

RTK
Super Conducting Super Collider

Supplemental Study of
Experimental Hall Concepts
Using Additional Model Detectors

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Draft

Transverse Hall

1. General Description

The model is shown in drawings 11-M-02. The facilities are comprised of: An integrally combined collision and assembly hall, equipment and personnel shafts and the necessary connecting tunnels. A unique feature of this design is its transverse mounting (perpendicular to the beam path) which permits the use of a rail system to transport the detector between two halls. essentially, this model duplicates the design of the halls used in the fermilab D-0 experimental areas.

2. Halls

Collision Hall

a. The collision hall is approximately 15m long, 23m wide and 23m high at the top of the crowned ceiling. Since no crane is employed in this hall, a lower ceiling height is allowed.

b. Assembly Hall

The assembly hall is approximately 62m long and 23m wide. The hall floor consists of two levels, and the hall is approximately 27m deep at the lower level. The lower level is flush with the collision hall floor, providing a base for the rail system. The upper level is used as a pre-assembly area. Less overhead room is required here hence the raised floor.

3. Shafts and Tunnels

o A 9m Dia. equipment shaft and a 7m Dia. personnel shaft are positioned on opposite sides of the assembly hall at the end farthest from the interaction point.

o A 3m utility bypass tunnel is on the ring center end of the assembly hall. Access to this tunnel is via the personnel shaft.

4. A 50/10T crane is used in the assembly hall. The use of the rail system obviates the need of a crane in the collision Hall.

5. Shielding of the assembly hall will be provided by the combination of a permanent wall (concrete lintel) and by stackable concrete block.

L3+1 Detector

1. General Description

This model is shown in drawings 12-M-01 and 12-M-02. The model consists of: The collision hall, the equipment shaft, the personnel shaft, and a labyrinth network. A key feature of this design is the large equipment shaft which is integral with the collision hall. This permits the pre-assembly of large sections of the detector above ground and eliminates the need for an assembly hall. The model is based on the CERN L3 design, however the hall has been lengthened to accommodate the L3+1 detector.

2. Collision Hall

The collision hall is 56m long, 26m wide and approximately 34m deep (at the top of the crown). As mentioned, the collision hall and equipment shaft function as an integral unit.

3. Equipment Shaft

A 26m Dia. equipment shaft mates directly to the collision hall. Equipment maintenance will also be provided through this shaft.

4. Shafts and Tunnels

- o A 7m Dia. personnel shaft leads to the labyrinth network. This 1.5m by 3m labyrinth network provides access to either end of the collision hall. The design of this network provides shielding for the personnel shaft area.
- o A 3M Dia. utility bypass tunnel is on the ring center side adjacent to the personnel shaft. Access to this tunnel is via the personnel shaft.

5. Cranes

Two 40T bridge cranes are used in the collision hall. These provide a hook height of 25m.

¹ "Muon Spectrometers - Report of the Detector Subgroup", Experiments, Detectors, and Experimental Areas for the Supercollider, Ed. R. Donaldson and M.G.D. Gilchriese (World Scientific Publishing Co. Pte. Ltd., 1988) P.531

Large Detector with Assembly Hall

1. General Description

The important features of the model are shown in drawings 13-M-01 and 13-M-02. This model is based on studies for the ~~CERN~~ project. It is comprised of: the collision hall, the assembly hall, and electronics house, personnel and equipment shafts, and the necessary connecting shafts and tunnels.

This arrangement provides two important features.

- o The accommodation of most, if not all, large detectors (The L3+1 type of detector is an exception).
- o The use of an arched crane in the collision hall reduces the overhead area required by the crowned ceiling.

2. a. Collision Hall

The collision hall is 56m long and 24m wide. The hall floor consists of three levels. The deepest of these will house the detector and the depth of the hall at this point is approximately 25.5m. The beam centerline is shown 52m below grade and 11.5m above the lowest floor level.

b. Assembly

The assembly hall is also 56m by 24m. The floor consists of two levels and the hall is approximately 23m deep at its deepest level.

c. Electronics House

the electronics house is 19m long, 13.5m wide and approximately 21m deep.

3. Shafts and Tunnels

a. 14m Dia. equipment shaft

This shaft leads to the larger of the two equipment transfer shafts.

b. 7m Dia. Personnel Shaft

This shaft leads to the smaller of the two equipment transfer shafts. A separate tunnel leads from this shaft to the electronics house.

c. Equipment Transfer Shafts and Access to Electronics House.

Two equipment transfer shafts connect the collision and assembly halls to each other and to the personnel and equipment shafts. The larger shaft is 15m wide and approximately 19m deep. The smaller shaft is 10m wide and 12m deep. Access to the electronics house is provided by tunnels via the personnel shaft and the large equipment transfer shaft.

d. Utility Bypass Tunnel

A 3m Dia. utility bypass tunnel is adjacent to the assembly hall, on the ring center side.

4. Cranes

As previously mentioned, an 20T arched crane will be used in the collision hall and a standard 100T capacity 100 ton bridge crane will be used in the assembly hall.

