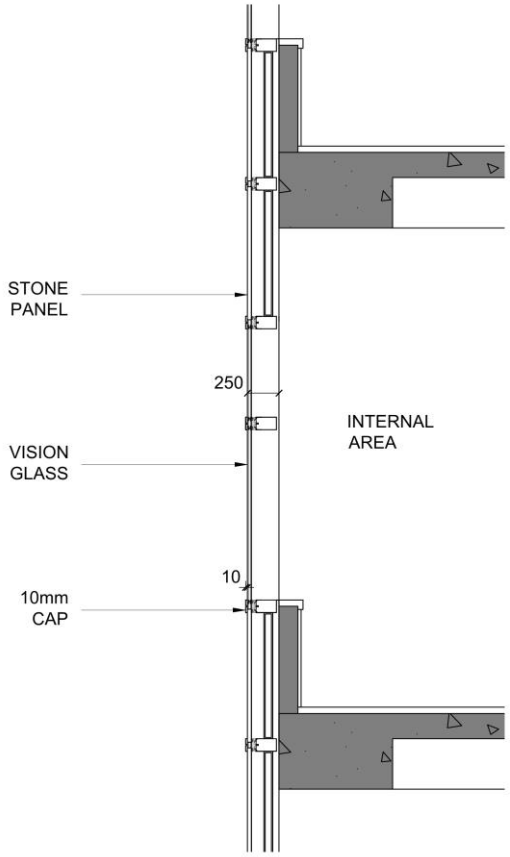
Summary of Items Discussed in 5/2022 APSEC Discussion Forum on 25 November 2022

	Items proposed by Convenors for Discussion	Summary of Discussion and BD's Response
	Items raised by HKIA	
1.	**<u>Submissions of Secondary Building Elements – Metal Ceiling</u>** The requirements for submission of secondary building elements have been clearly stated in PNAP ADV-33 with checklist and sample drawings. Under normal practice, some secondary building elements, such as metal ceiling will not be shown in general building plans (GBP) and it is our understanding that key plan(s) based on GBP showing the locations of the secondary building elements in the structural plans shall be sufficient for BD's processing of the structural submission. Would BD please advise if our understanding is correct?	BD advised that HKIA's understanding was correct, provided that the secondary building elements had been indicated in the general notes and/or with typical details in the GBP.
2.	**<u>Supporting Frame for Suspended Air-conditioning (AC) Plant / Mechanical Ventilation Plant – PNAP ADM-19</u>** The requirement to include proposed minor building works involving the erection of supporting frame for suspended AC plant / mechanical ventilation plant in plans for approval applies to development projects with consent to the commencement of superstructure works granted after 31 August 2021, as stated in paragraph 35 of PNAP ADM-19. For large development site it is very common to have more than one	BD advised that HKIA's understanding was correct, unless the later phases were in separate sites.

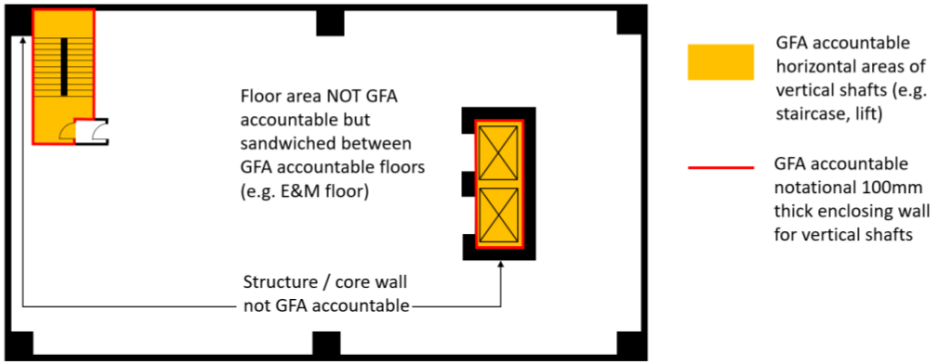
	superstructure consents due to phased piling and superstructure plan submissions. We would like to seek BD's clarification that the 1st consent granted on or before 31 August 2021 shall cover the whole development, such that requirement of submission for the erection of supporting frame for suspended AC Plant / mechanical ventilation plant is waived.	
3.	**<u>External Architectural Features for Screening of External Pipes in Single Family Houses</u>** Further to the discussion of the captioned in item 6 of ADF 5/2015 held on 13 November 2015 regarding the effective arrangement for visual inspection for external drainage pipes enclosed by architectural features, and according to requirement in paragraph 7 of PNAP APP-93, it is our understanding that CCTV is not the only means for visual inspection for external drainage pipes enclosed by architectural features while provision of demountable panels on the external architectural features can also be accepted for inspection provided that the access to these demountable panels is demonstrated in the maintenance and repair (M&R) plan. Would BD please advise if our understanding is correct?	BD advised that as per paragraph 7 of PNAP APP-93, "*the AP should provide an effective arrangement for visual inspection of the pipes including pipe connexions, fixing of pipes, etc. to enable the detection or inspection of any defect, leakage or insanitary condition of the pipes in a convenient and safe manner, where necessary*". While Appendix B to PNAP APP-93 elaborated that the architectural features and enclosed space should comply with the design and construction requirements in its Annex 1 to facilitate the use of CCTV imaging device for inspection of the drainage pipes, the use of CCTV imaging device was only an example of effective arrangement for inspection of external drainage pipes enclosed by architectural features. In general, the provision of demountable panels on external architectural features alone without an effective arrangement for visual inspection of the external drainage pipes enclosed was not acceptable. AP should demonstrate how the visual inspection could be effectively arranged and

