iii. Cable Tray System

The power supplies for most of the superconducting magnet loads are located in the equipment service buildings. These supplies are connected to gas cooled warm-to-cold power leads that are part of the cryogenic valve boxes, also located in the equipment service buildings. On the warm side of the power leads, copper cables connect to the power sources. On the cold side of the power leads, superconducting Cold Crossing Bus carries the current to the RHIC tunnel, where it is distributed over other superconductors to the magnet loads. The sextupole and corrector supplies are located in the tunnel alcoves, and power from these supplies is carried by conventional copper cables in trays. In addition to power supply leads, the trays also bring beam instrumentation cables and control signals to the alcoves.

In most of the ring, the trays are hung from the center of the tunnel. This is nearly directly above the magnets. The cables drop out of the trays and can either go to the power leads on the CQS assemblies, or to other devices, such as cryogenic, vacuum, and safety equipment. In those areas (typically in the region between each Q3 and Q4) where the vacuum jacketed piping bypasses warm beam tube sections, the cable trays move to the outside of the ring.

Figure 2-4 is a composite of two typical areas in the arch plate portions of the tunnel. The trays have been partitioned to segregate cable types, as required by the National Electrical Code. Each of the partitions in the tray has been labeled, and the cable types that occupy those sections of the trays have been listed in Table 2-3.

Some cables are totally internal to the ring. They might be connections between devices in the ring or between devices in the ring and equipment in the alcoves. Other cables need to go from the equipment service buildings to the ring. These are carried by tray to the ring, where they enter at the same location as the vacuum jacketed piping. At 6, 8, 10, and 12 o'clock this means entering through the top of the ring via conduits. At 2 and 4 o'clock the tray enters through the side of the tunnel. In either case, the cables enter the tray in the ring at a location between the Q1 and D0 magnets.

The cable tray system in each sextant stretches from DX to DX. At 2, 6, 8 and 10 o’clock no cables interior to the ring ever cross the beam crossing point. This avoids interference with equipment in the experimental areas. At 4 and 12 o’clock there are some optical signal cables that do cross the IR region.

Table 2-3. Cable Tray Space Allocation

Conductor		Total Tray Width, cm (in.) DX - Q4			Q5 - Q5	
Correctors	F,H	61	(24)	D,F,H	107	(42)
Beam Instrumentation	E,G	15	(6)	E,G	61	(24)
Vacuum, Cryogenics, Control	A	10	(4)	A	23	(9)
AC Power	B	5	(2)	B	23	(9)
High Voltage	J	15	(6)	J	15	(6)
Security	C	15	(6)	C	15	(6)
Totals		122	(48)		244	(96)

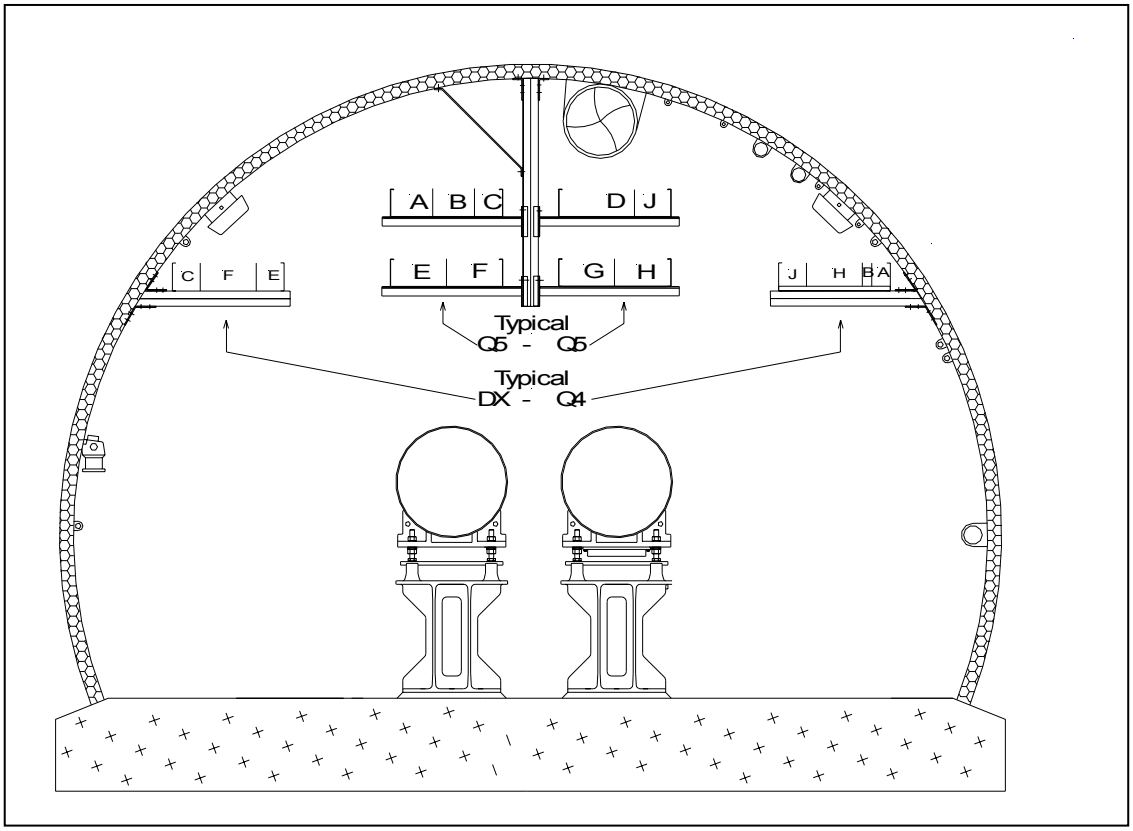

Fig. 2-4. Composite Cable Tray Layout