



Wireless Facility Design Requirements



City of Campbell

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ACKNOWLEDGEMENTS

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Introduction

This document includes requirements to minimize the visual impacts and aesthetic concerns of wireless communications facilities and encourage collocation of those facilities, consistent with applicable federal and state law. These requirements are adopted and may be amended by the City Council, at the recommendation of the City's Site and Architectural Review Committee and Planning Commission, and serve to implement the design requirements contained in Campbell Municipal Code ("CMC") Chapter 21.34 (Wireless Communications Facilities) (as may be amended from time to time) and other design standards and considerations when appropriate. These requirements should be used in conjunction with CMC Chapter 21.34 and do not supersede the requirements set forth in Chapter 21.34, but serve to provide specific standards and overall guidance for stakeholders involved in the design and development of wireless communications facilities in the City. Public notice shall be provided prior to significant changes to these requirements.

Checklists and handouts prepared by staff to facilitate implementation shall be consistent with these requirements.

Intent of the Requirements

These requirements are designed to protect and promote public health, safety, community welfare, zoning integrity and the aesthetic quality of the City, and to minimize adverse impacts of wireless communications facilities, in conformity with the goals of the General Plan, while providing for the communications needs of residents, businesses, visitors, and government within the City of Campbell. These requirements prescribe clear, reasonable, and predictable criteria to assess and process applications in a consistent and expeditious manner. The purpose of these requirements is to assure a degree of uniformity and consistency in the wireless communications facility review process and provide direction to applicants, service providers and their consultants in regard to the types of facilities that are encouraged, as well as the types of facilities that are discouraged and/or will not be supported. The purpose is also to require all wireless communications facilities to minimize visual and aesthetic impacts by providing for installations that are designed carefully to maintain or improve upon the aesthetic quality of the site and surrounding area, by utilizing, to the extent feasible,

the best siting, design, equipment, and construction methods and the smallest and least intrusive antennas, components and other necessary equipment available.

As further detailed below, the applicant shall use all feasible means to conceal or minimize the visual impact of the wireless communications facility(ies) through integration. Integration with existing structures or among other existing uses shall be accomplished through the use of architecture, landscape, and/or siting solutions.

Substantial conformance with these requirements is required as applicable and feasible to a given facility type. Not all requirements will be applicable to all projects, and therefore interpretation may be required to adapt to the scope of a particular facility request.

Review Criteria

The primary goals of these review criteria is to ensure safe and visually and aesthetically acceptable facility design of all wireless communications facilities, encourage the collocation of facilities, and provide a guide to preferred and acceptable design of wireless communications facilities.

Review Criteria:

1. The proposal minimizes visual and aesthetic impacts to the extent feasible through considerate design, screening, and siting.
2. The proposal blends with, integrates into, and/or complements the color, design, scale, massing, symmetry, and/or character of the surrounding context, whether natural backdrop, building or existing facility, to the extent feasible.
3. The proposal minimizes the removal or modification of any site landscaping or parking and provides appropriate replacement landscaping, or parking if necessary.
4. The proposal does not include any exterior lighting or signs, except to the extent required or recommended for safety purposes.
5. Ancillary equipment and support features have been incorporated into the design of the wireless communications facility except in instances where such an approach would result in a less favorable design.

6. The proposal has been collocated or designed to allow collocation to the extent feasible, except in instances where such an approach would result in a less favorable design.

Stealth Facilities

Stealth facilities are those which result in no perceptible visual impact. As such, stealth facilities are generally preferable to concealed facilities except in rare circumstances when the concealment method serves to improve the aesthetic value or interest to a building, structure or site. There are two primary categories of stealth facilities: (1) those which are completely integrated into an existing structure or architectural feature and (2) those which are imperceptible as a result of careful placement. Both stealth categories require the facility to remain integrated or imperceptible, even when the facility may be expanded upon under the provisions of an eligible facility request. (See CMC Section 21.34.190 (Definitions)).

Completely integrated facilities

Completely integrated facilities are those which are incorporated into an existing structure or site in a manner which does not result in a new feature being added. This stealth category may result in the removal of existing siding, or materials to achieve Radio Frequency (RF) transparency, provided that the replacement materials match, to the extent feasible, the existing or abutting material.

Where an equivalent material match cannot be adequately demonstrated, a stealth facility could propose to completely remove and replace an existing material if doing so serves to achieve a more cohesive design and does not disrupt the design of the building (e.g. the replacement of all roof shingles, as opposed to simply removing/replacing a smaller impacted roof or wall section).

