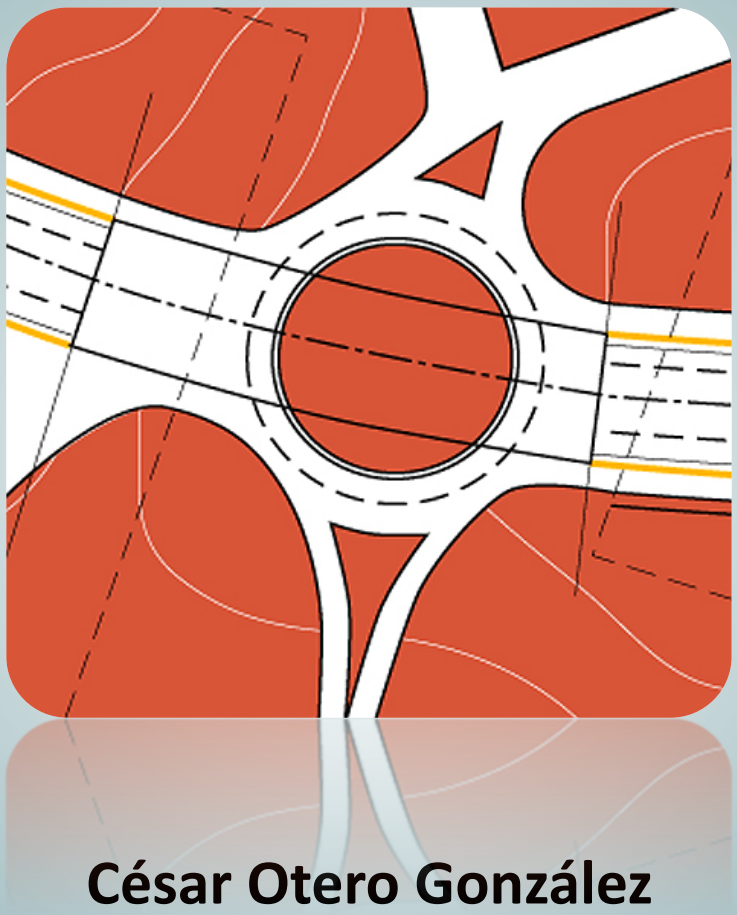
Workshop on Projects

Week 8. Comments Week 8 Script



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INTRODUCTION: Once the designer has made the corridor surface, the model has two TIN that are not co-ordinated. That means that both triangular networks are completely independent, so that at their borders, edges and vertices of triangles are not coincident. To co-ordinate both surfaces it is necessary to PASTE them to a third one that will have the sought result.

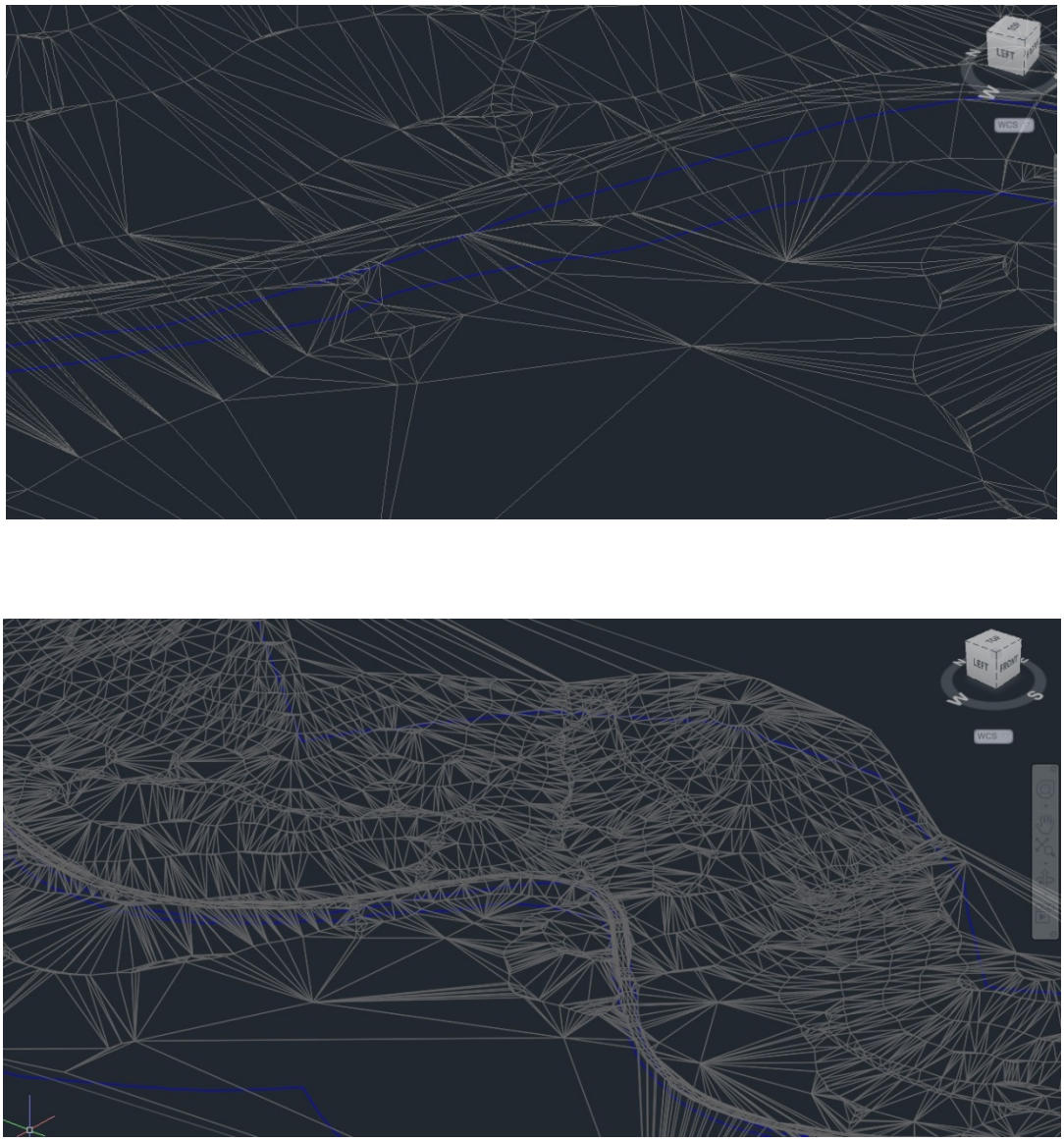

Fig. 1. Above, non co-ordinated surfaces of terrain and corridor; below, co-ordinated surfaces.

1. Open file WTC10.dwg. This file contains a surface called SURF1 WITH the terrain model and another surface called COOR1 with the surface derived from a corridor object.

2. Create a new TIN surface called S2.

   Type the command EDITSURFACEPASTE. First of all this command will ask for the main surface and then it will ask for the surface to be pasted on the former one.

   FIRST SURFACE: S2.
   SECOND SURFACE: SURF1.

3. Hide both surfaces (for example, choosing "no display" view style). You'll see that there are a closed blue 2D polyline (later we learn how to get this line from our corridor). This line is going to be an inner contour (an island) in our new surface S2.

4. Add this polyline to the boundaries of S2: as an **HIDE** one and keeping **breaklines as non-destructive**. As a result, S2 will have an inner island with exactly the contour of surface CORR1.

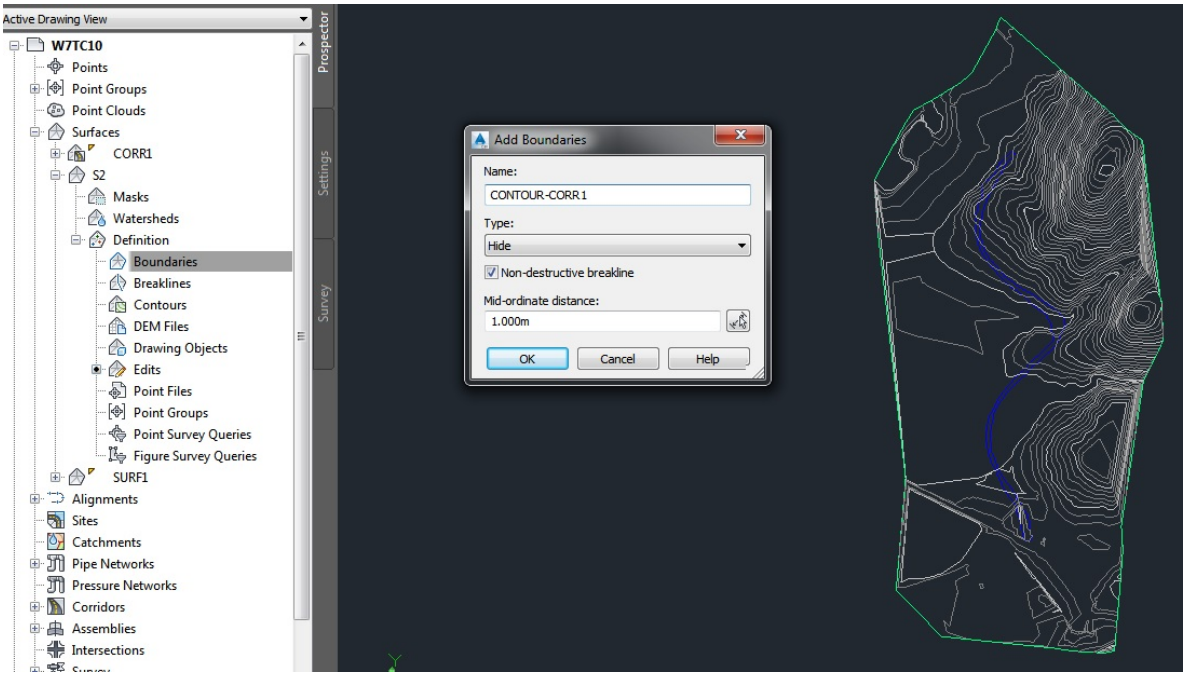

Fig. 2. Adding an inner boundary to S2.

