



Main Linac Tunnel Discussion

Tom Lackowski

Date

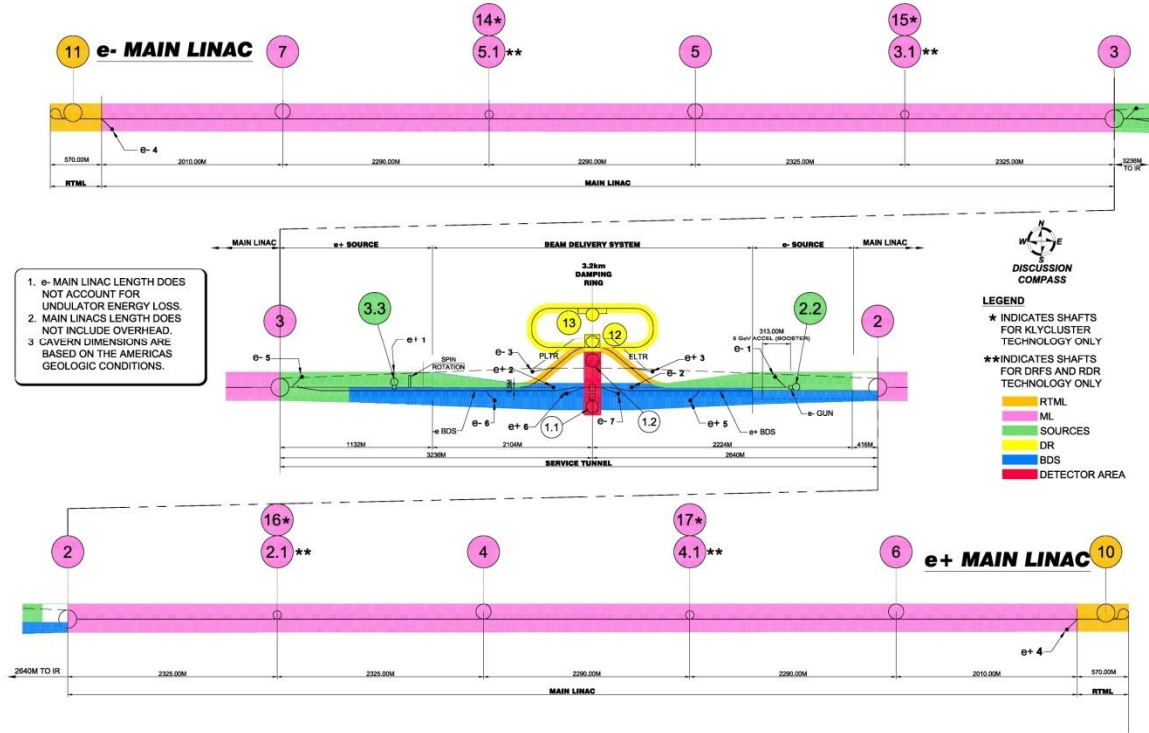
Event

Global Design Effort

1



Overall Plan



1. e- MAIN LINAC LENGTH DOES NOT ACCOUNT FOR UNDULATOR ENERGY LOSS.
 2. MAIN LINACS LENGTH DOES NOT INCLUDE OVERHEAD.
 3. CAVERN DIMENSIONS ARE BASED ON THE AMERICAS GEOLOGIC CONDITIONS.

LEGEND
 * INDICATES SHAFTS FOR KLYCLUSTER TECHNOLOGY ONLY
 ** INDICATES SHAFTS FOR DRFS AND RDR TECHNOLOGY ONLY

RTML
 ML
 SOURCES
 DR
 BDS
 DETECTOR AREA

| e- SIDE | e+ SIDE | B.D.S./SOURCES | DAMPING RING | TOTAL |
|-----------|-----------|----------------|--------------|-------|
| ML = RTML | ML = RTML | SERVICES TUNEL | RING | |
| 11810 | 11810 | 518 | 328 | 33048 |

