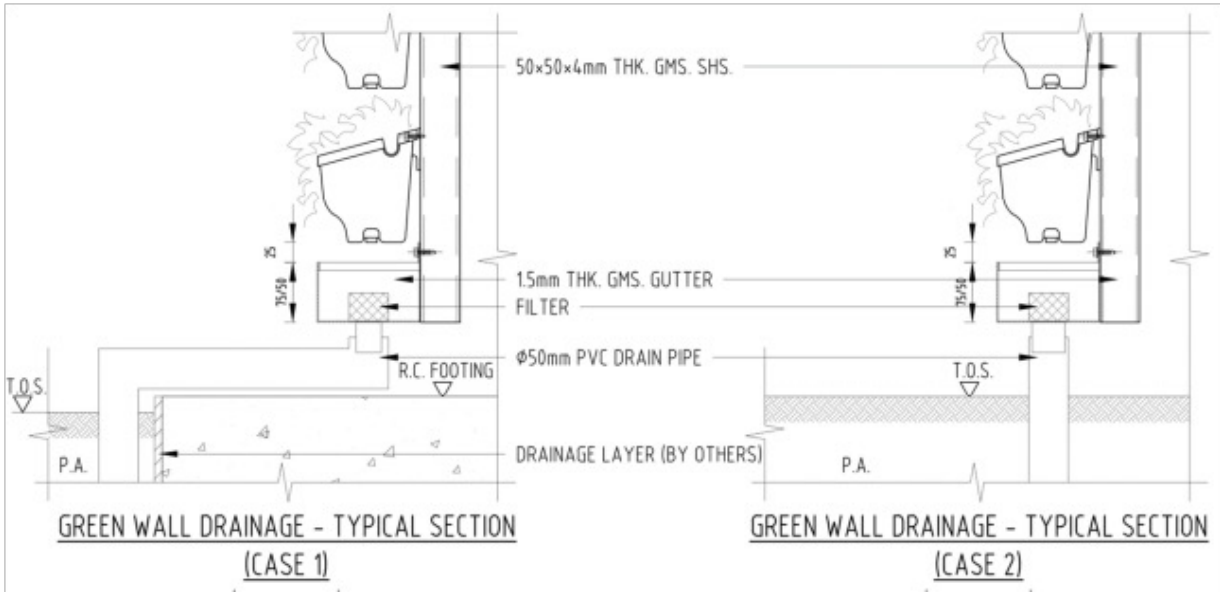
LEGEND

5	REINFORCED CONCRETE STRUCTURE TO ENGINEER'S DETAIL
8	LIQUID APPLIED WATERPROOFING MEMBRANE TO ARCHITECT'S FINISHES SCHEDULES AND SPECIFICATION
26	GEO-TEXTILE FILTER FABRIC BY SPECIALIST
27	75 MM DIA PERFORATED PVC DRAINAGE PIPE; CONNECT TO ADJACENT STORMWATER SYSTEM; REFER TO ENGINEER'S DETAIL
35	COMPOSITE DRAINAGE SYSTEM OR APPROVED EQUAL
249	MIN. 50mm THK. LIGHT WEIGHT CONCRETE INSULATION LAYER LAID TO FALL TO ARCHITECT'S SPECIFICATION
250	MIN. 20MM THK CEMENT SAND SCREED LAID TO FALL
251	MIN. 25MM THK CEMENT SAND SCREED
FL	FINISH LEVEL; FINISHED FLOOR LEVEL
SL	STRUCTURAL LEVEL; TOP OF SLAB

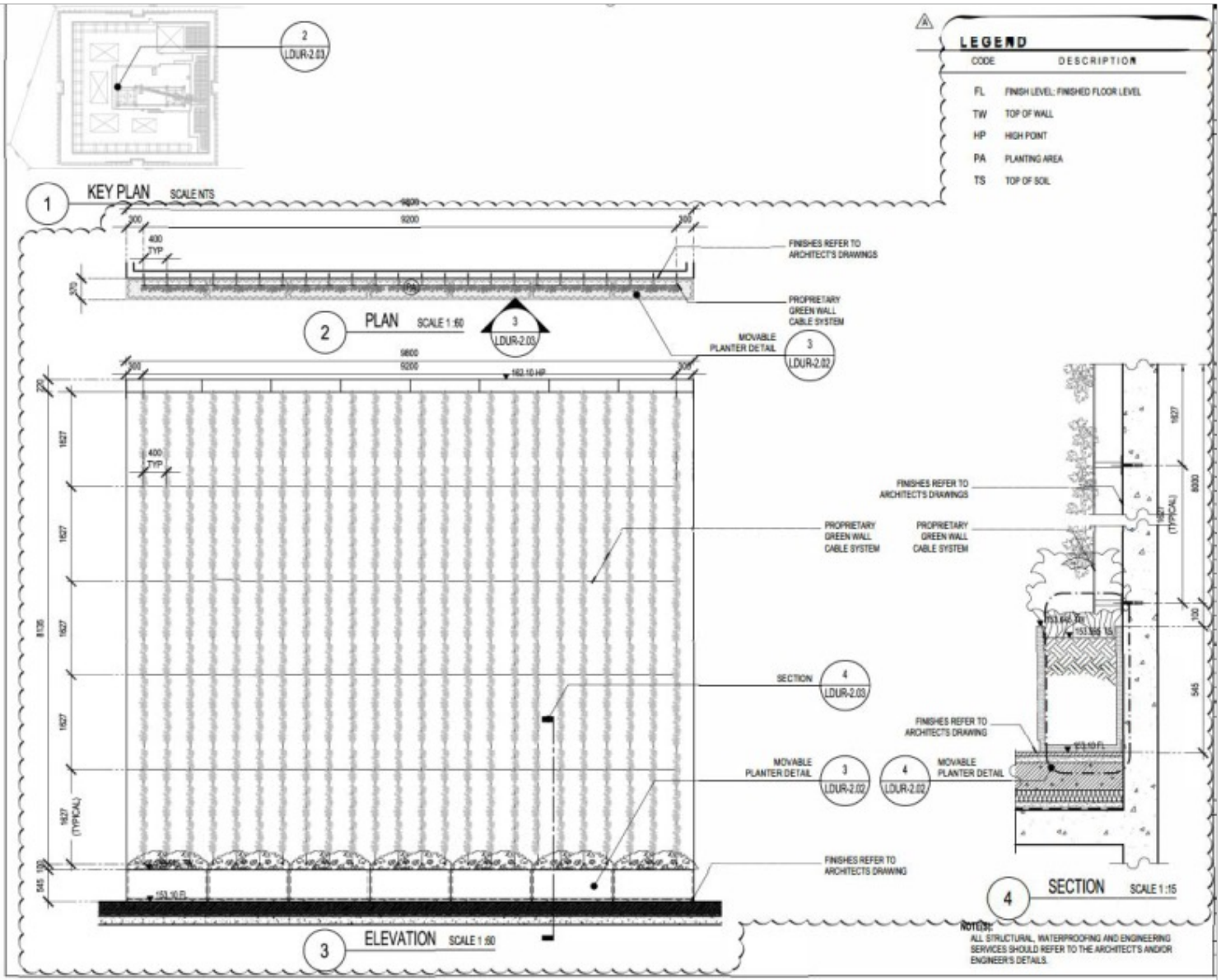
-G4.3. Green Wall Details

Note: There may be requirement for structural submission. Details can be referred to PNAP ADV-35.





-Green Wall with Removable Planter



SECTION H

FINAL REMARKS

This Study Guide has been prepared to help candidates with an appropriate scope of the study for the HKIA Professional Assessment and to serve as a technical reference in their early career to apprehend in actual practices. The HKIA Professional Assessment Committee will like to wish for the success of candidates in their examination as well as professional careers with the view of promoting the excellence of architecture in Hong Kong and anywhere with their practices!

Good Luck!!!

APPENDIX

FURTHER DETAILS FOR REFERENCE

The previous Sections have shown details sufficient to illustrate the basic principles of construction. The following additional drawings are included for further reference and adaptation to the other construction context. These are especially useful information for actual practice.

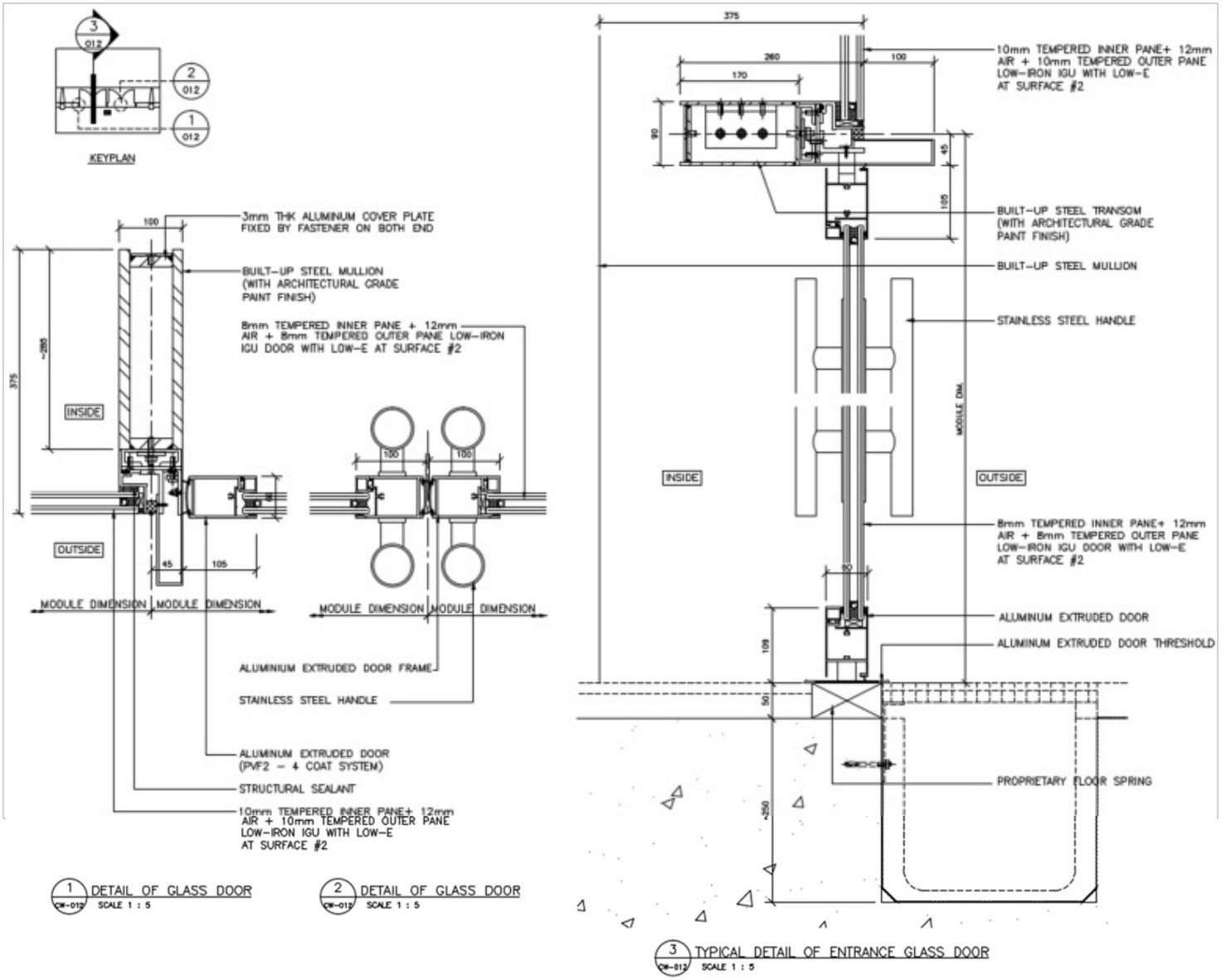
List of Detail Drawings related to the previous Sections D to F:

D2-a. Low-E Glass Entrance Door on Ground Floor
D2-b. Masonry on Ground Floor
D3-a. Roof with Floating Floor
D3-b. Roof of Terrace with Timber Decking
D4-a. Curtain Wall with Glass Fin
D4-b. Glass Canopy
D4-c. Glass Covered Walkway
D4-d. Stone Cladding
D7-a. Staircase (not for fire escape) for House
D8-a. Door Construction Details
D8-b. Solid Core Door with 1 hr FRP
D8-c. Solid Core Double Door with 1 hr FRP
D8-d. Solid Core Door with 2 hr FRP
D9-a. Dividing Stripes for Floor Finishes
D9-b. Movement Joints
D10-a. Corner Guard for Block Works
D10-b. Gypsum Block Wall

E3-a. Aluminium Windows
E3-b. Aluminium Door

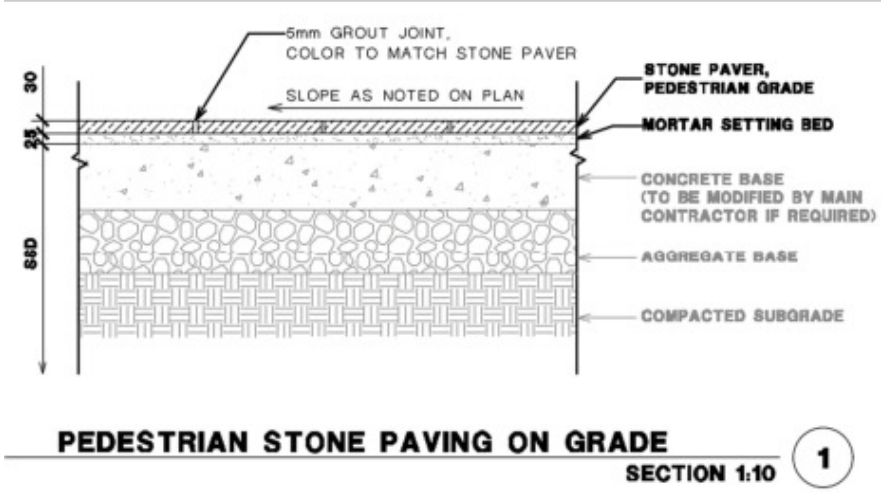
F2-a. Steel Door with Stone Cladding
F2-b. Metal Louvre
F2-c. Pipework in Sunken Slab
F3-a. Fire Shutters
F4-a. Terminal Manhole Construction
F4-b. Cover for Manhole
F4-c. Sump Pit Construction

D2-a. Low-E Glass Entrance Door on Ground Floor

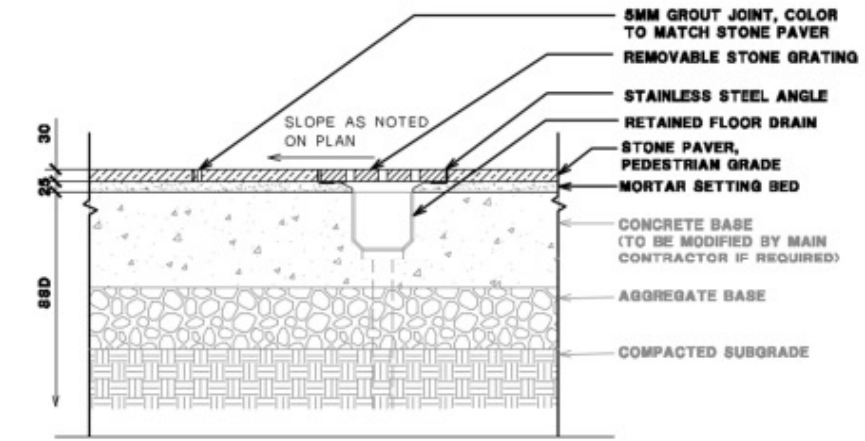


D2-b. Masonry on Ground Floor

This construction is applicable to the external ground with stone (granite) as the flooring finish. A non-slip texture should be provided for pedestrian safety. A rougher surface should be applied on ramps.



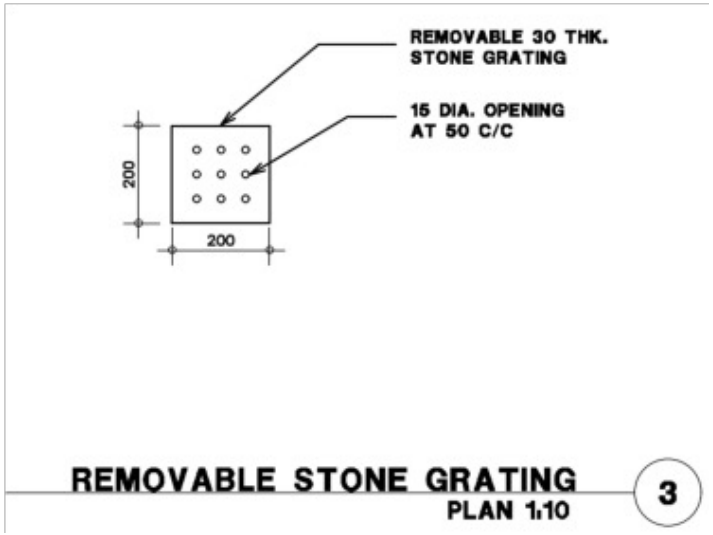
PEDESTRIAN STONE PAVING ON GRADE
SECTION 1:10 — 1



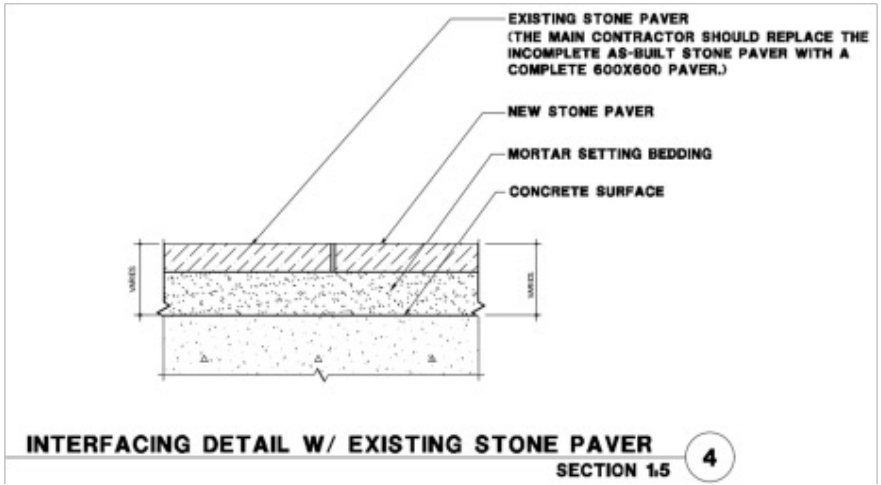
PEDESTRIAN STONE PAVING ON STRUCTURE
SECTION 1:10 — 2

Check:

-Materials and workmanship
-Waterproofing
-Non-slip surface



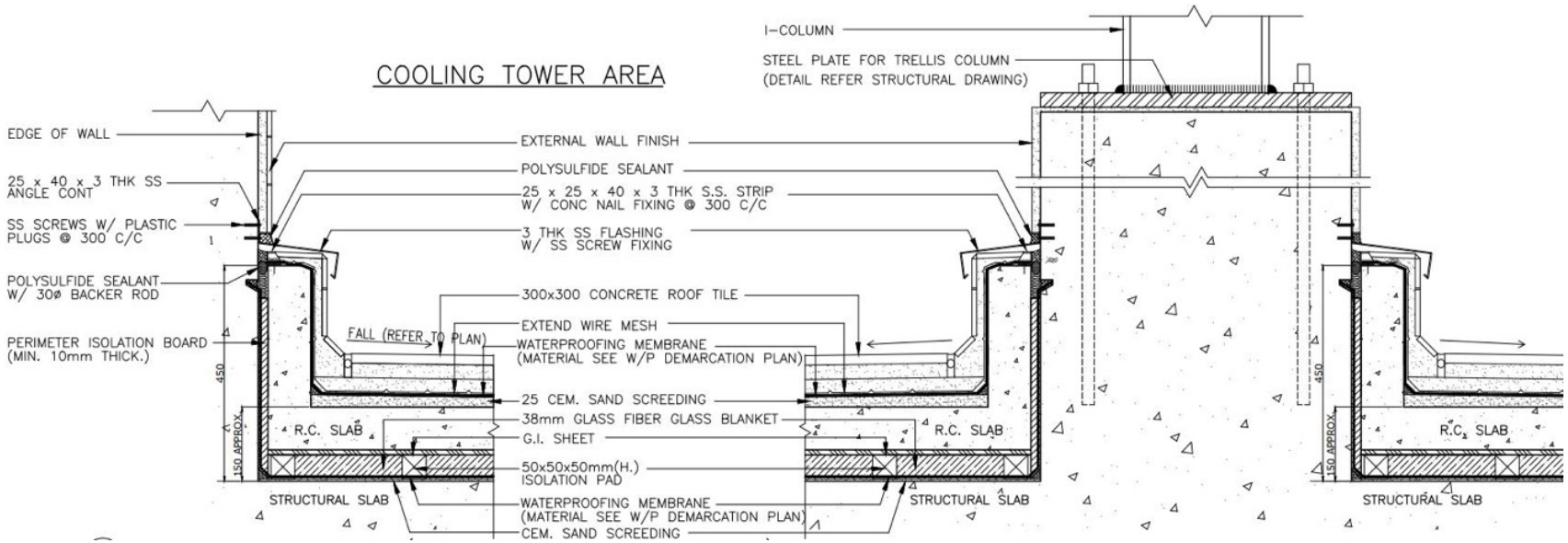
REMOVABLE STONE GRATING
PLAN 1:10 — 3



INTERFACING DETAIL W/ EXISTING STONE PAVER
SECTION 1:5 — 4

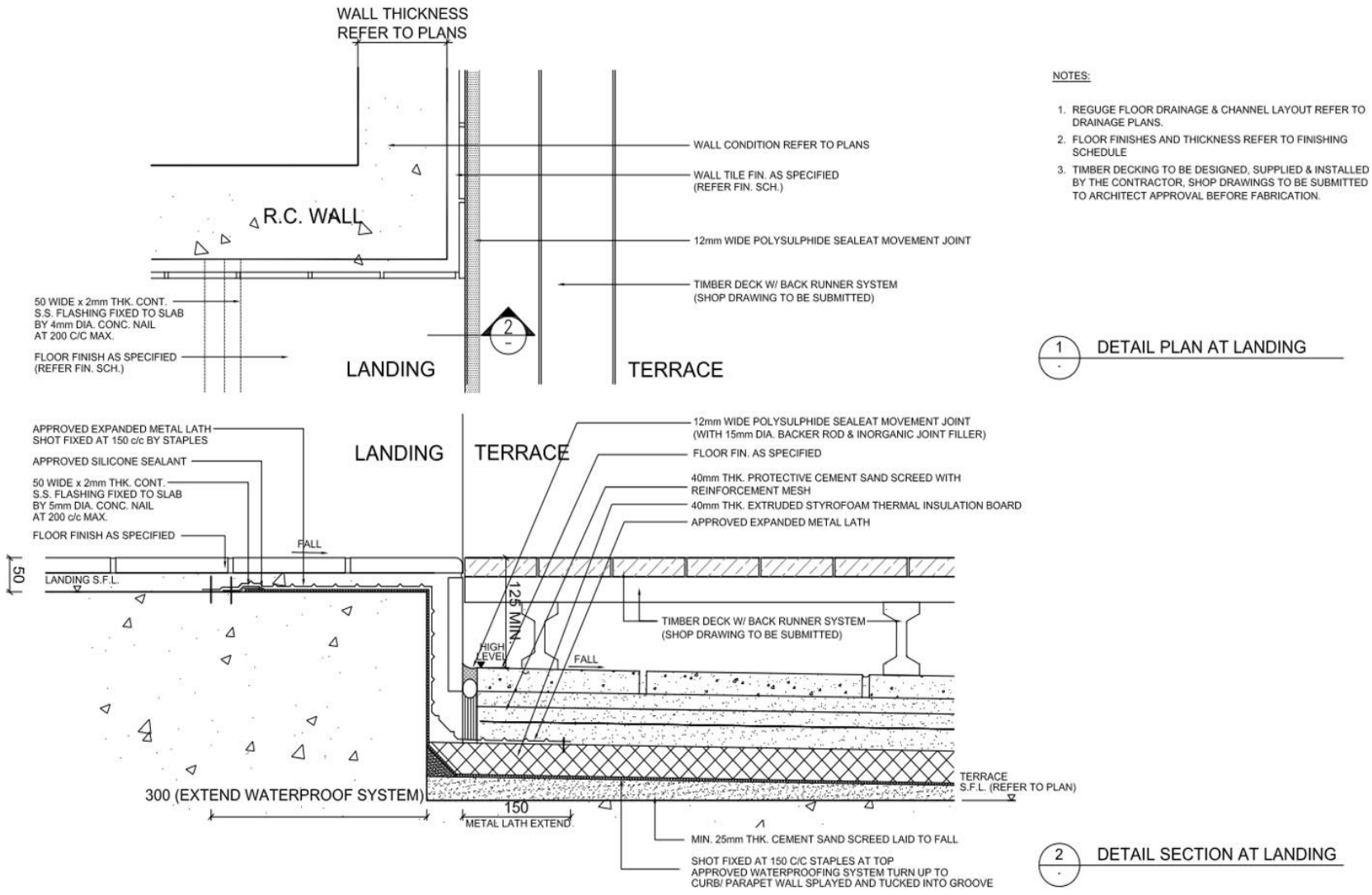
D3-a. Roof with Floating Floor

This construction is applicable with M/E equipment on the rooftop for the acoustical treatment of roof slab to cut off sound penetration to surrounding floors.



