Insert new Schedule 11

Procedures for demonstrating compliance with variation provisions for setbacks, separations and tapering in Central Sydney

The following processes are required to be complied with to demonstrate compliance with Section 5.1.1.1(3)(a) and (b) in regards to varying Minimum Street Setbacks, Section 5.1.1.3(5) in regards to varying Minimum Side and Rear Setbacks and Building Form Separations, and, Section 5.1.1.4(3) in regards to varying Tapering provisions.

Relevant sections of the DCP are reproduced below for ease of reference.

Minimum Street Setbacks

Section 5.1.1.1

(3) Where noted in Table 5.2 Minimum Street Setbacks and on the Special Character Area maps, variation to Street Setbacks may be permitted to building massing that provides:

(a) encroachment(s) 2m forward of the minimum Street Setback within the middle third of the frontage to a Public Place and provision of compensating recess(es) of equal to or greater area up to 4m behind the minimum Street Setback; or

(b) equivalent or improved wind comfort, wind safety and daylight levels in adjacent Public Places relative to a base case building massing with complying Street Frontage Heights and Street Setbacks (i.e. variation to massing is governed by achieving equal or better performance).

Procedures for demonstrating compliance with 5.1.1.1(3)(a) and (b) are set out in Schedule 11.

Side and Rear Setbacks and Building Form Separations

Section 5.1.1.3

(5) Variation to Side and Rear Setbacks and Building Form Separations may be permitted to building massing that provides equivalent or improved wind comfort, wind safety and daylight levels in adjacent Public Places relative to a base case building massing with complying Side and Rear Setbacks (i.e. variation to massing is governed by achieving equal or better performance) .

Procedures for demonstrating compliance with 5.1.1.3(4) are set out in Schedule 11.

Note: Building massing includes all building elements at all levels. For example fins, external sun shading devices, architectural features, screens, signs, awnings etc

Built form massing, tapering and maximum dimensions
Section 5.1.1.4

(3) Above the Street Frontage Height the total Building Envelope Area may occupy the following proportion of the site area less any areas of heritage items and required DCP setbacks:

(a) 100% up to 120m above ground;
(b) 90% above 120m up to 240m above ground; and
(c) 80% above 240m above ground.

Procedure A: Minimum Street Setback Encroachment and Compensating Recess

In order to demonstrate compliance with Section 5.1.1.1(3)(a) in regards to varying Minimum Street Setbacks, the following procedure must be followed:

(1) Building massing with a frontage to a Public Place, where each frontage is assessed independently at each floor the building, may encroach up to a maximum of 2m forward of the required Minimum Street Setback within the middle third of the frontage if it provides an equal or greater area of compensating recesses up to 4m behind the Minimum Street Setback, but not within any other required setback.

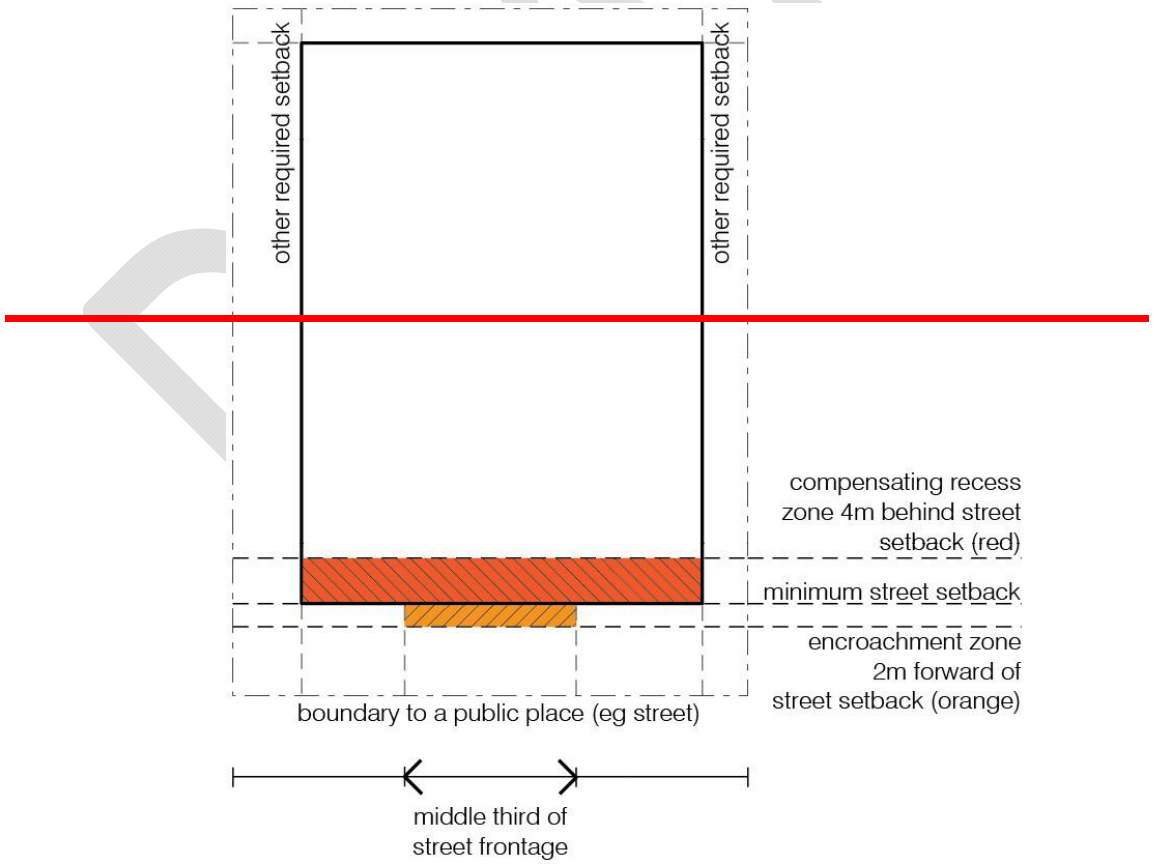

Figure 1.1: Setbacks provide building design flexibility – Minimum Street Setbacks may only be varied in accordance with Section 5.1.1.1(3) of the DCP and the procedures for demonstrating compliance. This diagram shows area

where encroachments and compensating recess(es) may occur.