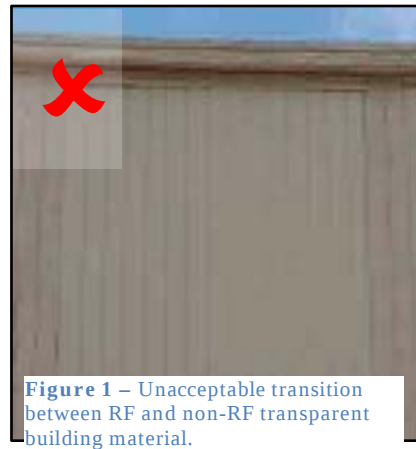


Figure 1 – Unacceptable transition between RF and non-RF transparent building material.



Figure 2 – Example of a facility completely integrated within an existing tower element.

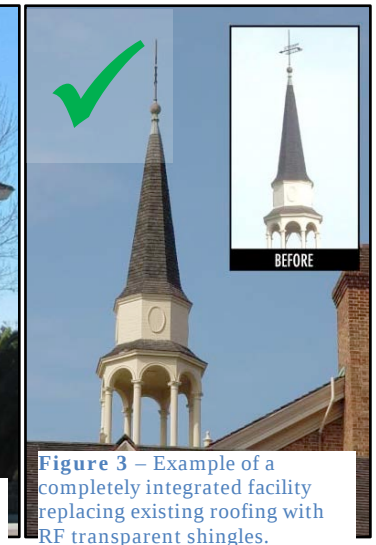


Figure 3 – Example of a completely integrated facility replacing existing roofing with RF transparent shingles.

Carefully placed facilities

Carefully placed facilities are those situated in a location which renders a facility virtually imperceptible to the public. As such, the emphasis for this category of stealth facility is on its location as opposed to its design. Carefully placed facilities require no camouflaging or screening, in that existing site features (e.g. buildings, walls, roof parapets) render such a requirement unnecessary. Successful examples of carefully placed facilities may include those proposed within an existing building (requiring no alteration of existing materials), those sited on the roof of a particularly large or tall building, and those which are flush mounted to an existing high voltage lattice tower.

In the case of a roof-mounted facility, decision-makers must carefully consider the appropriate height of the equipment, distance from the edges of the roof, and resultant views from adjoining properties to ensure facilities falling under this category are not visible.



Figure 4 – Example of a facility which is imperceptible to the public from multiple vantage points, as a result careful placement when considering the height of the equipment.

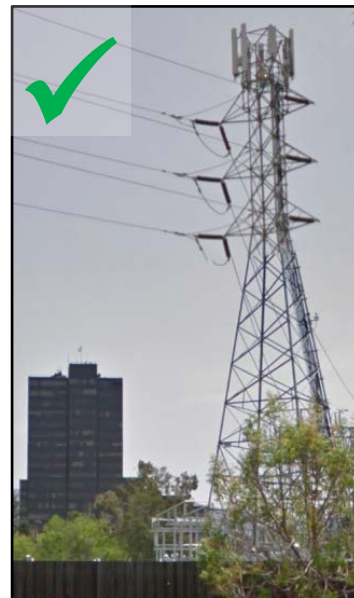


Figure 5 – Facility located on a high roof (Pruneyard Office Tower) and a facility flush mounted to an existing high voltage lattice tower and treated to match. Base equipment hidden by existing fencing and cabling should be minimized and treated to match legs/support posts of tower.



Figure 6 – Example of a several roof-mounted facilities on a single building which are visible as a result of being a combination of being too tall, or too close to the building edges.

Concealed Facilities

Concealed facilities are those which result in new site or architectural features being added to a property in a manner which complements, enhances, or seamlessly integrates into their surroundings. While this category of facility design allows for limitless innovation, concealed facilities most frequently associated with this category include roof mounted, façade mounted, faux trees, towers, and public art. In principle, facilities seeking approval under this category must be designed such that they would be supported irrespective of the equipment they seek to conceal and in a manner consistent with other adopted plans or design requirements or guidelines as applicable (e.g. Downtown Development Plan, East of Campbell Avenue Area Master Plan, and Winchester Boulevard Master Plan). In that concealed facilities often seek to mimic, recreate, or expand upon existing site or architectural features, colors, and materials, applicants are required to provide samples of the materials the applicant seeks to duplicate and compare those samples against the existing site features.

