Legionella Environmental Health Considerations

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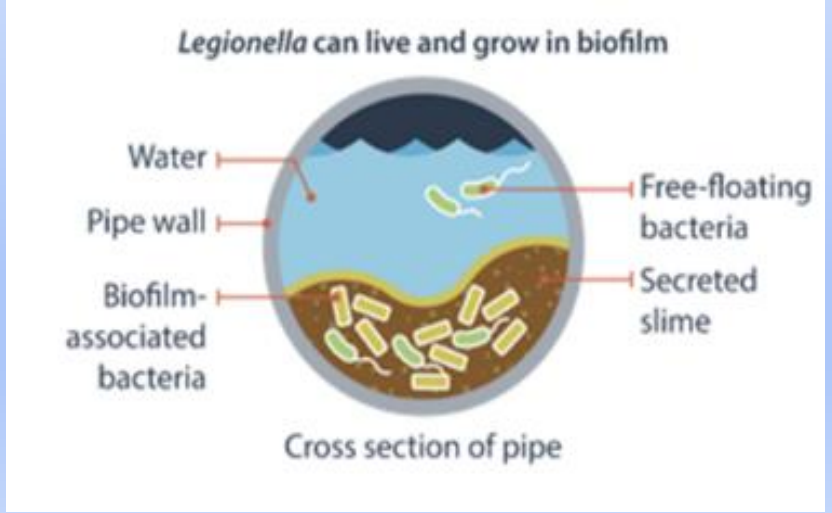
Agenda

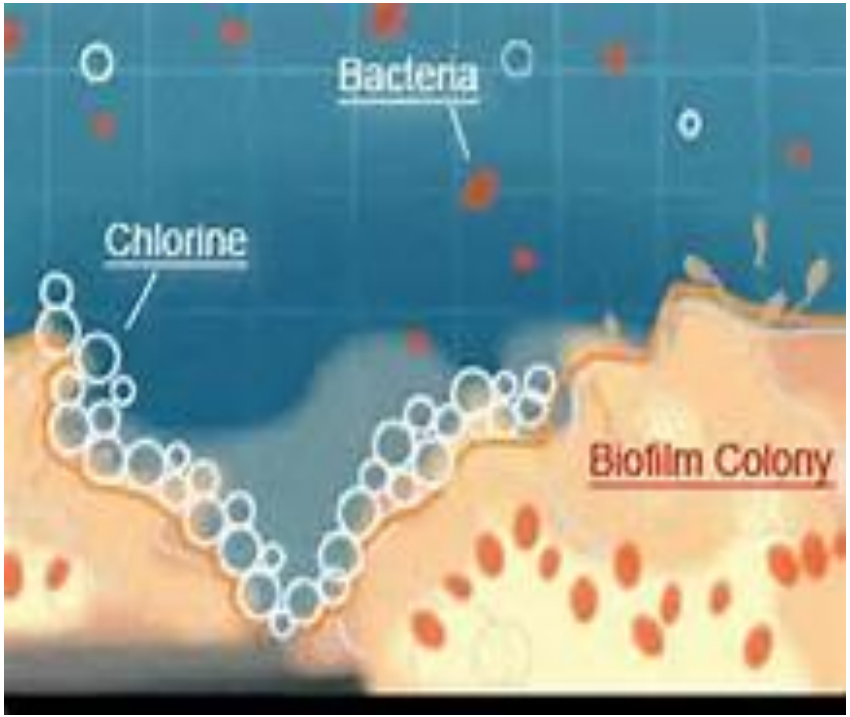
- *Legionella*
- Where *Legionella* grows, and does not grow
- How do *Legionella* exposures occur
- What devices are a risk and which are not
- Cooling tower recognition

Causative Agent: Legionella

- Gram-negative bacillus
- Primarily found in freshwater
- Intracellular parasite of free-living protozoa
- Can live and grow in biofilm
- More than 60 species
- L. pneumophila: ~80-90% of reported US cases



Biofilm



Where and How?

Locations for Growth/Exposure

More Growth and Exposure Locations

More Growth/Exposure Locations

Common Air Conditioning Types

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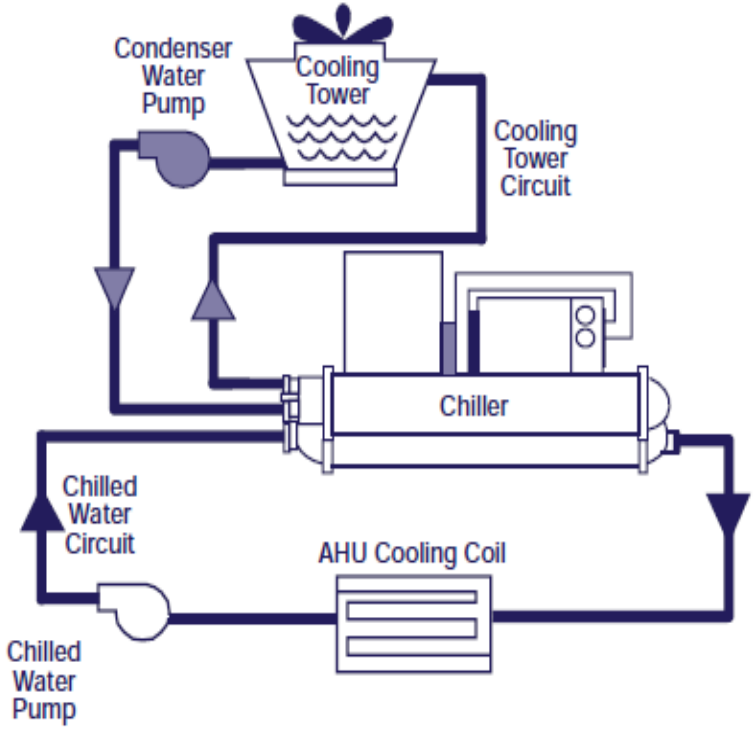
HVAC vs. Cooling Towers



