

Univerza
v Ljubljani

Fakulteta *za*
gradbeništvo in
geodezijo



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NASLOV

DOKTORSKA DISERTACIJA

(ZA DELA V ANGLEŠČINI TUDI)

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INTERDISCIPLINARNI DOKTORSKI ŠTUDIJSKI PROGRAM

GRAJENO OKOLJE

kraj, leto

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ERRATA

Page	Line	Error	Correction
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ACKNOWLEDGMENTS

Acknowledgements are an optional part of the thesis. Their purpose is to acknowledge those who helped in any way with your thesis. Thanks are typically given to the supervisor, co-supervisor, and the institution that may have financially or otherwise supported the study and work. This can be followed by acknowledgements to co-workers or colleagues who have helped with the work or study. Lastly, acknowledgement goes to family and friends.

BIBLIOGRAFSKO-DOKUMENTACIJSKA STRAN IN IZVLEČEK**UDK** **XYZ.XZ****Avtor:** Name Surname, standardised scientific or professional title**Mentor:** academic title (shortened) Name Surname, standardised scientific or professional title**Somentor:** academic title (shortened) Name Surname, standardised scientific or professional title**Naslov:** Title of thesis in Slovenian language**Tip dokumenta:** doktorska disertacija**Obseg in oprema:** 329 str., 278 sl., 63 preg., 13 en.**Ključne besede:** up to 10 keywords (in Slovenian language)**Izvleček**

The abstract is firstly presented in Slovenian language. If there is no co-supervisor, then the line with the co-supervisor (somentor) can be deleted. An example of academic title (shortened) is prof. Name Surname, Ph.D., but more information can be found in the document "Oblikovanje del na FGG".

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Abstract in English language.

TABLE OF CONTENTS

ERRATA	I
ACKNOWLEDGMENTS	II
BIBLIOGRAFSKO-DOKUMENTACIJSKA STRAN IN IZVLEČEK	III
BIBLIOGRAPHIC-DOCUMENTALISTIC INFORMATION AND ABSTRACT	IV
TABLE OF CONTENTS	VI
LIST OF FIGURES	VII
KAZALO SLIK	VII
LIST OF TABLES	IX
KAZALO PREGLEDNIC	IX
OKRAJŠAVE IN SIMBOLI / ABBREVIATIONS AND SYMBOLS	XI
1 FORMATING AND STYLES	1
1.1 Chapter levels	1
1.1.1 Subchapter of third level	1
a) Subchapter of fourth level	1
1.2 Page header - pagina viva	1
1.2.1 Bachelor thesis	2
1.2.2 Master thesis	2
1.2.3 PhD thesis	4
1.2.4 Adding intentionally blank pages	5
2 CAPTIONING ELEMENTS	7

2.1	Figure captions	7
2.1.1	Figure editing	7
2.1.2	Tables	7
2.1.3	Equations	9
a)	Monotonic behaviour	9
2.1.4	Numbering and bulleted lists	10
2.1.5	Referencing numbered elements in the text	11
3	LISTING AND CITING REFERENCES	13
3.1	Damage states	13
4	SUBMITTING THE DOCUMENT	15
4.1	Difference between printed and electronic version	15
4.2	Exporting to PDF/A format	15
5	TIPS	17
	Bibliography	18
	Appendices	21
A	List of papers	A-1
B		B-3

LIST OF FIGURES

2.1	Numbering of the structure damage state spectrum and the corresponding probability of exceedance in 50 or 100 years. Mostly adapted from VISION (2000). . .	8
2.2	(a) A buckled $\phi 16$ longitudinal bar with several microscopic cracks after reversed cyclic loading and (b) a longitudinal section of the same bar with etched surface.	8
2.3	(a) Main characteristics of tensile monotonic curve and (b) the effect of the location and length of the gauged region on the tensile curve in the necking region. . . .	10

KAZALO SLIK

2.1	Oštevilčenje spektra stanj poškodovanosti konstrukcij in pripadajoče referenčne verjetnosti za prekoračitev potresa v 50 ali 100 letih. Večinoma povzeto po VISION (2000).	8
2.2	(a) Uklonjena vzdolžna palica z množico razpok po cikličnem obremenjevanju in (b) vzdolžni prerez palice z jedkano površino.	8
2.3	(a) Glavne karakteristike monotone natezne krivulje armature in (b) učinek lokacije in dolžine merilnega območja deformacij na natezno krivuljo v področju vratenja armature.	10

LIST OF TABLES

2.1	Typical nominal characteristics of high ductility class reinforcing steel in different countries	9
A1	List of papers	A-1

KAZALO PREGLEDNIC

2.1	Običajne nominalne karakteristike armature visokega razreda duktilnosti po različnih državah	9
A1	Seznam člankov	A-1

OKRAJŠAVE IN SIMBOLI / ABBREVIATIONS AND SYMBOLS

Here the list of frequently used abbreviations along with their meaning in English and Slovenian language is presented. Detail formatting of this section is left to the author.