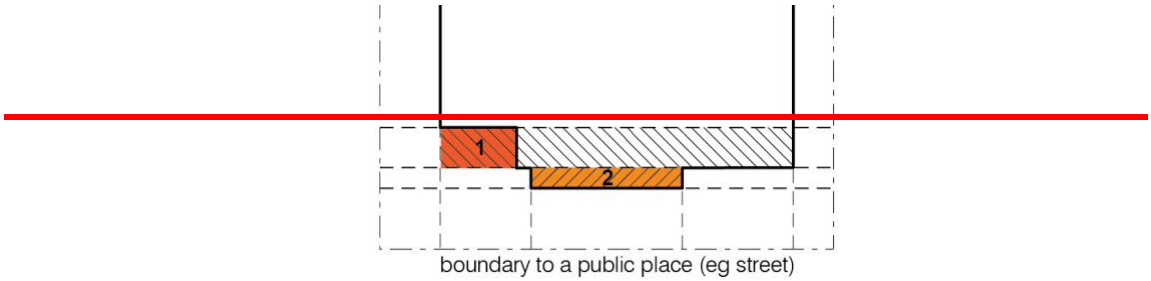

Figure 1.2: Example showing area of compensating recess (1) equal to area of encroachment (2).

(2) Some encroaching elements have a larger impact on daylight to a Public Place than is directly reflected in their plan area. For the purposes of assessing the area of such small or tightly spaced elements like architectural fins, any encroachments are deemed to have an area equal to their plan area except elements less than:

(a) 1m wide – where they are treated as if they are 1m wide; and

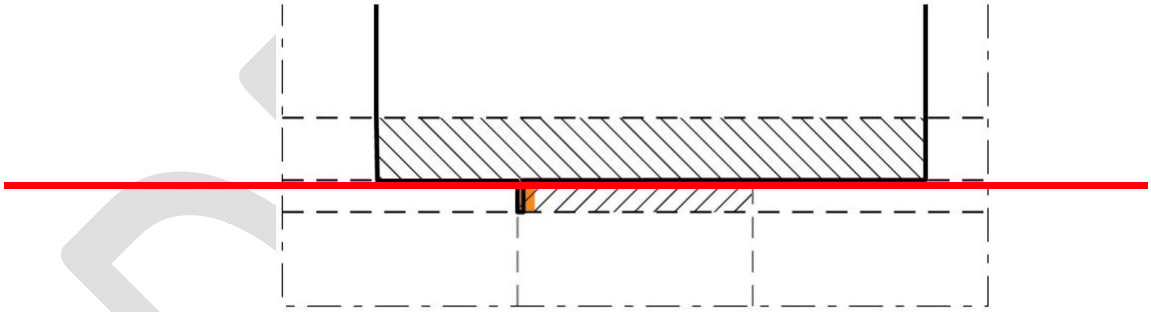

Figure 1.3: Example showing a narrow fin less than 1m wide within the encroachment zone - the deemed area of the encroachment shown orange has equal depth and is 1m wide.

(b) 3m apart – where they are treated as if they are a single element that has a plan area extent described by joining the element's outermost edges with straight lines.

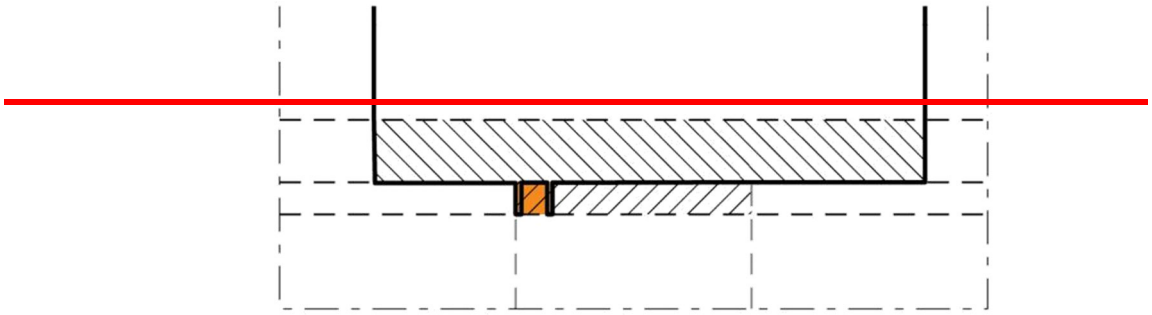

Figure 1.4: Example showing 2 narrow fins less than 3m apart within the encroachment zone – the deemed area of the encroachment shown orange includes the space between the encroaching elements.

