



SAN FRANCISCO PLANNING DEPARTMENT

WIRELESS PLANNING ADVISORY BULLETIN #3 | BEST PRACTICES FOR MICRO WTS FACILITIES

This bulletin is intended to cover best practices for the preparation of applications for new Micro WTS facilities that are typically mounted on rooftops (faux vents or attachments to penthouses), or inside business signage. Micro WTS facilities typically feature either two “whip” antennas, or a single panel antenna (typically in a single faux vent pipe) along with supporting electronic equipment cabinets.

Generally, Micro WTS facilities can be approved through a building permit (and not require a Conditional Use Authorization); though they are still subject to design, environmental (CEQA) and historic resource review, as well as a 30-day neighborhood notification (where applicable). Micro WTS Facilities require review by the Zoning Administrator, through a Letter of Determination.

Where are Micro WTS Facilities typically allowed?

- A Micro WTS facility can be permitted as an Accessory Use in Location Preference 1 through 6 sites as outlined by the [City’s WTS Facility Siting Guidelines](#).
- For Location Preference 7 sites (residential areas with an RH or RM [zoning district](#) prefix [except RM-4] where WTS facilities are Disfavored), there are two exceptions where Micro WTS Facilities are permitted as an Accessory Use:
 - 1) If a residentially zoned location features a Publicly-Used Structure (e.g. church, museum, hospital, or public parking structure) then the Project Site could be classified as a Preference 1 location, and would therefore be eligible for a Micro WTS Facility.
 - 2) If a residentially zoned location features an existing Macro WTS facility, which was previously approved subject to the WTS Facility siting guidelines (typically sites approved by the Planning Commission on/after August 1996), then the Project Site would be classified as a Preference 2 “Co-location,” and would also be eligible for a Micro WTS Facility.

Nine common challenges with Project Submittals for Micro WTS Facilities:

1. **Adequate Screening.** Designs frequently lack adequate screening, including screening of all support elements (pipe mounts, cabling, support structures) from various perspectives. Screening should be complete enough that pedestrians on the public right-of-way should not be able to see around the side of, or under screening.
2. **Complete Submittals.** Initial submittals often fail to show ancillary elements such as cable trays, caged access ladders, generator plugs, GPS antennas, radio relay units (RRUs), and storefront alterations for new electric meters & generator plugs. These elements are sometimes left off of initial plan sets and/or photo simulations, and may need to be relocated or redesigned.
3. **Conflict with Residential Amenities.** Designs that impede on residential usable open spaces, such as balconies, decks, and yards, should be sited such that they do not reduce the amount of residential usable open space below the Planning Code minimum & exposure requirements for such

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To lookup zoning in a given neighborhood, visit propertymap.sfplanning.org/ then find a sample Project Site, choose the Zoning Tab, and click on the blue oval next to the Zoning District designation

spaces. Similarly, designs should not include cable trays or related conduit over tenant windows for any reason.

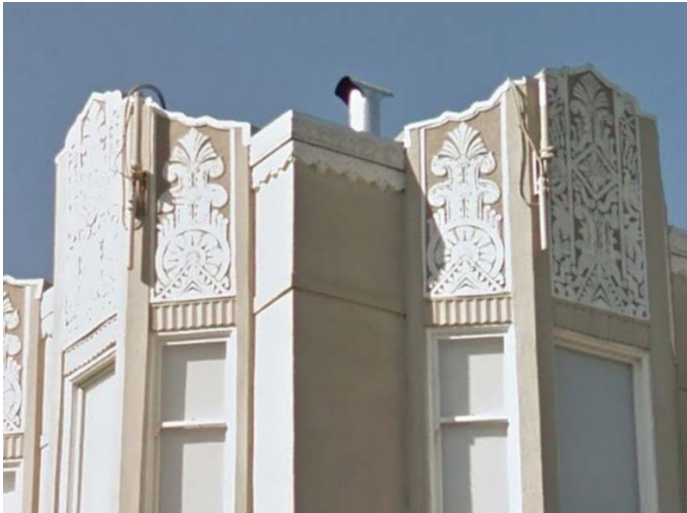
4. **Consistency with RF Reports.** Designs should be consistent with the project scope and location details described in the radio-frequency (RF) reports, as well as the Project Description on the cover sheet of plans. This includes the number of antennas and their locations. Ensure consistency as antenna locations are changed.
5. **Accurate Depiction of Existing Facilities.** Plans should always accurately show other existing WTS facilities on-site; including approved sites that have not yet been constructed.
6. **Dimension Key Elements on Plans.** Elevations should show the roof height, parapet height, top of antennas, and top of screening (if proposed). Many initial plan submittals only indicate the “rad center” of the panel antennas.
7. **Complete Carrier Information on Application.** Building permit applications (pink sheets) must include the wireless carrier’s name in the Project Description field (not just the lessee field), and describe how many antennas are being added, relocated, or removed.
8. **Height of Radio-Frequency Barriers/Barricades.** RF barriers/barricades should be designed with the same design intent as screening elements. These should be eliminated if not absolutely needed (controlled access roof), or thought through as a design element and integrated into the installation’s screening. Four-foot tall fences approaching the roof edge of historic buildings are not acceptable. Consider designs that taper downward toward and slightly below the parapet (if present).
9. **Noise & Fire Safety.** Designs should take into account (both day and night) noise standards (Article 29 of Police Code) from equipment, and also reflect [fire safety review items](#) related to back-up batteries, fire escapes, railing heights, standpipes, and transmitting antennas.

Four Basic Principles for Submittals of Micro WTS Facilities

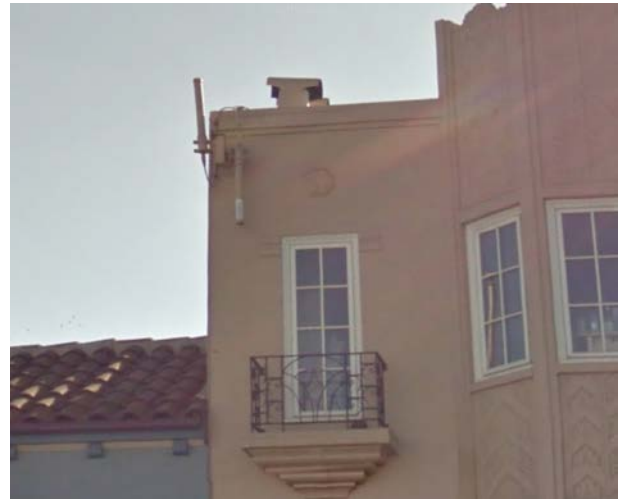
1. Select the least intrusive site possible, avoiding buildings with residential dwellings, whenever feasible; and take into account the Location Preferences in the WTS Facility Siting Guidelines. *SEE ALSO: ALTERNATIVE SITE ANALYSIS, NOISE*
2. Ensure the location and type of transmitting antenna(s) does not result in radio-frequency (RF) exposure which exceeds public exposure limits established by the FCC for any publicly accessible spaces (including roof decks, patio, yards). *SEE RADIO-FREQUENCY (RF) REPORTS*
3. Ensure the overall design (plans and photo simulations) demonstrates the least intrusive design possible with respect to antennas, brackets, cables, equipment areas, GPS antenna, RF barriers and striping. *SEE ALSO: ANTENNAS, CABLE TRAYS, ELECTRIC METERS & GENERATOR PLUGS, FENCES, GENERATORS, GPS ANTENNA, LADDERS, NOISE, PRIMARY EQUIPMENT LOCATIONS, ROOFTOP BARRICADES, SECONDARY EQUIPMENT LOCATIONS, SCREENING, SIGNAGE*
4. Ensure a project application is complete. *SEE ALSO: CODE VIOLATIONS, COVERAGE MAPS, FIRE REVIEW, HISTORIC PRESERVATION, LETTER OF DETERMINATION, NEIGHBORHOOD NOTIFICATION, PROJECT PLANS, RADIO-FREQUENCY REPORTS, REAR YARD AREAS, REVISION TO PLANS, SHADOW STUDY, AND USABLE OPEN SPACE*

This bulletin is not intended to supersede Federal/State laws, the Planning Code, [Wireless Facility Siting Guidelines \(and 2003 supplement\)](#), or determinations made by the Zoning Administrator. Images used are for illustrative purposes only, and do not reflect an endorsement of a particular technology.

Search Tip: *As you look for relevant information in this document consider using the word search function on your computer. For PC systems hold down the CTRL key then press the F key. For Apple systems hold down the Command key then press the F key.*



The photo on the left shows an older (legacy) Micro WTS Facilities featuring four whip antennas (the vent pipe is “real”).



The photo on the right shows two whip antennas, also mounted on the primary façade. Designs such as these, with antennas on the primary façade(s) of a building designated as a known or potential historic resource, are no longer permitted. “Primary facades” are essentially the main walls of the building that present the building to the surrounding streets and neighborhood.

Proposed Micro WTS Facility featuring two (2) antennas within a single faux (fake) rooftop-mounted vent pipe. Additional equipment such as radio relay units (RRUs) are mounted on the roof along with a computer and battery backup cabinet in a rear yard area.

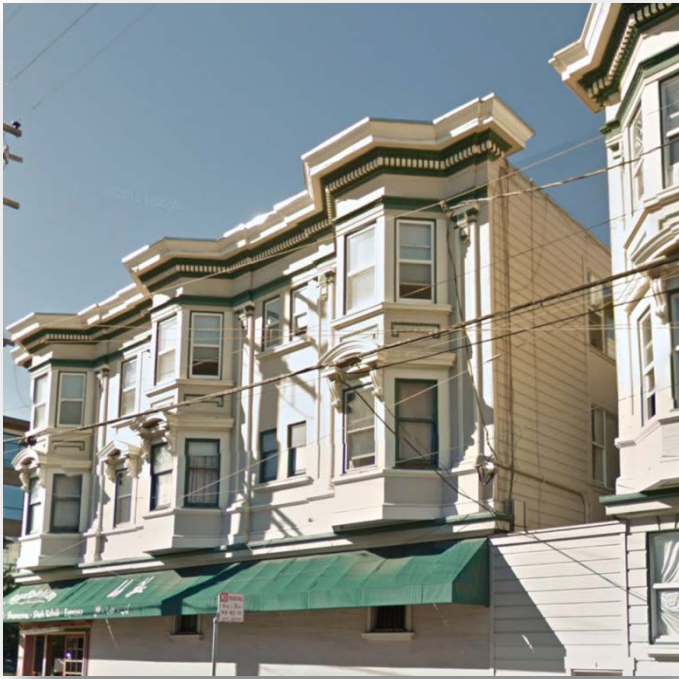
Existing



Proposed



Key issues in reviewing this proposal included ensuring the use of a narrow vent pipe (e.g. 18 inches), and ensuring the antenna and equipment cabinets are sufficiently setback from roof edges.



Another consideration was ensuring any RF barriers/fences would not be visible from surrounding sidewalks.

Also, avoiding vertical rear wall-mounted cabling running over resident windows, and moving the vertical rear-mounted cabling (to connect antenna to ground mounted equipment at the back of the building) far enough away from the street frontage so as to be minimally visible (photo below) from nearby sidewalks.

On Victorian and Edwardian era buildings, for example, carriers are encouraged to seek an attachment to an existing elevator or stairwell penthouse; if not feasible, attempt to place the antenna within a faux vent pipe that does not appear centered over the corner bay windows; particularly for smaller-scale buildings (e.g. three stories or less and with a 25 foot wide lot dimension).

3RD PARTY COVERAGE AND/OR CAPACITY REVIEW | Third Party review is **not** required for qualifying Micro WTS facilities. Third Party Review is required for those Macro WTS facilities where a Conditional Use Authorization (CUA) is required. The review is intended to determine that a facility is needed to meet a coverage and/or capacity gap. This is not required for Micro WTS facilities, or most (Macro) WTS Facilities in zoning districts with a C, M, MB, or PDR prefix (except PDR-1-B), since WTS facilities in those zoning districts are typically principally permitted¹.

ABANDONED ANTENNAS | Work with the property owner to include within the scope of the Project the removal of any abandoned antennas/dishes (and mounting brackets) at the Project Site.

In many instances it may be more expedient to ask the property owner if the scope of work of the proposed Project can include the removal of any existing abandoned antennas/dishes. Clearly note the removal (and patching/painting of any façade mounted brackets) in the scope of work on the cover sheet of the plans, as well as the site plan and elevation sheets.

Note: While personal TV or satellite reception dishes are generally exempt from permitting requirements, the [FCC's Over the Air Receiving Device \(OTARD\) exemption](#) does not extend the exemption to installation locations that may impair a historic building element (e.g. attachments to primary facades or parapets). The FCC's OTARD Rules also cover small microwave dishes used by [Wireless Internet Service Providers](#) (WISPs), when installed to provide service for a customer within the building.

¹ A **Macro** WTS facility that is in a zoning district with a C/M/PDR prefix (except PDR-1-B) may still require a CUA if it is either: 1) 25 feet above the mounting surface (e.g. ground or roof); 2) 25 feet above the applicable height limit; 3) is unscreened within the Waterfront 2 or 3 Special Use Districts; or 3) features larger unscreened elements (pursuant to Article 2 of the Planning Code).

ALTERNATIVE SITE ANALYSIS | APPLICABILITY

- An alternative site analysis is required for Micro WTS facilities, if the proposed project site is a Preference 5 or 6 location ([see WTS Facility Siting Guidelines](#)).
- Ensure a deliberate attempt has been made to seek higher preference locations. Consider conveying the small nature (compared to a Macro WTS facility) of the facility to a potential private landlord or other government agency, by including sample site photos. This may reduce instances where a property owner (representing a higher preference location) rejects a proposal based solely on an assumption of a much larger Macro facility.
- If a Location Preference 5 or 6 Site is chosen, provide a written statement, with photos of nearby higher preference sites, indicating why higher preference sites were not pursued or available.
- Check the City's map of existing WTS facilities (Map Library on the Planning Department's website) for Co-Location opportunities with other Tier 1 PCS wireless carriers.
- Preference 1 locations are not all zoned "P" (Public). Conduct a neighborhood walk to ensure no institutional (e.g. church or hospital) or similar public/civic uses (on properties with other zoning classifications) are missed.
- It is generally recommended that buildings without residential dwellings be considered first, due to challenges such as potential noise generation (e.g. cooling fans inside equipment cabinets) and overall space required space for antennas and equipment cabinets.

ANTENNAS | Evaluate opportunities to consider antenna designs which allow robust coverage and capacity while adapting to the challenge of varying environs.

While the City does not dictate the technology used, it has been observed that wider and shorter antenna designs can sometimes be better suited for uses such as behind a faux penthouse on a larger and wider historic building. In these contexts the design challenge is often more due to height (and setback from roof edge) than to linear massing. Taller and skinnier antennas designs can be better suited for use on narrower and shorter buildings within elements such as (slim) faux vent pipes.

Non-screened antenna designs that incorporate electronic tilt mechanisms and do not require a significant tilt (where feasible) can often allow for a much "cleaner" profile, that is less noticeable due to the lack of bulky physical tilt brackets with visible offsets from pipe mounts holding up the antenna.

