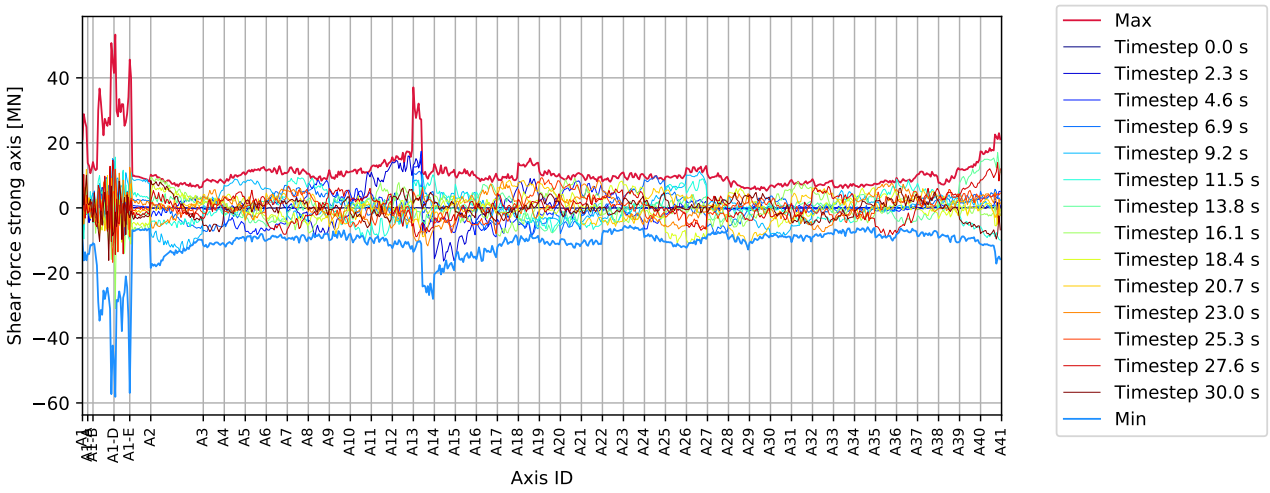


Figure 4.606: DH A13-A14 180deg - bridgegirder : Shear force strong axis [MN]

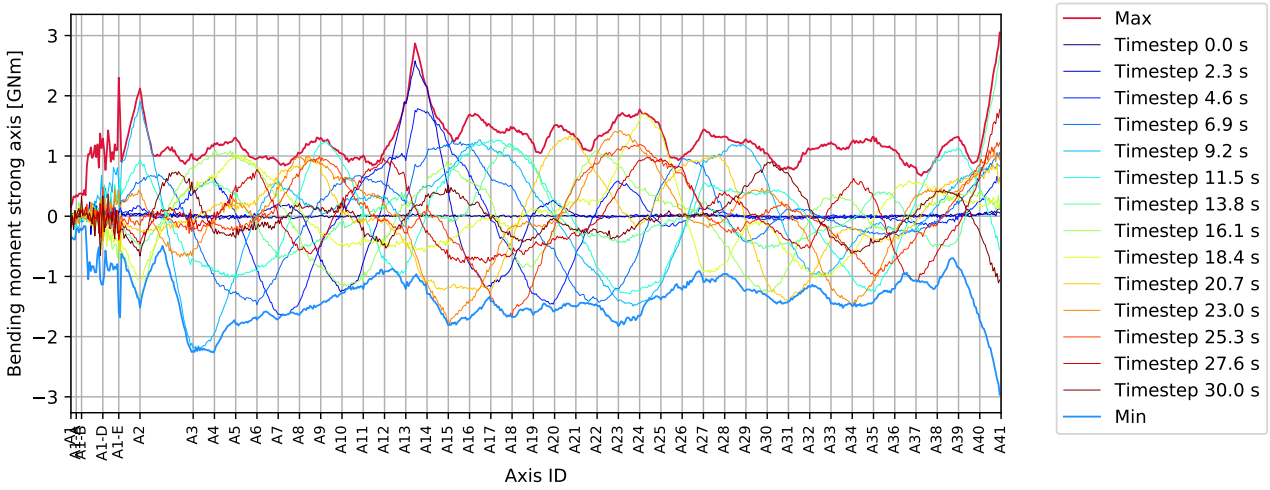


Figure 4.607: DH A13-A14 180deg - bridgegirder : Bending moment strong axis [GNm]

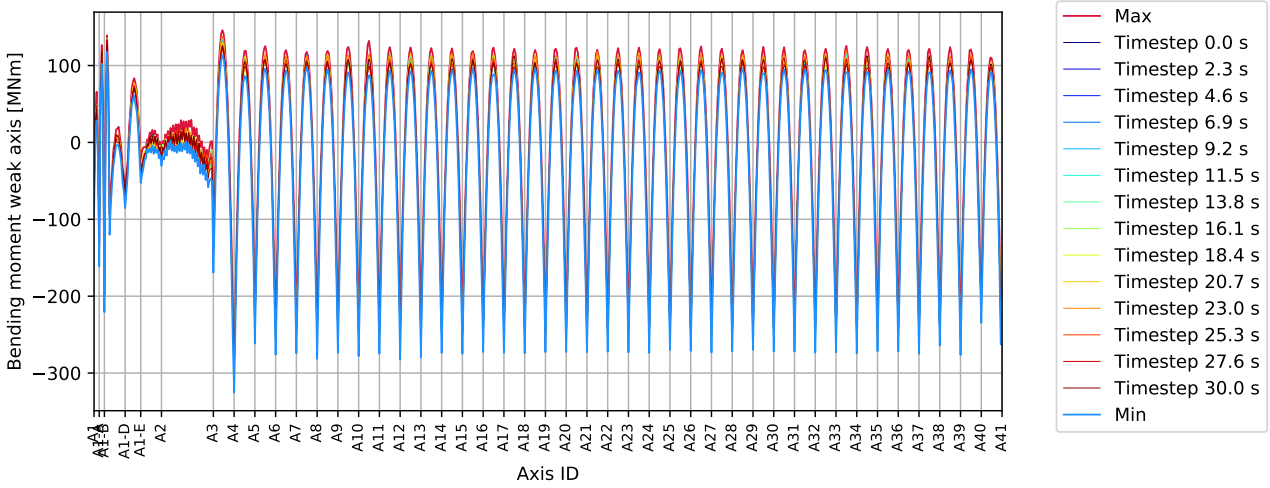


Figure 4.608: DH A13-A14 180deg - bridgegirder : Bending moment weak axis [MNm]

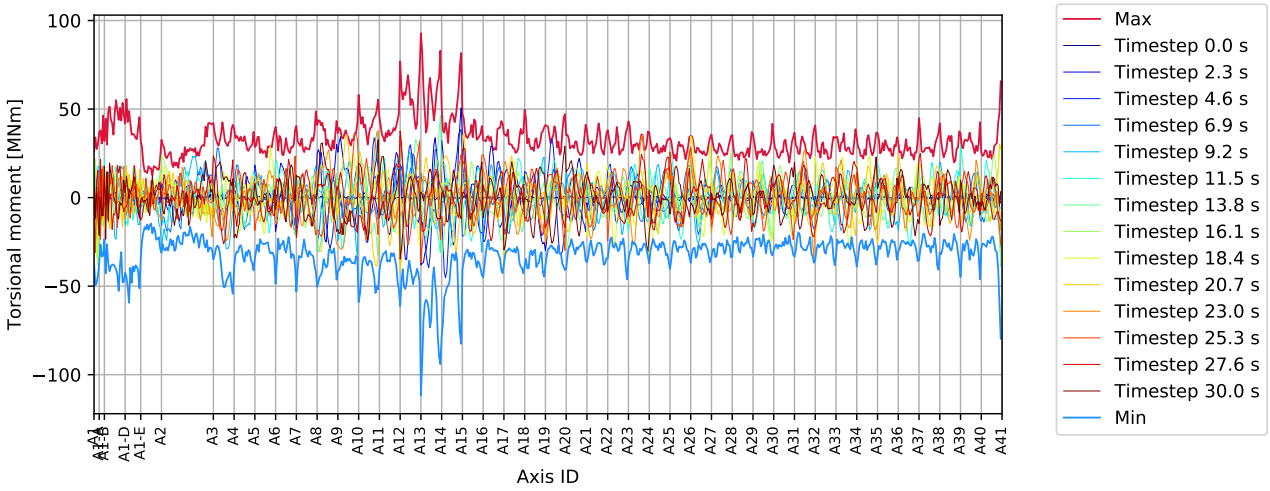


Figure 4.609: DH A13-A14 180deg - bridgegirder : Torsional moment [MNm]

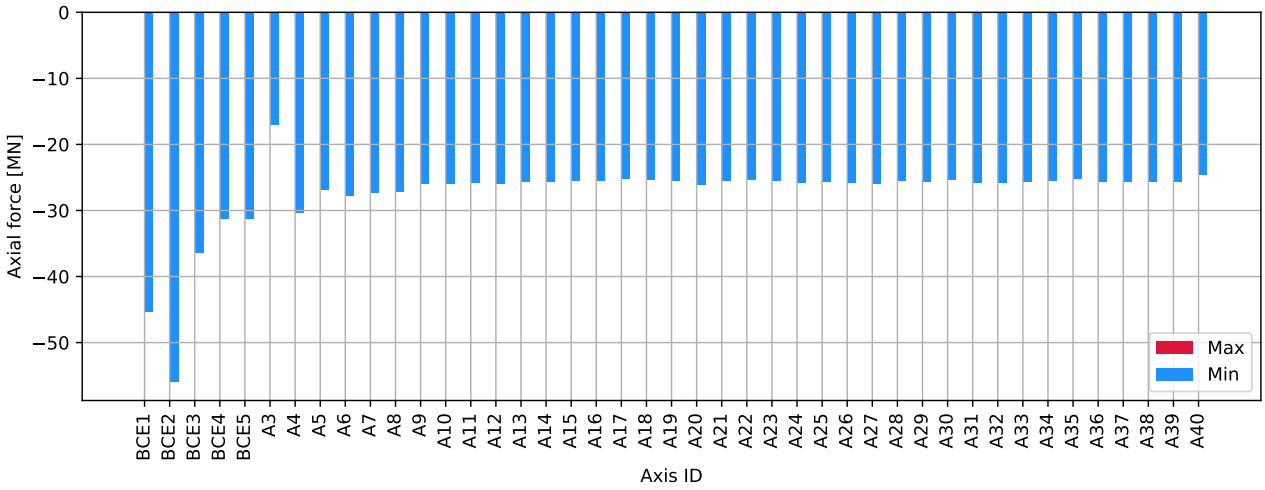


Figure 4.610: DH A13-A14 180deg - columns bottom : Axial force [MN]

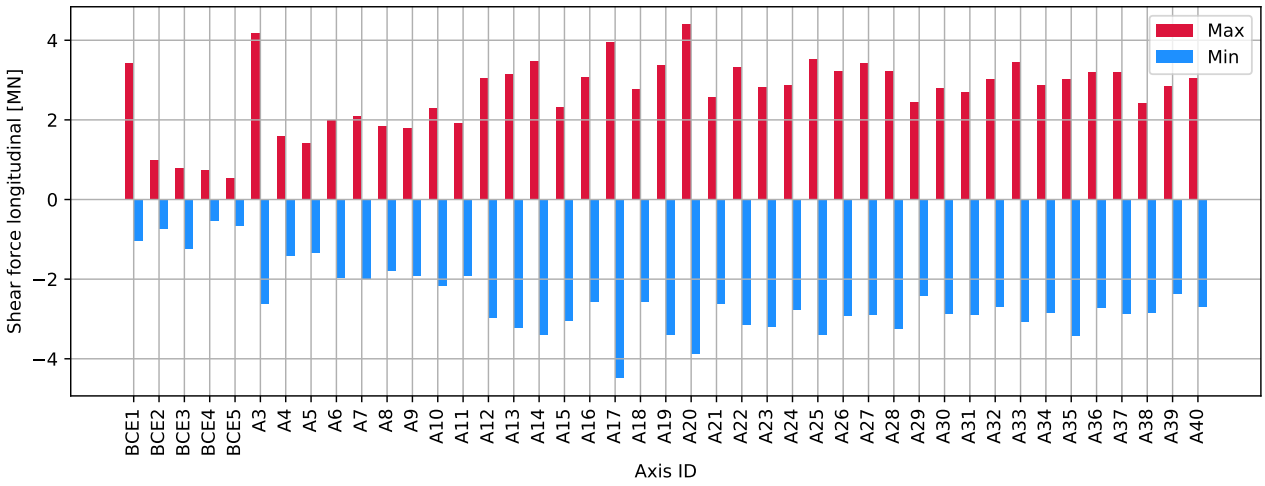


Figure 4.611: DH A13-A14 180deg - columns bottom : Shear force longitudinal [MN]

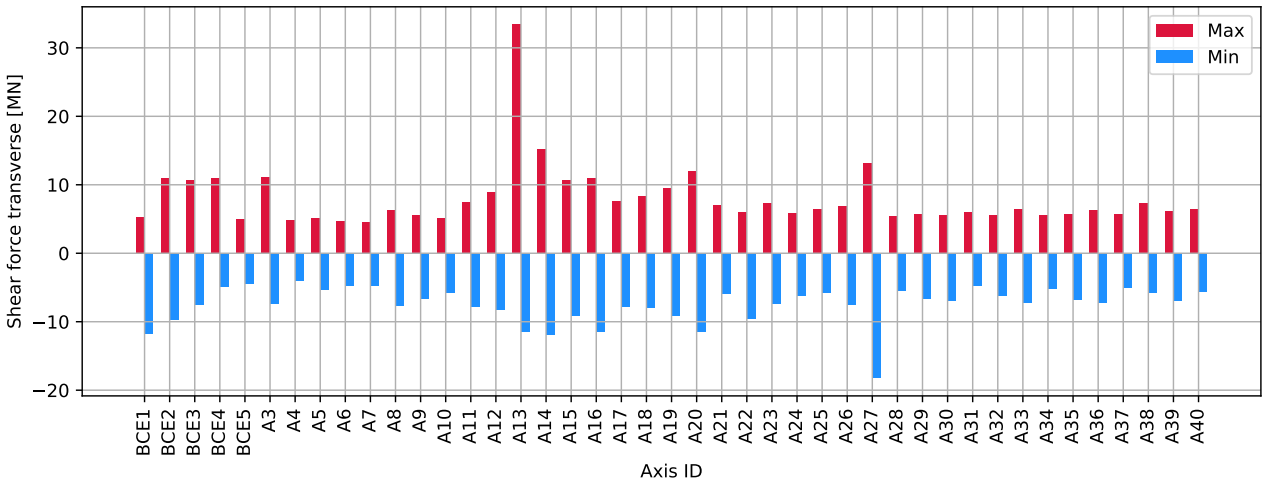


Figure 4.612: DH A13-A14 180deg - columns bottom : Shear force transverse [MN]

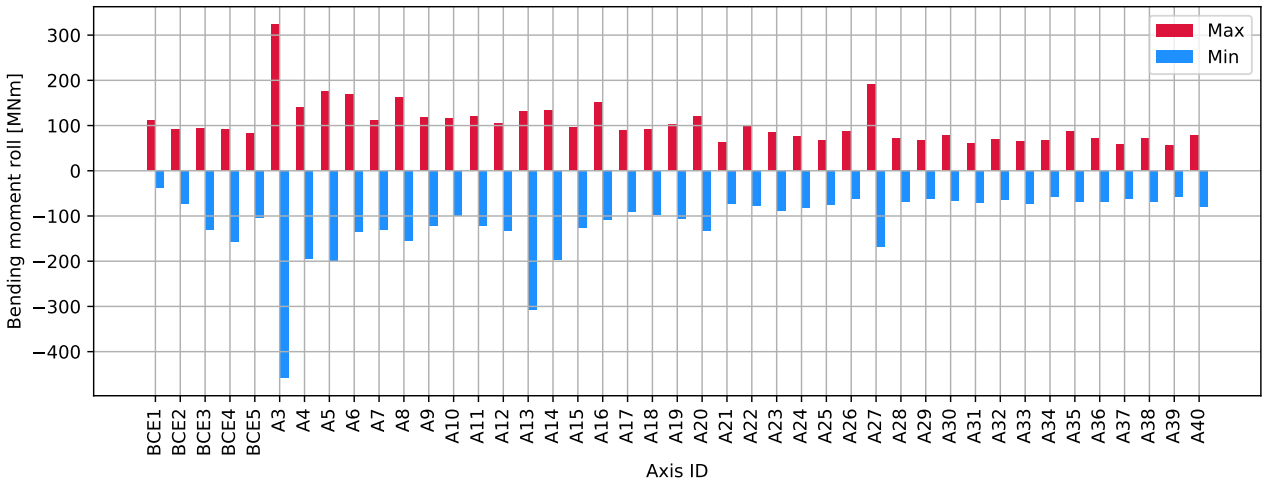


Figure 4.613: DH A13-A14 180deg - columns bottom : Bending moment roll [MNm]

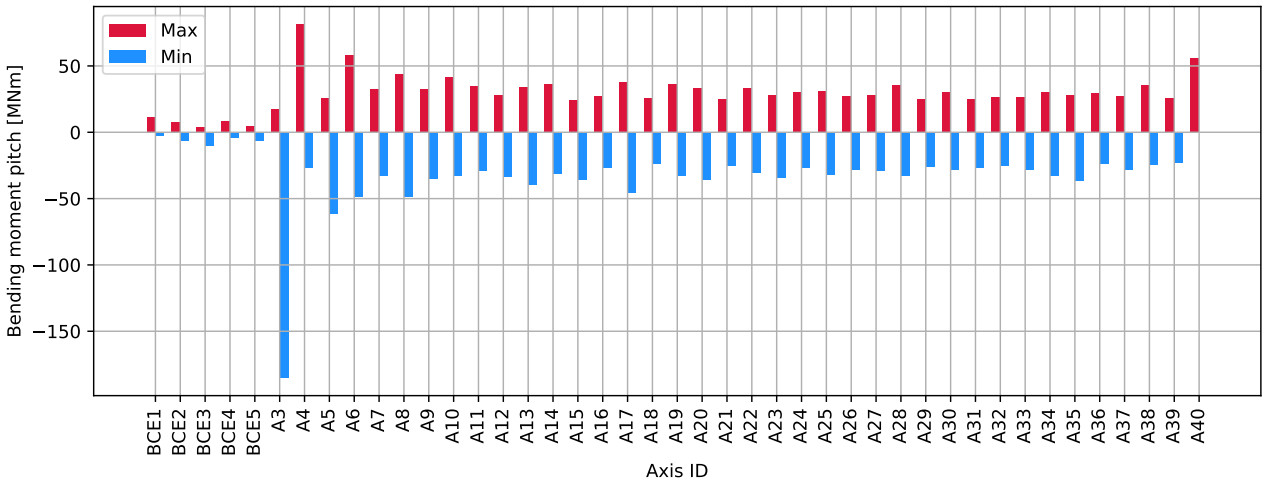


Figure 4.614: DH A13-A14 180deg - columns bottom : Bending moment pitch [MNm]

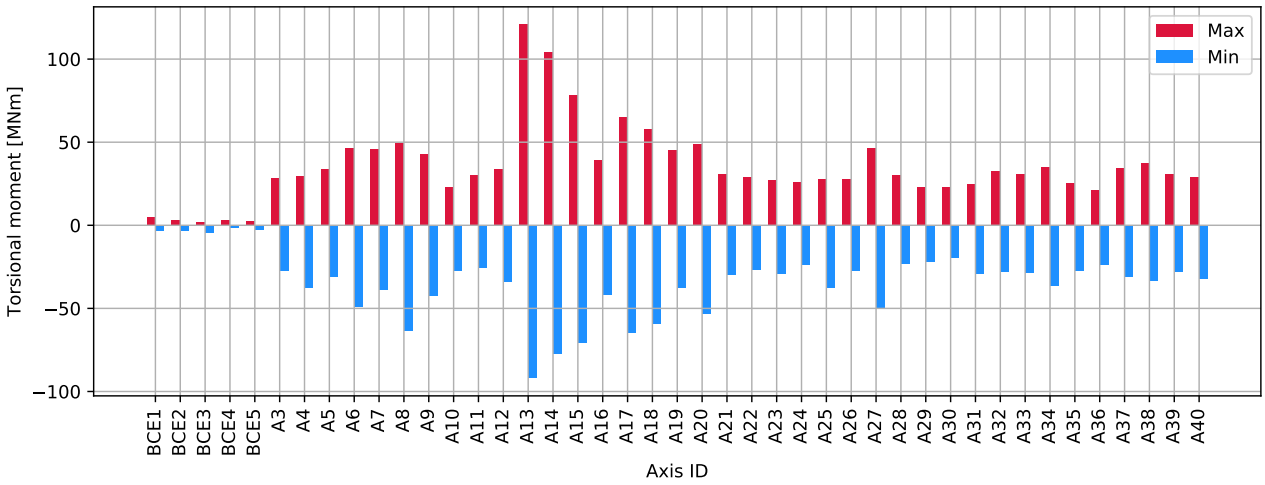


Figure 4.615: DH A13-A14 180deg - columns bottom : Torsional moment [MNm]

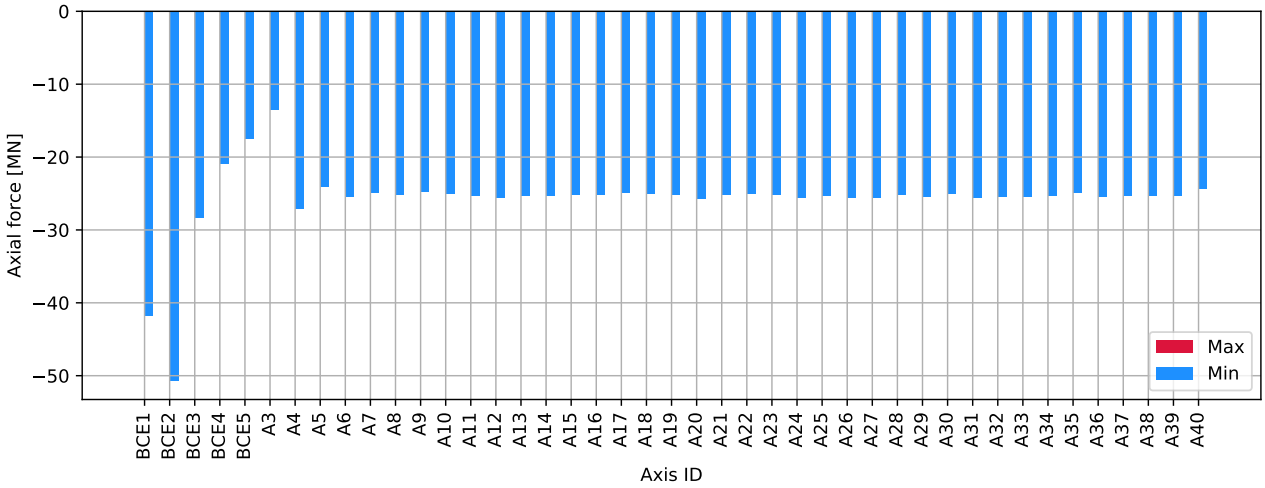


Figure 4.616: DH A13-A14 180deg - columns top : Axial force [MN]

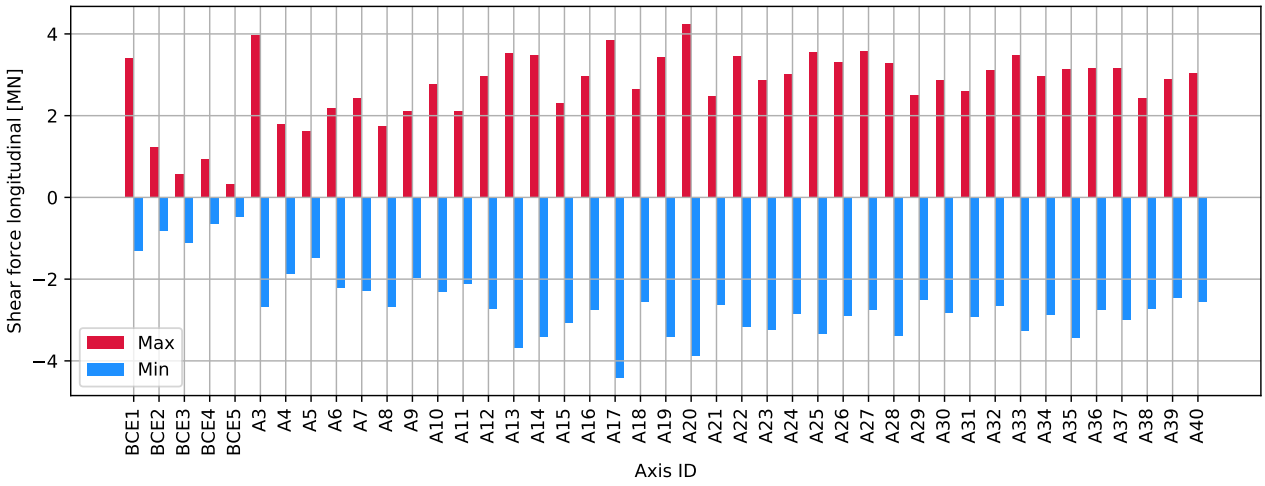


Figure 4.617: DH A13-A14 180deg - columns top : Shear force longitudinal [MN]

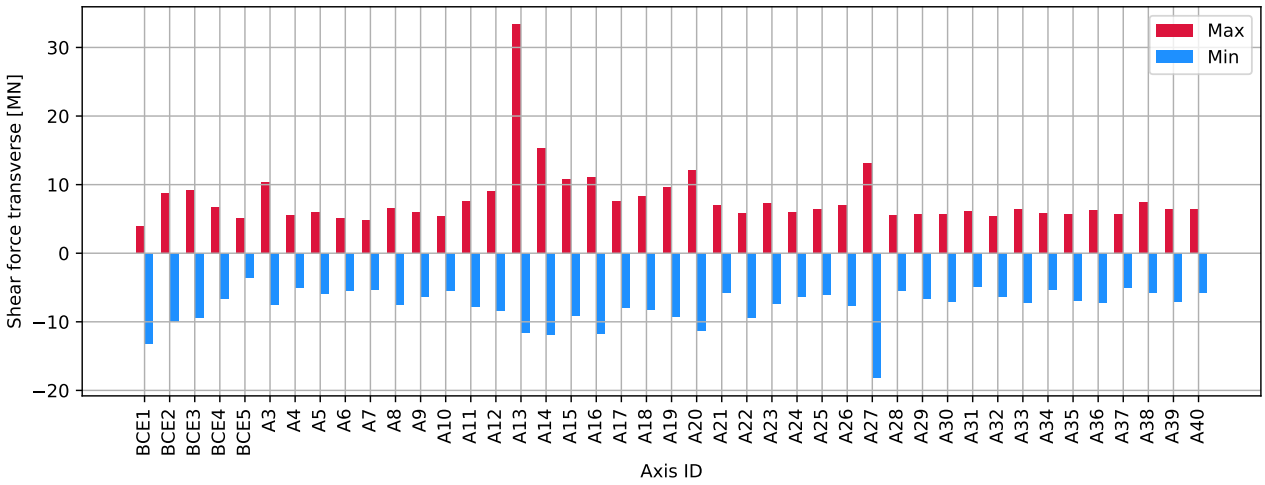


Figure 4.618: DH A13-A14 180deg - columns top : Shear force transverse [MN]

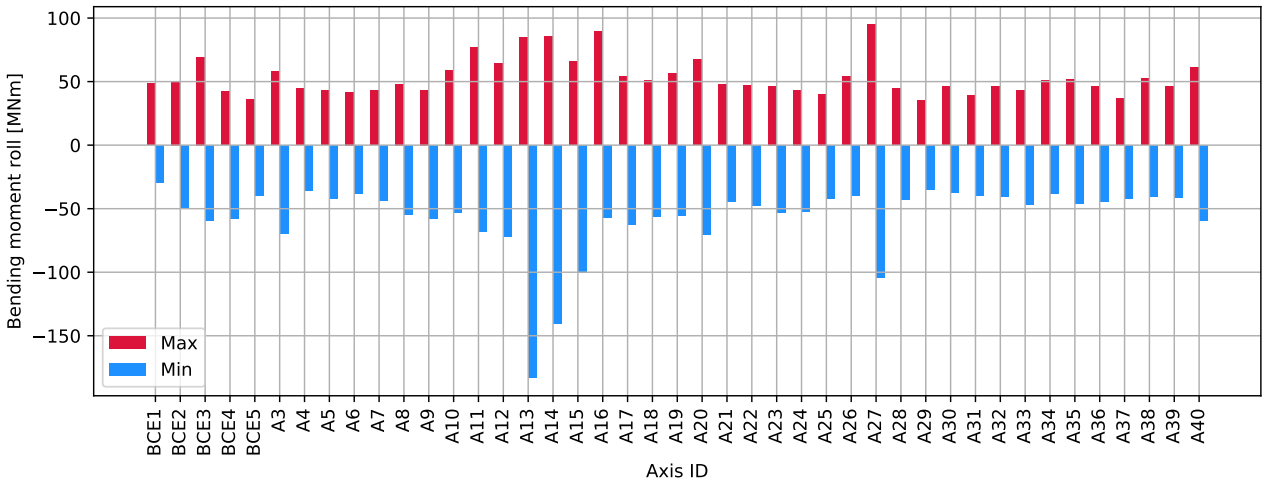


Figure 4.619: DH A13-A14 180deg - columns top : Bending moment roll [MNm]

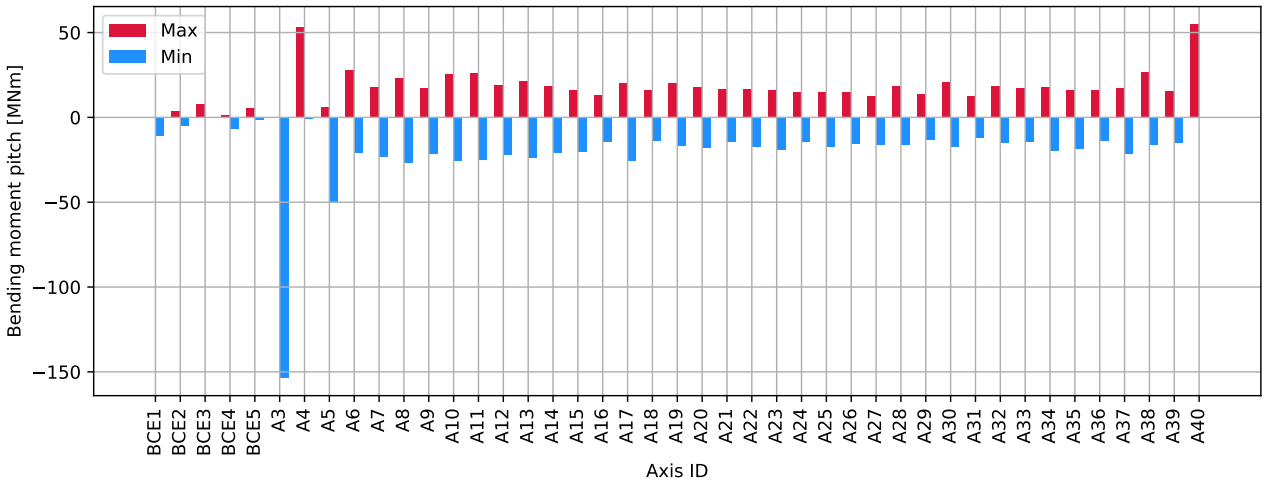


Figure 4.620: DH A13-A14 180deg - columns top : Bending moment pitch [MNm]

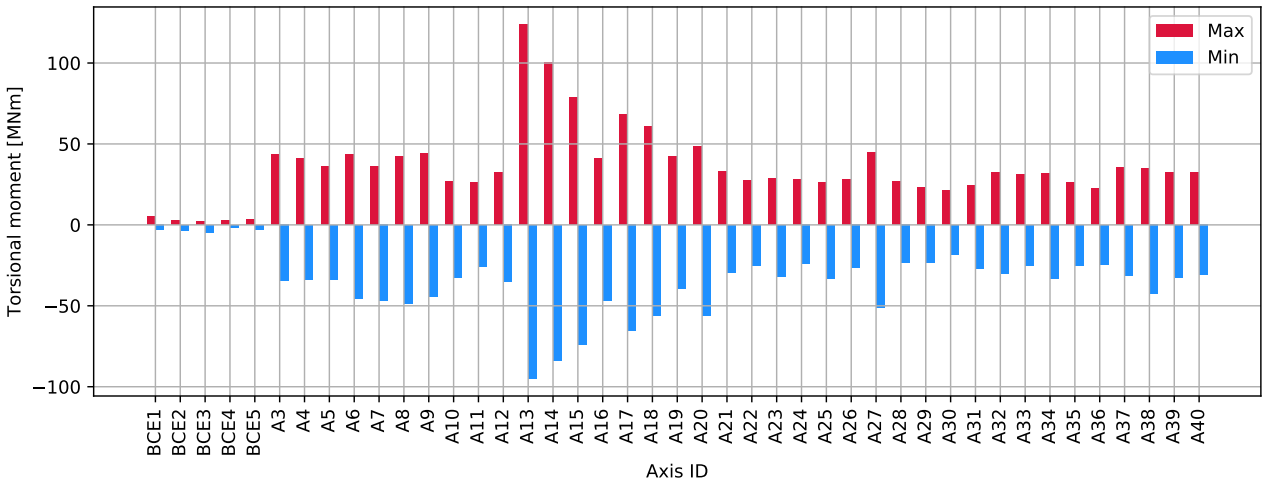


Figure 4.621: DH A13-A14 180deg - columns top : Torsional moment [MNm]

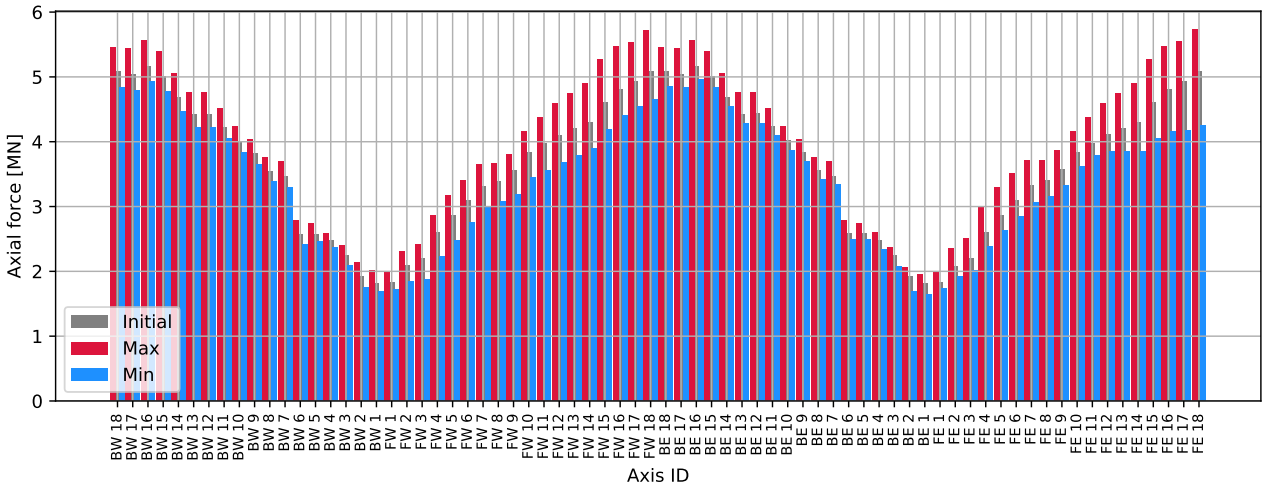


Figure 4.622: DH A13-A14 180deg - cables : Axial force [MN]

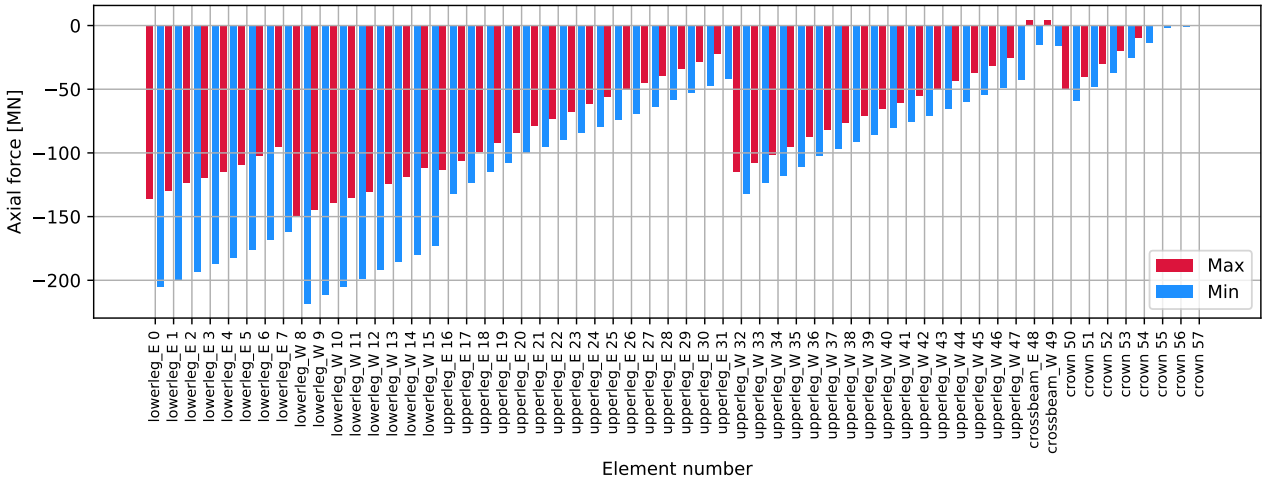


Figure 4.623: DH A13-A14 180deg - tower: Axial force [MN]

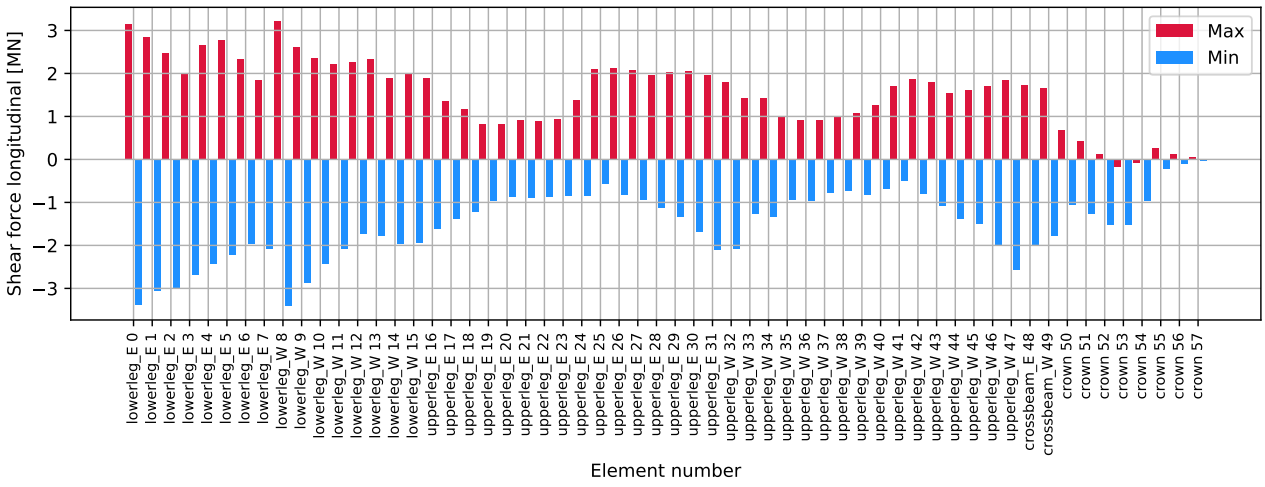


Figure 4.624: DH A13-A14 180deg - tower: Shear force longitudinal [MN]

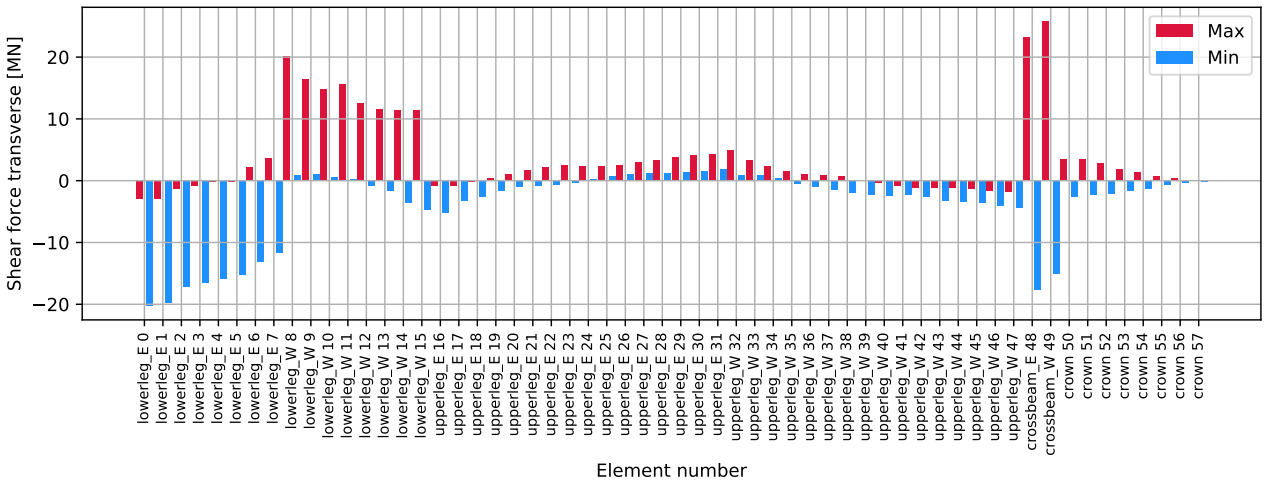


Figure 4.625: DH A13-A14 180deg - tower: Shear force transverse [MN]

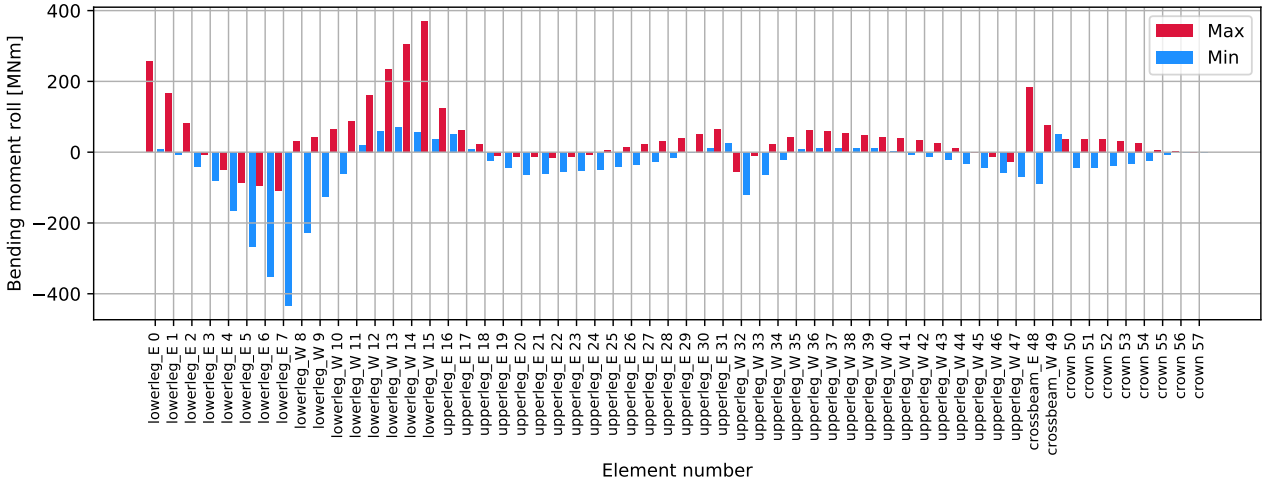


Figure 4.626: DH A13-A14 180deg - tower: Bending moment roll [MNm]

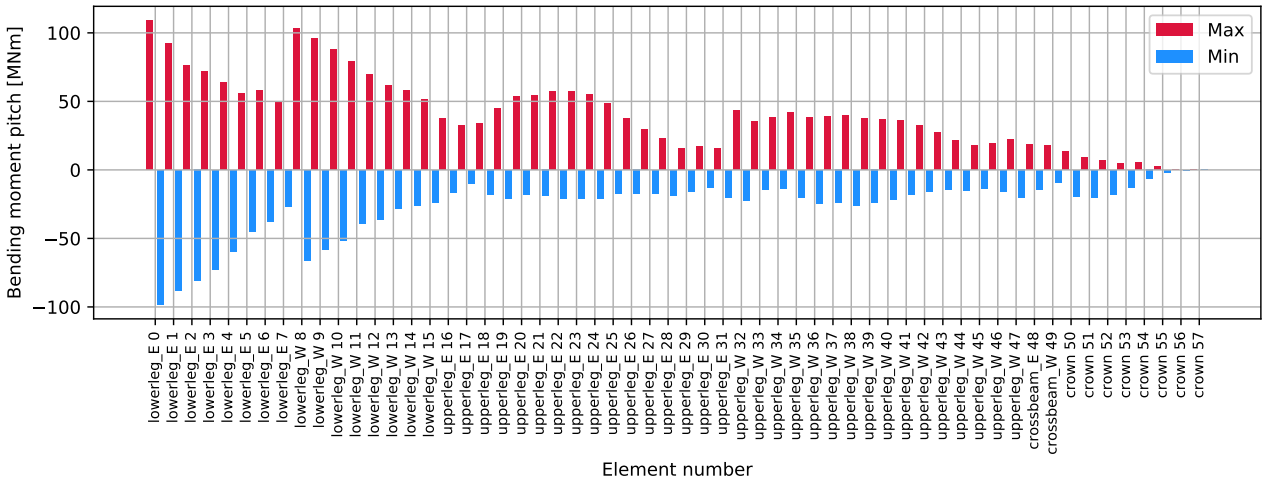


Figure 4.627: DH A13-A14 180deg - tower: Bending moment pitch [MNm]

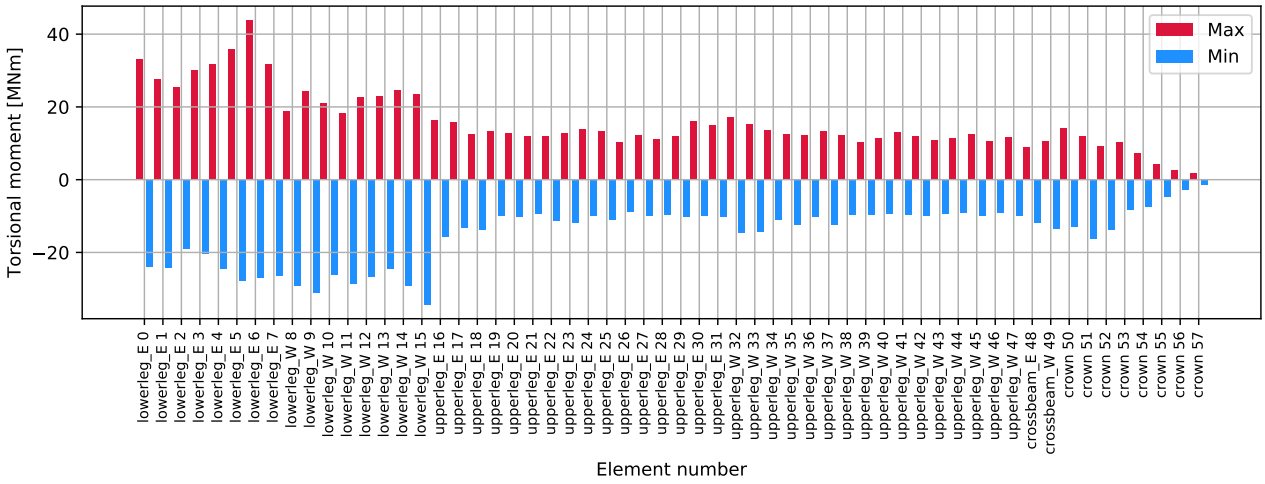


Figure 4.628: DH A13-A14 180deg - tower: Torsional moment [MNm]

### 4.14.3 Time series

Note : Time series are filtered using a Saviotzky-Golay filter for increased readability of the time history plots. Hence, maximum values that occur due to a rapid vibration are not shown in the plots. For maximum values, refer to the tabulated data.
All elements are numbered from South to North, bottom to top

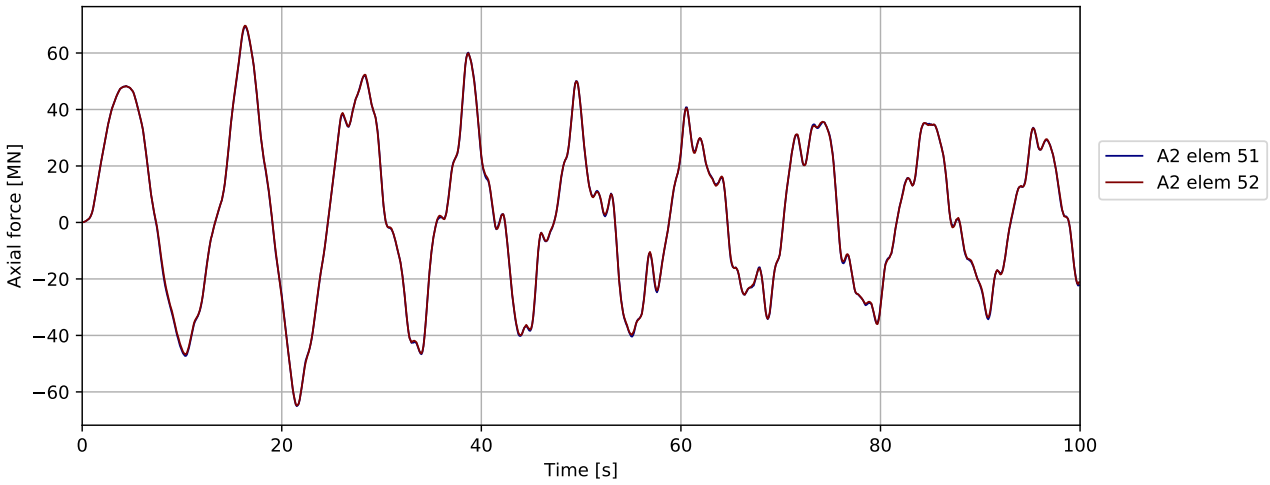


Figure 4.629: DH A13-A14 180deg - bridgegirder @ pylon: Axial force [MN]

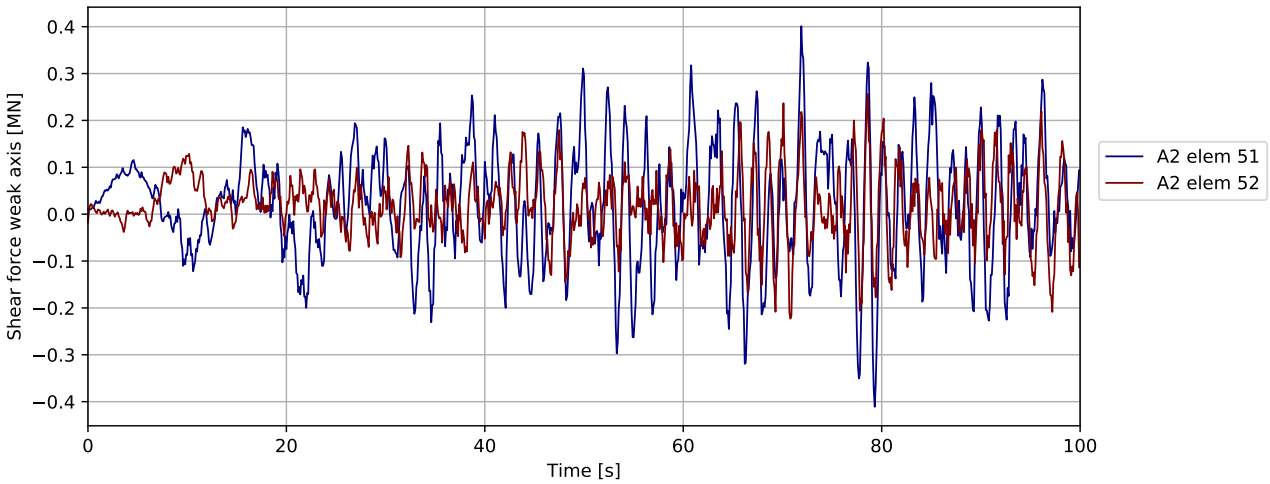


Figure 4.630: DH A13-A14 180deg - bridgegirder @ pylon: Shear force weak axis [MN]

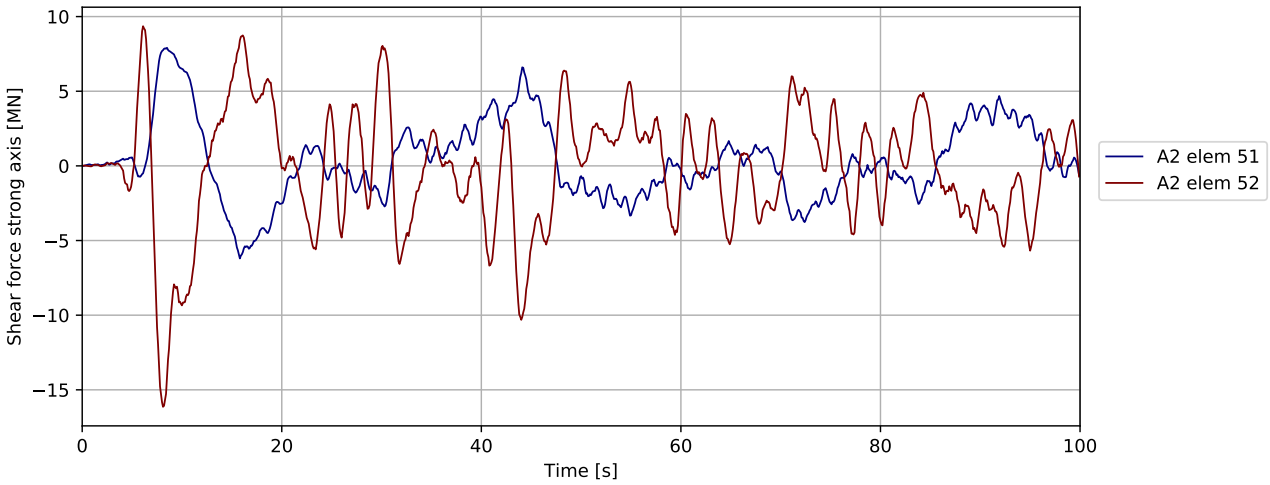


Figure 4.631: DH A13-A14 180deg - bridgegirder @ pylon: Shear force strong axis [MN]

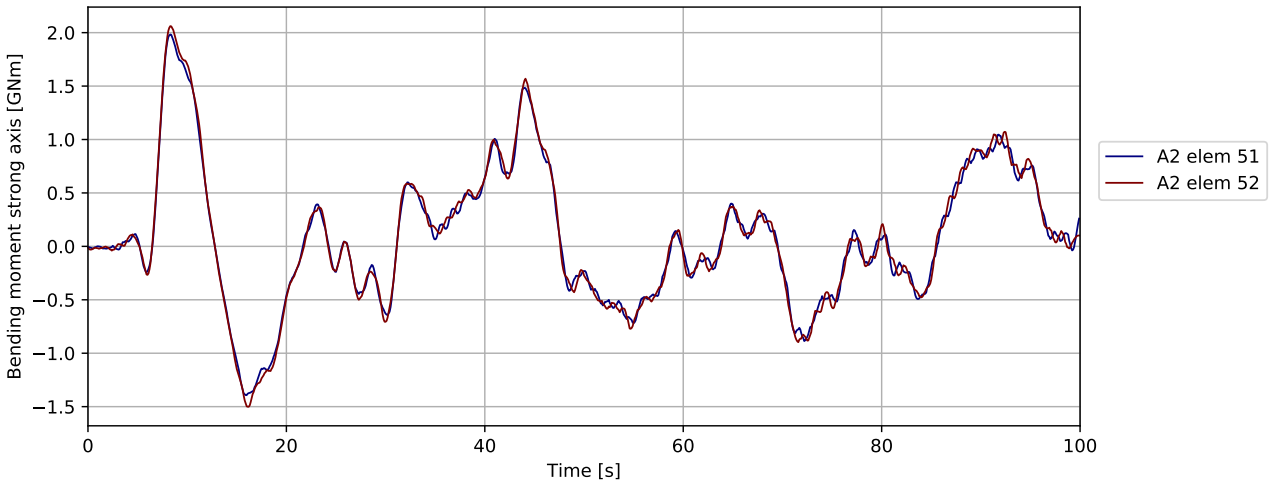


Figure 4.632: DH A13-A14 180deg - bridgegirder @ pylon: Bending moment strong axis [GNm]

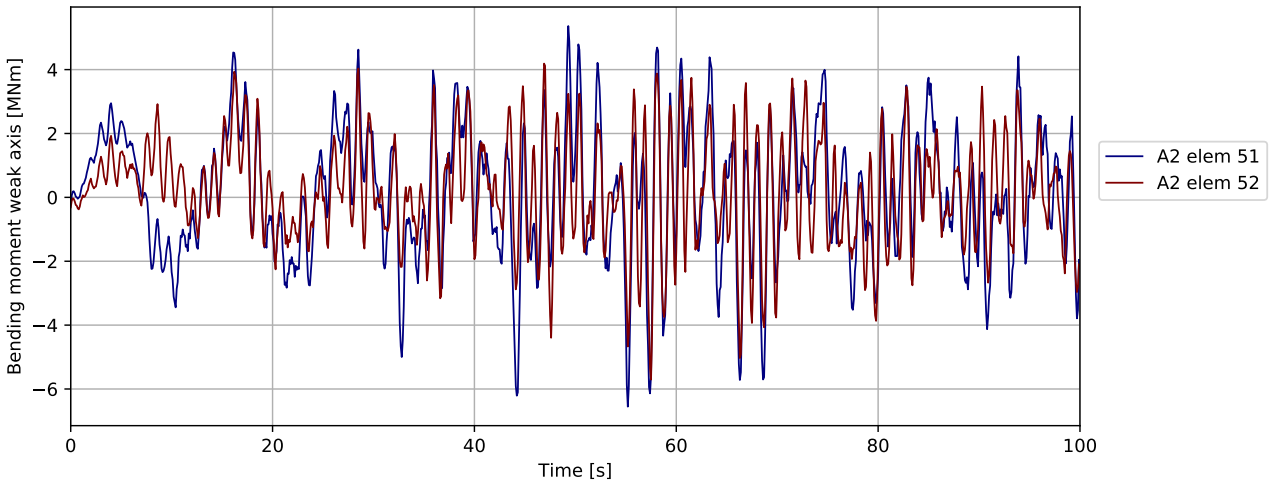


Figure 4.633: DH A13-A14 180deg - bridgegirder @ pylon: Bending moment weak axis [MNm]

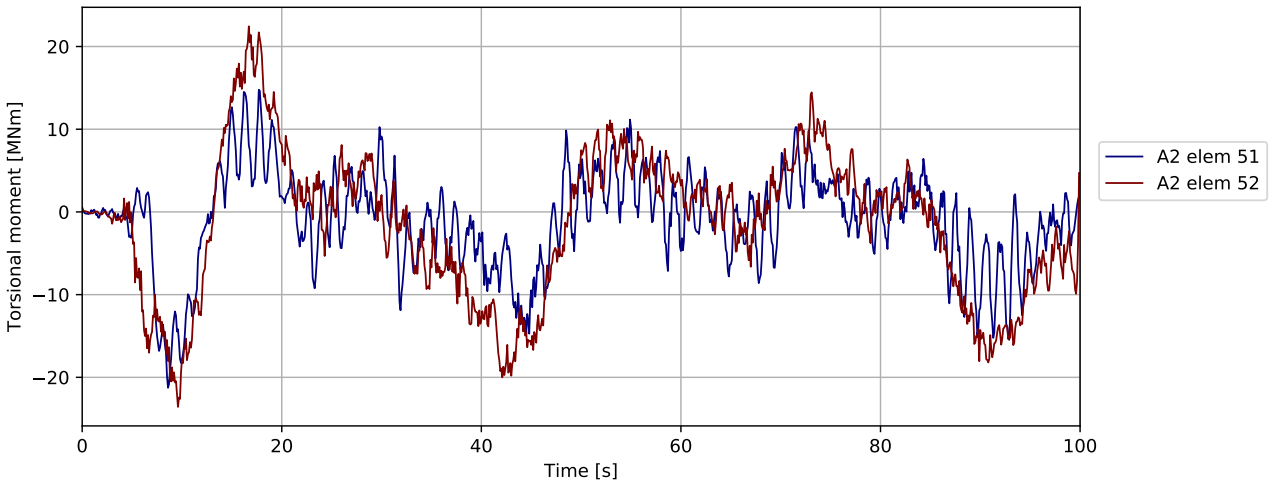


Figure 4.634: DH A13-A14 180deg - bridgegirder @ pylon: Torsional moment [MNm]

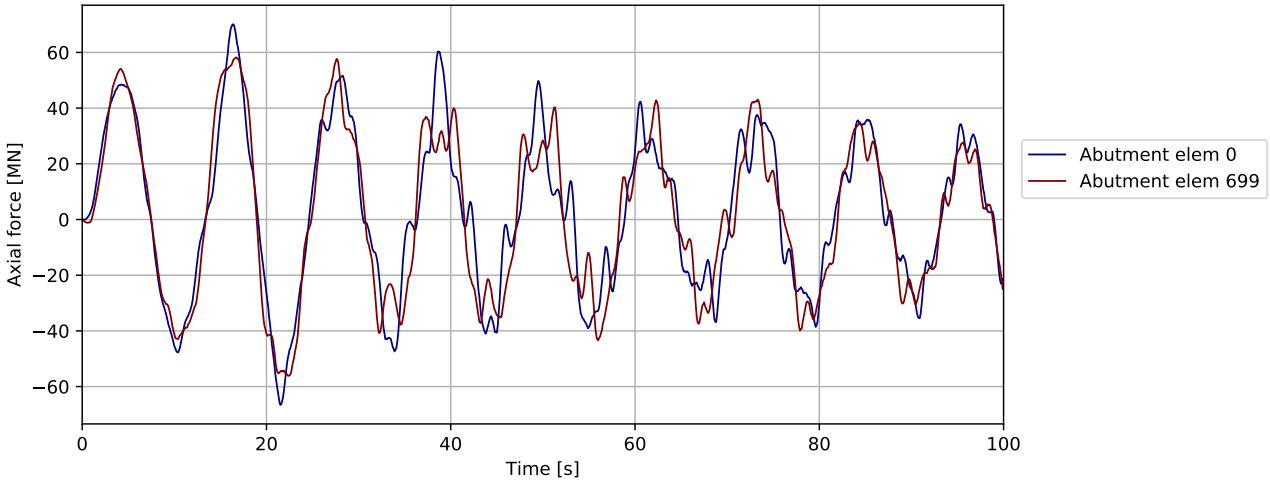


Figure 4.635: DH A13-A14 180deg - bridgegirder @abutments: Axial force [MN]

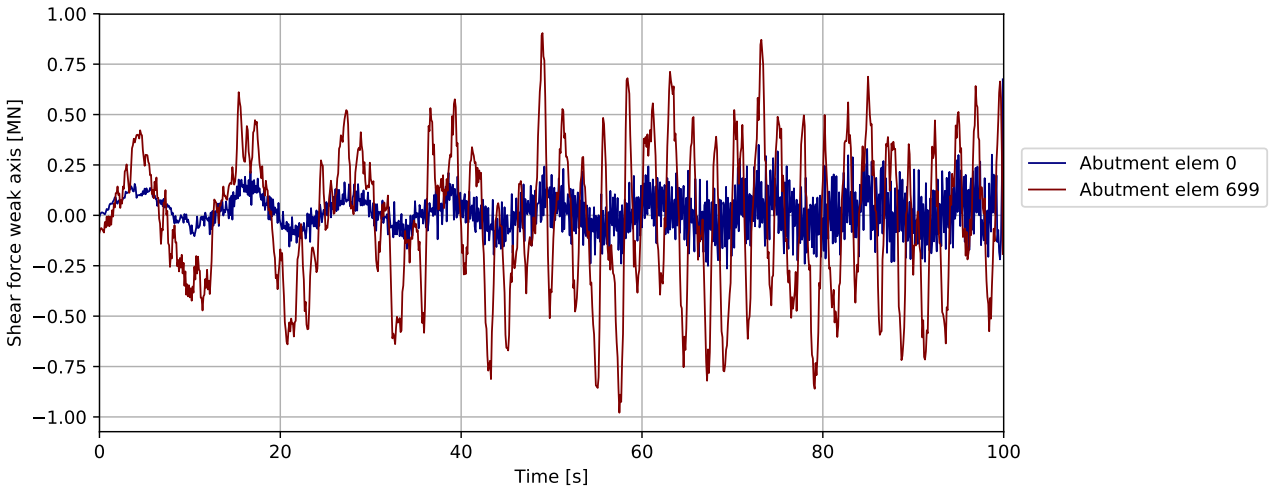


Figure 4.636: DH A13-A14 180deg - bridgegirder @abutments: Shear force weak axis [MN]

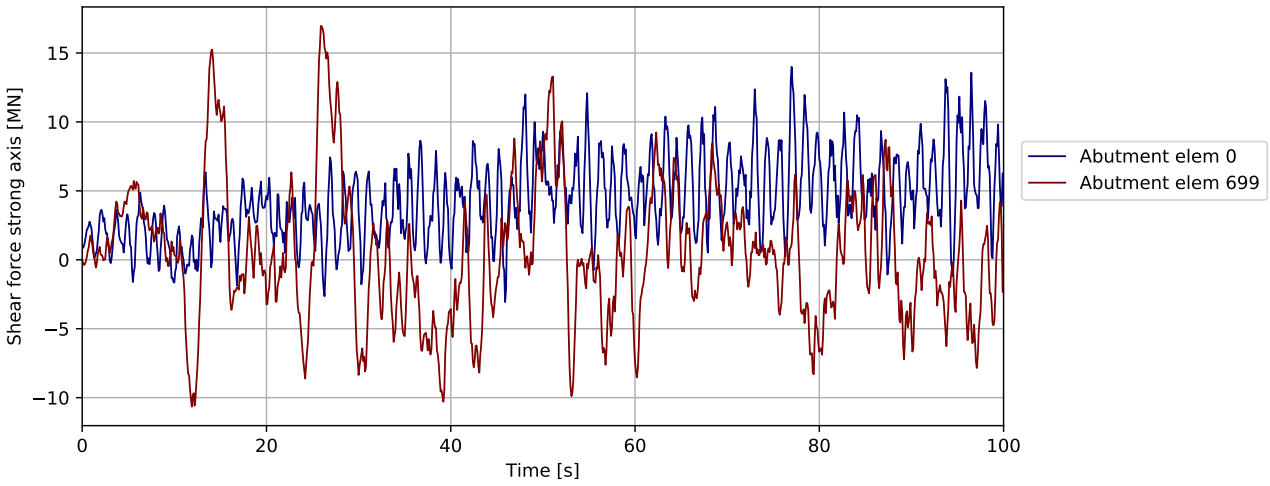


Figure 4.637: DH A13-A14 180deg - bridgegirder @abutments: Shear force strong axis [MN]

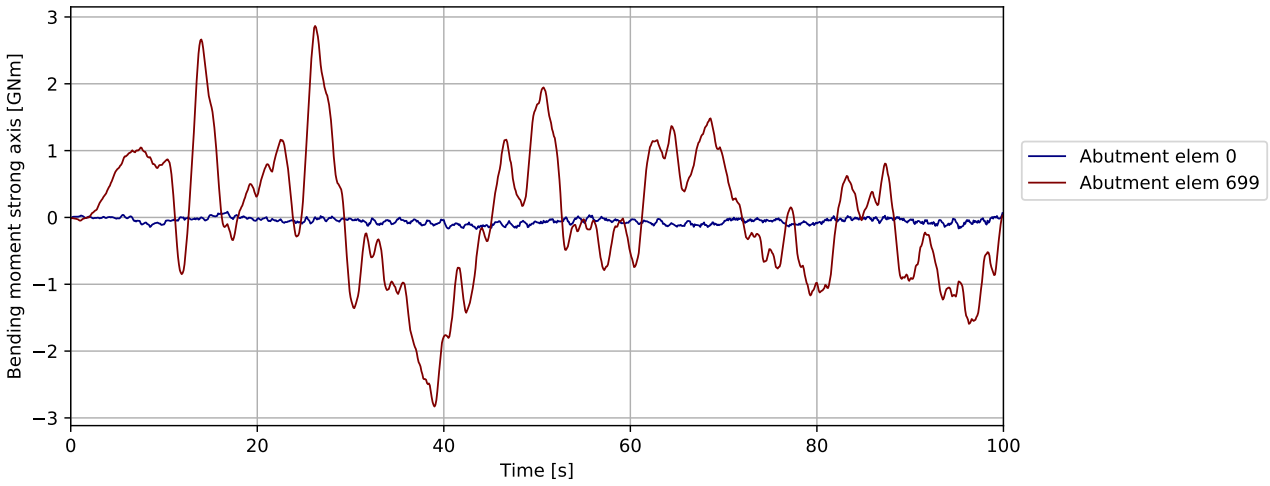


Figure 4.638: DH A13-A14 180deg - bridgegirder @abutments: Bending moment strong axis [GNm]

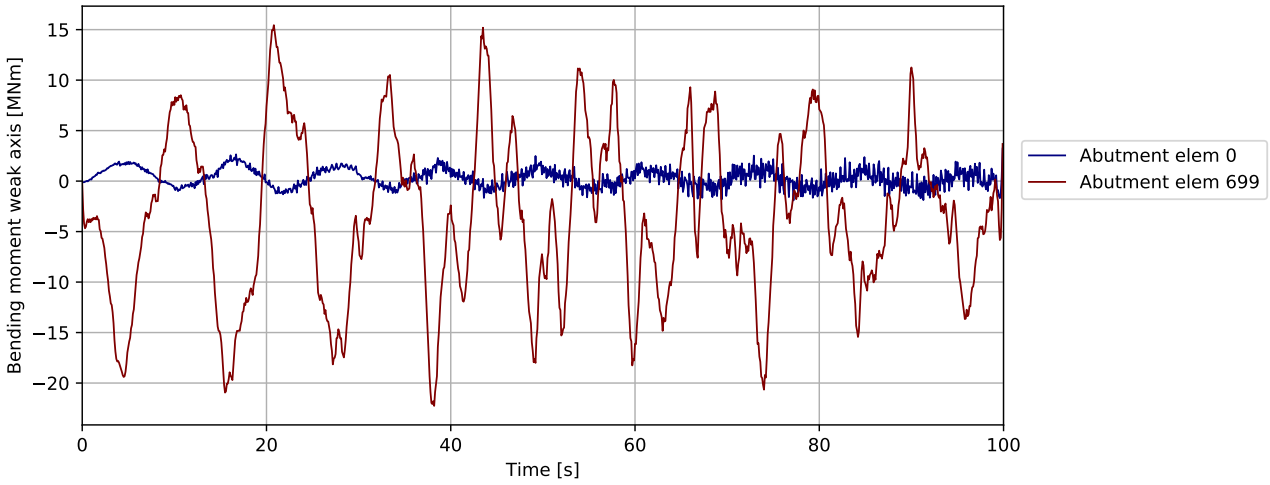


Figure 4.639: DH A13-A14 180deg - bridgegirder @abutments: Bending moment weak axis [MNm]

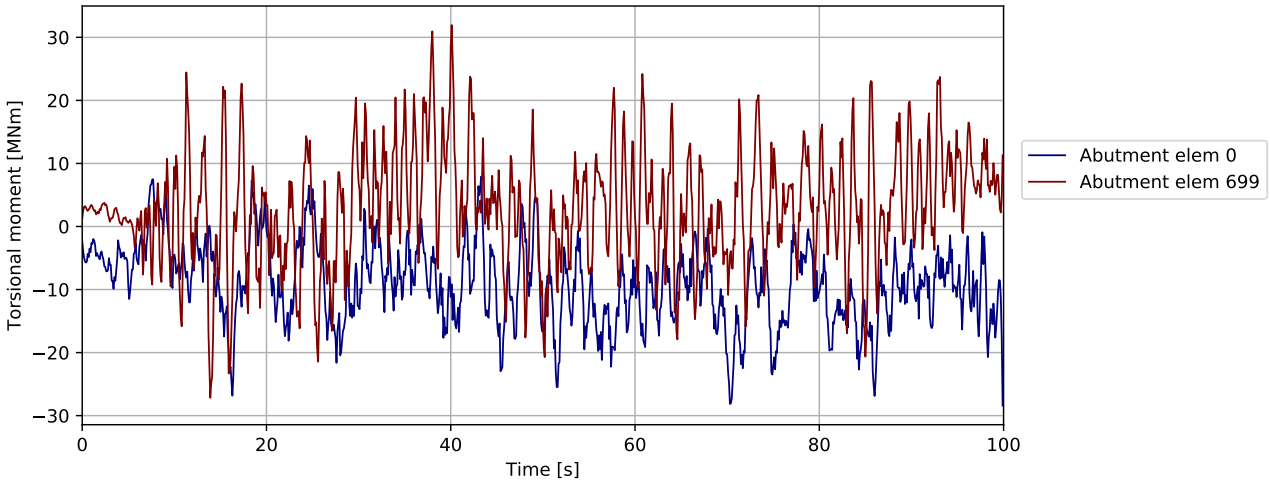


Figure 4.640: DH A13-A14 180deg - bridgegirder @abutments: Torsional moment [MNm]

Note : Compressive spring force is negative

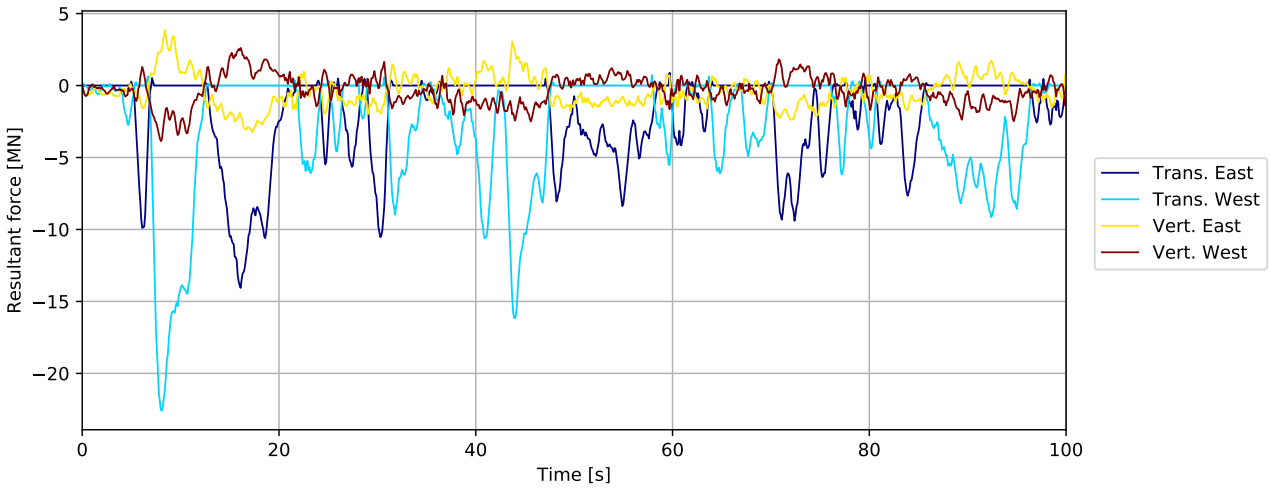


Figure 4.641: DH A13-A14 180deg - bridgegirder supports in tower: Resultant force [MN]

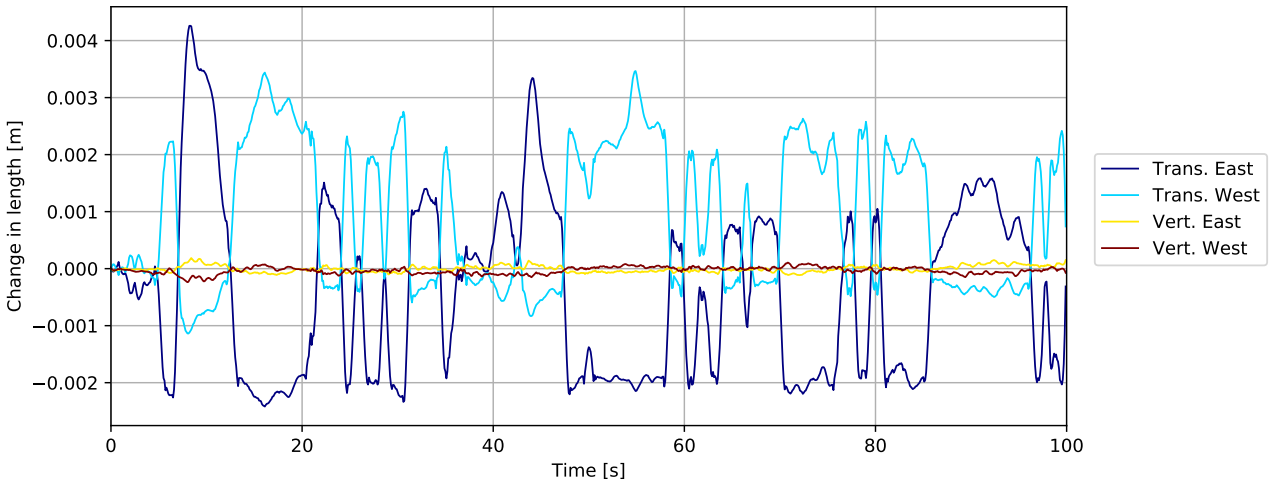


Figure 4.642: DH A13-A14 180deg - bridgegirder supports in tower: Change in length [m]

