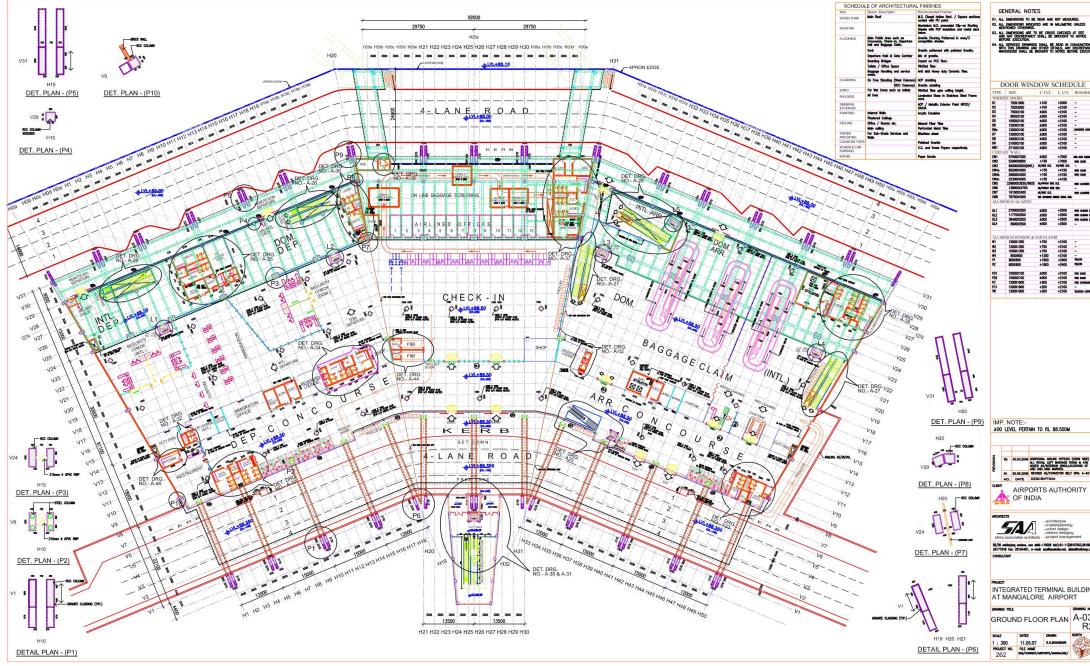
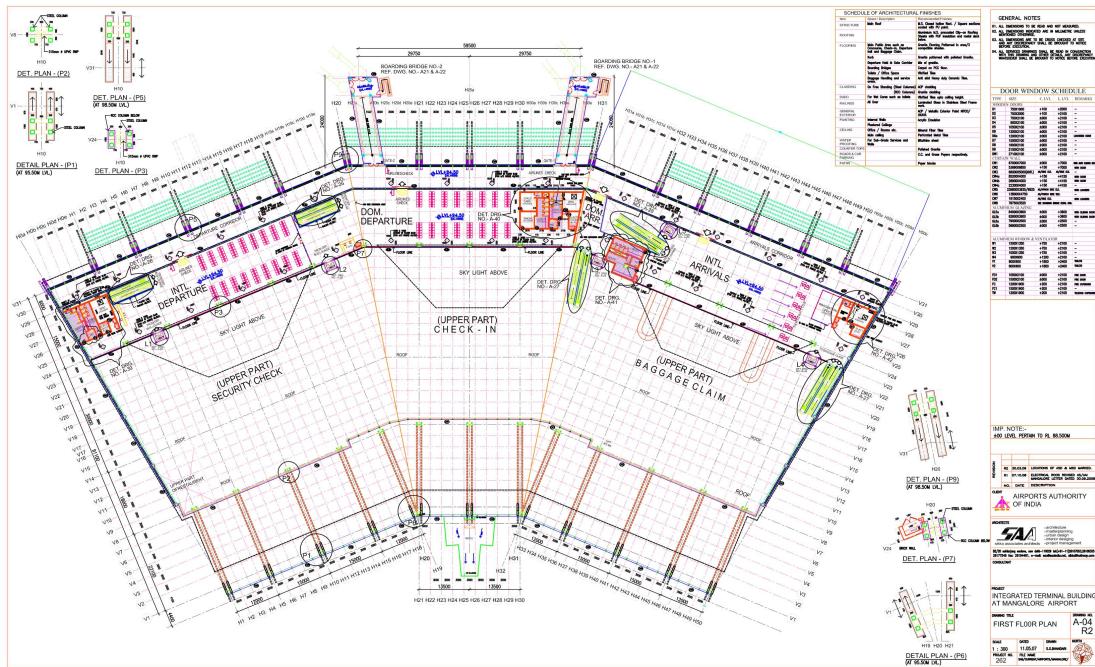