The profile can be further improved when paired with a shroud below the antenna to hide the multiple cable loops dropping below each panel antenna. *However, the use of non-screened antennas should typically be avoided.*

See also **SCREENING**

Newer panel antennas often incorporate electronic tilt mechanisms that may allow a carrier (if no significant azimuth angle is needed) to use a bracket that is more flush to the wall surface. A flush bracket along with tidy cable management (painted to match adjacent surfaces) can dramatically reduce the noticeability of antennas; especially in hilly residential and mixed-use areas (view from sidewalks).



Example Micro WTS facility consisting of a single panel antenna attached to the face of an existing rooftop stairwell penthouse. In this example, the top of the antenna is flush with the roofline of the top of the wall (which is preferred); however the cabling and brackets appear overly visible and in need of bundling (or shrouding preferably) and repainting.

Generally, unscreened antennas are disfavored. Modest (minimal bulk) fibre-reinforced plastic (FRP) screen boxes around antennas are preferred instead; as they can screen both the antenna, brackets, and cabling and be textured and painted to mimic wood, stucco, or metal. Also note the disfavored lack of painting of cabling, which makes the facility more noticeable.

APPEALS | Building permits submittals for Micro WTS facilities can be appealed to the Planning Commission, during the 30-day neighborhood notification period, through a process known as Discretionary Review. [See the Discretionary Review form on the Planning Department's Website.](#)

Whether or not Discretionary Review is requested prior to permit issuance, a building permit that is **issued** by the Department of Building Inspection can be appealed to the [Board of Appeals](#), subject to certain timing and filing requirements

In addition, the environmental determination (typically a categorical exemption under the California Environmental Quality Act, or "CEQA") for a Micro WTS facility can also be appealed to the [Board of Supervisors](#). Historic preservation review is one component of environmental review for a Micro WTS facility.

Also see MPTA and ACOA references under HISTORIC PRESERVATION

BLOCK BOOK NOTIFICATION (BBN) HOLDS | Community members may choose to be notified of any building permit application for a specific property by signing up for a [Block Book Notification, or BBN](#).

Unless the BBN is cleared in advance, a community member would have 10 days (from the time they are notified by the Department of the permit) to review a building permit application and plans. This can place a hold on any permit approval by Planning, in order for the BBN requestor to determine if they wish to request further dialogue with the Project Sponsor, or request Discretionary Review (see APPEALS) before the Planning Commission.

Recommended course of action for properties with active BBN:

1. Check the SF Property Information Map, (propertymap.sfplanning.org), to see if the Project Site has an active "BBN" listing in the "BBN" tab.
2. If there is a BBN present, then check with Planning Information Center, at 1660 Mission St (1st floor), to determine the scope of the BBN(s), and whether the BBN applies to "all permits" or "only new construction," or changes of use. Ask the Planner to check if the BBN requestor would like to review the permit.

BUILDING PERMIT APPLICATIONS | Ensure the (pink) building permit application clearly indicates: "A _____ (carrier name) Micro Wireless facility" within the Project Description field (*and not only in the lessee field on the application*).

- Due to space limitations for the permit description, use common acronyms such as "RRUs," for radio relay units.
- Indicate the number of antennas being added or relocated and if screening is proposed.
- If the Project is revised and new plans are provided, ensure that the Project Description is updated by Department of Building Inspection (DBI) staff.

CABLE TRAYS | Ensure that cable tray locations are clearly shown. Also include the height above mounting surface or a note indicating a flush mount on plans and photo simulations. In addition:

- Do not place cable trays over residential windows.
- Evaluate opportunities to utilize lightwells or abandoned/sealed refuse chutes, and other vertical shafts instead of exterior wall-mounted cable trays/conduit.
- Avoid wide cable tray arcs over parapets. Show the cable tray/conduit route change (e.g. over a parapet) on the elevation sheet and in photo simulations.
- Whenever feasible, use elements intended to mimic a limited number of steel water pipes (typically 2" diameter), instead of wide cable trays. The use of faux steel water pipes may also deter incidences of copper theft. This design preference (pipes instead of cable trays) is greater in more residential/historic contexts, or where potentially visible from adjacent sidewalks and parks.
- Ensure plans indicate if any attachment/anchor points are proposed on building facades.
- Historic preservation review may be required for structures considered Potential or Known Historic Resources. Avoid cable trays on primary facades, or on secondary facades where prominently visible from surrounding sidewalks or parks.



Photo on the left: Disfavored cable tray rising above parapet and visible GPS antennas



Photo on the right: Disfavored wide cable tray arc over parapet



Disfavored example with cabling not shrouded at entry point

CITY PROPERTIES | New facilities, and major modifications (those typically visible from street level) on buildings owned by City agencies generally require review before the Civic Design Review committee of the

SF Arts Commission ([link](#)). This requirement does not apply to properties owned by City College, San Francisco Unified School District, the Port of San Francisco, the Airport, Bay Area Rapid Transit (BART), [The Presidio](#), and State/Federal properties.

CODE VIOLATIONS | Check both the [San Francisco Property Information Map website](#) (Complaints Tab), **and** also check the [Department of Building Inspection \(DBI\) website](#) (Track Permits & Complaints) for Planning or Building related complaint or enforcement cases. Planning and DBI will not typically approve a Project until active violations are cleared.

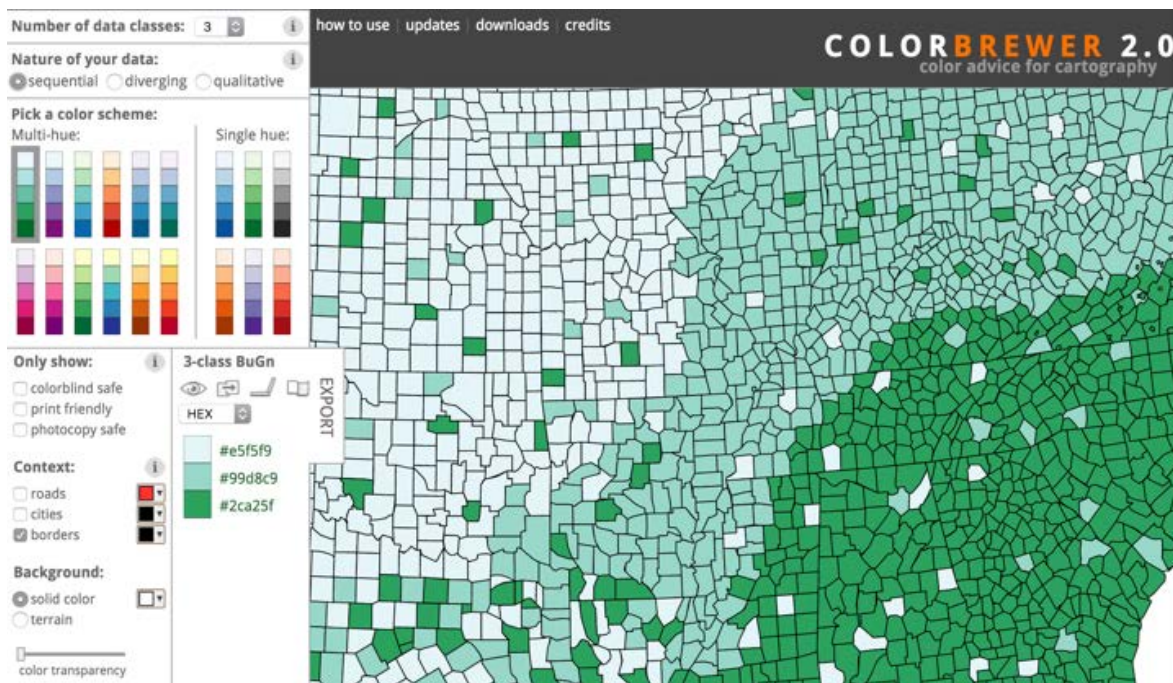
COMMUNITY MEETING | A community meeting is **not** required for a Micro WTS Facility. However, also see NEIGHBORHOOD NOTIFICATION.

Wireless carriers are encouraged to proactively engage with community members who may have questions or concerns. This may include, but is not limited to:

- Provide a clear understanding of how the project site was chosen, with respect to both the City's location preferences (WTS Facility Siting Guidelines), and to the overall community preference for keeping facilities away from residential areas.
- Providing an opportunity for a qualified radio-frequency (RF) engineer to provide information (using plain English), such as reviewing highlighted sections of the RF report, and exhibits; such as three dimensional (3-D) RF propagation illustrations (if available), and information on how the proposed site complies with the FCC's standards.
- Community members may also inquire as to whether the proposed facility would comply with overseas (e.g. overall European Union standards - which are very similar to US standards) limits for RF emissions, or nearby (e.g. Berkeley) standards (which are the same throughout the US). *Though, it should be noted that the City is prohibited by Federal law, from adopting a more restrictive RF emissions standard.*
- Community members may also have questions about RF exposure for dwellings directly underneath the antenna. While many RF reports indicate the standoff distance is much lesser for areas below the antenna, this may not provide sufficient clarity. *Typically, the City has seen RF exposure levels approaching one percent of the FCC's public exposure standard for dwellings directly below an antenna.*
- Provide periodic safety monitoring reports (previous RF level readings) for existing facilities (preferably in San Francisco) that utilize similar antennas and effective radiated power (ERP) levels.
- Consider presenting the project before any neighborhood groups that express an interest in the proposed Project. Be prepared to discuss issues of site selection, range of the facility, battery usage and safety, noise or vibration issues; and how Micro WTS facilities differ from Macro WTS facilities (provide comparative site photos of antennas and equipment areas and ERP comparisons).
- If a translator is utilized, it is recommended that the Project Sponsor familiarize the translator with applicable technical terms, before engaging with community members, in order to ensure clear communication. This may include concepts such as: radio-frequency exposure, standoff/exclusion distances, and antenna orientation.
- In some instances, questions may arise as to whether the proposed facility would lead to tenant (small business or resident) displacement. Ensure site walks and discussions with the property owner consider this issue.

COVERAGE MAPS |

- Clearly show existing and recently approved, but not yet constructed, nearby (typically one mile area) Micro, Macro WTS facilities and oDAS or Small Cells, for the same wireless carrier.
- Label street names near the proposed WTS facility.
- Use site location markers that are clear and legible.
- Consider using tools such as www.colorbrewer.org to choose colors (typically 3 classes), representing signal strength levels (for example), that are also colorblind and print friendly (*utilize check boxes on the website*). Recommended colors include the following RGB greens (in order of strongest to weakest coverage)
44,162,95 then 153,216,201 and 229,245,249
- Avoid the use of symbols that appear to mimic a radiation trident symbol.



DISTRIBUTED ANTENNA SYSTEMS or SMALL CELLS | Outdoor Distributed Antenna Systems (oDAS or Small Cells) in the Public Right-of-Way (e.g. [steel](#) or [wooden](#) light, transit or utility poles along streets) are subject to [Article 25 of the Public Works Code](#). Permits are reviewed by Planning; but submitted to, and administered by the Department of Public Works, Bureau of Street Use & Mapping.

Indoor Distributed Antenna Systems (iDAS) typically do not require Planning review, except for exterior elements (e.g. rooftop-mounted GPS and/or donor antennas). iDAS Systems serving on-site tenants only, are allowed in residential zoning districts, subject to applicable building and/or electrical permits.

However, in certain historic buildings, antenna or conduit attachments to interior elements, such as storefront and lobby areas may require further review. Provide site photos for review by Preservation staff.

No Radio-Frequency (RF) report is needed for an iDAS system which only uses exterior (typically rooftop-mounted) GPS antennas. However, an RF report may be needed if a donor antenna or microwave dish (also referred to as a radio packet antenna) is proposed.

See, also HISTORIC PRESERVATION

The City generally encourages iDAS networks installed in existing buildings to carry public safety (police and fire radios) signals and cover the whole premises, including areas with low-signal penetration, such as underground parking areas. New buildings are subject to City-adopted in-building public safety radio coverage requirements.

Carriers are encouraged to discuss the scope of radio-frequency (RF) emissions review in advance of iDAS permit submittals with the Department of Public Health's point of contact, Patrick Fosdahl at (415) 252-3904 or Patrick.Fosdahl@sfdph.org.

ELECTRIC METERS & GENERATOR PLUGS | Ensure the location of generator plugs (where trailer



mounted generators are connected to power the facility in the event of a power outage) is clearly shown on plans and photo simulations (if potentially visible).

Evaluate placement locations that do not detract from primary building frontages (e.g. storefront areas or facades of Potential or Known Historic Resources), such as recessed doorway entrances or alleys.

The element at the bottom of the photo is where an emergency generator can be plugged in to power the WTS facility in the event of a power outage. These elements should be located so they are not prominently visible from surrounding sidewalks.

FACADE MOUNTED ANTENNAS | Even when antennas are screened, primary concerns with facade mounted antennas involve the potential visibility of conduit/cabling, brackets, and GPS antennas.

Screened, facade mounted antennas are generally discouraged on buildings that are designated as potential or known historic resources; but specific case-by-case review is encouraged.

In some instances, antennas can be placed inside signage (e.g. business signs) in a manner that would be appropriate on a building considered a known historic resource. See SIGNAGE.

Ensure plans and photo simulations accurately show dimensions of antennas/screening, and location of conduit, brackets, RF warning stickers, and GPS antennas. See also UNSCREENED ANTENNAS.

FENCING / WALLS | Plain chain link fencing (without slats, battens, or landscaping) and/or barbed wire for equipment areas, is generally not supported (or consistent with applicable design guidelines). Razor wire is prohibited.

- The use of non-commercial artistic murals (if appropriate, and preferably with community support) and/or landscaping (e.g. trellis with vines) may reduce incidences of graffiti.
- Plans and photo simulations should provide a clear sense of height and location of fencing.

- Decorative wrought iron, with or without mesh panels, and landscaping are often appropriate for equipment areas facing public streets and parks.
- Plants with thorns, such as rose bushes may reduce incidences of trespassing.
- Also see the [City's Residential Design Guidelines](#) for Project Sites that are residential buildings in "R" Zoning Districts.

FIRE DEPARTMENT REVIEW | Review [SF Fire Department Bulletin 2.06](#). Typical areas of concern include ensuring sufficient clearance between transmitting antennas and fire escapes or standpipes. Also ensure plans show locations of battery racks/cabinets for other existing WTS facilities also located in the same area or nearby (e.g. adjacent rooms). *A significant number of plan revisions are due to plans which do not demonstrate compliance.*

GENERATORS | While generators are typically only utilized at some **Macro** WTS facilities, the information below should be consulted, if applicable:

- Provide a fuel spill cleanup kit, if liquid fuels are utilized. Indicate the location on the site plan.
- Ensure plans and photo simulations show the generator, gas meters (if any), vent stacks (if any), and supply lines (especially conduits running up building walls).
- If the generator is only intended for use during power outages, clearly indicate such on the cover sheet of the plans. It is generally recommended that weekly or monthly (as applicable) test operations (industry standard appears to be 15 minute test times on a weekly basis) be limited to periods between 10 AM to 2 PM on weekdays; and on days other than State holidays. *It is recommended, though not required, that a note indicating general conformance with such time parameters be added to the site plan.*
- Generator use shall comply with the City's noise ordinance (e.g. 45 decibels at night as measured at the nearest residential dwelling).
- Determine if the type of generator used requires permitting from the Bay Area Air Quality Management District.
- Avoid using diesel generators in locations where they may result in noise or exhaust impacts to nearby dwellings, or be placed near HVAC intake units of adjacent buildings (especially hospitals or child care centers).
- Evaluate opportunities to use natural gas or fuel cell generators, as they typically generate less particulate matter and feature a lower noise profile.