		carried out without the aids of specific tools or personnel, taking into account the design and construction of the architectural features as well as the M&R access.
4.	**<u>Measurement of Gross Floor Area (GFA) and Site Coverage (SC) of Curtain Walls – PNAP APP-2</u>** According to paragraph 6 of PNAP APP-2, where a curtain wall system forms the external face of a building, the Building Authority is prepared to accept the outer surface of the structural elements as the external wall for the purpose of measuring GFA and SC where the projection of the system from the outer surface of the structural elements does not exceed 200 mm for a domestic building and 250 mm for a non-domestic building. i) Whilst in Clause 7.1.1 of the Code of Practice for Structural Use of Glass 2018 (Glass Code), *"façade system or glass element with structural sealant glazing application shall be designed to prevent any fall of glass pane in the event of bond failure in the structural sealant. Retaining devices for such structural sealant glazing in the form of feature capping, angle, bracket or insert, etc. shall be designed and constructed at the top and the bottom of the glass pane for the added purpose of restraining the glass pane from dislocation or falling in case of bond failure of structural sealant."* To fulfill this requirement, it is quite common to provide a 10 mm thick capping or angle at the top and the bottom of the glass panel. It is our understanding that to measure the projection of the system	BD advised that the HKIA's understanding on both i) and ii) were correct. For i), BD would consider the extent of the projection of the curtain wall as up to the external face of the glass panel instead of the 10 mm thick capping provided that it complied with Clause 7.1.1 of the Glass Code. For ii), stone or aluminum panels, forming part of the curtain wall as stipulated in section 26 of the Building (Construction) Regulation, could be excluded from GFA calculations in accordance with paragraphs 6 to 10 of PNAP APP-2.

	from the outer surface of the structural elements, it is acceptable to measure up to the external face of the glass panel instead of the 10mm capping. Would BD please confirm this understanding is correct? ii) Apart from glass, stone panel, aluminum panel, etc. can be used for the façade system, including but not limited to the spandrel, and is still non-accountable to GFA. Would BD please advise if our understanding is correct?	


STONE
PANEL
250
INTERNAL
AREA
VISION
GLASS
10
10mm
CAP

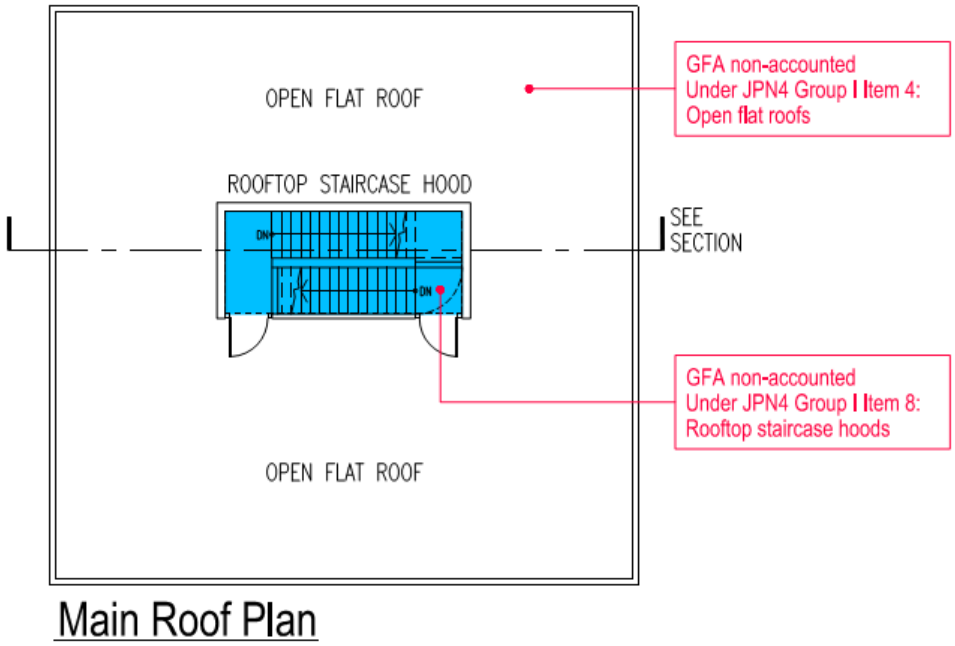
5.	**<u>Lift Shaft and Staircase GFA passing through Floors with Non-accountable GFA</u>** It is stated in item 3 of Group I in JPN No. 4 that *"horizontal areas of staircases, lift shafts and vertical ducts solely serving floors accepted as not being GFA accountable"* are generally exempted from GFA calculation by all the three departments regardless of any GFA exemption provision under the respective lease. It is our understanding that the horizontal area of staircases, lift shafts and vertical ducts should normally be measured for GFA together with the floor through which they pass (e.g. E&M floors sandwiched between GFA accountable floors). We would like to seek BD's clarification that, in the said circumstances, GFA is only measured for the horizontal areas of the staircases and the lift shaft themselves but not the enclosing walls. Should BD consider that enclosing walls need to be GFA accountable, we would like BD to clarify whether a notational thickness of 100 mm can be adopted, based on the logic that the 100 mm thickness of plant room wall can be disregard from GFA calculation in accordance with paragraph 12 of PNAP APP-2.	For the scenario illustrated by HKIA, BD clarified that apart from the horizontal areas of staircases, lift shafts and vertical ducts, the entire thickness of their enclosing walls should be fully accounted for the purpose of GFA calculation. BD supplemented that paragraph 12 of PNAP APP-2 referred to the disregarding of GFA of the enclosing walls for plant rooms and other features that were to be disregarded from GFA calculation, was irrelevant to the said scenario.

