Report

Example E8

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| Prepared by: | Prepared for: |
| SDC Verifier |  |
|  |  |

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| --- | --- |
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| Customer: |  |
| Project Number: |  |
| Version: | 1 |
| Date: | 17 Sep 2014 |

# Preface

This document is generated with SDC Verifier 3.6.1 and calculated with FEMAP v11.1.0

Model File: D:\SDC\AISC Examples\Chapter E\Example E8\Example E.8\_v11\_1.modfem

Project File: D:\SDC\AISC Examples\Chapter E\Example E8\Example E8.sdcv

Report Profile: 1..Standards

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Femap and SDC Verifier models coincide. Checked information is presented below:

|  |  |  |
| --- | --- | --- |
| Entity | Femap Model Entities Count | SDC Verifier Model Entities Count |
| Nodes | 11 | 11 |
| Elements | 10 | 10 |
| Materials | 1 | 1 |
| Property | 1 | 1 |

# Model Information

Model Summary

|  |  |
| --- | --- |
| Entity | Count |
| Nodes | 11 |
| Elements | 10 |
| Materials | 1 |
| Property | 1 |
| FEM Loads | 2 |
| Constraints | 1 |
| Jobs | 1 |
| Views | 1 |

Model Mass and Centre of Gravity

|  |  |
| --- | --- |
| Entity | Count |
| Mass | 300.206 |
| Gravity Center | [120.000; 0.000; 0.000] |
| X [Min;Max] | [0.000; 240.000] |
| Y [Min;Max] | [-2.400; 2.400] |
| Z [Min;Max] | [-2.400; 2.400] |

# Model Entities

This paragraph shows detailed or brief model overview.

## Materials

This paragraph contains materials information.

### Materials Summary

|  |  |  |  |
| --- | --- | --- | --- |
| Title | Element(s) | Mass | Gravity Center |
| 1..A992 Steel | 10 | 300.21 | [120.00; 0.00; 0.00] |

### 1..A992 Steel

|  |  |
| --- | --- |
| Property | Value |
| Elements | 10 |
| Mass | 300.21 |
| Gravity Center | [120.00; 0.00; 0.00] |
| X [Min;Max] | [0.00; 240.00] |
| Y [Min;Max] | [0.00; 0.00] |
| Z [Min;Max] | [0.00; 0.00] |

|  |  |  |
| --- | --- | --- |
|  | Property | Value |
| FEM Relevant | Young Modulus | 2.90e+07 |
|  | Shear Modulus | 11200000.000 |
|  | Poisson Ratio | 0.320 |
|  | Shear | 0.000 |
|  | Mass Density | 0.283 |
| SDC Verifier Relevant | Tensile Strength | 0.07e+6 |
|  | Yield Stress | 0.05e+6 |
|  | | | |

## Properties

This paragraph contains properties information.

### Properties Summary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Title | Element(s) | Material | Mass | Gravity Center |
| 1..WT7x15 | 10 | 1..A992 Steel | 300.21 | [120.00; 0.00; 0.00] |

### 1..WT7x15

|  |  |
| --- | --- |
| Property | Value |
| Elements | 10 |
| Type | Beam |
| Material | 1..A992 Steel |
| Mass | 300.21 |
| Gravity Center | [120.00; 0.00; 0.00] |
| X [Min;Max] | [0.00; 240.00] |
| Y [Min;Max] | [0.00; 0.00] |
| Z [Min;Max] | [0.00; 0.00] |
| Moment I1 or Izz | 9.79 |
| Moment I2 or Iyy | 19.00 |
| Moment I3 or Izy | 0.00 |
| Area A | 4.42 |
| Z Shear Area | 1.47 |
| Y Shear Area | 2.12 |
| Torsional Constant J | 0.19 |
| Nonstructural Mass Length | 0.00 |
| Warping Constant | 0.28 |
| Perimeter | 27.30 |
| Y Neutral Axis Offset | 0.00 |
| Z Neutral Axis Offset | -1.39 |

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| --- | --- | --- | --- |
|  |  |  |  |
| Geometry Property | Value | Points Of Interest | Value |
| Height | 6.92 | Point 1 | [-0.14 ; -6.72] |
| Width | 6.73 | Point 2 | [0.14 ; -6.72] |
| h | 6.92 | Point 3 | [3.37 ; 0.20] |
| b | 6.73 | Point 4 | [-3.37 ; 0.20] |
| d | 0.27 |  |  |
| t | 0.39 |  |  |
|  | | | | |

## FEM Loads

This paragraph contains information about applied loads to model.