Cooling Tower ID

Access Imagery

Oblique (angled)
Aerial

Ortho (straight down)
Satellite or aerial

Cooling Tower ID Guide

- Positive ID:
  - Location on or near a larger building (e.g., big box store, large office building, hospital)
  - Large size (though size does vary)
  - Large fan blades
  - “Large circle in a square (or rectangle)”
  - Piping
- Negative ID:
  - Location on a small building (e.g., house, standalone restaurant or shop)
  - Small size
  - Many circular holes that are smaller in relation to the “box”

Cooling Tower ID Guide

- Possible sources of confusion:
  - Round towers (unusual)
  - Cooling towers with fan on side (fairly common) or on bottom (unusual, used to reduce noise, seen at some healthcare sites)
- Contact an HVAC expert for assistance if needed!

Cooling Tower Structure

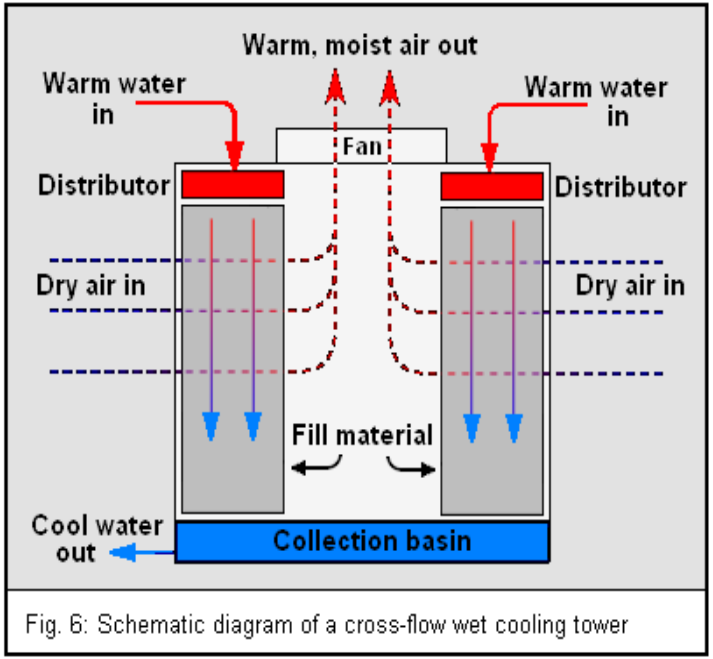


Fig. 6: Schematic diagram of a cross-flow wet cooling tower

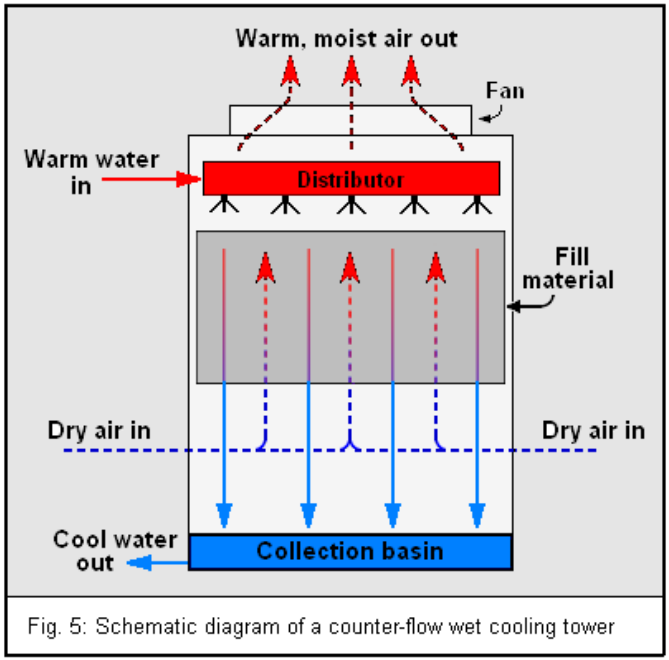
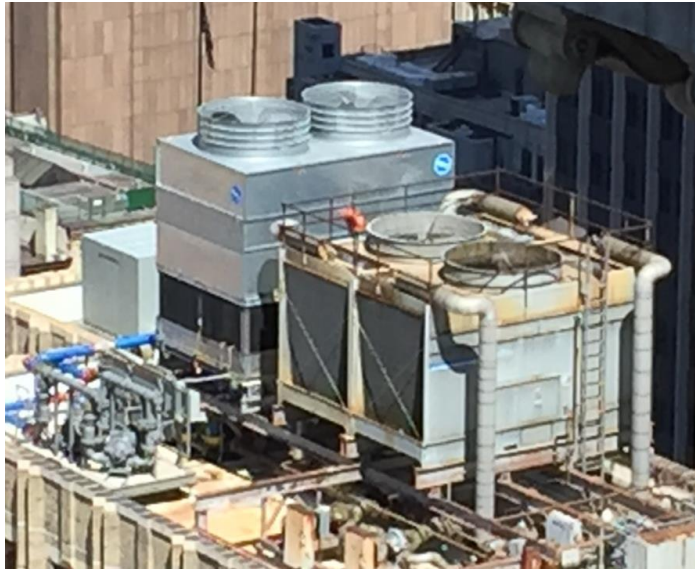


