



FIG Working Week 2012

Rome, Italy 6–10 May

Knowing to:

Manage the territory
Protect the environment
Evaluate the cultural heritage



PROVINCIA DI TRENTO
GEOMETRI
COLLEGIO



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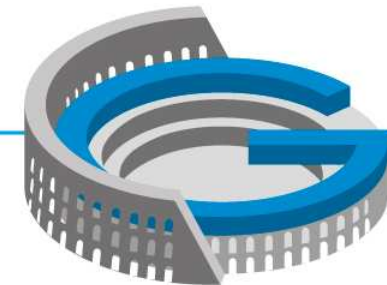




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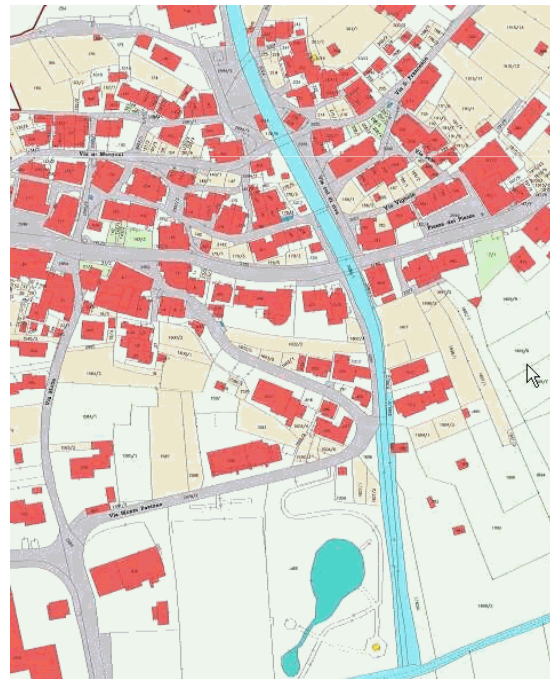
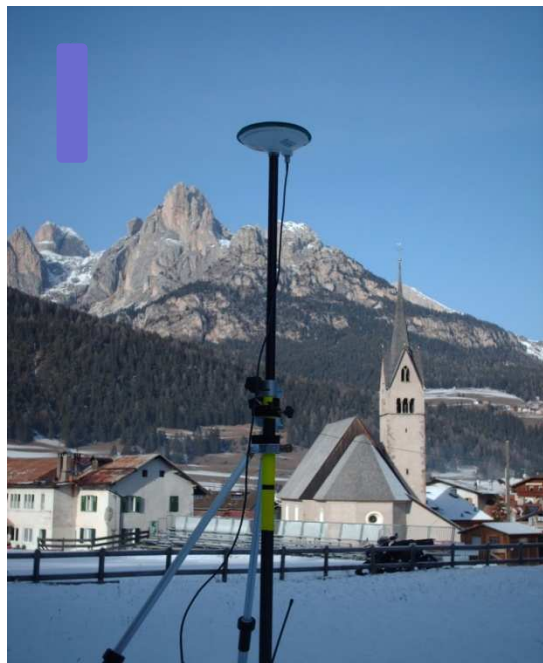
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Works for the

CREATION on NUMERICAL CADASTRAL MAPPING

by ground surveys in the Province of Trento



*a cordial welcome
to the participants*

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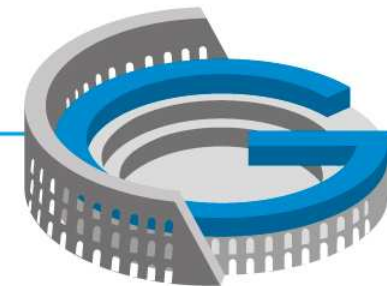




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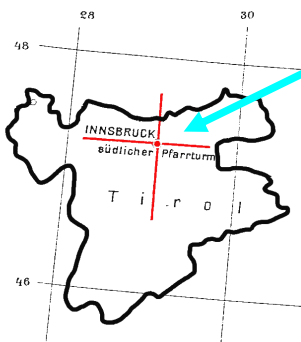
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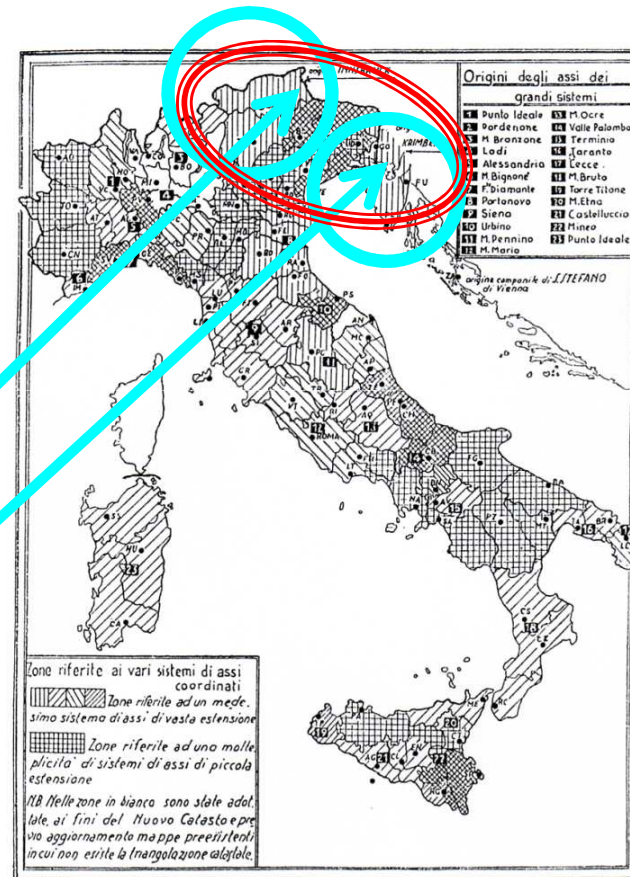
cadastral reference systems in Italy : 23 large systems

for the whole region of Trentino-Alto Adige
and some areas in Friuli Venezia Giulia
(former Austro-Hungarian Empire), there
are two reference systems inherited from
the Austrian Cadastre with origins
respectively in



Innsbruck

Krimberg



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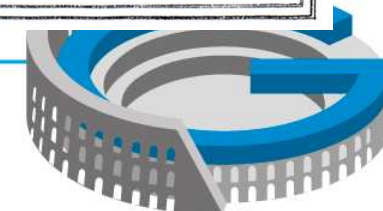




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technical specifications of the original MAP from former Austrian Cadastre



- cartographic representation system :
CASSINI - SOLDNER dim. Km. 300 H. x 265 L.
- scale 1:2880 (original proportion: 1 Viennese inch to 40 Klaffer (old unity of measure = 1.89 mt.)
- triangulation network survey : 1851-1855
- detailed survey : 1856 -1861
- surveyed a total of 13,297 Map Sheets on an area of 38,500 square kilometers

... a huge work carried out in a very short time !!

..... a sincere praise to our predecessor Surveyors !!

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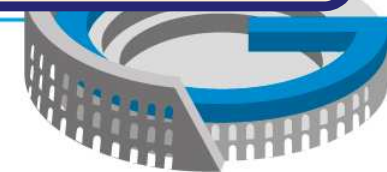




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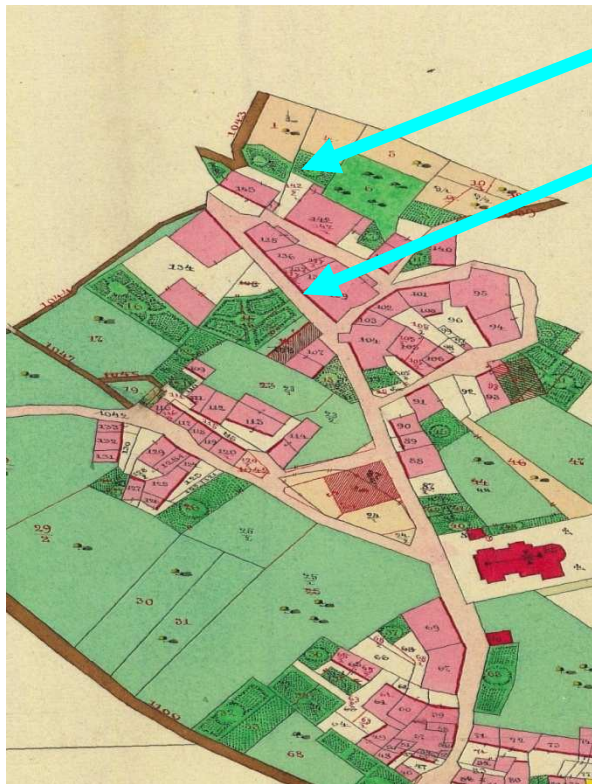
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the attention paid to details have made these maps "talking"