D3-b. Roof of Terrace with Timber Decking

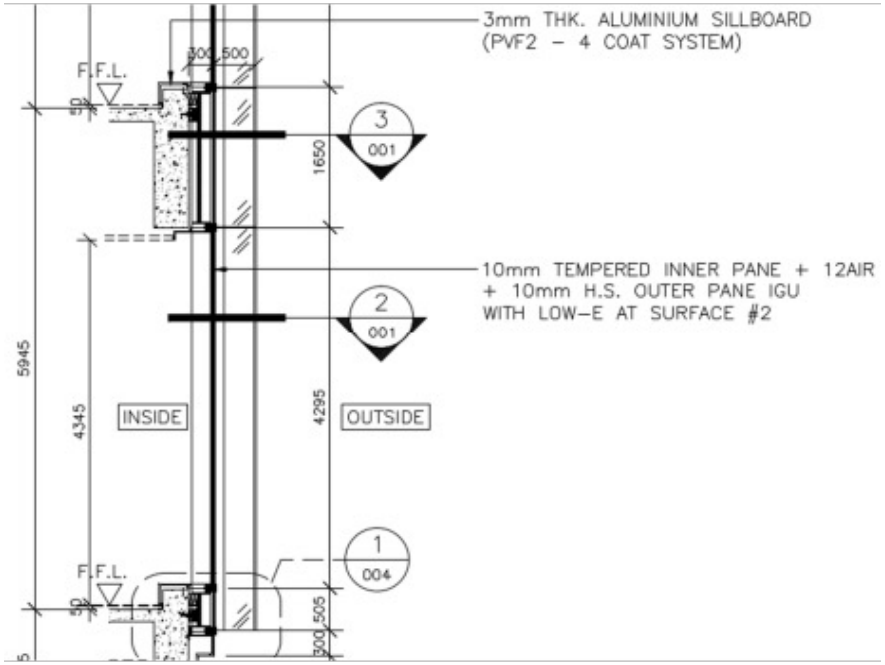
The flat construction is applicable to the roof on the podium. (Landscaped areas) A floating floor here makes a perfect “flat” roof finish allowing drainage of water underneath. Flat roof is usually not really flat because of allowing fall for the rainwater.

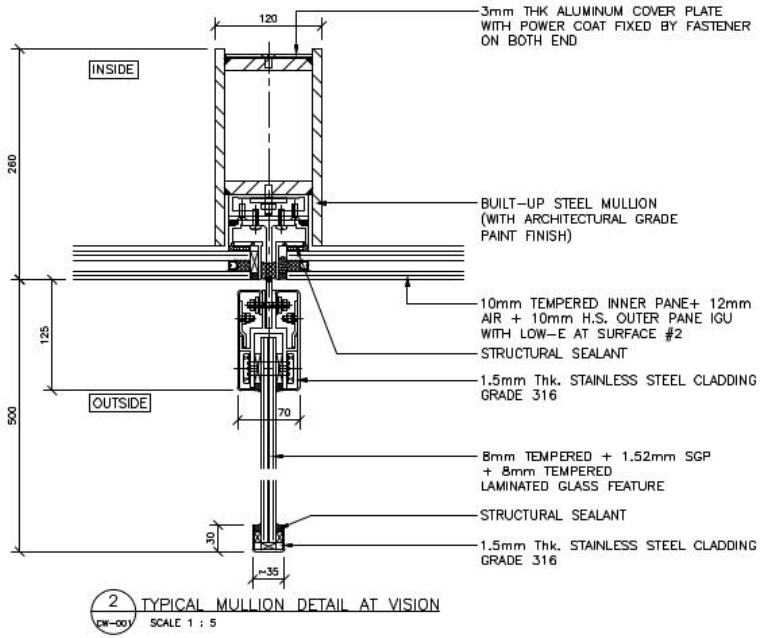


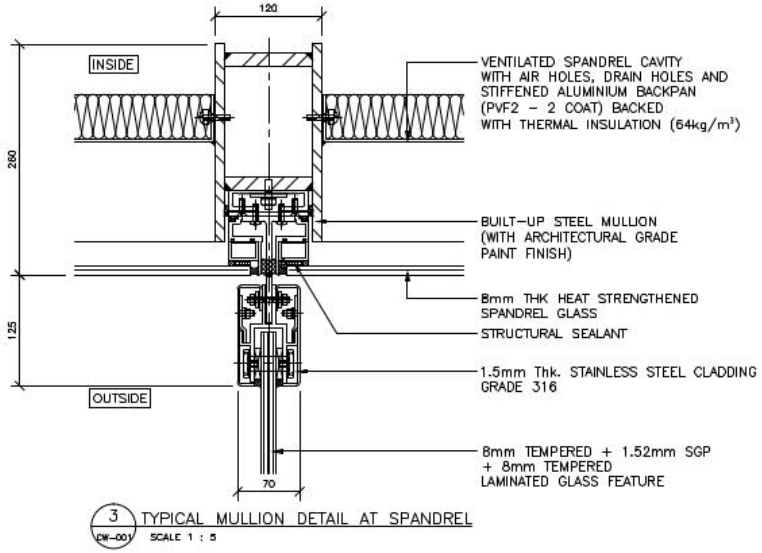
D4-a. Curtain Wall with Glass Fin

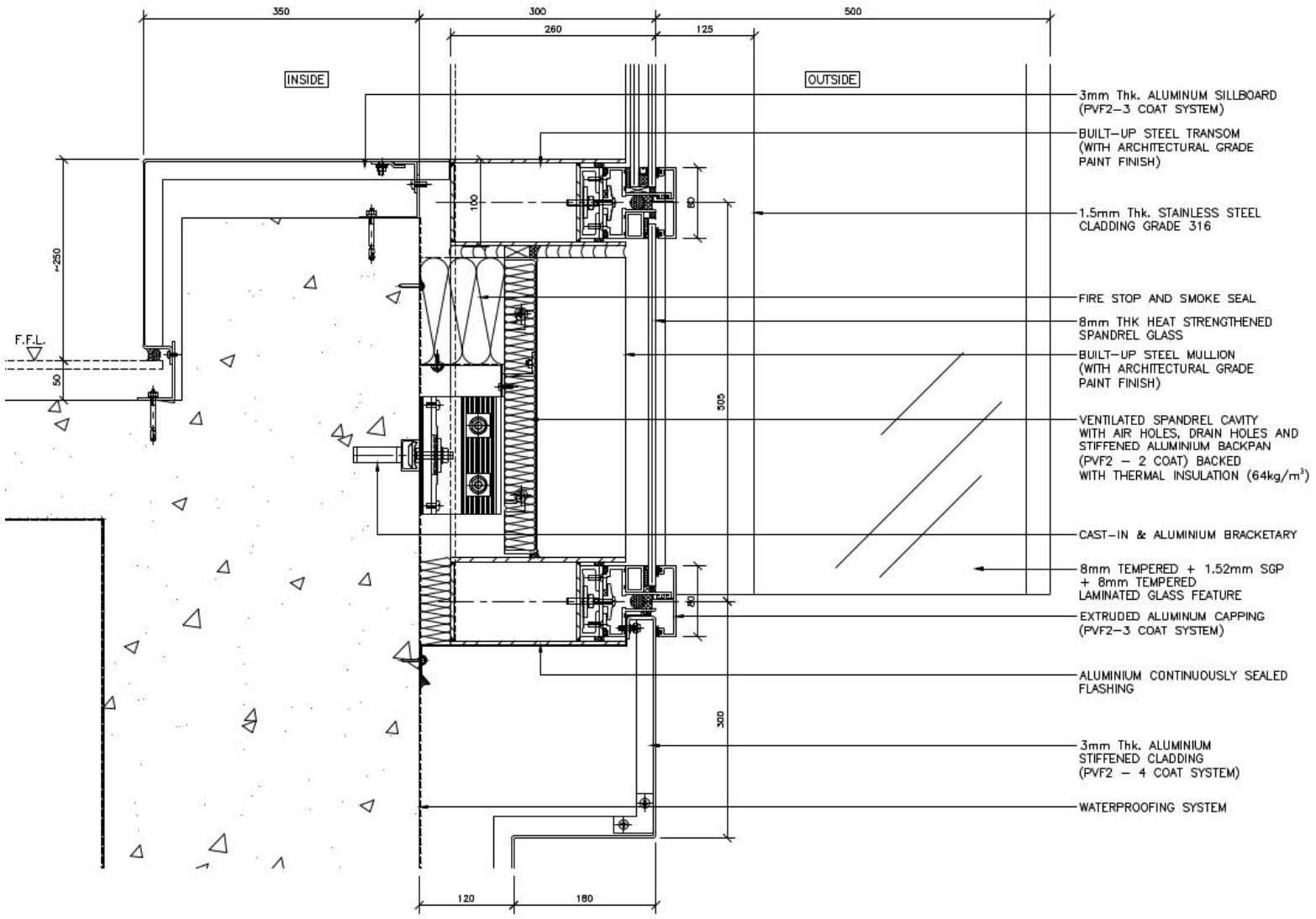
This curtain wall system contains an external glass fin feature which is not part of the structural system. Please check if this system can be exempted from the Gross Floor Area calculation.

Reference: PNAP APP-2 on Non-accountable Gross Floor Area for Curtain Walls and Claddings





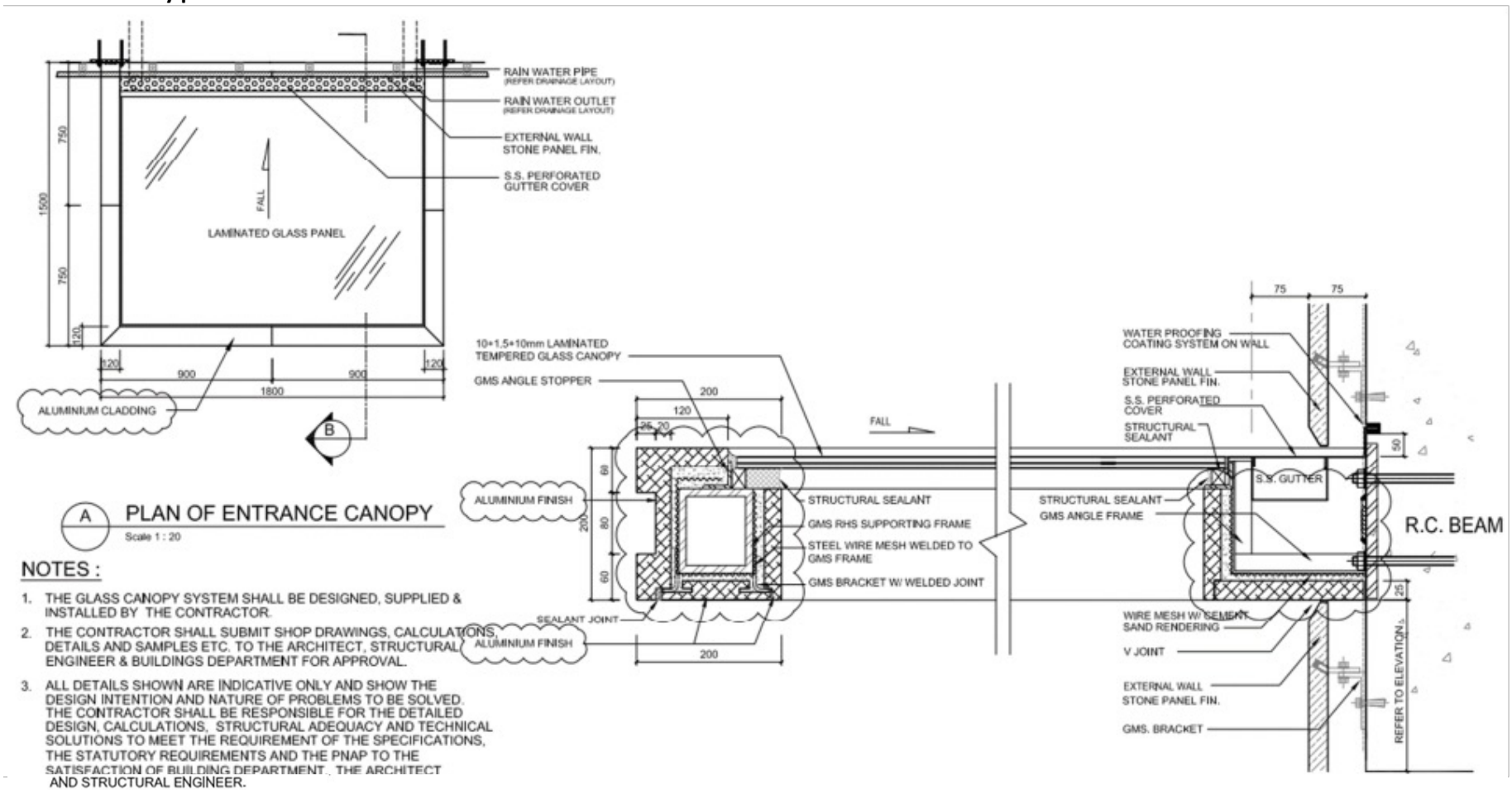




1 CW-004 CURTAIN WALL DETAIL AT SPANDREL
SCALE 1 : 5

D4-b. Glass Canopy

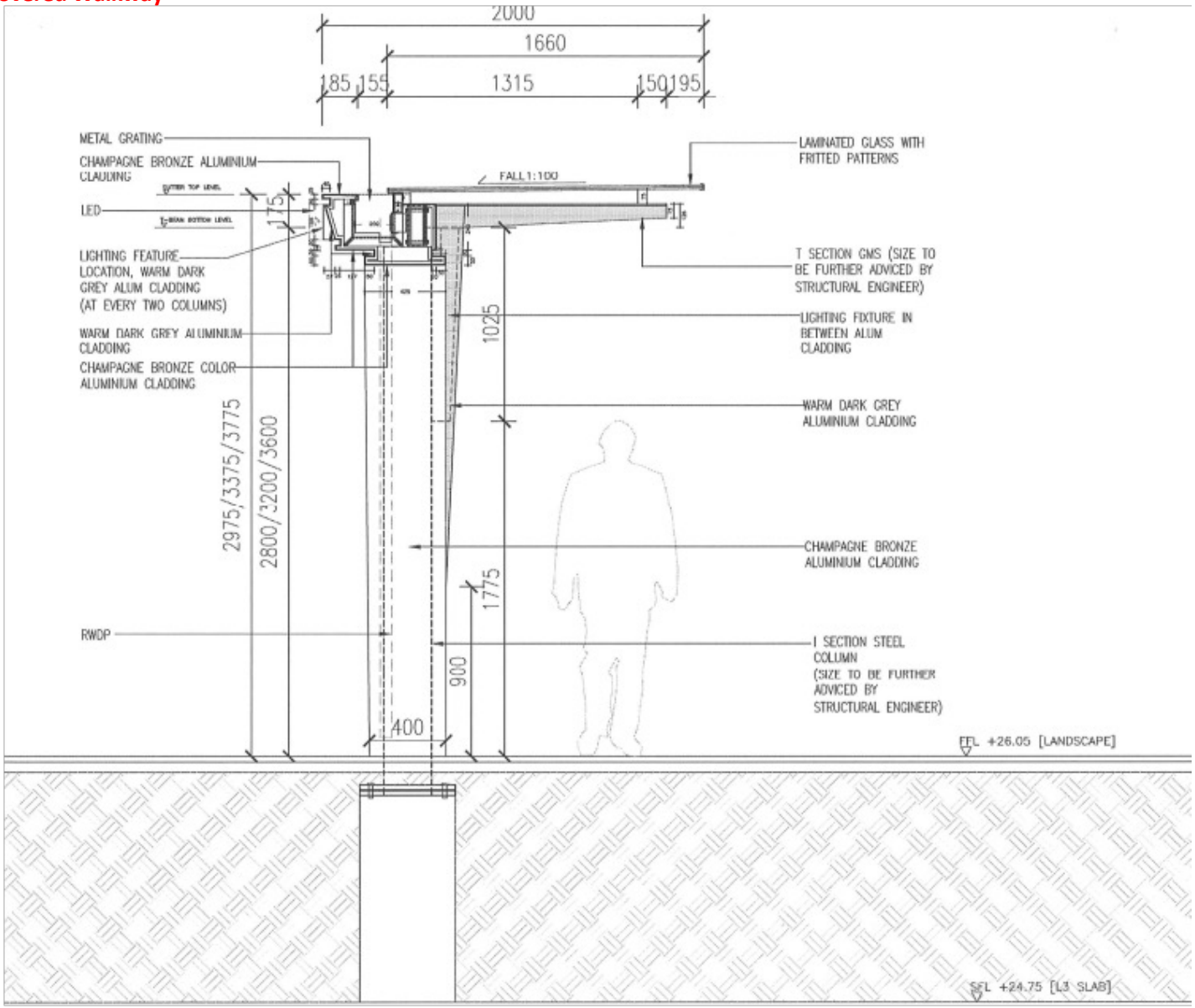
These are usually provided at the entrance lobbies.



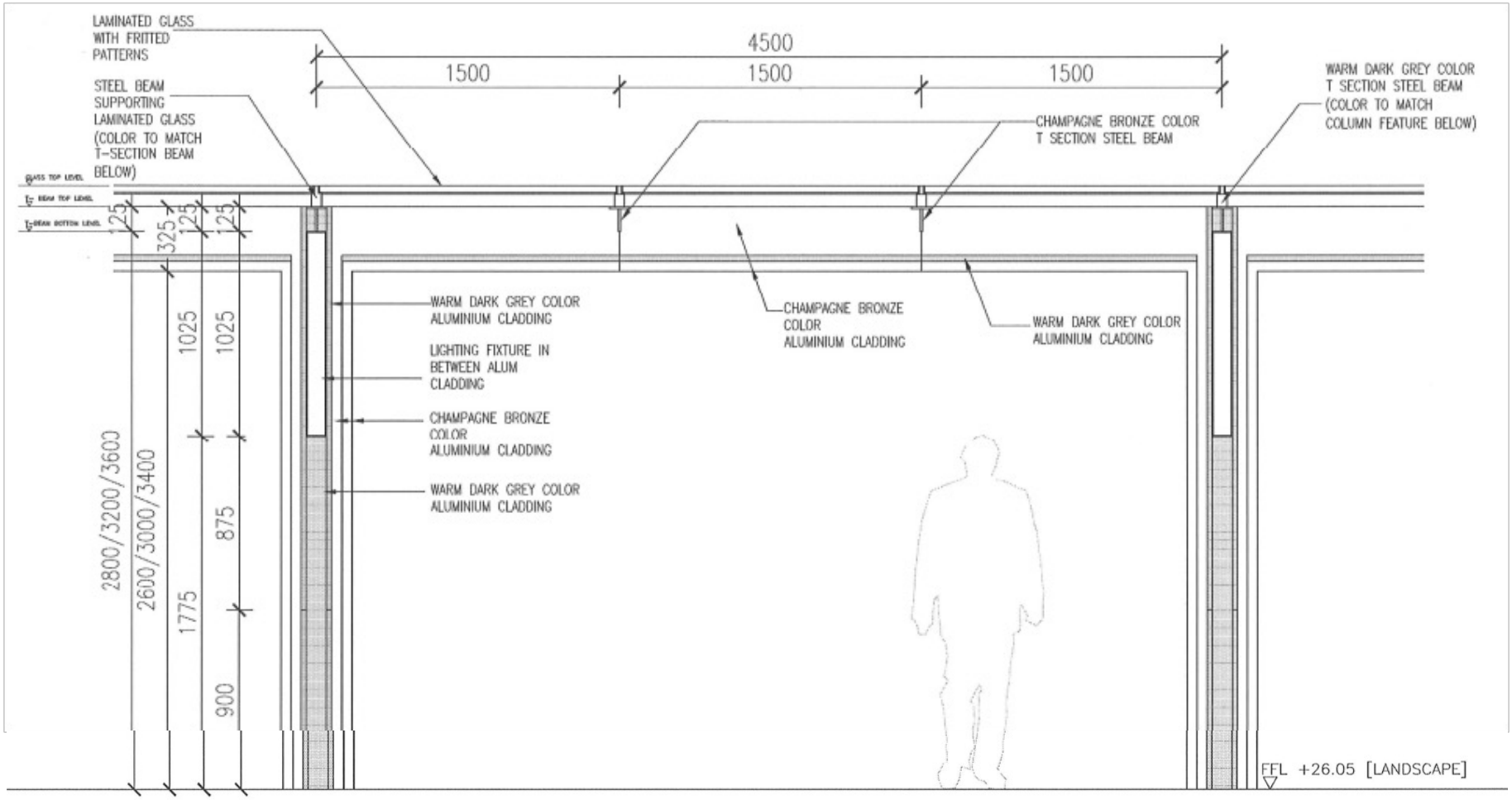
NOTES :

1. THE GLASS CANOPY SYSTEM SHALL BE DESIGNED, SUPPLIED & INSTALLED BY THE CONTRACTOR.
2. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, CALCULATIONS, DETAILS AND SAMPLES ETC. TO THE ARCHITECT, STRUCTURAL ENGINEER & BUILDINGS DEPARTMENT FOR APPROVAL.
3. ALL DETAILS SHOWN ARE INDICATIVE ONLY AND SHOW THE DESIGN INTENTION AND NATURE OF PROBLEMS TO BE SOLVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DETAILED DESIGN, CALCULATIONS, STRUCTURAL ADEQUACY AND TECHNICAL SOLUTIONS TO MEET THE REQUIREMENT OF THE SPECIFICATIONS, THE STATUTORY REQUIREMENTS AND THE PNAP TO THE SATISFACTION OF BUILDING DEPARTMENT, THE ARCHITECT AND STRUCTURAL ENGINEER.
4. ALL COMPONENT SIZES AND THICKNESS FORMING PART OF ANY DESIGN INTENT DETAILS SHALL BE TAKEN AS MINIMUM REQUIREMENTS AND SHALL BE VERIFIED BY THE CONTRACTOR.
5. ALL FIXINGS TO THE STRUCTURE ARE INDICATIVE ONLY AND SHALL BE DESIGNED WITH ALLOWANCE FOR ADJUSTMENT BY THE CONTRACTOR.
6. ALL DIMENSIONS TO BE CHECKED AND VERIFIED ON SITE BEFORE FABRICATION.

