

CW CODE SUMMARY

07.20.2018

ennead

CURTAIN WALL GOVERNMENT REVIEW AND INSPECTION MILESTONE

1. CW DD stage

Light pollution government review _ about 2 months from report preparing to get the result.

Light pollution consultant use EA SD elevation and masterplan drawings to produce the report.

CW safety government review _ about 3 months from drawing and report preparing to get the result.

CW consultant use EA DD curtain wall package to develop CW detail drawings for CW safety review.

2. CW CD stage

CW shop drawing government review

CW consultant use curtain wall tendering package to develop CW shop drawings.

3. Building completion & inspection

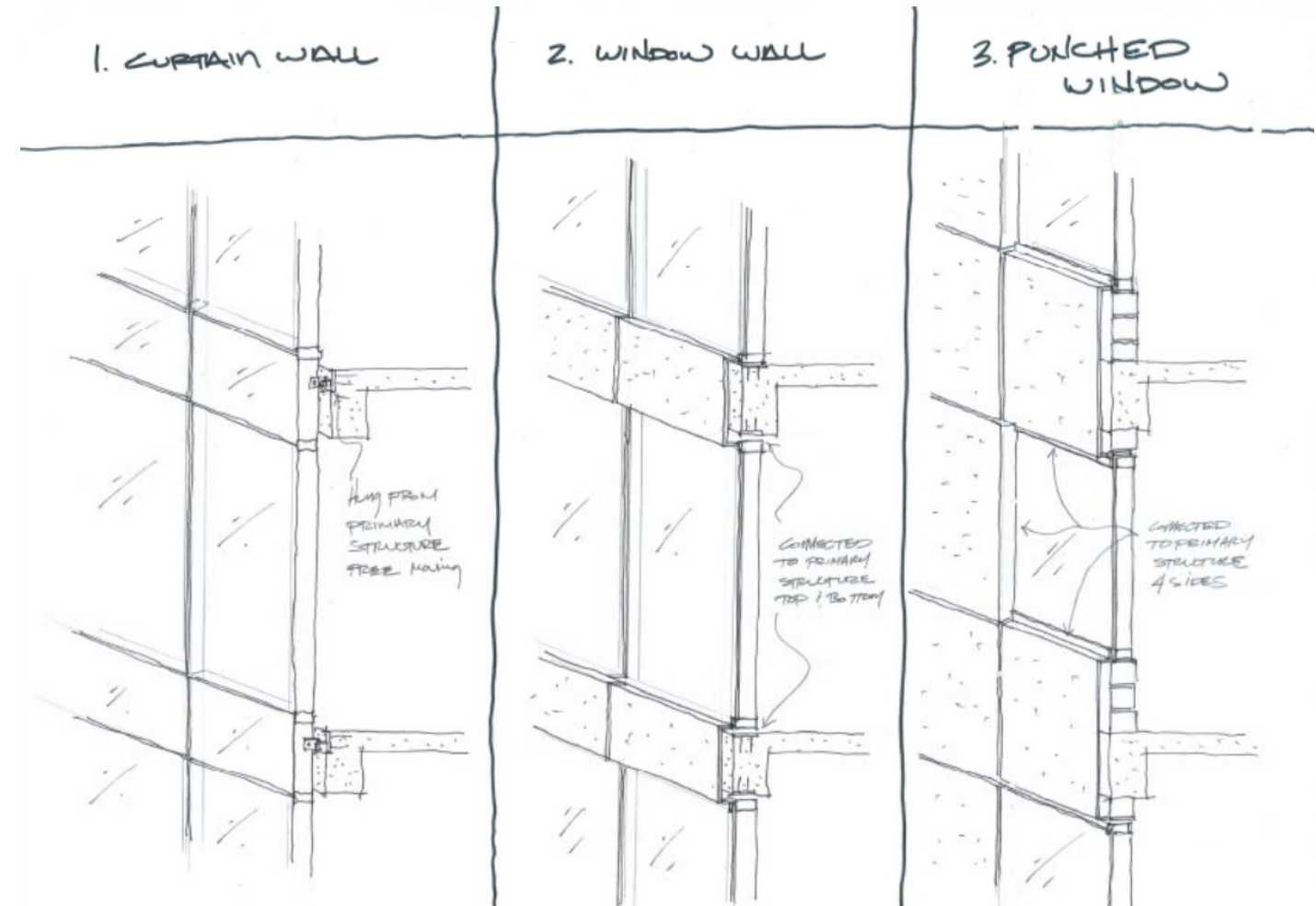
Government CW inspection and fire inspection

CURTAIN WALL & WINDOW WALL

Curtain wall system is hung from the primary structure, it can have free moving relatively to primary structure.

1. CW consists of frames and panel, and is independent to the primary structure
2. CW system will not withstand primary structure's loading
3. CW system can tolerate certain movement.
4. Structurally, CW transfer its weight and lateral wind loads to primary structure by anchoring points

Window wall system is connected to primary structure. TOP & BOTTOM or 4 SIDES. It transfers its weight and lateral wind loads direct to primary structure.

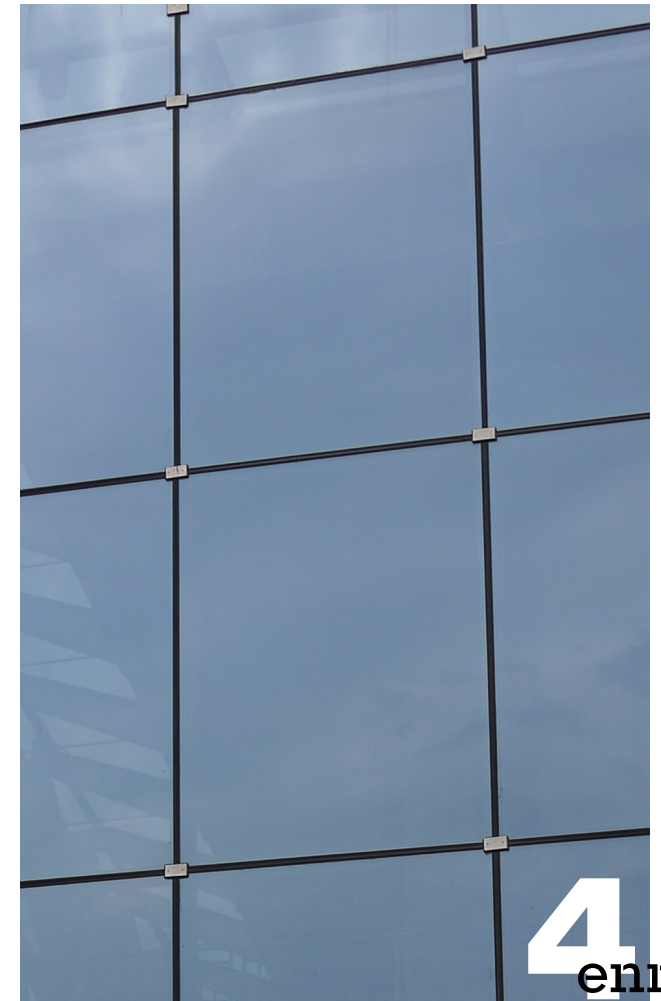
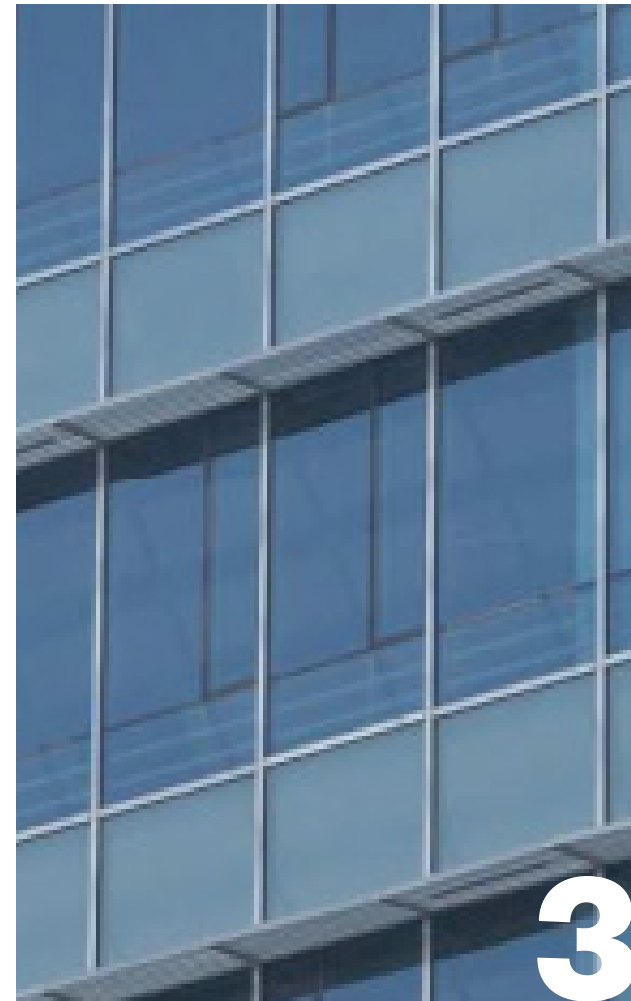


FRAMING OF GLASS PANEL

The hidden frame glass wall is not allow to use in **SHANGHAI** for the safety reason.