### 1..Dead load 6 kips

|  |  |  |  |
| --- | --- | --- | --- |
| Definition Title | Load Type | Applied on | Value(s) |
| 1..6 kips | Force | Node: 11 | (-6000;0;0) |

|  |
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### 2..Live load 18 kips

|  |  |  |  |
| --- | --- | --- | --- |
| Definition Title | Load Type | Applied on | Value(s) |
| 1..18 kips | Force | Node: 11 | (-18000;0;0) |

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## Constraints

This paragraph contains information about constrained parts of the model.

### 1..Constraint

|  |  |  |
| --- | --- | --- |
| Definition | Count | Type (DOF) |
| 1..Bottom | 1 node(s) | Tx Ty Tz Rx |
| 2..Top | 1 node(s) | Ty Tz |
|  | | | |

# Standards

This paragraph shows detailed information about applied standards.

## 2..ANSI / AISC LRFD 360-10

#### General Information

|  |  |
| --- | --- |
| Property | Value |
| Title | ANSI / AISC LRFD 360-10 |
| Type | 11 |
| Constants | 8 |
| Classifications | 0 |
| Standard Tables | 0 |

### Constant

|  |  |
| --- | --- |
| Title | Value |
| F\_t | 0.9 |
| F\_c | 0.9 |
| F\_v | 0.9 |
| rolled | 1 |
| built\_up | 2 |
| nonslender | 3 |
| slender | 4 |
| NotSupported | -12345678 |

### Characteristics

This paragraph contains information about extra elemental characteristics

#### 1..Section Build Type

|  |  |
| --- | --- |
| Property | Value |
| Type |  |
| AliasName | Section\_Build\_Type |
| Groups count | 1 |

#### Description

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Property | Value | No. | Property | Value |
| 1 | 1..WT7x15 | 1 |  |  |  |

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#### 1..Beam Length Y

|  |  |
| --- | --- |
| Property | Value |
| Type |  |
| AliasName | Ly |
| Groups count | 1 |

#### Description

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Property | Value | No. | Property | Value |
| 1 | Beam Member 1 | 240 |  |  |  |

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#### 2..Effective Length Factor Y

|  |  |
| --- | --- |
| Property | Value |
| Type |  |
| AliasName | Ky |
| Groups count | 1 |

#### Description

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Property | Value | No. | Property | Value |
| 1 | Beam Member 1 | 1 |  |  |  |

|  |
| --- |
|  |

#### 3..Beam Length Z

|  |  |
| --- | --- |
| Property | Value |
| Type |  |
| AliasName | Lz |
| Groups count | 1 |

#### Description

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Property | Value | No. | Property | Value |
| 1 | Beam Member 1 | 240 |  |  |  |

|  |
| --- |
|  |

#### 4..Effective Length Factor Z

|  |  |
| --- | --- |
| Property | Value |
| Type |  |
| AliasName | Kz |
| Groups count | 1 |

#### Description

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Property | Value | No. | Property | Value |
| 1 | Beam Member 1 | 1 |  |  |  |

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|  |

#### 5..Torsional Length

|  |  |
| --- | --- |
| Property | Value |
| Type |  |
| AliasName | Ltor |
| Groups count | 1 |

#### Description

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Property | Value | No. | Property | Value |
| 1 | All Entities | 240 |  |  |  |

|  |
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|  |

#### 6..Effective Torsional Length

|  |  |
| --- | --- |
| Property | Value |
| Type |  |
| AliasName | Ktor |
| Groups count | 1 |

#### Description

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Property | Value | No. | Property | Value |
| 1 | All Entities | 1 |  |  |  |

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|  |

### Checks

This paragraph contains checks descriptions with their results.