σ	stress - napetost
<i>DOF</i>	Degree of freedom - prostostna stopnja
<i>FEM</i>	Finite Element Method – metoda končnih elementov
<i>SDOF</i>	Single degree of freedom – ena prostostna stopnja

1 FORMATING AND STYLES

Any thesis at the Faculty of Civil and Geodetic Engineering, University of Ljubljana should be formatted according to the instructions given in the document:

Koler Povh, T. in Turk, G. 2020. Navodila za oblikovanje visokošolskih del na Fakulteti za gradbeništvo in geodezijo in navajanje virov – dopolnjena izdaja. Ljubljana, Univerza v Ljubljani, Fakulteta za gradbeništvo in geodezijo: 60 str.

Since all the styles are already set (e.g. styles for text, chapters and subchapters, style for spreadsheet and captions, etc.), it is recommended that you write the thesis directly in this template. The text is written in Times New Roman, but any similar font can also be chosen. The font size is 11 pt, and a Line Spacing between 1 and 1.5 should be used. It is recommended that when writing the text, the Style “Besedilo” is selected, which can be modified depending on the choice (e.g. Font or Line Spacing). For a thesis written by a student at UL NTF, the Page Header must be changed.

1.1 Chapter levels

The individual parts of the thesis should be divided into subchapters, which should be numbered sequentially. The format, style and numbering of the titles should be as presented in this template. Before the chapter title (i.e. first level chapter), the page break is considered; however, this does not apply to lower levels of chapters. The first level chapter line is always written with capital letters, which is already automatically done in this template. Nevertheless, it is recommended to write the title with a capital letter, as this ensures that all titles will be written the same in the table of contents within the final PDF document. A blank line must always be placed before and after the chapter title and the subchapters or lower level chapters. In this proposal, this is already considered automatically. Subchapters up to 4th level are included in this template. If necessary, lower-level chapters can also be added.

1.1.1 Subchapter of third level

a) Subchapter of fourth level

1.2 Page header - pagina viva

A selection of appropriate page headers is listed for different studies and the bachelor, master, and PhD thesis.

1.2.1 Bachelor thesis

Priimek, I. 2021. Naslov dela.

Dipl. nal. Ljubljana, UL FGG, Univerzitetni študijski program prve stopnje Gradbeništvo.

Surname, N. 2021. Title.

BSc Th. Ljubljana, UL FGG, First cycle academic study programme Civil Engineering.

Priimek, I. 2021. Naslov dela.

Dipl. nal. Ljubljana, UL FGG, Univerzitetni študijski program prve stopnje Geodezija in geoinformatika.

Surname, N. 2021. Title.

BSc Th. Ljubljana, UL FGG, First cycle academic study programme Geodesy and Geoinformation.

Priimek, I. 2021. Naslov dela.

Dipl. nal. Ljubljana, UL FGG, Univerzitetni študijski program prve stopnje Vodarstvo in okoljsko inženirstvo.

Surname, N. 2021. Title.

BSc Th. Ljubljana, UL FGG, First cycle academic study programme Water Science and Environmental Engineering.

Priimek, I. 2021. Naslov dela.

Dipl. nal. Ljubljana, UL FGG, Visokošolski strokovni študijski program prve stopnje Operativno gradbeništvo.

Surname, N. 2021. Title.

BSc Th. Ljubljana, UL FGG, First cycle higher education professional study programme Construction Management.

Priimek, I. 2021. Naslov dela.

Dipl. nal. Ljubljana, UL FGG, Visokošolski strokovni študijski program prve stopnje Tehnično upravljanje nepremičnin.

Surname, N. 2021. Title.

BSc Th. Ljubljana, UL FGG, First cycle higher education professional study programme Technical Real Estate Management.

1.2.2 Master thesis

Priimek, I. 2021. Naslov dela.

