OZYEGIN UNIVERSITY

DEPARTMENT OF CIVIL ENGINEERING

CE 441 SENIOR PROJECT

submitted in partial fulfilment of the requirement for the degree of B.Sc. in civil engineering

PROJECT TITLE

By:

Student # 1 (name and surname)

Student # 2 (name and surname)

Student # 3 (name and surname)

Student # 4 (name and surname)

Supervised by:

Title and name of your project advisor

2019

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SUMMARY

This section should give a one-page summary of the project. It should be at least three paragraphs. First paragraph should be a brief introduction, second paragraph should include methodology/work done and results, last paragraph should include conclusion.

Throughout the report make sure you use word “styles” as used here. For example, this text s “MainBody” style.

For table of contents: just update it at the end when you are done with report. Right click the table and select update field option.

TABLE OF CONTENTS

LIST OF SYMBOLS

Once done with all symbols hide the table borders (select table on left top corner ➔ go to border and remove it. Add rows as needed.
Update properly. Symbols should appear in alphabetic order

A_s	Steel Area
D	Effect
E_c	Modulus of Concrete
E_s	Steel Modulus
f_{cc}	Concrete Strength at Member
f_{cd}	Concrete Design Strength
f_{ck}	Concrete Characteristic Strength
f_{yd}	Steel Design Strength
f_{yk}	Steel Characteristic Strength
H	Height of the Section
k_1	Concrete Coefficient
M	Bending Moment
N	Number of Bars
P	Axial Force
γ_{mc}	Concrete Material Factor
γ_{ms}	Steel Material Factor
ε_0	Strain at Peak Strength
ε_{sy}	Steel Yield Strain
ε_u	Concrete Failure Strain
ϕ	Bar Diameter

For list of tables: just update it at the end. Right click the table and select update field option.

LIST OF TABLES

For list of figures: just update it at the end. Right click the table and select update field option.

LIST OF FIGURES

1 INTRODUCTION IS HEADING 1 USE STYLE

Sections can be different from report to report depending on nature of the project. But Introduction, Methodology and Design, Conclusions sections are must

This section should give an introduction of the project. If there is no separate literature review section, it should also include literature review. It should also clearly specify project objectives/ goals. What will you design should be explained here.

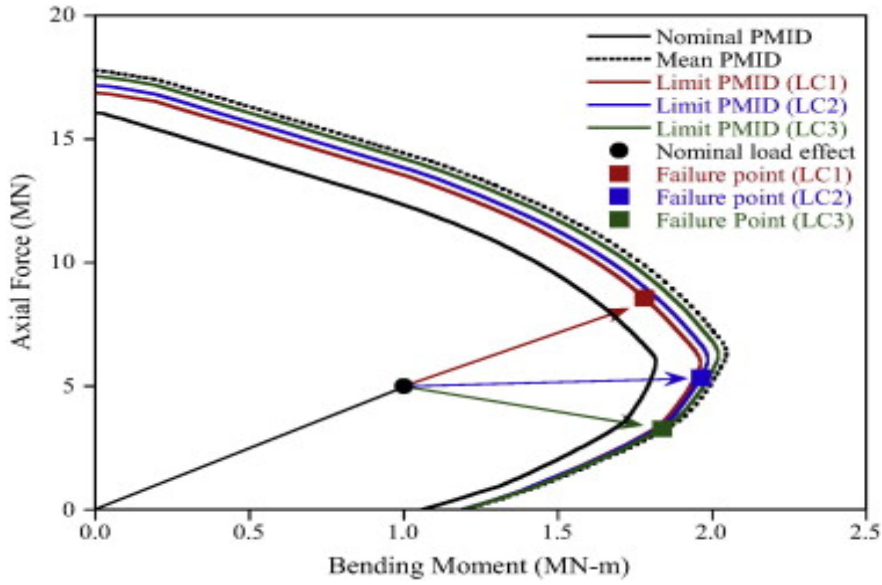

Figure 1: Sample P-M interaction diagram

To insert figure caption (Figure X): reference→ insert caption→ select label figure→ok

Select figure caption that is (Figure 2: Sample P-M interaction diagram) and change style to FIGURE

Figure should be clear and readable. Axis both x and y should have title and if applicable units. If there is more than one live (curve) they should be distinguished using legends.

2 LITERATURE REVIEW HEADING 1

If a detailed literature review is not included in Introduction Section or in any other section, it should be included here. Give references where needed. Some reports may not need a literature review.

3 METHODOLOGY AND DESIGN

Change title if needed. But this section should include methodology followed. Also, if applicable include design basis. This will be typically inputs from your advisor (if applicable). For example, codes and standards that will be used will be mentioned here.

To insert tablecaption: reference→ insert caption→ select label table→ok

Select table caption that is (Table 1: Concrete and steel material properties) and change style to Table

Font in table should be times new roman 11.

Table 2: Concrete and steel material properties (this is table caption)

Parameter	Concrete	Steel
Characteristic strength	f_{ck}=30 *MPa*	f_{sk}= 420 *MPa*
Material factor	γ_{mc} =1.5	γ_{ms} =1.15
Design strength	f_{cd} = 20 *MPa*	f_{sd}=365.2 *MPa*
Modulus of elasticity	E_c =19379 *MPa*	E_s=200000 *MPa*
Whitney constant	k_1=0.82	
Crushing strain	ε_u =0.003	

3.1 Whitney Stress Block this is heading 2 (style)

Use as many as sub heading as needed.

Put equations in Tables as shown below. Once done select borders and select "no borders"

$k_1 = \begin{cases} 0.85 & f_c < 25\ MPa \\ 0.85 - 0.006(f_c - 25)k_1 & f_c \geq 25\ MPa \end{cases}$	(1)

3.1.1 Actual Concrete Compressive Stress-Strain Curve) this is heading 3)

Use as many sub heading as needed.

4 RESULTS AND DISCUSSION

This section should have your results and discussions

5 COST ANALYSIS FOR TENDER BIDDING

Provide a cost analysis as if you are bidding for a specialized project as a contractor.

6 IMPACT OF THE PROJECT

Physical, technical, social, environmental and economic impact of your project Please keep the discussion longer than 1 page but no longer than 3 pages.

Below such sections are provided for a dam project as example.

6.1 Describe and Evaluate Physical Impacts

Building such a dam will include a large number of technical issues. The dam will require a significantly large area of excavation, which need to be done over a short period of time. Therefore, a large number of excavators and large or custom-made trucks may be required. The rivers feeding the reservoir have a large volume of clay, and therefore project specific precautions maybe needed to increase dam life cycle. Finally, the dam main body will require a large volume of reinforced concrete. Several concrete plants will be required to be built on site.

6.2 Describe and Evaluate Scenarios for Social Impacts

The dam will require a large reservoir and relocating many small to large towns presently located within the reservoir boundaries. Relocating so many native people to the region will have significantly social and economical impacts. Moving a new town and building houses, social areas, and parks can be relatively easy, but moving history and identity is not so simple. Such large-scale relocations will likely have impacts on people daily life as well as social life. Finally, the physical distance between relocated towns can increase significantly, and this can create additional social impacts on the communities. On the other hand, the presence of such a

large reservoir can also have significant positive social effects on people. Living by such a large volume of water will provide opportunity for the people to fully enjoy numerous excursions out on water including fishing, swimming, and boat trips etc.

6.3 Describe and Evaluate Scenarios for Environmental Impact

The construction of this dam will have significant environmental impacts including disruption of vast area in an extremely fragile ecosystem. In the dam basin there are plant specimens that are unique to this area and not growing in any other regions in the country. In addition, the dam basin is significantly large and therefore can potentially effects air humidity of a large region. The change in air humidity can have significant effects on both people and ecosystem.

6.4 Describe and Evaluate Scenarios for Economic Impacts

The economic impacts will be significant due to relation of a large number of towns and people located within the reservoir. The cost of moving these towns will include building new roads, houses, community places etc. In addition, the dam project itself will have a large impact on economy during construction. However, the produced electricity will likely drop the cost of electricity. The dam will also be used for irrigation purposes, and the water will be transported to fertile lands for farming. These will have substantial economic impacts on farming in the region. The dry-land farming will be replaced with wetland agriculture, and this will reduce poverty in the region.

7 CONCLUSIONS

This section should have conclusions. Conclusion should be brief. Clearly state findings of your projects. It can have a one paragraph project summary too at the beginning. This section should not be more than 2 pages.

8 ACKNOWLEDGMENT

Here you should acknowledge the contributors to your project. It can be your advisor, companies that have donated material or provided data/drawing, etc.

9 REFERENCES

References should appear together in the References section in the order in which they are cited in the report. All references should be cited in the text. The codes or standard used for the project should be included.

- **Kitap referansı için gösterim [2]**

  Yazarın SOYADI, ADI., *Kitap adı,* Yayınevi, Basım Yeri, Yayın yılı.

  MERCER, P.A. ve SMITH, G., *Private viewdata in the UK,* 2nd ed., Longman, London, 1993.

- **Dergilerdeki makaleler için gösterim [3]**

  Yazarın SOYADI, ADI., Makalenin adı, *Derginin Adı*, Cilt no ve (bölüm no), sayfa numaraları, Yayın yılı.

  EVANS, W.A., Approaches to intelligent information retrieval, *Information processing and management,* 7 (2), 147-168, 1994.

- **Konferans bildirileri için gösterim [4]**

  Yazarın SOYADI, ADI., *Konferans bildirisinin basligi,* Kongre adi, Kongre Yeri, yılı.

  SILVER, K., *Seismic proporties of concrete structures,* World Eartqukae Conferance, London, 1991.

- **Tezler için gösterim [5]**

  Yazarın SOYADI, ADI., *Tezin Adı,* Yüksek Lisans/Doktora, Enstitü Adı, Yayın yılı.

  AGUTTER, A.J., *The linguistic significance of current British slang,* Thesis (PhD), Edinburgh University, 1995.

10 APPENDIX-A: PUT HERE TITLE

This appendix includes ……..

Include appendixes here. You can have multiple ones. Name them Appendix-A, Appendix-B…

Appendix can have drawings or data such as calculation details. All appendix should eb referred in main text

$$
\begin{aligned}
PM := \;& i \leftarrow 0 \\
& c_{max} \leftarrow \frac{\varepsilon_u \times h}{\varepsilon_u - \varepsilon_{sy}} \times 1.1 \\
& c_{min} \leftarrow 0.02 \times h \\
& \text{for } c \in c_{max}, c_{max} - 1mm .. c_{min} \\
& \quad \varepsilon_{s1} \leftarrow \frac{\varepsilon_u}{c} \times (h - d_1) - \varepsilon_u \\
& \quad \varepsilon_{s2} \leftarrow \frac{\varepsilon_u}{c} \times (h - d_2) - \varepsilon_u \\
& \quad \varepsilon_{s3} \leftarrow \frac{\varepsilon_u}{c} \times (h - d_3) - \varepsilon_u \\
& \quad \varepsilon_{s4} \leftarrow \frac{\varepsilon_u}{c} \times (h - d_4) - \varepsilon_u \\
& \quad \varepsilon_{s5} \leftarrow \frac{\varepsilon_u}{c} \times (h - d_5) - \varepsilon_u \\
& \quad \sigma_{s1} \leftarrow \min(\varepsilon_{s1} \times E_s, f_{yd}) \text{ if } \varepsilon_{s1} \geq 0 \\
& \quad \sigma_{s1} \leftarrow \max(\varepsilon_{s1} \times E_s, -f_{yd}) \text{ if } \varepsilon_{s1} < 0 \\
& \quad \sigma_{s2} \leftarrow \min(\varepsilon_{s2} \times E_s, f_{yd}) \text{ if } \varepsilon_{s2} \geq 0 \\
& \quad \sigma_{s2} \leftarrow \max(\varepsilon_{s2} \times E_s, -f_{yd}) \text{ if } \varepsilon_{s2} < 0 \\
& \quad \sigma_{s3} \leftarrow \min(\varepsilon_{s3} \times E_s, f_{yd}) \text{ if } \varepsilon_{s3} \geq 0 \\
& \quad \sigma_{s3} \leftarrow \max(\varepsilon_{s3} \times E_s, -f_{yd}) \text{ if } \varepsilon_{s3} < 0 \\
& \quad \sigma_{s4} \leftarrow \min(\varepsilon_{s4} \times E_s, f_{yd}) \text{ if } \varepsilon_{s4} \geq 0 \\
& \quad \sigma_{s4} \leftarrow \max(\varepsilon_{s4} \times E_s, -f_{yd}) \text{ if } \varepsilon_{s4} < 0 \\
& \quad \sigma_{s5} \leftarrow \min(\varepsilon_{s5} \times E_s, f_{yd}) \text{ if } \varepsilon_{s5} \geq 0 \\
& \quad \sigma_{s5} \leftarrow \max(\varepsilon_{s5} \times E_s, -f_{yd}) \text{ if } \varepsilon_{s5} < 0 \\
& \quad F_{s1} \leftarrow A_{s1} \times \sigma_{s1} \\
& \quad F_{s2} \leftarrow A_{s2} \times \sigma_{s2} \\
& \quad F_{s3} \leftarrow A_{s3} \times \sigma_{s3} \\
& \quad F_{s4} \leftarrow A_{s4} \times \sigma_{s4} \\
& \quad F_{s5} \leftarrow A_{s5} \times \sigma_{s5} \\
& \quad F_{si} \leftarrow F_{s1} + F_{s2} + F_{s3} + F_{s4} + F_{s5} \\
& \quad F_c \leftarrow -\min(c \times k_1, h) \times 0.85 \times f_{cd} \times b \\
& \quad N \leftarrow F_c + F_{si}
\end{aligned}
$$