(3) Some recesses will have a negligible or limited benefit to daylight levels in Public Places so an area of building recess will only be deemed to be a compensating recess if it is:

(a) at least 3m wide (see example at "3" in Figure 1.2 which is not 3m wide so is not a compensating recess);

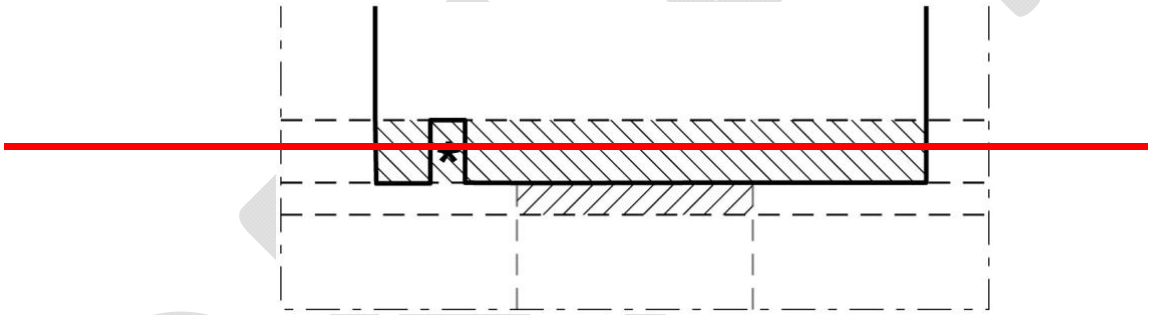

Figure 1.5: Example showing a slot that is not 3m wide (at the asterisk) – this is not deemed to be a compensating recess because it is too narrow to provide any daylight benefit.

(b) wider than it is deep (ie no narrow slots [see example at "4" in Figure 1.2 which is wider than it is deep so is a compensating recess, where as "5" in Figure 1.2 is deeper than it is wide so is only a compensating recess for that portion of the recess equal to its width]); and

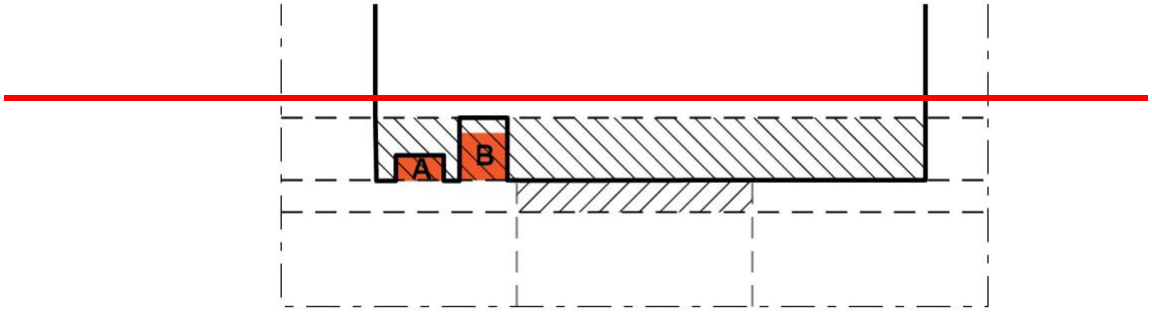

Figure 1.6: Example showing two recesses that are both 3m wide – recess A is wider than it is deep so the full area shown red is deemed a compensating recess, recess B is deeper than it is wide so only an area with a depth equal to the width shown red is deemed as an area of compensating recess.

(c) is clear to the sky for the full height of the building.

(4) Notwithstanding 3(a) and (b) above, the full area of a building recess contiguous with any other required setback (other than the relevant street setback) is a compensating recess.

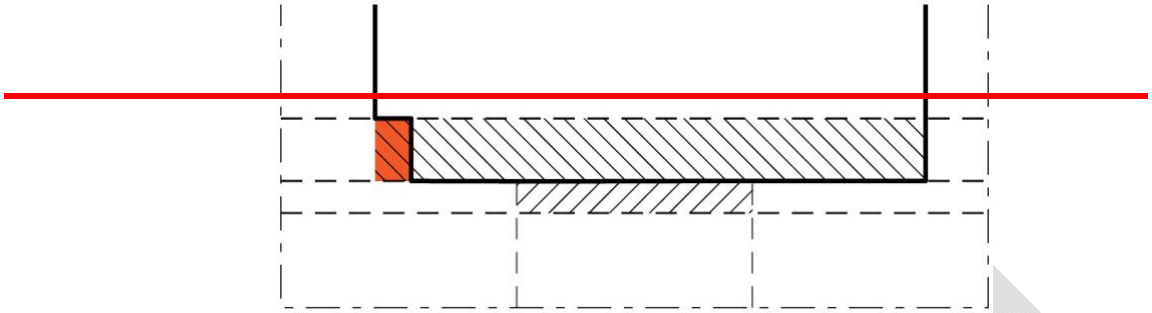

Figure 1.7: Example showing a narrow deep recess that is contiguous with a required side setback – the full area shown red is deemed a compensating recess.

(5) On corner sites, the compensating recesses for each frontage are assessed independently of each other. That part of a recess that complies with the criteria for both street frontages may be counted as compensation toward encroachments on each frontage.

Procedure B: Equivalent or improved wind comfort and wind safety and daylight levels in adjacent Public Places

In order to demonstrate compliance with Section 5.1.1.1(3)(b) and Section 5.1.1.3(5) in regards to varying Minimum Street Setbacks and Side and Rear Setbacks, Building Form Separations and Tapering provisions respectively, the following procedure must be followed:

(1) Procedure B can only be used to vary setbacks for sites larger than 1000m^2.

(2) Where (1) is satisfied, variation to relevant setbacks may be permitted to building massing that provides equivalent or improved wind comfort, wind safety and daylight levels in adjacent Public Places relative to a base case building massing with complying Height, Street Frontage Heights, Street Setbacks, Side and Rear Setbacks and Tapering.

(3) The base case building massing with complying Street Frontage Heights, setbacks and tapering is established by modelling 3 dimensional podium and tower components as follows:

(4) The podium is modelled by extruding the subject site boundary vertically 35m above existing ground level (as it varies around the site perimeter) for buildings up to 120m high and 25m above ground level for taller buildings.

