Agenda

- Scaling Models for increased pulse width
- Discussion of Single Tunnel Layouts
- Discussion of Cost reconciliation issues

Scaling Models for Increased Pulse Width: Klystron and Modulator

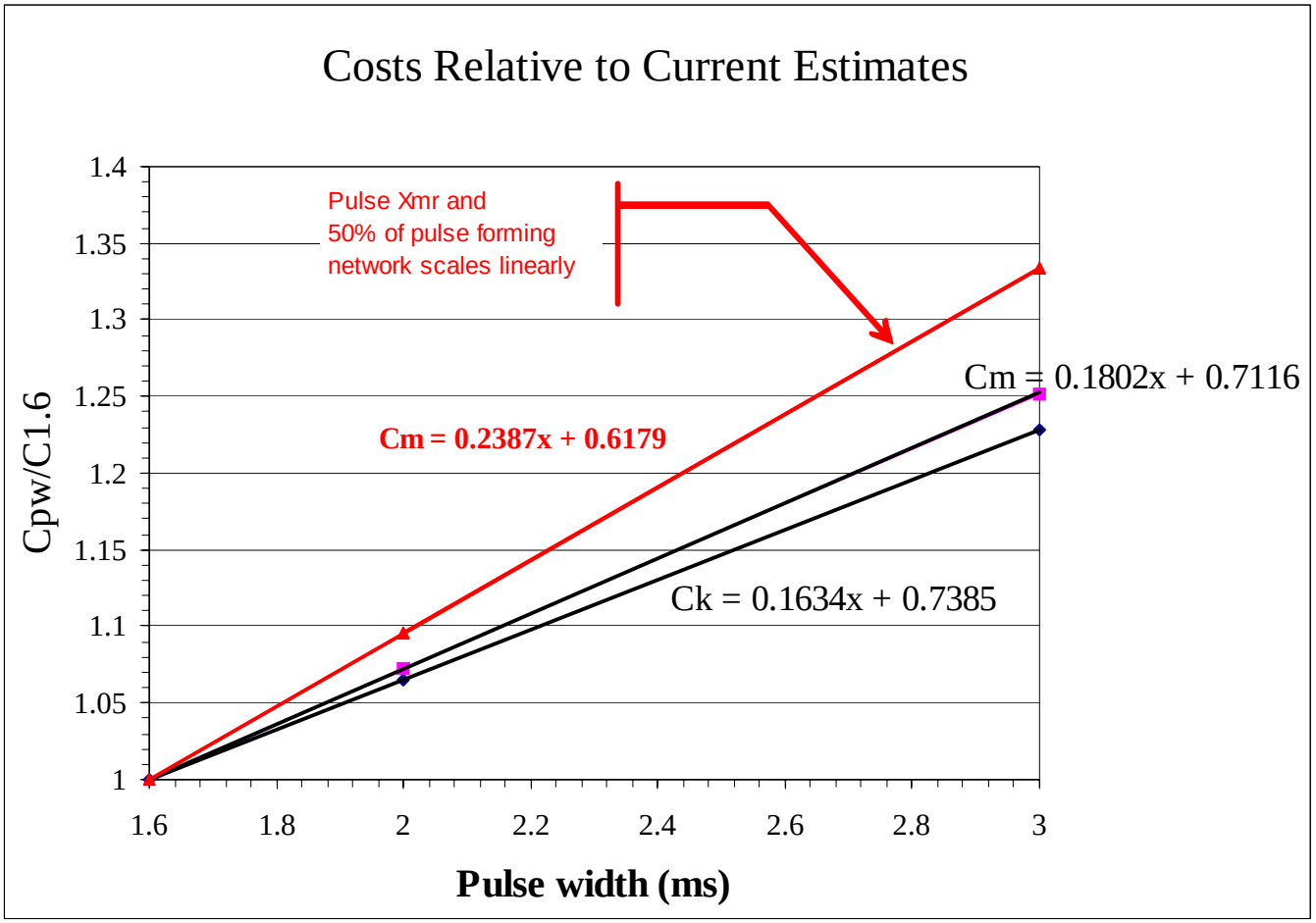
Klystron pulse width sensitive components