- "different color backgrounds" on the basis of the typology of crops
- "front entrance" of the buildings highlighted in bold

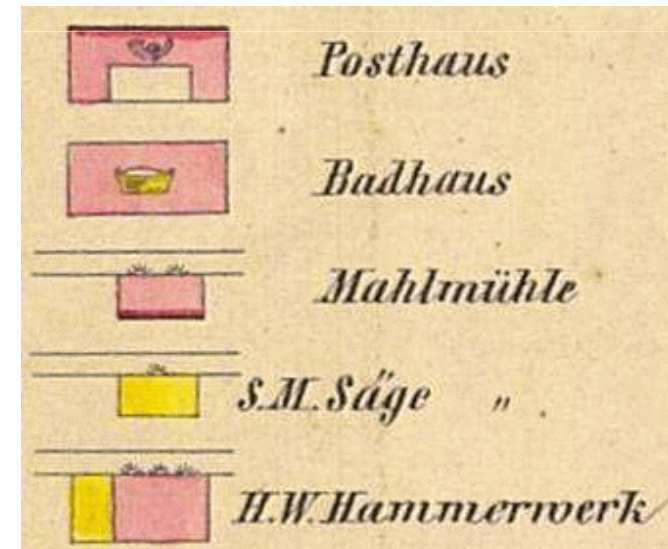
- post office building

- public toilets

- the mill

- the lumber mill

- the blacksmith's shop



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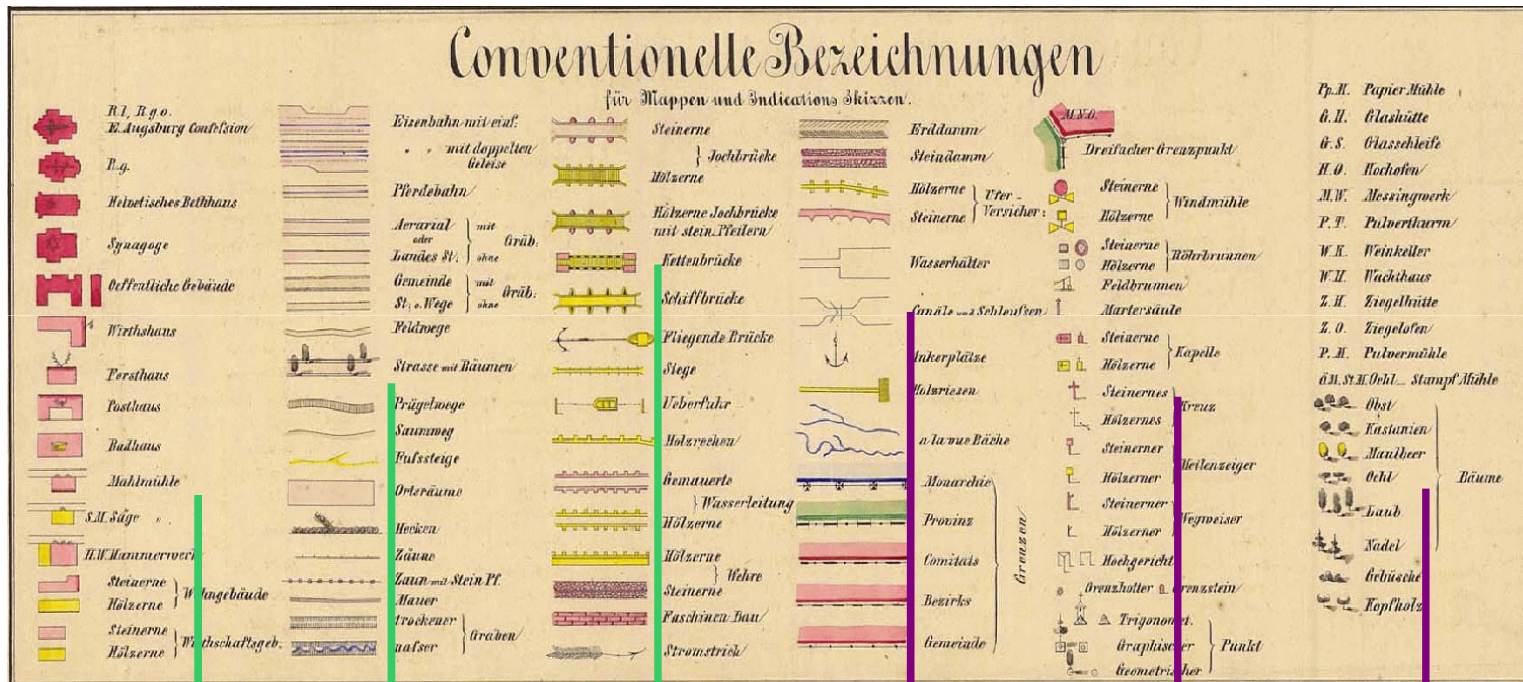
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the completeness of the symbols on the maps in the ex Austrian Cadastre



type of attributes

buildings

traffic

bridges

various boundaries

different manufacturings

different crops

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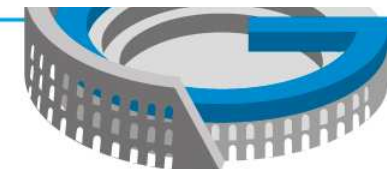




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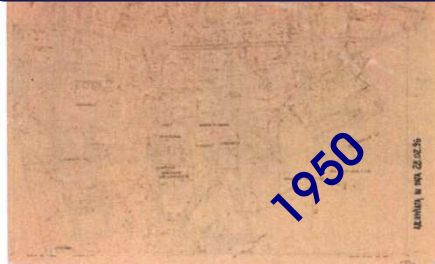
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the **different editions** of the map starting from 1851 to date



updating and recopying the original MAP have **induced a progressive decline of the reliability and accuracy**



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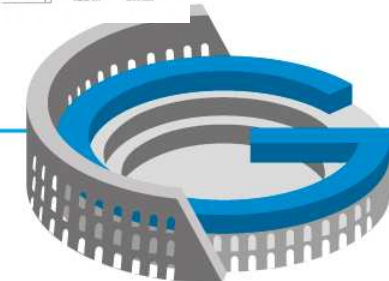




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some reasons to create new “numerical cadastral mapping”

ex AUSTRIAN MAP 1856 - 1861

- tax purposes only
- precision of **mt. 1.50**
- calculation of areas with the **graph numerical method** with crosslinks



TODAY'S MAP of 2000

- **TAX** and **CARTOGRAPHIC** purposes with a gradual **approach** to the "GIS"
- certainty about the location of the boundaries with **centimetric** mapping precision
- calculation of areas with **analytical methods** (GAUSS areas)
- correspondence between the **state of Cadastral Map** in the DataBase and the **current condition**



