

## THE GEORREFERENCIACION OF TOPOGRAPHICAL SURVEYS IN THE PROCESSING OF URBAN LICENSES IN THE CITY OF MADRID

### OBLIGATORIEDAD DE LA GEORREFERENCIACION DE LEVANTAMIENTOS TOPOGRÁFICOS EN LA TRAMITACION DE LICENCIAS URBANAS EN EL AYUNTAMIENTO DE MADRID

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The past 5 February 2018 published in the Official Bulletin of the City council of Madrid (BOAM) the approval of the initial project of the Ordenanza of Means of Intervention in Performances Urbanísticas [1].

The new ordenanza demands the precise georeferencing obtained by means of topographical lifting of the physical reality of the real estates, like compulsory documentation, or that it can be requested by the city council in the following formalities:

- ✓ **Request of official alignments.** In the case that they exist unconformities among the physical reality and the planning and/or simple note of the Register of the property, the Municipal Administration will request a topographical lifting of the parcel.
- ✓ **Applications of licences of first occupation and operation.** For the finalization of works through the urban planning procedure, a topographic survey of the final state of the executed works will be required.
- ✓ **Applications of performances of reparcelación.** It will owe to hand flat of a complete topographical lifting of the plots matrices or contributed if the reality does not coincide with the plots registrales or cadastral.
- ✓ **Requets for new building projects.** The delivery of a topographic map of the plot made on the Digital Cartography of Madrid will be obligatory, with delimitation of the boundaries and distances to the next reference buildings.

Article 41 of said ordinance explains that technical projects must be signed by competent technicians or technicians, meet the formal requirements required, and be mandatorily approved in the cases contemplated in the regulations. The development of the ordinance introduces, from the point of view of the topographic work, a series of novelties, which go through the obligatory nature of the coordinate system used in the plans and its georeferencing. The topographic map in relative coordinates is no longer valid, and the obligatory nature is introduced that the topographic survey must be in the **in the System of coordinates ETRS-89 UTM Huso 30**.

The new obligation is very important to comply with, because in some cases, the administrative act will be interrupted while this requirement is not corrected. Therefore, the element that we describe below is of greater value and that is the georeferencing in a topographic survey.

Every topographic survey has a coordinate origin. In all topographic work, we always have a Cartesian system of three axes, X, Y, Z, which shows us an origin for the coordinates of the topographic survey, but nevertheless it is very common that in the projects in our field of construction, that origin of coordinates is an arbitrary origin, in what we call relative coordinates.

However, a georeferencing is the spatial positioning technique in which we give an entity a unique and well-defined geographic location in a system of specific coordinates and datum. It is a usual operation within the geographic information systems, SIG.

In our case, in Spain, the DATUM ETRS-89 is used in the uses defined by Royal Decree 1071/2007 of July 27, which regulates the official reference geodetic system in Spain and a UTM projection for the Huso 30 that corresponds to Madrid.

To georeference the topographic maps, we must use the appropriate topographic and geomatic techniques, which are supported by the official network, using GNSS techniques, or any other technique that allows us to work in absolute coordinates, or at least transform the relative coordinates into absolutes.



**Fig. 1: Landmark topographical network. Signal 8322.**

For this purpose, the city council of Madrid has available to the public the Geographical Information System of Urbanism [2], where it shows the situation of the existing vertices of the topographic network of Madrid and the review of the vertices. This network still shows the data in systems ED-50 and ETRS-89, because we have to be careful in which coordinates we use of the two presented, since both are correct but only some are currently official. This step that has taken the city of Madrid for georeferencing, is just the initial step, because they have already launched new initiatives such as the GML plot Parcela Urbanística, (GML-PU) to describe the minimum urban planning content of the planning files.

This format is already used as an attached file in the qualification plans of said files [3]. In the GML-PU scheme, for each plot its coordinates must be specified in the current official projection system, that is, they must be geo-referenced, so the georeferenced topographic survey is intuited as a complement for the generation of these files GML- PU. The georeferenced topographic survey constitutes a very important tool in the communication of urban events in the city council of Madrid.

## REFERENCES

- [1] Ordinance of means to intervention in urban activities of the city council of Madrid. Reference in pág 27, 97, 98, 118 to 120
- [2] Geographical information system and urban planning of the City council of Madrid: [http://www-2.munimadrid.es/urbanismo\\_inter/visualizador/index\\_inter.jsp](http://www-2.munimadrid.es/urbanismo_inter/visualizador/index_inter.jsp)
- [3] Diagram GML for urban planning of the City council of Madrid: [http://www-2.munimadrid.es/urbanismo\\_inter/visualizador/index\\_inter.jsp](http://www-2.munimadrid.es/urbanismo_inter/visualizador/index_inter.jsp)