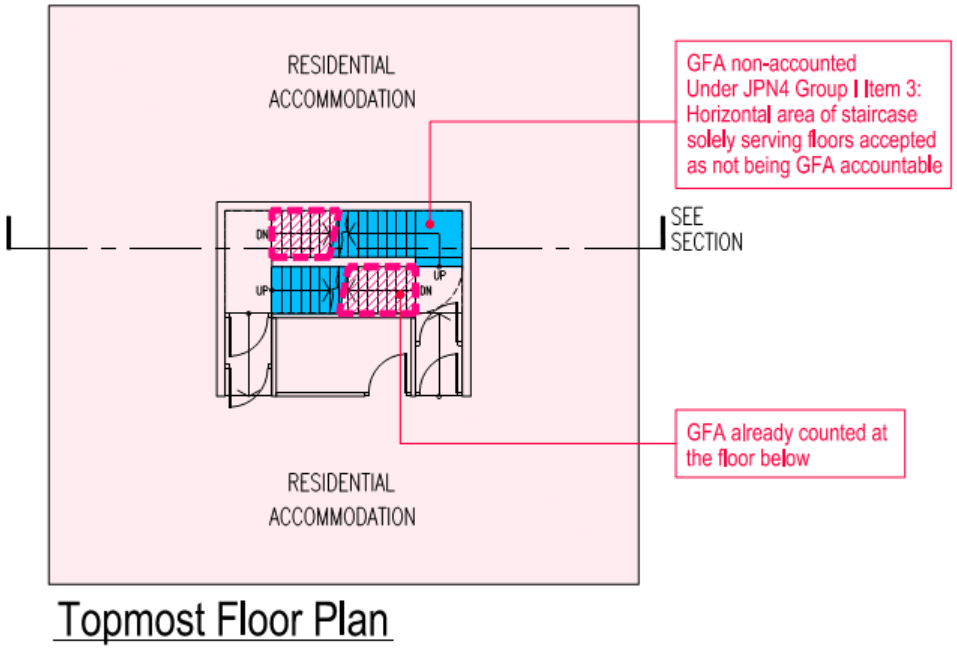
		
	Items raised by HKIE	
6.	**<u>Quality Supervision – PNAP APP-158</u>** Appendix A to PNAP APP-158 lists the items of works at various stages of Superstructure/Excavation and Lateral Support/Site Formation Works for required for Quality Supervision. The list covers almost every item of site activities during construction period. With the provision of Code of Practice for Site Supervision 2009 (Site Supervision Code) and Technical Memorandum for Supervision Plans 2009, it is not possible for technically competent persons (TCPs) under AP/RSE/RGE Streams to conduct inspection for every single item of works listed in the said PNAP during their daily or part-time routine inspection. Under the prevailing industry practice, the TCPs under their respective streams record the inspection details such as the location of works	BD advised that in accordance with the Site Supervision Code, PNAP APP-158 provided guidelines for AP/RSE/RGE/Authorized Signatory of Registered Contractor (RC) to devise checklists by reference to the typical items, and to include any other particular items or critical elements considered essential for the project, including those for quality supervision and any other conditions imposed at approval and/or consent stages, for compliance by TCPs. AP/RSE/RGE should determine appropriate frequencies of periodic inspections to suit the needs of individual project. BD also advised that Appendix B to the said PNAP provided a sample of record of quality supervision and inspection carried out by the respective TCPs based on the specific tasks performed given in Appendix VI of the