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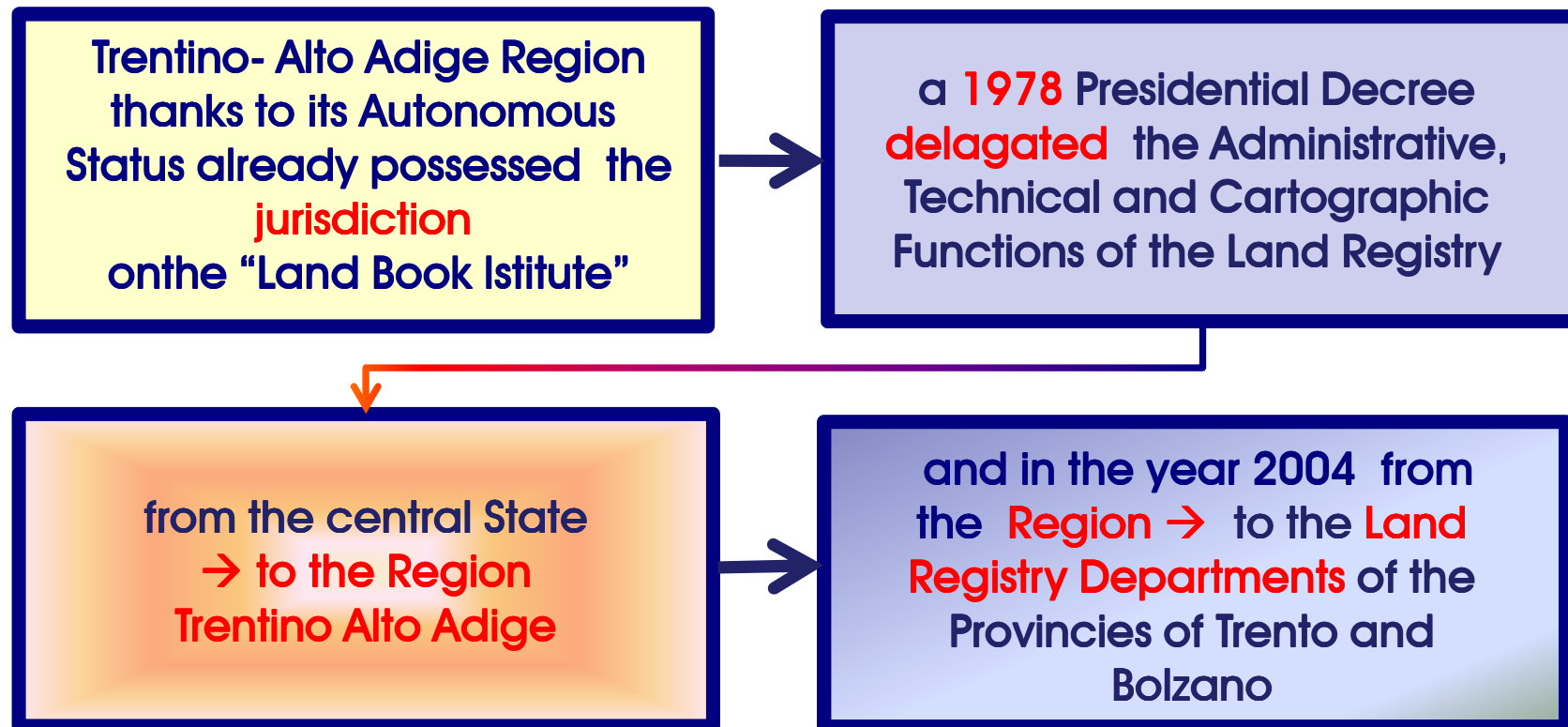
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the legislative premises of **the project**



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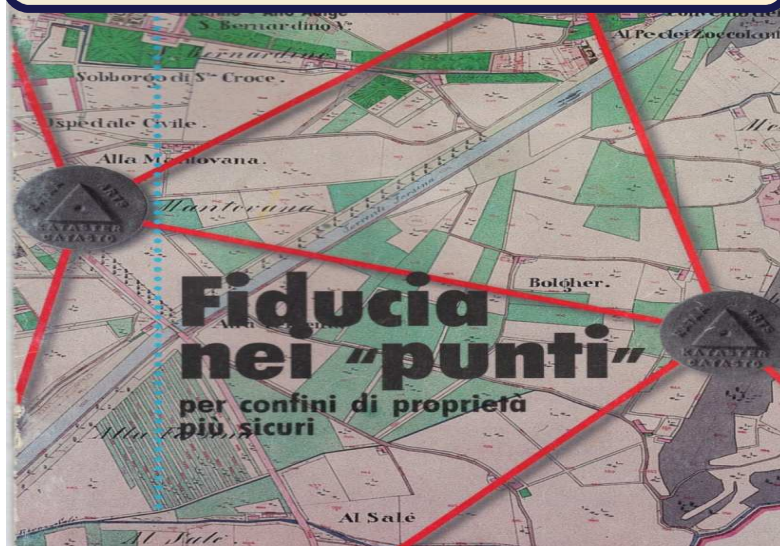
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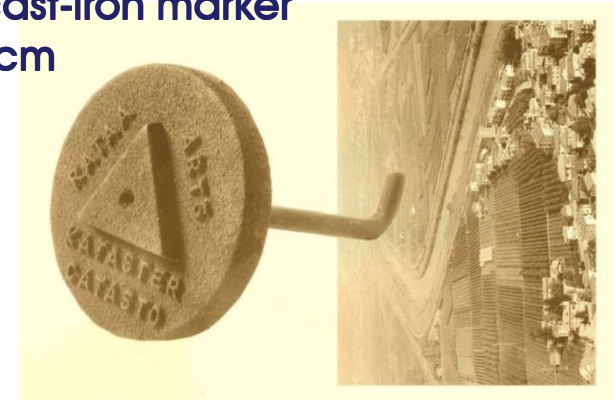


1st Phase - the materialization of the vertices of the network : the “Fiducial Points”

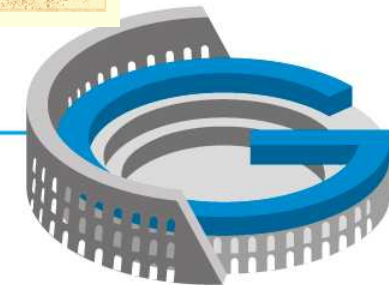
today n° 27800 point
D.B. updates every 24 hours



surface cast-iron marker
diam. 8 cm



marker of depth
(small well 15x 15cm)



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PROVINCIA AUTONOMA DI TRENTO – SERVIZIO CADASTRO

P.F. 120

COMUNE CATASTALE: FOLGARIA
COMUNE AMMINISTRATIVO: FOLGARIA
ORDINE: 4 RETE REGIONALE

LOCALITA': FOLGARIA NOME:

PARTICELLA: 6469/2
F.M.: 17

RIFERIMENTI CARTOGRAFICI

GAUSS-BOAGA: FUSO OVEST - UTM: FUSO 32
CARTA TECNICA PROVINCIALE Foglio nr.: 081070

DESCRIZIONE MONOGRAFICA:

Centro di superficie posto sulla cordona che delimita l'inizio del marciapiede a monte della statale.

ACCESSO:

lungo la S.S.nr.350 in prossimita' del km. 12,700 a lato dell'ingresso al magazzino comunale.

PUNTI DI RIFERIMENTO:

R1 - spigolo muretto = 1,30 m.
R2 - spigolo muretto = 2,42 m.

PIANO DI PARAGONE:

Al centro di superficie

Scala 1:1000

COORDINATE UTM-ETRF89
N = 5086734.24
E = 668557.13

COORDINATE GAUSS-BOAGA
N = 5086756.74
E = 1668586.23

COORDINATE CARTESIANE GEOCENTRICHE
X = 4361782.95 m
Y = 861537.12 m
Z = 4559417.77 m

COORDINATE GEOGRAFICHE (gr. pr. sec.)
LATTITUDINE 45° 54' 48.6155"
LONGITUDINE 11° 10' 24.4691"

QUOTA ELLISSOIDICA: 1188.82m
QUOTA ORTOMETRICA: 1139.23m

ULTIMA RICOGNIZIONE:
25/05/1999

monographic card template related to a "Fiducial Point" released by Trento Cadastre Department

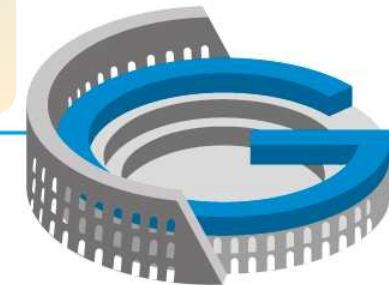
cartographic references

description and access point

Coordinates UTM / ETRF89
Coordinates Gauss/Boaga

Gecentric Cartesian coordinates
Geographical coordinates

Orthometrics heights
Ellipsoidal heights



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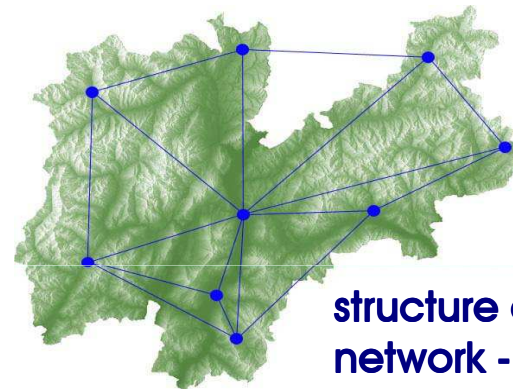
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the GNSS network called "TPOS" (Trentino Positioning Service) of the Autonomous Province of Trento