GPS ANTENNA | Ensure the GPS antenna(s) location (elevation height and setback from roof edges) is clearly shown on plan sets.

Utilize a location where the GPS antenna would not be visible from off-site, such as cable trays at mid-roof locations. Avoid placement along roof edges.



Example of visible GPS antennas (white elements) that should be moved away from roof edges

HEIGHT LIMITS | While antennas and towers are exempt from height limits, screening elements are subject to height limits in the City’s height and bulk district map. Look up the property on the San Francisco Property Information Map and then choose the Zoning tab.

- **In height districts of 65 feet or less:** 1) faux vent pipes and screen walls (e.g. faux mechanical, elevator or stairwell penthouses) may rise 10 feet above the specific height district (subject to design and preservation review); and/or 2) horizontal-only expansions to existing stairwell or elevator penthouses, regardless of existing height.
- **In height districts over 65 feet:** 1) faux vent pipes and screen walls may rise 16 feet above the specific height district (subject to design and preservation review); and/or 2) horizontal-only expansions to existing stairwell or elevator penthouses, regardless of height. This assumes a relatively modest increase in bulk.
- For additional rules see Planning Code Section 260.
- There are no variances available to exceed height limits.

HISTORIC PRESERVATION | Nearly all WTS facilities are reviewed by Preservation staff to determine if the facility would comply with the U.S. Secretary of the Interior’s Standards for the Treatment of Historic Properties; and if applicable, Articles 10 or 11² of the Planning Code. This review also applies to WTS facilities on buildings in principally permitted areas such as potential and known historic resources (buildings) in industrial zones (e.g. PDR-2 Zoning District).

In certain locations, a Certificate of Appropriateness (Article 10 Landmarks or Article 10 Districts) may also be required for a Micro WTS facility; in conjunction with the building permit application.

POTENTIAL ADMINISTRATIVE REVIEW: The Historic Preservation Commission (HPC) has delegated review³ of Micro or Macro wireless facilities within Article 10 historic districts and/or Article 10 landmark buildings to Preservation staff; when the facility is not visible, or is minimally visible from surrounding public rights-of-way⁴

This typically means that well-designed (consistent with Preservation standards) WTS facility within Article 10 Districts, or on Article 10 Landmark buildings, can be approved through an [Administrative Certificate of Appropriateness \(ACOA\)](#); instead of automatic review before a public hearing, at the HPC. However, a member of the public, or Commissioners, can still request that an ACOA be reviewed (within 20 days) before an HPC hearing.

“NEWER” BUILDINGS IN ARTICLE 10 DISTRICTS | WTS facilities on both “older” and “newer” buildings, within any Article 10 District may also require an ACOA.

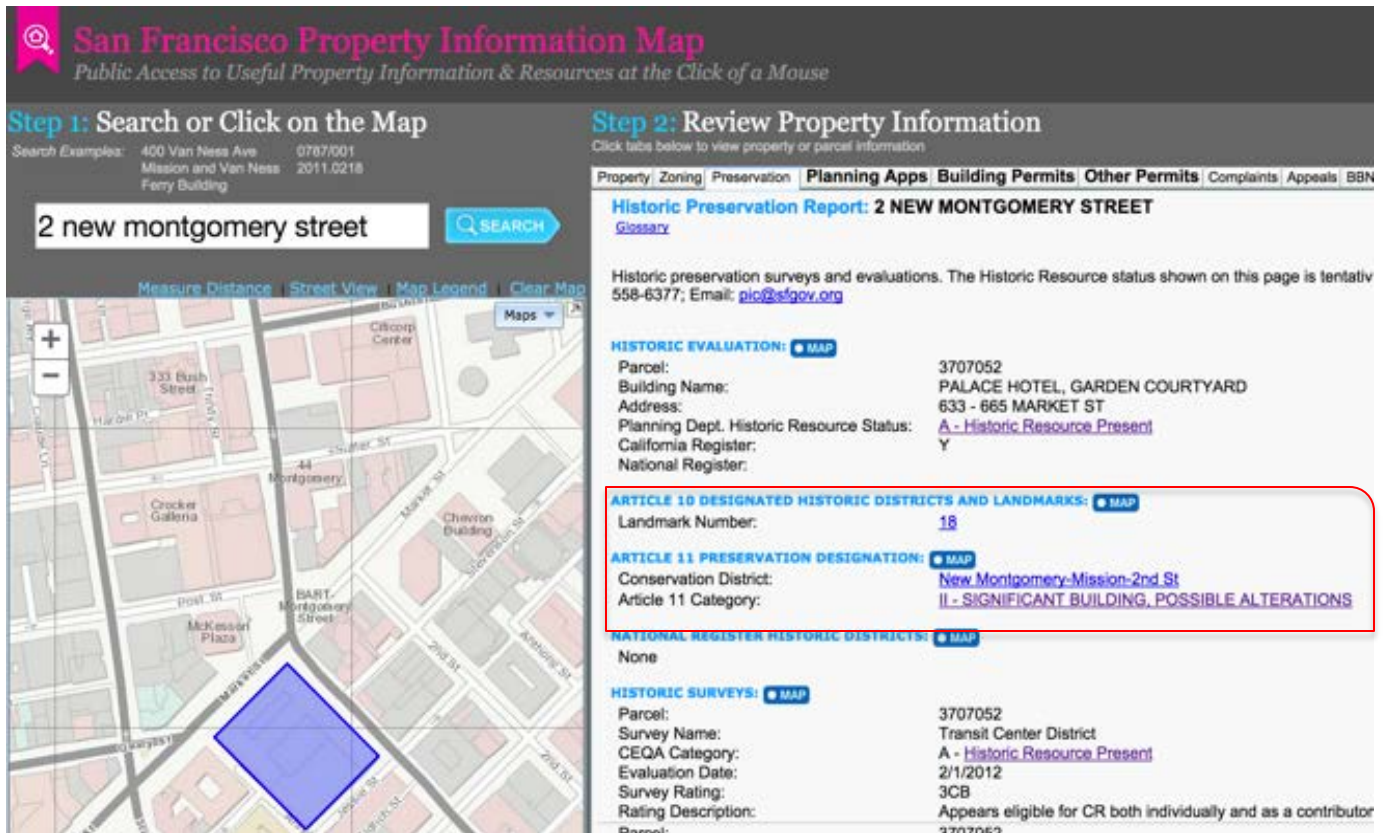
In addition, WTS facilities on buildings less than 45 years in age, throughout the City, are reviewed to determine if the facility’s placement may impair the view (especially of primary facades or character-defining features) of adjacent buildings within nearby historic districts, or nearby buildings considered Known or Potential Historic Resources

² Article 11 Conservation Buildings/Districts are limited to certain areas of Downtown. Article 10 Districts, and individual Article 10 landmark buildings are found throughout the City ([map](#)).

³ Historic Preservation Commission (HPC) Motion No. 0241 ([link](#)); subject to periodic reauthorization by the HPC.

⁴ The reference to surrounding public rights-of-way typically means from the perspective pedestrian level along sidewalks on surrounding streets, and, if present, nearby public parks and vistas.

Figure 1 | In this example, a Certificate of Appropriateness would be required, since the project site is designated as a landmark (Article 10 listing). Even though the site is also located in an Article 11 District, no [Minor Permit to Alter](#) would be required as the Article 10 designation takes precedence.



KEY CONSIDERATIONS FOR WTS FACILITIES:

1. **Exterior alterations**, including, but not limited to the addition or replacement of antennas, equipment cabinets, fences, or the addition of radio relay units (RRUs/RRHs), require Preservation review and may also be subject to an ACOA requirement, depending on location (see Items 4 and 5 below). Revisions to associated building plans after approval of the ACOA may require a new ACOA.

2. **Interior alterations** (e.g. addition of equipment cabinets, antennas, or RRUs inside existing enclosed areas) typically do not require Preservation/HPC review (or an ACOA), but may still require Planning and Public Health review (based on RF output changes).

In some properties, certain interior areas may also be considered “contributory,” or part of the historic character of the building. Two examples include storefront or lobby areas in historic buildings, and certain interior courtyards (e.g. the Palace Hotel at 2 New Montgomery Street). If in doubt, check with Planning or Preservation staff, and provide site photos.

3. **Indoor Distributed Antenna Systems (iDAS)** do not typically require Preservation review. However, certain interior alterations (see Item 2 above), and all exterior alterations (e.g. donor or GPS antennas mounted on rooftops) may require an ACOA.

4. An Administrative Certificate of Appropriateness (ACOA) is required for alterations to properties (including antenna swaps and rooftop-mounted radio relay unit additions) which are designated as (Article

10) landmarks (e.g. Castro Theater), and/or within an **Article 10 Conservation District**. This requirement also applies to WTS facilities on newer buildings that are located within Article 10 Districts. See the image example above.

REVIEW PROCESS

If a proposed WTS facility requires an ACOA, based on location and design, the following would occur:

1. Project Sponsor (applicant) submits a building permit application, two sets of plans, and photo simulations, to the Department of Building Inspection, along with the required submittals (including ACOA) forms. No upfront fee is required for the ACOA applications; however Project Sponsors are later billed a Time and Materials charge by the SF Planning Department.
2. Planning and Preservation staff review permit to determine if information shown on plans and required photo simulations would comply with Preservation standards.
3. If determined to be a compatible design, then the Project Sponsor e-mails PDF's of plans and photo simulations to Case Planner.
4. Planning staff prepares the ACOA case packet, which is then mailed to the HPC and other interested community members.
5. If no community or HPC members ask for formal HPC review, within 20 days of mailing, the building permit can be approved by Planning and routed forward for Building and Fire Department review.

RESOURCES

6. [Visit the SF Property Information Map website](#), then enter the address, and choose the "Preservation" tab, to determine if a property is subject to Article 10/11 review. See Examples in Figures 1 and 2 above.
7. [Certificate of Appropriateness \(Administrative\) Application](#).
8. [Minor Permit to Alter Application \(for Article 11 buildings/districts in Downtown\)](#).

KEY PRESERVATION DESIGN AND COMPLETENESS CONSIDERATIONS

1. Ensure ancillary equipment (GPS antennas, cable trays, conduit, access ladders, RF warning signage, barricades/fences, generator plug receptacles and new meters) is clearly shown on both building plans (including elevation sheets) and photo simulations (if potentially visible); and is designed to comply with Preservation standards.
2. Ensure plans clearly show roof height, parapet height, height to top of antenna(s) or screening (many submittals only show "rad centers"), and setbacks from nearest roof edges.
3. Faux parapet replacements (e.g. replacing a wood or masonry element with one made of fibre-reinforced plastic) are generally not supported on primary building facades or other elements demonstrating detailed craftsmanship. Replacements on secondary facades (e.g. rear of building) are reviewed on a case-by-case basis.
4. Faux vent pipes and faux mechanical or stairwell penthouses are often viable screening elements for antennas near roof edges; however the massing (height, size and setback from roof edges) and overall number of such elements needs to be context appropriate. For example, designs featuring faux vent pipes should avoid placements where more than four or more vent pipes are visible from a given nearby sidewalk perspective.
Evaluate opportunities to place antennas and scale-appropriate screening in front of existing un-screened rooftop-mounted HVAC equipment.

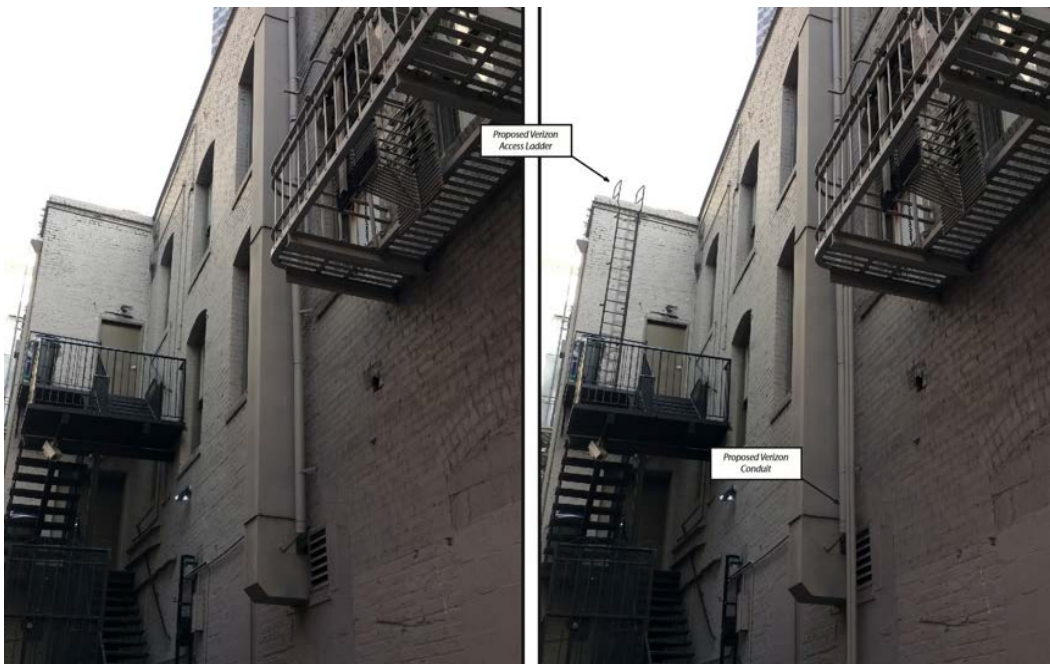
5. Antennas hidden in signage should avoid large sign widths and demonstrate that mounting brackets and cabling are well designed; with cabling either non-visible or sufficiently screened or shrouded. Signs are subject to Historic Preservation review.
6. Cable trays are discouraged from being placed along primary building facades or secondary facades where they are prominently visible from nearby sidewalks.
7. GPS antennas should be moved away from public view (e.g. attached to cable trays at mid-roof locations).

HOSPITALS | Certain hospital buildings, such as those with overnight care, or buildings providing power and other services to nearby overnight care buildings are typically subject to (building) permitting by the [Office of Statewide Health & Planning](#) (OSHDP) for permitting. The City's Zoning Administrator reviews new WTS facilities and modifications through a Letter of Determination (SEE LETTER OF DETERMINATION). See also NEIGHBORHOOD NOTIFICATION

Resource: Lookup OSHPD Status: <https://www.alirts.oshpd.ca.gov/AdvSearch.aspx>

LADDERS | Ensure any proposed ladders (including caged access ladders) are shown on plans and photo simulations (if visible). New ladders visible from off-site (e.g. nearby sidewalks, parks and plazas) are generally discouraged. Especially, those with cages, on buildings in residential and neighborhood commercial areas. The use of a vehicle lift for maintenance access may need to be considered instead.

Powder coating (to color match in a durable non-glossy finish) of new ladders is recommended when potentially visible from nearby sidewalks and placed near older ladders or fire escapes on potentially historic buildings.