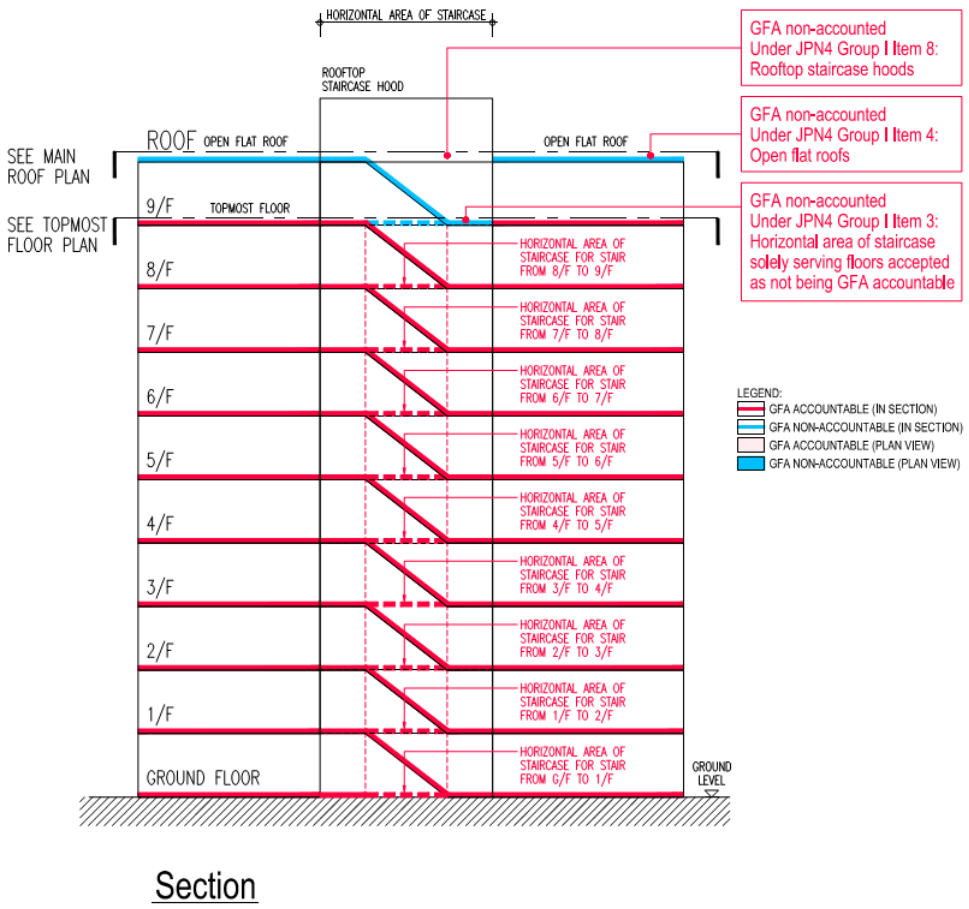
	inspected and inspection findings, etc. in their Quality Inspection Records as per Appendix B to PNAP APP-158. They would not inspect every single item of construction works carried out on site during their site visits. It is the duties of Registered Contractor(s), who shall provide continuous site supervision to their building works. Would BD please confirm the above?	Site Supervision Code. Such inspection records should be properly kept on site and made available for inspection by BD officers.
7.	**<u>Flat Slab Design according to the Code of Practice for Structural Use of Concrete 2013 (2020 Edition) (Concrete Code)</u>** According to Clause 6.1.5.1(a) of the Concrete Code, design provisions on flat slab design are given with the following limitations:- (i) generally rectangular arrangement of columns using the equivalent frame method; and (ii) ratio of the longer to the shorter spans does not exceed 2. Designer is reminded the applicability of the design provisions in Section 6.1.5. The said Clause of the Concrete Code also advised the acceptance of flat slab design based on a finite element analysis (FEA). It is our outstanding that, FEA of flat slab, being considered as "a more rigorous treatment", fulfils Clause 6.1.5.2(b) of the Concrete Code, and therefore the design provisions stated in Clauses 6.1.5.2(c) to (j) of the	BD advised that HKIE's understanding that the FEA of flat slab was considered as "a more rigorous treatment" such that Clause 6.1.5.2(c) to (j) of the Concrete Code were not applicable to flat slab design with FEA was correct. BD also advised that the Concrete Code did not specify that Clauses 6.1.5.3 (a), 6.1.5.6(b) and 6.1.5.6(c) were not applicable to flat slab design with FEA, as there might be certain limitations in the FEA due to the assumptions and set-up in its modelling. The issue would be deliberated in the Technical Committee on the Concrete Code.