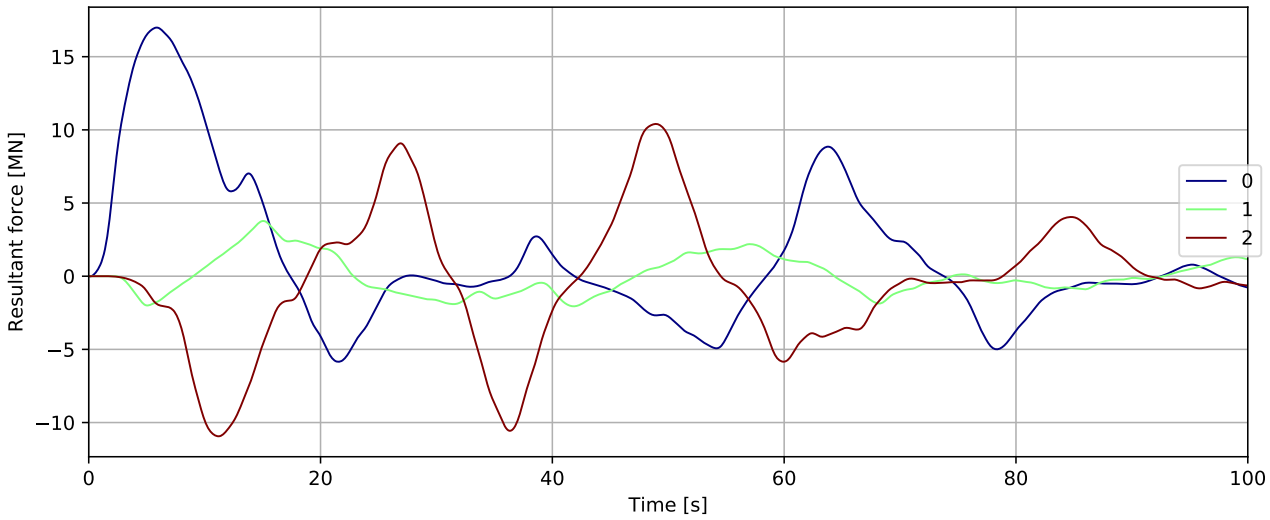


Figure 4.643: Mooring force

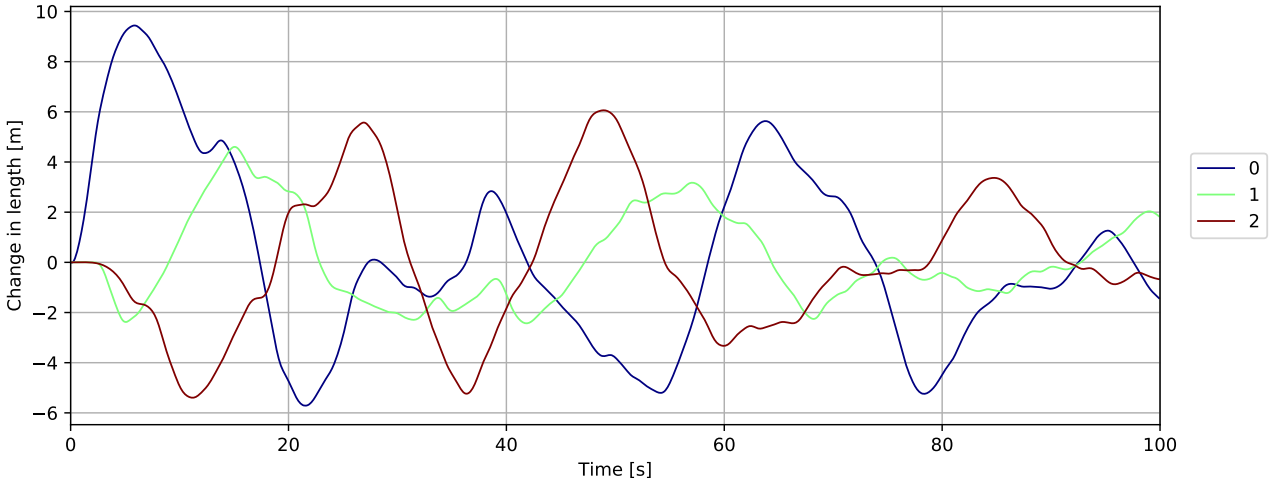


Figure 4.644: Mooring displacement

## 4.15 Deck house A16-A17 180deg

### 4.15.1 Overall response

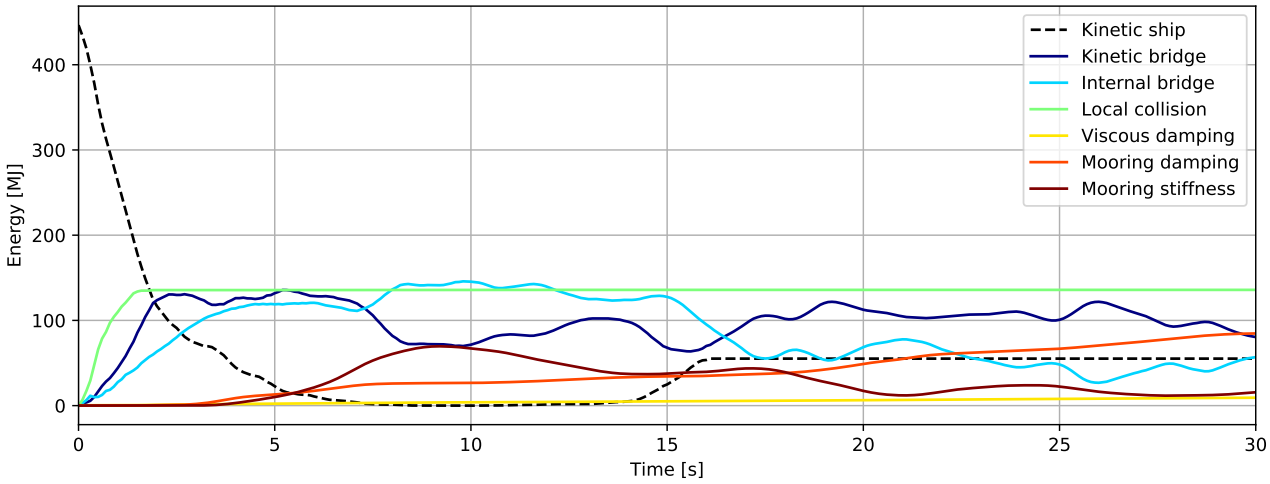


Figure 4.645: Energy [MJ] - initial phase

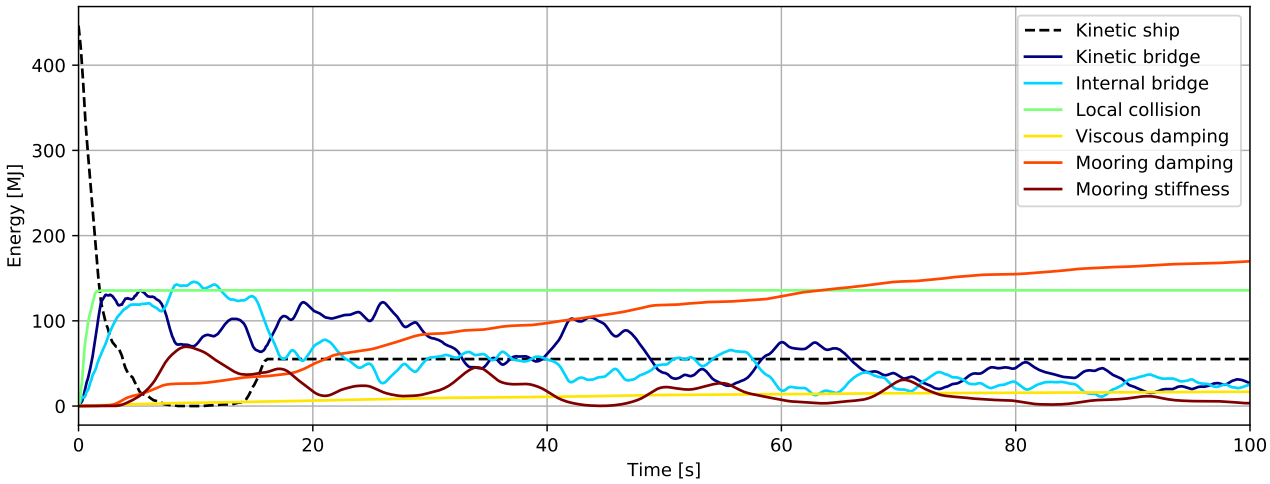


Figure 4.646: Energy [MJ]

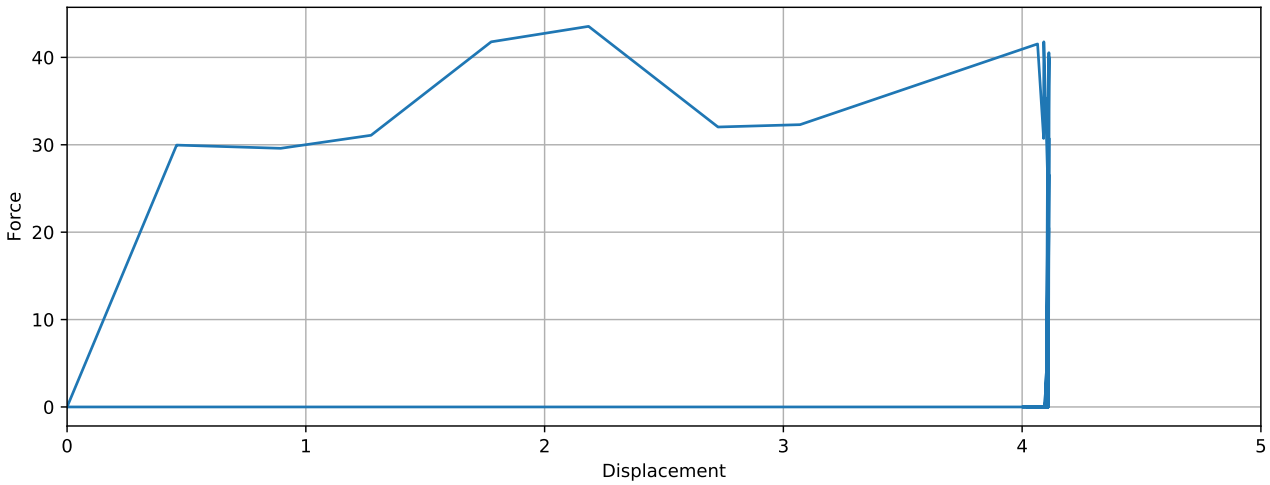


Figure 4.647: Simulated local collision force-displacement

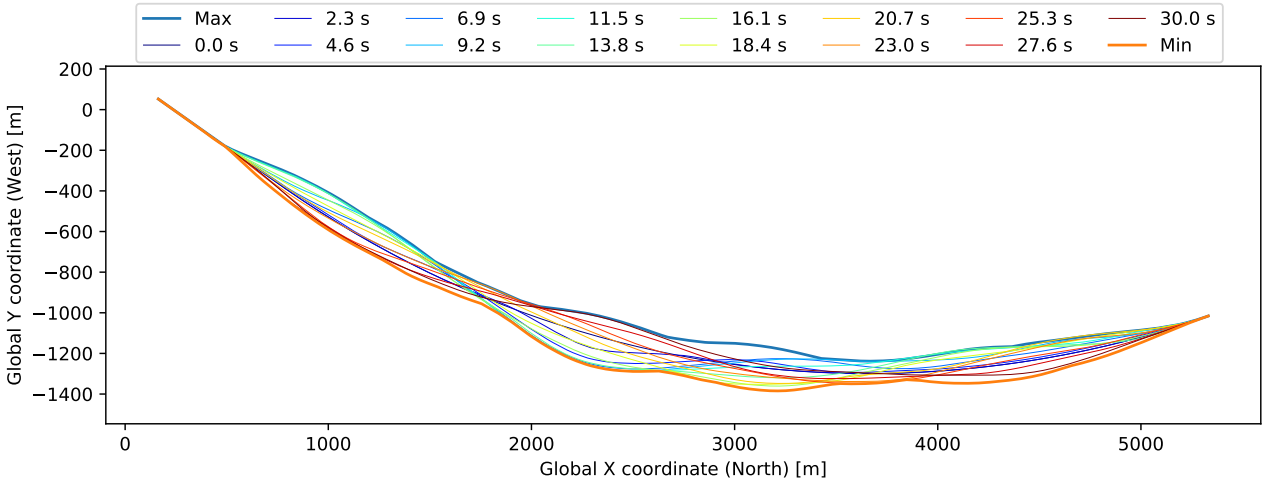


Figure 4.648: Bridgegirder deflection (10x displacment scaling)

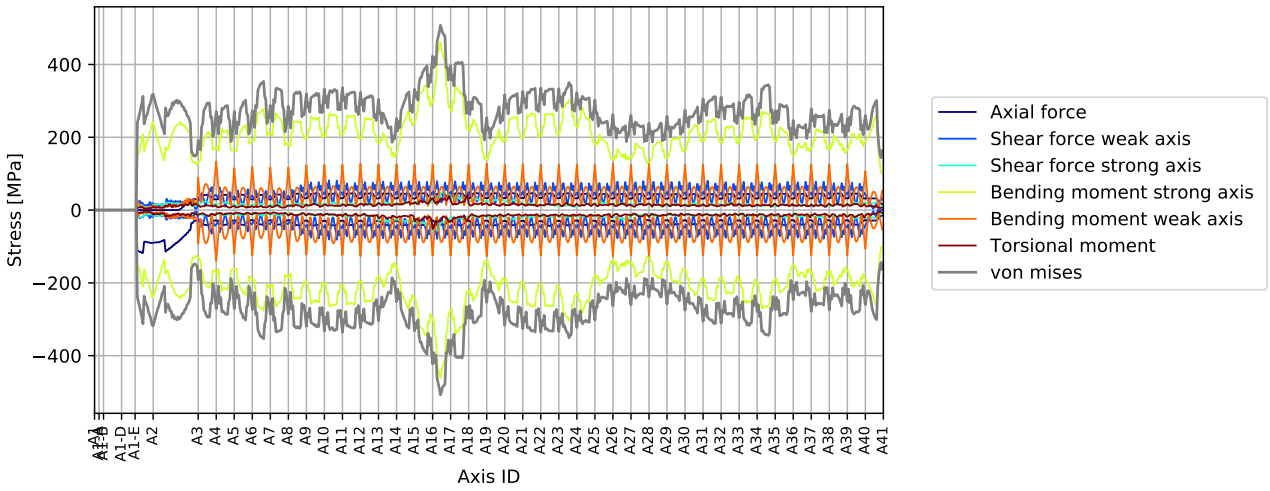


Figure 4.649: Stress envelope from all force components

### 4.15.2 Envelope plots

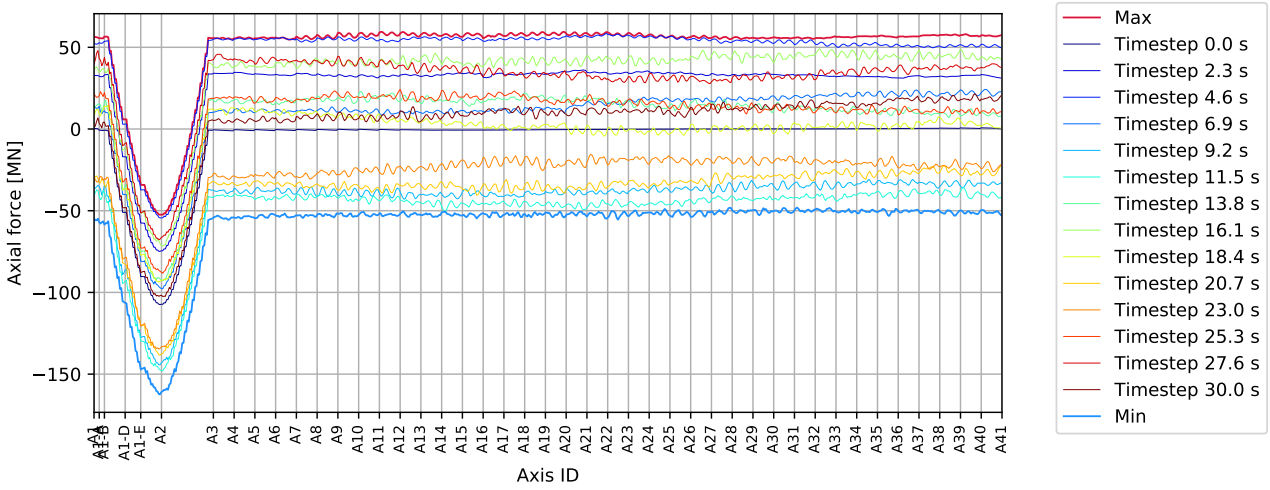


Figure 4.650: DH A16-A17 180deg - bridgegirder : Axial force [MN]

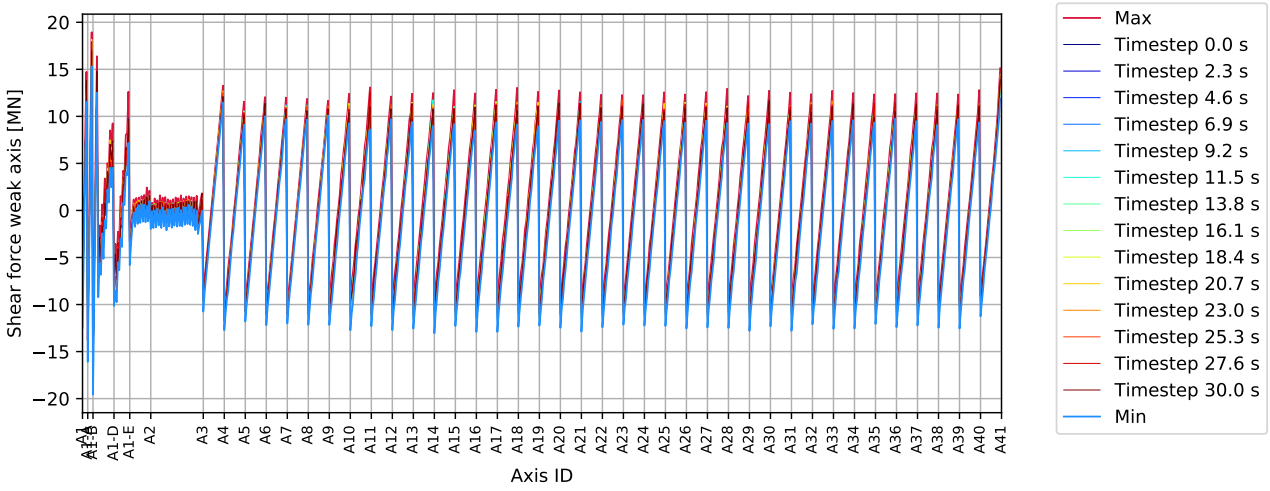


Figure 4.651: DH A16-A17 180deg - bridgegirder : Shear force weak axis [MN]

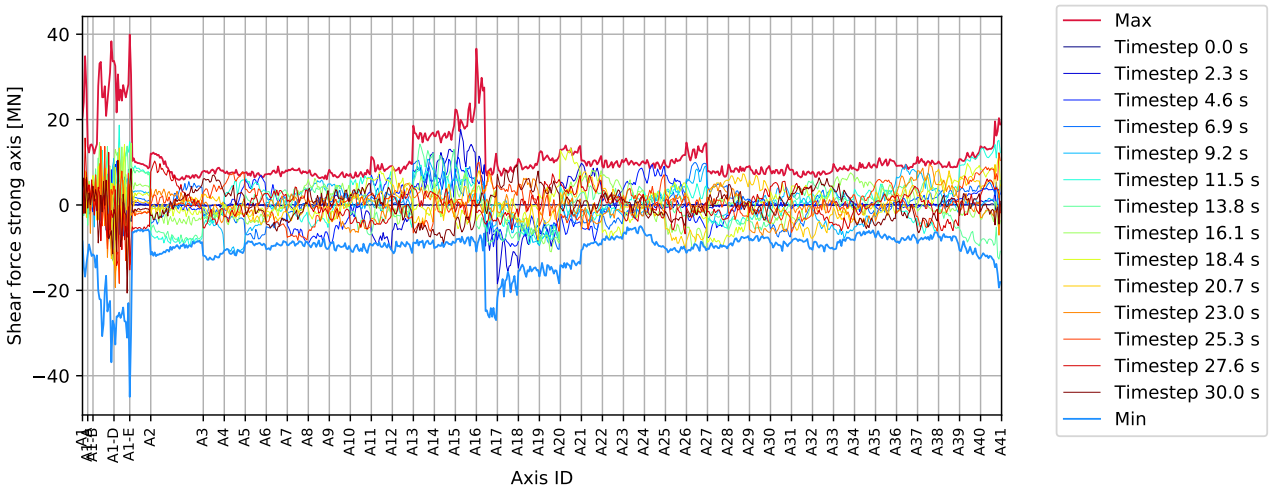


Figure 4.652: DH A16-A17 180deg - bridgegirder : Shear force strong axis [MN]

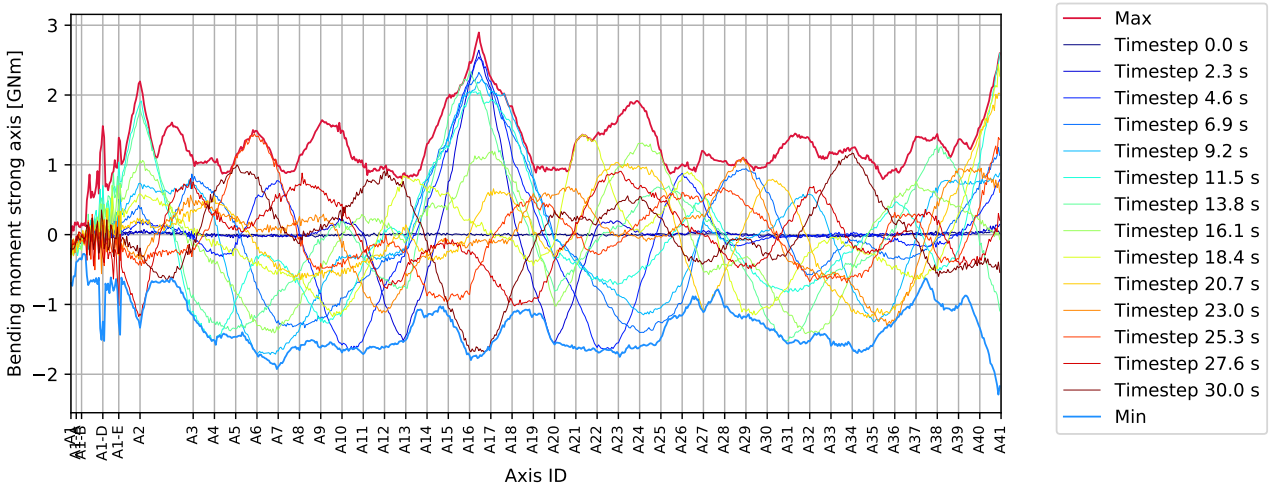


Figure 4.653: DH A16-A17 180deg - bridgegirder : Bending moment strong axis [GNm]

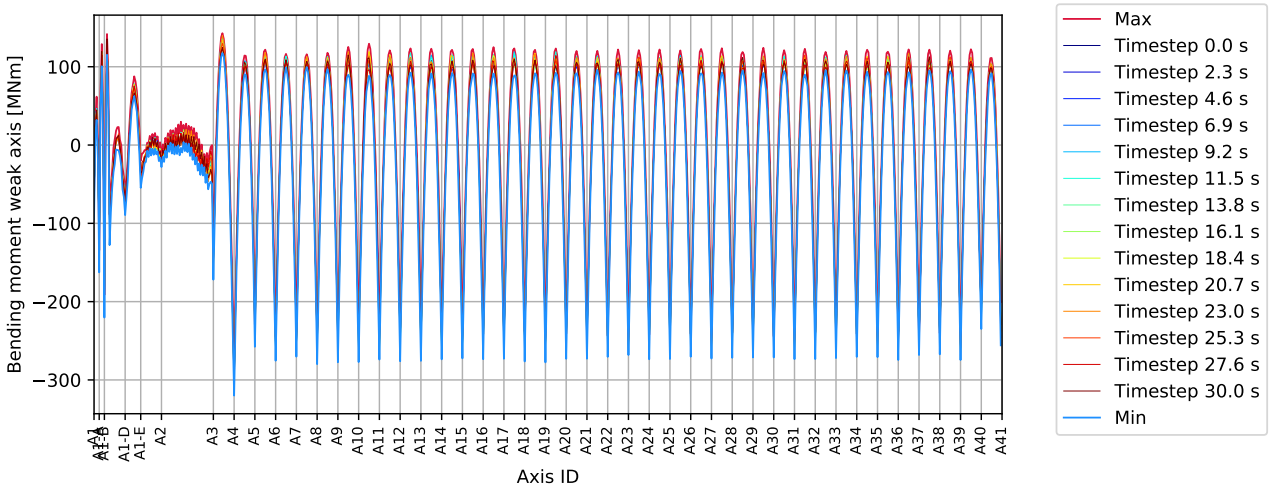


Figure 4.654: DH A16-A17 180deg - bridgegirder : Bending moment weak axis [MNm]

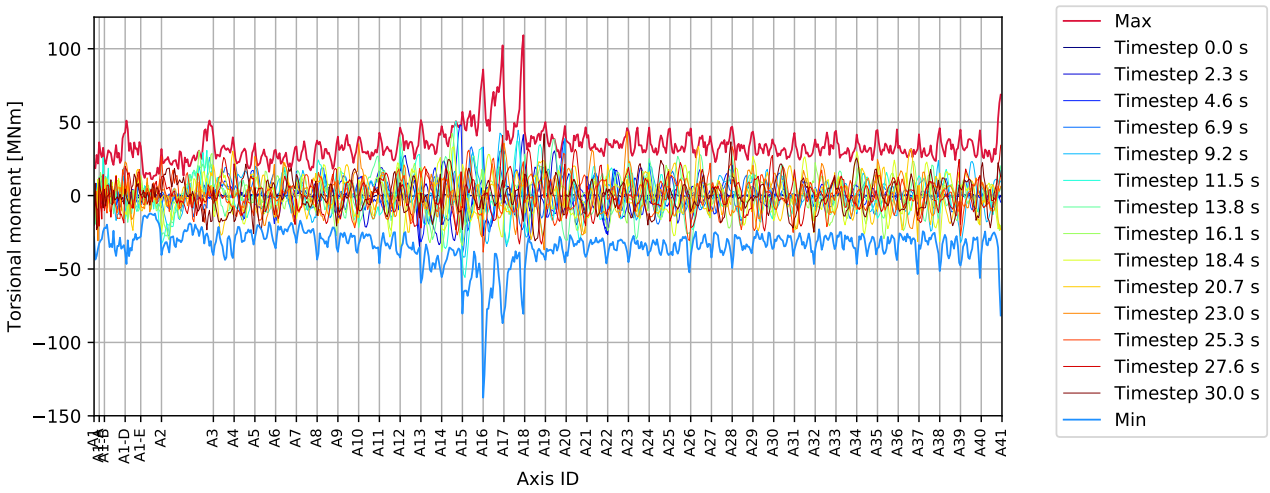


Figure 4.655: DH A16-A17 180deg - bridgegirder : Torsional moment [MNm]

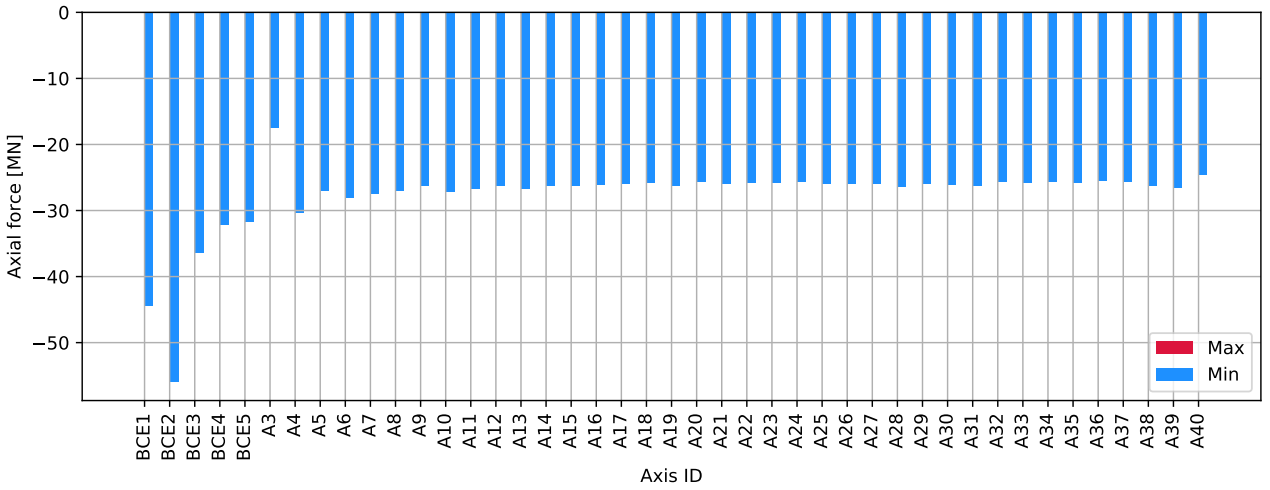


Figure 4.656: DH A16-A17 180deg - columns bottom : Axial force [MN]

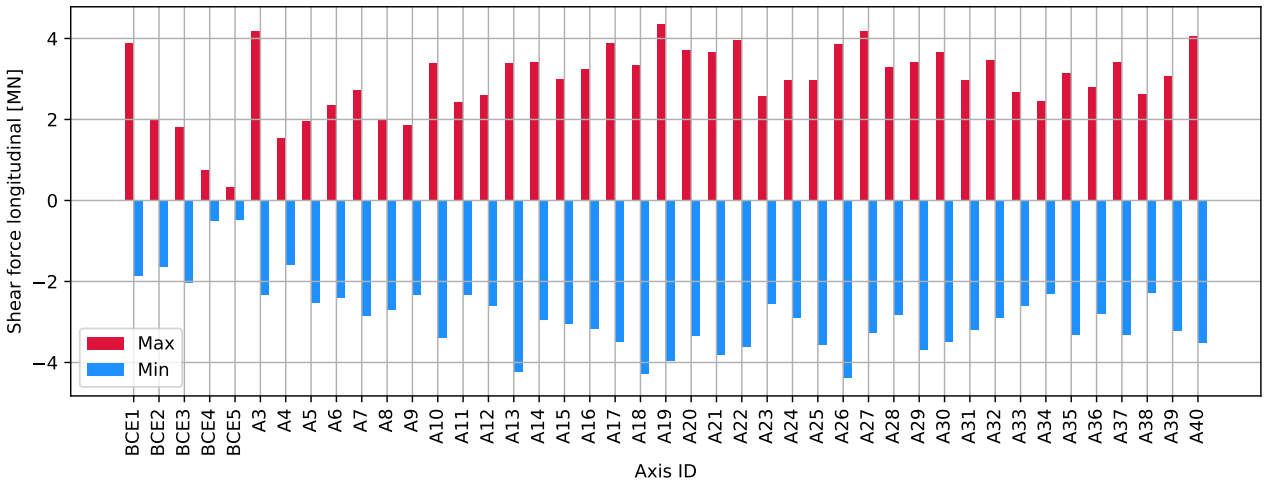


Figure 4.657: DH A16-A17 180deg - columns bottom : Shear force longitudinal [MN]

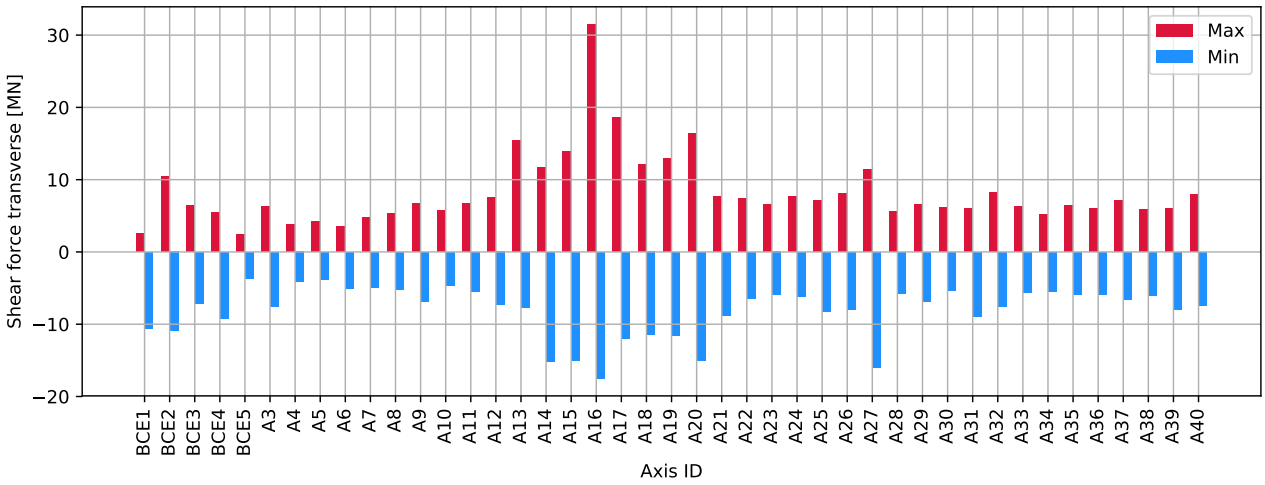


Figure 4.658: DH A16-A17 180deg - columns bottom : Shear force transverse [MN]

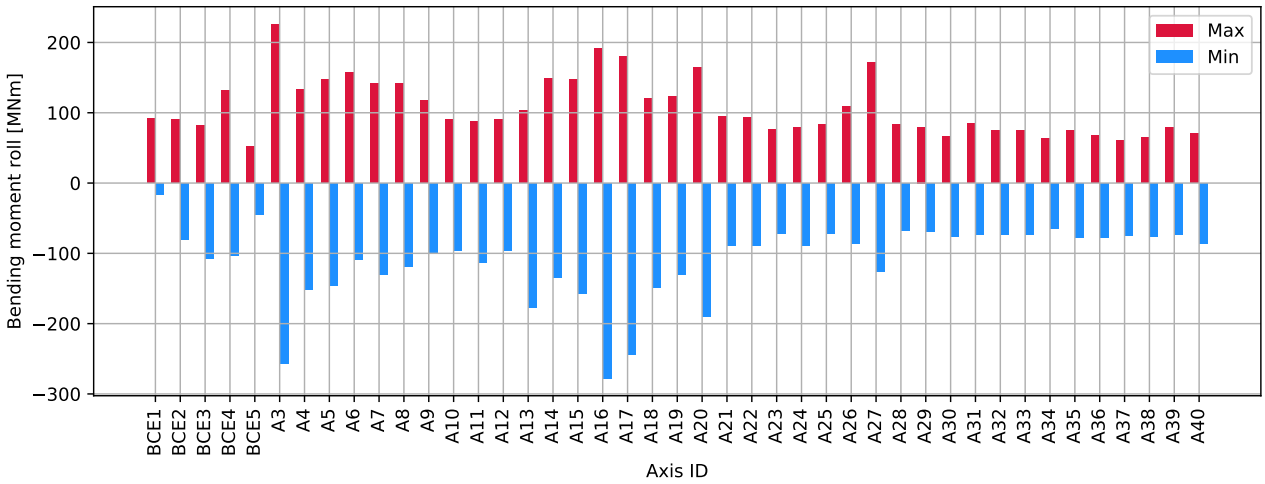


Figure 4.659: DH A16-A17 180deg - columns bottom : Bending moment roll [MNm]

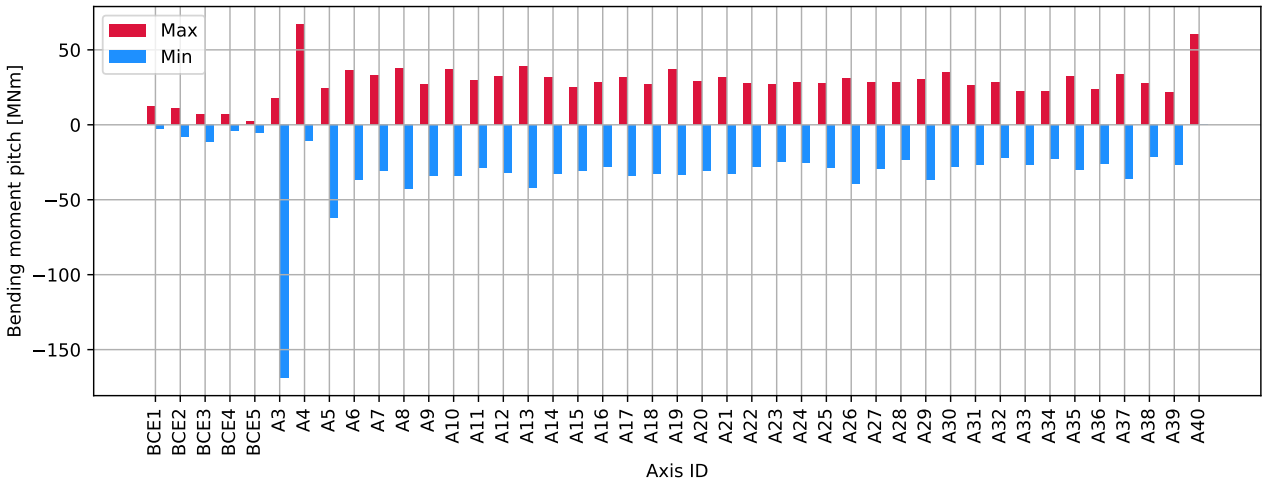


Figure 4.660: DH A16-A17 180deg - columns bottom : Bending moment pitch [MNm]

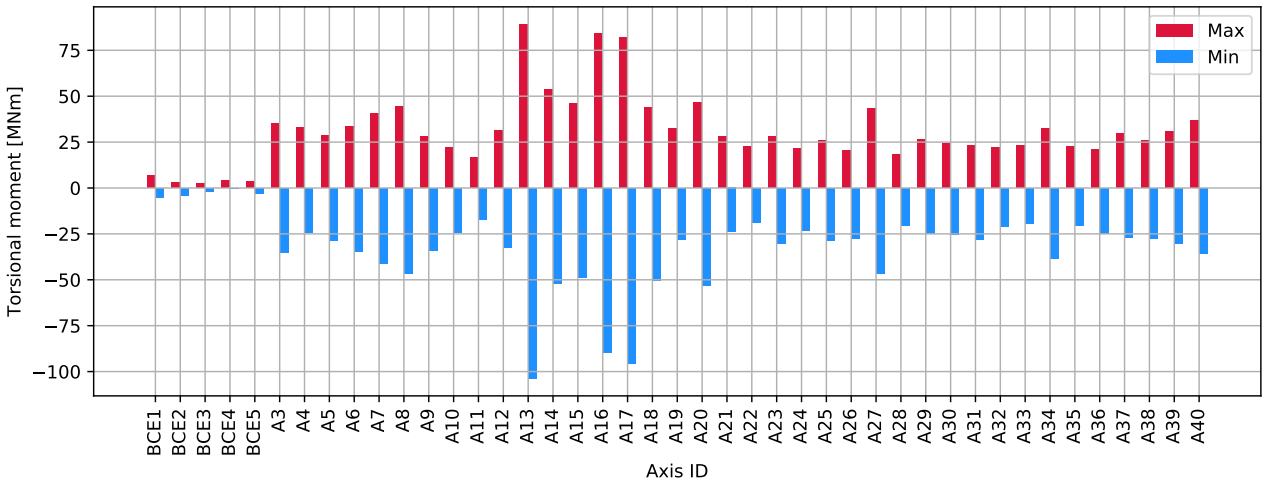


Figure 4.661: DH A16-A17 180deg - columns bottom : Torsional moment [MNm]

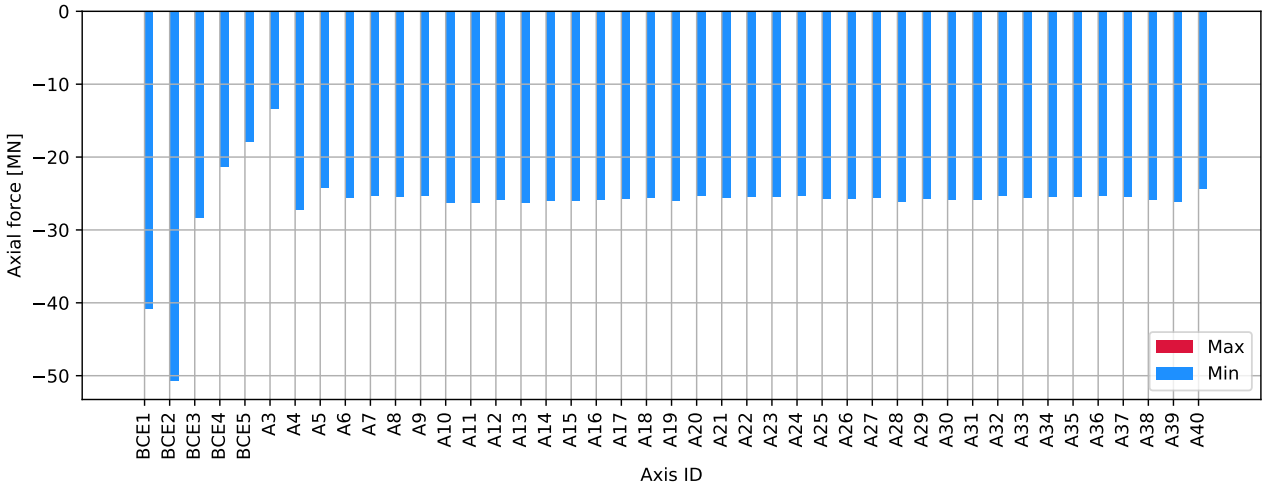


Figure 4.662: DH A16-A17 180deg - columns top : Axial force [MN]

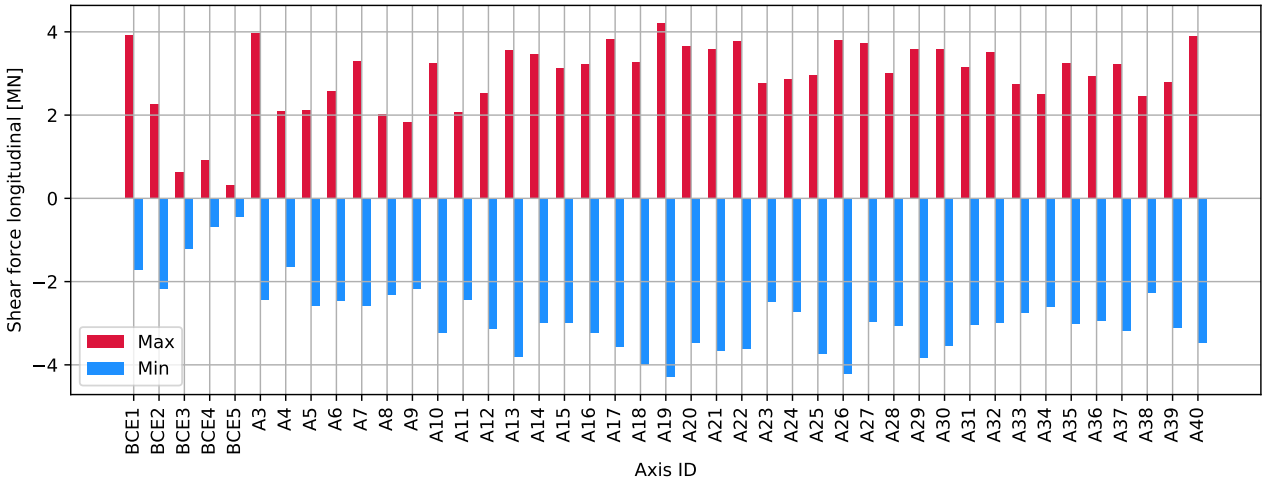


Figure 4.663: DH A16-A17 180deg - columns top : Shear force longitudinal [MN]

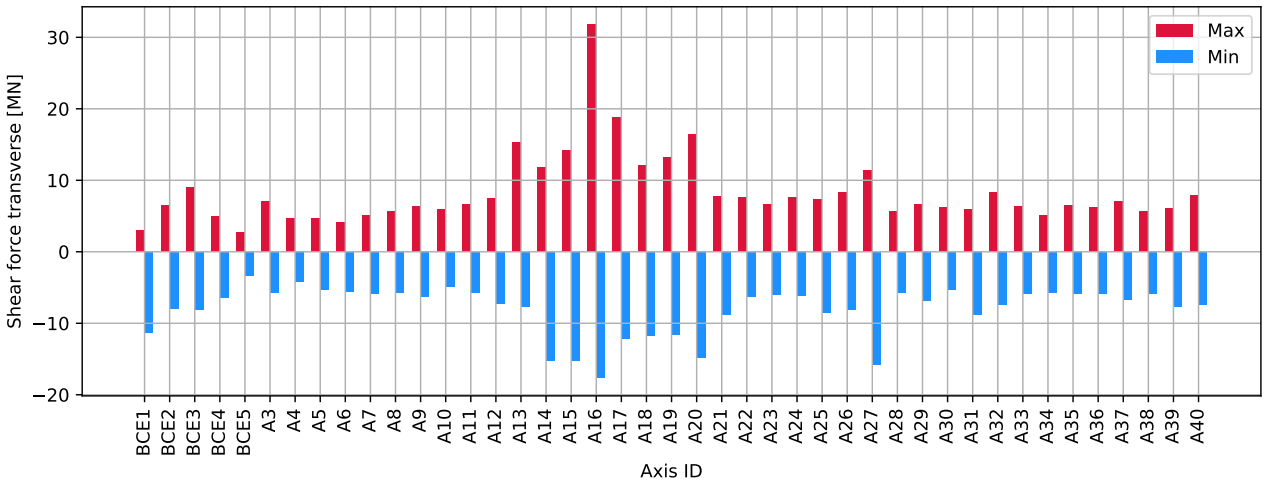


Figure 4.664: DH A16-A17 180deg - columns top : Shear force transverse [MN]

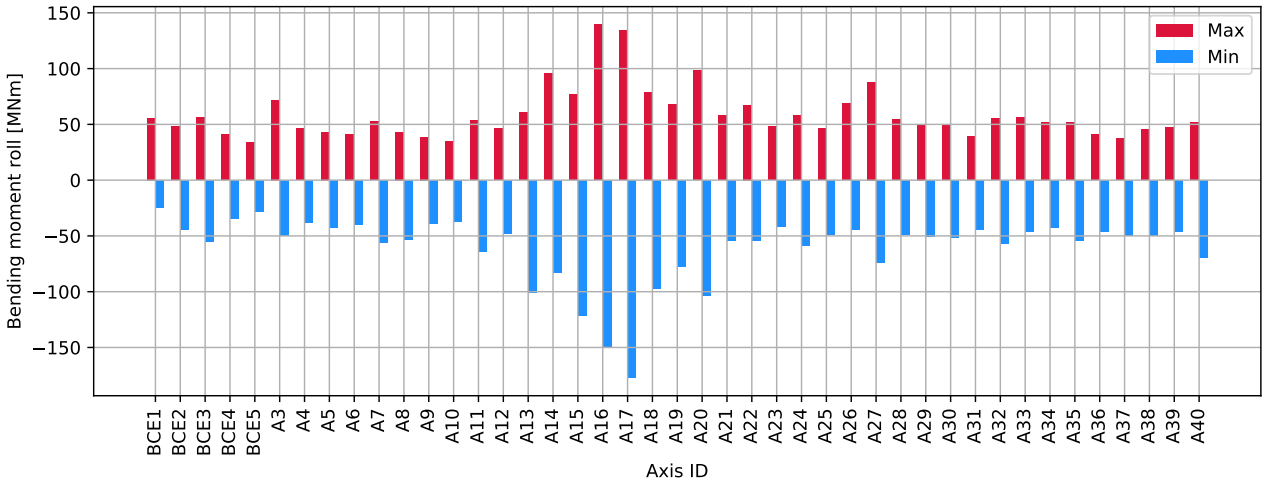


Figure 4.665: DH A16-A17 180deg - columns top : Bending moment roll [MNm]

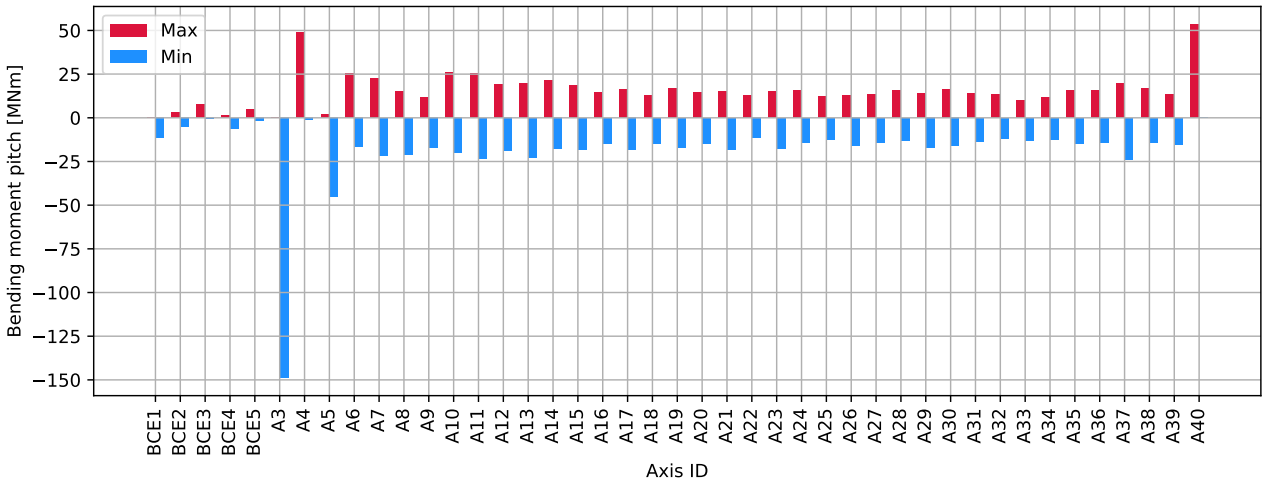


Figure 4.666: DH A16-A17 180deg - columns top : Bending moment pitch [MNm]

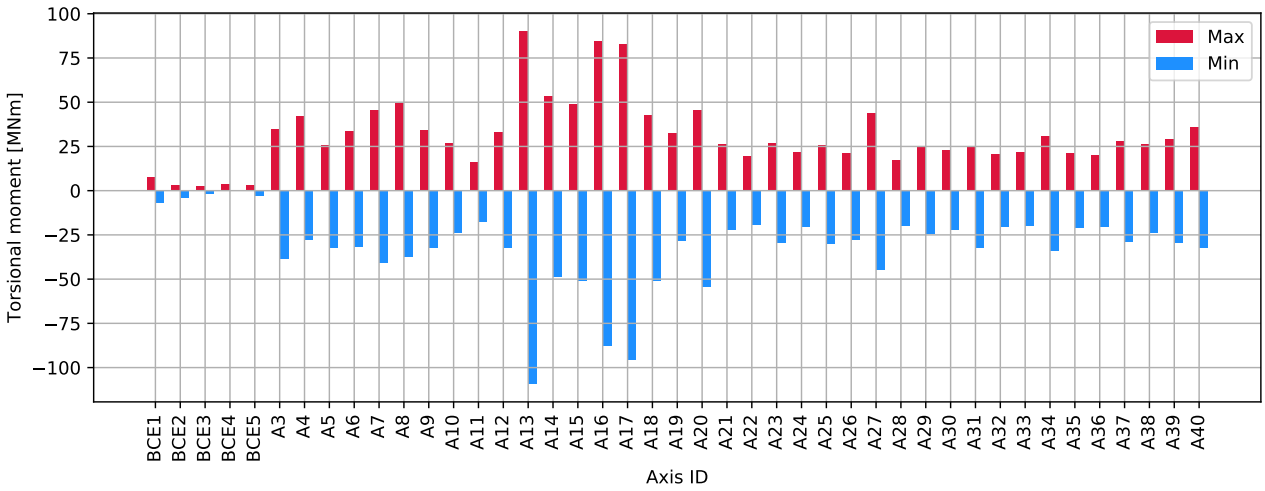


Figure 4.667: DH A16-A17 180deg - columns top : Torsional moment [MNm]

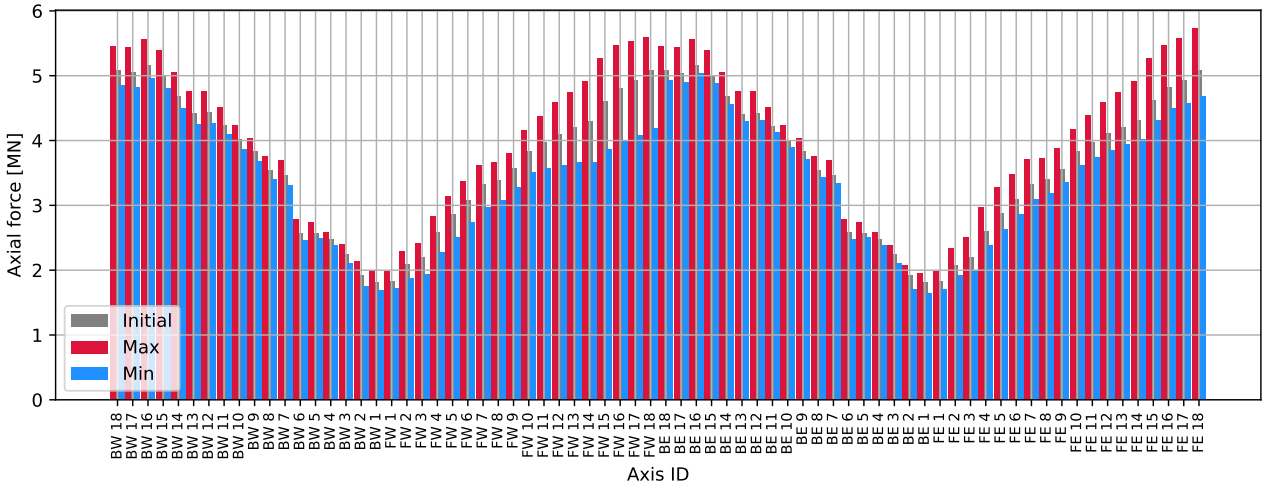


Figure 4.668: DH A16-A17 180deg - cables : Axial force [MN]

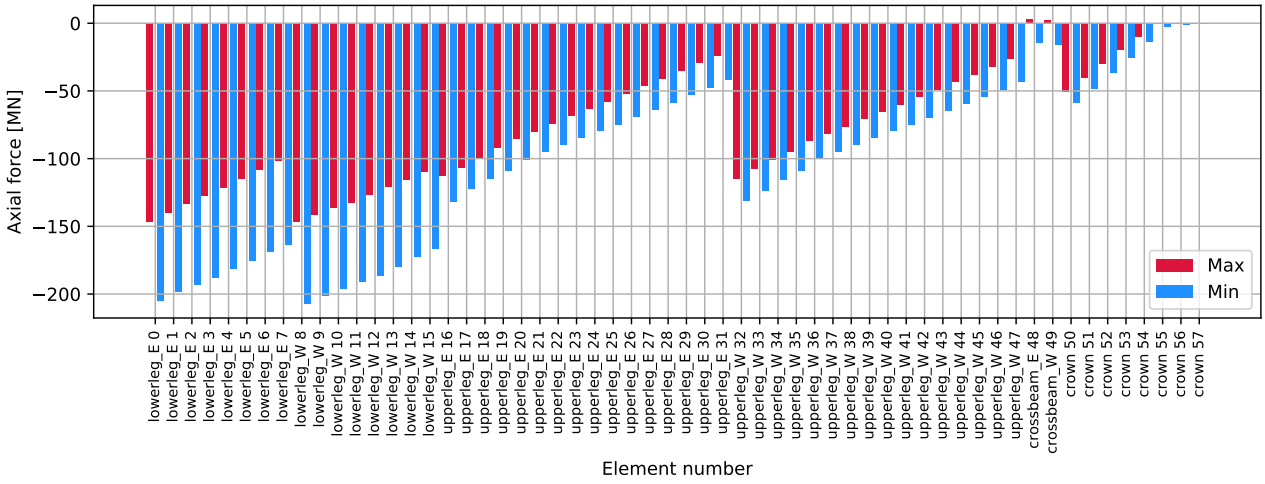


Figure 4.669: DH A16-A17 180deg - tower: Axial force [MN]

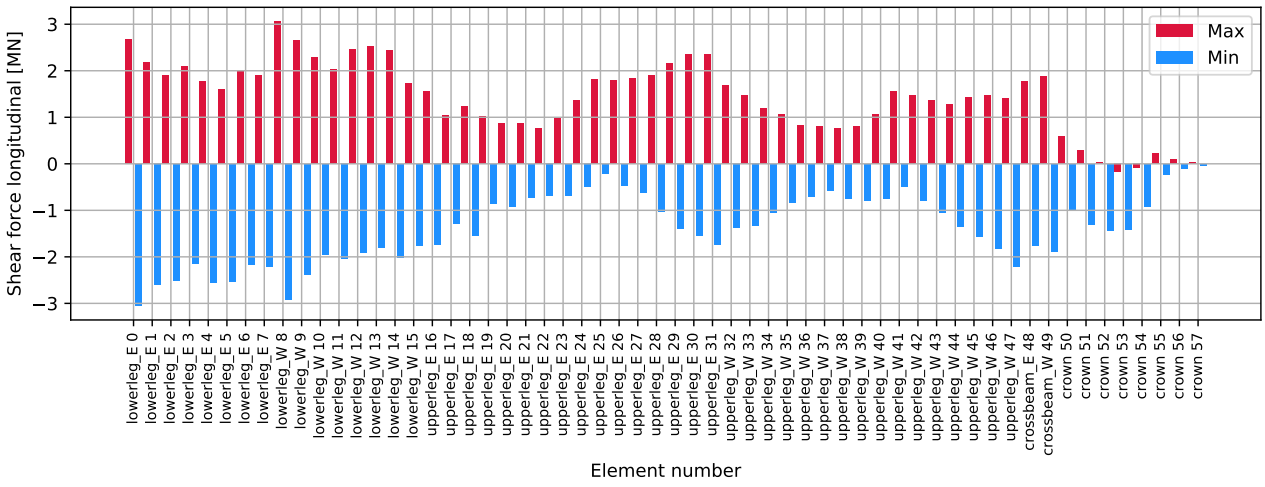


Figure 4.670: DH A16-A17 180deg - tower: Shear force longitudinal [MN]

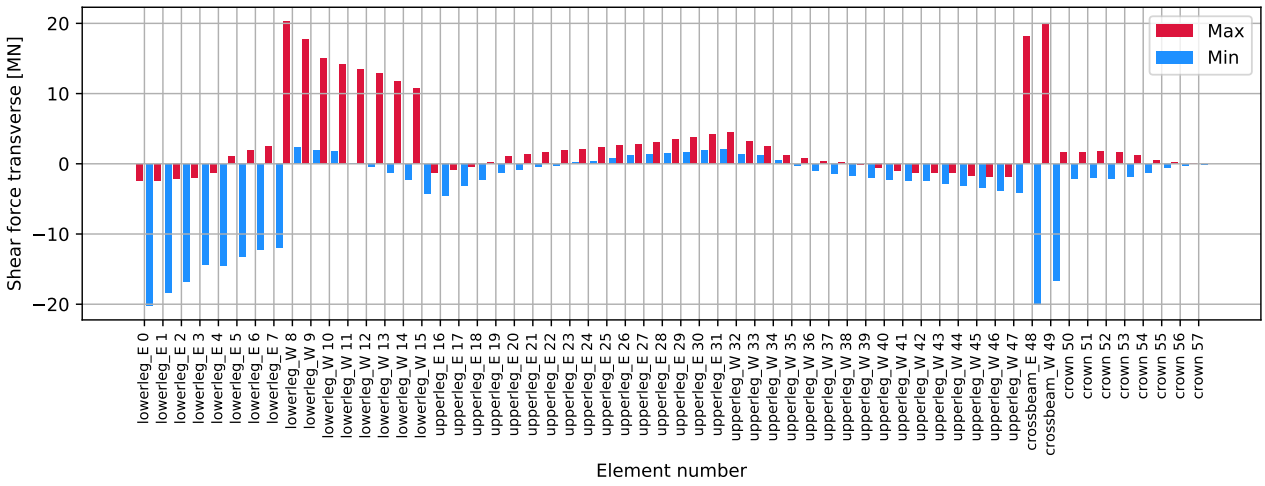


Figure 4.671: DH A16-A17 180deg - tower: Shear force transverse [MN]

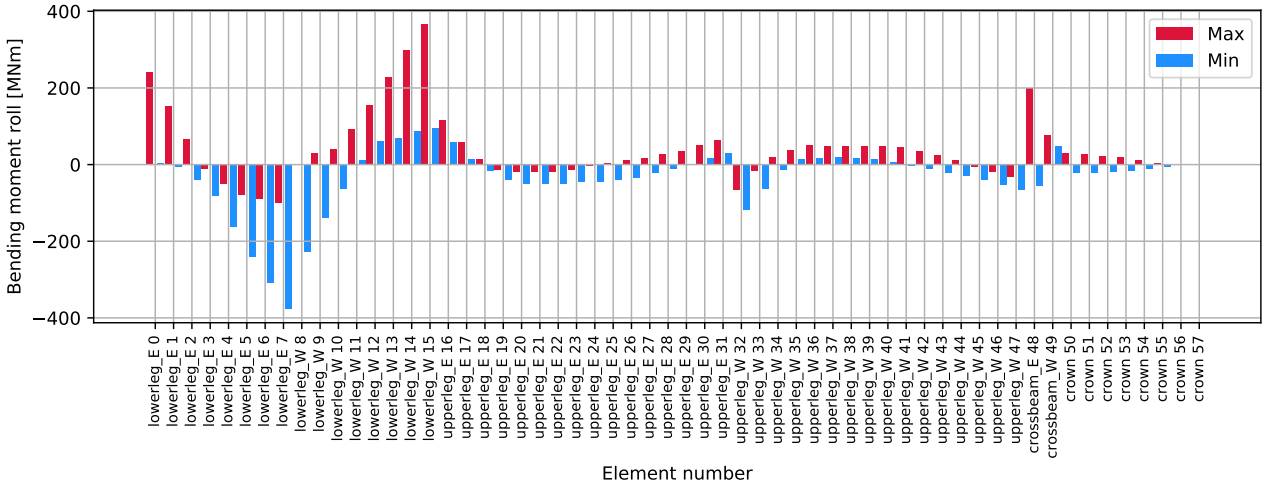


Figure 4.672: DH A16-A17 180deg - tower: Bending moment roll [MNm]

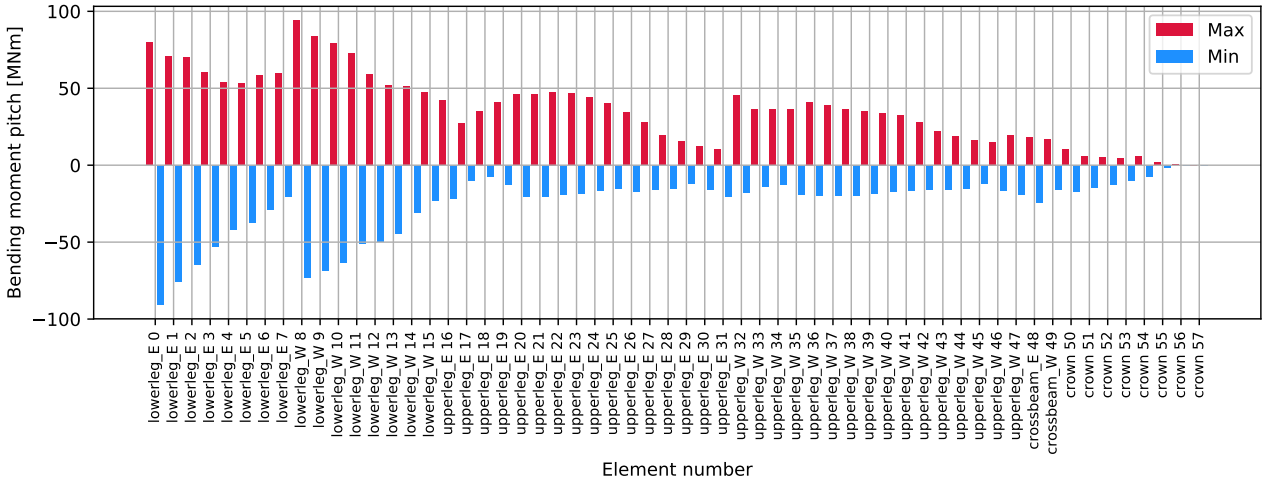


Figure 4.673: DH A16-A17 180deg - tower: Bending moment pitch [MNm]

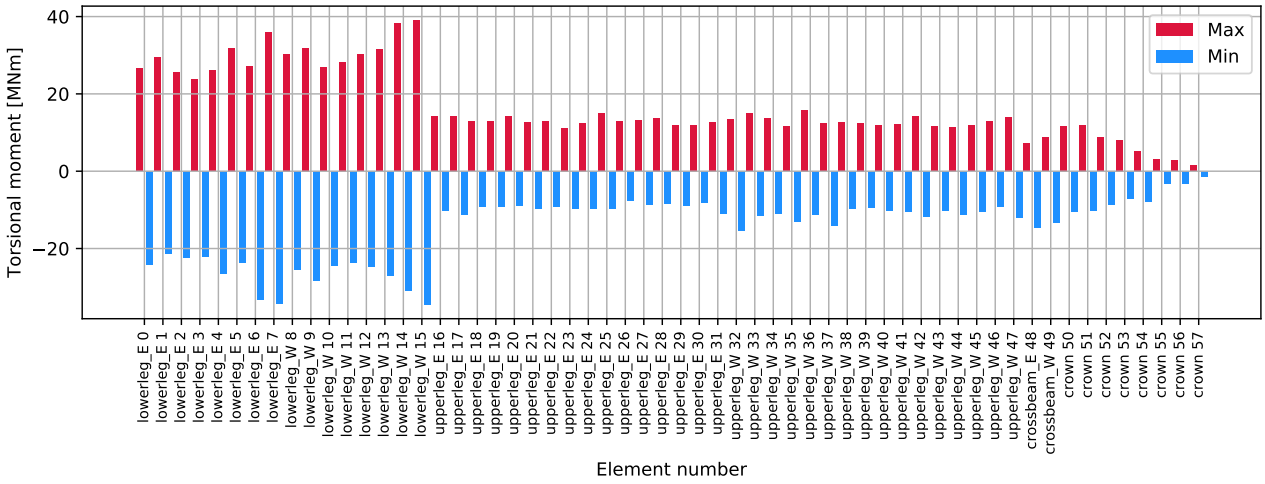


Figure 4.674: DH A16-A17 180deg - tower: Torsional moment [MNm]

### 4.15.3 Time series

Note : Time series are filtered using a Saviotzky-Golay filter for increased readability of the time history plots. Hence, maximum values that occur due to a rapid vibration are not shown in the plots. For maximum values, refer to the tabulated data.
All elements are numbered from South to North, bottom to top

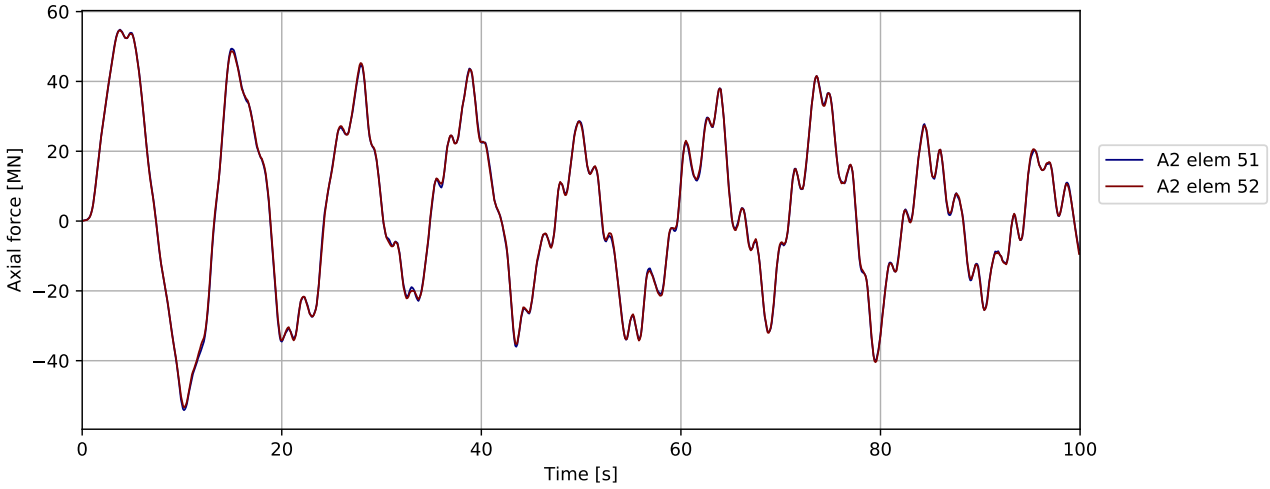


Figure 4.675: DH A16-A17 180deg - bridgegirder @ pylon: Axial force [MN]

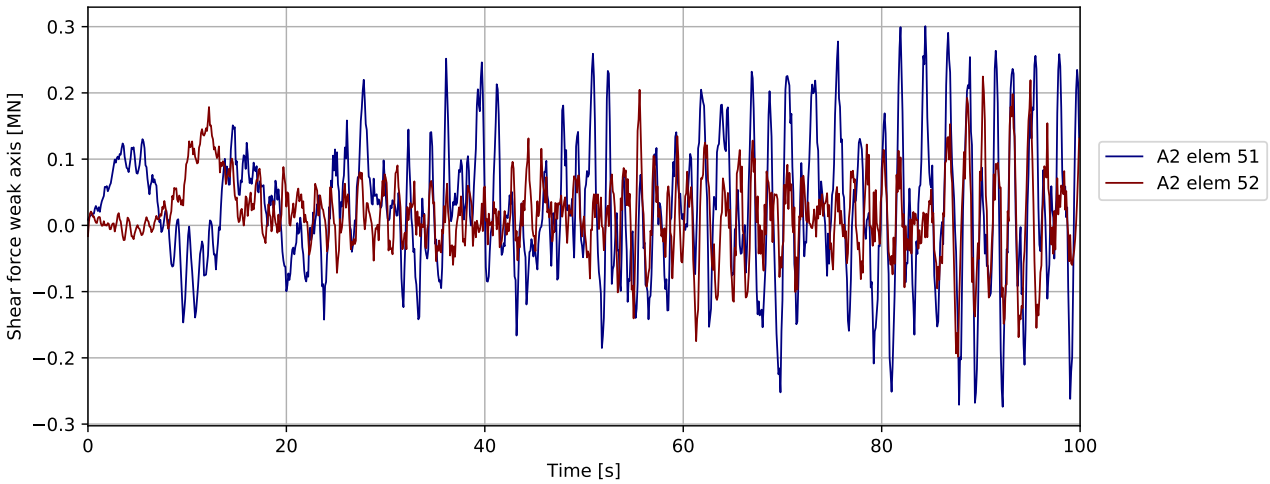


Figure 4.676: DH A16-A17 180deg - bridgegirder @ pylon: Shear force weak axis [MN]

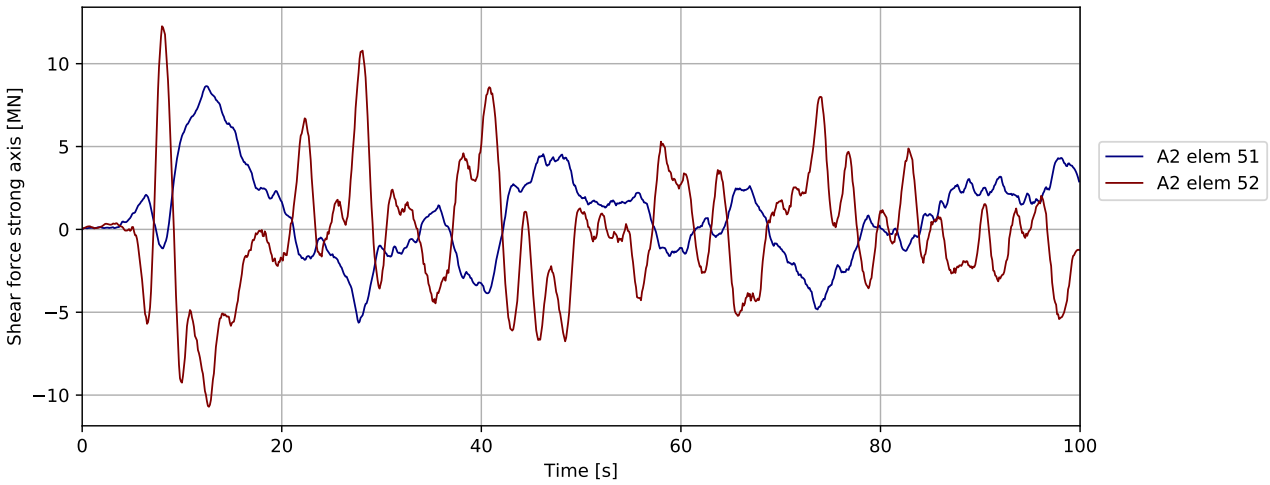


Figure 4.677: DH A16-A17 180deg - bridgegirder @ pylon: Shear force strong axis [MN]

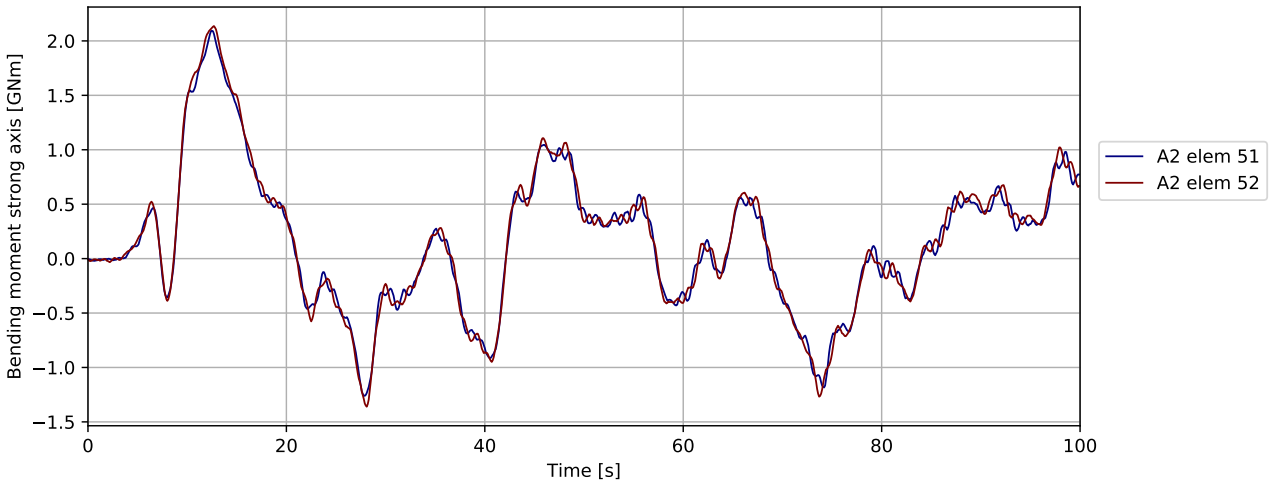


Figure 4.678: DH A16-A17 180deg - bridgegirder @ pylon: Bending moment strong axis [GNm]

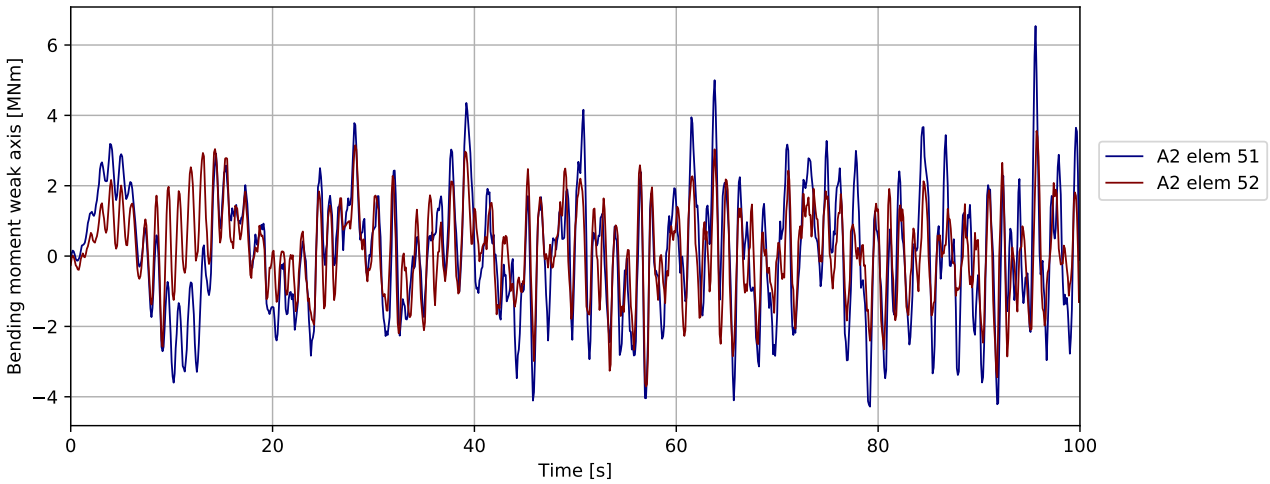


Figure 4.679: DH A16-A17 180deg - bridgegirder @ pylon: Bending moment weak axis [MNm]

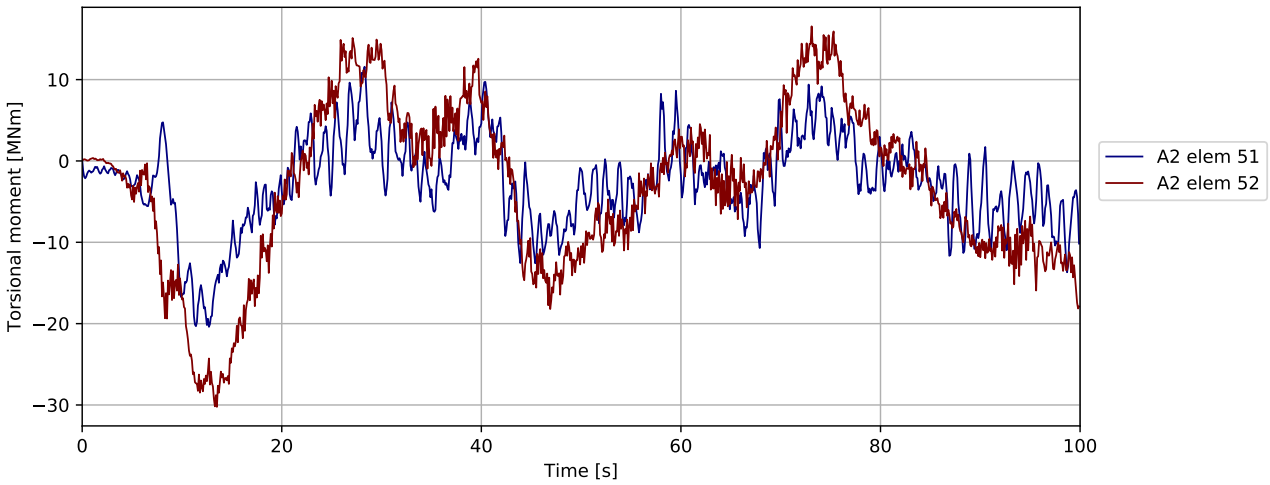


Figure 4.680: DH A16-A17 180deg - bridgegirder @ pylon: Torsional moment [MNm]

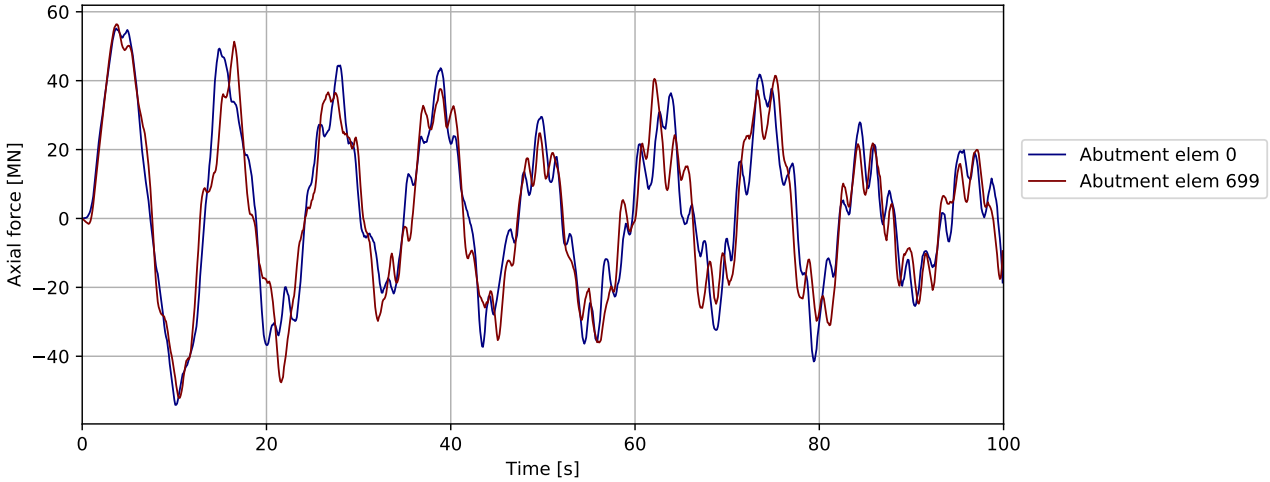


Figure 4.681: DH A16-A17 180deg - bridgegirder @abutments: Axial force [MN]