Fig. 5: Schematic diagram of a counter-flow wet cooling tower

Diagrams from http://chemengineering.wikispaces.com/Wet+cooling+towers

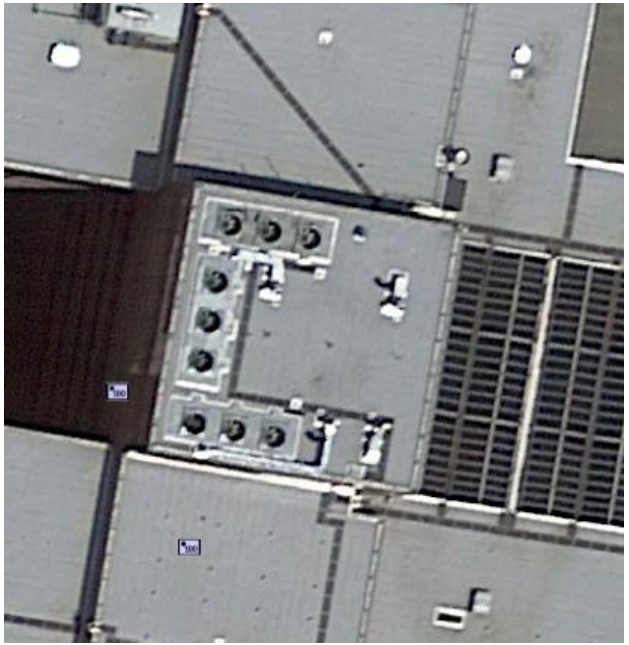
Some Typical Cooling Towers



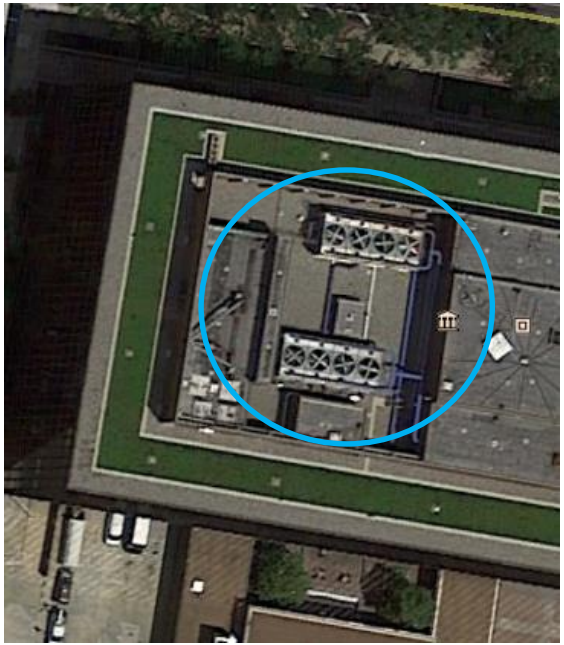
Some Typical Cooling Towers

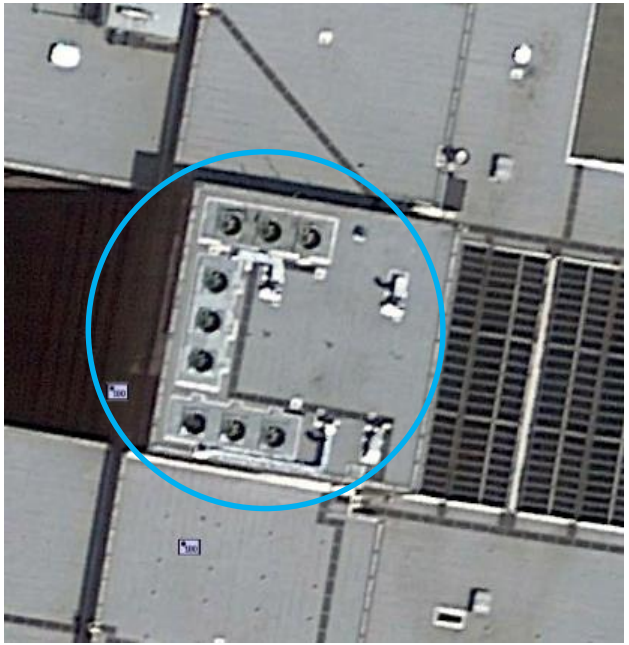
Unusual Cooling Towers

Are these cooling towers?

