

Civil Engineering Works Status of the Proton Accelerator Research Center in PEFP - Site and Access Road Earthwork

Jung Min Nam, G. P Jeon, Yi-Sub Min, Sung Sik Park, Jin Sam Cho, Kyeong-Jun Mun, Jun Yeon Kim
 Proton Engineering Frontier Project, Korea Atomic Energy Research Institute,
 Daedeok-Daero 1045, Dukjin-Dong Yuseong-Ku, Daejeon, 305-353, Korea
 *Corresponding author: namjm@kaeri.re.kr

1. Introduction

PEFP(Proton Engineering Frontier Project) was Launched in 2002 as one of the 21st Century Frontier R&D Programs of MOST(Ministry of Science & Technology). Gyeongju city was selected as the project host site in March, 2006, where 'Proton Accelerator Research Center' was going to be constructed. Since 2005, the Architectural and Civil design work has been performing. The Earthwork of the site was started in June, 2009.

In this paper, we describe the status of the civil engineering works for the PEFP, focusing on the earthwork of the site and access road.

2. Grading and Earthwork design

In this chapter, we describe the earthwork design of the site and access road for the proton accelerator research center.

As shown in Fig. 1, we grouped 4 different grade elevations for site grading. Each grade elevation is EL 74.0m, EL 76.5m, EL 80.3m and EL 90.0m, respectively. Access road to the research center, which surrounds the site, connects entrance (EL 74.0m) to power supply facilities (EL 90.0m).

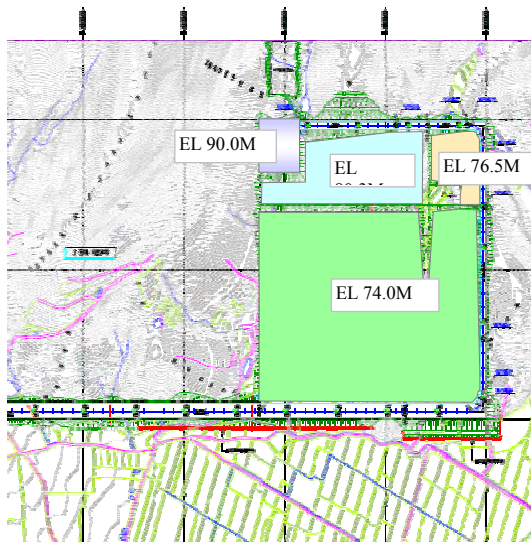


Fig. 1. Site leveling and access road Planning

Site and Access Road earthwork balancing (Bulldozer) and site and Access Road earthwork balancing (Dump truck) are described in Fig.2 and Fig.3, respectively.



Fig. 2. Site and Access Road earthwork balancing (Bulldozer)

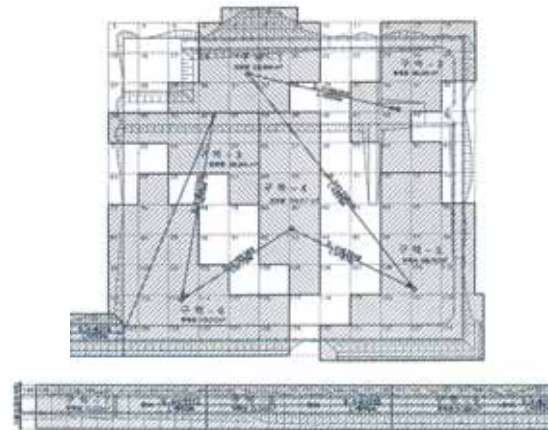


Fig. 3. Site and Access Road earthwork balancing (Dump truck)

Table I describes Earthwork Balancing of the Civil Engineering work.

Table I : Earthwork Balancing of the Civil Engineering work

	Cutting(m ³)	Embanking(m ³)
Site Grading	650,173	636,912
Access Road	124,513	124,513
Architectural Work	279,809	205,444
Total	1,054,495	966,869

As shown in Fig. 2, 3 and Table I, the earthwork balance of the site grading and access road have surplus soils (13,261 m³). Total earthwork balance of the Civil Engineering work requires surplus soils(87,626 m³).

3. Site and Access road Earthwork

In this chapter, we describe the earthwork of the site and access road for the Proton Accelerator Research Center.