- Components assuming a linear scale:
  - Gun
    - Cathode loading and HV standoff
  - Collector
    - Pulse heating
  - Window/waveguide
    - Multipactor and pulse heating

Modulator pulse width sensitive components

- Modulator (all energy storage devices)
  - Assume to be linear wrt pulse width (35% of pulse forming cost)
    - Main cap bank (maybe should be sq. rt.?)
    - Main switch
    - Bouncer
    - Current Transformers
- Pulse transformer (10% of total Modulator Systems cost)
  - Already scaled by $(1.6\text{ms}/4.5\text{ms})^{1/2}$ (maybe should be linear?)
- "Misc Components" are currently 23% of the Modulator cost. What fraction of those components should be scaled linear and/or square root? 50%?

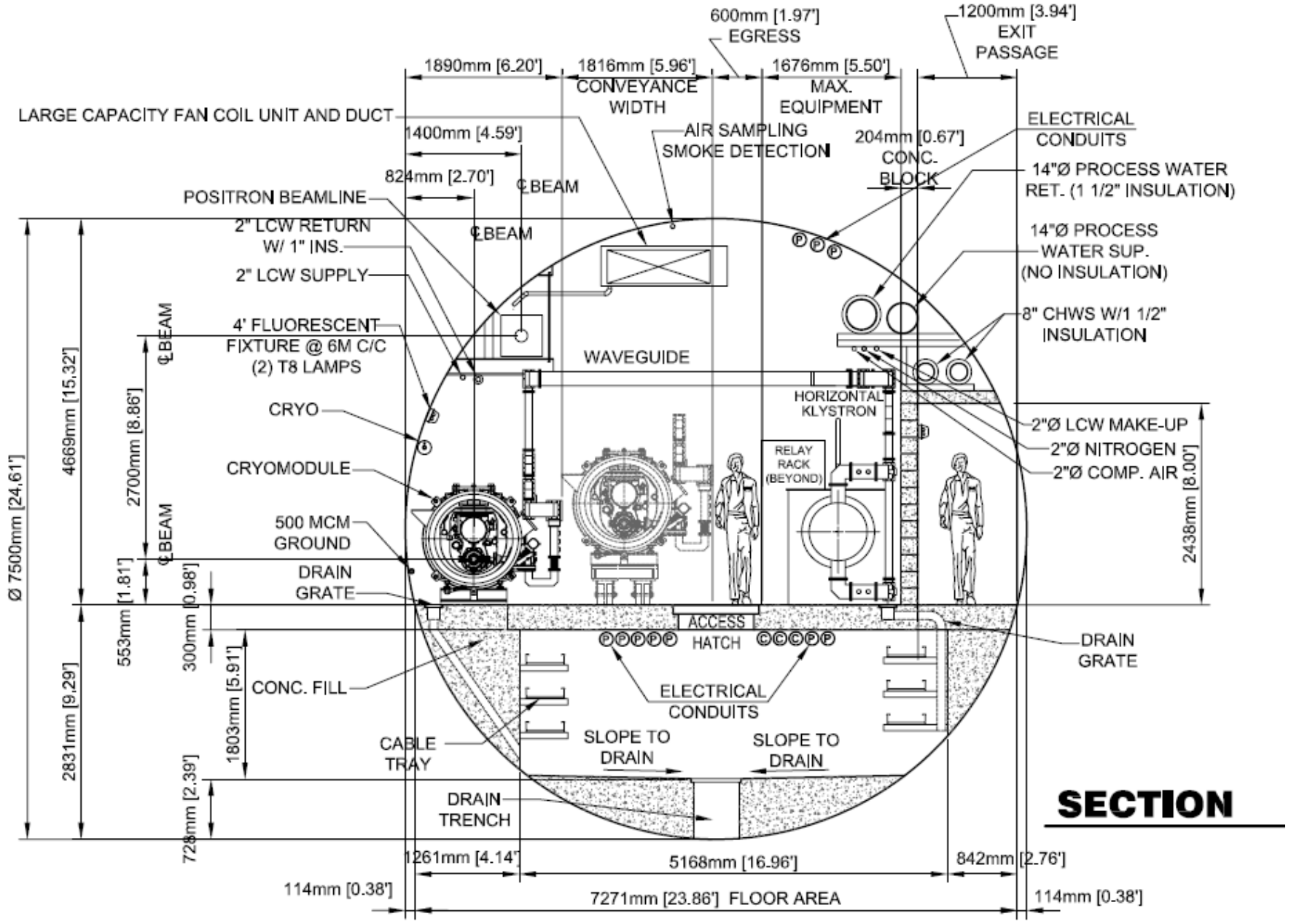
Cost Curves


Costs Relative to Current Estimates
Pulse Xmr and
50% of pulse forming
network scales linearly
Cm = 0.2387x + 0.6179
Cm = 0.1802x + 0.7116
Ck = 0.1634x + 0.7385
Cpw/C1.6
1.4
1.35
1.3
1.25
1.2
1.15
1.1
1.05
1
1.6
1.8
2
2.2
2.4
2.6
2.8
3
Pulse width (ms)

