

Einstein Telescope

WP1 – Site selection and infrastructure

Ft. Lauderdale – ET meeting

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*Jo van den Brand
Nikhef / VU Amsterdam*

Contents

Goal of this F2F meeting

- Review our commitments and tasks
 - Site selection, geophysical issues
 - Seismic data
 - NN noise, modeling (e.g. FEA)
 - Infrastructure and safety
 - Suspensions, vacuum and cryogenic systems
- Goals for next few months
 - Reporting: June


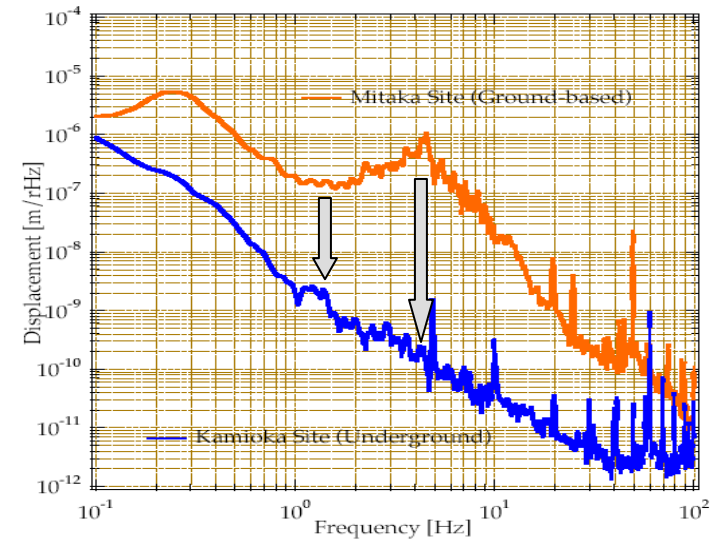


Table 1.3-e: List of milestones

Milestone number	Milestone name	Work package(s) involved	Expected date	Means of verification
WP1.1	Site requirements definition	WP1	M12	Report
WP1.2	Site noise evaluation	WP1	M18	Report
WP1.3	Site selection and evaluation procedure	WP1	M24	Report
WP1.4	Main infrastructure conceptual design	WP1	M33	Report