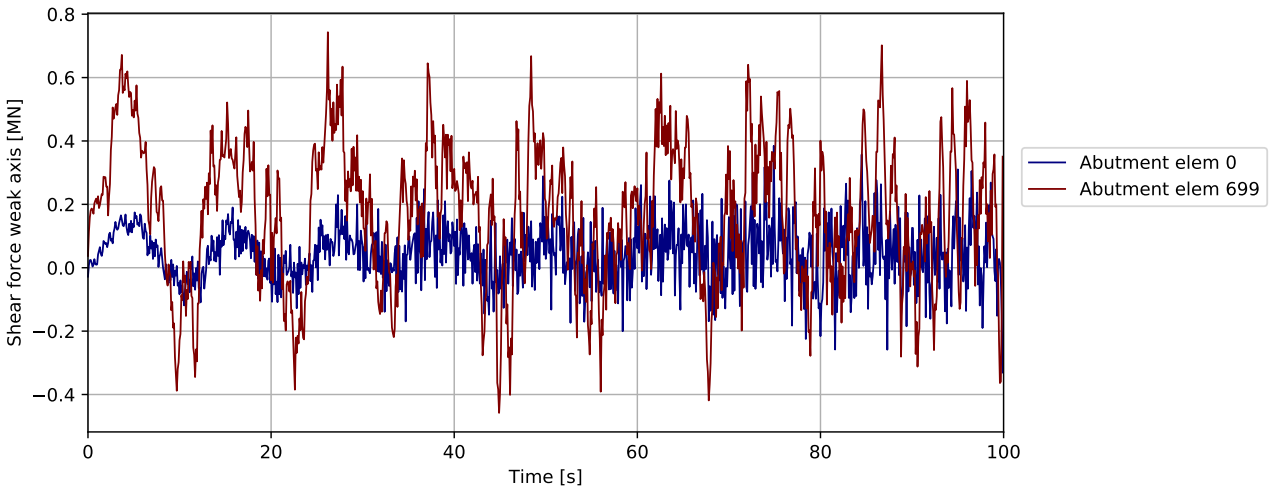


Figure 4.682: DH A16-A17 180deg - bridgegirder @abutments: Shear force weak axis [MN]

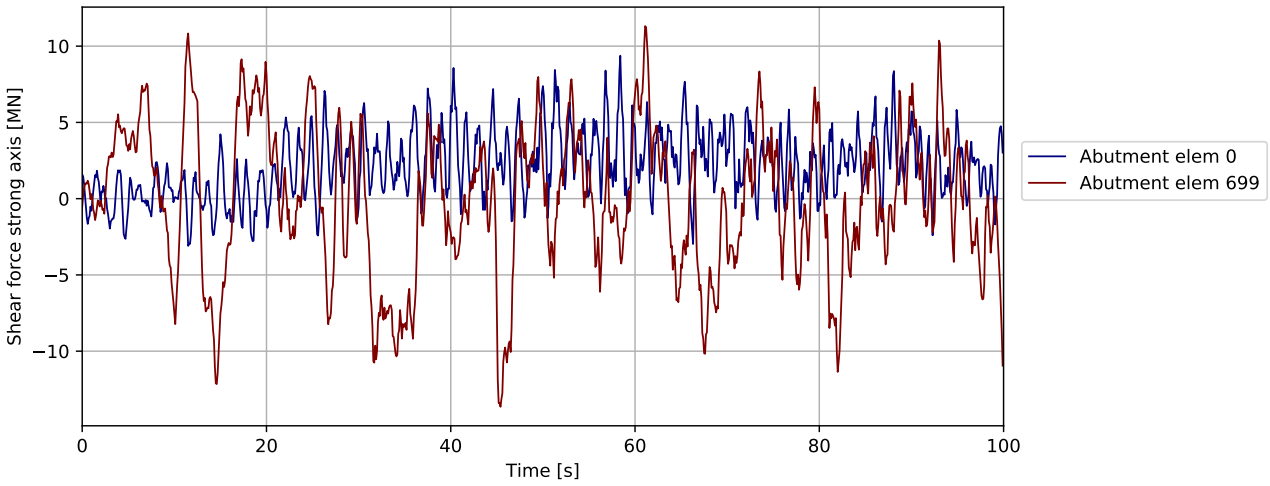


Figure 4.683: DH A16-A17 180deg - bridgegirder @abutments: Shear force strong axis [MN]

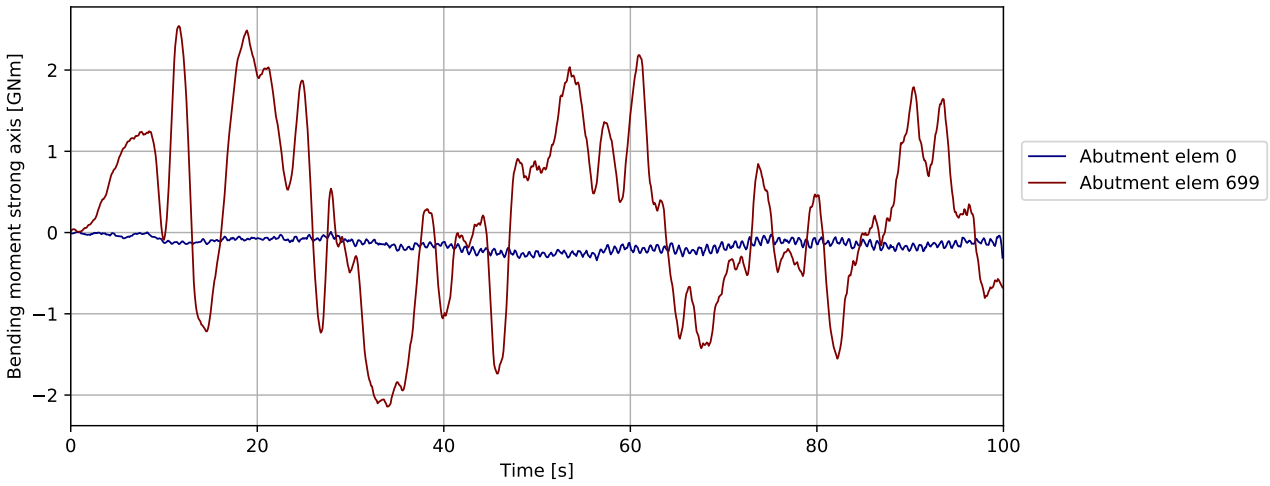


Figure 4.684: DH A16-A17 180deg - bridgegirder @abutments: Bending moment strong axis [GNm]

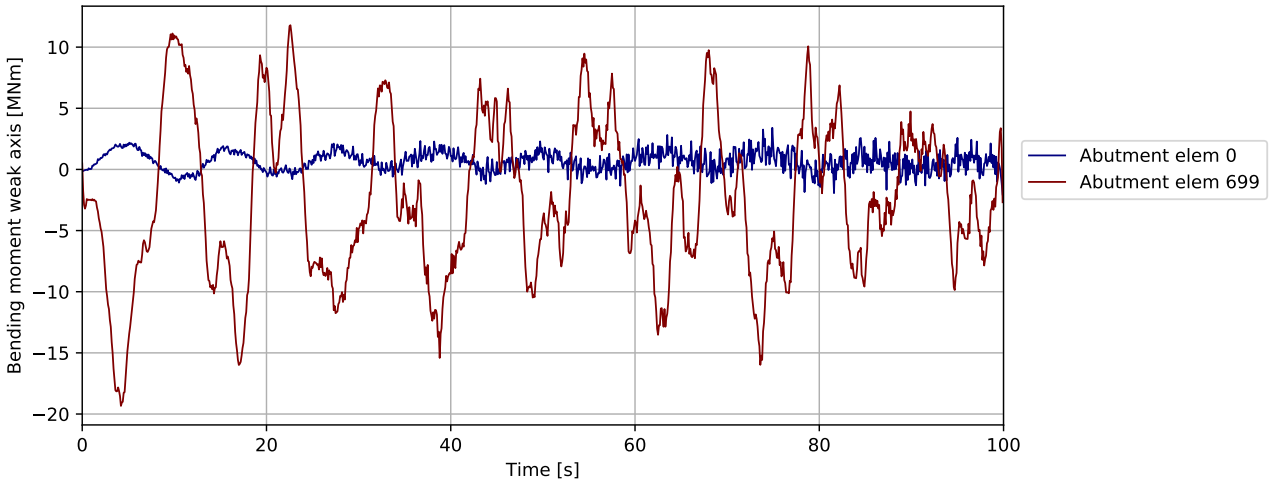


Figure 4.685: DH A16-A17 180deg - bridgegirder @abutments: Bending moment weak axis [MNm]

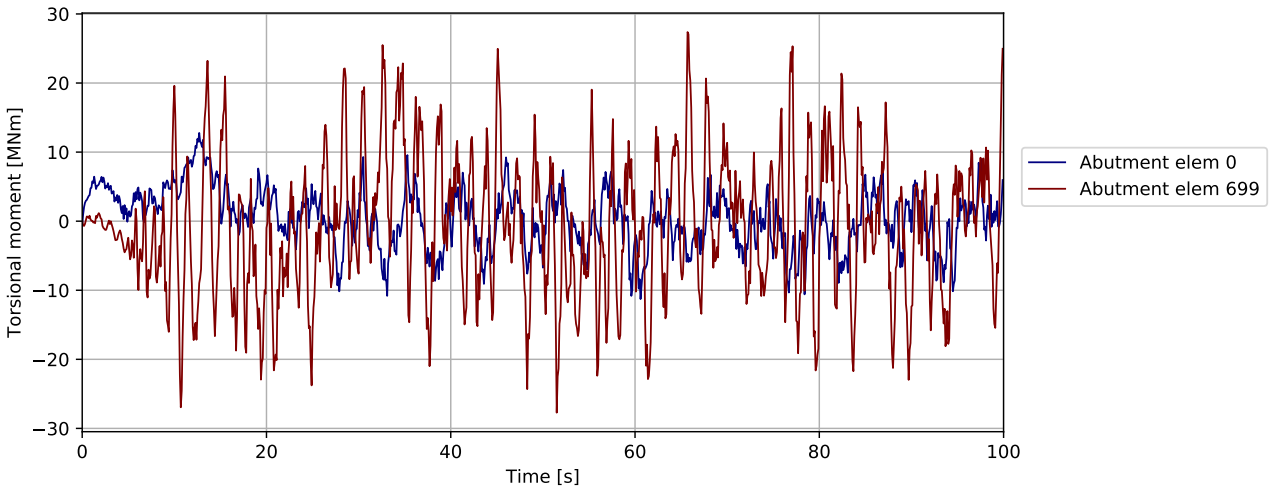


Figure 4.686: DH A16-A17 180deg - bridgegirder @abutments: Torsional moment [MNm]

Note : Compressive spring force is negative

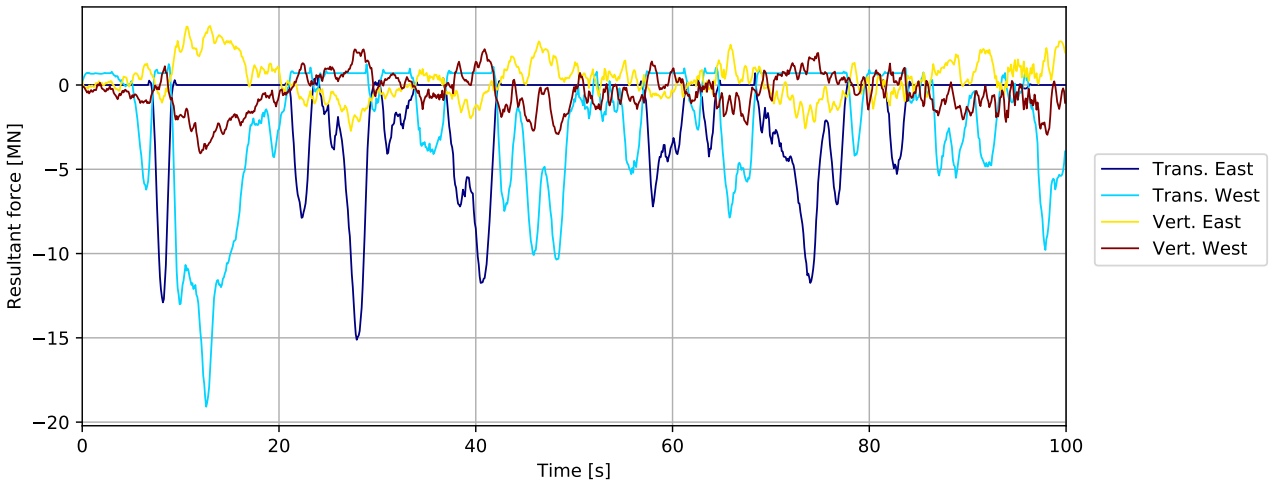


Figure 4.687: DH A16-A17 180deg - bridgegirder supports in tower: Resultant force [MN]

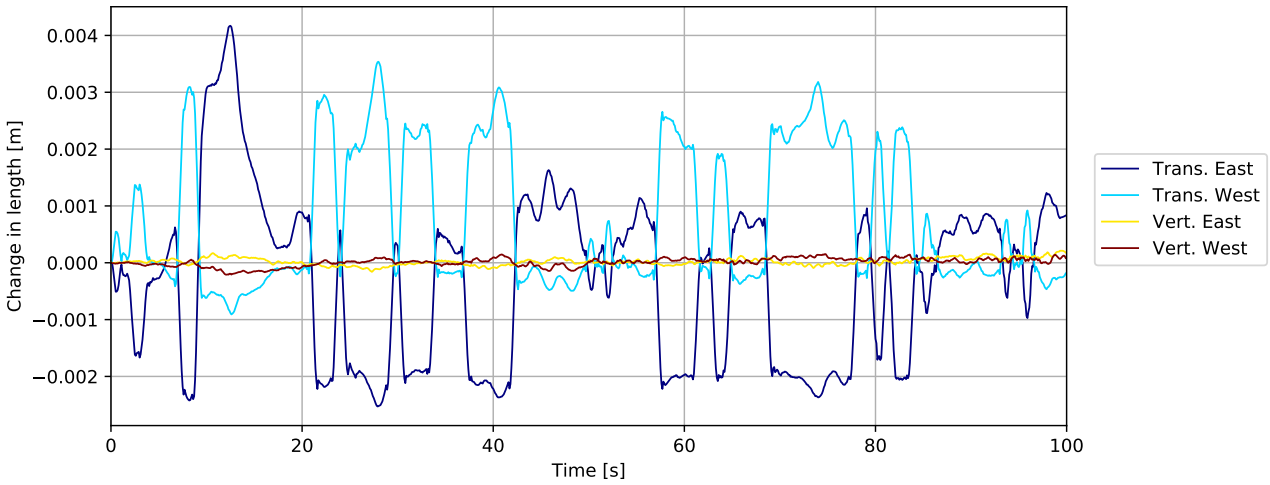


Figure 4.688: DH A16-A17 180deg - bridgegirder supports in tower: Change in length [m]

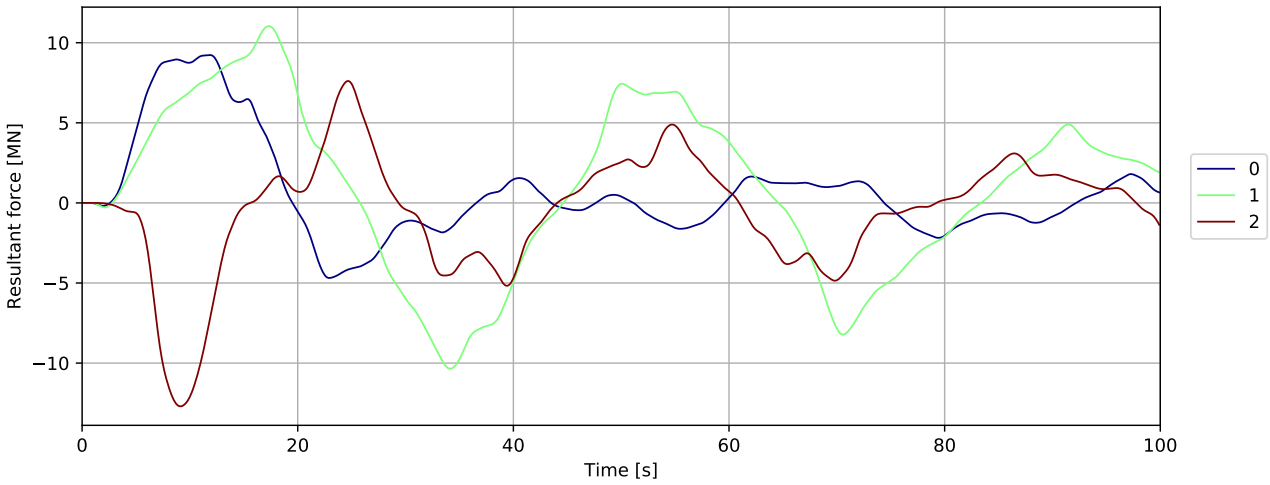


Figure 4.689: Mooring force

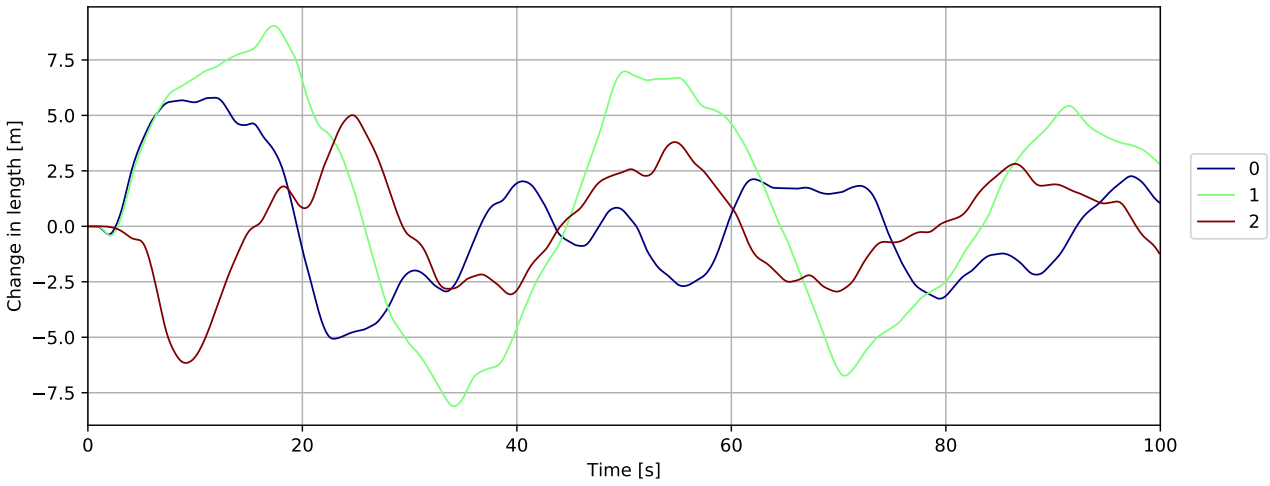


Figure 4.690: Mooring displacement

## 4.16 Deck house A20-A21 180deg

### 4.16.1 Overall response

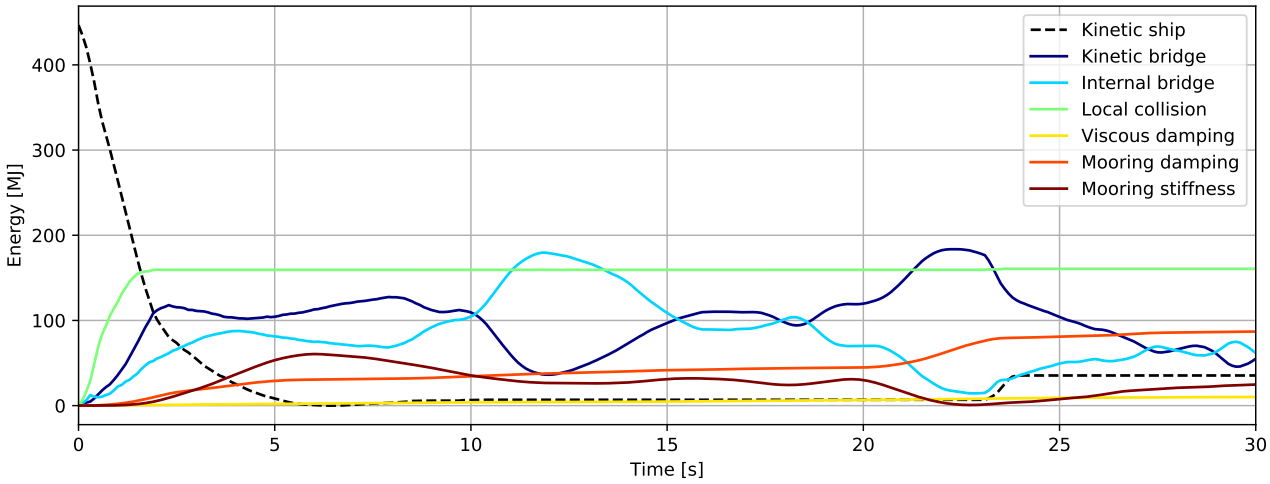


Figure 4.691: Energy [MJ] - initial phase

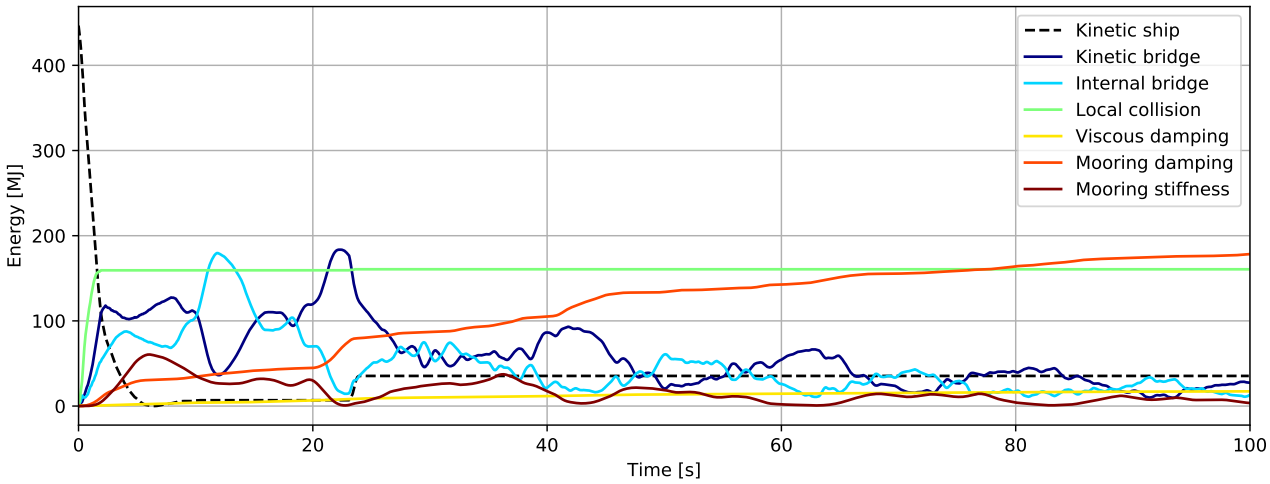


Figure 4.692: Energy [MJ]

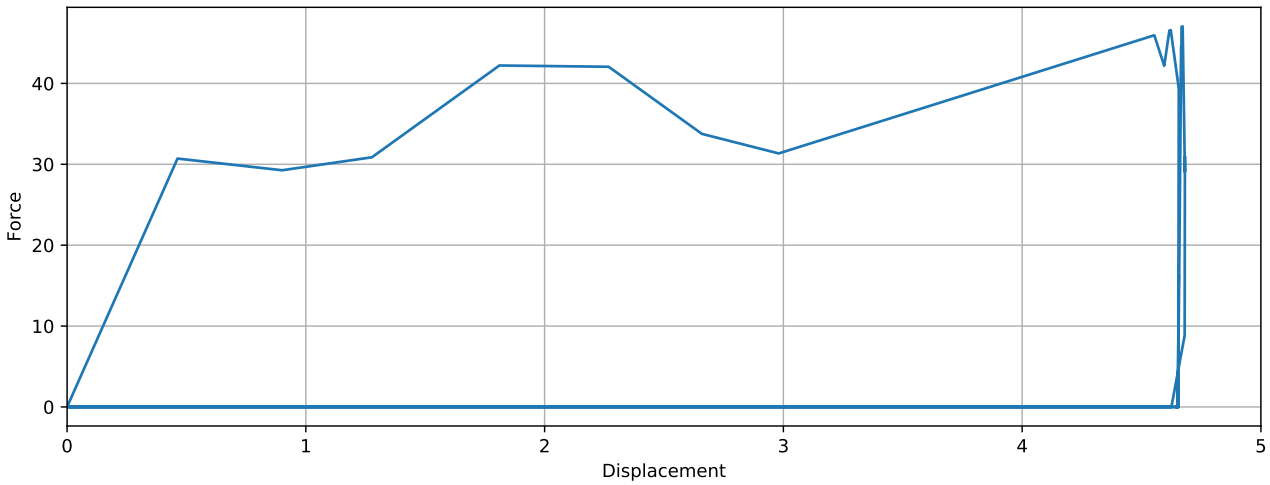


Figure 4.693: Simulated local collision force-displacement

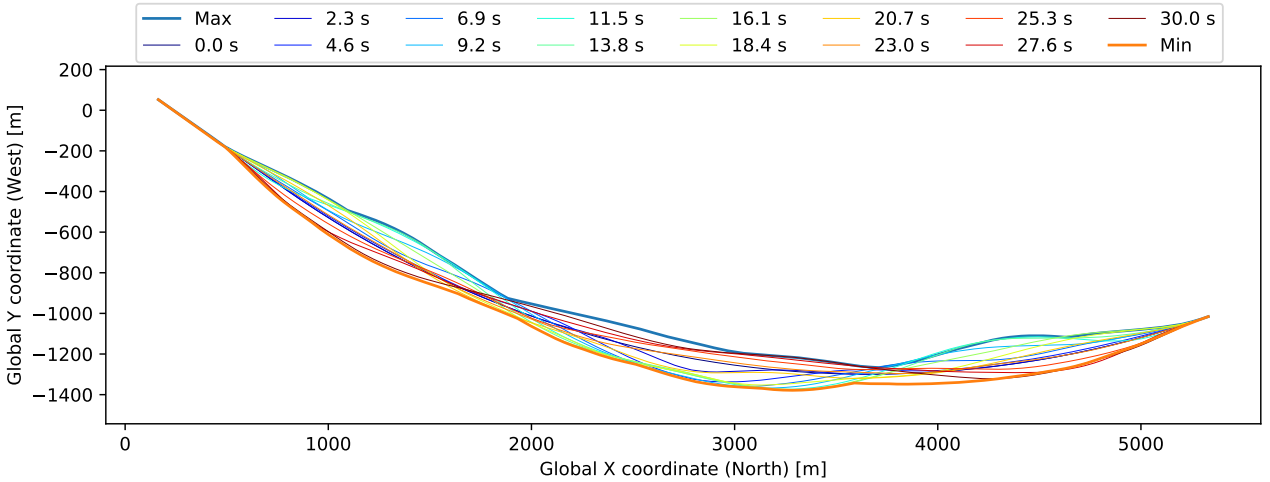


Figure 4.694: Bridgegirder deflection (10x displacment scaling)

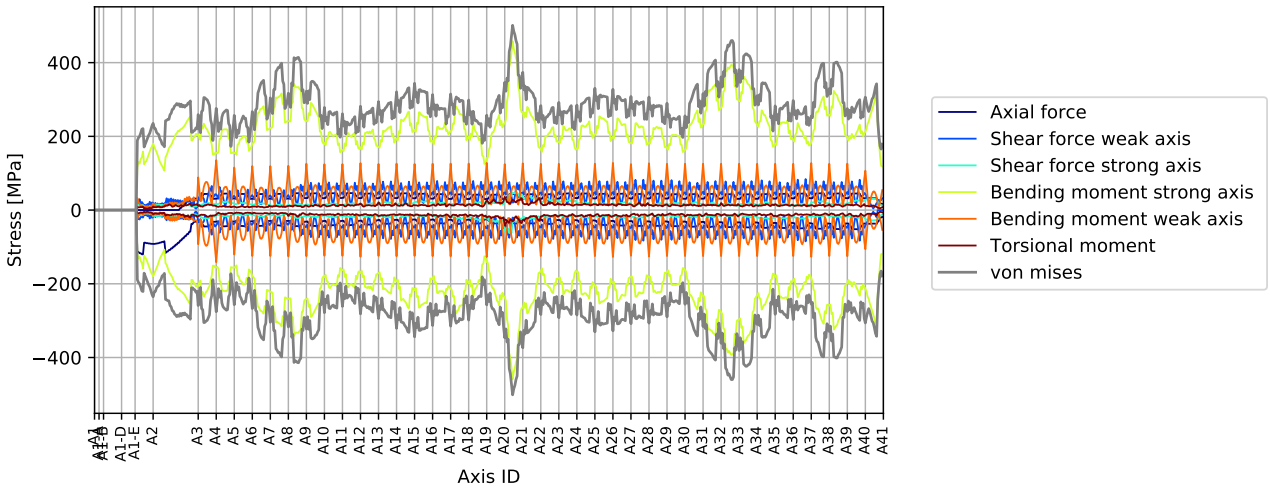


Figure 4.695: Stress envelope from all force components

### 4.16.2 Envelope plots

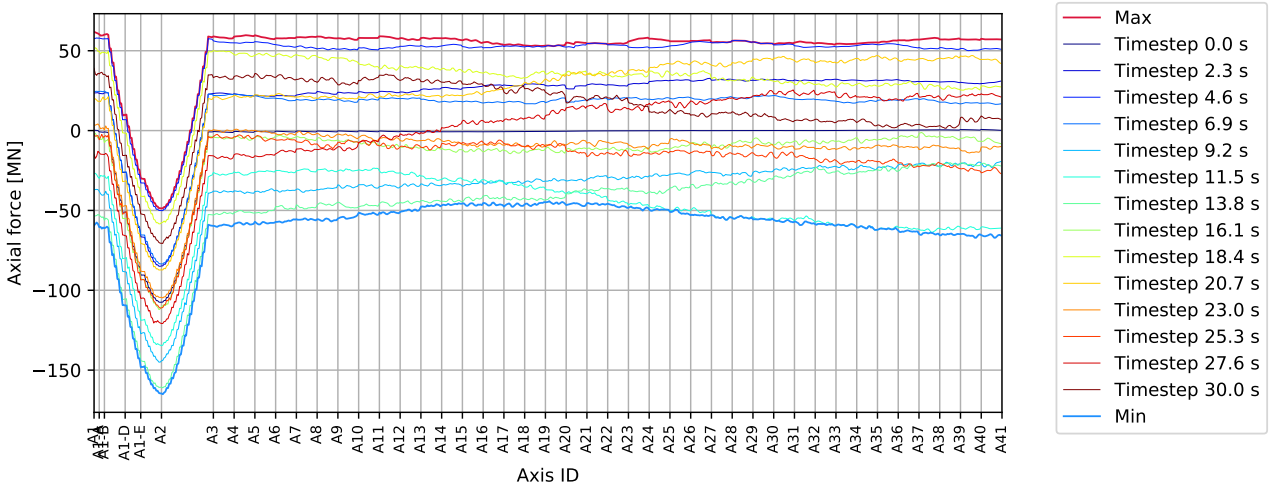


Figure 4.696: DH A20-A21 180deg - bridgegirder : Axial force [MN]

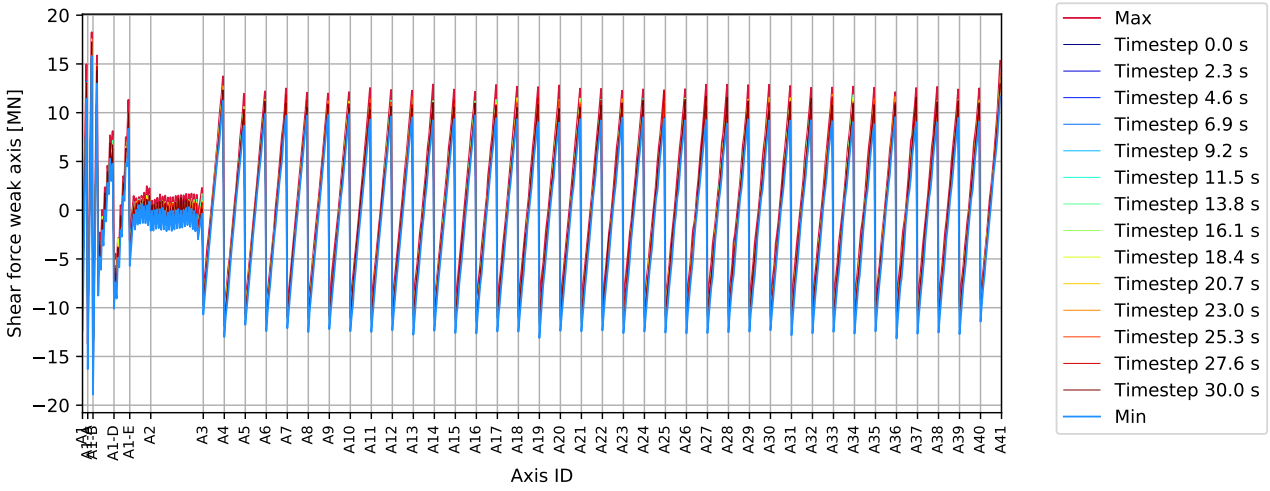


Figure 4.697: DH A20-A21 180deg - bridgegirder : Shear force weak axis [MN]

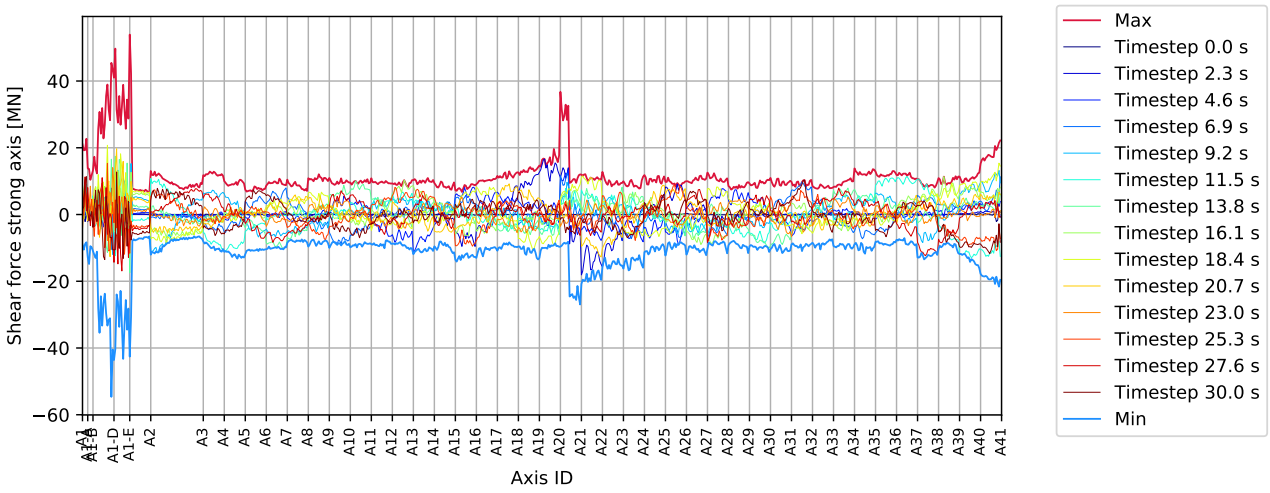


Figure 4.698: DH A20-A21 180deg - bridgegirder : Shear force strong axis [MN]

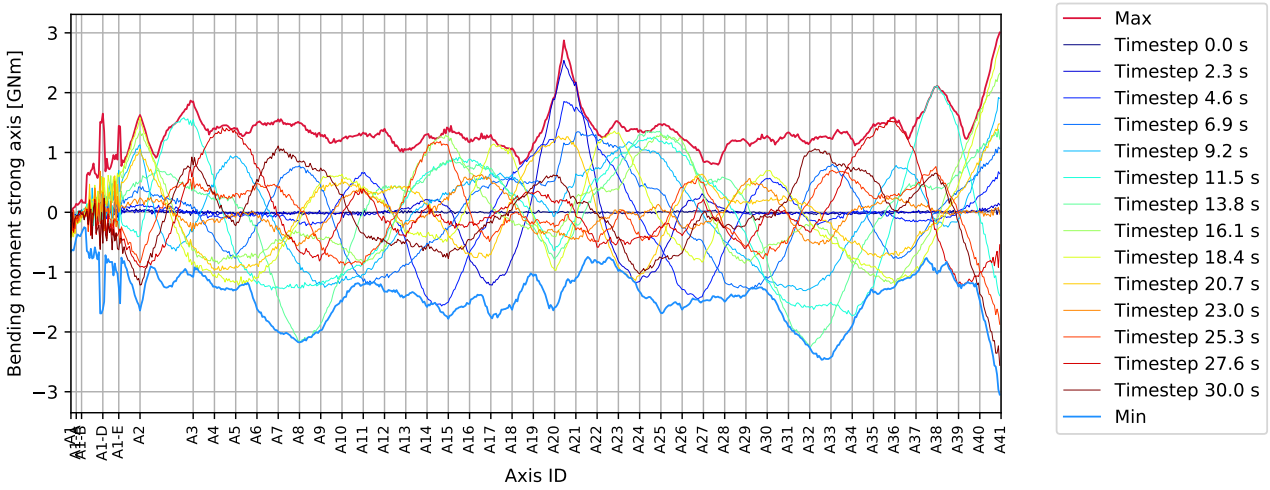


Figure 4.699: DH A20-A21 180deg - bridgegirder : Bending moment strong axis [GNm]

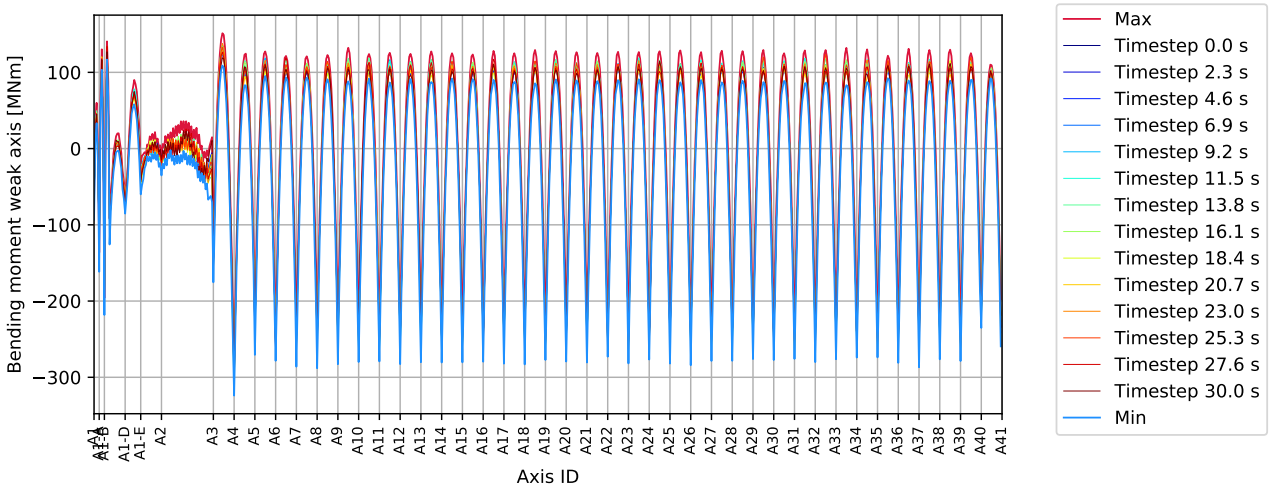


Figure 4.700: DH A20-A21 180deg - bridgegirder : Bending moment weak axis [MNm]

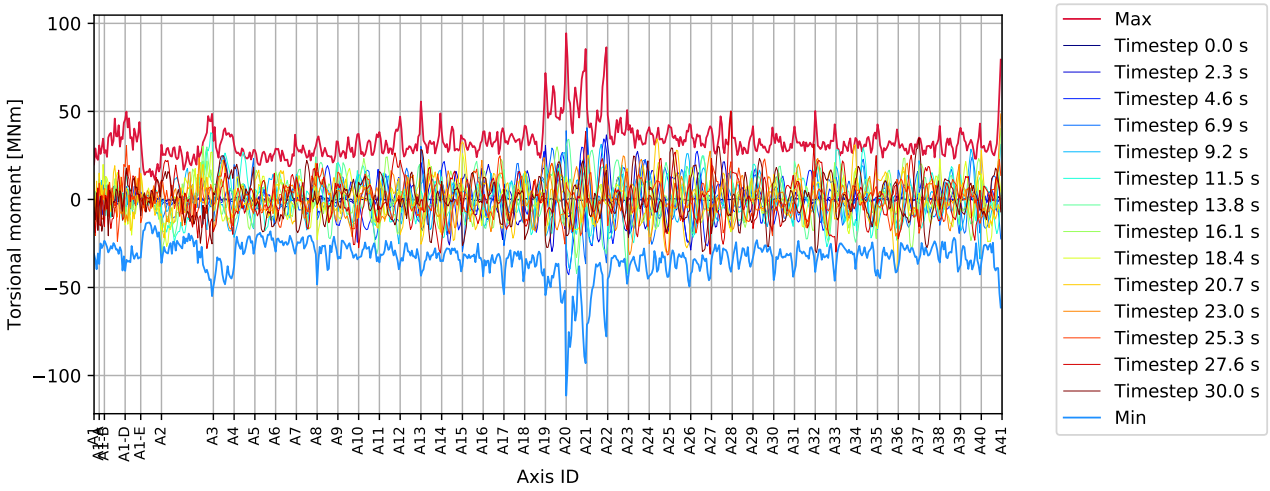


Figure 4.701: DH A20-A21 180deg - bridgegirder : Torsional moment [MNm]

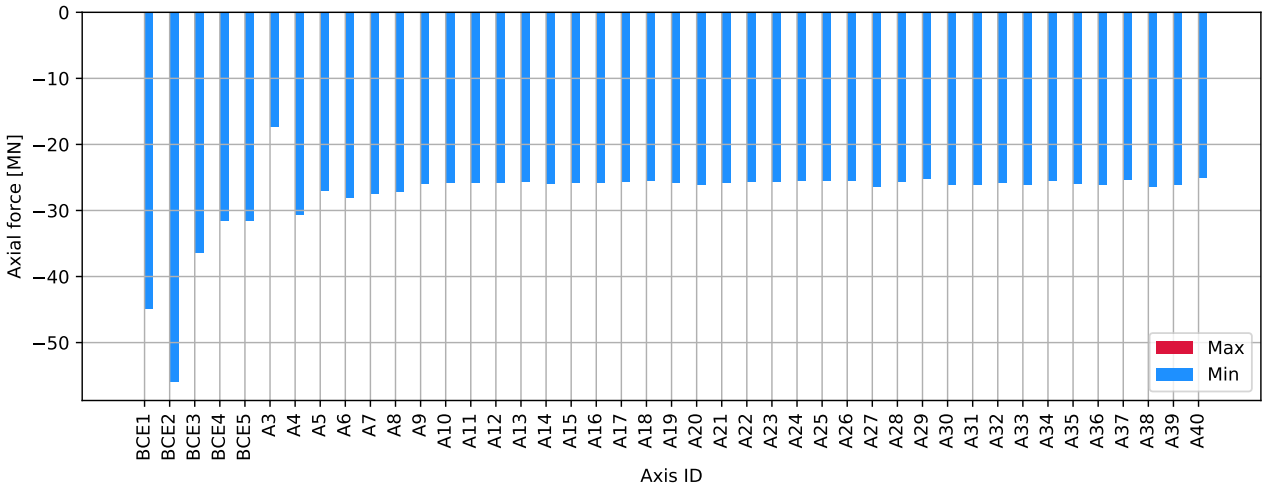


Figure 4.702: DH A20-A21 180deg - columns bottom : Axial force [MN]

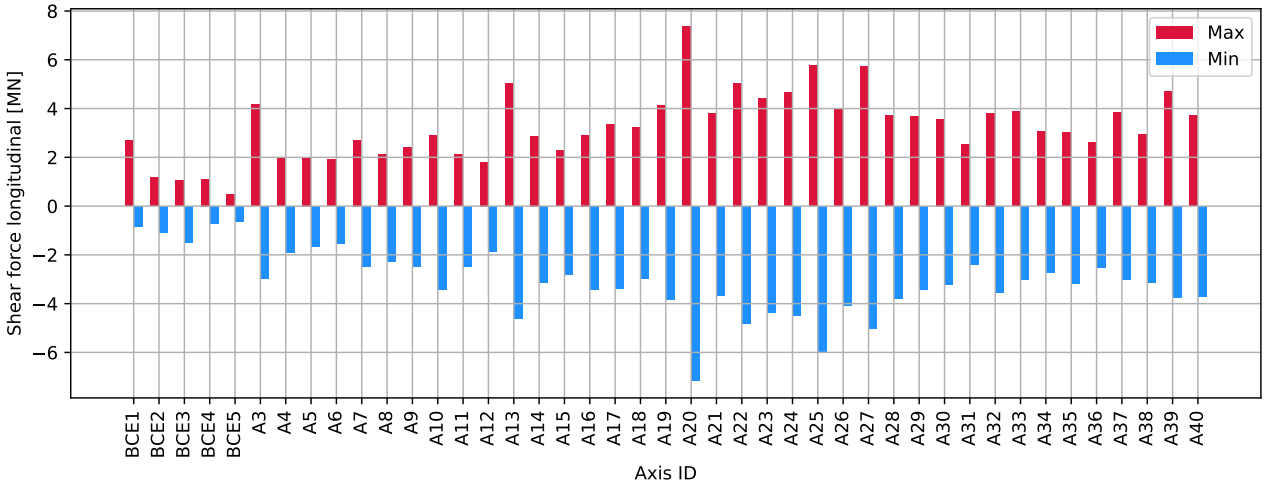


Figure 4.703: DH A20-A21 180deg - columns bottom : Shear force longitudinal [MN]

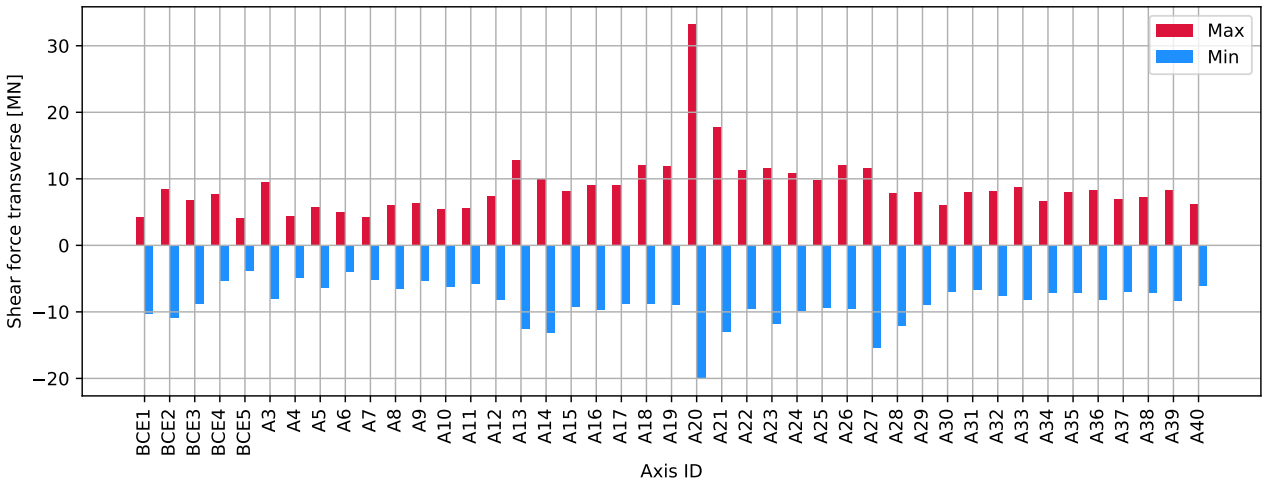


Figure 4.704: DH A20-A21 180deg - columns bottom : Shear force transverse [MN]

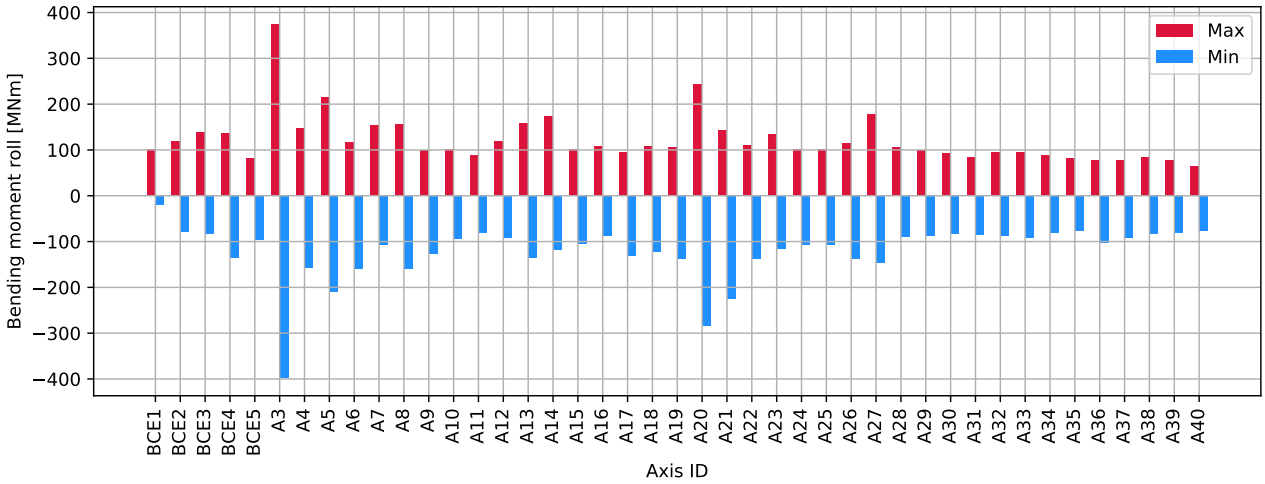


Figure 4.705: DH A20-A21 180deg - columns bottom : Bending moment roll [MNm]

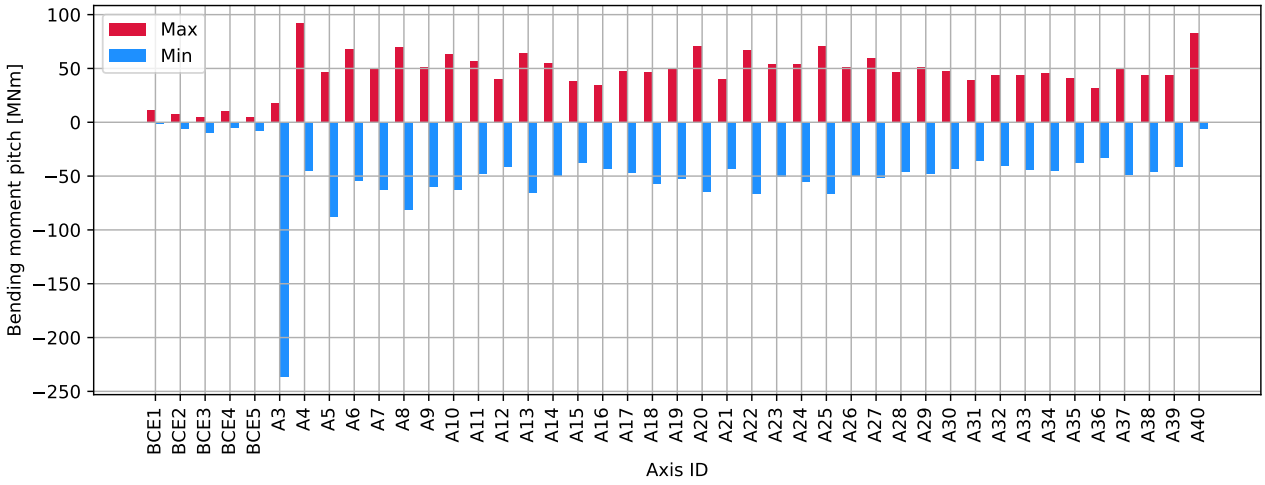


Figure 4.706: DH A20-A21 180deg - columns bottom : Bending moment pitch [MNm]

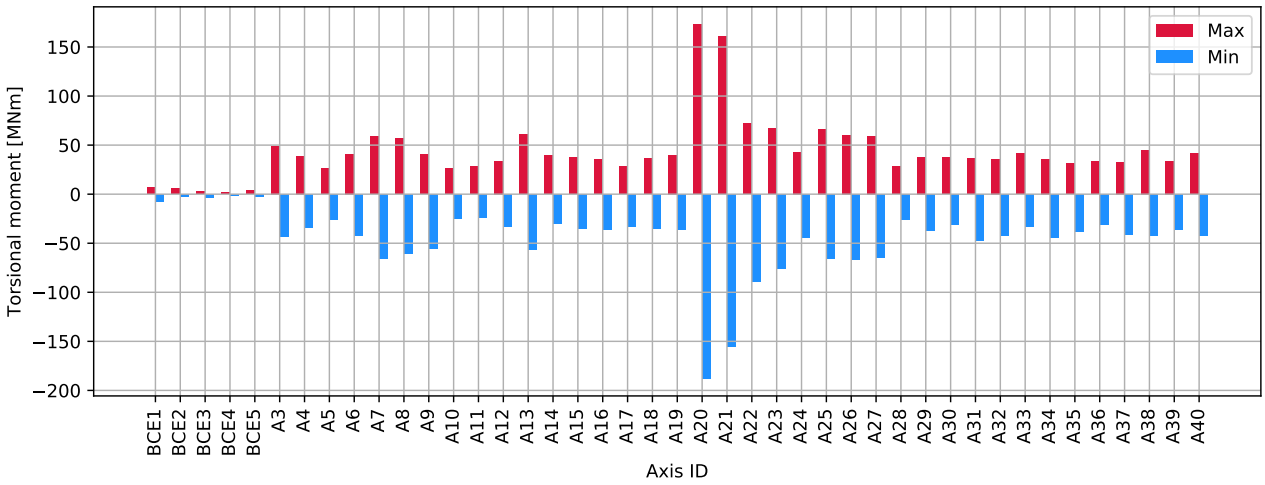


Figure 4.707: DH A20-A21 180deg - columns bottom : Torsional moment [MNm]

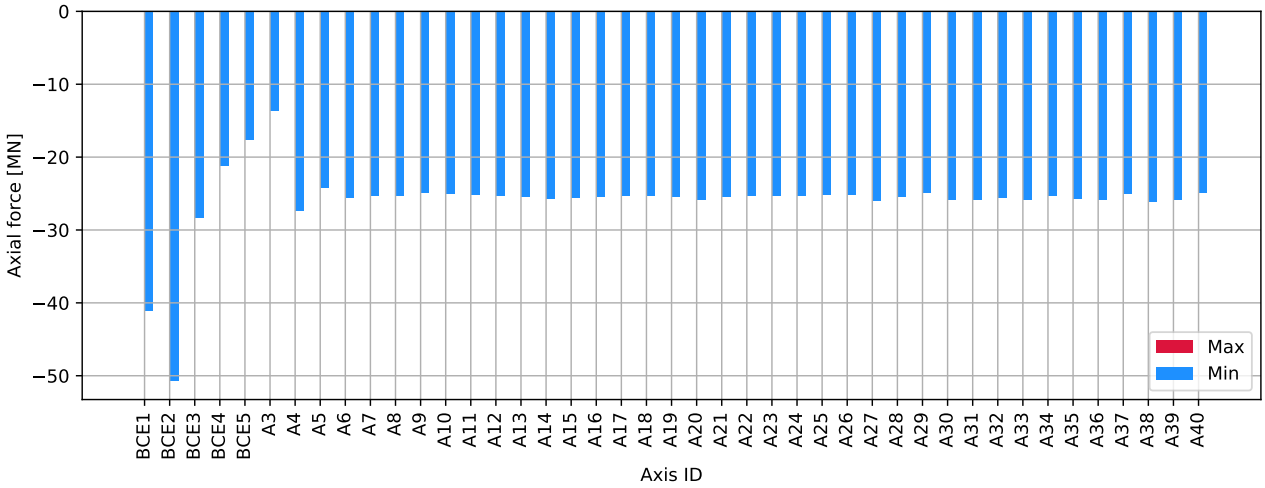


Figure 4.708: DH A20-A21 180deg - columns top : Axial force [MN]

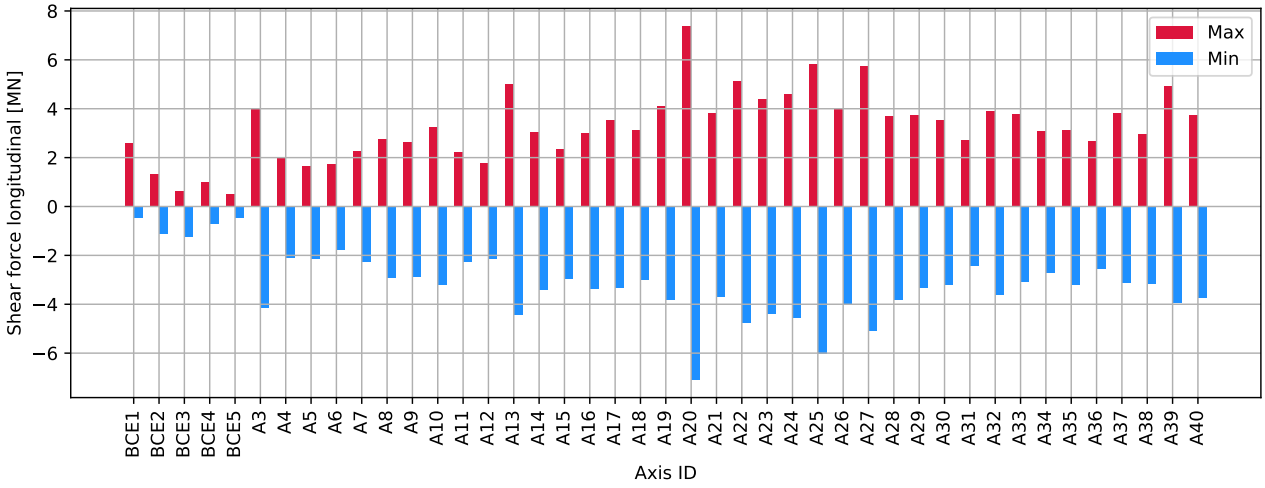


Figure 4.709: DH A20-A21 180deg - columns top : Shear force longitudinal [MN]

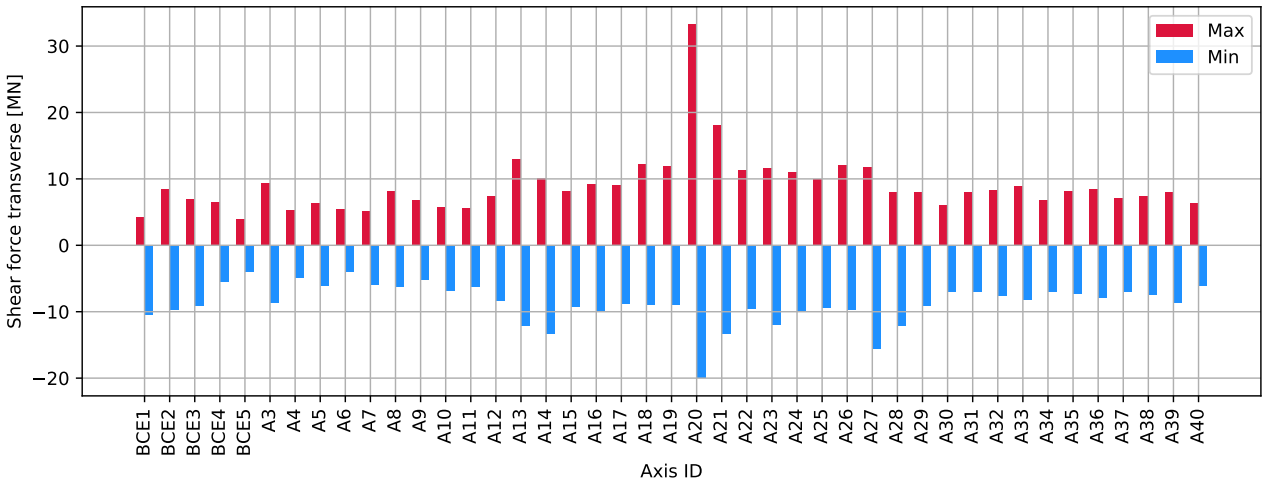


Figure 4.710: DH A20-A21 180deg - columns top : Shear force transverse [MN]

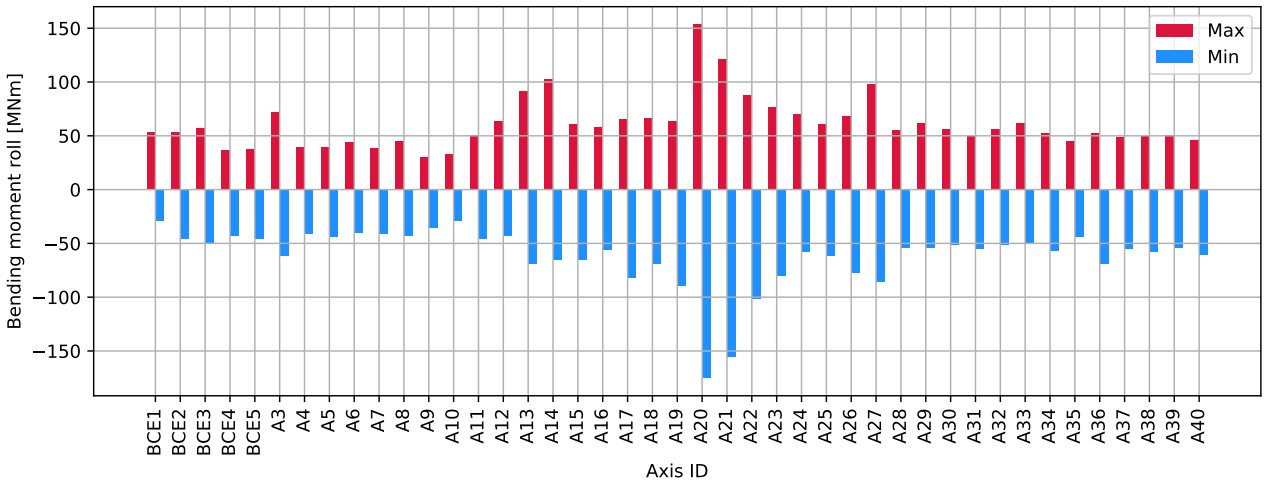


Figure 4.711: DH A20-A21 180deg - columns top : Bending moment roll [MNm]

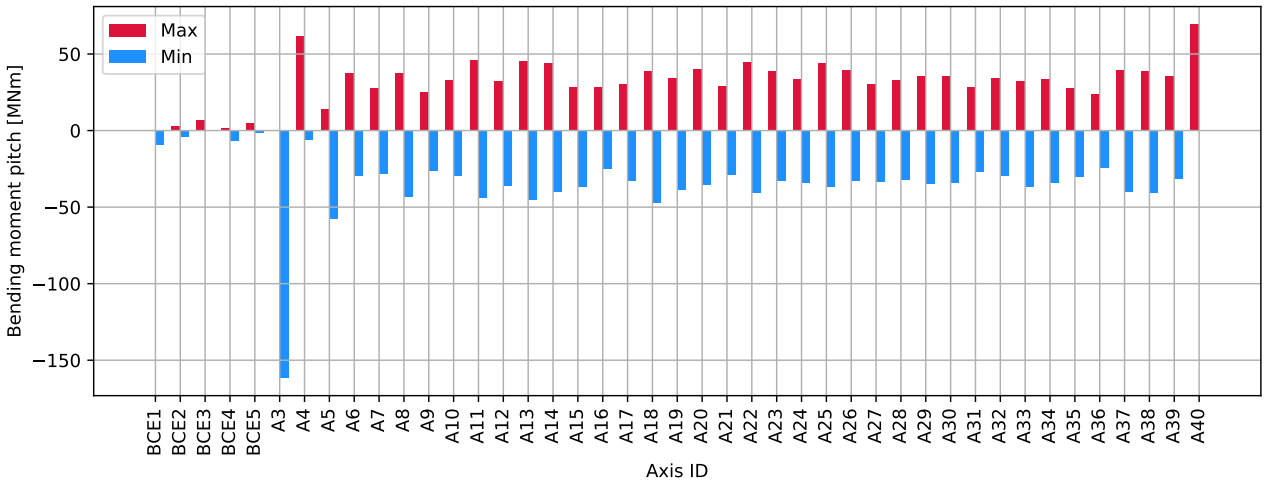


Figure 4.712: DH A20-A21 180deg - columns top : Bending moment pitch [MNm]

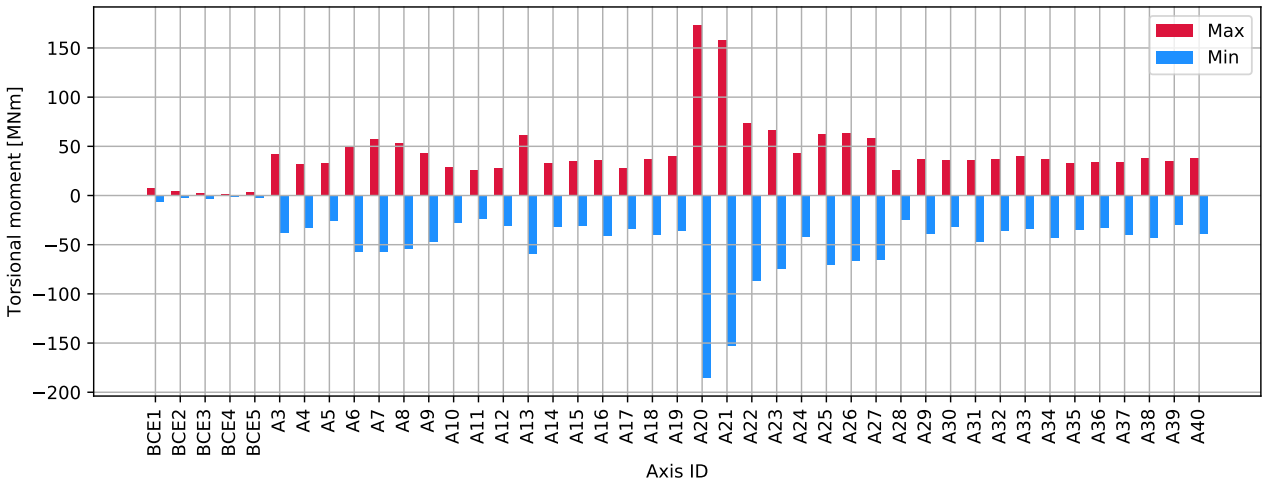


Figure 4.713: DH A20-A21 180deg - columns top : Torsional moment [MNm]

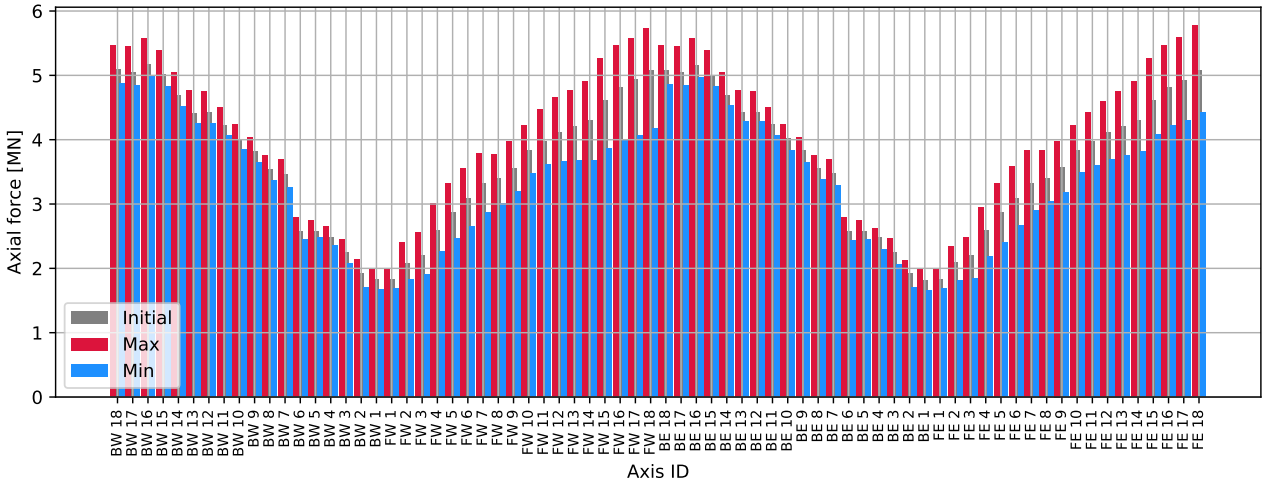


Figure 4.714: DH A20-A21 180deg - cables : Axial force [MN]

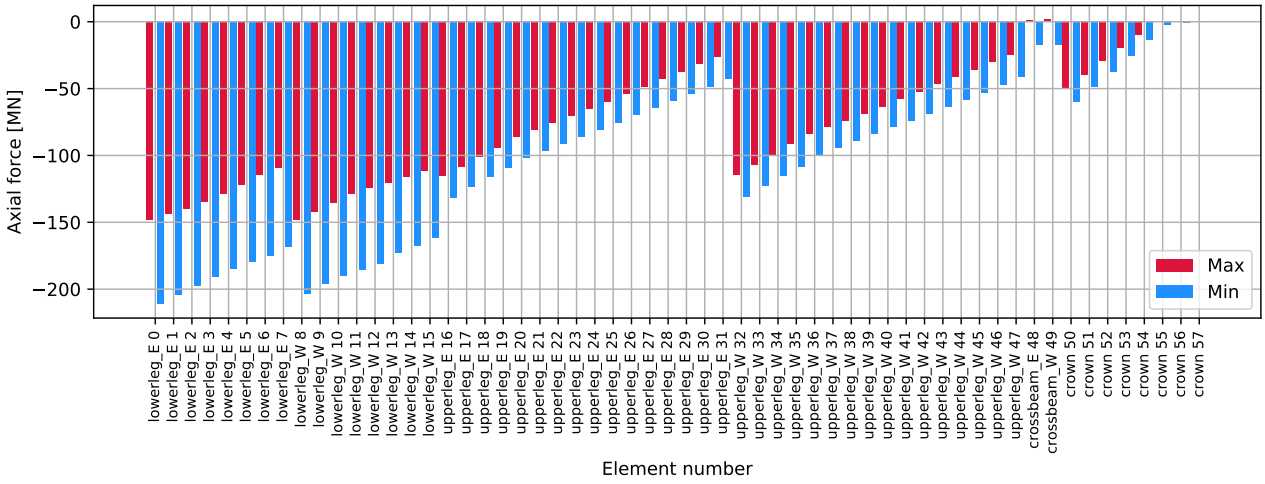


Figure 4.715: DH A20-A21 180deg - tower: Axial force [MN]

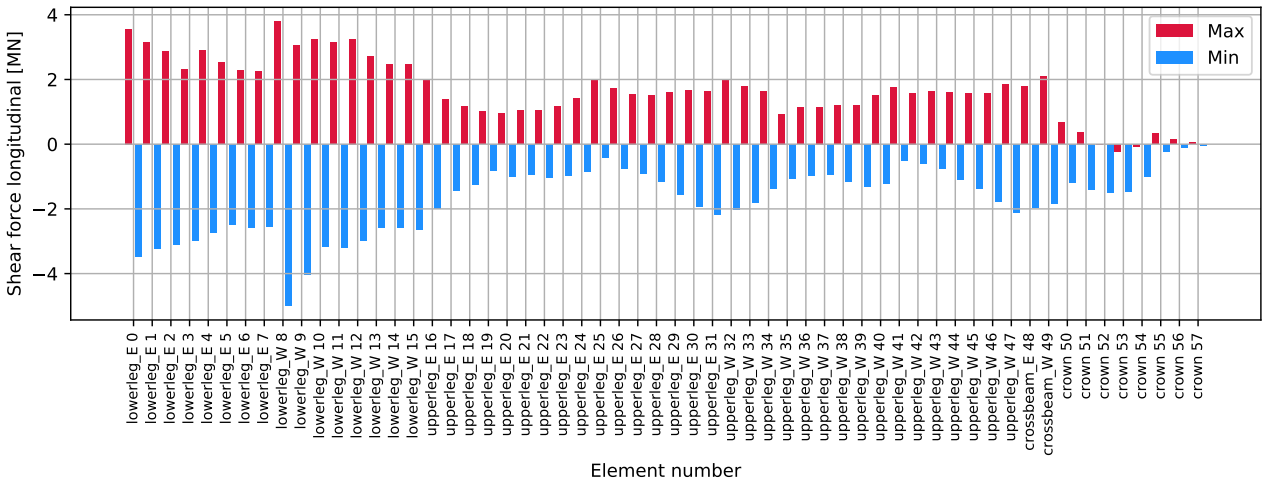


Figure 4.716: DH A20-A21 180deg - tower: Shear force longitudinal [MN]

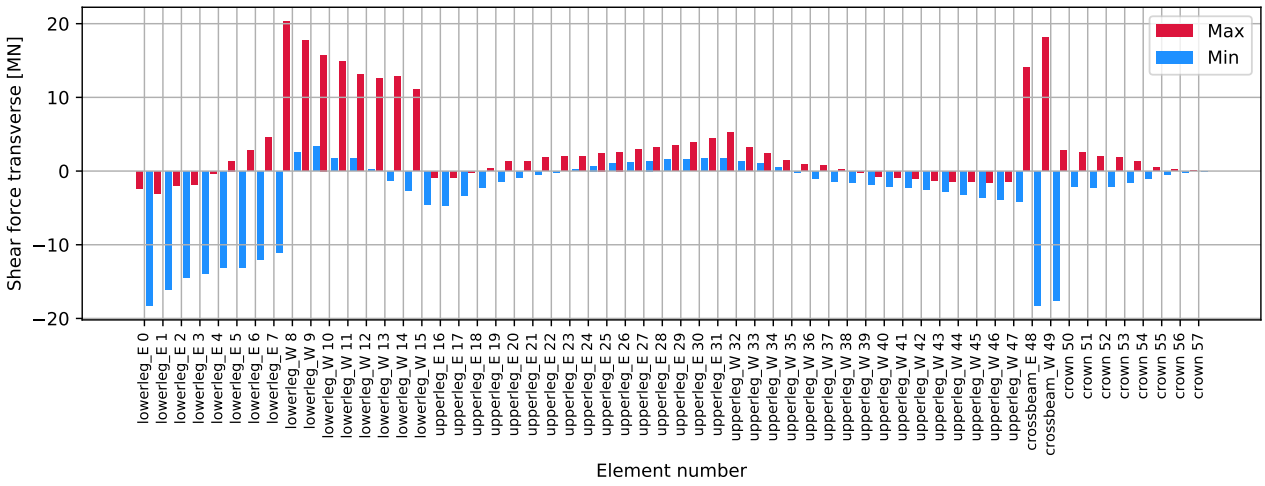


Figure 4.717: DH A20-A21 180deg - tower: Shear force transverse [MN]

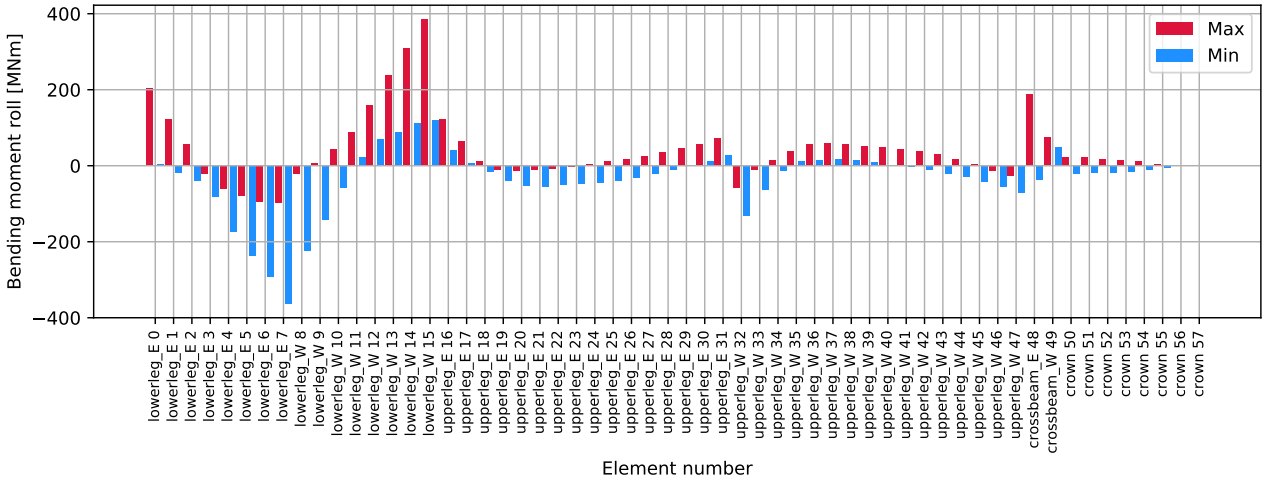


Figure 4.718: DH A20-A21 180deg - tower: Bending moment roll [MNm]

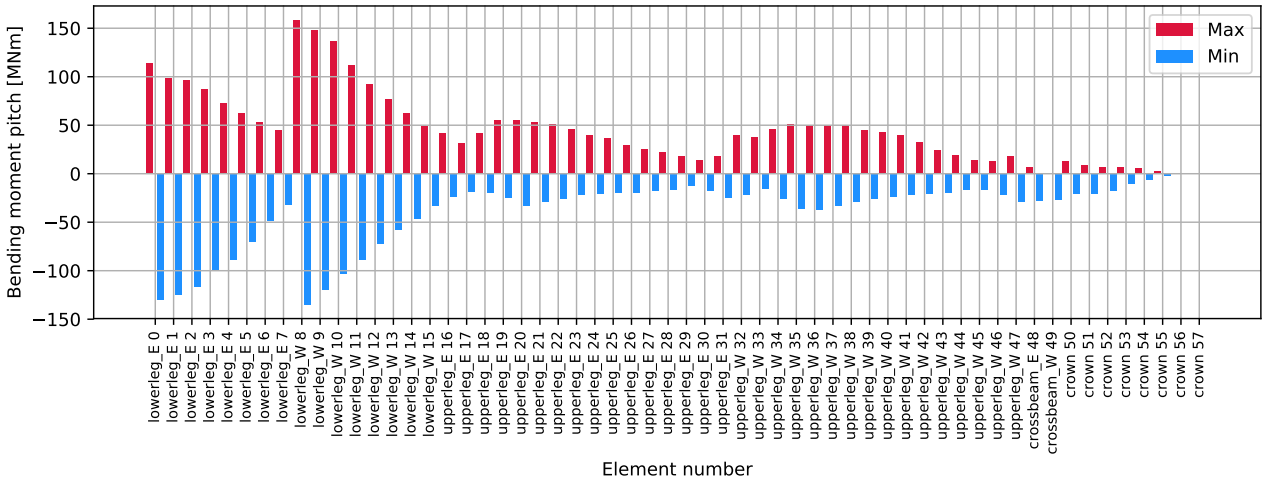


Figure 4.719: DH A20-A21 180deg - tower: Bending moment pitch [MNm]