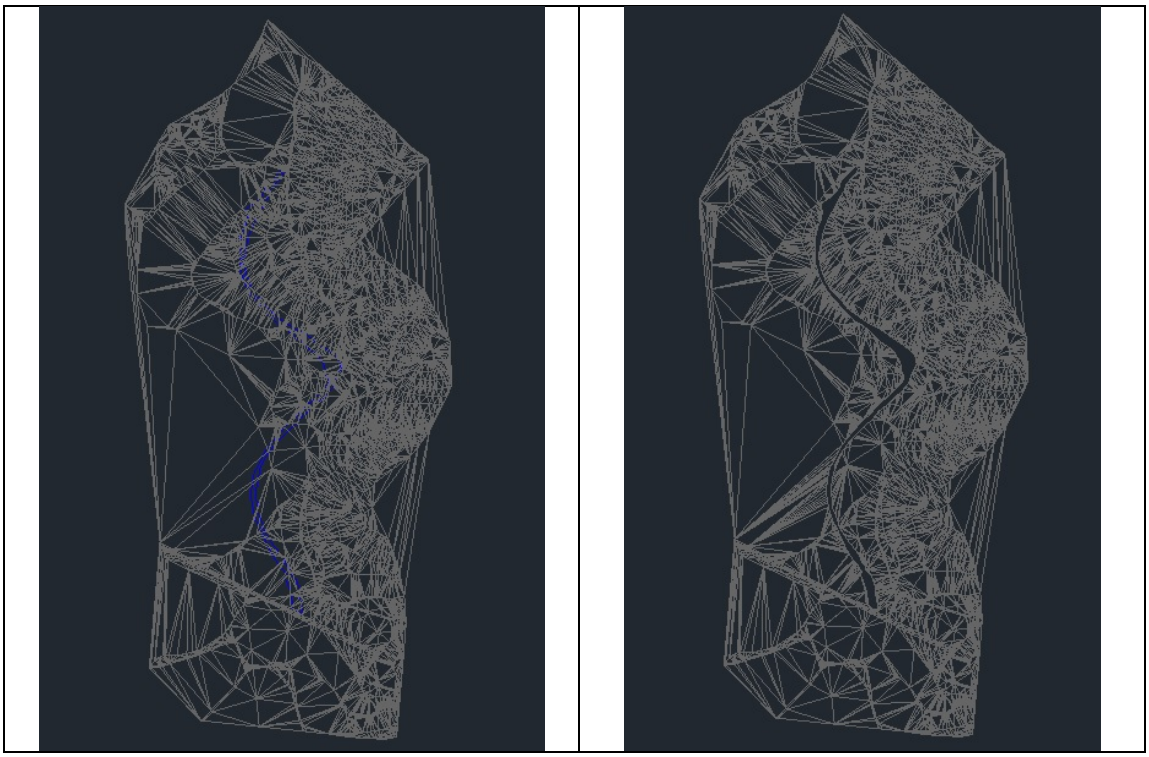

Fig. 3. S2 as looks before and after the inner boundary has been added.

5. Type the command EDITSURFACEPASTE again. This command ask for the main surface and then it will ask for the surface to be pasted on the former one.

FIRST SURFACE: S2.
SECOND SURFACE: CORR1.

That gives us the sought model. See fig. 4 next.

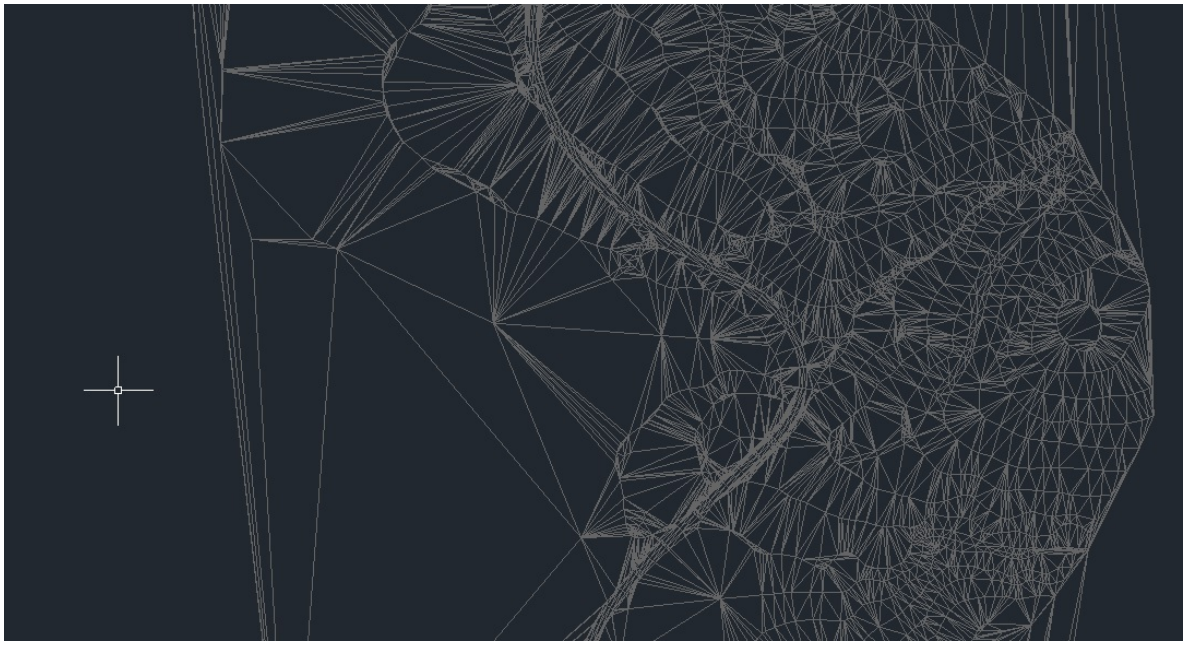

Fig. 4. As a result, the terrain has been modified by the corridor into an only co-ordinated surface: S2.

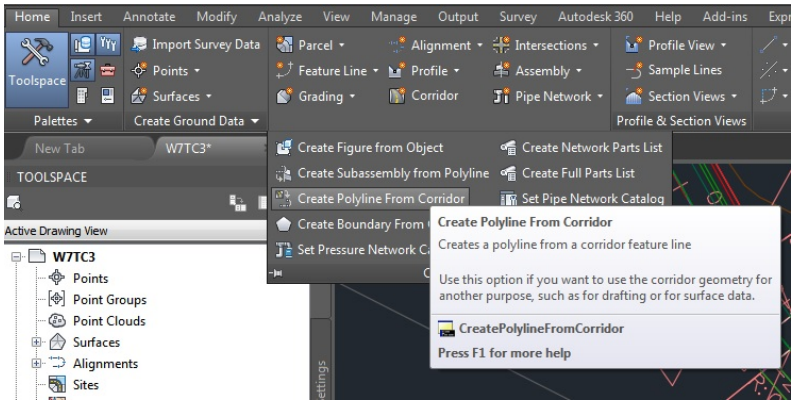

Fig. 5. Command Create Polyline from Corridor.

