

**REDESIGN THE STRUCTURE AND CONSTRUCTION
MANAGEMENT OF ASSALAFFIYAH ISLAMIC BOARDING
SCHOOL**

Final Project Report

As one of the requirements to obtain a Bachelor's degree from
Atma Jaya Yogyakarta University



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FACULTY OF ENGINEERING
ATMA JAYA YOGYAKARTA UNIVERSITY**

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INTISARI

Laporan tugas akhir desain infrastruktur merupakan salah satu syarat untuk memperoleh gelar Sarjana dari Universitas Atma Jaya Yogyakarta untuk program studi Teknik Sipil. Laporan akhir yang diberikan kepada mahasiswa sebagai bentuk akhir pembelajaran yang telah didapat dan dipelajari selama proses perkuliahan, dengan tujuan menciptakan lulusan sarjana yang berkompeten sebagai perencana infrastruktur di bidang teknik sipil yang dituangkan dalam laporan tugas akhir ini.

Laporan tugas akhir ini disusun oleh Tim Kelompok yang terdiri dari : Antonio Christopher Paramarta (191317696), Alfredo Ago Sangke (191317697) dan Alby Reiji Frananda (191317872). Proses pembelajaran dan penyusunan laporan ini dilakukan secara luring dengan didampingi oleh dosen pembimbing dan dosen pengajar. Isi dari laporan ini merupakan pengaplikasian dari semua pembelajaran wajib yang kami dapatkan selama perkuliahan. Perancangan yang telah dilakukan meliputi tiga bidang, antara lain perancangan struktur atas dan perencanaan struktur bawah, geoteknik dan manajemen konstruksi yang pada setiap proses pengerjaan tersebut memiliki korelasi antara satu dengan yang lainnya.

Pada tugas akhir ini, proyek yang diberikan kepada kelompok kami adalah Pondok Pesantren Assalaffiyah yang berlokasi di Dusun Mlangi, Desa Nogotirto, Kecamatan Gamping, Kabupaten Sleman, Daerah Istimewa Yogyakarta. Pondok Pesantren Assalaffiyah I terdiri dari 2 buah gedung utama yaitu gedung asrama dan gedung edukasi yang terdiri dari 3 tingkat lantai pada setiap bangunannya. Pada perencanaan ini mencakup perencanaan struktur atas, perencanaan struktur bawah dan juga perencanaan biaya dan waktu. Dalam perancangan gedung, perhitungan dan analisis menggunakan metode LRFD (Load Resistance and Factor Design) dan Perencanaan bangunan ini mengikuti SNI (Standar Nasional Indonesia) yang berguna untuk membuat suatu perencanaan sesuai standar yang berlaku yang dibuat oleh para ahli di bidang Teknik Sipil agar kualitas dari sebuah perencanaan ini dapat dipertanggung jawabkan dari aspek kualitas dan kekuatan dari sebuah perencanaan bangunan yang kami buat.

Perancangan struktur pada Pondok Pesantren Assalaffiyah I dimulai dari atap. Atap dari kedua bangunan ini menggunakan atap berbentuk limas sesuai gambar arsitektural yang dikombinasikan dengan dak dan las sebagai sambungannya. Kemudian kedua Gedung memiliki ukuran kolom yang sama dengan dimensi 50 cm x 50 cm , dan lima tipe balok induk dan tiga balok anak. Pada perencanaan pelat lantai, gedung edukasi memiliki sebelas 11 tipe plat yang menggunakan penulangan 1 arah dan 2 tipe plat menggunakan penulangan 2 arah. Sedangkan gedung asrama memiliki 5 tipe plat 1 arah dan 4 tipe plat 2 arah dan terakhir pada jenis tangga menggunakan 1 jenis tangga pada kedua Gedung ini. Pada bidang geoteknik, tanah pada area Pondok Pesantren Assalaffiyah I termasuk dalam kategori normal konsolidasi dari asumsi bahwa tanah tersebut belum pernah digunakan untuk sebagai sarana infrastruktur sebelumnya, dengan situs tanah

sedang (SD) dari data Website Respon Spektrum. Sehingga proyek ini menggunakan pondasi dalam, yang terbagi menjadi pondasi tunggal dan gabungan.

Perancangan manajemen konstruksi pada Proyek Pondok Pesantren Assalafiyah meliputi pekerjaan penyusunan Work Breakdown Structure (WBS), perhitungan volume pekerjaan, analisis harga satuan, perhitungan durasi pekerjaan, network diagram, kurva s, penjadwalan sumber daya dan rencana anggaran biaya. Sehingga dari perhitungan tersebut pada proyek ini memakan waktu 570 hari untuk durasi pengerjaan kedua gedung dan memakan biaya kurang lebih sebesar Rp. 20.691.031.736,53 untuk kedua Gedung ini.

Kata kunci : *pondok pesantren, perancangan gedung, perancangan geoteknik,, manajemen proyek*

ABSTRACT

The infrastructure design final project report is one of the requirements for obtaining a Bachelor's degree from Atma Jaya University, Yogyakarta for the Civil Engineering study program. The final report is given to students as the final form of learning that has been obtained and studied during the lecture process, with the aim of creating competent undergraduate graduates as infrastructure planners in the field of civil engineering as outlined in this final report.

This final project report was prepared by a Group Team consisting of: Antonio Christopher Paramarta (191317696), Alfredo Ago Sangke (191317697) and Alby Reiji Frananda (191317872). The learning process and the preparation of this report are carried out offline accompanied by supervisors and teaching lecturers. The content of this report is the application of all the compulsory learning that we got during lectures. The design that has been carried out covers three areas, including superstructure design and substructure planning, geotechnical and construction management which in each work process has a correlation between one another.