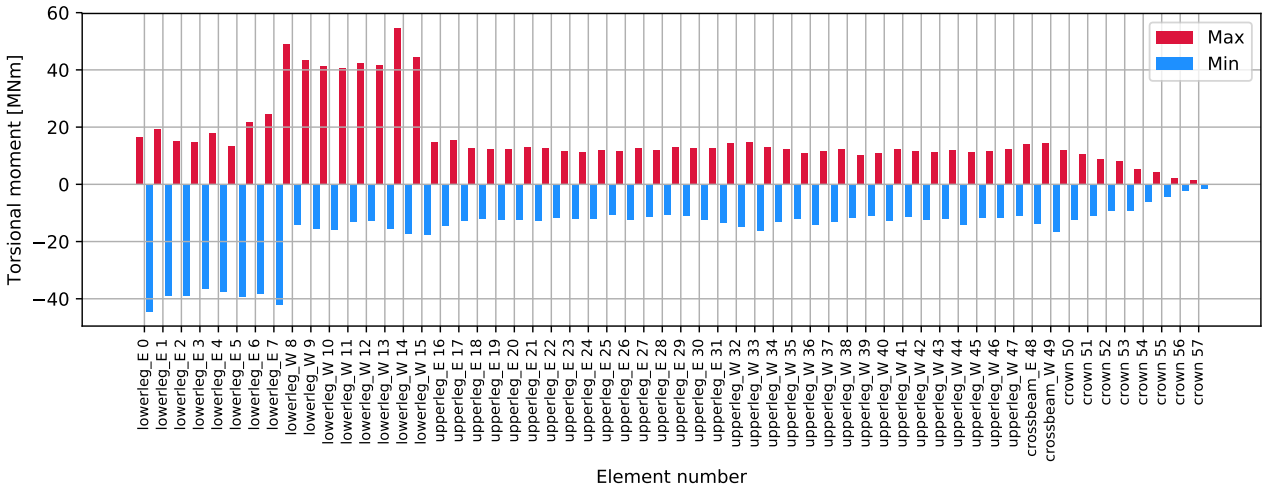


Figure 4.720: DH A20-A21 180deg - tower: Torsional moment [MNm]

### 4.16.3 Time series

Note : Time series are filtered using a Saviotzky-Golay filter for increased readability of the time history plots. Hence, maximum values that occur due to a rapid vibration are not shown in the plots. For maximum values, refer to the tabulated data.
All elements are numbered from South to North, bottom to top

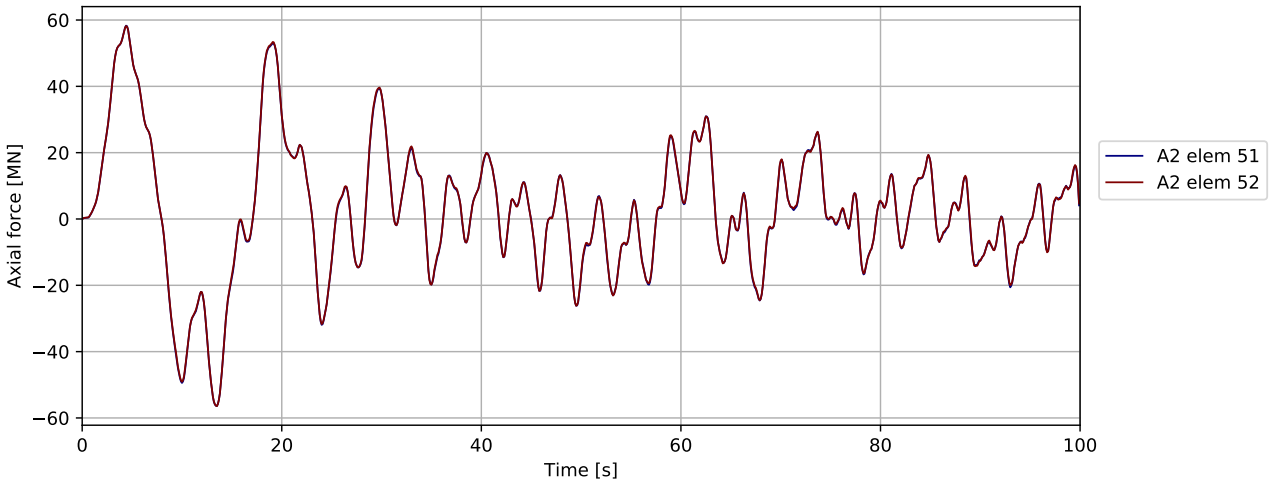


Figure 4.721: DH A20-A21 180deg - bridgegirder @ pylon: Axial force [MN]

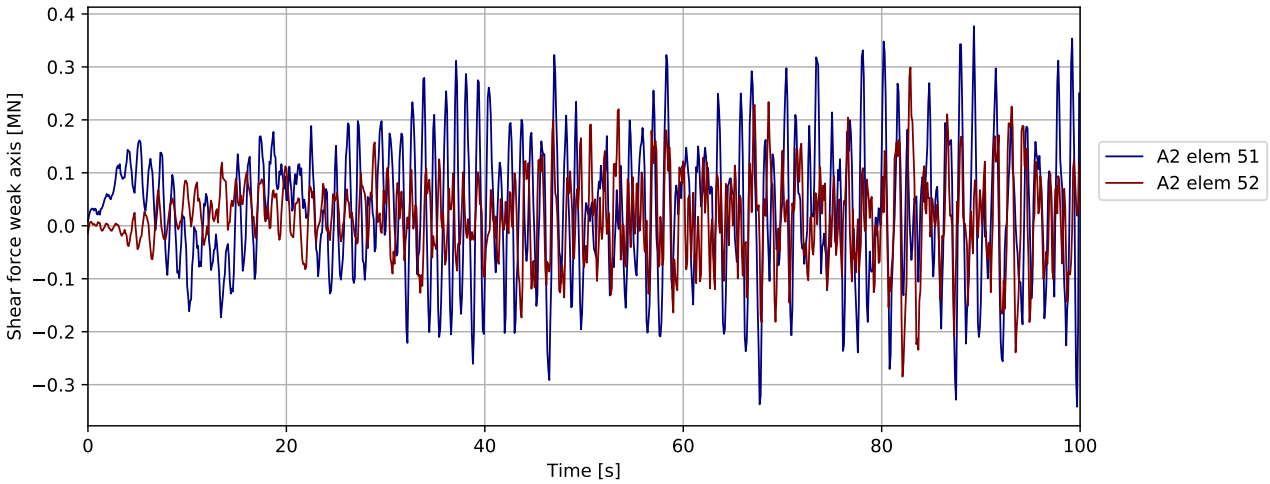


Figure 4.722: DH A20-A21 180deg - bridgegirder @ pylon: Shear force weak axis [MN]

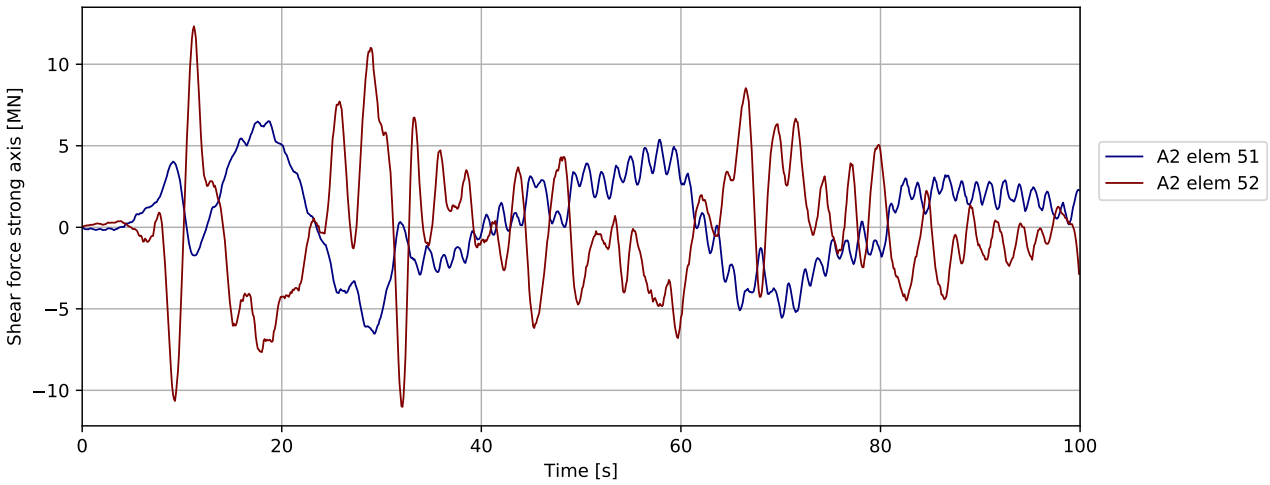


Figure 4.723: DH A20-A21 180deg - bridgegirder @ pylon: Shear force strong axis [MN]

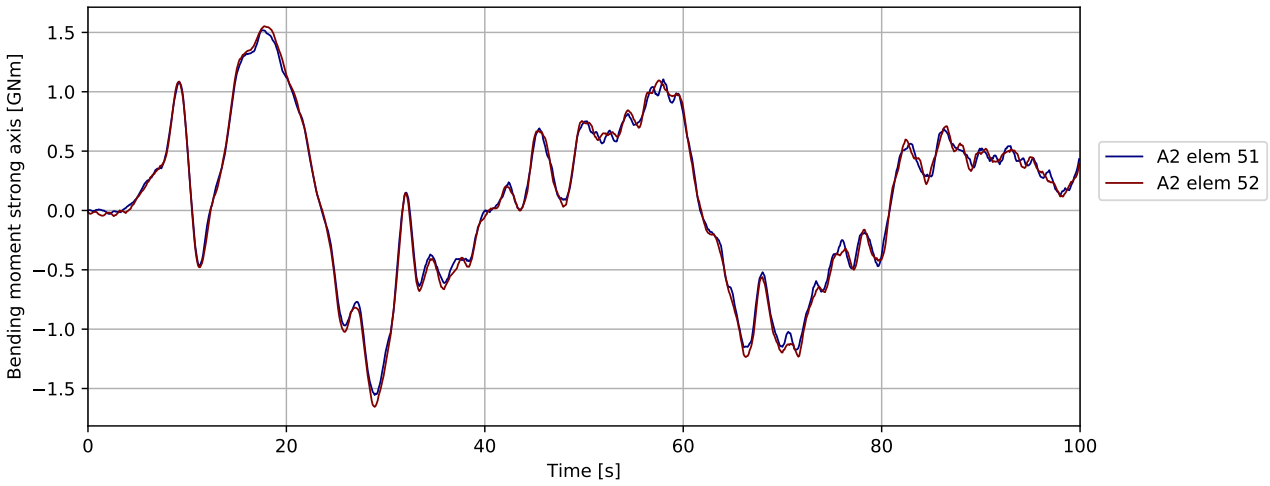


Figure 4.724: DH A20-A21 180deg - bridgegirder @ pylon: Bending moment strong axis [GNm]

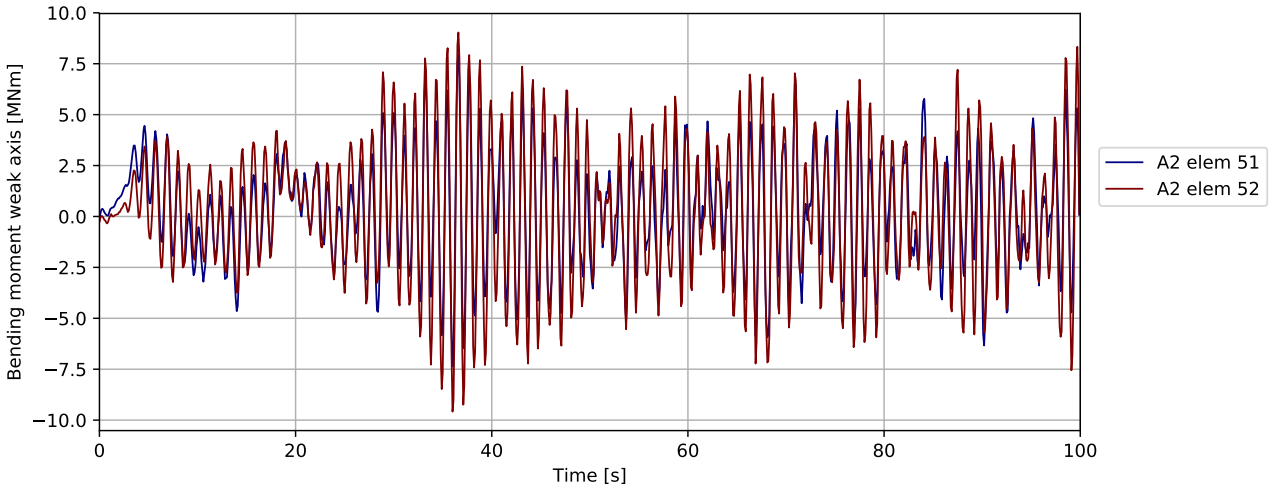


Figure 4.725: DH A20-A21 180deg - bridgegirder @ pylon: Bending moment weak axis [MNm]

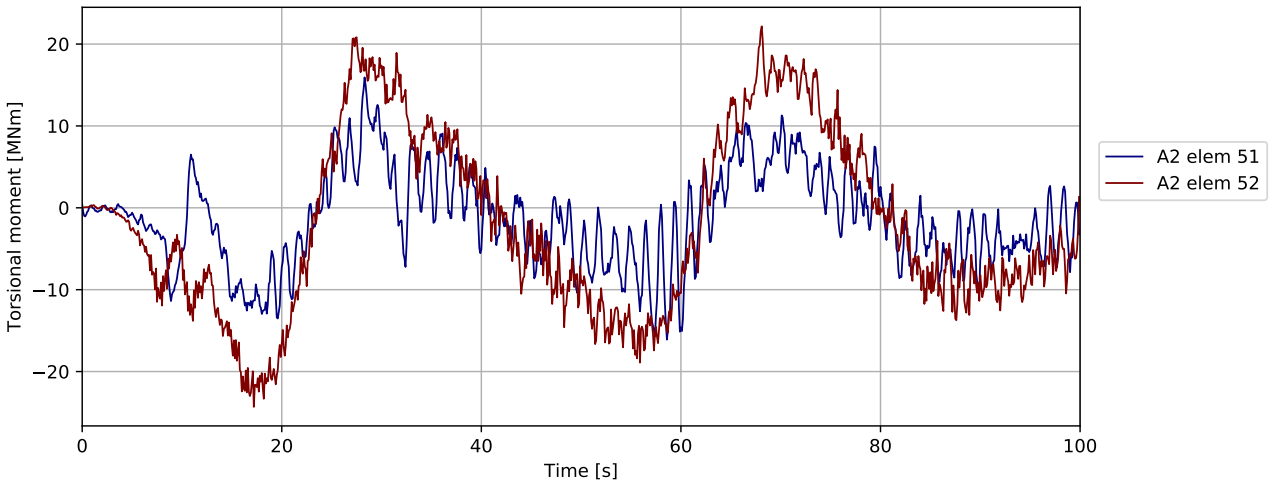


Figure 4.726: DH A20-A21 180deg - bridgegirder @ pylon: Torsional moment [MNm]

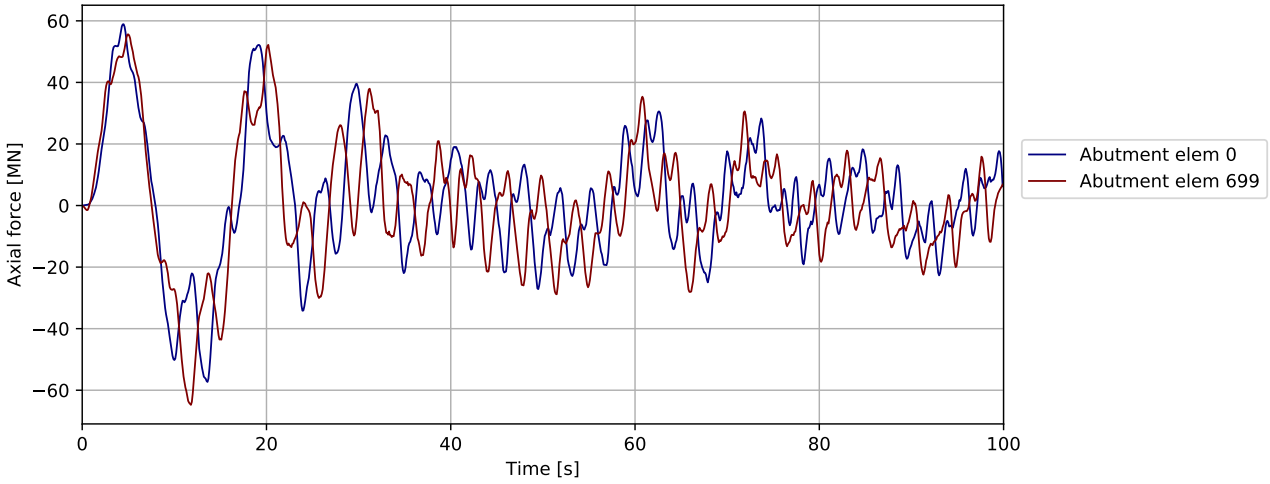


Figure 4.727: DH A20-A21 180deg - bridgegirder @abutments: Axial force [MN]

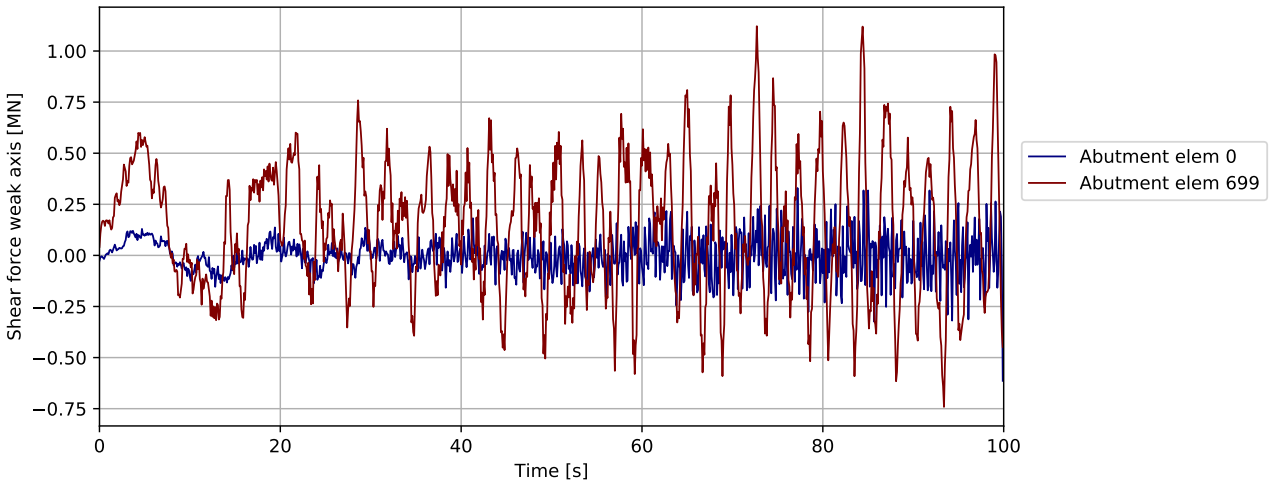


Figure 4.728: DH A20-A21 180deg - bridgegirder @abutments: Shear force weak axis [MN]

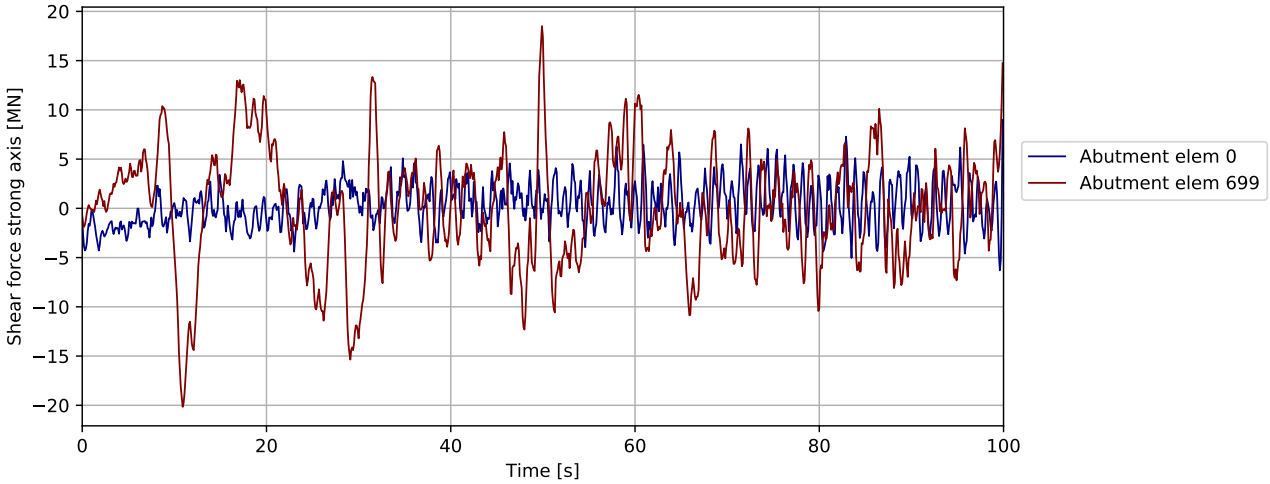


Figure 4.729: DH A20-A21 180deg - bridgegirder @abutments: Shear force strong axis [MN]

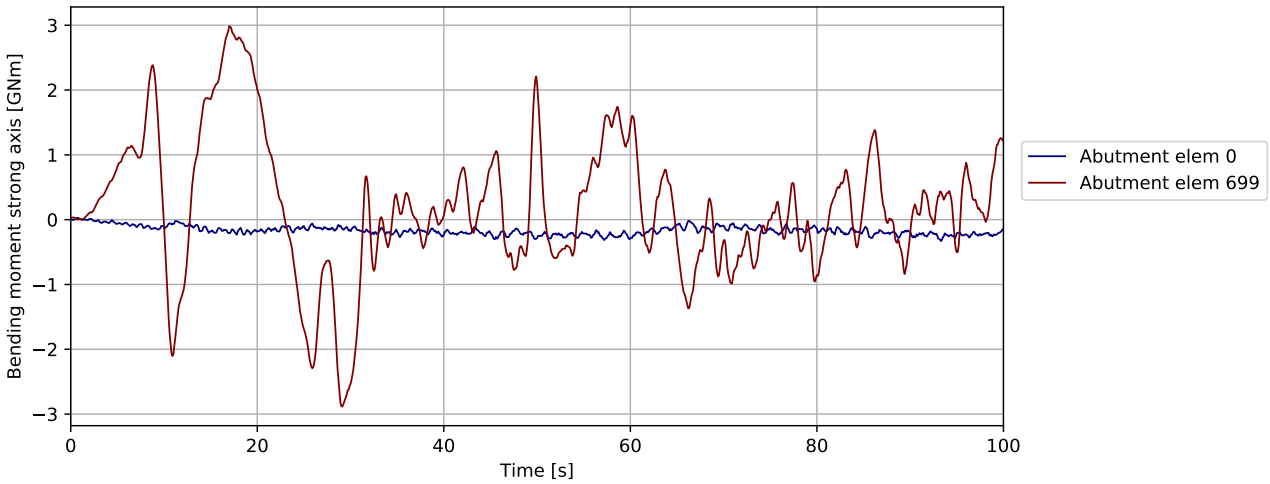


Figure 4.730: DH A20-A21 180deg - bridgegirder @abutments: Bending moment strong axis [GNm]

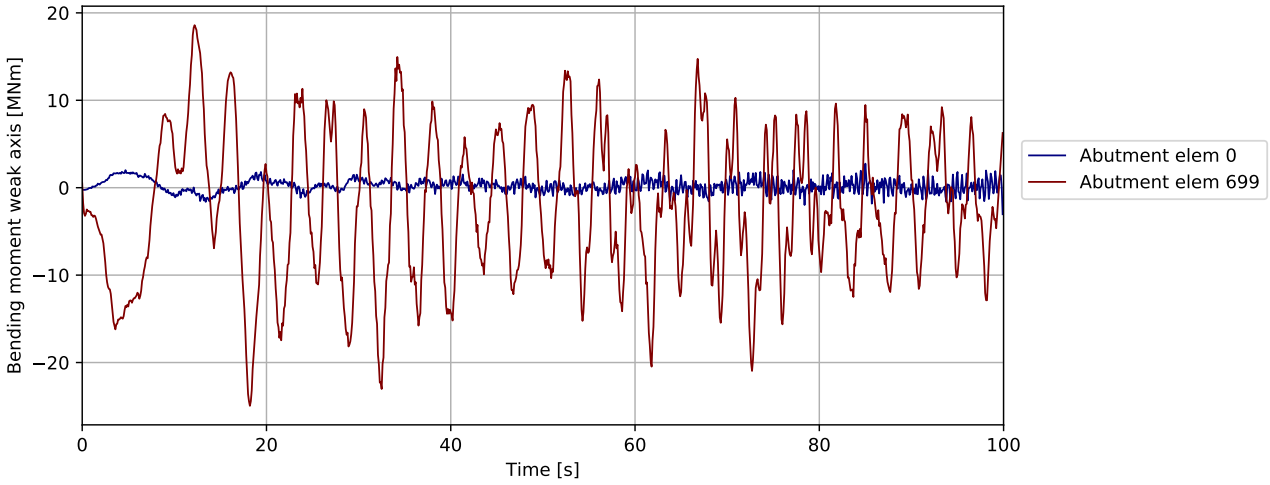


Figure 4.731: DH A20-A21 180deg - bridgegirder @abutments: Bending moment weak axis [MNm]

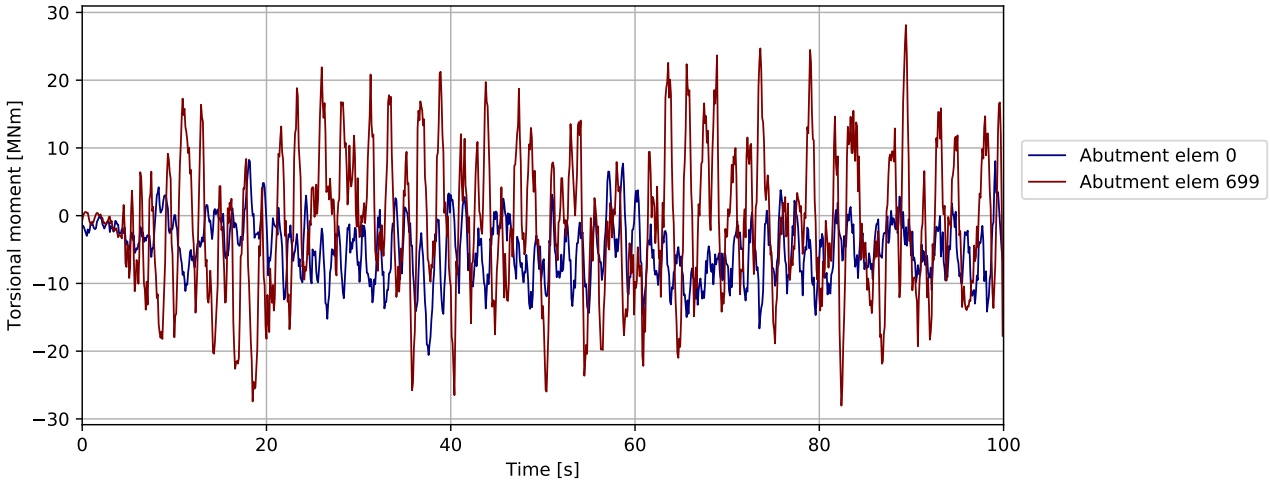


Figure 4.732: DH A20-A21 180deg - bridgegirder @abutments: Torsional moment [MNm]

Note : Compressive spring force is negative

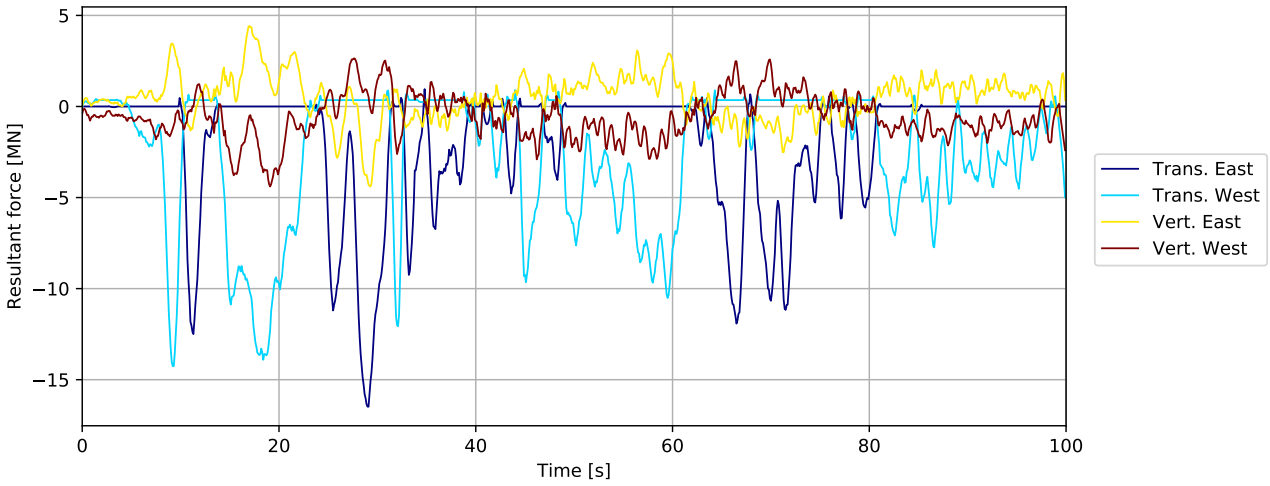


Figure 4.733: DH A20-A21 180deg - bridgegirder supports in tower: Resultant force [MN]

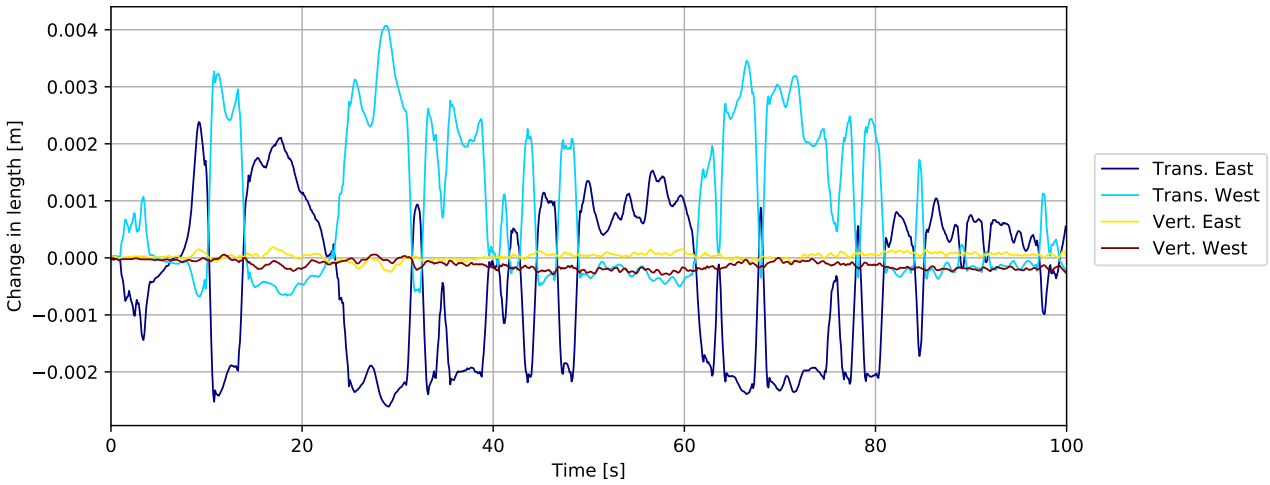


Figure 4.734: DH A20-A21 180deg - bridgegirder supports in tower: Change in length [m]

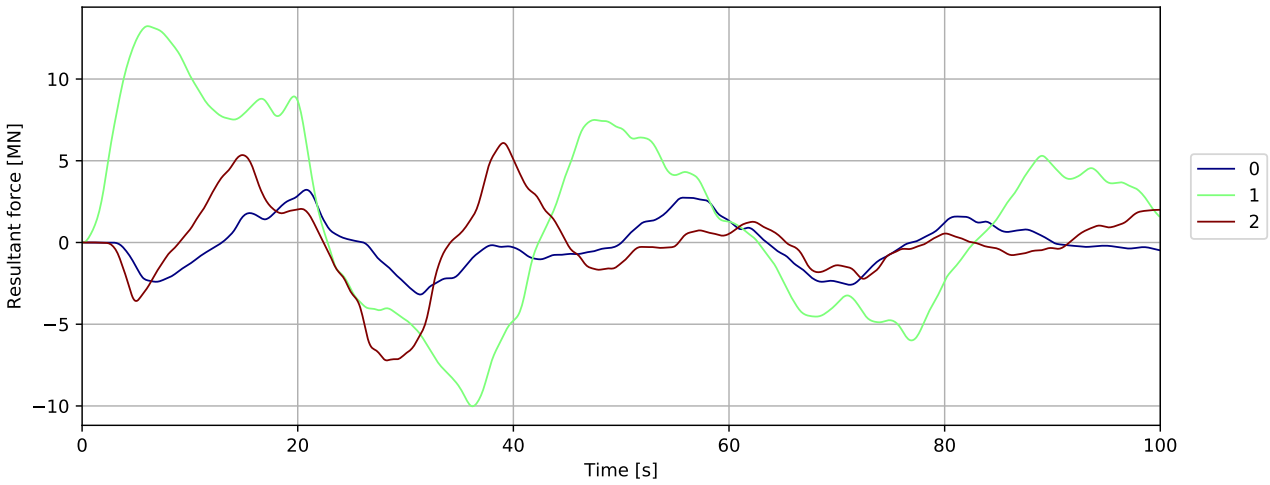


Figure 4.735: Mooring force

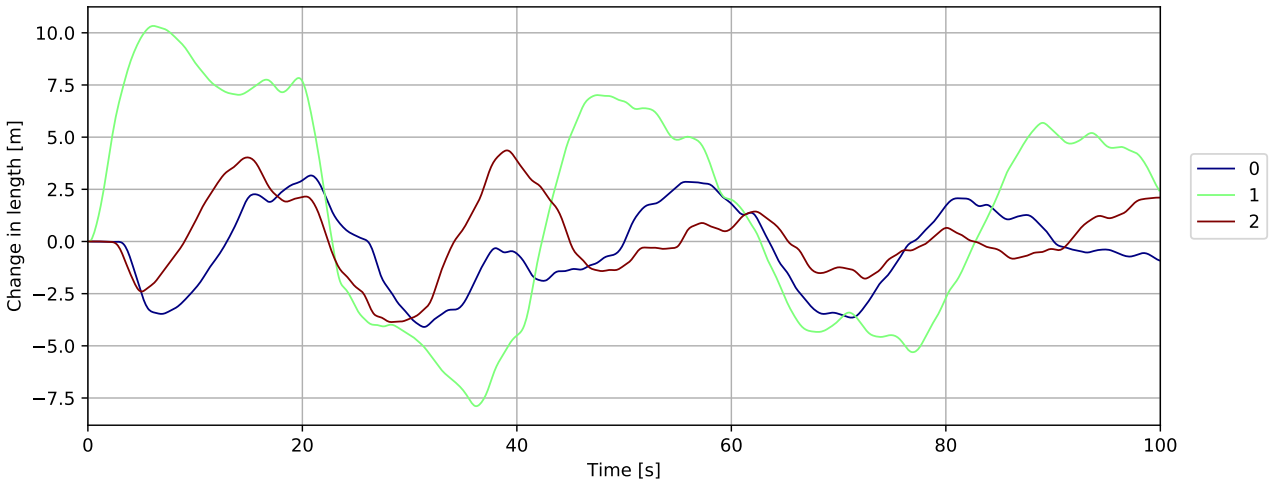


Figure 4.736: Mooring displacement

## 4.17 Deck house A23-A24 180deg

### 4.17.1 Overall response

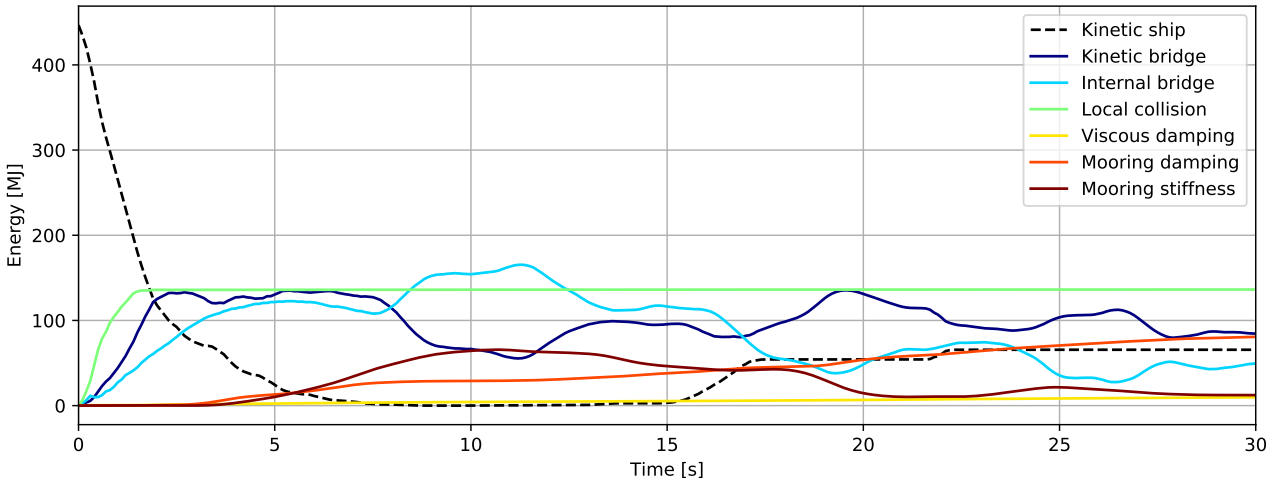


Figure 4.737: Energy [MJ] - initial phase

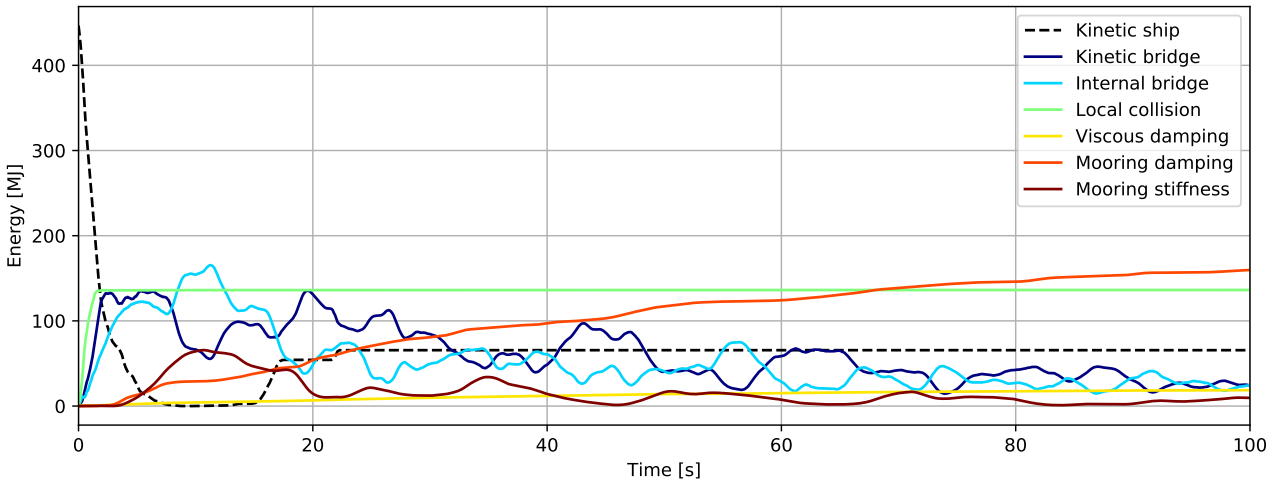


Figure 4.738: Energy [MJ]

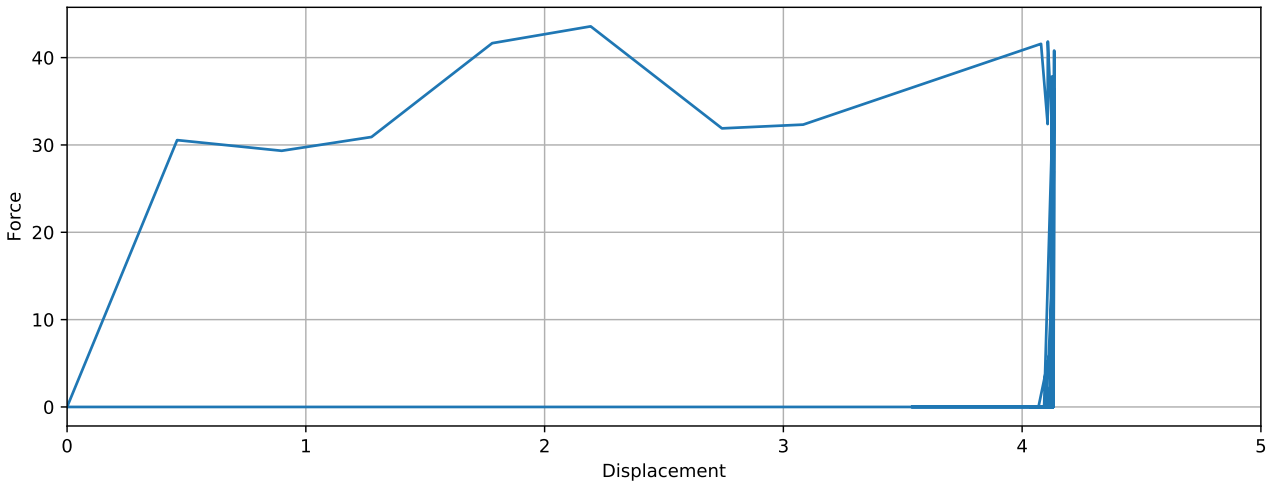


Figure 4.739: Simulated local collision force-displacement

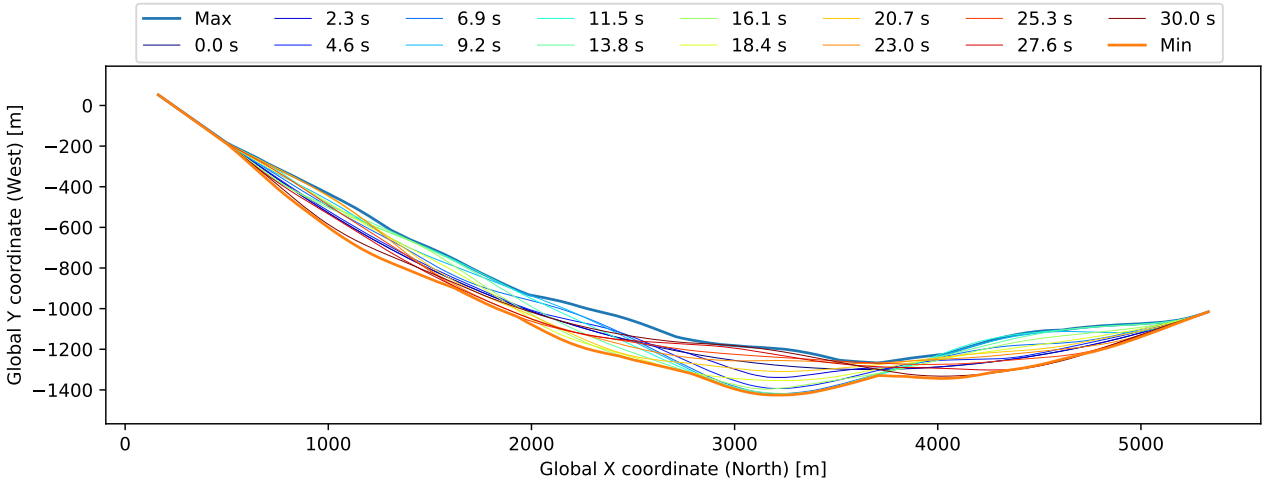


Figure 4.740: Bridgegirder deflection (10x displacment scaling)

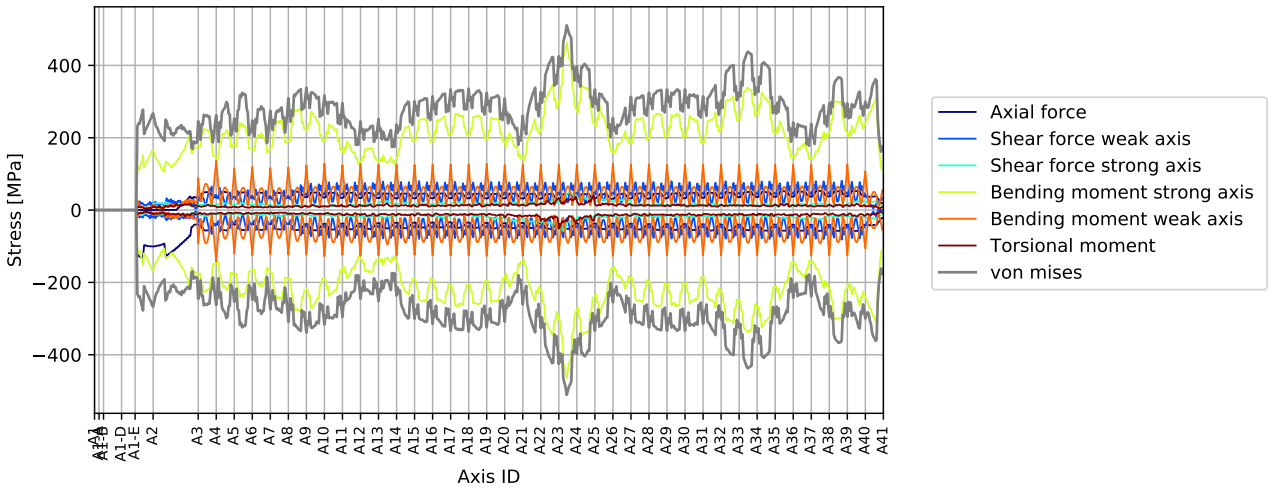


Figure 4.741: Stress envelope from all force components

### 4.17.2 Envelope plots

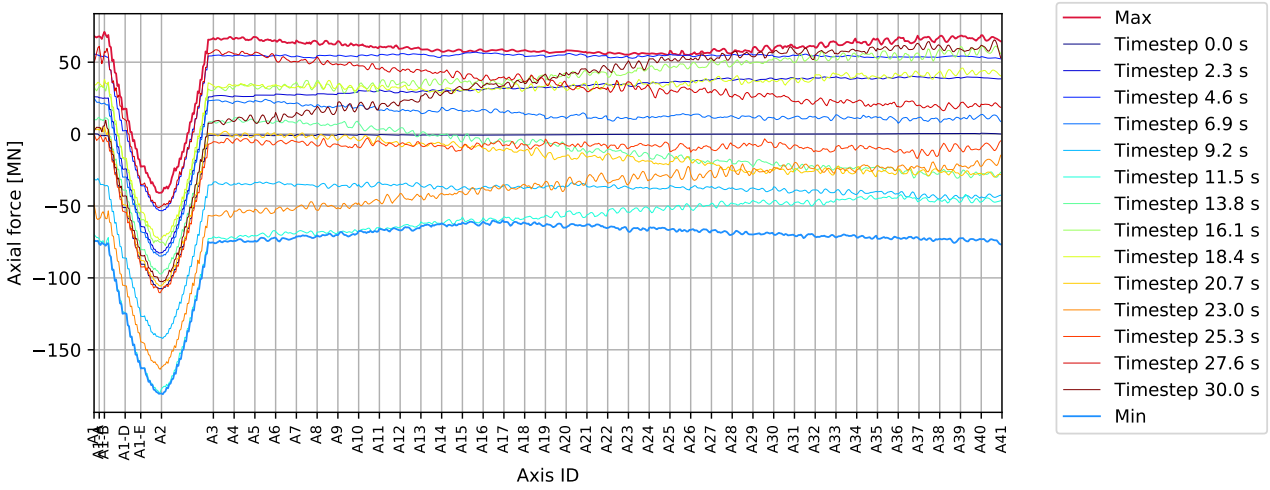


Figure 4.742: DH A23-A24 180deg - bridgegirder : Axial force [MN]

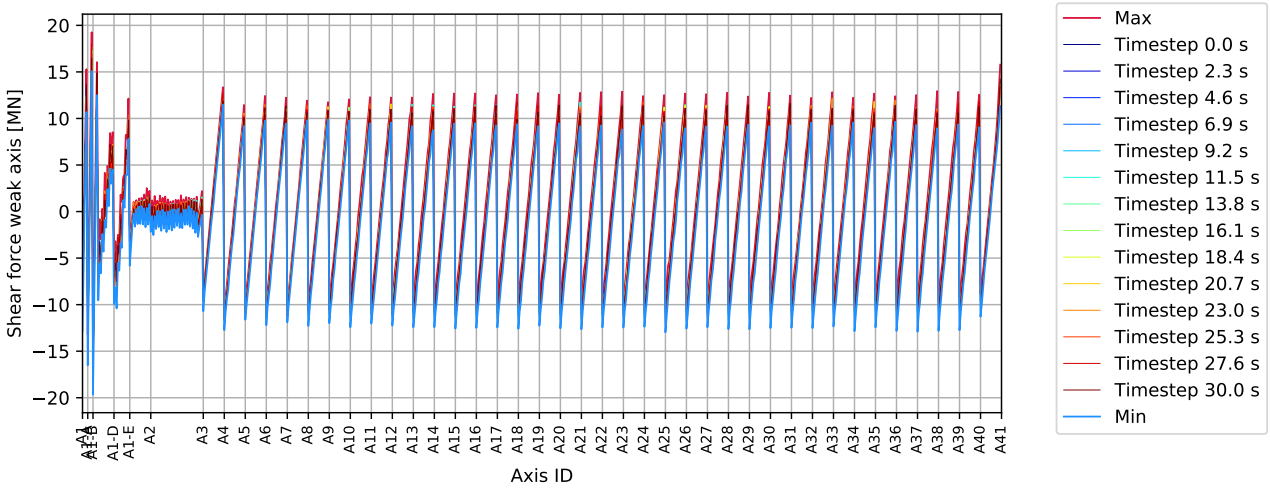


Figure 4.743: DH A23-A24 180deg - bridgegirder : Shear force weak axis [MN]

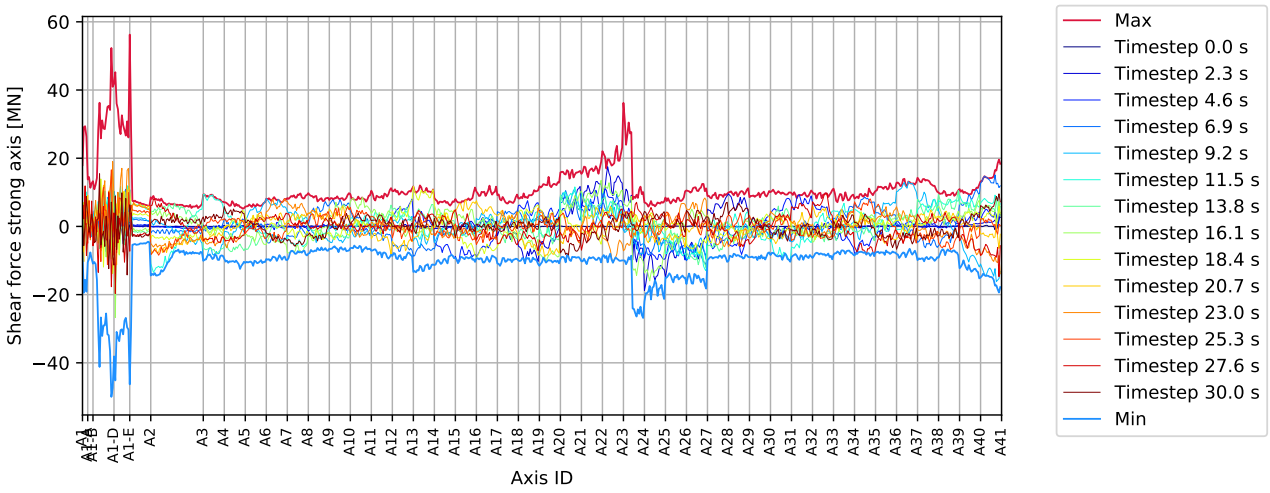


Figure 4.744: DH A23-A24 180deg - bridgegirder : Shear force strong axis [MN]

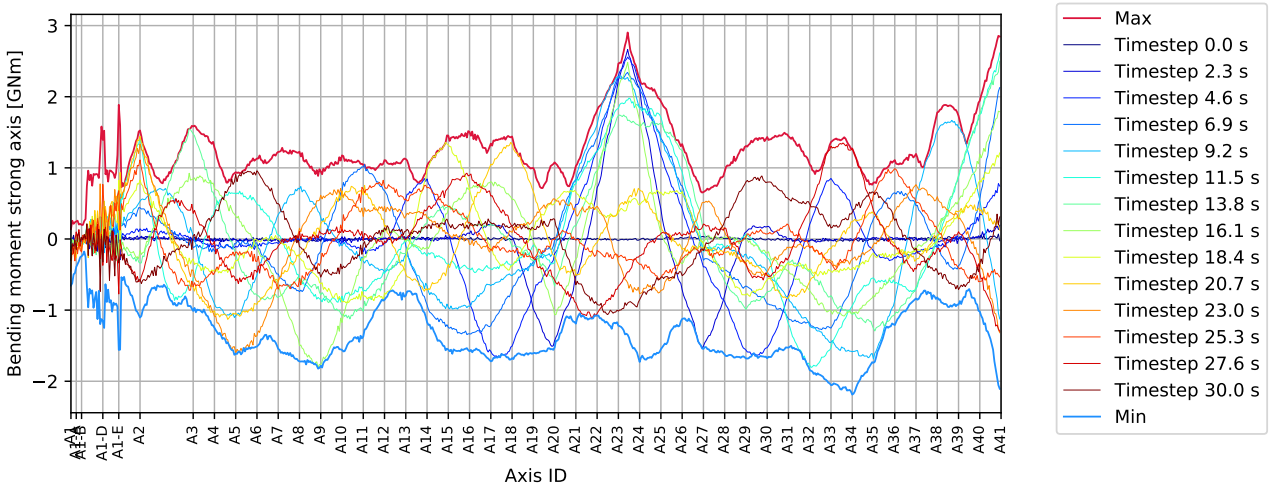


Figure 4.745: DH A23-A24 180deg - bridgegirder : Bending moment strong axis [GNm]

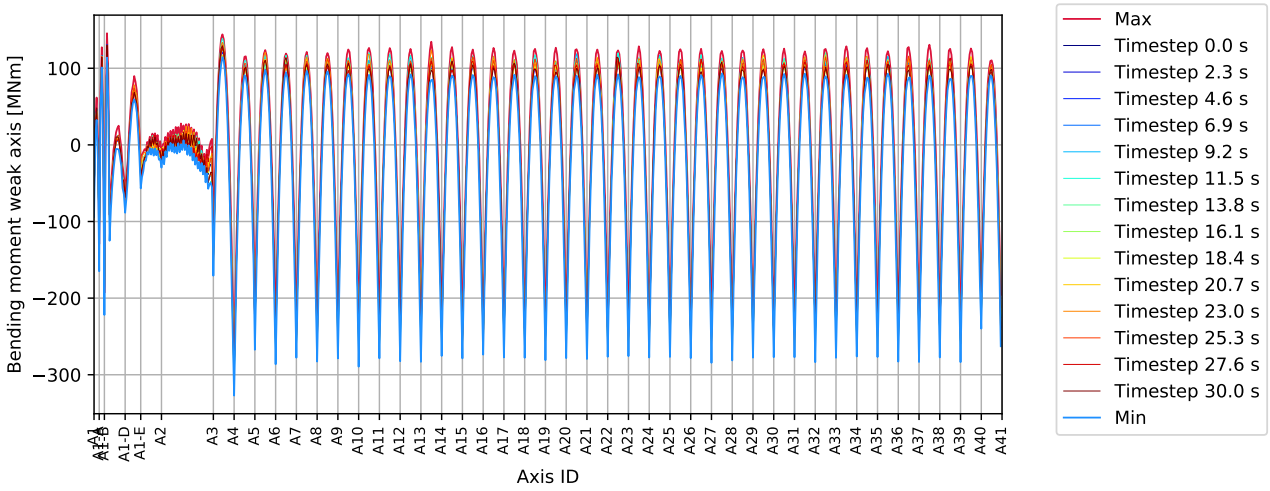


Figure 4.746: DH A23-A24 180deg - bridgegirder : Bending moment weak axis [MNm]

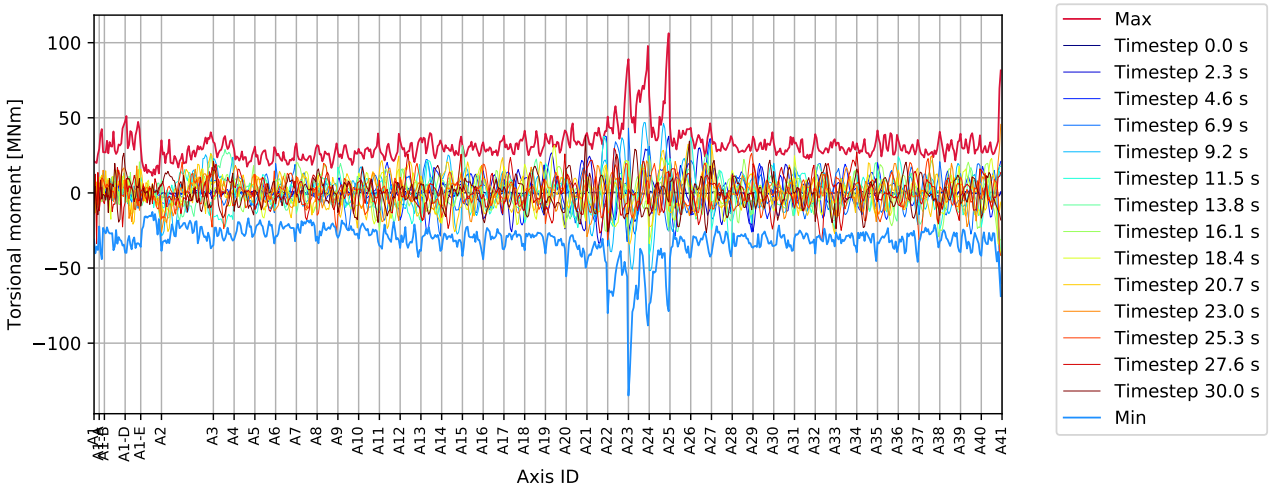


Figure 4.747: DH A23-A24 180deg - bridgegirder : Torsional moment [MNm]

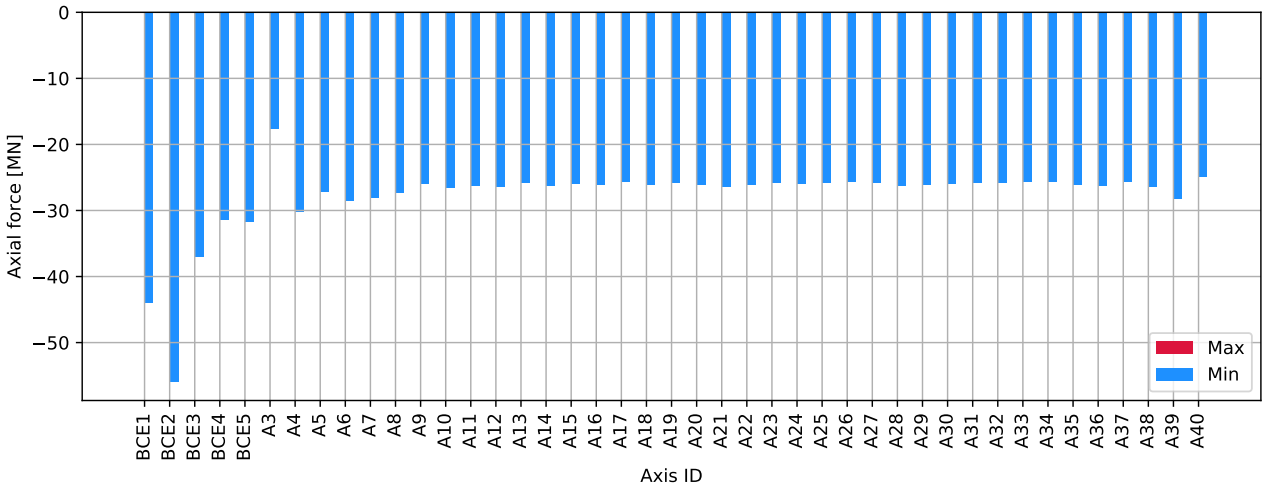


Figure 4.748: DH A23-A24 180deg - columns bottom : Axial force [MN]

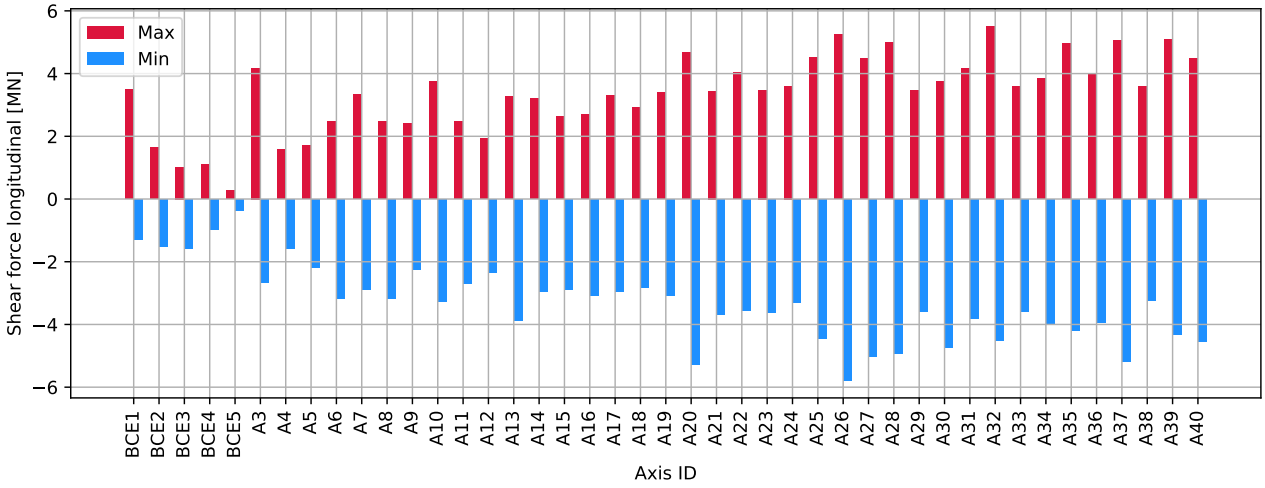


Figure 4.749: DH A23-A24 180deg - columns bottom : Shear force longitudinal [MN]

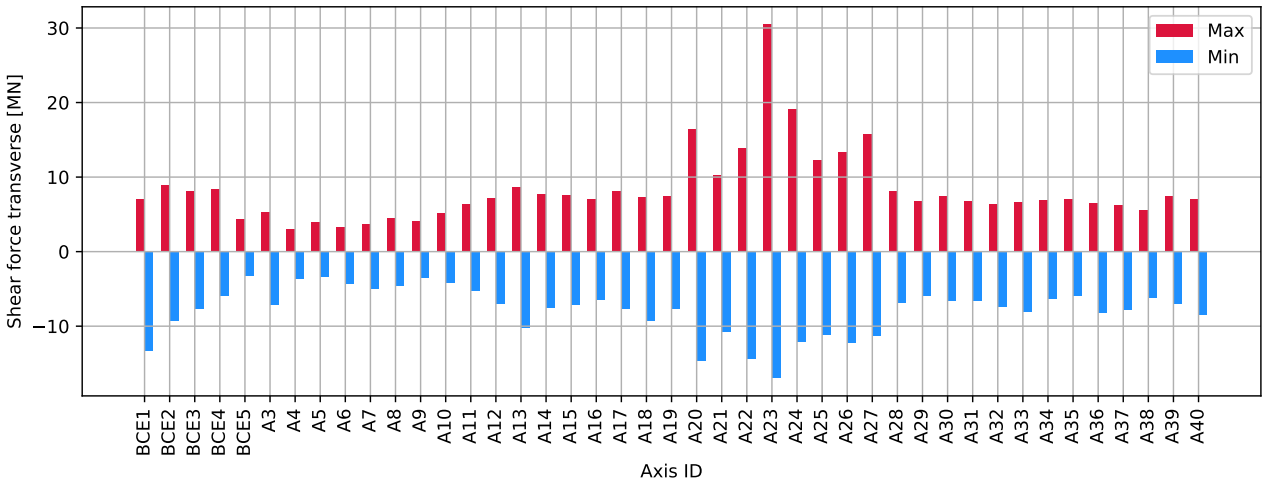


Figure 4.750: DH A23-A24 180deg - columns bottom : Shear force transverse [MN]

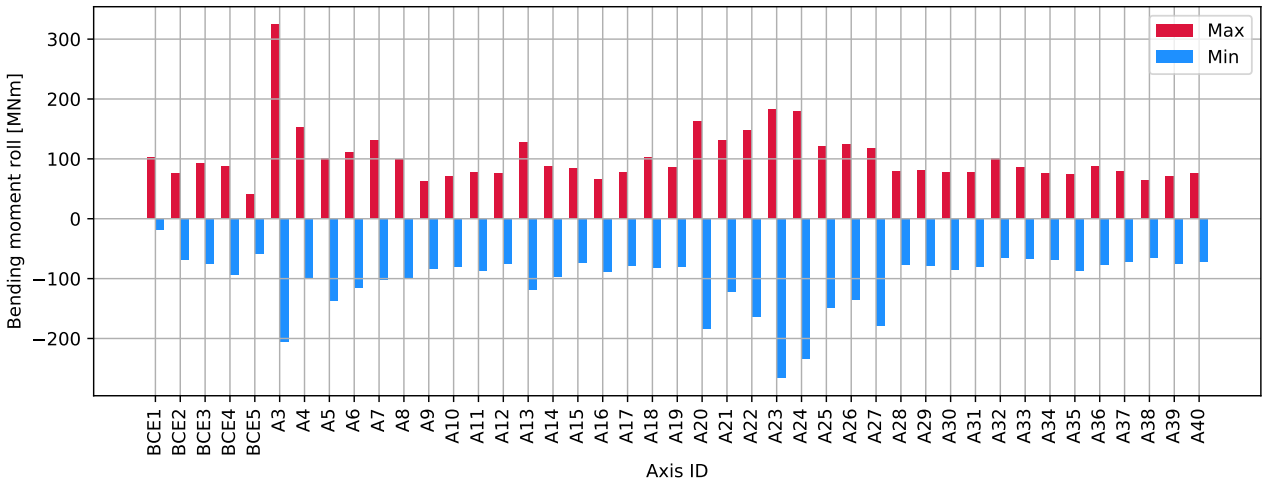


Figure 4.751: DH A23-A24 180deg - columns bottom : Bending moment roll [MNm]

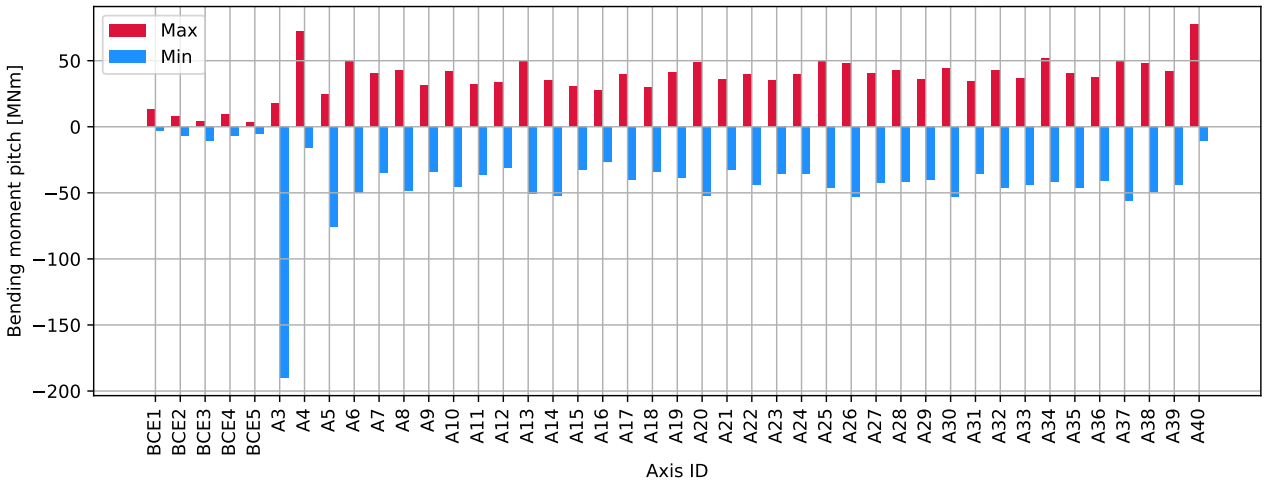


Figure 4.752: DH A23-A24 180deg - columns bottom : Bending moment pitch [MNm]

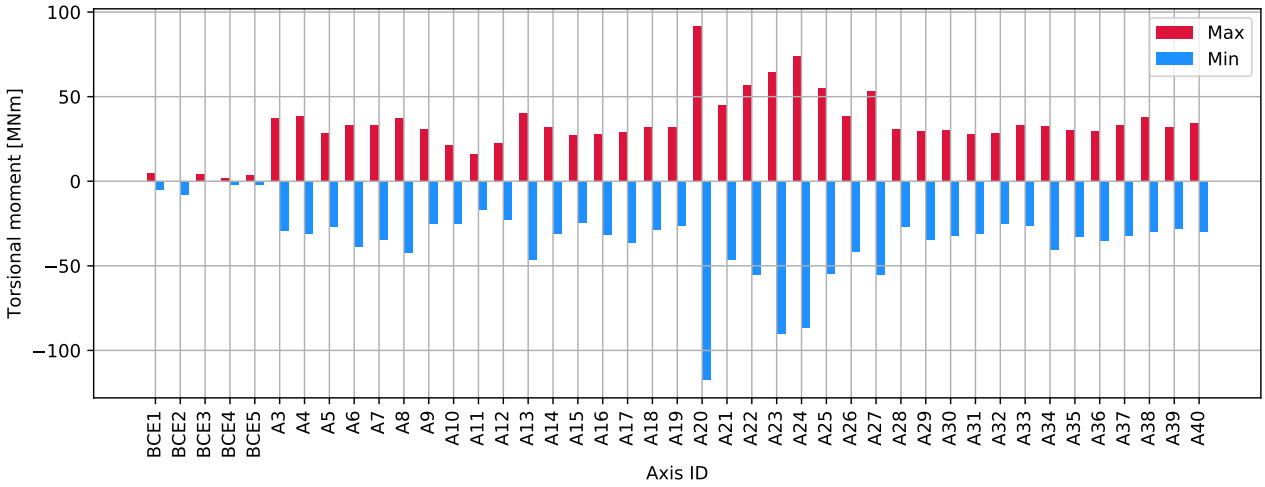


Figure 4.753: DH A23-A24 180deg - columns bottom : Torsional moment [MNm]

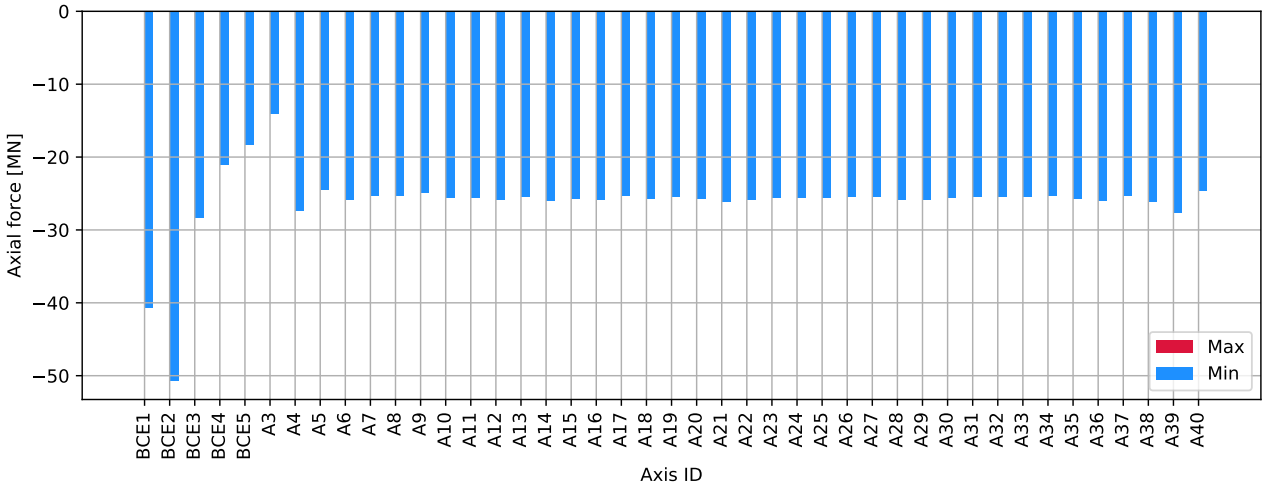


Figure 4.754: DH A23-A24 180deg - columns top : Axial force [MN]

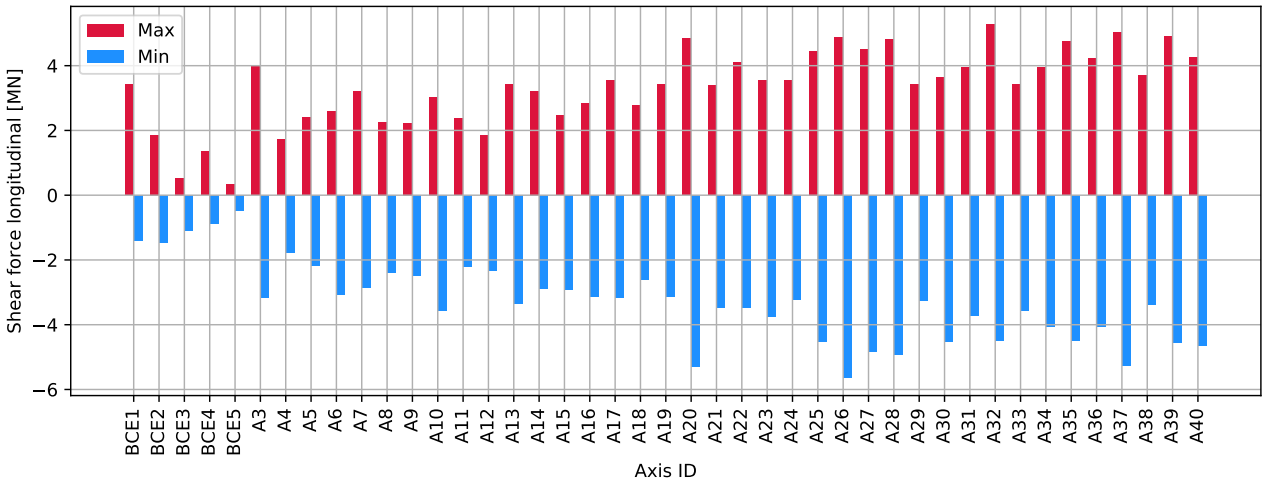


Figure 4.755: DH A23-A24 180deg - columns top : Shear force longitudinal [MN]

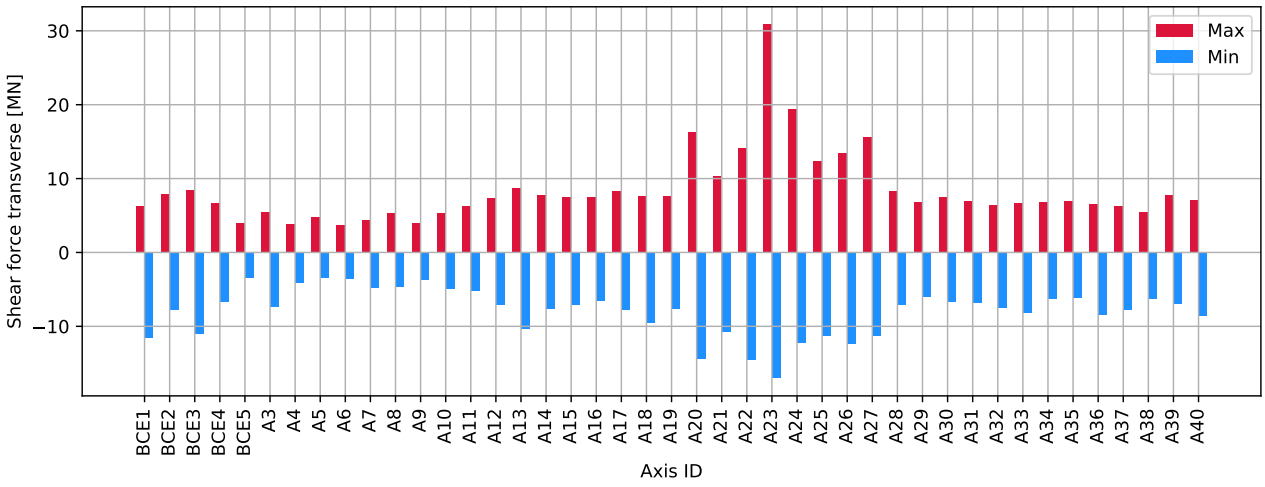


Figure 4.756: DH A23-A24 180deg - columns top : Shear force transverse [MN]

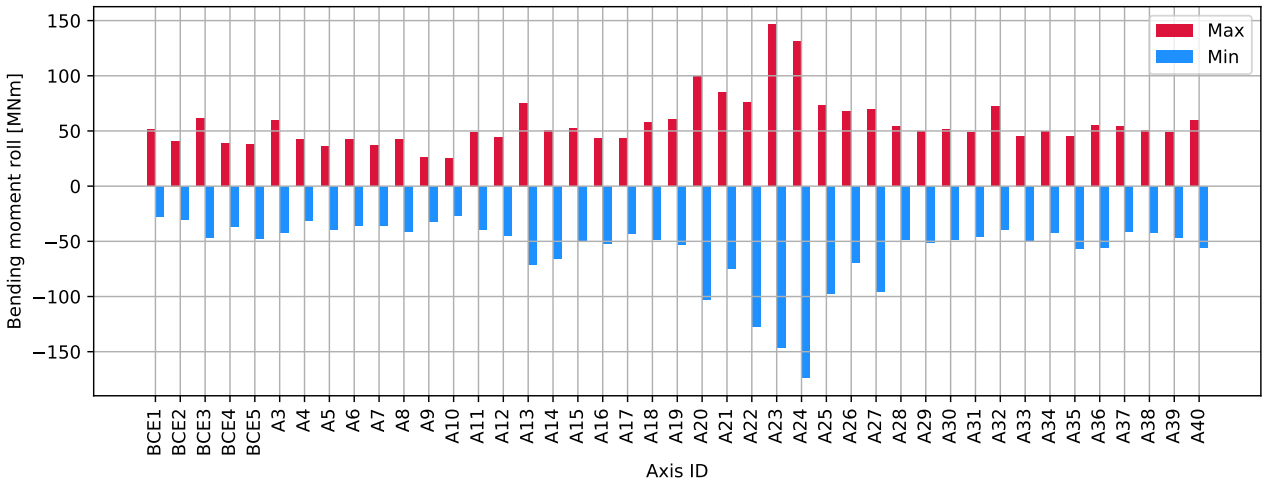


Figure 4.757: DH A23-A24 180deg - columns top : Bending moment roll [MNm]