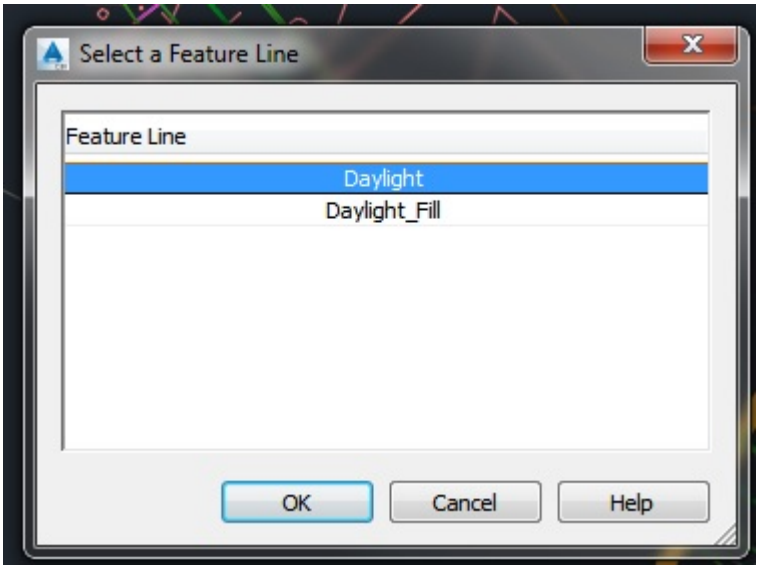

Fig. 6. Select DAYLIGHT lines.

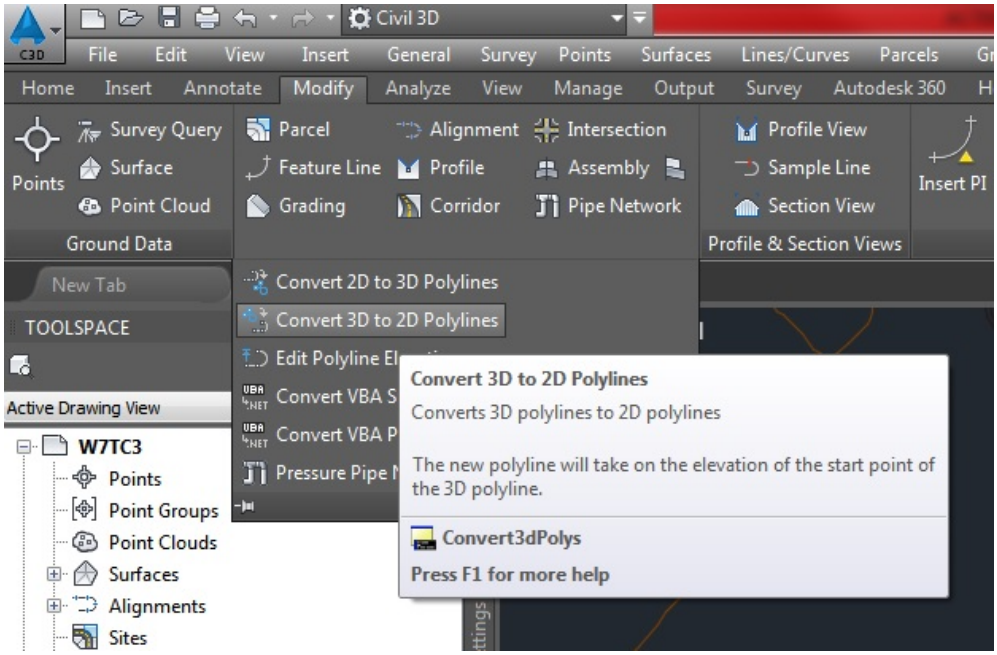

Fig. 7. 3D to 2D Polylines.

Fig. 8. The sought 2DLWpolylines.

FRIDAY

1. Open the file W7FR0.dwg. It has a surface called SURF1.
2. Create a corridor CORR1, as similar as possible to the one shown in fig. 1. The alignment AL1 is just a line 507 meters long; the profile layout LAYOUT-PROF-AL1 is also just a descending line, approximately 4 meters above the terrain. See fig. 2.

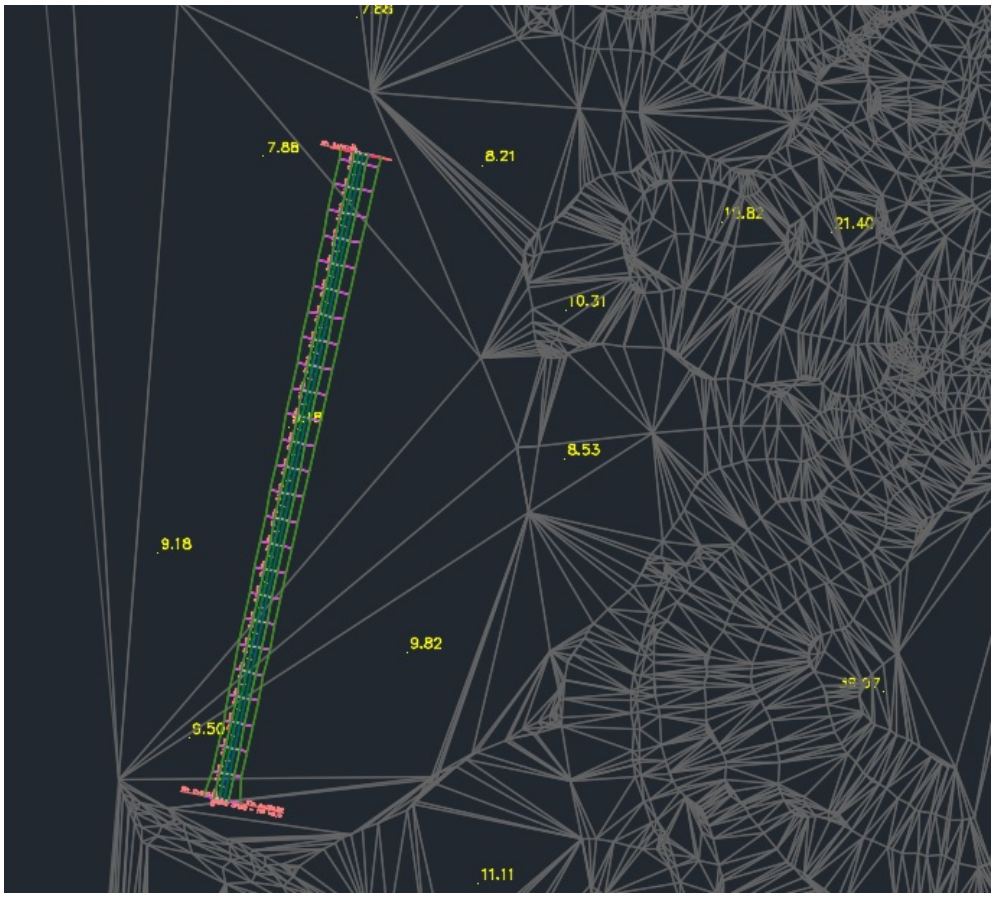

Fig. 1. Corridor CORR1.

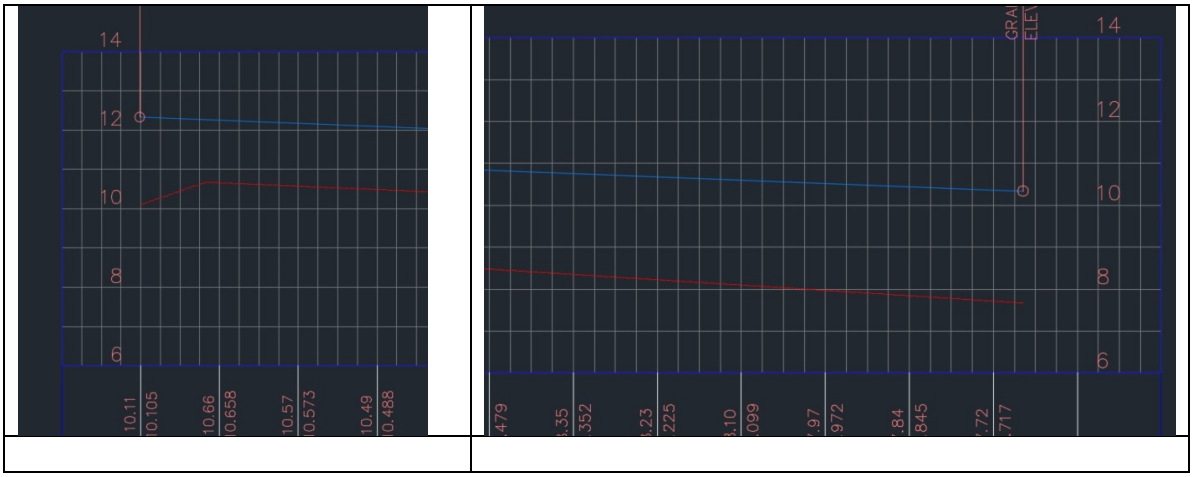

Fig. 2. Profile layout of AL1.

3. CORR1 is defined with a single assembly called AL1-AS1 (see fig. 3) composed of:

a. RIGHT: two BasicLane and one SlopeCutdDitch subassemblies (parameters by default).

b. LEFT: one BasicLane and one SlopeCutdDitch subassemblies (parameters by default).

