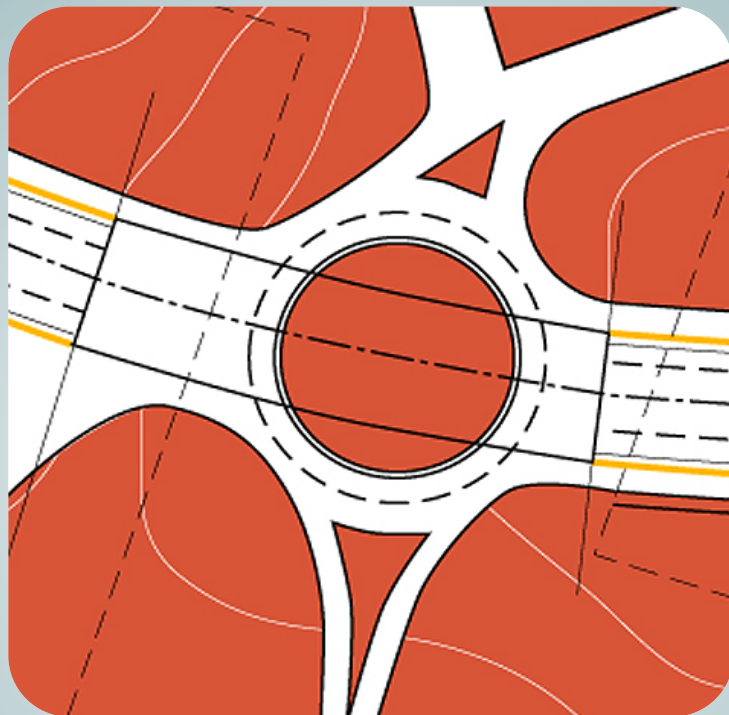


# Workshop on Projects

## Week 3. Activity Lecture Week 3 Script



**César Otero González**

**Valentín Gómez Jáuregui**

**Cristina Manchado del Val**

Department of Geographical Engineering and  
Graphic Expression Techniques

This work is published under a License:

[Creative Commons BY-NC-SA 4.0](https://creativecommons.org/licenses/by-nc-sa/4.0/)

## CIVIL 3D INTERFACE: MAIN ELEMENTS

(TUESDAY, 1ST HOUR. CONTINUING THE SCRIPT OF THE WEEK 2 )

### **1. EDITING THE SURFACE OBJECT: ADDING A NEW BREAKING LINE. (VIDEO 5).**

- TRY TO MAKE THAT OUR SURFACE MODEL LOOKS LIKE THE ONE SHOWN AT THE BEGINNING OF VIDEO 5.
- BRIEFLY DESCRIBE WHAT A BREAKING LINE IS. ALSO, DESCRIBE WHAT KIND OF RESTRICTION IT CAUSES WITHIN A SURFACE OBJECT.

### **5.B. ERRORS/WARNINGS IN THE SURFACE MODEL.**

- COMMENTS AND CONNECTION TO FRIDAY'S CLASS.

### **2. ALIGNMENT SETTINGS. (VIDEO: 1 & 4 ALINEACIONES PLANTA STYLES).**

- THE USER CREATES A POLYLINE AND CONVERTS IT INTO AN ALIGNMENT. AS A RESULT, A NEW ALIGNMENT IS CREATED WITHIN THE COLLECTION CALLED "ALIGNMENTS", IN THE PROSPECTOR TAB.
- THE REST OF THIS VIDEO IS FOCUSED ON USING CERTAIN SETTINGS. THEY WILL BE EXPLAINED LATER.

### **3. CREATING AN ALIGNMENT. (VIDEO: 2 ALINEACIONES PLANTA TRAZADO).**

- THE USER TRIGGERS THE EDITION ENVIRONMENT FOR ALIGNMENTS. THIS ENVIRONMENT OFFERS A PALETTE WITH A LOT OF TOOLS FOR EDITING THE ALIGNMENT. EDITION OF THE ALIGNMENT REMAINS IN PROGRESS UNTIL THIS PALETTE IS SWITCHED OFF.
- THE MOST TYPICAL WAY TO MAKE A TRANSITION BETWEEN STRAIGHT SEGMENTS IS USING THE GROUP SCS: SPIRAL-CURVE-SPIRAL. THE USER SELECTS THIS OPTION AND PROVIDES DATA FOR THE RADIUS OF THE CURVE AND FOR THE PARAMETER OF THE CLOTHOIDS. AS A RESULT, THE TRANSITION IS DESIGNED.
- THE USER SOLVES A SECOND VERTEX OF THE ALIGNMENT BY MEANS OF THIS TECHNIQUE AND THEN DECIDES TO SOLVE A THIRD VERTEX USING A SIMPLE CURVE (WITH NO SPIRALS).
- THE USER STARTS THE PALETTE OF ENTITIES OF THE ALIGNMENT, WHOSE SET OF ELEMENTS IS PRESENTED IN A NUMERICAL TABLE. DATA IN BLACK ARE EDITABLE; DATA IN GREY ARE NOT. THE ALIGNMENT IS MADE BY 14 CHUNKS; 8 ARE SIMPLE, 2 ARE COMPLEX (THE AFOREMENTIONED SCS GROUPS).
- THE USER CHECKS THE TABLE TO GET AN OVERALL IDEA OF THE SOLUTION OBTAINED.