# Wireless insite simulation for Mangaore airport

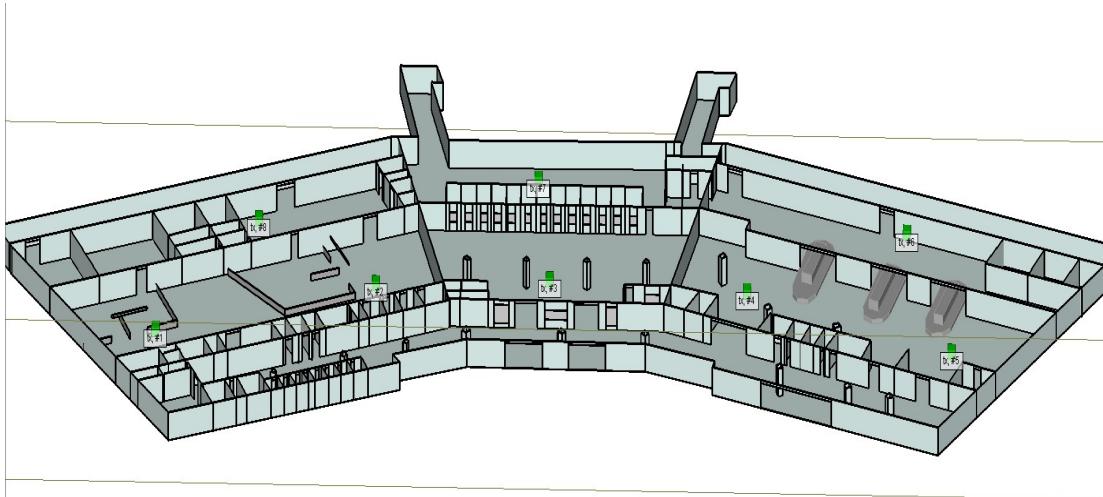
## ground floor plan for airport



## first floor plan



3d model of ground floor

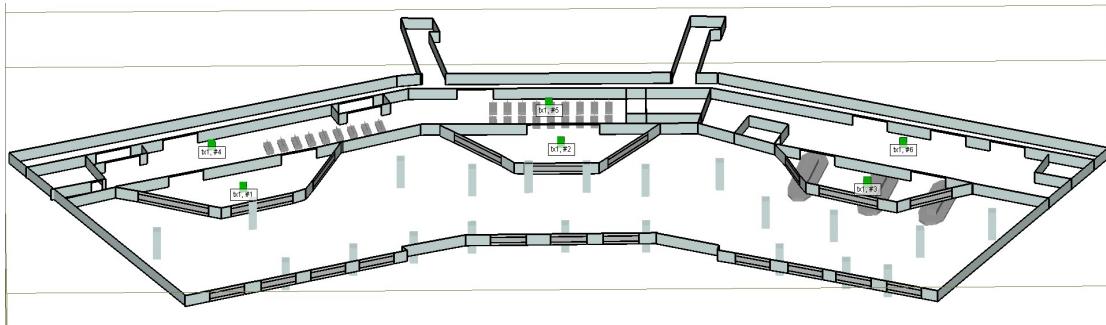


here height of ground floor is 6m

green dot represent 8 transmitter location with height of 5m from ground

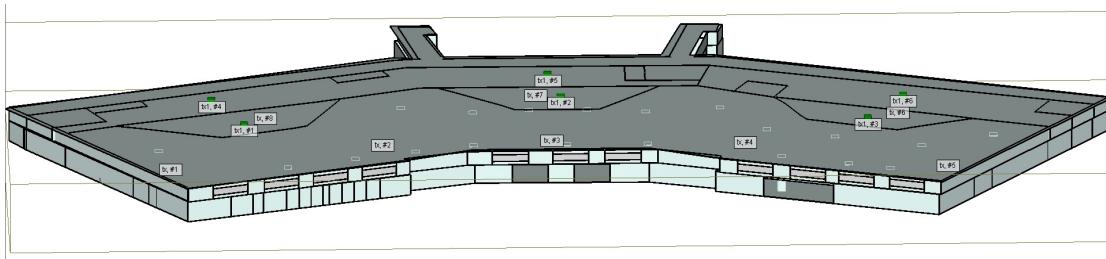
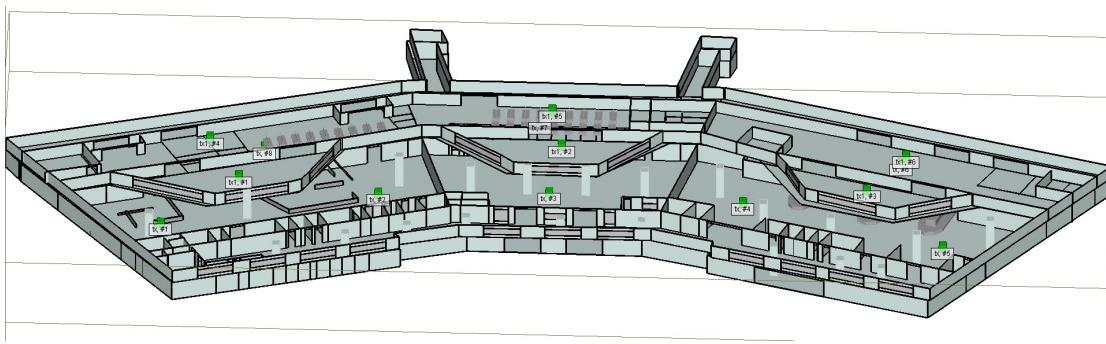
3d model of first floor

height of first floor is 4m



green dot represent 6 transmitter location in first floor with height of 9m from ground and 3m from floor

3d model of airport



material used in above 3d model

### PEC properties

Short description: Metal

Thickness (m): 0.000e+00

Roughness: 0.000e+00

Color:

DS Enabled  Diffuse Scattering

### Layered dielectric properties

Short description: Glass

Dielectric layers:

Layer #	Description	Permittivity	Conductivity	Thickness
1		2.400	0.000	0.00300 m

Color:

DS Enabled  Diffuse Scattering

waveform used in simulation is sinusoid with 100Ghz or 0.1Thz with 1Ghz bandwidth

(here in wireless insite has limitation of 50Mhz to 100Ghz for simulation )

The screenshot shows a software window for managing sinusoid properties. On the left, there are four input fields: 'Short description' (set to 'Sinusoid'), 'Carrier frequency (MHz)' (set to '100000.000'), 'Effective bandwidth (MHz)' (set to '1000.0000'), and 'Phase (°)' (set to '0.0000'). Below these is a 'Monte Carlo' button and a group of three buttons: 'OK', 'Cancel', and 'Apply'. A vertical separator bar is positioned between the property inputs and the plots.