(5) The Tower Component is modelled by defining an area set out by the required street, side and rear setbacks, excluding areas over heritage items and Tower Component areas narrower than 6m wide. For Tower Components where at least one face is longer than 30m the resultant area is chamfered with a 10m radius at all external corners. The resultant shape is extruded to the maximum permissible building height as it varies around the site. The resulting tower form must be tapered by scaling it horizontally in both horizontal directions (X and Y) by 95% between 120-240m and by 90% above 240m above ground level.

Note: the maximum permissible building height excludes architectural roof features but includes all other relevant controls including LEP height controls, Sun Access Planes, No Additional Overshadowing Controls, Special Character Area height and setback controls, View Controls Airport restrictions etc.

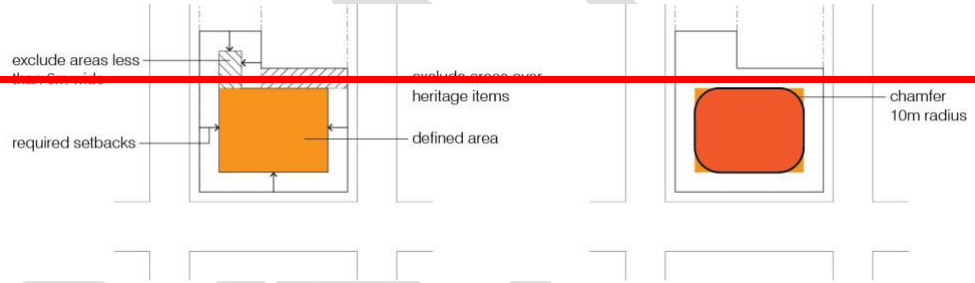

Figure 1.8: Defining the base case tower component area and building massing

Schedule 11

Procedures for demonstrating compliance with variation provisions for street frontage height and setbacks, side and rear setbacks, building separations and tapering controls in Central Sydney

The following processes are required to be complied with to demonstrate compliance with Section 5.1.1.1(3)(a) and (b) in regards to varying Minimum Street Setbacks, Section 5.1.1.3(5) in regards to varying Minimum Side and Rear Setbacks and Building Form Separations, and, Section 5.1.1.4(3) in regards to varying Tapering provisions.

Relevant sections of the DCP are reproduced below for ease of reference.

Minimum Street Frontage Height and Street Setbacks

Section 5.1.1.1

(1) The Street Frontage Height and Street Setbacks of a building must be in accordance with Table 5.1 – Permissible range of Street Frontage Heights and Table 5.2 Minimum Street Setbacks, except for buildings in Special Character Areas that must be in accordance with the Minimum Street Frontage Heights for Special Character Areas in Table 5.3, and the Minimum Street Setbacks and Maximum Street Frontage Heights as shown in the Special Character Area maps at Figures 5.3 to 5.15 in Section 5.1.1.2.

(3) Where noted in Table 5.2 Minimum Street Setbacks and on the Special Character Area maps, variation to Street Setbacks may be permitted to building massing that provides:

(a) encroachment(s) 2m forward of the minimum Street Setback within the middle third of the frontage to a Public Place and provision of compensating recess(es) of equal to or greater area up to 4m behind the minimum Street Setback; or

(b) equivalent or improved wind comfort, wind safety and daylight levels in adjacent Public Places relative to a base case building massing with complying Street Frontage Heights and Street Setbacks (i.e. variation to massing is governed by achieving equal or better performance).

Procedures for demonstrating compliance with 5.1.1.1(3)(a) and (b) are set out in Schedule 11.

Side and Rear Setbacks and Building Form Separations

Section 5.1.1.3

(5) Variation to Side and Rear Setbacks and Building Form Separations may be permitted to building massing that provides equivalent or improved wind comfort, wind safety and daylight levels in adjacent Public Places relative to a base case building massing with complying Side and Rear Setbacks (i.e. variation to massing is governed by achieving equal or better performance) .

Procedures for demonstrating compliance with 5.1.1.3(4) are set out in Schedule 11.

Note: Building massing includes all building elements at all levels. For example fins, external sun shading devices, architectural features, screens, signs, awnings etc

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Built form massing, tapering and maximum dimensions

Section 5.1.1.4

(3) Above the Street Frontage Height the total Building Envelope Area may occupy the following proportion of the site area less any areas of heritage items and required DCP setbacks:
(a) 100% up to 120m above ground;
(b) 90% above 120m up to 240m above ground; and
(c) 80% above 240m above ground.

Procedure A: Minimum Street Setback Encroachment and Compensating Recess

In order to demonstrate compliance with Section 5.1.1.1(3)(a) in regards to varying Minimum Street Setbacks, the following procedure must be followed:

(1) Building massing with a frontage to a Public Place, where each frontage is assessed independently at each floor the building, may encroach up to a maximum of 2m forward of the required Minimum Street Setback within the middle third of the frontage if it provides an equal or greater area of compensating recesses up to 4m behind the Minimum Street Setback, but not within any other required setback.

