SITE SELECTION CRITERIA AND SENSOR PARK REQUIREMENTS FOR AUTOMATED WEATHER OBSRERVING SYSTEMS

by Levent YALÇIN
Turkish State Meteorological Service
Electronics Observing Systems Division
Ankara, TURKEY
Tel: +90.3123022790, Fax: +90.3123612353
lyalcin@meteor.gov.tr

ABSTRACT

In the last years there is lots of uncontrolled changing inside and outside of meteorological observing parks in consideration of developing of the cities and their accessories. So some necessities must be done to make them standard by meteorological services, local and national authorities etc. In this study some experiences by TSMS while installing and transferring sensor parks or meteorological observing parks are presented during site selection and application.

Key words: observing park, site selection, site survey.

INTRODUCTION

It was last quarter of the 19 century when the meteorological parameters started to be measured and recorded. Turkish State Meteorological Service (TSMS), founded in 1937, established an observing network composed of several type meteorological stations and expanded that network to all cities and towns in Turkey. As is known, the locations of the stations were acceptable at the beginning. Then the cities expanded by horizontally and vertically till they cover the stations with obstructions like buildings and trees. Then replacement of the stations needed. Actually because of the developing of the cities and the sectors related with meteorology, new meteorological stations were also required.

There are about 400 synoptic and climatological stations containing manual instruments which are located all over Turkey. Last decade TSMS changed their stations from manual to electronics by monitoring new technology. Nowadays TSMS has about 250 AWOSs in the

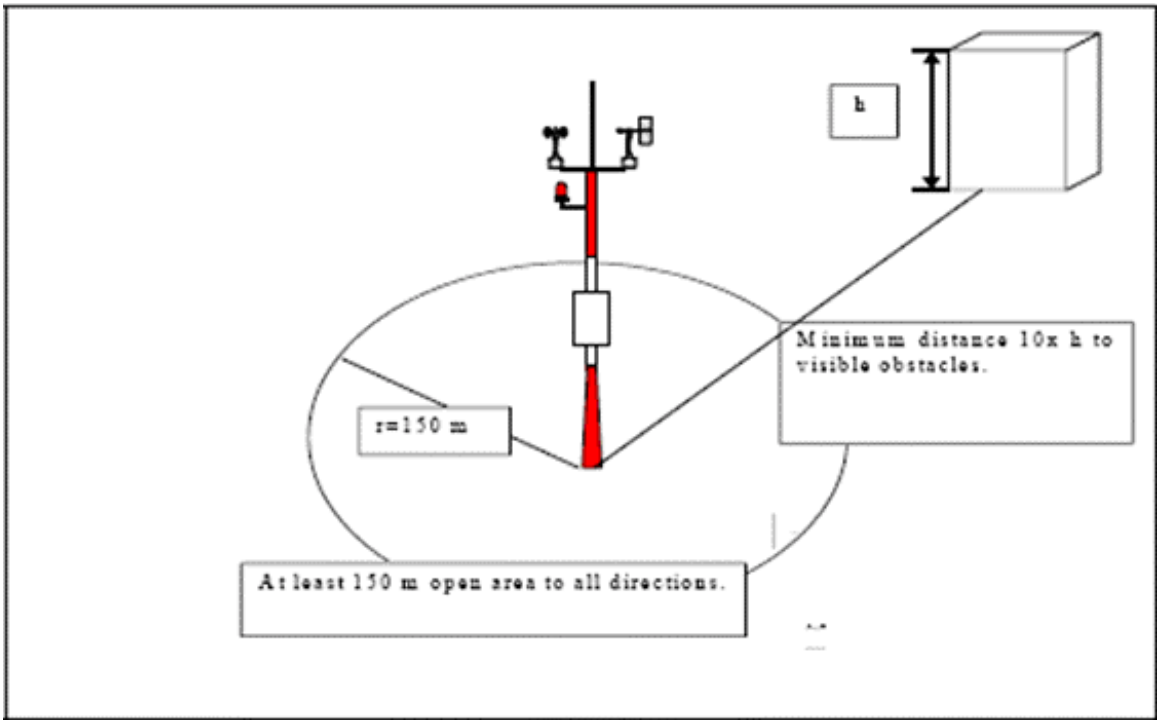
west part of country. Furthermore 150 AWOSs will be installed in the other part of country within a few years. So, all meteorological parameters will be measured by electronics sensors whole Turkey.

The installation of the new system meteorological stations (AWOSs) has to be obey some principles by TSMS (listed below). Although lots of principles are being used and some courses about site survey are being done, many observing parks remained among buildings and trees etc.