**Sinusoid**

Amplitude

Time (s)	Amplitude
0.0000	0.00
1.5e-11	0.87
3.0e-11	0.00
4.5e-11	-0.87
6.0e-11	0.00
7.5e-11	0.87
9.0e-11	0.00
1.05e-10	-0.87
1.2e-10	0.00
1.35e-10	0.87
1.5e-10	0.00
1.65e-10	-0.87
1.8e-10	0.00
1.95e-10	0.87
2.1e-10	0.00
2.25e-10	-0.87
2.4e-10	0.00
2.55e-10	0.87
2.7e-10	0.00
2.85e-10	-0.87
3.0e-10	0.00
3.15e-10	0.87
3.3e-10	0.00
3.45e-10	-0.87
3.6e-10	0.00
3.75e-10	0.87
3.9e-10	0.00
4.05e-10	-0.87
4.2e-10	0.00
4.35e-10	0.87
4.5e-10	0.00
4.65e-10	-0.87
4.8e-10	0.00
4.95e-10	0.87
5.1e-10	0.00
5.25e-10	-0.87
5.4e-10	0.00
5.55e-10	0.87
5.7e-10	0.00
5.85e-10	-0.87
6.0e-10	0.00
6.15e-10	0.87
6.3e-10	0.00
6.45e-10	-0.87
6.6e-10	0.00
6.75e-10	0.87
6.9e-10	0.00
7.05e-10	-0.87
7.2e-10	0.00
7.35e-10	0.87
7.5e-10	0.00
7.65e-10	-0.87
7.8e-10	0.00
7.95e-10	0.87
8.1e-10	0.00
8.25e-10	-0.87
8.4e-10	0.00
8.55e-10	0.87
8.7e-10	0.00
8.85e-10	-0.87
9.0e-10	0.00
9.15e-10	0.87
9.3e-10	0.00
9.45e-10	-0.87
9.6e-10	0.00
9.75e-10	0.87
9.9e-10	0.00
1.0e-09	-0.87
1.01e-09	0.00
1.02e-09	0.87
1.03e-09	0.00
1.04e-09	-0.87
1.05e-09	0.00
1.06e-09	0.87
1.07e-09	0.00
1.08e-09	-0.87
1.09e-09	0.00
1.1e-09	0.87
1.11e-09	0.00
1.12e-09	-0.87
1.13e-09	0.00
1.14e-09	0.87
1.15e-09	0.00
1.16e-09	-0.87
1.17e-09	0.00
1.18e-09	0.87
1.19e-09	0.00
1.2e-09	-0.87
1.21e-09	0.00
1.22e-09	0.87
1.23e-09	0.00
1.24e-09	-0.87
1.25e-09	0.00
1.26e-09	0.87
1.27e-09	0.00
1.28e-09	-0.87
1.29e-09	0.00
1.3e-09	0.87
1.31e-09	0.00
1.32e-09	-0.87
1.33e-09	0.00
1.34e-09	0.87
1.35e-09	0.00
1.36e-09	-0.87
1.37e-09	0.00
1.38e-09	0.87
1.39e-09	0.00
1.4e-09	-0.87
1.41e-09	0.00
1.42e-09	0.87
1.43e-09	0.00
1.44e-09	-0.87
1.45e-09	0.00
1.46e-09	0.87
1.47e-09	0.00
1.48e-09	-0.87
1.49e-09	0.00
1.5e-09	0.87
1.51e-09	0.00
1.52e-09	-0.87
1.53e-09	0.00
1.54e-09	0.87
1.55e-09	0.00
1.56e-09	-0.87
1.57e-09	0.00
1.58e-09	0.87
1.59e-09	0.00
1.6e-09	-0.87
1.61e-09	0.00
1.62e-09	0.87
1.63e-09	0.00
1.64e-09	-0.87
1.65e-09	0.00
1.66e-09	0.87
