

Architecture & Civil Design Status of the Proton Accelerator Research Center in PEFP

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1. Introduction

PEFP (Proton Engineering Frontier Project) is scheduled to administrate the conventional facilities design with Gyeongju and complement its unfit points. When construction work starts according to the construction schedule, a field work office will be installed to supervise the Proton Accelerator Conventional Facilities Construction.

In this paper, we describe the geological investigation procedure for the construction of the proton accelerator conventional facilities of PEFP. By the geological investigation, data for the reasonable and economic construction work, such as stratum structure and geotechnical characteristics [1,2].

In Site Plot Plan for PEFP, we classified center as 2 groups such as main facilities and support facilities. We also designed access road of the Proton Accelerator Research Center of PEFP.

In architectural design for PEFP, we described the design procedure of the buildings and landscape architectures of the Proton Accelerator Research Center.

2. The Geological Investigation

In this chapter, we describe the geological investigation for the Proton Accelerator Research Center. By the geological investigation, data for the reasonable and economic construction work, such as stratum structure and geotechnical characteristics, is provided. Fig. 1 describes exploratory hole position for the geological investigation for the Proton Accelerator Research Center.

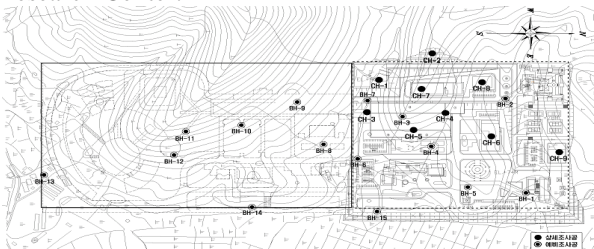


Fig. 1. Exploratory hole position for the geological investigation for the Proton Accelerator Research Center.

As shown in Fig. 1, 24 exploratory holes over the construction site are examined, that is, 15 exploratory holes (6 holes for preliminary exploration, 6 for detail exploration) for 1st construction site and 7 exploratory hole for preliminary exploration for 2nd construction site.

In Fig. 2, contour map of the construction site is described. According to the contour map of the construction site, elevation from ground level in the north of the construction site is low, while elevation from ground level in the south of the construction site is high. In the meantime, most parts over the construction site are being seen the gentle slope except several valleys with steep slope.

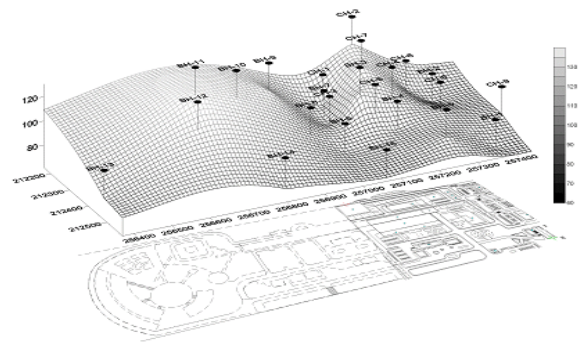


Fig. 2. contour map of the construction site of PEFP

In the anomalous area estimation procedure, we utilized data by geophysical prospecting and borehole survey. Estimated anomalous area direction is N5~10W, N75~85W, which are described in Fig. 3.

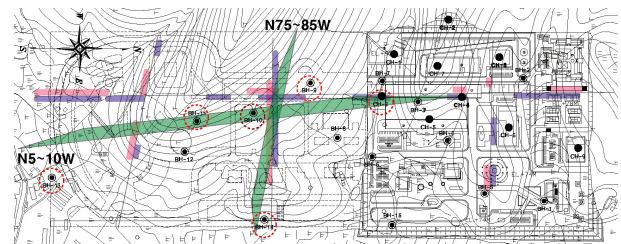


Fig. 3. Estimated Anomalous Area Direction

As shown in Fig. 3, anomalous area is supposed to distribute almost in the valleys and ridges in the 2nd construction site, while several valleys in the 1st construction site.

Accelerator & Beam Application Research area, which is the main building with proton accelerator facilities, is placed at the firm ground acquired by geological investigation. Also, for the Ion Beam Application Building, it is placed next to the Accelerator & Beam Application Research Area with firm ground.

3. Site Plot Plan

To establish the site plot plan of the Proton Accelerator Research Center, we classified center as 2 groups such as main facilities and support facilities. Main facilities are composed of Accelerator & Beam Application Research Area, Ion Beam Application Building and Utility Building, while support facilities are composed of Administrative Building, Regional Cooperation Building and Dormitory Building. Site plot plan of the Proton Accelerator Research Center is described in Fig. 4.

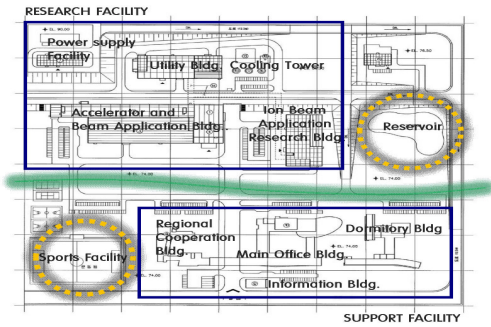


Fig. 4. Site plot plan of the Proton Accelerator Research Center

In the access road design procedure, roads in the circumferences and their connectivity, economical efficiency and reasonability should be considered. We also designed roads in center with parking lots to provide convenience to the workers and visitors.

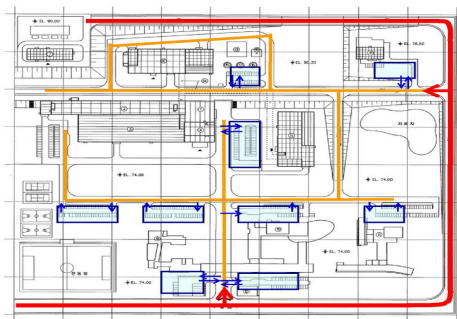


Fig. 5. A Plane Figure of the Road for the Proton Research Center

4. Architectural Design

Bird's-eye view of the Proton Accelerator Research Center is described in Fig. 6.



Fig. 6. Bird's-eye View of the Proton Accelerator Research Center of PEFP

As shown in Fig. 6, playground with sports facilities and pond are arranged in the proper position to ensure open views of the proton accelerator research center. A pedestrian passage is installed between main facilities and support facilities. Fig. 7 represents the front view of the support facilities, which are composed of Administration Building, Dormitory Building, and Regional Cooperation Building.



(a) Administrative Building



(b) Regional Cooperation Building

(c) Dormitory Building

Fig. 7. Front View of the Support Facilities

5. Conclusions

In this paper, we describe the management procedure for the construction of the proton accelerator conventional facilities of PEFP. We described several parts of the proton accelerator complex construction work such as geological investigation procedure, site plot plan and architectural design for the Proton Accelerator Research Center of PEFP.

Execution of the conventional facilities construction work management plan makes it possible to ordering a construction work faithfully.

Acknowledgement

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REFERENCES

- [1] Detail Design Report for the Land Improvement and Access Load, KOPEC, 2008
- [2] Technical Review Report for slope stability analysis (Rev.0), KOPEC, 2008