



# BT5M production on a GIS environment

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de Catalunya



**Generalitat  
de Catalunya**

# Agenda

## ➤ Challenges

- Data model
- Production system
- Quality system

# Challenges

- Limitations in the data model:
  - No possibility of incremental updating: lack of unique and persistent element identifiers and life cycle attributes.
  - No metadata at feature level.
  - No explicit relationship between map names and topographic features

***Data model enrichment***



# Challenges

- Limitations in the data model:
- Limitations in the ICGC data capture system:
  - ICGC applications were based on CAD commercial software, mainly MicroStation
  - Difficulties for the topology management with MicroStation, topology must be rebuilt in each updating process:

***Production system based on a GIS***

# Challenges

- Limitations in the data model:
- Limitations in the ICGC data capture system:
- Limitations in the quality management:
  - Lineage per map sheet
  - Potential problems due to topology reconstruction

***Quality system robustness***



# Challenges

- Limitations in the current data model:
- Limitations in the ICGC data capture system:
- Limitations in the quality management:
- Interoperability:
  - BTA, INSPIRE

***Standards compatibility***

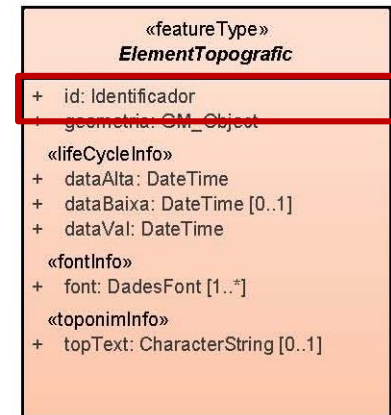
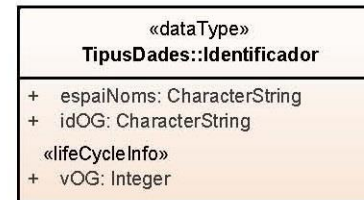


**Data model  
&  
Interoperability**

Changes

# Feature identifier

- Unique and persistent:
  - It facilitates the identification of changes
  - It allows the incremental updating deliveries
  - It makes possible the establishment of relationship with other databases



bt25mv20t.edifici\_servei Properties

Name	Value
ID	237
IDO	00000004000339
IDR	1
DATA_ALTA	10/14/2013 11:07:04 AM
DATA_BAIXA	
DATA_VOL	5/1/2013 12:00:00 AM
TOP_ID	56748965
TOP_TEXT	Cal Batlle
TOP_DATA	10/25/2013 11:07:04 AM
DATA_REV	10/30/2013 11:07:04 AM
ESTAT_EDI	cas genèric
ORIENT_EDI	

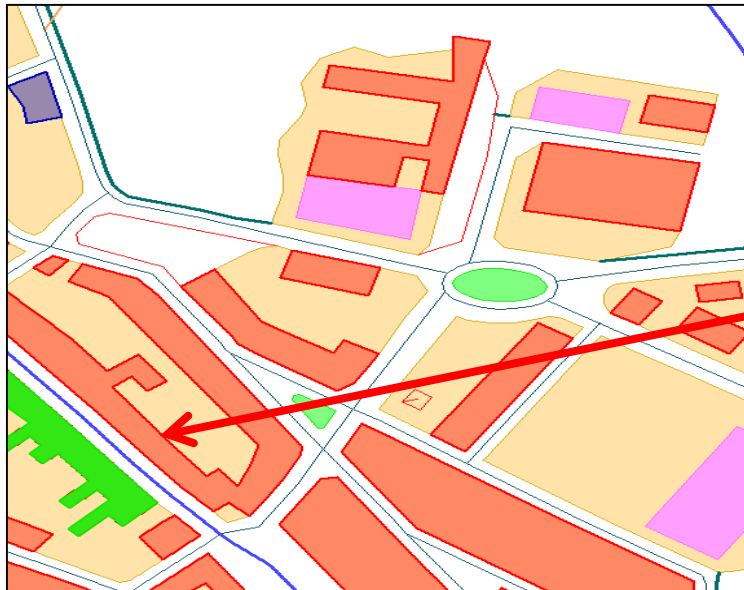
Close



# Life cycle

«featureType» ElementTopografic	
+ id: Identificador	
+ geometria: GM_Object	
«lifeCycleInfo»	
+ dataAlta: DateTime	
+ dataBaixa: DateTime [0..1]	
+ dataVal: DateTime	
«fontInfo»	
+ font: DadesFont [1..*]	
«toponimInfo»	
+ topText: CharacterString [0..1]	

- Begin, validation and end dates per object version in the database
  - It facilitates the identification of changes
  - It allows the incremental updating deliveries

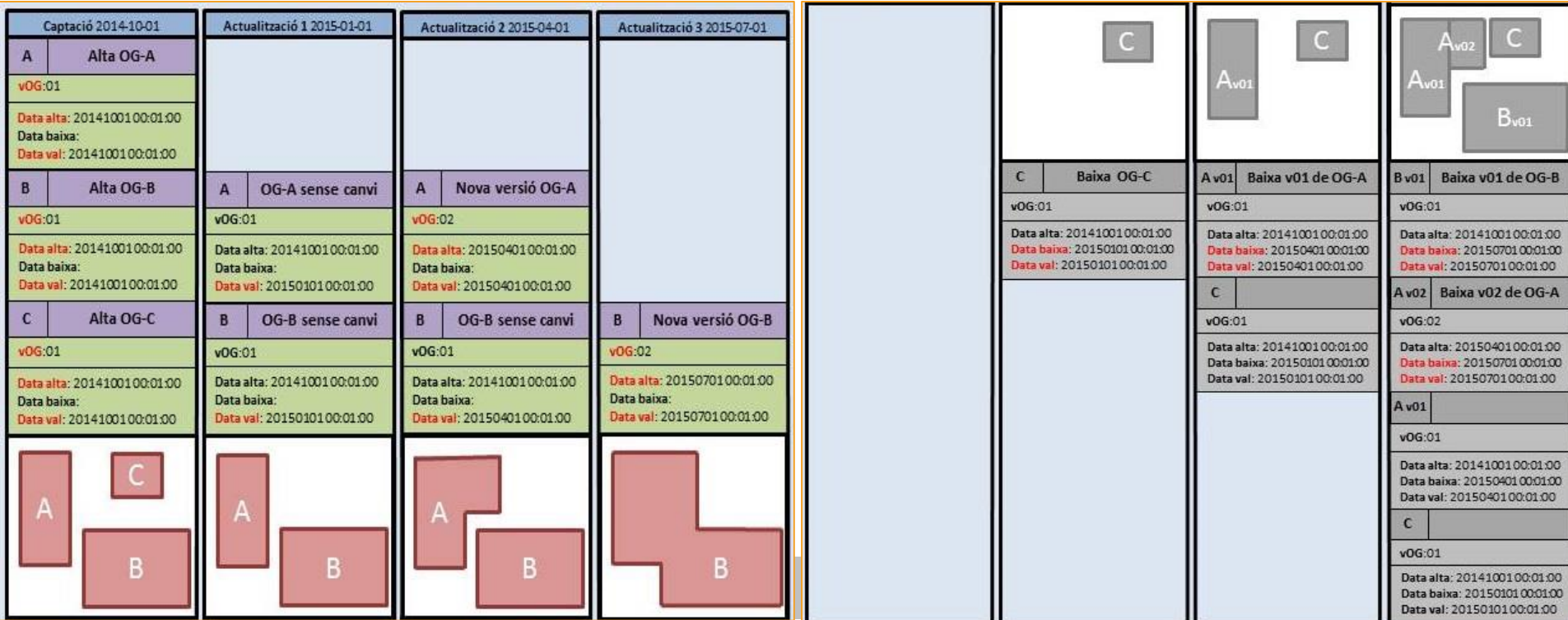


edi2 esborrats Properties	
General Attributes	
Name	Value
IDG	959
IDO	00000000006774
IDR	1
IDT	0
DATA_ALTA	12/10/2012 1:47:04 PM
DATA_BAIXA	10/14/2013 11:07:04 AM
DATA_VAL	3/1/2013 12:00:00 AM
TOP_ID	
TOP_TEXT	
TOP_DATA	
DATA_REV	5/1/2013 12:00:00 AM
ESTAT_EDI	cas genèric
ORIENT_EDI	
Close	

# Life cycle

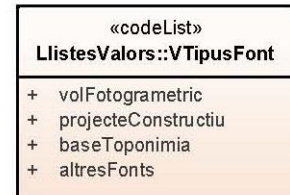
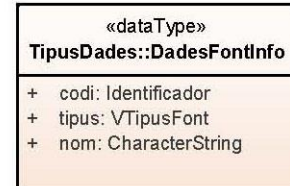
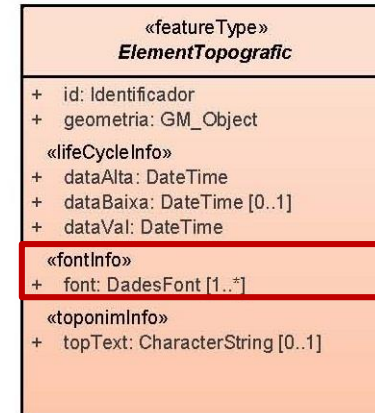
«featureType» ElementTopografic	
+	id: Identificador
+	geometria: GM_Object
«lifeCycleInfo»	
+	dataAlta: DateTime
+	dataBaixa: DateTime [0..1]
+	dataVal: DateTime
«fontInfo»	
+	font: DadesFont [1..*]
«toponimInfo»	
+	topText: CharacterString [0..1]

- Begin, validation and end dates per object version in the database
- Validation date means that there are no changes in the object.