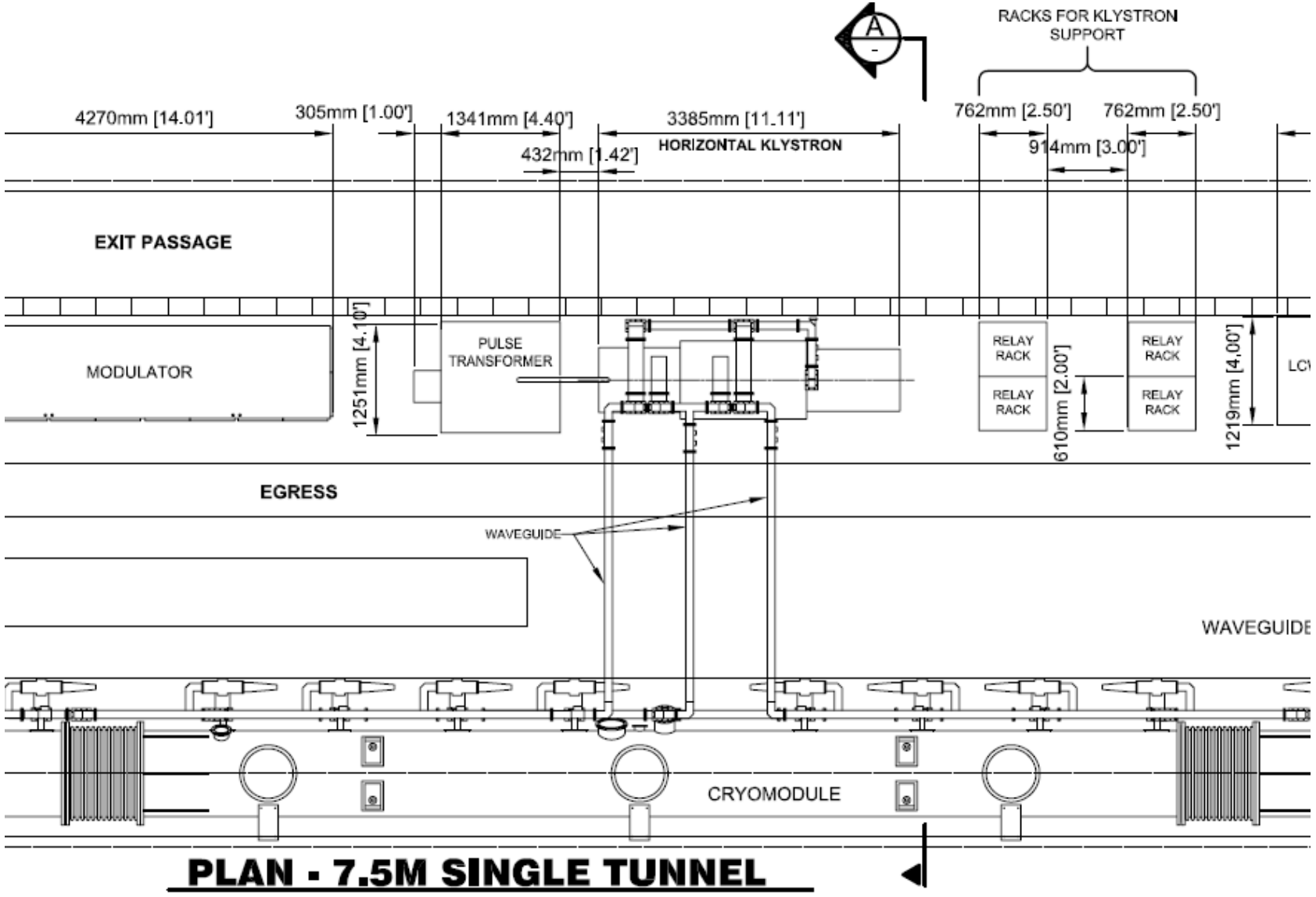
Tunnel Layout

- 7500 mm
- 5200 mm
- XFEL

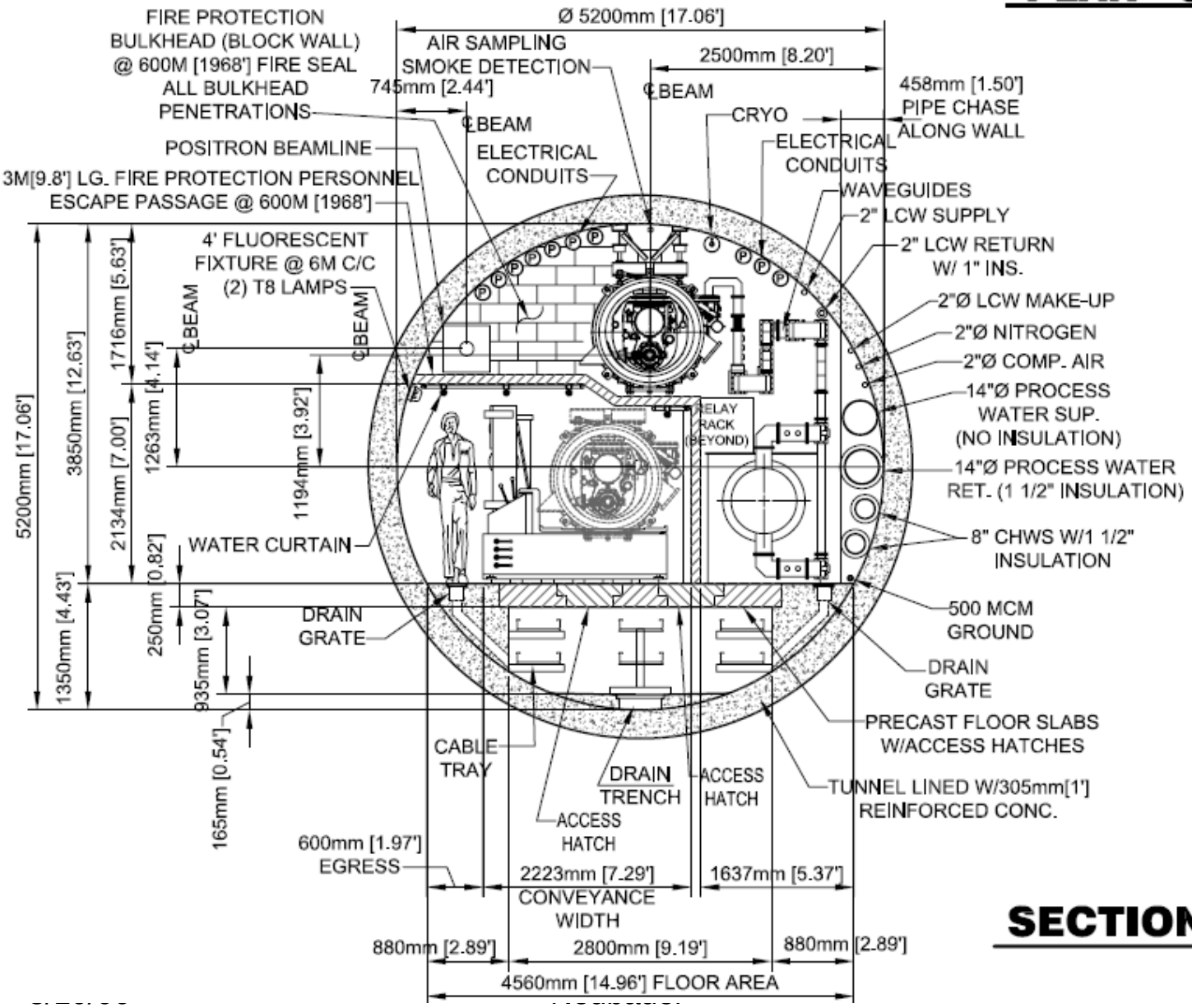
PLAN - 7.5M SINGLE TUNNEL



SECTION


RACKS FOR KLYSTRON SUPPORT
A
4270mm [14.01']
305mm [1.00']
1341mm [4.40']
3385mm [11.11']
HORIZONTAL KLYSTRON
432mm [1.42']
762mm [2.50']
762mm [2.50']
914mm [3.00']
EXIT PASSAGE
MODULATOR
1251mm [4.10']
PULSE TRANSFORMER
RELAY RACK
RELAY RACK
RELAY RACK
RELAY RACK
610mm [2.00']
1219mm [4.00']
EGRESS
WAVEGUIDE
WAVEGUIDE
CRYOMODULE
PLAN - 7.5M SINGLE TUNNEL

PLAN - 5.2M



SECTION

TESLA - A CHALLENGE IN PLANNING LARGE FACILITIES*

Gerhard Neubauer
Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany

*Proceedings of the 7th International Workshop on Accelerator Alignment, SPring-8, 2002