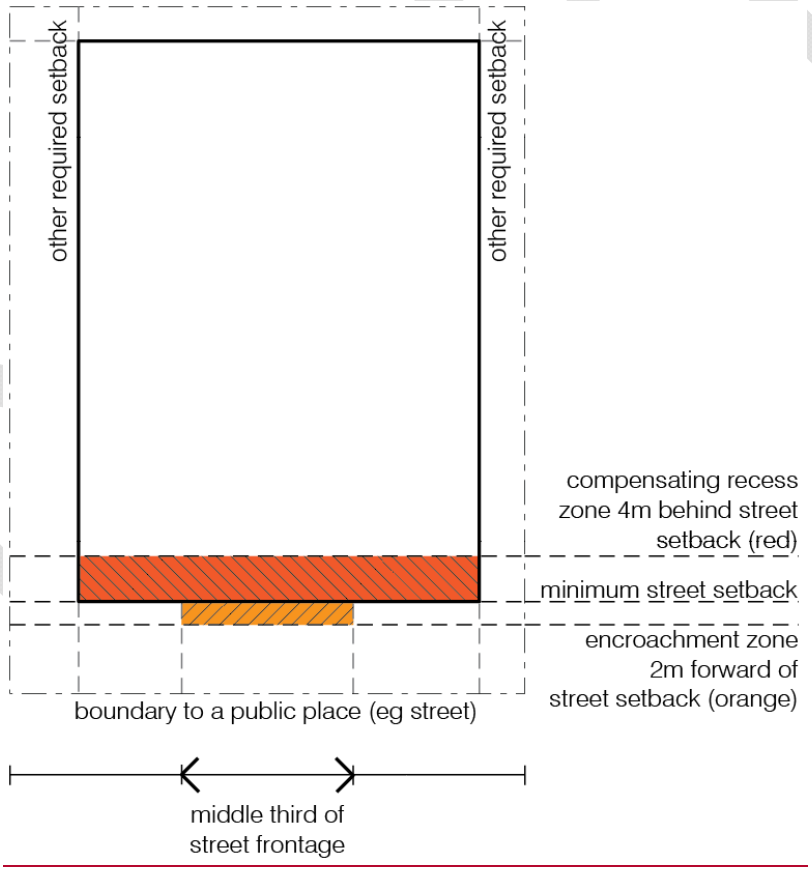


Figure 1.1: Setbacks provide building design flexibility – Minimum Street Setbacks may only be varied in accordance with Section 5.1.1.1(3) of the DCP and the procedures for demonstrating compliance. This diagram shows area where encroachments and compensating recess(es) may occur.

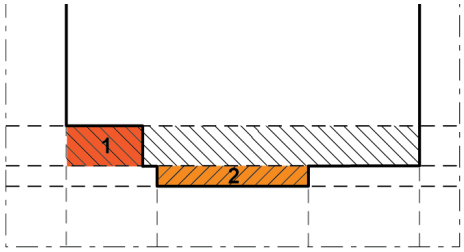


Figure 1.2: Example showing area of compensating recess (1) equal to area of encroachment (2).

(2) Some encroaching elements have a larger impact on daylight to a Public Place than is directly reflected in their plan area. For the purposes of assessing the area of such small or tightly spaced elements like architectural fins, any encroachments are deemed to have an area equal to their plan area except elements less than:

(a) 1m wide – where they are treated as if they are 1m wide; and

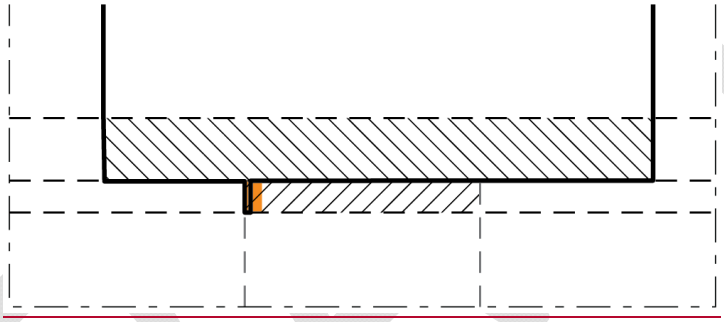


Figure 1.3: Example showing a narrow fin less than 1m wide within the encroachment zone - the deemed area of the encroachment shown orange has equal depth and is 1m wide.

(b) 3m apart – where they are treated as if they are a single element that has a plan area extent described by joining the element's outermost edges with straight lines.

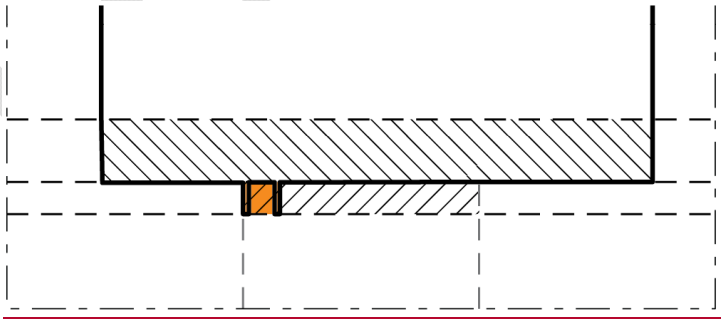


Figure 1.4: Example showing 2 narrow fins less than 3m apart within the encroachment zone – the deemed area of the encroachment shown orange includes the space between the encroaching elements.

(3) Some recesses will have a negligible or limited benefit to daylight levels in Public Places so an area of building recess will only be deemed to be a compensating recess if it is:

(a) at least 3m wide (see example at "3" in Figure 1.2 which is not 3m wide so is not a compensating recess);

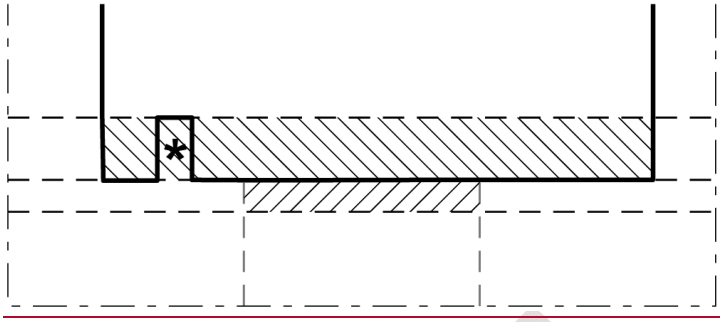


Figure 1.5: Example showing a slot that is not 3m wide (at the asterisk) – this is not deemed to be a compensating recess because it is too narrow to provide any daylight benefit.