Mag. delo. Ljubljana, UL FGG, Magistrski študijski program druge stopnje Gradbeništvo, Gradbene konstrukcije.

Surname, N. 2020. Title.

Master Th. Ljubljana, UL FGG, Second cycle master study programme Civil Engineering, Structural Engineering.

Priimek, I. 2021. Naslov dela.

Mag. delo. Ljubljana, UL FGG, Magistrski študijski program druge stopnje Gradbeništvo, Nizke gradnje.

Surname, N. 2021. Title.

Master Th. Ljubljana, UL FGG, Second cycle master study programme Civil Engineering, Infrastructural Engineering.

Priimek, I. 2021. Naslov dela.

Mag. delo. Ljubljana, UL FGG, Magistrski študijski program druge stopnje Gradbeništvo, Geotecnika-hidrotehnika.

Surname, N. 2021. Title.

Master Th. Ljubljana, UL FGG, Second cycle master study programme Civil Engineering, Geotechnics-Hyrotechnics.

Priimek, I. 2021. Naslov dela.

Mag. delo. Ljubljana, UL FGG, Magistrski študijski program druge stopnje Geodezija in geoinformatika.

Surname, N. 2021. Title.

Master Th. Ljubljana, UL FGG, Second cycle master study programme Geodesy and Geoinformation.

Priimek, I. 2021. Naslov dela.

Mag. delo. Ljubljana, UL FGG, Magistrski študijski program druge stopnje Vodarstvo in okoljsko inženirstvo.

Surname, N. 2021. Title.

Master Th. Ljubljana, UL FGG, Second cycle master study programme Water Science and Environmental Engineering.

Priimek, I. 2021. Naslov dela.

Mag. delo. Ljubljana, UL FGG, Magistrski študijski program druge stopnje Prostorsko načrtovanje.

Surname, N. 2021. Title.

Master Th. Ljubljana, UL FGG, Second cycle master study programme Spatial Planning.

Priimek, I. 2021. Naslov dela.

Mag. delo. Ljubljana, UL FGG, Magistrski študijski program druge stopnje Stavbarstvo.

Surname, N. 2021. Title.

Master Th. Ljubljana, UL FGG, Second cycle master study programme Buildings.

Priimek, I. 2021. Naslov dela.

Mag. delo. Ljubljana, UL FGG, Magistrski študijski program druge stopnje Informacijsko modeliranje zgradb – BIM A+.

Surname, N. 2021. Title.

Master Th. Ljubljana, UL FGG, Second cycle master study programme Building information modelling – BIM A+.

1.2.3 PhD thesis

Priimek, I. 2021. Naslov dela.

Dokt. dis. Ljubljana, UL FGG, Interdisciplinarni doktorski študijski program Grajeno okolje – smer Gradbeništvo.

Surname, N. 2021. Title.

PhD Th. Ljubljana, UL FGG, Interdisciplinary doctoral study programme Built Environment – Civil Engineering.

Priimek, I. 2021. Naslov dela.

Dokt. dis. Ljubljana, UL FGG, Interdisciplinarni doktorski študijski program Grajeno okolje – smer Geodezija.

Surname, N. 2021. Title.

PhD Th. Ljubljana, UL FGG, Interdisciplinary doctoral study programme Built Environment – Geodesy.

Priimek, I. 2021. Naslov dela.

Dokt. dis. Ljubljana, UL FGG, Interdisciplinarni doktorski študijski program Grajeno okolje – smer Načrtovanje in urejanje prostora.

Surname, N. 2021. Title.

PhD Th. Ljubljana, UL FGG, Interdisciplinary doctoral study programme Built Environment – Spatial Planning and Spatial Development.

Priimek, I. 2021. Naslov dela.

Dokt. dis. Ljubljana, UL NTF, Interdisciplinarni doktorski študijski program Grajeno okolje – smer Geologija.

Surname, N. 2021. Title.

PhD Th. Ljubljana, UL FGG, Interdisciplinary doctoral study programme Built Environment – Geology.

Priimek, I. 2021. Naslov dela.

Dokt. dis. Ljubljana, UL FGG, Interdisciplinarni doktorski študijski program Varstvo okolja.

Surname, N. 2021. Title.

PhD Th. Ljubljana, UL FGG, Interdisciplinary doctoral study programme Environmental Protection.