# Feature metadata

- Source date
- Source information
  - Source identifier
  - Source type
  - Source name



**bt25mv20t.edifici\_servei Properties**

General | Attributes

Name	Value
<b>IDG</b>	237
IDO	00000004000339
IDR	1
IDT	6
DATA_ALTA	10/14/2013 11:07:04 AM
DATA_BAIXA	
<b>DATA_VOL</b>	<b>5/1/2013 12:00:00 AM</b>
TOP_ID	38748383
TOP_TEXT	Cal Batlle
<b>TOP_DATA</b>	<b>10/25/2013 11:07:04 AM</b>
DATA_REV	10/30/2013 11:07:04 AM
ESTAT_ED	cas genèric
ORIENT_ED	

Close

# Sources

- Main source (photogrammetric flight)
  - Flight date is the initial “main source” date
  - Revision date is the last “main source” date without changes
- Specific sources
  - Infrastructure projects
  - Geographical names
- Other sources



bt25mv20t.edifici\_servei Properties

Name	Value
<b>IDG</b>	237
IDO	00000004000339
IDR	1
IDT	6
DATA_ALTA	10/14/2013 11:07:04 AM
DATA_Baixa	
DATA_VOL	5/1/2013 12:00:00 AM
TOP_ID	30740303
TOP_TEXT	Cal Batlle
TOP_DATA	10/15/2013 11:07:04 AM
DATA_NEV	10/30/2013 11:07:04 AM
ESTAT_EDI	cas genèric
ORIENT_EDI	

Close

# Map name relation

- Map name
- MapNames DB
  - Extraction date
  - Map name identifier

«featureType» <i>ElementTopografic</i>	
+	id: Identificador
+	geometria: GM_Object
«lifeCycleInfo»	
+	dataAlta: DateTime
+	dataBaixa: DateTime [0..1]
+	dataVal: DateTime
«fontInfo»	
+	font: DadesFont [1..*]
«toponimInfo»	
+	topText: CharacterString [0..1]



bt25mv20t.edifici_servei Properties	
General Attributes	
Name	Value
IDG	237
IDO	00000004000339
IDR	1
IDT	6
DATA_ALTA	10/14/2013 11:07:04 AM
DATA_BAIXA	
DATA_VAL	5/1/2013 12:00:00 AM
TOP_ID	56748965
TOP_TEXT	Cal Battle
TOP_DATA	10/25/2013 11:07:04 AM
DATA_REV	10/30/2013 11:07:04 AM
ESTAT_ED	cas genèric
ORIENT_ED	

**Production  
system**

Changes

## ICGC Data Capture application

## System architecture

### ICGC GM+ISSG application

GeoMedia  
Object Library

ISSG Object  
Library

GeoMedia

ISSG

Oracle Spatial

- It extends the functionalities of Geomedia and solves 3D shortcomings
- Ensure the most ergonomic and complete visualization mode and the same functionalities in the photogrammetric environment than in the standard one.
- Provide tools specifically designed for the data model.



## ICGC Data Capture application

### Extended functionalities on GIS

- Geometric primitives not existing in GM, as curve, circle 3D and ellipse 3D
- Auxiliary drawing geometries as orthogonal element, arc of ellipse and curve, stroking always as a polyline or polygon
- Possibility to combine the different drawing geometries in the same element compilation
- 2D/3D for snapping, modify, copy parallel, sharing geometry or sharing vertices
- UNDO of the full result of the command or of one step of the command
- Specific message fields for managing the command
- ...



# Integration CAD + GIS

The screenshot displays the GeoMedia Professional - zona3.gws interface. The main map area shows a topographic map with various features including roads, buildings, and vegetation. The left sidebar contains a tree view of the project layers, including 'Attribute Query of BT25MV20T.MAI2 (21)', 'Orografia', 'Vialitat', 'Usos del sòl', 'Hidrografia', 'Comunicacions', 'Ferrocarrils', and 'Models'. The right sidebar shows the 'bt25mv20t.vial\_NO\_elevat Properties' window, which lists various attributes and their values.

**ICC Command Dynamic Information**

ICC Coordinates

Snap 3D 426202.19 4685547.75 1172.94

Toolbar2

**bt25mv20t.vial\_NO\_elevat Properties**

Name	Value
IDG	2619
IDO	00000000023786
IDR	0
IDT	3
DATA_ALTA	12/10/2012 1:49:00 PM
DATA_MODIF	
DATA_BAIXA	
DATA_VOL	6/1/2001 12:00:00 AM
DATA_PROJ	
FONT_ALTTIP	BT50M
DATA_ALTTIP	1/1/2004 12:00:00 AM
TOP_ID	
TOP_TEXT	
TOP_DATA	
DATA_REV	
REVEST_VIA	revestit
ESTAT_VIA	cas genèric
TIPNRE_VIA	no aplicable
SEP_VIA	no separades
TER_VIA	no elevat
ENTORN_VIA	cas genèric
TIPTRA_VIA	tronal
NCAL_VIA	calçada única
URBA_VIA	no urbà
CTEC_VIA	via convencional
CFUNC_VIA	xarxa bàsica
ORGAN_VIA	
AMP_VIA	
CODI_VIA	
CODIEUR_VIA	

Press F1 for Help.

start E:\usuarios\bt25mv2... GeoMedia Profession...

1:3,041

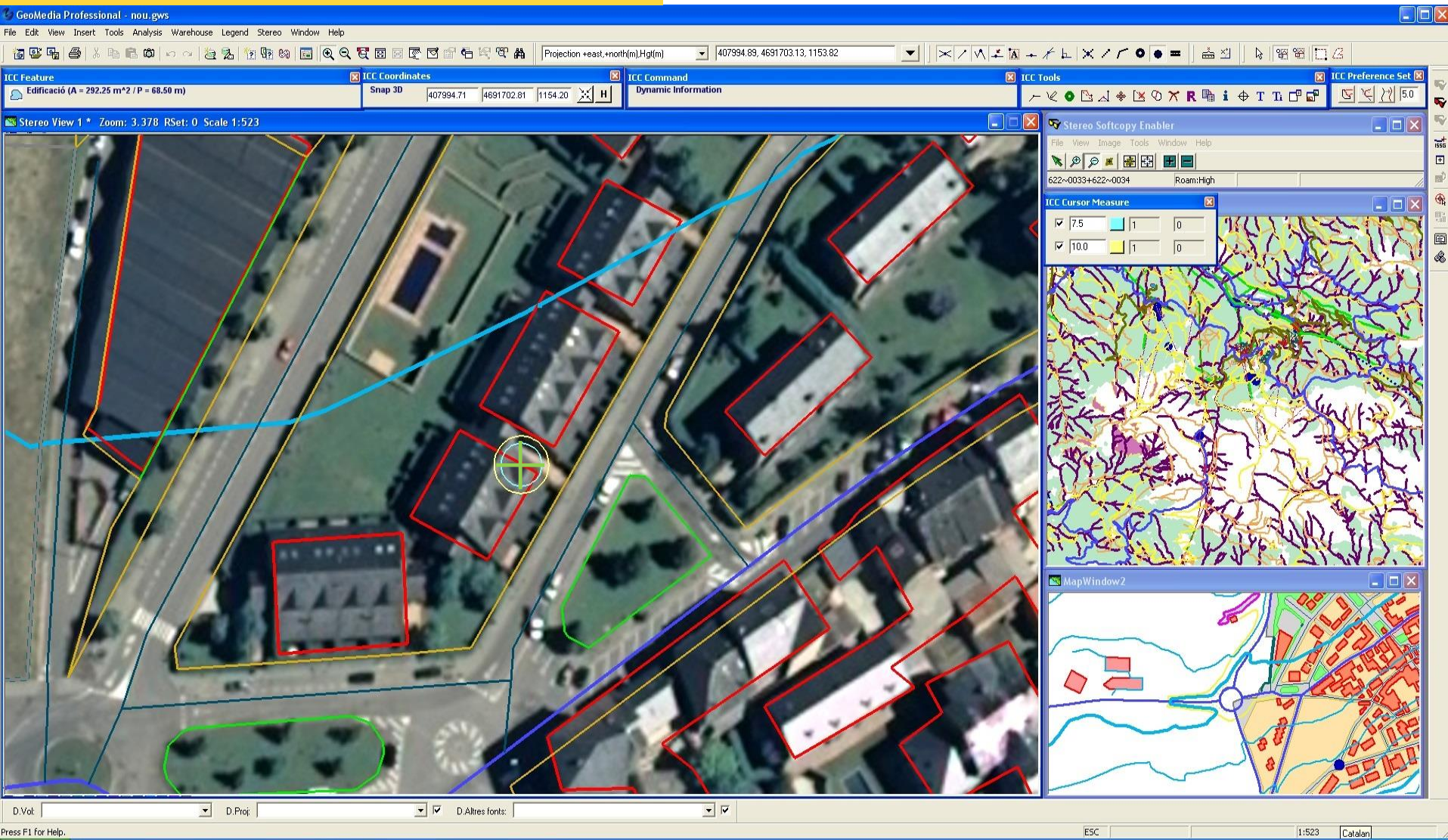
## ICGC Data Capture application

Improvement of vector visualization on the photogrammetric environment

- Standard point symbology in the photogrammetric environment
- Window tracking capabilities in the standard environment
- Interaction between different views
- Specially designed cursor glyphs
- Auxiliary display geometries (halo) associated to the cursor for the visualization of minimum distances while drawing or editing
- ...