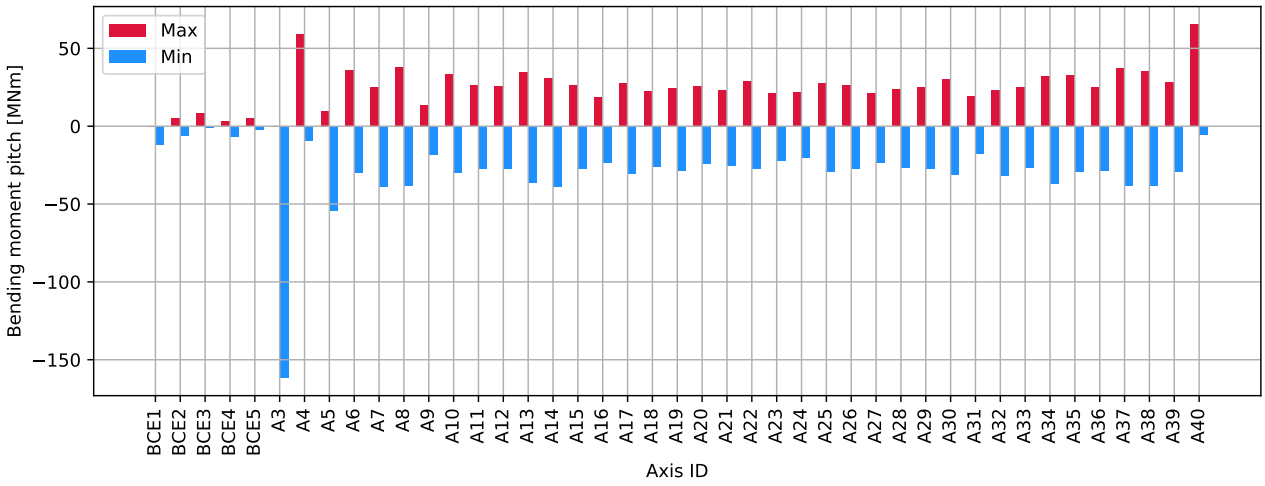


Figure 4.758: DH A23-A24 180deg - columns top : Bending moment pitch [MNm]

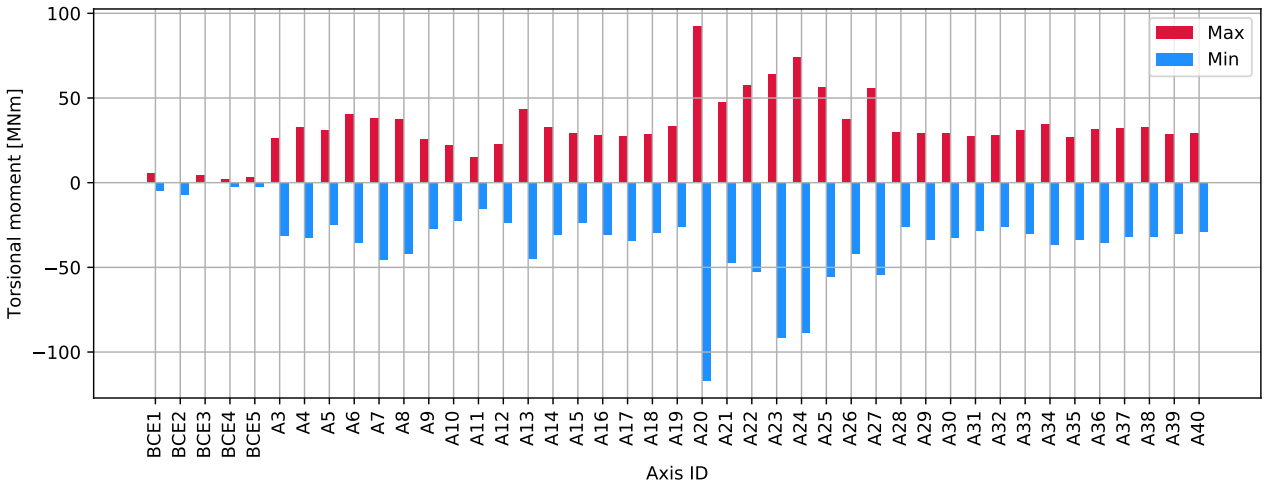


Figure 4.759: DH A23-A24 180deg - columns top : Torsional moment [MNm]

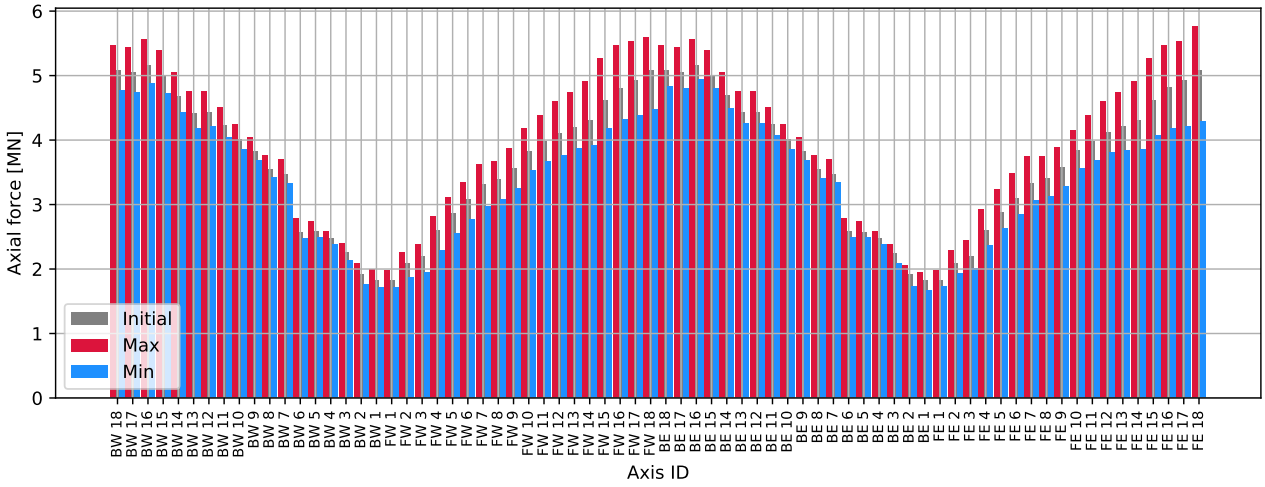


Figure 4.760: DH A23-A24 180deg - cables : Axial force [MN]

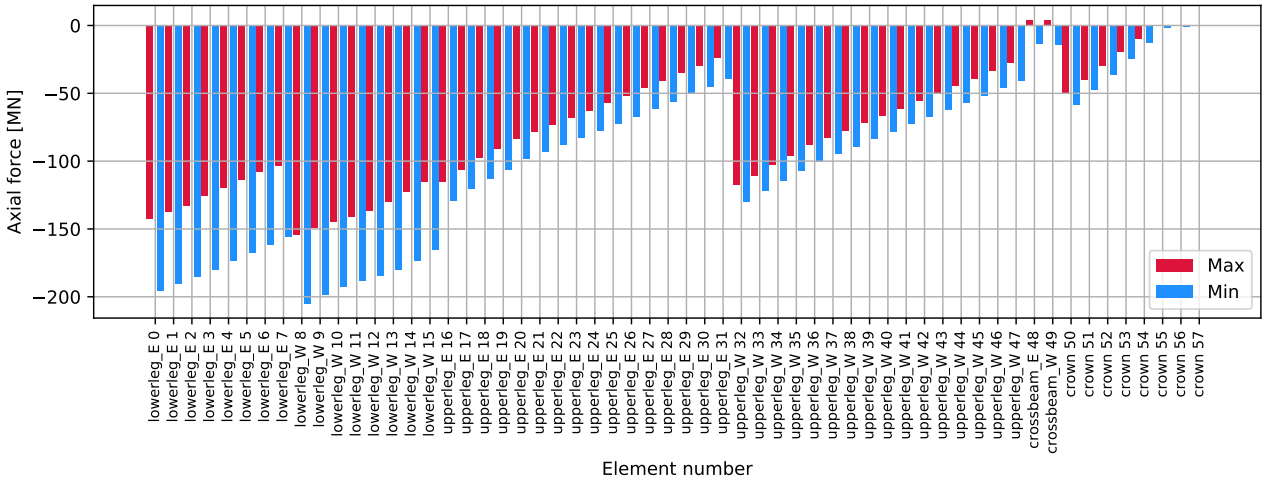


Figure 4.761: DH A23-A24 180deg - tower: Axial force [MN]

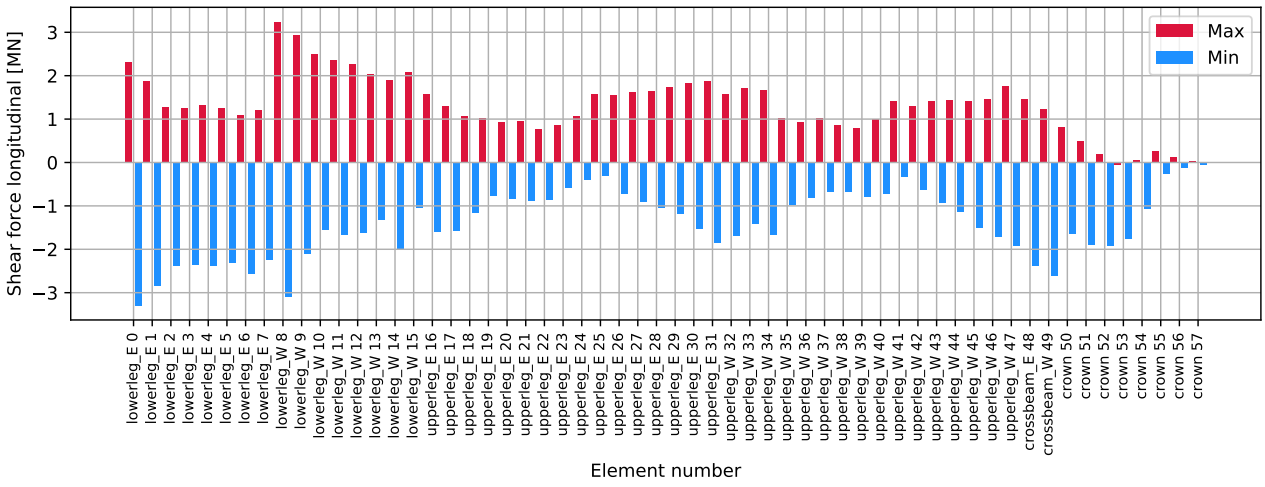


Figure 4.762: DH A23-A24 180deg - tower: Shear force longitudinal [MN]

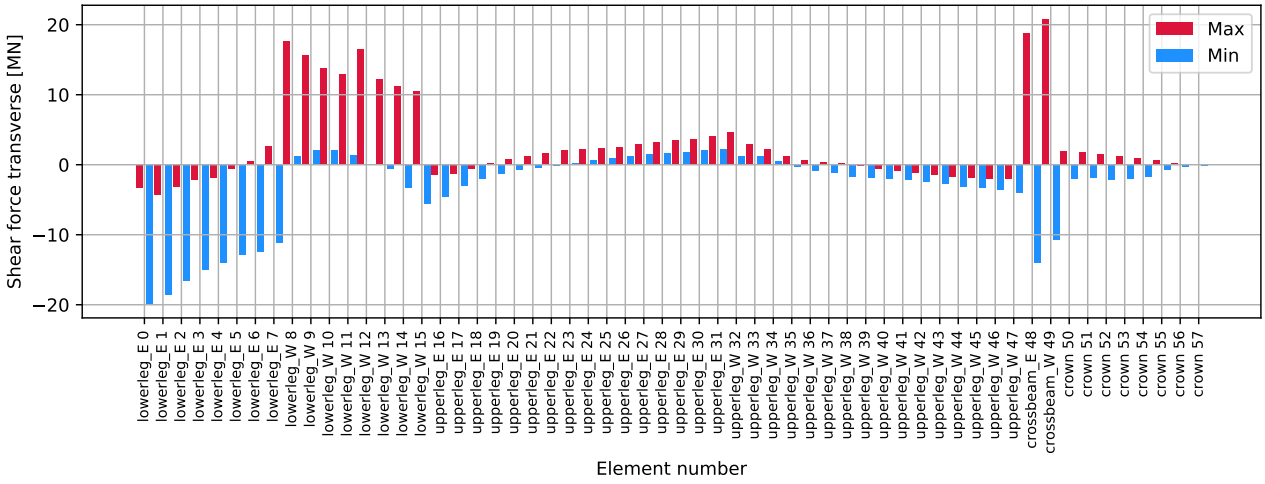


Figure 4.763: DH A23-A24 180deg - tower: Shear force transverse [MN]

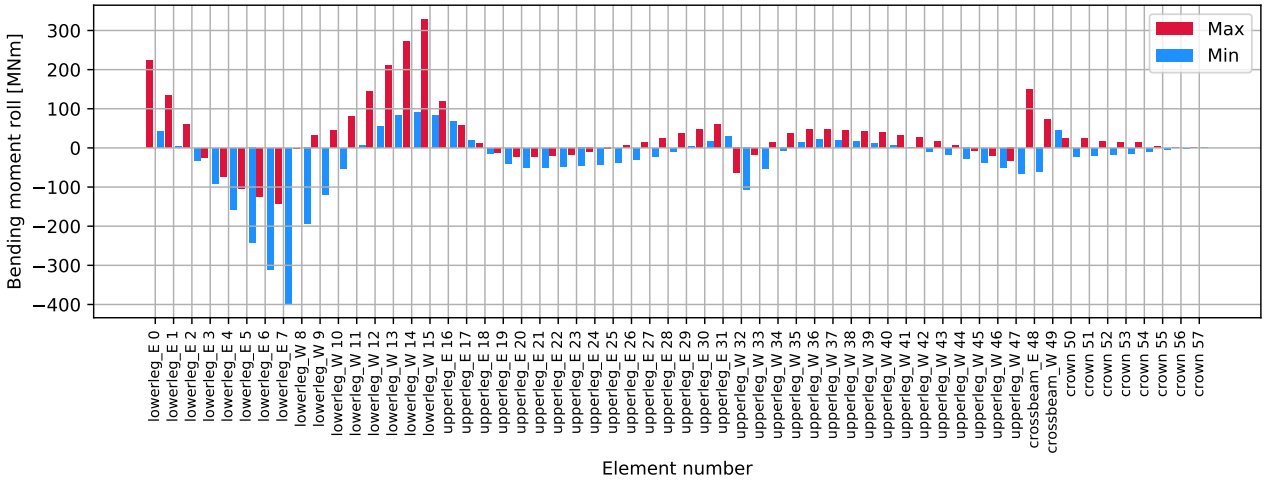


Figure 4.764: DH A23-A24 180deg - tower: Bending moment roll [MNm]

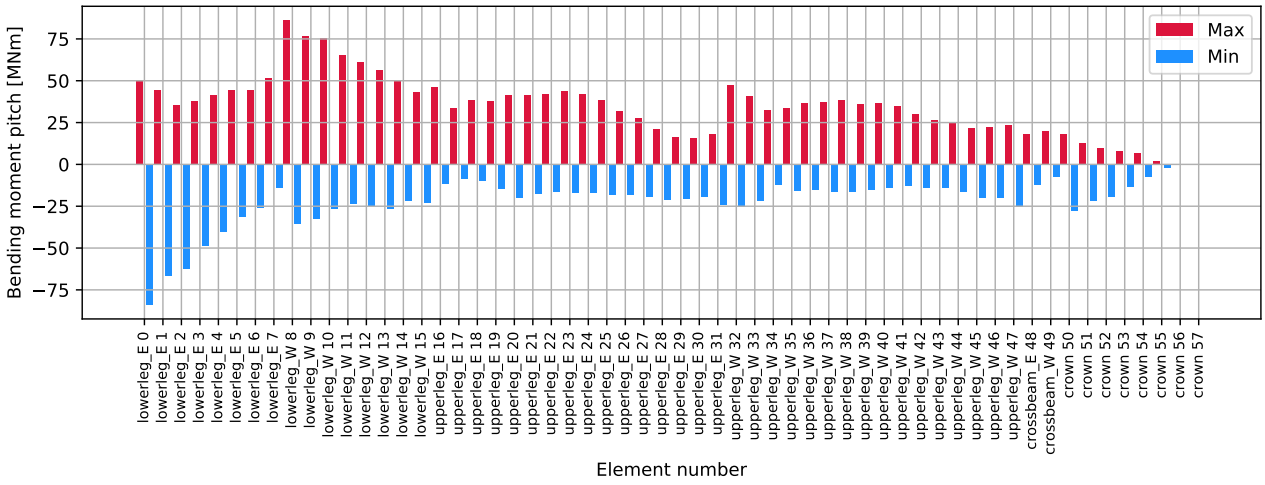


Figure 4.765: DH A23-A24 180deg - tower: Bending moment pitch [MNm]

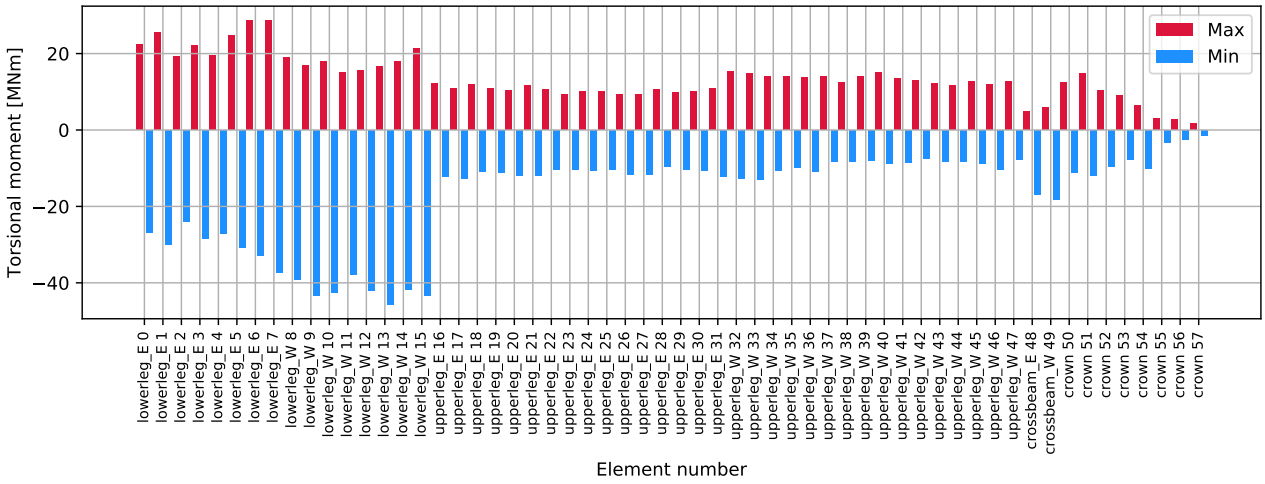


Figure 4.766: DH A23-A24 180deg - tower: Torsional moment [MNm]

### 4.17.3 Time series

Note : Time series are filtered using a Saviotzky-Golay filter for increased readability of the time history plots. Hence, maximum values that occur due to a rapid vibration are not shown in the plots. For maximum values, refer to the tabulated data.
All elements are numbered from South to North, bottom to top

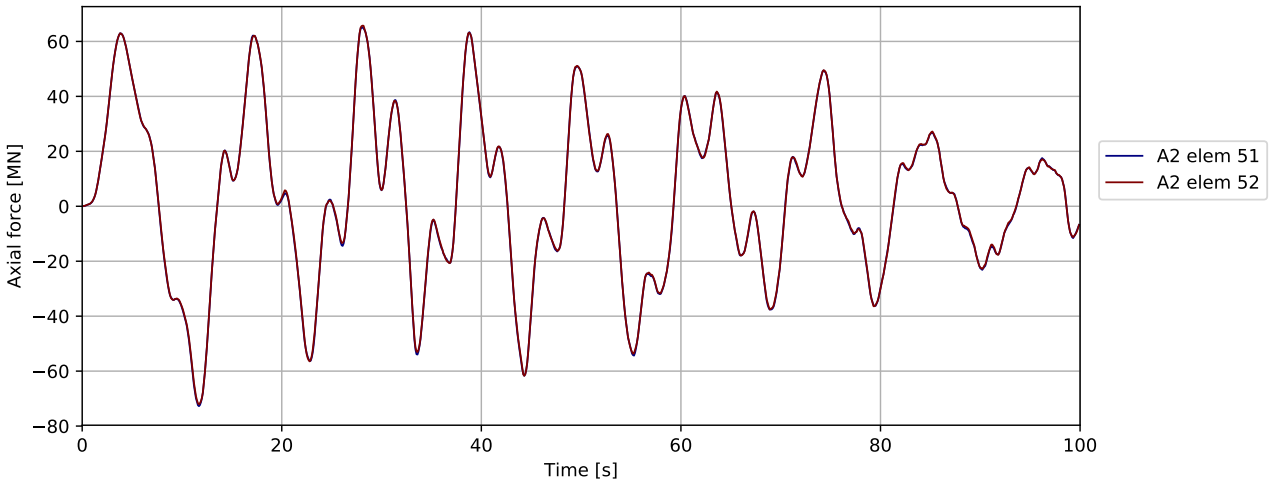


Figure 4.767: DH A23-A24 180deg - bridgegirder @ pylon: Axial force [MN]

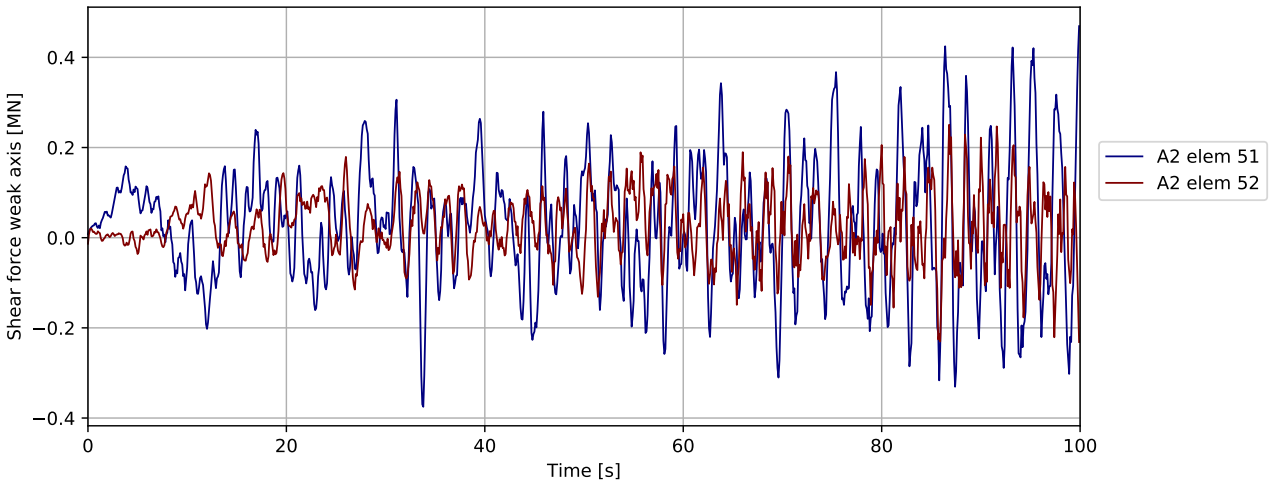


Figure 4.768: DH A23-A24 180deg - bridgegirder @ pylon: Shear force weak axis [MN]

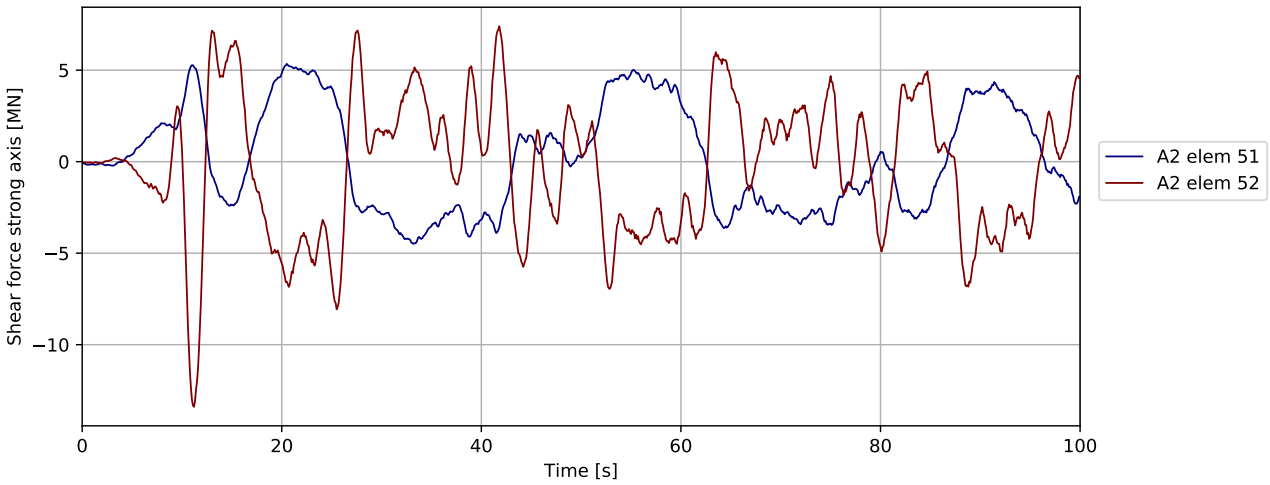


Figure 4.769: DH A23-A24 180deg - bridgegirder @ pylon: Shear force strong axis [MN]

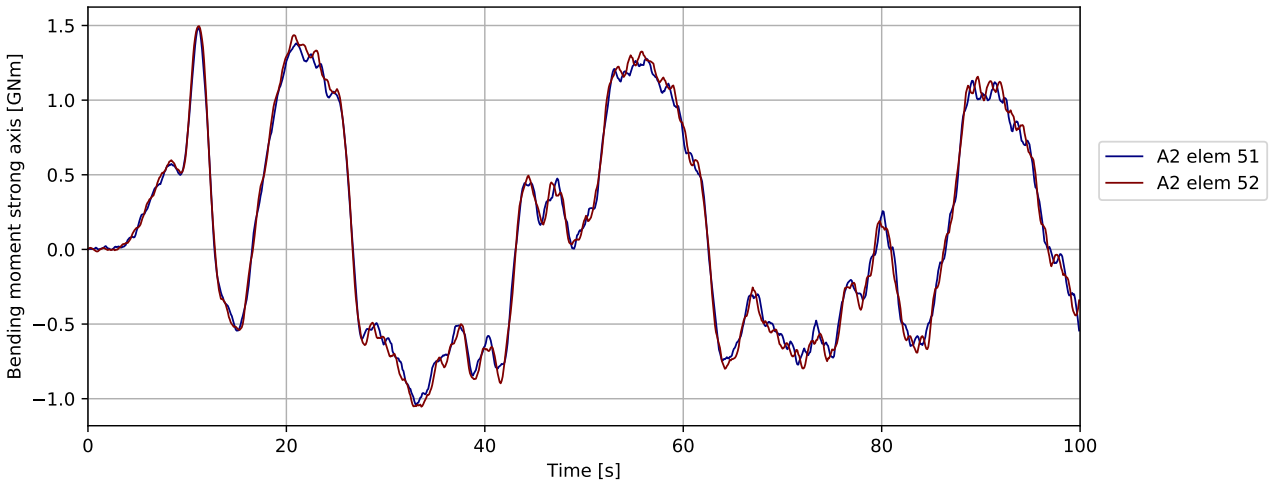


Figure 4.770: DH A23-A24 180deg - bridgegirder @ pylon: Bending moment strong axis [GNm]

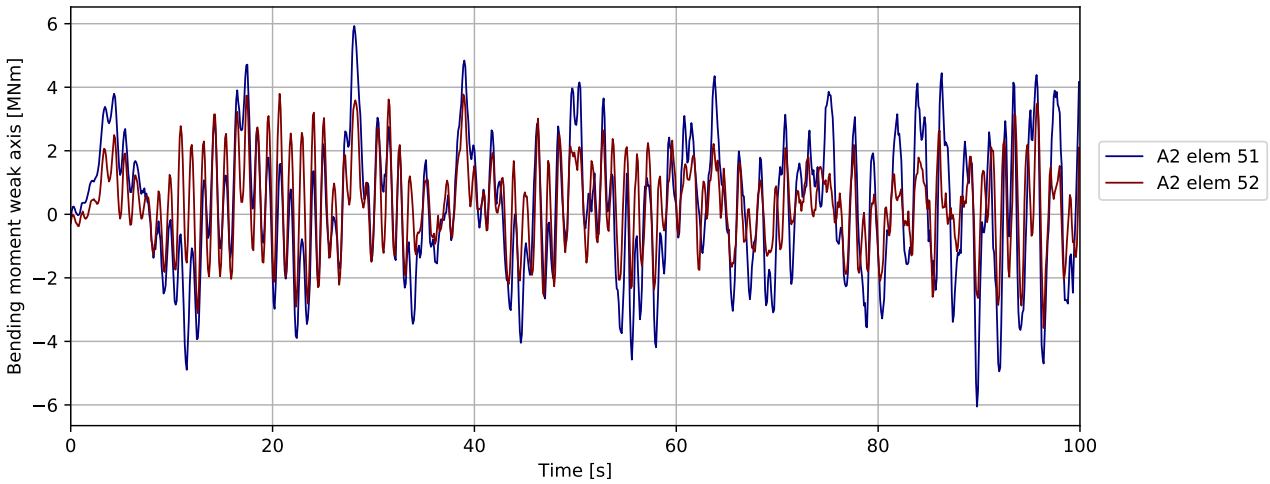


Figure 4.771: DH A23-A24 180deg - bridgegirder @ pylon: Bending moment weak axis [MNm]

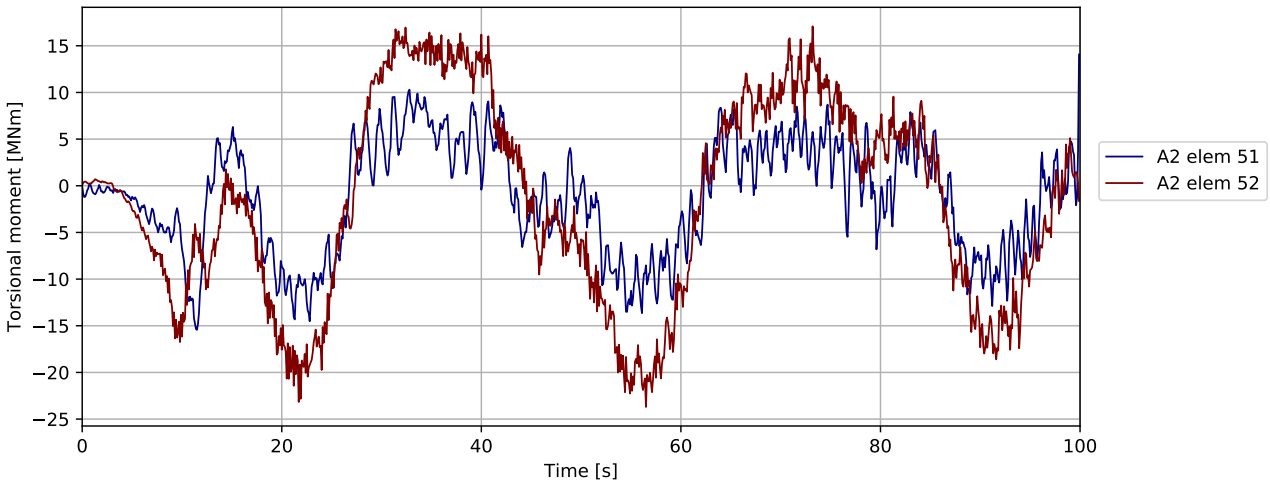


Figure 4.772: DH A23-A24 180deg - bridgegirder @ pylon: Torsional moment [MNm]

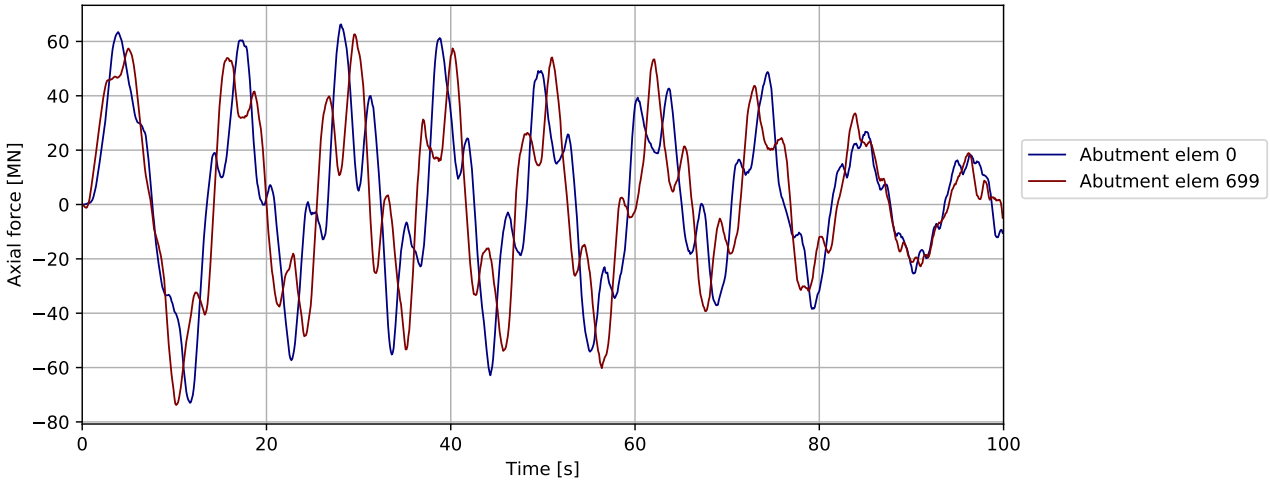


Figure 4.773: DH A23-A24 180deg - bridgegirder @abutments: Axial force [MN]

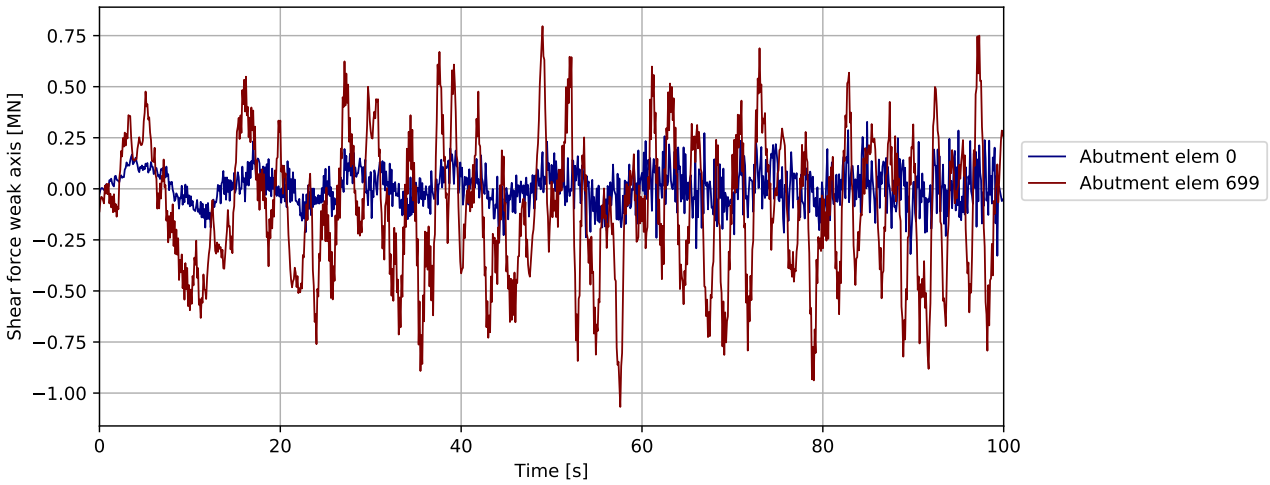


Figure 4.774: DH A23-A24 180deg - bridgegirder @abutments: Shear force weak axis [MN]

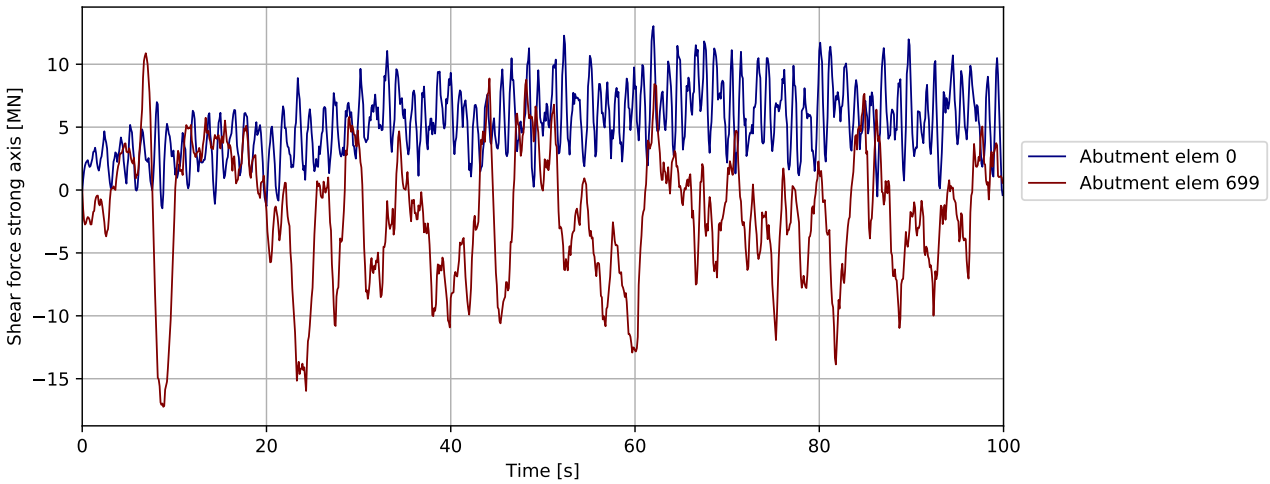


Figure 4.775: DH A23-A24 180deg - bridgegirder @abutments: Shear force strong axis [MN]

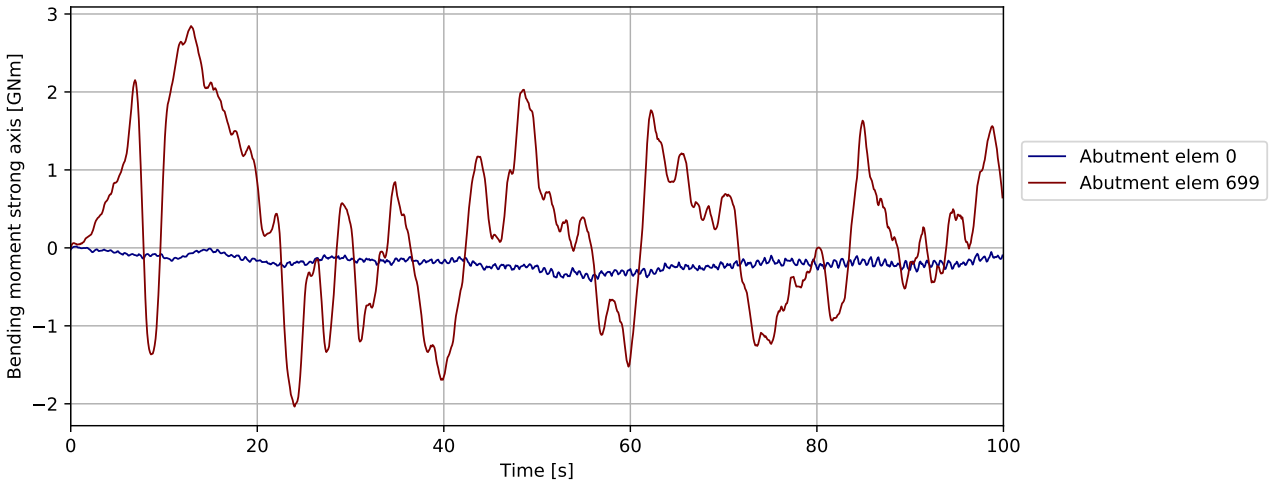


Figure 4.776: DH A23-A24 180deg - bridgegirder @abutments: Bending moment strong axis [GNm]

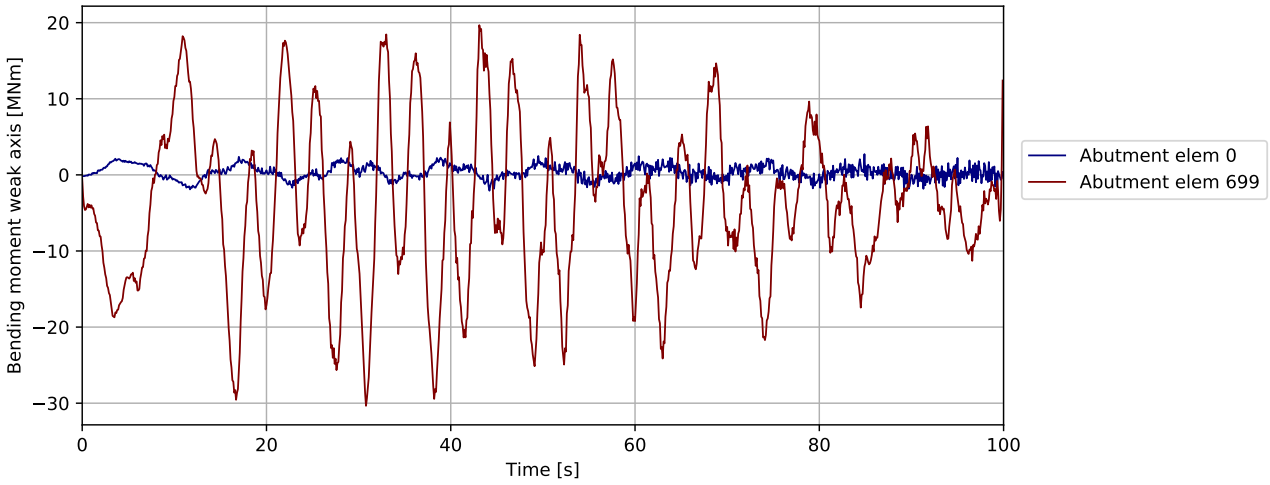


Figure 4.777: DH A23-A24 180deg - bridgegirder @abutments: Bending moment weak axis [MNm]

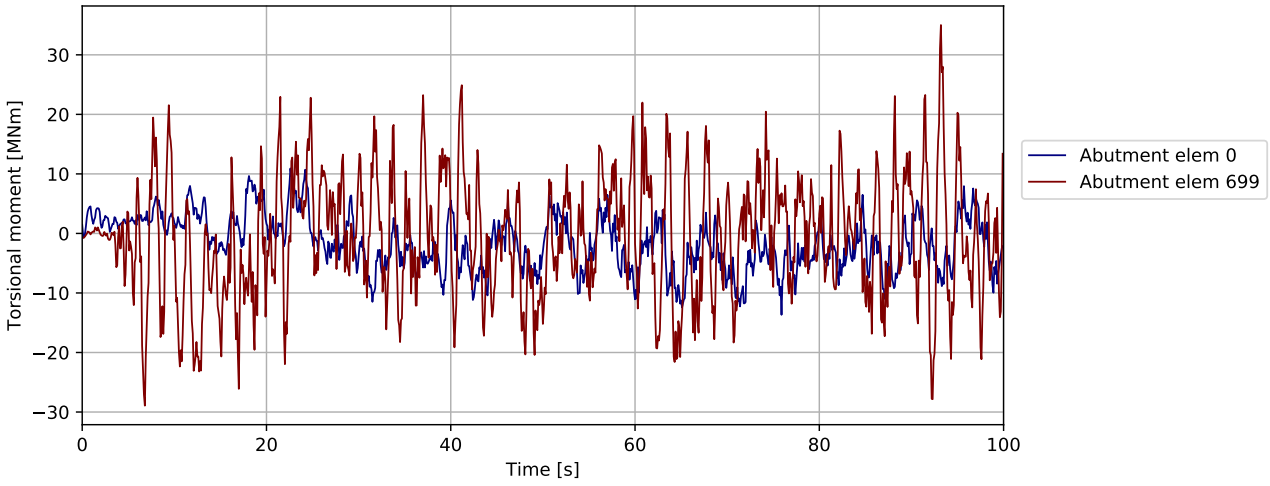


Figure 4.778: DH A23-A24 180deg - bridgegirder @abutments: Torsional moment [MNm]

Note : Compressive spring force is negative

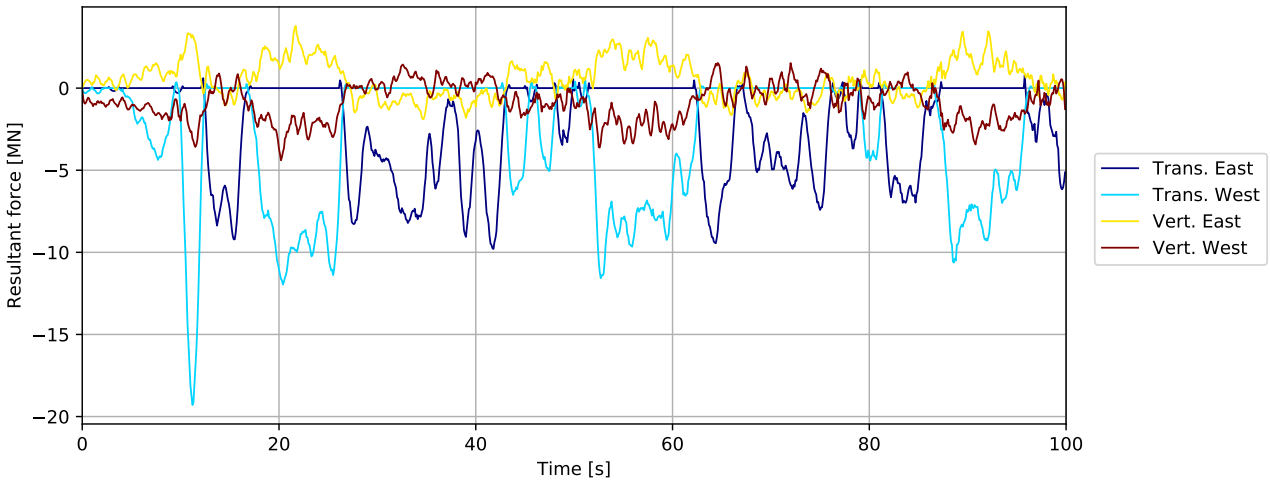


Figure 4.779: DH A23-A24 180deg - bridgegirder supports in tower: Resultant force [MN]

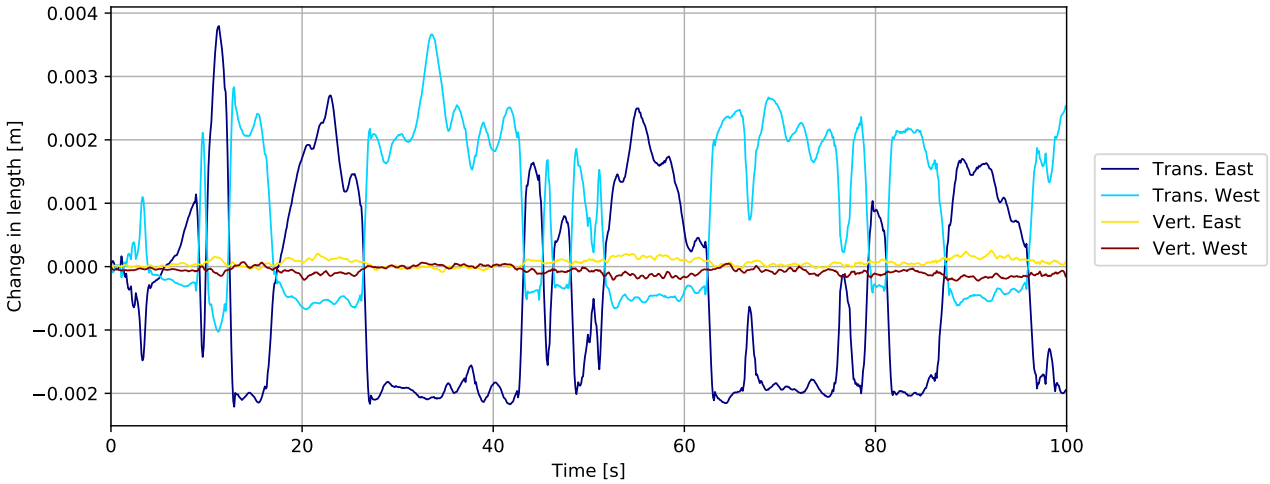


Figure 4.780: DH A23-A24 180deg - bridgegirder supports in tower: Change in length [m]

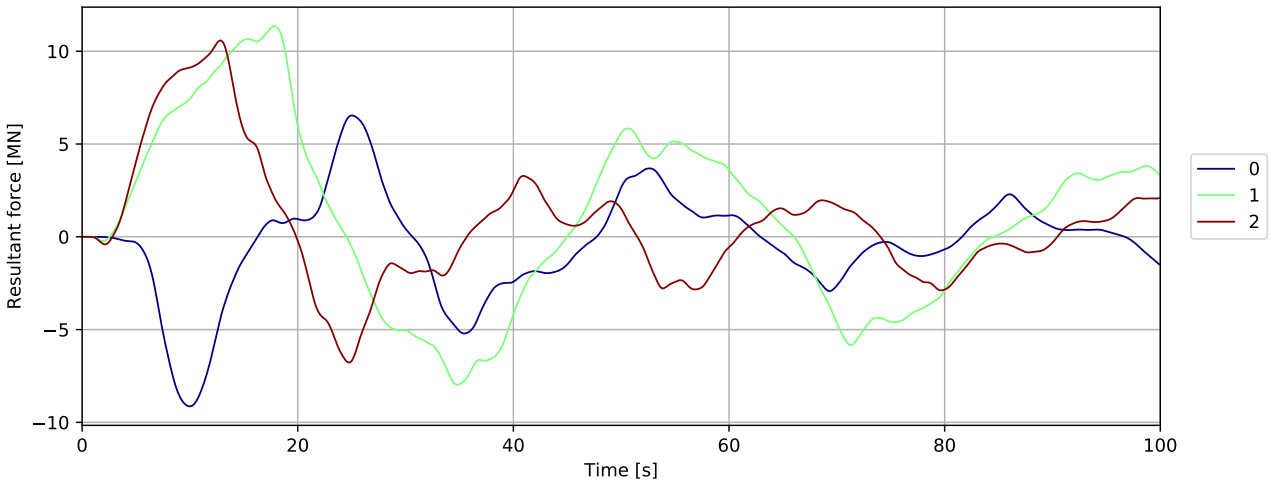


Figure 4.781: Mooring force

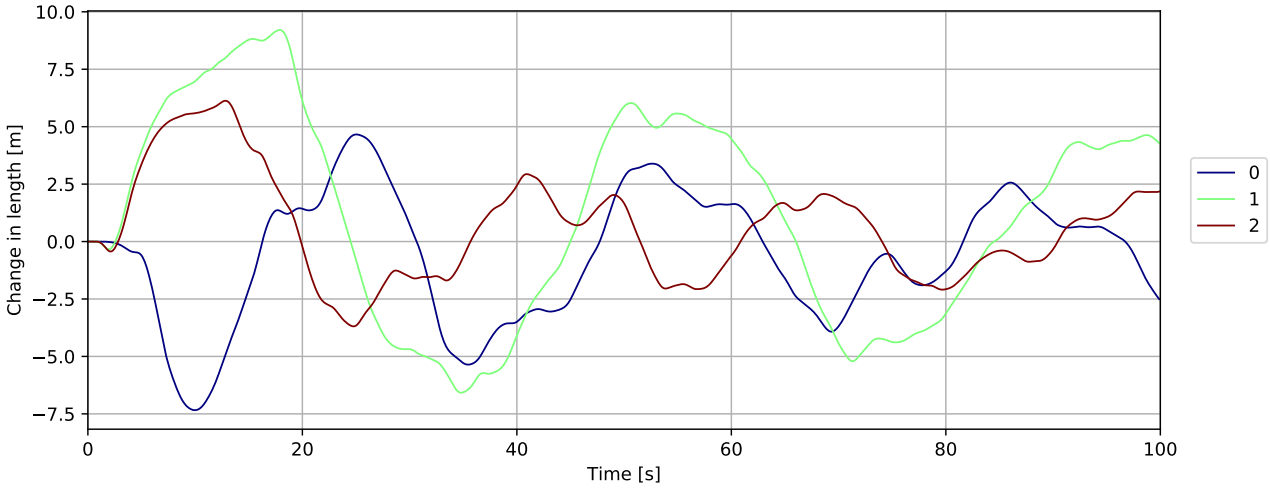


Figure 4.782: Mooring displacement

## 4.18 Deck house A27-A28 180deg

### 4.18.1 Overall response

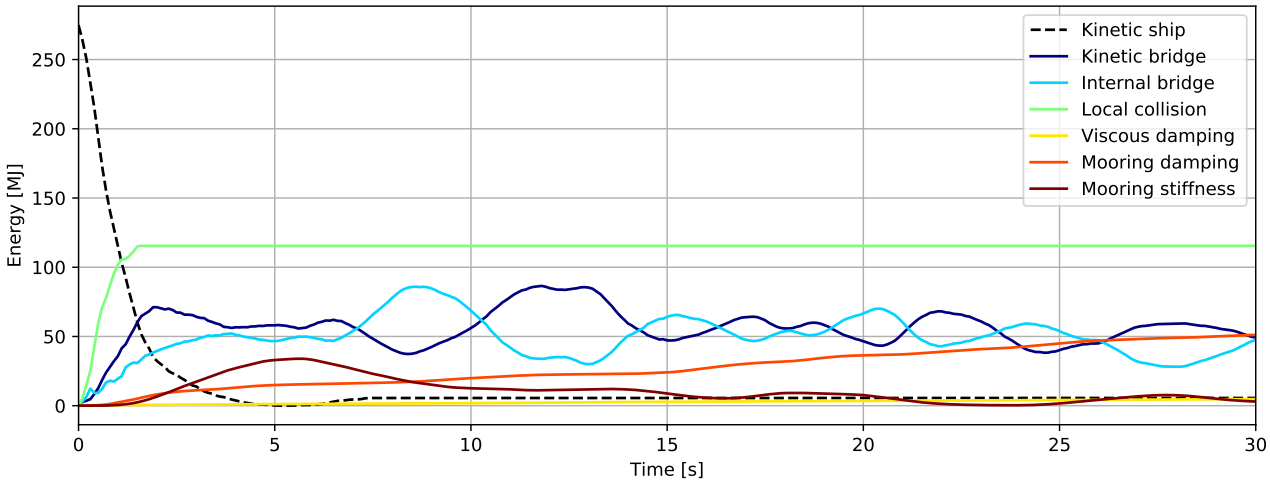


Figure 4.783: Energy [MJ] - initial phase

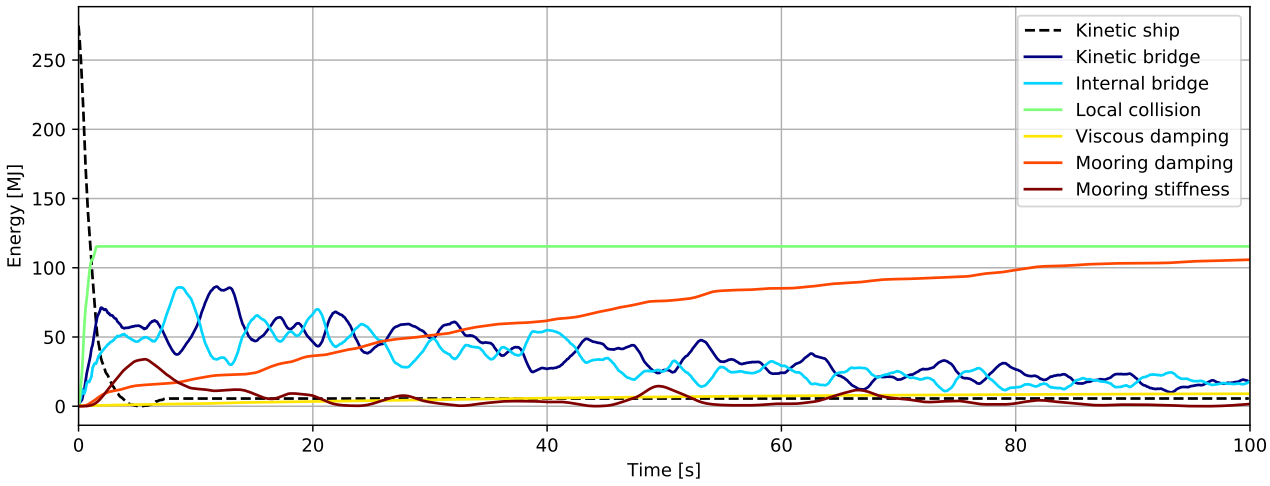


Figure 4.784: Energy [MJ]

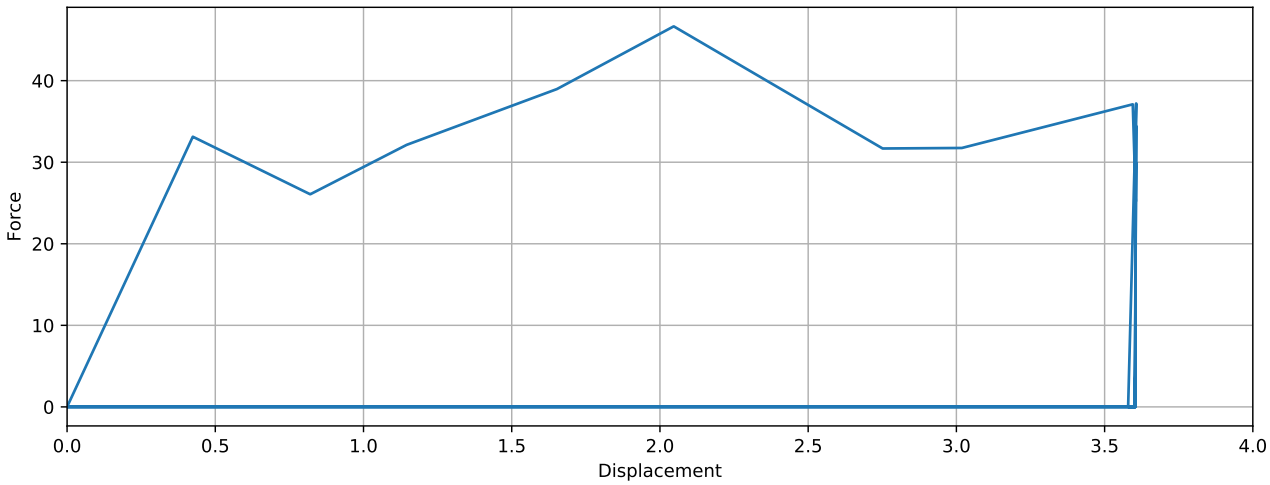


Figure 4.785: Simulated local collision force-displacement

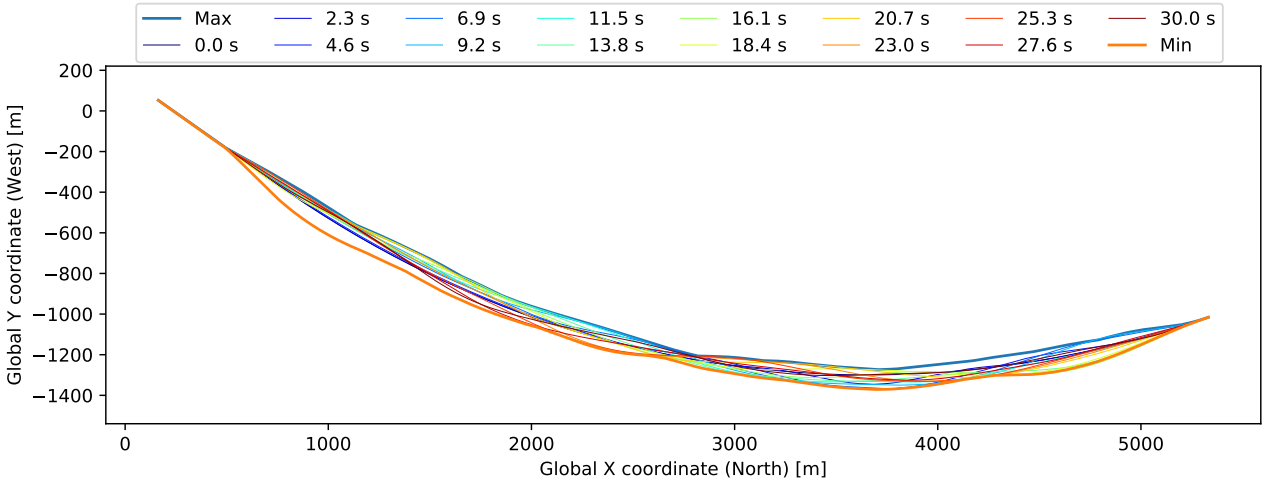


Figure 4.786: Bridgegirder deflection (10x displacment scaling)

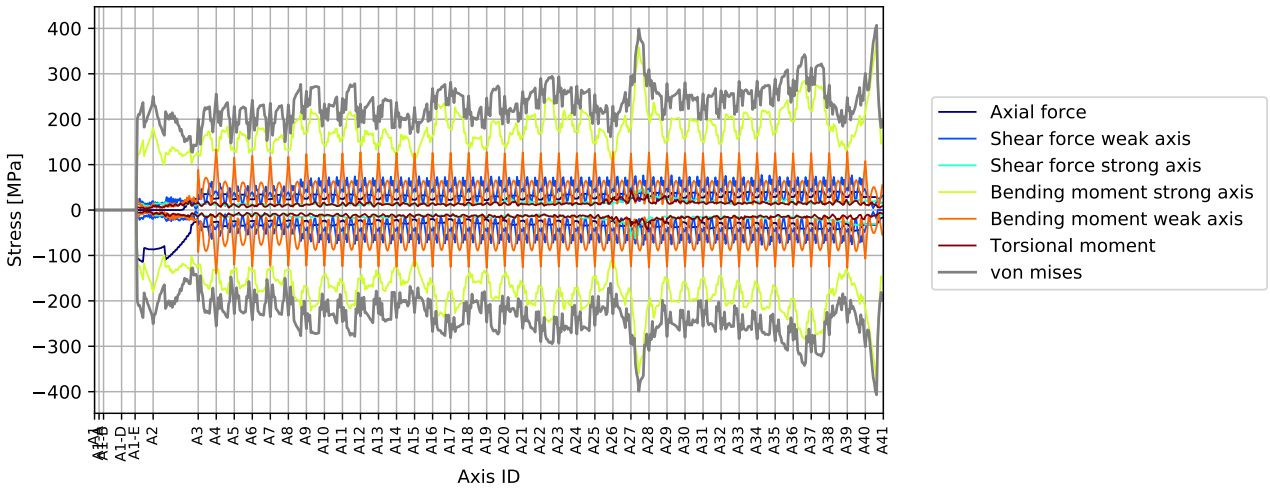


Figure 4.787: Stress envelope from all force components

### 4.18.2 Envelope plots

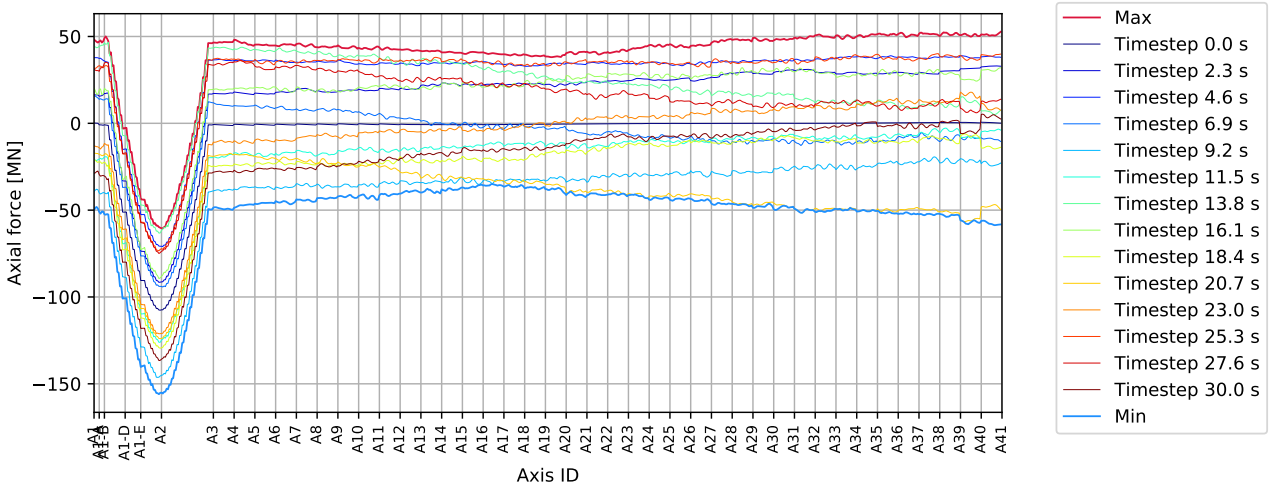


Figure 4.788: DH A27-A28 180deg - bridgegirder : Axial force [MN]

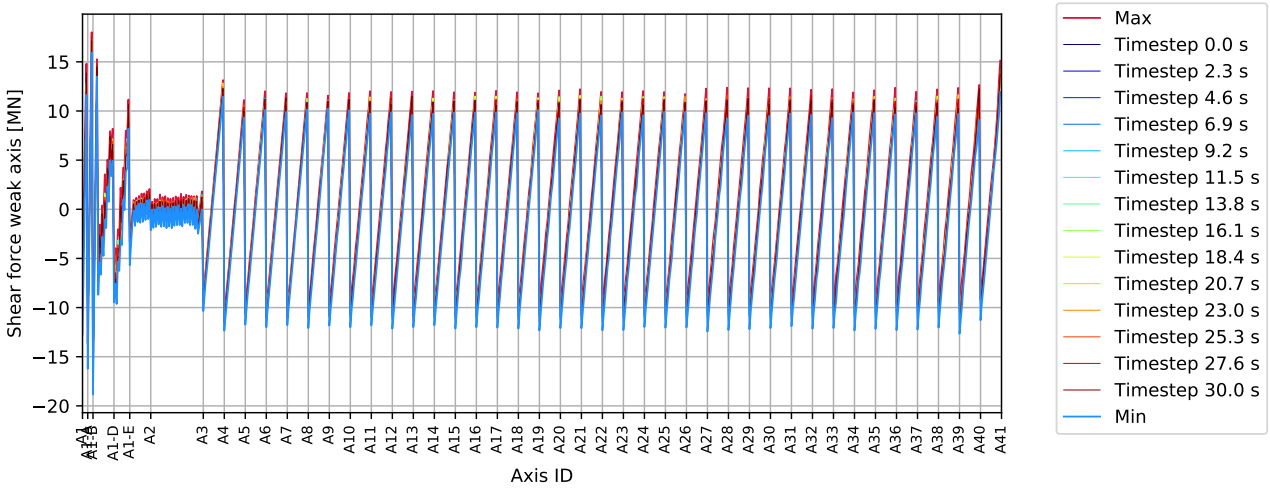


Figure 4.789: DH A27-A28 180deg - bridgegirder : Shear force weak axis [MN]

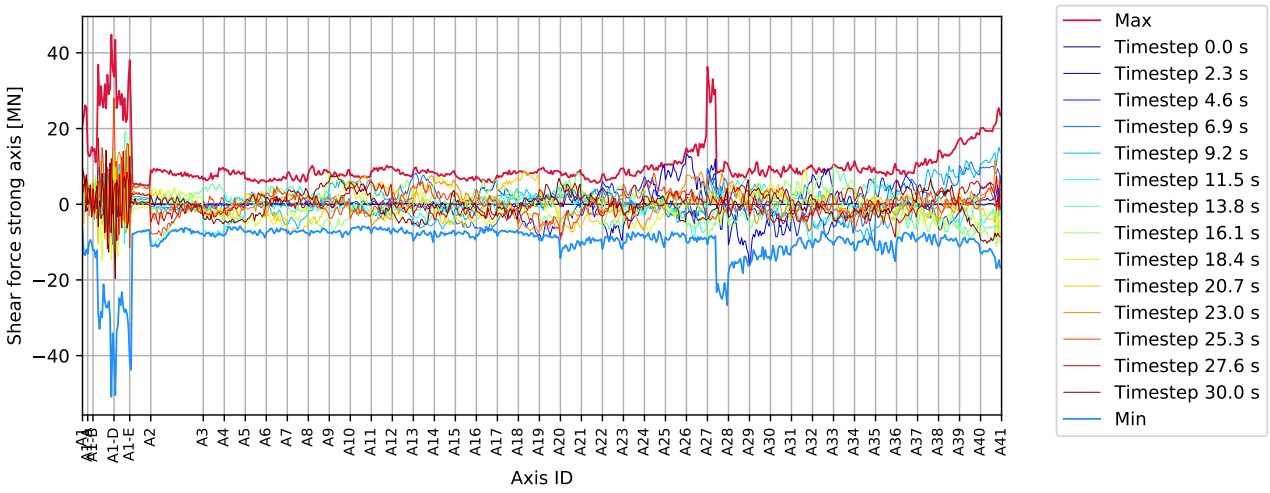


Figure 4.790: DH A27-A28 180deg - bridgegirder : Shear force strong axis [MN]

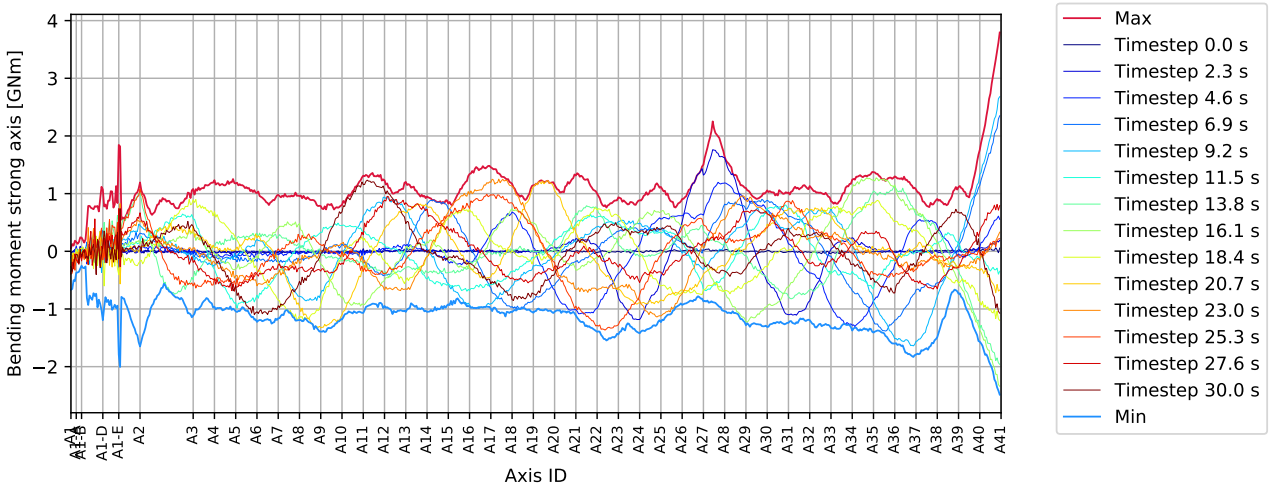


Figure 4.791: DH A27-A28 180deg - bridgegirder : Bending moment strong axis [GNm]

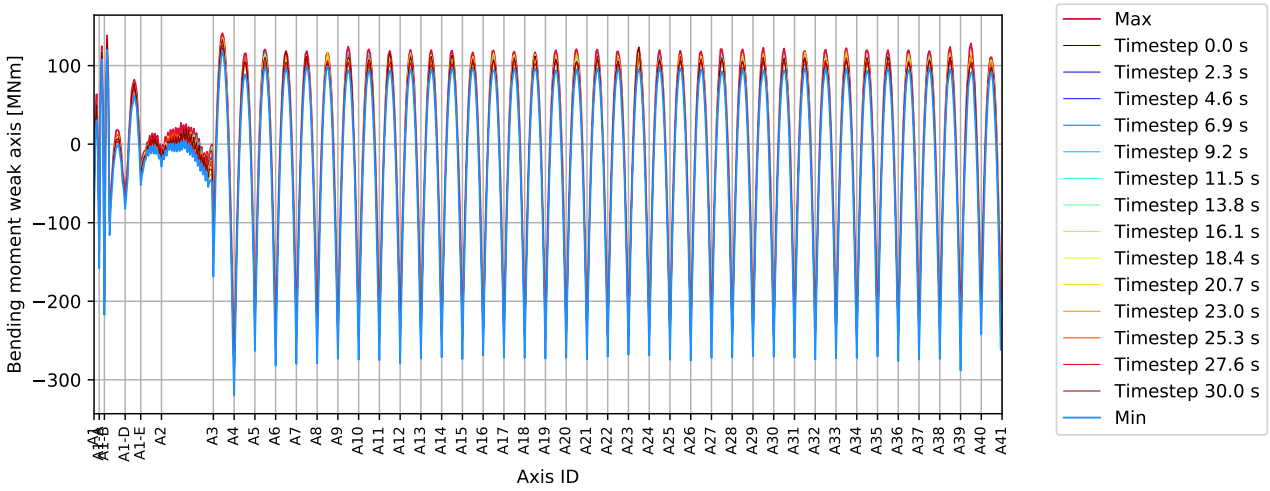


Figure 4.792: DH A27-A28 180deg - bridgegirder : Bending moment weak axis [MNm]

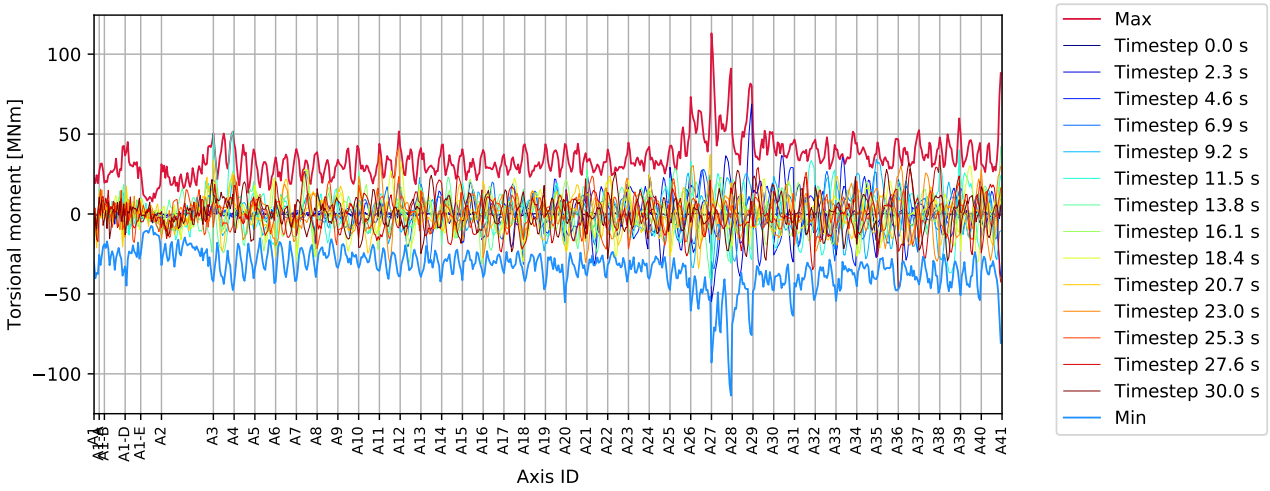


Figure 4.793: DH A27-A28 180deg - bridgegirder : Torsional moment [MNm]

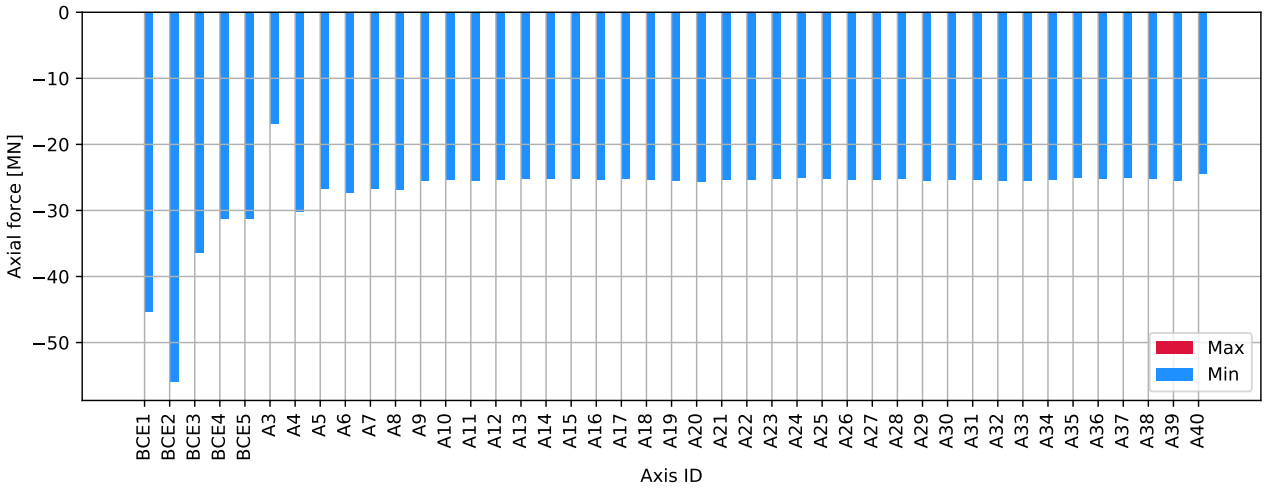


Figure 4.794: DH A27-A28 180deg - columns bottom : Axial force [MN]