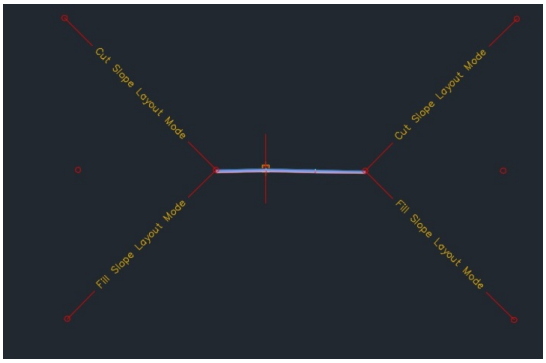

Fig. 3. Assembly AL1-AS1 for CORR1.

4. Create the corridor (it should look like the one in fig. 1) and also create its derived surface CORR1 – (1).

5. From now on, we will work with both surfaces hidden. Starting in PK 0+140 in AL1, create a second alignment AL2 according to the conditions given in table 1. The result should look like fig. 4.

No.	Number	Type	Tangency Constraint	Length	Radius	A
1	1	Line	Not Constrained (Fixed)	20.000m		
2.1	2	Spiral-Curve	Constrained by Previous (Floating)	82.185m		128.207m
2.2	2	Spiral-Curve	Constrained by Previous (Floating)	154.185m	200.000m	

Table 1.

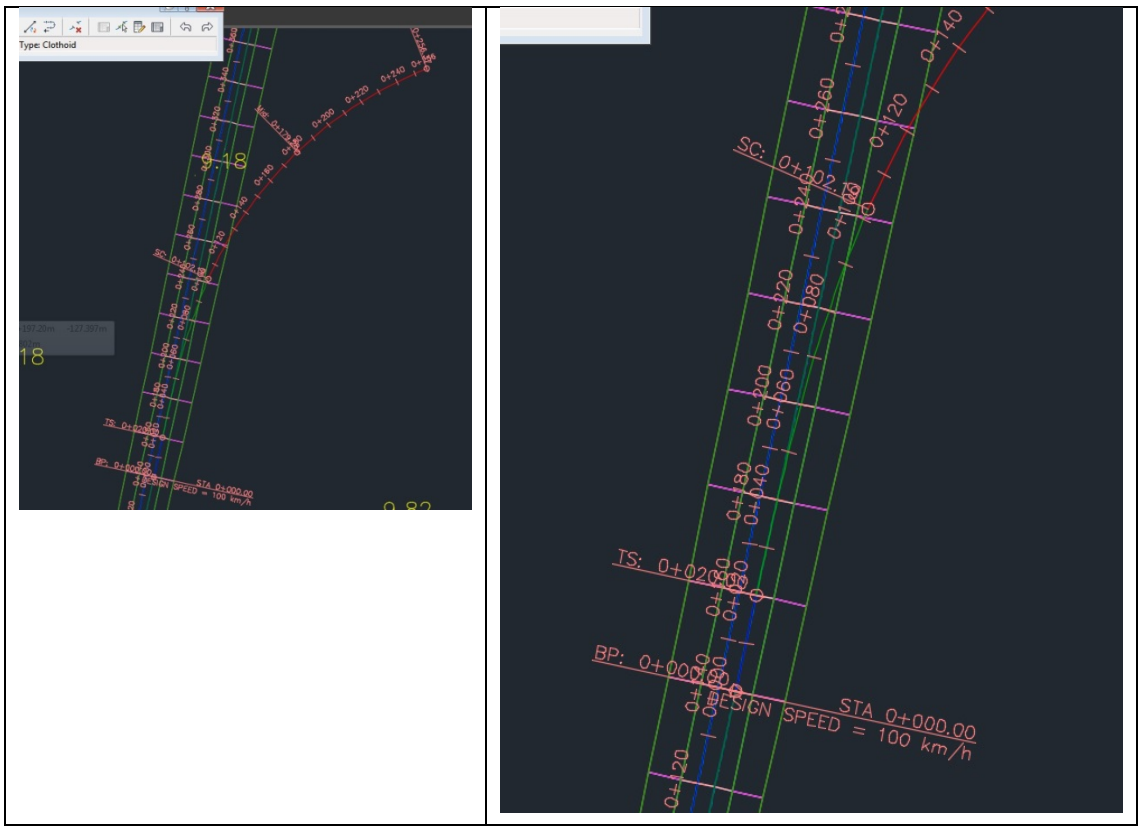

Fig. 4. AL2.

6. Create both the AL2's surface profile and profile view. IMPORTANT REMARK: these profiles must be designed taking into account both surfaces: SURF1 and CORR1 – (1). This is the reason why a pair of lines appears on the left side of the view. Ask me if you don't understand this detail or if you have any difficulties. See fig. 5.

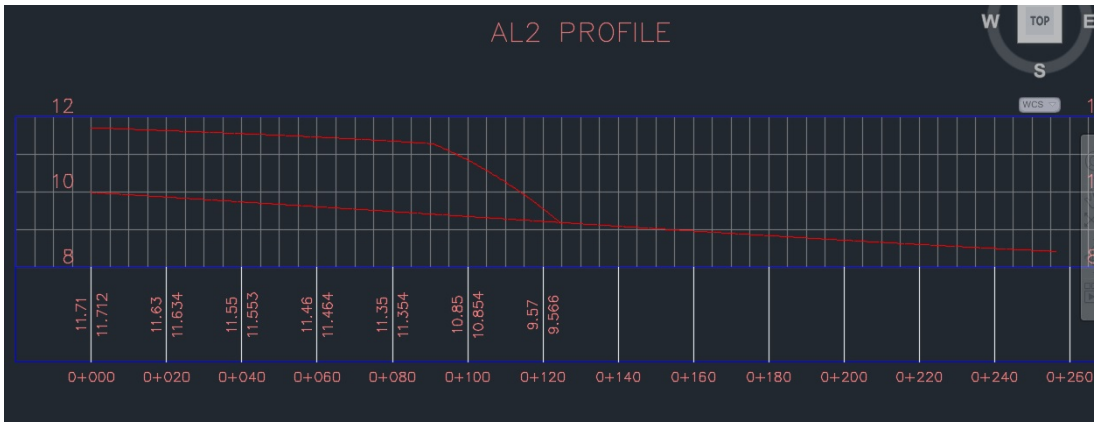

Fig. 5. A surface profile related to two surfaces.

7. Create the layout profile AL2, according to the fig. 6. Check that this layout starts exactly at the endpoint of the line CORR1 – (1) (see fig. 7a) and that it always stays slightly above this surface (See fig. 7b).

Fig. 6. AL2's Layout profile.

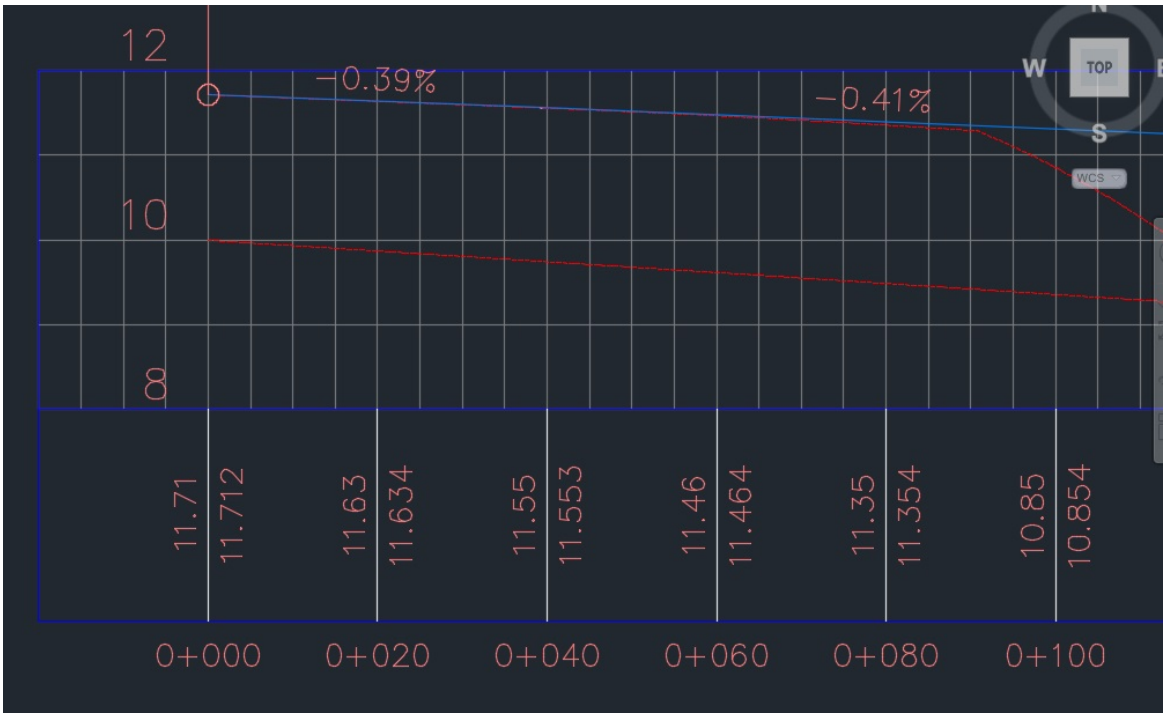

Fig. 7a. AL2's layout profile.