1.2.4 Adding intentionally blank pages

A deliberately blank page labelled »*This page is intentionally blank.*« is added if the next main chapter (first level chapter) does not begin on the odd page. This means a blank page can only be added to even pages. If the chapter ends on an even page, a blank page should not be added. This applies both to the pages in the main part of the document (Arabic page numbers) and in the introductory part of the document (Roman page numbers).

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2 CAPTIONING ELEMENTS

2.1 Figure captions

Figure captions are usually presented below the figures. The font in the figures may be smaller than in the text, but not smaller than 8 pt. In the case of many images, the numbering may begin with the chapter number, followed by a sequential number of figure in that chapter. Figures should be aligned centred. A minimum figure quality format must be at least 300 DPI. Settings in this template are set to the highest quality of figure storage in the document, which can avoid reducing the size and thus the quality of the images.

The figure and figure caption should be centred, where the figure caption must be below the figure. The title of the figure caption should be followed by a sequential number and the sign “.”. The description of the figure should start with a capital letter and with a final punctuation mark. There should be a blank line between the figure and the text before. Between the figure and the corresponding caption, there should not be any blank lines. The figure caption style is already set in this template under the name Oznaka ENG.

If more figures want to be joined, the joined figure should be divided into appropriate parts. These parts must be marked with a sequence of letters and titles of the images.

2.1.1 Figure editing

The EPS format is very well known among the vector formats. Also pdf format can be used. An example of vector format is shown in Figure 2.1.

The JPG format is well known among raster formats. In general it is not recommended due to its lower quality. For these cases, we recommend using the PNG or TIFF format. However, digital photos are very good example raster format. An example of subfigure implementation in the document is given in Figure 2.2.

2.1.2 Tables

For tables, the table caption is added above them. The font in tables can be smaller than in text but not smaller than 8 pt. If many tables are in a chapter, the table numbering may begin with the chapter number, followed by the table's sequential number. The spreadsheets should be left-aligned.

The title with the sequential number and description should be above the table and left-aligned. After the Table (title) a sequential number is given, which is followed by the sign

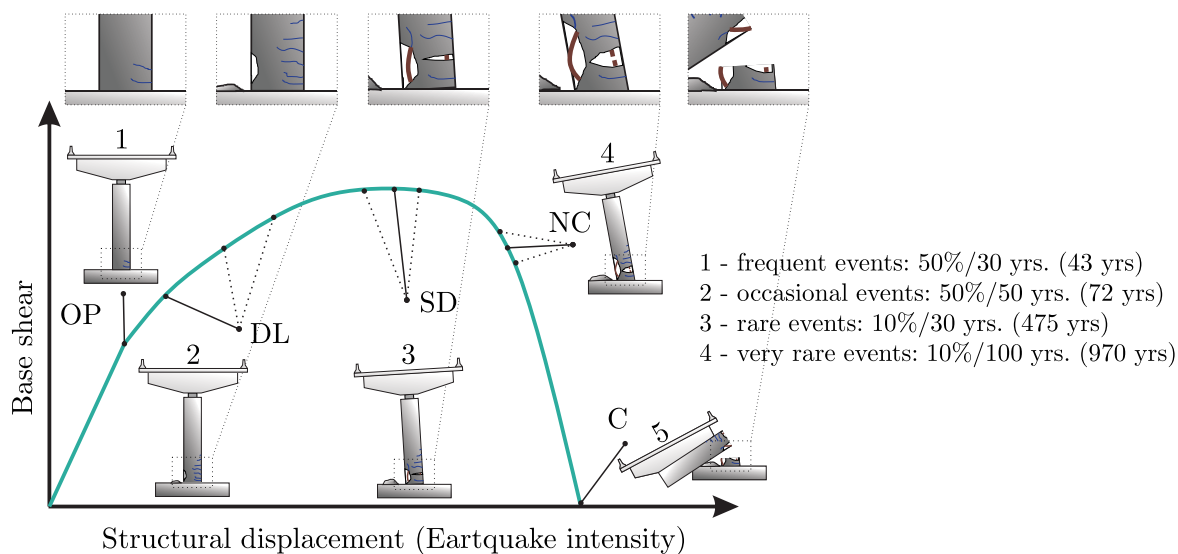


Figure 2.1: Numbering of the structure damage state spectrum and the corresponding probability of exceedance in 50 or 100 years. Mostly adapted from VISION (2000).