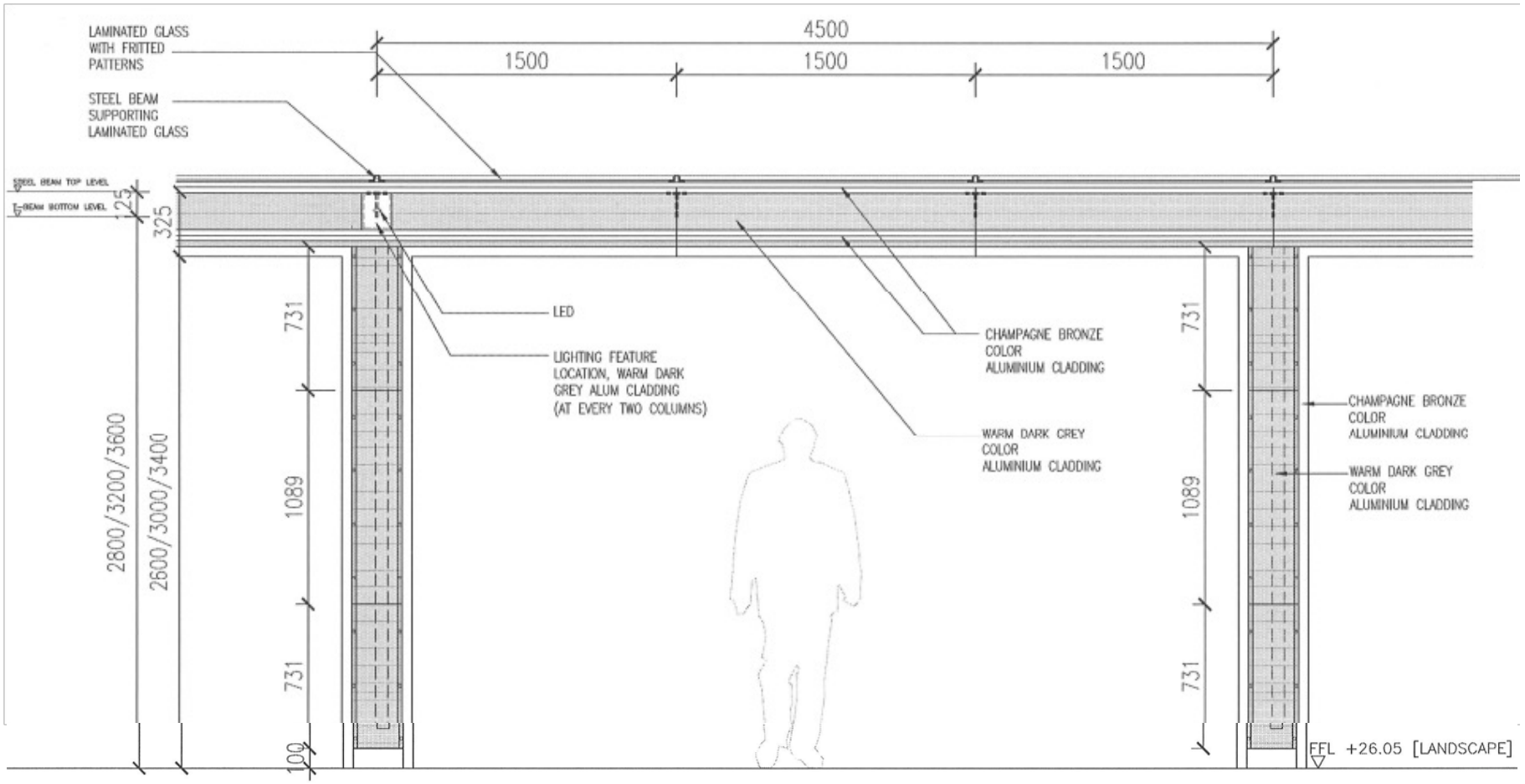
D4-c. Glass Covered Walkway



Elevation

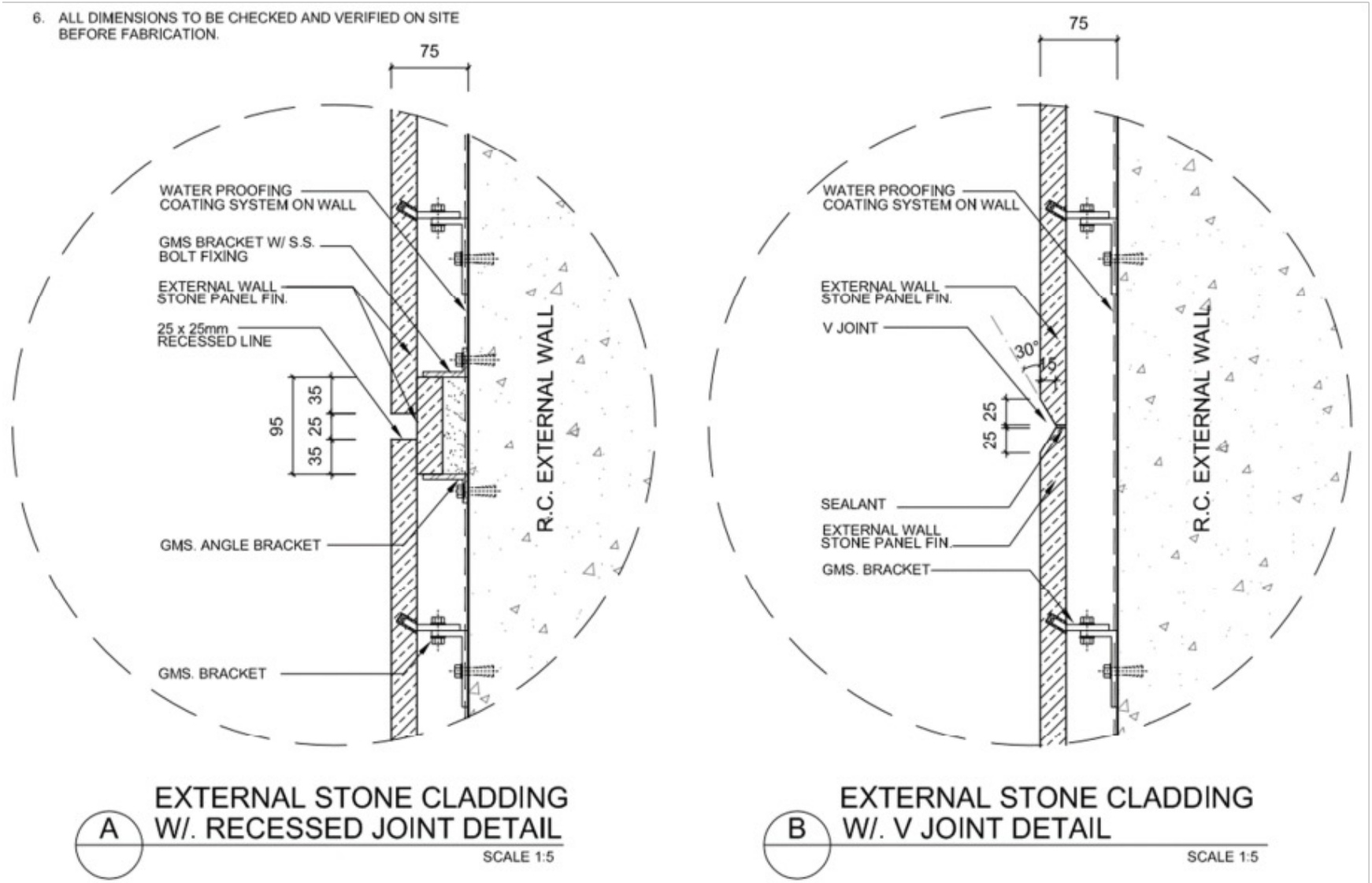

LAMINATED GLASS WITH FRITTED PATTERNS
STEEL BEAM SUPPORTING LAMINATED GLASS (COLOR TO MATCH T-SECTION BEAM BELOW)
4500
1500
1500
1500
CHAMPAGNE BRONZE COLOR T SECTION STEEL BEAM
WARM DARK GREY COLOR T SECTION STEEL BEAM (COLOR TO MATCH COLUMN FEATURE BELOW)
GLASS TOP LEVEL
BEAM TOP LEVEL
BEAM BOTTOM LEVEL
125
325
125
125
1025
1025
875
900
1775
2800/3200/3600
2600/3000/3400
WARM DARK GREY COLOR ALUMINIUM CLADDING
LIGHTING FIXTURE IN BETWEEN ALUM CLADDING
CHAMPAGNE BRONZE COLOR ALUMINIUM CLADDING
WARM DARK GREY COLOR ALUMINIUM CLADDING
CHAMPAGNE BRONZE COLOR ALUMINIUM CLADDING
WARM DARK GREY COLOR ALUMINIUM CLADDING
FFL +26.05 [LANDSCAPE]

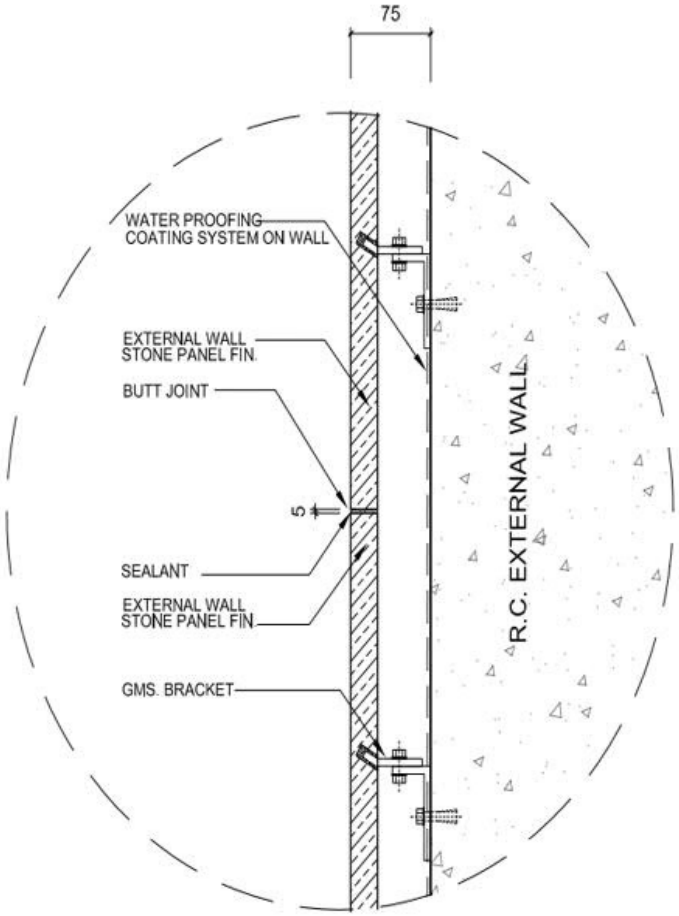
Section


LAMINATED GLASS WITH FRITTED PATTERNS
STEEL BEAM SUPPORTING LAMINATED GLASS
4500
1500
1500
1500
STEEL BEAM TOP LEVEL
T-BEAM BOTTOM LEVEL
125
325
731
1089
731
100
2800/3200/3600
2600/3000/3400
LED
LIGHTING FEATURE LOCATION, WARM DARK GREY ALUM CLADDING (AT EVERY TWO COLUMNS)
CHAMPAGNE BRONZE COLOR ALUMINIUM CLADDING
WARM DARK GREY COLOR ALUMINIUM CLADDING
731
1089
731
CHAMPAGNE BRONZE COLOR ALUMINIUM CLADDING
WARM DARK GREY COLOR ALUMINIUM CLADDING
FFL +26.05 [LANDSCAPE]

D4-d. Stone Cladding

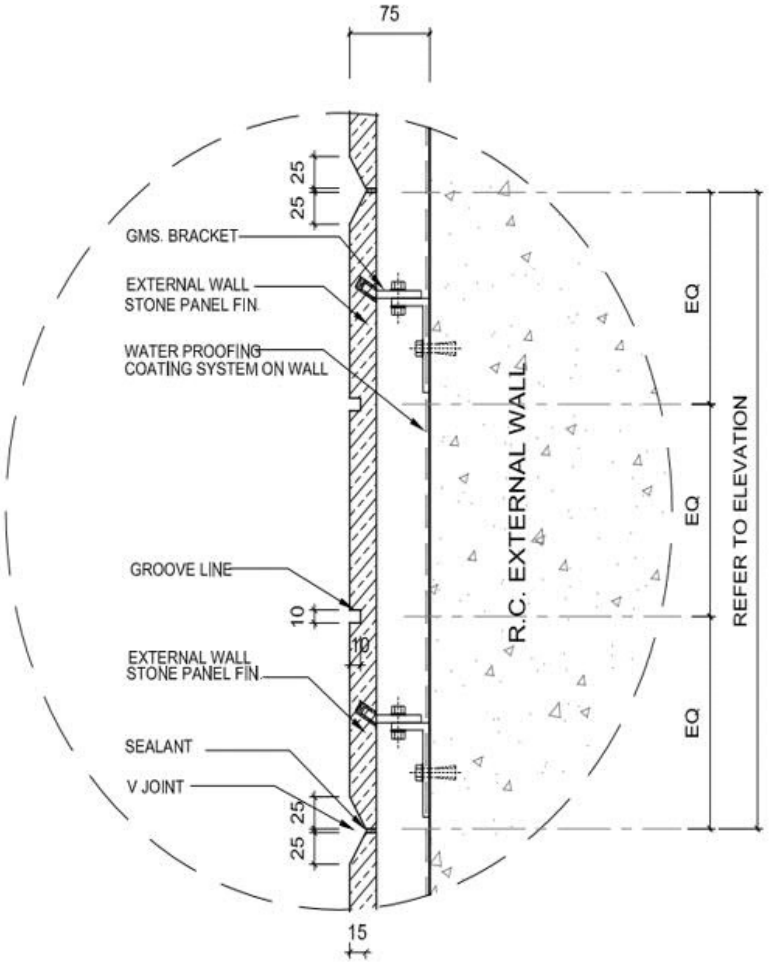
Example: Project 1
Stone cladding with various appearance