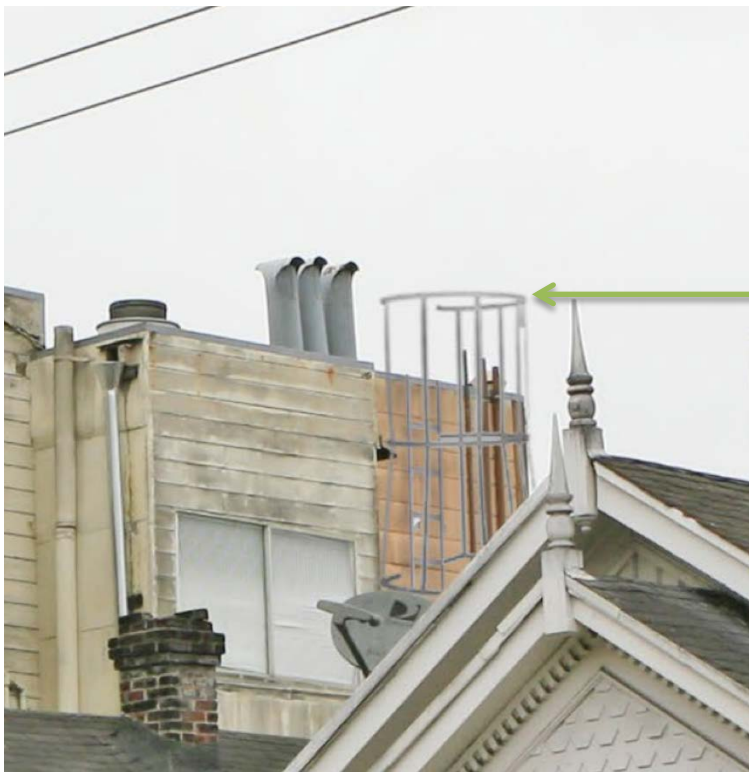
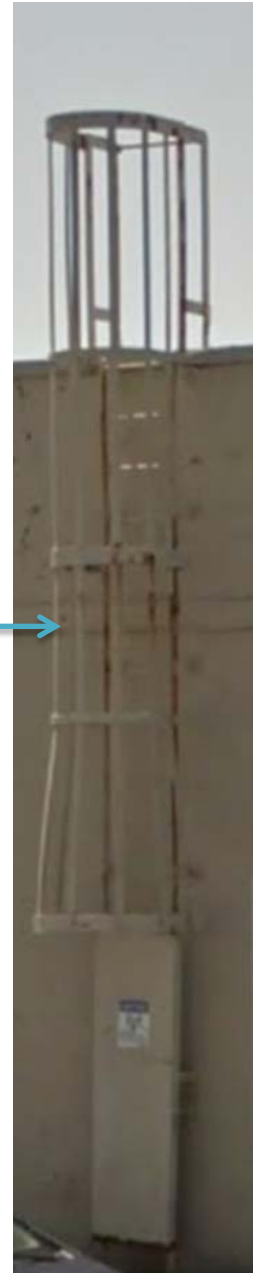


Example: while the use of internal conduit and roof access is preferred, this proposed conduit and roof access ladder was considered compatible as the conduit was designed to mimic water pipes, and both the roof ladder and conduit pipes are sufficiently setback from view on nearby sidewalks. Furthermore the ladder would be powder coated to match the color of the stairs below, and would not be placed on or near decorative elements.



StreetView photo of alley and building where a ladder is proposed.

Example of a caged access ladder prominently visible from a surrounding street (disfavored).



Disfavored (proposed but not approved) example of a proposed ladder on a building considered a known historic resource, and prominently visible from surrounding sidewalks.

LAND USE JURISDICTION | As some locations fall under the jurisdiction of other government agencies, not all WTS facilities are reviewed by the San Francisco Planning Department and/or Department of Building Inspection. See the list further below.

However, given the dense nature of San Francisco, it is generally recommended that all outdoor WTS facility installations, and modifications be reviewed by the San Francisco Department of Public Health. E-mail plans and a signed RF report to Patrick.Fosdahl@sfdph.org.

The list below covers common procedures, subject to case-by-case inter-agency discussions:

BART (Bay Area Rapid Transit): New commercial neighborhood-serving WTS facilities and major modifications are reviewed by the Planning Department. Building permits are reviewed and issued by BART. However, in-subway/platform systems are not reviewed by the Planning Department.

Bay Bridge and Golden Gate Bridge: reviewed by respective bridge districts and potentially Caltrans.

Caltrans (California Department of Transportation): reviewed by the Planning Department, with building permits issued by Caltrans ([Airspace Wireless Program](#)). Portions of Van Ness Avenue, Lombard Street and Richardson Avenue; between the Golden Gate Bridge and the elevated Central Freeway (near Duboce Street) form part of Interstate 101. WTS facilities on buildings fronting these streets are reviewed by the Planning Department and DBI, but any road closures in these areas, for construction, may require both City (Public Works) and Caltrans review.

Bayview Hunters Point (Former Naval Shipyard), **Candlestick Point**, and **Mission Bay:** Review by [Office of Community Investment & Infrastructure](#) (OCII; a Successor to the Redevelopment Agency).

Hospitals: Planning Department and the California Office of Statewide Health Planning Development (OSHPD) for hospitals and specific buildings with overnight/ambulatory medical care. Modifications are reviewed through a Zoning Administrator's **Letter of Determination**, with building permits issued by OSHPD. Resource: Lookup OSHPD Status: <https://www.alirts.oshpd.ca.gov/AdvSearch.aspx>

Port of San Francisco: review by Port staff. However, a Certificate of Appropriateness may be required (prepared by the Planning Department) for specific locations under Port jurisdiction within the Northeast Waterfront Landmark District ([neighborhood west of Pier 17](#)). See also reference to Port in **SIGNAGE**. Use the following link to find jurisdiction: <http://bsm.sfdpw.org/mapviewer/>

San Francisco Airport: review by Airport.

San Francisco Unified School District (2 existing macro WTS facilities): Reviewed by SFUSD and the Division of the State Architect.

San Francisco State University (SFSU). [Reviewed by SFSU.](#)

The Presidio: Review by The [Presidio Trust](#).

Transbay. Review by OCII

Treasure Island and Yerba Buena Island. Review and permitting by [Treasure Island Development Authority](#), or US Coast Guard, or Caltrans; as applicable.

UCSF Mission Bay and Parnassus. Review by UCSF. Smaller UCSF-owned buildings outside main campuses would likely require Planning Department review.

Veterans Affairs (VA) Campus (4150 Clement Street). Reviewed by the Planning Department. Building permits issued by DBI or the VA, based on guidance from VA.

LETTER OF DETERMINATION | A letter of determination (LOD) is typically used for two scenarios related to wireless facilities.

1. To either establish that a (smaller) WTS facility is considered "Micro" or accessory in nature; or
2. To request Planning review of WTS facilities on properties under other agency jurisdiction (e.g. hospitals under OSHPD jurisdiction).

The typical LOD process involves a letter of request, a set of plans, photo simulations, an RF report, and a check made out to the San Francisco Planning Department (see fee schedule) that is mailed to: Zoning Administrator, San Francisco Planning Department, 1650 Mission Street, 4th Floor, San Francisco, CA 94103. [Example Tri-Band Antenna Micro WTS Facility Letter of Determination](#)

NEIGHBORHOOD NOTIFICATION | PLANNING CODE SECTION 311/312

For **Micro** WTS facilities in certain “R” (RH, RM, RTO), Neighborhood Commercial (*all zoning districts listed in Article 7 of the Planning Code*), or Mixed-Use (*all zoning districts listed in Article 8 of the Planning Code except RSD, SLR, SLI, SSO, RH-DTR, SB-DTR, and TB-DTR*) Zoning Districts; a copy of the plans (cover sheet, site plan and elevations) are mailed by Planning Department staff to all residential tenants and property owners within 150 feet of the Project Site (including tenants within the building).

A notice is also sent to all neighborhood groups registered with the Planning Department for the applicable neighborhood.

This process is referred to as Planning Code Section 311 (residential districts), or 312 (Neighborhood Commercial or Mixed-Use Districts) Neighborhood Notification.

If no requests for Discretionary Review are filed by community members, within 30 days of mailing and posting; then the building permit can be approved, by the Planning Department, and routed to DBI, and the Fire Department, for permit review.

Key items:

- Micro WTS facilities do not require neighborhood notification in RC-4 Zoning Districts.
- Neighborhood notification letters are sent directly by the Planning Department using mailing labels (an excel spreadsheet) provided by the Project Sponsor.
- Planning Department staff will also provide a poster(s) to be placed, by the Project Sponsor, at the Project Site for at least 30 days for those Micro facilities subject to Section 311/312 notification.
- Ensure the poster placement is handled correctly and replaced if needed. In the event a concern arises the hearing or notice period may be extended at the discretion of the Zoning Administrator. See Planning Code Section 306.8 for rules on poster placement.
- It is recommended, though not required, that when site posters are put up for WTS facilities that a copy of the photo simulations are also posted. This may reduce the likelihood that community members may assume a freestanding steel tower is proposed.
- While an overall requirement Citywide; in areas such as the northeast (east of Van Ness Avenue and north of Market Street) of the City and SOMA; ensure mailing labels are provided (or hand deliver multiple copies to property manager) to properties which function as long term residential hotels (those with guests who typically stay more than 30 days, known as SROs). In many instances the property tax records (often used to create mailing labels) may list these SROs as commercial hotels, even though they now provide long-term housing.
- Also provide notices to dormitory managers for universities and other schools if the actual dormitory building is within 150 feet of the Project Site boundary.
- Mailing labels provided to staff for 311/312 or Planning Commission hearings expire after six (6) months.
- If the Project Site borders a neighborhood group boundary, then registered neighborhood groups for the adjacent area will be included by Planning Department staff as well.

In this example the Project Site at 5226 Mission Street falls within the Mission neighborhood boundary area and is also across the street from the Crocker Amazon area. So neighborhood groups for both neighborhoods would need to be notified. When using the San Francisco Property Information Map, type in the Project Site address, then scroll down the Property Tab to “Neighborhood” and click on the blue oval that says “map.”

Mission and Van Ness 2011.0218
Ferry Building

5226 mission SEARCH

Measure Distance | Street View | Map Legend | Clear Map

Maps

Outer Mission

MISSION ST

POPE ST

Crocker Amazon

5216

Property | Zoning | Preservation | **Planning Apps** | Building Permits

Property Report: 5226 MISSION

General information related to properties at this location.

ON THIS PAGE:

- [Parcels](#)
- [Addresses](#)
- [Neighborhood](#)
- [Current Planning Team](#)
- [Supervisor District](#)
- [Census Tracts](#)
- [Traffic Analysis Zone](#)
- [Recommended Plants](#)
- [City Properties](#)
- [Port Facilities](#)
- [Assessor's Report](#)

PARCELS (Block/Lot): MAP

7031/002B

ADDRESSES:

5226 MISSION ST, SAN FRANCISCO, CA 94112

NEIGHBORHOOD: MAP

Outer Mission [View Neighborhood Groups Map](#)
[Find services nearby \(street cleaning, parks, MUNI, etc\)](#)

NOISE | Noise studies are not automatically required for Micro WTS facilities, unless it appears the facility may potentially result in adverse noise effects for tenants or the general public, or otherwise violate the City’s noise ordinance. For example, at night, noise from equipment is limited to 45 decibels as measured inside any residential dwellings.

Noise is typically generated by cooling fans for equipment cabinets, air conditioning or condenser units, and diesel or natural gas generators (generators are not present at most WTS facilities in San Francisco). Noise is not typically generated by transmitting or GPS antennas, or microwave dishes.

Determine whether equipment noise amplification caused by echoes against certain wall surfaces may occur, and if alternate placement or other measures can be utilized. Evaluate the use of sound-dampening blankets, if needed.

In some instances a slightly large equipment cabinet (if appropriate) can house larger fans with slower revolutions per minute; thereby reducing overall noise. Also, some systems can be set to turn off either some or all of the fans at night (when a lower noise standard applies for nearby residences).

Avoid the placement of noise-generating equipment cabinets in narrow lightwell locations where an echo effect may disturb residents.

PERMIT FEES

Micro WTS facilities within zoning districts (e.g. RC-4), where a building permit is required would include permit review & inspection fees for permit submittals to the Department of Building Inspection, permit review fees for Planning review (administered by DBI), a Department of Public Health review fee, and a Time and Materials fee (varies by site) for an ACOA or MPTA, if required (See HISTORIC PRESERVATION). Building permit and Planning review fees are typically based on valuation.

Micro WTS facilities that also require Section 311 or 312 neighborhood notification are typically subject to those fees listed above, plus the mailing costs for sending a notice to neighbors and neighborhood groups, within 150 feet of the site. Mailing lists are provided by the Project Sponsor.

PHOTO SIMULATIONS | Ensure photo simulations provide an accurate depiction of the facility from likely off-site locations such as adjacent sidewalks. This includes additional photo simulations if the site is near a public gathering area (e.g. public parks or plazas). In addition:

- Indicate the date the photo simulations were created, to ensure clarity in case revisions are made.
- Ensure photo simulations show ancillary elements, if they are potentially visible, such as cable trays, exposed cable loops below panel antennas, caged/non-caged access ladders, GPS antennas, and Radio Relay Units. In many instances the photo simulations submitted to Planning do not appear to take into account the visibility of these elements.
- Ensure photo simulations depict any proposed storefront modifications (new access doors, generator plug receptacles, door or window replacements).
- See other references to photo simulations in this document.
- Avoid creating photo simulations based on Google StreetView photos as the camera heights vary. Generally photos should be taken from adjacent public sidewalks or parks and plazas.
- For sites requiring historic preservation review, where the screening element (e.g. faux penthouse) peeks above the roofline, additional photo simulations may be necessary to demonstrate when the new screening element is and isn't visible as a pedestrian travels toward the site from a nearby street(s).

PRIMARY EQUIPMENT LOCATIONS | Ensure equipment locations (e.g. equipment cabinets, battery racks and telco switches) are appropriately sited, taking into account the following considerations:

- **Avoid displacement of residents or commercial tenants. Please note this is a significant concern in San Francisco, and is noted as a priority by the City's Master Plan (Planning Code Section 101.1).**
- Avoid impairing light or air into residences.
- Avoid reducing usable open space (see USABLE OPEN SPACE), which includes resident roof decks and balconies. Especially, reductions beyond required minimum amounts and/or exposure requirements.
- Avoid equipment locations that may result in conduit runs (cable trays running between equipment areas and antennas) that would be noticeable from off-site locations.