Four types of framing way

1. Vertical capped, horizontal hidden frame
2. Horizontal capped, vertical hidden frame
3. 4 sides captured
4. Point supported, clamps or spider fixtures on corners or edges

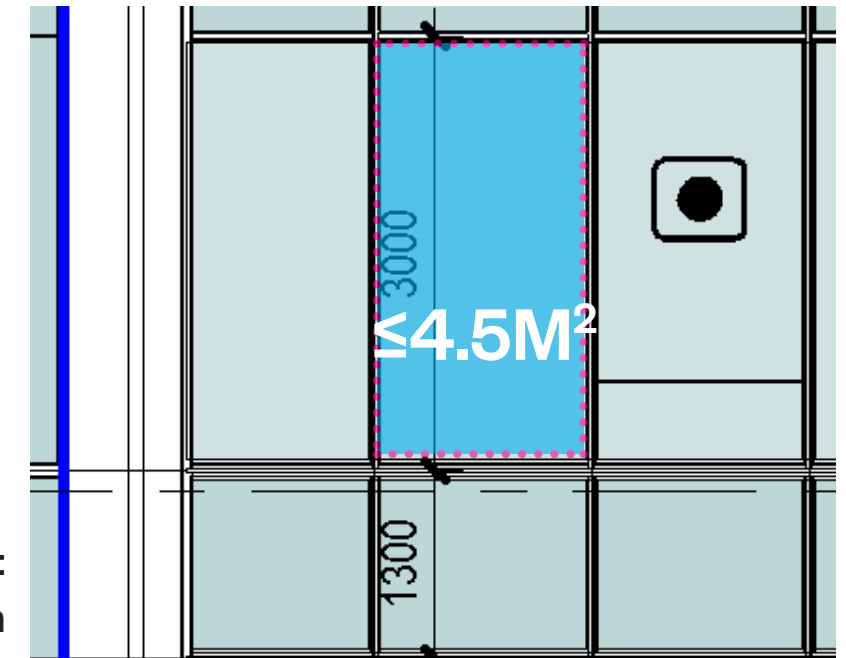


GLASS PANEL AREA RESTRICTION

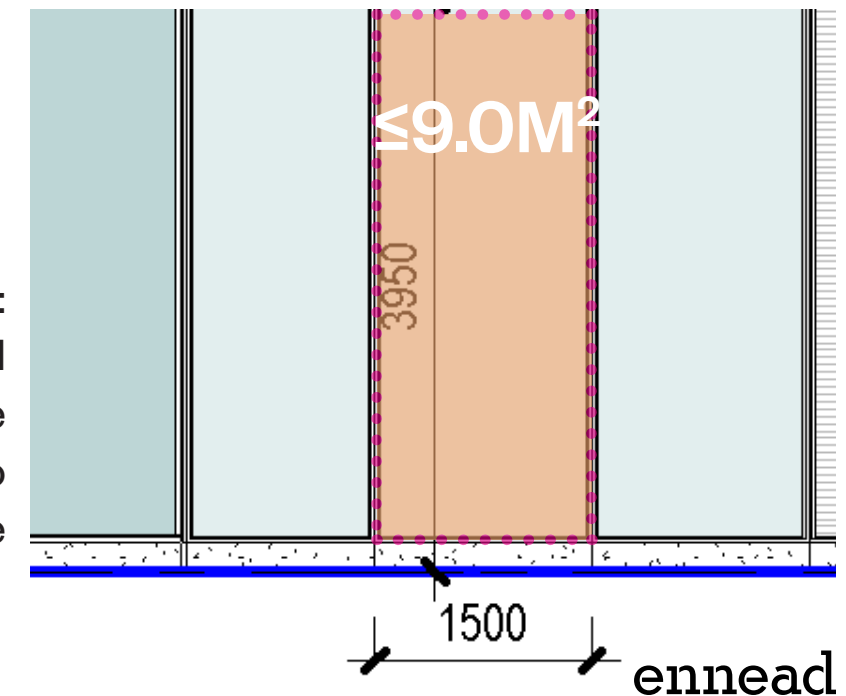
In summary, size of glass is limited to 4.5sqm, above 10 meters high, no matter it is tempered or laminated. Below 10 meters size of laminated glass can reach 9sqm, but tempered glass is still limited to 4.5sqm.

Except for laminated glass, size of tempered glass should not exceed 4.5sqm, size of heat strengthen glass should not exceed 2.5sqm. tempered glass should have safety method against falling due to its self-explosion, heat strengthen glass should have safety method against falling as well.

Typical floor:
Glass panel is controlled under 4.5sqm

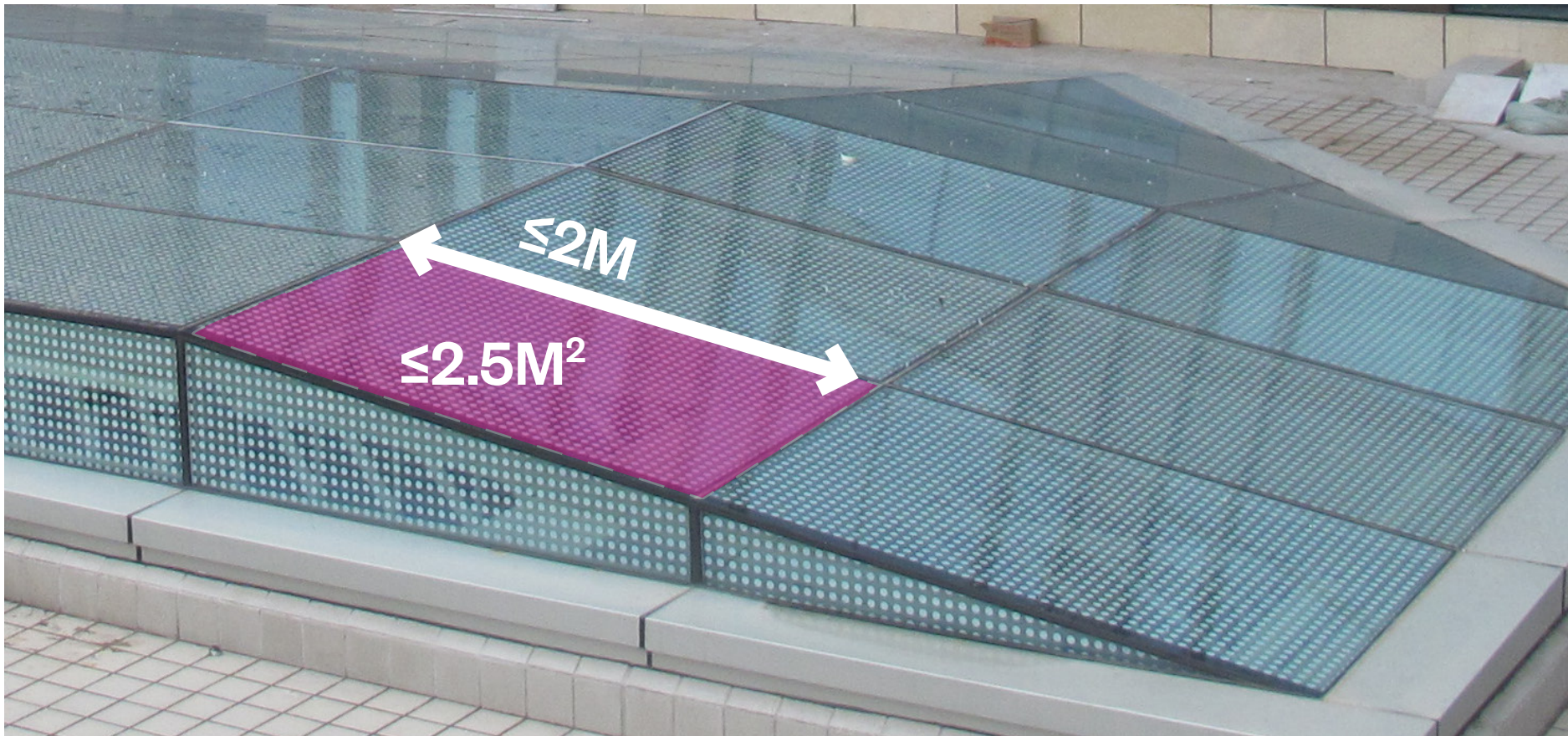


Ground floor:
Glass panel can over 4.5sqm, but need to be laminated both inside and outside as tempered glass over 4.5sqm need to have falling against measure



