



## Architectural Integration Design Guidelines For Telecommunications Facilities

City of Spearfish, South Dakota

### Introduction

In the past several years, there have been significant technological advances that have allowed for the integration of wireless antenna into architectural structures. These structures are built with radio frequency (RF) friendly material so that wireless antenna can be undetected. For example, the parapet section of the roof at the nearby grocery store can become a space for antenna. Or, a cross on top of a church steeple can be a canister with antenna that is mounted inside the canister.

The following are suggestions to guide decision making regarding whether or not a particular wireless antenna meets the intent of being architecturally integrated.

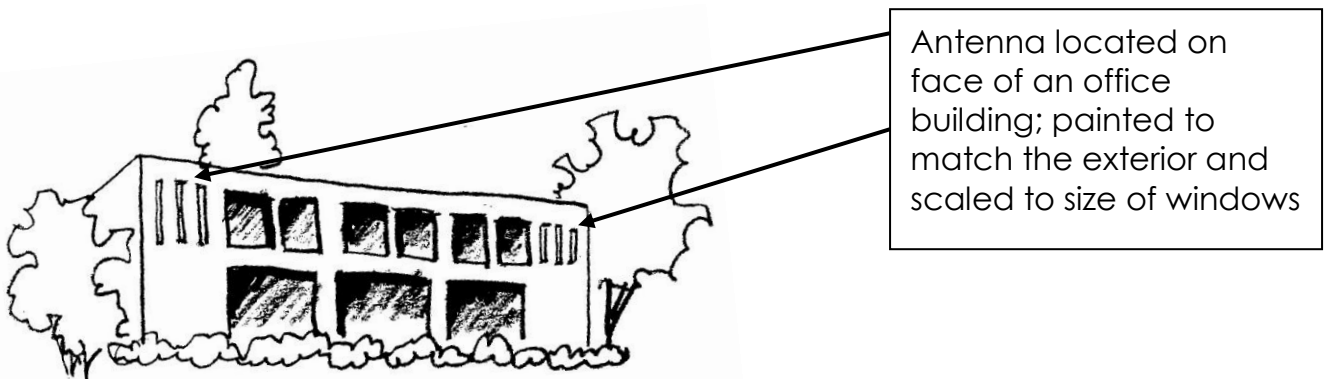
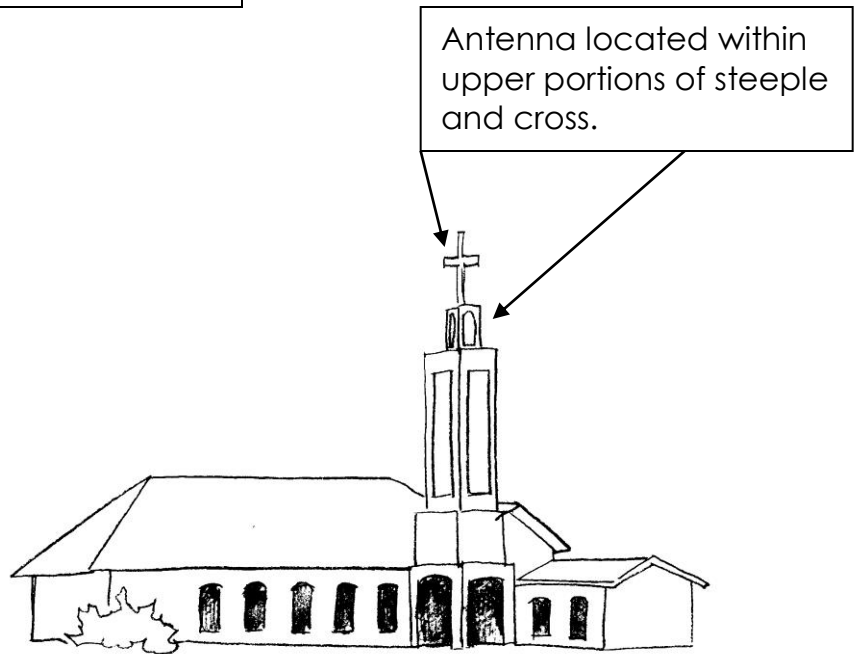
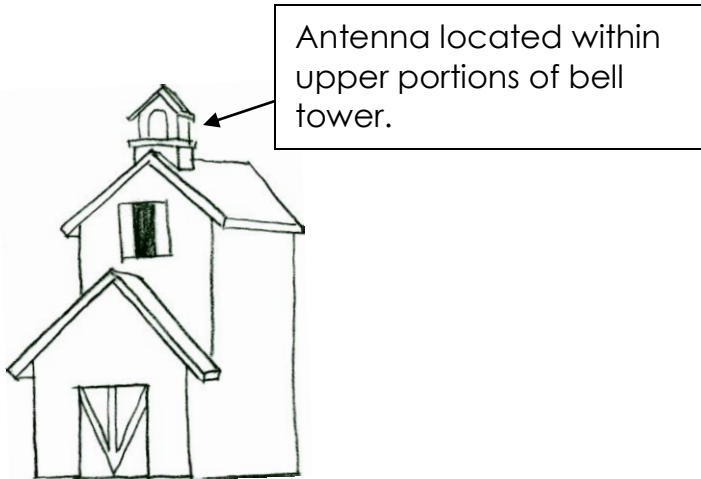
### The Basics of Architectural Integration

For an application to be considered architecturally integrated, the following are examples of the primary integration techniques:

- 1) The antenna are fully concealed within a structure so they are not visible to the public.
- 2) If the antenna are mounted on the exterior of a building, they are painted to match the building color, and the antenna match approximate size or scale of a component of the building (window, door, masonry courses, etc.)