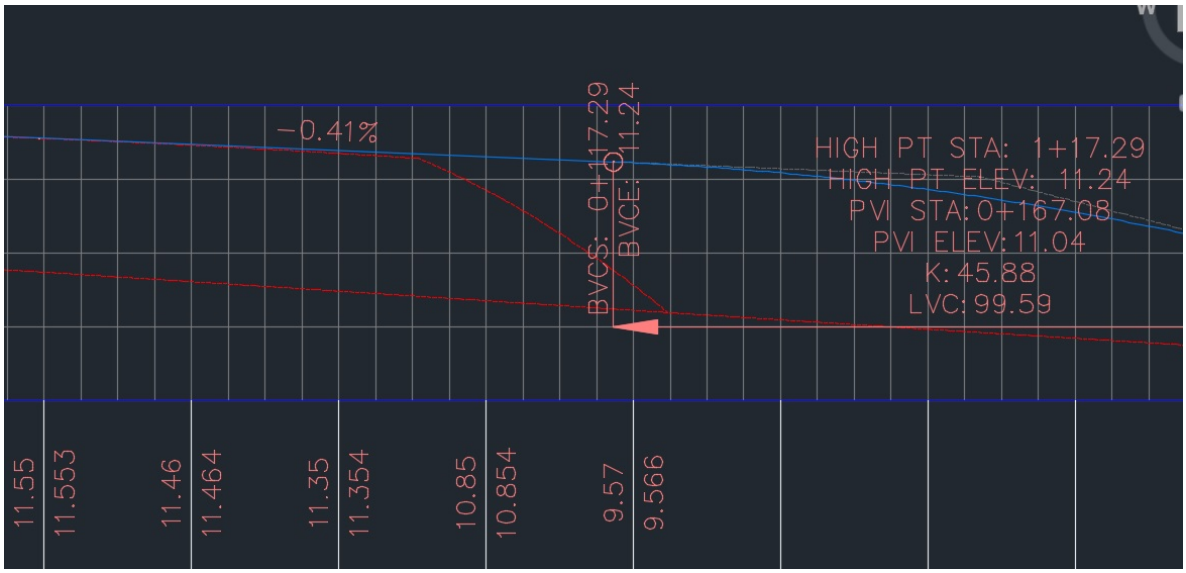

Fig. 7b. AL2's layout profile.

8. Make an assembly called AL2-AS1, composed of (see fig. 8):

a. RIGHT: one subassembly BasicLane and one SlopeCutdDitch (parameters by default).

b. LEFT: one subassembly SlopeCutdDitch (parameters by default).

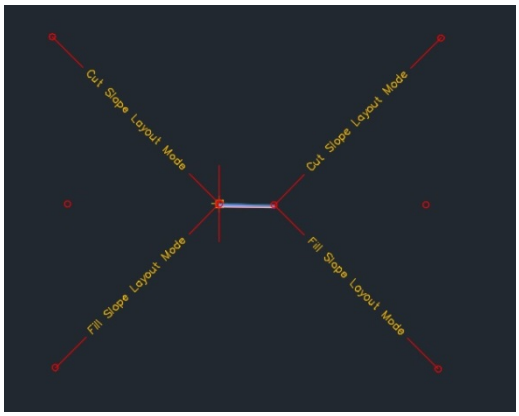

Fig. 8. Assembly AL2-AS1.

8. Create the corridor CORR2 according to these specifications (fig. 9):

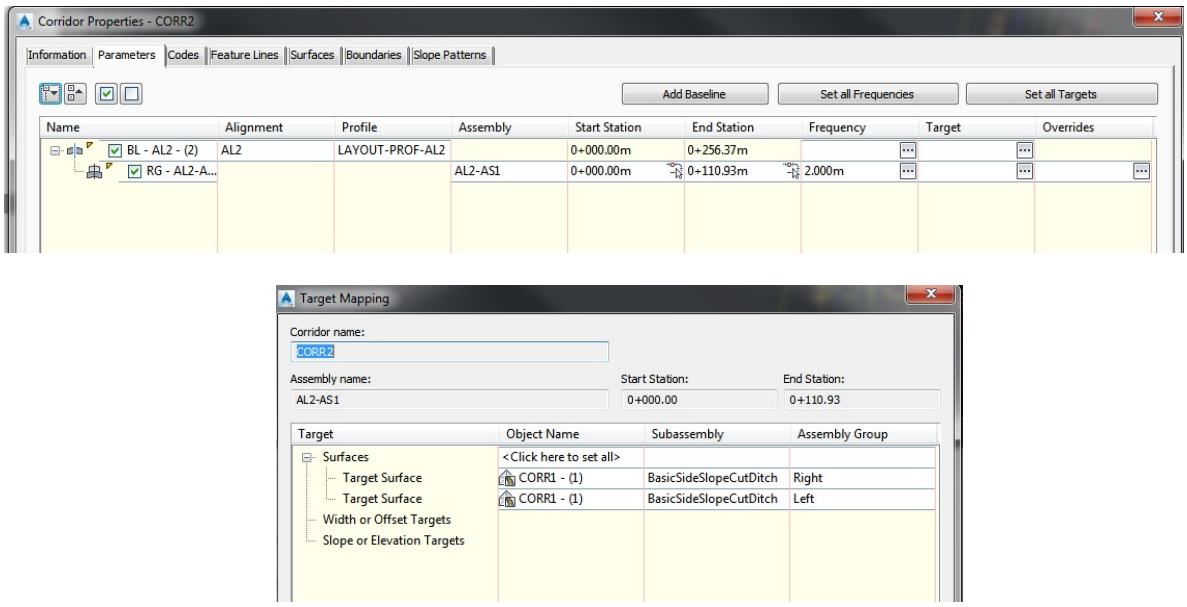

Fig. 9. Specification for CORR2.

REMARK: notice that the right side of the assembly AL2-AS1 does not reach the surface CORR1 – (1). In fact, the right target surface could be defined as empty. The aim of this technique is for the intersection between both corridors to be available at the left side of CORR2. See fig. 10.

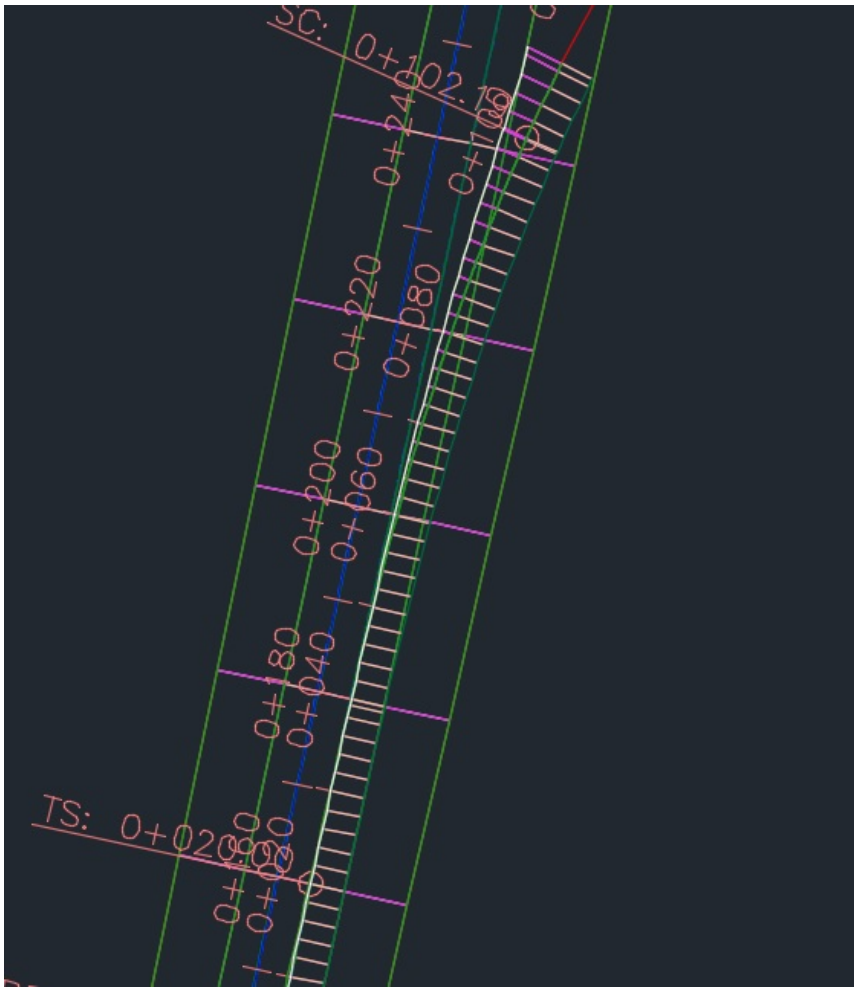

Fig. 10. Line of intersection between corridors.