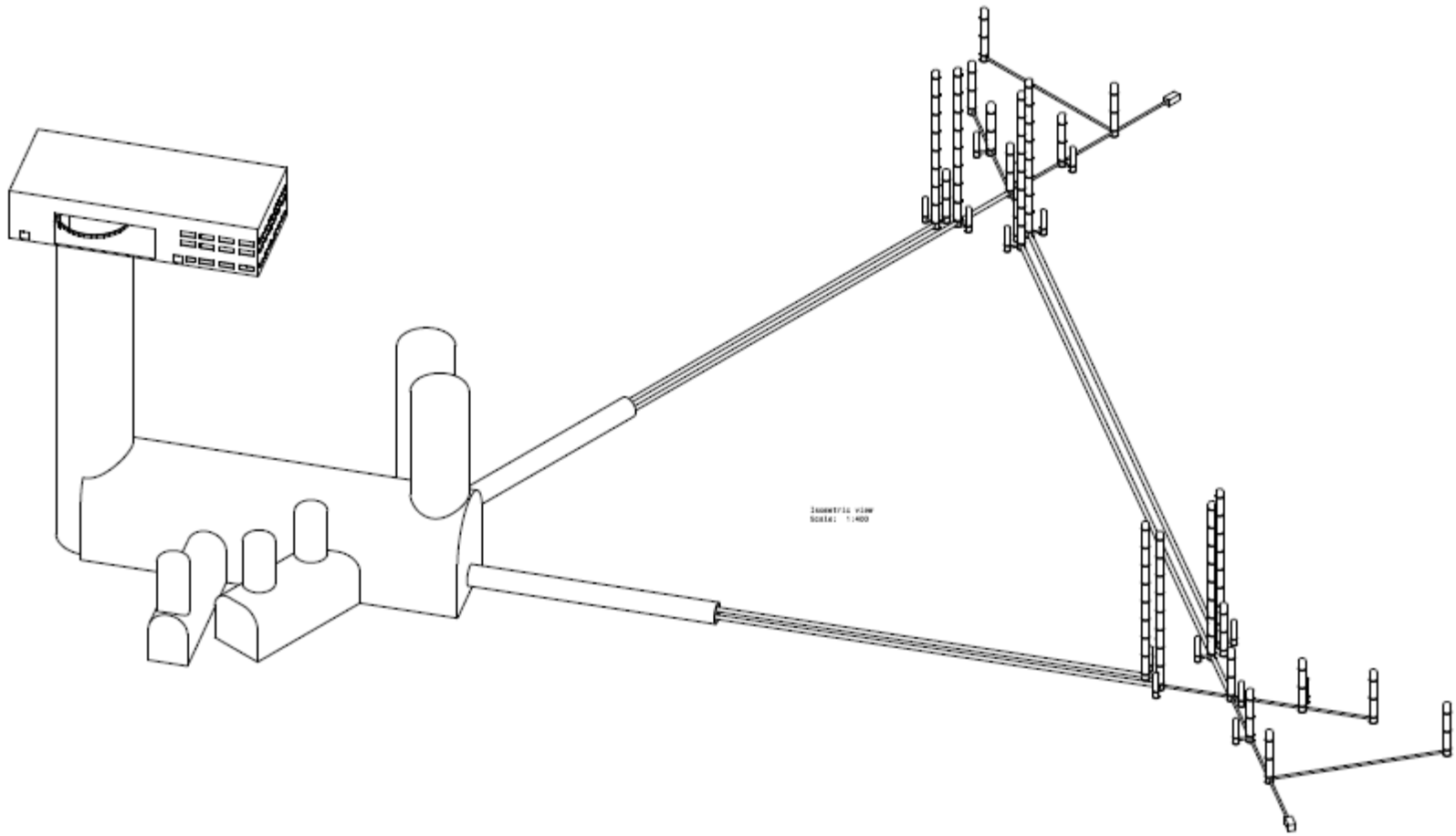
Einstein Telescope

- Main characteristics
 - Multiple interferometers with 10 km arm length
 - Underground
 - Cryogenics
- LCGT will have such features: share experience
- Homestake collaboration
- FEA on NN