GLASS PANEL AREA RESTRICTION ON SKYLIGHT

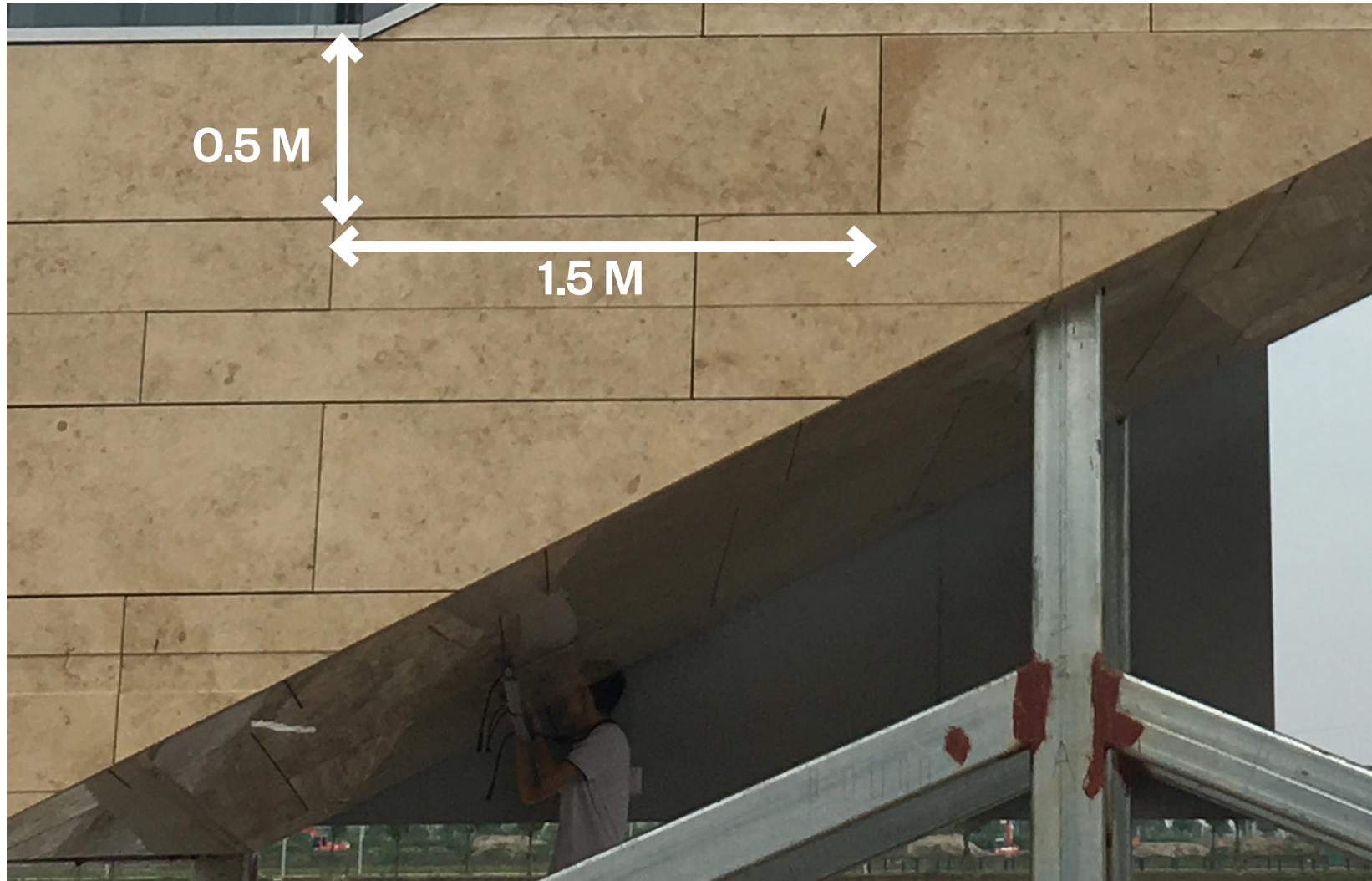
The skylight glass panel area should be not greater than 2.5sqm.
Meanwhile the edge length should be not greater than 2m.



STONE PANEL SIZE RESTRICTION

Granite stone panel area should not exceed **1.5sqm**

Other type stone panel area should not exceed **1.0sqm**



S&T PROJECT, LIMESTONE

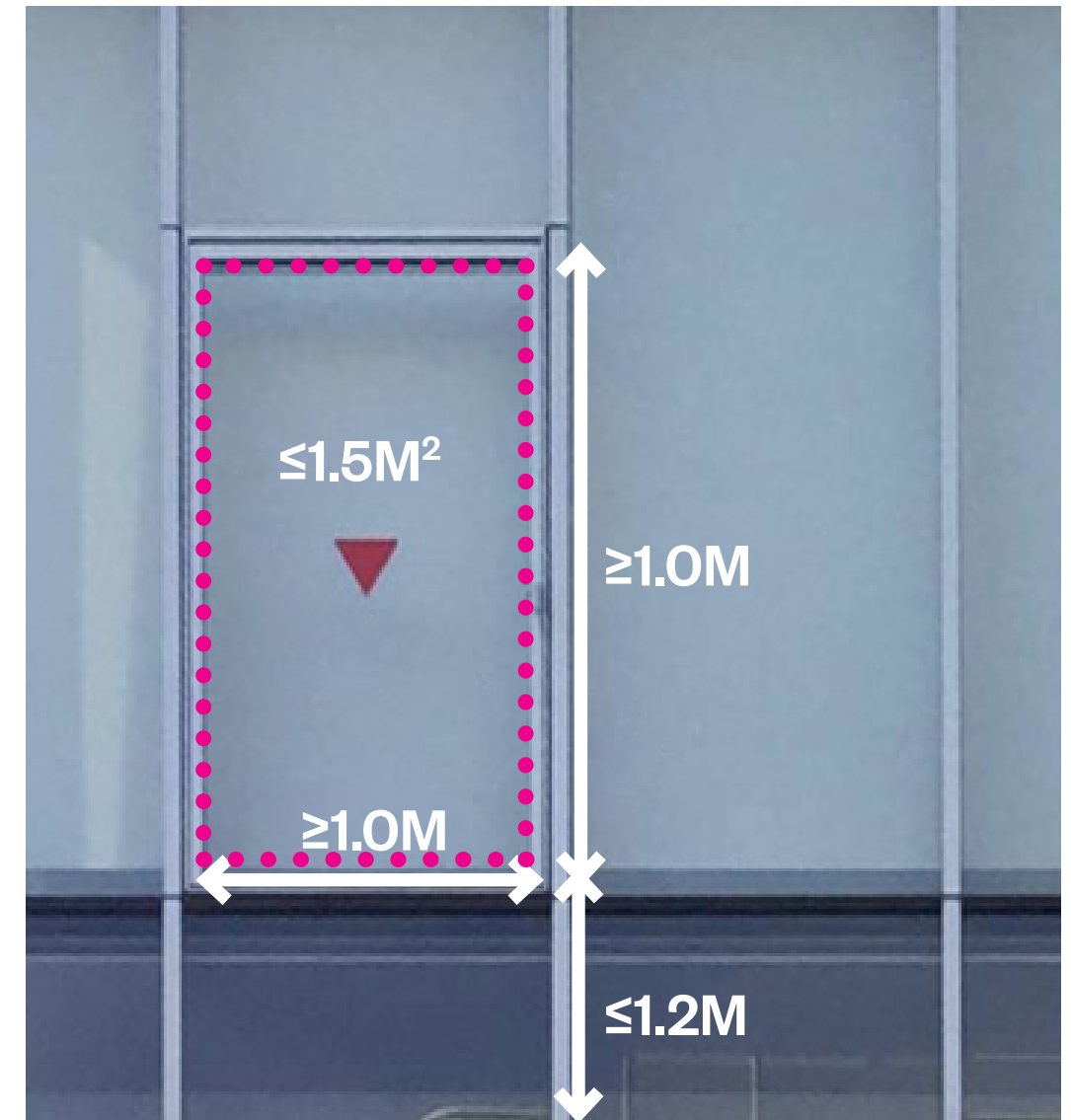
FIRE RESCUE WINDOW

National CW code requires FRW could be either operable window or breakable window, and the **clear width and height** should be not smaller than **1m**. The bottom of FRW to finish floor height should be less than **1.2m**.

And the FRW area should be less than **1.5sqm**, this is because, the code also requires FRW should not be laminated or tempered glass, but should be normal float glass, while the float glass is not a safety glass, it has an area restriction of **1.5sqm**.

There should be a conspicuous signage on the FRW.

FRW should be arranged along the 4 sides of the building and the horizontal intervals should be no more than **20m**. And each fire compartment has to have at least 2 FRWs.

