CONVENTIONAL FACILITIES (WBS 1.10)

i. Ring Tunnel and Experimental Halls

The availability of the CBA conventional facilities for use in the Relativistic Heavy Ion Collider represented an unprecedented opportunity to build the collider at minimum cost. The existing tunnel configuration provides for six experimental areas where the ring beams will cross. Four areas have been provided with the major structures necessary for an operating experimental area. The RHIC lattice will use these existing areas which are at the 2, 4, 6 and 8 o'clock locations (see Fig. 10-1). The 4 o'clock facility is an "open area" which will be enclosed with shielding, and will be used for the high frequency rf system and is also suitable for small experiments. In order to make the ring operational, the gaps at each of the two undeveloped areas - 10 and 12 o'clock - had to be closed. Multi-plate arch tunnels 4.9 m (16 ft) and 7.9 m (26 ft) in diameter have been erected at 10 o'clock, along with a service building. The 10 o'clock area is the location of the beam dump and can be used for small experiments. At 12 o'clock, 4.9 m and 7.9 m diameter multi-plate arch tunnels have been erected, along with 2 concrete headwalls, 2 stair structures, a base slab and service building. Multi-plate arch magnet access tunnels have also been constructed at either side of the 12 o'clock facility. This area will be available for development at a later date, thus maintaining the option of adding an experimental hall for future experimental needs. Additional multi-plate arch magnet access tunnels have been constructed at either side of the 8 o'clock facility. A complete list of RHIC buildings and tunnel identification is given in Table 10-1.

The experimental halls at 2, 6 and 8 o'clock are fully enclosed structures complete with support buildings. The area and height of the facilities vary and each is equipped with overhead cranes, air conditioning, and sprinkler protection and has direct access from grade. Table 10-2 gives the dimensions, crane capacities and beam heights in each of these facilities as well as the 4 o'clock open area. The open area has a concrete deck capable of supporting portable shielding blocks in varying configurations. All conventional services, including a support building, are in place. The experimental hall at 6 o'clock has an assembly building addition constructed similar to the existing assembly building at 8 o'clock.

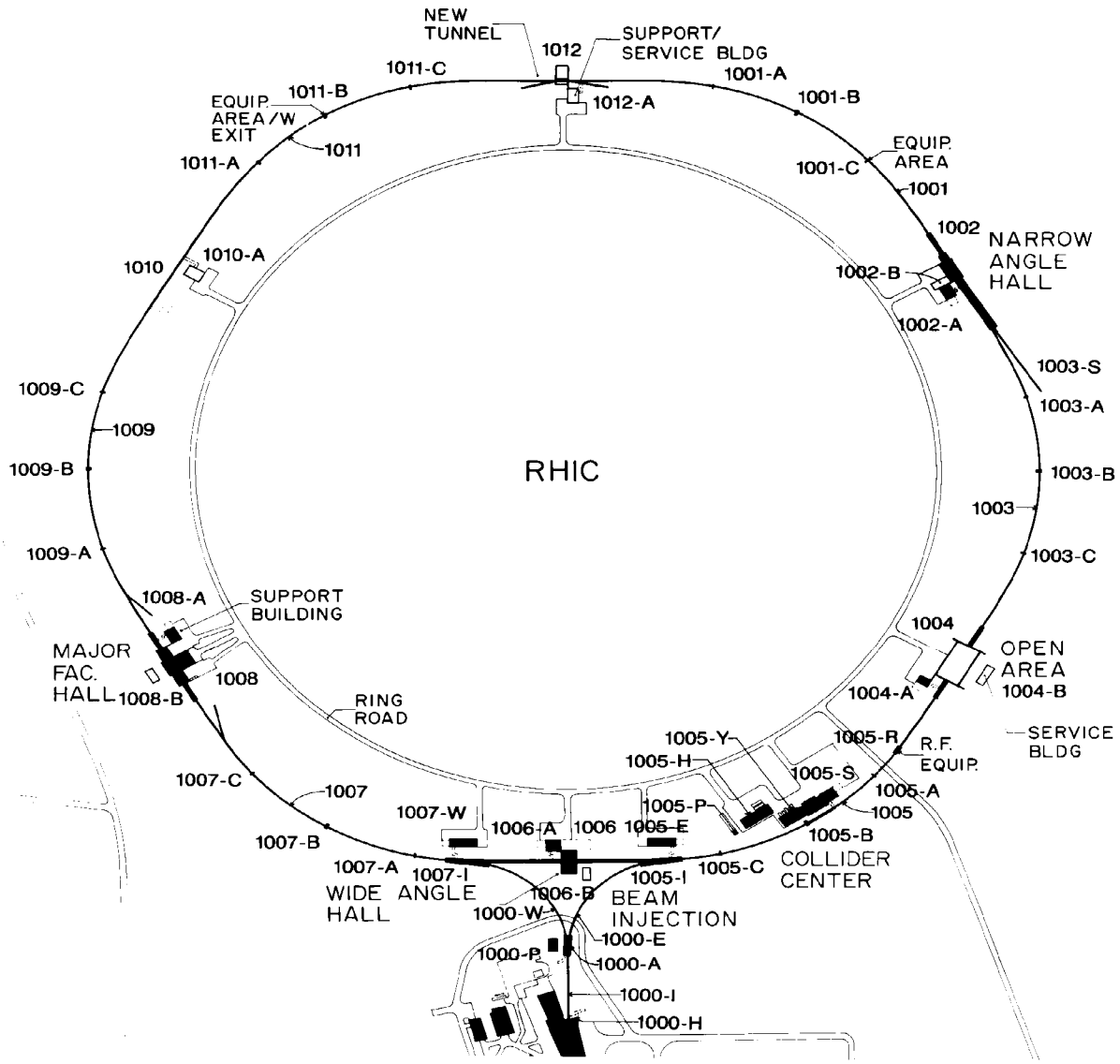

Fig. 10-1. RHIC building and tunnel identification.

