Chapter 3
Key principles for the design and siting of low-impact facilities

Begin by analysing the site.

Achieving better visual outcomes for low-impact facilities should start with a good understanding of the site and its context.

The purpose of this is to ensure that an appropriate site in the search area is selected for the proposed facility. The following page has a list of issues and questions that may be considered when assessing a potential site. The issues may not be relevant for all sites, and this will depend on the nature of the site and facility proposed. For example, consideration of “design” of the existing site may be relevant to a proposal for a building rooftop, but may be less so for a proposal to co-locate on an existing telecommunications tower (unless that tower is specifically “designed” for the location).

Begin by analysing the site...

In the first place, the siting of a facility is influenced by the “key factors in the siting and design of low-impact mobile facilities”, as outlined on pages 4 and 5 of this document. The design of the facility is then very much dependent on the opportunities and constraints of the selected site. These opportunities and constraints directly influence the ability to minimise visual impact.

The siting and design of a facility requires a PROCESS of investigation and analysis – here are some of the visual issues typically considered as part of that process.

Are there any other towers or public utility structures in the area?

Carriers are obliged by law to consider co-locating on any existing towers or public utility structures in the area before engaging in a low impact facility activity.

In some cases however, even though a tower or structure may exist in the area, it may produce a better visual outcome to locate on a rooftop or elsewhere. Co-locations don’t always result in the best visual outcome.

Co-location on a water tank

In this case three carriers co-locating results in substantially increased visual bulk (note that the lower tower has since been removed).

Co-location facility with antennas flush mounted below the original headframe.
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The existing site

<table>
<thead>
<tr>
<th>Key elements</th>
<th>Typical considerations</th>
</tr>
</thead>
</table>
| Colour              | • Is it possible or appropriate to colour the facility to blend with the colour of this site?  
                         • Would it be more appropriate to colour the facility so that it contrasts, or would a neutral colour have less impact? |
| Texture             | • Is it possible or appropriate to match the texture or materials of the facility to the texture or materials of the background? For example, could an equipment cabin be brickwork? |
| Form                | • Is the form of this building blocky or finely articulated?                             
                         • Could a low-impact facility on this site be sympathetic to the form?                
                         • How could antennas be mounted so that they will have the least impact? For example, should they be flush mounted to maintain the flat profile of the building, or is it more appropriate to mount them on the rooftop? 
                         • Could the form of the building assist to minimise the impact of a facility?      
                         • Does the form lend itself to the use of radio transparent screening?             |
| Bulk and Scale      | • Is this site/building of a bulk and scale so that a facility here would not be visually obtrusive? 
                         • How does the bulk/scale relate to the form, and how does this impact on whether or not this site is appropriate for a telecommunications installation? |
| Design              | • Could the proposed facility on this site be designed so it is sympathetic with the design of this building/site? |
| Existing telecommunications infrastructure | • Are there other telecommunications facilities on the site? |
|                     | • Will the proposed facility create or add to the existing clutter?                |
|                     | • How could this be avoided or corrected?                                           |

Surrounding the site

<table>
<thead>
<tr>
<th>Key elements</th>
<th>Typical considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Views and view corridors</td>
<td>• Will the facility detract from a significant view corridor? What can be done to minimise this?</td>
</tr>
<tr>
<td>Local landmarks, places of heritage or cultural significance</td>
<td>• Will the facility detract from any local landmarks or places of significance? For example, it is located on a rooftop next to a church steeple which currently dominates the skyline?</td>
</tr>
<tr>
<td>Vegetation</td>
<td>• Is there vegetation around the site? Could vegetation be used to minimise the visual impact of a facility in this area? For example, could plants around the equipment cabin screen it from the footpath?</td>
</tr>
</tbody>
</table>
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...then consider how the visual impact of the facility could be minimised on this site

The ability or decision to adopt these suggestions depends on the opportunities and constraints of the particular site as well as the technical requirements of the facility and other factors outlined on pages 4 and 5 of this document.

1. Maintain the integrity of landmarks and places of significance

Low-impact telecommunications facilities may detract from the integrity of landmarks or places of cultural or heritage significance. It is important to consider the visual impact of the facility on the buildings and places surrounding the site, as well as the site itself.

2. Avoid interrupting significant views

It is preferable that facilities should not substantially impact on the integrity of important views. If a proposed facility may interrupt such a view, then options to minimise the visual impact should be considered. It may be appropriate to integrate the facility in some way in order to reduce the visual clutter.