# ICGC Data Capture application

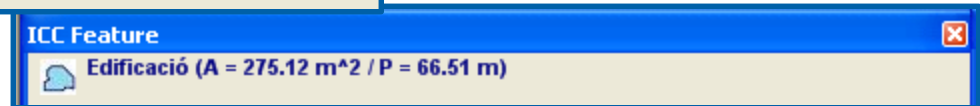
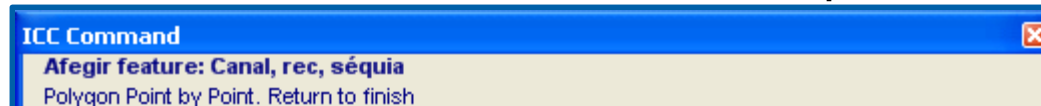
Same functionalities: Auxiliary display geometries (halo)



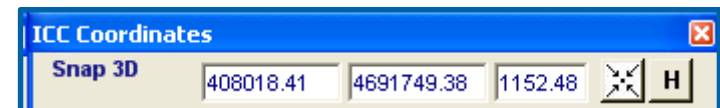


# ICGC Data Capture application

- Command management and interaction using the keyboard and both type of mouse (standard and photogrammetric)
- Specifically designed message fields informing the operator about the feature instance: class, attributes, perimeter, area

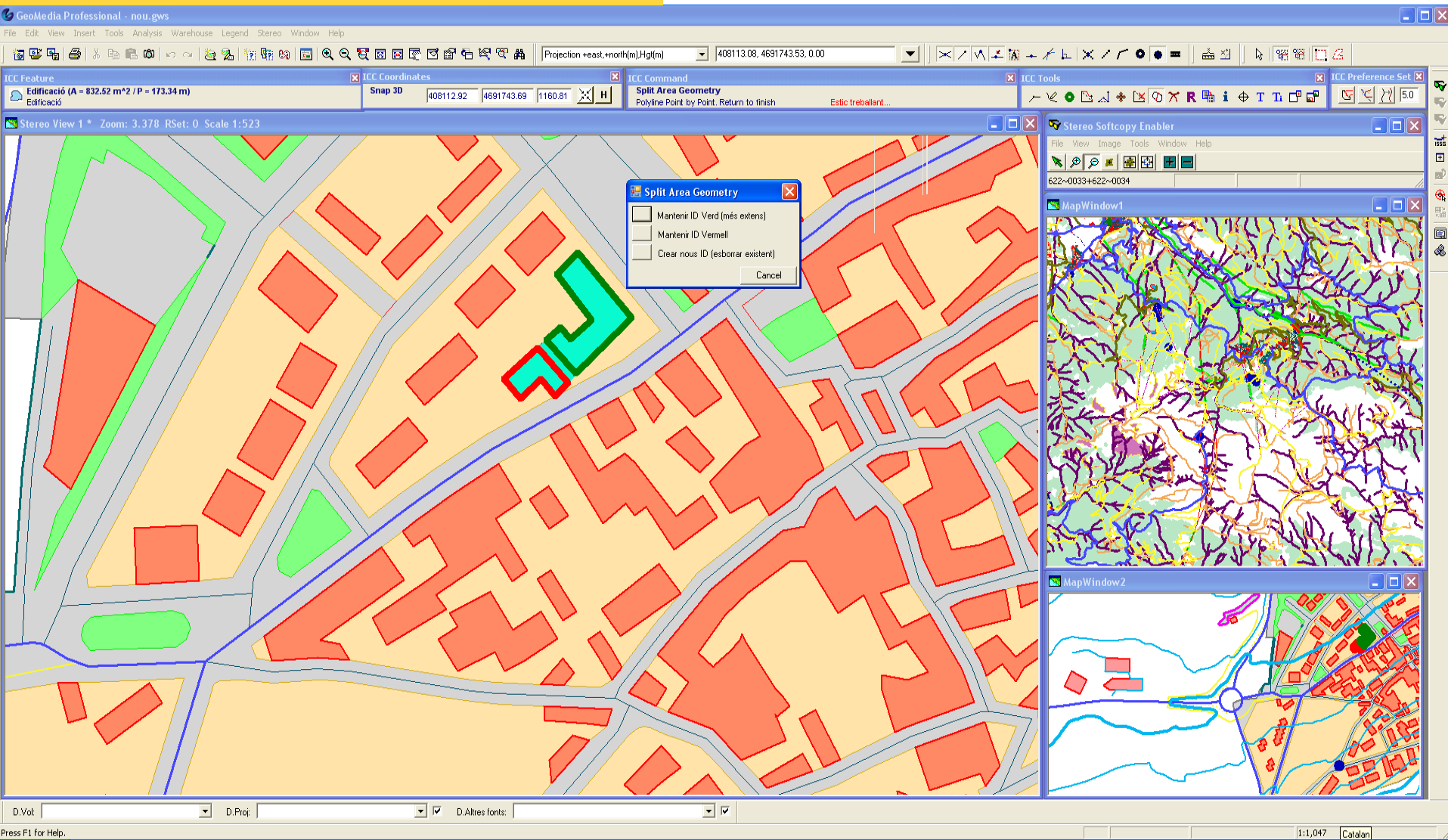


- Information about feature instance moving around it without clicking the element
- Specific coordinates field, including H, for showing and enter coordinate values using keyboard
- ...