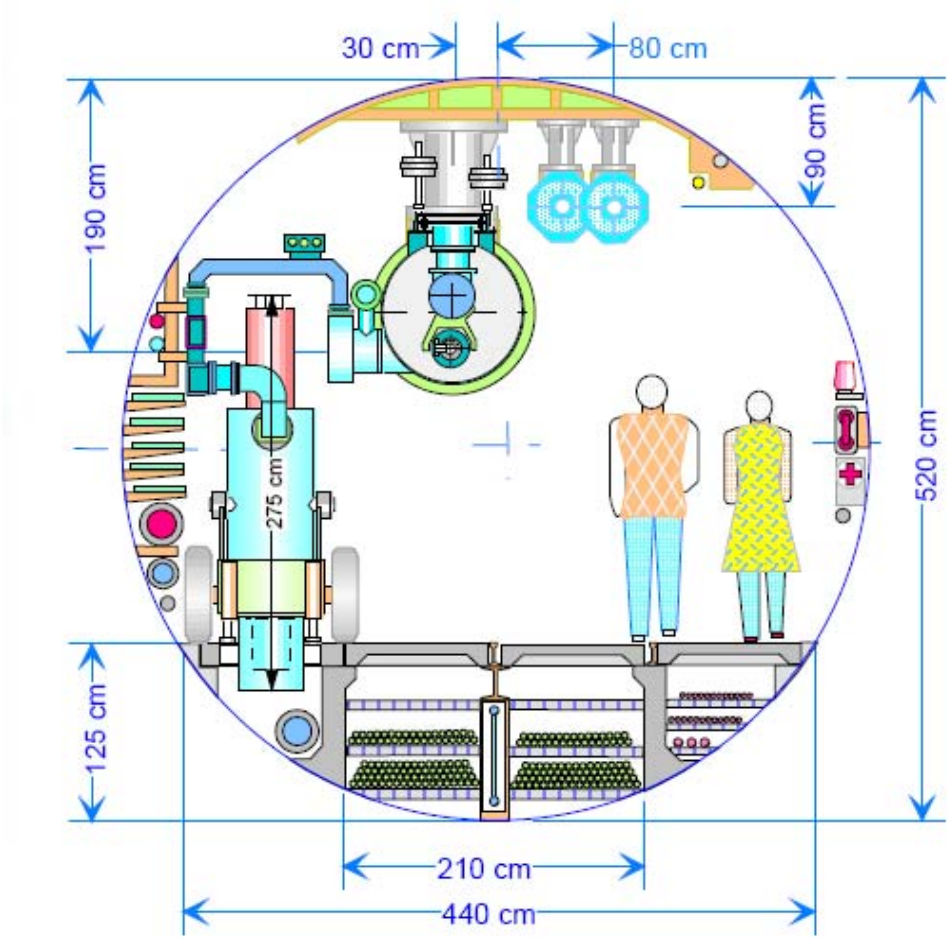