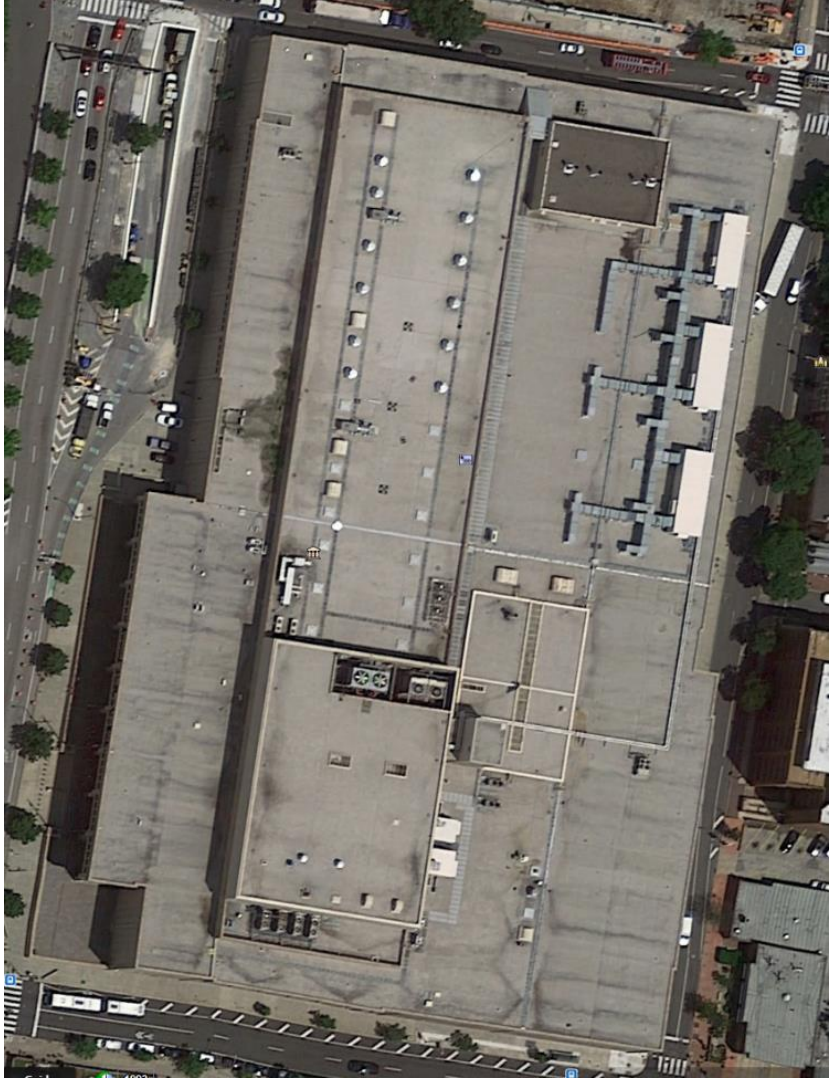


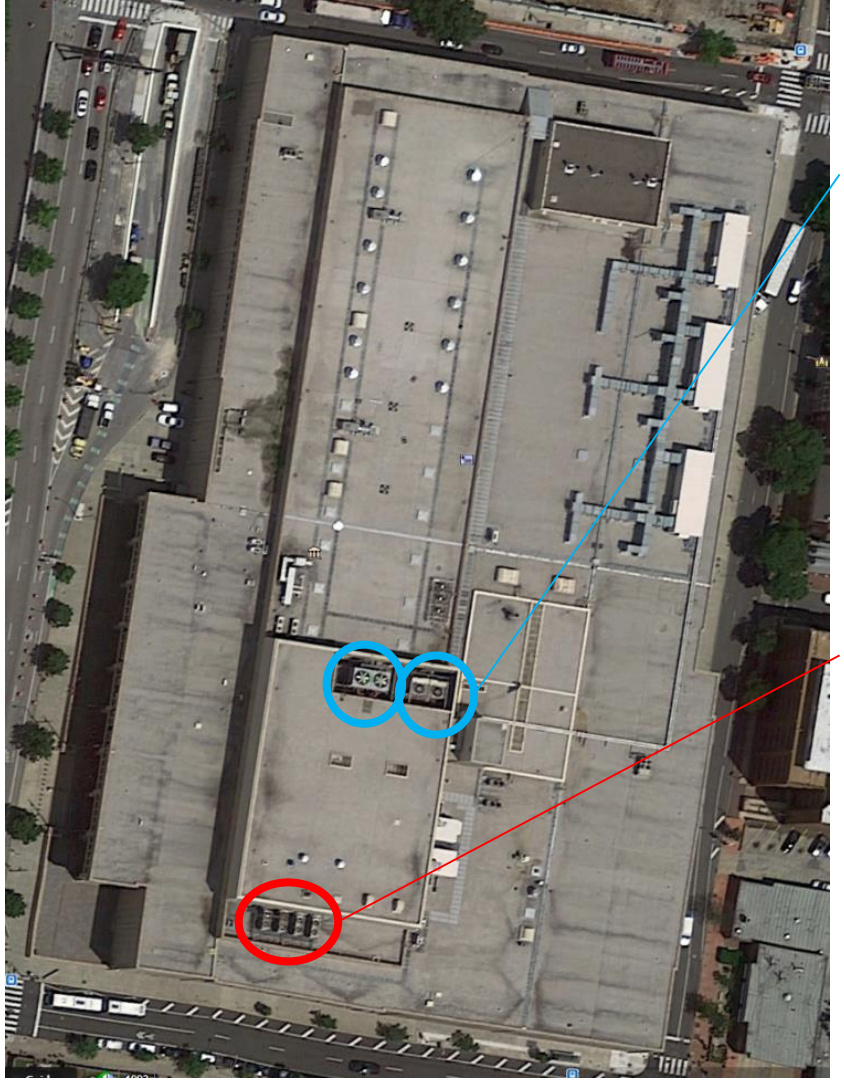
Are these cooling towers?