- Evaluate opportunities to place rooftop-mounted equipment in locations where they would be minimally visible from both adjacent residences and nearby sidewalks. Take into account visibility in hilly areas; especially in lower density neighborhoods (typically those with an “R” or “NC” zoning prefix or a “Neighborhood Commercial District” suffix). Additional screening (e.g. wood lattice) or painting of equipment (with clear notes on plans indicating such) may be necessary.
- During site visits consider the potential for echoes created in areas such as small courtyards or lightwells as they may amplify equipment fan noise.
- In some instances, a lightwell on the Subject building is situated directly across from a lightwell of an adjacent property. Avoid instances where equipment areas may substantially reduce light into adjacent dwellings.
- If the San Francisco Property Information Map (Zoning Information Tab) also indicates the site is a potential flood location, evaluate opportunities to ensure fuel tanks (if present), batteries, and other equipment are raised off ground floor or basement levels to the extent feasible. A sump pump may also be advisable for below ground locations.
- Avoid the use of indicator or other lights (including work lights with fixed arms rising well above the equipment area) visible from off-site or adjacent residences.
- If the equipment area may result in the loss of parking, determine if the loss of parking would fall below a required minimum, and whether a code-complying bicycle parking space can be utilized in-lieu of a vehicle parking space.
- See also FENCING / WALLS, PROJECT PLANS, REAR YARD AREAS, SITE VISITS, AND USABLE OPEN SPACE

PROJECT PLANS / SITE PLANS |

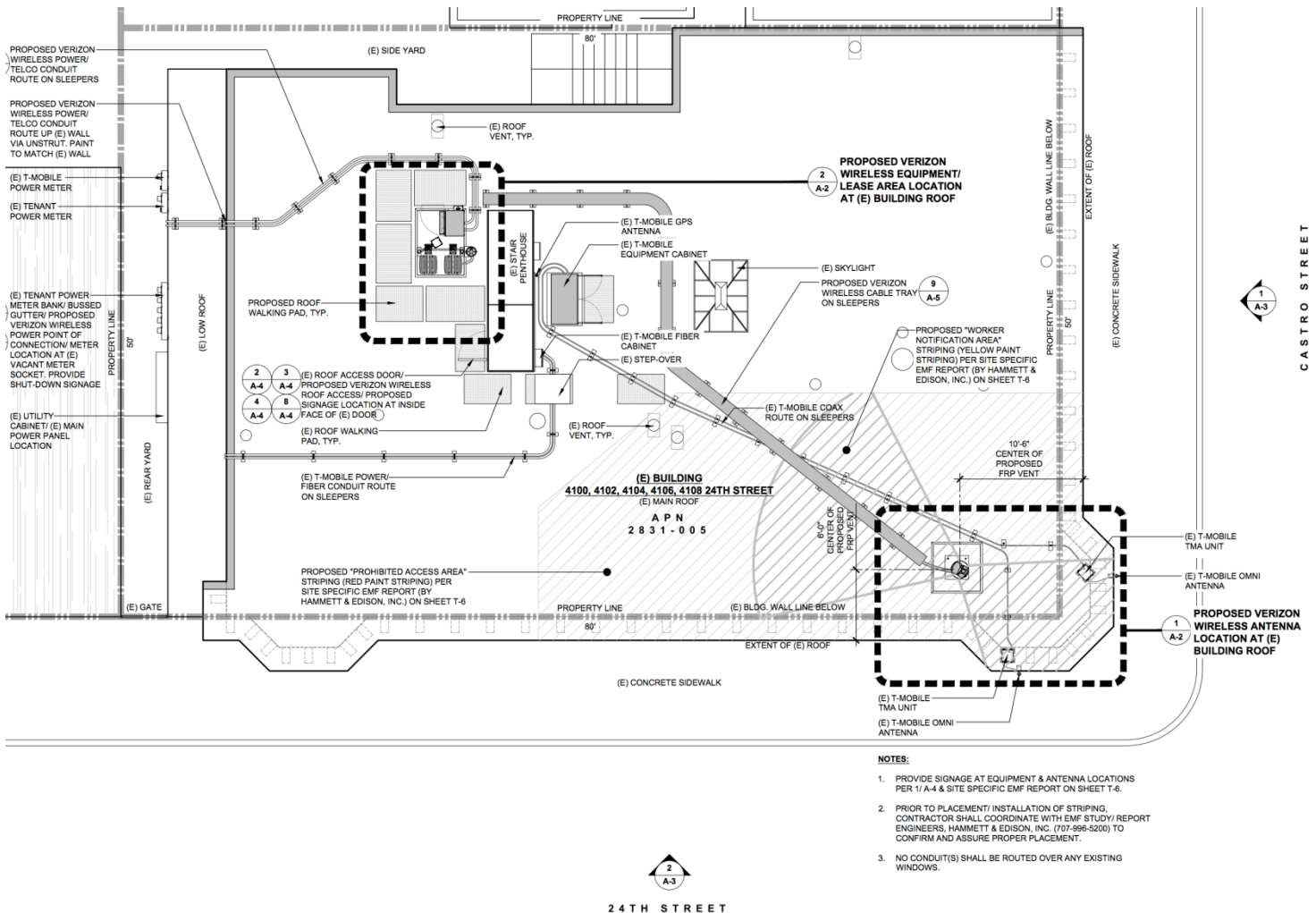
- **COVER SHEET:** Provide a clear Project Description that front-loads the major equipment elements first in the description (e.g. *An unmanned CARRIER NAME HERE Micro wireless telecommunications facility featuring 1 rooftop-mounted panel antenna, screened by an 18-inch diameter vent pipe; (3) radio relay units, and a 104 s.f. equipment area in basement*).
- If the facility is a Micro WTS facility that is also subject to neighborhood notification (plans are sent to residents within 150 feet), ensure the cover sheet text is very clear that the site is “Micro” in nature. *Planning staff will typically include only the cover sheet, site plan, and elevations in the packet mailed to residents. Ensure the cover page appears readable.*
- If there are abandoned/disused antennas on-site, and they are slated for removal, indicate such in the Project Description and on site plan sheet.
- Ensure the correct block and lot (equivalent to an Assessor’s Parcel Number), zoning district, and height and bulk district is used. Check the [San Francisco Property Information Map website](#).
- Verify if the street name shown on the plans uses the correct street type (e.g. street or avenue).

SITE PLAN & ELEVATION SHEETS

- Print the photo simulations on a plan set preceding site plan sheet.
- Ensure plans show the location of other on-site existing WTS facilities.
- Ensure any proposed microwave or radio-packet dishes are shown on site plan and elevation sheets.
- Ensure elevation sheets show, as applicable, the heights of the roof, the parapets, the top of screening elements, and top of GPS and transmitting *antennas*. *Avoid only indicating only the “rad center” height of the antennas.*
- Call out distances to nearest roof edges.
- Show the diameter of faux vent pipes, if proposed.
- Avoid instances where pipe mounts for antennas rise above or below screening elements. Determine if plan notes to indicate cut excess pipe mounts may be needed.

- Show location of generator plug & electric meter. SEE ALSO ELECTRIC METERS / GENERATOR PLUGS
- Show storefront modifications (e.g. new vents for air conditioning, weatherheads, replacement of access doors, or removal of windows) on plans and photo simulations.
- Provide elevation sheets for facades where conduit or other attachments are proposed.
- If generators are proposed, show vent stack heights and fuel line locations (if applicable). Also indicate on the cover sheet if the generator is a backup or emergency-only generator (for use during power outages).
- Avoid worklights rising above the equipment area. Consider the use of swivel bracket to lower the light when not in use.
- Provide sufficient information to demonstrate compliance with any applicable usable open space or required rear yard area (*and side yard requirements in RH-1[D] Zoning Districts*) requirements. This typically includes lot dimensions as well as the rear yard area dimensions and a clear depiction of proposed equipment locations. SEE ALSO REQUIRED REAR YARD, SIDE YARD, & USABLE OPEN SPACE
- **OTHER REQUIREMENTS:**
- [Review SF Fire Department Guidance.](#)
A substantial number of plan revisions are often attributed to plans that do not demonstrate compliance with Fire Department requirements.
- See Plan Submittal Guidelines. Typically 2 sets of plans and structural calculations are required. <http://www.sf-planning.org/modules/showdocument.aspx?documentid=8676>
- If the RF report indicates that an adjacent property needs RF exclusion area controls (e.g. striping of the rooftop or signage) ensure that property owner permission is obtained and this is clearly noted on the site plan sheet and photo simulations (if potentially visible).
- **SCREENING ELEMENTS SHOWN ON PLANS:**
- If a screening element is suspended above a surface (e.g. antenna inside signage or a screen box mounted on the rear façade of a building), ensure the plans (e.g. S-Sheets) clearly show that screening will extend to the underside of the element as well (*avoid pipe mounts and cabling hanging below the screen box*).
- Ensure the person(s) creating the S-sheets (which show details of stealthing) has reviewed the photo simulations. *In previous instances this has not occurred and led to stealthing installations that are not acceptable.*
- Screening elements should be labeled as smooth faced (no visible exterior bolt patterns) and textured and painted to match adjacent surfaces (as needed). Generally, rooftop elements rising above other existing rooftop elements should be painted the equivalent of “Ponder” by Sherwin Williams (non-glossy finish).
- See also **REVISIONS TO PLANS**

In this example, the proposed radio relay units (RRUs) were moved further away from the proposed faux vent pipe, toward the center of the roof; given that a placement near the proposed faux vent pipe at the southeast corner of the roof would likely be very visible from adjacent sidewalks, such as Castro Street, which features a relatively steep slope. In addition the cable trays running down the rear wall (left side of plan) are push back relative to the sidewalk along 24th Street and intended to mimic hot water pipes (with notes to paint to match) instead of a wide cable tray.



PROPERTY OWNERS | Ensure property owners are aware of the full scope of the proposal and site design changes. Additional areas of consideration:

- Ensure areas used for equipment cabinets, for example, do not displace or materially affect commercial or residential tenants. This is a key concern in San Francisco, as noted in the City’s Master Plan policies.
- Property owners are required to ensure required RF warning signage (e.g. signage at rooftop access doors) is well maintained so as to notify persons they may be entering a controlled environment. Signage should clearly note information in English, Chinese, and Spanish.
- Avoid site designs that may impair resident usable open space (roof decks, balconies).
- Work with the property owner to remove any existing antennas or dishes that appear abandoned; especially if in a location where the equipment would detract from views of primary building facades that are considered potential or known historic resources.

- While many property owners prefer to avoid new penetrations of roofing surfaces; antenna placement, even if screened, is typically not supported by Planning, when proposed at the edge of a roof along a primary facade. The use of bracing mechanisms running across a roof and attachment to various parapet elements or mechanical penthouses may offer opportunities to avoid new roof penetrations and allow for a viable design.
- Work with property owners to resolve any existing Building or Planning code violations. Check the SF Property Information Map website, as well as the SF DBI website (Track Permits and Complaints option).
- Work with property owners to identify less-intrusive conduit (cable tray) routing opportunities (to connect equipment areas to rooftop-mounted antennas) such as abandoned trash chutes, or stairwell areas. Ensure such placement does not impair light into tenant windows.
- Wireless carriers are expected to remove any inactive facilities, within six (6) months after the system ceases operation. However, property owners are ultimately responsible for removing decommissioned or abandoned WTS facilities. The removal must be completed under a building permit to remove the facility. [See Wireless Planning Advisory Bulletin #1 \(Removal or Transfer of WTS Facilities\)](#).
- **See also REQUIRED REAR YARD AREAS & USABLE OPEN SPACE**

RADIO-FREQUENCY (RF) REPORTS | The City does not mandate a specific vendor for the preparation of RF reports, or Periodic Safety Monitoring Reports. The Department of Public Health utilizes a checklist to demonstrate compliance. See Appendix A below.

Ensure the scope of the RF report (also referred to as an electromagnetic energy or “EME” report) is consistent with the structural analysis scope, the Project Description on the building permit application, and the building plans (cover sheet and site plan). RF Reports should:

- State the number of antennas or microwave dishes to be removed, replaced, or added. Do not include GPS antennas.
- Report should clearly indicate, **in an easy to find location**, how many total antennas are proposed at the site, by wireless carrier, post-installation.
- Report should indicate the number of existing antennas for other carriers on-site, and within 100 feet.
- Include the date of the building/zoning plan set used to prepare the RF report on the front page of the report. *Doing so helps ensure the RF report is consistent in the event a facility is re-designed.*
- Ensure that if plans are revised, and the revisions include new antenna models or locations (compared to original plans); that a new RF report is prepared.
- Ensure the RF Report features an engineer’s stamp by a California licensed engineer.
- Include a site plan clearly depicting the public and occupational exposure areas.
- Clarify the type of barricades or barriers required, if any.
- Avoid the use of barriers that hang off roof edges into view from off-site. In many instances a set of 12-inch tall (for example) blocks and a bright yellow plastic chain (a few inches above the roof), along with warning signs and roof striping can suffice. Consult with a qualified RF engineer and/or the Department of Public Health. *While RF barricades 4 to 5 feet above a rooftop (approaching the edge of the roof) may be needed to ensure visibility in the event of snow piling on the roof that is not a challenge in San Francisco.*
- If the RF report is being prepared for items other than antennas, then provide clarity on what is proposed (e.g. the addition of 3 radio relay units and [2] A-2 backpack units).
- Provide a roof plan (if applicable) that shows antenna, striping and signage locations.
- Review [San Francisco Fire Department Submittal Requirements](#)

- If the RF report breaks out each panel antenna on-site by frequency (not required); then also provide a separate discussion/table of how many physical panel antennas there are, by wireless carrier.
- If the RF report indicates that an adjacent property needs RF exclusion area controls (e.g. striping of the rooftop or signage) ensure that property owner permission is obtained and this is clearly noted on the site plan sheet and photo simulations (if potentially visible). A key concern includes barriers/fences attached to the edge of buildings (and visible from off-site) considered potential or known historic resources.
- If the antenna is proposed on the roof of a building with residences directly underneath the roof, provide clarity as to likely RF exposure for tenants below an antenna. While many RF reports indicate the exclusion distance is “much lesser below” the antenna; this is often not considered sufficient information by residents.
- **See also [San Francisco Department of Public Health RF Report Submittal Requirements](#) (end of document)**
- E-mail RF report and Project Plans to Patrick Fosdahl with the San Francisco Department of Public Health at Patrick.Fosdahl@sfdph.org

REAR YARD AREAS | *See also (separate but related) USABLE OPEN SPACE.* The siting of WTS facility elements such as equipment cabinets should take into account rear yard area requirements, which may preclude the placement of equipment cabinets in those areas:

- The rear yard area requirement applies to various zoning districts noted in Articles, 2, 7, and 8 of the Planning Code. See Planning Code Section 134 and Zoning Administrator Bulletin No. 5.
- Rear yard area requirements vary (portion of lot depth) based on the specific zoning district, and land use; such as whether the given adjacent floor level is residential or non-residential.
- For instance, in the Inner Sunset Neighborhood Commercial District (NCD), rear yards are required at ground level and every story of the building for the rear of the property (25% of lot). *Note this requirement applies to every story of the building within the Inner Sunset NCD, and is akin to a horizontal airspace projection. This may, for example, preclude equipment on 2nd floor rear decks in some locations.*
- In other zoning districts the rear yard area requirement may only apply based on whether the same floor features residential uses. Check the Zoning Control Table for the applicable zoning district.
- Minor WTS facilities elements on the roofs of buildings, where a portion of the building does not comply with rear yard area requirements, would require case-by-case review. This tends to not be an area of concern on upper roofs of the building; but may require further consideration for lower roofs and mid roof decks encroaching into the required rear yard areas.
- Large equipment areas in required rear yard areas near residential dwellings are discouraged and would also require a variance. Areas of concern include both the bulk of the equipment, the potential for sound generation (e.g. from cooling fans), and how the equipment may detract from mid-block open space. *Mid-block open space is the cumulative area created by individual rear yards in a given block; and it provides a sense of open space, even if individually fenced, as well as provide light and air into rear windows.* [See Pages 26-26 of the Residential Design Guidelines.](#)
- [Zoning Administrator Bulletin No. 5](#) should be reviewed for rules on rear yard averaging; which may allow reductions in required rear yard areas. However, a 30-foot height limit would apply within the last 10 feet of area within the buildable area.
- Rear yard area requirements do not apply to equipment areas proposed in basements of existing buildings.
- The 100 square-foot rear yard area exemption for sheds for gardening tools cannot be applied to equipment areas for WTS facilities.

