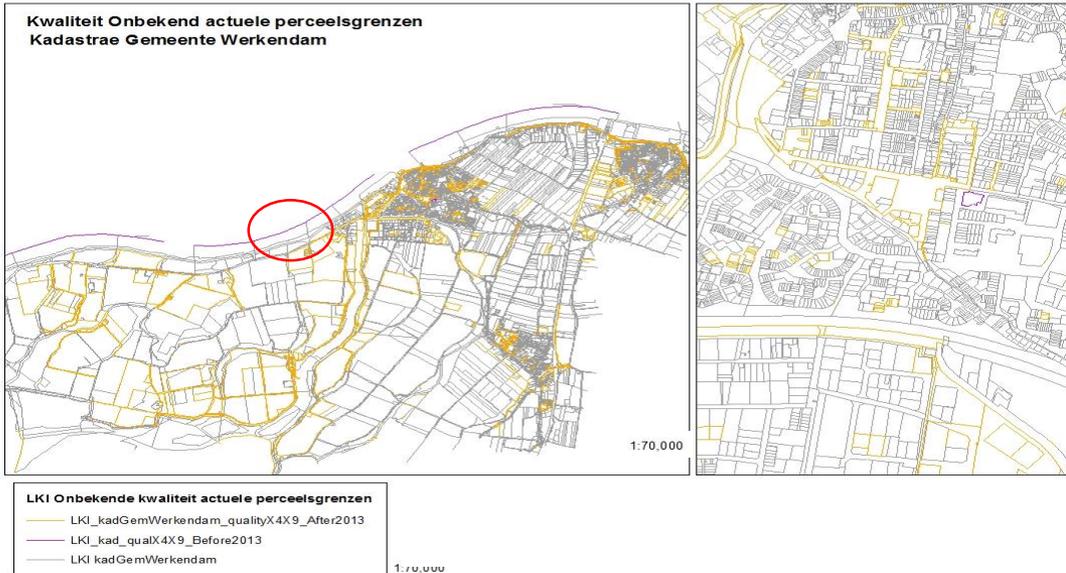




Quality improvement of the Dutch cadastral map and the surveying process

Eric Hagemans, Kadaster
CLGE Riga, september 22th, 2016



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feitelijk verrassend

Introduction

Subjects

- Cadastral map & day to day updating proces (new boundaries)
- Field sketches
- Feasability study to map improvement (better geometric quality)
- 2 goals: communication & do-it-yourself
- Automatic reading!?
- Calculation process





Process cadastral updating



Relaas van bevindingen

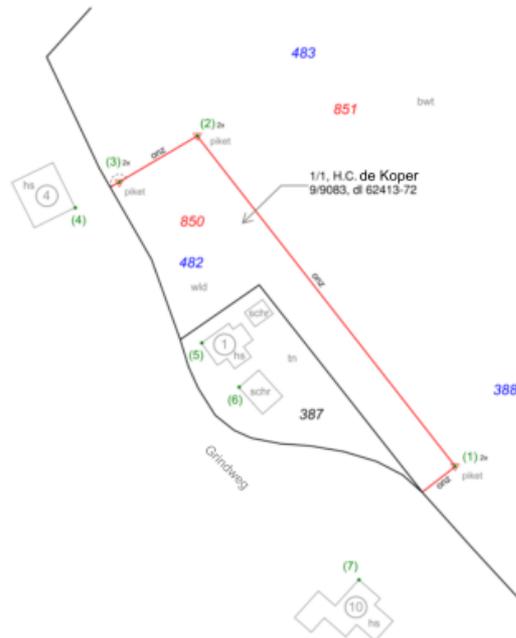
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Gemeente: **APELDOORN**
 Sectie: **8**
 Blad: **Z van 2**

Reconstructiebestand: **Ja** Metingproject: **227883** Archiefnummer: **537**
 Aantal blz/ten: **0**

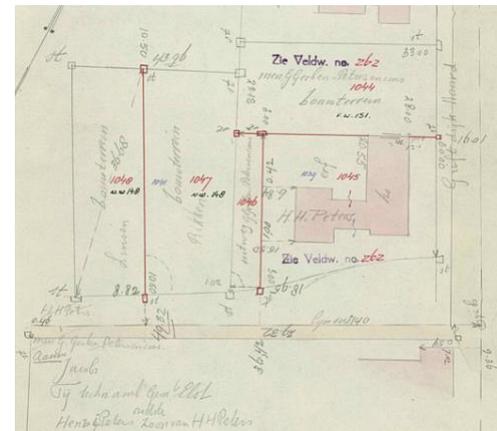
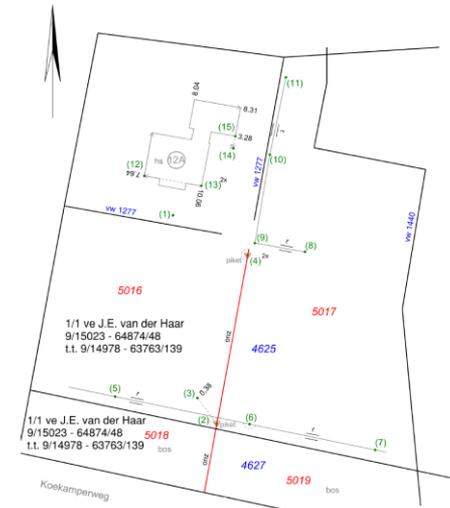
Opgetoond op: **20-02-2013** door: **A.P. van Doorn, Landmeter Specialist Grenzreconstructie**
 Perceelnummers: **850, 851.**

Meetgegevens en waarnemingen



Cadastral map & field sketches

- Boundary = **invisible !!** outside, unless...
- Surveyor can show boundary outside:
reconstruction



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Feasibility study: “from good to better” *increasing geometric quality and consistency*



Field Sheets

→ **reconstruction**
accurate & local relations

Cadastral Map

→ **overview and relations**
inaccurate & **coordinates**

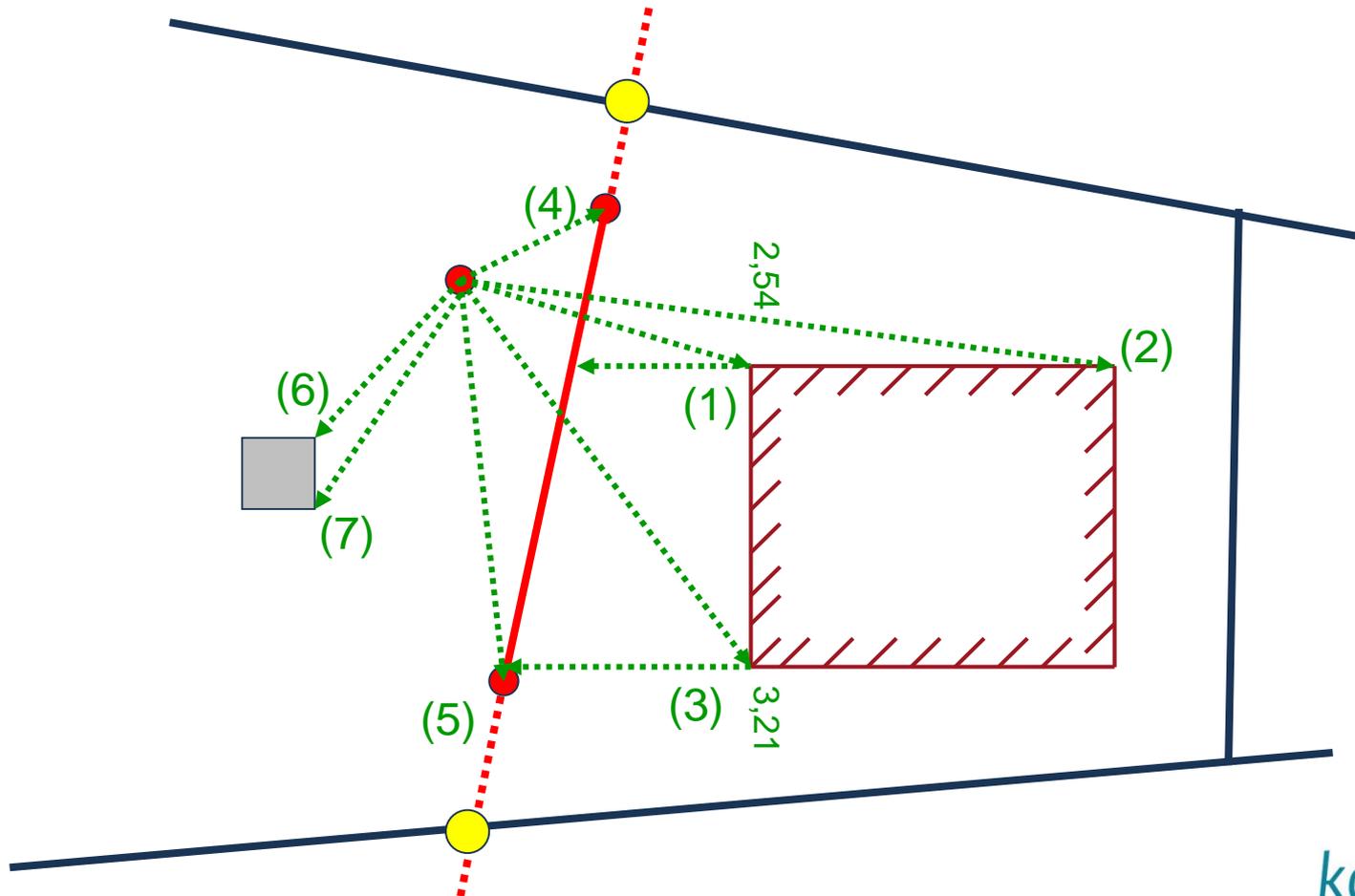
“1 to 1 map”