	Concrete Code are not applicable for the flat slab design with FEA adopted. Would BD please clarify that the requirements in the following clauses of the Concrete Code **<u>are also not applicable</u>** for flat slab design with FEA adopted as *the design moments are not obtained from the design provisions given in Clause 6.1.5.2*, in particular Table 6.10 of the Concrete Code: (i) The particular requirement on placing reinforcement for negative design moment in column strip as given in Clause 6.1.5.3 (a); (ii) The increase in shear stresses for punching shear check on supporting columns of flat slab as stated in Clause 6.1.5.6(b) and Clause 6.1.5.6(c) <u>for the purpose of considering the effects of moment transfer</u>, i.e. $V_{eff} = 1.15V_t$ for internal columns, $V_{eff} = 1.25V_t$ for corner columns and $V_{eff} = 1.25V_t$ / $1.4V_t$ for edge columns. Instead, for the flat slab design with FEA adopted, the flexural and shear reinforcements will be designed in accordance with the strip bending moment and shear force obtained from the FEA. The effects of moment transfer from flat slab to supporting columns should have been well considered in the FEA, and therefore the punching shear shall be the summation of all shear forces in column for all directions.	
	Items raised by AAP	
8.	**<u>GFA Measurement for Horizontal Area of Staircases</u>** In accordance with JPN No. 4, the following items are generally exempted	BD advised that the horizontal area of staircase to be exempted from

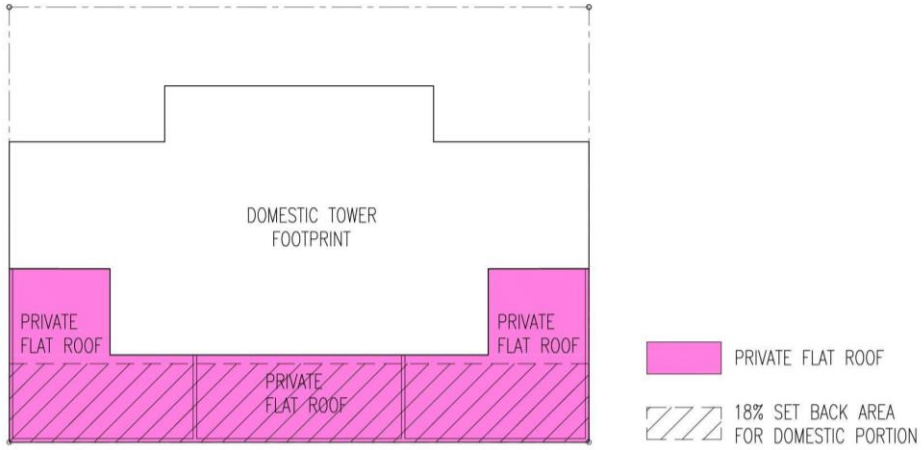
	from GFA calculation by all the three departments regardless of any GFA exemption provision under the respective lease: 1. Group I Item 4, open flat roofs 2. Group I Item 8, rooftop staircase hoods of residential developments (size being not excessive and that no other building facilities, features and structures at roof are accountable for GFA) 3. Group I Item 3, horizontal areas of staircases solely serving floors accepted as not being GFA accountable Therefore the calculation of GFA for the staircases to reflect the above can be illustrated as follows:	GFA calculation should refer to its horizontal area on that particular floor which was exempted from GFA calculation. Item 2 of ADF 4/2012 held on 3 August 2012 and item 7 of ADF 4/2014 held on 8 August 2014 also clarified that area of the staircase would be measured at each floor level for the purpose of GFA calculation. In the illustrated scenario, the topmost floor was GFA accountable and therefore the horizontal area of the staircase connecting to the roof at the topmost floor level should be included in GFA calculation. This had long been the practice adopted by BD on measurement of GFA for staircase. BD also advised that the space underneath the staircase connecting to the roof as highlighted in blue dotted line in the Section illustrated, should be GFA accountable as per item 8 of ADF 1/2021 held on 22 January 2021 regarding GFA calculation of space below open staircase to roof.


OPEN FLAT ROOF
ROOFTOP STAIRCASE HOOD
SEE SECTION
OPEN FLAT ROOF
GFA non-accounted Under JPN4 Group I Item 4: Open flat roofs
GFA non-accounted Under JPN4 Group I Item 8: Rooftop staircase hoods
Main Roof Plan