3.1 Cultural Inspection

We have to make the cultural inspection before site grading and Earthwork. As shown in Fig. 4, cultural inspection is carried out by Yeungnam Institute of Cultural Properties (ZONE B) and (Sungrim Institute of Cultural Properties (ZONE A).

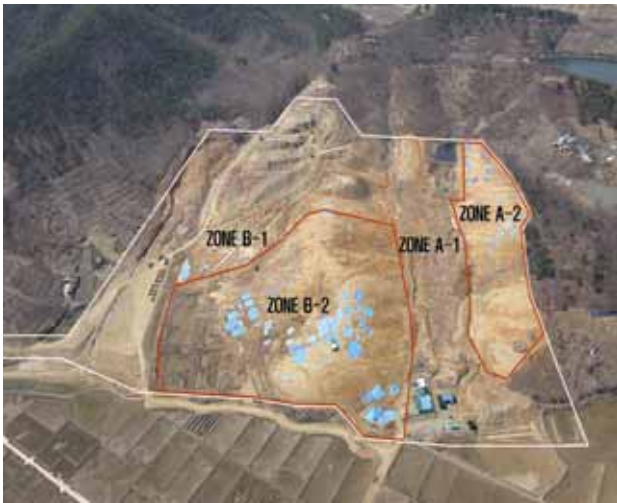


Fig. 4. Cultural Inspection zoning

Since cultural inspection started in 2008, the inspection for the zone B-1 and the zone A-1 had been completed. We are scheduled to complete cultural inspection by 2010; that is, cultural inspection for the Zone A and ZONE B is going to complete in September, 2010 and December, 2010, respectively.

3.2 Earthwork status of the site and access road

We selected the construction company for the site grading and access road construction. Construction works started from June, 2009. Earthwork of the whole site and access road except for ZONE B-2 and ZONE A-2 was started to recover the delayed construction schedule by cultural inspection.

Cutting and embanking zone for earthwork of the site and access road are described in Fig. 5. In Fig. 5, we also indicated the location of building plot of accelerator and beam application building, utility building, power supply facilities.

To complete construction for accelerator and beam application building, utility building, power supply facilities until March 2012, we firstly started cutting work for the designated area (including Zone B-1) in Fig. 5.

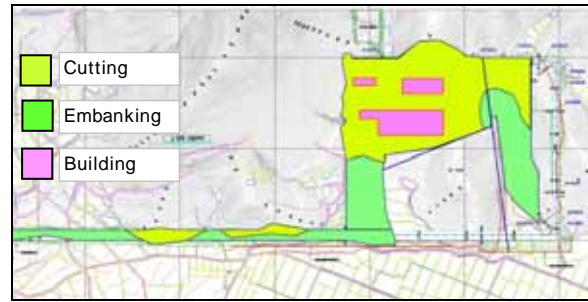


Fig. 5. Earthwork status

Fig. 6 describes the photographs of the construction site for the proton accelerator research center of PEFP.



Fig. 6. Photographs of the construction site

4. Conclusions

In this paper, we describe the earthwork design & status of the site and access road for the proton accelerator research center of PEFP. We firstly started cutting & embanking work for the designated area complete the construction of accelerator and beam application building, utility building, power supply facilities. Subsequently, we are scheduled to build support buildings, such as main office building, regional cooperation building, dormitory building, information house, etc. All construction work will be completed until March 2012.

Acknowledgement

This work was supported by the Ministry of Education, Science and Technology of the Republic of Korea through the Proton Engineering Frontier Project.

REFERENCES

- [1] Detail Design Report for the Land Improvement and Access Road(Rev.0), KOPEC, 2009
- [2] Technical Review Report for slope stability analysis (Rev.0), KOPEC, 2008
- [3] J.M. NAM, K.J. MUN, J.Y. KIM, Investigation of the Structural Stability on the Accelerator Tunnel of the Proton Accelerator Research Center in PEFP, 2007 KAPRA & KPS/DPP Conference, 54P~56P, 2007
- [4] Jung Min Nam, Jun Yeon Kim, Kyeong-Jun Mun, G. P Jeon, J. S. Cho, Seok-Ki Lee, Yi Sub Min, Architecture & Civil Design status of the Proton Accelerator Research Center in PEFP, the Korean Nuclear Society Spring Meeting, Jeju, Korea, May 22, 2009