

THE DESIGN OF MUNTILAN CHRISTIAN CHURCH

Final Project Report

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



By:

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BACHELOR OF CIVIL ENGINEERING STUDY PROGRAM

DEPARTMENT OF CIVIL ENGINEERING

FACULTY OF ENGINEERING

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ESSENCE

Praise and gratitude we go to God Almighty because with His blessings and grace we were able to complete the final report for the Final Infrastructure Design course which contains the contents of the structure, foundation and cost design calculations for the planning work of the Muntilan Christian Church. This report presents calculations for the structural design of the Muntilan Christian Church which were carried out based on the regulations and planning standards in force in Indonesia, as well as regulations on building foundations, as well as calculations of construction costs according to regulations and cost standards in force in Indonesia. In this regard, this report presents several detailed calculations and technical data regarding planning regulations and standards used, specifications for structural materials, design load analysis, design calculations for structural elements, soil and foundation calculations, as well as calculations of estimated costs and time spent in construction. The author would like to thank those who have helped and supported the writer in carrying out the Field Work Lecture, especially to:

1. Mr. Johan Ardianto, S.T., M.T., as our lecturer in Infrastructure Design Final Project I and as our supervisor in completing Infrastructure Design Final Project II
2. Mr. William Wijaya S.T. M.Eng., as a lecturer in Infrastructure Design Final Project II.
3. Ms. Nectaria Putri Pramesti, S.T., M.T., as our lecturer in Infrastructure Design Final Project II.
4. Dean of Faculty of Engineering Dr. Eng. Luky Handoko, S.T., M.Eng.
5. Head of Civil Engineering Departement Vienti Hadsari, S.T., M.Eng., MECRES, Ph.D.
6. Our parents and family who supported me, whether economically or motivationally.

We thank you for the trust that has been given to us to carry out this work. Do not forget we would like to thank all parties who have collaborated and were involved in the implementation of this work. Thus the final report of the Final Infrastructure Design Project, I hope it can be used properly.

Yogyakarta, 10th February 2023

Author

ABSTRACT

The project for the construction of the Muntilan Christian Church Building in Muntilan, Magelang Regency, Central Java, which is viewed from the Structural, Geotechnical and Construction Management Sector, was prepared by Adithya Aladar (191317568) and Nafarani Bongga (191317834). The Muntilan Christian Church building consists of 2 (two) main buildings, namely the Church Building and the Management Building which are connected by connecting bridges on the 2nd, 3rd and 4th floors. However, in this design the author focuses on designing building 1 or the Church Building. . The design of this building covers three areas, namely Structure, Geo-Engineering and Construction Management which are interrelated with one another.

In designing the Indonesian Christian Church Building the method used is a quantitative research method in which the author must collect numerical data or numbers so that conclusions can be drawn from existing calculations, for example such as the design of columns, beams and floor slabs to the analysis of project costs and time. The structural material specifications used in this design include the Profile Steel used is BJ 342 with a yield stress of 240 MPa and Ultimate Stress of 370 MPa, Modulus of elasticity of steel 200,000 MPa, Concrete compressive strength at 28 days old with f_c' 30 MPa. For cost and time management, everything is guided by SNI by using the newest Work Unit Price Analysis each year according to the given project location. Calculations made always refer to working drawings which contain the terms and conditions that apply.

The structural design of the Muntilan Indonesian Christian Church begins with the calculation of the roofs of building 1 and building 2. In planning the roof structure, the church Muntilan Indonesian Christians use the WF roof. Structural columns have one size, two types of main beams, one type of child beams, and four types of floor slabs.

The design in the field of Geo-Engineering at the Muntilan Indonesian Christian Church has a sandy loam soil type obtained from the interpretation of soil data from the SPT and CPT tests, because it is based on the calculation of the carrying capacity of the piles compared using two methods, namely Meyerhoff and Briau et al, in the construction of the Christian Church building Indonesia Muntilan uses a pile foundation because it has a safe limit at a depth of 18 meters.

Design in the field of Construction Management for the Muntilan Indonesian Christian Church includes the preparation of WBS, calculation of activity volume, unit price analysis, calculation of activity duration, Precedence Diagram Method, Network Diagram, Barchart, S-Curve, Worker Scheduling and Budget Plan. So from the calculations and analysis above, the Muntilan Indonesian Christian Church takes a total of 323 days (11 months) with an estimated cost of Rp. 31,733,896,353,719.37 In the field of Construction Methods the drafting team used Unit Price Analysis in accordance with the project location, namely in Magelang.

Keywords: Church, Structure, Geo Engineering, Construction Management

STATEMENT

Those of us who signed below,

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NPM : 191317568

Student name 2 : Nafarani Bongga

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Stating in fact that the Final Project with the title:

THE DESIGN OF MUNTILAN CHRISTIAN CHURCH

is an original work and is not a plagiarized work of someone else's. Those of us undersigned contribute to this Final Project in equal proportion. Thus we make this statement as a complement to this Final Project document.

