

Performing an Optimum Design in Osdag

Spoken Tutorial Project

<https://spoken-tutorial.org>

National Mission on Education through ICT

Anandajith TS

FOSSEE, IIT Bombay

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Learning Objectives

In this tutorial, we will learn,



Learning Objectives

In this tutorial, we will learn,

- ▶ **Difference between optimum design and design check**



Learning Objectives

In this tutorial, we will learn,

- ▶ Difference between optimum design and design check
- ▶ How to launch a design module



Learning Objectives

- **Step by step process to perform an optimum design**

Learning Objectives

- ▶ **Step by step process to perform an optimum design**
- ▶ **How to review the results of an optimum design**

System Requirements

To record this tutorial, I am using



System Requirements

To record this tutorial, I am using

► **Windows 11**



System Requirements

To record this tutorial, I am using

- ▶ Windows 11
- ▶ Osdag v2021.02.a.a12f



Pre-requisites

To follow this tutorial you should have

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To follow this tutorial you should have

► **Osdag installed on your system**

Pre-requisites

To follow this tutorial you should have

- ▶ Osdag installed on your system
- ▶ **Basic knowledge of structural steel design**



Pre-requisites

To follow this tutorial you should have

- ▶ **Osdag installed on your system**
- ▶ **Basic knowledge of structural steel design**

The pre-requisite tutorials are available on <https://spoken-tutorial.org>

Sample Design Example

- **Design a Tension Member with a bolted end connection**



Sample Design Example

- ▶ **Design a Tension Member with a bolted end connection**
- ▶ **The member carries a factored axial force of 600 kN**



Sample Design Example

Perform an optimum design by adopting the following design specifications:



Sample Design Example

Section:



Sample Design Example

Section:

► Profile: Back to Back Channels

Sample Design Example

Section:

- ▶ **Profile: Back to Back Channels**
- ▶ **Connection Location: Web**

Sample Design Example

Section:

- ▶ **Profile: Back to Back Channels**
- ▶ **Connection Location: Web**
- ▶ **Section Size: Most optimum**

Sample Design Example

Section:

- ▶ **Profile: Back to Back Channels**
- ▶ **Connection Location: Web**
- ▶ **Section Size: Most optimum**
- ▶ **Material Grade: E 250(Fe 410 W)A**



Sample Design Example

Section:

- ▶ **Profile: Back to Back Channels**
- ▶ **Connection Location: Web**
- ▶ **Section Size: Most optimum**
- ▶ **Material Grade: E 250(Fe 410 W)A**
- ▶ **Length: 3200 mm**

Sample Design Example

End Connection:



Sample Design Example

End Connection:

► **Connector**

Sample Design Example

End Connection:

- ▶ Connector
 - ▶ Type: Bolted

Sample Design Example

End Connection:

- ▶ **Connector**

- ▶ **Type: Bolted**

- ▶ **Bolt Type: Bearing Bolt**

Sample Design Example

End Connection:

▶ Connector

- ▶ Type: Bolted
- ▶ Bolt Type: Bearing Bolt
- ▶ **Diameter and Grade: Most optimum**



Sample Design Example

End Connection:

▶ Connector

- ▶ Type: Bolted
- ▶ Bolt Type: Bearing Bolt
- ▶ Diameter and Grade: Most optimum

▶ Gusset Plate:

Sample Design Example

End Connection:

▶ Connector

- ▶ Type: Bolted
- ▶ Bolt Type: Bearing Bolt
- ▶ Diameter and Grade: Most optimum

▶ Gusset Plate:

- ▶ Thickness: Most optimum



Summary

In this tutorial, we have

- ▶ Launched a design module**
- ▶ Learnt step by step process to perform an optimum design**
- ▶ Reviewed the results of an optimum design**



Assignment

As an assignment,

- ▶ **Design a Tension Member with a welded end connection**
- ▶ **The member carries a factored axial force of 235 kN**



Assignment

Perform an optimum design by adopting the following design specifications:



Assignment

- ▶ **Section:**
 - ▶ **Profile: Angles**
 - ▶ **Connection Location: Longer leg**
 - ▶ **Section Size: Most optimum**
 - ▶ **Material Grade: E 250 (Fe 410 W)A**
 - ▶ **Length: 2560 mm**
- ▶ **Gusset Plate: Most optimum**

About the Spoken Tutorial Project

- ▶ Watch the video available at https://spoken-tutorial.org/What_is_a_Spoken_Tutorial
- ▶ It summarises the Spoken Tutorial project
- ▶ If you do not have good bandwidth, you can download and watch it



Spoken Tutorial Workshops

The Spoken Tutorial Project Team

- ▶ Conducts workshops using spoken tutorials
- ▶ Gives certificates to those who pass an online test
- ▶ For more details, please write to contact@spoken-tutorial.org



Answers for THIS Spoken Tutorial

- ▶ Questions in THIS Spoken Tutorial
- ▶ Visit <https://forums.spoken-tutorial.org/>
- ▶ Choose the minute and second where you have the question
- ▶ Explain your question briefly
- ▶ The Spoken Tutorial project will ensure an answer
- ▶ You will have to register to ask questions



- For any general or technical questions on Osdag, visit the FOSSEE forum and post your question <https://forums.fossee.in/>

Sample Design Examples

- ▶ The Osdag team at FOSSEE creates sample design examples for self-learning
- ▶ These examples can be practiced using the Osdag software
- ▶ For more details, please visit:
<https://osdag.fossee.in/resources/sample-design>



Acknowledgements

- ▶ **The Spoken Tutorial project is funded by the Ministry of Education, Government of India**

Thank You!

- ▶ **This is Anandajith TS, FOSSEE IIT Bombay signing off**
- ▶ **Thanks for joining**

