State of preparation for 3D-CAD design in Asian Sample Site

CFS (Conventional Facilities & Siting)
ALCPG (American Linear Collider Physics Group) 09 Parallel Session

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Design procedure and 2D/3D CAD model

- Entire layout model
  - Topography
  - Outline of underground structures (not detailed)
- Detailed Cavern and Tunnels model
  - Detector hall
  - Beam tunnels
  - Other tunnels for experimental equipment
  - Access tunnels (Shafts, Sloped tunnels)
- Detailed Surface facilities and Land formation model
  - Main Campus area
  - Access tunnel portal area
Design procedure and 2D/3D model
Entire layout model

Basic plot plan of main structure
Regional condition
Layout design of main structure
Design of access route
Optimization

2D study
Completion of layout design
3D modeling of layout design

3D study

Geological investigation
3D modeling of topography / geology
Integration of 3D model

Given by GDE team or,
Natural: Geology, topography,
Social: Environment, legal
restrictions, land-use plan,
Shafts, sloped tunnels, roads,
ground-space,

Iterative study
3D topographical map for entire layout model on sample site

- 3D Models drawn by using AutoCAD Civil 3D
- Digital Map data (50m Grid data), XML-format, GSI.

Map data are imported to AutoCAD point data by “Digital map reader”. Ground surface can be displayed as a surface model, consist of small triangles “TIN”.
3D model of underground structure
Entire view model

- Entire model is made referring to 2D drawings
- Basic layout condition is according to GDE team or KEK
3D model of underground structure
Damping Ring Region

- Damping Ring Tunnel
- Damping Ring Tunnel Shaft 13
- Shaft 1
- Shaft 1.1
- Shaft 1.2
- Shaft 1.1
- Shaft 1.2
- Shaft 1.1
- Shaft 1.2
- Shaft 1.1
- Shaft 1.2
Plot plan

**e- MAIN LINAC**

**e+ MAIN LINAC**

**SITE / TUNNEL LENGTHS (M)**

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<th>Damping</th>
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**TUNNELS**

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**SHAFTS**

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**DAMPING RINGS**

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**BEAM ABORT SERVICE HALLS (**)**

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<td>10 x 10 x 5</td>
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**MONO WALL WIDENING**

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**DETECTORS HALL**

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<td>40 x 15 x 15</td>
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**LEGEND**

- RTML
- ML
- SOURCES
- DR
- BOS
- DETECTOR AREA

**SHEET • 1**
3D model of underground structure
Interaction Regions

- Damping Ring Tunnel
- Detector Hall Shaft
- Service Tunnel Shaft
- Service Tunnel Shaft Cavern
- Damping Ring Tunnel Shaft
- Detector Hall
- Main Linac Tunnel
- Service Tunnel
Over-lay view of ground-surface and underground structure (see-through)
Over-lay view of ground-surface and underground structure (Wire-frame)
3D model of underground structure overlay topography and structure

Longitudinal section
Design procedure and 2D/3D model
Inside of Cavern and Tunnels

Setting dimensions

Conventional facilities
- Power supply, air-treatment, Safety facility, ...

Experimental facilities

Plot design of each facility inside of cavern & tunnels
- 2D and 3D modeling

Optimization

Determination of Underground dimensions and plot design of each facility

CFS work group or,

Iterative study
Layout design inside of underground structure

- Not yet studied.
- Section profile:
  - Section dimensions and profiles will be decided by considering the layout planning of each facility.

Note: According to an old design plot plan.
Design procedure and 2D/3D model
Surface facilities and Land formation

Listing structures and buildings
Given by GDE team

Restrictions for layout design

Setting required space
Main campus, each access area

Layout and land formation
Mainly 2D model

Optimization
Iterative study

Completion of design
2D & 3D model

Investigations
- geological, topographical
- environmental, legal restriction,
Land formation and ground-surface buildings & structures

- Not yet studied

Note:
According to an old design plot plan