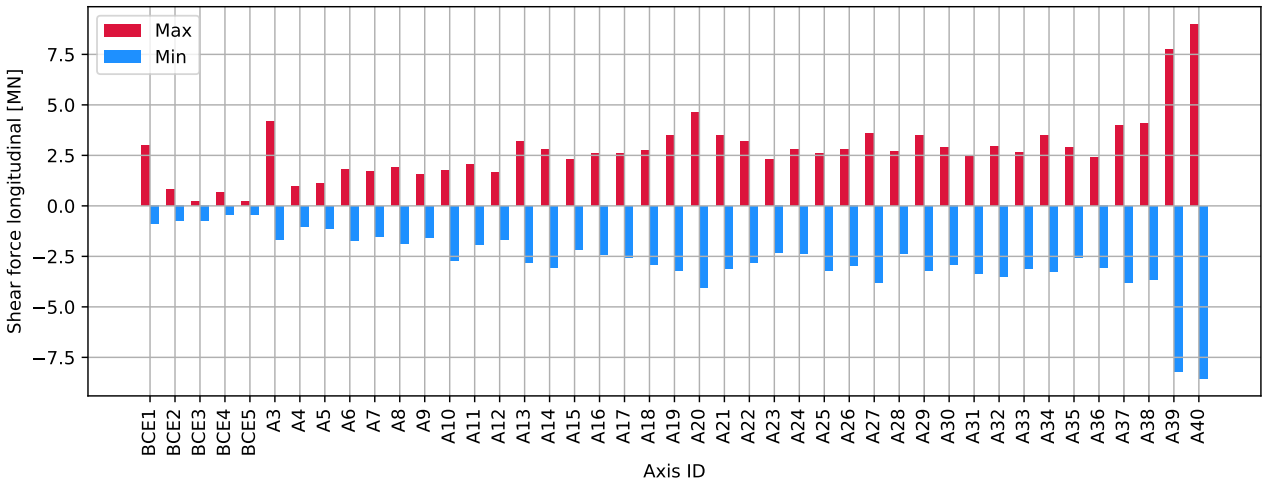


Figure 4.795: DH A27-A28 180deg - columns bottom : Shear force longitudinal [MN]

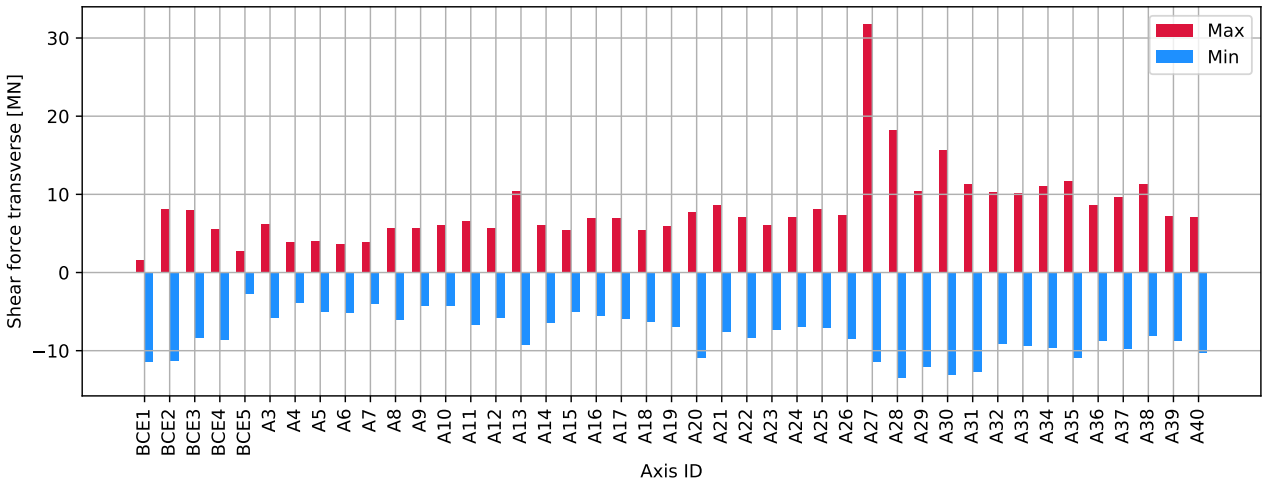


Figure 4.796: DH A27-A28 180deg - columns bottom : Shear force transverse [MN]

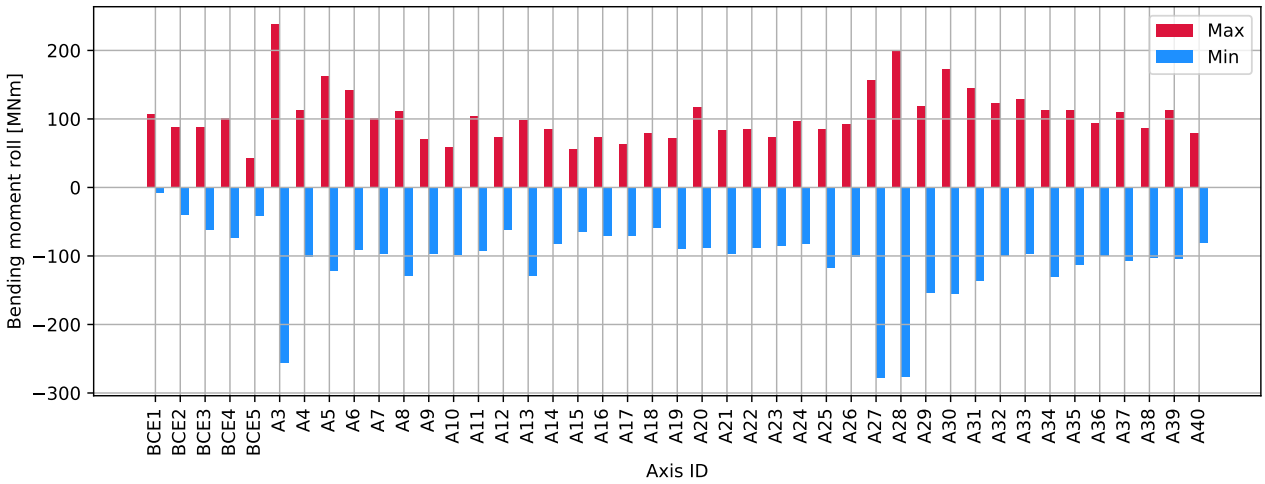


Figure 4.797: DH A27-A28 180deg - columns bottom : Bending moment roll [MNm]

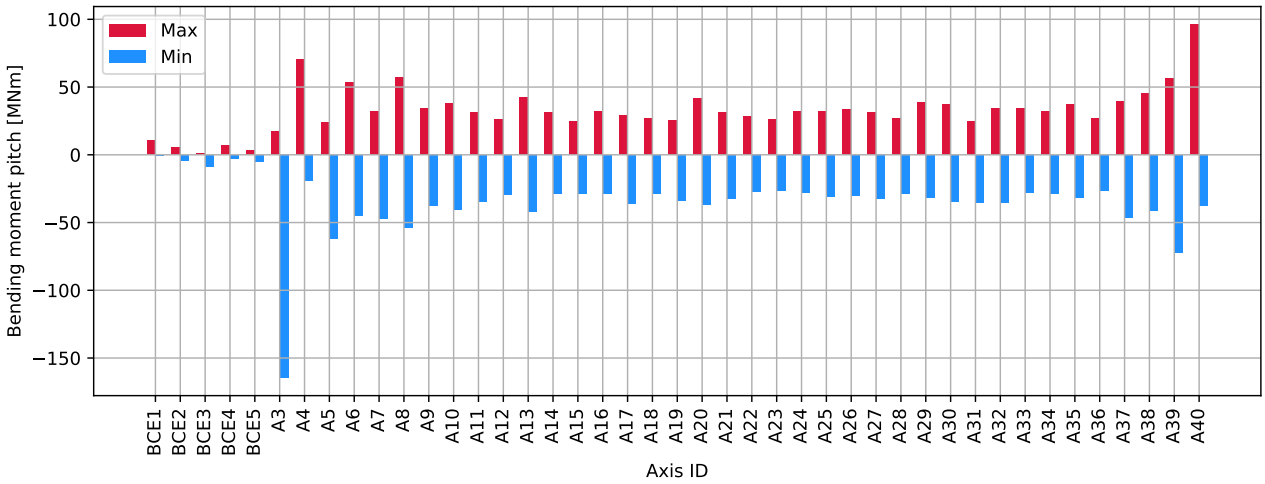


Figure 4.798: DH A27-A28 180deg - columns bottom : Bending moment pitch [MNm]

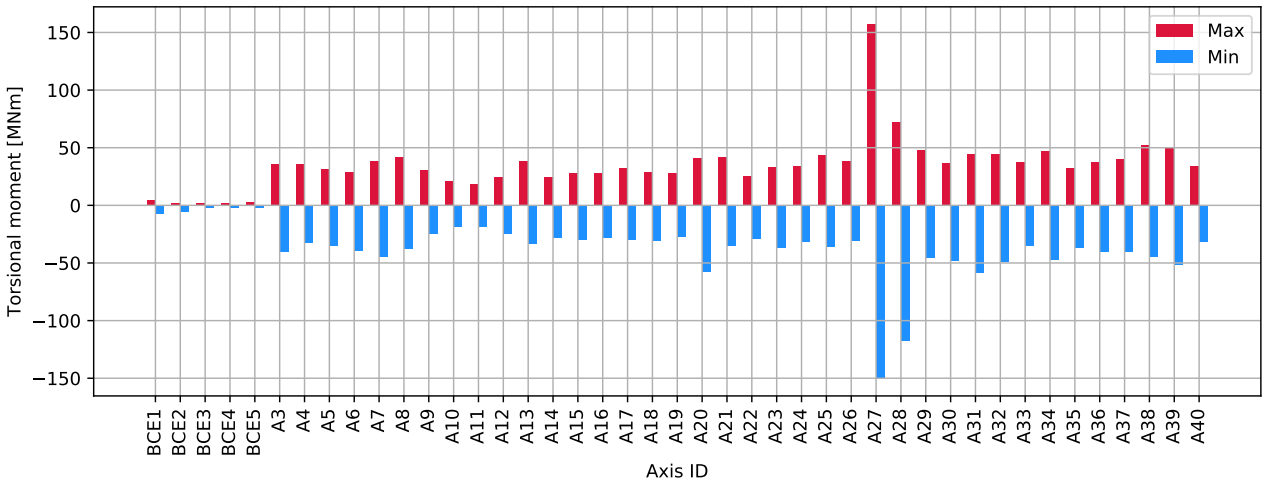


Figure 4.799: DH A27-A28 180deg - columns bottom : Torsional moment [MNm]

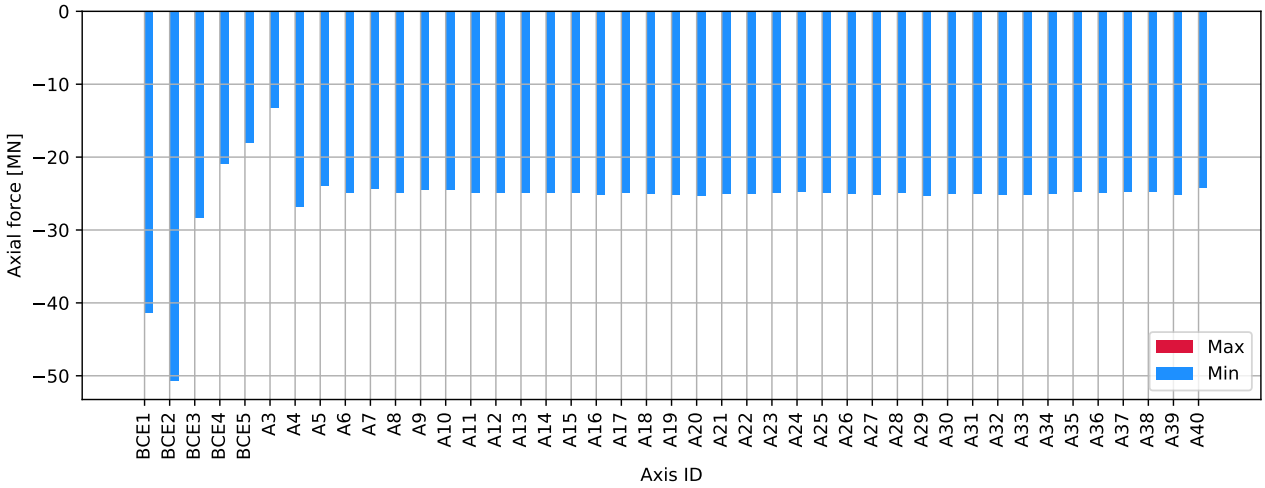


Figure 4.800: DH A27-A28 180deg - columns top : Axial force [MN]

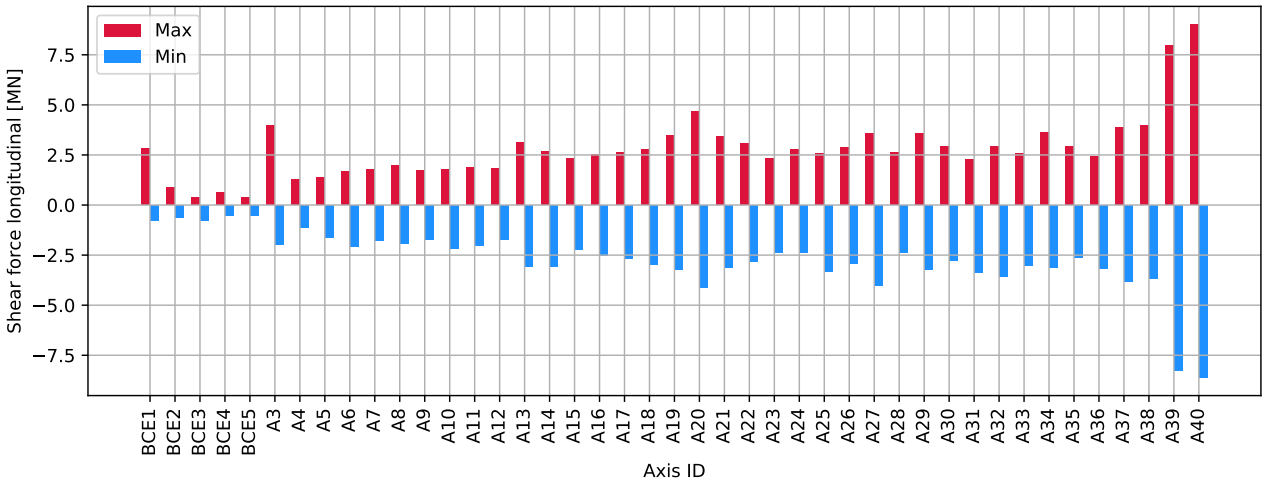


Figure 4.801: DH A27-A28 180deg - columns top : Shear force longitudinal [MN]

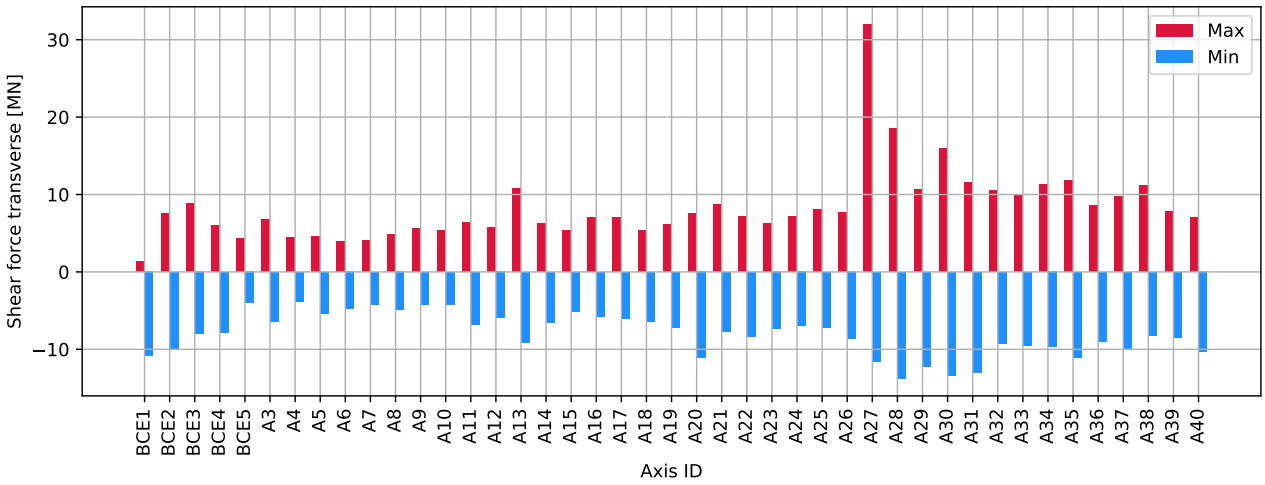


Figure 4.802: DH A27-A28 180deg - columns top : Shear force transverse [MN]

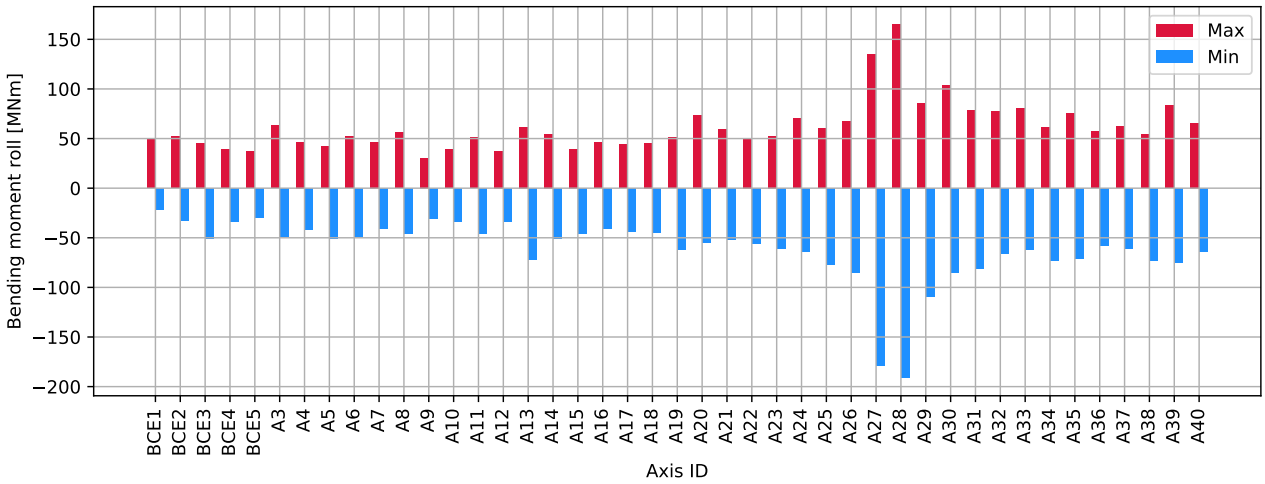


Figure 4.803: DH A27-A28 180deg - columns top : Bending moment roll [MNm]

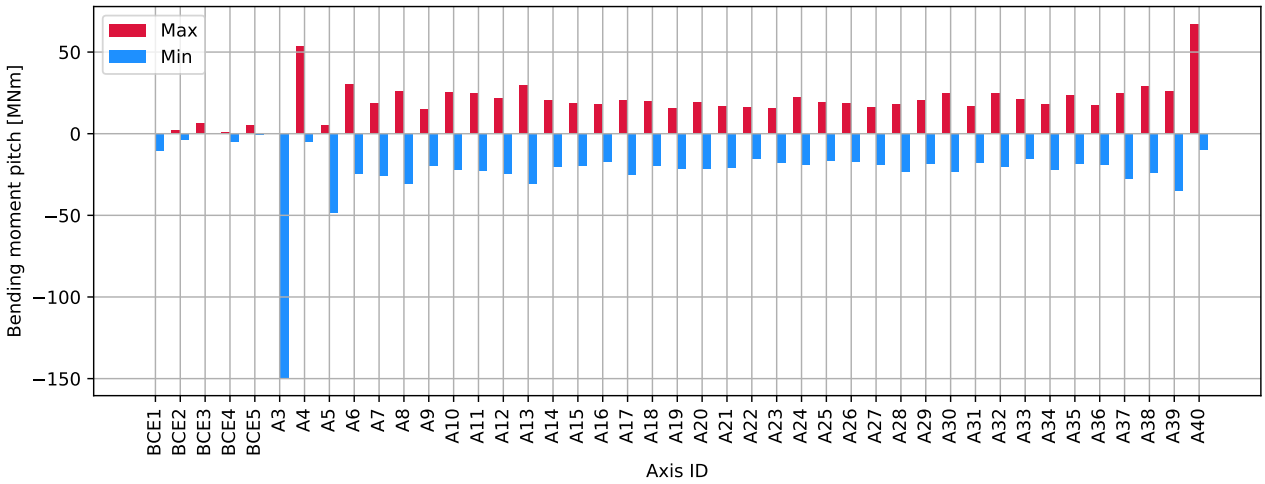


Figure 4.804: DH A27-A28 180deg - columns top : Bending moment pitch [MNm]

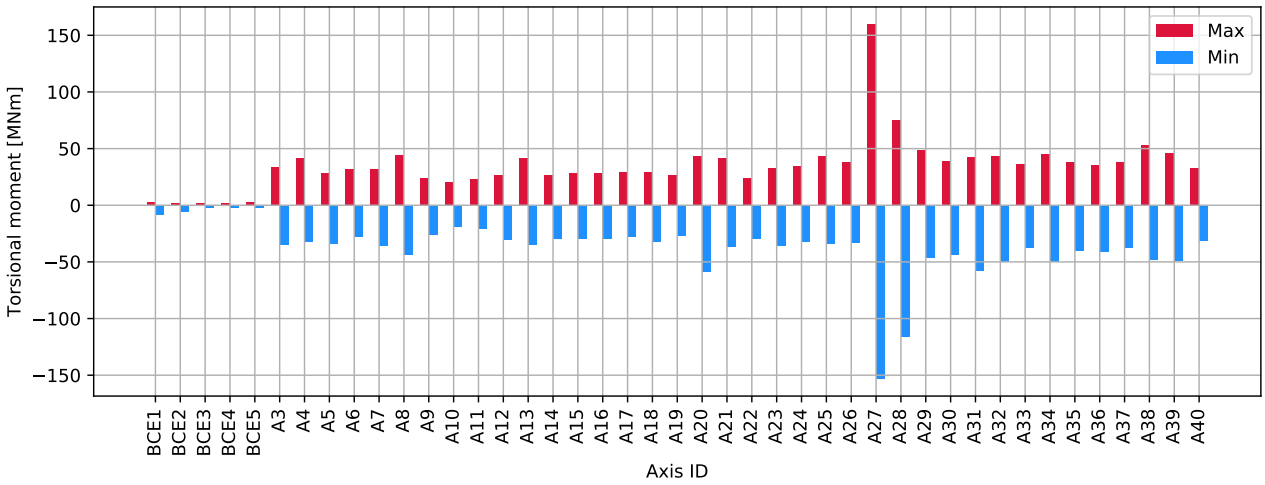


Figure 4.805: DH A27-A28 180deg - columns top : Torsional moment [MNm]

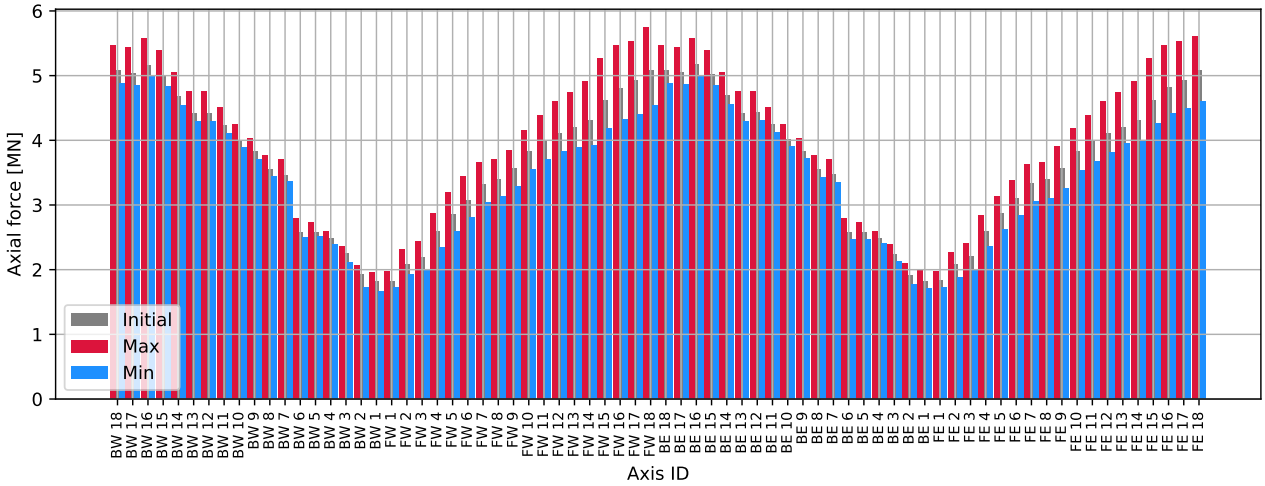


Figure 4.806: DH A27-A28 180deg - cables : Axial force [MN]

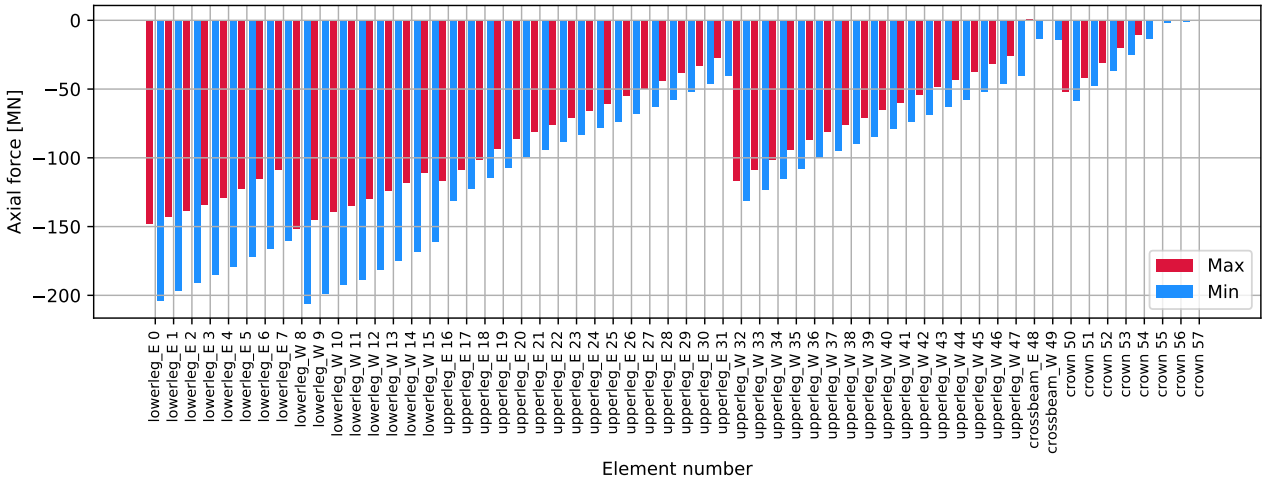


Figure 4.807: DH A27-A28 180deg - tower: Axial force [MN]

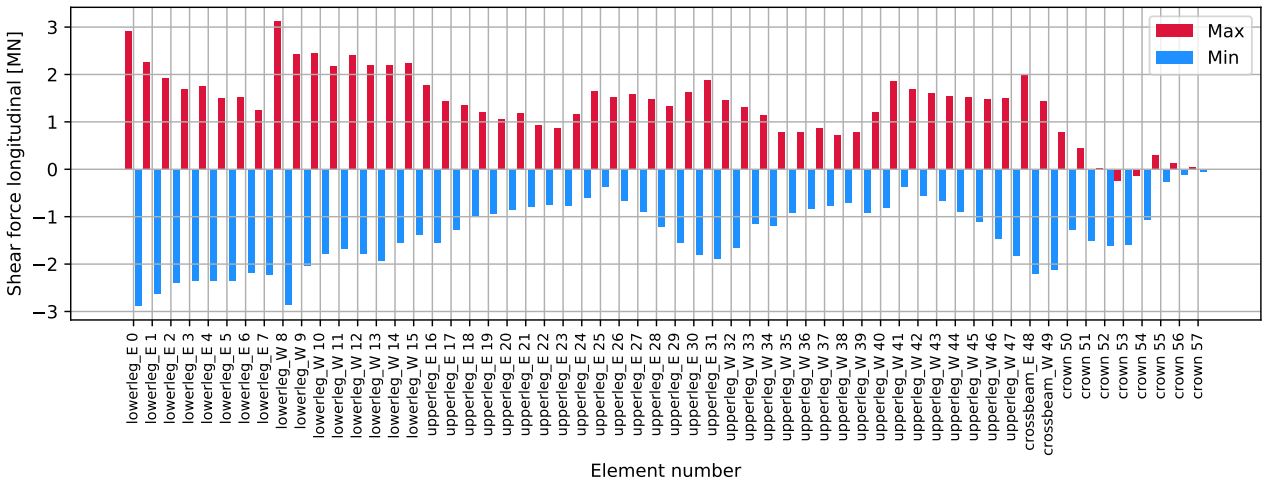


Figure 4.808: DH A27-A28 180deg - tower: Shear force longitudinal [MN]

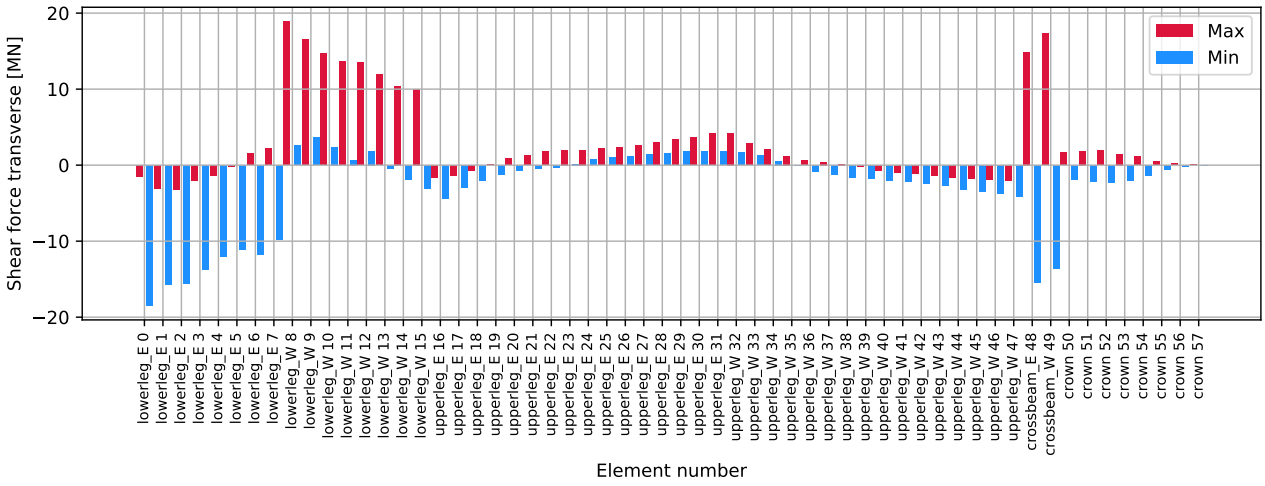


Figure 4.809: DH A27-A28 180deg - tower: Shear force transverse [MN]

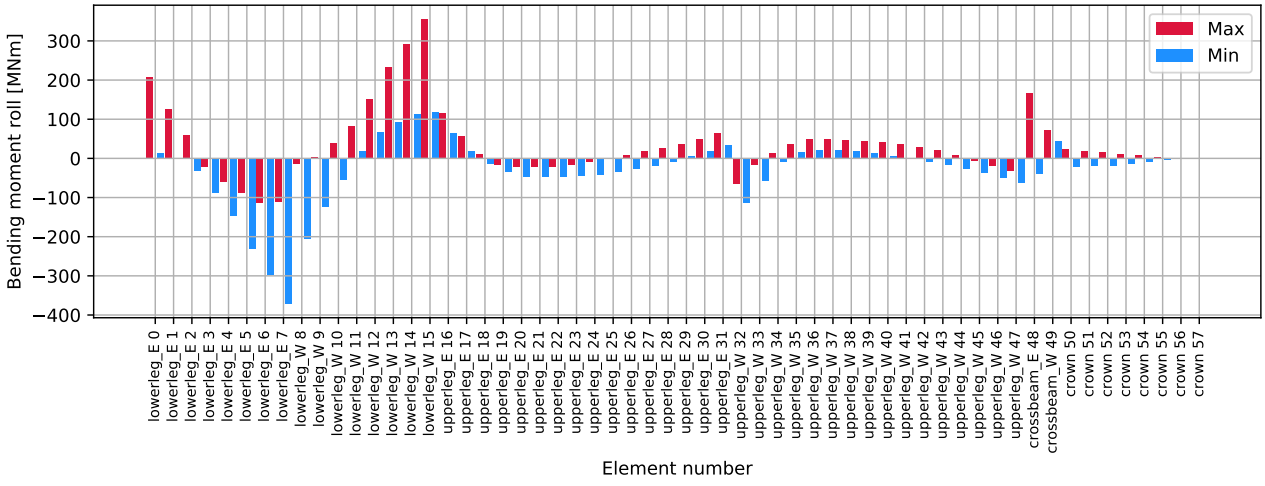


Figure 4.810: DH A27-A28 180deg - tower: Bending moment roll [MNm]

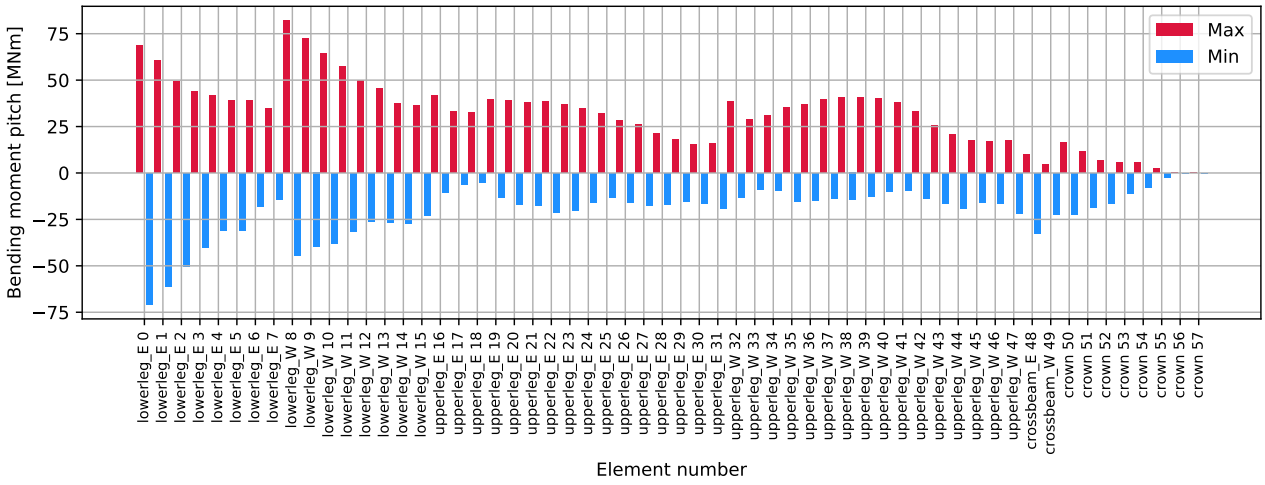


Figure 4.811: DH A27-A28 180deg - tower: Bending moment pitch [MNm]

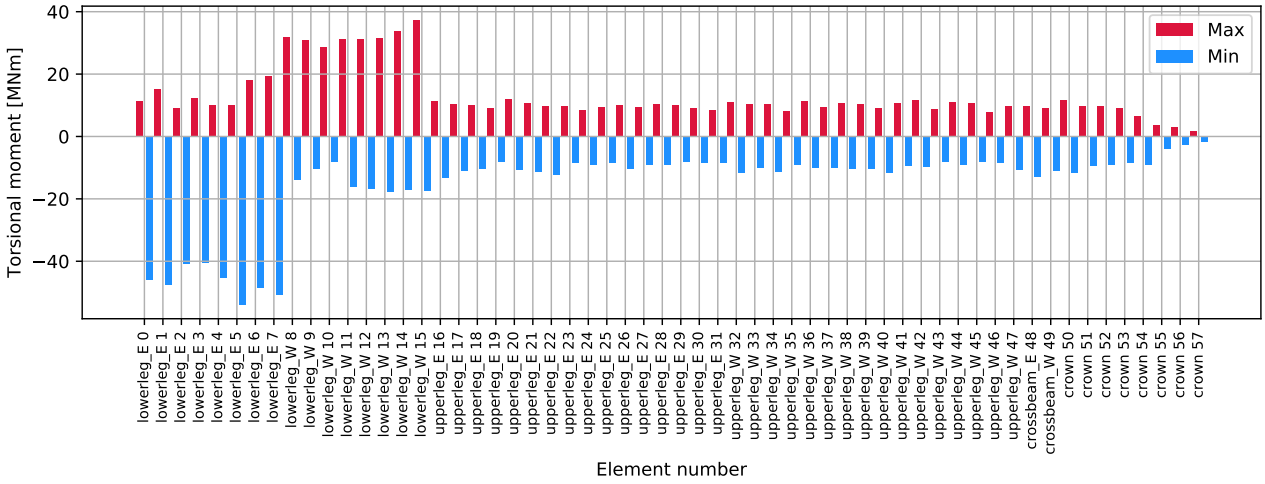


Figure 4.812: DH A27-A28 180deg - tower: Torsional moment [MNm]

### 4.18.3 Time series

Note : Time series are filtered using a Saviotzky-Golay filter for increased readability of the time history plots. Hence, maximum values that occur due to a rapid vibration are not shown in the plots. For maximum values, refer to the tabulated data.
All elements are numbered from South to North, bottom to top

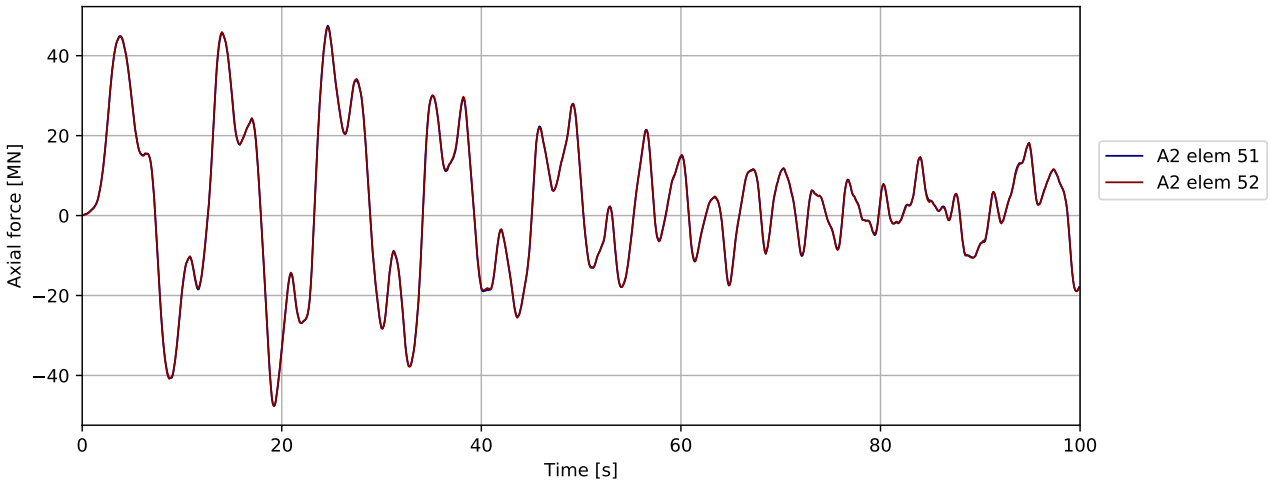


Figure 4.813: DH A27-A28 180deg - bridgegirder @ pylon: Axial force [MN]

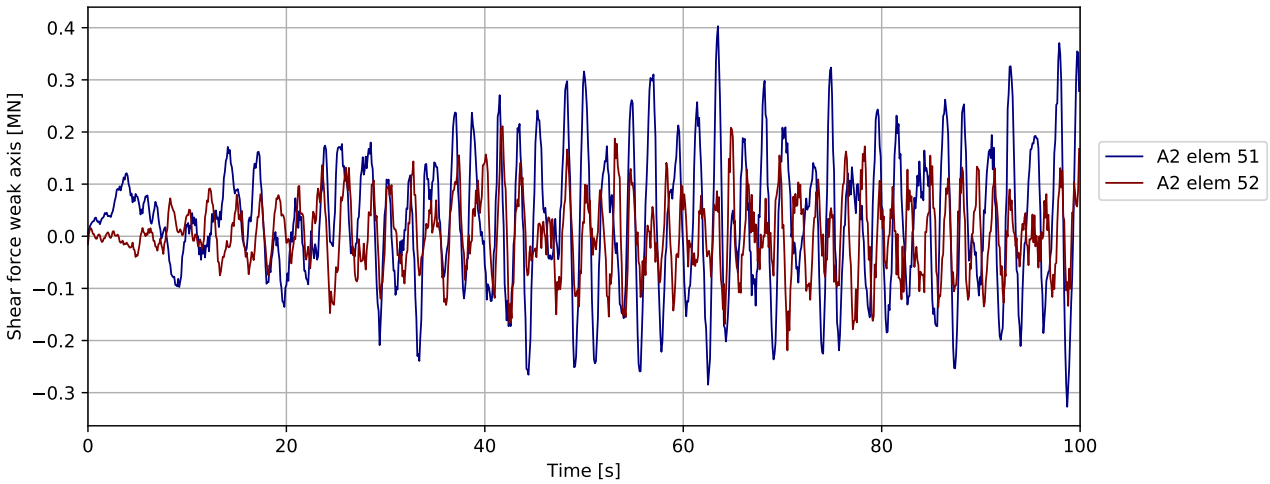


Figure 4.814: DH A27-A28 180deg - bridgegirder @ pylon: Shear force weak axis [MN]

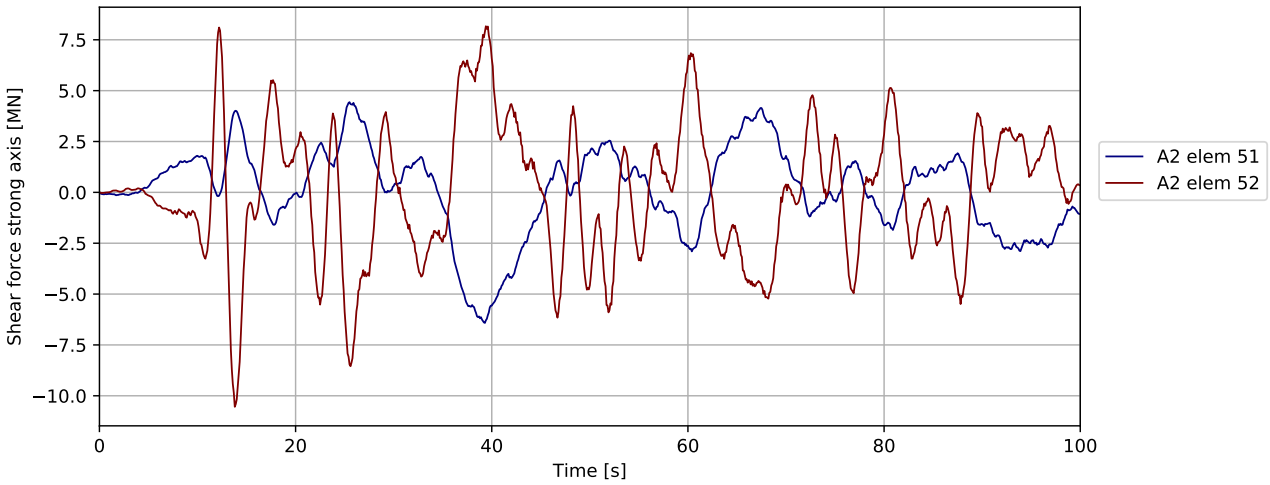


Figure 4.815: DH A27-A28 180deg - bridgegirder @ pylon: Shear force strong axis [MN]

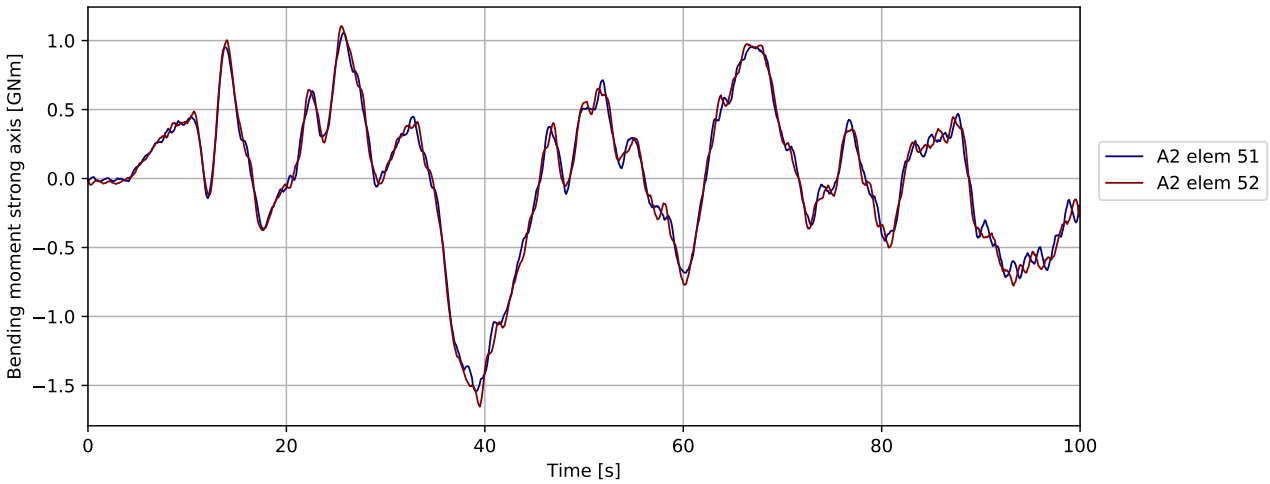


Figure 4.816: DH A27-A28 180deg - bridgegirder @ pylon: Bending moment strong axis [GNm]

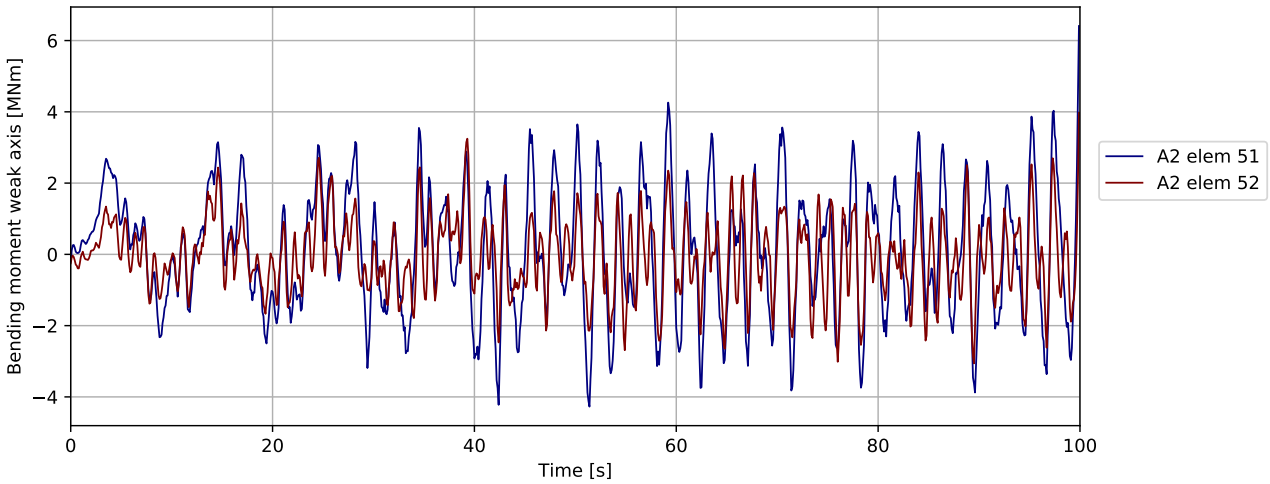


Figure 4.817: DH A27-A28 180deg - bridgegirder @ pylon: Bending moment weak axis [MNm]

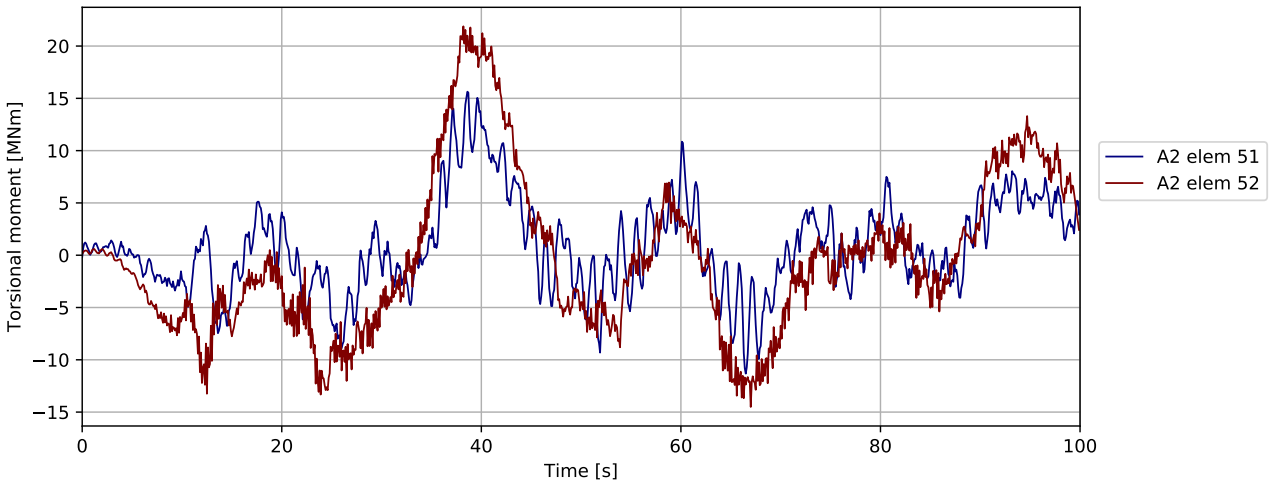


Figure 4.818: DH A27-A28 180deg - bridgegirder @ pylon: Torsional moment [MNm]

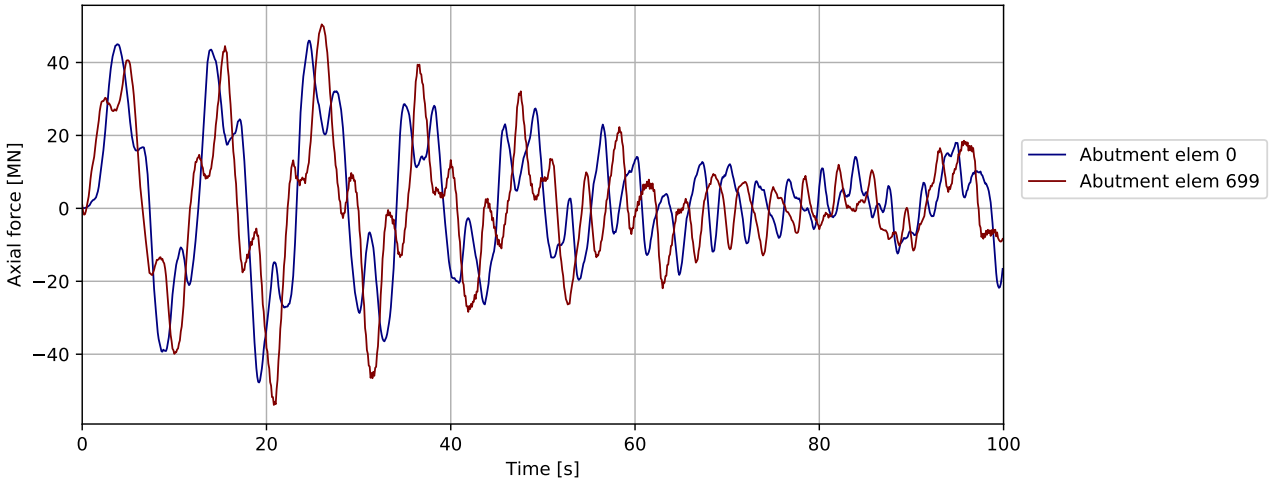


Figure 4.819: DH A27-A28 180deg - bridgegirder @abutments: Axial force [MN]

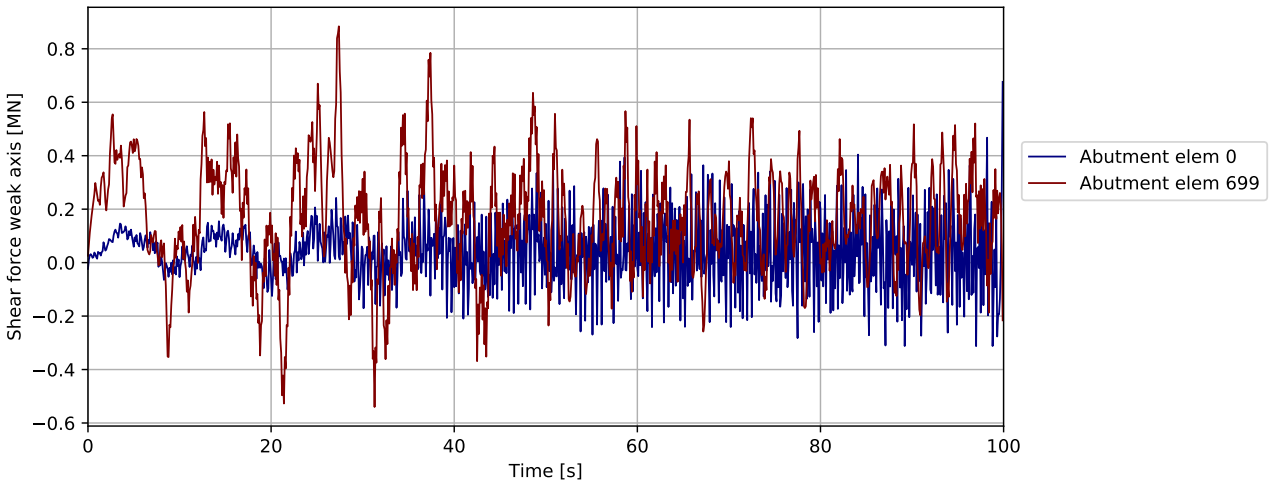


Figure 4.820: DH A27-A28 180deg - bridgegirder @abutments: Shear force weak axis [MN]

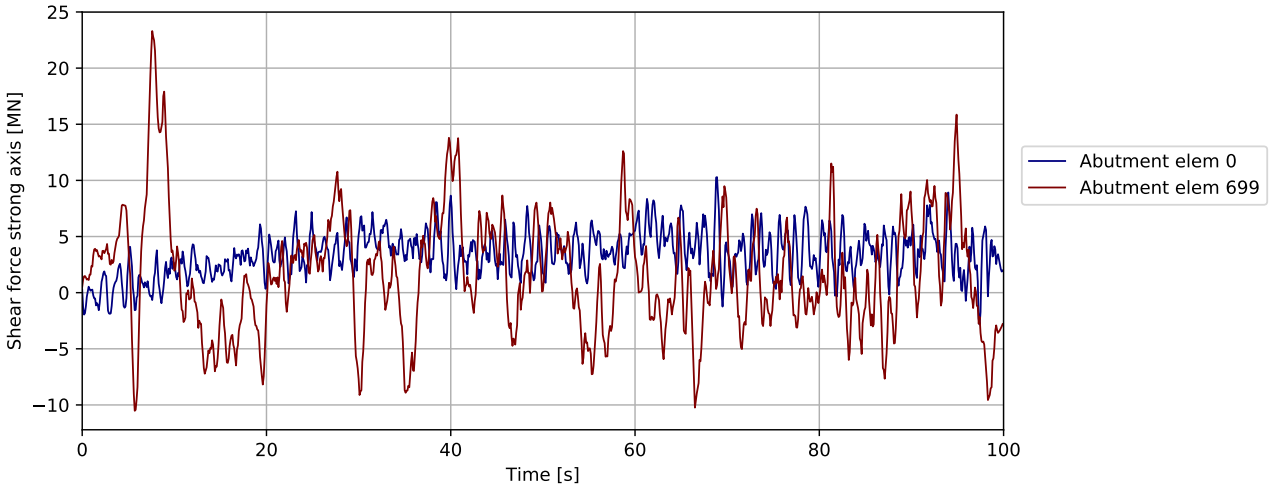


Figure 4.821: DH A27-A28 180deg - bridgegirder @abutments: Shear force strong axis [MN]

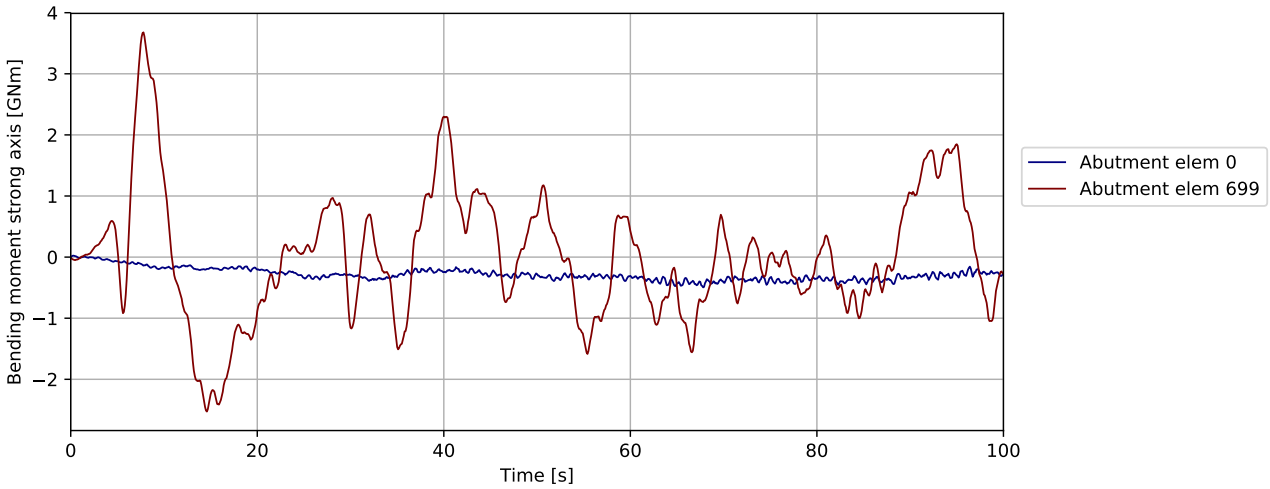


Figure 4.822: DH A27-A28 180deg - bridgegirder @abutments: Bending moment strong axis [GNm]

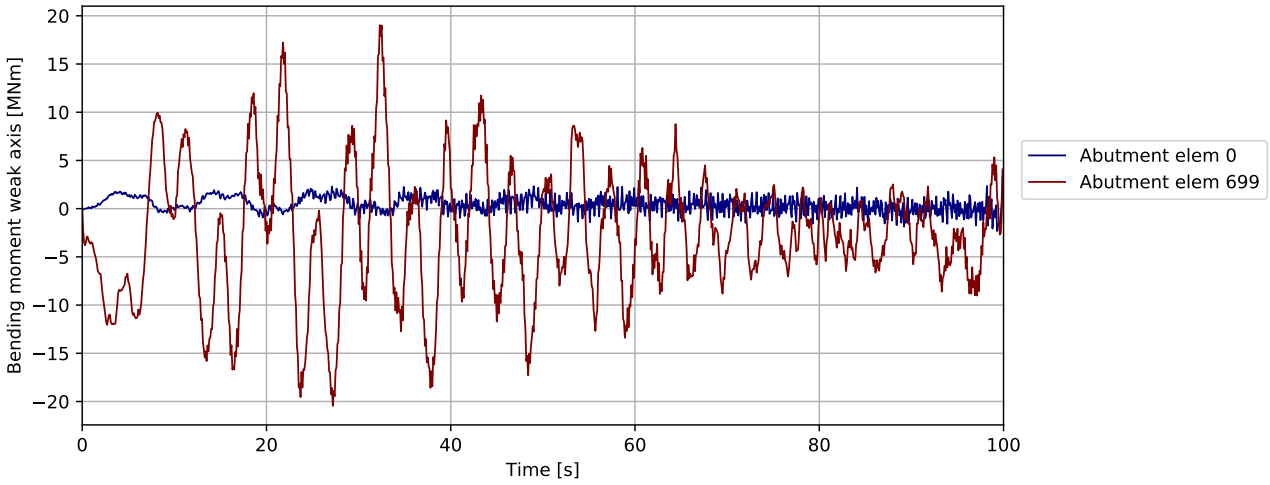


Figure 4.823: DH A27-A28 180deg - bridgegirder @abutments: Bending moment weak axis [MNm]

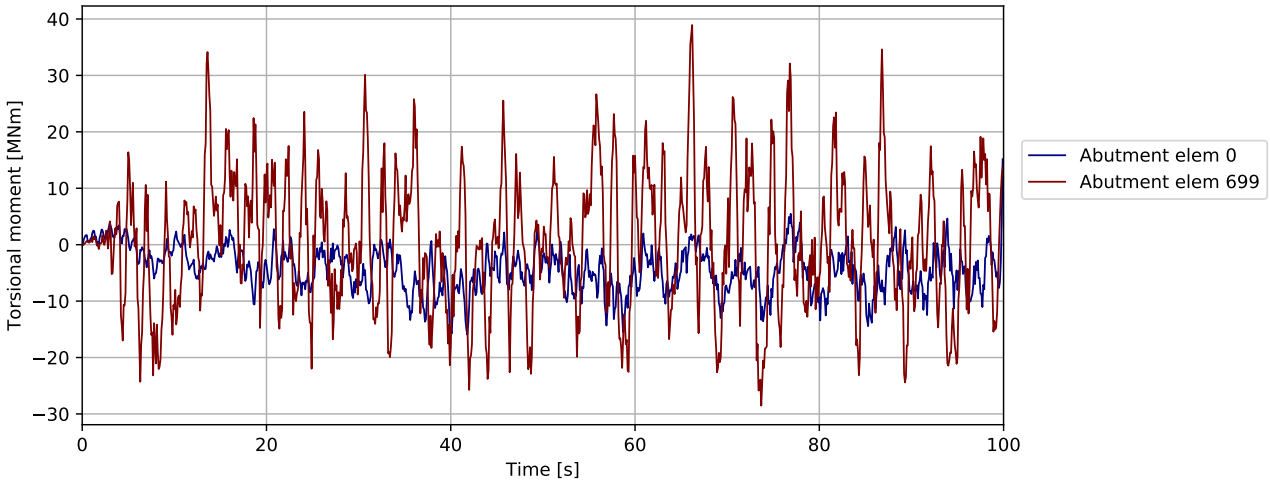


Figure 4.824: DH A27-A28 180deg - bridgegirder @abutments: Torsional moment [MNm]

Note : Compressive spring force is negative

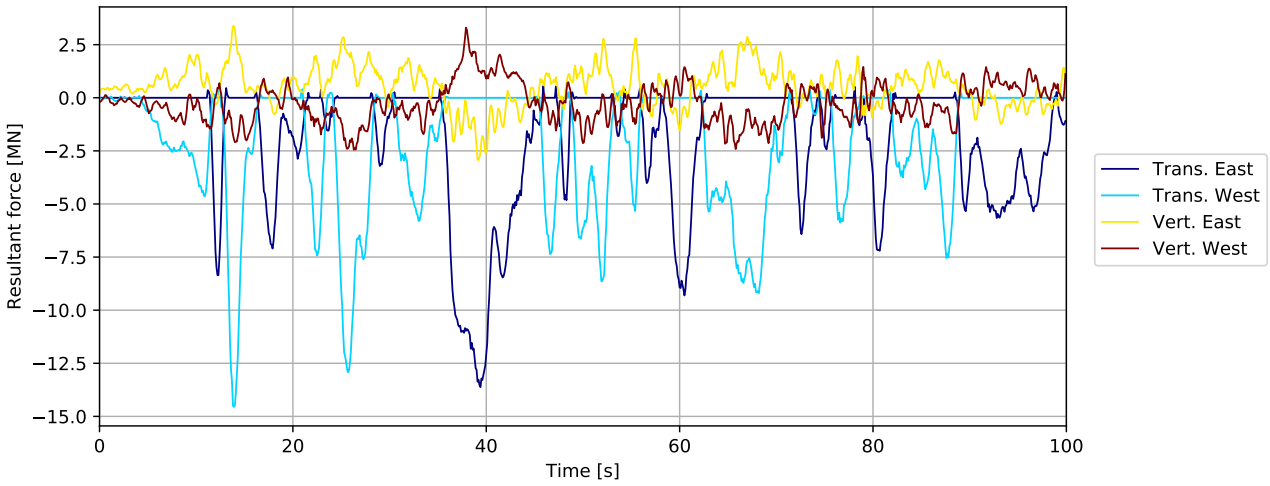


Figure 4.825: DH A27-A28 180deg - bridgegirder supports in tower: Resultant force [MN]

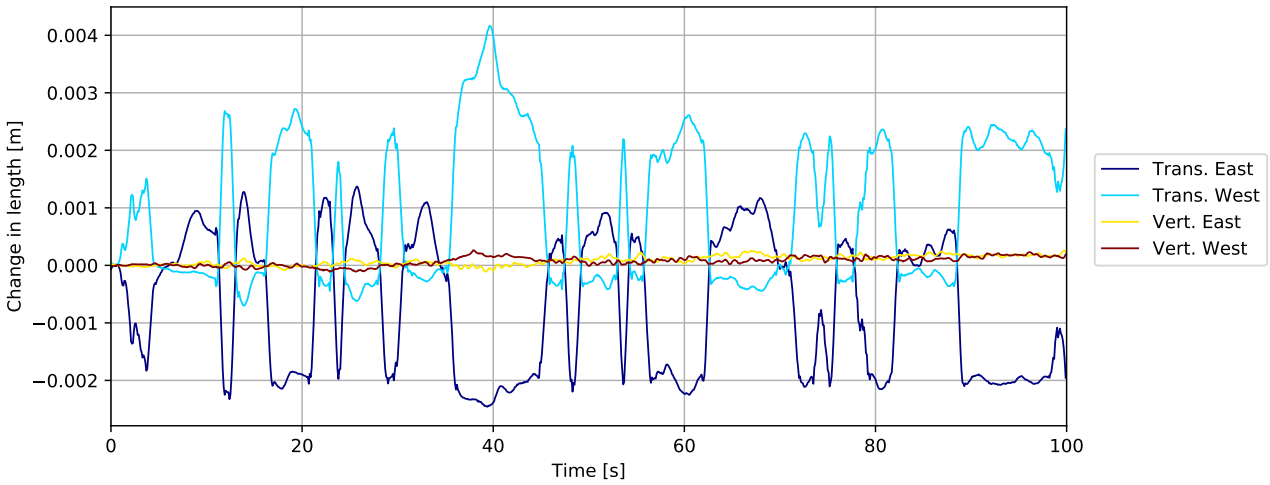


Figure 4.826: DH A27-A28 180deg - bridgegirder supports in tower: Change in length [m]

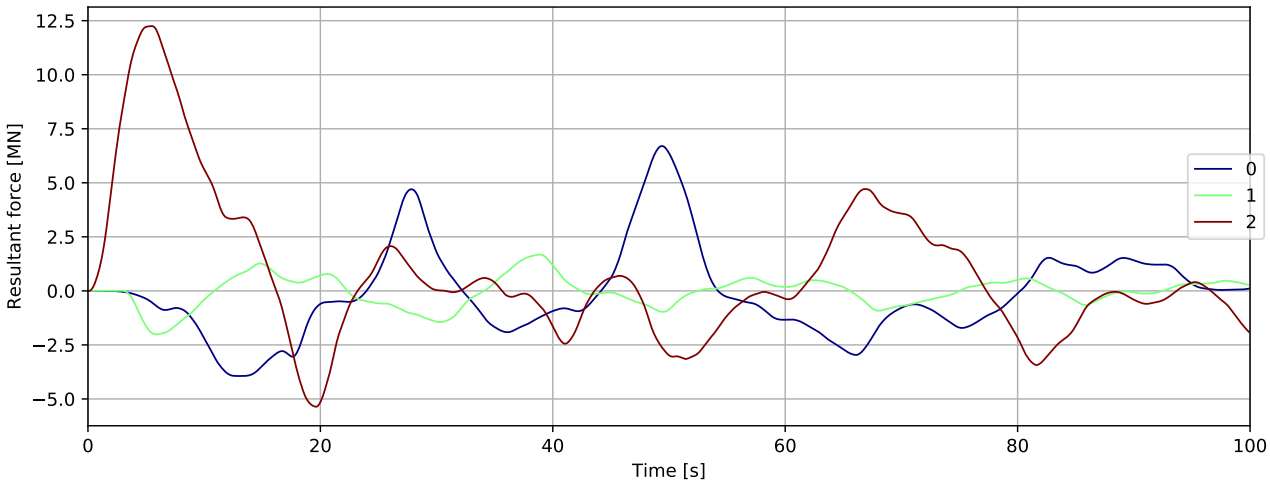


Figure 4.827: Mooring force

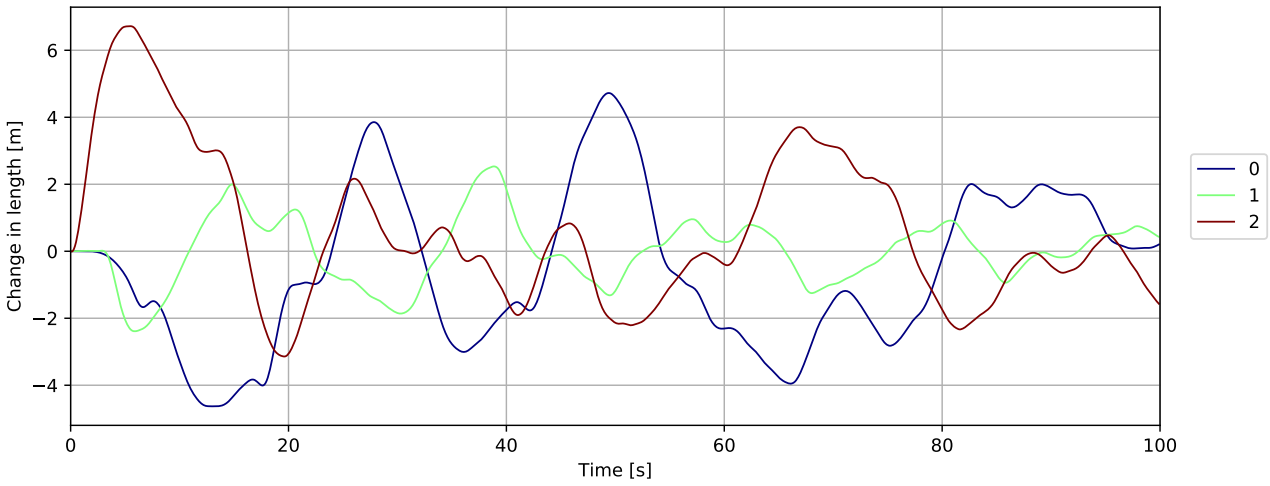


Figure 4.828: Mooring displacement

## 4.19 Deck house A30-A31 180deg

### 4.19.1 Overall response

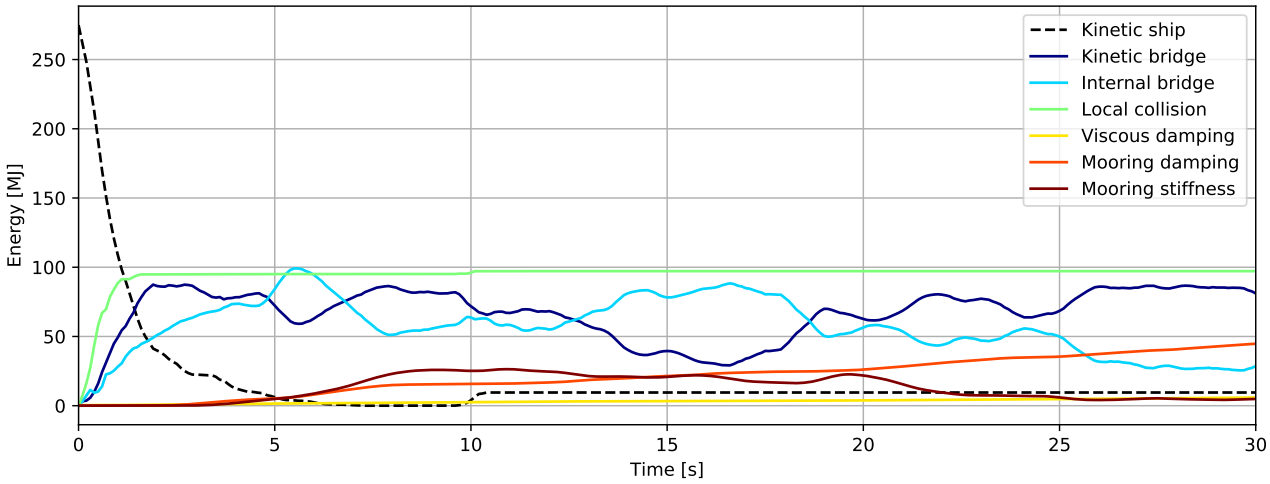


Figure 4.829: Energy [MJ] - initial phase

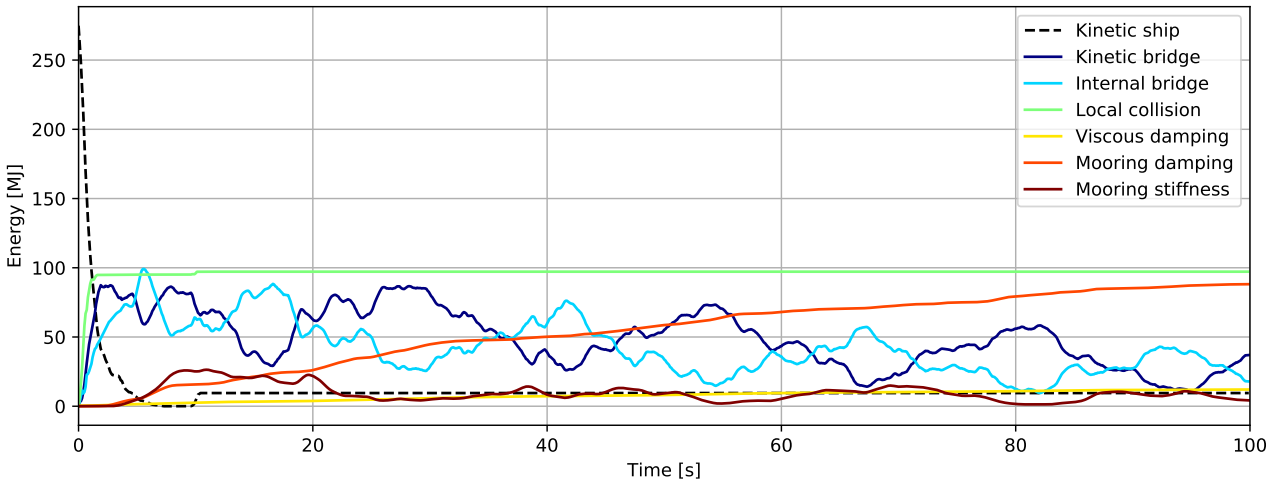


Figure 4.830: Energy [MJ]

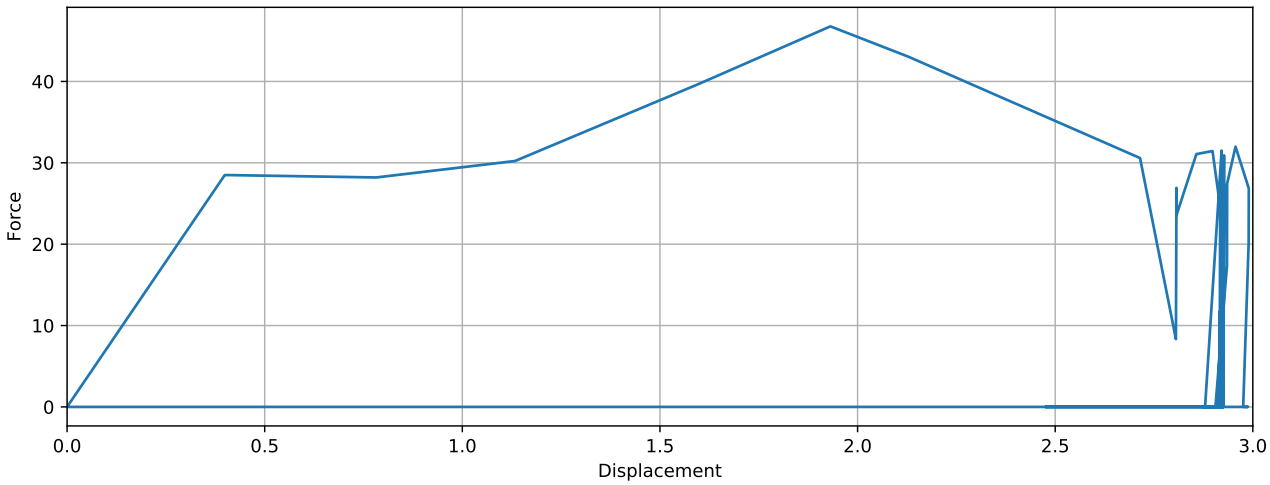


Figure 4.831: Simulated local collision force-displacement

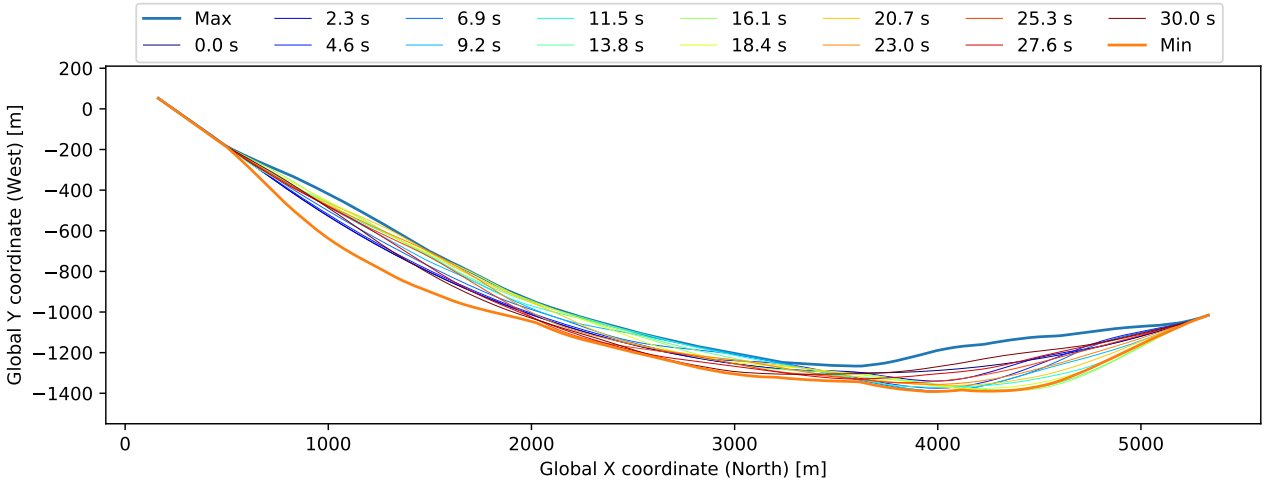


Figure 4.832: Bridgegirder deflection (10x displacment scaling)