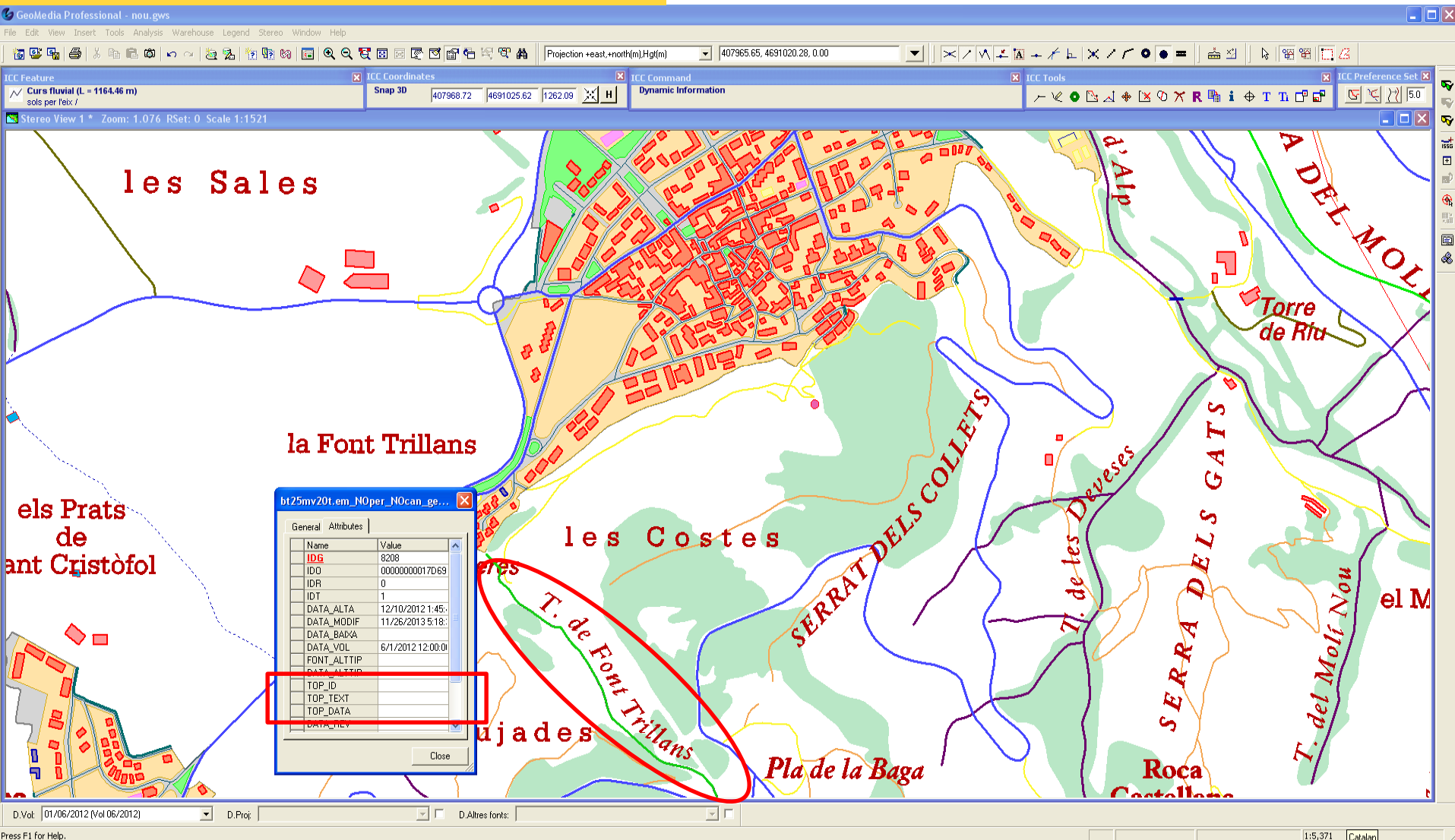
# ICGC Data Capture application

## Management: Feature identifier



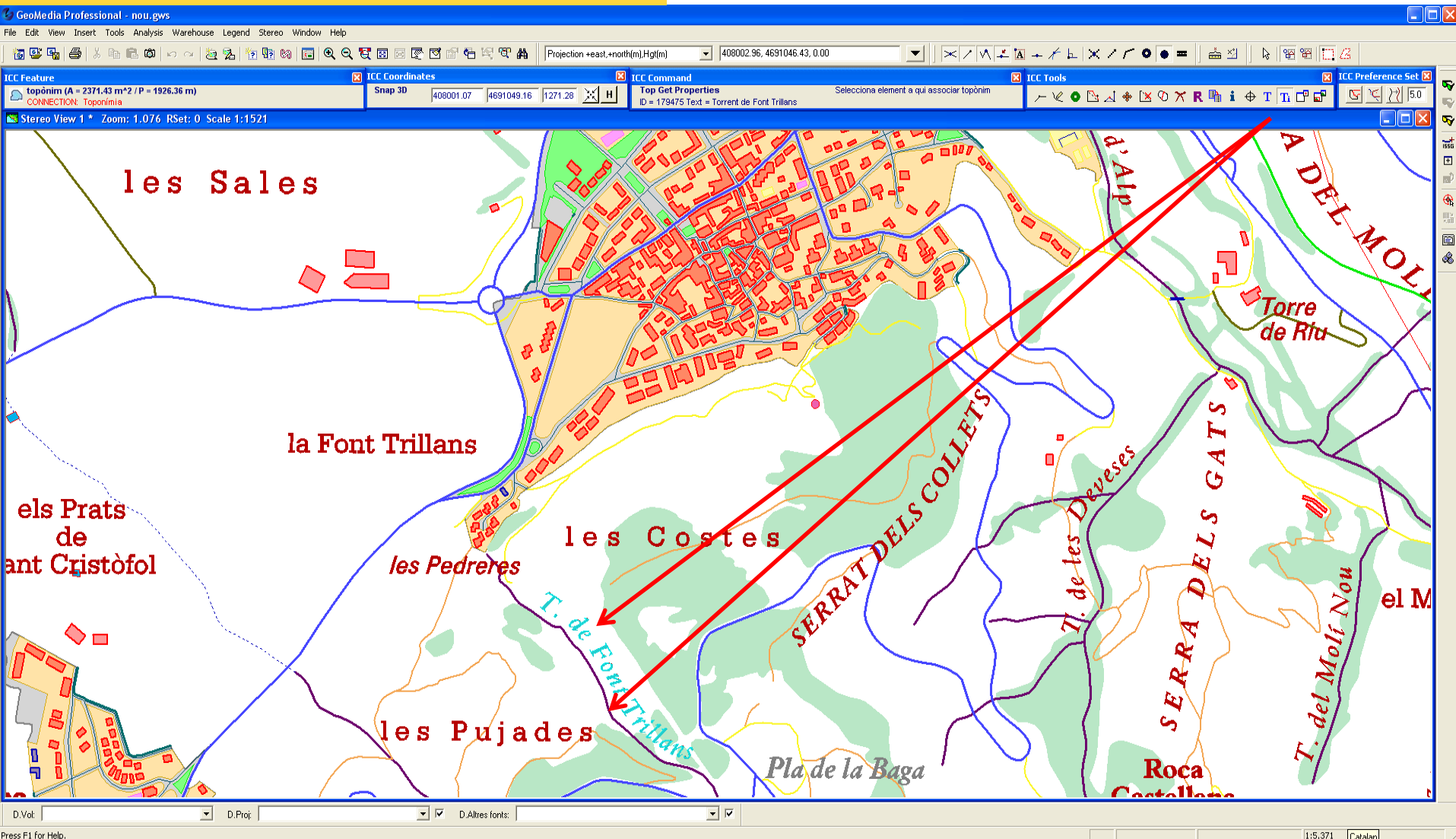
# ICGC Data Capture application

Management: Map name and feature link



# ICGC Data Capture application

Management: Map name and feature link



## Management: Map name and feature link



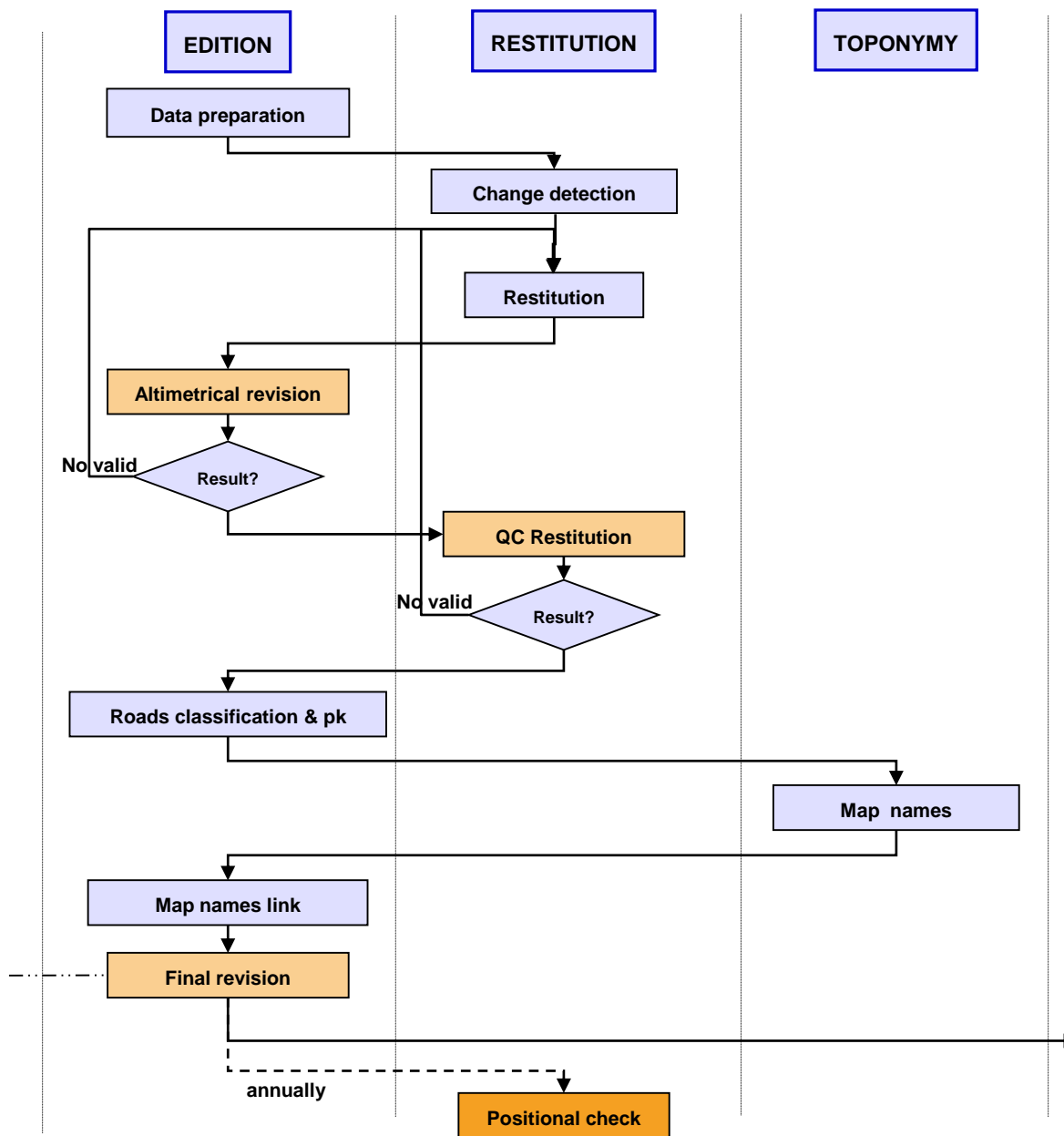


**Quality  
system**

Changes

## Assurance by design

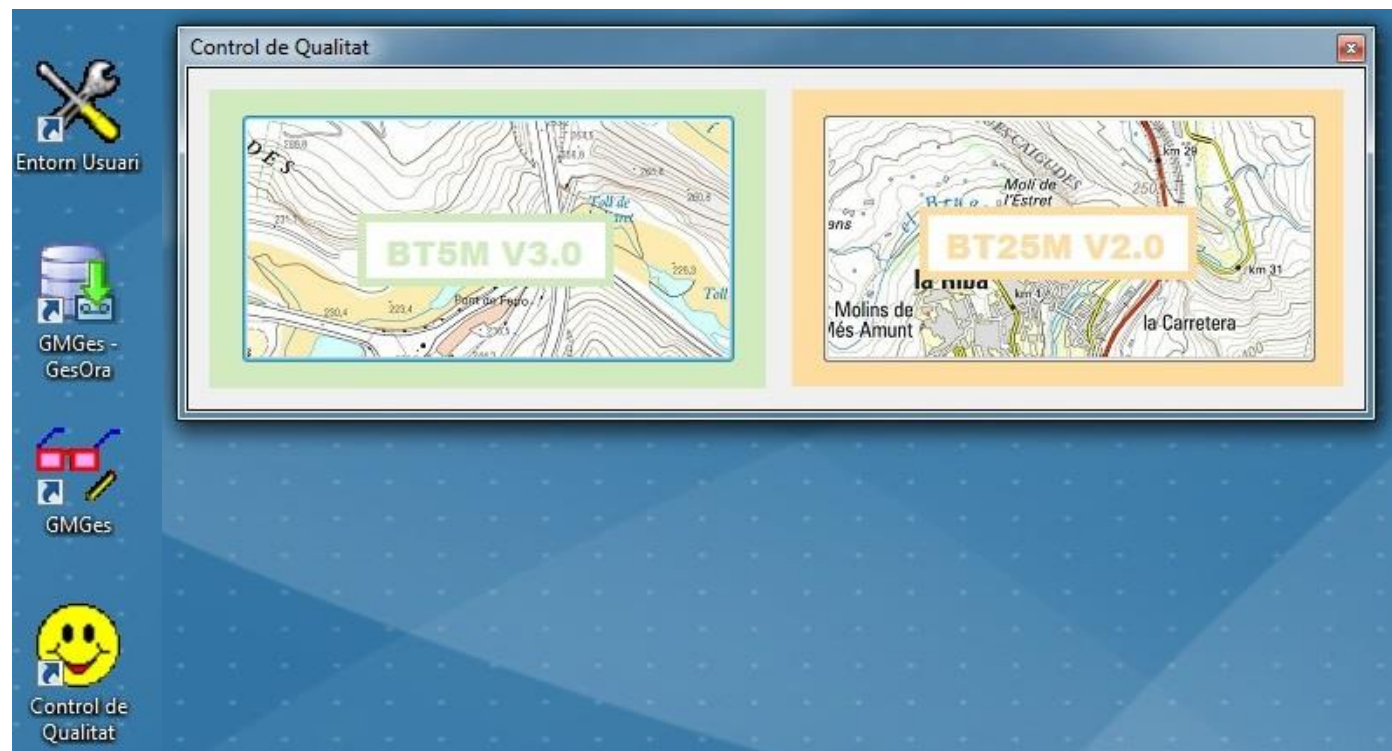
- Full control on feature catalogue: feature classes, authorized attribute combination, attributes domain ...