D EXTERNAL STONE CLADDING W/. BUTT JOINT DETAIL

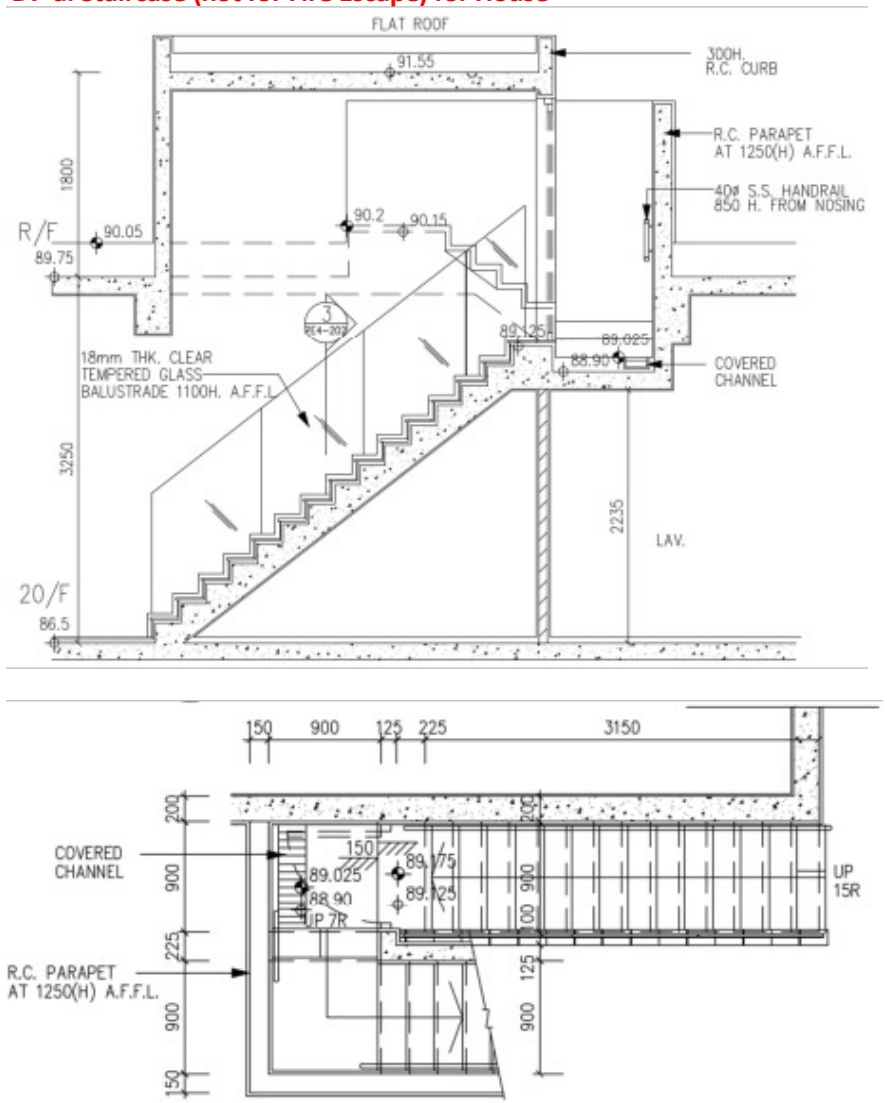
SCALE 1:5

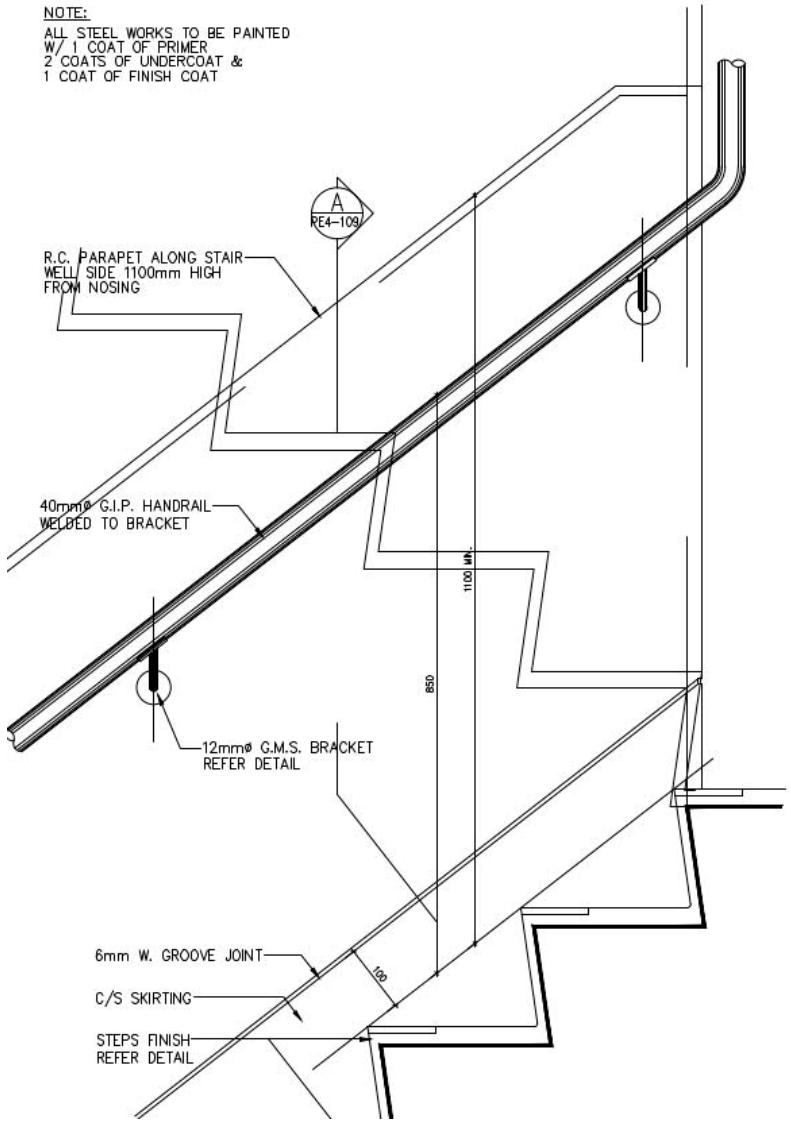


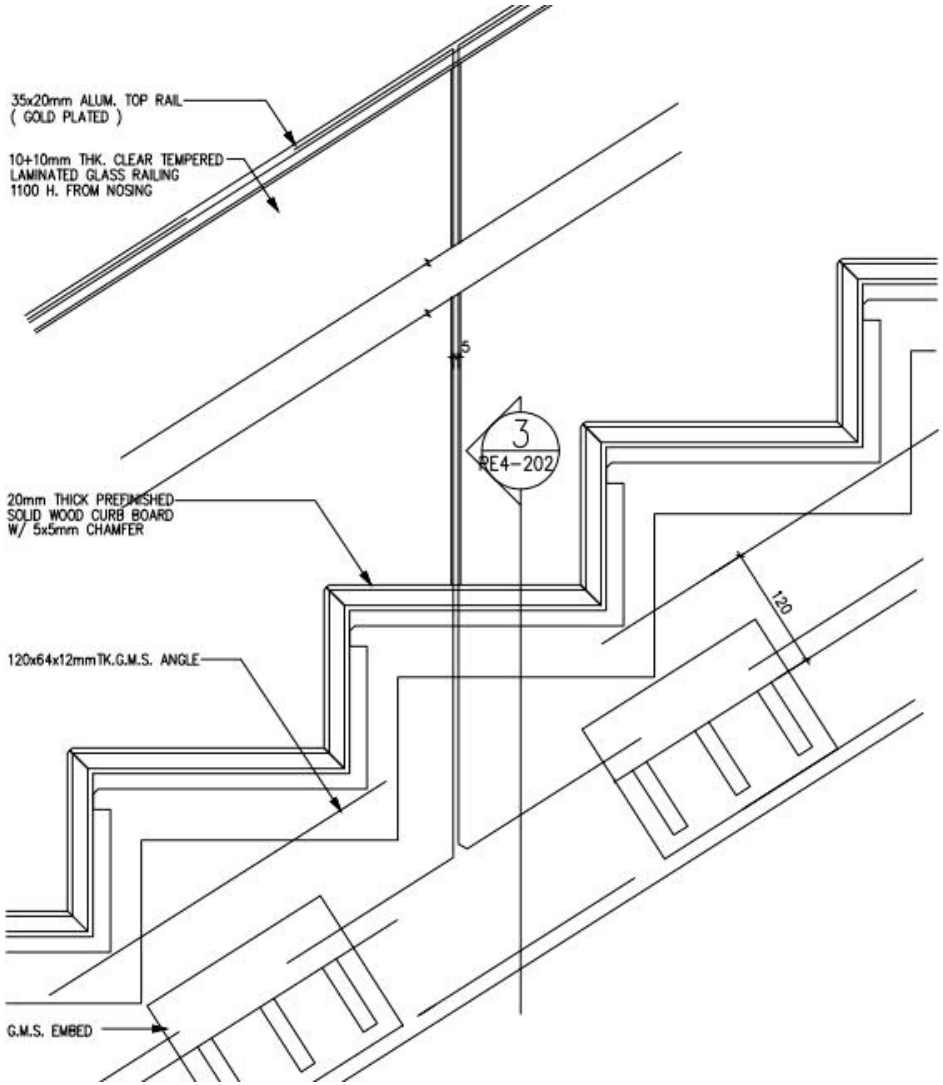
E EXTERNAL STONE CLADDING W/. GROOVE LINE DETAIL

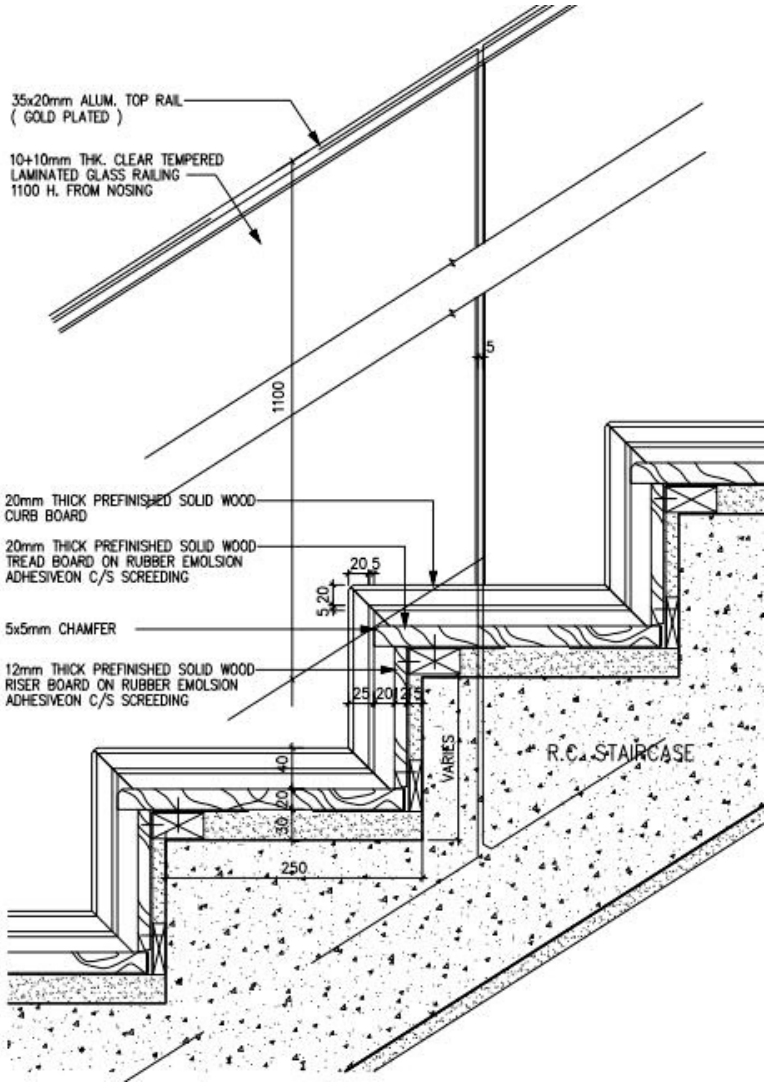
SCALE 1:5

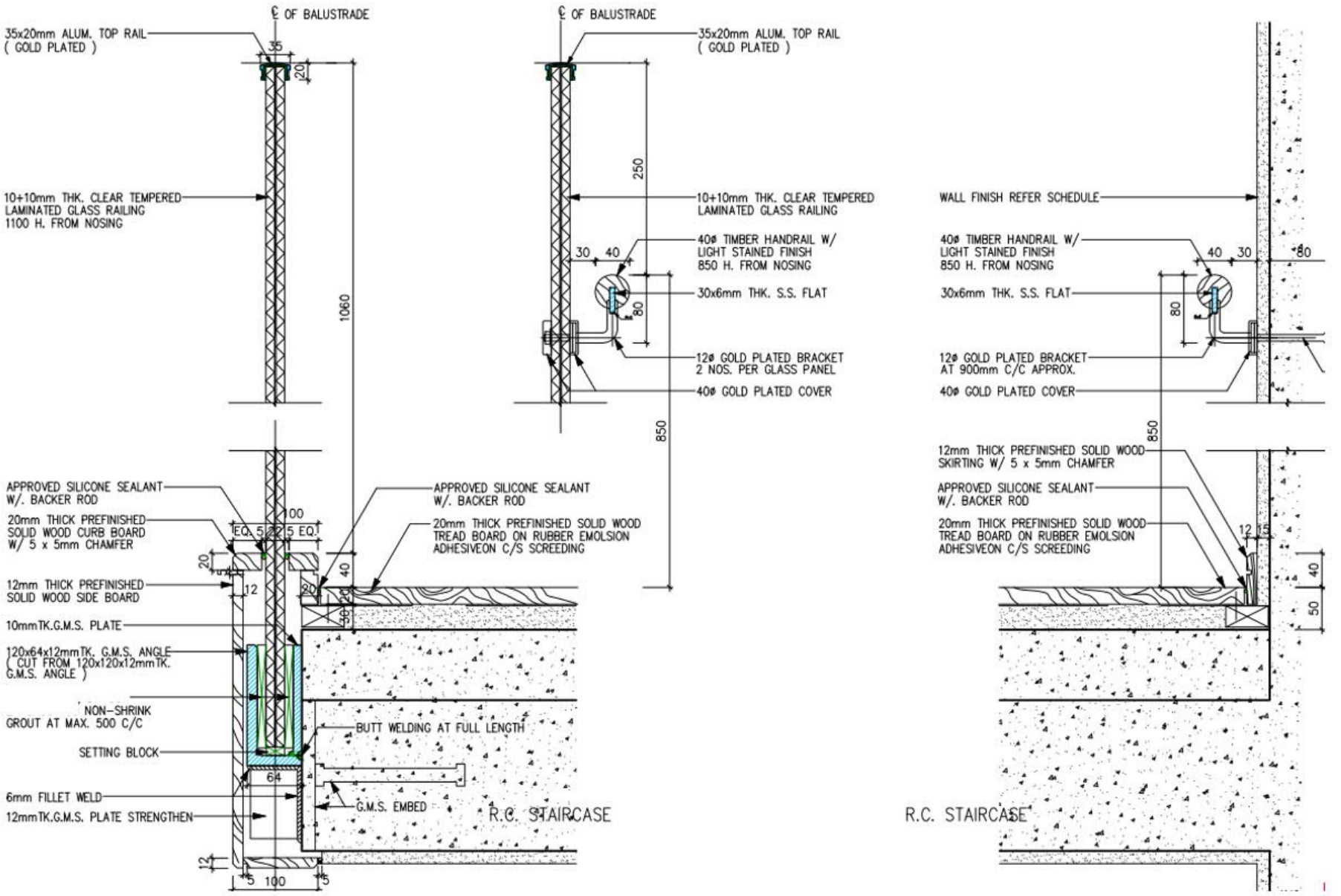
D7-a. Staircase (not for Fire Escape) for House



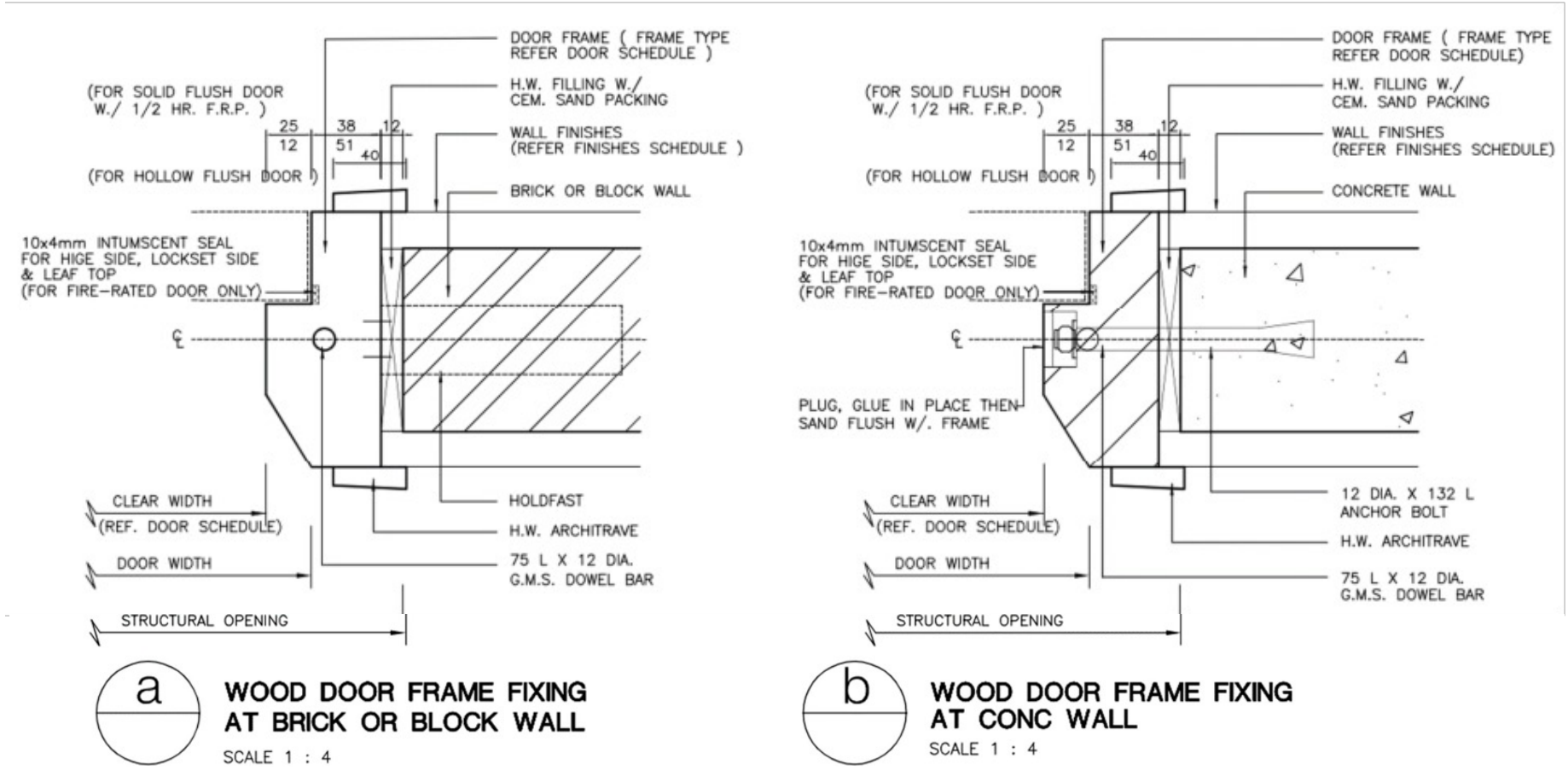


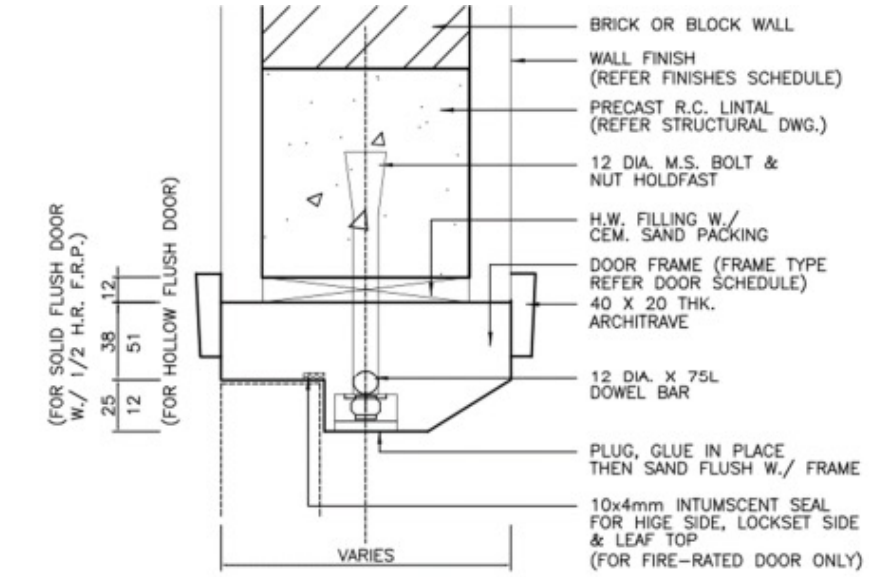

35x20mm ALUM. TOP RAIL
(GOLD PLATED)
10+10mm THK. CLEAR TEMPERED
LAMINATED GLASS RAILING
1100 H. FROM NOSING
5
3
RE4-202
20mm THICK PREFINISHED
SOLID WOOD CURB BOARD
W/ 5x5mm CHAMFER
120
120x64x12mmTK.G.M.S. ANGLE
G.M.S. EMBED


35x20mm ALUM. TOP RAIL
(GOLD PLATED)
10+10mm THK. CLEAR TEMPERED
LAMINATED GLASS RAILING
1100 H. FROM NOSING
1100
5
20mm THICK PREFINISHED SOLID WOOD
CURB BOARD
20mm THICK PREFINISHED SOLID WOOD
TREAD BOARD ON RUBBER EMOLSION
ADHESIVEON C/S SCREEDING
20.5
5.20
5x5mm CHAMFER
12mm THICK PREFINISHED SOLID WOOD
RISER BOARD ON RUBBER EMOLSION
ADHESIVEON C/S SCREEDING
25
20
25
VARIES
R.C. STAIRCASE
40
20
30
250

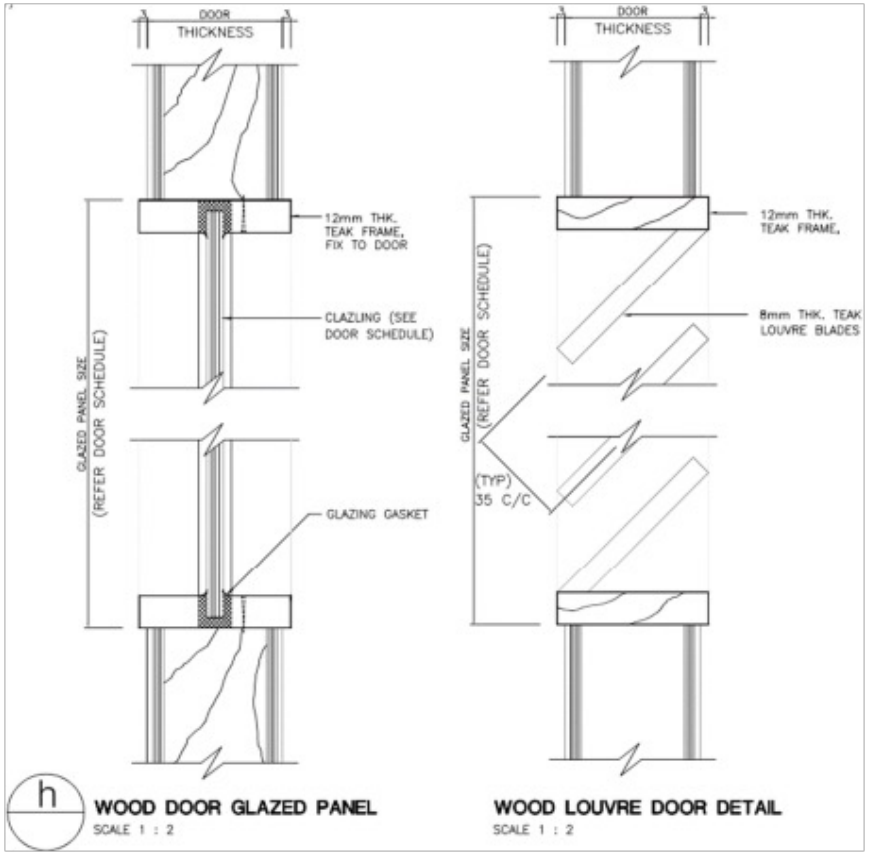

℄ OF BALUSTRADE
35x20mm ALUM. TOP RAIL
(GOLD PLATED)
10+10mm THK. CLEAR TEMPERED
LAMINATED GLASS RAILING
1100 H. FROM NOSING
1060
APPROVED SILICONE SEALANT
W/. BACKER ROD
20mm THICK PREFINISHED
SOLID WOOD CURB BOARD
W/ 5 x 5mm CHAMFER
12mm THICK PREFINISHED
SOLID WOOD SIDE BOARD
10mmTK.G.M.S. PLATE
120x64x12mmTK. G.M.S. ANGLE
(CUT FROM 120x120x12mmTK.
G.M.S. ANGLE)
NON-SHRINK
GROUT AT MAX. 500 C/C
SETTING BLOCK
6mm FILLET WELD
12mmTK.G.M.S. PLATE STRENGTHEN
APPROVED SILICONE SEALANT
W/. BACKER ROD
20mm THICK PREFINISHED SOLID WOOD
TREAD BOARD ON RUBBER EMOLSION
ADHESIVEON C/S SCREEDING
BUTT WELDING AT FULL LENGTH
G.M.S. EMBED
R.C. STAIRCASE
℄ OF BALUSTRADE
35x20mm ALUM. TOP RAIL
(GOLD PLATED)
250
10+10mm THK. CLEAR TEMPERED
LAMINATED GLASS RAILING
40ø TIMBER HANDRAIL W/
LIGHT STAINED FINISH
850 H. FROM NOSING
30x6mm THK. S.S. FLAT
12ø GOLD PLATED BRACKET
2 NOS. PER GLASS PANEL
40ø GOLD PLATED COVER
850
WALL FINISH REFER SCHEDULE
40ø TIMBER HANDRAIL W/
LIGHT STAINED FINISH
850 H. FROM NOSING
30x6mm THK. S.S. FLAT
12ø GOLD PLATED BRACKET
AT 900mm C/C APPROX.
40ø GOLD PLATED COVER
850
12mm THICK PREFINISHED SOLID WOOD
SKIRTING W/ 5 x 5mm CHAMFER
APPROVED SILICONE SEALANT
W/. BACKER ROD
20mm THICK PREFINISHED SOLID WOOD
TREAD BOARD ON RUBBER EMOLSION
ADHESIVEON C/S SCREEDING
R.C. STAIRCASE

D8-a. Door Construction Details



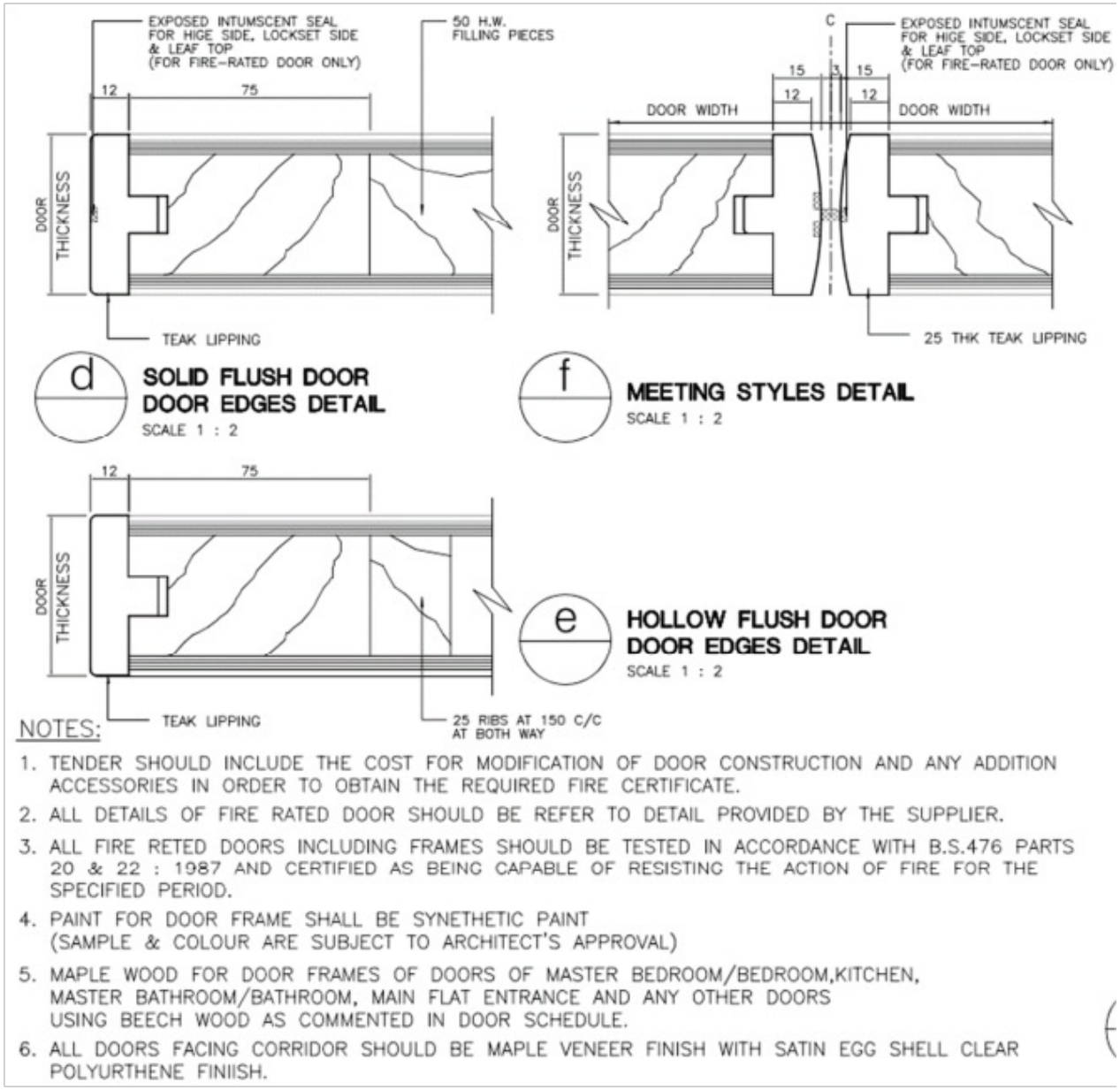


C **WOOD DOOR TOP FRAME / LINTEL DETAIL**
SCALE 1 : 4



h **WOOD DOOR GLAZED PANEL**
SCALE 1 : 2

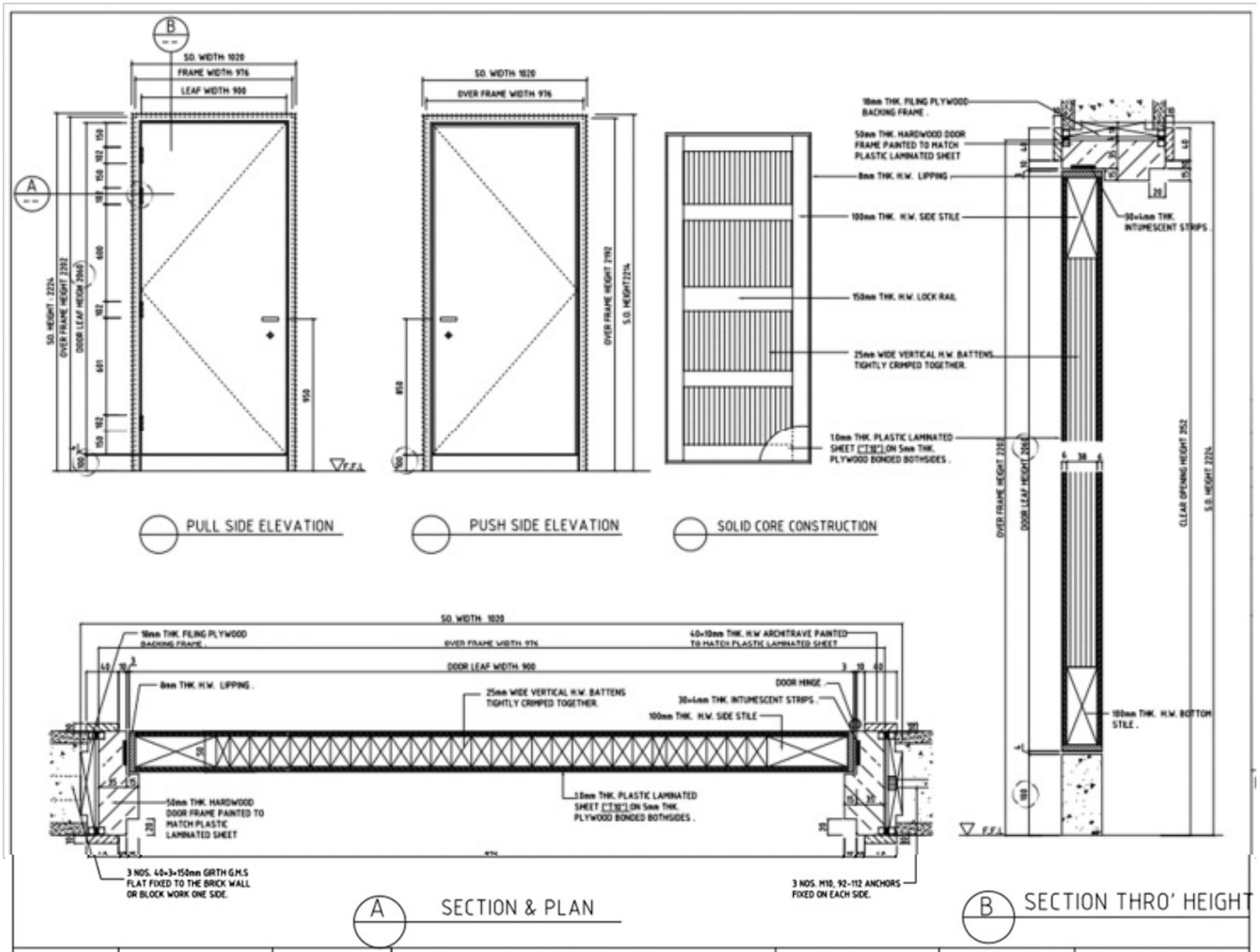
WOOD LOUVRE DOOR DETAIL
SCALE 1 : 2



NOTES:

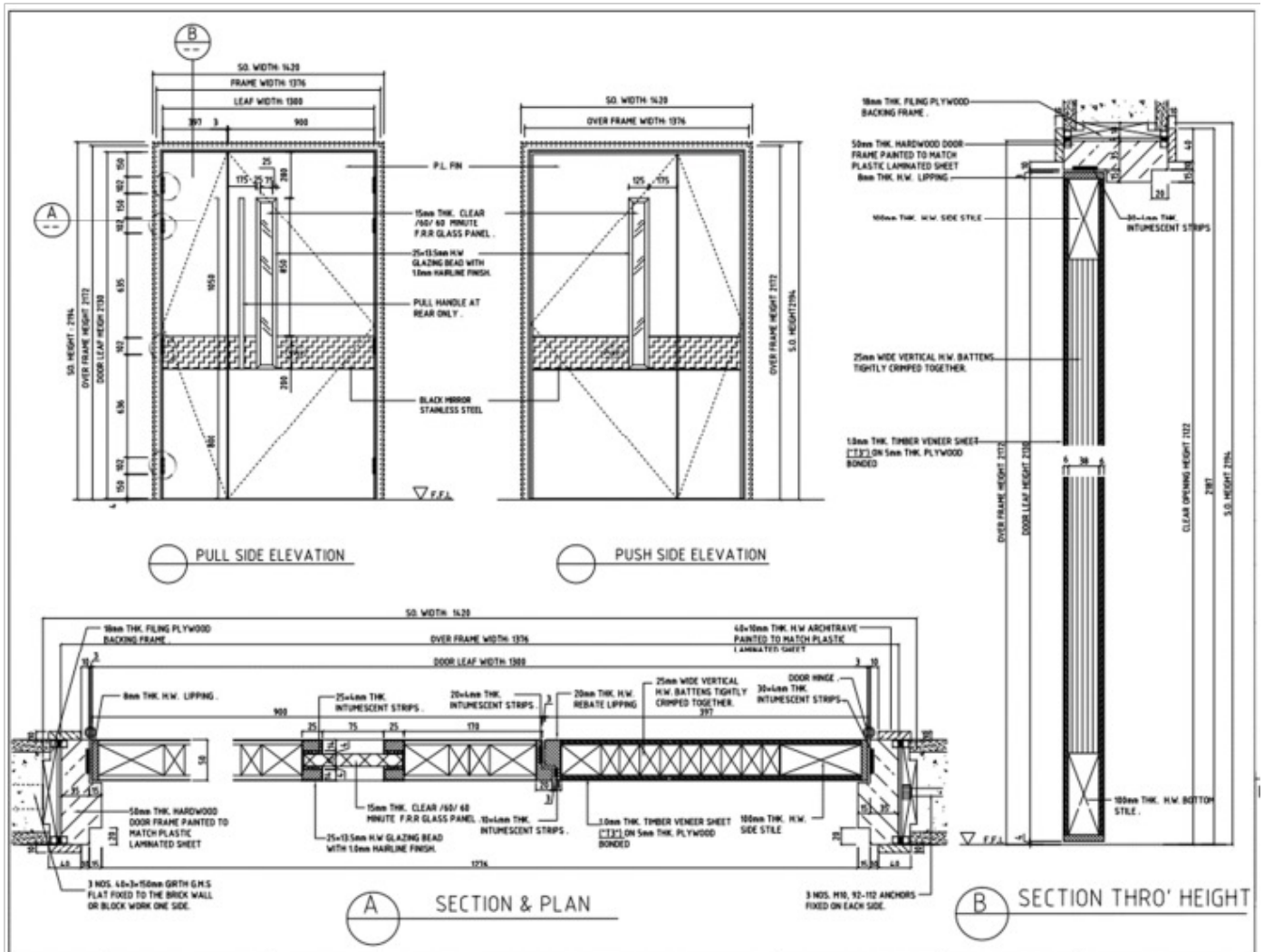
1. TENDER SHOULD INCLUDE THE COST FOR MODIFICATION OF DOOR CONSTRUCTION AND ANY ADDITION ACCESSORIES IN ORDER TO OBTAIN THE REQUIRED FIRE CERTIFICATE.
2. ALL DETAILS OF FIRE RATED DOOR SHOULD BE REFER TO DETAIL PROVIDED BY THE SUPPLIER.
3. ALL FIRE RETED DOORS INCLUDING FRAMES SHOULD BE TESTED IN ACCORDANCE WITH B.S.476 PARTS 20 & 22 : 1987 AND CERTIFIED AS BEING CAPABLE OF RESISTING THE ACTION OF FIRE FOR THE SPECIFIED PERIOD.
4. PAINT FOR DOOR FRAME SHALL BE SYNETHETIC PAINT (SAMPLE & COLOUR ARE SUBJECT TO ARCHITECT'S APPROVAL)
5. MAPLE WOOD FOR DOOR FRAMES OF DOORS OF MASTER BEDROOM/BEDROOM,KITCHEN, MASTER BATHROOM/BATHROOM, MAIN FLAT ENTRANCE AND ANY OTHER DOORS USING BEECH WOOD AS COMMENTED IN DOOR SCHEDULE.
6. ALL DOORS FACING CORRIDOR SHOULD BE MAPLE VENEER FINISH WITH SATIN EGG SHELL CLEAR POLYURTHENE FINIISH.

D8-b. Solid core door with 1 hr FRP



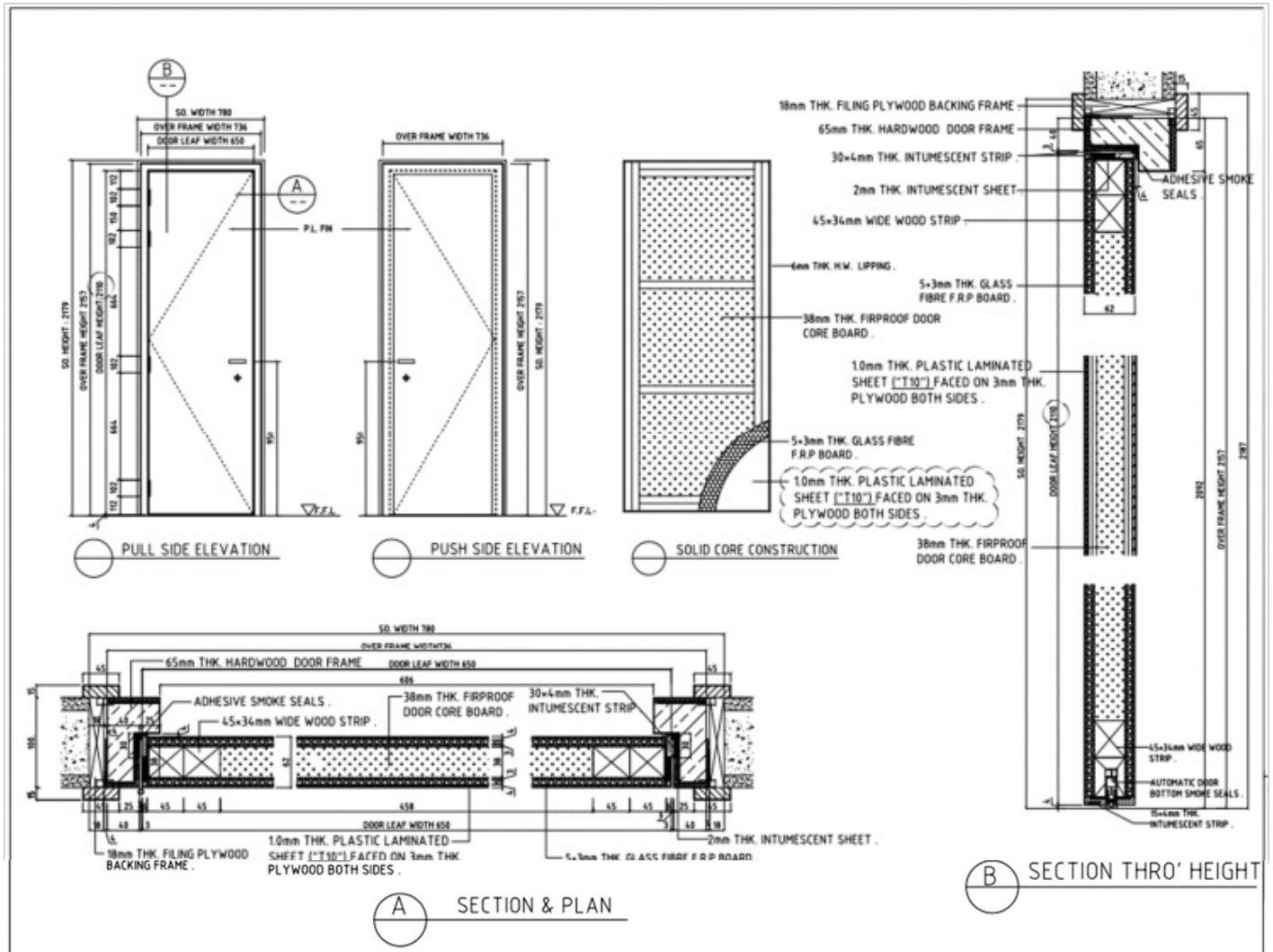
DOOR MARK	LOCATION	DOOR SIZE	DOOR MATERIAL FINISH		FRAME		ARCHITRAVE		FIRE RATE (HOUR)
			INSIDE(PULL SIDE)	OUTSIDE (PUSH SIDE)	MAT.	FIN.	MAT.	FIN.	
FD2	PAU & FAN ROOM,LINEN ROOM	900×2060×50	1.0mm THK. PLASTIC LAMINATED SHEET ("T10") ON 5mm THK. PLYWOOD BONDED	1.0mm THK. PLASTIC LAMINATED SHEET ("T10") ON 5mm THK. PLYWOOD BONDED	H.W	PAINTED TO MATCH PLASTIC LAMINATED SHEET.	H.W	PAINTED TO MATCH PLASTIC LAMINATED SHEET.	50mm THICK SOLID CORE DOOR WITH 1 HOUR F.R.P.

D8-c. Solid core double door with 1 hr FRP



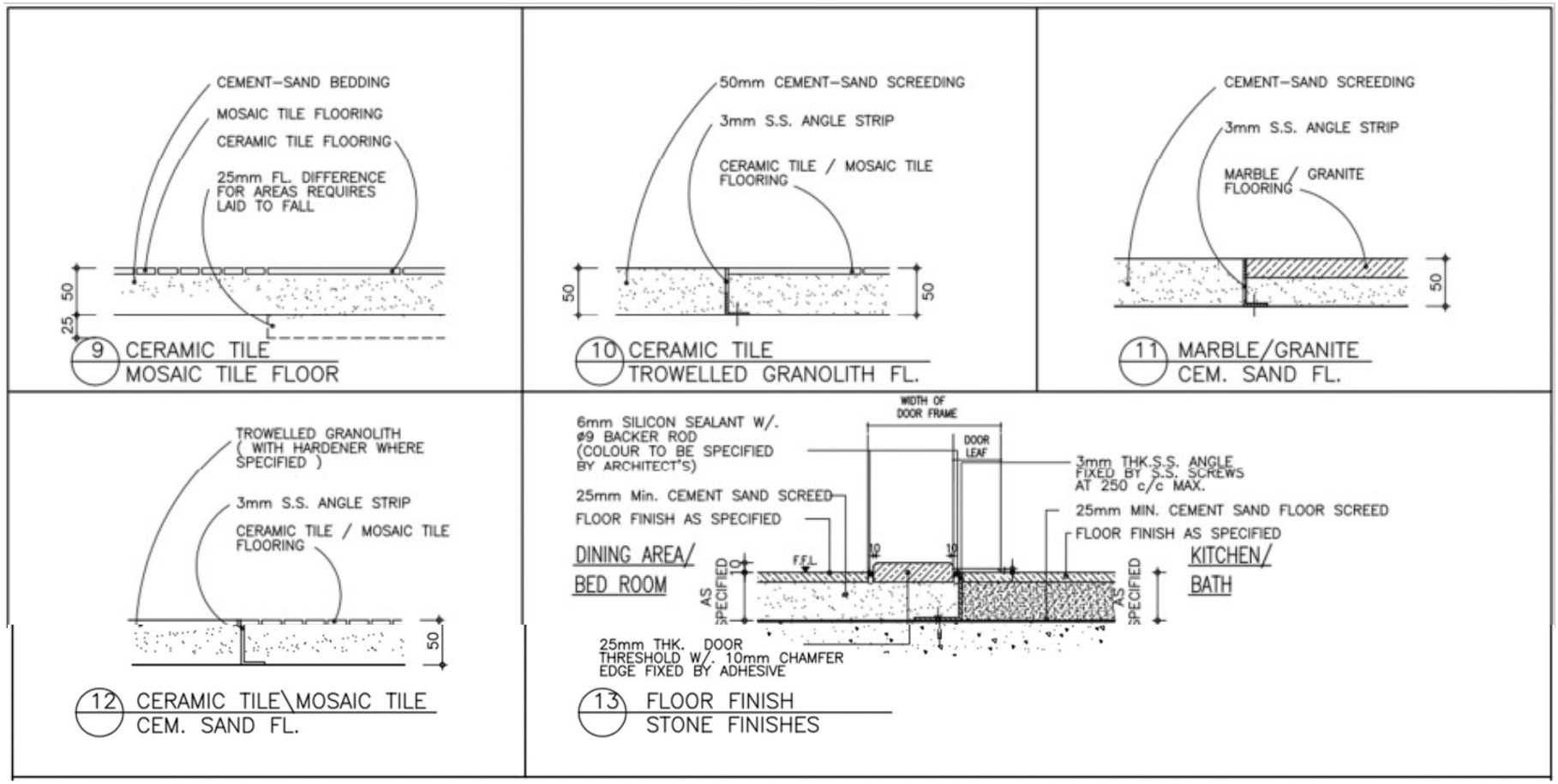
DOOR MARK	LOCATION	DOOR SIZE	DOOR MATERIAL FINISH		FRAME		ARCHITRAVE		FIRE RATE (HOUR)
			INSIDE(PULL SIDE)	OUTSIDE (PUSH SIDE)	MAT.	FIN.	MAT.	FIN.	
FD3	TYPICAL FLOOR LIFT LOBBY	(900+400)×2130×50	1.0mm THK. PLASTIC LAMINATED SHEET ["T10"] BONDED ON 3mm THK. PLYWOOD	1.0mm THK. PLASTIC LAMINATED SHEET ["T10"] BONDED ON 3mm THK. PLYWOOD	H.W	PAINTED TO MATCH PLASTIC LAMINATED SHEET.	H.W	PAINTED TO MATCH PLASTIC LAMINATED SHEET.	50mm THICK SOLID CORE DOOR WITH 1 HOUR F.R.P.

D8-d. Solid core door with 2 hr FRP



DOOR MARK	LOCATION	DOOR SIZE	DOOR MATERIAL FINISH		FRAME		ARCHITRAVE		FIRE RATE (HOUR)
			INSIDE(PULL SIDE)	OUTSIDE (PUSH SIDE)	MAT.	FIN.	MAT.	FIN.	
FD4	3/F TO 7/F ELECTRLC ROOM	650×2110×62	1.0mm THK. PLASTIC LAMINATED SHEET ("T10") BONDED ON 3mm THK. PLYWOOD	1.0mm THK. PLASTIC LAMINATED SHEET ("T10") BONDED ON 3mm THK. PLYWOOD	H.W	PAINTED TO MATCH PLASTIC LAMINATED SHEET.	H.W	PAINTED TO MATCH PLASTIC LAMINATED SHEET.	62mm THICK SOLID CORE DOOR WITH 2 HOURS F.R.P

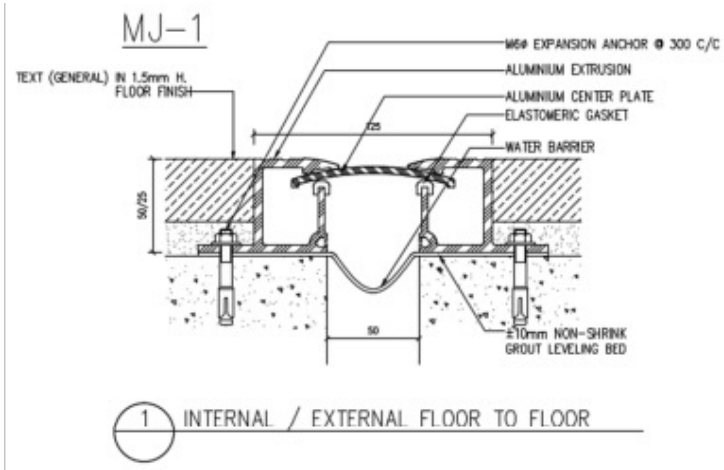
D9-a. Dividing Stripes for Floor Finishes

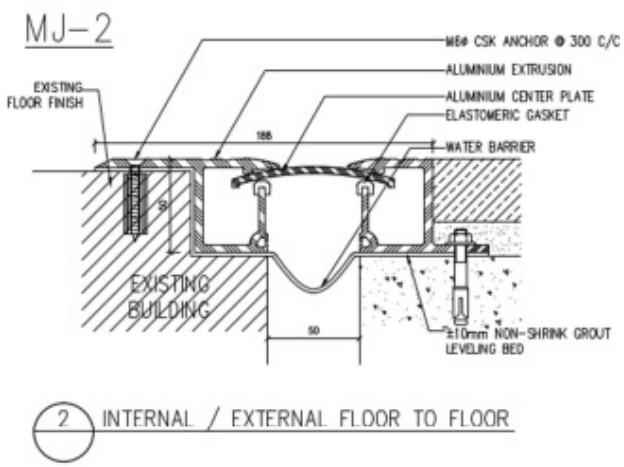


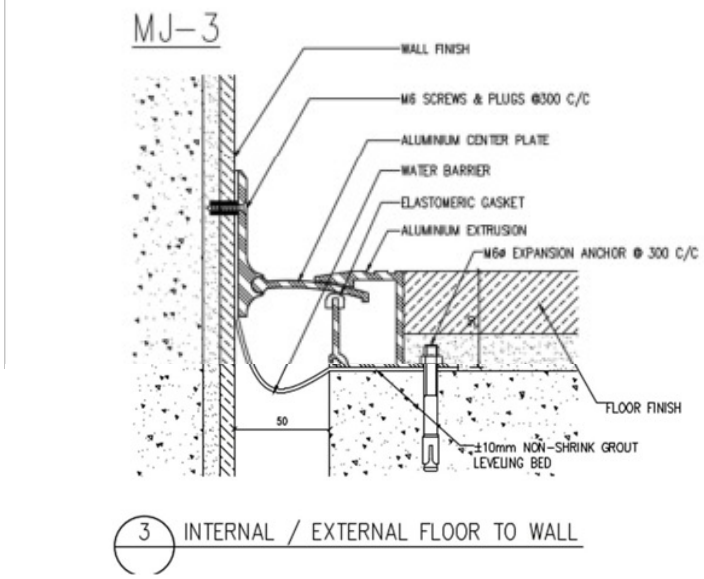
D9-b. Movement Joints

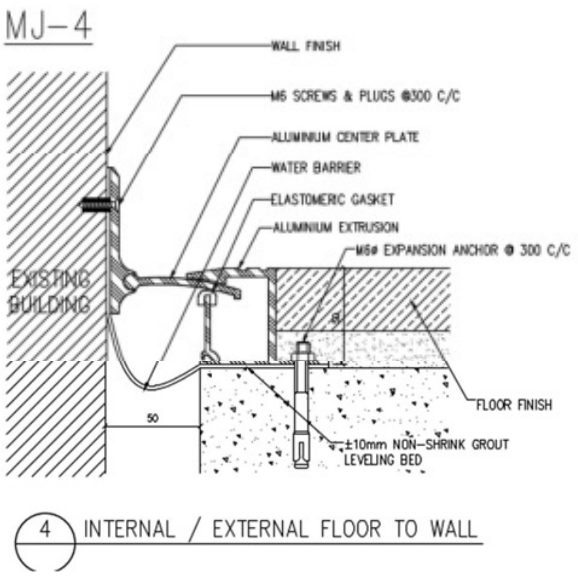
Note: Different forms of expansion joints can be seen in the reference literature.