Table 10-1. RHIC Building and Tunnel Identification

		1000A	Injection Conjunction Structure
		1000E	East Injection Tunnel
		1000H	Injection Access
		1000I	Injection Tunnel
		1000P	Injection Power Supply Building
		1000W	West Injection Tunnel
1001	1 O'Clock Sextant	1001A	1 O'Clock Sextant Electronics Alcove
		1001B	1 O'Clock Sextant Electronics Alcove
		1001C	1 O'Clock Sextant Electronics Alcove
1002	Narrow Angle Hall	1002A	Narrow Angle Hall Support Building
		1002B	Narrow Angle Hall Service Building
1003	3 O'Clock Sextant	1003A	3 O'Clock Sextant Electronics Alcove
		1003B	3 O'Clock Sextant Electronics Alcove
		1003C	3 O'Clock Sextant Electronics Alcove
		1003S	3 O'Clock Sextant Spectrometer Tunnel
1004	Open Area	1004A	Open Area Support Building
		1004B	Open Area Service Building
1005	5 O'Clock Sextant	1005A	5 O'Clock Sextant Electronics Alcove
		1005B	5 O'Clock Sextant Electronics Alcove
		1005C	5 O'Clock Sextant Electronics Alcove
		1005E	East Injection Power Supply Building
		1005H	Compressor Structure
		1005I	East Injection Transition Structure
		1005P	Cooling Tower Pump House
		1005R	rf Structure
		1005S	Collider Center
		1005Y	Cryogenic Structure
1006	Wide Angle Hall	1006A	Wide Angle Hall Support Building
		1006B	Wide Angle Hall Service Building
1007	7 O'Clock Sextant	1007A	7 O'Clock Sextant Electronics Alcove
		1007B	7 O'Clock Sextant Electronics Alcove
		1007C	7 O'Clock Sextant Electronics Alcove
		1007W	West Injection Power Supply Building
		1007I	West Injection Transition Structure
1008	Major Facility Hall	1008A	Major Facility Hall Support Building
		1008B	Major Facility Hall Service Building
1009	9 O'Clock Sextant	1009A	9 O'Clock Sextant Electronics Alcove
		1009B	9 O'Clock Sextant Electronics Alcove
		1009C	9 O'Clock Sextant Electronics Alcove
1010	Experimental Facility	1010A	Support/Service Building
1011	11 O'Clock Sextant	1011A	11 O'Clock Sextant Electronics Alcove
		1011B	11 O'Clock Sextant Electronics Alcove
		1011C	11 O'Clock Sextant Electronics Alcove
1012	Future Major Facility Hall	1012A	Future Major Facility Hall Support/ Service Building

Table 10-2. Summary of Hall Dimensions (m)

		Length	Width	Beam Height	Hook Height/ Capacity (tons)
2.	Narrow Angle				
	Central Hall	28	12	1.7	6.1/20
	Forward Exp. Bldg.	68	7.9	1.7	5.3*
	"Stub"	91	2.4	1.0	2.0*
4.	Open Area	57†	29†	2.2	---*
6.	Wide Angle				
	Central Hall	16	32	4.3	9/20
	Assembly Building	31	18	4.3	12.2/40 + 12.2/10
8.	Major Facility				
	Central Hall	19	15	5.2	11/40
	Forward Exp. Bldgs. (2)	16	9	3.3	6.6*
	Assembly Building	19	19	5.2	11.3/40+15/5**

*No crane - ceiling height given
†Pad dimensions given
**Rails installed, no crane

The Collider Center, approximately 4650 m^2 (50,000 sq ft), consisting of a Cryogenic Wing, a Compressor Structure and a four level Main Building, is complete. The air conditioned main building contains technical shops, an RF/Power Supply wing, office and conference room space, and space for the collider control center. The RHIC cost estimate includes funding to complete such items as a power substation for the accelerator rf and Power Supplies Wing, site improvements such as paved access roads, hardstands, parking areas, yard lighting and general restoration of facilities and grounds. Additional power supply service buildings have been constructed at various locations around the ring. The 2, 6 and 8 o'clock buildings will be 300 m^2 (3200 sq ft) and the 4 o'clock building will be 450 m^2 (4800 sq ft). Dimensions of support and service buildings are given in Table 10-3.

Construction of the utility services, roadways, drainage and other site improvements for the CBA have been underway since 1979. All have been completed except for some paving and site work. The extension of the 69 kV substation was completed in May 1982.

Table 10-3. Summary of Building Dimensions (m)

Location	Building	Length	Width	Building No.
2	Support	14	18	1002A
	Service	24	12	1002B
4	Support	14	10	1004A
	Service	38	12	1004B
6	Support	14	18	1006A
	Service	24	12	1006B
8	Support	14	18	1008A
	Service	24	12	1008B
10	Support/Service	15	27	1010A
12	Support/Service	15	27	1012A

The underground ductbank for electrical power and communication distribution was completed in 1981. Installation of conventional power feeder cables to the Collider Center was finished in 1982. Installation of the balance of the power cables around the Ring Road ductbank and the unit substations at areas 2, 4, 6 and 8 o'clock location was completed in the Spring of 1983. The Main Ring Sector 11 and Sector 1, approximately one-third of the enclosure, which had remained unfinished during CBA, has been provided with permanent power, lights, fire alarm, HVAC and dehumidification. The Main Ring has been completed, and the two support buildings at areas 10 and 12 o'clock have been constructed as is required to supply the utility services to these areas in order to make the ring operational by the end of 1994.