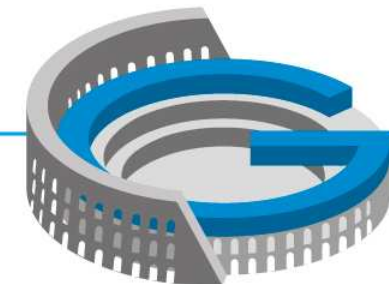
N° 4 stations in the Province of Bolzano
N° 12 stations in the Province of Trento



structure of the GNSS/TPOS network - system IGb00
S.P. = IGM95 / ETRF89



realization antenna type TPOS



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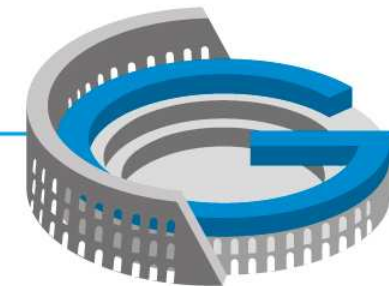
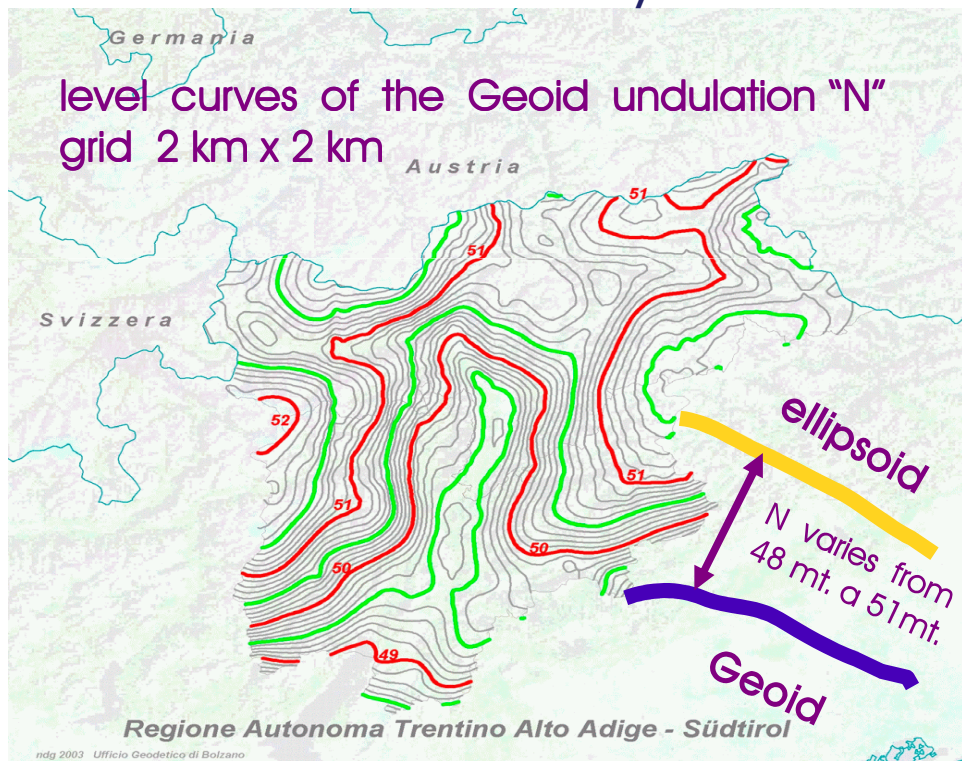
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GEOIDE **altimetric model** in the region Trentino Alto Adige (study by Office Geodetic Bolzano - by Di Girolamo A. - Surveyor)



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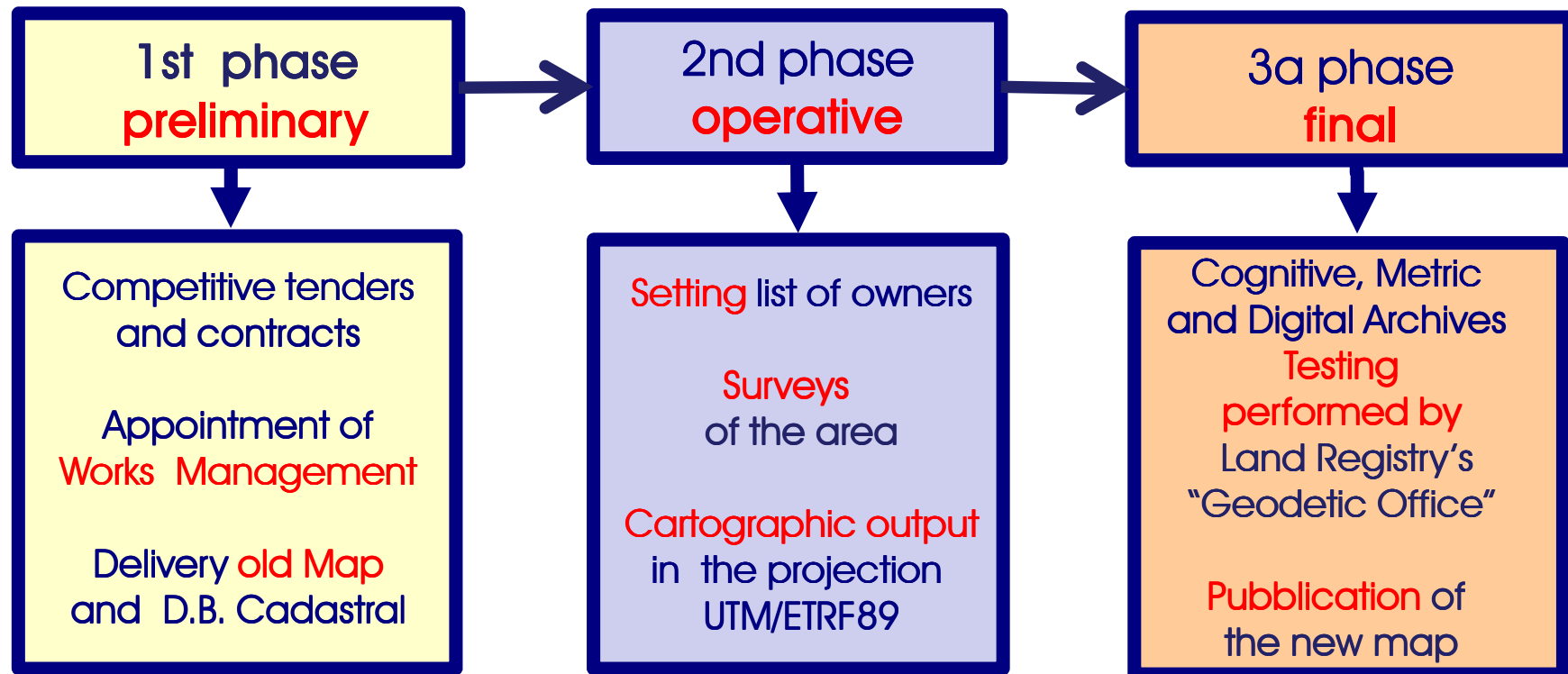
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2nd phase : operative steps for the creation of numerical cadastral mapping