Different context for the external expansion joint:

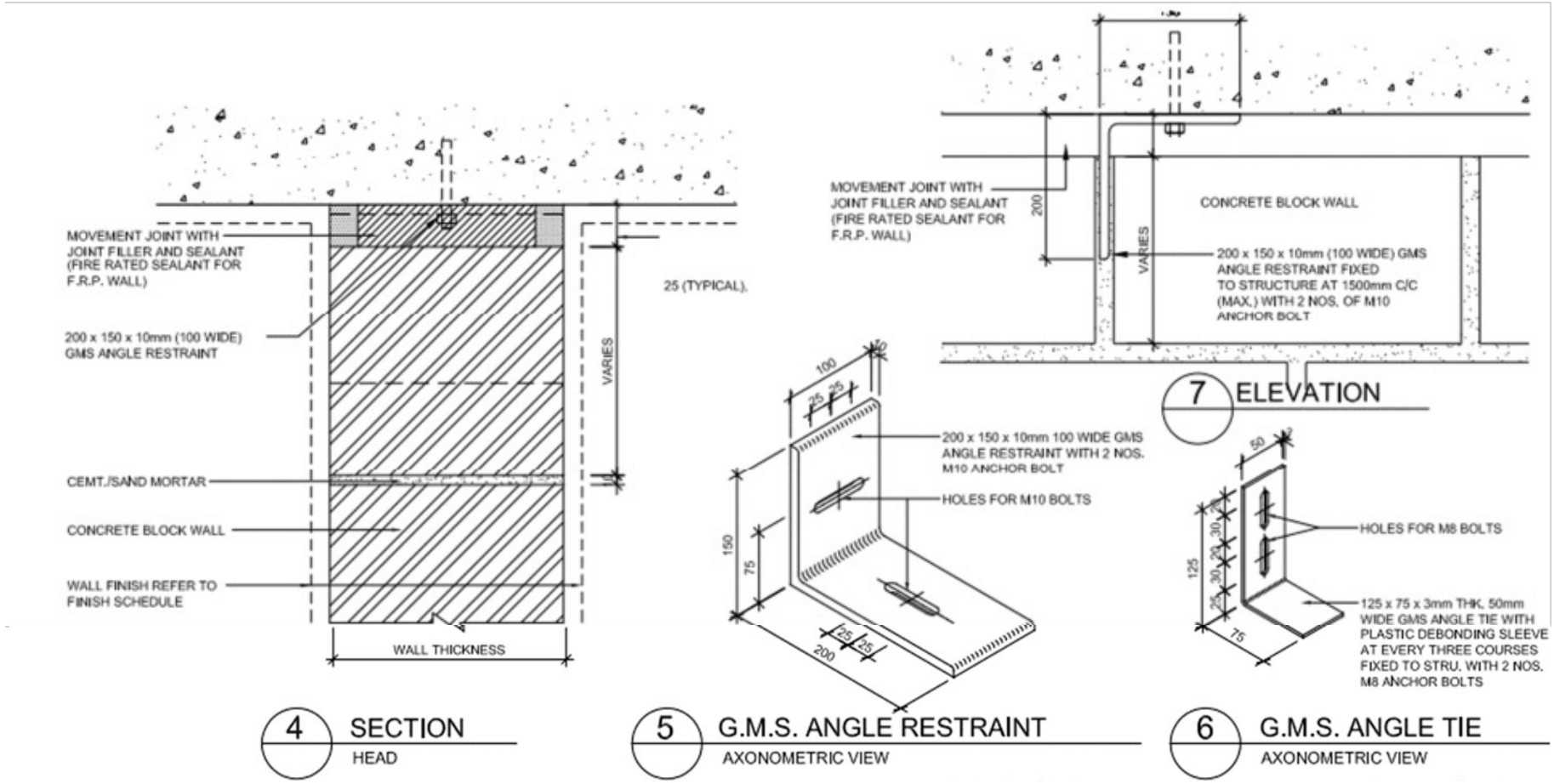




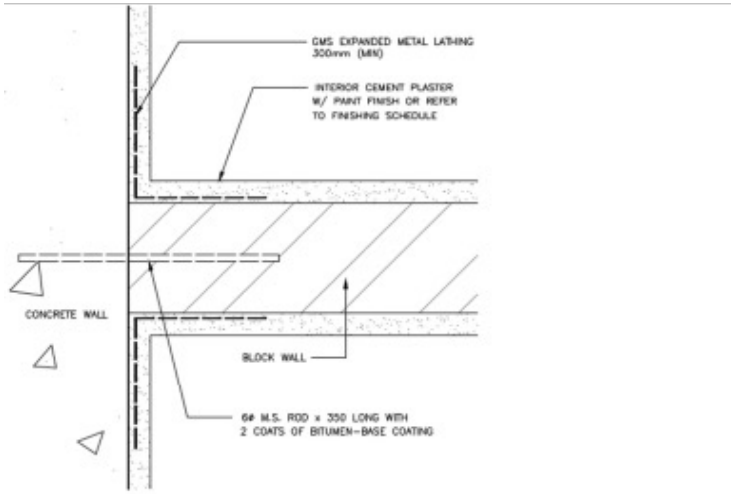




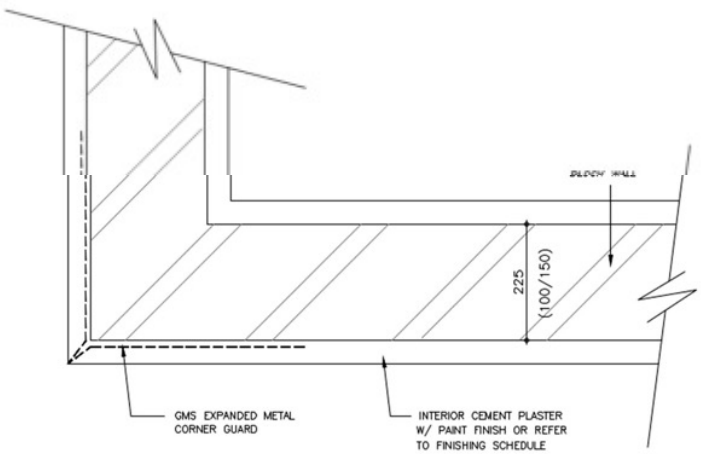
Example of Movement Joint for Top of Concrete Block Wall



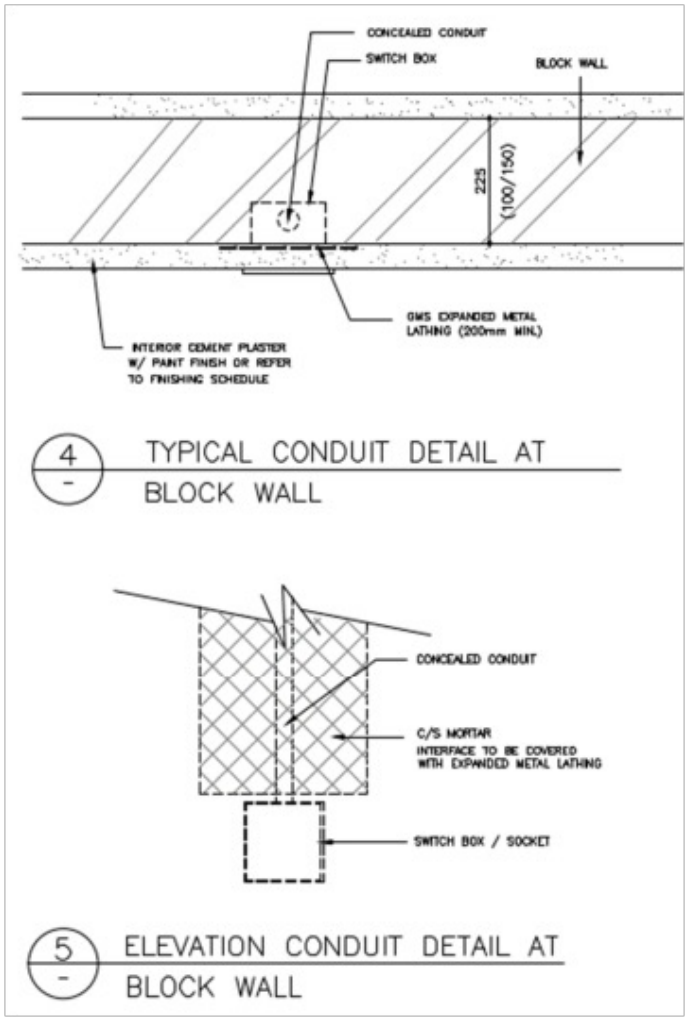
D10-a. Corner Guard for Block Work



1 - TYPICAL PLAN OF JUNCTION BETWEEN CONCRETE WALL & BLOCK WALL



6 - TYPICAL CORNER GUARD AT BLOCK WALL

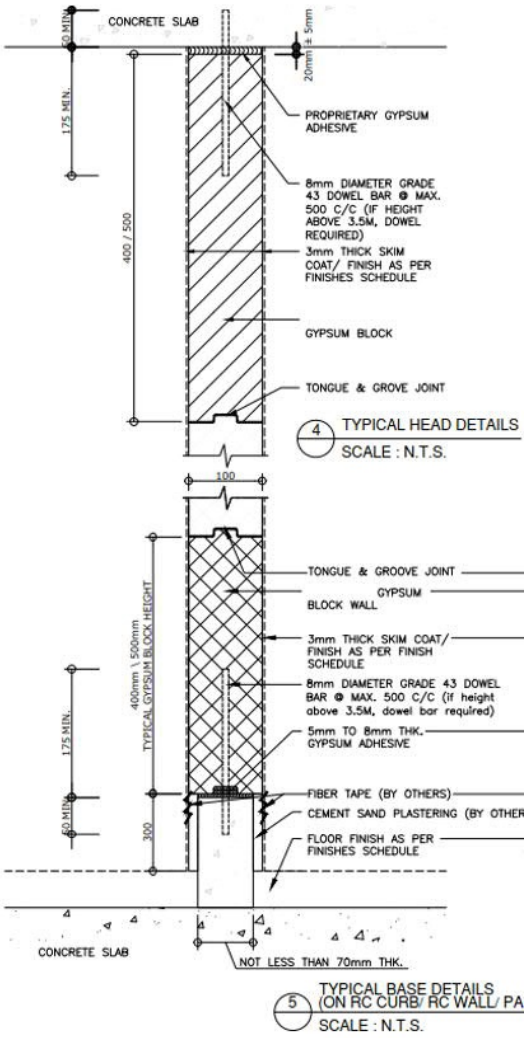


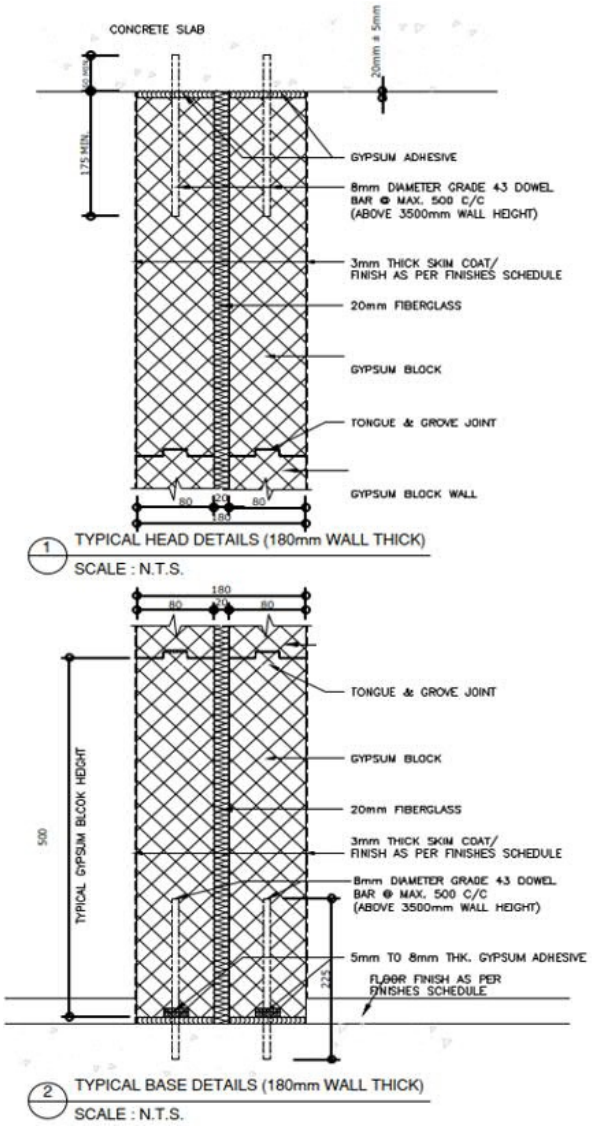
4 - TYPICAL CONDUIT DETAIL AT BLOCK WALL

5 - ELEVATION CONDUIT DETAIL AT BLOCK WALL

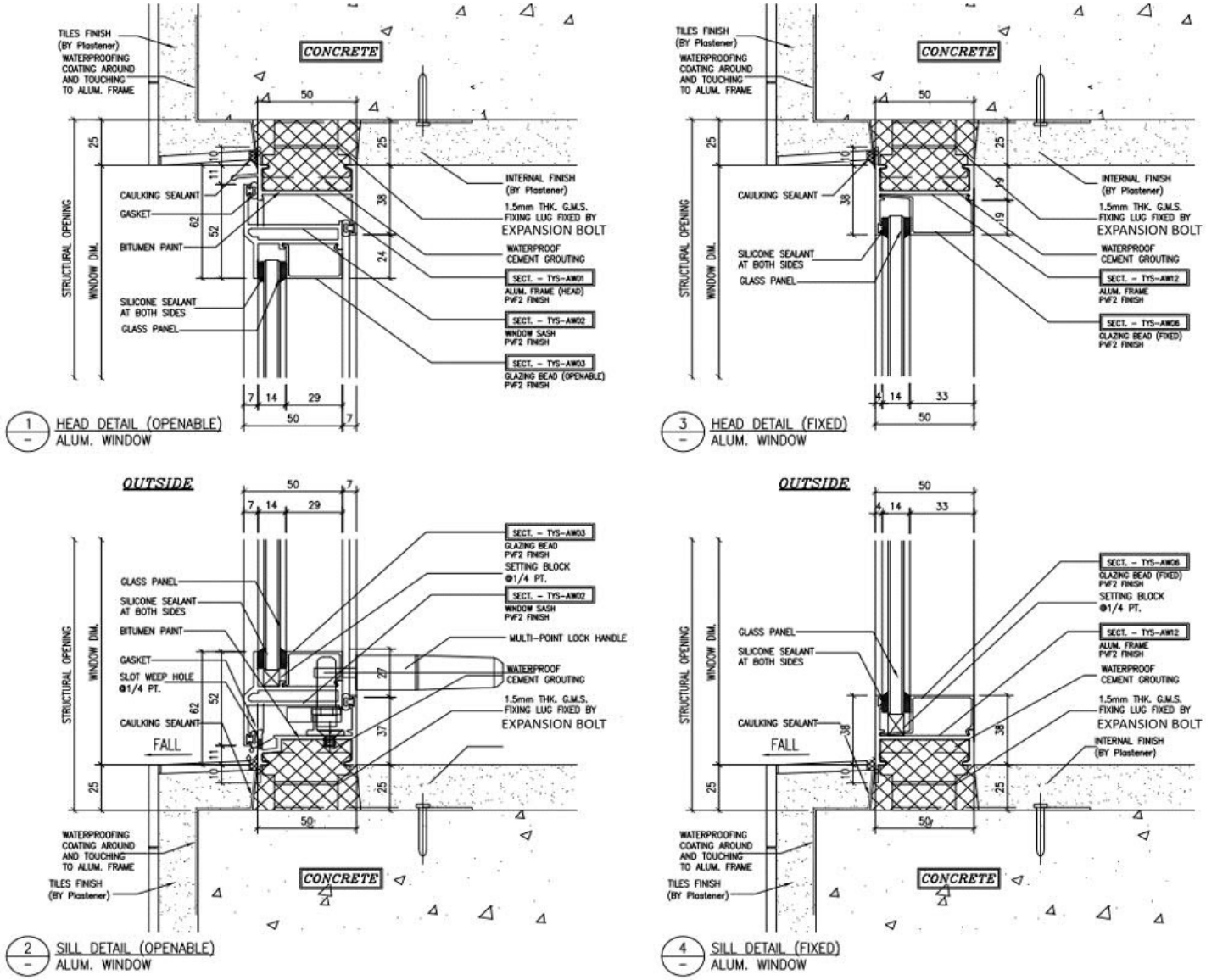
D10-b. Gypsum Block Wall

Gypsum block is a light weight, fire resisting material good for internal partitions.