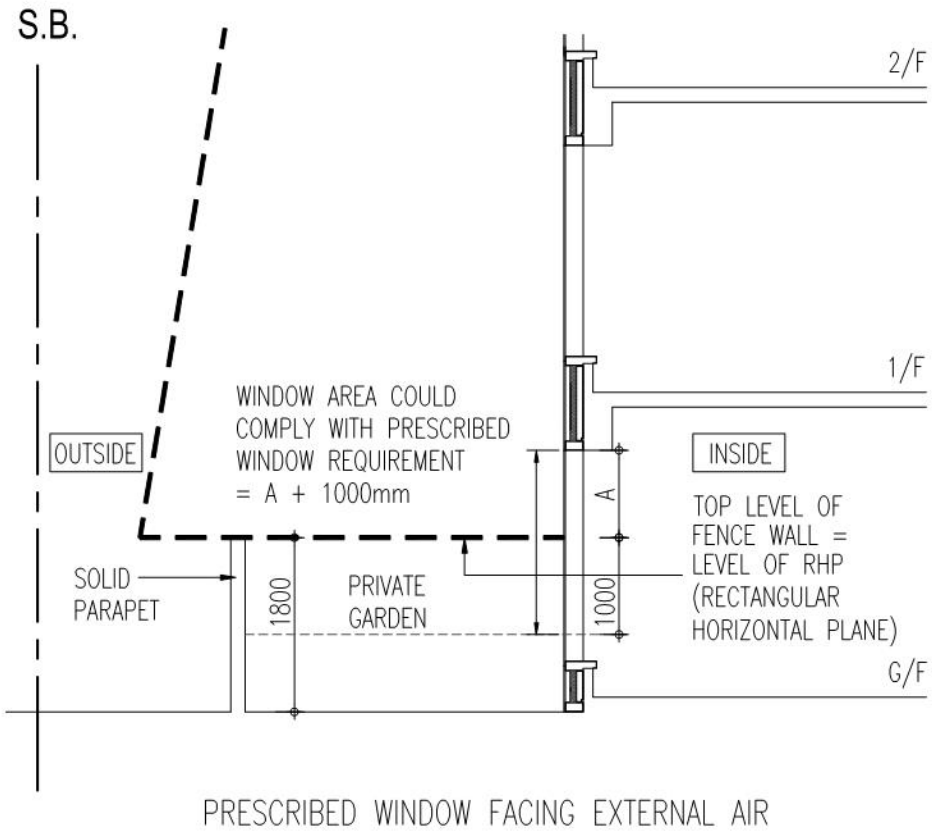

RESIDENTIAL
ACCOMMODATION
GFA non-accounted
Under JPN4 Group I Item 3:
Horizontal area of staircase
solely serving floors accepted
as not being GFA accountable
SEE
SECTION
DN
UP
UP
DN
GFA already counted at
the floor below
RESIDENTIAL
ACCOMMODATION
Topmost Floor Plan

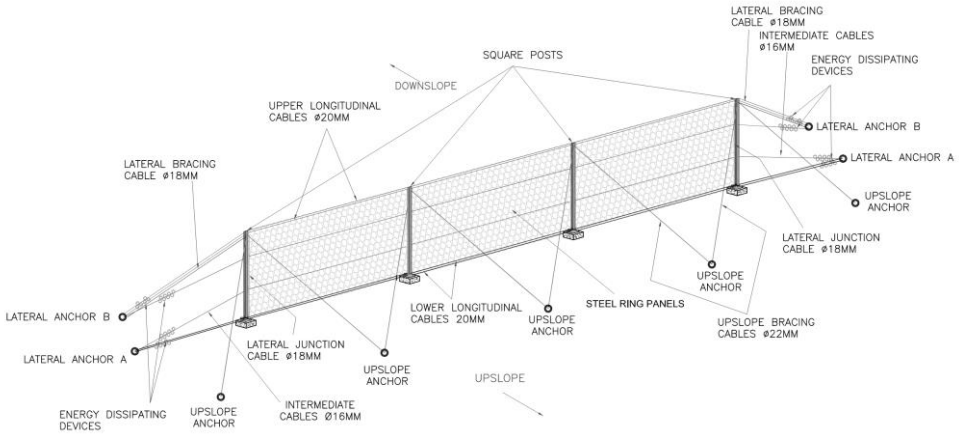
	 Section Would BD please advise if our understanding is correct?	
9.	**<u>Site Coverage of Greenery – PNAP APP-152</u>** According to paragraph 2 of Appendix D to PNAP APP-152, a 50% reduction factor in computing the greenery areas should be applied for	BD advised that the aquatic planting would be considered as part of the water features which was subject to the 50% reduction factor in

	"water features" in calculating the Site Coverage of Greenery. In some cases of town planning application, the Agriculture, Fisheries and Conservation Department (AFCD) may require to provide a "water feature with natural habitat" for conservation / compensation of existing natural pond in the approval conditions. Such re-provision of "natural habitat" may include types of aquatic plants (e.g. water-lily) for a balanced aquatic ecosystem. Would BD consider these aquatic planting provisions in water features to be counted as greenery areas, without imposing the 50% reduction factor in computing the greenery areas?	calculating the Site Coverage of Greenery under PNAP APP-152.
10.	**<u>Set Back Approach – PNAP APP-132</u>** For the 18% setback area at domestic portion, it is our understanding that this setback area at the lowest domestic floor can be served as private flat roof (refer to sketch below), provided that the requirements set out under paragraph 3 of PNAP APP-132 are complied with. Please advise if this understanding is correct.	BD advised that paragraph 3(c) of PNAP APP-132 required the assurance of satisfactory arrangements for the control and maintenance of the setback area and any resultant flat roofs and covered areas. In view that effective control and maintenance would not be available for private flat roofs generally, the setback area under PNAP APP-132 could not include such areas.

