

GUIDELINES FOR PREPARATION OF PROJECT REPORT

Undergraduate course, B.E. / B. TECH. / B. ARCH Postgraduate course, M. Tech. /M. Sc/M. Phil

1. ARRANGEMENT OF CONTENTS:

The sequence in which the project report material should be arranged and bound should be as follows:

- 1. Cover Page & Title Page
- 2. Bonafide Certificate
- 3. Abstract
- 4. Table of Contents
- 5. List of Tables
- 6. List of Figures
- 7. List of Symbols, Abbreviations
- 8. Chapters
- 9. Appendices
- 10. References

The table and figures shall be introduced in the appropriate places.

2. PAGE DIMENSION AND SIZE OF THE THESIS:

(a) The size of the project report for undergraduate and post graduate degree should not exceed 60 and 80 pages of type matter respectively. The pages will be counted from the first page of Chapter I. the dimension of the project report should be in A4 size.

(b) The project report should be bound using flexible cover of the thick art paper. The undergraduate and post graduate projects reports of each school shall have same colour prescribed by their respective schools. The cover should be **printed in black letters** and the text for printing should be identical.

(c) Page Numbering

All page numbers (whether it is in Roman or Arabic numbers) should be typed without punctuation on the central bottom of each page. The preliminary pages of the reports (such as Title page, Acknowledgement, Table of Contents, etc.) should be numbered in lower case Roman numerals. The title page will be numbered as (i) but this should not be typed. The page immediately following the title page shall be numbered as (ii) and it should appear at the top right hand corner as already specified. Pages of main text, starting with Chapter 1 should be consecutively numbered using Arabic numerals.

3. PREPARATION FORMAT:

- **3.1** Cover Page & Title Page A specimen copy of the Cover page & Title page of the project report are given in Appendix 1.
- 3.2 Bonafide Certificate The Bonafide Certificate shall be in double line spacing using Font Style Times New Roman and Font Size 14, as per the format in Appendix 2.

The certificate shall carry the supervisor's signature and shall be followed by the supervisor's name, academic designation (not any other responsibilities of administrative nature), Department and School where the supervisor has guided the student. The term **'SUPERVISOR'** must be typed in capital letters between the supervisor's name and academic designation.

- **3.3** Abstract Abstract should be one page synopsis of the project report typed double line spacing, Font Style Times New Roman and Font Size 13.
- 3.4 Table of Contents The table of contents should list all material following it as well as any material which precedes it. The title page and Bonafide Certificate will not find a place among the items listed in the Table of Contents but the page numbers of which are in lower case Roman letters. One and a half spacing should be adopted for typing the matter under this head. A specimen copy of the Table of Contents of the project report is given in Appendix 3.
- **3.5** List of Tables The list should use exactly the same captions as they appear above the tables in the text. One and a half spacing should be adopted for typing the matter under this head.
- **3.6** List of Figures The list should use exactly the same captions as they appear below the figures in the text. One and a half spacing should be adopted for typing the matter under this head.
- **3.7. Table and figures -** By the word Table, is meant tabulated numerical data in the body of the project report as well as in the appendices. All other non-verbal materials used in the body of the project work and appendices such as charts, graphs, maps, photographs and diagrams may be designated as figures.

- **3.8 List of Symbols, Abbreviations** One and a half spacing should be adopted for typing the matter under this head. Standard symbols, abbreviations etc. should be used.
- **3.9** Chapters The chapters may be broadly divided into 3 parts
- (i) Introductory chapter,
- (ii) Chapters developing the main theme of the project work
- (iii) Conclusions and scope

The introductory chapter will have sections covering (a) general introduction and importance of the research project.

The main text will be divided into several chapters and each chapter may be further divided into several divisions and sub-divisions.

- Each chapter should be given an appropriate title.
- Tables and figures in a chapter should be placed in the immediate vicinity of the reference where they are cited.
- **3.10** Appendices Appendices are provided to give supplementary information, which if included in the main text may serve as a distraction and cloud the central theme.
 - Appendices should be numbered using Arabic numerals, e.g. Appendix
 1, Appendix 2, etc.
 - Appendices, Tables and References appearing in appendices should be numbered and referred to at appropriate places just as in the case of chapters.
 - Appendices shall carry the title of the work reported and the same title shall be made in the contents page also.