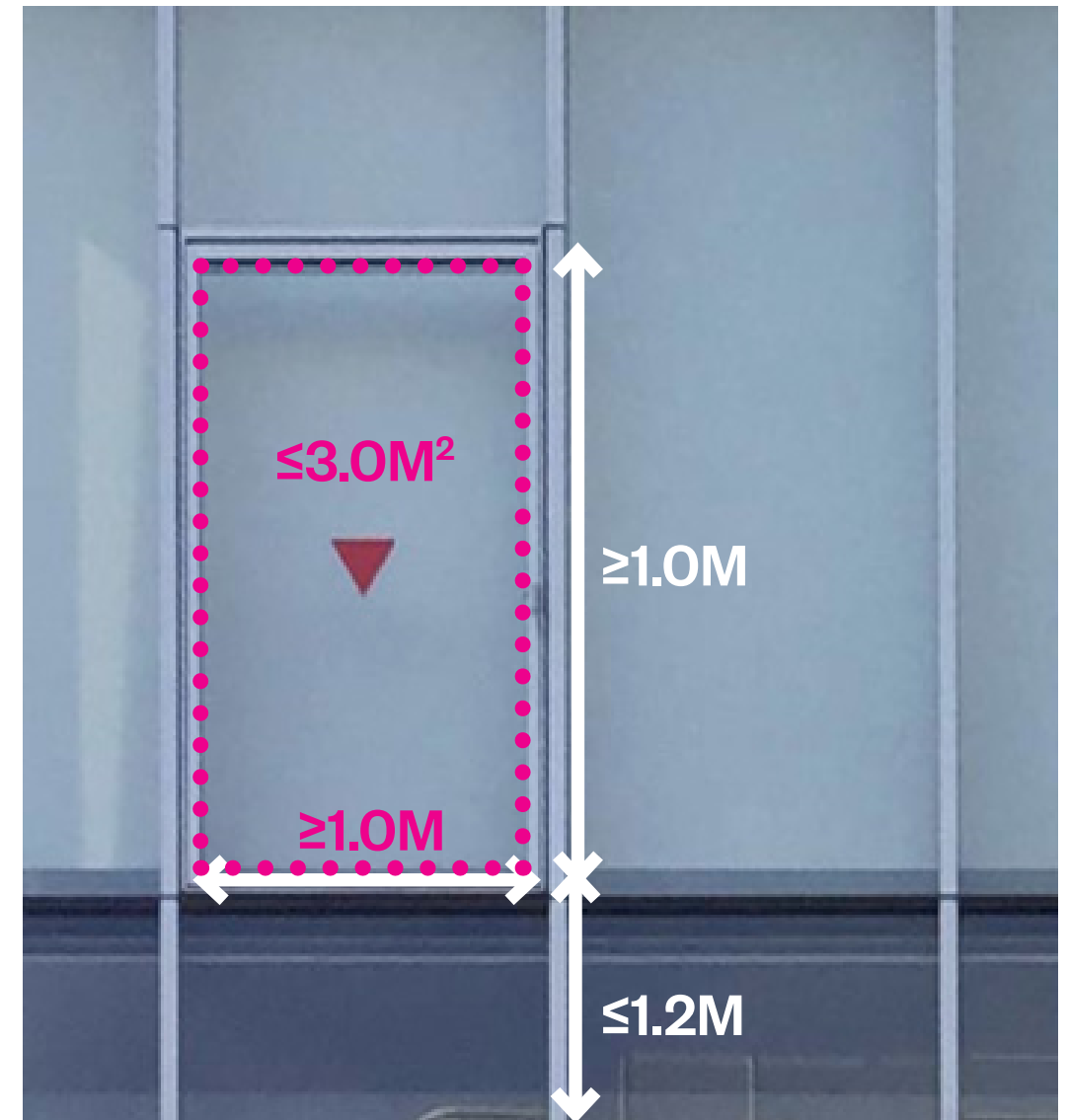


FIRE RESCUE WINDOW

SH curtain wall code

The minimum FRW width is identical with **national code**. But **SH CW code** allows to use tempered glass, while to forbid to use laminated or normal float glass.

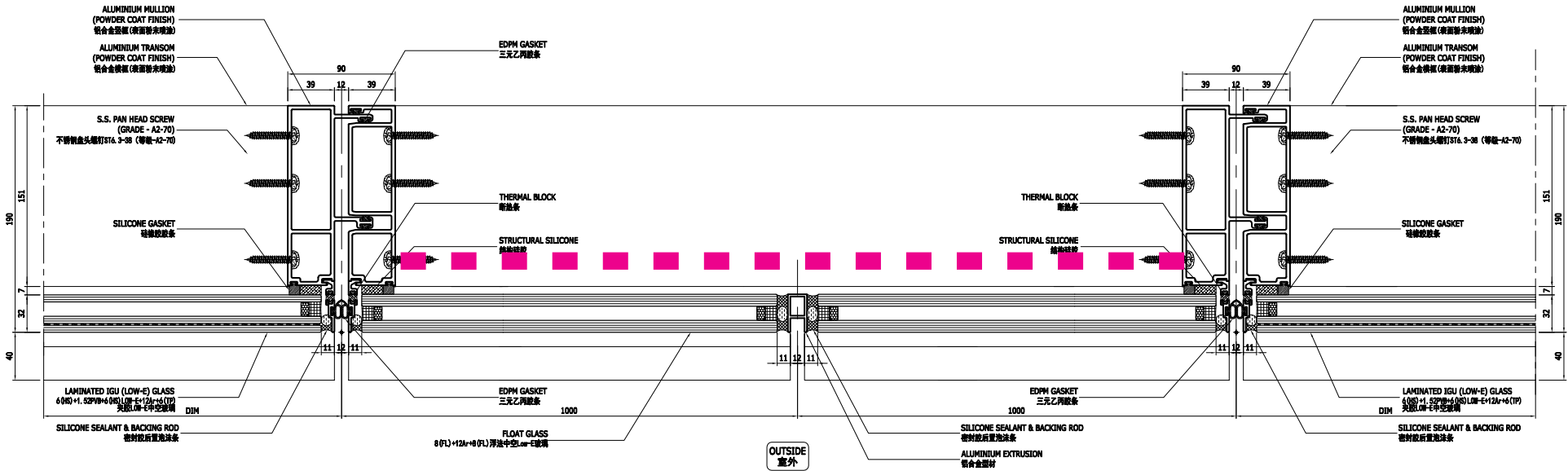
The FRW panel glass area should be no larger than **3m²**



FIRE RESCUE WINDOW

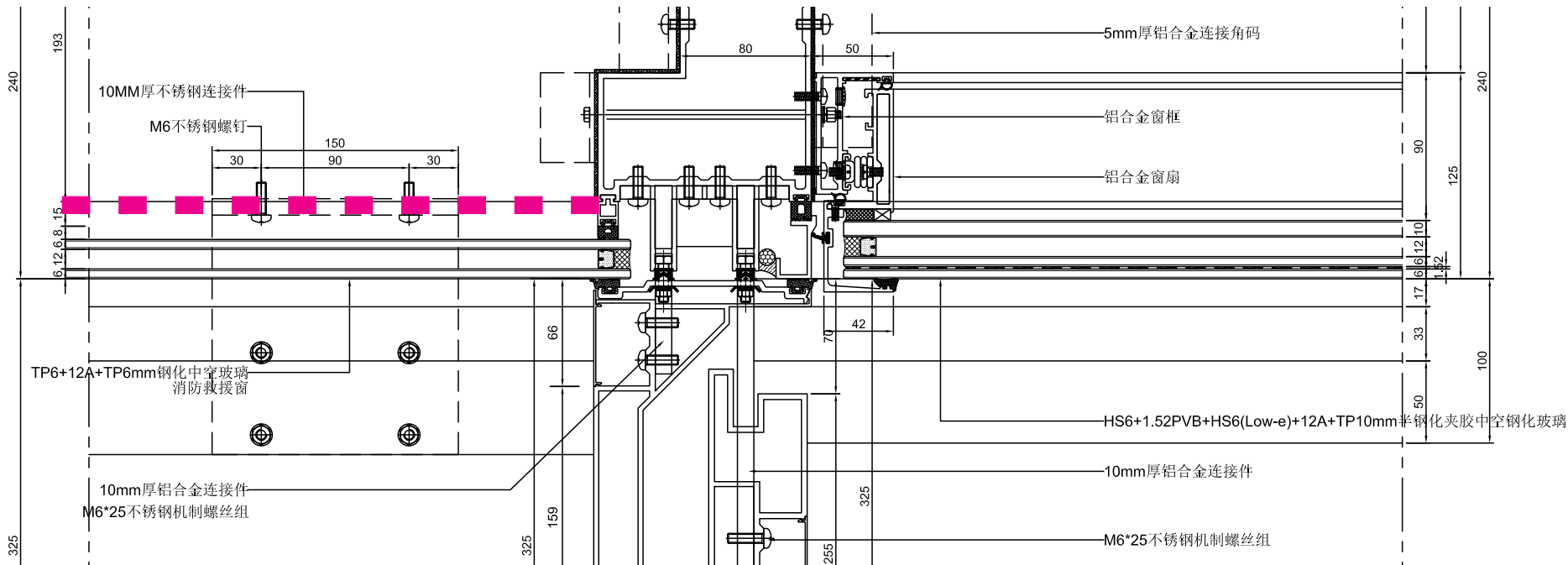
Lingang S&T Project, FRW

2.1m tall, 1m + 1m wide,
fake mullion in middle,
glass area is less than 2.1sqm each.
(CW shop drawing to be reviewed by gov-
ernment)
This is an exception, needs special EPR
and approval