(b) wider than it is deep (ie no narrow slots [see example at "4" in Figure 1.2 which is wider than it is deep so is a compensating recess, where as "5" in Figure 1.2 is deeper than it is wide so is only a compensating recess for that portion of the recess equal to its width]); and

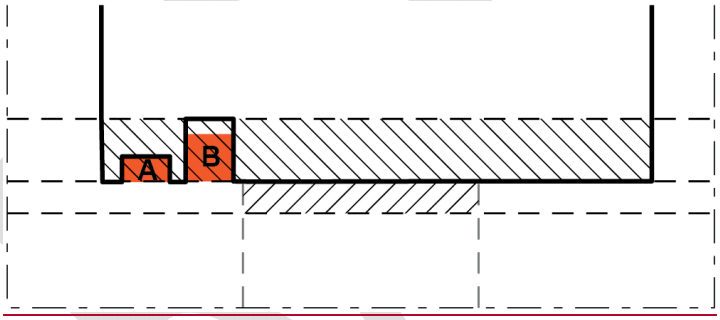


Figure 1.6: Example showing two recesses that are both 3m wide – recess A is wider than it is deep so the full area shown red is deemed a compensating recess, recess B is deeper than it is wide so only an area with a depth equal to the width shown red is deemed as an area of compensating recess.

(c) is clear to the sky for the full height of the building.

(4) Notwithstanding 3(a) and (b) above, the full area of a building recess contiguous with any other required setback (other than the relevant street setback) is a compensating recess.

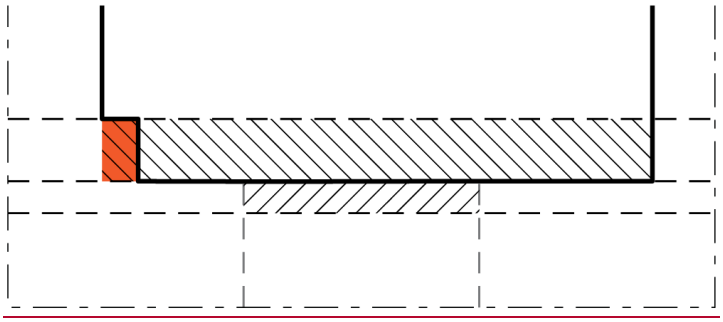


Figure 1.7: Example showing a narrow deep recess that is contiguous with a required side setback – the full area shown red is deemed a compensating recess.

(5) On corner sites, the compensating recesses for each frontage are assessed independently of each other. That part of a recess that complies with the criteria for both street frontages may be counted as compensation toward encroachments on each frontage.

Procedure B: Equivalent or improved wind comfort and wind safety and daylight levels in adjacent Public Places

Procedure B can only be used for sites larger than 1000m^2.

Procedure B is used for demonstrating compliance with Section 5.1.1.1(3)(b) and Section 5.1.1.3(5) in regards to varying Minimum Street Setbacks, Side and Rear Setbacks, Street Wall Height, Building Form Separations and Tapering provisions.

A base case model is prepared which meets all the requirements set out for Procedure B. The base case model is tested to establish the minimum performance benchmarks for daylight levels (or sky view factor) and wind comfort and safety in public places adjacent to the site. The alternative building envelopes are tested for equivalence with these performance benchmarks.

The base case model and proposed alternative building envelopes are tested, with the results of this performance benchmark equivalence testing used to demonstrate that the proposed alternative envelopes perform better than the base case in relation to daylight levels (or sky view factor) and wind performance. This informs the suitability of proposed variations to the setbacks, street wall height, building form separation and tapering controls in relation to measurable daylight (or sky view factor) and wind performance.

The base case model envelope is not a “complying envelope” for future development on a site. Any proposed building envelope needs to demonstrate that a high quality urban design outcome will be achieved through the preparation of a detailed urban design and options analysis that demonstrates how the proposed massing is compatible with the context, and is in accordance with all the relevant controls within the LEP and DCP (including Clause 6.21 of the LEP for design excellence ~~considerations matters~~) .

The base case model, with complying street frontage heights, setbacks, building separation and tapering controls, comprising a podium and tower component (in terms of area and volumes), is a 3-dimensional model to be prepared, tested and reported as follows:

(1) Podium Component Volume:

(a) for part(s) of a site occupied by heritage items or forming part of the curtilage of a heritage item: reflect the existing height and form of the existing building or provide open curtilage to the heritage item.

(b) for parts of the site within a Special Character Area: extrude to the lower of the heights nominated on the Special Character Area map and in Table 5.3.

(c) for other parts of the site:

i. where the building envelope is up to 120m high – extrude the part of the site vertically 35m above existing ground level (as it varies around the site perimeter);

ii. where the building envelope is more than 120m high – extrude the part of the site vertically 25m above existing ground level (as it varies around the site perimeter).

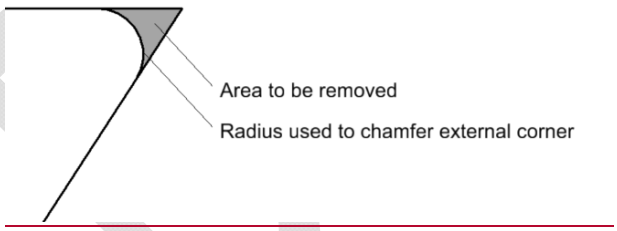
Note: Where both (i) and (ii) are applicable to the site, the podium height is based on the height of the building envelope at the point above.