1.67e-09	0.00
1.68e-09	-0.87
1.69e-09	0.00
1.7e-09	0.87
1.71e-09	0.00
1.72e-09	-0.87
1.73e-09	0.00
1.74e-09	0.87
1.75e-09	0.00
1.76e-09	-0.87
1.77e-09	0.00
1.78e-09	0.87
1.79e-09	0.00
1.8e-09	-0.87
1.81e-09	0.00
1.82e-09	0.87
1.83e-09	0.00
1.84e-09	-0.87
1.85e-09	0.00
1.86e-09	0.87
1.87e-09	0.00
1.88e-09	-0.87
1.89e-09	0.00
1.9e-09	0.87
1.91e-09	0.00
1.92e-09	-0.87
1.93e-09	0.00
1.94e-09	0.87
1.95e-09	0.00
1.96e-09	-0.87
1.97e-09	0.00
1.98e-09	0.87
1.99e-09	0.00
2.0e-09	-0.87
2.01e-09	0.00
2.02e-09	0.87
2.03e-09	0.00
2.04e-09	-0.87
2.05e-09	0.00
2.06e-09	0.87
2.07e-09	0.00
2.08e-09	-0.87
2.09e-09	0.00
2.1e-09	0.87
2.11e-09	0.00
2.12e-09	-0.87
2.13e-09	0.00
2.14e-09	0.87
2.15e-09	0.00
2.16e-09	-0.87
2.17e-09	0.00
2.18e-09	0.87
2.19e-09	0.00
2.2e-09	-0.87
2.21e-09	0.00
2.22e-09	0.87
2.23e-09	0.00
2.24e-09	-0.87
2.25e-09	0.00
2.26e-09	0.87
2.27e-09	0.00
2.28e-09	-0.87
2.29e-09	0.00
2.3e-09	0.87
2.31e-09	0.00
2.32e-09	-0.87
2.33e-09	0.00
2.34e-09	0.87
2.35e-09	0.00
2.36e-09	-0.87
2.37e-09	0.00
2.38e-09	0.87
2.39e-09	0.00
2.4e-09	-0.87
2.41e-09	0.00
2.42e-09	0.87
2.43e-09	0.00
2.44e-09	-0.87
2.45e-09	0.00
2.46e-09	0.87
2.47e-09	0.00
2.48e-09	-0.87
2.49e-09	0.00
2.5e-09	0.87
2.51e-09	0.00
2.52e-09	-0.87
2.53e-09	0.00
2.54e-09	0.87
2.55e-09	0.00
2.56e-09	-0.87
2.57e-09	0.00
2.58e-09	0.87
2.59e-09	0.00
2.6e-09	-0.87
2.61e-09	0.00
2.62e-09	0.87
2.63e-09	0.00
2.64e-09	-0.87
2.65e-09	0.00
2.66e-09	0.87
2.67e-09	0.00
2.68e-09	-0.87
2.69e-09	0.00
2.7e-09	0.87
2.71e-09	0.00
2.72e-09	-0.87
2.73e-09	0.00
2.74e-09	0.87
2.75e-09	0.00
2.76e-09	-0.87
2.77e-09	0.00
2.78e-09	0.87
2.79e-09	0.00
2.8e-09	-0.87
2.81e-09	0.00
2.82e-09	0.87
2.83e-09	0.00
2.84e-09	-0.87
2.85e-09	0.00
2.86e-09	0.87
2.87e-09	0.00
2.88e-09	-0.87
2.89e-09	0.00
2.9e-09	0.87
2.91e-09	0.00
2.92e-09	-0.87
2.93e-09	0.00
2.94e-09	0.87
2.95e-09	0.00
2.96e-09	-0.87
2.97e-09	0.00
2.98e-09	0.87
2.99e-09	0.00
3.0e-09	-0.87