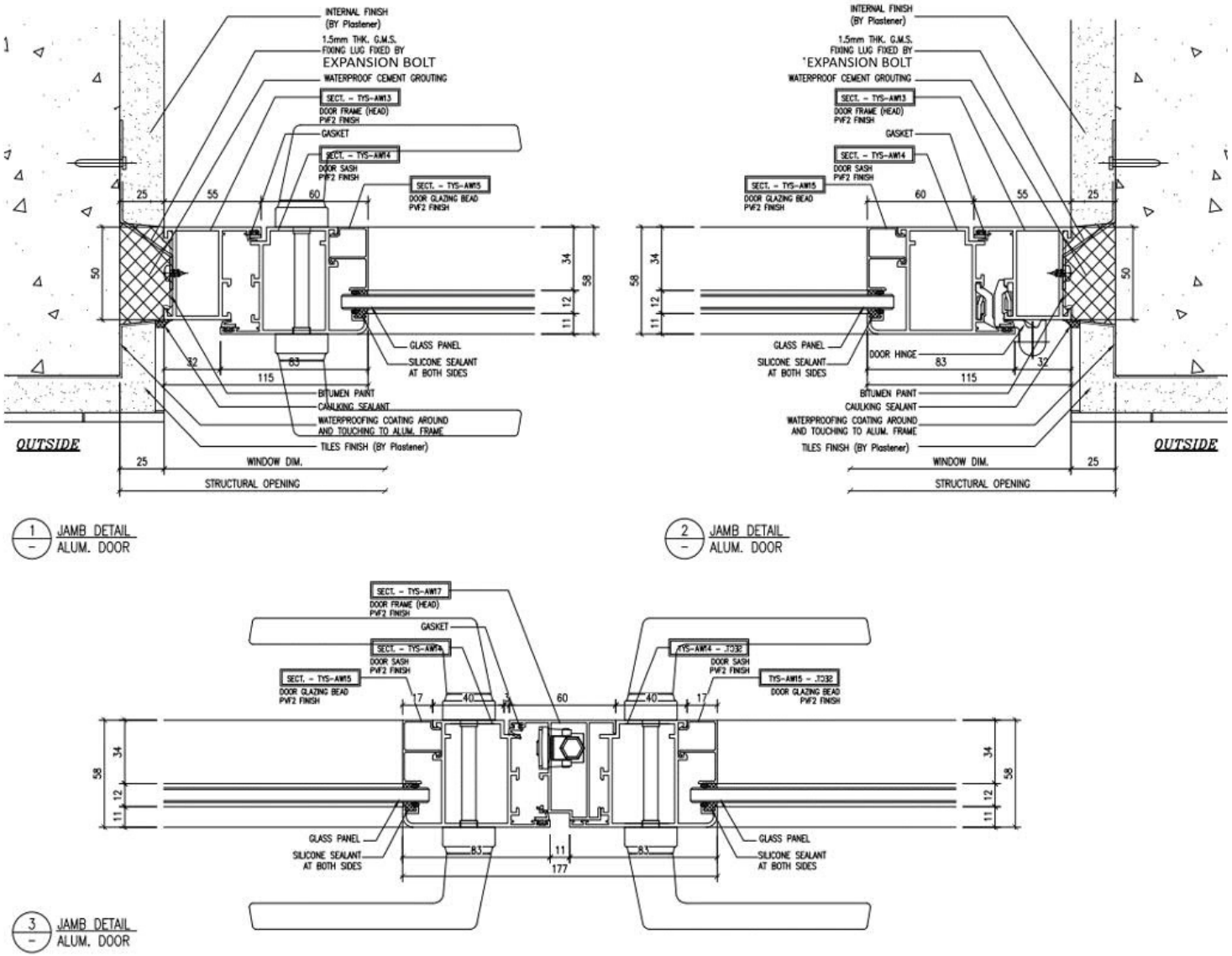




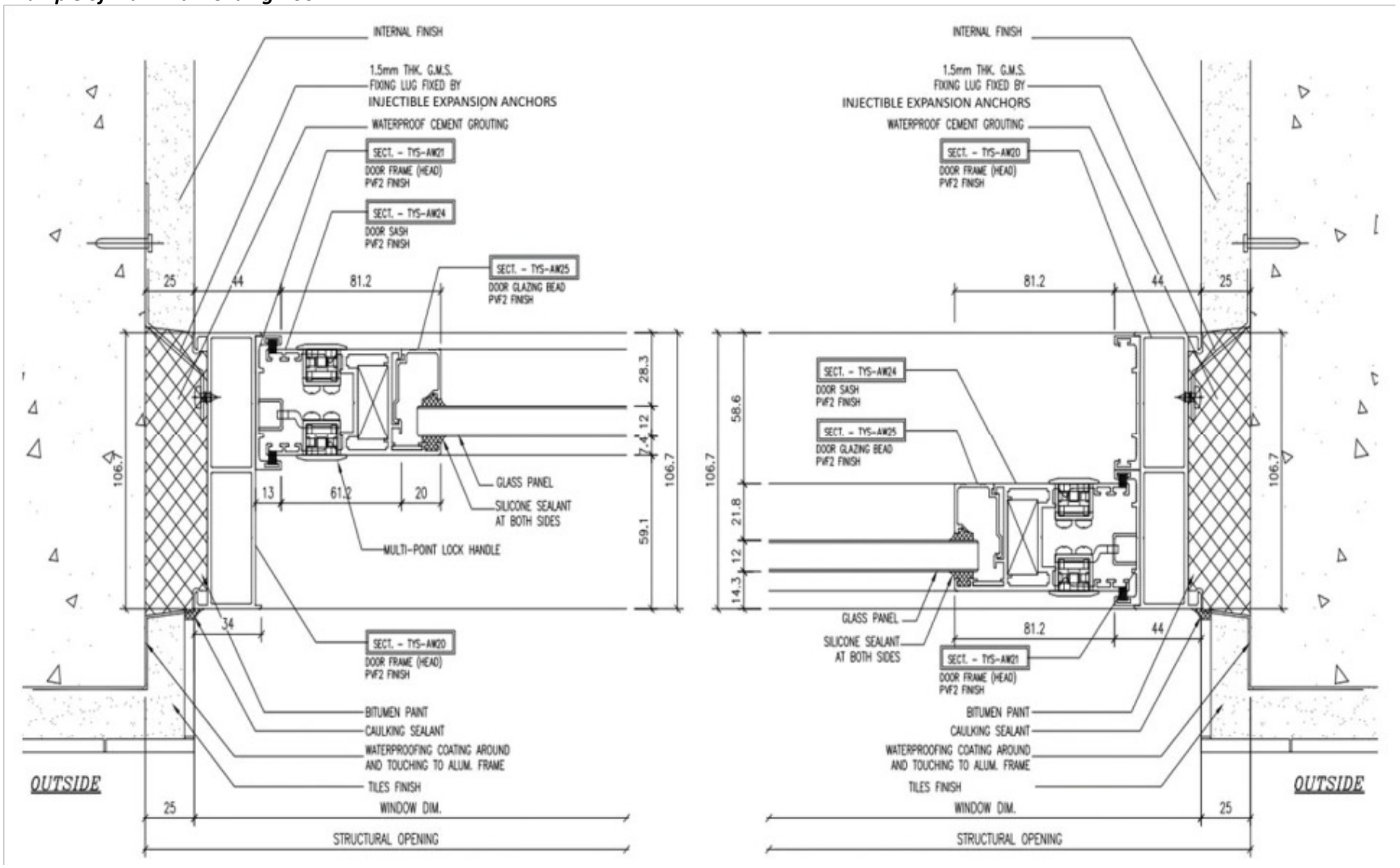
E3-a. Aluminium Windows



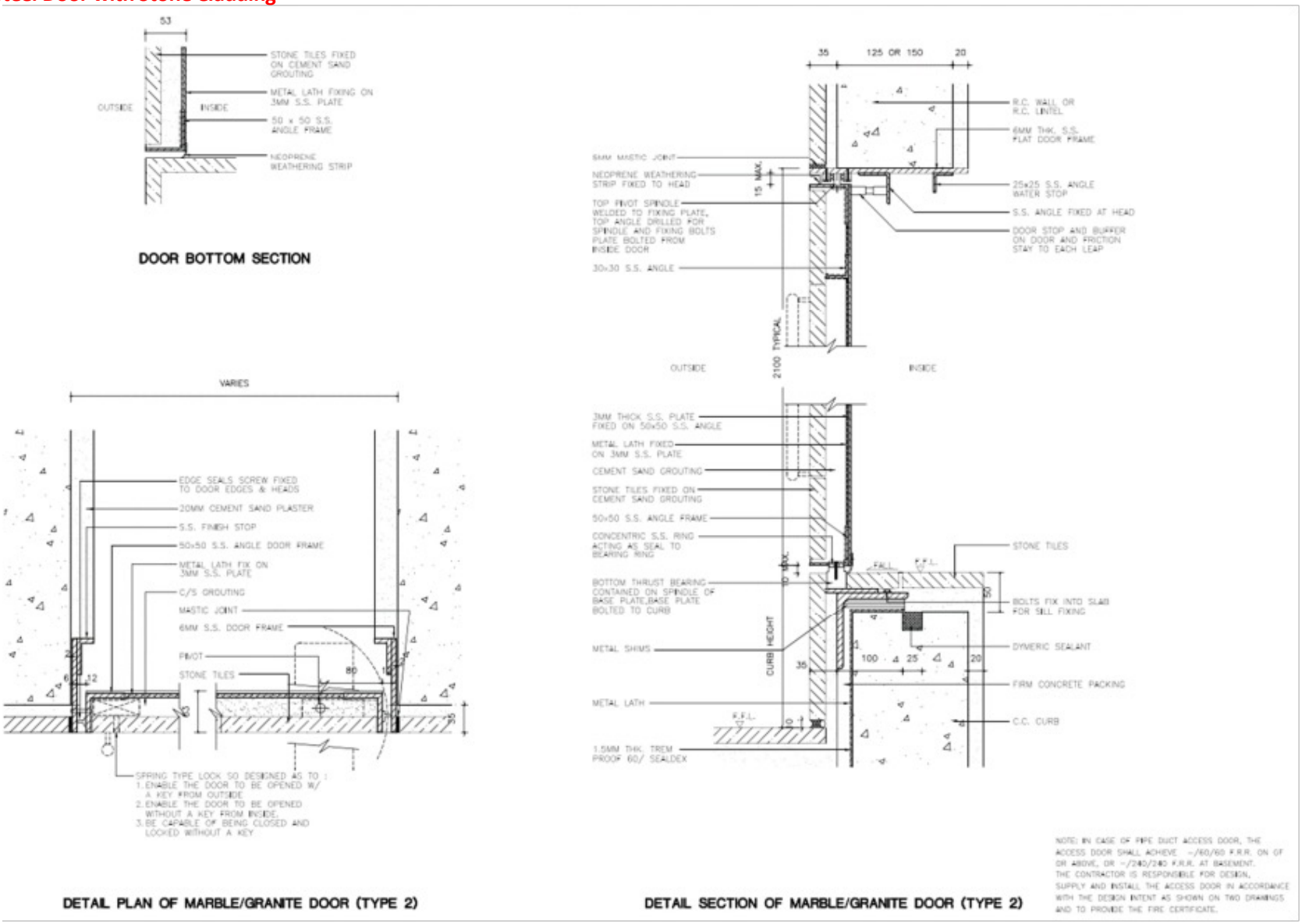
E3-b. Aluminium Door



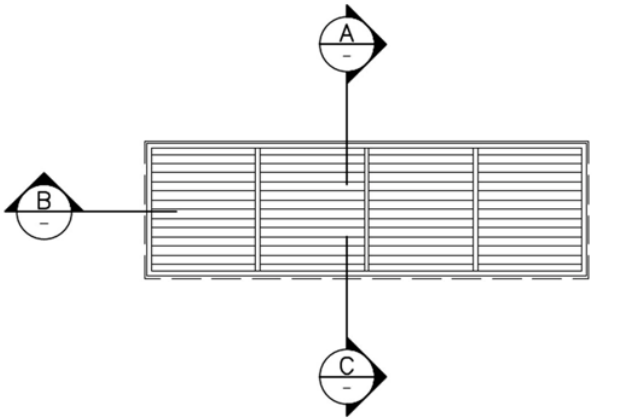
Example of Aluminium Sliding Door

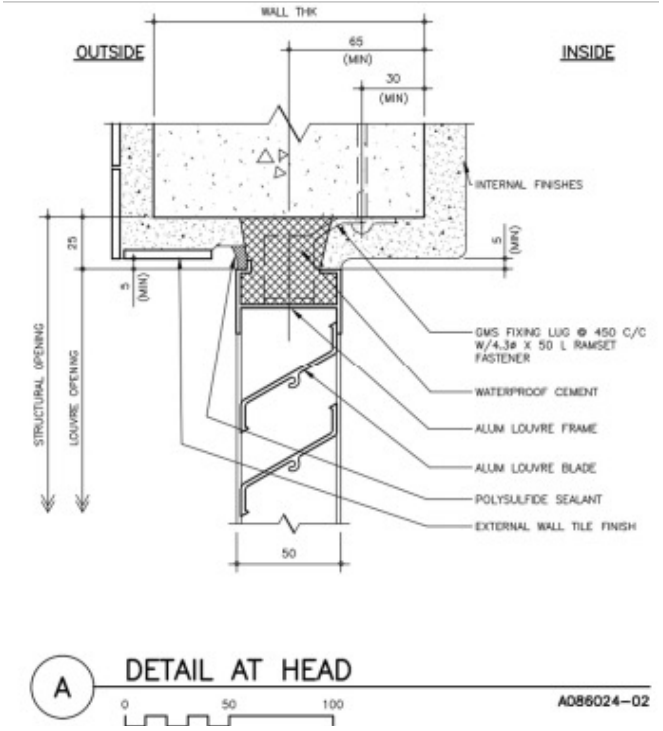


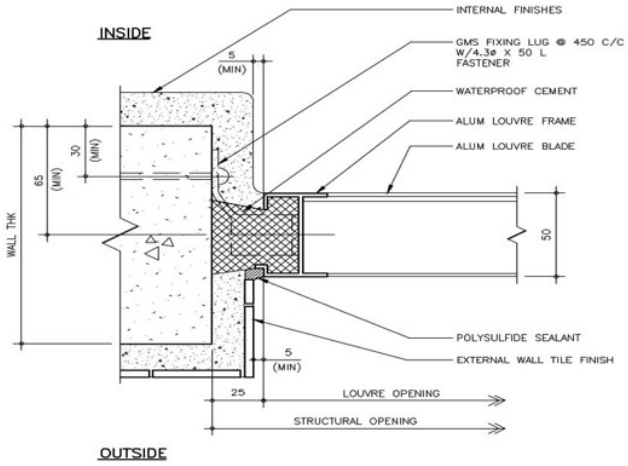
F2-a. Steel Door with Stone Cladding

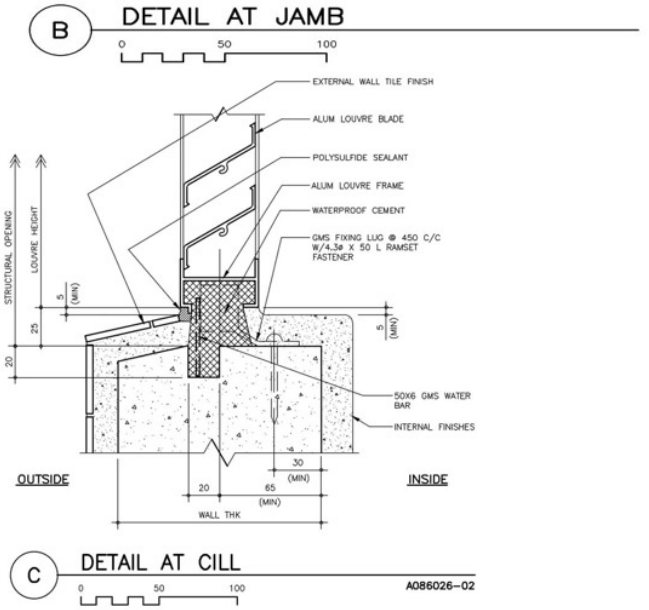


F2-b. Metal Louvre

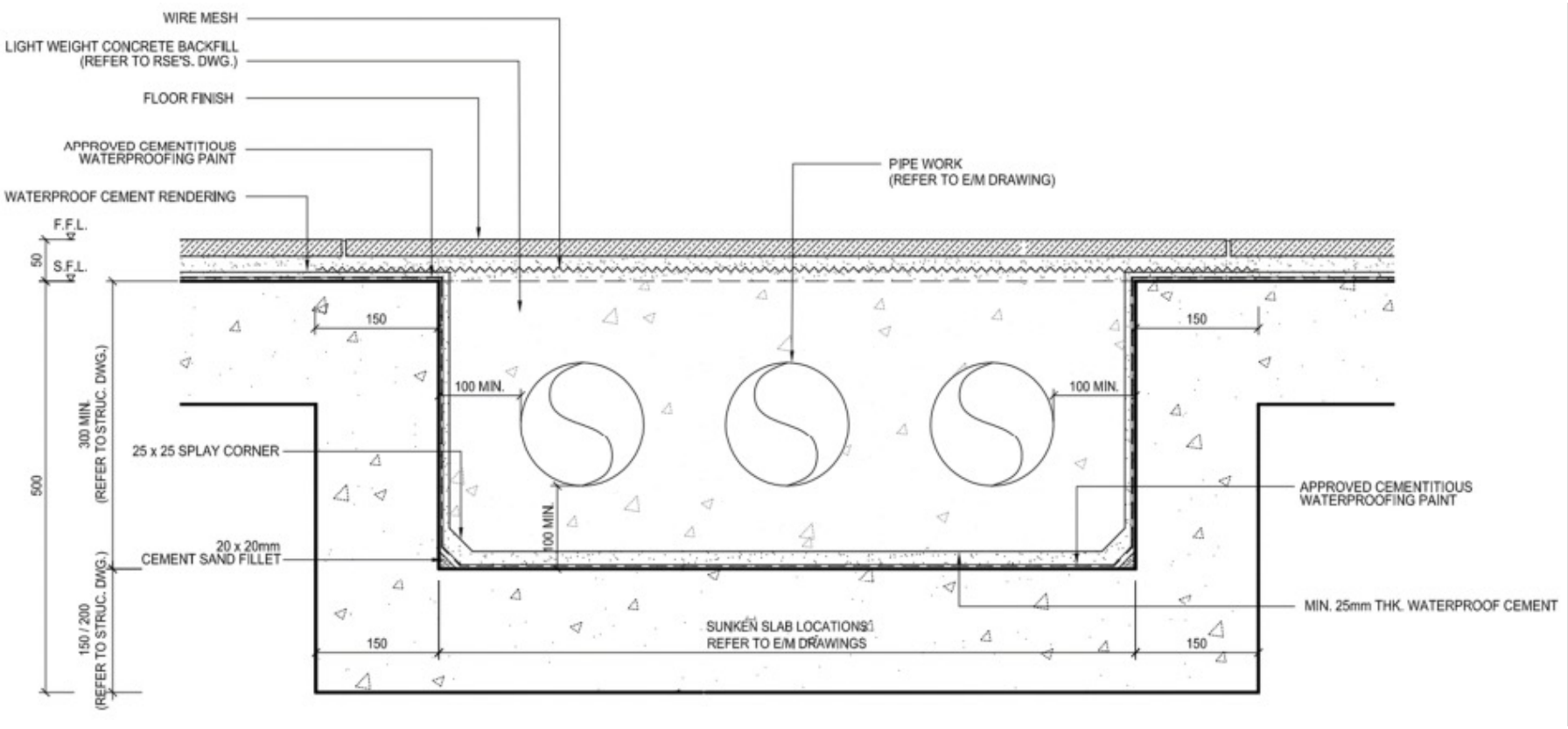




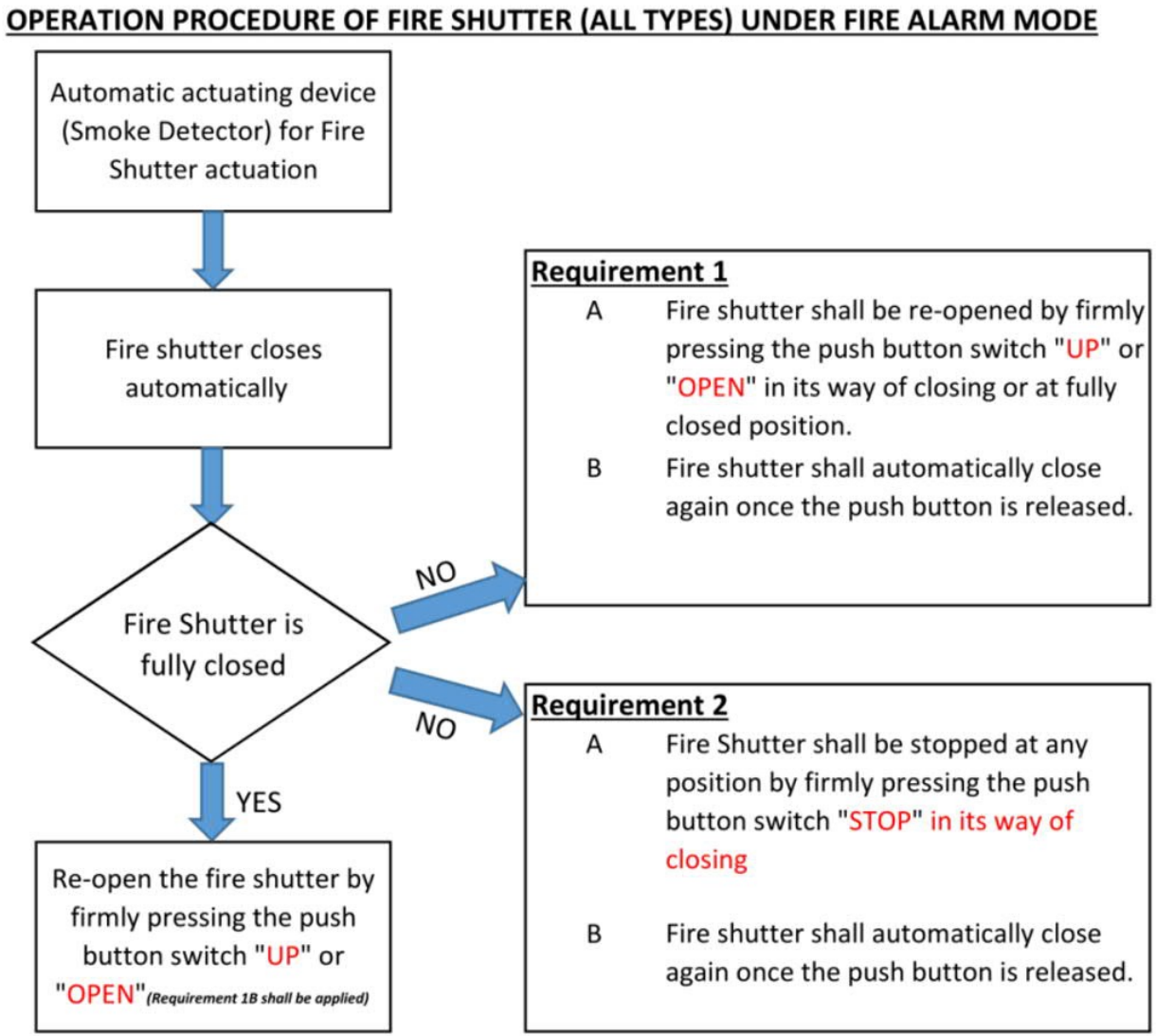


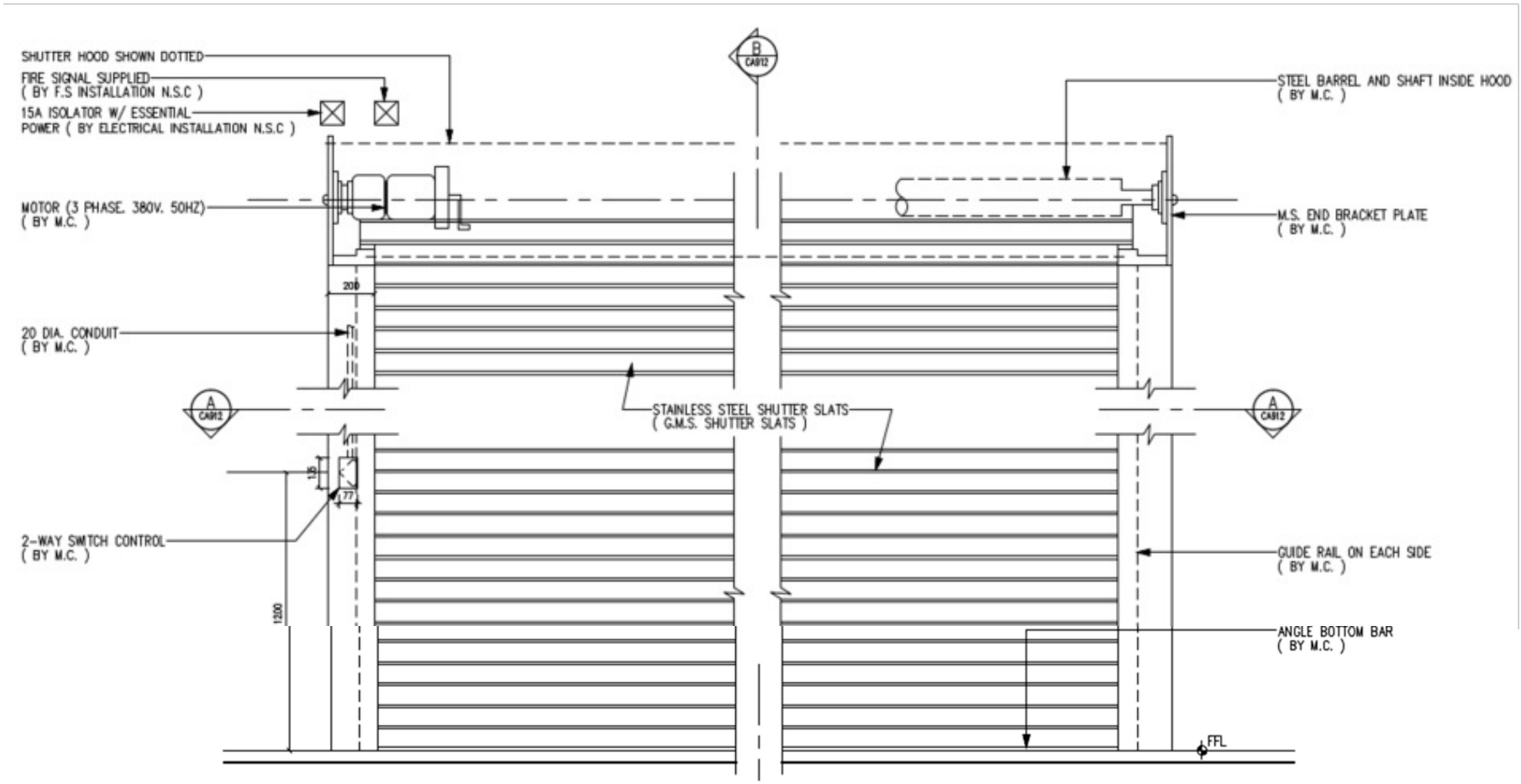


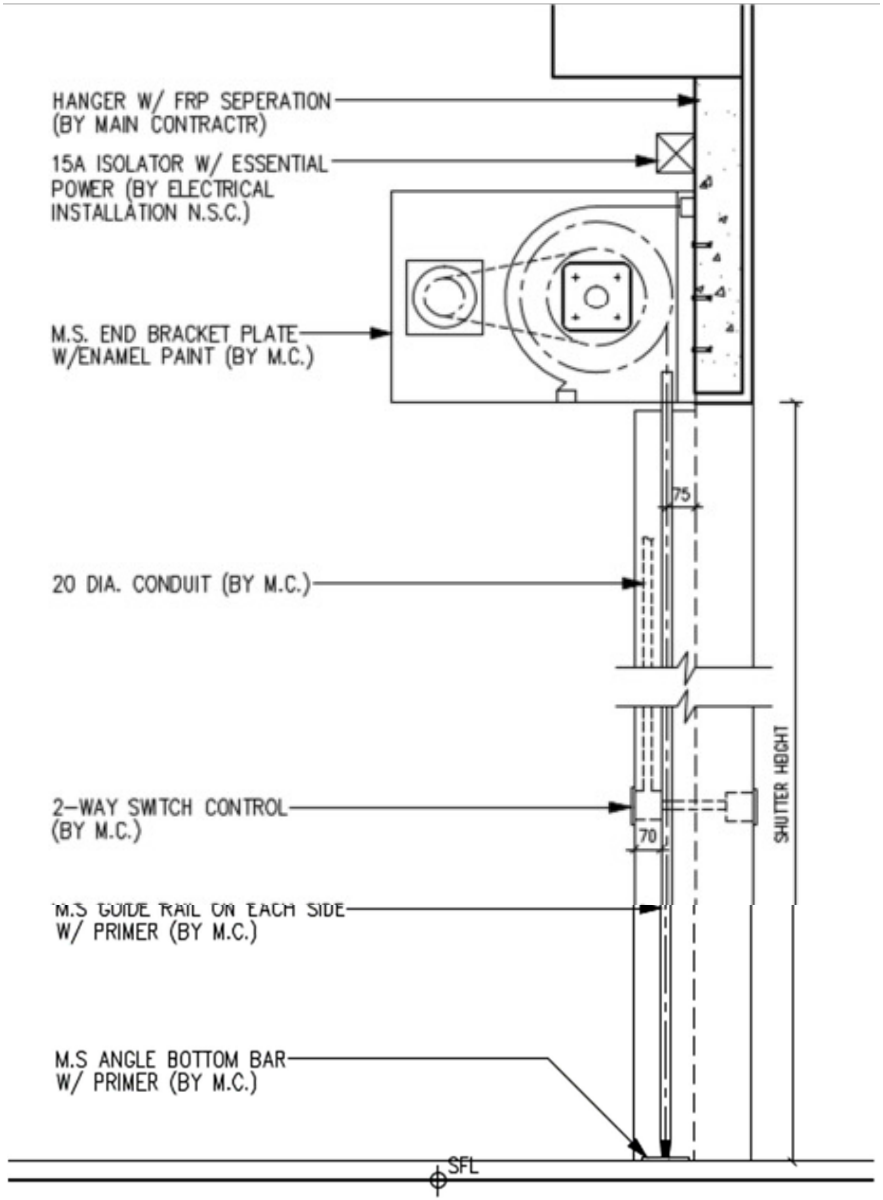
F2-c. Pipework in Sunken Slab



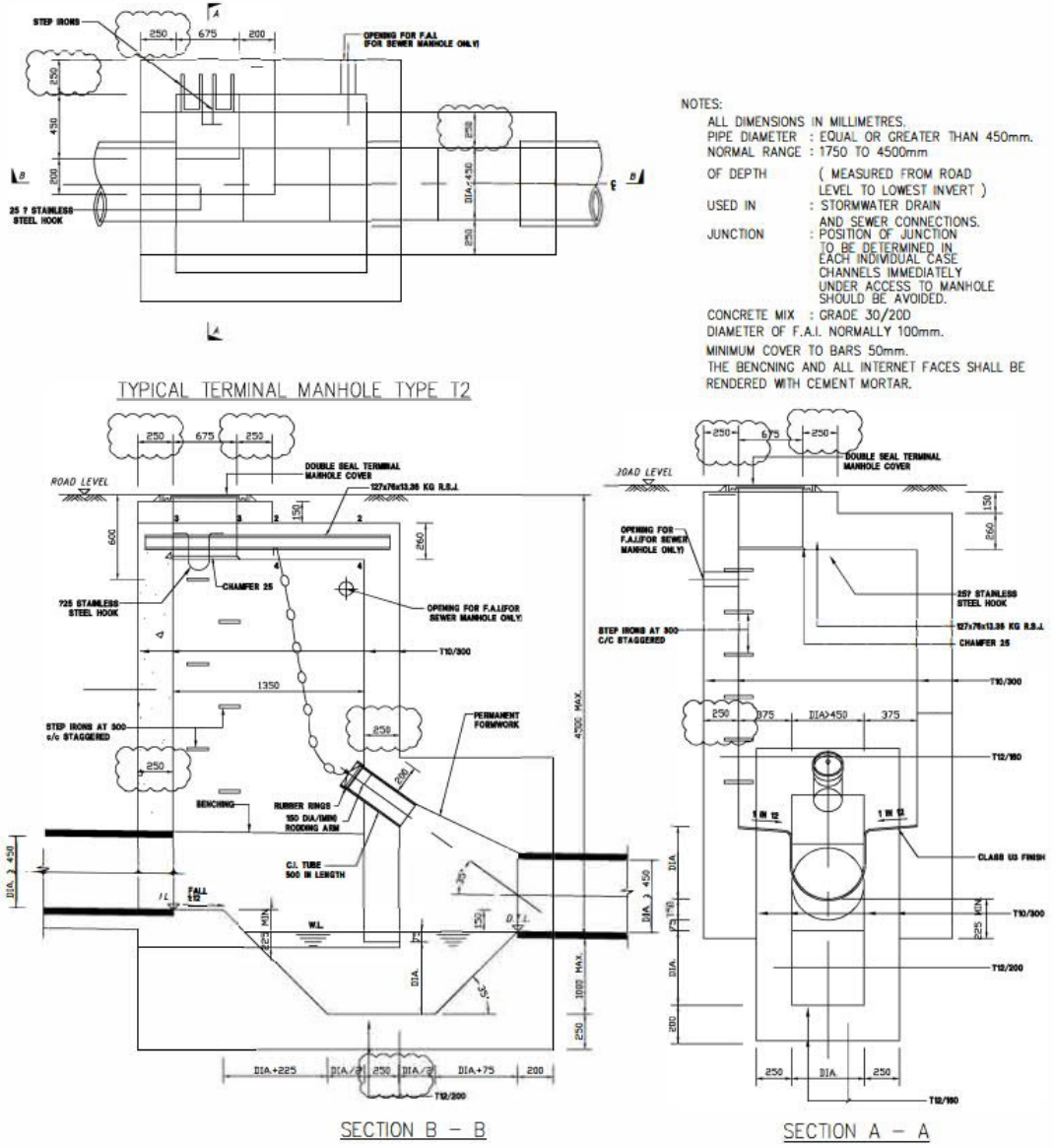
F3-a. Fire Shutters

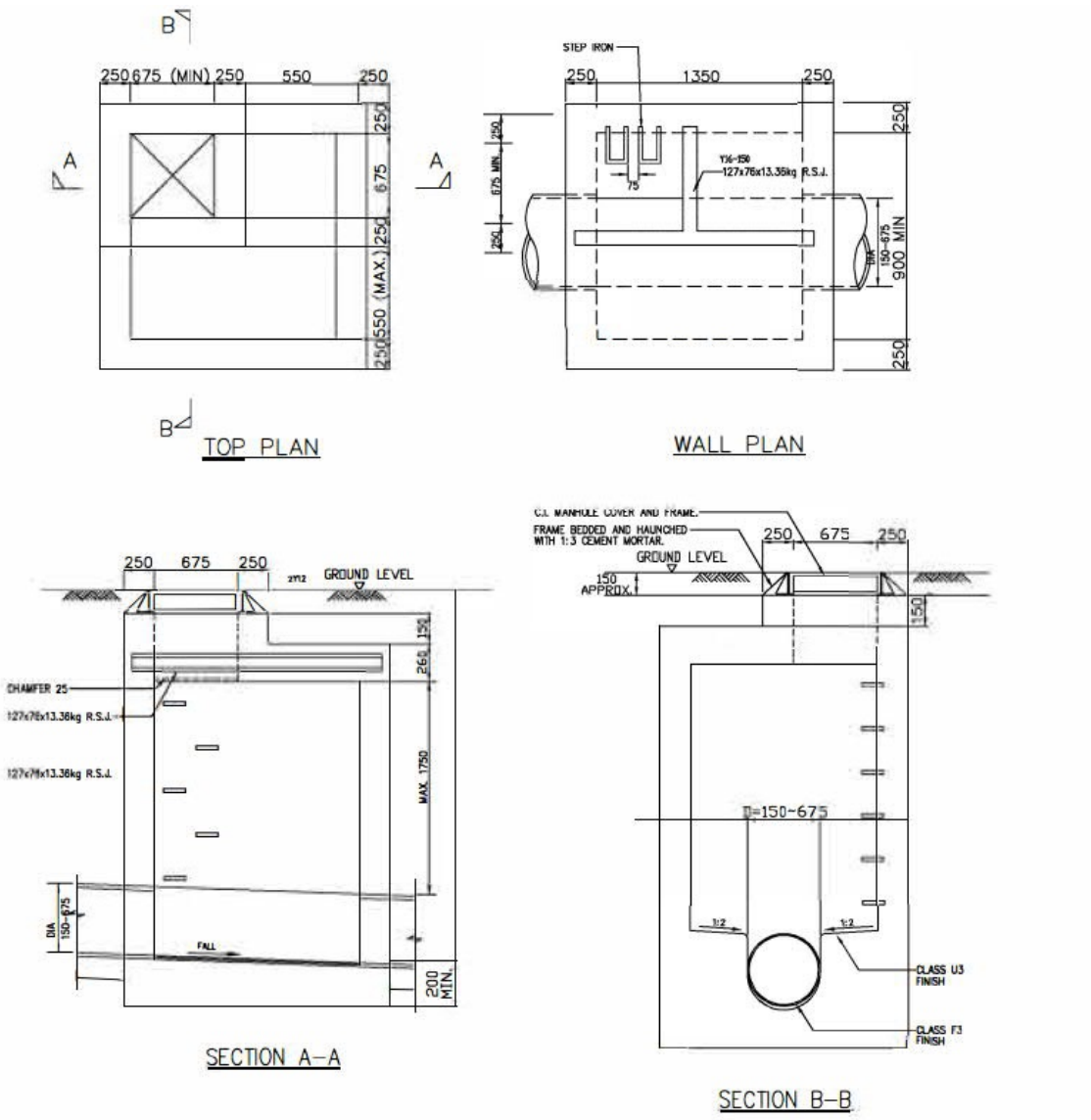



SHUTTER HOOD SHOWN DOTTED
FIRE SIGNAL SUPPLIED
(BY F.S INSTALLATION N.S.C)
15A ISOLATOR W/ ESSENTIAL
POWER (BY ELECTRICAL INSTALLATION N.S.C)
MOTOR (3 PHASE. 380V. 50HZ)
(BY M.C.)
20 DIA. CONDUIT
(BY M.C.)
2-WAY SWITCH CONTROL
(BY M.C.)
B
CA912
A
CA912
STAINLESS STEEL SHUTTER SLATS
(G.M.S. SHUTTER SLATS)
STEEL BARREL AND SHAFT INSIDE HOOD
(BY M.C.)
M.S. END BRACKET PLATE
