Antennas and Water Towers:
Why or Why Not?

PA AWWA Conference
Technical Sessions
May 12, 2016

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TANK TYPES

Legged
TANK TYPES

Single Pedestal – Spheroid / Sphere
TANK TYPES

Fluted Column / Hydropillar - Composite
TANK TYPES

Standpipe
Tank Locations for Reference

Basecone / Basebell

Stem / Riser

Access Tube
Antenna Installation Types

- Cellular
- Wireless Internet
- Municipal
- Emergency
SAFETY

**WARNING**
Do not use this antenna support frame in any manner to support any other equipment or personnel. This frame was designed to support existing antenna only.

**NOTICE**
Radio frequency fields beyond this point may exceed the FCC maximum exposure limit allowable for the general public.

To protect your safety, instructions and guidelines for working in radio frequency environments must be strictly adhered to.

Complies with 47 CFR 15.597 (b) FCC rules on radio frequency emissions.

Authorized personnel only.

* RF safety guidelines for human exposure.
* To protect your safety, instructions and guidelines for working in radio frequency environments must be strictly adhered to.

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* RF safety guidelines for human exposure.
* To protect your safety, instructions and guidelines for working in radio frequency environments must be strictly adhered to.
Lease Agreements

- Check with neighboring communities
- Plan for increases at certain intervals
- Reviewed by attorney
- Reviewed by qualified engineer
LEASE AGREEMENT BETWEEN
CITY OF BROOKFIELD AND
T-Mobile Central LLC

WATER TOWER SITE
License Agreement dated Sept. 4, 2007, by and between City of Brookfield ("City/Village/Town") and T-Mobile Central LLC, a Delaware limited liability company, with its principal office at 8550 Bryn Mawr Avenue, Chicago, Illinois 60663 ("Company").

RECITALS
A. City owns certain real property, consisting of, among other things, a water tower and surrounding property, located in the City of Brookfield, Waukesha County, Wisconsin, as more particularly described in the attached Exhibit A (the "Property").
B. Company desires to construct, install, maintain and operate on the Property, at its expense, certain communications facilities, including, but not limited to, antennas, mounting equipment, equipment shelter buildings, and communications towers or monopoles, if any, specifically described in Exhibit B (the "Communications Facilities").

NOW, THEREFORE, FOR VALUABLE CONSIDERATION AND INTENDING TO BE BOUND, CITY AND COMPANY AGREE AS FOLLOWS:

1. Recitals. The Recitals are incorporated and form a part of this Agreement.

2. License. City hereby grants Company a nonexclusive license to construct, install, maintain, and operate the Communications Facilities, up to a maximum of twelve (12) antennas on part of the Property, in the specific location designated on construction plans and drawings approved by City, which shall be attached hereto and incorporated herein as Exhibit C (the "Premises"). City further authorizes Company, where appropriate, to attach the Communications Facilities to a structure located on Premises, which structure also shall be designated on the construction plans and drawings approved by the City and attached hereto as Exhibit C (the "Structure"). Company shall make no other use of the Premises.

The parties expressly understand and agree that this Agreement shall not be revoked or otherwise terminated except by expiration of its term or as provided in this Agreement.

3. Terms. The initial term of this Agreement shall be for a period of five (5) years, commencing on the date Company obtains all necessary City approvals (the "Commencement Date"), and ending on the fifth anniversary thereof. Thereafter, Company shall have the right to extend this Agreement for up to four (4) successive additional five (5) year renewal terms ("Renewal Terms"). If Company shall remain in possession of the premises at the expiration of

4. Company shall design, place and improve all of its Communications Facilities in a manner that will keep aesthetic impact held to a minimum practical level. City reserves the right to require Company to paint the Communications Facilities or shield the Communications Facilities from view and take such other reasonable and appropriate action as City determines necessary or convenient to minimize aesthetic impact.

5. Company shall separately meter charges for the consumption of electricity and any other utilities associated with its use of the Premises and shall pay all costs associated therewith. City shall cooperate with Company to obtain all easements or rights-of-way to separately meter utilities.

6. Company, at its expense, shall have sole responsibility for the maintenance, repair, and security of its Communications Facilities and shall keep the same in good repair and condition during the term of this Agreement.

7. A landscape plan for the site shall be proposed and approved by City prior to the Commencement Date. Company, at its expense, shall install and maintain its landscape according to the approved landscape plan, which shall be attached hereto and incorporated herein as Exhibit E.

8. City shall notify Company at least forty-five (45) days in advance of the date when any Structure is scheduled to be painted. Company shall decide, after consulting with City, which of the following two options shall be used. Option 1: Shortly before the painting date, Company, at its sole expense, shall place a temporary antenna array on a crane parked near the site. Company shall then remove the antennas from the Structure and the painting shall proceed as it normally does. Once the painting is finished, Company, at its sole expense, shall then re-attach the antennas where they were and shall have them painted to match the newly painted Structure and touch up paint on repainted structure after reinstallation of antennas. Option 2: The painting contractor will bid on the cost of painting the Structure without the Communications Facilities. The contractor will then bid on the cost of painting the Structure with the Company’s antennas left in place. The contractor will then proceed to paint the Structure with Company’s antennas left in place. Company shall reimburse City for the difference between the two bids.