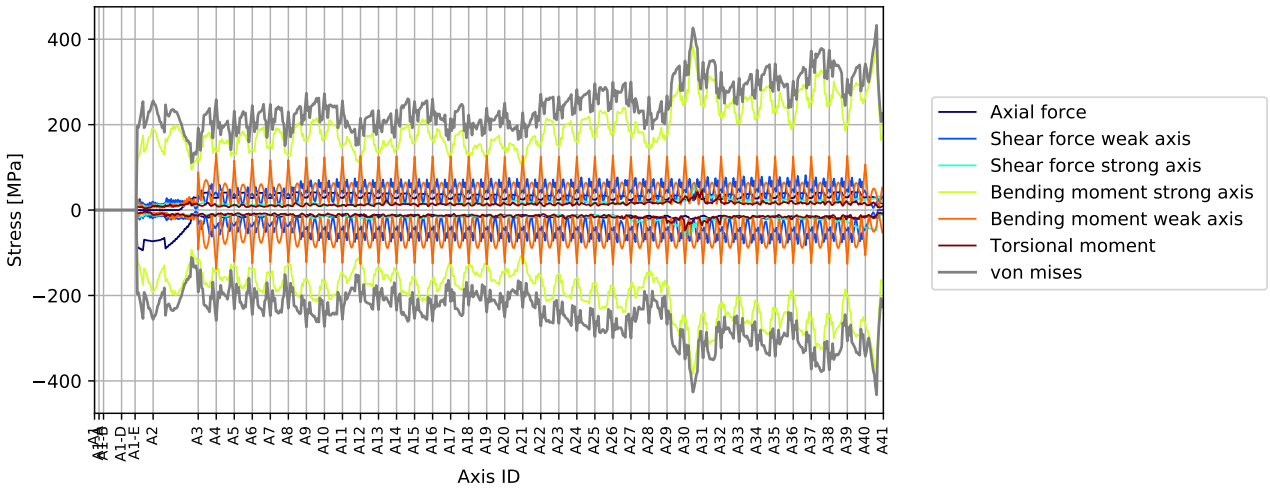


Figure 4.833: Stress envelope from all force components

### 4.19.2 Envelope plots

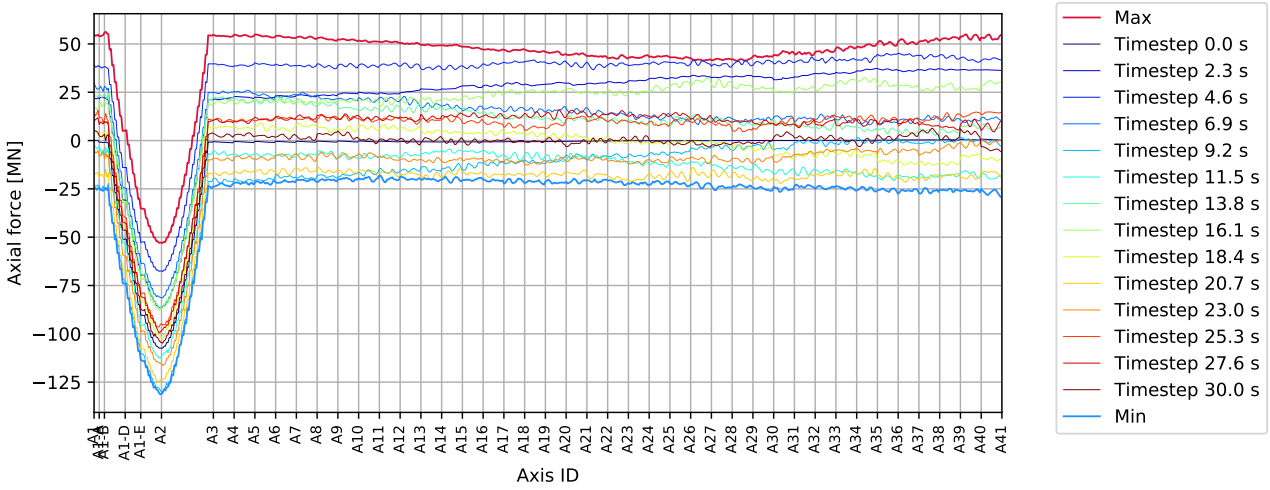


Figure 4.834: DH A30-A31 180deg - bridgegirder : Axial force [MN]

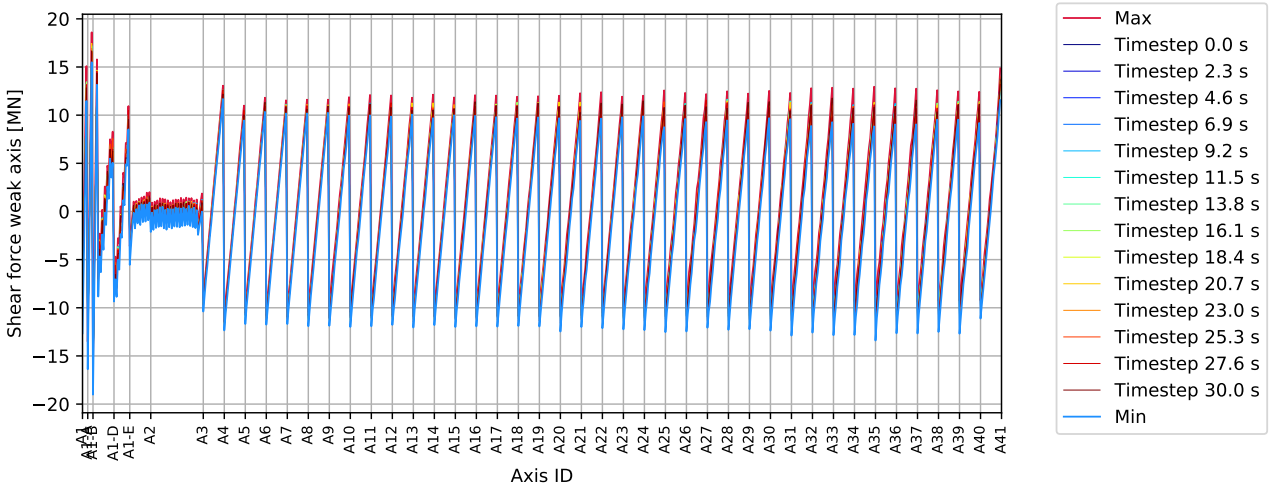


Figure 4.835: DH A30-A31 180deg - bridgegirder : Shear force weak axis [MN]

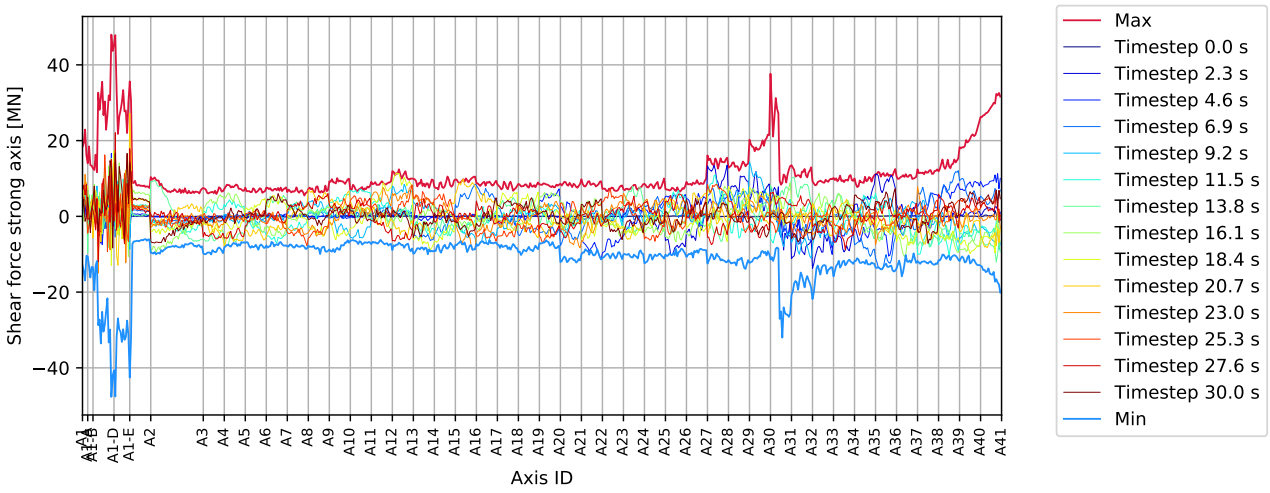


Figure 4.836: DH A30-A31 180deg - bridgegirder : Shear force strong axis [MN]

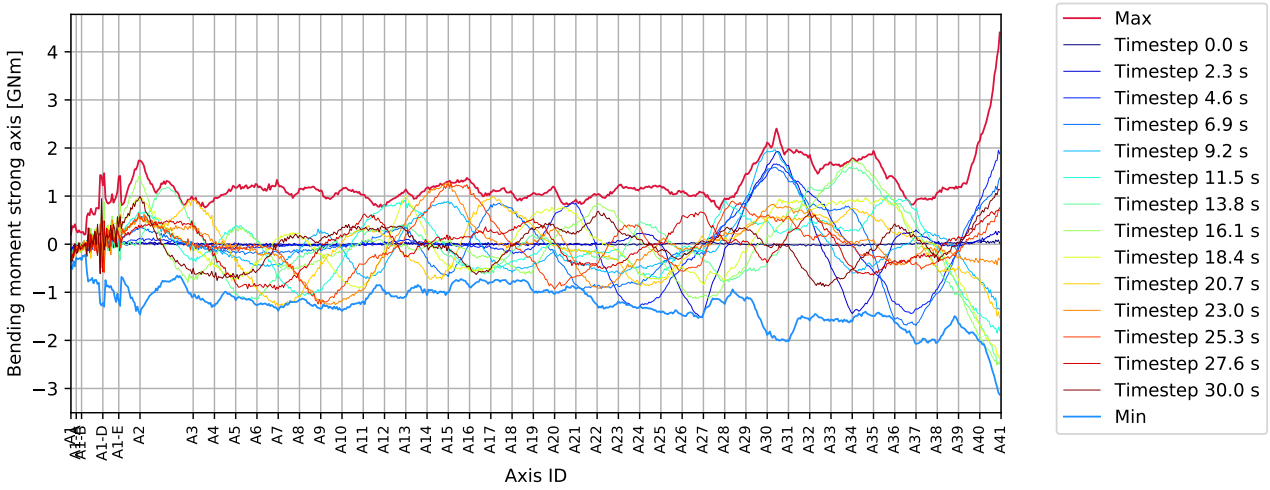


Figure 4.837: DH A30-A31 180deg - bridgegirder : Bending moment strong axis [GNm]

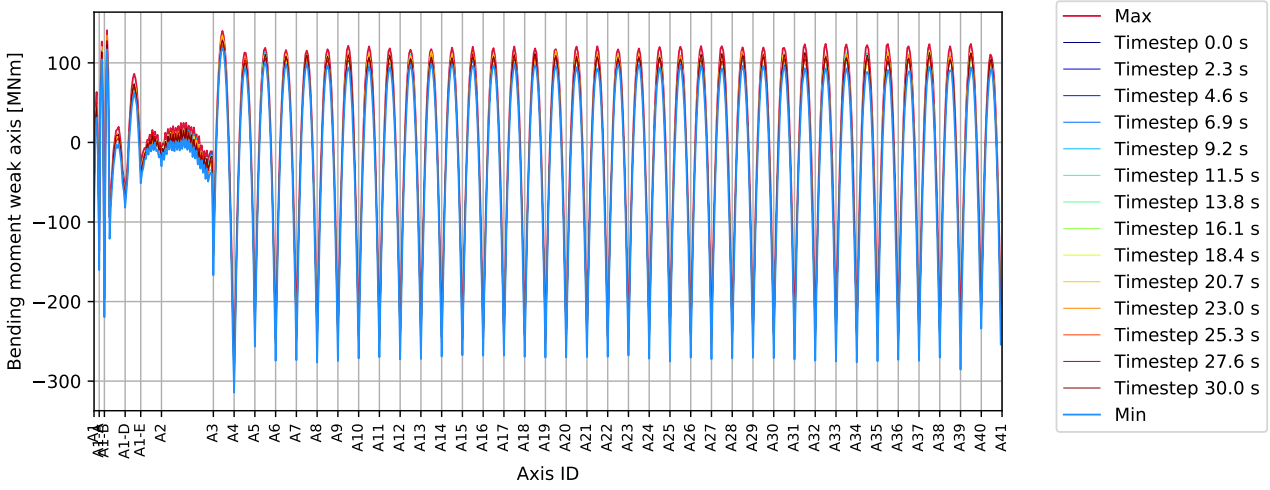


Figure 4.838: DH A30-A31 180deg - bridgegirder : Bending moment weak axis [MNm]

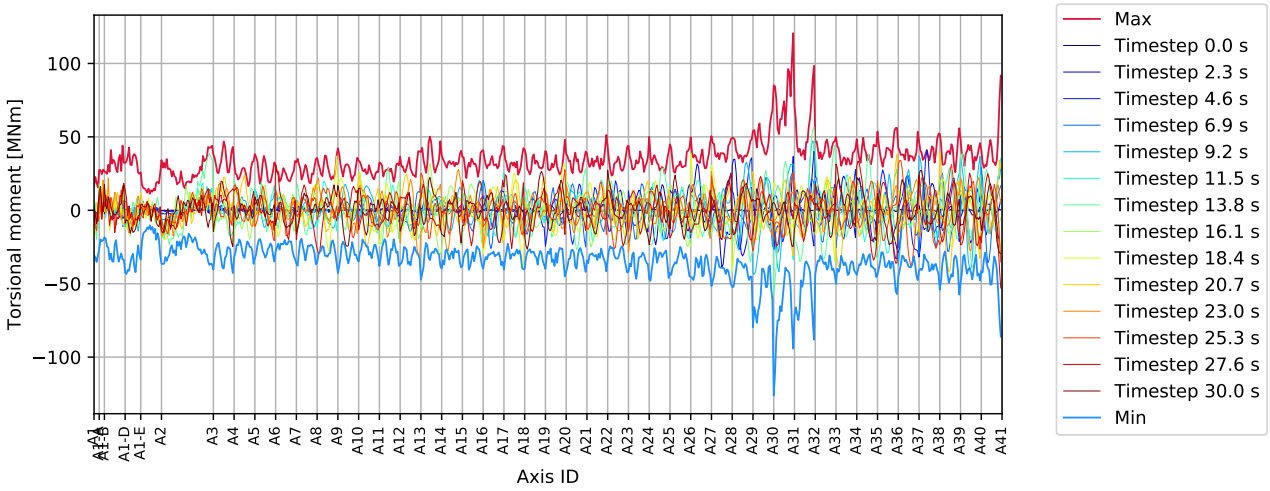


Figure 4.839: DH A30-A31 180deg - bridgegirder : Torsional moment [MNm]

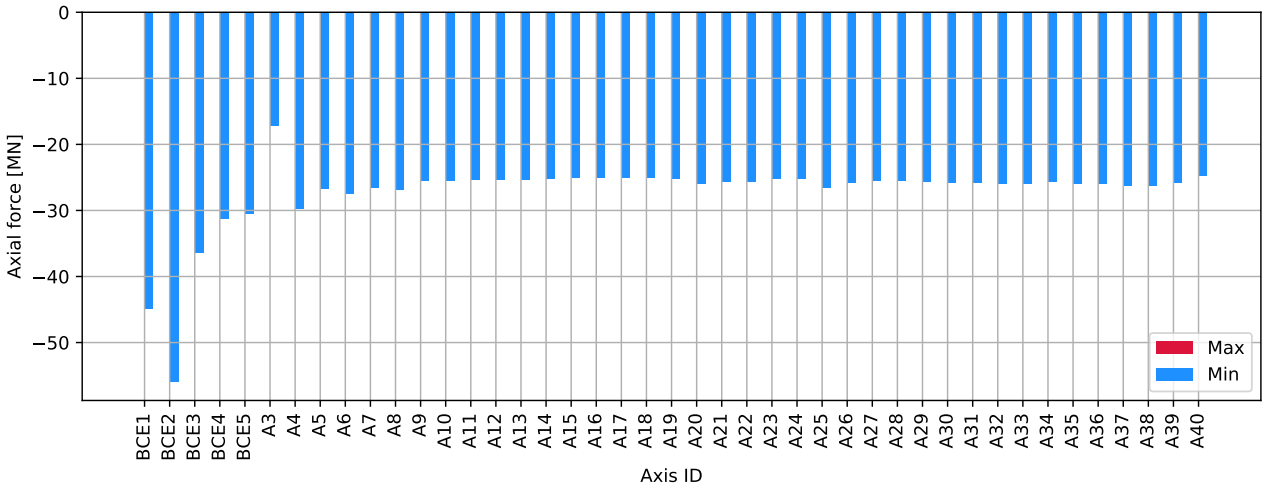


Figure 4.840: DH A30-A31 180deg - columns bottom : Axial force [MN]

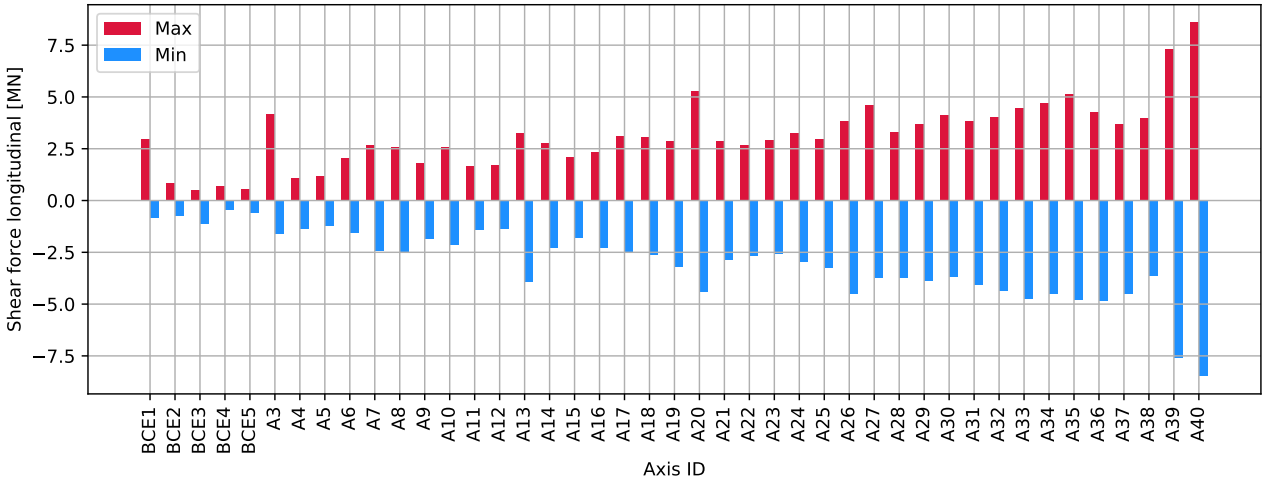


Figure 4.841: DH A30-A31 180deg - columns bottom : Shear force longitudinal [MN]

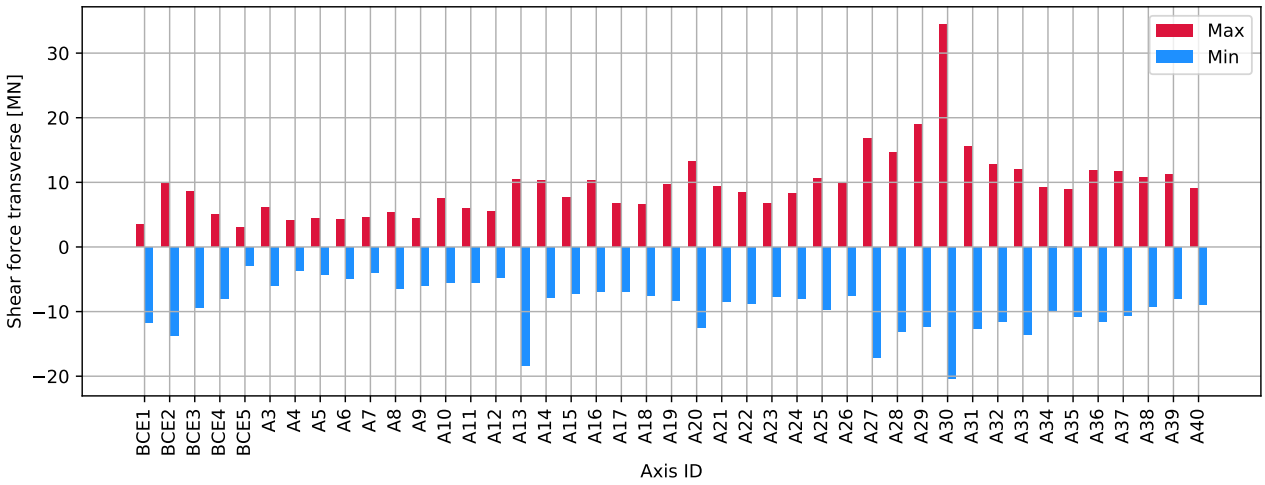


Figure 4.842: DH A30-A31 180deg - columns bottom : Shear force transverse [MN]

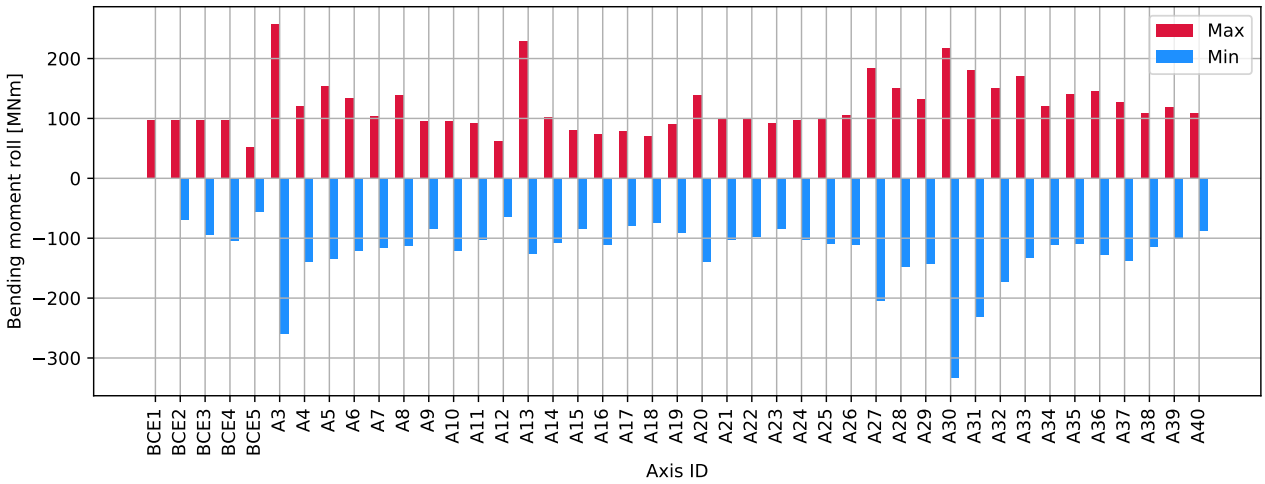


Figure 4.843: DH A30-A31 180deg - columns bottom : Bending moment roll [MNm]

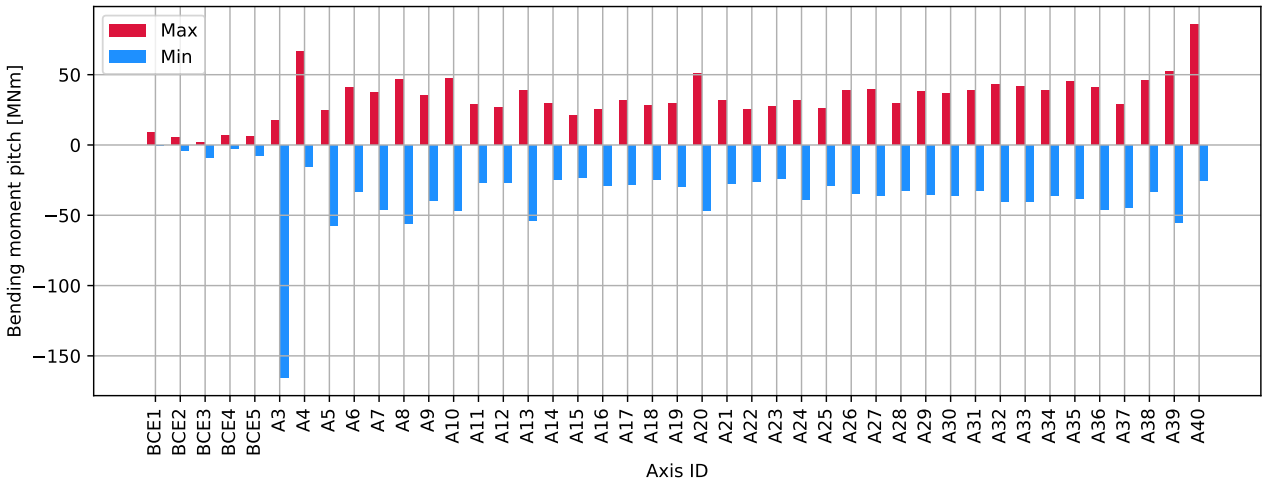


Figure 4.844: DH A30-A31 180deg - columns bottom : Bending moment pitch [MNm]

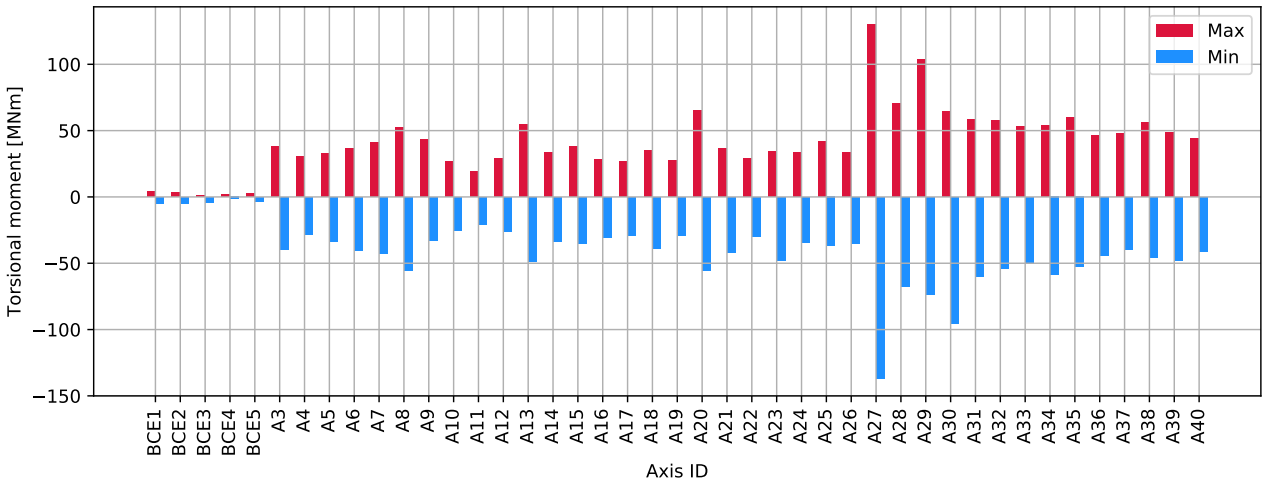


Figure 4.845: DH A30-A31 180deg - columns bottom : Torsional moment [MNm]

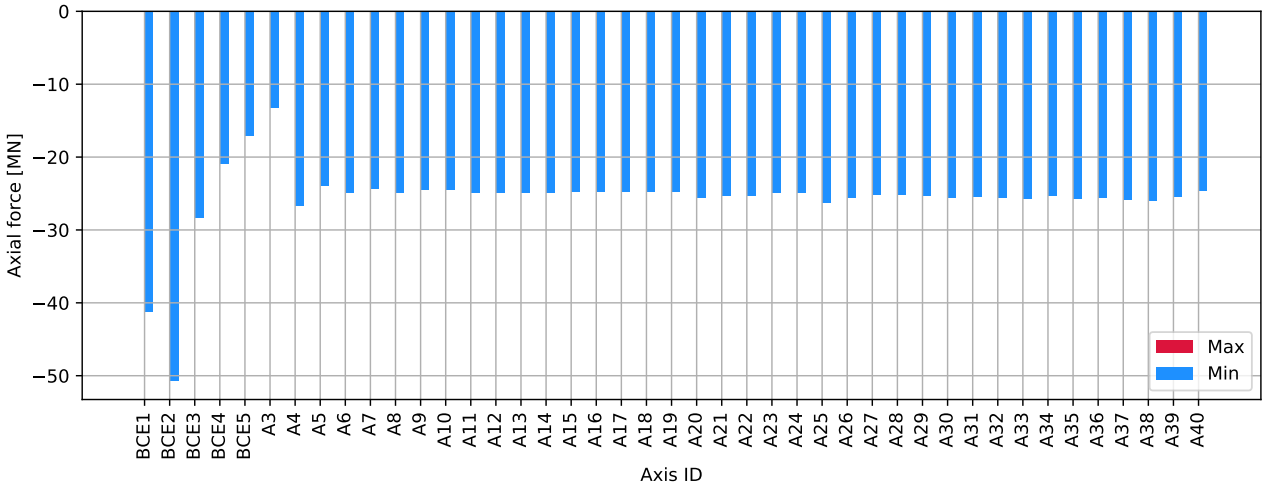


Figure 4.846: DH A30-A31 180deg - columns top : Axial force [MN]

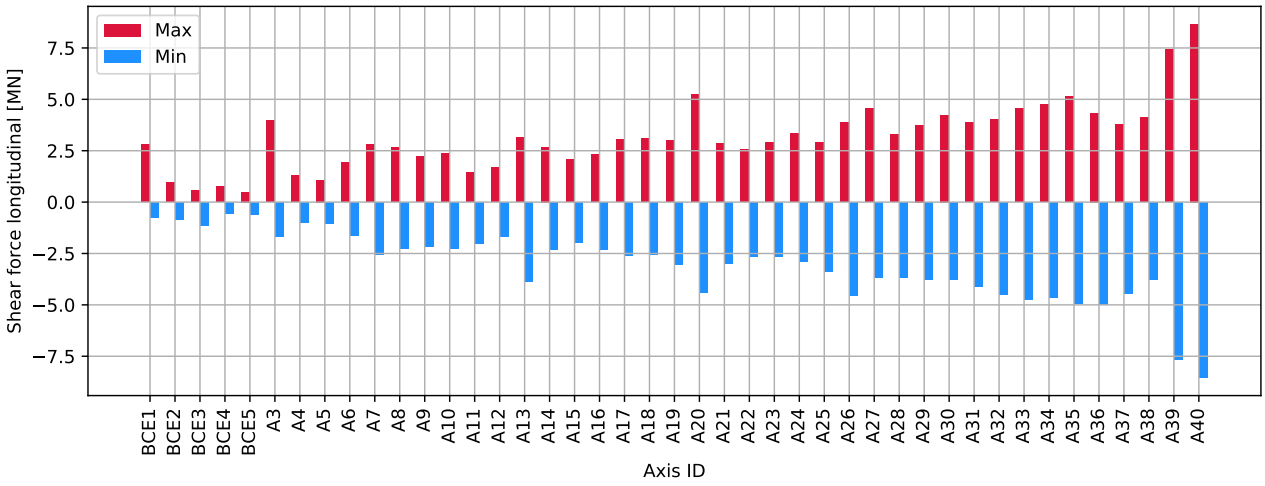


Figure 4.847: DH A30-A31 180deg - columns top : Shear force longitudinal [MN]

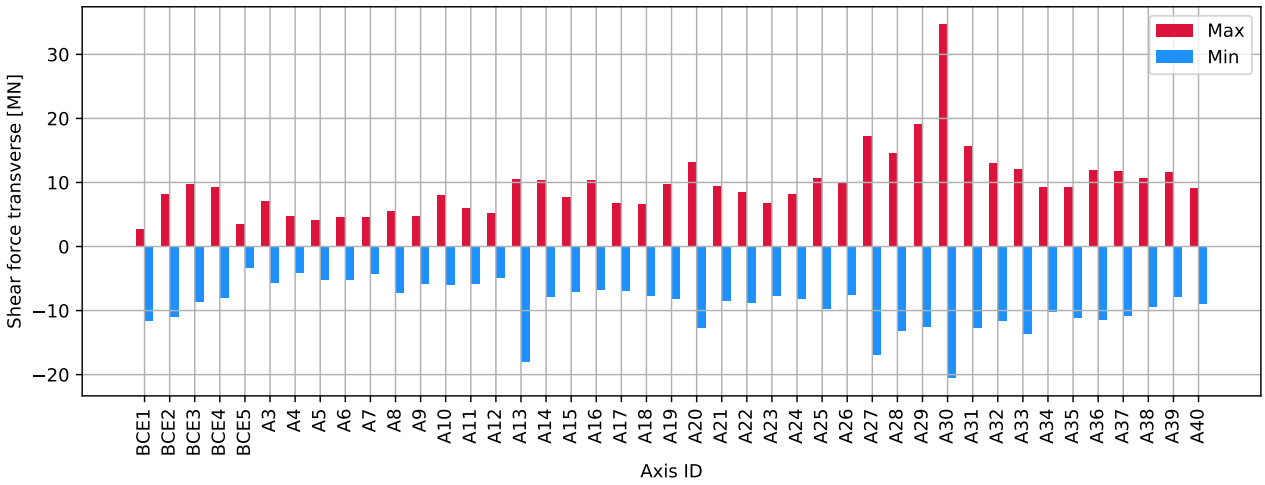


Figure 4.848: DH A30-A31 180deg - columns top : Shear force transverse [MN]

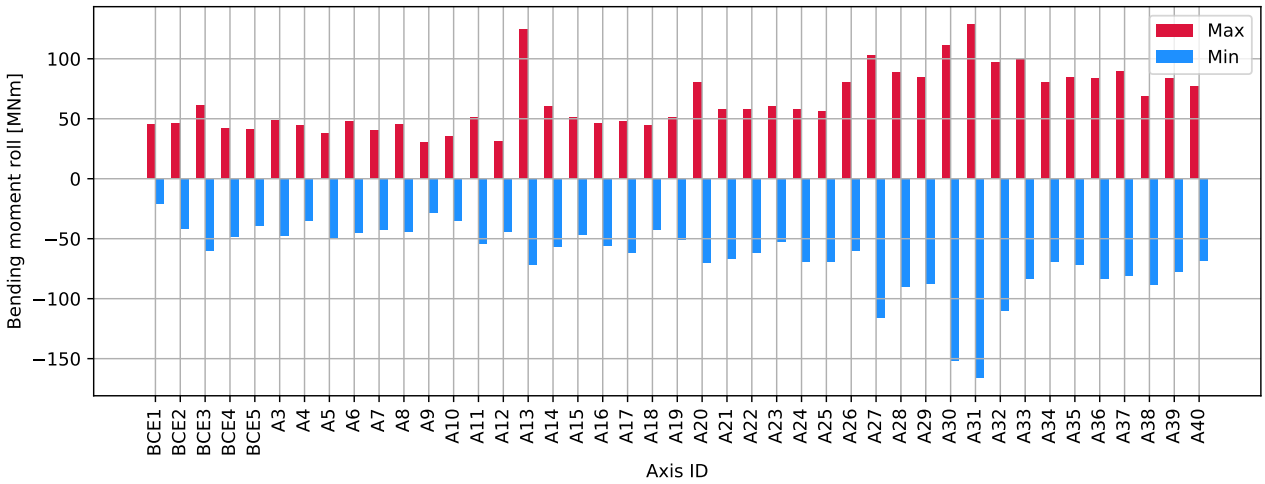


Figure 4.849: DH A30-A31 180deg - columns top : Bending moment roll [MNm]

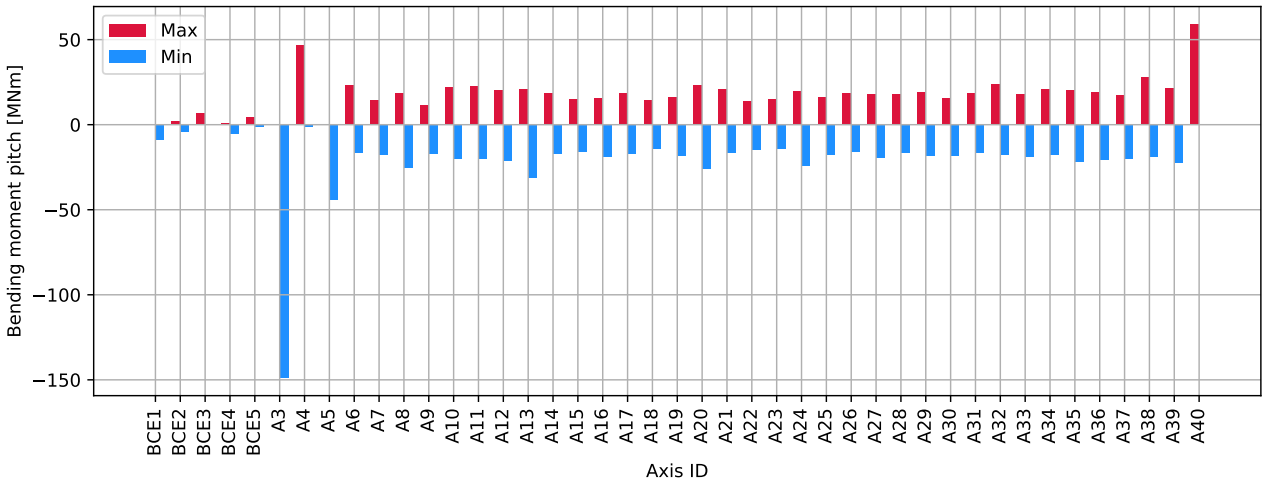


Figure 4.850: DH A30-A31 180deg - columns top : Bending moment pitch [MNm]

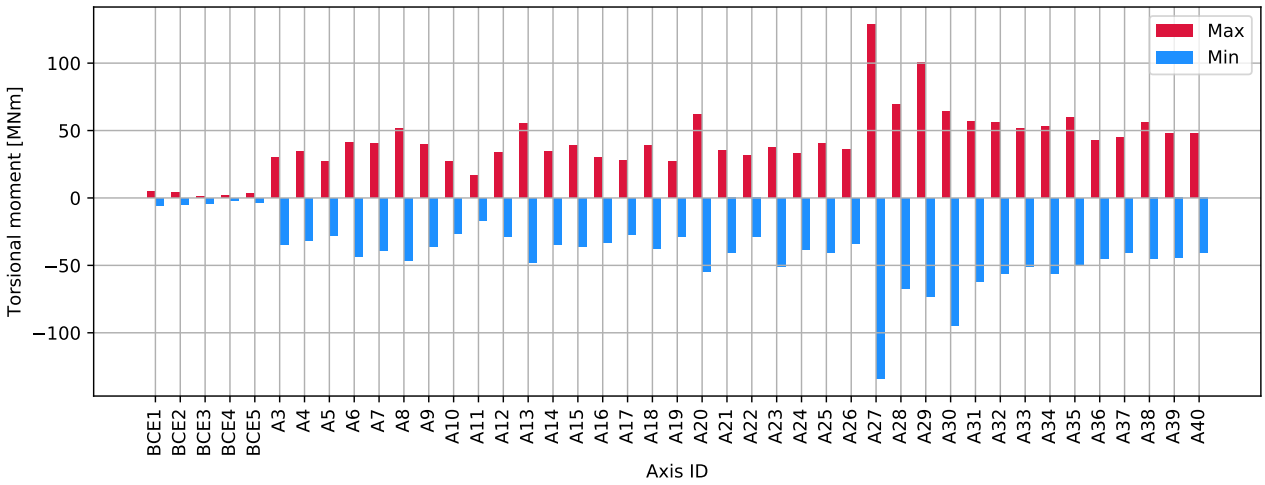


Figure 4.851: DH A30-A31 180deg - columns top : Torsional moment [MNm]

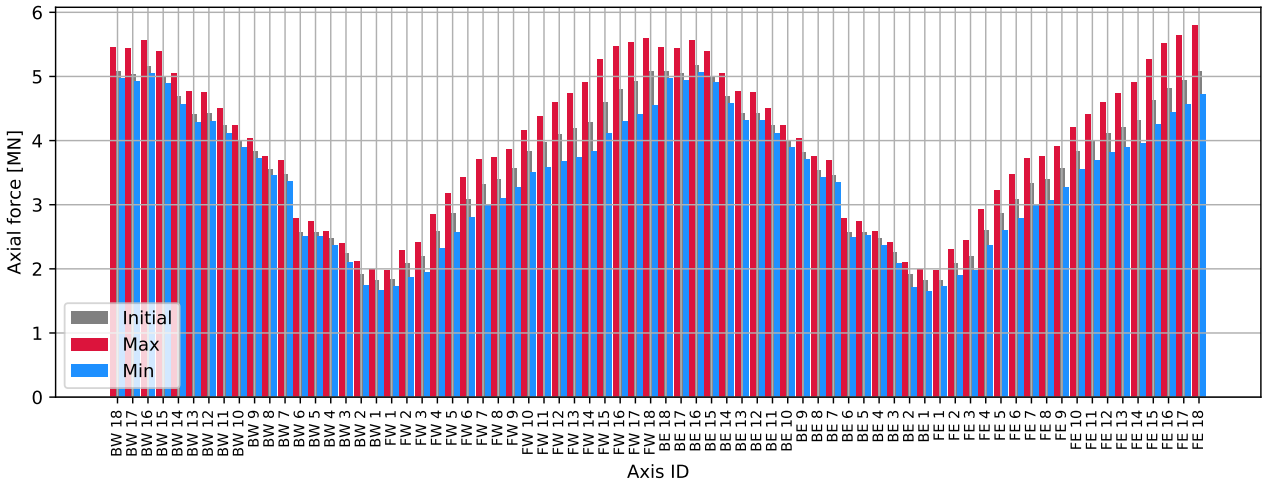


Figure 4.852: DH A30-A31 180deg - cables : Axial force [MN]

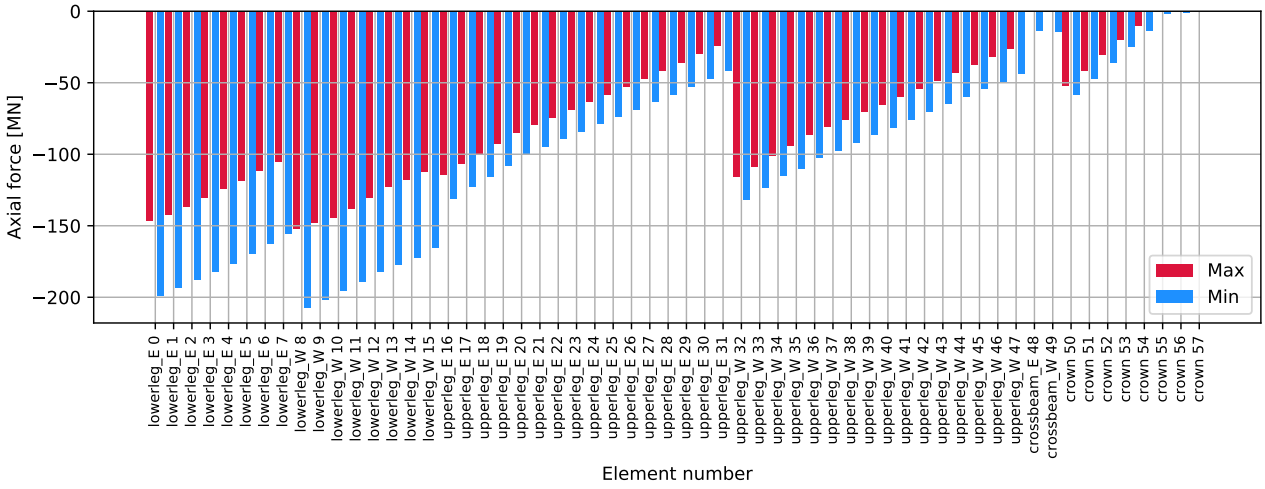


Figure 4.853: DH A30-A31 180deg - tower: Axial force [MN]

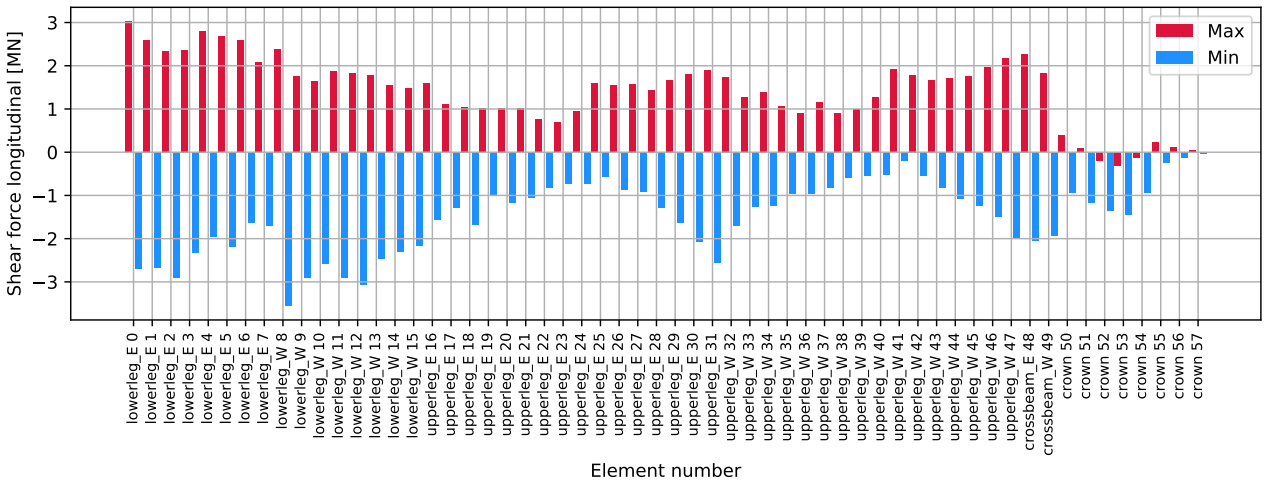


Figure 4.854: DH A30-A31 180deg - tower: Shear force longitudinal [MN]

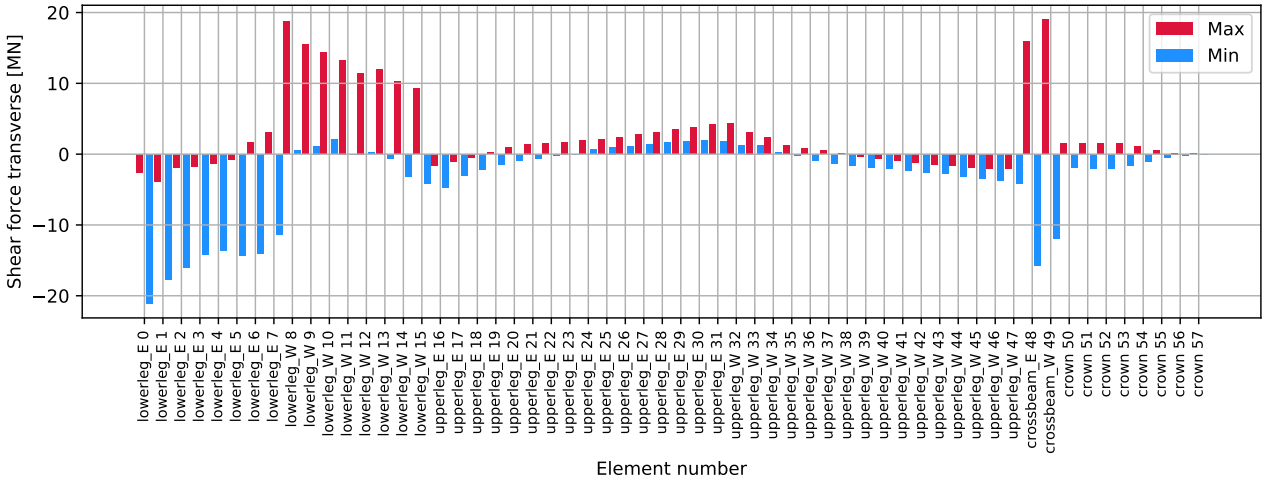


Figure 4.855: DH A30-A31 180deg - tower: Shear force transverse [MN]

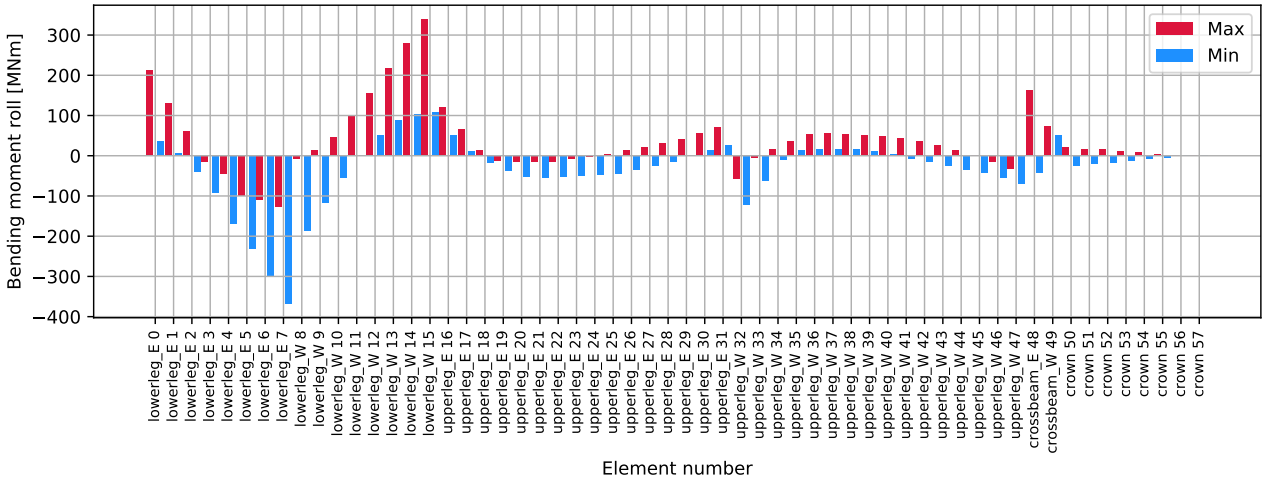


Figure 4.856: DH A30-A31 180deg - tower: Bending moment roll [MNm]

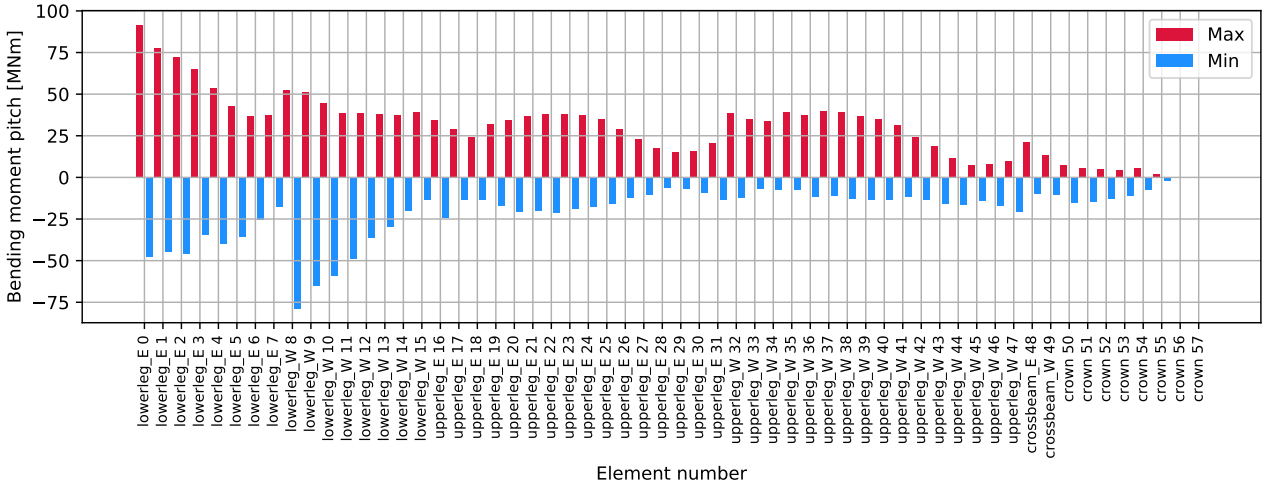


Figure 4.857: DH A30-A31 180deg - tower: Bending moment pitch [MNm]

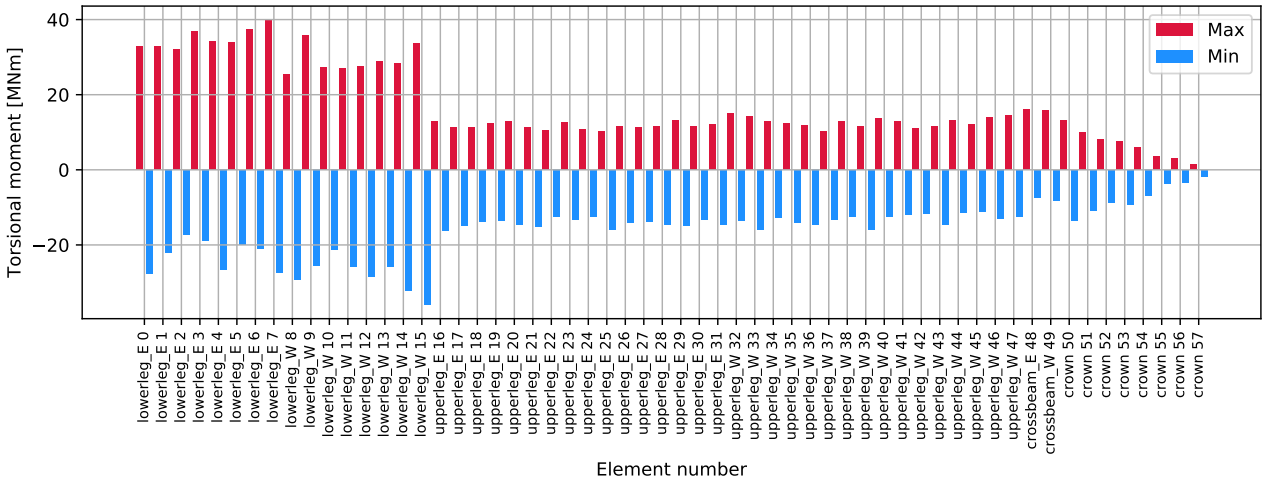


Figure 4.858: DH A30-A31 180deg - tower: Torsional moment [MNm]

### 4.19.3 Time series

Note : Time series are filtered using a Saviotzky-Golay filter for increased readability of the time history plots. Hence, maximum values that occur due to a rapid vibration are not shown in the plots. For maximum values, refer to the tabulated data.
All elements are numbered from South to North, bottom to top

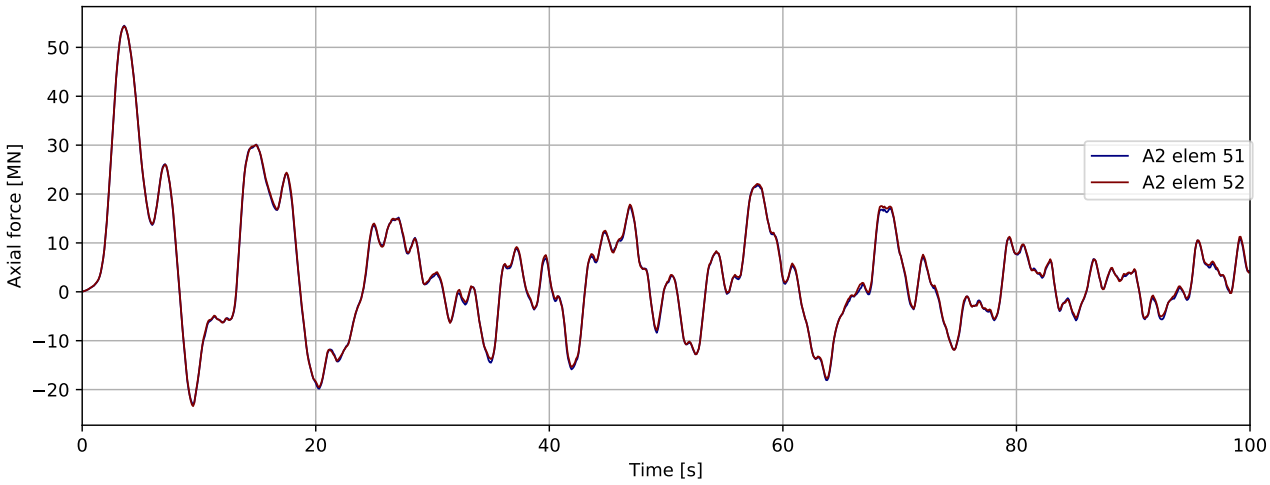


Figure 4.859: DH A30-A31 180deg - bridgegirder @ pylon: Axial force [MN]

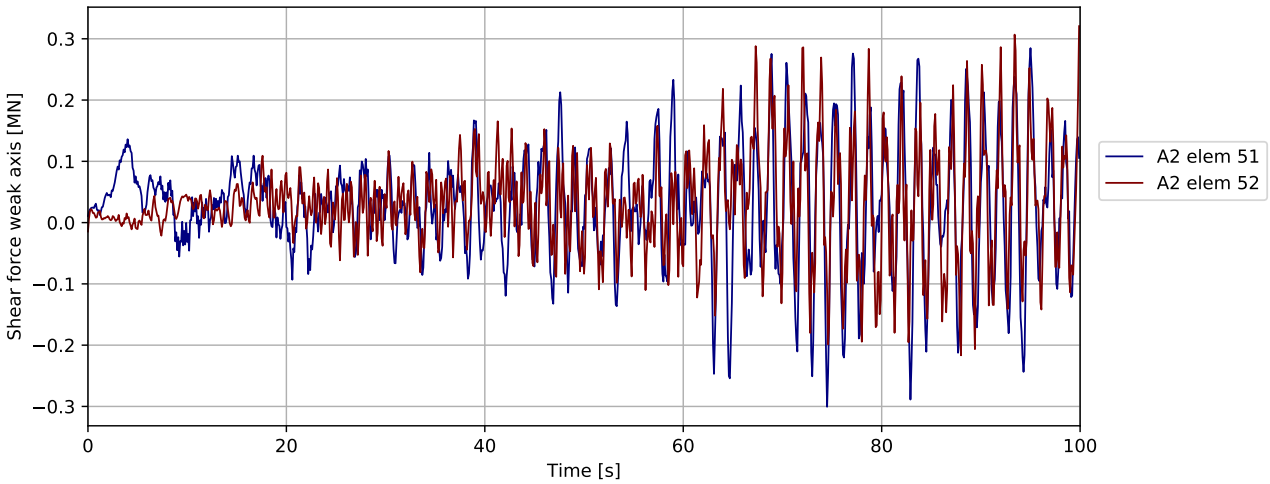


Figure 4.860: DH A30-A31 180deg - bridgegirder @ pylon: Shear force weak axis [MN]

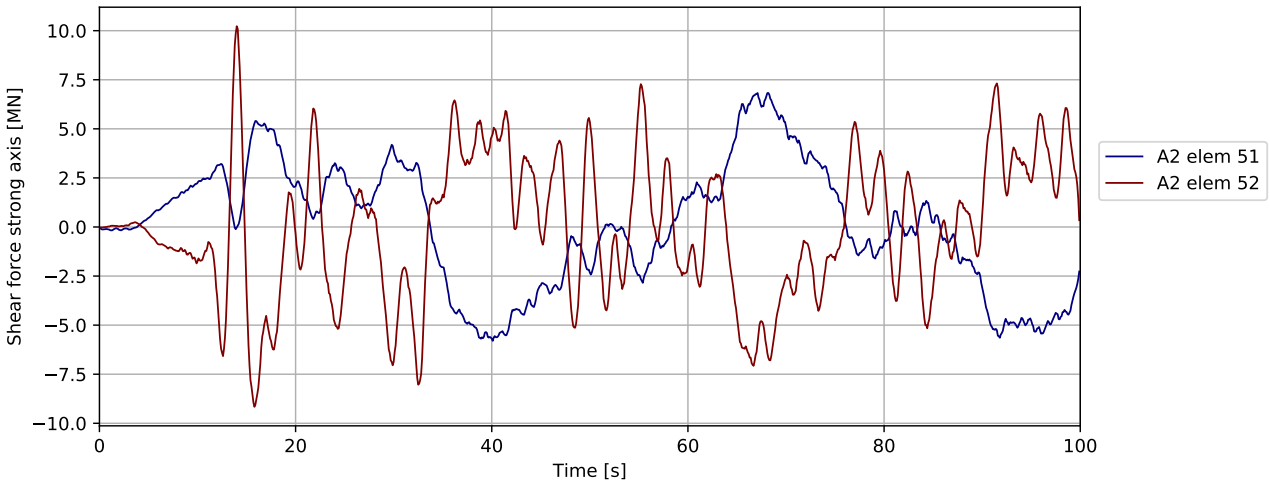


Figure 4.861: DH A30-A31 180deg - bridgegirder @ pylon: Shear force strong axis [MN]

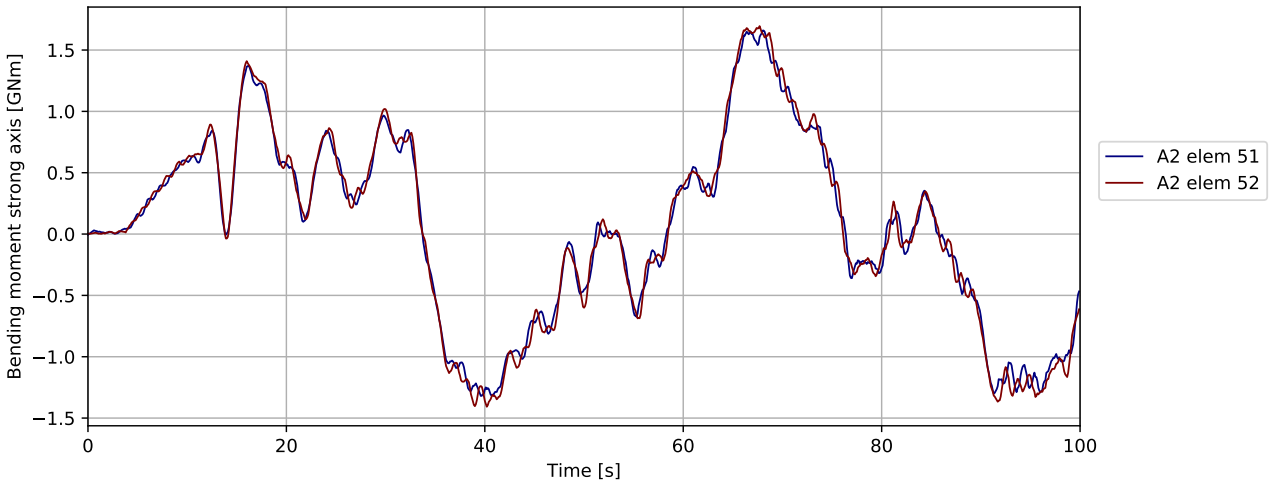


Figure 4.862: DH A30-A31 180deg - bridgegirder @ pylon: Bending moment strong axis [GNm]

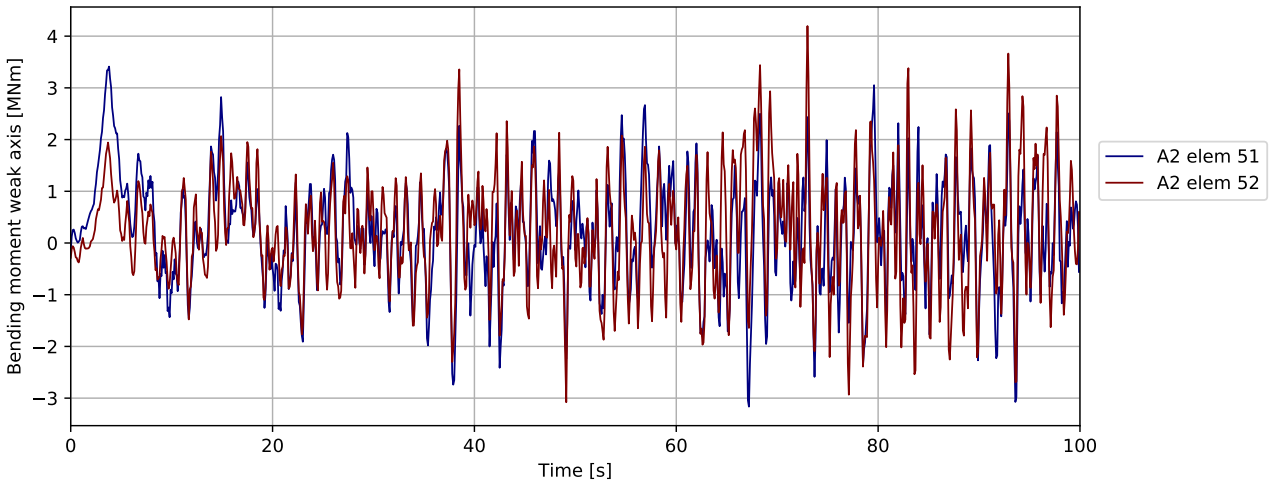


Figure 4.863: DH A30-A31 180deg - bridgegirder @ pylon: Bending moment weak axis [MNm]

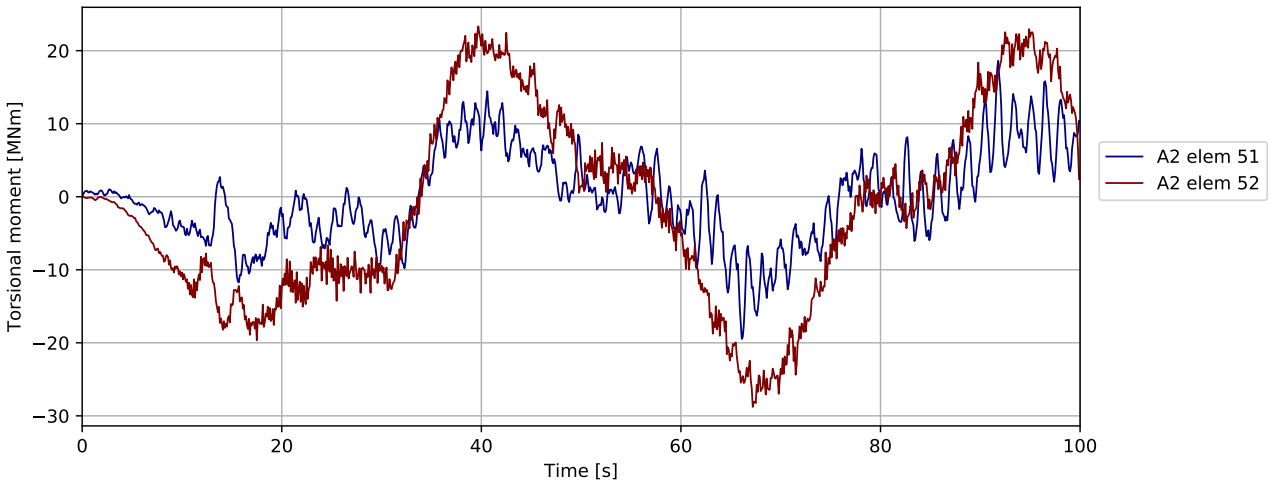


Figure 4.864: DH A30-A31 180deg - bridgegirder @ pylon: Torsional moment [MNm]

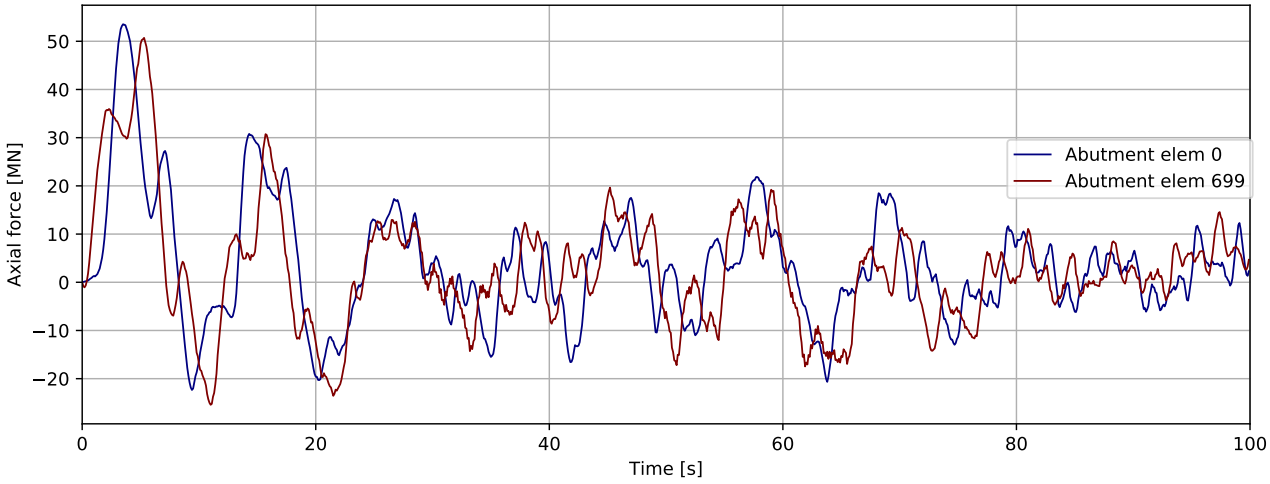


Figure 4.865: DH A30-A31 180deg - bridgegirder @abutments: Axial force [MN]

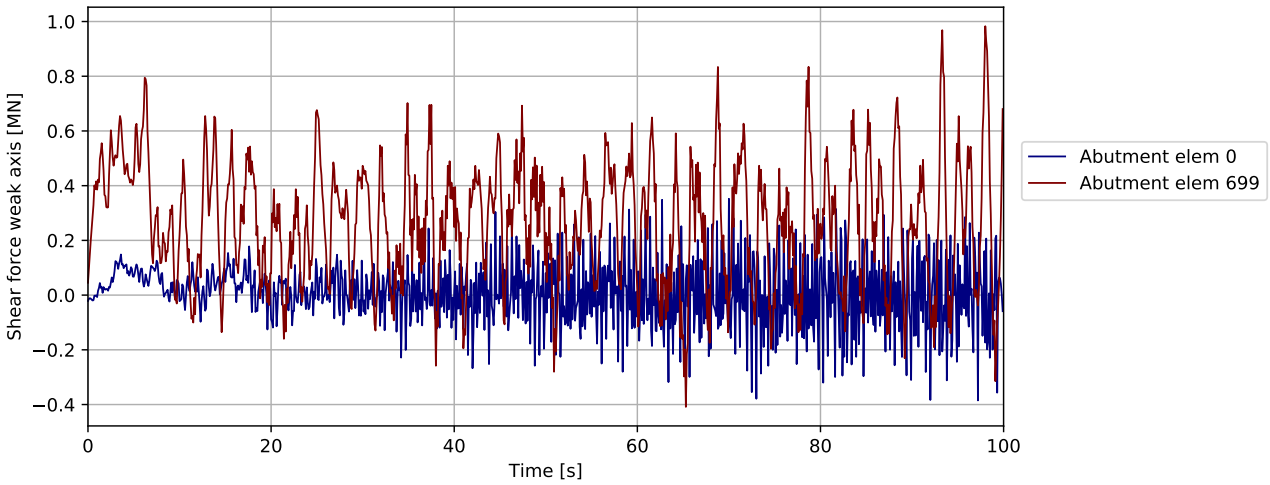


Figure 4.866: DH A30-A31 180deg - bridgegirder @abutments: Shear force weak axis [MN]

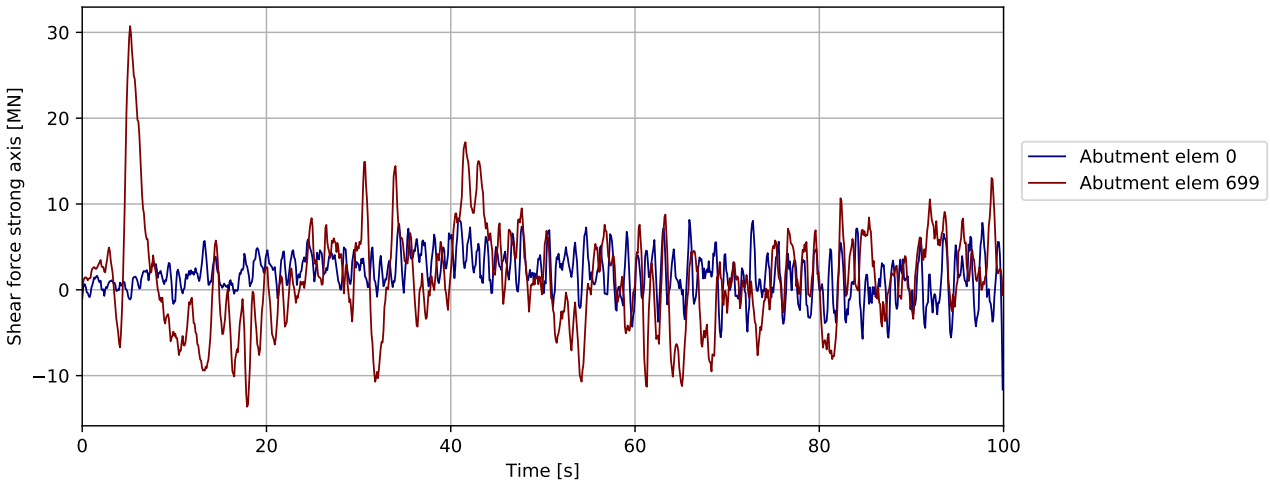


Figure 4.867: DH A30-A31 180deg - bridgegirder @abutments: Shear force strong axis [MN]

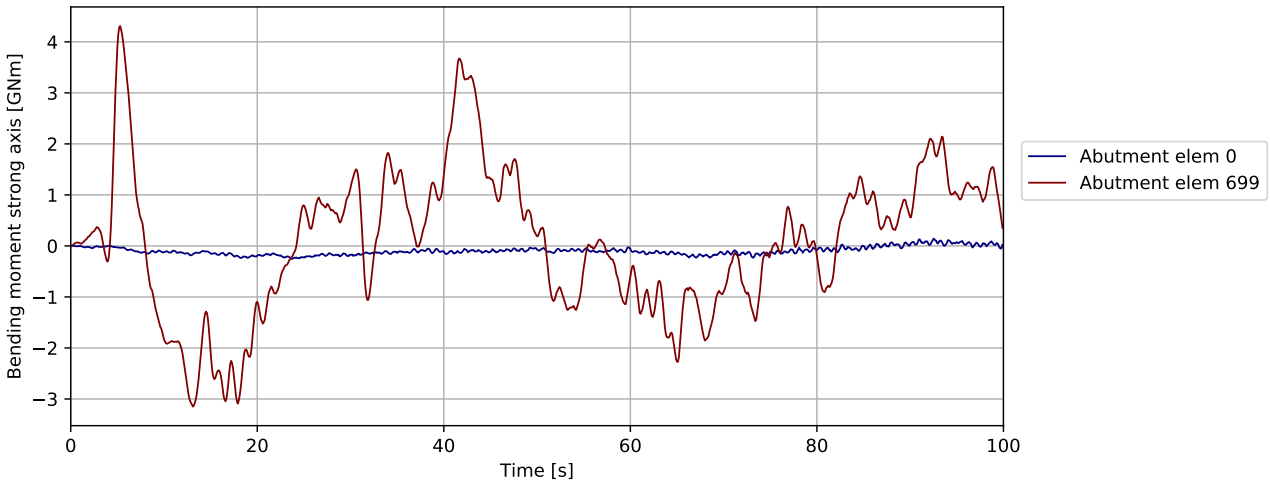


Figure 4.868: DH A30-A31 180deg - bridgegirder @abutments: Bending moment strong axis [GNm]

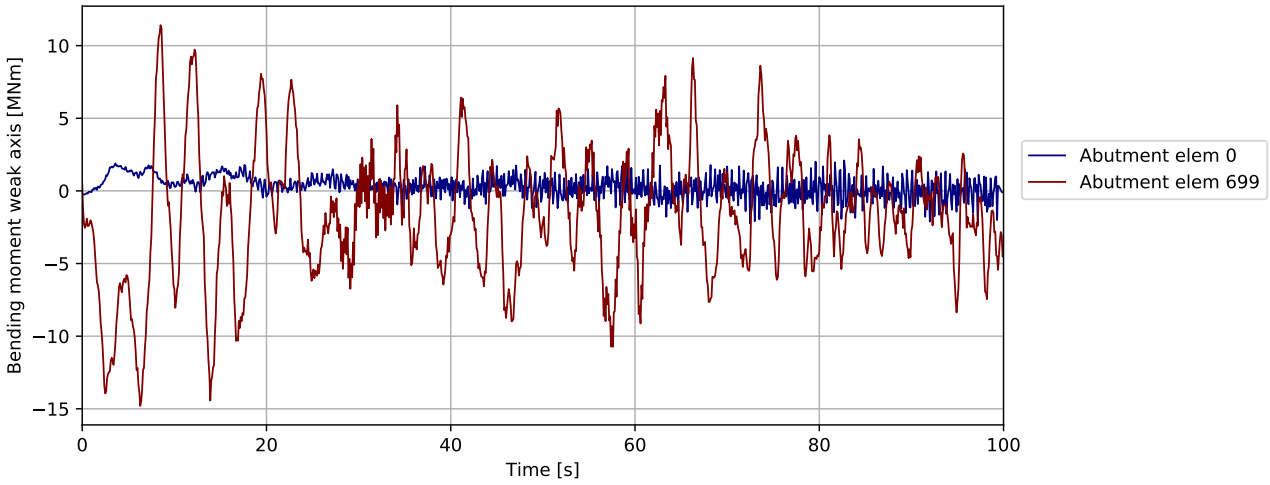


Figure 4.869: DH A30-A31 180deg - bridgegirder @abutments: Bending moment weak axis [MNm]

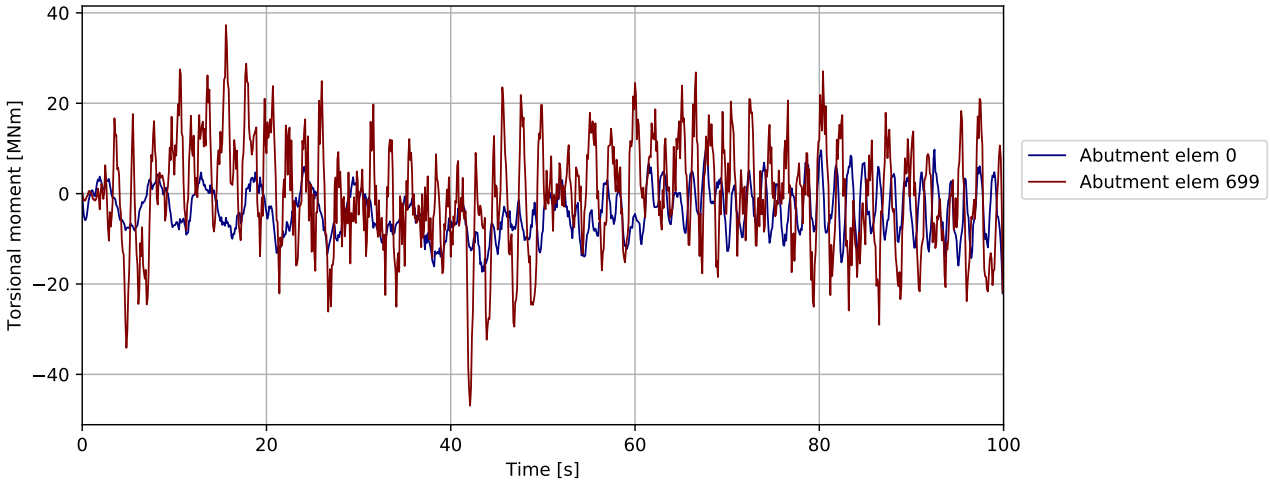


Figure 4.870: DH A30-A31 180deg - bridgegirder @abutments: Torsional moment [MNm]