Roof mounted

Roof mounted facilities, as their name implies, are those with their antennas and equipment placed directly on the roof of a building or structure. This type of facility is most frequently concealed by housing the equipment in a new cupola, dormer, or penthouse, and/or by screening it behind a raised parapet. Roof mounted facilities should generally be comprised of the same materials, colors, and finishes as the existing structure, and proportionate in scale and massing.



Figure 7 – Building prior to construction of concealment.



Figure 8 – Building after construction of extended parapet serving to conceal a new roof-mounted facility.

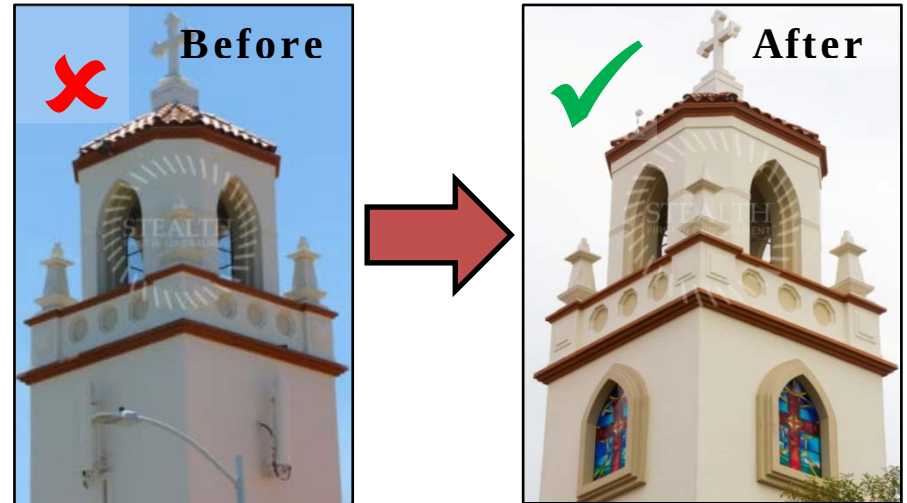
Façade mounted

Façade mounted facilities are those which include antennas mounted, attached, and/or affixed to any façade of a building. Generally, this facility type is difficult to conceal, except in instances where an architectural element may be added in a considerate manner.

Façade mounted antennas attached to an existing structure must consider the scale, symmetry and design of the structure and minimize the addition of bulk and clutter to a building. The examples provided below illustrate several successful and unsuccessful façade mounted facility designs.



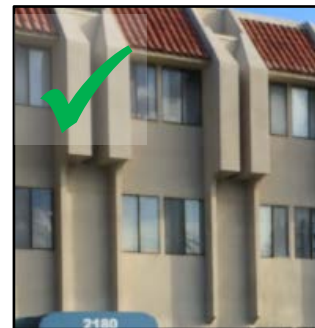
Figure 9 – Unsuccessful example of façade mounted equipment.



Figures 10 & 11 - Elevations showing the removal and replacement of flush mounted antennas with an architecturally integrated concealment (faux stained glass windows).



Figure 12 – Unsuccessful example of antennas trying to replicate an architectural feature. These antennas extend above the parapet of the building, and protrude down in front of a metal mesh screen.



Figures 13 & 14 – Successful examples of antennas being installed in new architectural elements.

Faux trees

Faux trees are effectively a tower facility camouflaged to resemble a tree. Design of these facilities should include an assessment of the appropriate tree species, shape, and size, as well as the quality and longevity of materials (branches & bark), color, and finish in consideration of the facilities' surroundings. Detailed specifications must be provided during plan review. In addition to the general review criteria, all faux tree facilities shall comply with the following standards:

- a. The tree species shall be selected based on its proposed surroundings and ideally placed in an established grove of trees of comparable size, height, species and shape as the proposed.
- b. Utilize faux trees that replicate the shape, structure, height, and color of live trees.
- c. The canopy shall completely envelop all tower-mounted equipment and extend beyond the tower-mounted equipment at least 18 inches.
- d. The canopy shall be naturally tapered to mimic the particular tree species.
- e. All faux trees must incorporate a sufficient number of branches (no less than 3 branches per foot) and design materials so that the structure is as natural in appearance as possible.
- f. Where branches are connected to the pole, the branches shall make a seamless connection with the faux bark cladding.
- g. All tower-mounted equipment, including, without limitation, antennas, equipment cabinets, cables, mounts and brackets, shall be painted flat, natural colors to mimic the bark or branches of the particular tree species based on the predominant backdrop.
- h. All antennas and other tower-mounted equipment cabinets shall be covered with leaf or needle "socks" to blend in with the faux foliage.
- i. The entire vertical structure shall be covered with permanently-affixed three- dimensional faux bark cladding to mimic the particular tree species.
- j. All coaxial cables must be routed directly from the ground up through the pole.