**4. ALIGNMENT REGULATIONS AND STANDARDS. (VIDEO: 3 ALINEACIONES PLANTA LEYES).**

- IN THE FIRST PART OF THIS VIDEO, THE USER SETS THE SPECIFIC SPEED OF THE ALIGNMENT. THIS SPEED DETERMINES THE SUPERELEVATION LAW; THIS LAW WILL BE APPLIED TO THE STANDARD SECTION OF THE ROAD, GIVING AS A RESULT THE SET OF SAMPLE LINES, THAT DEFINE THE CROSS SLOPE OF THE ROAD.
- BEGINNERS USUALLY FORGET TO PROVIDE THE SUPERELEVATION LAW. DO NOT FORGET IT.
- THE SECOND PART OF THE VIDEO SHOWS HOW TO EDIT THE ALIGNMENT FROM THE DRAWING AREA.

**5. ALIGNMENT SETTINGS. (VIDEO: 1&4: ALINEACIONES PLANTA STYLES).**

- THE SECOND PART OF THIS VIDEO SHOWS SOME TECHNIQUES FOR IMPROVING THE GRAPHIC APPEARANCE OF OUR DESIGN, PARTICULARLY, IN THIS CASE, CONCERNING THE TAGS OF THE ALIGNMENT.

(TUESDAY, 2<sup>ND</sup> HOUR)

**6. CREATING A SURFACE OBJECT FROM A SET OF POINTS**

- OPEN THE FILE Surface-1A-PENZD (space delimited).TXT AND SEE ITS STRUCTURE.
- LOADING THIS SET OF POINTS, CREATE A NEW SURFACE S2.
- EDIT ITS STYLE TO SEE ITS TRIANGLES, CONTOUR LINES, ETC.
- EXPORT THIS SURFACE TO A DEM FILE (REFERENCE WGS84, UTM Z30N).
- OPEN A NEW FILE.
- IMPORT THE DEM FILE.

**7. MAKE AN ALIGNMENT, DEFINE ITS SUPERELEVATION AND EDIT ITS STYLE ACCORDING TO THE VIDEOS PROVIDED.**

### TECHNICAL ENGLISH WORDS RELATING TO A SURFACE OBJECT

DITCH (CREEK)

BOUNDARY (AS A LINE OF TERRAIN)

BREAKLINE

CONTOUR

CONTOUR INTERVAL

MINOR CONTOUR INTERVAL / MAYOR CONTOUR INTERVAL

TIN

DTM

RESOLUTION

MANHOLE

POND

POOL

CANT ROAD: [http://en.wikipedia.org/wiki/Cant\\_\(road/rail\)#Roads](http://en.wikipedia.org/wiki/Cant_(road/rail)#Roads)

SUPERELEVATION: <http://tecalive.mtu.edu/modules/module0003/Superelevation.htm>

CROSS SLOPE: <https://www.dirtandgravel.psu.edu/pa-program-resources>

CAMBER: <http://en.wikipedia.org/wiki/Camber>

(FRIDAY, 2 HOURS)

### PRACTICAL EXERCISE WEEK 3

Download videos V1, V2,..., V7 from [www.egicad.unican.es](http://www.egicad.unican.es).

The videos show a technique for merging several map sheets into a single drawing file and creating a surface containing several collections of contour lines and break lines.

Develop the following topics and proposals:

- What is a .SHX file (look for it in the INTERNET)? (V1)
- Make a short description of the commands that make it possible to copy all the information from a .dwg file to another one, so that the graphic objects keep their original UTM coordinates. (V2).
- Make a short description about what the file 00\_CODIF\_DEFINITIVA.DWG is (V3).
- The surface called SUPERFICIE1 has been created by loading into the collection of contours the layers 11001, 11002, etc. Notice that borders of the map sheet and its co-ordinates have been selected (and consequently included) as well. Do you think this is right or wrong? Why? (V3. Discuss this in pairs or in group, write your answer individually). (V4)
- Do you think this could be related to the big set of errors reported by the application? (V4)
- Notice the collection of different surface styles that are offered by C3D in this case. Select the one called Contours and Triangles. Edit this style; hide its layers of contours, to show only the triangles. Find out which layer shows the little arrows inside each triangle. Once achieved, keep everything as it is in the video, hiding the arrows. (V4).
- Once the set of borders of motorways, roads, etc. has been loaded as break lines, I focus on the errors form. Which is the most common reported error? Is the new surface model acceptable? Why? Develop this idea according to the explanation given in last Tuesday's class. (V5).
- Can a surface have several collections of break lines, or contour lines? (V7).
- REMARK: by means of any method of visualization, look at the surface obtained as a TIN from a camera point different to the plan view. Check the result. Why do you think it is advisable to do that?