Time (s)

**Sinusoid**

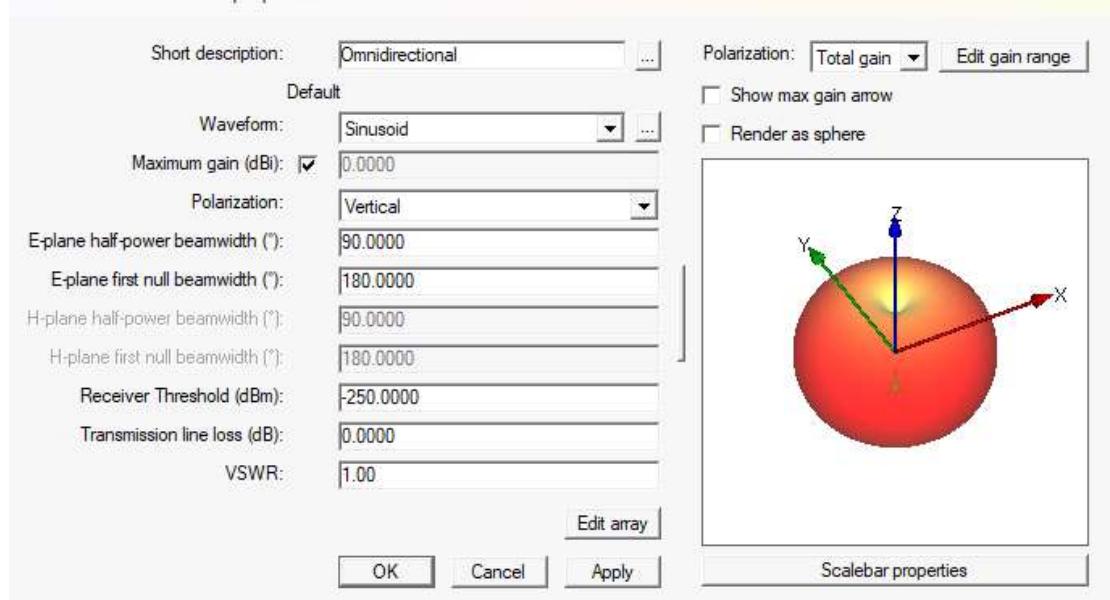
Amplitude (dB)

Frequency (MHz)	Amplitude (dB)
99000.0	-250
99400.0	-100
99800.0	-100
1e+05	-100
1.01e+05	-250