Yes!



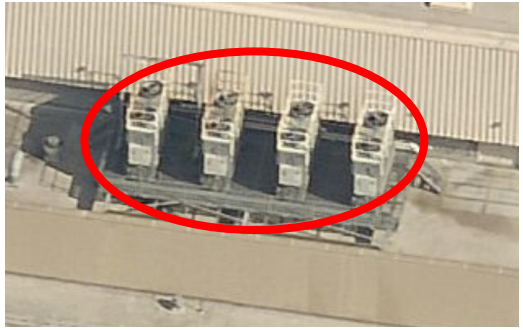


4 units

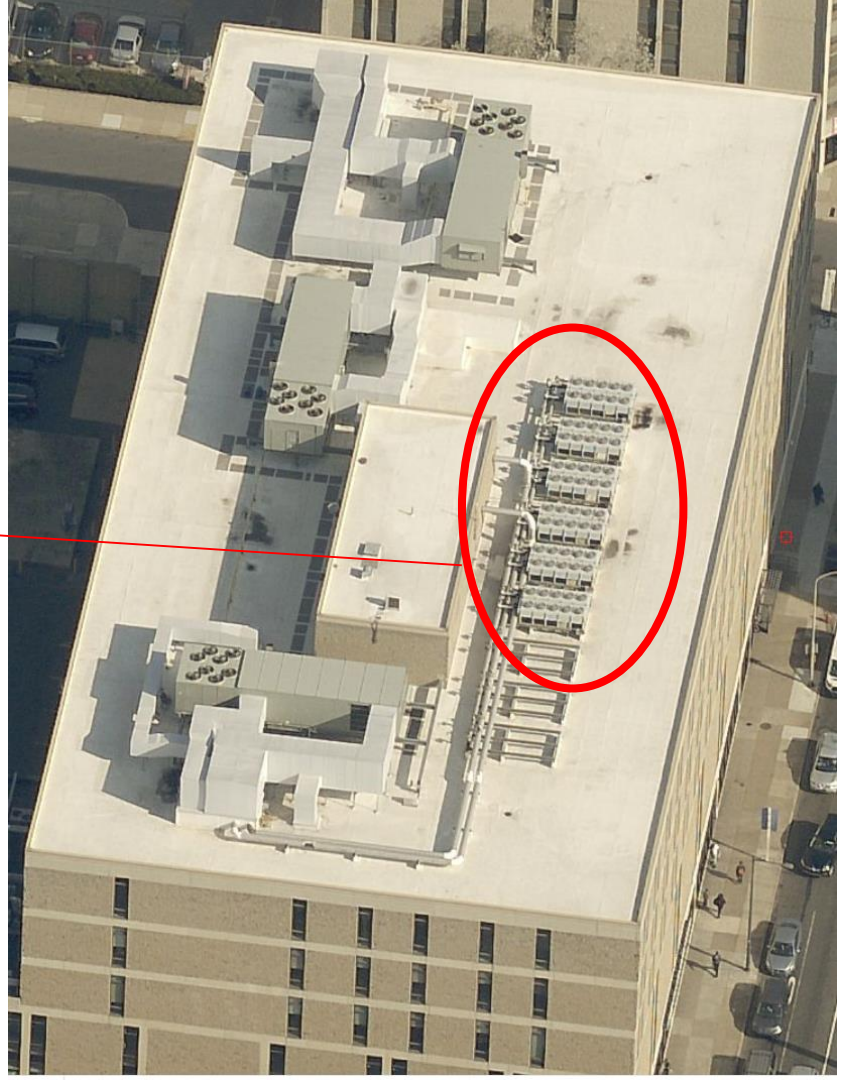
These units are divided into 2 two-cell cooling towers. It is easiest for us to count cells, or units. How many fans/openings are visible?

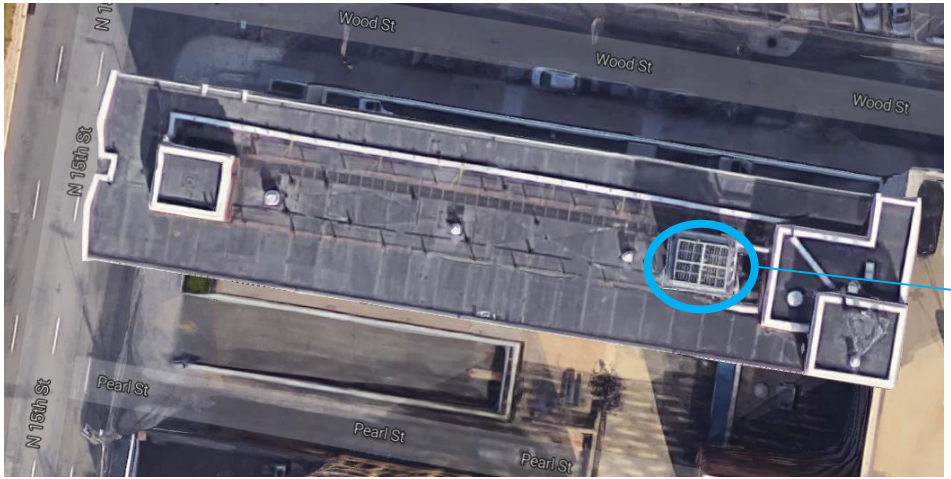
Probably not cooling towers, as the building already has two.