- Tools designed to ensure the minimum sizes and minimum distances between elements during data capture
- Implementation of the 2D/3D drawing mode for snapping, copy parallel, sharing geometries and sharing vertices
- Tools to force the isotonic or flatness characteristic of features
- Automatic orthogonality inside a range close to 90° in drawing time



# CQ manager

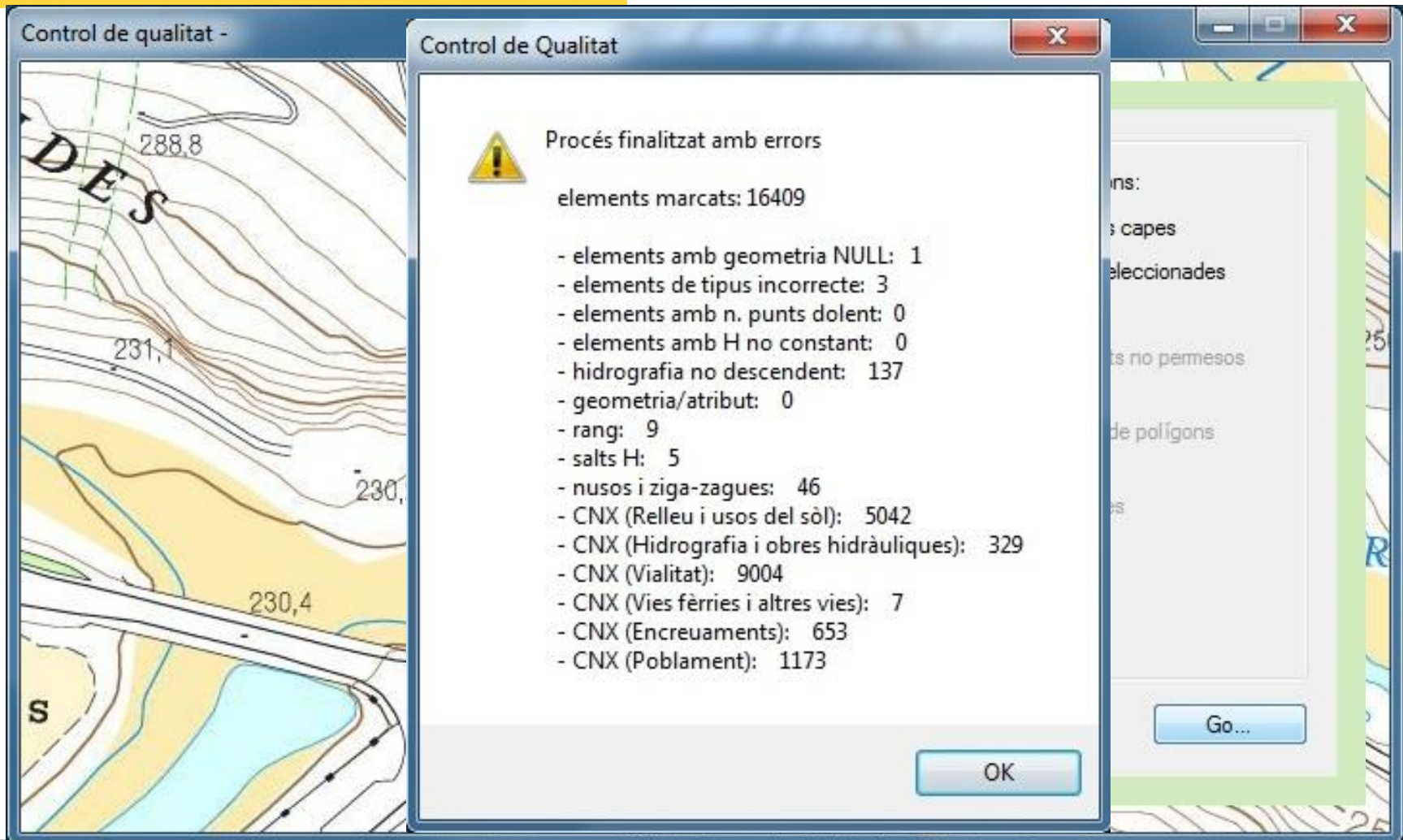
Integrated in the work environment

- Off-line quality control processes for testing the topology constraints, the altimetrical coherence between elements...