→ **reconstruction & viewer**
accurate & coordinates

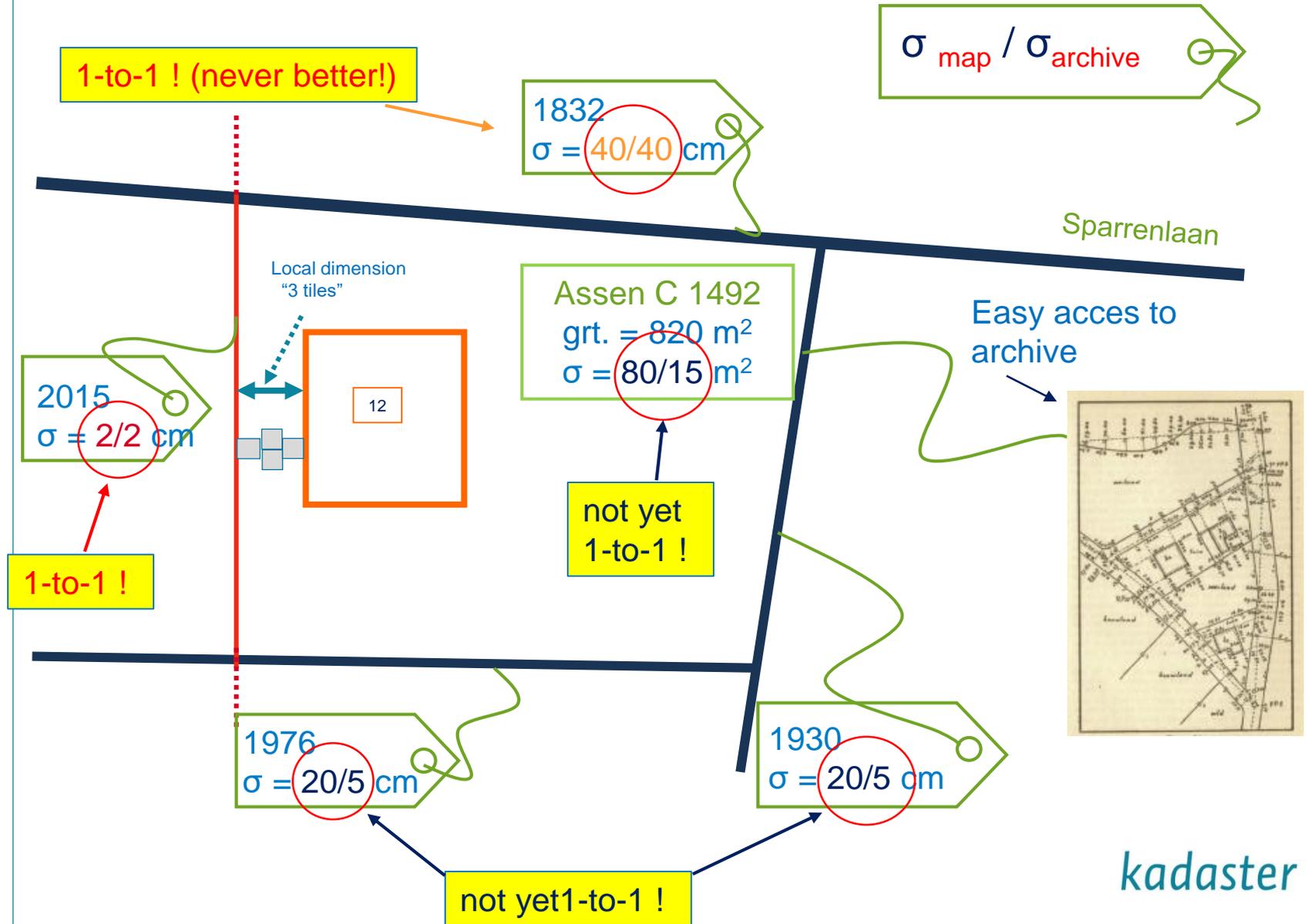


Measuring a new boundary

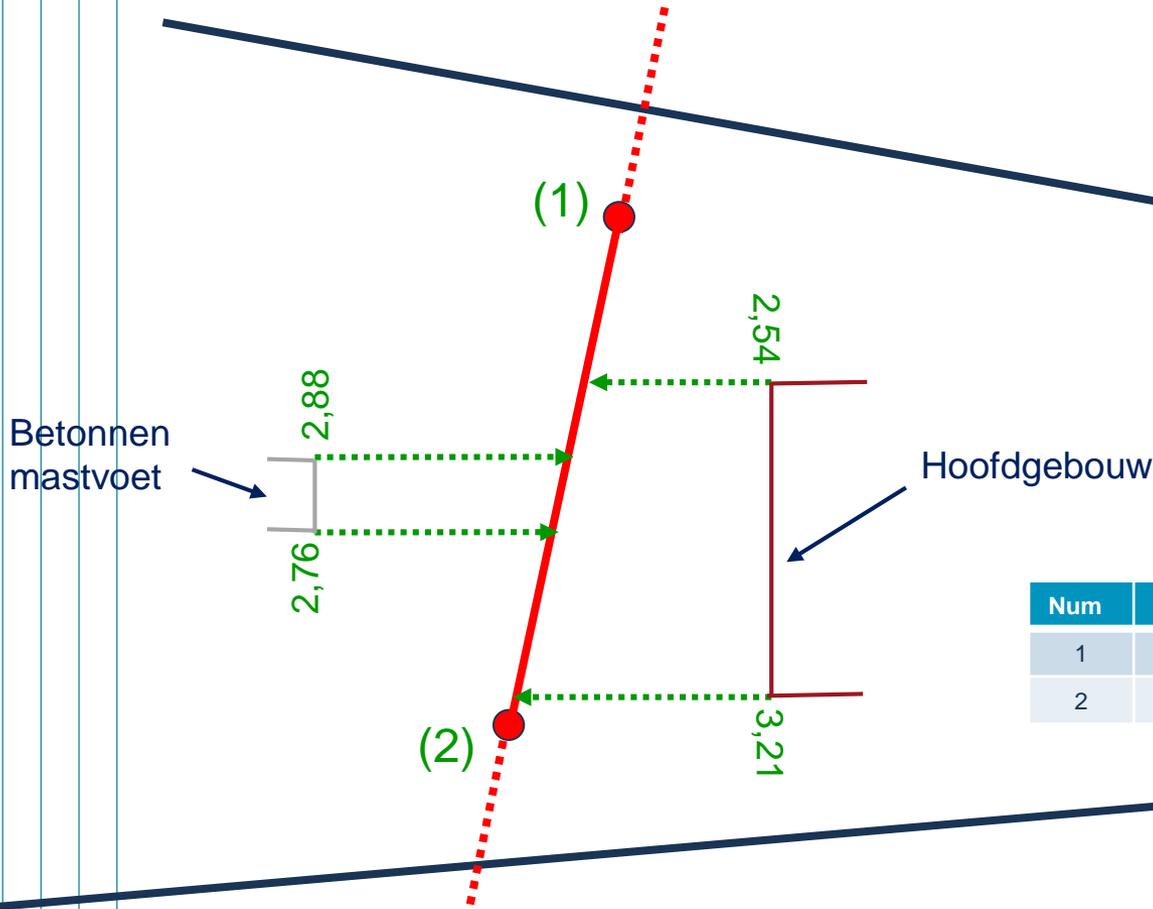
- combi of GPS, robotic totalstation and disto measurements
- yellow points constructed at the office, **not in the field!**