- **3.11** List of References –The listing of references should be typed 4 spaces below the heading "REFERENCES" in alphabetical order in single spacing left justified. The reference material should be listed in the alphabetical order of the first author. The name of the author/authors should be immediately followed by the year and other details.
 - (i) If more than one paper by the same first author and same year of publications, the year of citation will be followed by a, b etc to differentiate them.
 - (ii)While citing the paper in the text, the name of the first author and year alone must be cited. e.g Samson (2004) or Jeyaraj (2007a). The reference numbers should not be used in the text of the paper
 - (iii)A paper, a monograph or a book may be designated by the name of the first author followed by the year of publication, placed inside brackets at the appropriate places in the Thesis.

The citation may assume any one of the following forms.

Examples of Citation

- (i) An improved algorithm has been adopted in the literature (Rupf. 2009)
- (ii) (Massey and Mittelholzer 2008) have dealt at length this principle
- (iii) The problem of mechanical manipulators has been studied by Anigstein et al (2010) and certain limitations of the method used, has been pointed out by (Anigstein et al., 2010a).
- (iv) When reports prepared by well known agencies are cited, the name of the organization (Example: World Health Organization, Bureau of Indian Standards) with year of publication may be given as citation. Ex:World Health Organisation (2006).

Examples of References

Abdou. L., Ami Saada. R., Meftah. F. and Mebarki. A. (2006) "Experimental investigations of the joint-mortar behaviour", Mechanics Research Communications 33, 370-379.

Central Ground Water Board Ministry of Water Resources Government of India. (2010) "Groundwater Quality in Shallow Aquifers of India", Faridabad.

Deodhar. S.V. and Patel. A .N. (1996) "Behavior of brick masonry in compression" Journal of Structural Engineering 22, 221-227.

Liu. H., Williams Burkett. and Kirk Haynes.(2005) "Improving freezing and thawing properties of fly ash bricks", World of coal ash conference 11-15.

Sarangapani. G., Venkatarama Reddy. B. V. and Jagadish. K. S. (2009) "Structural characteristics of bricks, mortars and masonry" Journal of Structural Engineering 29(2), 101-110.

Wong. Y. L., Lam L., Poon. C. S. and Zhou. F. P. (1999) "Properties of fly ash-modified cement mortar-aggregate interfaces", Cement and Concrete Research 29, 1905-1911.

4. TYPING INSTRUCTIONS:

The impression on the typed copies should be black in colour.

One and a half spacing should be used for typing the general text. The general text shall be typed in the Font style 'Times New Roman' and Font size 13.

APPENDIX 1

A typical Specimen of Cover Page and Title Page

TITLE <1.5 line spacing>

a project report submitted by

 <Italic>

A. FRANSIS (UR14CE281)

in partial fulfillment for the award of the degree

 <Italic> <1.5 line spacing> of

NAME OF THE DEGREE

in

NAME OF THE PROGRAMME

under the supervision of <Italic>

Dr. F. LEON



NAME OF THE DEPARTMENT

KARUNYA INSTITUTE OF TECHNOLOGY AND SCIENCES

<1.5 line spacing>

(Deemed-to-be-University) Karunya Nagar, Coimbatore - 641 114. INDIA <1.0 line spacing>

MONTH & YEAR

ELECTROCHEMICAL TREATMENT OF INDUSTRIAL WASTEWATER

a project report Submitted by

A.FRANSIS (UR14CE281)

in partial fulfillment for the award of the degree

of

BACHELOR OF TECHNOLOGY

in

CIVIL ENGINEERING

under the supervision of

Dr. F. LEON



KARUNYA INSTITUTE OF TECHNOLOGY AND SCIENCES

<1.5 line spacing>

(Deemed-to-be-University) Karunya Nagar, Coimbatore - 641 114. INDIA <1.0 line spacing>

APRIL 2018

THE CANDIDATE(S)....." who carried out the project work under my

supervision.

<<Signature of the Head of the Department>> **SIGNATURE** <<Name>> <<size -16>

HEAD OF THE DEPARTMENT

<<Academic Designation>>

<<Department>>

<<School >>

<<Signature of the Supervisor>> **SIGNATURE** <<Name>> <<size -16>

<<Academic Designation>> <<Department>> <<School >>

SUPERVISOR

Submitted for the (Phase I/Phase II/Full Semester/Half Semester)* Viva Voce held on

Internal Examiner

External Examiner

*Mention whichever is relevant

APPENDIX 2

(A typical specimen of Bonafide Certificate)

BONAFIDE CERTIFICATE

This is to certify that the project report entitled ".....TITLE OF THE

BONAFIDE CERTIFICATE

This is to certify that the project report entitled "An electrochemical treatment of industrial waste water" is the bonafide work of "A. FRANSIS" who carried out the project work under my supervision.