Slika 2.1: Oštevilčenje spektra stanj poškodovanosti konstrukcij in pripadajoče referenčne verjetnosti za prekoračitev potresa v 50 ali 100 letih. Večinoma povzeto po VISION (2000).

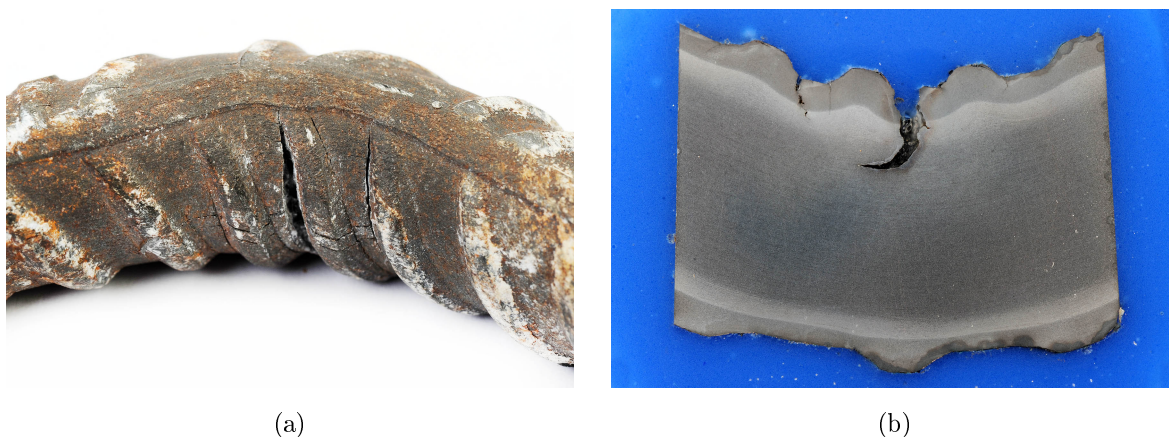


Figure 2.2: (a) A buckled $\phi 16$ longitudinal bar with several microscopic cracks after reversed cyclic loading and (b) a longitudinal section of the same bar with etched surface.

Slika 2.2: (a) Uklonjena vzdolžna palica z množico razpok po cikličnem obremenjevanju in (b) vzdolžni prerez palice z jedkano površino.

":". The table caption must begin with a capital letter and end with a final punctuation mark. Blank line must be added between the text and the table caption. The same goes for the table and the following text. There should be no blank lines between the table caption and the table.

It is recommended that the table is located on one page unless it is too large and needs to be divided to multiple pages.

An example of a table is given bellow (Table 2.1), where the table design can be changed arbitrarily, for example table border styles, cell sizes, etc.

Table 2.1: Typical nominal characteristics of high ductility class reinforcing steel in different countries

Tabela 2.1: Običajne nominalne karakteristike armature visokega razreda duktilnosti po različnih državah

Region	Clasification	$f_{y,min}/f_{y,max}$ [MPa]	ε_u [%]	f_u/f_y
America †	Grade 60	414/538	10-12	1.35-1.50
Chile††	A630-420H	420/580	≥ 8	≥ 1.25
Europe ‡	S500C	400/600	≥ 7.5	1.15-1.35
Japan ‡‡	SD390	390/510	$\geq 16-18$	≥ 1.60
New Zealand and Australia*	500E	500/600	≥ 10.0	1.15-1.40

† *ASTM A-616*, †† *NCh204-2006*, ‡ *EC2/1*, ‡‡ *JIS 3112*, * *ASNZS 4671-2001*

2.1.3 Equations

Numbered or unnumbered equations should all be written in a new line, left aligned with indentation of 1 cm. In case of a numbered equation, the numbering should be written in parentheses and aligned to the right. When the equations are referenced in the text, the reference should also include the parentheses. Some basic rules regarding equations are given bellow: numbers, function, parentheses, units and textual descriptions inside mathematical expressions are all written using non-italic and non-bold letters, variables are written using italic symbols from Latin or Greek alphabet, matrices and vectors are written using bold, non-italic letters.