Goal 1: more transparency of quality



Goal 2: Boundary information (Do It Yourself)



Infotype	Inhoud
Nummer	APN00 D 12589
Jaar stichting	1985
Topografische definitie	Onzichtbare grens
Adres	Vlierbeslaan 2 Roelofarendsveen

Num	x/y/h	s.a.	topol.	ontstaan	betekenis
1		2 cm	Col	Ter	grens
2		2 cm	Col	Ter	grens



Customer gets:

- “easy” local dimensions (own tape)
- accurate coordinates (hired GPS)
- additional info & instructions

picture?

customer

Business case improved map

Size:	Curr. map σ : 20 cm	Acc. map σ : 5 cm
150 m ²	± 5 m ²	± 1 m ²

Benefits ...

- Surface determination directly from map
- Quality labels known
- Boundary reconstruction directly from map
- Consistency with topography/aerial imagery

Costs...

- Manual data extracting: astronomic costs!
- Automatic data extracting: the only way!?

Man.

Aut.



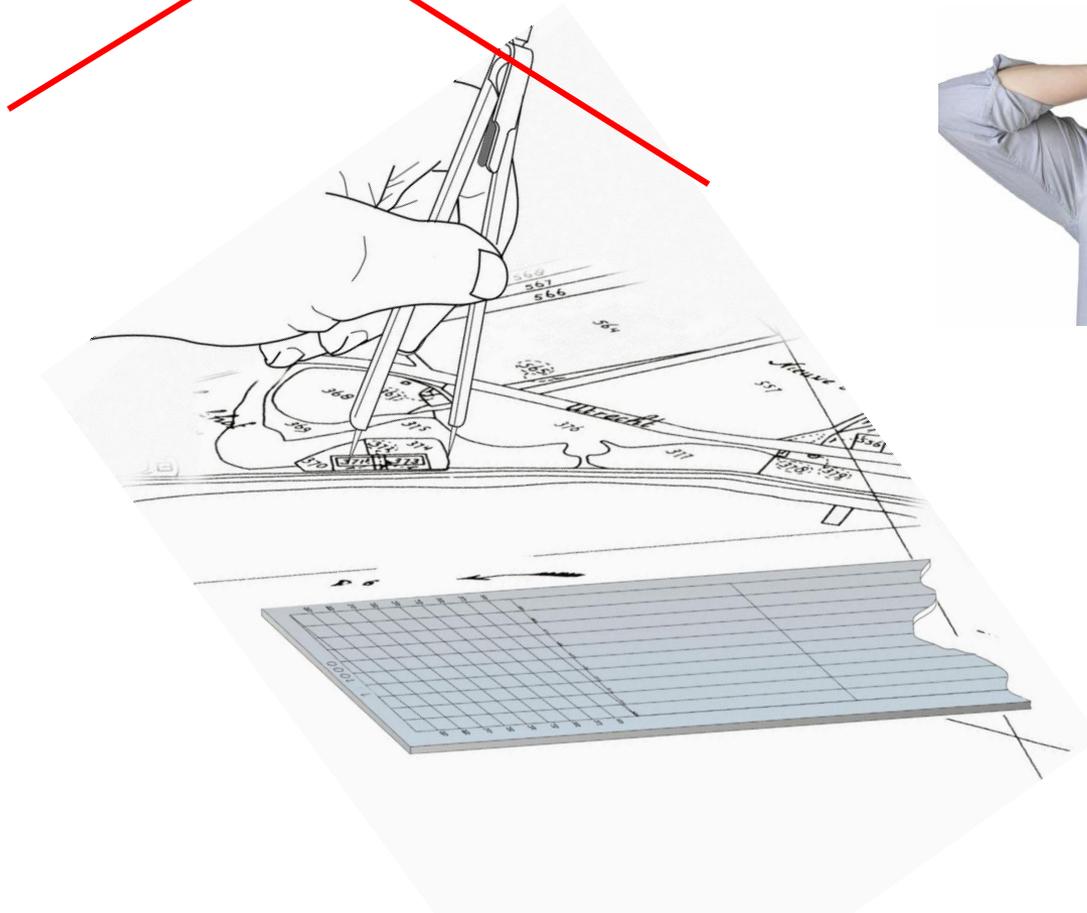
costs

benefits

In the past map was drawn directly out of field sketch instead of first ...



~~calculating the coordinates~~

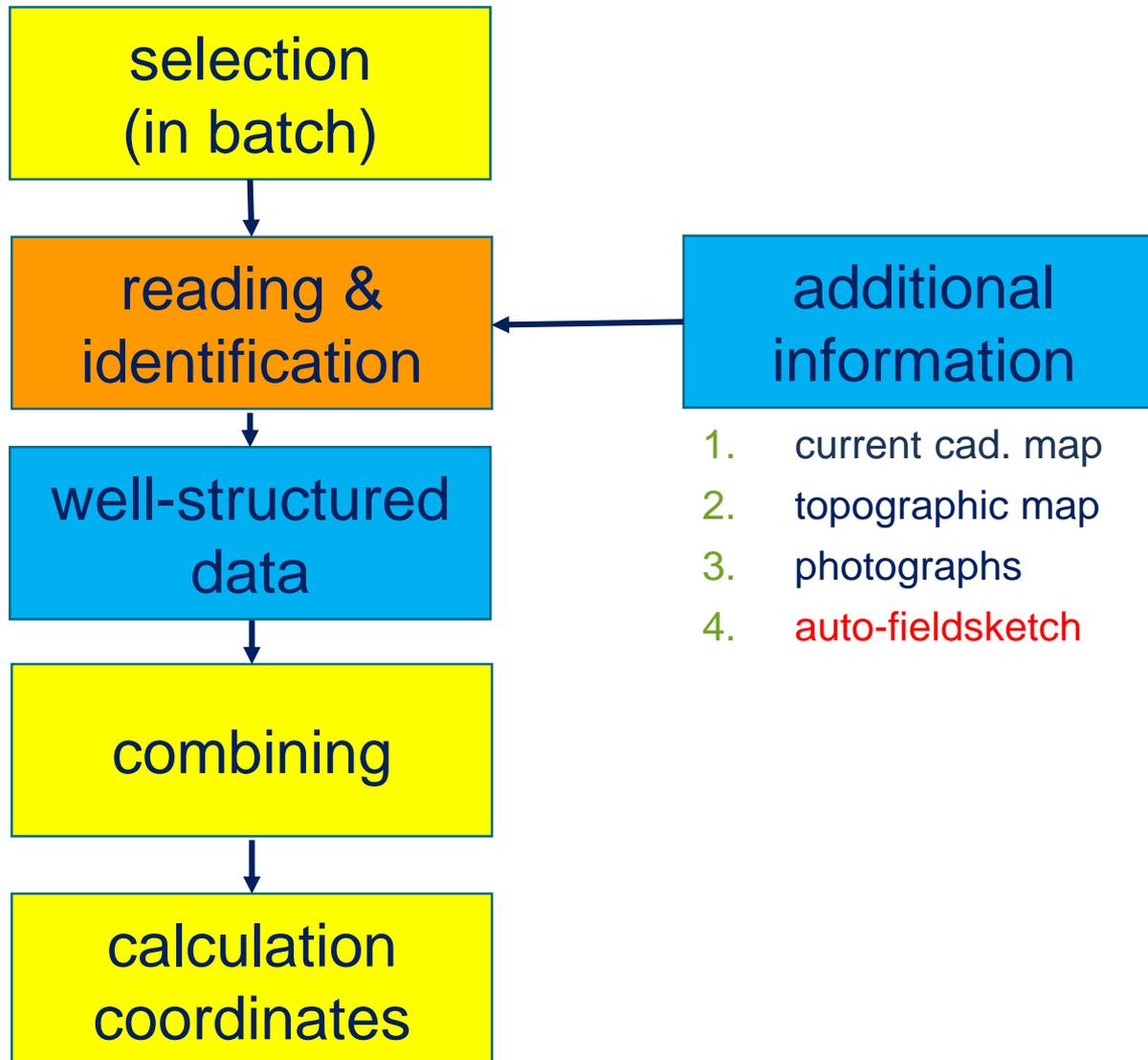


Why?