REVISIONS TO PLANS | Ensure revisions to building plans are submitted through the Department of Building Inspection (DBI), and not directly to Planning, as they require an intake stamp from DBI.

If antenna models or locations change, ensure a new RF report is prepared.

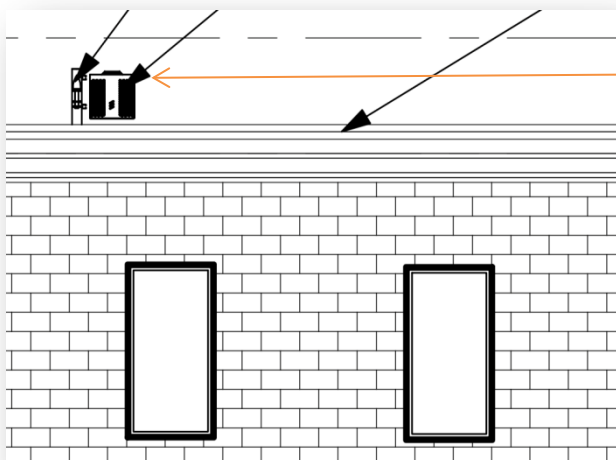
Also verify if the following needs to be updated: photo simulations, project description on the cover sheet, RF Report (and SF DPH Approval), structural analysis, or the original building permit description (update with DBI staff).

ROOFTOP BARRICADES / BARRIERS | Ensure that any radio-frequency (RF) warning rooftop barricade (used to exclude the public from RF exclusion areas); if recommended by a licensed engineer, is clearly depicted on plans (site plan and elevation sheets) and photo simulations (if potentially visible). Evaluate opportunities to avoid barricades where the height and placement near a roof edge would be visible from off-site (e.g. when standing on nearby sidewalks); especially in hilly residential or neighborhood commercial neighborhoods.

Ensure plans correctly show parapet heights, as certain existing parapet heights (typically 42 inches) may negate the need for additional barriers or railing at specific locations (see [SF Fire Department Bulletin 2.06](#)).

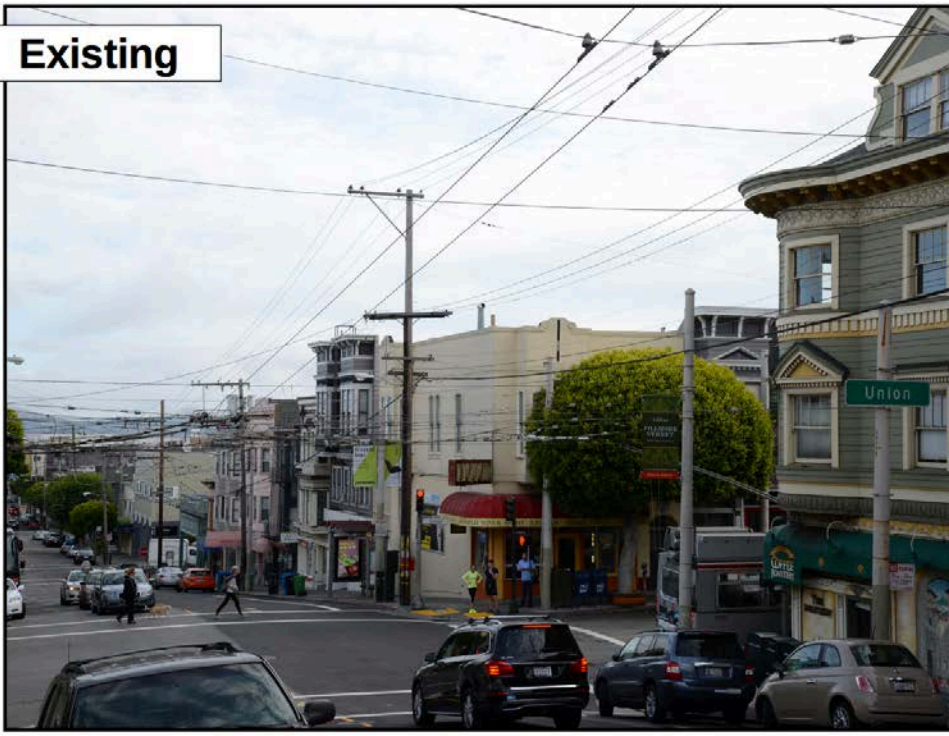
SECONDARY EQUIPMENT LOCATIONS | Secondary equipment refers to equipment other than the antennas and the primary equipment (large equipment cabinets) areas; and typically involves “H-frames” and radio relay units (RRUs or RRHs), condensers, and surge suppressors. Carriers typically seek to install this equipment closer to the antennas and/or on a roof. Common considerations include:

- Avoiding “scattered placement” on a roof that appears to further complicate the potential for a roof deck to be provided in the future, if the building features residential dwellings. Look for opportunities to leave an area clear for a future roof deck, while still complying with public exposure limits for RF emissions.
- Ensure the height and setback (from roof edge) of the equipment is shown on plans and reflected in photo simulations.
- Avoid instances where the equipment (including RRUs) is visible from off-site (e.g. sidewalk level on surrounding streets).
- In some locations such as a residential area with hilly streets surrounding the Project Site, screening may be required (e.g. boxes, walls, or wood lattice elements) to minimize visibility. Or, in some instances the equipment may need to be painted to match either the roof surface or a nearby building wall, so as to blend in with surroundings. Ensure notes on plans, and the project description on the cover sheet clearly indicates the painting (if needed) of equipment to match adjacent surfaces, so as to ensure completion by the contractor.

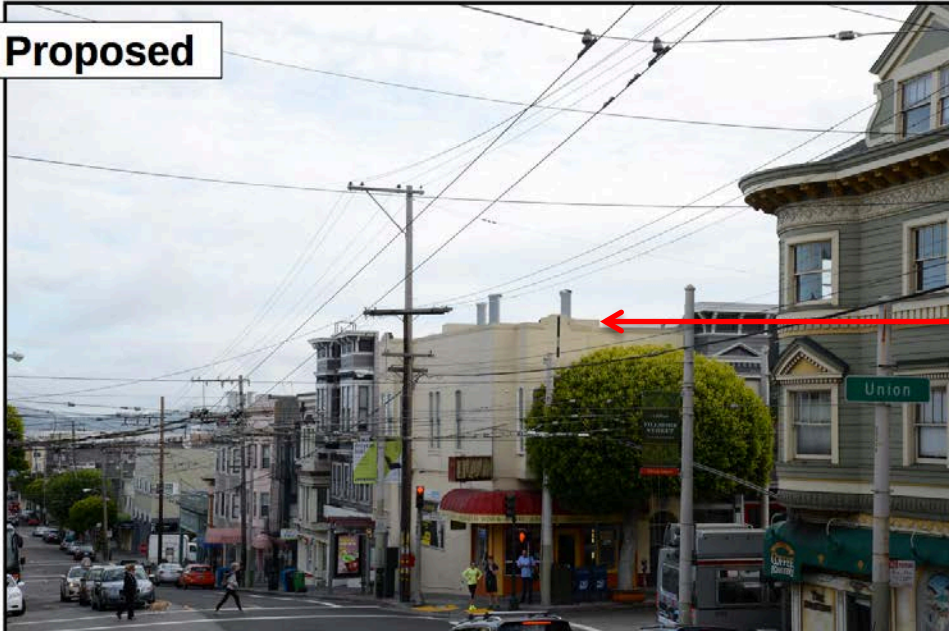


This example shows a rooftop-mounted radio relay unit and GPS antenna. These elements should be mounted as low to the roof level as possible, and pushed back from roof edges, so as to minimize their visibility from surrounding sidewalks (especially in hilly areas).

Existing



Proposed



*In this example of a previously proposed **Macro** WTS facility (3 panel antennas in individual faux vent pipes), the secondary equipment (e.g. radio relay units) are screened with enclosures that rise slightly above the parapet, but without significantly obscuring views of the Golden Gate entrance (waterfront).*

SCREENING | Micro WTS facility antennas are typically screened within a narrow vent pipe (e.g. 18-inch diameter), or an attachment (preferably with a narrow screen box) to the face of an existing rooftop stairwell or elevator penthouse wall.

Common challenges to avoid includes screening elements that leave the sides or undersides of antennas/brackets exposed from off-site view. Also, avoid screening elements that are out of the proportion with the Project site.

For example, faux vent pipes that are 30 inches in diameter, on a three-story neighborhood commercial building, with a 50-foot wide street frontage, would likely be out of proportion.

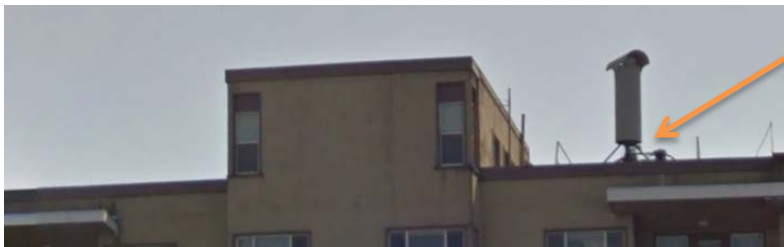
When complex screening elements are proposed, it is recommended the carrier ensure the actual screening construction design plan sheets (“S-Sheets”) are created by the screening manufacturer, or at a minimum reviewed by the screening manufacturer (plans and simulations) to ensure the proposal is viable.

Screening elements, such as FRP elements should use an additional layer, or alternate installation method to avoid the visibility of rivets (small bubbles) that may appear inconsistent with the surrounding building material.

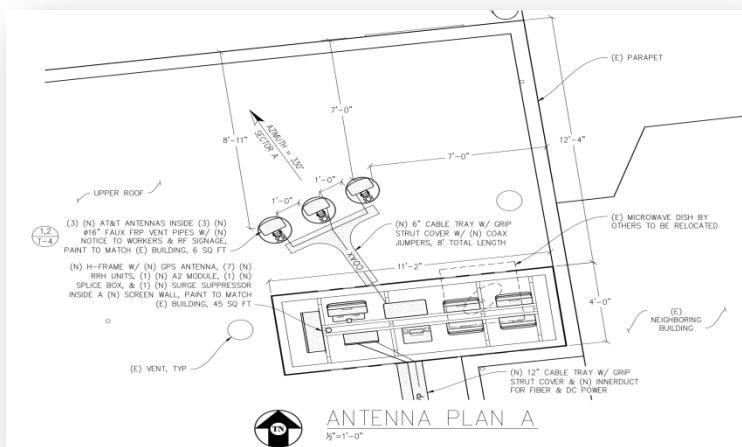
Ensure screening elements run below the parapet (if present) and avoid leaving an exposed tripod or cabling visible from many off-site vantage points.

In some locations, such as residential areas with rooftops that are more visible from off-site (due to hills, for instance), consider the use of screening for ancillary equipment as well. For example this may include the use of faux or real wood lattice screens for those radio relay units, condensers, surge suppressors and microwave dishes (the rear face) that may be partially visible from surrounding sidewalks, parks, or plazas.

Replacing parapets within portions composed of FRP is not generally allowed on primary facades of buildings considered known or potential historic resources. Case-by-case review required for secondary facades.



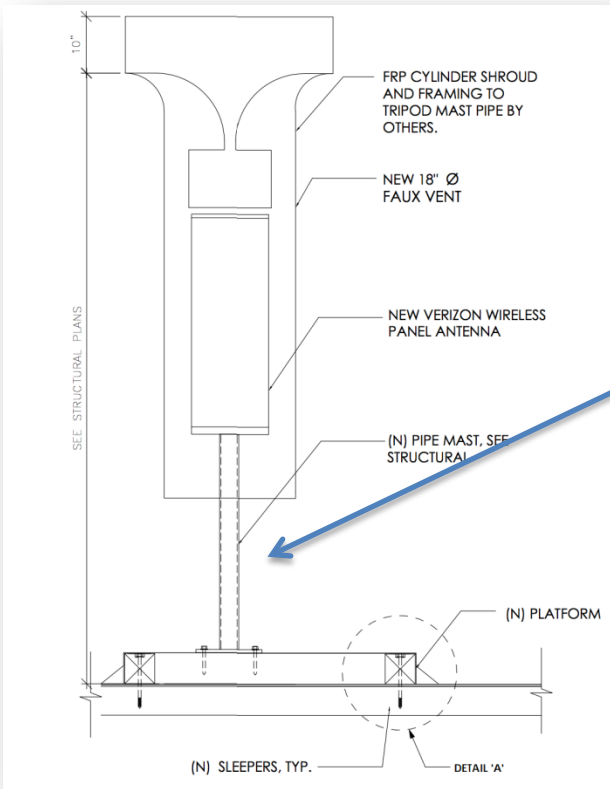
Example of disfavored screening, due to the installation of a faux vent pipe without cladding closer to roof level. Take into account both the vent pipe length and whether there are parapets along roof edges.



In this (Macro WTS facility) example, a screen box is also proposed around the radio relay units (behind the 3 antennas); since portions of the roof of this three-story building are visible from nearby sidewalks within a hilly residential area



This example features a Micro WTS facility antenna mounted within a faux vent pipe. However, the placement of unscreened electronic equipment (e.g. RRUs) on the eastern face of the stairwell penthouse is Disfavored, as it is prominently visible from adjacent sidewalks. The vent pipe is also too dark (recommended color is "Ponder" by Sherwin Williams, or equivalent).



This example shows an antenna within an 18-inch diameter faux rooftop vent pipe. A key concern, depending on the location, would be ensuring the vent pipe runs sufficiently downward to the roof (additional cladding may be needed).

SHADOW STUDY

A shadow study may be required for new elements (e.g. faux vent pipes or faux penthouses) for new elements on buildings which are over 40 feet above ground level; when the Project Site is near a City park. See Planning Code Section 295. This provision does apply to properties under the control of the Recreation and Parks Department (RPD); but it does **not** apply to those plazas (e.g. United Nations Plaza) that are not administered by RPD.

SIDE YARD REQUIREMENTS | Side yard requirements apply in RH-1(D) Zoning Districts (Planning Code Section 133). Equipment areas within required side yards can only be approved by the Zoning Administrator; pursuant to a variance. Large equipment cabinets, with noise-generating cooling fans are generally discouraged in side yard areas abutting residential dwellings.

SIGNAGE (ANTENNAS INSIDE BUSINESS SIGNAGE) |

- Ensure plans and photo simulations show cabling/conduit paths, RF warning stickers and GPS antennas. Visible elements such as conduit/cabling, transformers, and GPS antennas should be relocated to a less visible location (e.g. inside sign mounting brackets).
- Ensure photo simulations demonstrate sign depth (thickness). This is a key concern within historic districts and on buildings considered historic resources. Bulky signage is not typically supported.
- Review the Project Site to determine if signage as a whole (other signs as well) complies with the sign code.
- Historic Preservation review is typically required for buildings over 45 years of age and/or properties (including newer buildings) within historic districts.
- Port of San Francisco review is required for Projecting/Blade business signs that overhang the sidewalk on the south side of Jefferson Street. A blue line painted on the sidewalk notes the jurisdiction line.
- Adjacent property owner permission may also be required if the antennas overhang an adjacent property line (but not including public street, alleys, or sidewalks).