| AREA SYSTEM | e- INJECTOR | D.R. | RT.M.L. BEAM | MAIN LINAC BEAM | e+ INJECTOR |
|-----------------|---------------------------|------|--------------|-----------------|---------------------------|
| AMERICA-width M | 4.5 + 4.5 = WIDENED AREAS | 5.0 | 4.5 | 4.5 | 4.5 + 4.5 = WIDENED AREAS |
| EUROPE-width M | - | - | 4.5 | 4.5 | - |
| ASIA-width M | - | - | - | 5.2 | - |

| POINT | 2,3 | 4, 5, 6, 7, 10, 11 | 12 | 13 | 14, 15, 16, 17 |
|---------------|---------------|--------------------|---------|---------------|----------------|
| (L x W x H) m | 52 x 10 x 5.3 | 56 x 10 x 7 | 10x10x7 | 3 x 3 x SHAFT | |

| POINT | 10 | 11 | 12 | 2 | 2,2 | 3 | 3,3 | 4 | 6 | 6 | 7 | 10 | 11 | 12C | 13A | 14* | 10* | 16* | 17* | 2,1** | 3,1** | 4,1** | 5,1** | |
|-------|----|----|----|---|-----|---|-----|----|----|---|---|----|----|-----|-----|-----|-----|-----|-----|-------|-------|-------|-------|-----|
| Ø M | 9 | 16 | 14 | 4 | 14 | 4 | 14 | 14 | 14 | 9 | 9 | 14 | 14 | 9 | 9 | 3 | 3 | 3 | 3 | 3 | 1.6 | 1.5 | 1.5 | 1.5 |

| POINT | 11, 12 |
|---------------|---------------|
| (L x W x H) m | 120 x 25 x 39 |

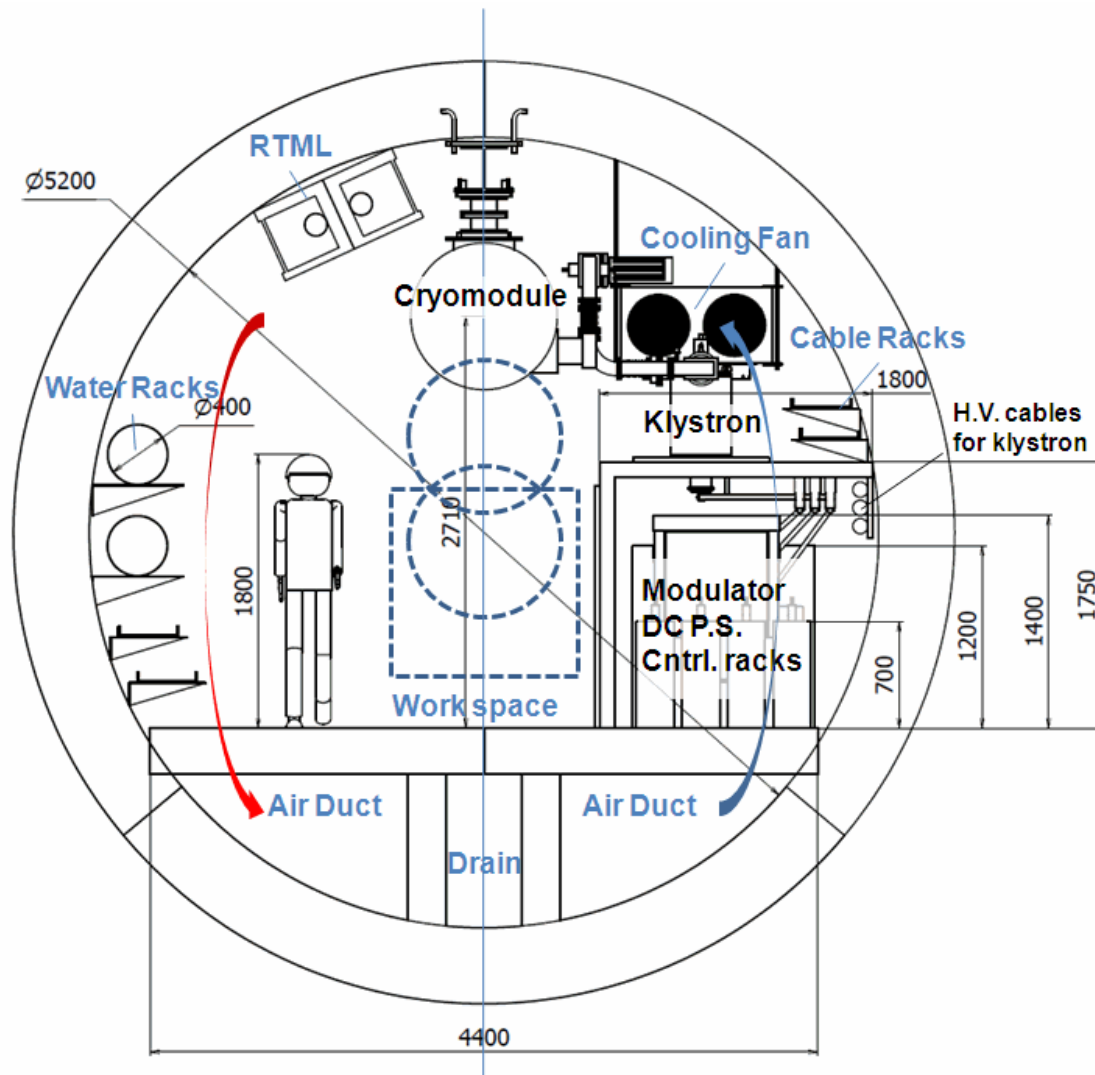
| POINT | BDS |
|---------------|-------------|
| (L x W x H) m | 25 x 7 x 6 |
| | -15 x 7 x 6 |