Yogyakarta, 21 February 2023


(..... Adithya Aladar)


(..... Nafarani Bongga)

APPROVAL SHEET

Final Project Report

THE DESIGN OF MUNTILAN CHRISTIAN CHURCH

By:

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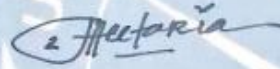
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TABLE OF CONTENTS

TITLE PAGE	i
ESSENCE	ii
ABSTRACT	iii
STATEMENT	iv
APPROVAL SHEET	v
TABLE OF CONTENTS	vii
LIST OF FIGURES	xi
LIST OF TABLES	xii
LIST OF APPENDIX	xv
CHAPTER I INTRODUCTION	1
1.1 Background	1
1.2 Project Overview	2
1.3 Statement of Problems.....	2
1.4 Purpose	3
1.5 Research Methods	3
1.6 Final Project Systematics	3
CHAPTER II TOP STRUCTURAL	5
2.1 Introduction	5
2.2 Loaded	5
2.2.1 Dead Load	6
2.2.2 Live Load	6
2.2.3 Wind Load.....	6
2.2.4 Earthquake Load	7
2.3 Combine Load Plan	12
2.4 Structure Modeling.....	14

2.4.1	Definition of Material	14
2.4.2	Definition of Beam and Column Profile	16
2.4.3	3D Modeling of Structure	17
2.4.4	Giving Workload.....	17
2.4.5	Giving Earthquake Burden.....	18
2.4.6	Combine and Loading Factors	19
2.4.7	Running Program	20
2.4.8	Inner Result	21
2.5	Roof Planning.....	21
2.5.1	Purlin Plan.....	21
2.5.2	Truss Load Plan.....	26
2.5.3	Wind Load.....	27
2.5.4	Truss Element Plan	28
2.5.5	Exterior Compression Member.....	31
2.5.6	Interior Compression Member	32
2.5.7	Exterior Tension Member	34
2.5.8	Interior Tension Member	34
2.5.9	Connection Plan of Truss Elements	34
2.6	Stair Planning	36
2.6.1	Stair Load Plan.....	38
2.7	Slab Structural Planning.....	42
2.7.1	Preliminary Design.....	43
2.7.2	Calculation of Slab Type A.....	45
2.8	Beam Planning.....	51
2.8.1	Preliminary Design.....	51
2.8.2	Main Beam 40 x 55	52
2.8.3	Main Beam 40 x 50	58

2.8.4	Secondary Beam 25 x 35.....	63
2.9	Column Planning (600 x 600)	69
2.9.1	Preliminary Design.....	69
2.9.2	Column 60 x 60.....	70
2.10	Conclusion.....	75
CHAPTER III LOWER STRUCTURE PLANNING		76
3.1	Preface	76
3.2	Interpretation of Soil Data.....	76
3.3	Liquifaction	79
3.4	Foundation Bearing Capacity.....	84
3.5	Settlement.....	89
3.6	Reinforcement	92
3.6.1	Pile Reinforcement.....	92
3.6.2	Pile Cap Reinforcement	93
3.7	Conclusion.....	97
CHAPTER IV COST AND TIME MANAGEMENT		99
4.1	Introduction	99
4.2	Work Breakdown Structure (WBS).....	102
4.3	Analysis of Work Unit Prices (AHSP).....	102
4.4	Cost Budget Plan (RAB)	105
4.5	Bill of Quantity (BoQ).....	105
4.6	Volume	106
4.7	Duration of Activity	107
4.8	Relation Between Activity	108
4.9	Microsoft Project.....	109
4.10	S-Curve.....	110
4.11	Conclusion.....	111

BAB V PENUTUP	112
5.1 Structure Design	112
5.2 Geotechnical Design.....	113
5.3 Cost and Time Management.....	113
BIBLIOGRAPHY	114
APPENDIX	115



LIST OF FIGURE

Figure 2. 1 Graphic Design Spectrum Muntilan	12
Figure 2. 2 Material Properties.....	15
Figure 2. 3 Section Properties	16
Figure 2. 4 Section Properties Column K1	16
Figure 2. 5 3D Model of Building A (right) and Building B (left)	17
Figure 2. 6 Loading of Floor Plates in 3D Model.....	18
Figure 2. 7 Earthquake Load Input	19
Figure 2. 8 Load Combination Input.....	19
Figure 2. 9 Running Results.....	20
Figure 2. 10 Inner Results	21
Figure 2. 11 Gording Load Direction Axis-2 And Axis-3	23
Figure 2. 12 C-Profile	24
Figure 2. 13 Result from SAP2000.....	28
Figure 2. 14 Room Plan of Front Stairs and Steps.....	37
Figure 2. 15 SFD Due to Dead Load.....	39
Figure 2. 16 SFD Due to Live load.....	39
Figure 2. 17 BMD Due to Dead Load.....	40
Figure 2. 18 BMD Due to Live load	40
Figure 2. 19 Stair reinforcement	42
Figure 2. 20 Slab Plan	43
Figure 2. 21 Slub Type A.....	46
Figure 2. 22 Result SPColumn of Structural Column 60 x 60.....	74
Figure 3. 1 Soil Data	78
Figure 3. 2 Image of PGA Map.....	82
Figure 4. 1 The Steps in Project Scheduling	101
Figure 4. 2 Example for Calculate Volume of Each Activity	106
Figure 4. 3 Duration and Relation Between Activity on Ms Project	109
Figure 4. 4 S-Curve from Excel	110
Figure 4. 5 S-Curve from Ms Project.....	111