(BY M.C.)
GUIDE RAIL ON EACH SIDE
(BY M.C.)
ANGLE BOTTOM BAR
(BY M.C.)
FFL
200
1200
77


HANGER W/ FRP SEPERATION
(BY MAIN CONTRACTR)
15A ISOLATOR W/ ESSENTIAL
POWER (BY ELECTRICAL
INSTALLATION N.S.C.)
M.S. END BRACKET PLATE
W/ENAMEL PAINT (BY M.C.)
75
20 DIA. CONDUIT (BY M.C.)
SHUTTER HEIGHT
2-WAY SWITCH CONTROL
(BY M.C.)
70
M.S GUIDE RAIL ON EACH SIDE
W/ PRIMER (BY M.C.)
M.S ANGLE BOTTOM BAR
W/ PRIMER (BY M.C.)
SFL

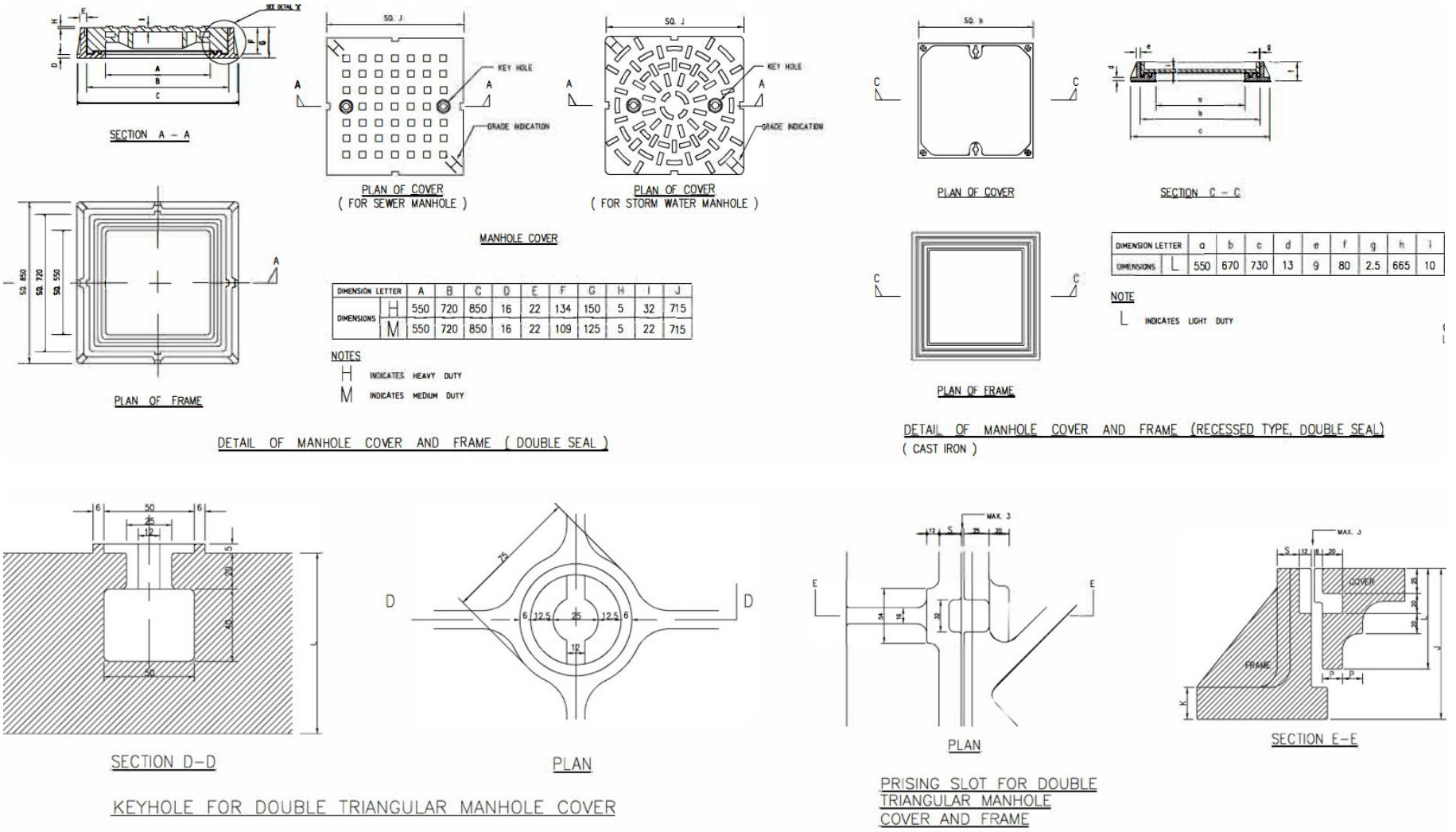
F4-a. Terminal Manhole Construction





TYPICAL MANHOLE DETAIL (TYPE E) (OUTSIDE LOT BOUNDARY)

F4-b. Cover for Manhole



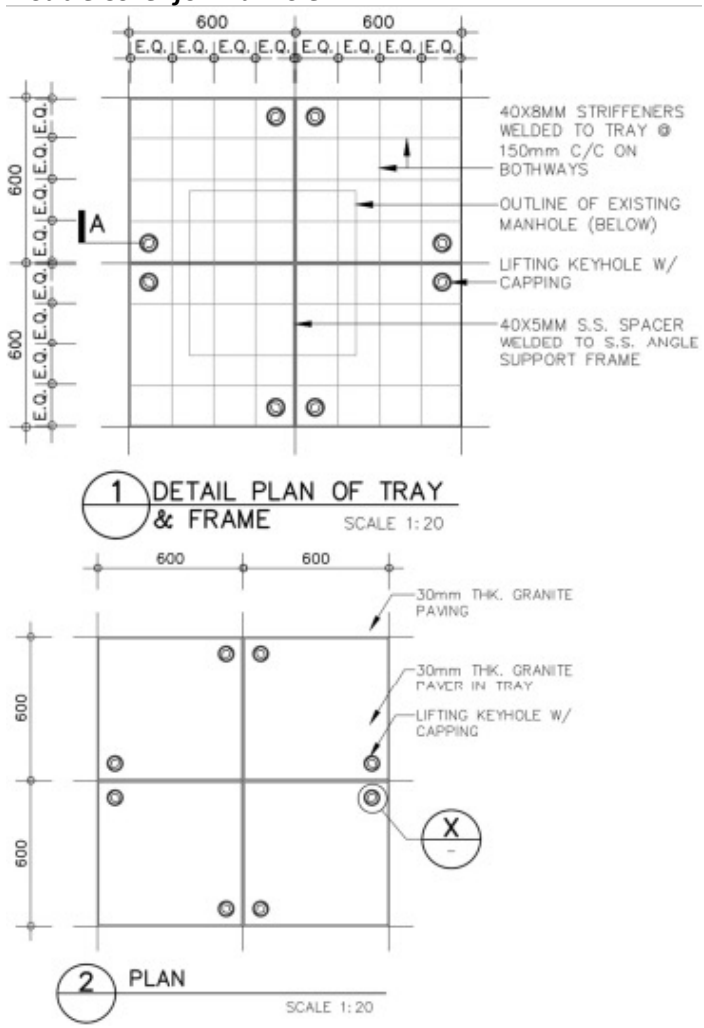
DIMENSION LETTER		A	B	C	D	E	F	G	H	I	J
DIMENSIONS	H	550	720	850	16	22	134	150	5	32	715
	M	550	720	850	16	22	109	125	5	22	715

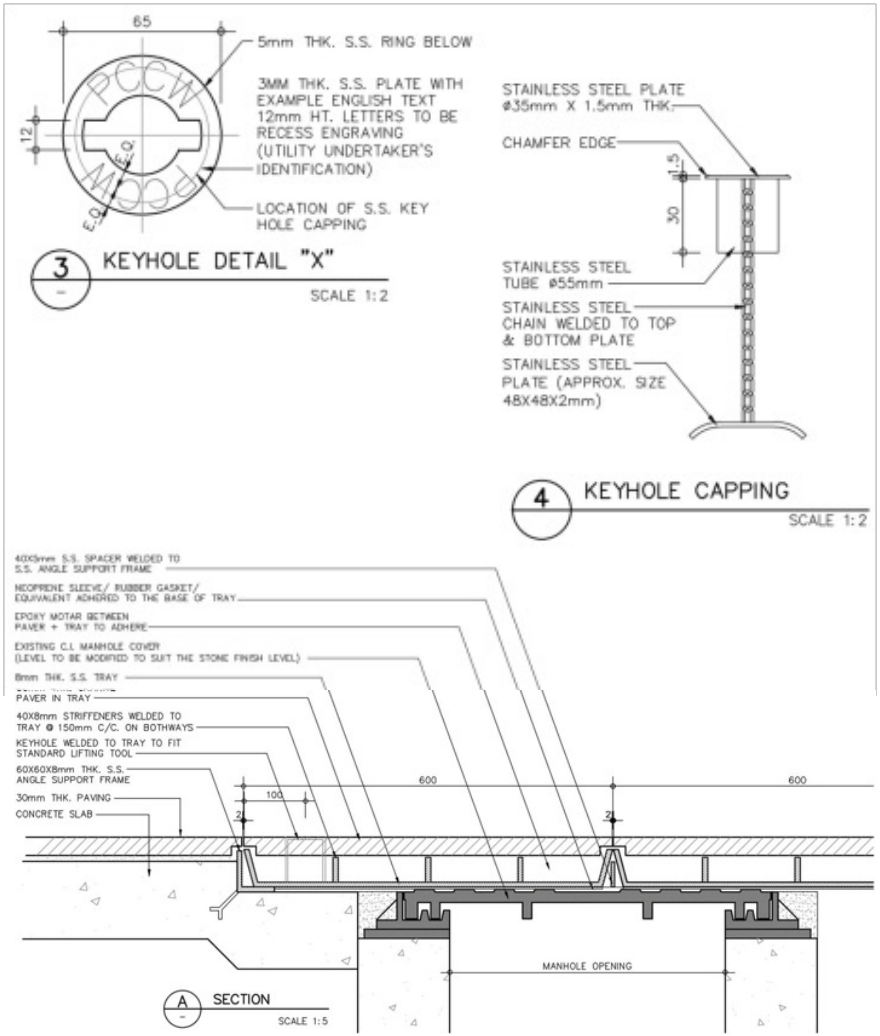
NOTES
H INDICATES HEAVY DUTY
M INDICATES MEDIUM DUTY

DIMENSION LETTER		a	b	c	d	e	f	g	h	i
DIMENSIONS	L	550	670	730	13	9	80	2.5	665	10

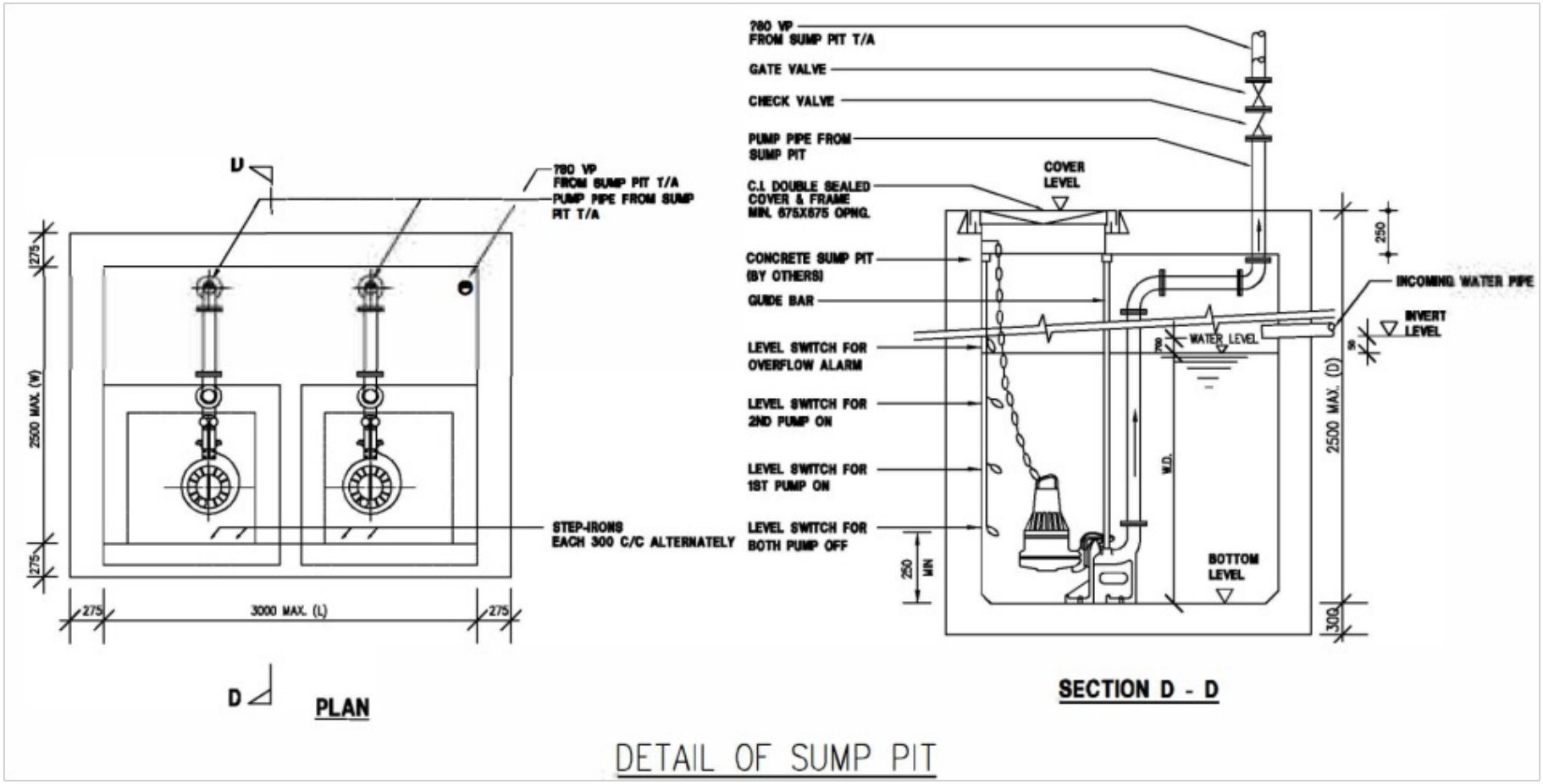
NOTE
L INDICATES LIGHT DUTY

Double Cover for Manhole





F4-c. Sump Pit Construction



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