- Ø- 1 NC TUNE UP DUMP 11KW
- Ø- 2 SC TUNE UP DUMP 311KW
- Ø- 3 EDRX TUNE UP DUMP 311 KW
- Ø- 4 RTML TUN EUP DUMP 220 KW
- Ø- 5 e- LINAC FAST ABORT 11 KW
- Ø- 6 BDS TUNE UP DUMP 18MW
- Ø- 7 PRIMARY e- DUMP - 20MW
- Ø+ 1 TARGET DUMP 200 KW
- Ø+ 2 SC TONE UP DUMP 311 KW
- Ø+ 3 PDRX TUNE UP DUMP 311 KW
- Ø+ 4 RTML TUNE UP DUMP 220 KW
- Ø+ 5 BDS TUNE UP DUMP 18MW
- Ø+ 6 PRIMARY e+ DUMP - 20 MW

| POINT | SOURCES | RTML | ML | BDS |
|---------------|---------|----------------------------------|-------------|--------------------|
| (L x W x H) m | Ø-1 | Ø-2, Ø-3, Ø-4, Ø+1, Ø+2, Ø+3&Ø+4 | Ø-5, Ø+5 | Ø-6, Ø-7, Ø+8, Ø+7 |
| | | 10 x 13 x 7 | 20 x 9 x 15 | 20 x 42 x 8 |