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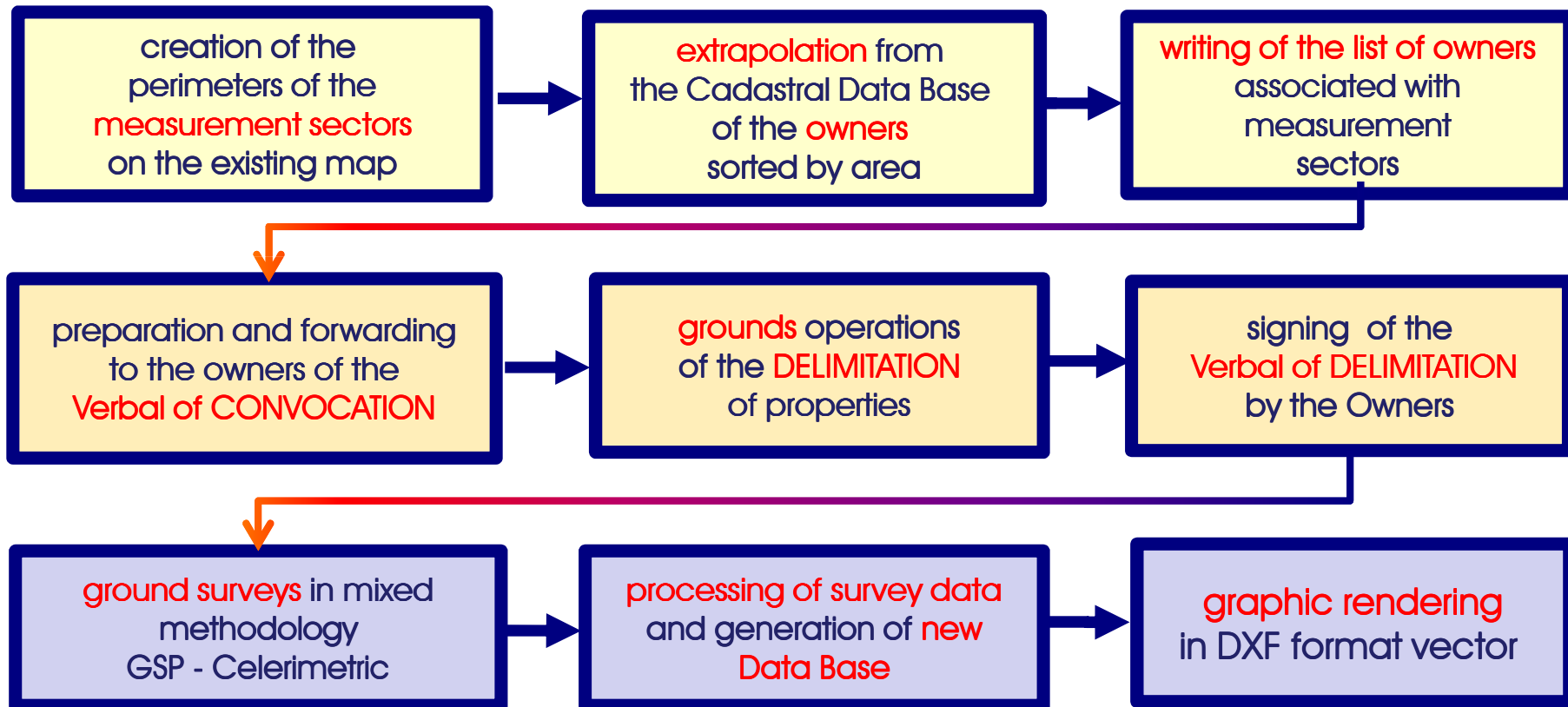
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detail of the **2nd phase** : the creation of the map



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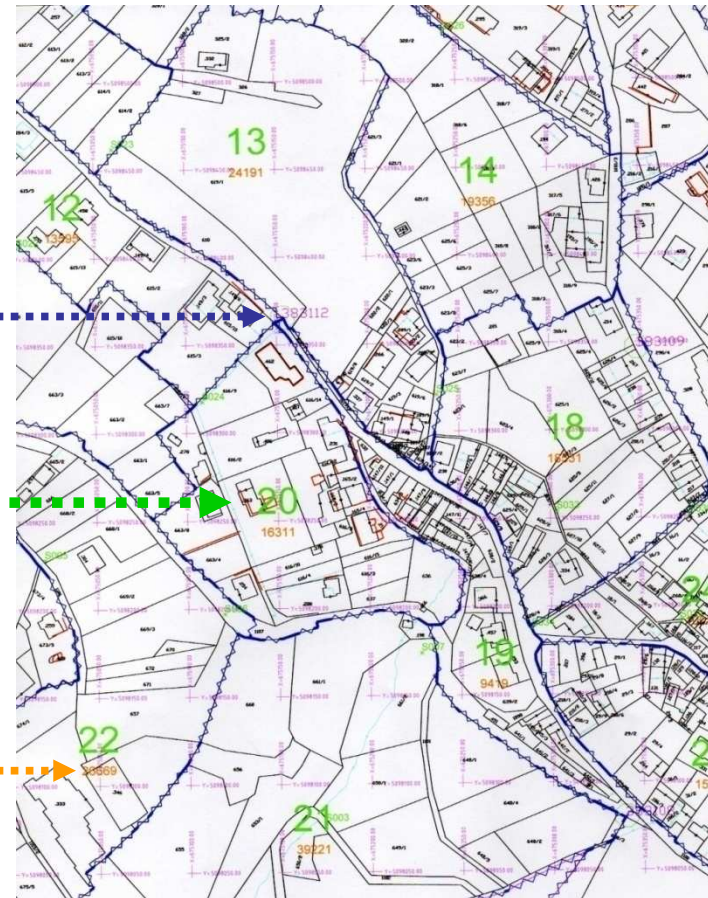
Setting-up of the measurement sectors

(areas of approx 20,000 square meters)

limit of sectors along the lines of natural land demarcation (streets - rivers - railway – etc ...)

identification number of the sector for researching and cataloging of the Verbals

nominal surface of the sector data used for the construction of production statistics



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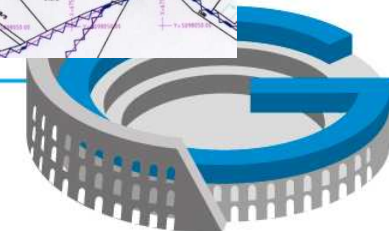




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Setting the List of the Owners and Verbals of Convocation on MDB ACCESS platform - **starting** from a cadastral db file in ASCII format

Query di selezione: Q_IST_01

Cadastral Data Base in ASCII format with different data

link to correlate the data and produce the List of Owners and Verbals of Convocation

Campo:	IST	tipo_PART (E F)	NUM_part	DEN_part	9 PM	6 PARTITA TAV	Località	2 C C
Ordinamento:								
Mostra:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteri:								
Oppure:								

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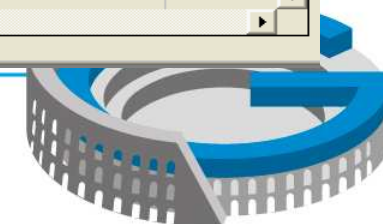




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setting-up of the Convocation Verbals in **automatic** on platform Mdb Access

coupon of notification receipt

NOTIFICATION to Owners
is made
by the Municipality with :

- Official of the Municipality
- Urban Police Corps
- Postal Service

PROVINCIA AUTONOMA DI TRENTO
Servizio Catasto

COMUNE DI POZZA di FASSA C.C. POZZA AVVISO n. 07 / 24

Il Signor / ra - la Ditta **ROSSI Mario** nato/a **Cavalesse** il **07/10/1958** è invitato/a a trovarsi dalle ore **08.00**.....
alle ore **08.15**.....del giorno **12 maggio 2006**.....sulle particelle **E 458 / 2 - F 345 - F 346**
site in **C.C. POZZA località Buffaure** per le operazioni di **DELIMITAZIONE CATASTALE** di dette proprietà.

Si avverte che i proprietari possono farsi rappresentare da una persona di fiducia che dovrà intervenire munita della delega in calce e di documento di riconoscimento.

È del massimo interesse che i proprietari intervengano o si facciano rappresentare per fornire al Tecnico Catastale incaricato tutte le necessarie indicazioni per l'individuazione dei confini.

Tuttavia si avverte che, ai sensi dell'art. 6 del Regolamento approvato con D.P.G.R. n. 10/L del 19.7.1990 n. 10/L, l'assenza del proprietario non interrompe il corso delle operazioni.

Per eventuali comunicazioni chiamare dalle ore **18.00 - 18.30** ai lunedì al venerdì i numeri : **349 1004970** oppure **349 1006612**.

Per evidenti ragioni operative connesse con la gestione delle operazioni di delimitazione l'orario suindicato può subire lievi variazioni.