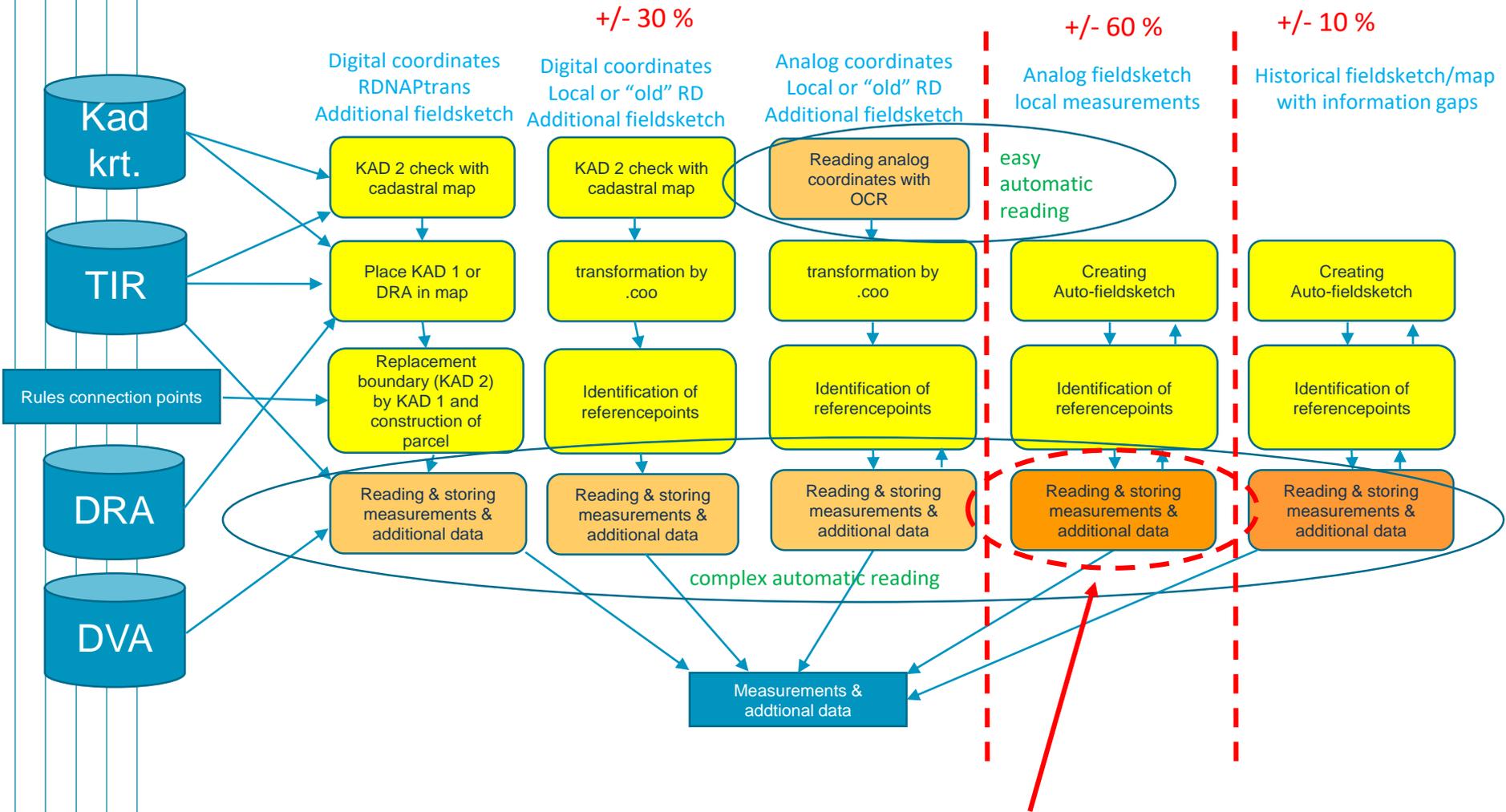
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Production of improved map

Proces of calculation of new map coordinates



Production of improved map processing different types of information



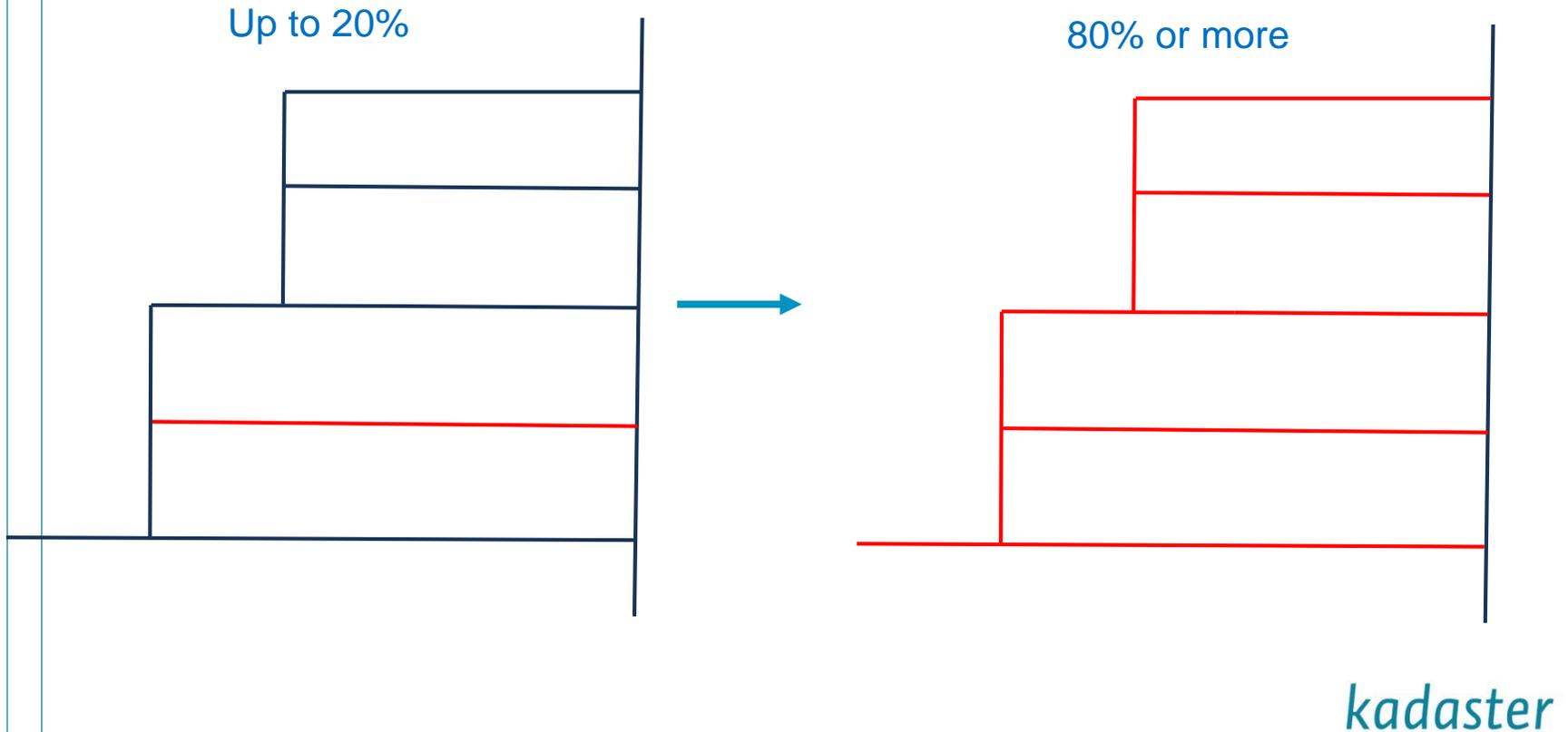
Biggest bottleneck: analog fieldsketches with local measurements