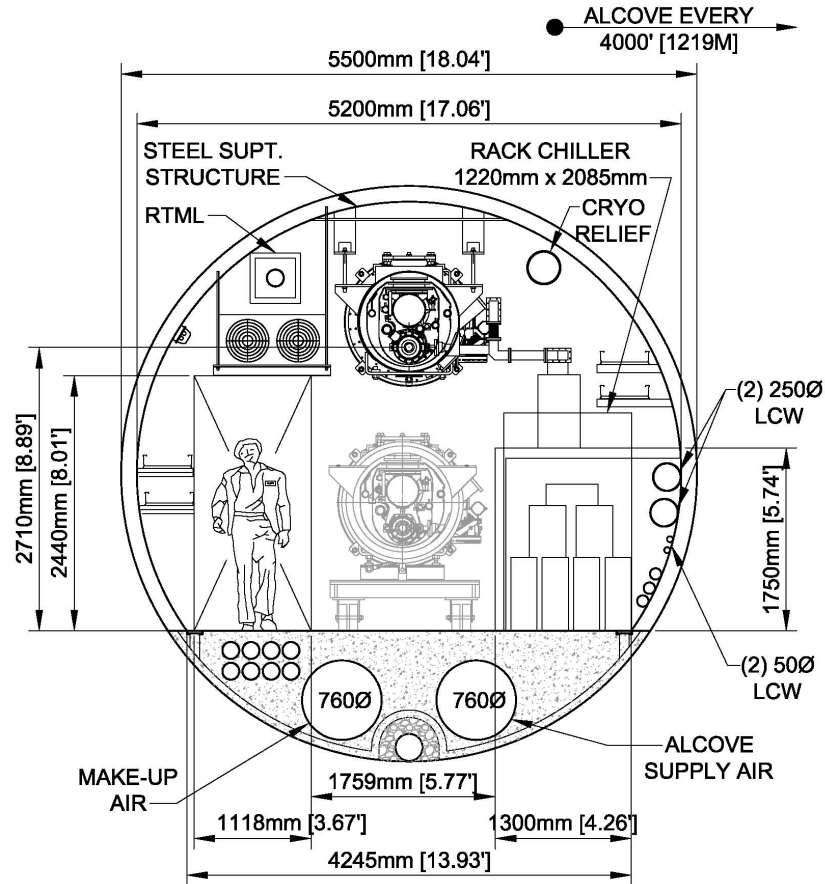
SHEET - 1
Draft
11-20-09

Asian DRFS



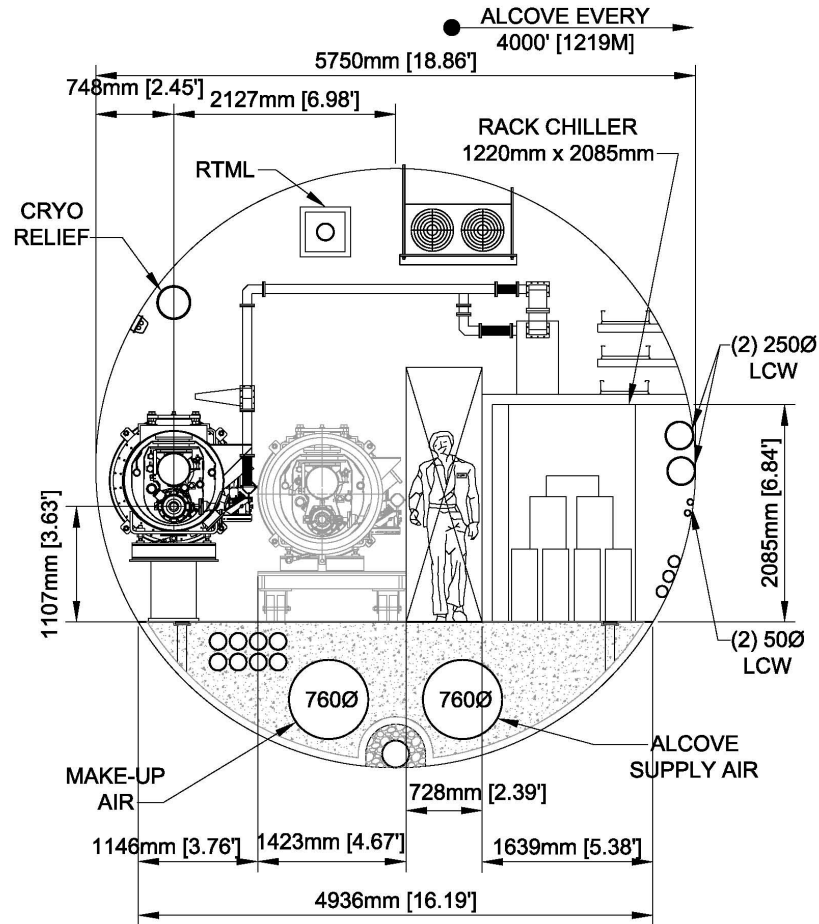


Americas DRFS Ceiling Mount

