A New Geomagnetic Observatory in Austria for High Precision Geomagnetic Data in Real Time for Space Research Programs. CONRAD Observatory Phase 2

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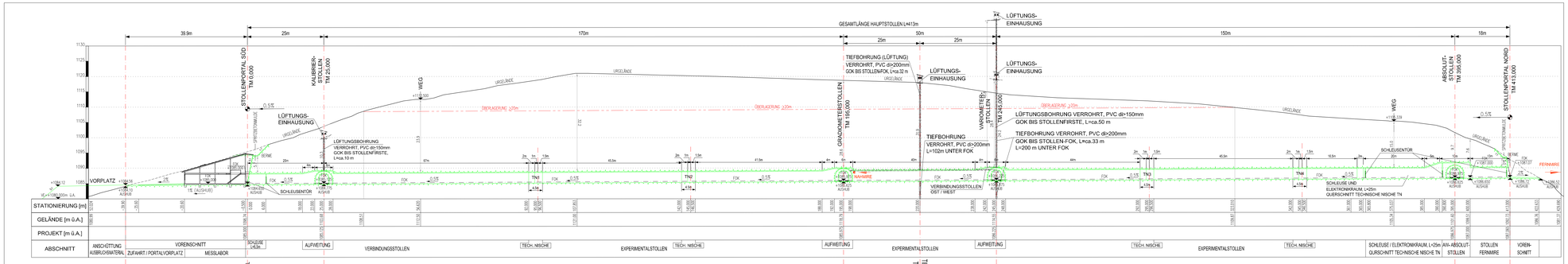
The new Geomagnetic Observatory GMO in Austria, is a construction of a completely underground non-magnetic tunnel system in the limestone massif of the Trafelberg in Lower Austria. The GMO is situated in the east part of Lower Austria, 1.090 m above sea level in a dedicated nature reserve of 550 hectares in size. The GMO is being built next to the already existing CONRAD Observatory, which hosts facilities for seismic and gravimetric research projects since 2002. The Observatory can be accessed via a 6 km long service road, which is not open to the public. The tunnels are developed with non-magnetic support. Due to the overburden of 30 m a stable temperature of about 10 degrees can be expected. Marks - orientation devices for the determination of the astronomical North direction exist outside and inside of the GMO. Their use is therefore weather independent and guarantees correct measurements. Due to the length of the tunnel system of about 1.000 meter high sensitive instruments can be deployed - they are able to detect changes of the magnetic field down to pico and femto Tesla without influencing each other. The GMO will also serve classical magnetic instruments, which monitor continuously the magnetic field, as well as absolute systems. For the operation of highly sensitive potassium gradiometer systems for the Total Force of the Geomagnetic Field - which measures the total magnetic field difference in three directions simultaneously North-South/X, East-West/Y and Vertical/Z on a fixed 200 m long base line with an integrated variable short base line of 5 to 50 meter on the axis X, Y and Z. The 3D CONRAD gradiometer system - long and short baseline combinations - can help to get new insights into the nature of the magnetic field in real-time, including the current systems in the ionosphere and magnetosphere. The resolution of the gradiometer goes down to femto Tesla. The gradiometer systems are able to sample 20 times per second with high-precision GPS-timing. The gradiometer system will have a high sensitivity for current systems in the ionosphere. This will enable the identification of extremely small-scale structures in the ionosphere. A 3D component fluxgate magnetometer array at the GMO area provides additional parameter for special calculations to monitor 3D fluctuations of the magnetic field.

The infrastructure for the GMO was established together with the building phase1, a Research and Development Center for Seismic and Gravimetric Studies of the CONRAD Observatory in May 2002.