IL TECNICO CATASTALE

DELEGA:

il sottoscritto delega il Signor / ra
a rappresentarlo nelle operazioni di delimitazione catastale della sua proprietà p.f./p.ed
come dal soprascritto avviso

II PROPRIETARIO

ART. 2 L.R. 8.3.1990, N° 6 – ARTT. 6 e 8 REGOLAMENTO APPROVATO CON D.P.G.R. N° 10/L del 19.7.1990

AVVISO n° 07/ 24 C.C. POZZA COMUNE DI POZZA DI FASSA

Il sottoscritto (2).....attesta che in data odierna è stato notificato
al Signor / ra / Ditta **ROSSI Mario** residente in **38036 POZZA DI FASSA / TN via Marmolada 7**.....
l'invito per assistere alle operazioni di delimitazione catastale di cui al sopraccitato avviso,
mediante consegna al Sig. (1).....
Pozza di Fassa, li 15 /04 / 2006 (s) ilComunale

(1) Cognome nome e qualità della persona cui è stato consegnato l'avviso. (2) Il messo ovvero l'indicatore

the data are fictitious
for Privacy

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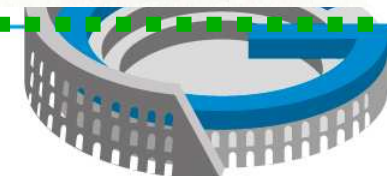




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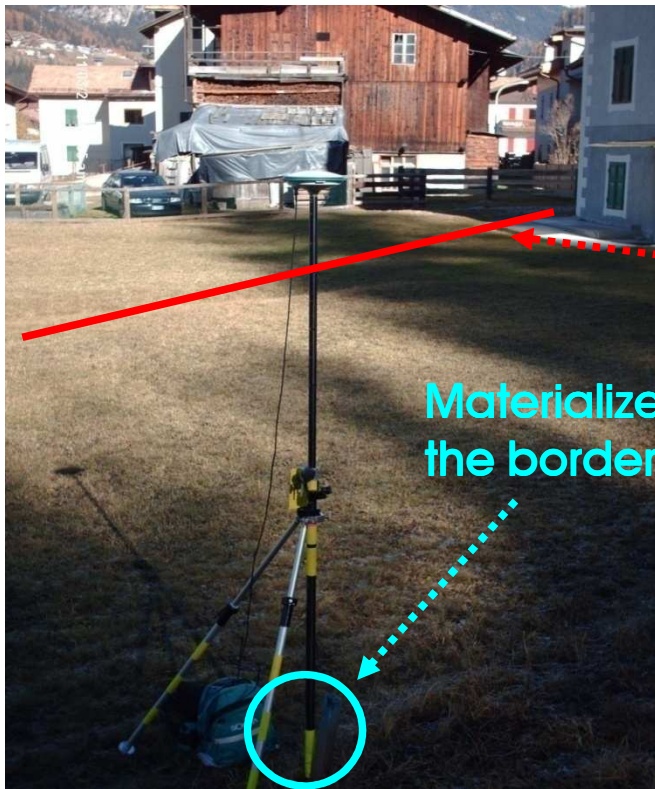
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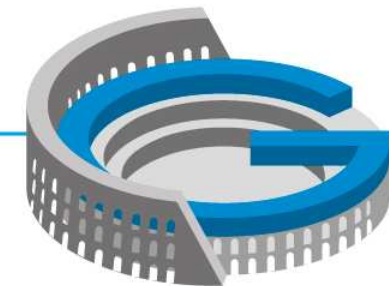
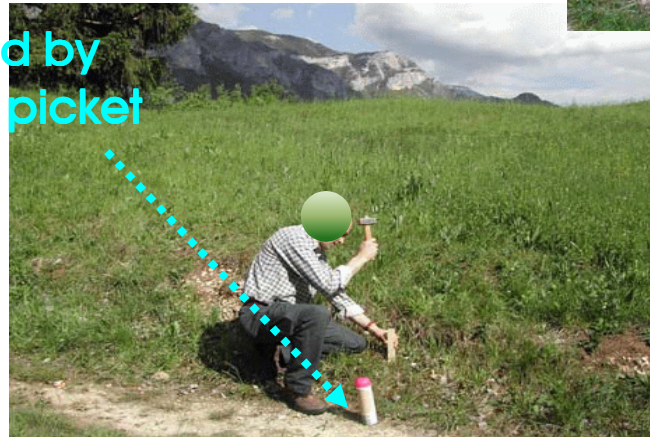


boundary demarcation and reconstruction



Materialized by
the border picket

Boundary
to be rebuilt



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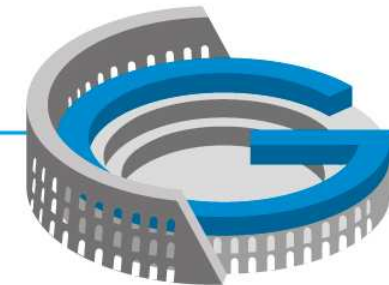


the delimitation of the territory

operations of
"MARKING the BOUNDARY"



scheme
"SKETCH of DELIMITATION"



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Verbal of ACCEPTANCE of the delimitation

in the **VERBAL** appears what follows :

Owner's name or delegated person

**Number of ground and
building particles**

various observations :
absence of the owners, disagreement,
reconstruction of the historical land
border with documents, etc.

VERBALE n° 07/01...



PROVINCIA AUTONOMA DI TRENTO
Servizio Catasto

Comune Catastale di POZZA di FASSA

AVVISO n° 07/24...

VERBALE di DELIMITAZIONE
(Art. 10 del D.P.G.R. 19.7.1990, n. 10/L)

nel Comune di POZZA di Fassa in località *Buffaure*
il sottoscritto **geometra Walter Iseppi** in qualità di Tecnico Catastale incaricato ai rilievi, alla presenza dei
Proprietari convocati ai sensi dell'art. 6 del D.P.G.R. 19.7.1990, n. 10/L :

Sig. *ROSSI MARIO* Sig. _____
Sig. _____ Sig. _____

ha proceduto alla ricognizione delle linee di confine tra le particelle :
F 458/2
F 345 - F 346

Essendosi le Parti dichiarate d'accordo, o, essendosi risolta la controversia insorta con l'arbitrato del
Tecnico Catastale, la linea di confine fra le sopraccitate particelle è stata determinata secondo le modalità di cui
all'art. 8 del D.P.G.R. 19.7.1990, n. 10/L.

Eventuali osservazioni:
*proprietà risulta tutta delimitata da cordolo
in cui sono staccate le parti in proprietà, tutto
Spigolo n° 10 F 345 presenza di cippo lapideo*
Della delimitazione della linea di confine in oggetto così eseguita si è redatto il presente processo Verbale.

I proprietari interessati
Anna P.H.