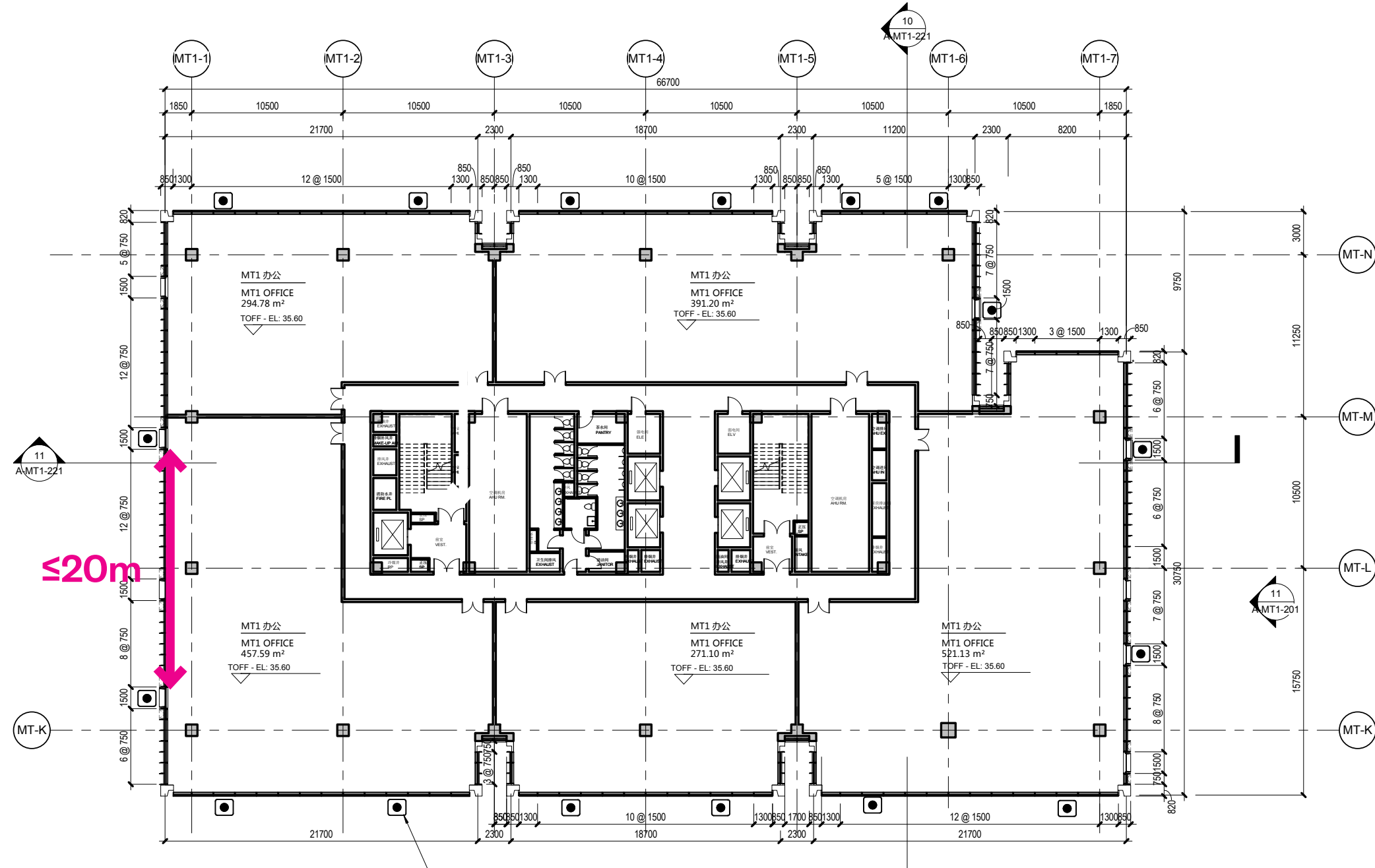
CR Land Qibao, Project, FRW

2.2m tall, 1.5m wide (including frames),
glass area is less than 3sqm.
(CW DD drawing to be reviewed in govern-
ment CW safety review)



FIRE RESCUE WINDOW

And FRW should be arranged **along the 4 sides of the building** and the **horizontal intervals should be no more than 20m**. And each fire compartment has to have at least 2 FRWs.

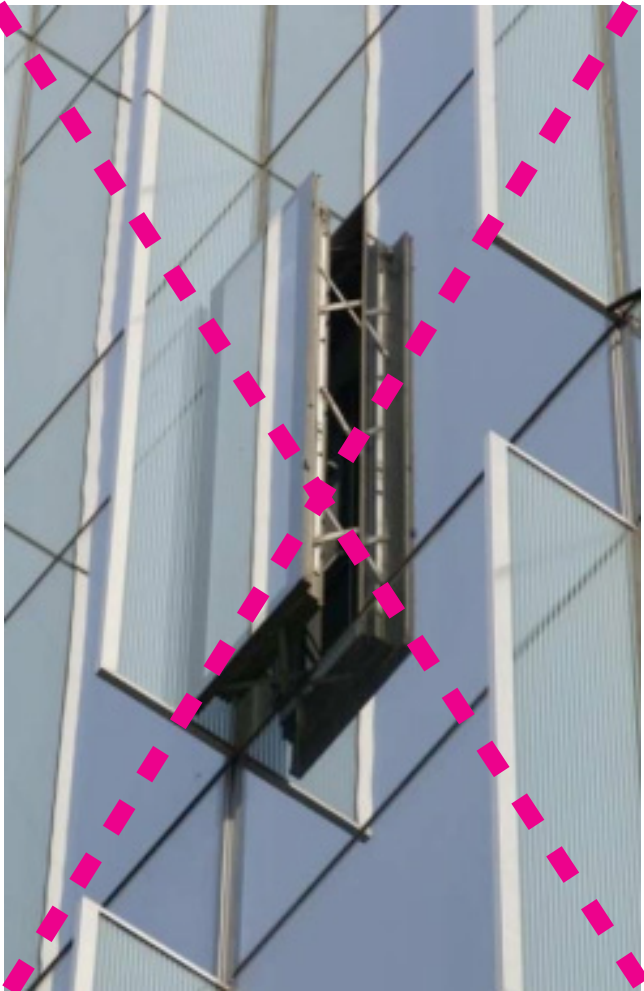


OPERABLE WINDOW

Primary operable window types
Top hinged is ommonly used on tall buildings in China



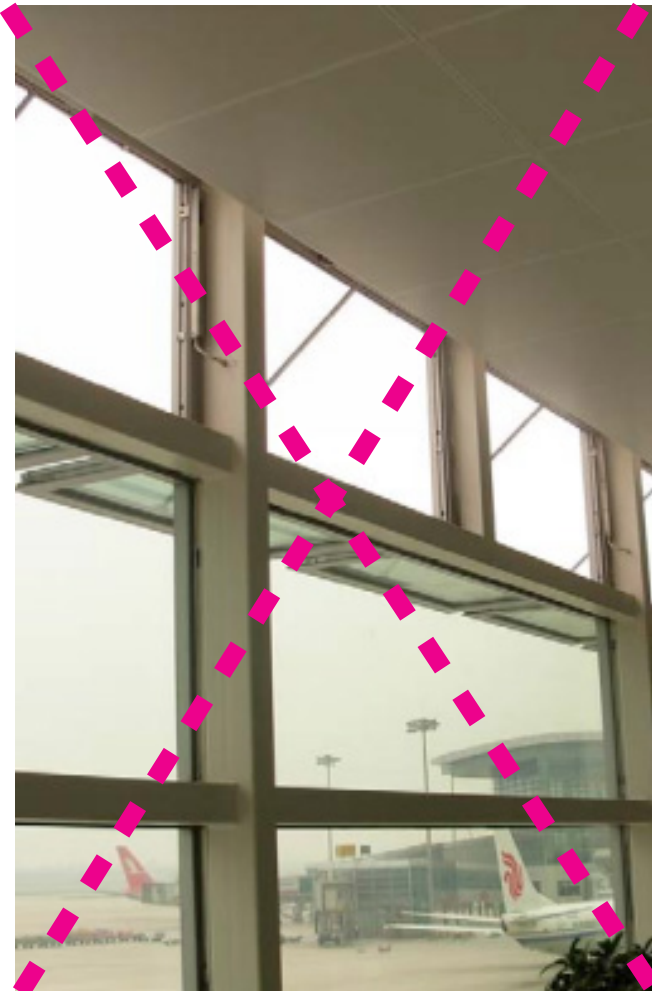
Top hinged



Parallel
Not allow to use



Horizontal
Open inwards is allow to use
Open outwards is not allow to use



Bottom hinged
Open inwards is allow to use
Open outwards is not allow to use

OPERABLE WINDOW

The operable window is restricted to have a no greater than 30 degree angle and 300mm opening depth for top / bottom hinged operable window