Figure 15 – V-Shaped trees (such as Eucalyptus) are generally preferred as they offer the greatest screening where antennas are mounted. The tree species shall be selected based on surroundings and ideally placed in a grove.

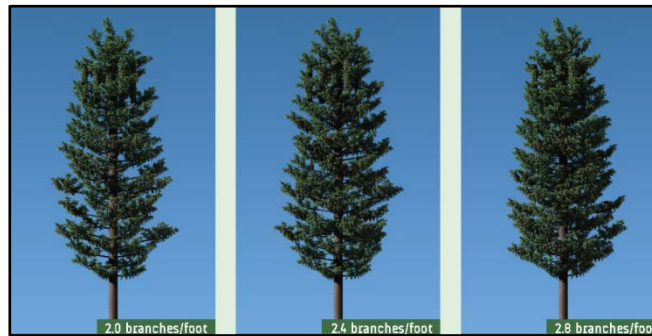


Figure 16 – Increases in branch length and density can dramatically improve the aesthetics of a faux tree. Where branches are connected, the branches shall make a seamless connection with the pole.



Figures 17 to 19 – Bark, needles, and leaves come in an array of quality and finishes. Selection of durable, realistic (mixture of healthy and less healthy) finishes is important in facility design. Leaf/needle socks shall be required for antennas.



Figures 20 to 25 – Examples of successful and unsuccessful faux tree designs.

Towers

Tower facilities include monopoles, lattice towers, guyed towers, freestanding towers, and/or other structures (other than faux trees) designed to support antennas. In general, towers are the least preferred category of facility as they are often significantly taller than their surroundings and the most difficult to conceal. Towers shall be designed to architecturally blend with the building, structure, and/or setting in which they are proposed. Towers shall be built at the lowest height possible.

For flag poles, antennas must be enclosed within the pole or a radome. The wireless communications facility(ies) must fully comply with the U.S. Flag Code. All cables must be routed directly from the ground up through the pole. The overall height and diameter of the flag pole must be compatible with the surrounding area. Decorative elements must be included in the overall height measurement.



Figures 26 to 31 – Examples of successful and unsuccessful tower designs.

Public art

Public art facilities marry functional and aesthetic design to arrive at attractive and stimulating visual qualities versus other types of concealed facilities which focus on making the facility visually obscure. Both are suitable concealment methods, though public art facilities are particularly suitable for areas with heavy pedestrian use (e.g. parks, entertainment facilities, community centers, regional shopping centers).

Ancillary Equipment and Support Features

To the extent feasible, ancillary equipment and support features should be incorporated into the design of the wireless communications facility. Where this approach is infeasible, or may result in a less favorable design, ancillary equipment and support features associated with the wireless communications facility are to be placed underground in vaults, within existing structures or buildings (i.e. utilizing existing mechanical equipment rooms), or built into new unobtrusive structures or enclosures onsite.

Landscaping

Landscaping may be required as a secondary means of screening for some projects to offset the overall visual impact, but should not be considered as a substitute for walls, screens, fencing or other structural and permanent improvements. New landscaping proposed for such purposes should be provided in the form of screening trees located near the antenna, or as canopy trees for nearby parking areas. Where it is not feasible to provide additional landscaping in proximity to the proposed antenna location, or substantial landscaping already exists on-site, other means of balancing a project's visual and aesthetic impacts shall be considered. Landscaping shall be installed and maintained as necessary to conceal or screen the facility from public view. All landscaping shall be installed, irrigated, and maintained consistent with CMC Chapter 21.26 (Landscaping Requirements).

Temporary Equipment

Mobile towers, also known as COW (Cell on Wheels) are prohibited except when a local emergency is declared by the City Manager or as otherwise expressly allowed by CMC Section 21.34.150 (Temporary Wireless Communications Facilities). A COW or similar temporary wireless communications facility or equipment shall not be permitted for maintenance activities or while awaiting an expected entitlement or pending plan review, and the temporary allowance of such equipment or facility during an emergency shall not be considered to establish a permanent use of such a facility or structure after the emergency has ended, as declared by the City Manager. Once the emergency has ended, the temporary wireless communications facility shall be removed from the site as soon as possible.