# Executive Summary

# Introduction

# Machine Layout and Performance

# Operation Scenarios

# Collider

# Booster

# Linac, Damping Ring and Sources

## Main Parameters

## Linac and Damping Ring Accelerator Physics

## Linac Technical Systems

## Damping Ring Technical Systems

### RF System

### RF Power Source

### Magnets

### Magnet Power Supplies

### Vacuum System

### Instrumentation

### Injection and Extraction System

### Control System

### Mechanical Systems

(Warning! – this section is too simple and cannot meet the requirement of TDR, which is a construction-ready document.)

The mechanical system provides support for the devices in the Damping Ring (DR), as listed in Table 6.4.9.1. The supports are fixed to the ground. Steel frame pedestals are adopted at the bottom with adjusting mechanisms on it, similar to those in the Linac. The beam has the same height as Linac, which is 1.2 meters from the tunel ground. The requirements for the support structure are also outlined in Section 4.3.10. (Error! – the numbers of magnets do not seem correct. Check with Kang Wen.)

**Table 6.4.9.1:** Supports in the Damping Ring

|  |  |  |
| --- | --- | --- |
| **Supports**  | **Quantity (set)** | **Remarks** |
| Quadrupole & sextuple support | 72 | Common girder for one quadrupole and one sextuple |
| Quadrupole support | 32 | Supports of 2 kinds of quadrupoles |
| Dipole support | 80 | Supports of 2 kinds of dipoles |
| Lambertson support | 2 |  |
| Kicker support | 2 |  |

There are 36 FODO cells in the arc of Damping Ring, with two dipoles, two quadrupoles and two sextupoles. Each Dipole is supported individually. While the adjacent quadrupole and sextupole are supported together, as shown in Figure 6.4.9.1. The thirty-two quadrupoles and eight dipoles in the RF of Damping Ring are supported separately as the distance between each other is relatively long. There are also two Lambertson and two kickers, all of them are supported separately.



**Figure 6.4.9.1:** Support method of FODO cell

Figure 6.4.9.2 shows the support of adjacent quadrupole and sextupole. The common steel frame pedestal is mounted to the ground. The magnets are adjusted individually, by screws in vertical direction and push-pull bolts in horizontal direction. Figure 6.4.9.3 shows the support of the quadrupole in RF section. It has a similar structure but only one magnet to be supported. Figure 6.4.9.4 shows the support of the dipole with the length of 700 mm, also has a similar support structure.



**Figure 6.4.9.2:** Support of adjcent quadrupole and sextupole

**Figure 6.4.9.3:** Individual support of quadrupole magnet



**Figure 6.4.9.4:** Individual support of dipole magnet