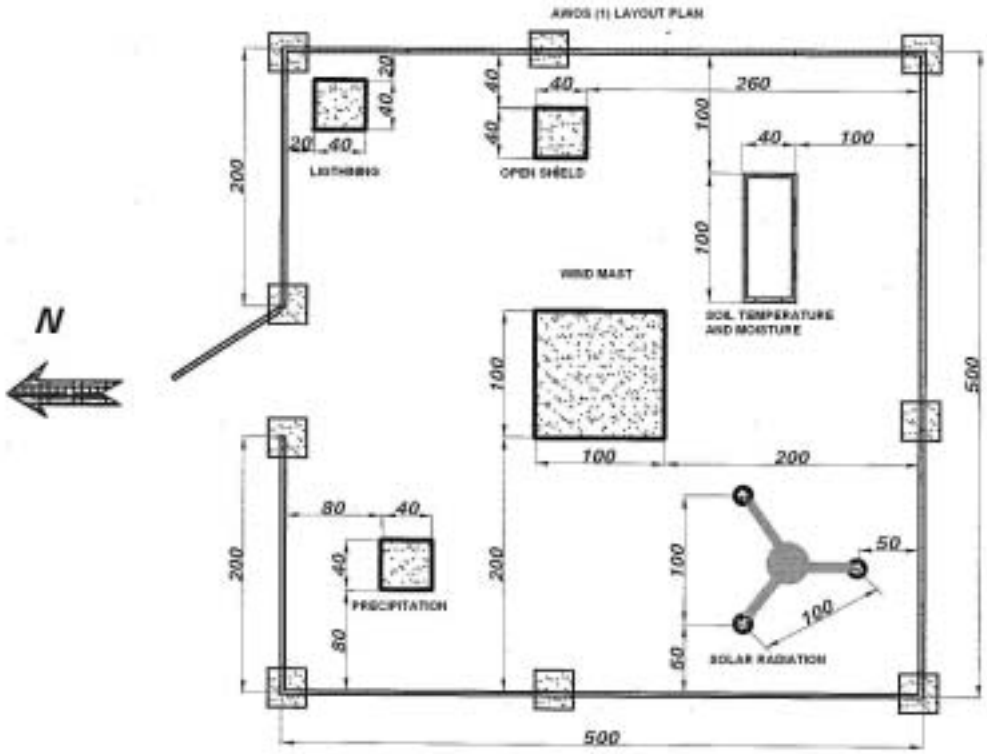
INTRODUCTION TO SITE SELECTION CRITERIA IN TSMS

1.	The place of station must not be in downtown but must be in the area of municipality services.
2.	The location must be stated in development plan by local government to prevent construction of new road or buildings because off data series can be continuous.
3.	It must not be near highway.
4.	Site is a reference place for its surroundings so it has to have a 4000-5000 meter square area without any cavity, hill, rock etc.
5.	Site must not be just near corner, riverside, railway or any place that produce heat.
6.	The ground of the observing park must not be asphalt, concrete or stone covering. There must be a natural plant cover such as grass, weed etc.
7.	The instruments installed in observing park must not be effected by shadow of buildings, trees etc all day.
8.	The ground of site does not need any leveling working too much.
9.	The site must be available to be visited by technicians, students and autorities, so meteorological works are directly related with public service.
11.	There must not be any sportive area around station.
12.	There must not be any irrigation area that is for agriculture or landscape purposes.
14.	There must not be any rubbish heap or bog.
16.	If the site is near post office or police station, this is an advantage to select the site location.
17.	The site must have convenience for authority to assign an observer and for observer to reach it.

STANDARD SITING



Drawing 1: Calculating of minimum distance between mast and obstraction



Drawing 2: An AWOS placement plan

SOME EXPERIENCES OF SITE SELECTION AND INSTALLATION OF AWOSs

Picture 1: A climatological station (AWOS) after structuring

Picture 2: A manual observing park among trees

Picture 3: The location for AWOS after pulling up

Picture 4: Determining and Planning a place of AWOS observing park according to North direction

Picture 5: Leveling working for observing park before installation

Picture 6: Lengthening of the observing park by considering north dimension

Picture 7: Cabling way is also important thing while selecting the place for AWOS

Picture 8: There must not be any obstruction round the observing park

Picture 9: Not only observing park but also telecommunication antenna needs planning

CONCLUSION

- Last decade due to become commonplace of the electronic ones instead of the manual meteorological instruments, the site width decreased than before.
- In past TSMS used VSAT technology for telecommunication between center and remote, so it needs 120 cm radius dish antenna. Now TSMS changed its telecommunication method to GPRS which needs just 12 cm radius place that can see sky.
- Furthermore wind mast containing wind speed and direction sensor changed from 2 m to 10 m height in last five years.
- Because of the electronic hardware such as sensors, power units and others need cabling between observing park and meteorological office to communicate and power we have to take account this subject while site survey.
- Although there are very advantages and disadvantages of the new ones we as meteorologist have to follow all requirements by WMO, local meteorological services and universities.