(2) Tower Component Area:

(a) apply the required minimum street, side and rear setbacks, and building separations in Sections Section 5.1.1.1(3)(b) and Section 5.1.1.3(5) of the DCP.

(b) do not include areas over heritage items or the curtilage of a heritage item, and Tower Component areas narrower than 6m wide.

(c) All external corners of the Tower Component are to be chamfered with a circular radius that removes an area in square metres at each corner equal to the maximum horizontal dimension of the Tower Component Area x 0.4 (see illustration) up to a maximum of 20m^2 or a radius of 10m. Where corners are close together each chamfering operation is to be considered independently to determine the appropriate radius , i.e. the areas to be removed may overlap. If a part of the Tower Component is too narrow to chamfer its corners individually with a single radius, that part's corners may be treated together using a single radius that removes the sum of the areas required to be removed, e.g. for a rectangular part of the Tower Component that is 7m wide where the chamfering is required to remove 20m^2 at each of two external corners a 3.5m radius chamfer could be used but located in such a way as to remove 40m^2 of the Tower Component Area).



(3) The Tower Component Volume:

(a) extrude the Tower Component Area to the maximum permissible building height as it varies around the site.

(b) The extruded Tower Component Volume must be tapered by scaling it horizontally in both horizontal directions (X and Y) by:

i. 95% (for the portion of the tower between 120-240m above ground level) which is equivalent to a 90% area relationship.

ii. 90% (for the portion of the tower greater than 240m above ground level) which is equivalent to an 80% area relationship.

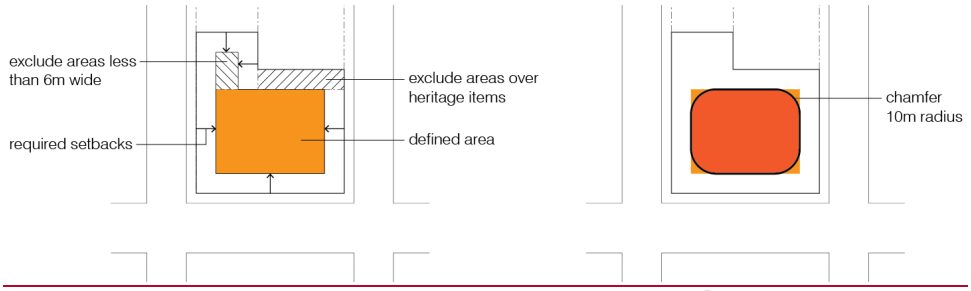


Figure 1.8: Defining the base case tower component area and building massing

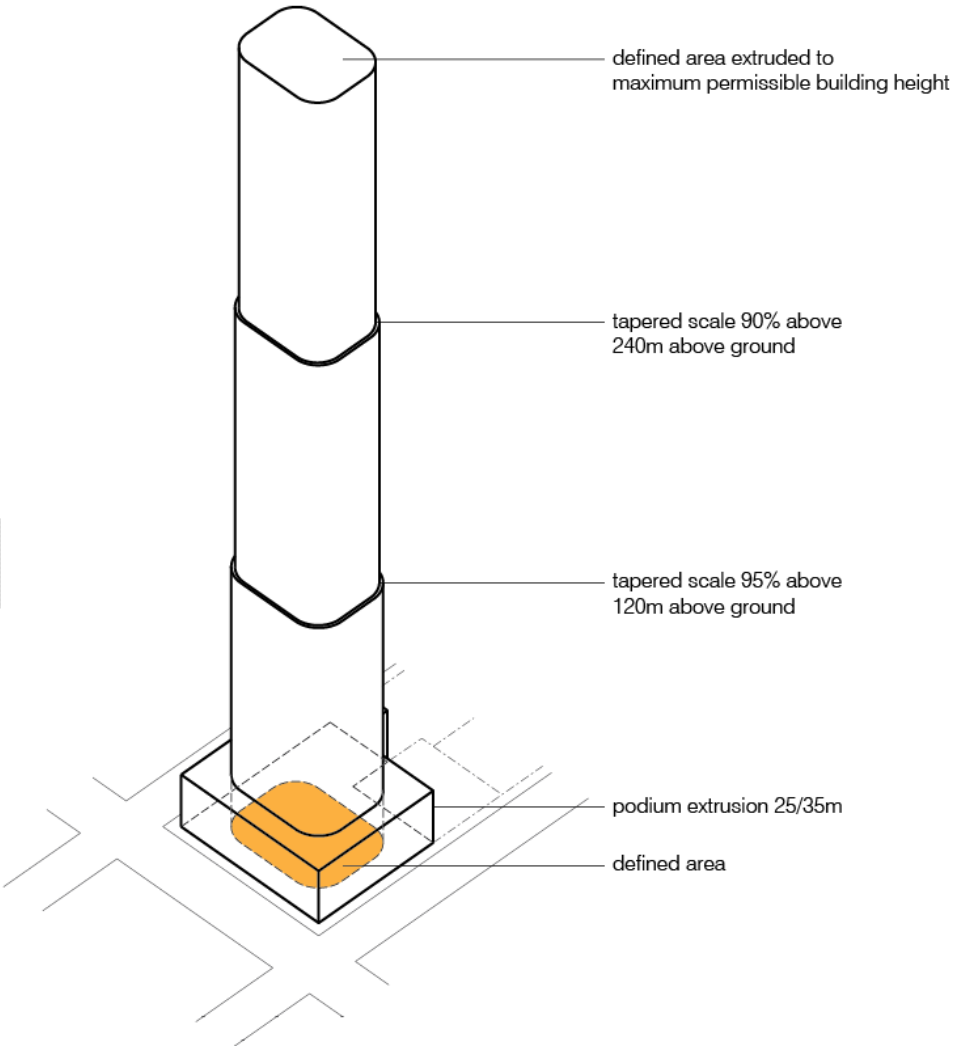


Figure 1.9: Tapering the base case tower building massing

Note: the maximum permissible building height excludes architectural roof features (i.e. no additional height should be assumed for permissible architectural roof features) but includes

all other relevant controls including LEP height controls, Sun Access Planes, No Additional overshadowing Controls, Special Character Area height and setback controls, View Controls Airport restrictions etc.