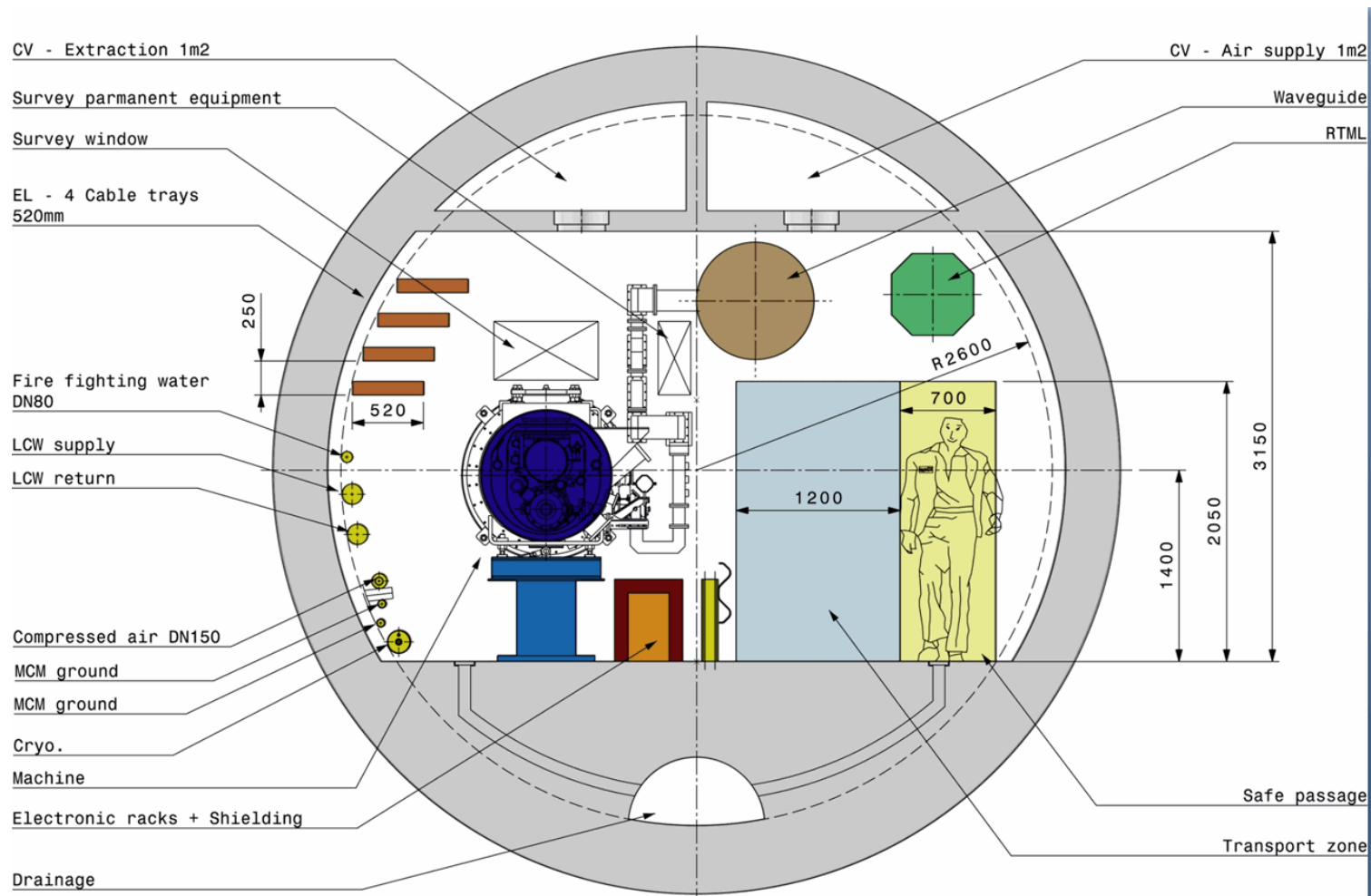




Americas DRFS Floor Mount



Europe KlyCluster

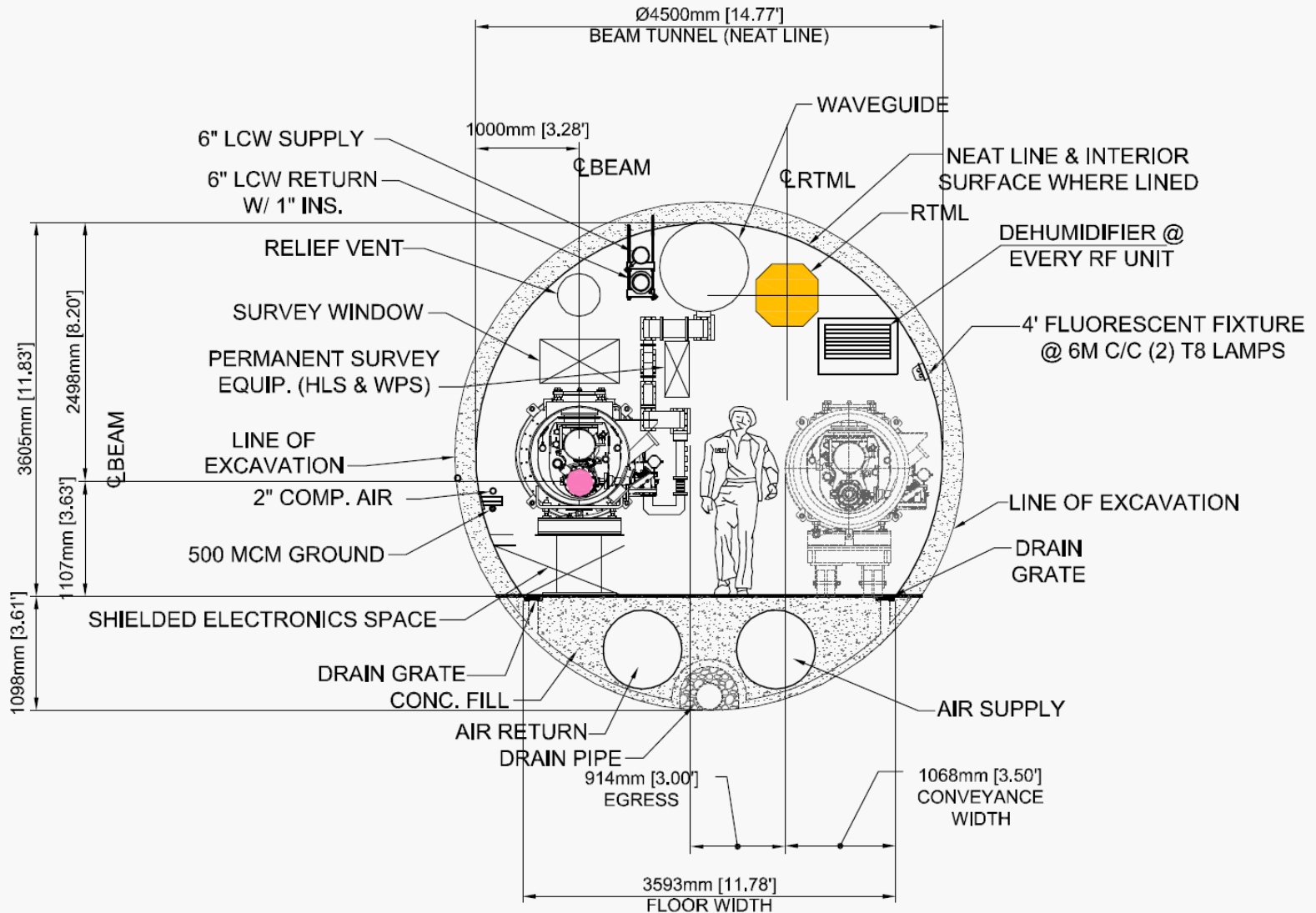


ILC - Typical Cross Section - Diameter 5200mm - Scale 1:25 (A3)
 KLY CLUSTER EUROPE - J.Osborne / A.Kosmicki - November 6th 2009