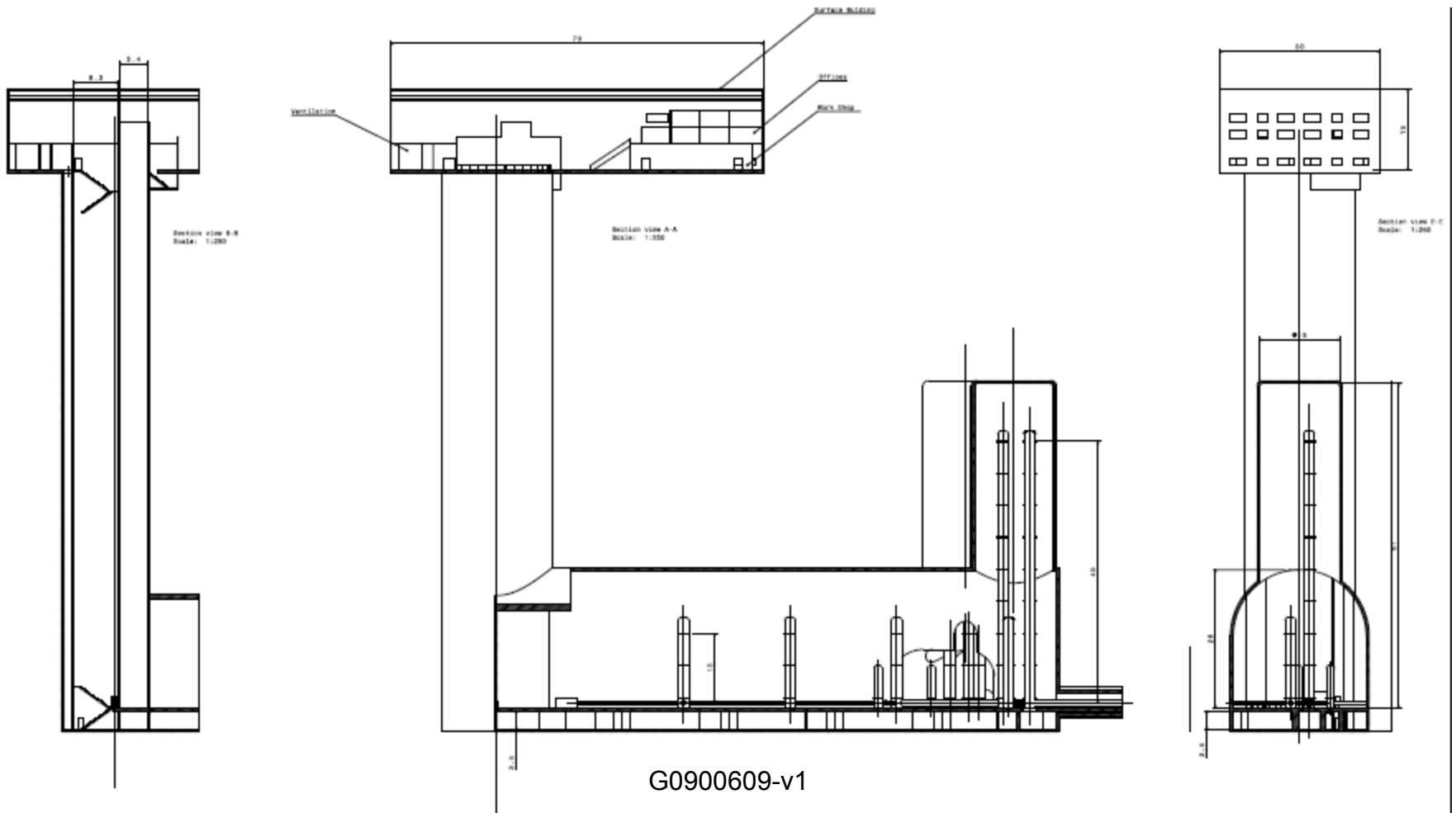


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Infrastructure design

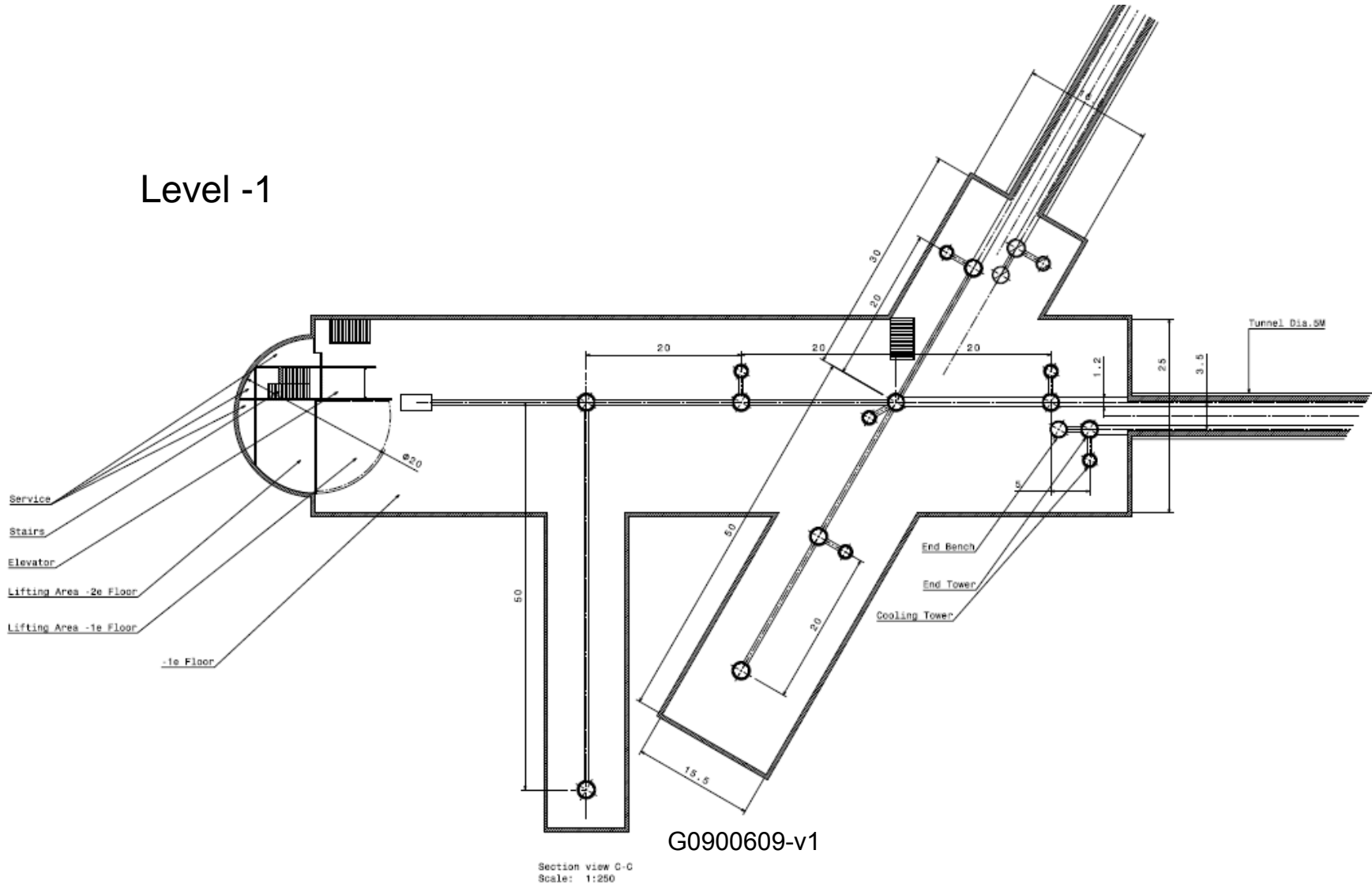


Infrastructure design



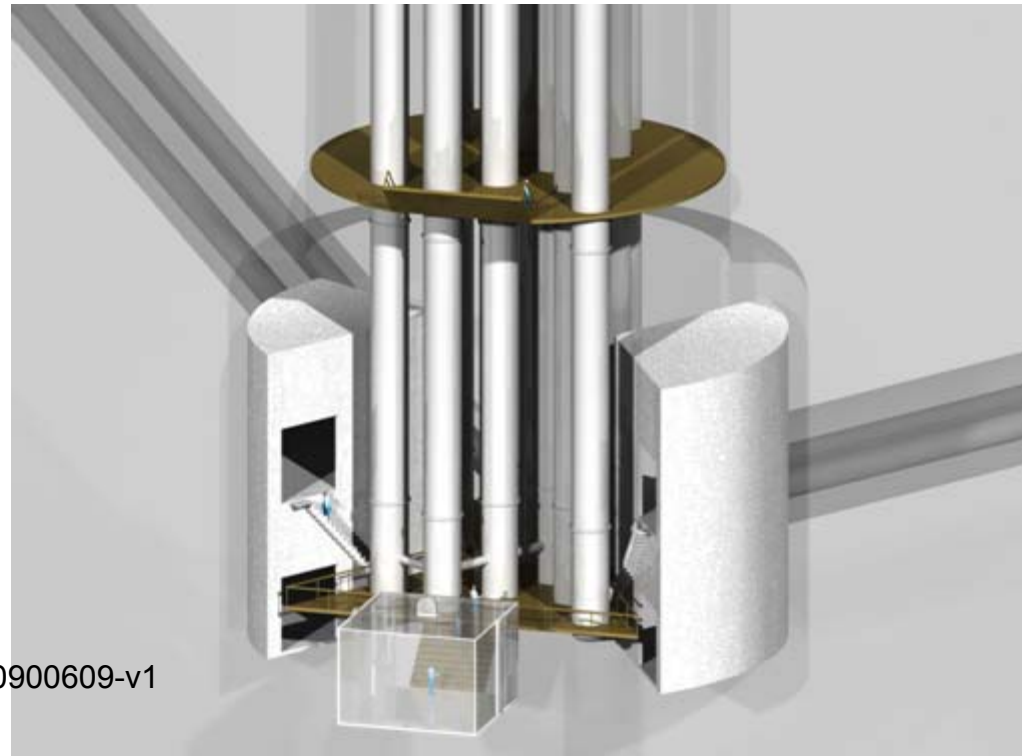
Infrastructure design

Level -1



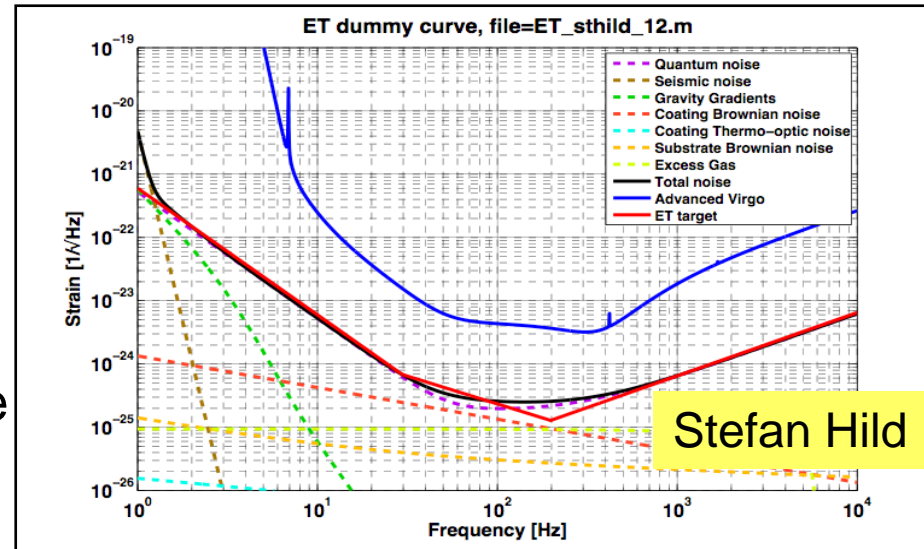
ET WP1 – Infrastructure

- Infrastructure – Martin Doets
 - Tunnels, caverns, buildings
 - Vacuum, cryogenics, safety systems
 - Computing, etc.
- Big cost items
 - Collaborate with industry
 - COB
 - Saes Getters Italy
 - Demaco Netherlands
- Input from WG2 & 3
 - Topology
 - Length of superattenuators
- Experience
 - Virgo, GEO, Gran Sasso
 - Kamioka LCGT
 - Homestake, LIGO, etc.