The form of this building enables the vertical element to be "extended" so that the addition looks like part of the original building. Careful detailing and colour matching are also very important in integrating this facility.

The impact upon the church may be minimised by locating antennas on the neighbouring building where the colour of the background makes the profile of antennas less visible.

An example of a view which should probably not be cluttered with mobile phone facilities.
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3. Integrate the facility

Facilities can in many instances be integrated with existing structures. Opportunities for site sharing could be used where appropriate.

Where facilities are located on an existing building, the ability to integrate the facility depends largely on the form of the building.

Taking advantage of a modulated form

A building with a modulated roofscape or façade may provide opportunities to locate antennas so that they emphasise the form or are not seen from some vantage points.

Using screening

On other sites it may be appropriate to use radio transparent material to screen a facility from view. That screening may be in front or behind the facility.

Screening in front of a facility shields it from direct view and may be appropriate on a rooftop, for example, where there are multiple facilities.

Screening behind a facility reduces the visual impact by making the profile less visible. It is particularly important to complement the colour of the facility and the screening when this technique is used.
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Screening may be more appropriate on some building forms than on others. For example, it’s easier to replicate or extend a simple block form using screening (a lift motor room for example) than a detailed, modulated façade (a carved sandstone building for example).

On some sites it may be appropriate to use radio transparent material to construct new building elements to screen mobile facilities.

For example, radio transparent material could be used to construct advertising signs, false chimneys, bell towers and other elements, and the mobile facilities placed inside these structures.

Remember that these screening techniques may not always be feasible for technical, structural, financial and other reasons.

The wind loading of screening must be considered as some buildings are not capable of accommodating the additional load. Screening solutions also substantially increase the cost of a facility.

Is screening low-impact?

Screening is not expressly referred to in the Low-impact Determination. In particular instances however, the use of screening may be authorised under Clause 6(2) of Schedule 3 of the Telecommunications Act. This clause provides that where a carrier is installing a low-impact facility, a carrier may, for purposes in connection with that installation, do anything necessary or desirable for that purpose on, over or under the land.

Here, the antennas are within the rooftop signage.

The bell tower has antennas within it.

Screening need not necessarily hide the antenna to be effective.

Antennas are located within the column elements in this example.
4. Minimise clutter

This is particularly important when there are several facilities on the one site. One means to reduce the visibility is to use screening as discussed in the previous section. Another is to organise or arrange facilities in an ordered way, all at the same height for example. It is acknowledged that this sometimes cannot be achieved however, due to the differing technical objectives of each of the carriers, and the different types of equipment used.

5. Respect an existing designed facility

In instances where one carrier has gone to lengths to design a facility so that visual impact is minimised, if a new carrier is considering co-locating or site sharing, then that carrier should respect the
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Design of the original facility. For example, it may be inappropriate to co-locate a bulky triangular headframe on an existing slim pole. In this instance, the use of flush mounted panel antennas, coloured to match the pole, would look more appropriate.

Likewise, if a part of a rooftop has been carefully screened, it may be inappropriate to locate visually obtrusive antennas next to that screening.

6. **Choose appropriate colours and textures**

Using appropriate colours and textures is a very useful technique to reduce the visibility of facilities.

Generally, facilities should be matched to their background.

Where facilities are seen against the sky, a better visual outcome is generally achieved by using a non-reflective grey. There are sites however, where it may be appropriate that facilities seen against the sky be the same colour as the building or structure on which they are mounted, or some other colour.

As well as colour matching the antennas, it is also sometimes appropriate to treat equipment cabins so that they blend with the surroundings. For example, a brick (or “brick-like”) cabin may be more appropriate than a standard metal cabin when adjoining a brick building.
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7. Place the facility so it is less likely to be seen by pedestrians

Where practical, facilities should be located out of the viewshed of pedestrians. This may be particularly relevant in areas where there is a lot of pedestrian traffic, such as the CBD.

For microcell installations in particular, a better visual outcome may be achieved if antennas are located above awning height. Consideration should also be given to the placement of associated equipment.

Better visual outcomes for other types of facilities may also be achieved by siting them out of the direct pedestrian viewshed. For example, a panel antenna on the edge of a building awning may be less visible if set back onto the building parapet, where the awning acts to screen it from view.

8. Use vegetation where appropriate

Planting may be used to partially screen equipment, and is often successfully used around cabins at ground level. Existing vegetation that does not compromise radio objectives may also be used to provide long distance screening or larger facilities.