9. Create a Polyline3D as the intersection between corridors CORR1 and CORR2. See fig. 11.

Fig. 11.

TO SUMMARISE: this sequence shows a typical way for graphically designing the line of intersection between the grades of alignments AL1 and AL2. This Polyline 3D will be used by the TransitionLine subassembly to solve the area of common pavement between these alignments.

FRIDAY WEEK 8

(THIS CONTINUES FROM LAST TUESDAY'S WORK. YOU CAN START FROM THE FILE **W8FR1.DWG**, PROVIDED IN AULA VIRTUAL, WEEK8, FRIDAY)

REDEFINING CORR1.

1. Create three new assemblies as they are defined in fig. 1 and 2.

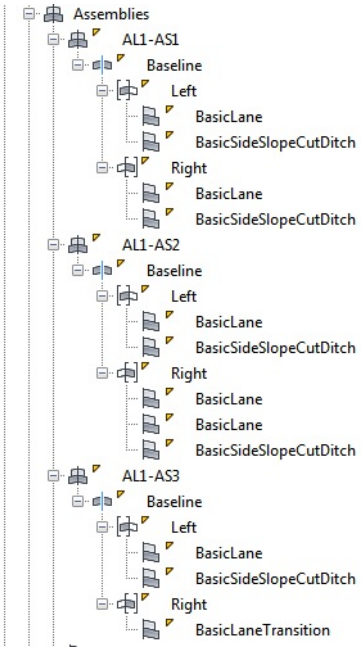

Fig. 1. Definition of AL1-AS1, AS2 and AS3 from PROSPECTOR.

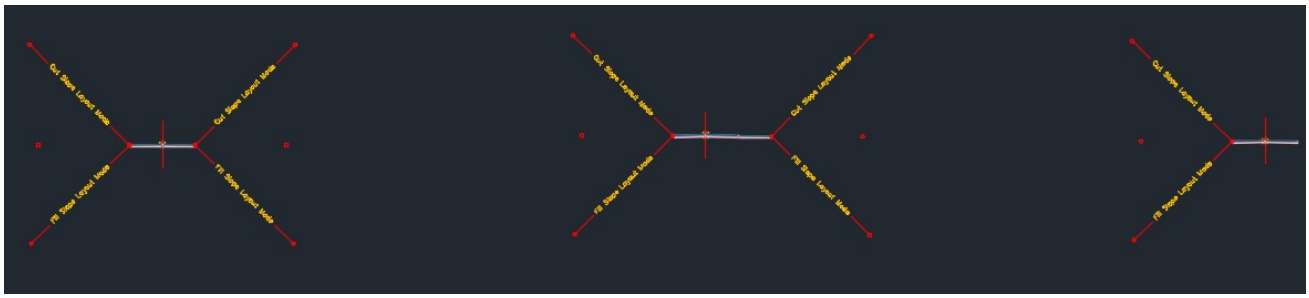

Fig. 2. AL1-AS1, AS2 and AS3 in the drawing area.

2. Redefine CORR1 according to the new regions established on fig. 3 and 4.

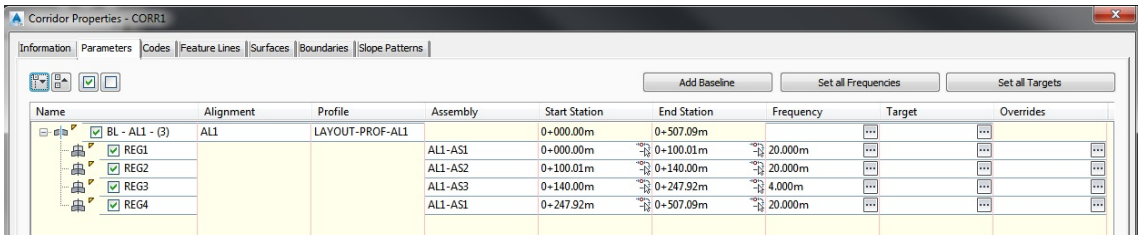

Fig. 3. Regions, assemblies, frequencies in new CORR1.

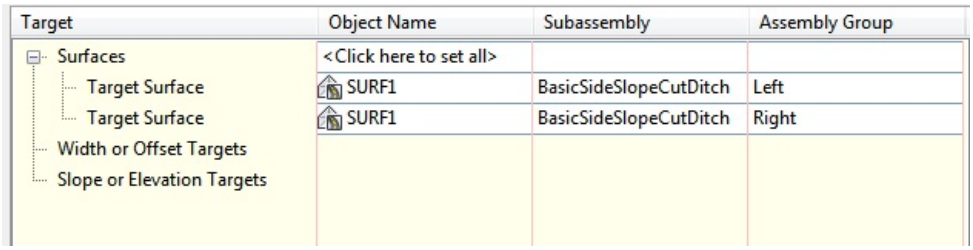

Fig. 4. Targets in region REG1, 2 and 4.

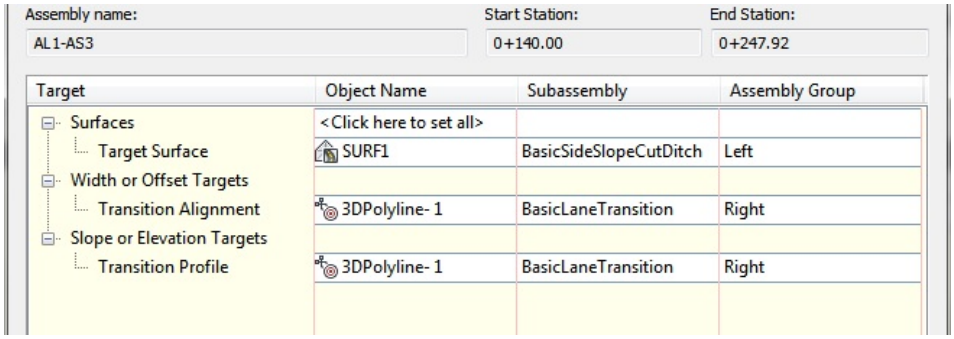

Fig. 5. Targets in region 4.

REMARK: the left fill slope remains as usual. The right one is not attached to a surface but to the polyline we obtained some days before, in the last Friday's practical class. Moreover, this attachment is constraining both the alignment and the profile. The effect is that the transition lane is not anymore conditioned by its slope value; it must finish over the polyline. This matter will be explained in the class.

3. The redefinition in CORR1 is not finished yet: go to the properties of the BasicLineTransition in ASSEMBLY AL1-AS3. Modify the one related to the type of transition, checking that the option is the one marked in fig. 6.