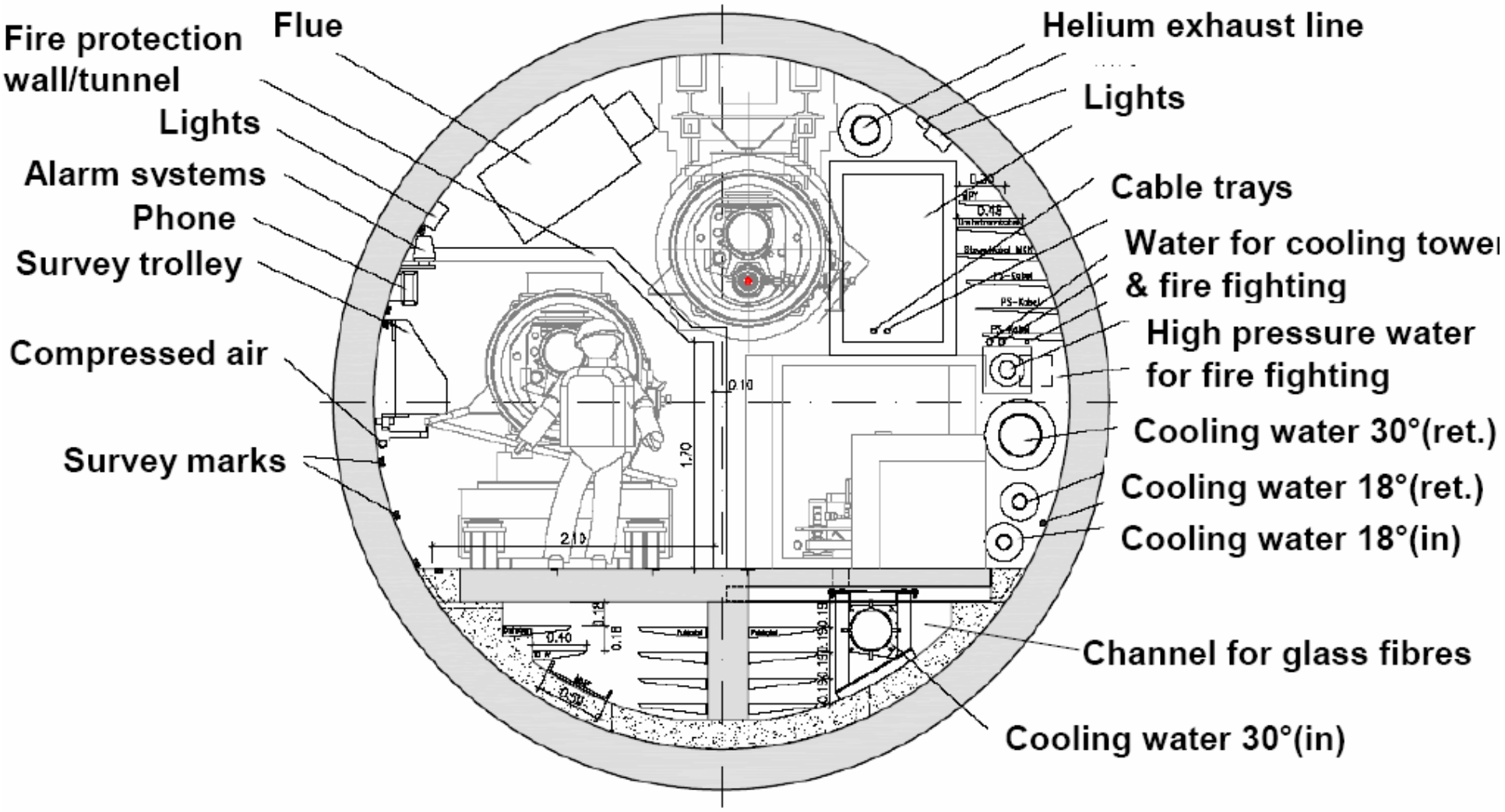