Typically towers would not be separated like this. These are probably condensers for computer room units.



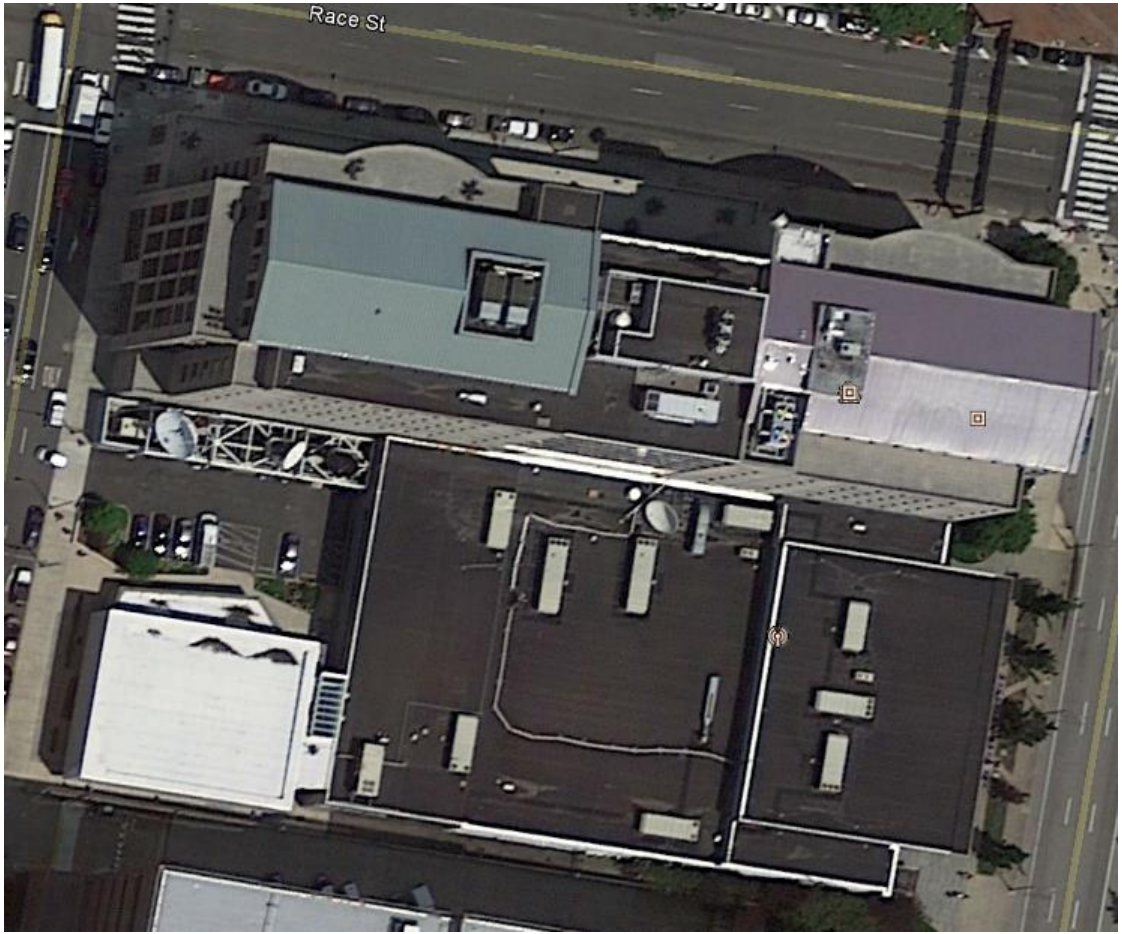
No cooling towers here – just air-cooled chillers)