Production of improved map

At least 80% = important

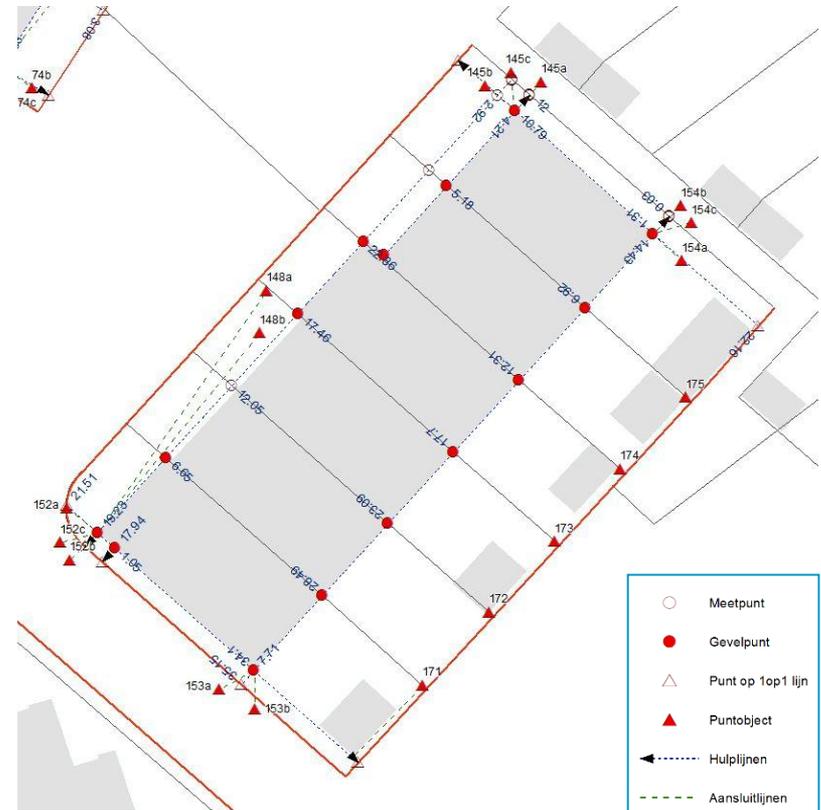
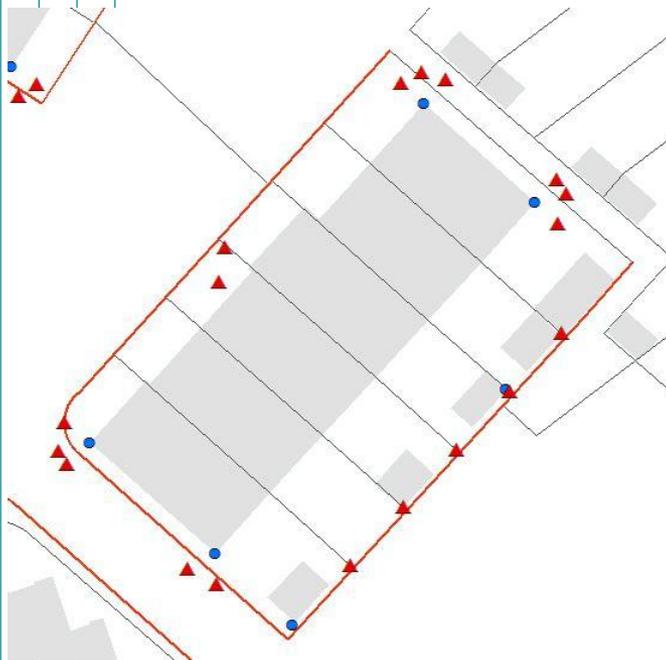
1 when only recent measurements -> too fragmented (max. 20%)

2 when 80% or more is reached -> complete enough!

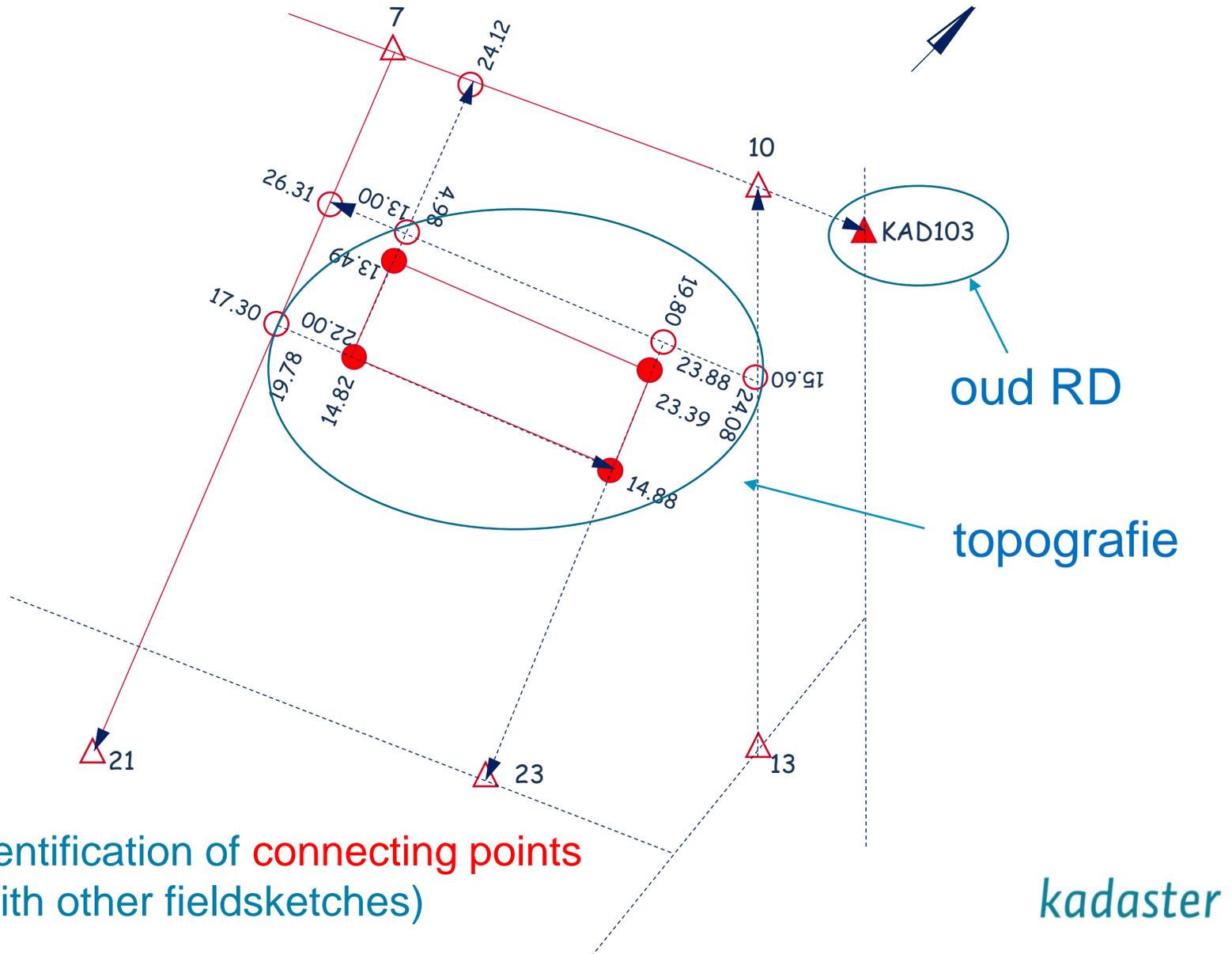


Additional information

Autofield sketch (simulated measurements!)