In this final project, the project given to our group is the Assalaffiyah Islamic Boarding School which is located in Mlangi Hamlet, Nogotirto Village, Gamping District, Sleman Regency, Yogyakarta Special Region. Pondok Pesantren Assalaffiyah I consists of 2 main buildings, namely the dormitory building and the educational building which consists of 3 floors in each building. This planning includes planning of the upper structure, planning of the lower structure and also planning of costs and time. In building design, calculations and analysis use the LRFD (Load Resistance and Factor Design) method and this building plan follows the SNI (Indonesian National Standard) which is useful for making a plan according to applicable standards made by experts in the field of Civil Engineering so that the quality of a plan can be accounted for from the aspect of quality and strength of a building plan that we make.

The structural design of the Assalaffiyah I Islamic Boarding School starts from the roof. The roofs of these two buildings use pyramid-shaped roofs according to architectural drawings which are combined with stone and welding as the joints. Then the two buildings have the same column size with dimensions of 50 cm x 50 cm, and five types of main beams and three types of beams. In planning floor slabs, the educational building has eleven 11 types of plates that use 1-way reinforcement and 2 types of plates that use 2-way reinforcement. While the dormitory building has 5 types of 1-way plates and 4 types of 2-way plates and finally for the type of stairs using 1 type of ladder in these two buildings. In the geotechnical field, the land in the Assalaffiyah I Islamic Boarding School area is included in the normal consolidation category from the assumption that the land has never been used as an infrastructure facility before, with medium soil sites (SD) from the Spectrum Response Website data. So this project uses a deep foundation, which is divided into single and combined foundations.

The construction management design for the Assalaffiyah Islamic Boarding School Project includes the work of compiling the Work Breakdown Structure (WBS), calculating work volume, analyzing unit prices, calculating work duration,

network diagrams, s-curves, resource scheduling and budget plans. So from these calculations, this project takes 570 days for the duration of the construction of the two buildings and costs approximately Rp. 20,691,031,736.53 for these two buildings.

Keywords : pondok pesantren, building design, geotech design, project management

STATEMENT PAGE

We are signed on this below,

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REDESIGN THE STRUCTURE AND XONSTRUCTION MANAGEMENT OF ASSALAFFIYAH ISLAMIC BOARDING SCHOOL YOGYAKARTA

is an original work and is not the result of plagiarism from the work of others.
We, the undersigned, contribute to this Final Project in the same proportion.
Thus we make this statement as a complement to this Final Project document.

Yogyakarta, February 1st 2023



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VALIDATION

Final Project Report

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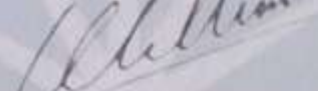
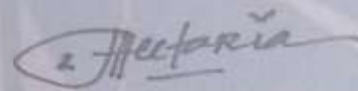
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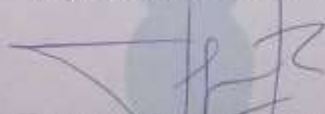
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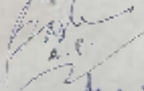
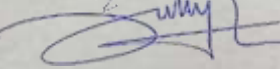
Final Project Report

REDESIGN THE STRUCTURE AND CONSTRUCTION MANAGEMENT OF ASSALAFFIYAH ISLAMIC BOARDING SCHOOL

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PREFACE

Praise and gratitude to God Almighty for all His grace and help so that we can finish this Final Infrastructure Design Report smoothly as a condition for completing higher education in the Undergraduate Program in International Civil Engineering Study Program, Faculty of Engineering, Atma Jaya University, Yogyakarta.

We realize that this final project cannot be completed alone without the help of other parties. On this occasion, we would like to thank those who have helped the author in completing this thesis, including:

1. Mr. Dr. Eng. Luky Handoko, S.T., M.Eng., as the Dean of the Faculty of Engineering, Yogyakarta Atma Jaya University.
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3. Mr. Johan Ardianto, S.T., M.T., as Coordinator of the Department of International Civil Engineering Study Program, Faculty of Engineering, Atmajaya University, Yogyakarta.
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7. Mr. Johan Ardianto, S.T., M.T., as our lecturer one on Final Project Infrastructure 1 that give us knowledge and advise during Final Project Infrastructure 1 progress, specially about upper structure design.
8. Mr. William Wijaya, S.T., M.Eng., as our lecturer two on Final Project Infrastructure 2 that give us a lot of knowledge and suggestions during Final Project Infrastructure 2, specially about foundation aspect.

9. Mrs. Nectaria Putri Pramesti, S.T., M.T., as our lecturer three on Final Project Infrastructure 2 that guide us during arranging project management.
10. Both our parents, family, relatives that have supported and encouraged the process of making this Final Project so that it runs smoothly.
11. Member of this group that already exert everything during the process, starting from Final Project Infrastructure 1 until preparation of this report.
12. All parties that the writer cannot mention one by one who have helped the writer in completing this thesis.

We know that this final project still has shortcomings. Therefore, we expect constructive criticism and suggestions for the perfection of this paper this final project.

The author hopes that this Infrastructure Design Final Project report can be useful for all readers, especially for Civil Engineering students at Atma Jaya University, Yogyakarta. Sorry if there is writing that offends or harms others.

Yogyakarta, December 17th 2022

Author,

Group IC4

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