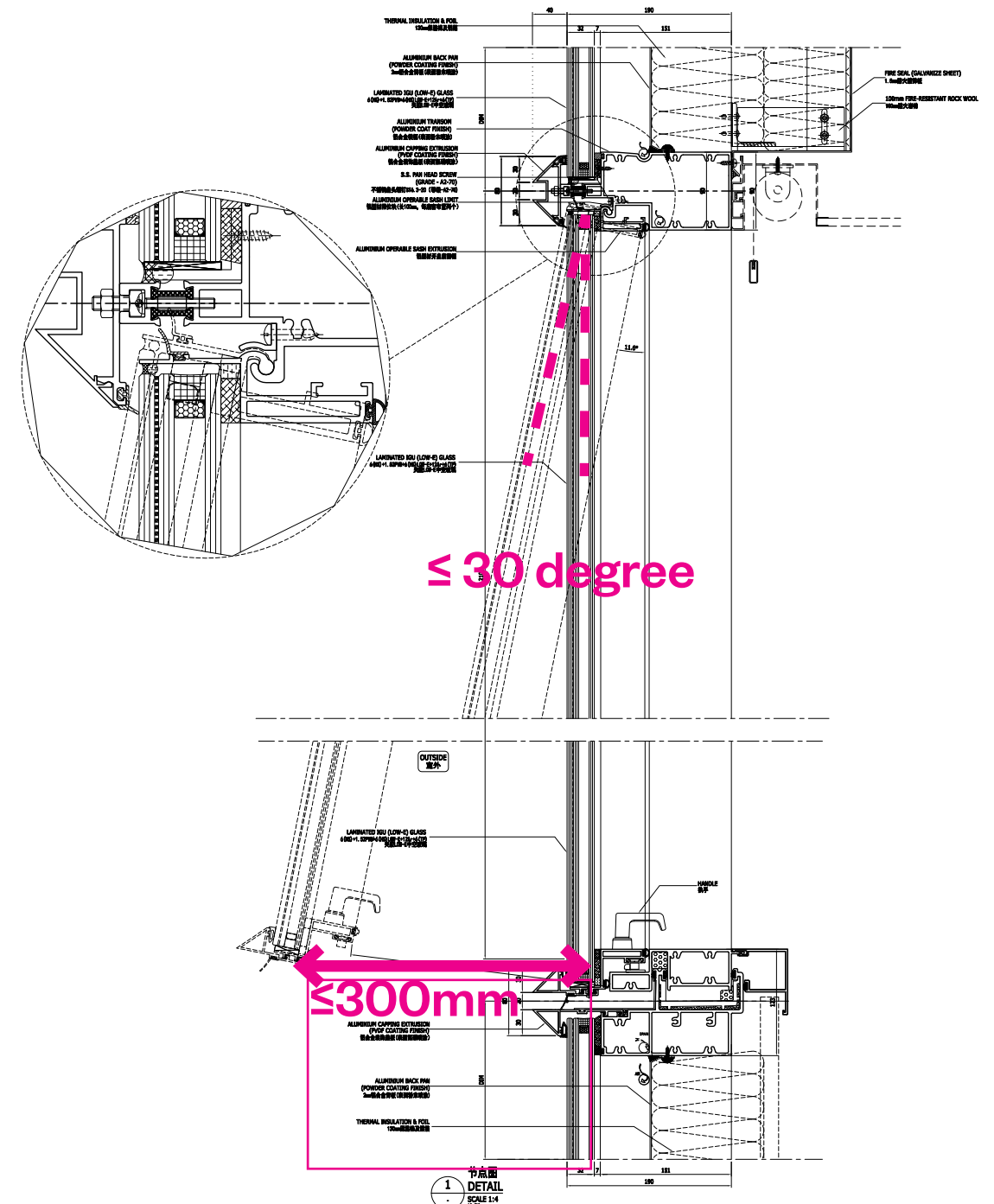
Operable window for natural ventilation

Condition 1: The green building standard requires to have 5% or 10% of total façade area as operable window, this will help to gain 4 and 6 credits respectively.

Condition 2: If there is no mechanical ventilation, the operable window effective open area should meet 5% of the room floor area which needs natural ventilation.

The condition in the red box above is the old specification in 2018.
2019 onwards, the new specification changed to use software to count the amount of ventilation.

Article 5.2.10 of the "Green Building Evaluation Standard" GB50378-2019, "Optimize the floor space of the building and improve the natural ventilation effect." "Under the typical working conditions of the transition season of public buildings, the average number of natural ventilation and ventilation of the main functional rooms is not less than 2 times/h, and the proportion of area reaches 70%, and 5 points are awarded; For every 10% increase, 1 point is added. The highest score is 8 points.



BALUSTRADE

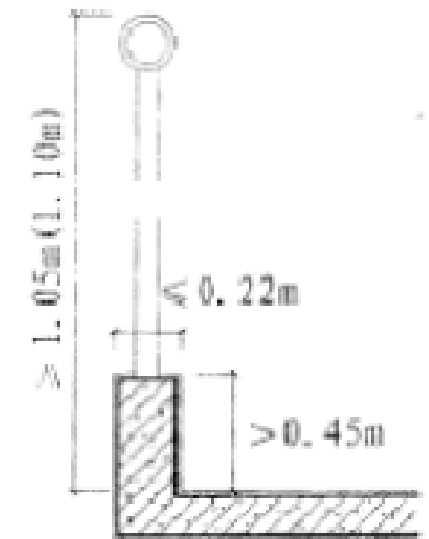
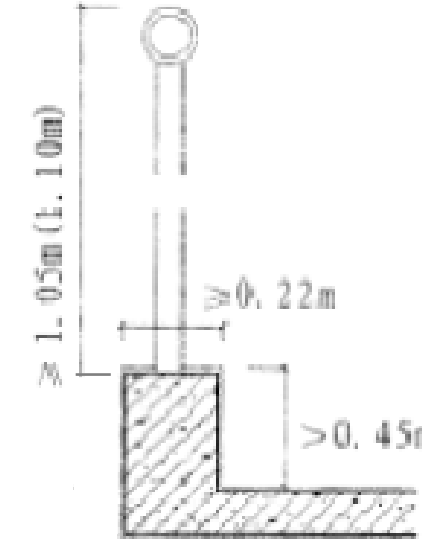
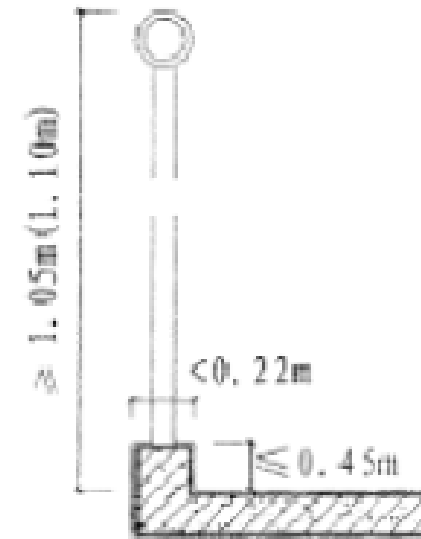
EXTERIOR GRILLE BALUSTRADE

Exterior balustrade:

Height of balustrade should not less than 1.05m, for floor height below 24m. (Sunkne plaza, terrace)

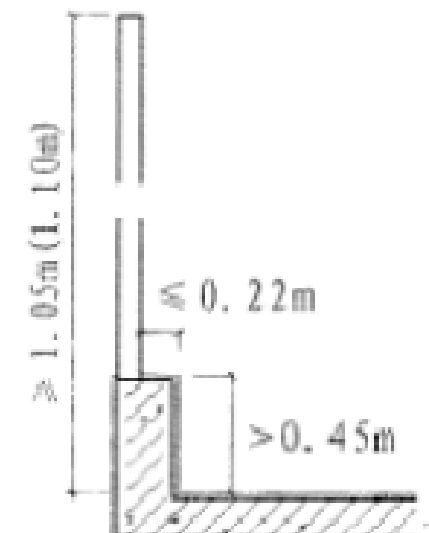
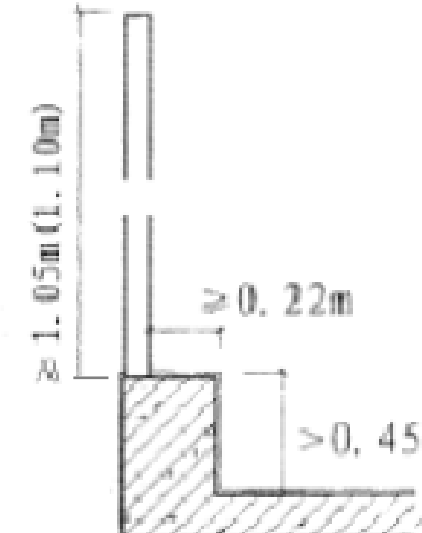
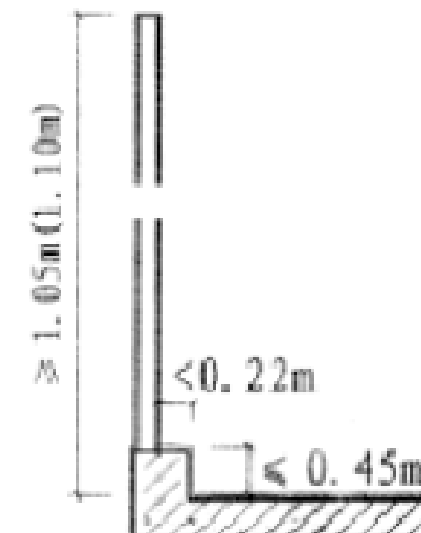
Height of balustrade should not less than 1.10m. for floor height above 24m. (Terrace, roof)

PS. Code also requires if there is an over 220mm depth and lower than 450mm curb behind the balustrade, balustrade height should count from the curb top face.



