

Site Survey Planning guide

For a successful installation, planning is the first and paramount step. We need as much relevant information as possible for the particular site and for the prospective site that will provide connectivity to it, that is, the place suitable for obtaining Internet access, normally referred to as the POP (Point Of Presence of the Internet).

Spectrum availability: please find out the local regulations regarding the use of the following frequencies bands:

900 MHz to 926 MHz

2400 MHz to 2480 MHz

5150 MHz to 5850 MHz

17 GHz

24 GHz

60 GHz

TVWS: 50 MHz to 800 MHz

Hint: in most countries the 2400 MHz to 2480 MHz range can be used without previous regulator's approval, as it is part of what is known as ISM (Industrial, Scientific and Medical applications), which are exempt from normal telecommunication regulation. However some countries can require previous registration. The same apply to the 5150 MHz to 5850 MHz range.

Currently, a few countries have opened other frequencies bands for unlicensed or lightly licensed usage, so it would be very interesting if you can find your country's regulations for these bands, so please get as much information as you can, but do not get discouraged if information is not available to you at this time.

Please replace the values in blue in the following text by the one of the site in which the meteorological equipment will be locate.

- 1) Site Name, example: [Galileo Guest House, ICTP, Italy](#), brief description, example: [3 storey building, 12 meters tower, 3 meters mast, 5 meters height water tank](#), etc. If it is a building, describe the kind of roof, for instance, walkable roof, pitched roof, etc. If it is a tower, [self standing](#) or [guyed](#)? Please provide a photo of the building or structure if possible.
- 2) Name and phone number of the person or persons that can grant access to the site, example: [Miss Lucy Jones, phone: 3478935](#) or [Mr. Pete Longley, phone 7891257](#).
- 3) Latitude in decimal degrees, example: [-45.703735°](#).
- 4) Longitude in decimal degrees, example: [13.720333°](#).
- 5) Terrain elevation in meters above sea level, example: [62](#) m.

- 6) Antenna elevation above the surrounding ground, example: 15 m.
- 7) Source of data, example: GPS reading, Google Maps, Google Earth, paper map.
- 8) Is there cell phone coverage at this site? from which provider?, example: Vodafone, Zain.
- 9) Name and Coordinates of the prospective Internet Provider Site, example: Meteorological Data Center, Lat: -45.00000°, Long. 13.000000°.
- 10) Approximate distance to the prospective Internet Provider Site, example: 8 km.
- 11) Please provide a photo taken from the site in the direction of the prospective Internet Provider Site.
- 12) Is there any obstacle in the direction of the prospective Internet Provider Site that could block the visual? If so, how high is the obstacle? example: one story building 4 meters high.
- 13) Is electrical power from the grid available? example : NO, YES

This information can be obtained by means of a GPS. Most smartphones nowadays have a built in GPS that will provide items from 2 to 5, while Item 6, antenna elevation above ground, can be estimated, for instance, if the antenna will be installed at the top of building, the height of the building can be estimated by multiplying the number of floors by the height of each floor. Typically the distance between adjacent floors is about 3 meters. Many towers are also built joining 3 m long sections, so by counting the number of sections one can estimate the height of the tower. Item 11 can also be calculated using Google Earth or maps and can also be measured with a compass, but keep in mind the magnetic declination of the place that will introduce a variation between the magnetic north and the geographical north. If no cell phone coverage is available at the site please enter none in Item 8.

Accessibility

14) The site is accessible by: tick the corresponding line:

Examples:

- The site is accessible by car.
- The site is accessible by car, but not in the rainy season.
- The site is accessible by car, four wheel drive only.
- The site is only accessible on foot.

Recommended tools for site survey:

15) Smart Phone or Tablet; This can provide:

Determination of cell phone coverage (Investigate also possibility of coverage by other providers)

GPS to obtain coordinates and altitude.

Compass to provide bearing towards prospective Internet Service Provider

Please check that the battery has enough charge to perform the measurements before traveling to the site which might not have power available.

16) Tape measure to measure diameter of existing structures for antenna installation.

17) A printout of this guide and a pen to write down the requested data fields and any other observation deemed of interest.

If no smartphone is available, a stand alone GPS receiver or a map can be used to determine coordinates, distance and bearing to the prospective Internet Service Provider.

Other optional items are: compass and binoculars, as well as a laptop running BotRf, RadioMobile or similar simulation software and also Open Street Maps with data of the region previously downloaded.