Fig. 5 New tunnel layout

WTM ENGINEERS AMBERG ENGINEERING

Tunnel cross-section @ modules - Technical layout



XFEL Linac Tunnel Layout

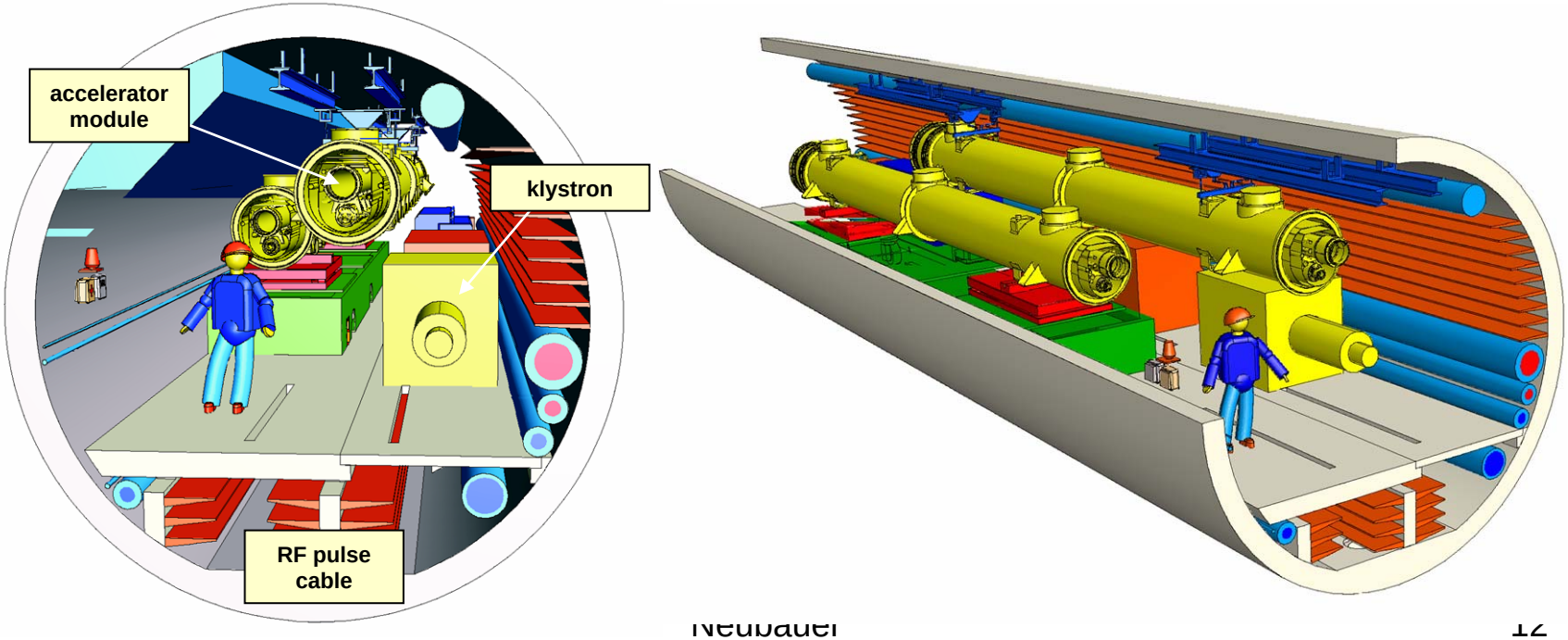
DESY meeting with KEK ILC Delegation (March 7th 2005)

Hans Weise / DESY

Accelerator is housed in a 5.2 m diameter tunnel ~ 15 - 30 m underground.

Klystrons in tunnel are connected to modulators in an external hall by 10kV pulse cables.

Preferred installation concept is suspension from tunnel ceiling



Cost Reconciliation

- RF distribution