Pozza di Fassa, li 12/05/2007

Il TECNICO CATASTALE
geom. WALTER ISEPPI

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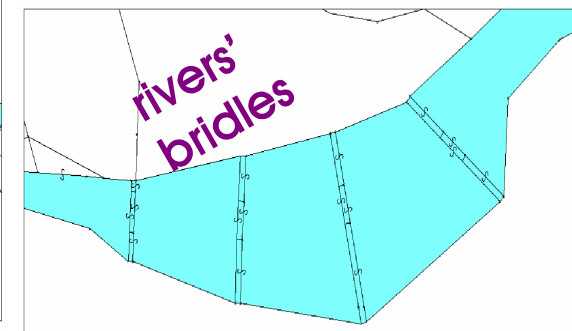
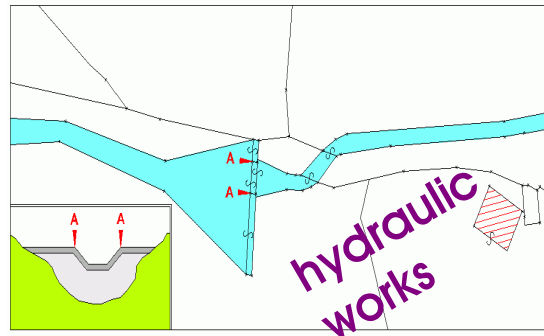
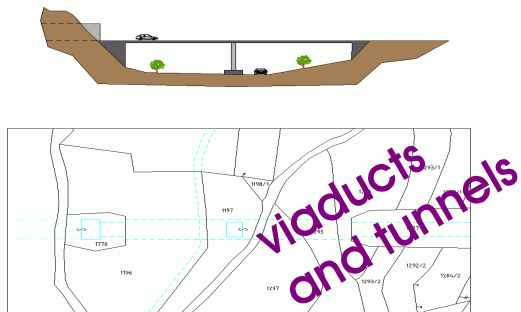
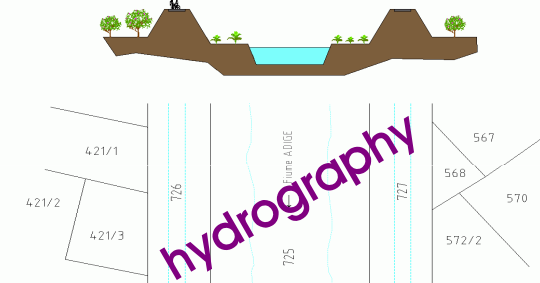
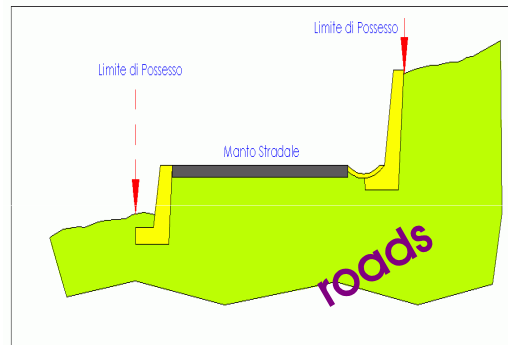
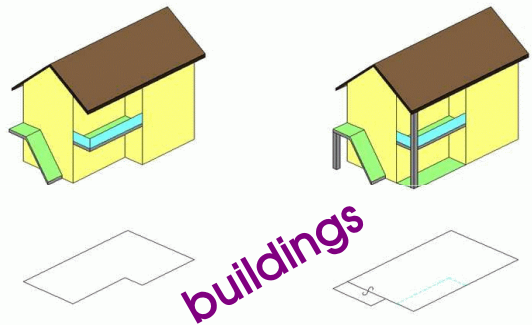
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in the Technical Specifications :
precise details "on what to do and how to detect "



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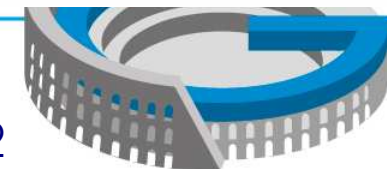




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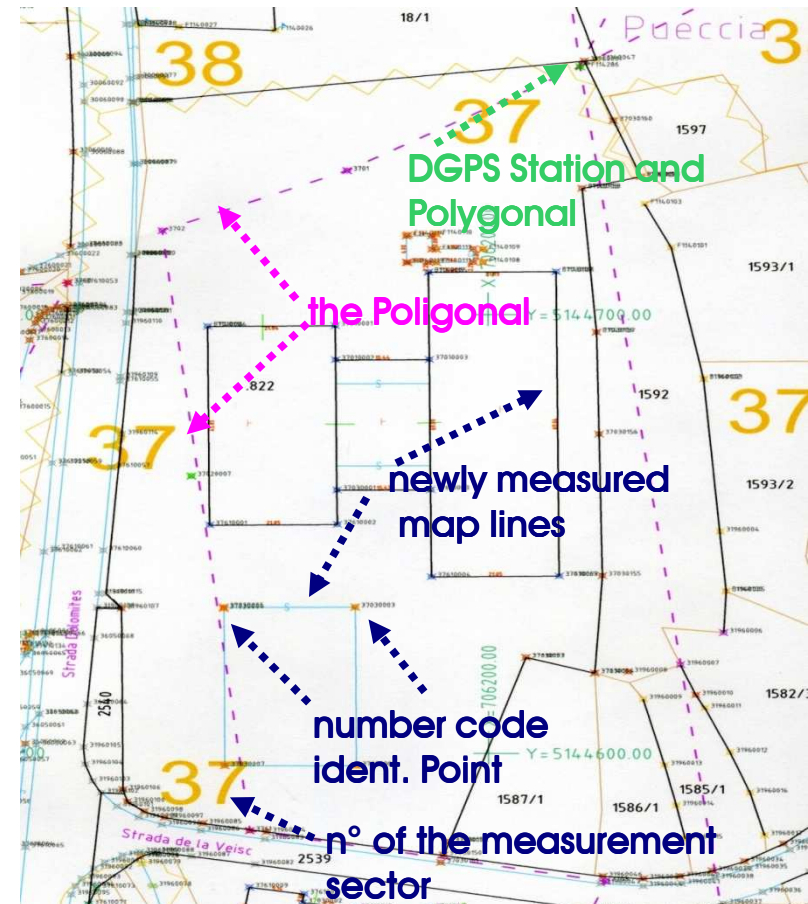
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PRELIMINARY cartographic script

the survey layout with :

- DGPS Station and Polygonal
- the polygonal
- code of the detected point
- new map of the vectorization of lines detected
- number of the measurement sector



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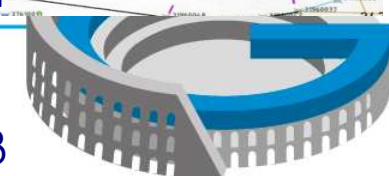




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Knowing to: Manage the territory
Protect the environment
Evaluate the cultural heritage



the surveys of the territory and the making up of digital archives

Surveying of the territory by means of Static DGPS and RTK and/or classical polygonal and Fast survey



planimetric tolerance as from specification : $\leq 0,10$ m.

Setting-up of the numerical Archive of measures in the standard form of the Italian cadastral's software, **PREGEO**

B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q		
C.C. 286 POZZA_Meida (sx. Avisio) DATI RILIEVO con ALTIMETRIA																	
Punti con H.pr. = 0 non sono validi in altimetria (punti battuti con Laser o Target retroriflettori fuori quota)																	
Per tipologia codici vedi TABELLA allegata alla RELAZIONE ILLUSTRATIVA																	
Type REC. 1 = punto ORI Type REC. 2 = N° P.to Dettaglio																	
Ind.	Prog#	Ind.	Stz.	Type REC.	Vertice Stz.	H. str.	N° P.to Dettagli	H. pr.	Hz	Hv	D. incl.	D. oriz.	Descrizione	Cod.	EST utm	NORD utm	QUOTA art.
1	1	2	PF121286	1,831	05900001	2,068	306,9116	99,2951	22,001	21,999	CONFINE presunto non materializzato	28	706523,126	5145084,642	1313,64		
2	2	2	PF121286	1,831	05900002	2,068	399,7858	99,0940	38,187	38,183	CONFINE presunto non materializzato	28	706523,512	5145100,873	1313,94		
3	2	2	PF121286	1,831	05900003	2,068	5,0120	100,1870	75,048	75,042	CONFINE presunto non materializzato	28	706520,406	5145128,534	1314,30		

| rec 1 GPS | n. Point | X | Y | Z | h. ant. | description |
 | rec 2 GPS | n. Point | Δx | Δy | Δz | Dop | H. ant | description |

| rec 1 | n.Station | H. station | description |
 | rec 2 | n.Point | Hz | Hv | slope Dist. | h. target | description |

23	23	2	PF121286	1,831	05900021B	2,068	227,9000	107,9969	113,813	112,917	PICCHETTO legno	15	706480,536	5144958,911	1299,14
24	24	2	PF121286	1,831	05900022	2,068	222,0684	108,1773	110,652	109,741	PICCHETTO legno	15	706491,195	5144958,307	1299,22
25	25	2	PF121286	1,831	05900022B	2,068	221,8733	107,8529	111,469	110,622	PICCHETTO legno	15	706491,577	5144957,259	1299,68
26	26	2	PF121286	1,831	05900023	2,068	231,0977	107,8647	118,030	117,131	ARGINE ciglio	11	706473,530	5144957,486	1298,85
27	27	2	PF121286	1,831	05900024	2,068	229,5491	108,0919	114,643	113,718	CIGLIO strada	21	706477,528	5144959,368	1298,86
28	28	2	PF121286	1,831	05900025	2,068	240,0067	108,5210	107,017	106,060	TACCA inoisa / MARKER colore	17	706465,553	5144874,857	1299,11
29	29	2	PF121286	1,831	05900026	2,068	246,2381	109,0001	100,396	99,365	CIGLIO strada	21	706461,524	5144886,235	1299,25
30	30	1	PF121286	1,831	0562	2,068	247,1136	108,8627	104,139	103,176	STAZIONE DGPS	4	706465,005	5144884,214	1299,27
31	31	2	PF121286	1,831	05900027	2,068	247,1556	108,8560	104,411	103,448	CIGLIO strada	21	706467,773	5144884,054	1299,24
32	32	2	PF121286	1,831	05900028	2,068	250,0787	109,2622	97,970	96,935	CIGLIO strada	21	706463,658	5144991,970	1299,19