(4) Model Testing

The wind and daylight testing of the base case model and alternative building envelopes are to include measurements in public places for a distance of at least 50m and no more than 100m from the site boundary. The tests must exclude any elements within a Public Place (e.g. trees and awnings) and must satisfy the following requirements for wind and daylight (or sky view factor):

(a) Wind: wind speeds are defined by Section 5.1.9 Managing Wind Impacts, Sydney DCP 2012 for comfort and safety.

Wind speeds must be measured within the existing city form and be distributed evenly across the surrounding public places and include testing locations in areas where wind speeds are likely to change as determined by a wind report.

(b) Daylight Factor: the average annual daylight level (which may be approximated by the average Sky View Factor) and should be measured on a 1m grid.

i. Daylight Factor is the percentage of available daylight, on a daily basis, throughout the year.

Daylight Factor is weighted by the daily availability of light (assuming an open environment), to account for variations in amount of light throughout the year, rather than an average annual quantum of daylight.

To calculate the Daylight Factor: simulate the available direct and diffuse illuminance that reaches the ground level of the adjacent public places each day for a typical year for the base case and alternative building envelopes and express them as daily percentages of the maximum available daylight in an equivalent open environment for each day. The daily percentage factors are then averaged to give a single Daylight Factor value for each option. These Factors can then be compared.

The daylight calculations are to include consideration including the directionality of sunlight, diffuse daylight access, seasonal weather variation, and typical luminance variation of the sky.

ii. Sky View Factor (SVF) is the extent of sky observed above a point as a proportion of the total possible sky hemisphere above the point.

SVF is calculated as the proportion of sky visible when viewed from the ground (as an abstract horizontal surface) up. SVF is a dimensionless value that ranges from 0 to 1. A SVF of 1 denotes that the sky is completely visible to the horizon in all directions; for example, in a flat terrain. When a location has topography or buildings blocking view to any part of the sky, it will cause the SVF to decrease proportionally.

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Because SVF measures the whole sky hemisphere and only a small fraction of the sky will be subject to change as part of a development the SVF must be resolved at a high resolution to detect the change. This is an inherent feature of the SVF measure. This means that the sky must be subdivided into more than 5000 equal areas for final SVF calculations but also that the difference in SVF may appear small particularly when averaged over a large area.

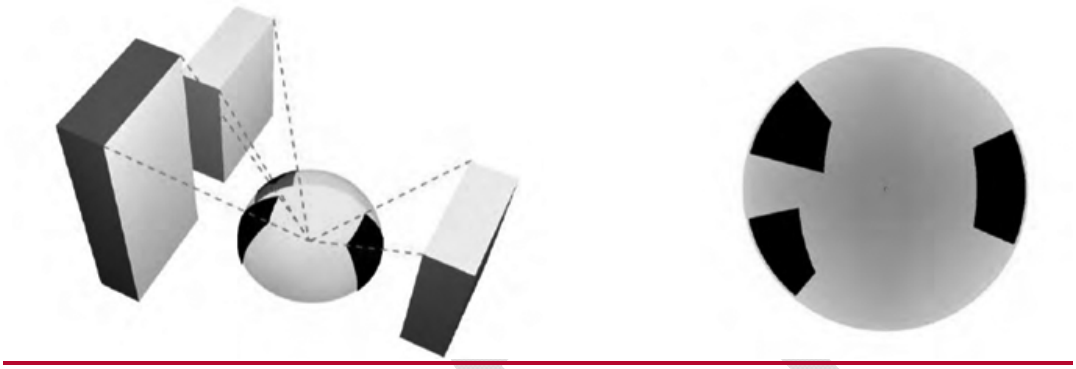

Figure 1.10: Sky View Factor means the extent of sky observed above a point as a proportion of the total possible sky hemisphere above the point.

(5) Equivalence reporting

All data that is relied on for equivalence testing must form part of the report including individual data points as tables and model geometries for the base case and alternative building envelopes. These must be described with sufficient dimensions to allow for the equivalent model to be created by a third party for checking.

(a) For wind: the 5% exceedance comfort wind speed values in metres per second must be averaged and compared. The comfort categories are not relevant in demonstrating equivalence.

Note that the proposed alternative building envelopes must both demonstrate equivalence and also not cause wind speeds that exceed comfort or safety standards or cause worsening of existing exceedances.

Note: if the equivalence testing shows new or worsened exceedances of the comfort or safety standards, additional wind tunnel testing will be required to show how these exceedances can be mitigated. This testing may include modelling of awnings consistent with DCP requirements.

(b) For daylight (or SVF): the factors are averaged and the single resultant values compared.

In this document “equivalent” wind speed and daylight/SVF is to be understood as very slightly “better than” at a high level of accuracy. For example a SVF of 0.10001 is equivalent to a SVF of 0.10000 by being very slightly better than it.

Authors of equivalence reports must note that while daylight and wind equivalence is essential, any proposal must still be supported by a detailed urban design and options analysis to demonstrate that a high quality urban design outcome will be achieved, and the proposed massing is compatible with the context.

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