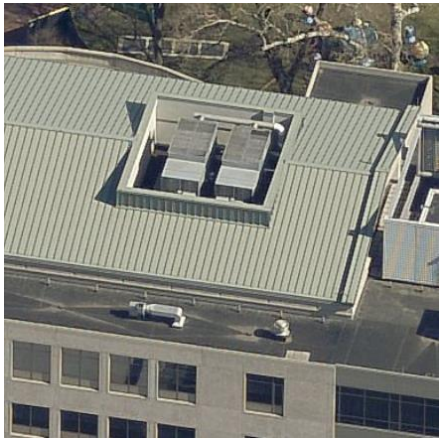


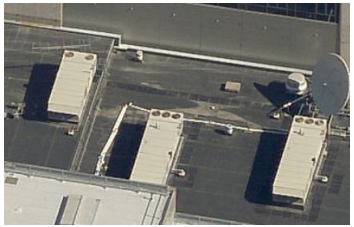


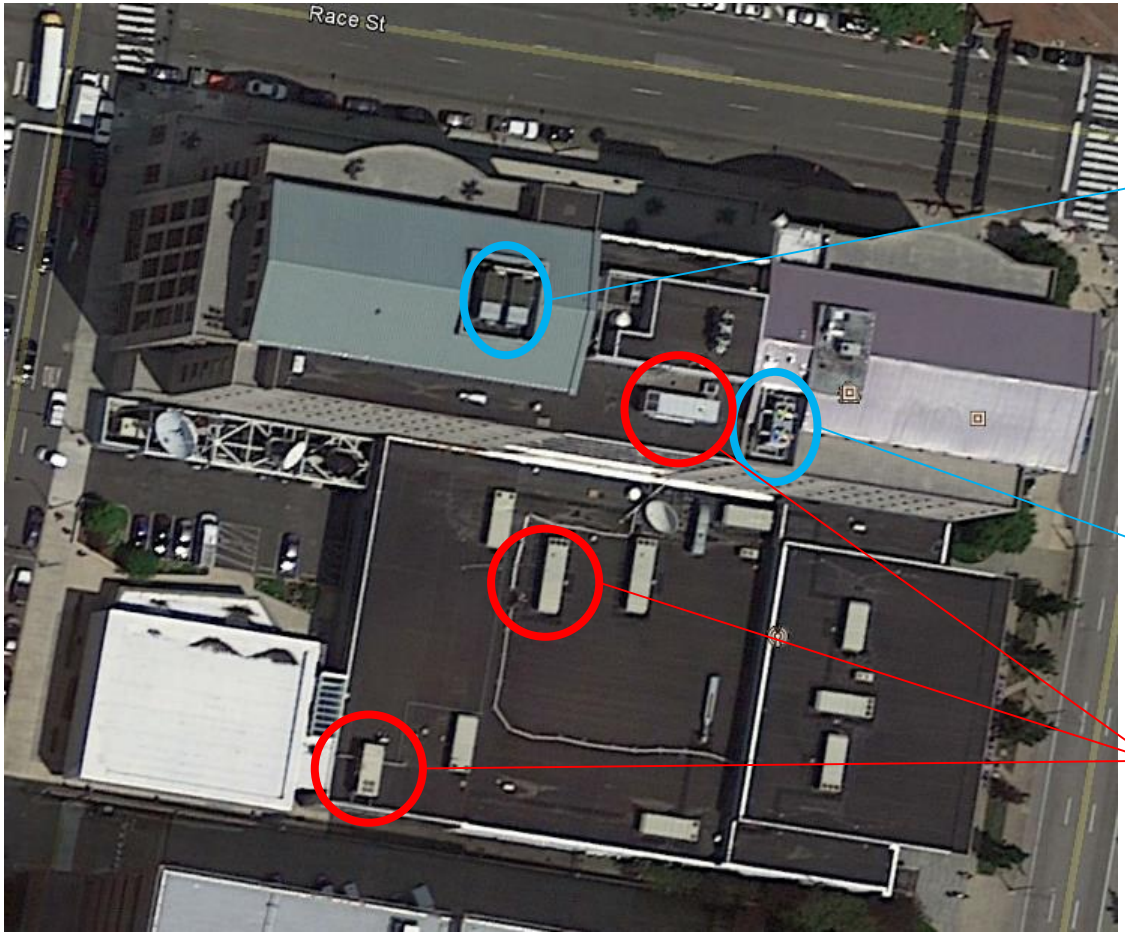
Cooling tower with fans on the side

Note that the top just has a grating and the fan blades are not visible from the top.


Race St





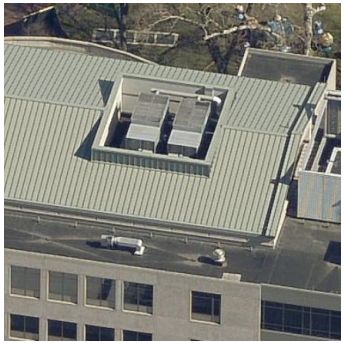


Unusual cooling towers

In these cases the fan is in the base of the tower; the fan and the heat exchanger have switched locations vs a typical tower.