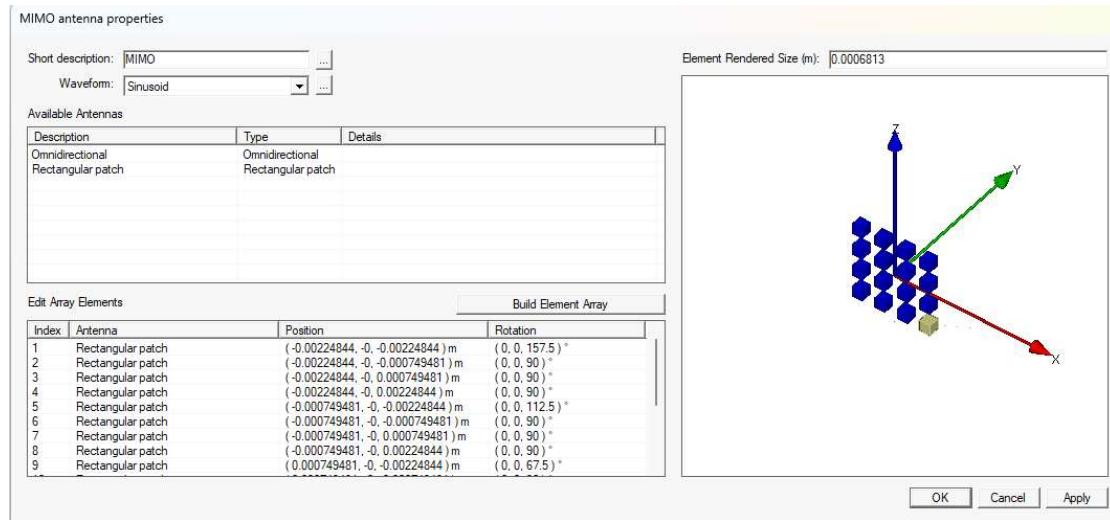
Frequency (MHz)