Any additional costs for servicing or maintaining any Structure that are due to the presence of the Communications Facilities, including additional driveway asphalt and snow plowing/salt control, shall be the responsibility of Company and shall be paid by Company. Company shall abate or remove graffiti from the Communications Facilities within fifteen (15) business days of City’s written notice regarding same.

9. Modifications. Company shall not update or add to the Communications Facilities located outside the equipment shelter or building nor shall it make any additions, alterations or improvements to the Structure, Premises or Property without the City’s prior written approval. Company shall submit to City a proposal for any such modifications and any supplemental materials as may be requested for City’s timely evaluation and approval. If approved, such
Containment During Rehabilitation

- Lease should require antennas to be removed during Rehabilitation
Safety / Better Results

- Safety for Painting Contractor
- Radio Frequencies (RF)
- Better Results
C.O.W.s and Poles
Antennas and Paint Projects

- Cudahy, Wisconsin
PASS THROUGH COSTS

- Lease requires antenna companies to pay for Engineering & Inspections
- Wireless companies want to get on water towers, but often do not have start up money (like cellular)
- Municipal / Emergency benefit owner or owner representatives
Engineering Drawing Review

- Structural Calculations Supplied for Review
  - Overturn Calculations (100 mph)
  - Uplift
  - Seismic Loading

Stamped & Signed
Engineering Drawing Review

- Additional Anchor Bolts
Engineering Drawing Review

- Additional Concrete Ballasts in the Foundation
Engineering Drawing Review

- Design Drawings Supplied for Review
- Initial Site Inspection
Painting Considerations

During Antenna Installations

The following "PAINTING NOTES" need to be added to the design drawings for the Nextel antenna installation. DIXON did not find any existing paint specifications in the design drawings, but if they do exist these "PAINTING NOTES" will replace any existing mention of paint. Please include the wet interior paint repairs in case of any burned paint in the wet interior from welding.

Surface Preparation (Exterior & Dry Interior):
- Abrasive blast clean all new steel components to an SSPC-SP6 "Commercial Blast Cleaning" condition prior to application of primer coat.
- After welding or cutting, clean all damaged surfaces in accordance with SSPC-SP3 "Power Tool Cleaning" condition prior to application of primer coat.

Coating (Dry Interior):
- The dry interior paint repair system will be two coats of Thene Series 20. Paint the dry interior to match the existing topcoat color.
- The two-coat system will be applied at 3.0 - 4.0 mils per coat, to a thickness of 6.0 - 8.0 mils.

Coating (Exterior):
- The exterior paint repair system will be one prime coat of Thene Series 20, one intermediate coat of Thene Series 20, and one topcoat of Thene Series 1074. Paint the exterior to match the existing topcoat color.
- The three-coat system will be applied at 3.0 - 4.0 mils per coat, to a thickness of 8.0 - 12.0 mils.
Pre-Project Meeting

- After completion of drawing review, but before any work begins
- Attendees should include owner, reviewing engineer, cellular company representatives, contractor, and sub contractor(s)
- Have the meeting at the site
Drawing Review & Inspections

- Leg / Column / Sidewall Attachments
Drawing Review & Inspections

- Leg / Column / Sidewall Attachments
Drawing Review & Inspections

- Access Tube
Drawing Review & Inspections

- Platform Penetrations
Drawing Review & Inspections

- Platform Penetrations
Drawing Review & Inspections

- Penetrations
Drawing Review & Inspections

- Penetrations
Drawing Review & Inspections

- Penetrations
Drawing Review & Inspections

- Ladders
Drawing Review & Inspections

- Access Tube
Drawing Review & Inspections

- Ladders
Drawing Review & Inspections

- Aviation Lights
Drawing Review & Inspections

- Roof Handrail
Roof Handrail
Drawing Review & Inspections

- **Roof Handrail**
Regulations (Standards - 29 CFR)

Guarding floor and wall openings and holes. - 1910.23

1910.23(e)

"Railing, toe boards, and cover specifications."

1910.23(e)(1)

A standard railing shall consist of top rail, intermediate rail, and posts, and shall have a vertical height of 42 inches nominal from upper surface of top rail to floor, platform, runway, or ramp level.

1910.23(e)(4)

A standard toeboard shall be 4 inches nominal in vertical height from its top edge to the level of the floor, platform, runway, or ramp. It shall be securely fastened in place and with not more than 1/4-inch clearance above floor level.
Drawing Review & Inspections

- Roof Handrail
Drawing Review & Inspections

- Wet Interior
- Burned Paint
Drawing Review & Inspections

- Buildings / Controls
Drawing Review & Inspections

- Buildings / Controls
Drawing Review & Inspections

- Buildings/Controls
Drawing Review & Inspections

- Buildings/Controls
Drawing Review & Inspections

- Buildings/Controls
Other Options

- Silos
- Power Poles
- Light Posts
- Billboards
Other Options

- Stadiums
Other Options

- Stadiums
Questions or Comments?

Contact Information:

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