Extracted information of fieldsketch



Extracted information: structure

Structure similar as example underneath

Automatic generating of pointnumbers is needed

not only measurements, but also geometric relations like intersection and collinearity (CL) have to be stored

MOVE3 V4.2.1 OBS file

\$

305563

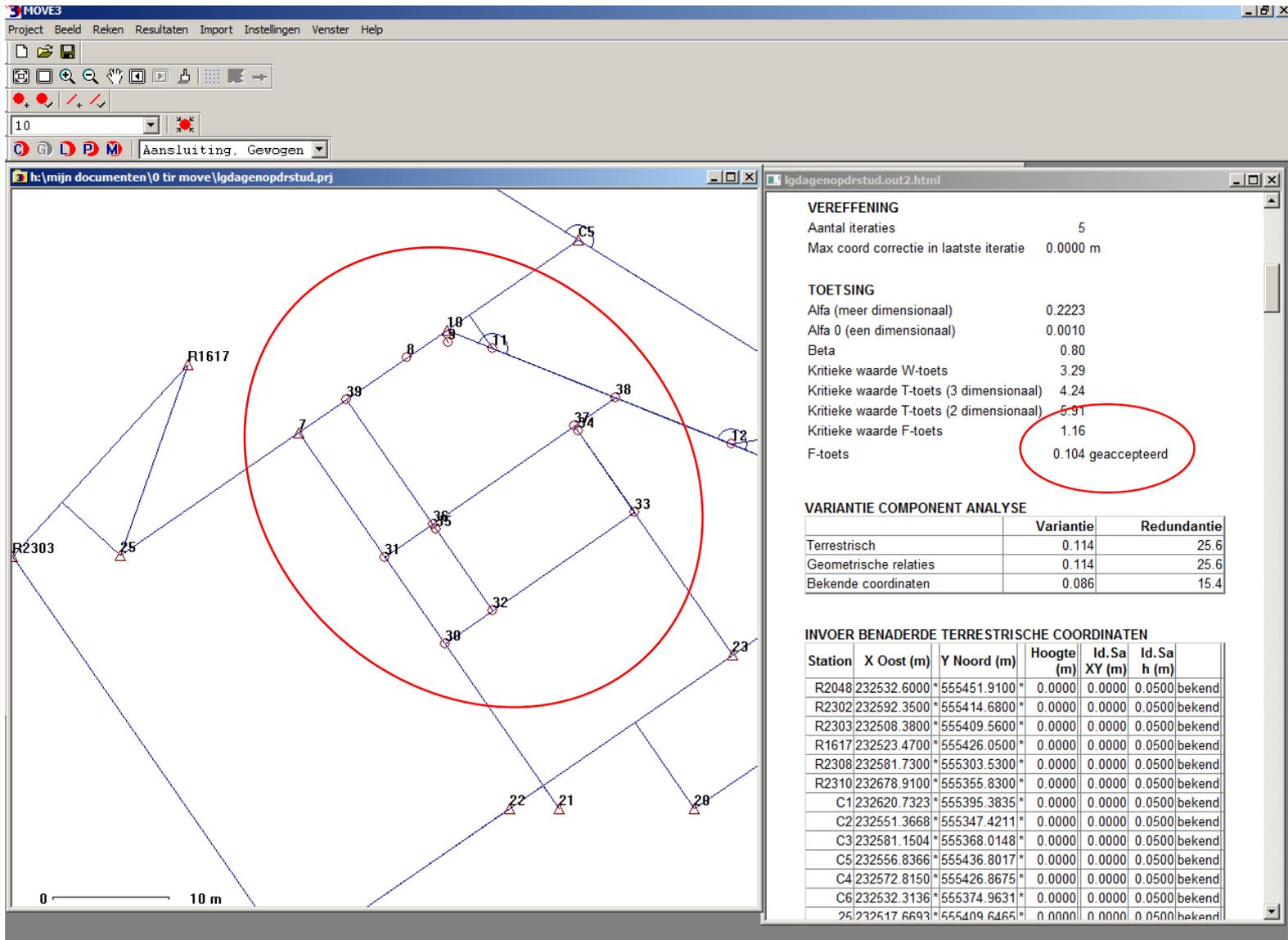
\$

ANGLEUNIT GON

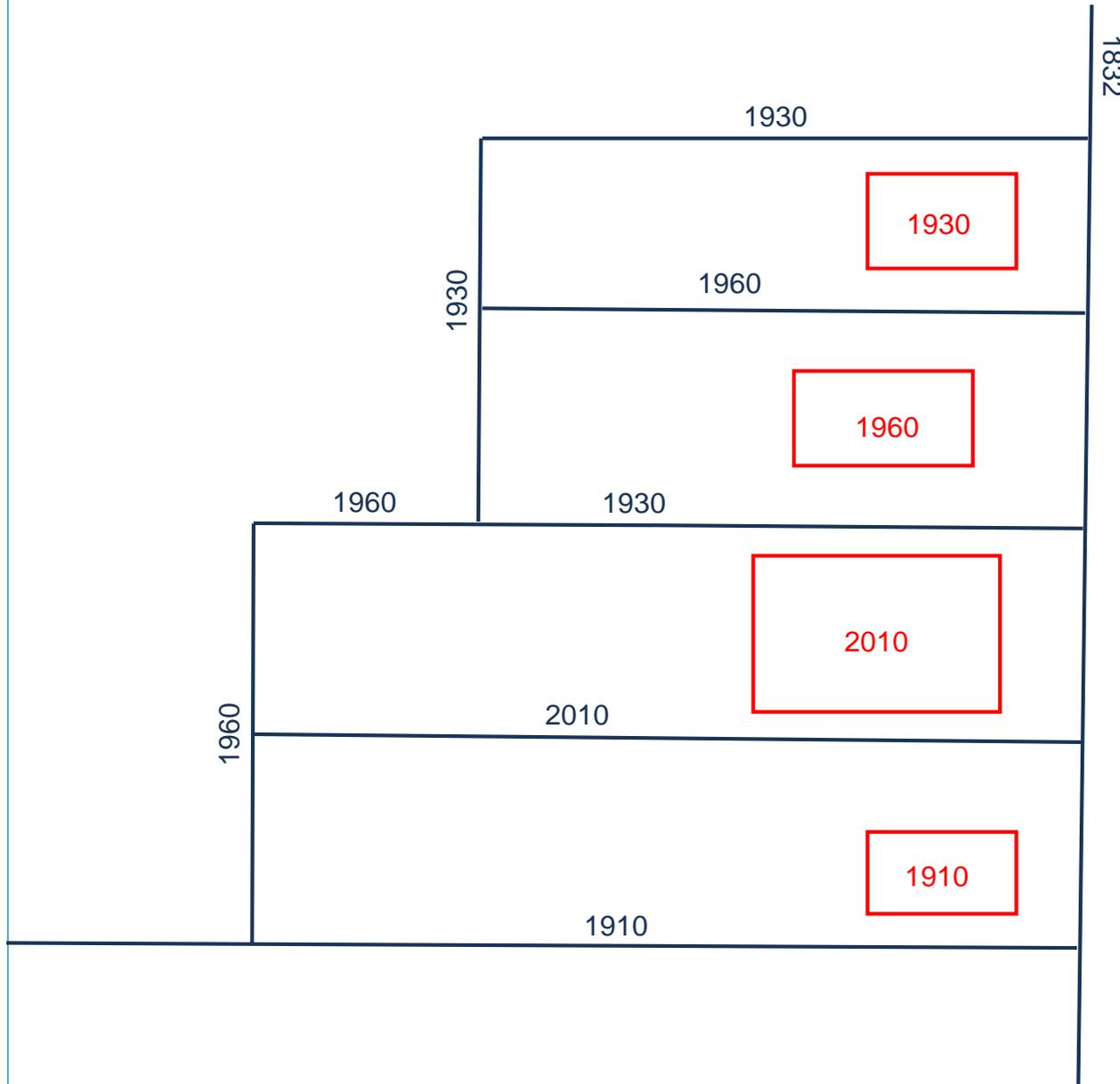
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	from (pnt)	to (pnt)	on (pnt)	meas.type	reading	stnd. deviation
GR 100	100	200		TD	120.4800	0.0100
GR 3	3	300		TD	132.1700	0.0100
GR 3	3	4		TD	40.7500	0.0100
GR 100	100	3		TD	114.7700	0.0100
GR 400	400	300		TD	94.4000	0.0100
GR 1	1	400		TD	139.4100	0.0100
GR 100	100	1		TD	37.0700	0.0100
GR 100	100	3		TD	114.7700	0.0100
GR 200	200	100	300	AN	100.00000	0.10000
GR 4	4	300	3	CL		0.0150
GR 3	3	200	100	CL		0.0150
GR 15	15	16		TD	9.5000	0.0100
GR 15	15	7		TD	42.4600	0.0100