Site requirements: scientific suitability of site

- Required sensitivity at low frequencies
 - Down to 1 Hz
- Performance of suspension system (Fulvio Ricci)
 - Length of suspension system
 - Active versus passive seismic reduction
- Newtonian noise (David Rabeling)
 - Required depth of interferometer
 - Depth, cavern size and shape
 - Efficiency of subtraction schemes
 - Homogeneity of geology
- Seismic activity characteristics of site (input from earth scientists)
 - Possible locations in Europe
 - Minimal microseismic and cultural noise
 - Homogeneous materials: salt, granite
 - Set-up measurement stations
 - Who takes responsibility where
 - Proposal to be discussed this afternoon
 - Make seismic map of most promising candidates (mobile station)



Site requirements – II

- Site availability and acquisition risk
 - Acquire land rights in reasonable time frame
- Construction suitability
 - Geological conditions (topography, hydrology)
 - Environmental considerations
 - Legal issues
 - Earthwork costs (local soil waste, labour costs)
- Operations suitability
 - Supporting technical infrastructure (local university support)
 - Nearby communities (travel time, schools, *etc.*)
 - Operation costs (power, utilities, *etc.*)
- Risks from environmental sources or future development
 - Future developments (noise sources)
 - Earthquakes, *etc.*
- Public opinion issues
 - Develop a plan to contain this