

July 22, 2019

Nokia Solutions and Networks
US LLC

Address:
600 Mountain Ave
Murray Hill, NJ 07974

RE: Addition of Station License Service Application and Antenna Registration, File No. 0199-EX-CM-2019 (modification to existing experimental license, call sign W12XHC, File No 0034-EX-CM-2019)

This is the exhibit for the directional antenna Fixed/Base Stations:

- Width of beam in degrees at the half power point:
 - Access Point (AP) will use multiple antennas:
 - 28 dBi gain Integrated Lens, 3 degree HPBW, steerable +/- 4 degree Elevation, +/- 17 degree Azimuth
 - 10 dBi Horn Antenna, 55 degree HPBW
 - 15 dBi Horn Antenna, 30 degree HPBW
 - 20 dBi Horn Antenna, 18 degree HPBW
- Orientation in horizontal plane (degrees):
 - AP will be mounted in several test scenarios up to 360 degrees
- Orientation in vertical plane (degrees):
 - AP will have a downtilt from 5 degrees to 20 degrees

User Devices:

- Width of beam in degrees at the half power point:
 - User Device (UD) will use multiple antennas
 - 3 dBi gain Open Ended Wave Guide, 60 degree HPBW
 - 10 dBi Horn Antenna, 55 degree HPBW
 - 15 dBi Horn Antenna, 30 degree HPBW
 - 20 dBi Horn Antenna, 18 degree HPBW
- Orientation in horizontal plane (degrees):
 - UD will be portable with a full 360 degree rotation
- Orientation in vertical plane (degrees):
 - UD will have be pointed at 0 degree azimuth

Nokia proposes to operate using BPSK, QPSK, 16QAM, 64QAM, and 256 QAM modulation.

New Stations to be added to License with the same parameters as the other stations

City – Naperville

State – Illinois

Address – 2000 W Lucent Lane

Latitude North 41 48 48

Longitude West 88 7 14

Yours Sincerely,
Glenn A. Steitz
Senior Manager
5G Demonstrations and Solutions
Nokia Solutions and Networks
Glenn.steitz@nokia.com
973-214-0028