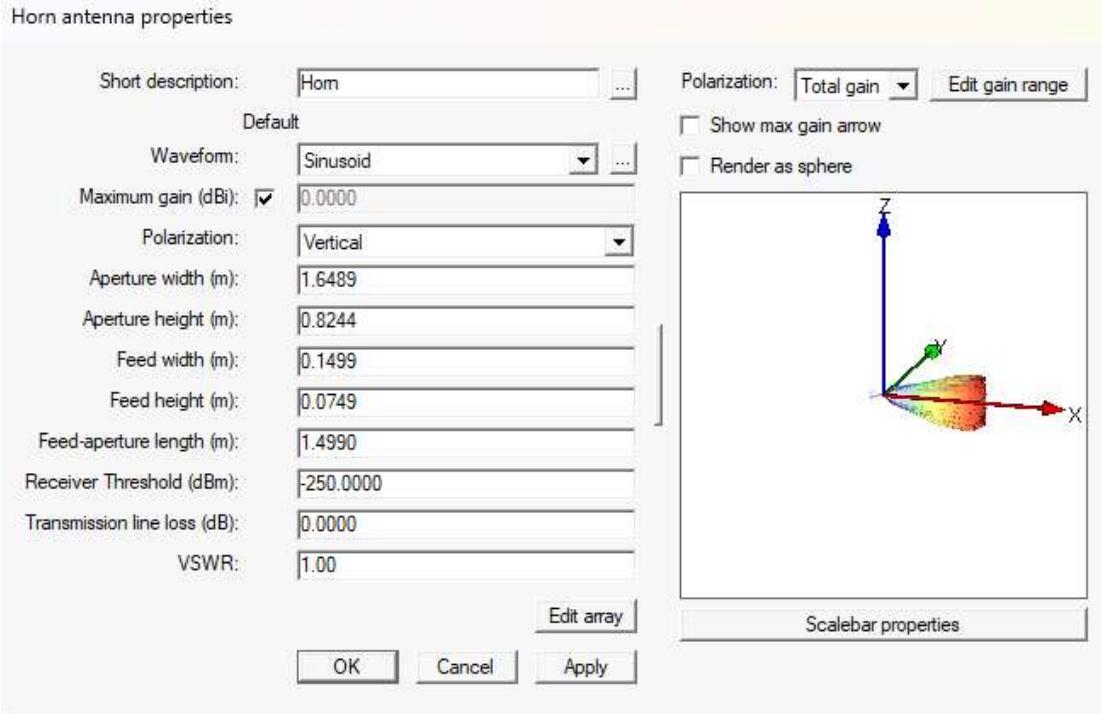
### Antenna used in simulation

### Omnidirectional antenna properties



### MIMO antenna properties





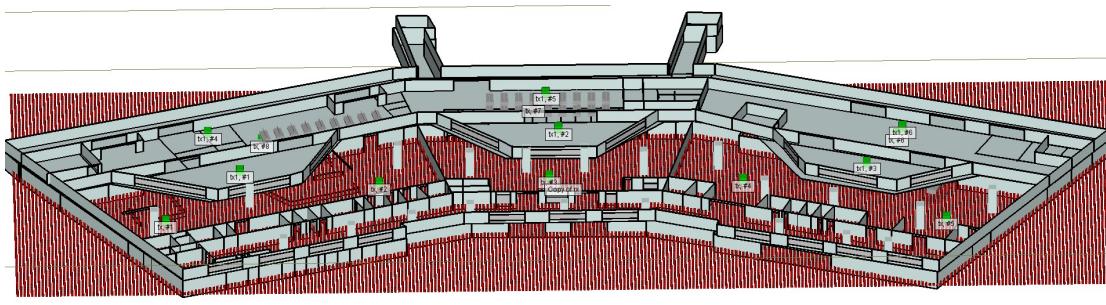
this is TX and Rx config

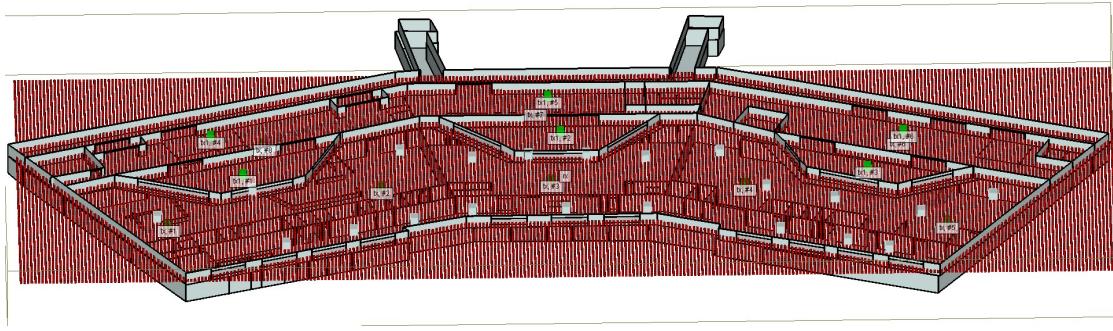
Wireless InSite 3.3.5.6 - Main: (mangalore\_airport) [D:\...\mangalore\_airport\mangalore\_airport.setup.]

Project Edit View Help

Images Features Materials Waveforms Antennas Transmitters / Receivers Study areas Comm. systems Output

ID	A	V	A.	Tx	Rx	Description	Type	No. points	Spacing	Power	Tx Antenna	Tx Waveform	Rx Antenna	Rx Waveform
5	A	V		Tx	tx		points	8	N/A	20.00 dBm	Omnidirectio...	Sinusoid	N/A	N/A
8	A	V.	A..	Rx	tx		grid	27,573	1.00 m	N/A	N/A	N/A	Omnidirectio...	Sinusoid
9	A	V..	A..	Rx	(Copy of rx		grid	27,573	1.00 m	N/A	N/A	N/A	Omnidirectio...	Sinusoid
10	A	V		Tx	tx1		points	6	N/A	20.00 dBm	Omnidirectio...	Sinusoid	N/A	N/A
12	A			Tx	xm		points	8	N/A	20.00 dBm	MIMO	Sinusoid	N/A	N/A
13	A			Tx	xmm		points	6	N/A	20.00 dBm	MIMO	Sinusoid	N/A	N/A
16	A			Tx	txh		points	2	N/A	20.00 dBm	Hom	Sinusoid	N/A	N/A
17	A			Tx	rxh2		points	2	N/A	20.00 dBm	Hom	Sinusoid	N/A	N/A
18	A			Tx	txh3		points	1	N/A	20.00 dBm	Hom	Sinusoid	N/A	N/A





here Rx ,copy of rx is always omni direction antenna and 1.5 m from floor in height