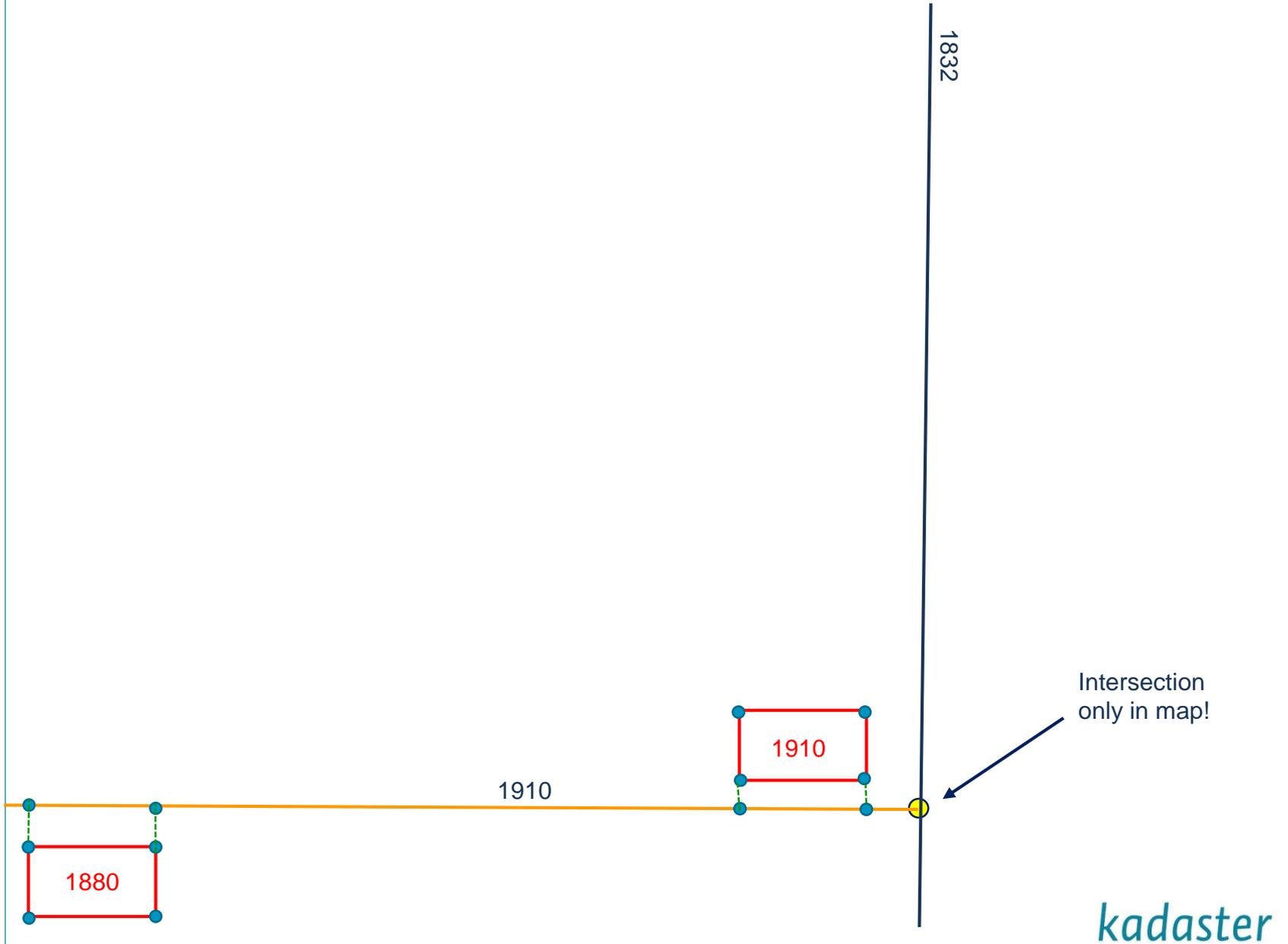
Expected result



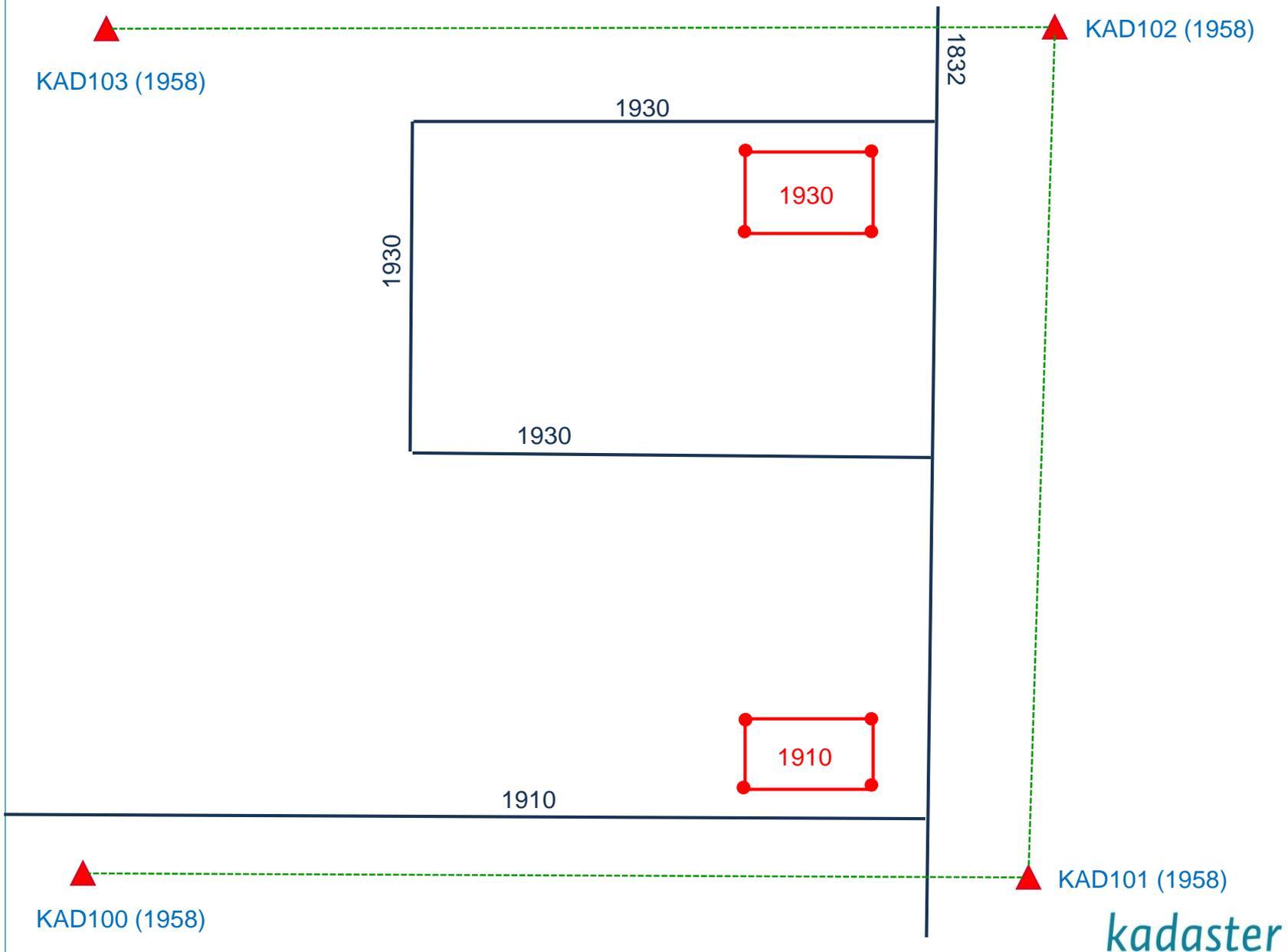
Example connecting fieldsketches: current situation