SIGNAGE (RF WARNING) | Ensure signage:

- Is in Chinese, English, and Spanish; and placed on the primary access door to a rooftop site
- Is placed in locations that provide RF warning information before a person would enter an RF exclusion area.
- Includes the carrier name and phone number for the network operations center. This information is sometimes left blank on signage when a facility is developed.

SITE VISITS | Check for the presence of roof decks or activity areas used by residents. Avoid (residential and small business) tenant displacement.

Check for emergency access routes/ladders, publicly accessible areas (e.g. roof decks) of adjacent properties (to ensure RF emission standards compliance required by the FCC), the location of resident windows (to avoid designs with cable trays in front of windows) and the presence of abandoned antennas.

If roof deck areas are present, note the location and dimensions on the plan set.

In many instances it may be more expedient to ask the property owner if the scope of work of the proposed Project (noted on cover sheet, site plan and building permit description) can include the

removal of any existing abandoned antennas. While personal TV or small satellite reception dishes are generally exempt from permitting requirements; the [FCC's OTARD exemption](#) does not extend that exemption to installation locations that may impair a historic building element (e.g. attachments to primary facades).

Avoid equipment placements that may not comply with usable open space requirements, or result in adverse noise effects ([See Article 29 of the San Francisco Police Code](#)); especially as a result of echoes within areas such as small lightwells or noise-generating equipment placed in front of residential windows.

Take site photos of rooftops, rear yards and secondary facades where equipment or cable trays are proposed; as they may be requested by Planning Department staff.

Also see, PRIMARY EQUIPMENT LOCATIONS, SECONDARY EQUIPMENT LOCATIONS, STOREFRONT ALTERATIONS, and STRUCTURAL ANALYSIS

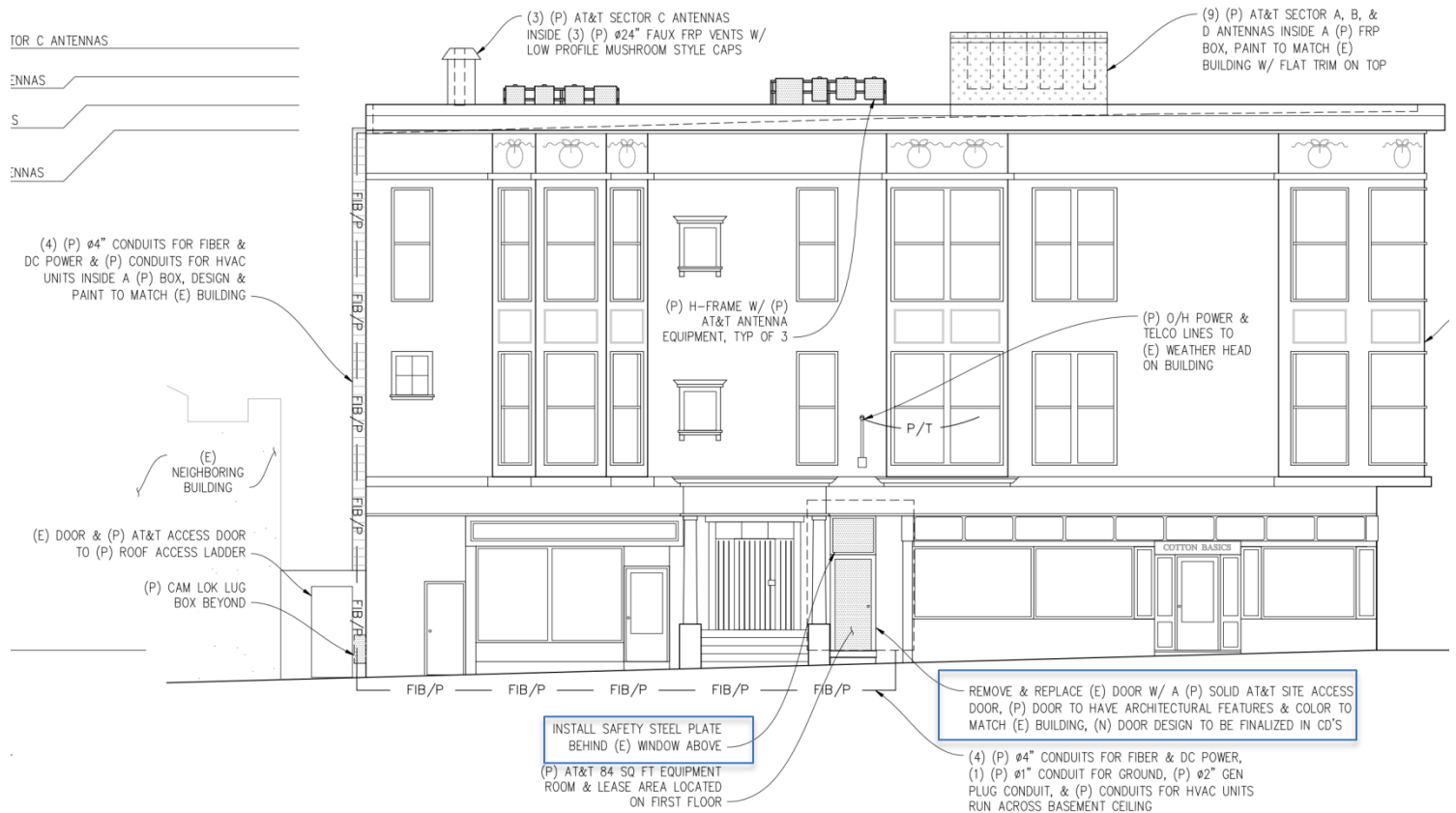
STOREFRONT ALTERATIONS | Primary challenges to avoid include the addition of new access doors, electrical meters, or generator plugs in locations that detracts from views of the building at street level. Evaluate opportunities for placement in recessed areas that do not impair views of the storefront, or tenant use of the building.

Ensure both project plans and photo simulations show the location of proposed generator plugs, weatherheads, electric meters, cable trays, new ventilation screens, and new/replacement doors that may be visible from surrounding streets and alleys.

Filling in windows or replacing original wooden entry doors on the primary facades of historic buildings (e.g. Victorian or Edwardian era buildings), with industrial-type steel access door, is not generally supported.

SEE ALSO ELECTRIC METERS / GENERATOR PLUGS

In this (Macro WTS facility) example, the storefront door was replaced, but with one intended to match the design of the existing door on a building built circa 1900. Also, instead of replacing the original window with solid wood or metal (as originally proposed), the window would be retained but with a steel safety plate “box” setback a few inches from the window so as to reduce the likelihood of entry by trespassers, while retaining more of the original storefront appearance.





Existing

Photosimulation of the proposed door, seen from 24th Street.

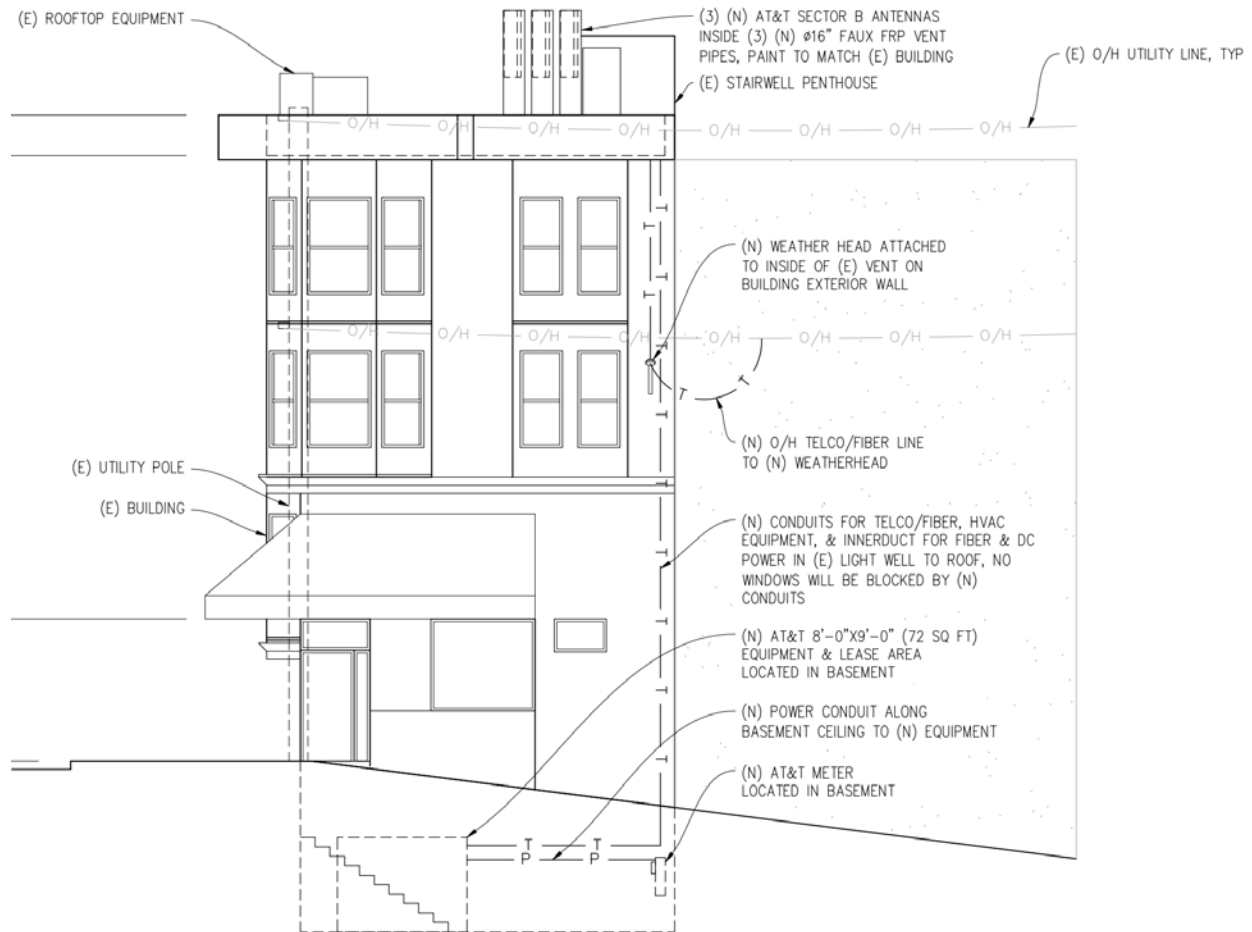
Photo simulation depicting the proposed storefront door and window alterations. Each site requires case-by-case Preservation review.



Proposed

The initial proposal (not shown) featured more of an industrial appearance.

In this (**Macro** WTS facility) example, the weatherhead is proposed on the primary facade, which is generally discouraged, however the mounting location would affix the weatherhead through an existing vent screen to reduce impairments to the facade of this historic building:



STRUCTURAL ANALYSIS | Ensure the project description included within the structural analysis accompanying the building plans is consistent with the scope of the project (e.g. number of antennas, mounting structures).

Also, ensure the structural analysis is updated in the event relevant changes are made to the WTS facility design (e.g. new equipment or antenna locations).

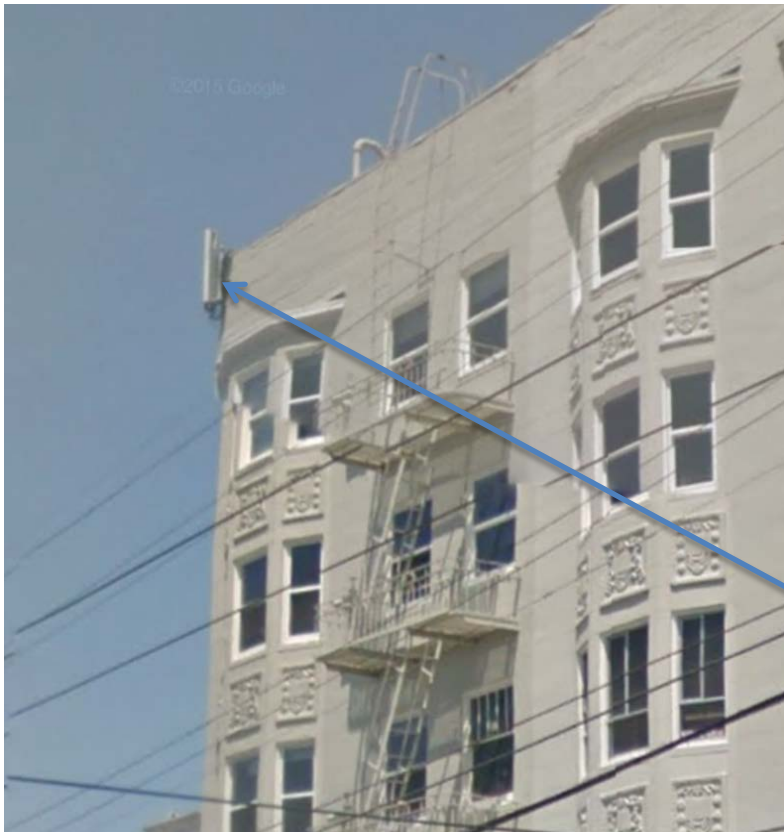
In some cases, a “rip and peek” to verify the location of load-bearing elements may be advisable on older buildings. It is not uncommon to find that there are no original building plans for some pre-1920 buildings; and load-bearing elements (which would support rooftop-mounted equipment) may not be where they are typically expected.

Ensure any loud construction noise for a “rip and peek” is limited to business hours, and consider placing a note in the lobby (if residential) to indicate the purpose of the activity. In some instances, community members who are not informed in advance of construction may presume a new WTS facility is being fully constructed without required approvals.

UNSCREENED PANEL ANTENNAS | Unscreened panel antennas are generally not supported; though some placements on mid-roof penthouse walls that are minimally visible from off-site may be viable.

Primary concerns include visible cabling above/below the antenna; especially in hilly residential areas where portions of the roof are more visible from nearby sidewalks. However, some antenna models allow for the attachment of a shroud below the antenna to hide most of the cable loop from view.

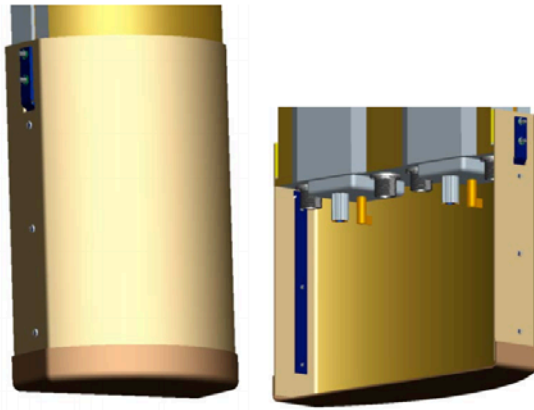
- The placement of RRUs near panel antennas (and cabling) may result in a cluttered appearance; though some antenna models feature an integrated RRU.
- Wide offsets (relying on mechanical tilt brackets) are also discouraged.



In some instances a slim offset mounting bracket can be paired with an antenna featuring electronic tilt built-in to the antenna. This installation type; along with a shroud below the panel antenna (which makes the antenna look longer but hides the bundle of cables exiting the bottom of the antenna) can result in far more streamlined (partially screened design).

See also **FACADE MOUNTED ANTENNAS**.