In the Section 2.1.3 a) example of equation style is given.

a) Monotonic behaviour

A typical monotonic tension stress-strain curve of a reinforcing bar, as presented in Fig. 2.3a, can be divided into four parts; the linear elastic region, the yield plateau region, the strain-hardening region and the post-peak stress or necking region. The behaviour of a bar in a monotonic tensile test $\sigma_s(\varepsilon_s)$ can therefore be described taking into account the characteristic shape of this diagram. In elastic range until yield deformation of reinforcing steel ε_{sy} with elastic modulus E_s :

$$\sigma_s = E_s \varepsilon_s; \text{ for } 0 \leq \varepsilon_{sy} \leq \varepsilon_y \quad (2.1)$$

The yield plateau is usually horizontal and limited by the yield strength of the reinforcing steel f_{sy} , and the deformation at the initial strain hardening ε_{sh} :

$$\sigma_s = f_{sy}; \text{ for } \varepsilon_y \leq \varepsilon_s \leq \varepsilon_{sh} \quad (2.2)$$

The strain hardening spectrum ranges from the deformation at which the hardening begins ε_{sh} to the deformation at the tensile strength ε_{su} . Mander (1983) proposed the following simple

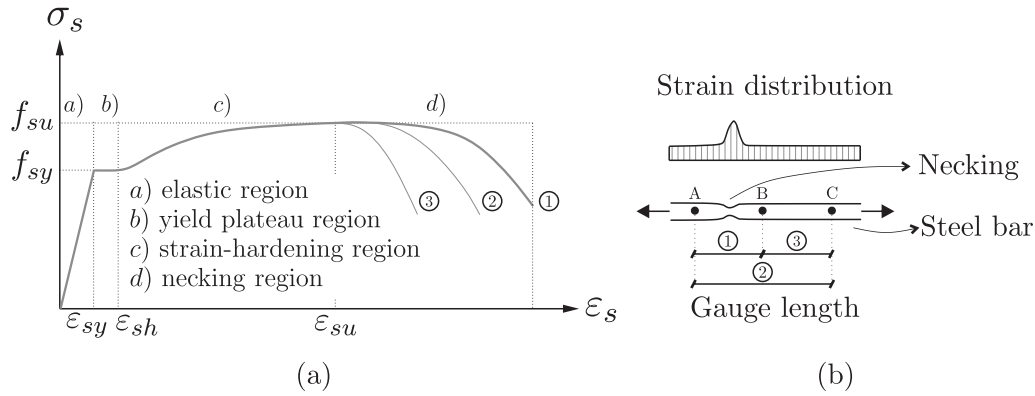


Figure 2.3: (a) Main characteristics of tensile monotonic curve and (b) the effect of the location and length of the gauged region on the tensile curve in the necking region.

Slika 2.3: (a) Glavne karakteristike monotone natezne krivulje armature in (b) učinek lokacije in dolžine merilnega območja deformacij na natezno krivuljo v področju vratenja armature.

correlation:

$$\sigma_s = f_{su} + (f_{sy} - f_{su}) \left| \frac{\epsilon_{su} - \epsilon_s}{\epsilon_{su} - \epsilon_{sh}} \right|^p; \text{ for } \epsilon_{sh} \leq \epsilon_s \leq \epsilon_{su}, \quad (2.3)$$

where the parameter p is computed from the tensile strength of the reinforcement f_{su} and the strain hardening modulus E_{sh} as:

$$p = E_{sh} \frac{\epsilon_{su} - \epsilon_s}{f_{su} - f_{sy}} \quad (2.4)$$

The tangent modulus of elasticity E_t with respect to the corresponding stress can therefore be calculated as:

$$E_t = E_{sh} \left| \frac{f_{su} - \sigma_s}{f_{su} - f_{sy}} \right|^{1-1/p} \quad (2.5)$$

After the peak stress (tensile strength) f_{su} is reached the bars are typically narrowed, i.e. necking of the specimen begins to occur. The strain is no longer evenly distributed. After this point, the path of the $\sigma - \epsilon$ curve is not trivial, but is strongly dependent on the location and length of the gauged region (Fig. 2.3b). In terms of the structural analysis of RC members, the post-peak response of the reinforcement can be neglected. The concluding ultimate point of the tensile test, which is of great importance for civil engineers, is thus the tensile strength f_{su} and the associated strain ϵ_{su} of the bar.

2.1.4 Numbering and bulleted lists

In order to achieve a unified look, the same style of bullets should be used for different levels of the lists throughout the text.

To bullet the text, we use the symbol at the beginning of the line in level 1 itemization, with a suitable punctuation at the end. An example of a 2 level bulleted list is given here:

there should be an empty line.