Connecting fieldsketches (1910, nw boundary)

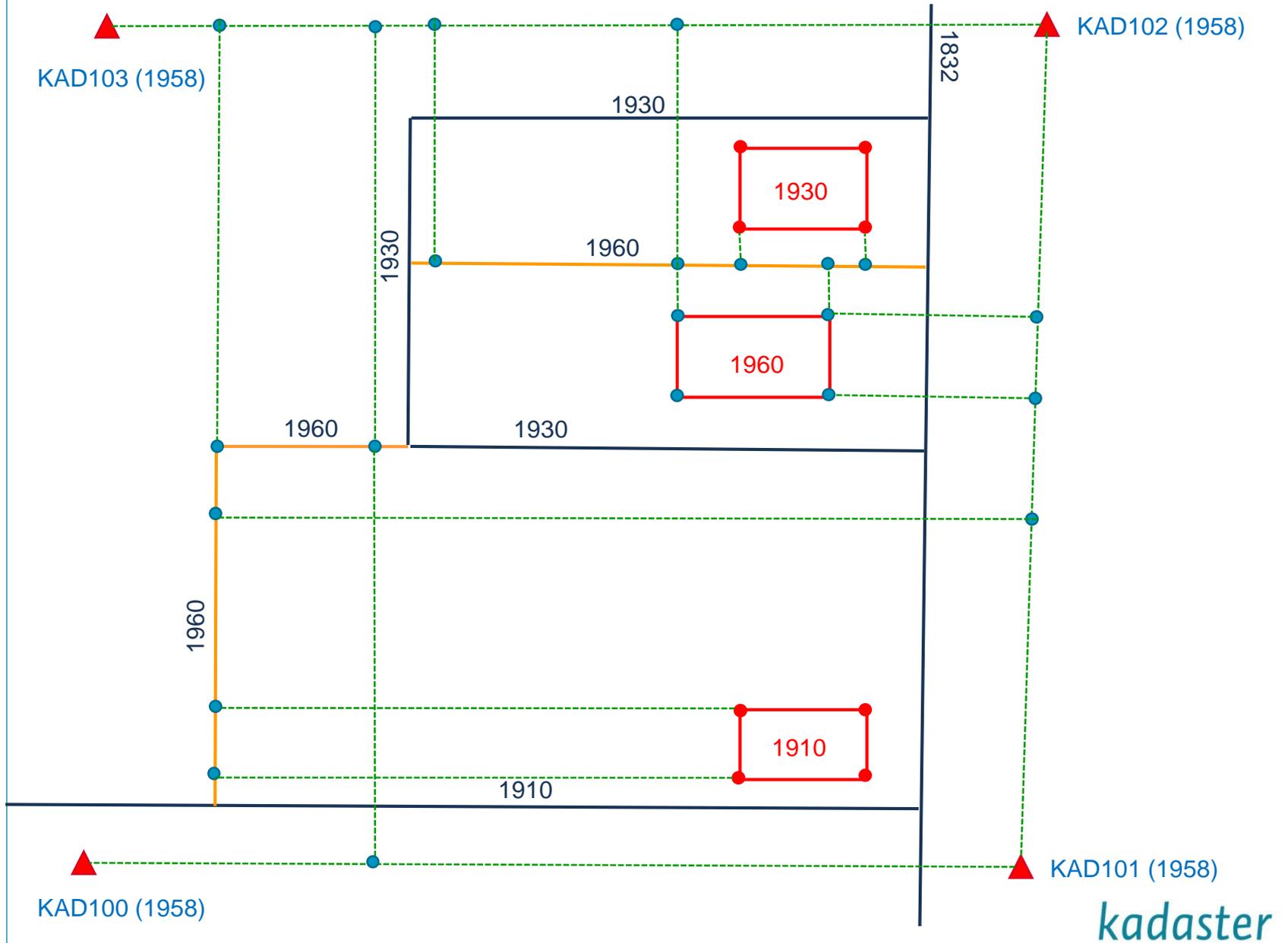


Connecting fieldsketches (1958: nw reference)

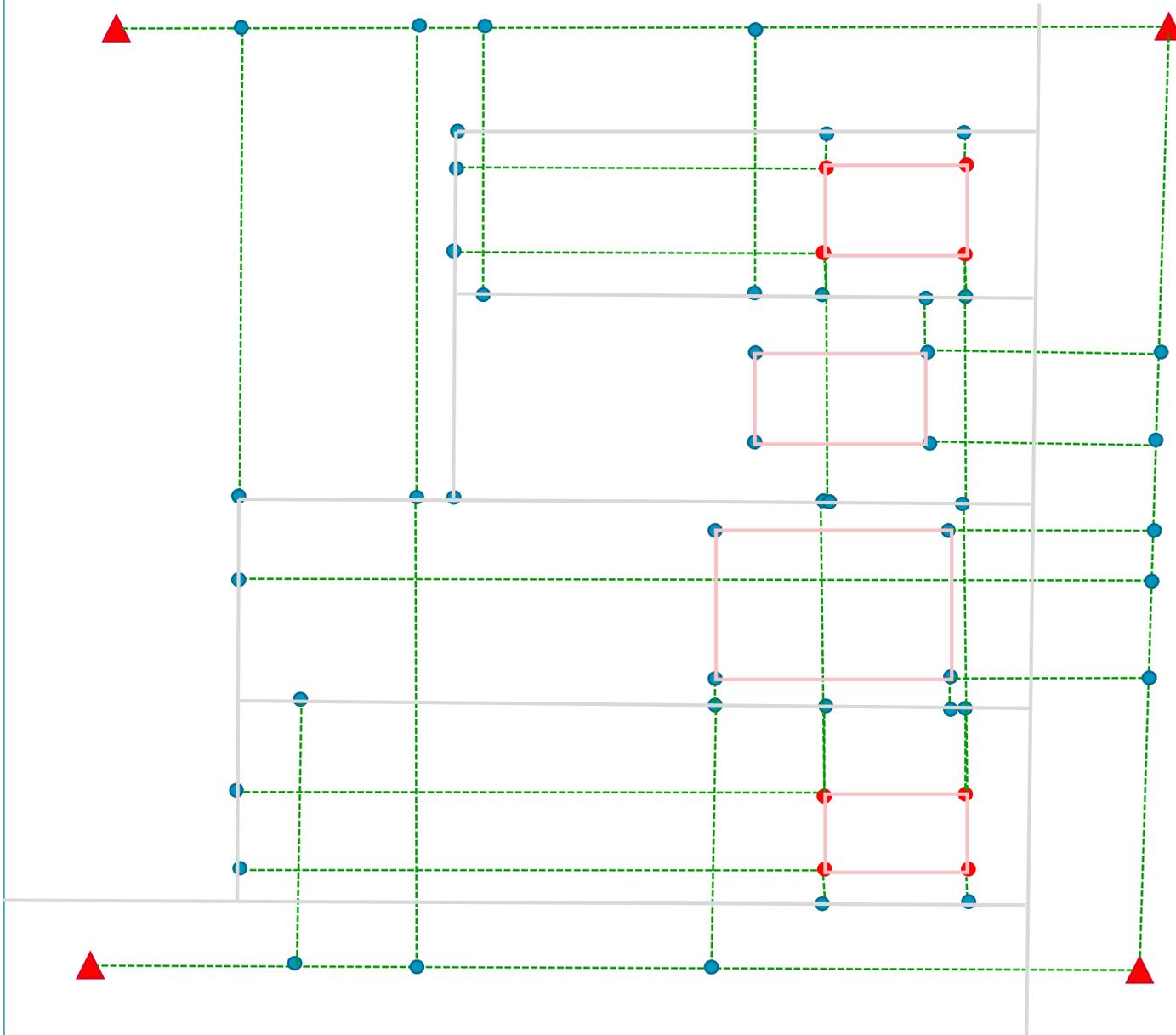


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Connecting fieldsketches (1960, nw boundary)



Connecting fieldsketches (all measurements!)



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Process improvement by redesign: Keyword is 100% digital