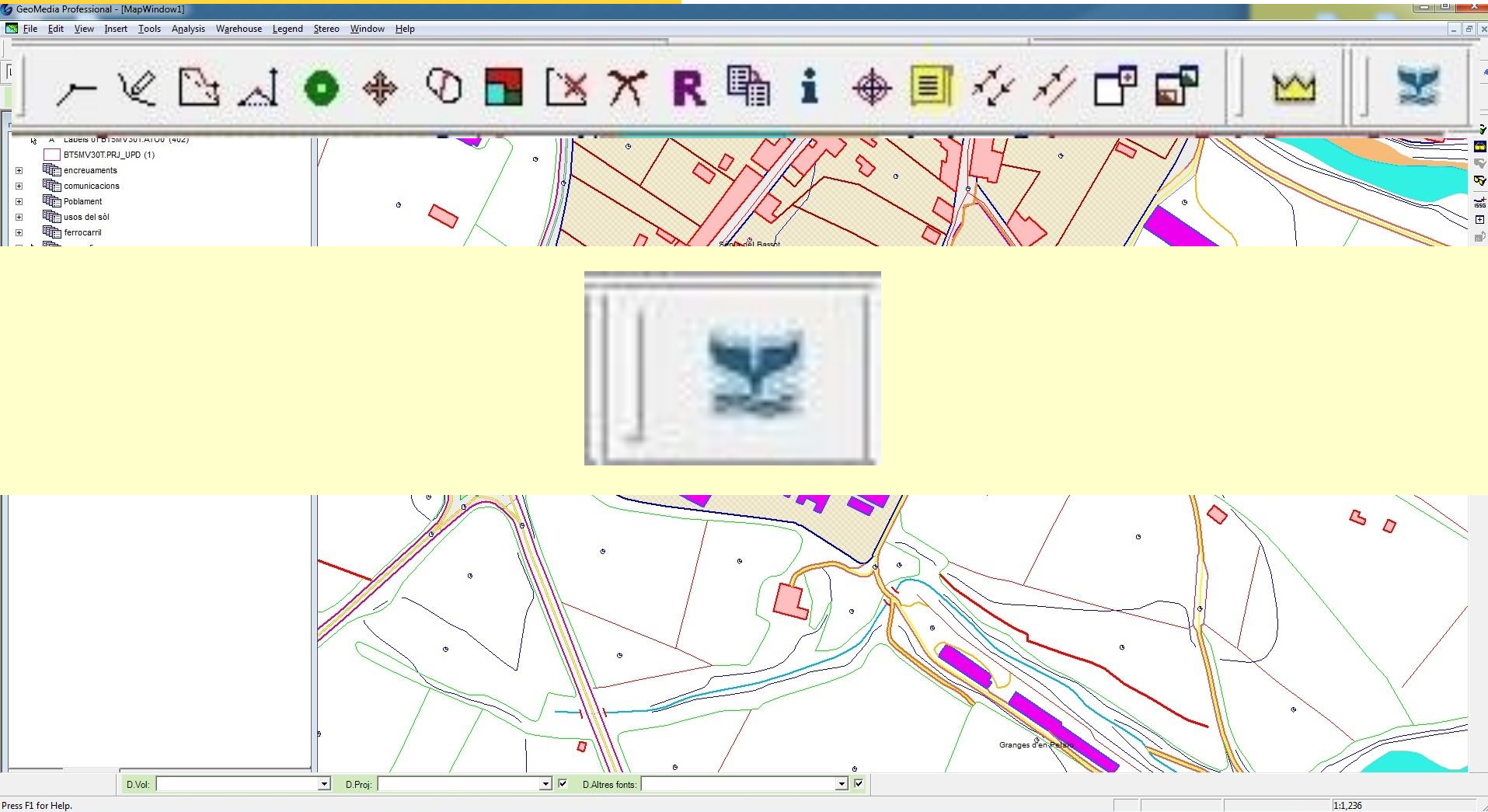


# Detection

Warning results marked in the DB



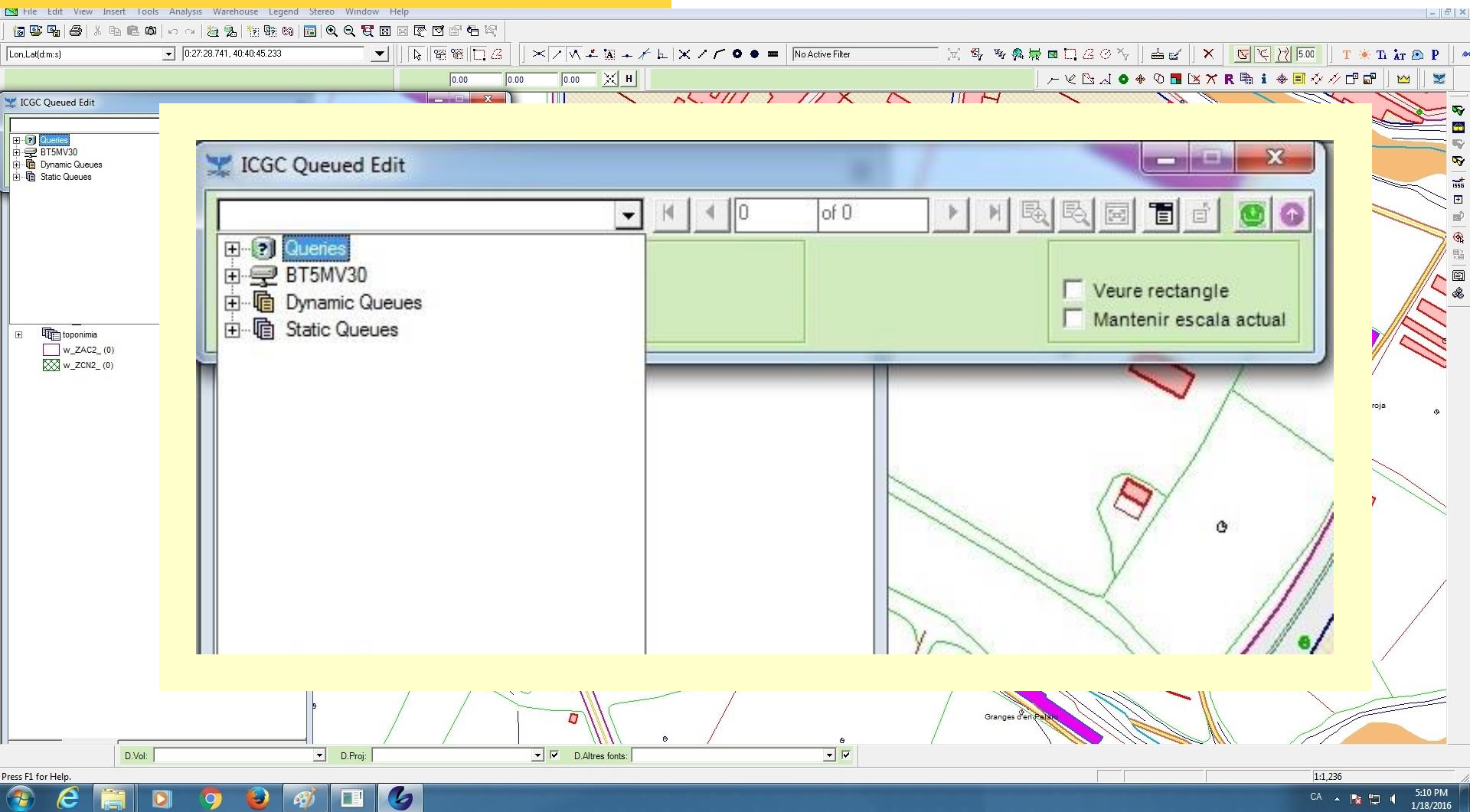
# Revision





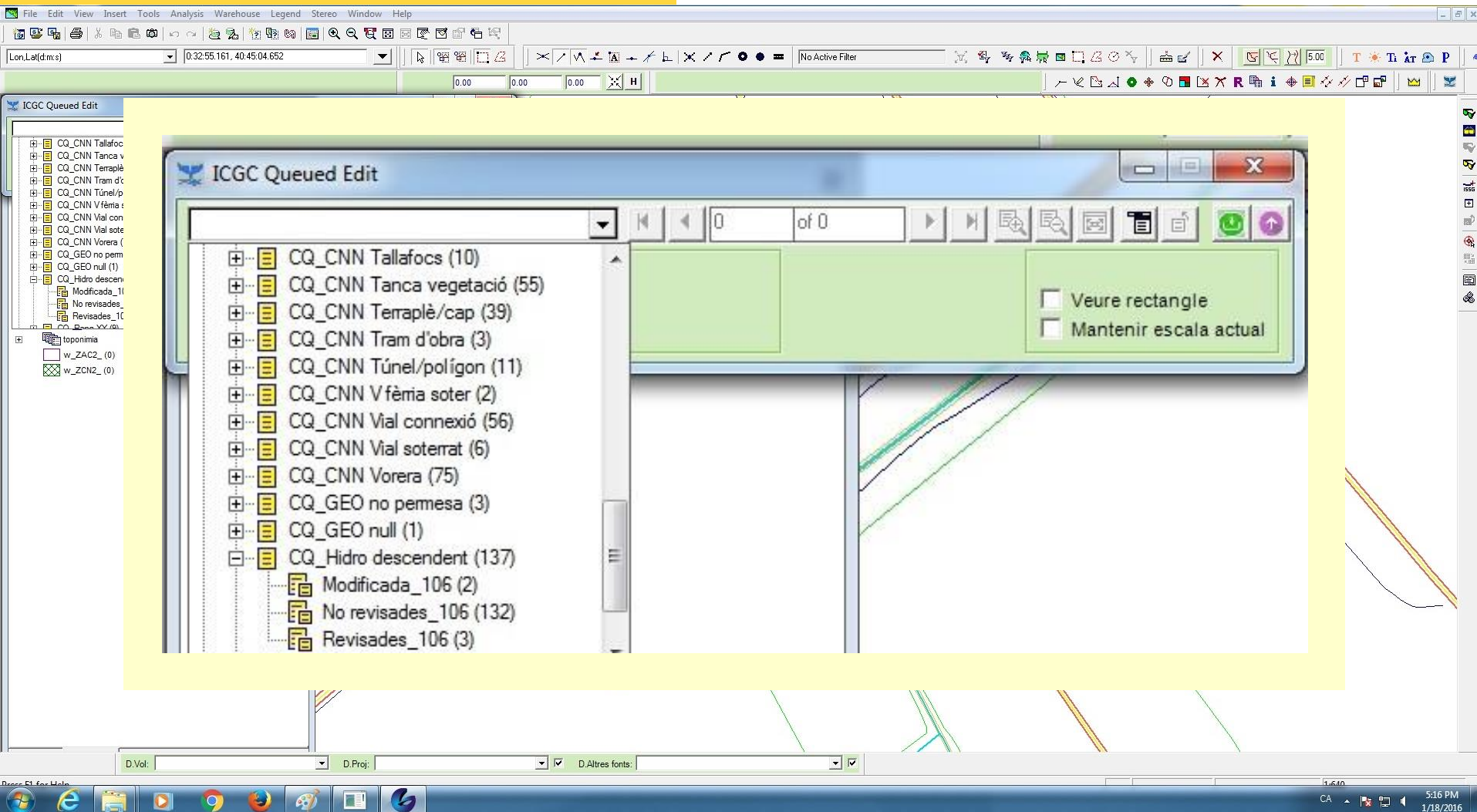