#### 1..Beam Characteristics

|  |  |
| --- | --- |
| Property | Value |
| Category | Elemental Custom Check |
| Selection | 18 PropertyShape(s) |
| Parameters | 8 |

##### Table Profiles

This paragraph represents result table profiles previously created in a job.

All (LS1, All Entities)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Check | | 1..Beam Characteristics | | | | Load Set: | | 1..LRFD | | | |
| Selection | | All Entities | | | | Direction | | All | | | |
| Load | Radius of Gyration Y | | Radius of Gyration Z | Slenderness Ratio Y | Slenderness Ratio Z | | Elastic Buckling Stress Y | | Elastic Buckling Stress Z | Critical Stress Y Q1 | Critical Stress Z Q1 | |
| Load Set '1..LRFD' | 1.49 | | 2.07 | 161.26 | 115.76 | | 11006.156 | | 21360.264 | 9652.40 | 18732.95 | |

#### 5..Section T

|  |  |
| --- | --- |
| Property | Value |
| Category | Elemental Custom Check |
| Selection | 4 PropertyShape(s) |
| Parameters | 10 |

##### Table Profiles

This paragraph represents result table profiles previously created in a job.

All (LS1, All Entities)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Check | | 5..Section T | | | | | Load Set: | | 1..LRFD | | | | |
| Selection | | All Entities | | | | | Direction | | All | | | | |
| Load | Width to Thickness Ratio Flanges | | Width to Thickness Ratio Stems | | Kc\_calc | Kc | | Qs for built\_up sections | | | Qs\_rolled for Flanges | Qs\_rolled for Stems | Qs\_rolled | |
| Load Set '1..LRFD' | 8.74 | | 25.63 | | 0.79 | 0.76 | | 1.000 | | | 1.000 | 0.609 | 0.609 | |
| Load | | | | Net Reduction Factor | | | | | | Slender Type | | | | | |
| Load Set '1..LRFD' | | | | 0.609 | | | | | | 4.000 | | | | | |

#### 8..Help

|  |  |
| --- | --- |
| Property | Value |
| Category | Elemental Custom Check |
| Selection | 17 PropertyShape(s) |
| Parameters | 15 |

##### Table Profiles

This paragraph represents result table profiles previously created in a job.

All (LS1, All Entities)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Check | | | 8..Help | | | | | | Load Set: | | | 1..LRFD | | | | | |
| Selection | | | All Entities | | | | | | Direction | | | All | | | | | |
| Load | Polar Radius of gyration Square | | | H\_parameter | | Fcr\_z\_torsional | | Net Reduction Factor | | Slender Type | | | Elastic Stress Z Torsional | | Fe Single Symmetric | | Elastic Stress Double Symmetric | |
| Load Set '1..LRFD' | 8.459 | | | 0.770 | | 56913.328 | | 0.609 | | 4.000 | | | 56951.2 | | 10464.3 | | 85709.9 | |
| Load | | Elastic Stress Torsional | | | Fey | | Fez | | Critical Stress Y | | Critical Stress Z | | | Critical Stress T Shape | | Critical Stress | | |
| Load Set '1..LRFD' | | 10464.3 | | | 10464.3 | | 10464.3 | | 9177.2 | | 16769.9 | | | 9240.432 | | 9177.233 | | |

#### 9..Axial

|  |  |
| --- | --- |
| Property | Value |
| Category | Elemental Custom Check |
| Selection | 17 PropertyShape(s) |
| Parameters | 4 |

##### Table Profiles

This paragraph represents result table profiles previously created in a job.

All (LS1, All Entities)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Check | 9..Axial | | | Load Set: | | 1..LRFD | |
| Selection | All Entities | | | Direction | | All | |
| Load | | Nominal Compressive Strength | Design Tensile Strength | | Axial Force | | Utilization Factor | |
| Load Set '1..LRFD' | | 36507.035 | 198900.000 | | -36000.000 | | 0.99 | |