Interior balustrade:

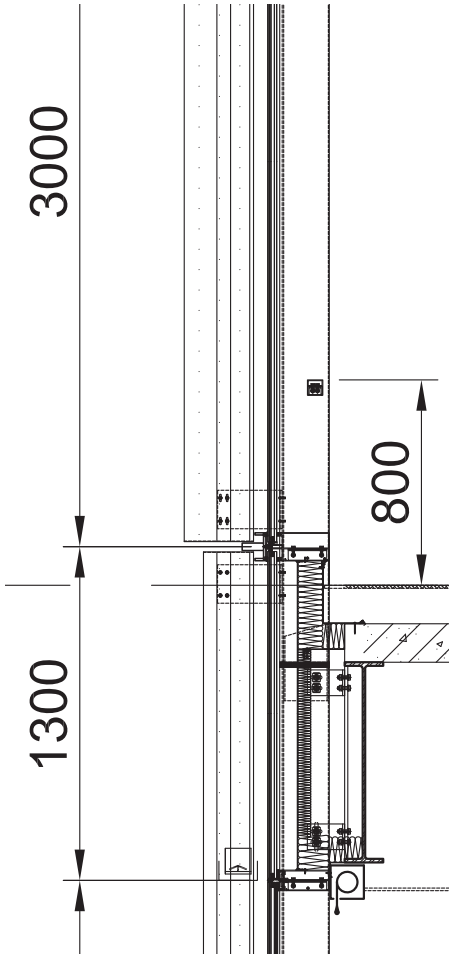
Usually, LDI will refer to exterior balustrade standard to require having a 1.05m (1.10m) tall balustrade installed right behind the curtain wall. However, sometimes, client want to cancel the additional balustrade behind the curtain wall by having transom or additional handrail at 800mm level from finish floor. This is not always workable, need to get the government drawing vetting company's approval. Different vetting companies holding different standards to this point.



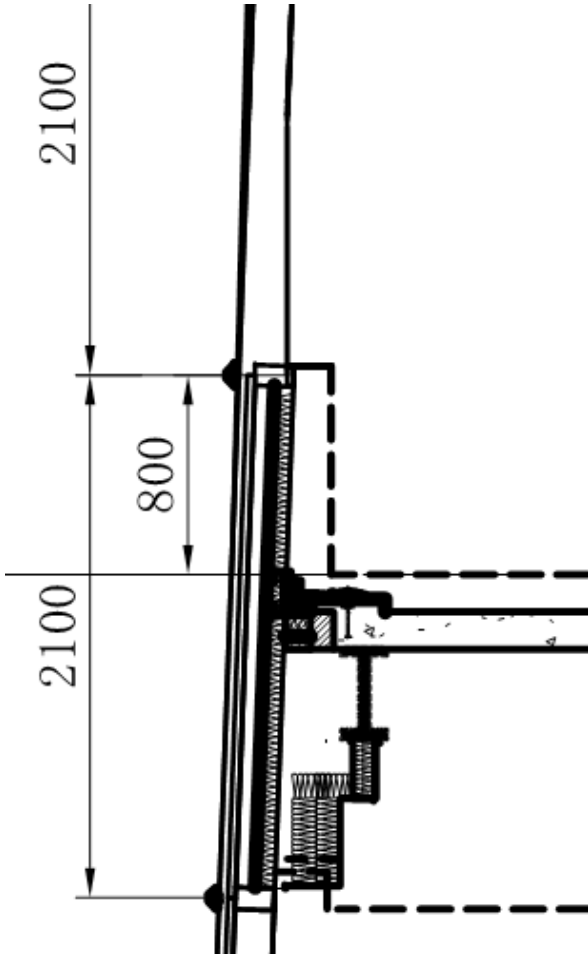
SOLID BALUSTRADE

BALUSTRADE
INTERIOR

HANDRAIL INSTALLED ON VERTICAL MULLIONS



TRANSOM AS HANDRAIL



FIRE RESISTANT GLASS

We don't suggest to use fire resistant glass on exterior curtain wall.

1, Color of the fire resistant glass product in China is quite different with the normal glass and is hard to match.

2. In most cases, fire bureau doesn't approve to use fire resistant glass, unless to provide very detailed fire resistant performance report and approved by the expert review. This will cost more time and money for client which is normally not preferred by client.



CERAMIC FRITS IN LAMINATED GLASS

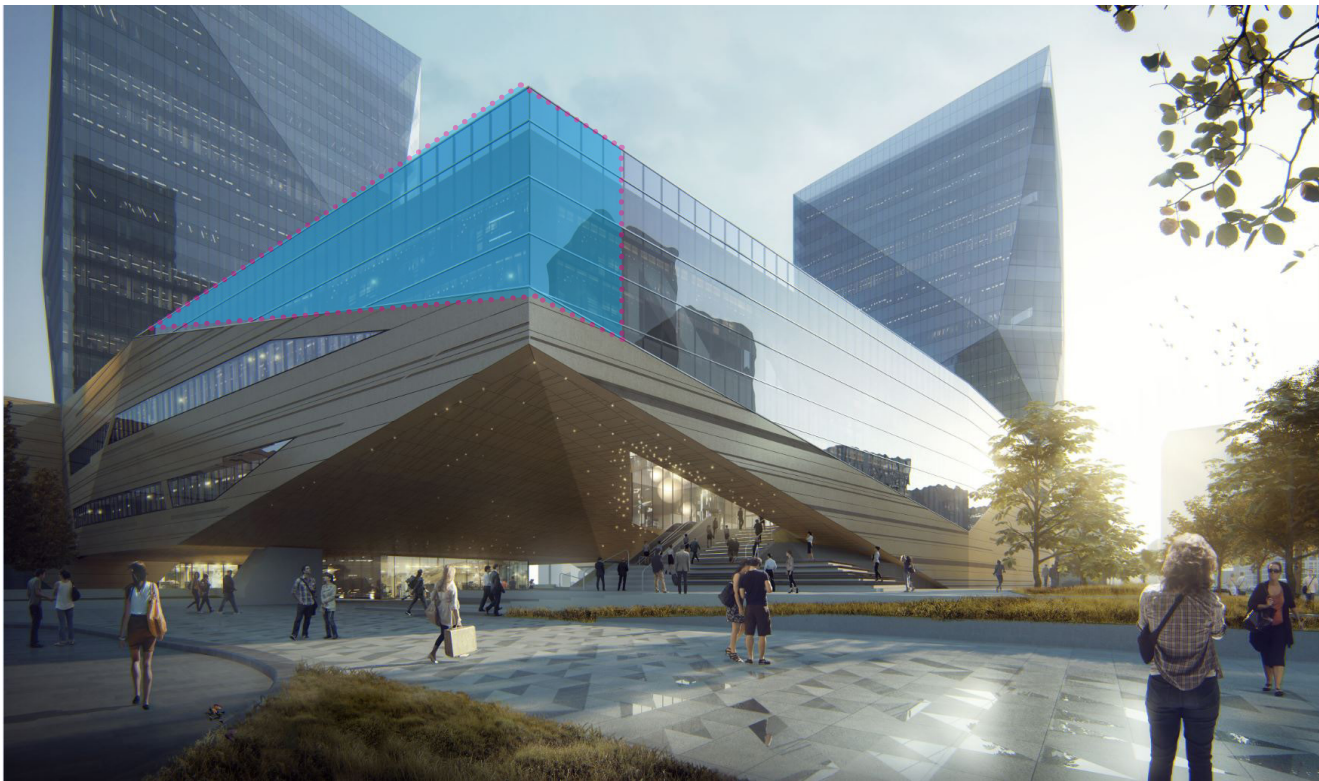
If the ceramic frits pattern is on 2# or 3#, using normal PVB interlayer only allows to have a frits coverage which is lower than 50%, while using SGP interlayer (SentryGlas) can allow the frits pattern have a full coverage as the ceramic frits will reduce the PVB strength.