	 FIRST DOMESTIC FLOOR PLAN	
11.	**Lighting and Ventilation – Regulation 30 & 31 of the Building (Planning) Regulations (B(P)R)** Following the previous discussion in item 16 of ADF 2/2020 held on 29 May 2020, it is understood that: a) the superficial area of the glazing and window opening at level below 1 m above finished floor level (A.F.F.L.) (window sill level of the rectangular horizontal plane) can be counted towards the aggregate glazing area and aggregate openable window area as required under regulation 30(2)(a)(i) and (ii) of the B(P)R respectively. Also, for the previous discussion in item 4 of ADF 2/2015 held on 20 March 2015 for Ground Floor Garden Unit:	BD advised that for prescribed window facing into a space uncovered and unobstructed above the area delineated by the rectangular horizontal plane, the sill of the window should be deemed to be at a level of 1 m A.F.F.L. Alternatively, the use of performance-based approach promulgated in PNAP APP-130 was also acceptable. The sketch showing that the window sill level at 1.8 m A.F.F.L. for the purpose of delineating the rectangular horizontal plane was not acceptable. Item 16 of ADF 2/2020 held on 29 May 2020 related to window facing into a balcony, and Item 4 of ADF 2/2015 held on 20 March 2015 related to window facing a street of not less than 4.5 m wide, were not

	b) For prescribed window facing fence wall, the measurement of the prescribed window should be from the top of fence wall instead of at 1 m A.F.F.L. Based on the above principles, we would like to BD to clarify that in case the window sill (i.e. the rectangular horizontal plane) is taken at the top level of fence wall (say 1.8m A.F.F.L.), whether the superficial area of the glazing and window opening for 1 m below that window sill level can be counted towards the aggregate glazing area and aggregate openable window area as well.	applicable to the scenario depicted in the sketch.

		
12.	**<u>Measures to Deter Misuse of Industrial Buildings for Residential Use – PNAP APP-159</u>** Paragraph 2(d) of PNAP APP-159 states that *"for an industrial building with small workshop units and provided with curtain walls, the outer face of the curtain walls will be taken as the external wall of the building for the purpose of measuring GFA and site coverage"*.	BD advised that AAP's understanding was correct.

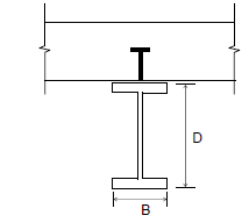
	We understand that the above provision also applies to precast units, to deter misuse, even though they are not explicitly mentioned in the above PNAP.	
	Items raised by ACEHK	
13.	**<u>Proposed Adoption of Soil Nail Design for Underground Supports</u>** Flexible barriers are designed to resist impact from the landslide debris or boulder fall. An isometric view of the above ground arrangement is shown as follows:-  There is no serviceability concern for the flexible barriers as they are designed to endure large deformation under impact and expected to be sacrificial. Also, the supports of the barriers will only be subjected to high stress during the impact and for most of its service life they will be subjected to minimal self-weight and transient wind load, which is different from the	BD noted the design of flexible barriers adopted in public works and advised that discussion with the GEO would be arranged for clarifications of the assumptions and design parameters of the flexible barriers. BD also reminded that public works on government land were exempted from the provisions of the Buildings Ordinance.

	pile foundation for building structures with sustained loads. The flexible barriers are usually constructed on the hillside and in view of the constructability concern, soil nails are commonly adopted as underground support for the barriers (at the post locations and anchor points) in government projects and follows the design and testing requirements stipulated in Geoguide 7 promulgated by GEO of CEDD. The soil nails are designed to carry both tensile and compressive loads. The axial capacity of the soil nail takes into account the bond strength at the grout-soil interface. As the bond strength between grout and soil in tension should be smaller than that in compression, it is common to use pull-out tests to validate the bond strength of the anchors taking tensile and/or compression loads. Instead of considering those underground supports as foundation piles for building structures, we propose to align with the government project practice and adopt soil nail design as per Geoguide 7 for the underground supports.	
14.	**<u>Application of Steel Reinforced Concrete (SRC) in Composite Beam Design</u>** Figure 10.1 of Code of Practice for the Structural Use of Steel 2011 (2021 Edition) (Steel Code) illustrates the typical section of composite beam arrangement of concrete slab and steel I-beam as follows:	BD advised that Figure 10.1 of the Steel Code only illustrated the sections of typical composite beams, and BS EN 1994-1-1:2004 stipulated under Section A2.3 of Annex A of the Steel Code provided the requirements of acceptable composite beam design. For unconventional composite beam design not provided in the said standard, the proposed design would be considered on case-by-case

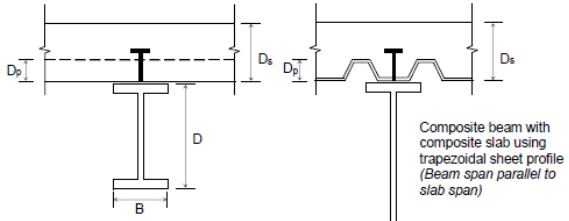
10.2 COMPOSITE BEAMS

10.2.1 General

(1) This clause presents the design of composite beams with either solid slabs or composite slabs using profiled steel sheet.