## ICGC Queued Edit

## Revision



# Revision

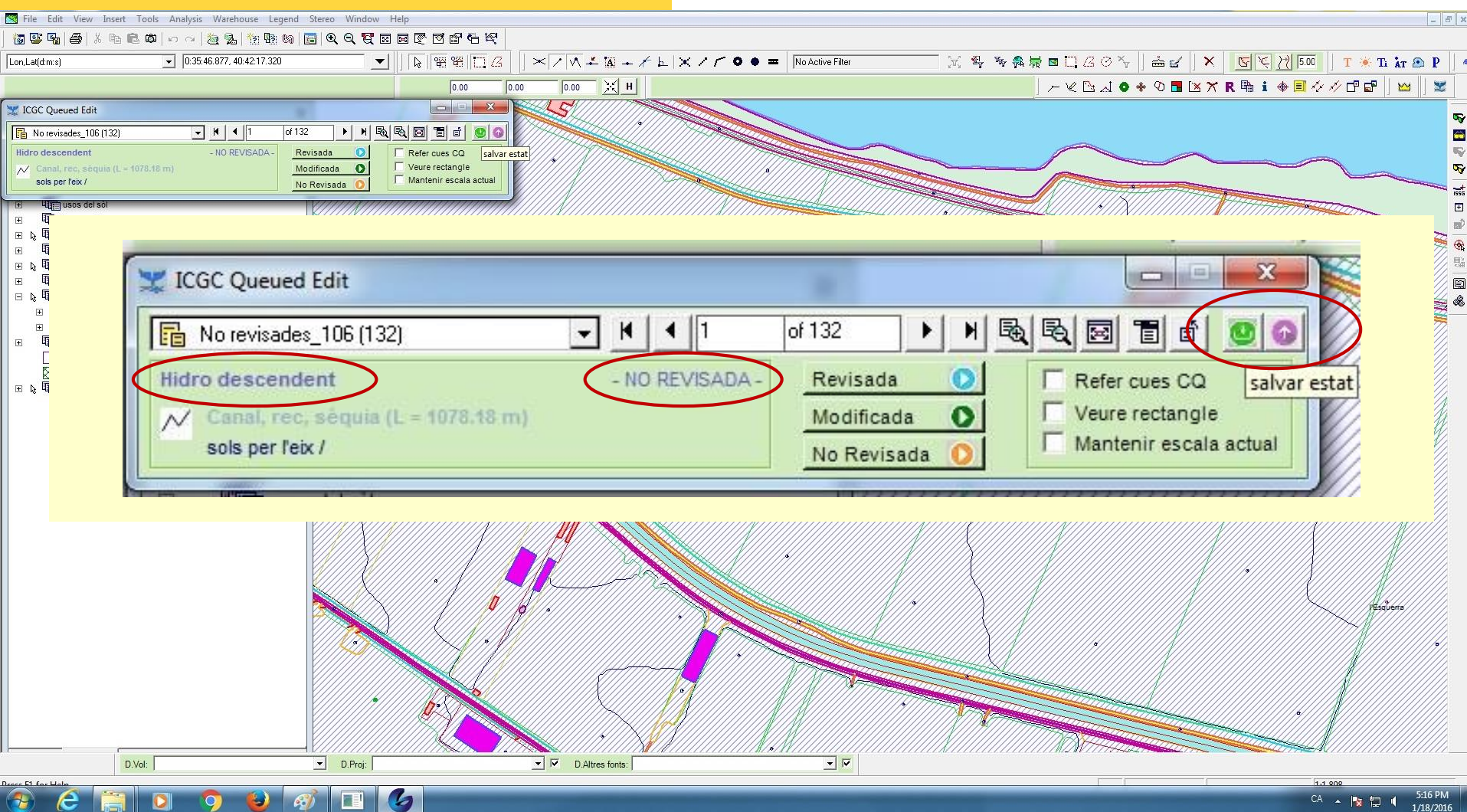
Classified and Queued Edit





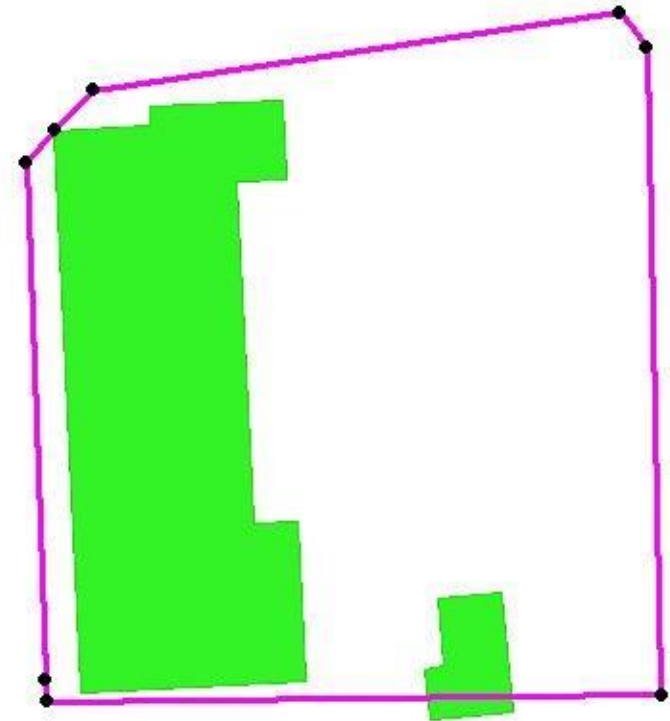
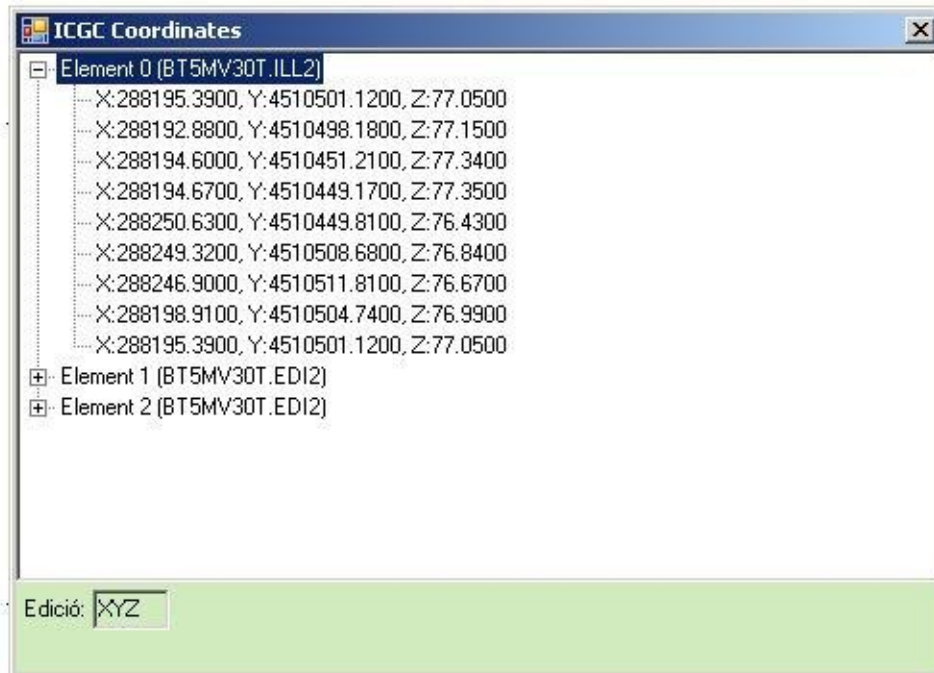
# Revision