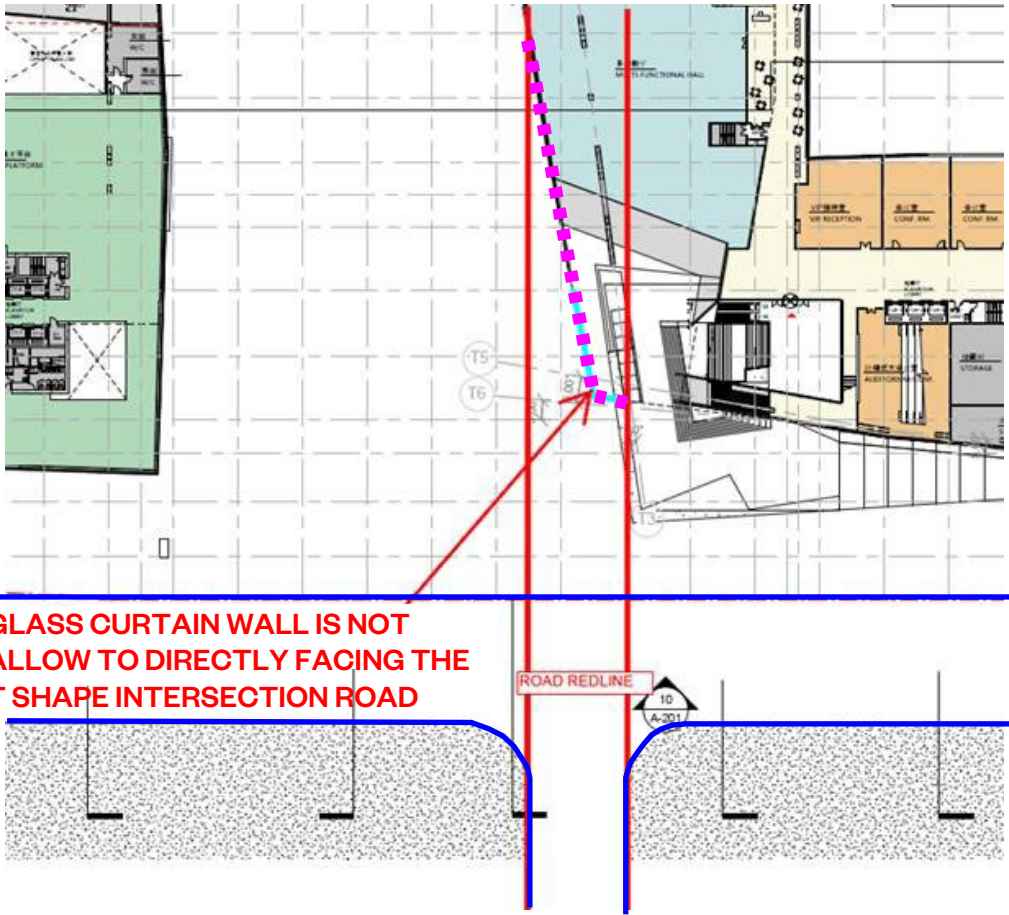
T SHAPE INTERSECTION ROAD

Shanghai local regulation requires the building directly facing to the T shape intersection road should not use glass curtain wall.

The cladding material need to use a solid type or to use window wall system.



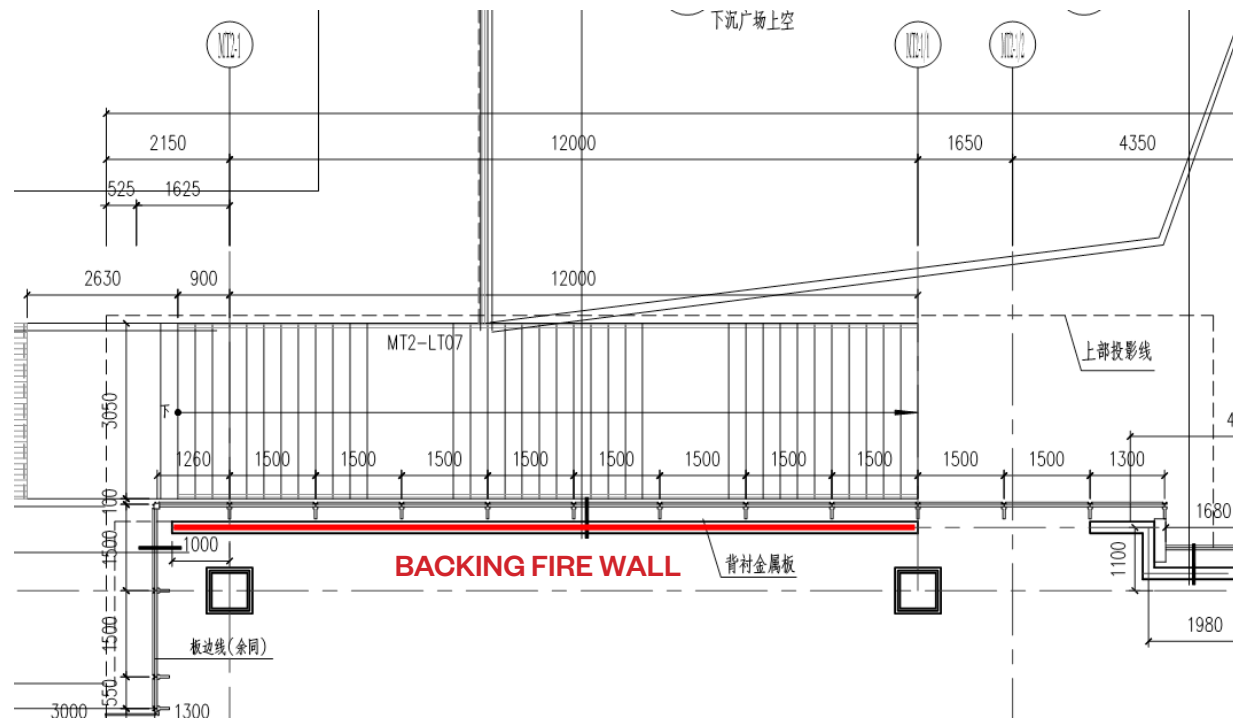
Lingang S&T project use advertisement to wrap the problematic part



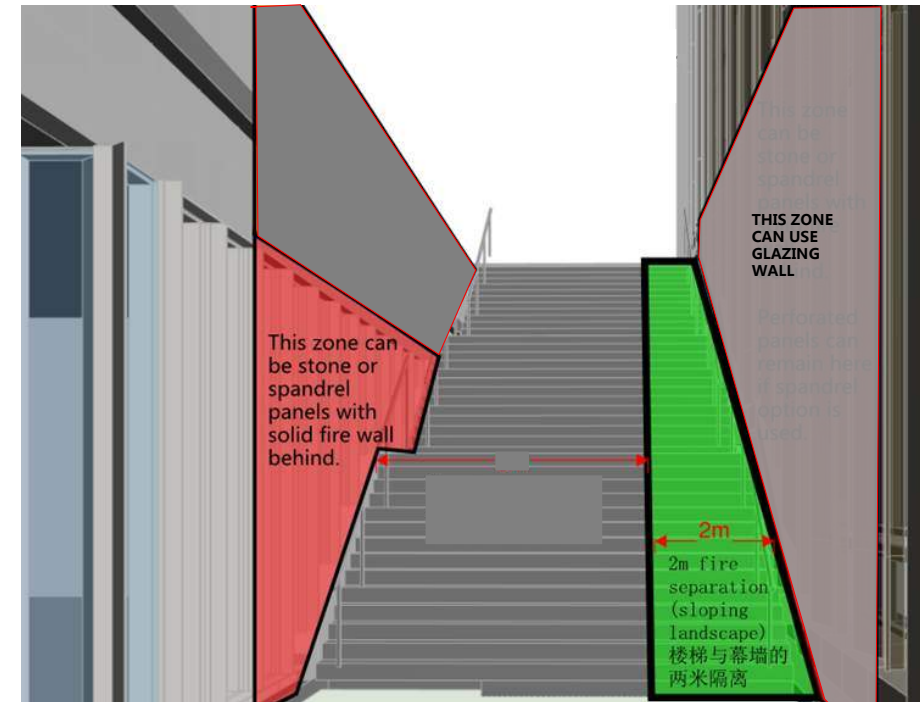
THE EGRESS STAIR IN SUNKEN PLAZA

When the sunken plaza egress stair is next to a glazing wall, there are two ways to treat to meet a fire code requirement.

1. The glazing wall is treated same as spandrel with a shadow box, and to set fire rated backing wall behind the glazing wall
2. The stair is kept 2m at least away from the glazing wall, landscape can be putted between stair and glazing wall.



CR LAND PROJECT, BACKING FIRE RATED WALL



PUJIANG PROJECT, BOTH TREATMENTS

Q & A

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