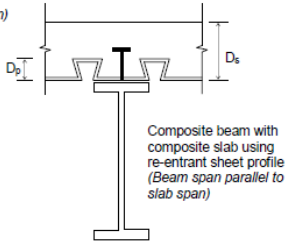


a) Composite beam with solid concrete slab



b) Composite beam with composite slab using trapezoidal and re-entrant sheet profiles
(Beam span perpendicular to slab span)

Composite beam with composite slab using trapezoidal sheet profile
(Beam span parallel to slab span)



Composite beam with composite slab using re-entrant sheet profile
(Beam span parallel to slab span)

Figure 10.1 - Typical composite beams

170

We would like to enquire if SRC can be applied to composite beam design given this form has already been commonly applied to composite columns.

basis and might be submitted to the Structural Engineering Committee for deliberation if necessary.

	Items raised by PBSCA	

15.	**<u>Erection of Internal Staircase and Stairhood between Top Floor and Roof in Domestic and Non-Domestic Buildings</u>**
	
	For the existing domestic and non-domestic buildings, it is common to erect an internal staircase between the main roof and the top floor underneath, with stairhood as shelter on top of the staircase. Regarding the erection of such staircase and stairhood, it is our understanding that:
	
	(a) the stairhood portion shall not be GFA accountable, provided that the stairhood is of reasonable size and there is no GFA accountable accommodations on the roof; and
	
	(b) provision of accessible lift to the roof is not required after the erection of staircase.
	
	Please confirm if our understanding is correct.
		BD advised that PBSCA's understanding was correct.
		
		For (a), the stairhood of reasonable size might not be accountable for GFA if there was no area accountable for GFA nor provision of commercial activities/uses on the roof.
		
		For (b), the provision of accessible lift to the roof, would depend on the use of the roof, which was irrelevant to the erection of such internal staircase.

16.	**<u>Acknowledgment of Form BA14</u>** Members commented that Form BA 14 acknowledgement is long outstanding from BD, and appreciated if the issue can be improved accordingly.	BD advised that as discussed in item 19 of ADF 5/2021 held on 12 November 2021, BD had been monitoring regularly and reminding staff on processing submissions of Form BA14 in a timely manner. Designated teams had been set up to clear the long outstanding Form BA14. BD would continue to monitor the situation. As most of the outstanding acknowledgements involved incomplete

		information/documents submitted by AP/RSE/RC, BD reminded again that AP/RSE should submit full set of required documentations to facilitate the processing of Form BA14. In response to PBSCA's suggestion on the submission of site photo and/or video records to facilitate the processing of Form BA14, BD advised that such practice had been adopted for accepting the rectification works of defects/irregularities found at the site inspection. The acceptance of such records would depend on the nature and scale of the defects/irregularities. BD also mentioned that new streamlining measures were being explored, which include the fast track acceptance of simple alteration and addition works, repair/replacement works of curtain wall, window wall and cladding, as well as erection/alteration of certain signboards in existing buildings. The proposal had been deliberated at the Joint BSC & APSEC Meetings and the revised PNAP APP-13 was being finalised for issuance.
17.	**<u>Approval of Plans in the First Submission</u>** Members commented that it is difficult to get approval of plans in the first submission. To our understanding, the approval should focus on the fundamental issues referred in PNAP ADM-19. We appreciate if BD can brief their frontline officers for such practice.	According to PNAP ADM-19, BD adopted curtailed check system when processing GBP, superstructure plans and drainage plans, under which only the fundamental issues would be checked. Non-fundamental issues would not be checked or raised as disapproval items. It was the responsibility of the AP/RSE/RGE to ensure that all such non-fundamental issues fully complied with the relevant regulations and

		codes of practice before the commencement of works. After the commencement of works, any contravention of the BO and its subsidiary regulations should be rectified as and when they were discovered and in any event, before certification of completion of works.
	AOB Items	
18.	**<u>Exit Route within Residential Flat with Open Kitchen</u>** (Item raised by BD) For a domestic flat provided with an open kitchen, the notional area of the open kitchen should be defined on the GBP. A minimum working space of 850 mm in front of the cooking bench should be provided to form part of the notional kitchen area; and the exit route within the flat should not pass through the notional kitchen area.	Members noted and would follow the arrangement accordingly. BD clarified that the requirement would generally apply to development projects with consent to the commencement of foundation works granted after the date of this ADF. Meanwhile, BD reminded that it was AP's responsibility to ensure adequate means of escape in case of fire were provided in residential flats with open kitchen, and AP should duly review the layout of these flats in developments which were under construction.
19.	**<u>Headroom for Communal Sky Gardens and Podium Gardens</u>** (Item raised by BD) According to JPN Nos. 1 and 2, sky gardens and podium gardens for residential and non-residential buildings should have a clear height of not less than 4.5 m. A previous study of air ventilation assessment (AVA) on the ventilation performance of sky gardens and podium gardens revealed that the greater the headroom of the gardens, the better the ventilation	Members noted and would follow the arrangement accordingly.

	effect. However, the additional positive effect tends to diminish when the clear height reaches 6 m. In view of the findings and the fact that communal sky gardens and podium gardens are designated as common areas and abuse is unlikely, BD would favorably consider accepting sky gardens and podium gardens with clear height of not more than 6m. Application for even higher height for improvement of ventilation purpose might be considered case by case.	