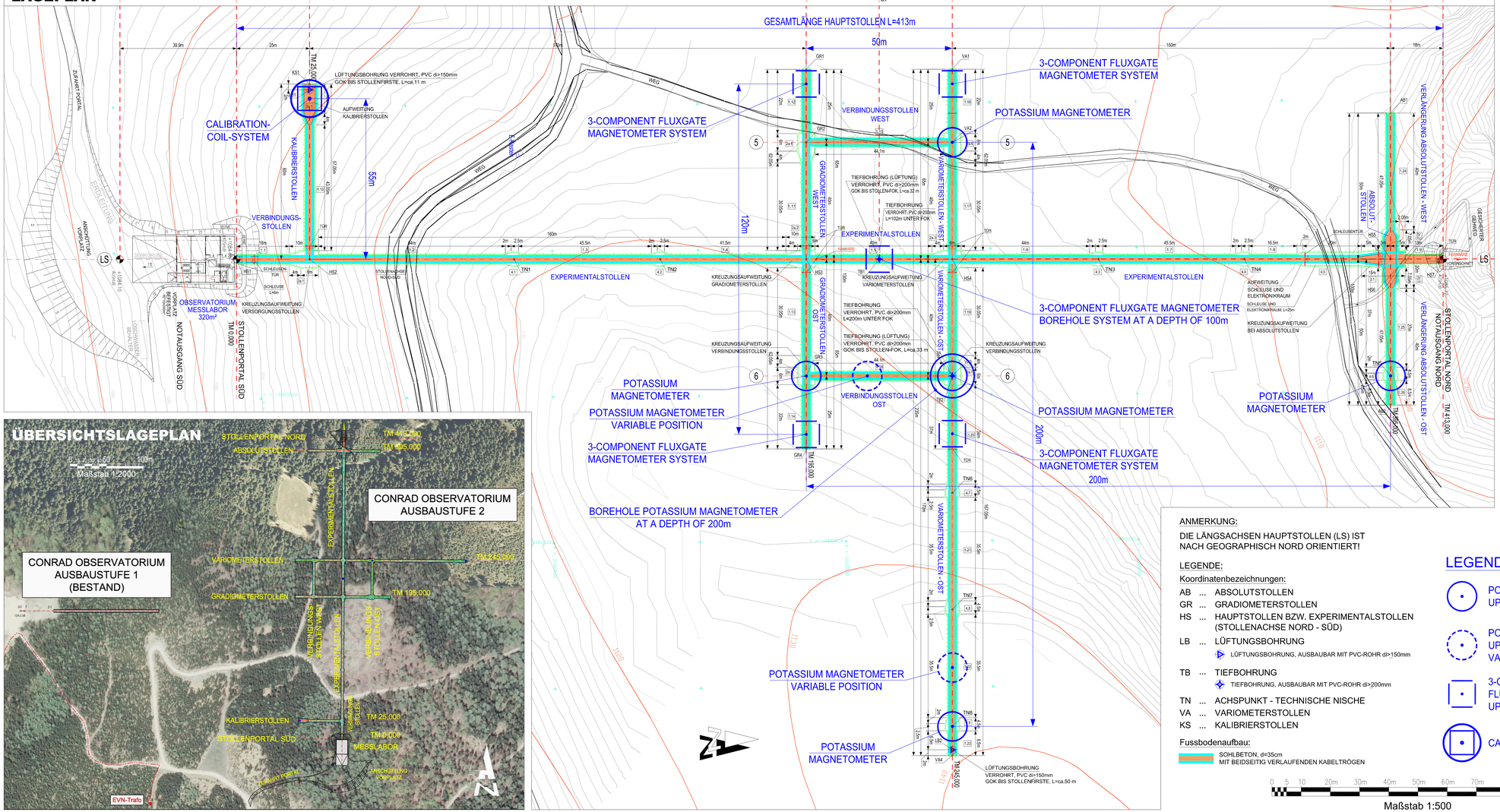
The official start-opening ceremony for the new Center for Geomagnetic Research, designed by DI Peter Melichar, took place on September 17, 2008 conducted by the Minister of Sciences Dr. Johannes Hahn and the Governor of Lower Austria Dr. Erwin Pröll.

Full operation of the GMO is expected in 2012.

LÄNGENSCHNITT



LAGEPLAN



ÜBERSICHTSLAGEPLAN

ANMERKUNG:

DIE LÄNGSACHSEN HAUPTSTOLLEN (LS) IST NACH GEOGRAPHISCH NORD ORIENTIERT!

LEGENDE:

Koordinatenbezeichnungen:

- AB ... ABSOLUTSTOLLEN
- GR ... GRADIOMETERSTOLLEN
- HS ... HAUPTSTOLLEN BZW. EXPERIMENTALSTOLLEN (STOLLENACHSE NORD - SÜD)
- LB ... LÜFTUNGSBOHRUNG
  - LÜFTUNGSBOHRUNG, AUSBAUBAR MIT PVC-ROHR di>150mm
- TB ... TIEFBOHRUNG
  - TIEFBOHRUNG, AUSBAUBAR MIT PVC-ROHR di>200mm
- TN ... ACHSPUNKT - TECHNISCHE NISCHE
- VA ... VARIOMETERSTOLLEN
- KS ... KALIBRIERSTOLLEN

Fussbodenaufbau:

SOHLBETON, d=35cm
MIT BEIDSEITIG VERLAUFENDEN KABELTRÖGEN

LEGEND:

- POTASSIUM MAGNETOMETER UP TO 1fT RESOLUTION
- POTASSIUM MAGNETOMETER UP TO 1fT RESOLUTION VARIABLE POSITION
- 3-COMPONENT FLUXGATE MAGNETOMETER SYSTEM UP TO 1pt RESOLUTION
- CALIBRATION-COIL-SYSTEM

0 5 10 20m 30m 40m 50m 60m 70m 80m 90m 100m

Maßstab 1:500

EINREICHPLANUNG

PARE

BAUVORHABEN

GEOMAGNETISCHES OBSERVATORIUM

CONRAD OBSERVATORIUM
MUGGENDORF / TRAFELBERG
BAUSTUFE 2
GST-NR 423, 424 u. 476/1, EZ 64, KG 23449 Muggendorf

BAUWERBER

BIG Bundesimmobiliengesellschaft m.b.H.
1031 Wien, Hintere Zollamtstraße 1

GRUNDSTÜCKSEIGENTÜMER

ÖBf ÖSTERREICHISCHE BUNDESFORSTE AG
1030 Wien, Marxergasse 2

GEOPHYSIKALISCHE PROJEKTGESTALTUNG

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BAUFÜHRER

PLANVERFASSER

IC consulenten
Ziviltechniker Gesmbh
A-1120 Wien
Schönbrunnerstr. 297

BAUBEHÖRDE

PLANINHALT

LAGEPLAN UND LÄNGENSCHNITT

MASSSTAB	DATUM	PLANNUMMER
1:500, 1:2000	4. Juni 2009	GMO-BA2-08_R00_PM

Index	Änderungen	Datum	GEZ	GEN
0	ERSTAUSGABE	20. April 2009	Ex	KAU

Proj.Nr. Bauwerber: -
Proj.Nr. Planverfasser: 11x09020
Dateiformat: AutoCAD 2008 / DWG
Planmaß: DIN A0 / 1m2