here tx,tx1 is transmitter with omni direction antenna

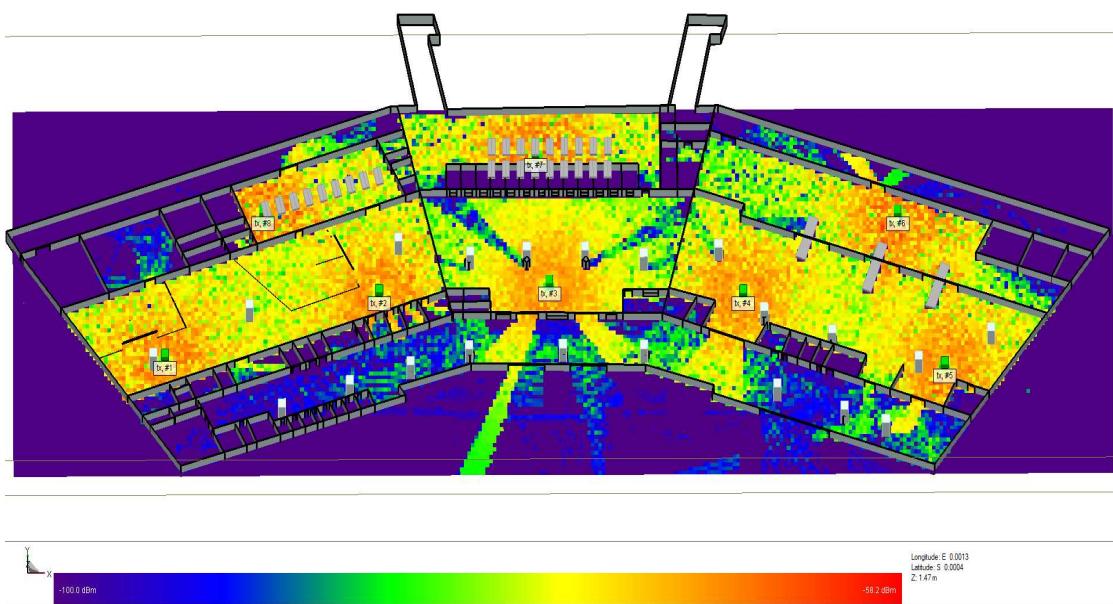
txm,txmm with mimo antenna

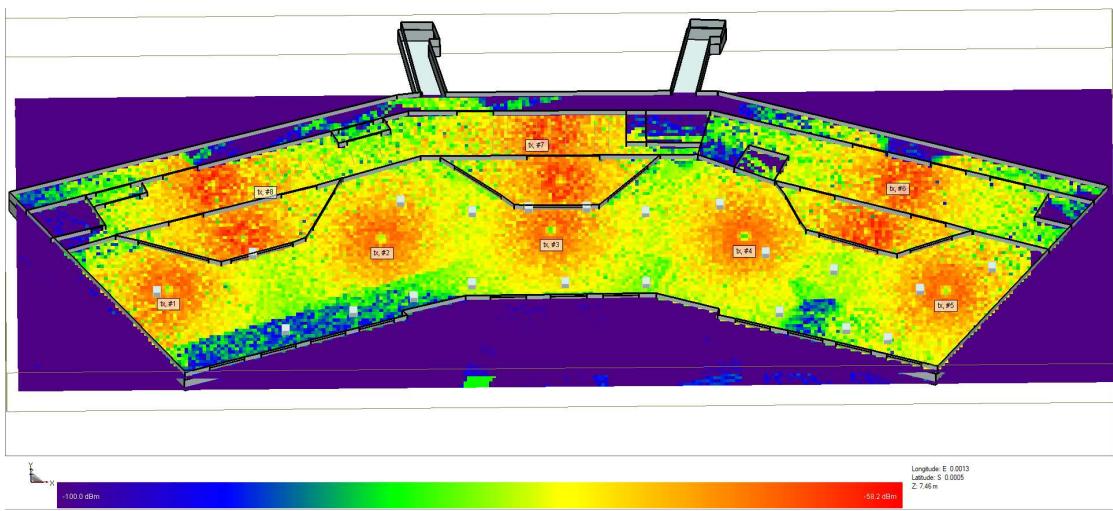
txh,txh2,txh3 with horn antenna

transmited power for all tx is 20dbm

#### RESULTS:

tx with omnidirection antenna ,height of 5m form gorund and rx heigth 1.5m





heatmap range -100dbm to -58.2