## Examples of Architectural Integration

The goal of architectural integration is to build a telecommunications facility that appears to be just another structure in the fabric of the community. The following are examples of common applications that could be considered as being architecturally integrated.



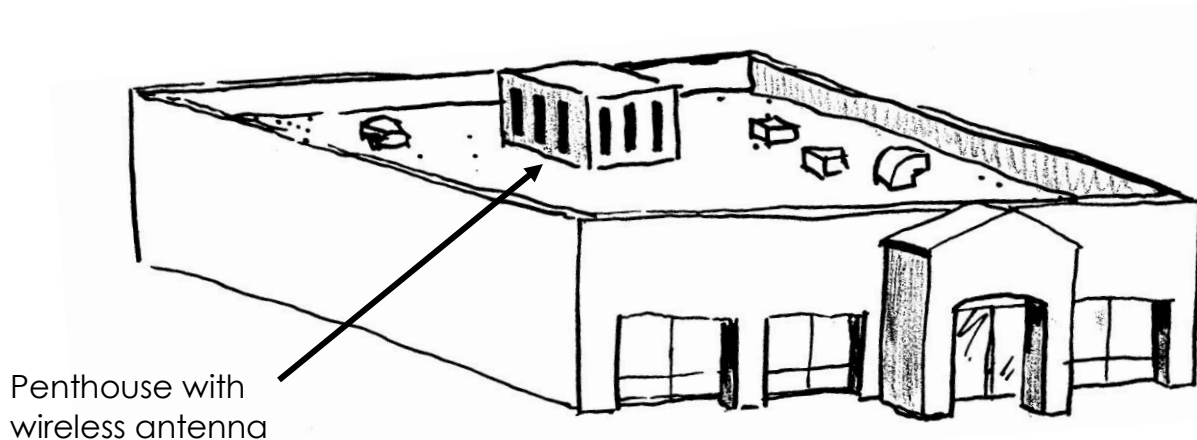
## Design Standards for Architectural Integration

### Penthouse facility

A penthouse is typically a square or rectangular structure, tall enough for the antenna to be mounted on, and is installed on top of a roof structure. Because it resembles the same massing that is associated with other rooftop mechanical devices, elevators, or air handling systems, penthouses do not draw attention because they are usually a small portion of the overall footprint of the building and they are finished to match the building. It is important to recognize that the penthouse will be visible from a distance several blocks away, but closer to the building, it is lost from view since it is on the roof.

The primary methods for successful placement are:

- Penthouse located as near to the center point of the roof as possible.
- A minimum distance from the edge of the roof that is at least two times taller than the penthouse itself.



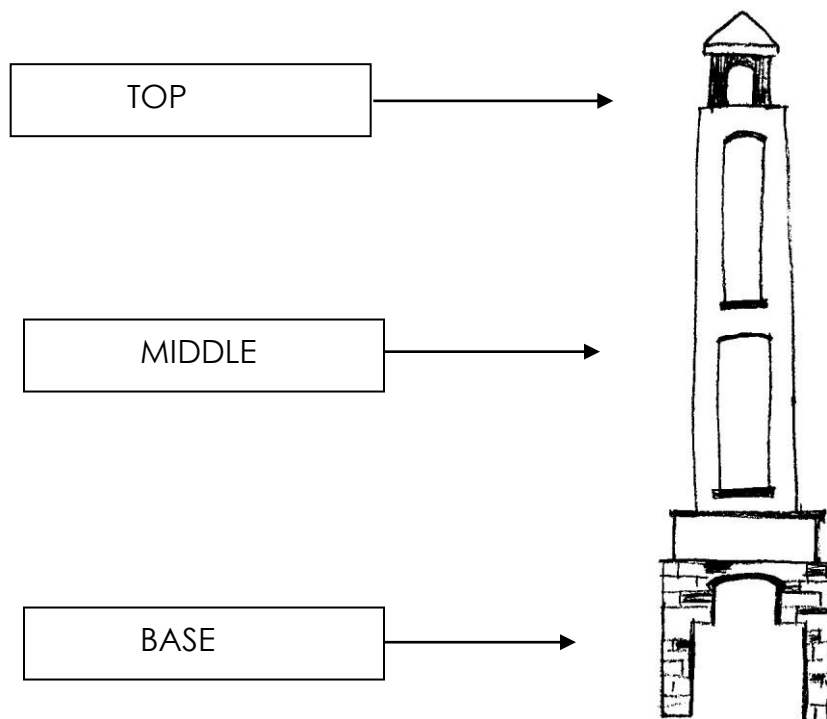
- Coordinating exterior finishes that match the main building.

### Steeples and ornamental towers

Throughout the United States, steeples, bell and clock towers, and freestanding ornamental structures have served as community landmarks. Considering that these structures serve as icons on the American landscape, their use as telecommunications facilities should be strongly encouraged.

The following are design standards that are key features for any kind of tower:

- A well designed ornamental tower has three main design elements: A base, middle and top.
- The base comprises at least the lower ¼ to 1/3 of the tower and typically features pedestrian scaled elements such as an opening for pedestrians if the tower is at the entry of a building.
- The middle portion of the tower is the area where transition or taper takes place between the base and top. Often, the middle section also has a different finish than the base.
- The top of the tower is typically a signature piece of the tower where a bell, clock or cross is placed.



### Summary

These guidelines suggest several methods of architectural integration, and are not intended to limit other creative solutions. The purpose for these guidelines is to establish basic expectations for quality design