Disfavored panel antenna (along with visible cabling and brackets) on the primary façade of a building. Such a design for a new facility, if proposed, would not comply with the U.S. Secretary of the Interior's Standards for the Treatment of Historic Properties, and would not be recommended for approval.



- Custom fitted antenna shroud to hide RF cabling and RET actuators in cellular installations

Bundles of loose cabling visible below each antenna can often be hidden from view with a shroud such as this. It makes the antenna look slightly longer. Photo credit: dbSpectra

USABLE OPEN SPACE | Usable open space can consist of (Planning) code-complying roof decks, patios, and actual yards. Usable open space requirements are dependent on the number of residential dwellings and whether the space is individual or shared with other dwellings; with increased area requirements for shared open space areas.

Areas of consideration, if the Project Site features residential dwellings (including commercial hotels which have become long term residences, or “SROs”) include:

- 1) Reductions to usable open space, for uses such as a WTS facility, below required minimums, require a variance; though it is highly recommended that placement locations, or the provision of alternate code-complying usable open space (e.g. a substitute deck area) be provided. [Variance requests are reviewed separately by the Zoning Administrator](#) (not the Planning Commission).
- 2) Avoiding instances, to the extent feasible, where the widespread “scattering” of WTS facility elements (H-frames, cable trays, RRUs) precludes the possibility of a future roof deck, even if modest in size.
- 3) When calculating usable open space, take into account the different required sizes (per dwelling) for open space that is either private (individual areas for each dwelling) or common (shared for multiple dwellings).
- 4) Avoid reducing existing (functional) usable open space below both the required minimums and exposure* requirements (per Section 135 of the Planning Code). Take into account the spatial effects of antennas, equipment (including radio relay units and generators), cable trays, and platforms.
- 5) Usable open space requirements are separate from required rear yard area requirements. See also REAR YARD AREAS.

**Exposure requirements within the Planning Code relate to issues such as ensuring usable open spaces are afforded light and air. So, for example, a proposed lower level deck tucked into a lightwell with little sunlight reaching the deck would not be considered qualifying usable open space area.*

FREQUENTLY ASKED QUESTIONS ABOUT MICRO WTS FACILITIES

Does the Planning Department typically support the use of Micro WTS facilities? Well-designed and location-appropriate Micro WTS facilities typically offer a more balanced approach of a) providing robust wireless coverage and capacity; b) complying with Federal laws which partially limit the City's jurisdiction over wireless infrastructure; c) retaining the character of residential or mixed-use neighborhoods, and d) avoiding potentially negative effects (*e.g. aesthetics [visibility], historic preservation, noise, equipment space requirements, and large RF standoff areas*) sometimes associated with larger Macro WTS facilities.

In addition, a single Micro WTS facility, on a rooftop (for example), may provide the same coverage and capacity as between 1 to 4 Small Cells (also referred to as an Outdoor Distributed Antenna System, or "oDAS") attached to existing wooden utility poles along public streets ([sample photos link](#)). Wireless facilities attached to wooden poles, are generally disfavored (*e.g. due to proximity of bulky equipment enclosures to residential windows, visual effect on residential streetscapes or areas with prominent views, and potential noise generation from cooling fans*). However, the City's jurisdiction over wireless facilities attached to wooden utility poles (*which are not owned by the City*) is more limited due to State law (State Public Utilities Code Section 7901).

How is a Micro WTS facility different from a Macro WTS facility; and do both require review by the Planning Commission?

Macro WTS facilities typically use more antennas, feature larger equipment cabinets, may include diesel or natural gas generators, and have higher radio-frequency (RF) emissions. For example, a Micro WTS facility may have 100 to 2,500 watts of effective radiated power (ERP), [while a typical \(local\) Macro WTS facility may be capable of 4,000 to 11,000 watts of ERP](#).

Macro WTS Facilities require Planning Commission review, in all residential, neighborhood commercial, and mixed-use zoning districts. A Macro WTS facility in a zoning district with a C, M, or PDR prefix (except PDR-1-B) typically does not require a Conditional Use Authorization, and therefore would not require Planning Commission review.

Micro WTS facility applications do not typically require Planning Commission review.

Can a Wireless Carrier build a Micro WTS Facility and then turn it into a larger (Macro) WTS Facility? Yes, though only if the carrier obtains approval at a public hearing, from the Planning Commission, through a Conditional Use Authorization.

In the last few years wireless carriers have sometimes chosen to convert a Micro WTS facility into a Macro WTS facility, though subject to approval of a Conditional Use Authorization (including community meeting and Planning Commission hearing). However, in numerous instances a wireless carrier has instead sought to develop a new Macro WTS facility on a nearby building; and then remove the existing Micro WTS facility, when the new Macro WTS facility is approved and constructed.

Has the City seen a pattern of hazards associated with Micro WTS facilities, due to the use of batteries, or other equipment? No. The City has not seen a pattern of fires or hazardous incidents associated with Micro WTS facilities.

The majority of the 700+ Micro or Macro WTS facilities in San Francisco include batteries (typically lead-acid batteries similar to those used in trucks) to operate the facility in the event of a power outage. The use of batteries is reviewed by the Department of Building Inspection, and the San Francisco Fire

Department. Factors such as equipment locations (e.g. battery racks in an enclosed room, versus outdoor rooftop cabinets) and the amount of battery solution may necessitate alarm sensors or ventilation by the Fire Department.

The City has not seen a pattern of fires associated with Micro WTS facilities; or RF emissions exceeding the public exposure limits established by the Federal Communications Commission.

If a WTS Facility is built, can a resident request radio-frequency (RF) emissions testing, or review recent RF testing reports? Yes. Please call the San Francisco Department of Public Health at (415) 252-3904. Testing is provided for free.

Is a Conditional Use Authorization (CUA) in San Francisco similar to when other cities or counties require a Conditional Use Permit (CUP)? Yes. However, a CUA is not required for a qualifying Micro WTS facility.

How long does a Wireless Carrier have to install a Micro WTS facility after approval? The Micro WTS facility shall be installed prior to the expiration of the issued building permit. In some locations where a Certificate of Appropriateness is also required ([Article 10 Landmarks/Districts](#)), the COA expires within three (3) years of approval.

Is there a limit on the number of Micro WTS facilities allowed on a single parcel? There is not an automatic limit, however new applications are reviewed with respect to the cumulative effect (aesthetics, historic preservation, equipment areas, and noise) of multiple Micro WTS facilities. Most existing Micro WTS facilities only feature one (1) such facility at a given parcel.

Do Micro WTS Facilities only serve “cellular” wireless carriers? No. While the majority of Micro WTS facilities in San Francisco serve the four main wireless carriers (AT&T Mobility, Sprint, T-Mobile, and Verizon Wireless), there are also Micro WTS facilities used by experimental location finding services (e.g. NextNav) and those providing outdoor Wi-Fi access. While the term “cellular” is commonly used, the four main wireless carriers serving mobile device users are referred to Tier 1 PCS providers (PCS = Personal Communications Services).

Do Micro WTS facilities have to be removed if inactive? Yes. Micro WTS facilities shall be removed, pursuant to a building permit, within six (6) months of inactivity or abandonment. See [Wireless Planning Bulletin #1](#).

Are façade-mounted (e.g. antennas attached to building walls) Micro WTS facilities prohibited?

They are generally discouraged, and typically not allowed in locations where the antennas, brackets, and cabling would detract from a building considered a historic resource (or a building considered a potential historic resource based on specific case-by-case review).

In many instances, the antenna can be screened to mimic a portion of the façade, but the visibility of mounting brackets or conduit/cabling may not be viable.

Antennas can be mounted within signage, provided the size (including width) of the sign is scale and location appropriate (not appearing bulky), and conduit is hidden from view (e.g. inside mounting bracket arms).

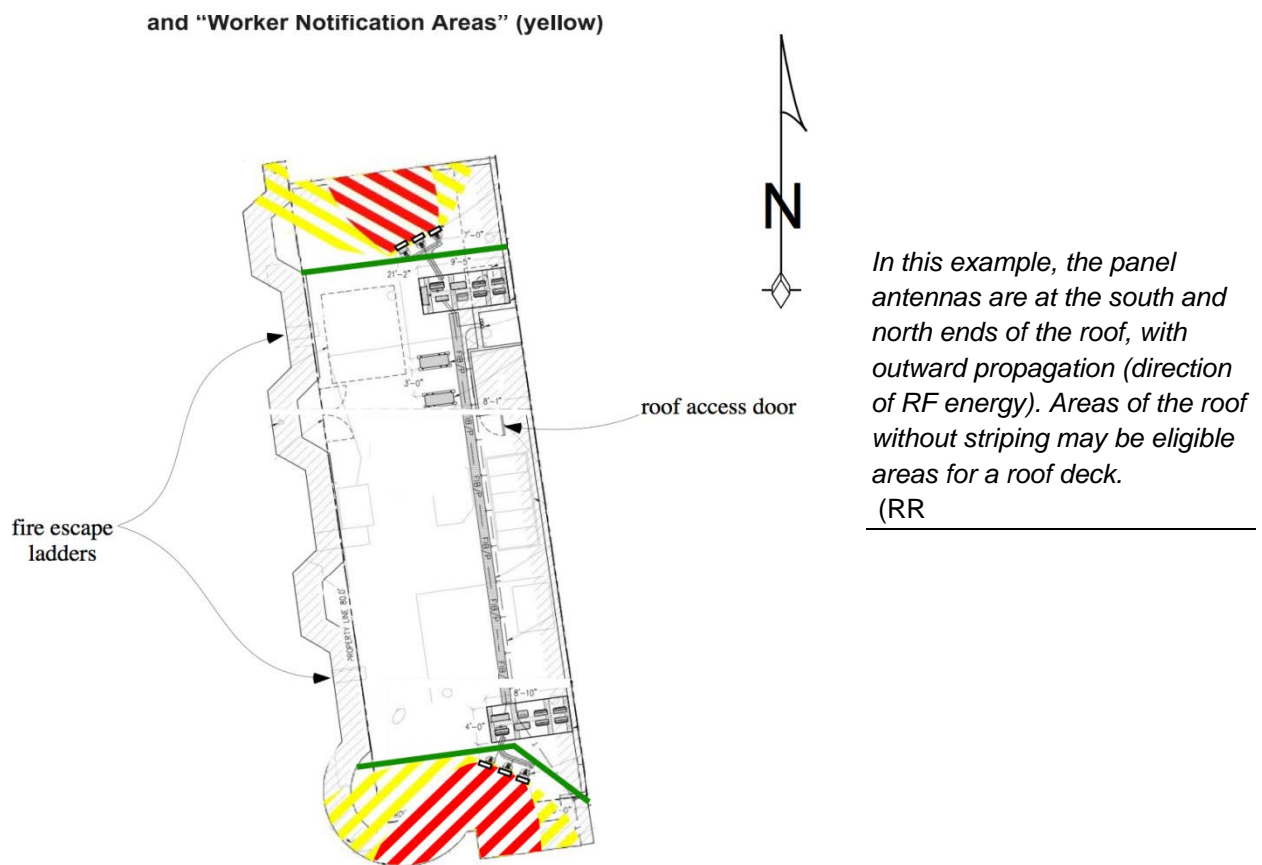
Can a Micro WTS facility antenna be placed on a roof, even with a residential dwelling right below the antenna? Potentially. Though subject to a radio-frequency emissions report, and Department of

Public Health approval.

The antennas typically used by wireless carriers for mobile device coverage are directional in nature; meaning the majority of the RF emissions propagate out toward the horizon with a slight (2 to 8 degree average) downtilt. The City's Department of Public Health has in the past, at the request of residents conducted RF emissions testing; and generally found RF emissions for dwellings below antennas to typically fall at or below 1% of the public exposure standards established by the Federal Communications Commission.

Can a Micro WTS facility antenna be placed on a roof, even when there is a residential roof deck?

Potentially. Though subject to a radio-frequency emissions report, and Department of Public Health approval, demonstrating the RF emissions at the roof deck will fall below limits established by the Federal Communications Commission. Some antenna models utilize a directional pattern, so in some instances, a roof deck can be placed in such a manner where the directional pattern of the antenna is "aimed away" from the roof deck. Thereby making the facility more likely to comply with RF exposure limits.





Review of Cellular Antenna Site Proposals

Project Sponsor:	Planner:
RF Engineer Consultant:	Phone Number:
Project Address/Location:	

The following information is required to be provided before approval of this project can be made. These requirements are established in the San Francisco Planning Department Wireless Telecommunications Services Facility Siting Guidelines dated August 1996. In order to facilitate quicker approval of this project, it is recommended that the project sponsor review this document before submitting the proposal to ensure that all requirements are included.

X 1. The location, identity and total number of all operational radiating antennas installed at this site. (WTS-FSG, Section 10.4.1, Section 11, 2b)

X 2. List all radiating antennas located within 100 feet of the site which could contribute to the cumulative radio frequency energy at this location. (WTS-FSG Section 10.5.2)

X 3. Provide a narrative description of the proposed work for this project. The description should be consistent with scope of work for the final installation drawings. (WTS-FSG, Section 10)

X 4. Provide an inventory of the make and model of antennas or transmitting equipment being installed or removed. The antenna inventory should also include the proposed installation height above the nearest walking/working surface as well as the height above ground level. Also include the orientations of the antennas. (WTS-FSG, Section 10.5.2)

X 5. Describe the existing radio frequency energy environment at the nearest walking/working surface to the antennas and at ground level. This description may be based on field measurements or calculations. Please include a description of any assumptions made when doing the calculations. (WTS-FSG, Section 10.4.1a, Section 10.4.1c, Section 10.5)

X 6. Provide the maximum effective radiated power per sector for the proposed installation. The power should be reported in Watts and reported both as a total and broken down by the frequency band width (i.e. PCS, AWS, Cellular, etc) (WTS-FSG, Section 10.1.2, Section 10.5.1).

X 7. Based on the antenna orientation, describe the maximum cumulative predicted radio frequency energy level for any nearby publicly accessible building or area. Include the address of the building or structure and the maximum predicted amount of radio frequency energy both as a percent of the FCC standard and in mW/cm². Include a description of any assumptions made when doing these calculations. (WTS-FSG, Section 10.4, Section 10.5.1)

X 8. Report the estimated cumulative radio frequency fields for the proposed site at ground level. State the percentage of the FCC standard utilized and power density exposure level in mW/cm². (WTS-FSG, Section 10.5)

X 9. Provide the maximum distance (in feet) the three dimensional perimeter of the radio frequency energy level equal to the public and occupational exposure limit is calculated to extend from the face of

the antennas. Indicate if this will include any walking/working surfaces or if it extends only into free space. (WTS-FSG, Section 10.9.2).

X 10. Provide a description of whether or not the public has access to the antennas. Describe any existing or proposed warning signs, barricades, barriers, rooftop striping or other safety precautions for people nearing the equipment as may be required by any applicable FCC-adopted standards. At a minimum, signs should be provided in English, Spanish and Chinese. (WTS-FSG, Section 9.5, Section 10.9.2).

X 11. Statement on who produced this report and qualifications. Report must be signed off by a licensed engineer expert in the field of radio frequency emissions. Typically, this is a licensed electrical engineer. The engineer must be licensed in the State of California. (WTS-FSG, Section 11, 8)

Review Template Rev 2015.1