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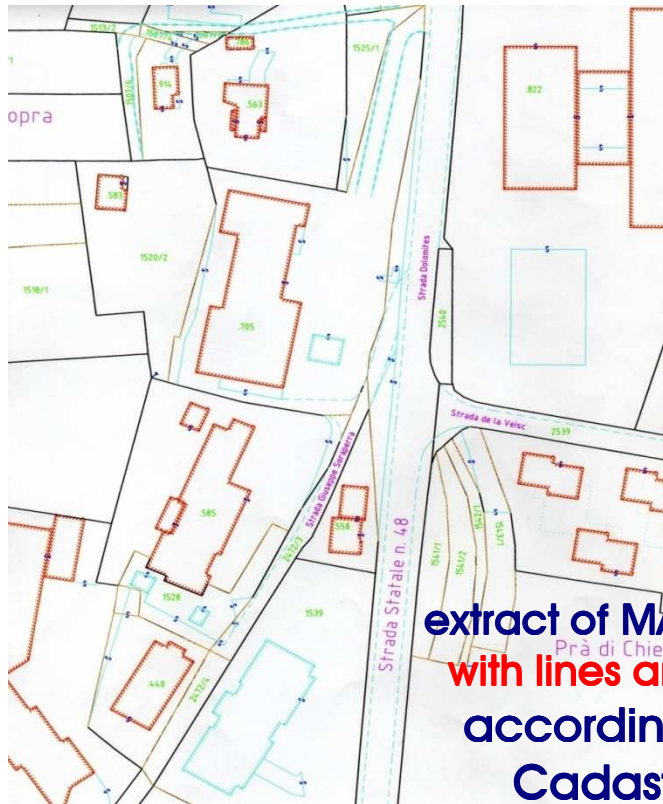
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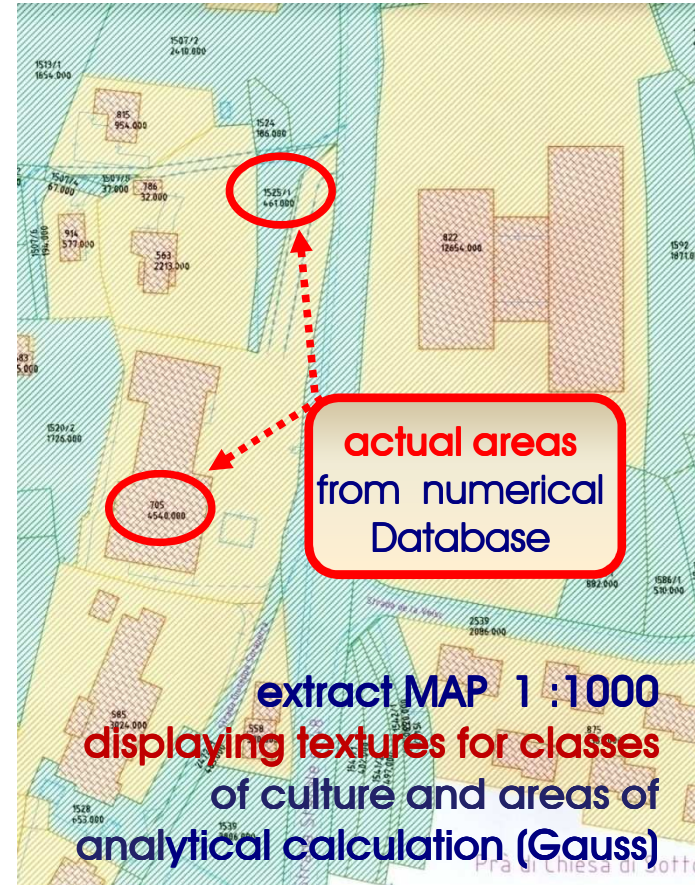
Manage the territory
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PRELIMINARY mapping



extract of MAP 1:1000
with lines and symbol
according to rules
Cadastre Office



extract MAP 1 :1000
displaying textures for classes
of culture and areas of
analytical calculation (Gauss)

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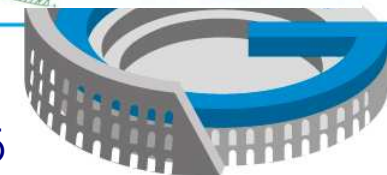




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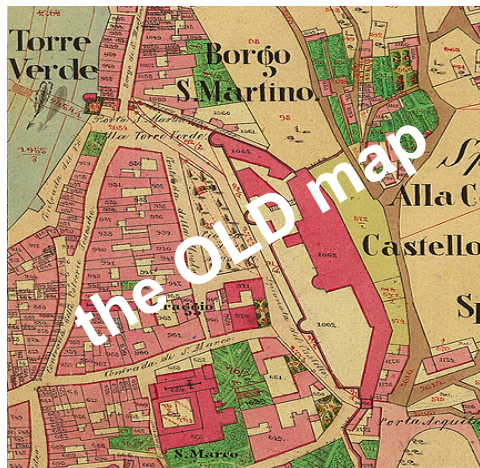
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the final MAP published

- DXF vector - format file in UTM projection in geodetic system WGS84 / ETRF89
- colored backgrounds for classes of culture as in 1856



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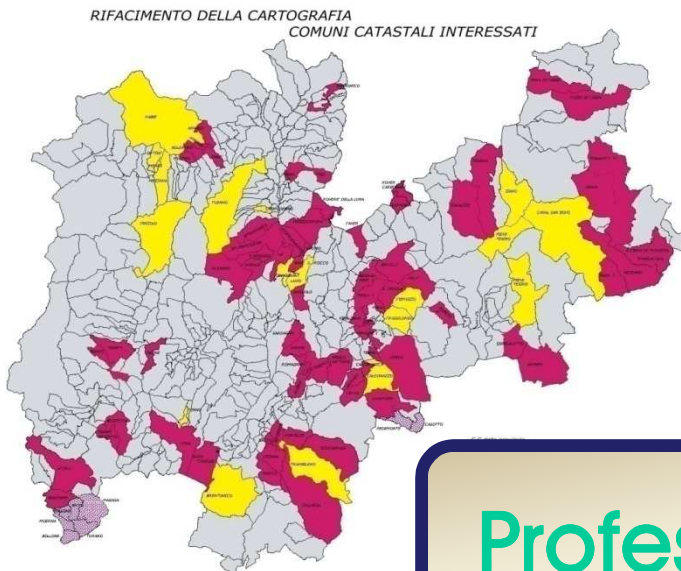
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work performed on the territory of the Province of Trento

statistical data :

- Cadastral Municipalities → n° 447
- total area of survey → Ha. 45000
- type of territory object of the survey → **habited centers and land under high-quality cultivation (excluding mountains, pastures and forests)**
- Municipalities surveyed and tested → n° 103
- Enterprises performing works → n° 35
- **70 %** of enterprises consisted of:



Professional Surveyors

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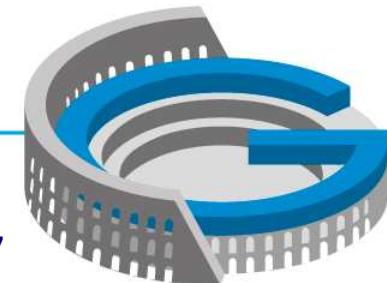




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Thank you for
your kind attention



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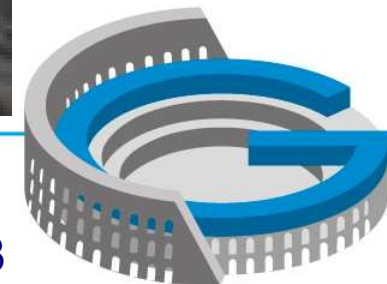




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PROVINCIA DI TRENTO
GEO METRI
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