SIGNATURE

SIGNATURE

Dr. M. Christopher

Professor of Civil Engineering Department of Environmental Engineering School of Civil Engineering

Dr. F. Leon

Associate professor of Civil Engineering Department of Environmental Engineering School of Civil Engineering

Submitted for the (Phase I/Phase II/Full Semester/Half Semester)* Viva Voce held on

.....

Internal Examiner

External Examiner

*Mention whichever is relevant

APPENDIX 3

| | Title | Page |
|----|--|------|
| | The | No. |
| | BONAFIDE CERTIFICATE | ii |
| | ABSTRACT | iii |
| | ACKNOWLEDGEMENT | iv |
| | TABLE OF CONTENTS | V |
| | LIST OF TABLES | vi |
| | LIST OF FIGURES | vii |
| | LIST OF SYMBOLS AND ABBREVIATIONS | viii |
| 1. | INTRODUCTION | 1 |
| | 1.1 Motivation and background | 1 |
| | 1.2 In-plane behaviour of brick masonry | 1 |
| | 1.3 Response of masonry structure to earthquake motion | 2 |
| | 1.4 Aim and objective of the research | 3 |
| | 1.5 Report organization | 3 |
| 2. | LITERATURE REVIEW | 4 |
| | 2.1 General | 4 |
| | 2.2 Review of previous research on masonry | 4 |
| | 2.2.1 Brick | 5 |
| | 2.2.2 Mortar | 8 |
| | 2.3 Research gap | 16 |
| | 2.4 Conclusions obtained from the literature review | 23 |
| 3. | MATERIAL PROPERTIES OF STRUCTURAL MASONRY | 23 |
| | 3.1 Introduction | 25 |
| | 3.2 Fly ash | 26 |
| | 3.3 Brick unit | 28 |
| | 3.3.1 Clay brick | 29 |

| | 3.3.2. Compressive strength of the brick | 30 |
|----|---|----|
| | 3.4 Mortar | 31 |
| | 3.4.1 Compressive strength of the mortar | 32 |
| | 3.4.2. Improving earthquake resistance behaviour of masonry buildings | 35 |
| | 3.5 Reinforcement | 35 |
| | 3.6 Masonry assemblages | 36 |
| | 3.7 Conclusions | 37 |
| 4. | EXPERIMENTAL INVESTIGATIONS ON MASONRY WALLS | 38 |
| | 4.1 Introduction | 39 |
| | 4.2 Objective of the test programme | 40 |
| | 4.3 Description of the specimen | 41 |
| | 4.4 Axial strength of the brick masonry | 42 |
| | 4.5 In-plane shear test methods | 43 |
| | 4.6 Wall under in-plane shear-compression test | 46 |
| | 4.7 Conclusions | 54 |
| 5. | FINITE ELEMENT MODELING | 55 |
| | 5.1 Introduction | 55 |
| | 5.2 Formulation of the model | 56 |
| | 5.3 Micro level modeling of the brick masonry | 57 |
| | 5.4 Meso level modeling of the brick masonry | 59 |
| | 5.5 Macro level modeling of the brick masonry | 60 |
| | 5.6 In-plane shear strength of the brick masonry wall | 61 |
| | 5.7 Conclusions | 62 |
| 6. | CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH | 63 |
| | 6.1 Conclusions | 64 |
| | 6.2 Suggestions for further research | 65 |
| | APPENDICES | 67 |
| | REFERENCES | 68 |
| | PUBLICATIONS | 69 |

APPENDIX 4

| А | - | Cross sectional area of masonry wall in mm ² |
|----------------|---|---|
| A_h | - | Design horizontal seismic coefficient of a structure |
| D | - | Depth of the brick in mm |
| d | - | Effective depth of the wall in mm |
| E_b | - | Elastic modulus of the brick in MPa |
| F | - | Flexural strength of the brick in MPa |
| h | - | Height of the masonry wall in mm |
| Н | - | In-plane load in Newtons |
| 1 | - | Length of the wall panel in mm |
| m | - | Mass of the building |
| MgO | - | Magnesium oxide |
| PGA(g) | - | Peak ground acceleration |
| R | - | Response reduction factor |
| S | - | Spacing of woven wire mesh in mm |
| t | - | Thickness of the wall panel in mm |
| t _b | - | Thickness of the brick unit in mm |
| URM | - | Unreinforced masonry |
| XRD | - | X-ray diffraction |
| | | |

LIST OF SYMBOLS AND ABBREVIATIONS