Cross section for Europe (CERN) 5.2m diameter for Kly Cluster

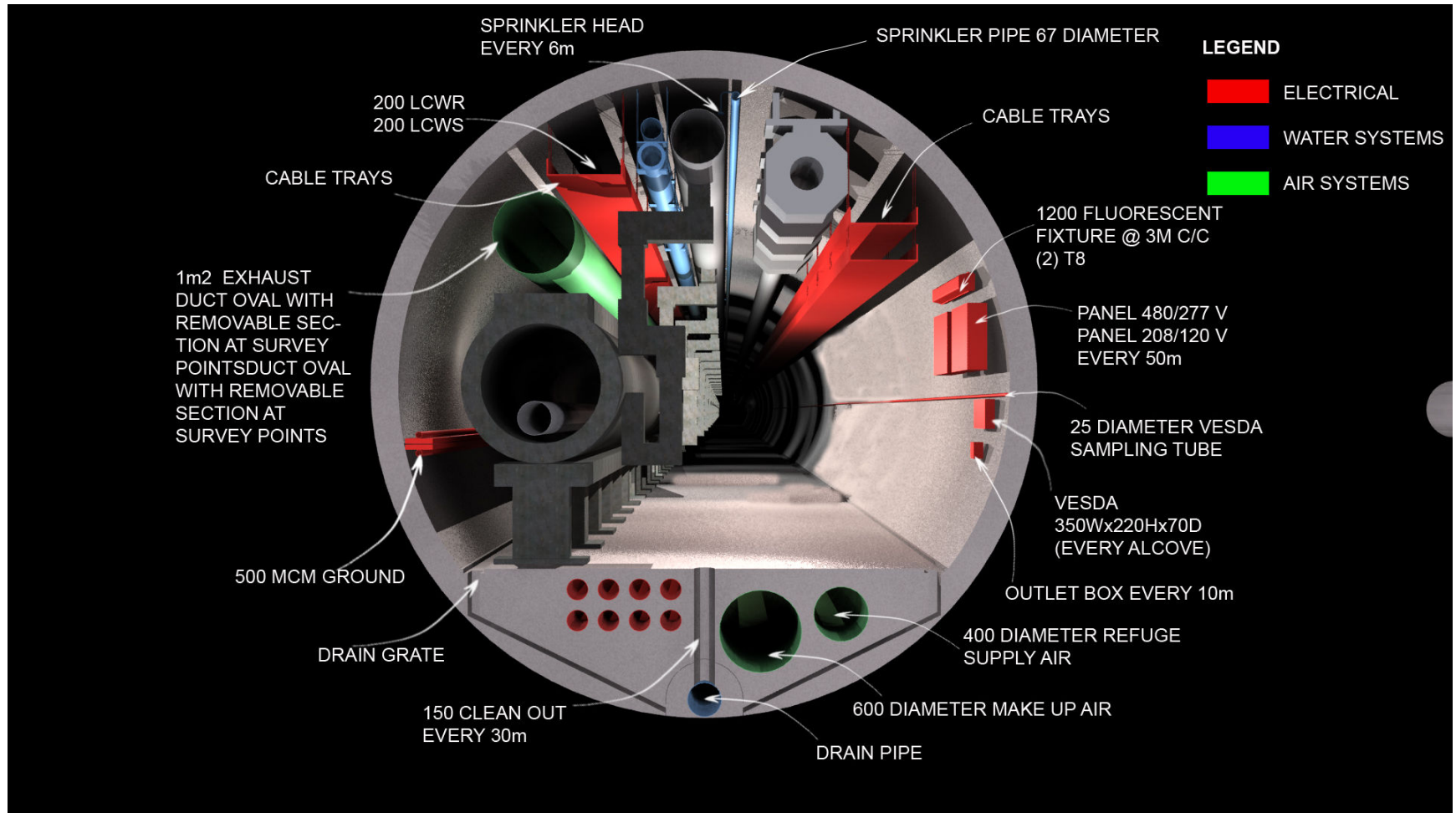


Americas KlyCluster





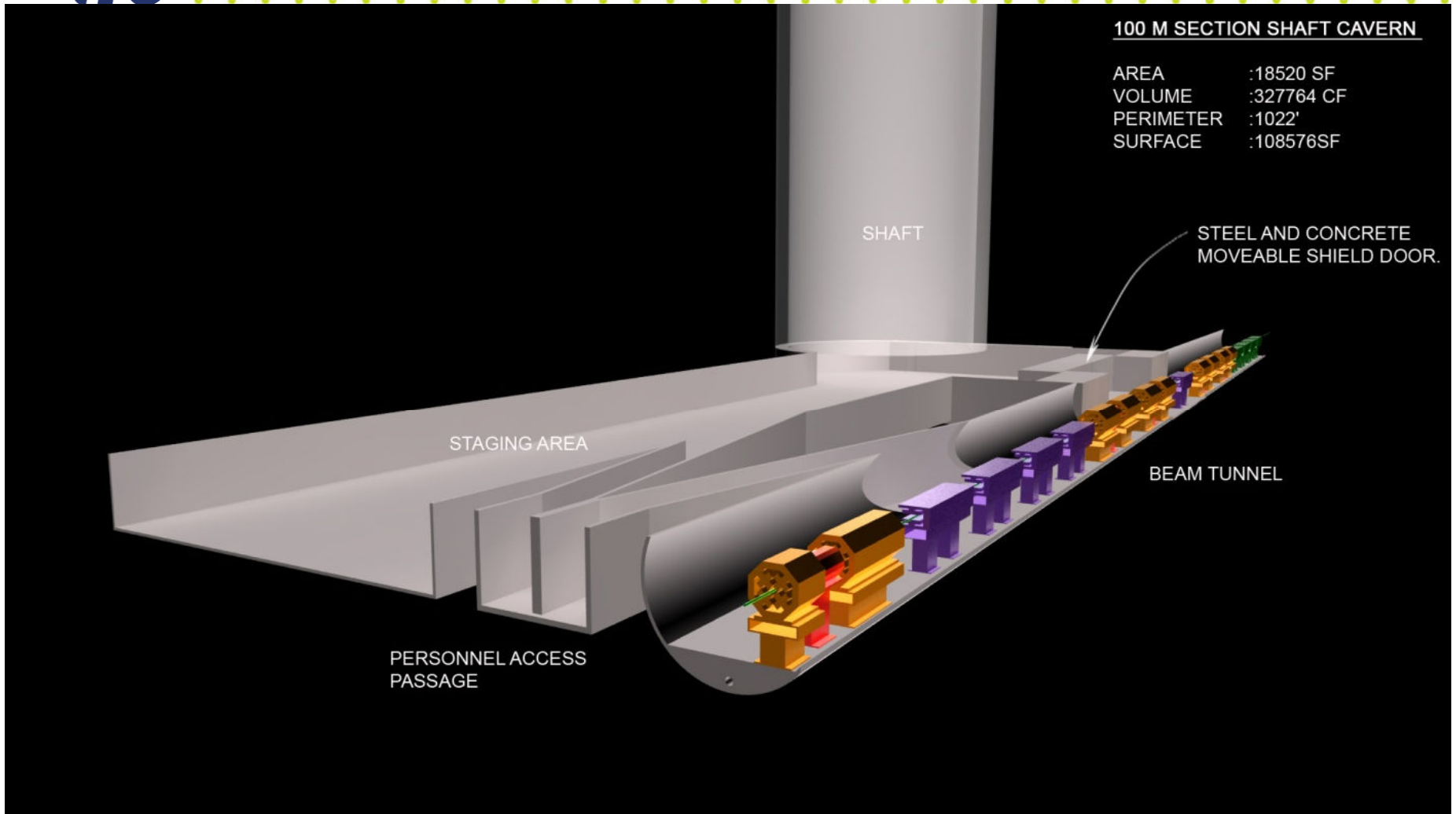
Americas KlyCluster 3D



- Draft In Progress Drawing



Americas Shaft Cavern



- Draft In Progress Drawing



Discussion Areas

- Tunnel
 - **KlyCluster**
 - Overhead for Undulator RF Units
 - Overhead for Reliability RF Units
 - Cryo Plant Locations (shafts)
 - **DRSF**
 - Overhead for Undulator
 - Overhead for Reliability
 - Cryo Plant Locations



Discussion Areas

- Tunnel
 - **KlyCluster**
 - Cabling
 - Racks- Surface/alcove/in tunnel
 - Power Supplies (Main Linac / RTML)
 - Waveguide Cooling
 - Waveguide Size
 - 2.5 km shaft spacing
 - Cryo Plant Spacing



Looking Ahead

- The transfer of technical information for the RDR started slow then ramped up to an intense pace.
- Due to funding, or other manpower limitation, CFS will need to develop the TD 2 effort in an even methodical pace.
- Requirements, requirements, requirements;
 - **We need to transition from cartoons without firm basis (2D or 3D) to cartoons based on Area System and Technical System solid requirements.**