LIST OF TABLE

Table 2. 1 Building and non-building risk categories	8
Table 2. 2 Site coefficient, F_a	10
Table 2. 3 Roof Plan Data	22
Table 2. 4 Purlin Load.....	23
Table 2. 5 Purlin Moment on Axis-2 And Axis-3 Direction.....	23
Table 2. 6 Ultimate Moment for Axis-2 And Axis-3 Direction.....	24
Table 2. 7 Calculation of Projected Loads at Certain Points on the Roof.....	26
Table 2. 8 Data profil WF 60 x 60 x 6	29
Table 2. 9 Data profil WF 65 x 65 x 6	30
Table 2. 10 Stair Dimension.....	37
Table 2. 11 Stair Load Plan.....	38
Table 2. 12 Front Stair Moment and Shear	41
Table 2. 13 Combination Moment and Shear	41
Table 2. 14 Main Reinforcement Calculations	41
Table 2. 15 Loading of 1 st and 2 nd Building Slab.....	44
Table 2. 16 Minimum Thickness of Prestressed One-way Solid Slab	44
Table 2. 17 Slub Types of 1 st and 2 nd Building	45
Table 2. 18 General Data of Slab	46
Table 2. 19 Slub Type A Data.....	46
Table 2. 20 X Direction Field Reinforcement.....	49
Table 2. 21 Y Direction Field Reinforcement.....	49
Table 2. 22 X Direction Pedestal Reinforcement	50
Table 2. 23 Y Direction Pedestal Reinforcement	50
Table 2. 24 Preliminary Design of Beams	52
Table 2. 25 Specification of 40 x 55 Main Beam	52
Table 2. 26 Inner force Main beam 40 x 55.....	53
Table 2. 27 Calculation of Reinforcement	53
Table 2. 28 Calculation of support Shear Reinforcement	54
Table 2. 29 Calculation of field Reinforcement.....	55
Table 2. 30 Calculation Shear Reinforcement	56
Table 2. 31 Recap of Reinforcement of Main Beam 40 x 55	57

Table 2. 32 Specification of 40 x 50 Main Beam	58
Table 2. 33 Inner force Main beam 40 x 55	58
Table 2. 34 Calculation of Reinforcement	59
Table 2. 35 Calculation of support Shear Reinforcement	59
Table 2. 36 Calculation of field Reinforcement.....	61
Table 2. 37 Calculation Shear Reinforcement	62
Table 2. 38 Recap of Reinforcement of Main Beam 40 x 50	63
Table 2. 39 Specification of 25 x 35 Secondary Beam	63
Table 2. 40 Inner force Secondary beam 25 x 35	64
Table 2. 41 Calculation of Reinforcement	64
Table 2. 42 Calculation of support Shear Reinforcement	65
Table 2. 43 Calculation of field Reinforcement.....	66
Table 2. 44 Calculation Shear Reinforcement	68
Table 2. 45 Recap of Reinforcement of Secondary Beam 25 x 35	69
Table 2. 46 Preliminary Design of Column	69
Table 2. 47 Specification of 60 x 60 Main Column.....	70
Table 2. 48 Inner force Main column 60 x 60	70
Table 2. 49 Calculation of Reinforcement	71
Table 2. 50 Calculation Shear Reinforcement	72
Table 2. 51 Recap of Reinforcement of Structural Column 60 x 60.....	73
Table 3. 1 N-SPT Correlation with Sand Soil Elasticity Modulus	77
Table 3. 2 N1 Result.....	81
Table 3. 3 Liquefaction Result.....	83
Table 3. 4 Pole Dimention	86
Table 3. 5 Bearing Capacity $D = 0,45$ m.....	86
Table 3. 6 Types of Types and Efficiency of Pole Groups	87
Table 3. 7 Reduction of Pole Group Permit.....	90
Table 3. 8 Reduction of Single Pole Permit.....	91
Table 3. 9 Single Permit.....	91
Table 3. 10 Reduction of Group Pole Permit.....	91
Table 3. 11 Group Permit.....	91
Table 3. 12 Shear Strength of Concrete	95
Table 4. 1 Analysis of Work Unit Prices (AHSP)	104
Table 4. 2 Bill of Quantity (BOQ)	106

Table 4. 3 Duration of Activity 107



LIST OF APPENDIX

Appendix 1 SP Column.....	116
Appendix 2 S-Curve.....	117
Appendix 3 Grand Chart	118
Appendix 4 AHSP.....	121
Appendix 4.1 Preparation Work	121
Appendix 4.2 Soil Activity	123
Appendix 4.3 Foundation Activity.....	123
Appendix 4.4 Structure Activity	124
Appendix 4.5 Architectural Work.....	126
Appendix 4.6 MEP Activity.....	134
Appendix 4.7 Roof Activity.....	144
Appendix 4.8 BOQ	145
Appendix 4.9 CPM	146
Appendix 5 DED Drawing.....	148