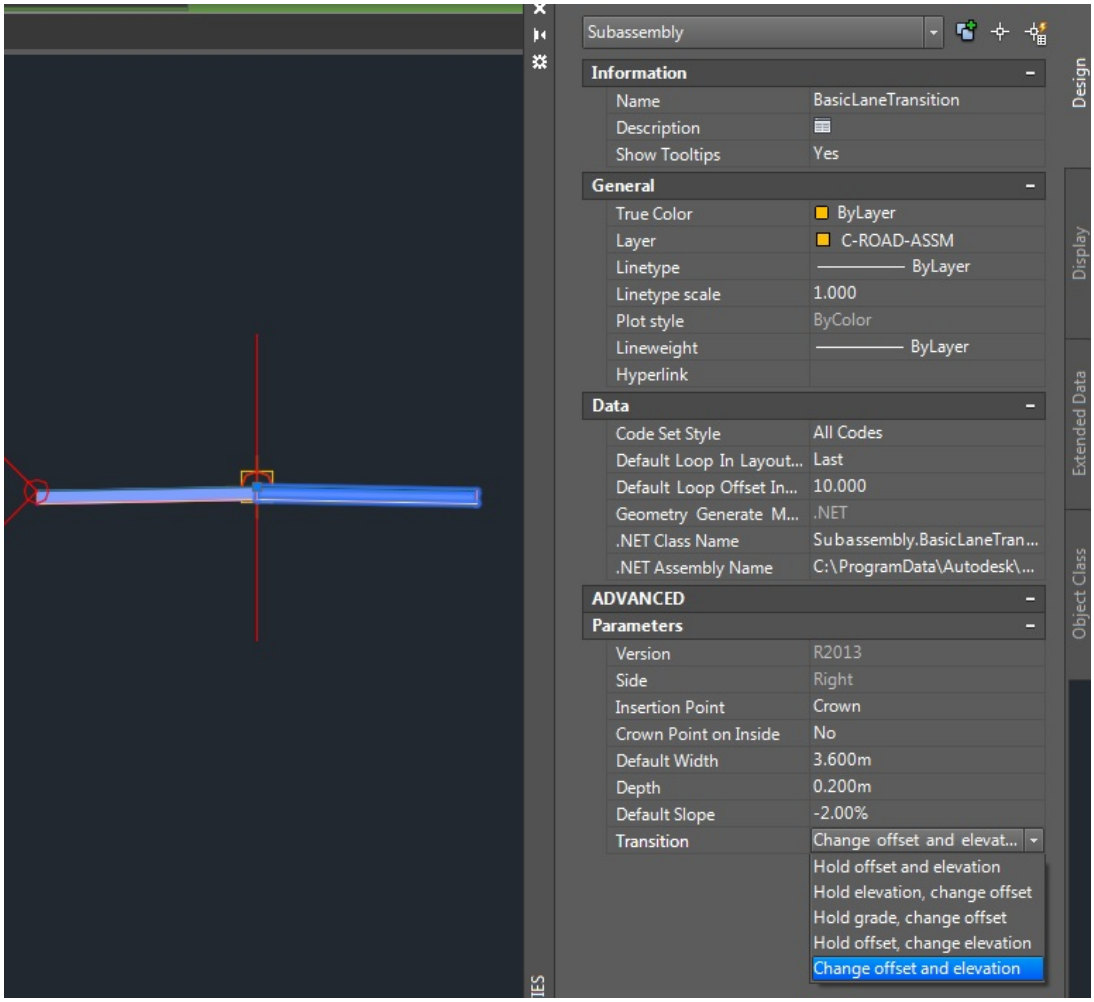

Fig. 6. Changing OFFSET and ELEVATION in AL1-AS3's BasicTransitionLine.

4. Now rebuild the corridor CORR1. It will look like the one shown in fig. 7. Almost the first half of our work is done.

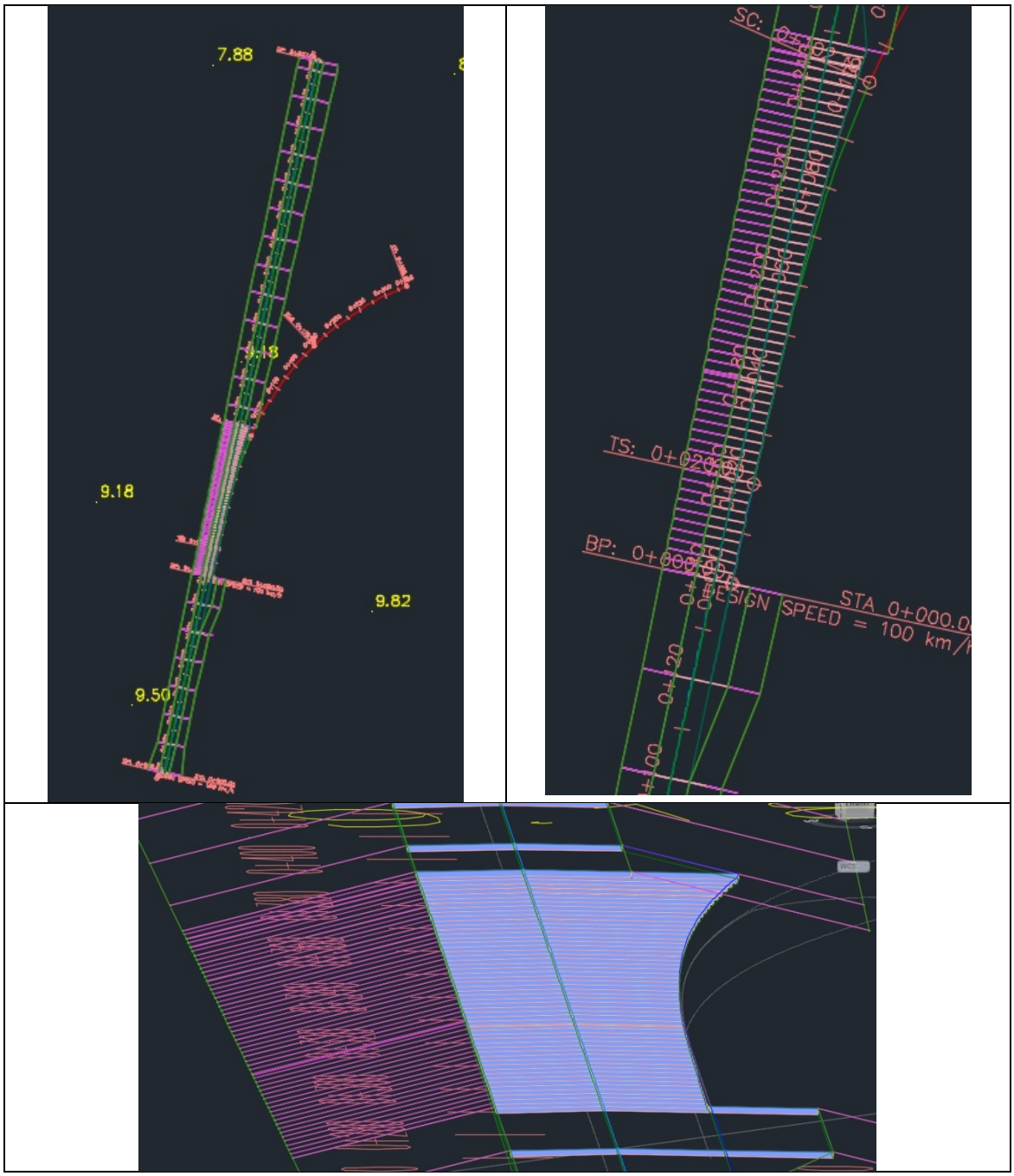

Fig. 7. CORR1 redefined.

5. As CORR1 has been redefined, the old associated surface CORR1 – (1) must be removed and a new associated CORR1 – (2) has to be created.

6. CORR2 needs to be redefined in a similar way. Define assemblies AL2-AS1 and 2 as shown in fig. 8.

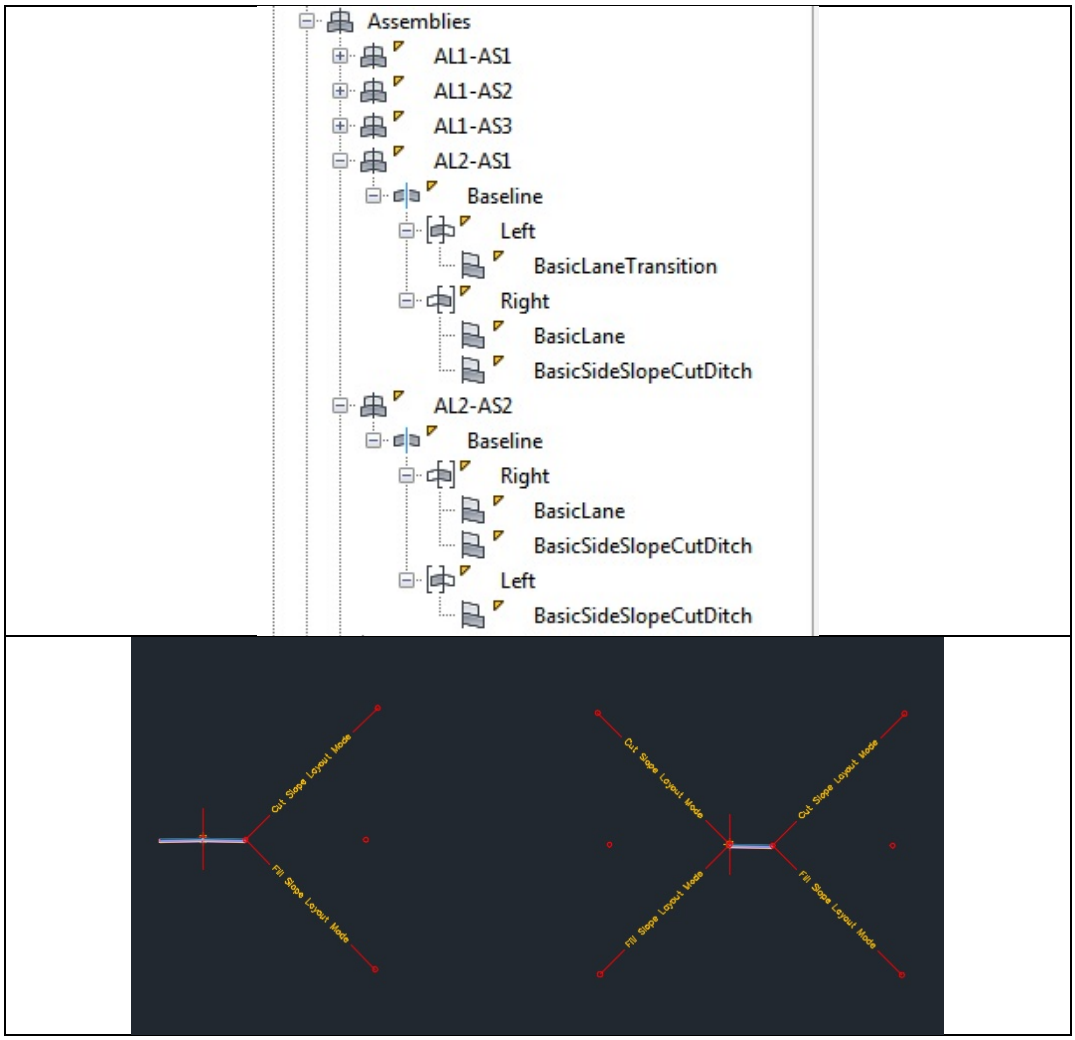

Fig. 8. New assemblies in CORR2.