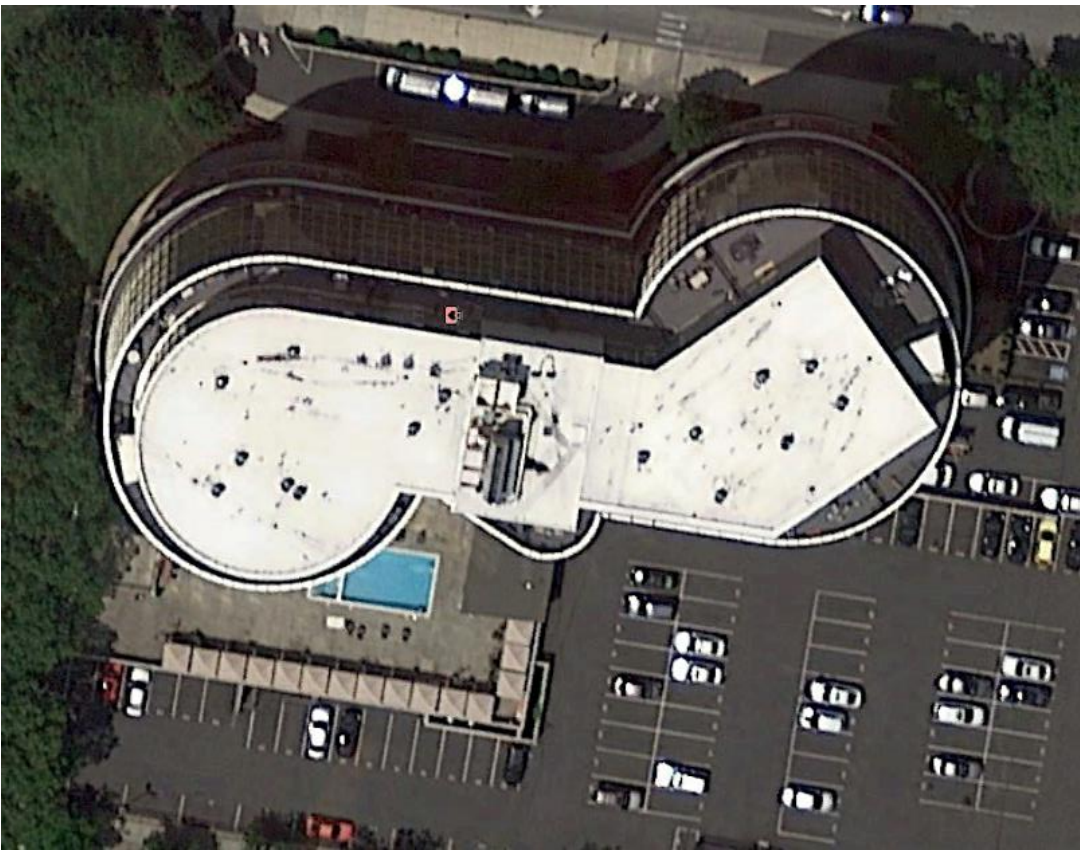
The reason for using this type is reduced noise and a smaller foot print per cooling tonnage.

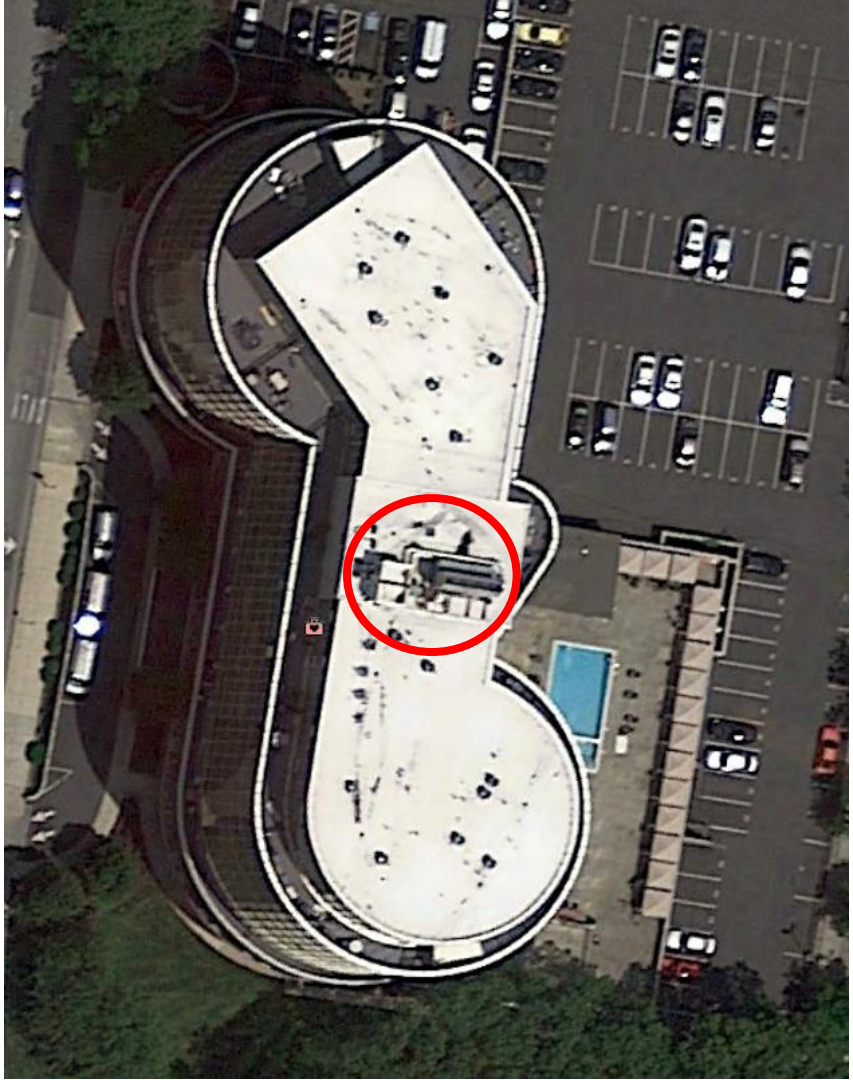
You do not see this style as much, because they are more expensive.
But they are required if the building owner prefers low noise over low cost.
Typically we see them in hospital applications and the like.



Typical cooling tower; 2 units

Not cooling towers





Probably not a cooling tower

It appears to be a very large plate and frame heat exchanger.

QUESTIONS?

References

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