- example of 1. level:
 - example of 2. level.
- example of 1. level:
 - example of 2. level,
 - example of 2. level.

Between the last line of the list and any new text,

2.1.5 Referencing numbered elements in the text

In L^AT_EX, you can easily reference almost anything that can be numbered, and have automatically updating the numbering for you whenever necessary, e.g. reference to Figure 2.1, Table 2.1, Equation 2.2, Section a), etc. The objects which can be referenced include chapters, sections, subsections, footnotes, theorems, equations, figures and tables. Usually the command *ref* is used in order to reference an object with the specified marker. This will print the number that was assigned to the object.

»This page is intentionally blank.«

3 LISTING AND CITING REFERENCES

In this chapter an example of citing is given. Two macros were created in this document, i.e. macro for citing in text *tcc* and macro for citing in parenthesis *pcc*. In the next section an example text is given.

3.1 Damage states

The concept of damage states (DS) or limit states (LS) was firstly introduced in 1964 by the *European Concrete Committee* (CEB 1964). Afterwards, a limit state design philosophy was adopted in provisions around the globe. For the purposes of the seismic design of concrete structures, such as bridges, buildings and dams, the limit states of structures were linked with member limit states (Paulay and Priestley 1992; Priestley et al. 1996) and reference return periods, e.g. in the *Eurocodes* (CEN 2005a; CEN 2005b; CEN 2016). For this reason the damage states of the structures will be first presented, followed by the damage states of members.

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4 SUBMITTING THE DOCUMENT

4.1 Difference between printed and electronic version

There should be no differences between the contents of the two document versions. Nevertheless, in order to prepare the electronic version, which will be uploaded to the UL repository, the cover (first page) and the two pages with statements of authorship must be removed from the the document

4.2 Exporting to PDF/A format

The instructions on the generation of PDF/A compliant documents using is given <https://tug.org/tug2015/preprints/moore-pdfx.pdf>

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5 TIPS

In this chapter some tips and preferred packages are listed:

- `includeonly` → only a section of document is compiled and therefore a compilation of the document is fastened

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Appendices

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Appendix A: List of papers

If the doctoral thesis is compiled in the form of a collection of articles, a table should be drawn up following the example below, showing all the articles, the journals in which they were published and whether consent was obtained for the use of the doctoral dissertation article.

Table A1: List of papers

Tabela A1: Seznam člankov

št.	Znanstveni članek	Revije	Dostop	Izdajatelj soglasja
1	Gašparič, R., Fraaije, R.H.B., Van Bakel, B.W.M., Jagt, J.W.M. & Skupien, P. 2015. Mesozoic Cenozoic crustaceans preserved within echinoid tests and bivalve shells. <i>Bulletin of Geosciences</i> , Vol 90 (3): 601-611.	Bulletin of Geosciences	Licenca odprtega dostopa (Open Access)	
2	Gašparič, R., Fraaije, R.H.B., Robin, N. & De Angeli, A. 2016. The first record of paguroids from the Eocene of Istria (Croatia) and further phylogenetic refinement of the Paguroidea (Crustacea, Anomura). <i>Bulletin of Geosciences</i> , Vol 91 (3): 467-480.	Bulletin of Geosciences	Licenca odprtega dostopa (Open Access)	
3	Gašparič, R., Audo, D., Hitij, T., Jurkovšek, B. & Kolar-Jurkovšek, T. 2020. One of the oldest polychelidan lobsters from Upper Triassic (Carnian) beds at Kozja dnina in the Julian Alps, Slovenia. <i>Neues Jahrbuch für Geologie und Paläontologie – Abhandlungen</i> , 296/1-2: 107-117.	Neues Jahrbuch für Geologie und Paläontologie		Schweizerbart
4	Hyžný, M., & Gašparič, R. 2014. Ghost shrimp Calliax de Saint Laurent, 1973 (Decapoda: Axiidea: Callianassidae) in the fossil record: systematics, palaeoecology and palaeobiogeography. <i>Zootaxa</i> , 3821, 37–57.	Zootaxa		Magnolia Press
5	Hyžný, M., Gašparič, R., Robins, C., Schlögl, J. 2014. Miocene squat lobsters (Decapoda, Anomura, Galatheoidea) of the Central Paratethys – a review, with description of a new species of Munidopsis. <i>Scripta Geologica</i> , 147: 241-267.	Scripta Geologica		Naturalis

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Appendix B: