

# Performing a design check in Osdag

**Spoken Tutorial Project**

<https://spoken-tutorial.org>

**National Mission on Education through ICT**

**Anandajith TS**

**FOSSEE, IIT Bombay**

**12 March 2023**



# Learning Objectives

**In this tutorial, we will learn how to**



# Learning Objectives

In this tutorial, we will learn how to

► **Perform a design check**

# Learning Objectives

**In this tutorial, we will learn how to**

- ▶ **Perform a design check**
- ▶ **Interpret the log messages**



# Learning Objectives

**In this tutorial, we will learn how to**

- ▶ **Perform a design check**
- ▶ **Interpret the log messages**
- ▶ **Rectify unsafe designs using log messages**



# Learning Objectives

In this tutorial, we will learn how to

- ▶ Perform a design check
- ▶ Interpret the log messages
- ▶ Rectify unsafe designs using log messages
- ▶ Arrive at a safe design using log messages



# 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,**



# Pre-requisites

**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 500 kN**



# Sample Design Example

- ▶ **Design a Tension Member with a bolted end connection**
- ▶ **The member carries a factored axial force of 500 kN**
- ▶ **Perform a design check by adopting the given design specifications:**





# Sample Design Example

**Section:**

# Sample Design Example

## Section:

► **Profile: Back to Back Angles**

# Sample Design Example

## Section:

- ▶ **Profile: Back to Back Angles**
- ▶ **Connection Location: Long Leg**

# Sample Design Example

## Section:

- ▶ **Profile: Back to Back Angles**
- ▶ **Connection Location: Long Leg**
- ▶ **Section Size: 120x120x12**

# Sample Design Example

## Section:

- ▶ **Profile: Back to Back Angles**
- ▶ **Connection Location: Long Leg**
- ▶ **Section Size: 120x120x12**
- ▶ **Material Grade: E 250(Fe 410 W)A**



# Sample Design Example

## Section:

- ▶ **Profile: Back to Back Angles**
- ▶ **Connection Location: Long Leg**
- ▶ **Section Size: 120x120x12**
- ▶ **Material Grade: E 250(Fe 410 W)A**
- ▶ **Length: 3200 mm**

# Sample Design Example

## End Connections:

# Sample Design Example

## End Connections:

### ► Connector:



# Sample Design Example

## End Connections:

- ▶ **Connector:**
  - ▶ **Type: Bolted**

# Sample Design Example

## End Connections:

- ▶ **Connector:**
  - ▶ **Type: Bolted**
  - ▶ **Diameter: 16, 20**

# Sample Design Example

## End Connections:

### ► Connector:

- Type: Bolted
- Diameter: 16, 20
- Bolt Type: Bearing Bolt



# Sample Design Example

## End Connections:

### ► Connector:

- Type: Bolted
- Diameter: 16, 20
- Bolt Type: Bearing Bolt
- Grade: 4.8, 5.8, 6.8



# Sample Design Example

## End Connections:

### ▶ Connector:

- ▶ Type: Bolted
- ▶ Diameter: 16, 20
- ▶ Bolt Type: Bearing Bolt
- ▶ Grade: 4.8, 5.8, 6.8

### ▶ Gusset Plate:



# Sample Design Example

## End Connections:

### ► Connector:

- Type: Bolted
- Diameter: 16, 20
- Bolt Type: Bearing Bolt
- Grade: 4.8, 5.8, 6.8

### ► Gusset Plate:

- Thickness: 16 mm

# Summary

**In this tutorial, we have**

- ▶ **Learnt to perform a design check**
- ▶ **Interpreted the log messages**
- ▶ **Rectified unsafe design using log messages**
- ▶ **Arrived at a safe design using log messages**



# Assignment

**As an assignment, please do the following**

- ▶ **Design a Tension Member with a welded end connection.**
- ▶ **The member carries a factored axial force of 500 kN**





# Assignment

**Perform a design check by adopting the given design specifications:**

► **Section:**

- **Profile: Angles**
- **Connection Location: Short Leg**
- **Section Size: 150x150x10**
- **Material Grade: E 300 (Fe 440)**
- **Length: 2560 mm**



# Assignment

- ▶ **Gusset Plate:**
  - ▶ **Thickness: 16 mm**

# About the Spoken Tutorial Project

- ▶ Watch the video available at [https://spoken-tutorial.org/What\\_is\\_a\\_Spoken\\_Tutorial](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](mailto: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



# FOSSEE Forum

- 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 practised 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**