ICGC Queued Edit  
Mark as classified for further updates



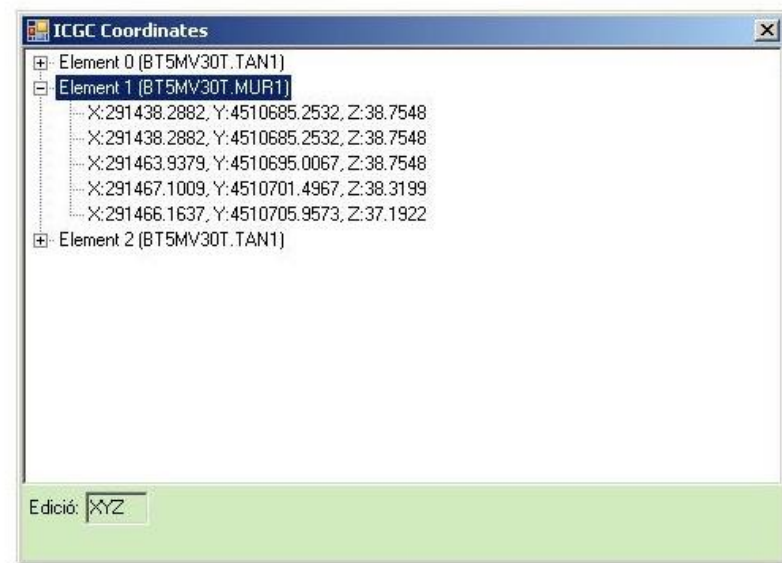
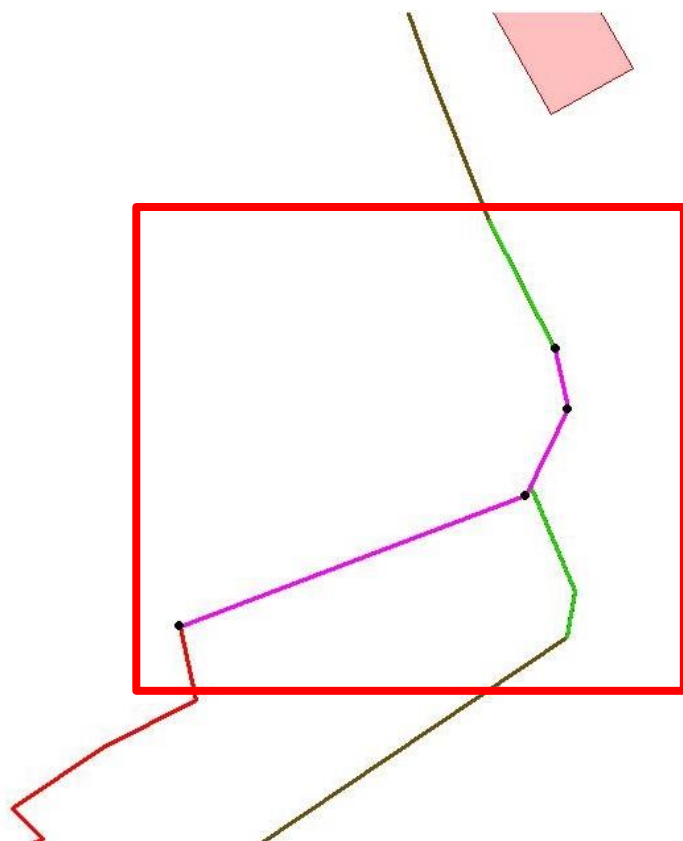
# Revision

## ICGC Coordinates



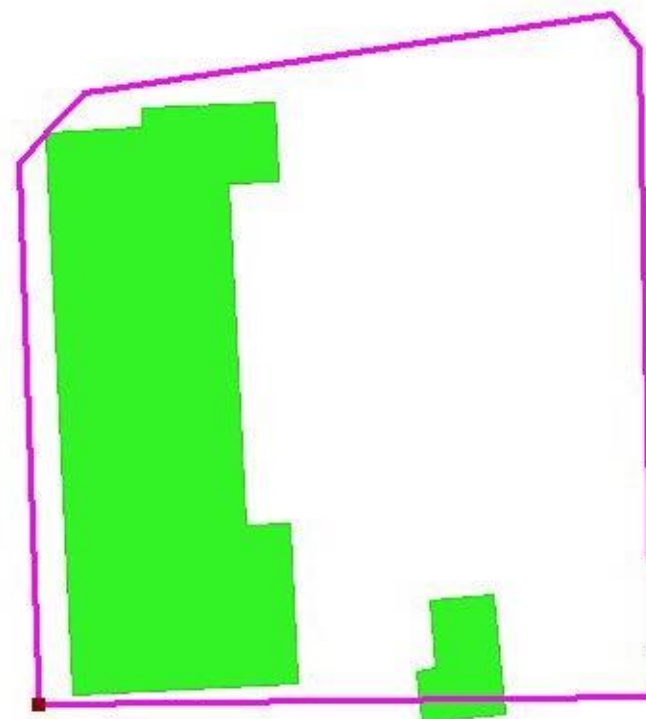
## ICGC Coordinates

## Revision



## ICGC Coordinates

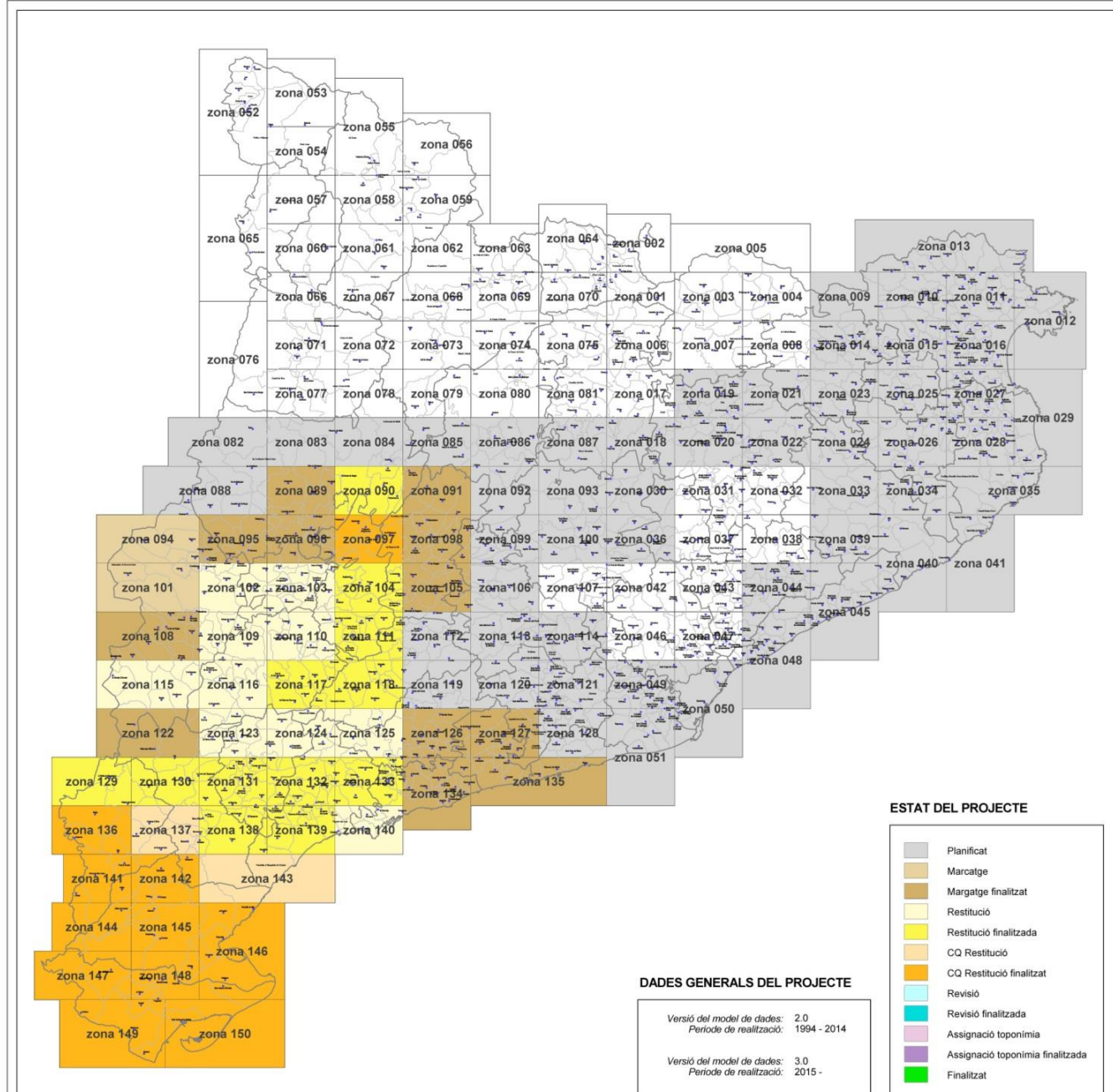
## Revision





# Up to the min

- Achievements
- ICGC Data ca
- Workers has
- Production of
- In progress
- Design of dist
- and thematic
- Content of me





**Thank you!**

**Ευχαριστώ πολύ!**

## Institut Cartogràfic i Geològic de Catalunya

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