7. Regions in CORR2 need to be redefined as well, as shown in fig. 9.

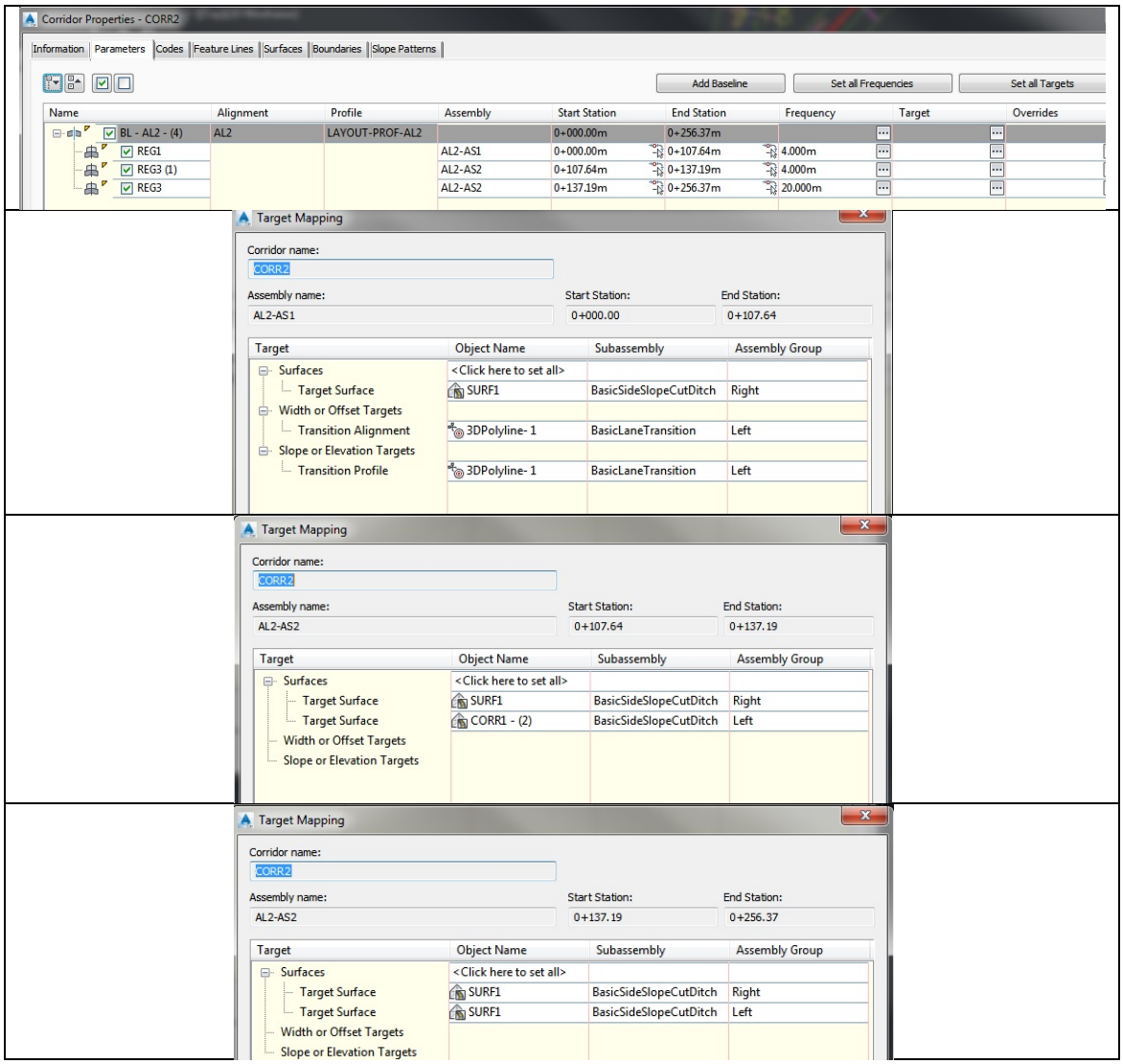

Fig. 9. New regions and targets in CORR2.

8. As in point 3, the BasicLineTransition again needs it property of Transition to be established as **Change OFFSET and ELEVATION.**

9. After which, CORR2 can be rebuilt. The result will be as in fig. 10.

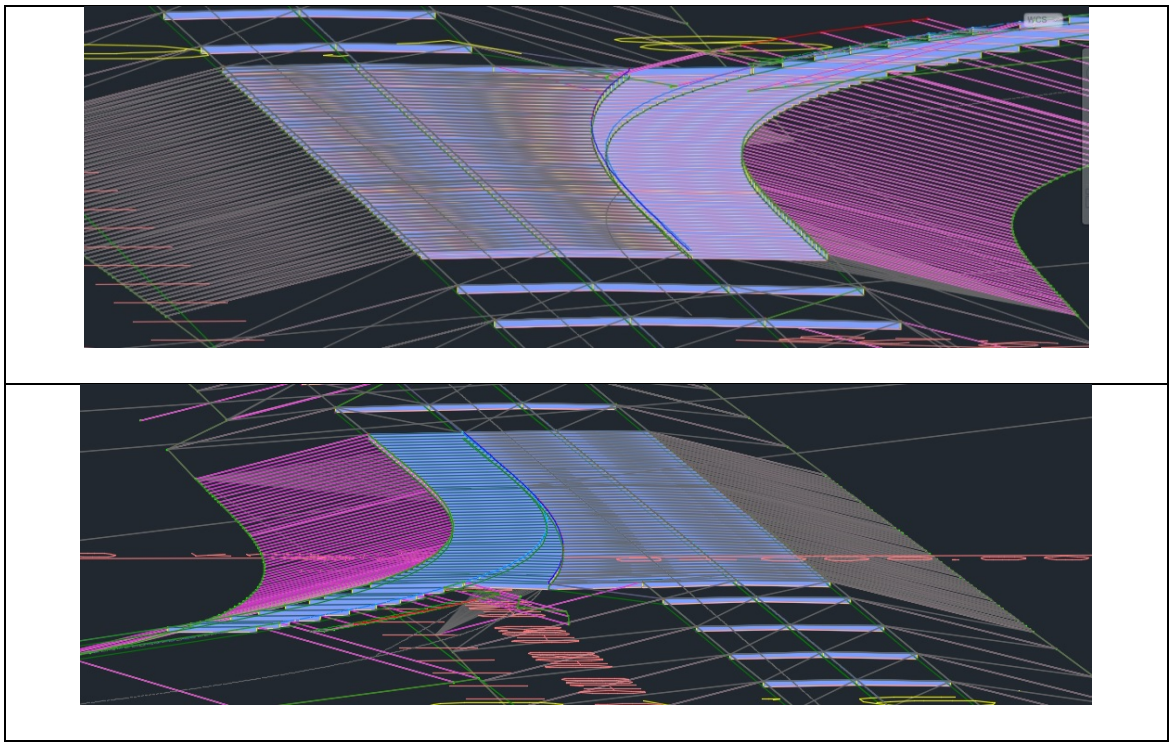

Fig. 10. Designing an exit lane.

A simplified procedure for designing an exit lane has been developed. Fortunately, an unexpected problem has appeared in Region2 of CORR2. See fig. 11. Analyze and propose how to solve the problem… and solve it.

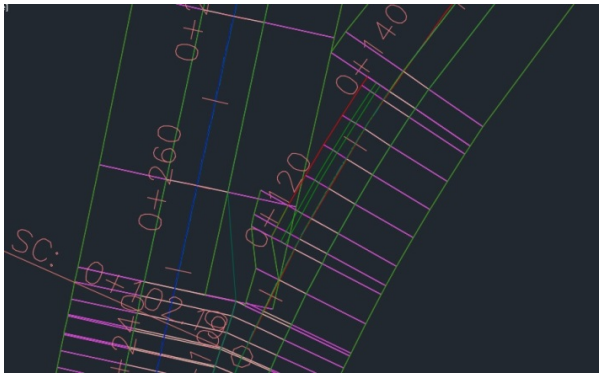

Fig. 11.