Note : Compressive spring force is negative

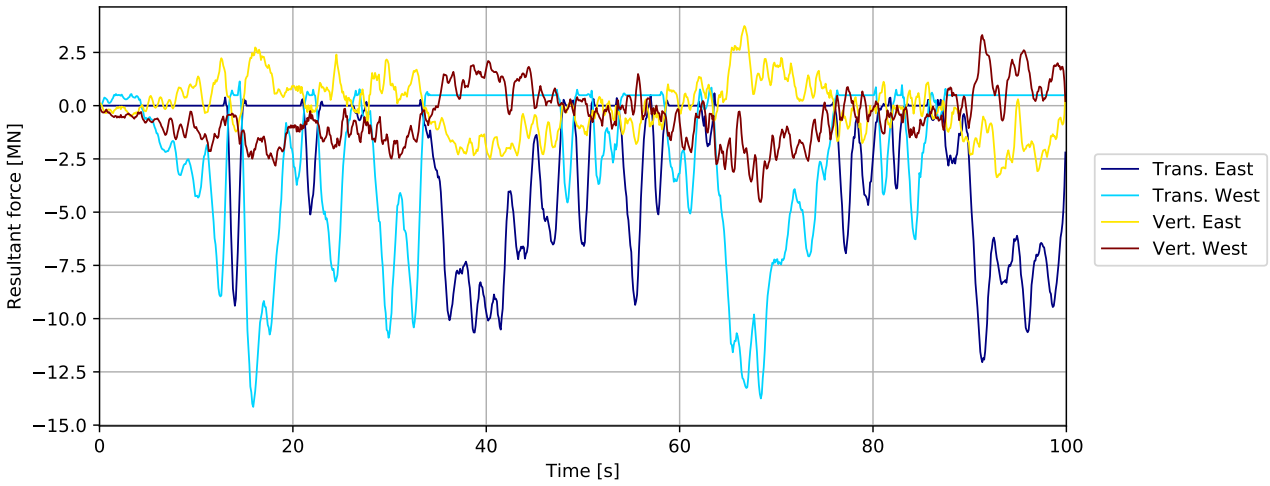


Figure 4.871: DH A30-A31 180deg - bridgegirder supports in tower: Resultant force [MN]

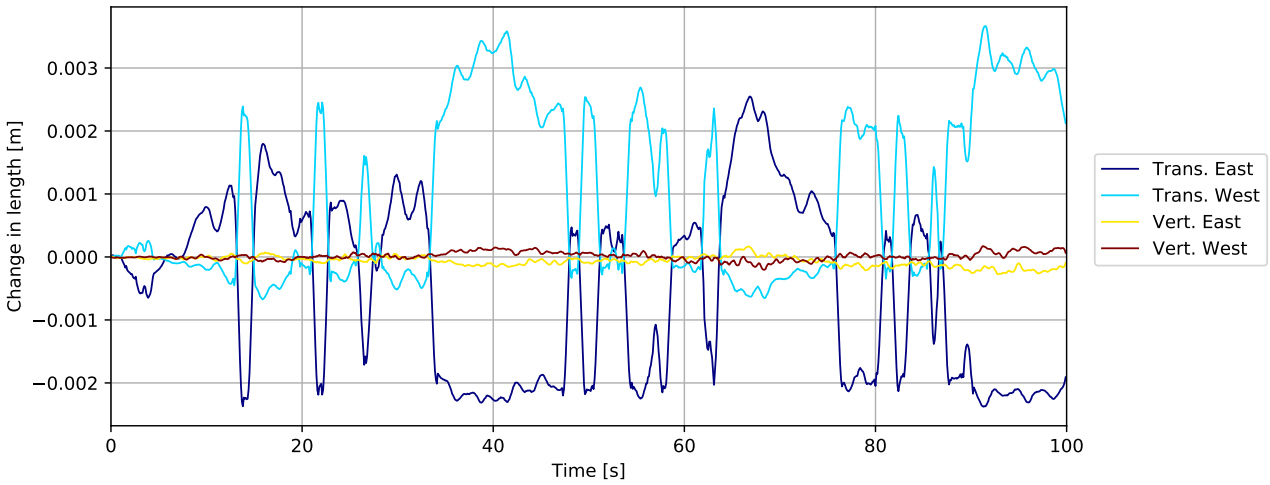


Figure 4.872: DH A30-A31 180deg - bridgegirder supports in tower: Change in length [m]

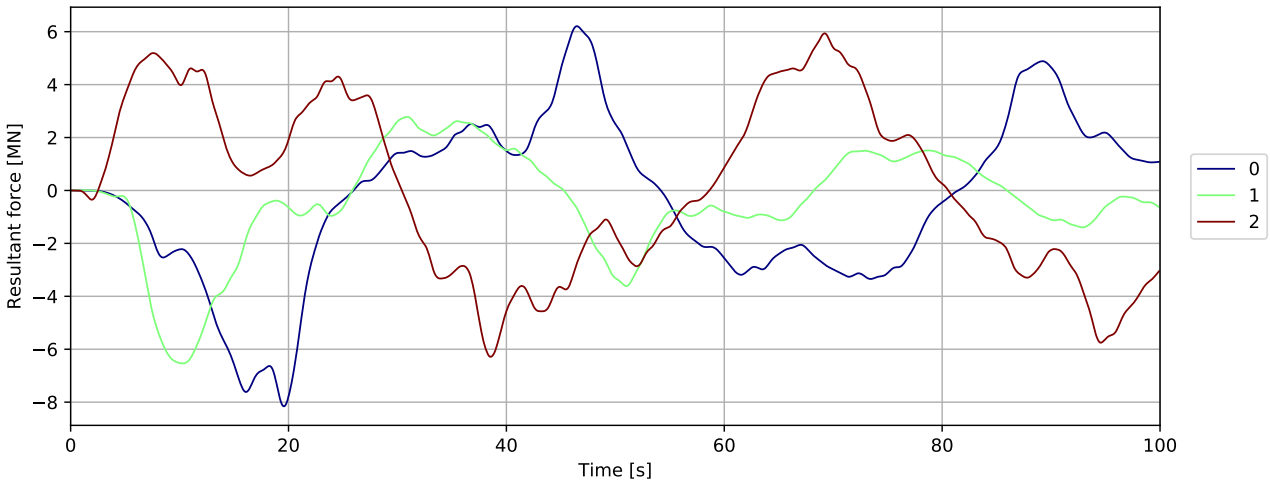


Figure 4.873: Mooring force

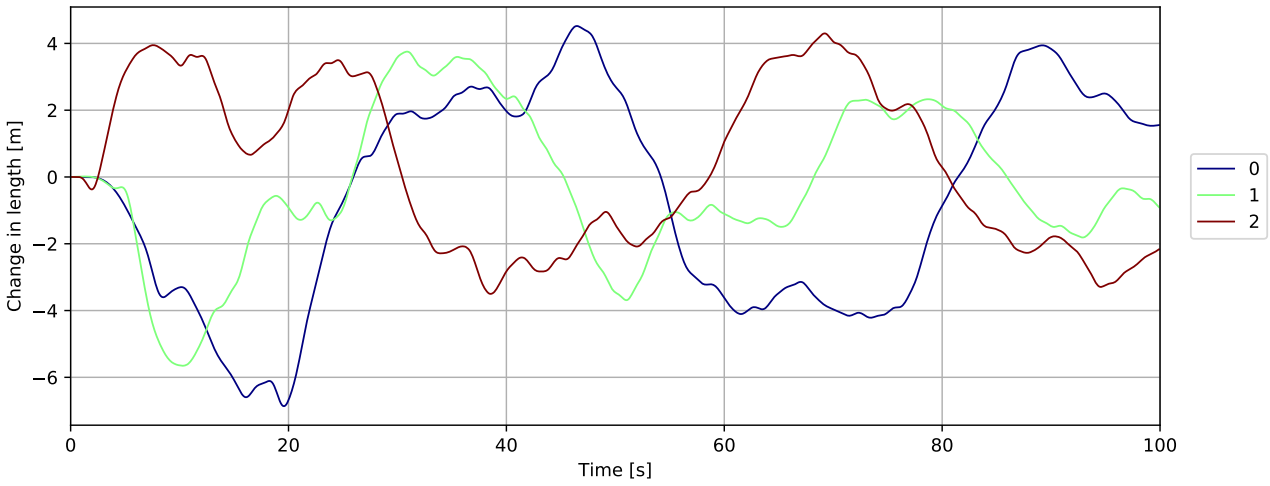


Figure 4.874: Mooring displacement

## 4.20 Deck house A35-A36 180deg

### 4.20.1 Overall response

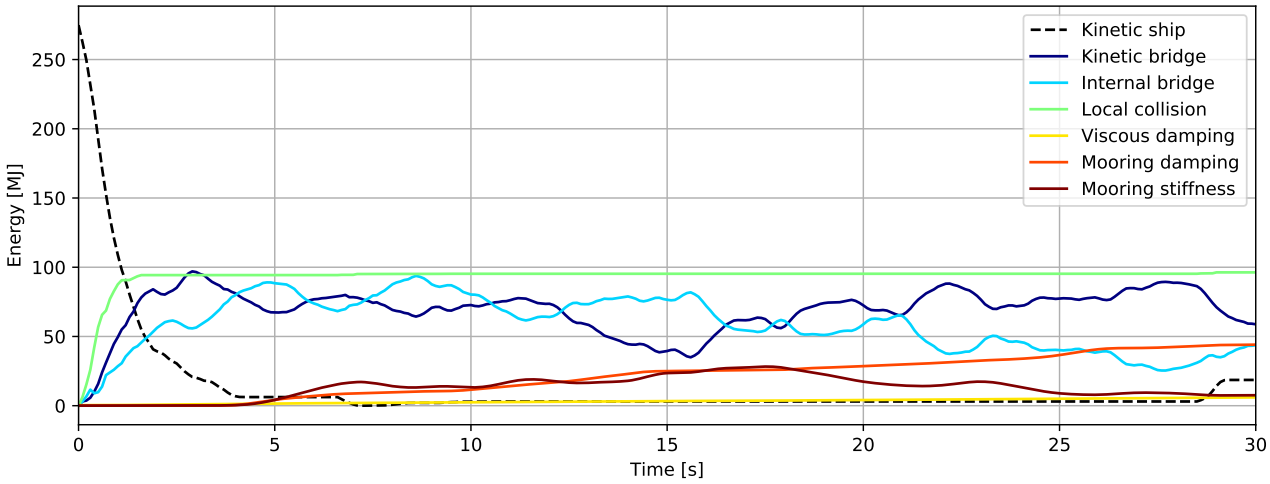


Figure 4.875: Energy [MJ] - initial phase

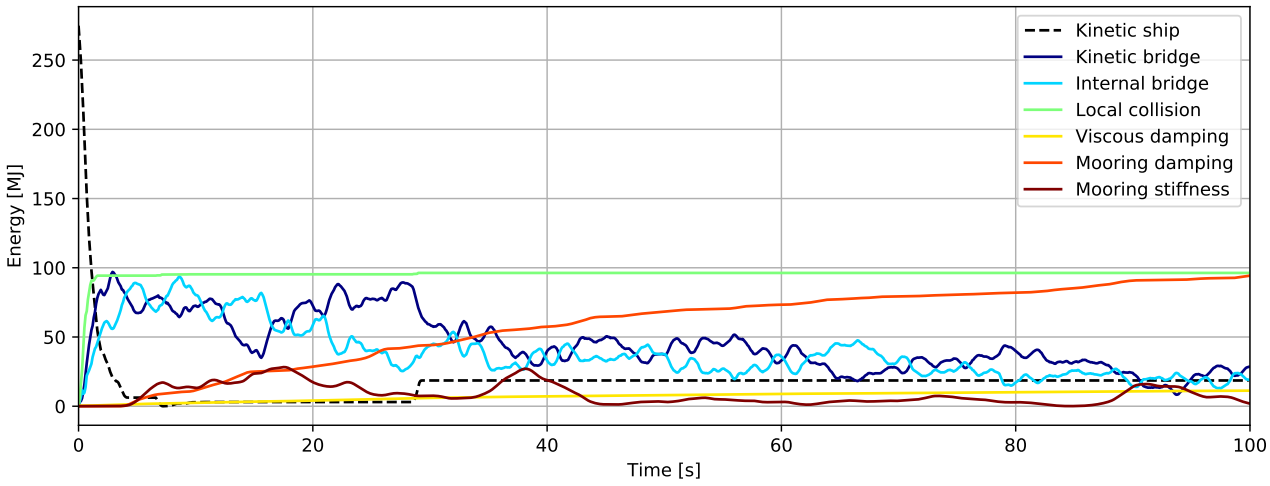


Figure 4.876: Energy [MJ]

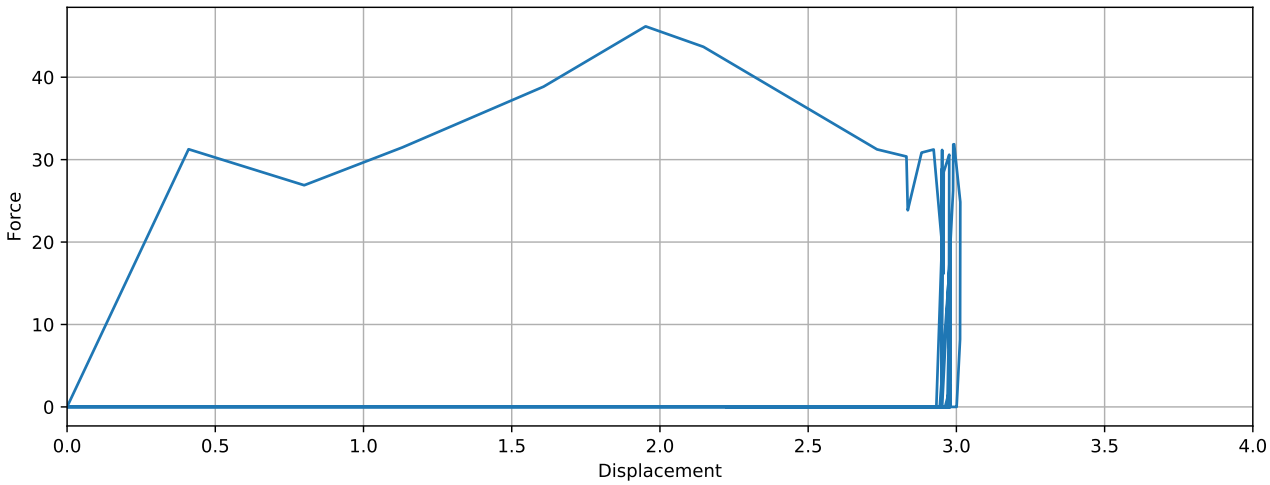


Figure 4.877: Simulated local collision force-displacement

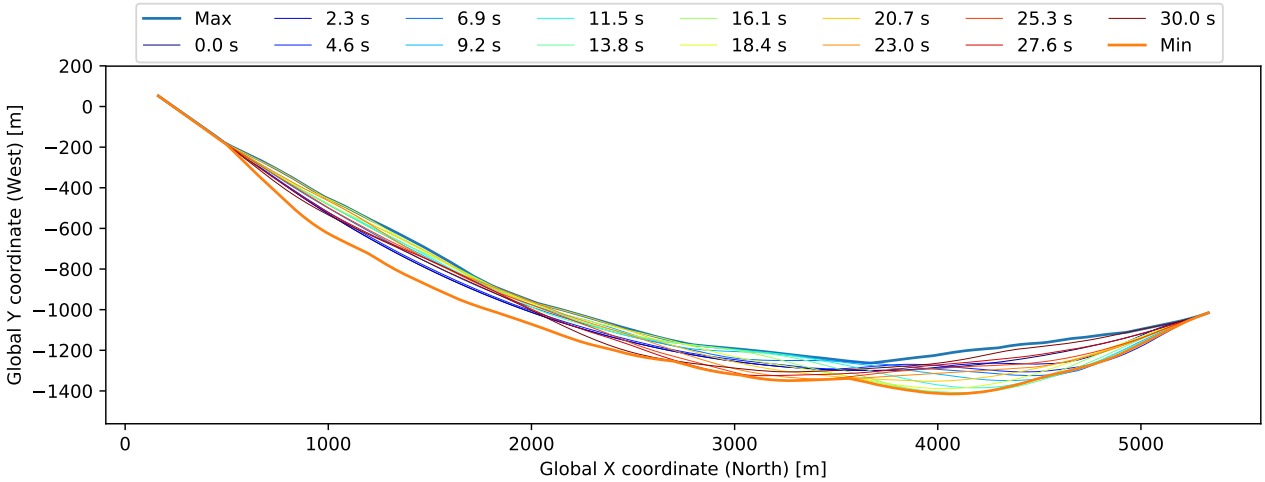


Figure 4.878: Bridgegirder deflection (10x displacment scaling)

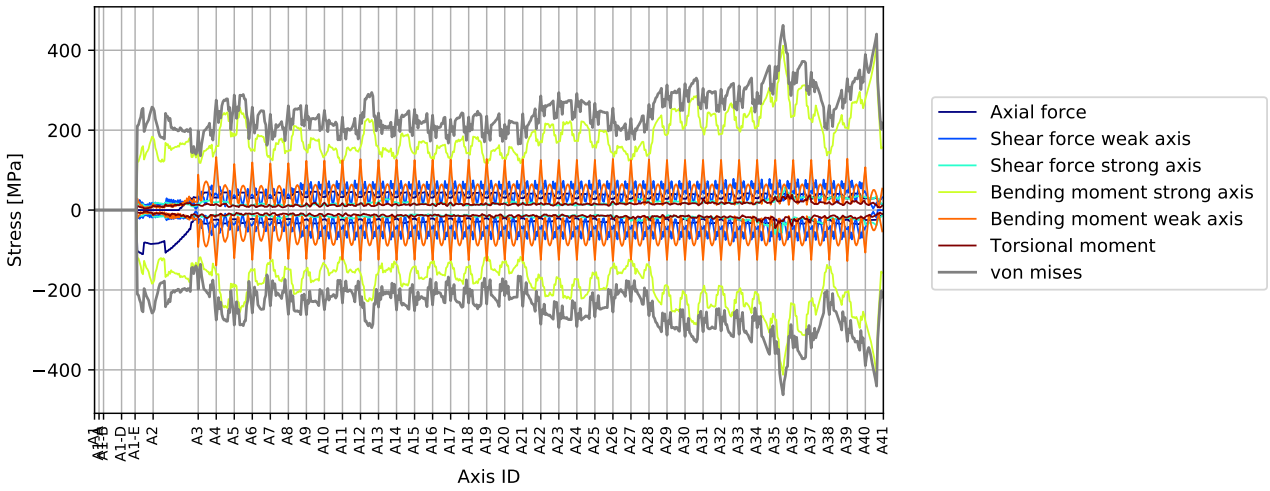


Figure 4.879: Stress envelope from all force components

### 4.20.2 Envelope plots

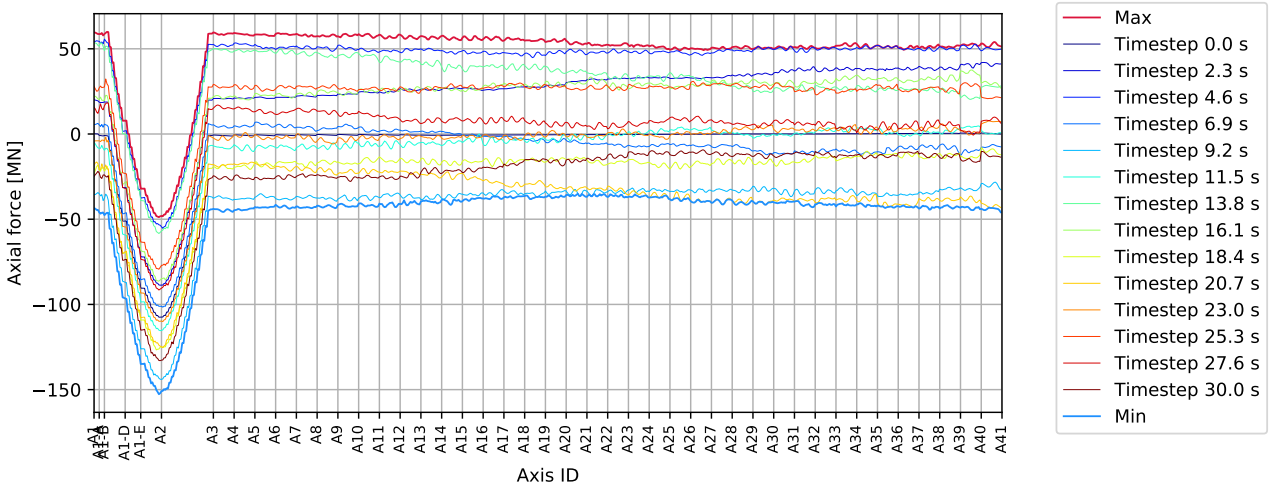


Figure 4.880: DH A35-A36 180deg - bridgegirder : Axial force [MN]

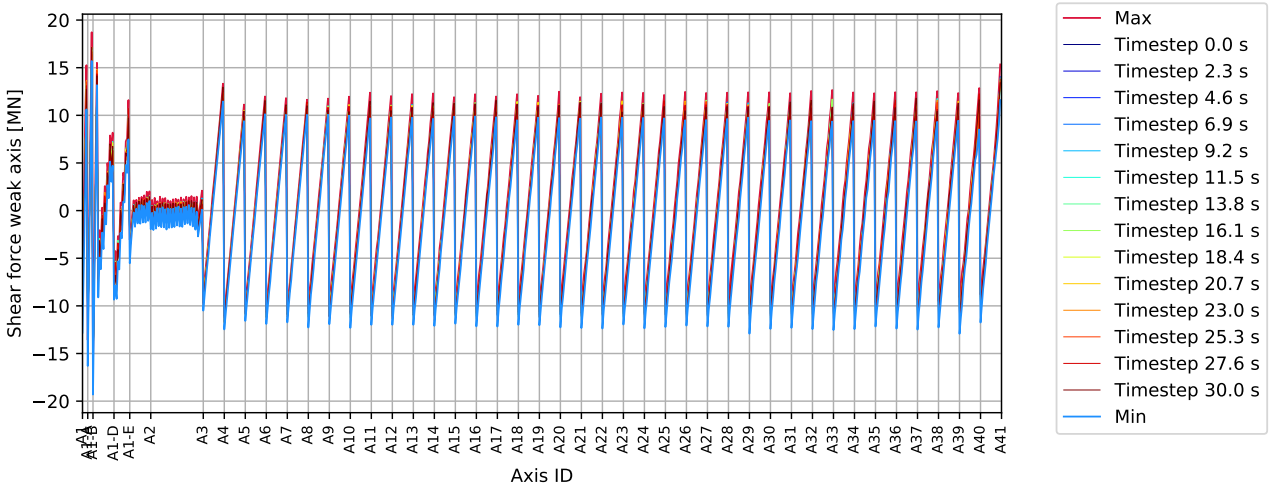


Figure 4.881: DH A35-A36 180deg - bridgegirder : Shear force weak axis [MN]

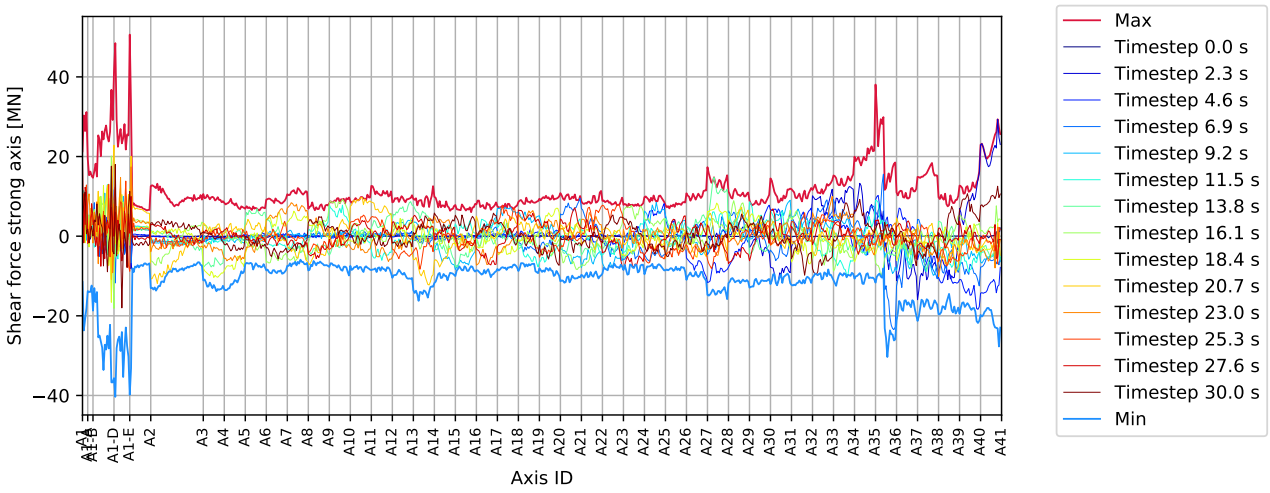


Figure 4.882: DH A35-A36 180deg - bridgegirder : Shear force strong axis [MN]

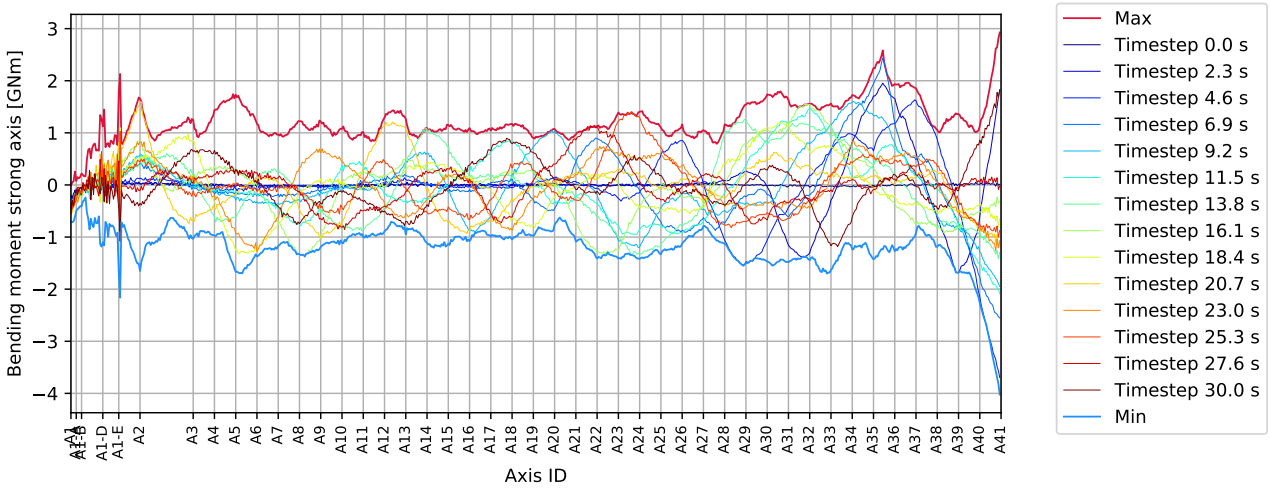


Figure 4.883: DH A35-A36 180deg - bridgegirder : Bending moment strong axis [GNm]

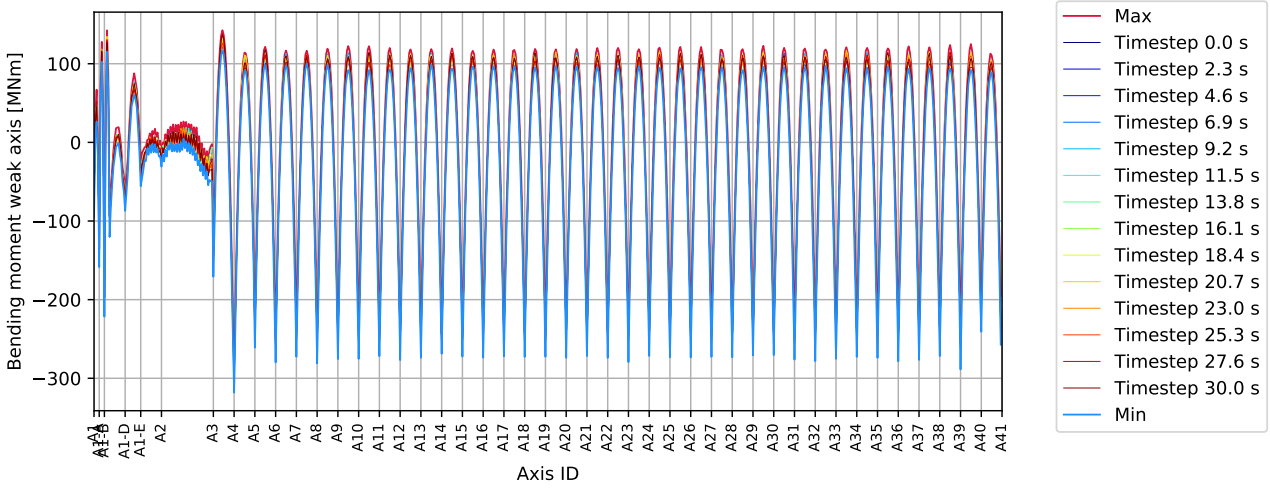


Figure 4.884: DH A35-A36 180deg - bridgegirder : Bending moment weak axis [MNm]

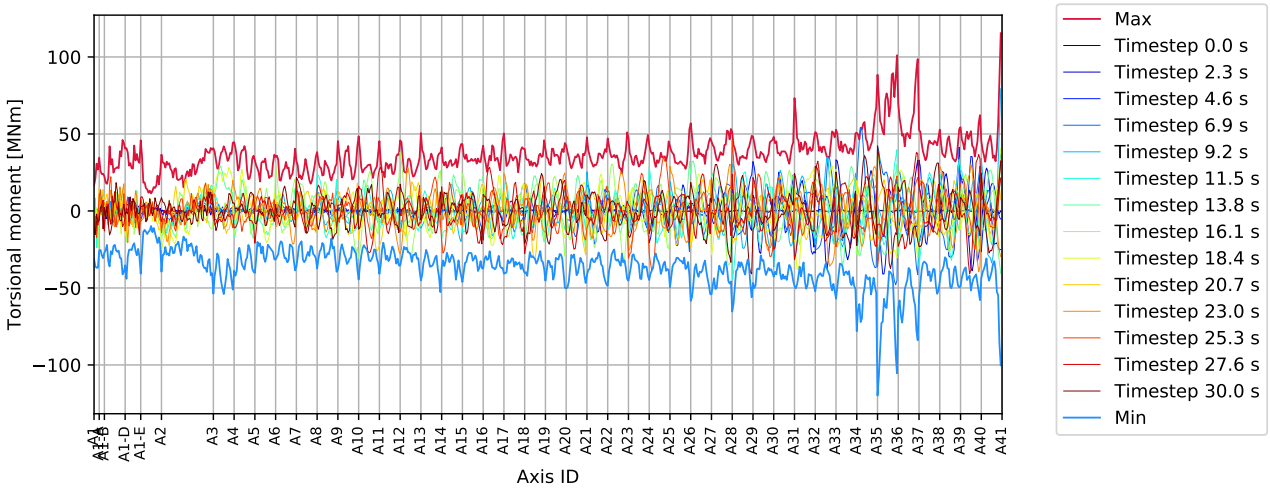


Figure 4.885: DH A35-A36 180deg - bridgegirder : Torsional moment [MNm]

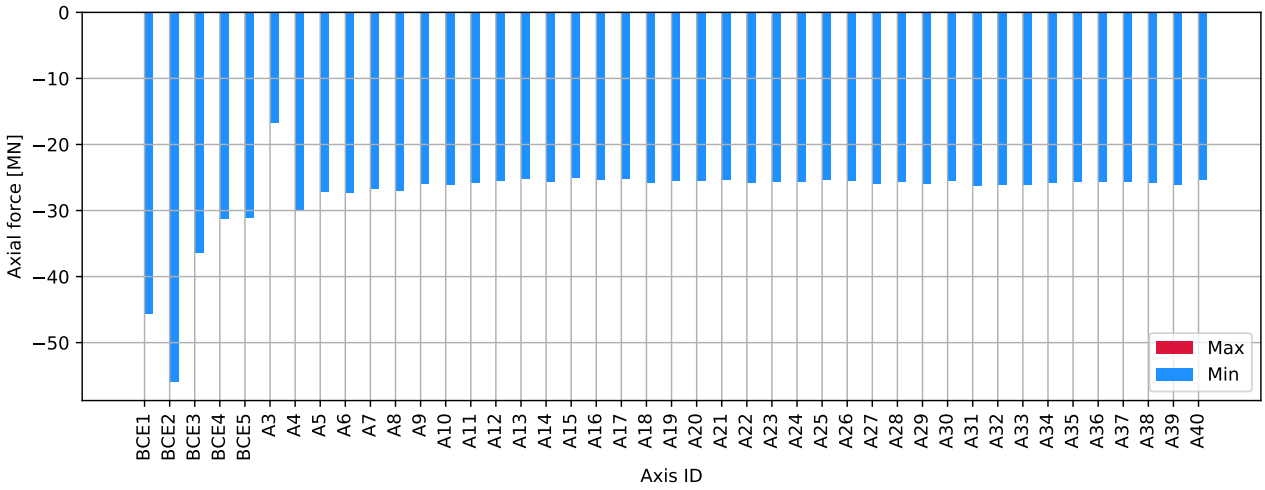


Figure 4.886: DH A35-A36 180deg - columns bottom : Axial force [MN]

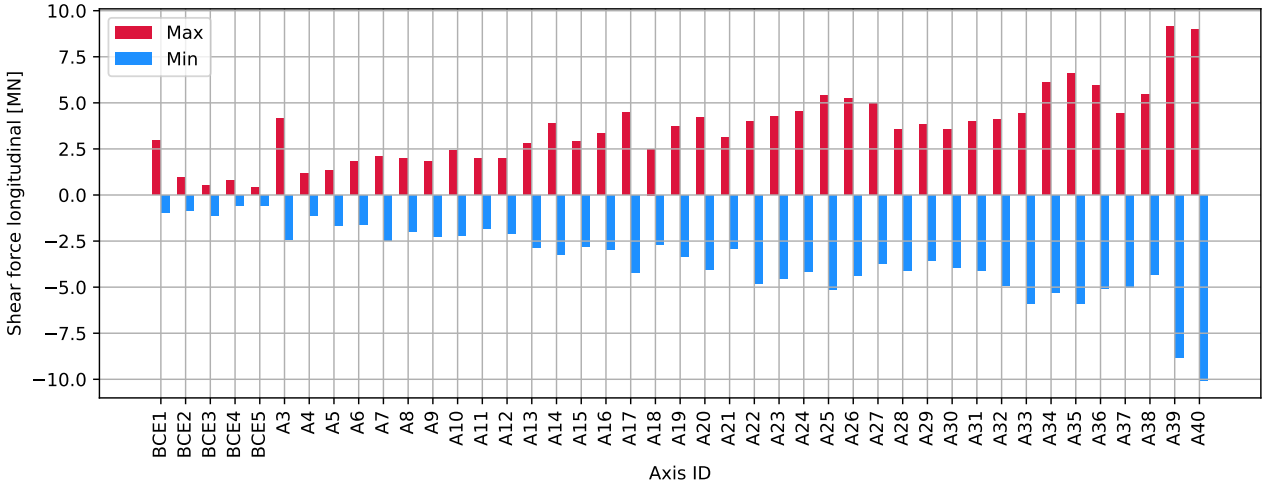


Figure 4.887: DH A35-A36 180deg - columns bottom : Shear force longitudinal [MN]

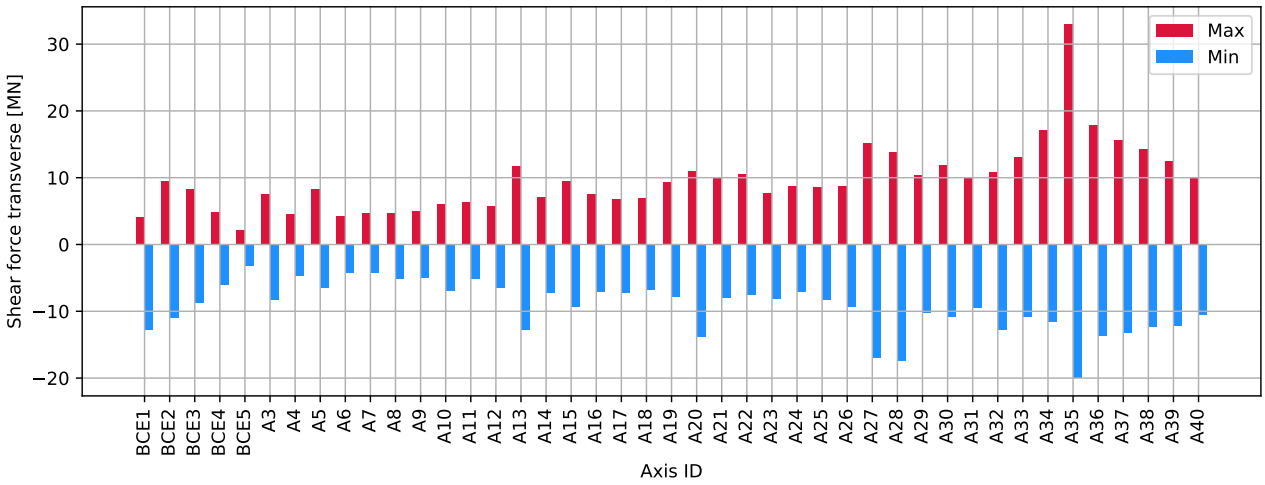


Figure 4.888: DH A35-A36 180deg - columns bottom : Shear force transverse [MN]

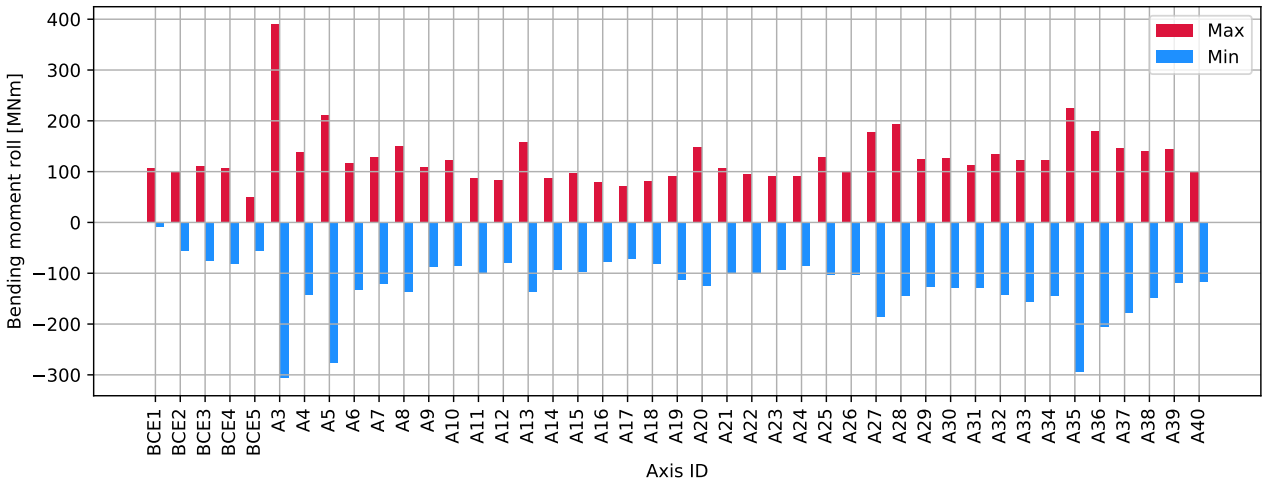


Figure 4.889: DH A35-A36 180deg - columns bottom : Bending moment roll [MNm]

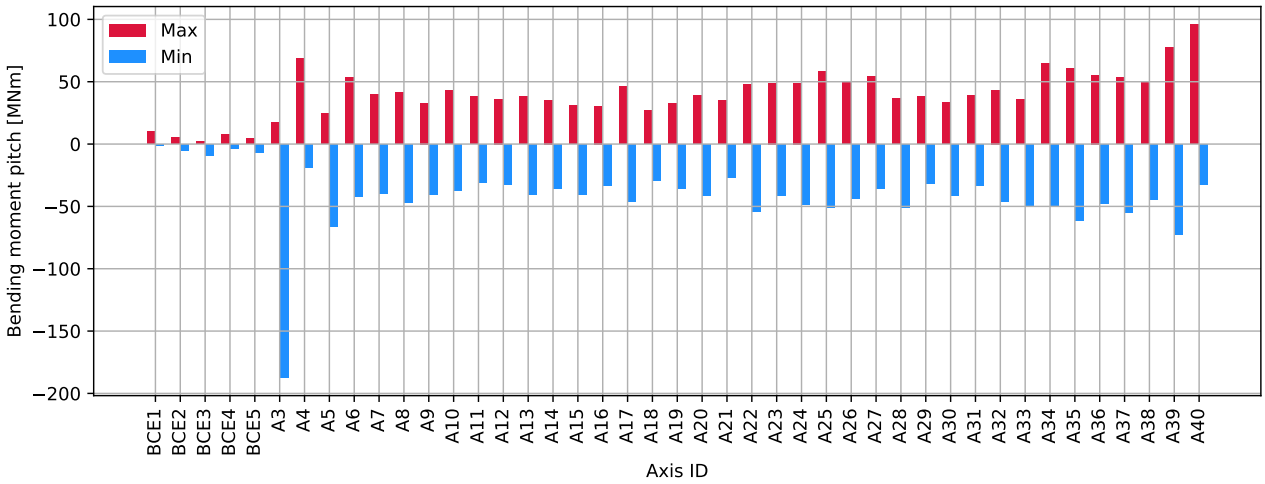


Figure 4.890: DH A35-A36 180deg - columns bottom : Bending moment pitch [MNm]

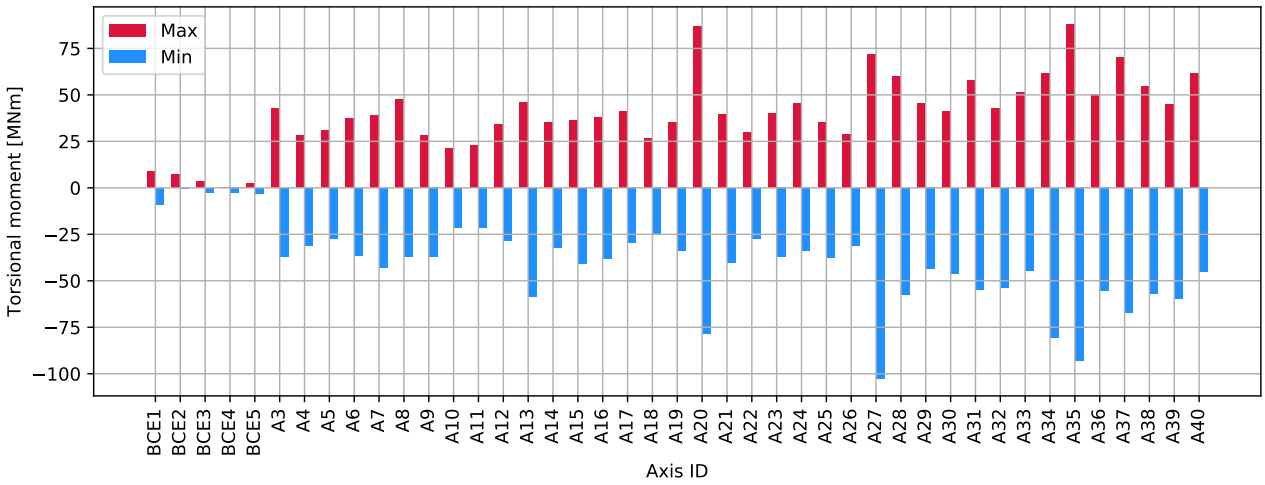


Figure 4.891: DH A35-A36 180deg - columns bottom : Torsional moment [MNm]

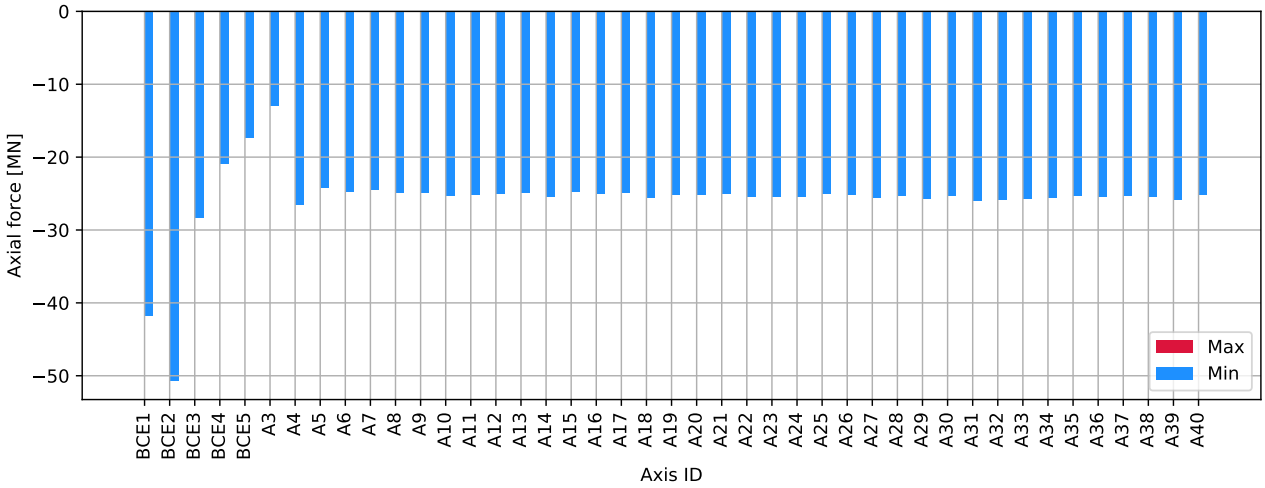


Figure 4.892: DH A35-A36 180deg - columns top : Axial force [MN]

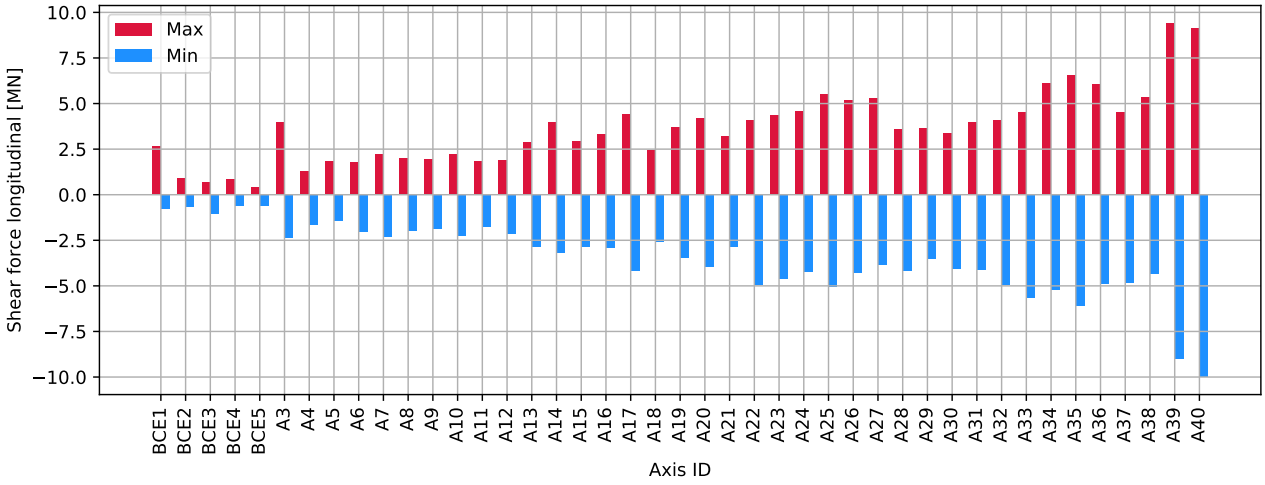


Figure 4.893: DH A35-A36 180deg - columns top : Shear force longitudinal [MN]

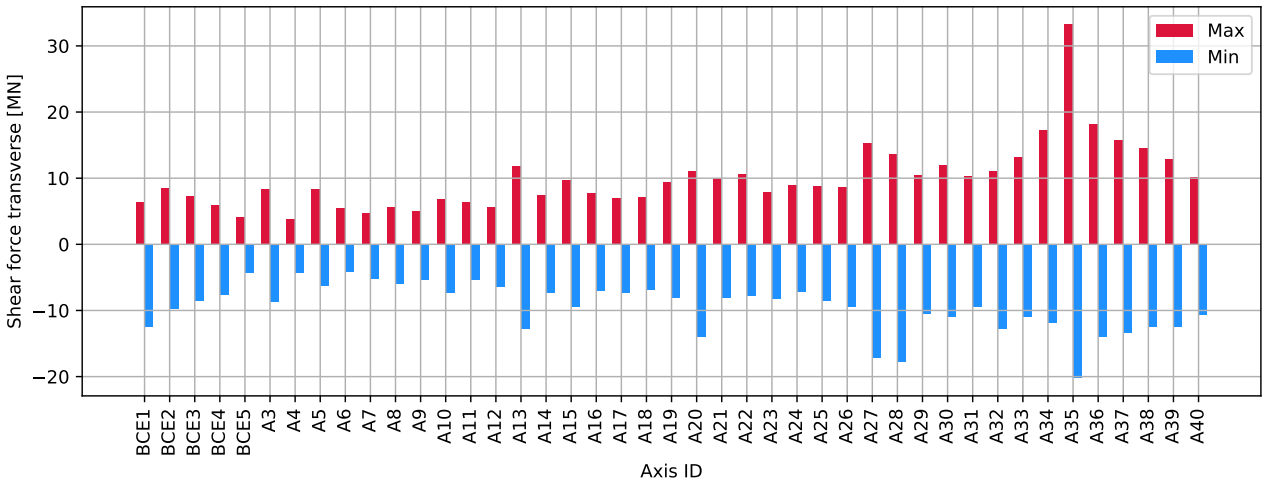


Figure 4.894: DH A35-A36 180deg - columns top : Shear force transverse [MN]

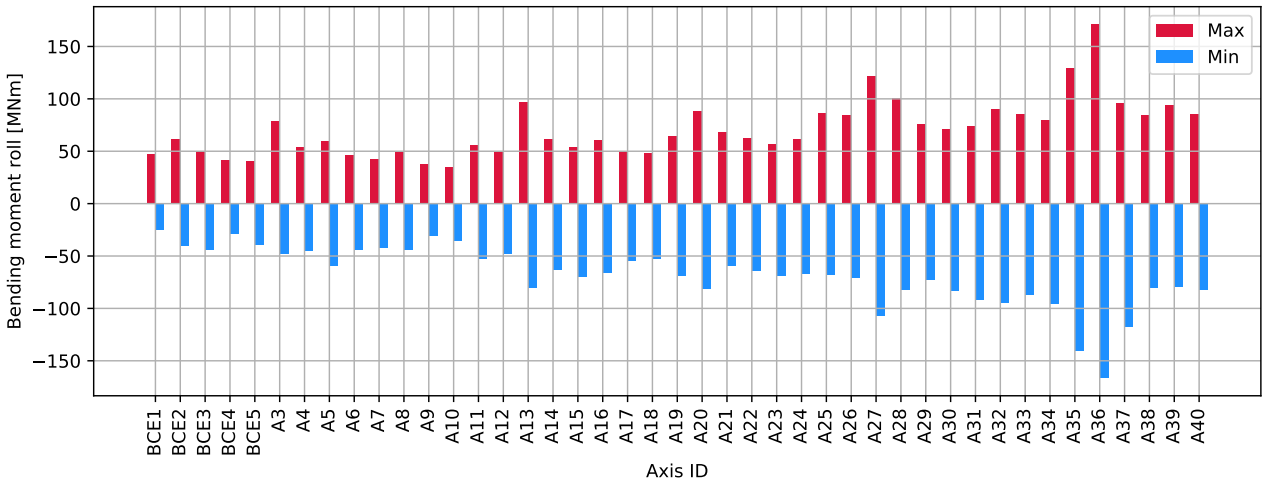


Figure 4.895: DH A35-A36 180deg - columns top : Bending moment roll [MNm]

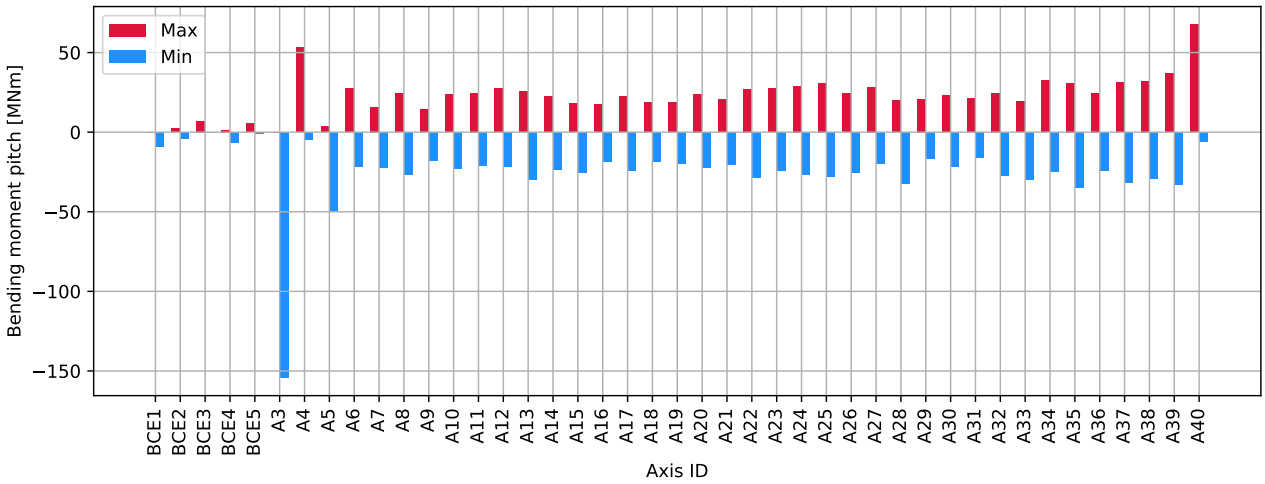


Figure 4.896: DH A35-A36 180deg - columns top : Bending moment pitch [MNm]

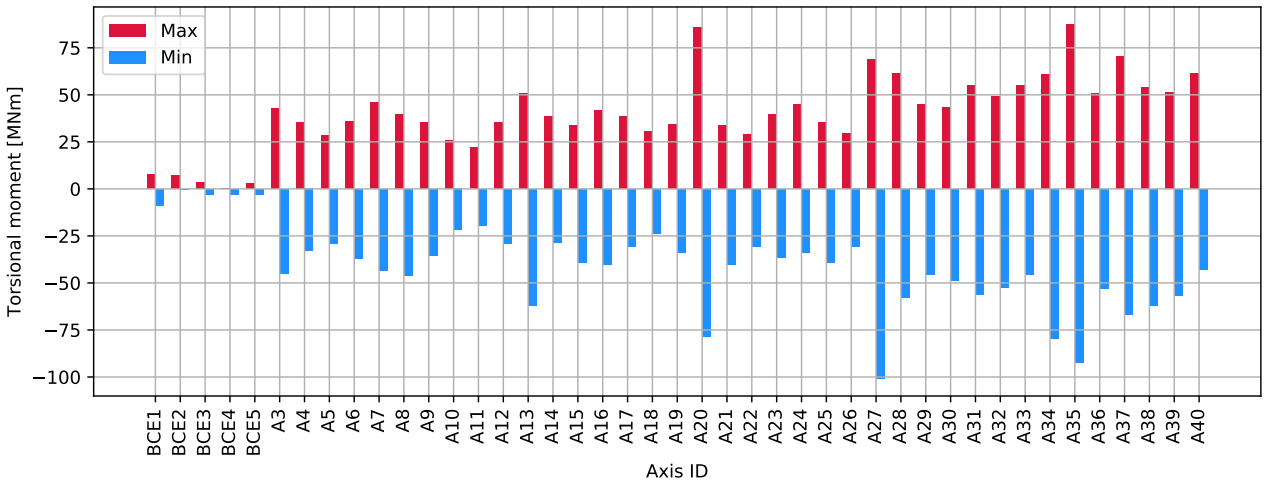


Figure 4.897: DH A35-A36 180deg - columns top : Torsional moment [MNm]

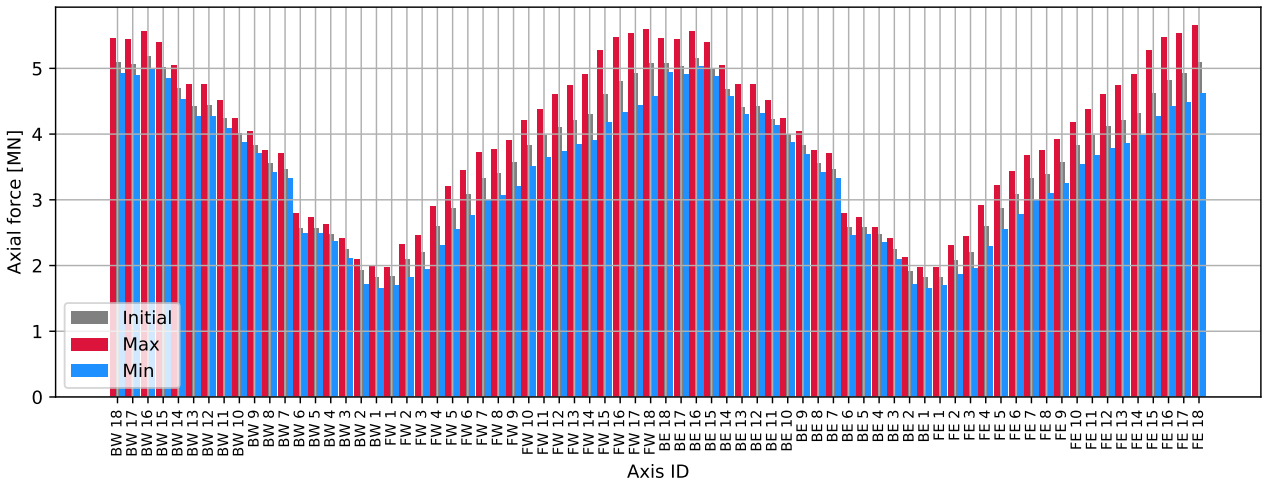


Figure 4.898: DH A35-A36 180deg - cables : Axial force [MN]

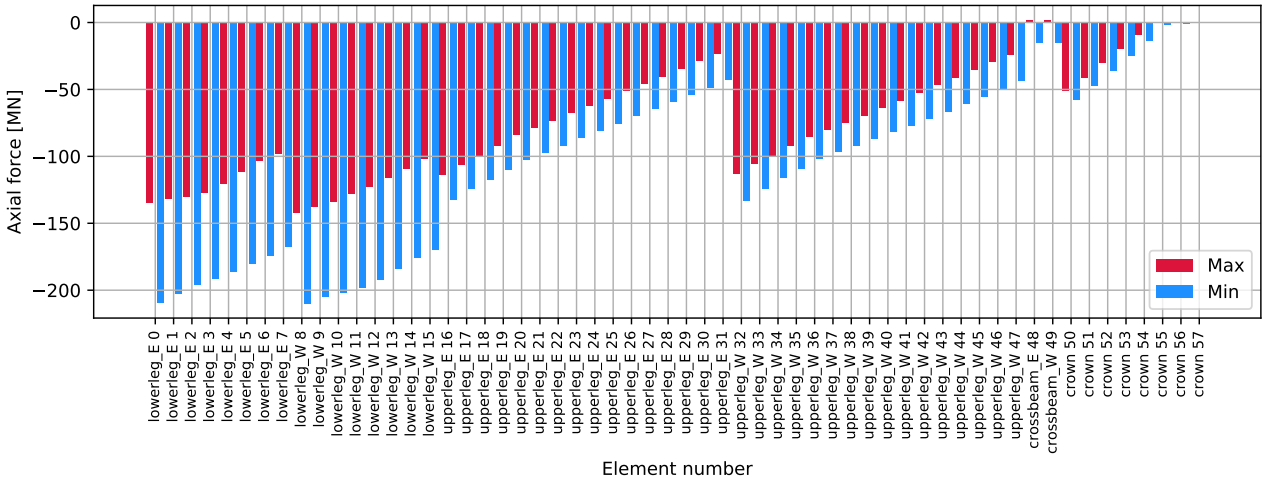


Figure 4.899: DH A35-A36 180deg - tower: Axial force [MN]

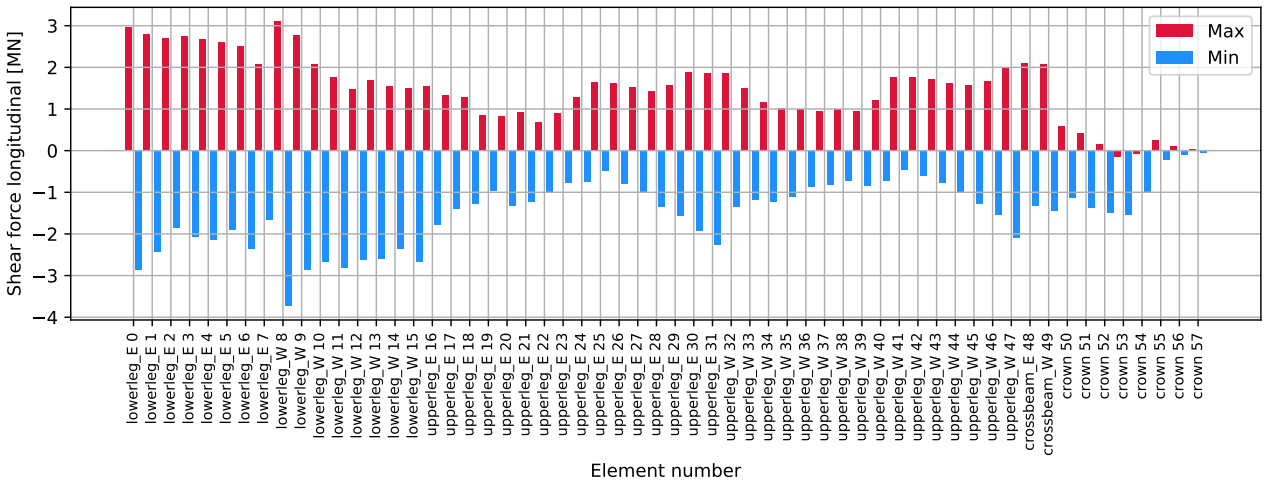


Figure 4.900: DH A35-A36 180deg - tower: Shear force longitudinal [MN]

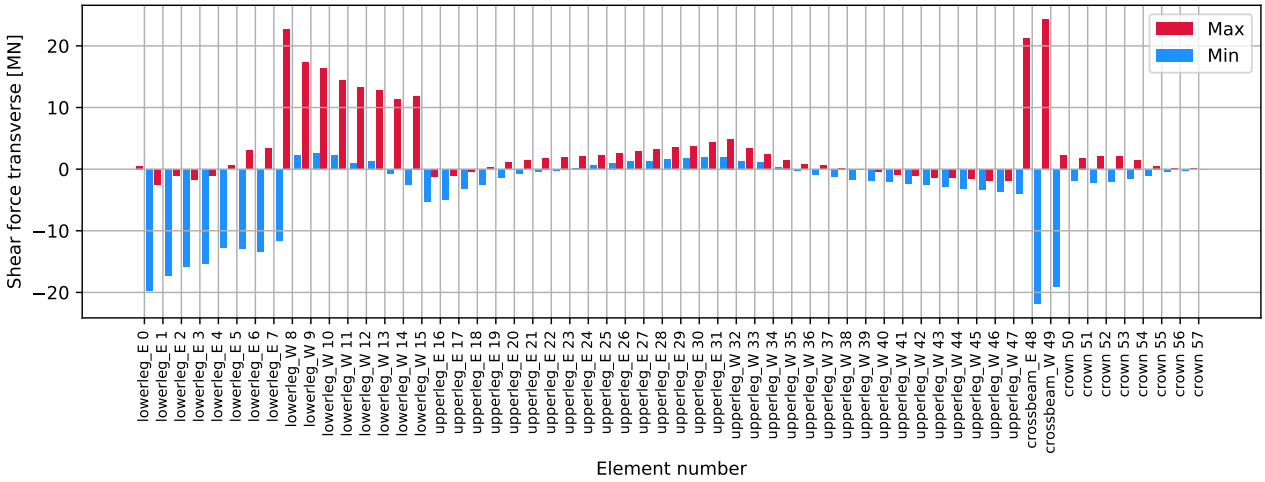


Figure 4.901: DH A35-A36 180deg - tower: Shear force transverse [MN]

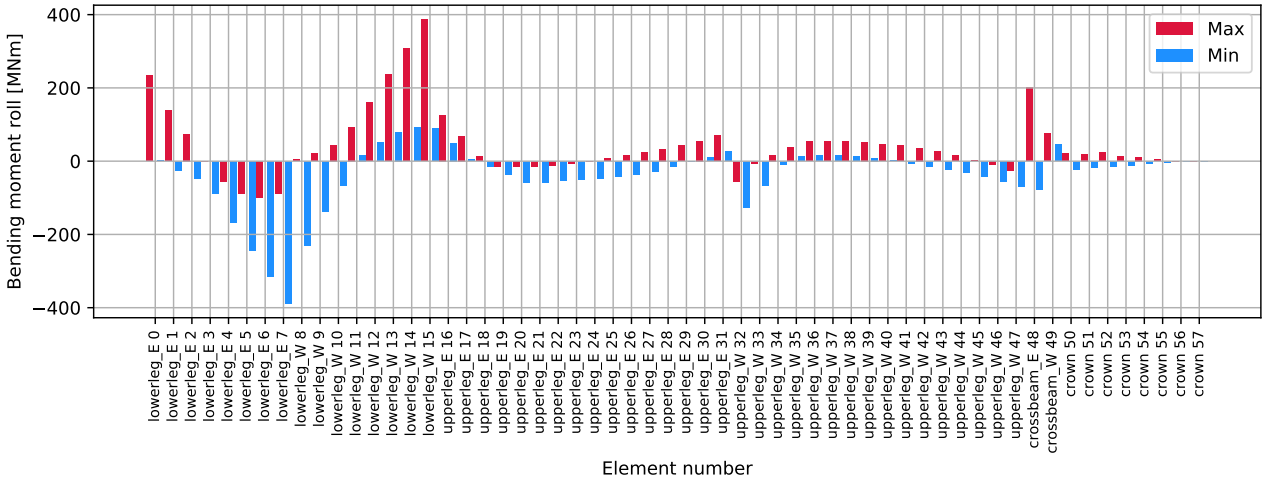


Figure 4.902: DH A35-A36 180deg - tower: Bending moment roll [MNm]

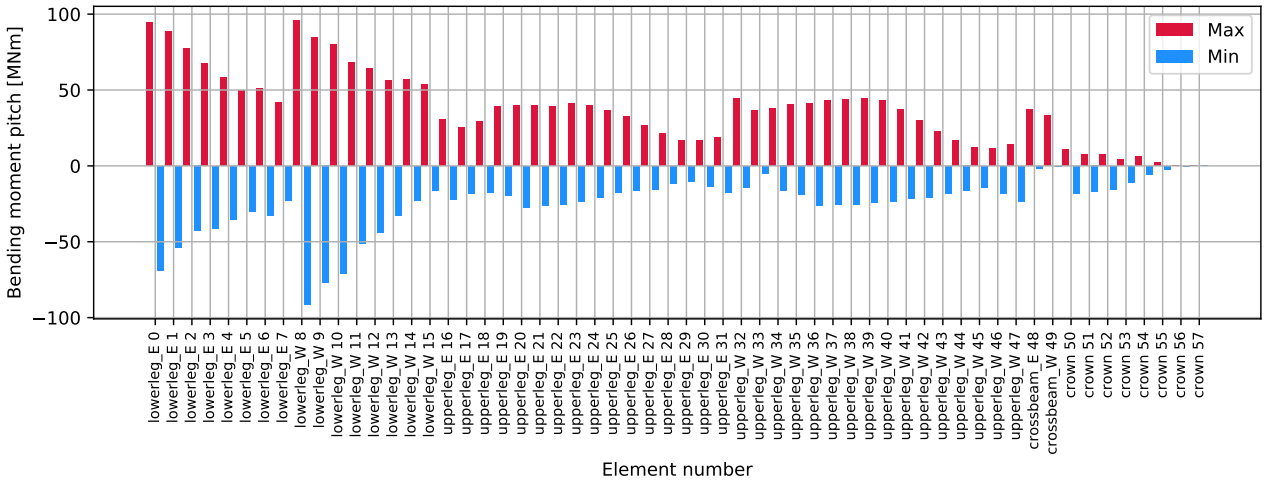


Figure 4.903: DH A35-A36 180deg - tower: Bending moment pitch [MNm]

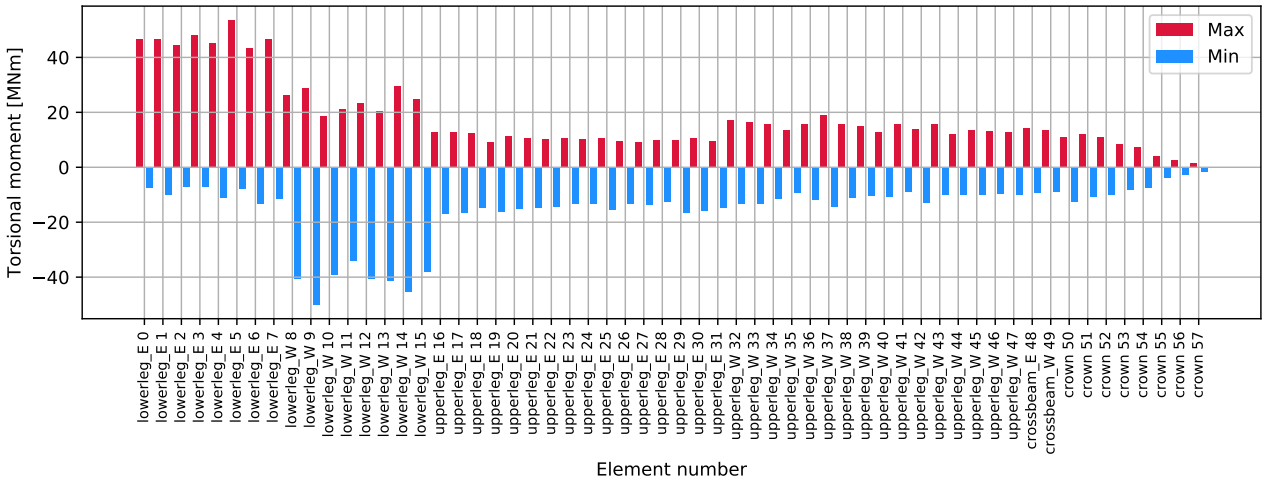


Figure 4.904: DH A35-A36 180deg - tower: Torsional moment [MNm]

### 4.20.3 Time series

Note : Time series are filtered using a Saviotzky-Golay filter for increased readability of the time history plots. Hence, maximum values that occur due to a rapid vibration are not shown in the plots. For maximum values, refer to the tabulated data.
All elements are numbered from South to North, bottom to top

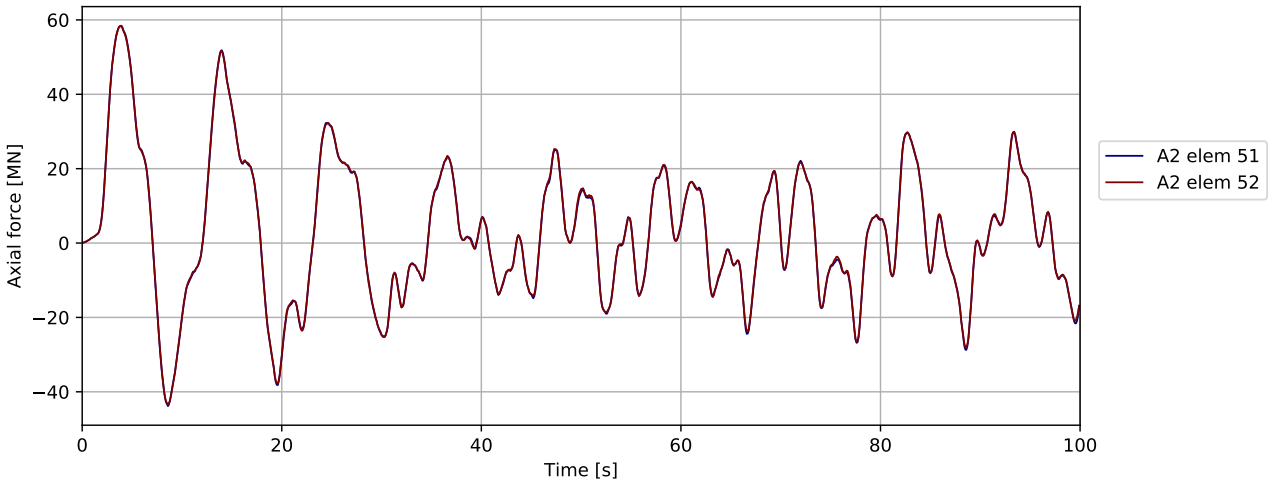


Figure 4.905: DH A35-A36 180deg - bridgegirder @ pylon: Axial force [MN]

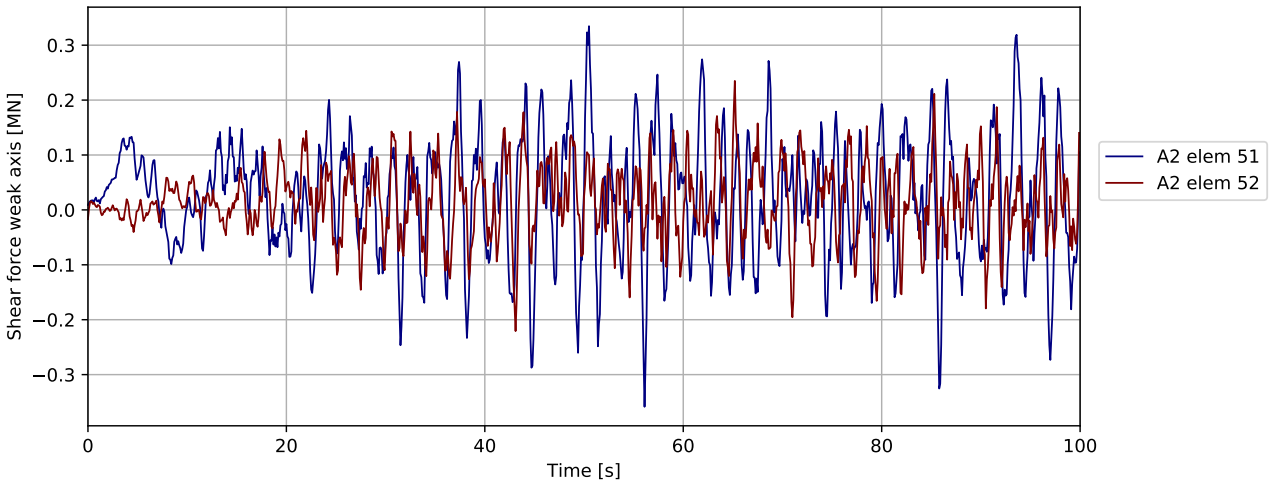


Figure 4.906: DH A35-A36 180deg - bridgegirder @ pylon: Shear force weak axis [MN]

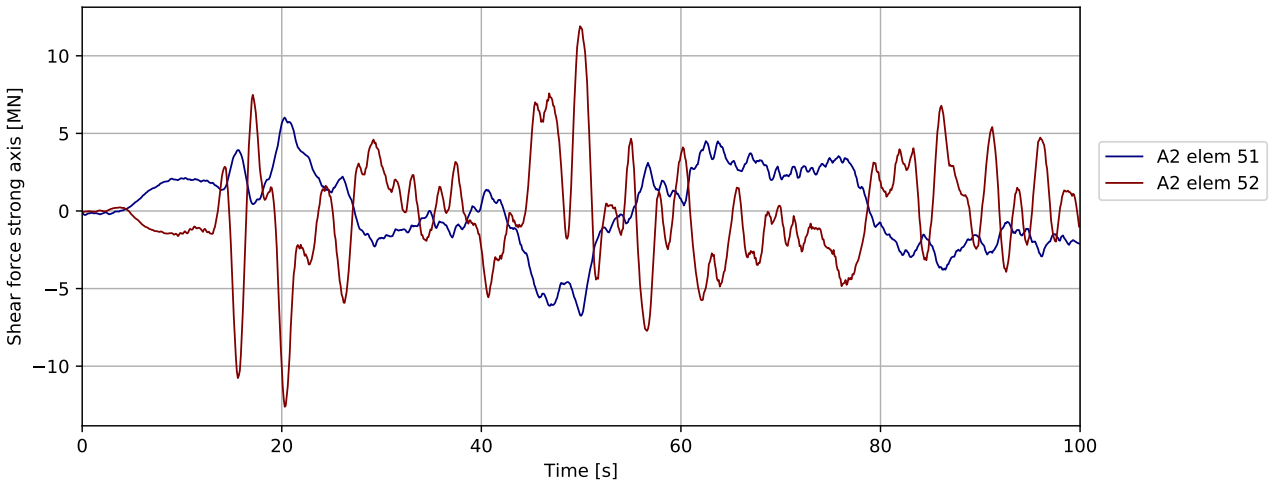


Figure 4.907: DH A35-A36 180deg - bridgegirder @ pylon: Shear force strong axis [MN]

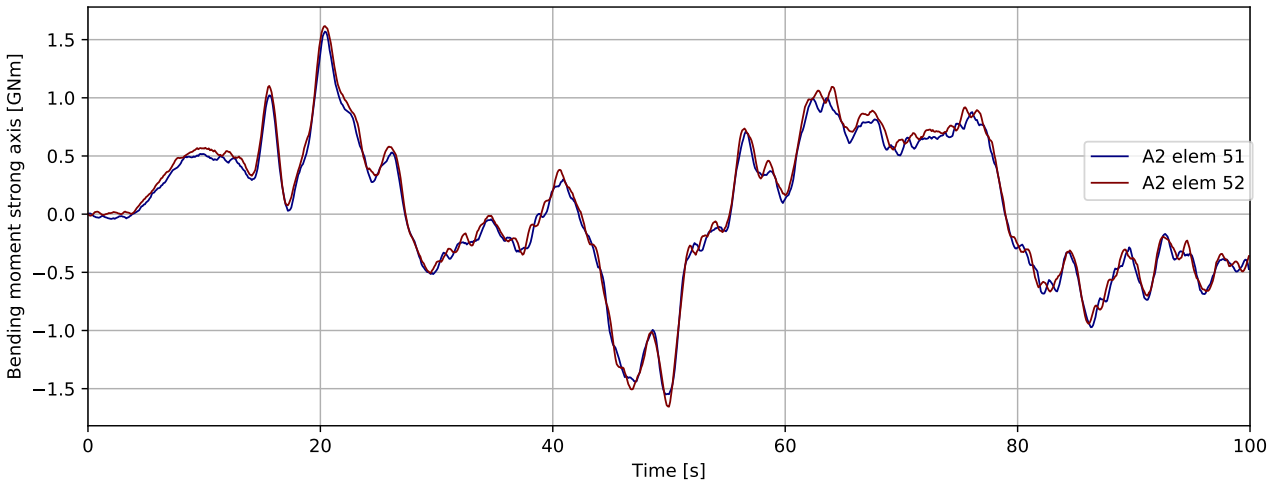


Figure 4.908: DH A35-A36 180deg - bridgegirder @ pylon: Bending moment strong axis [GNm]

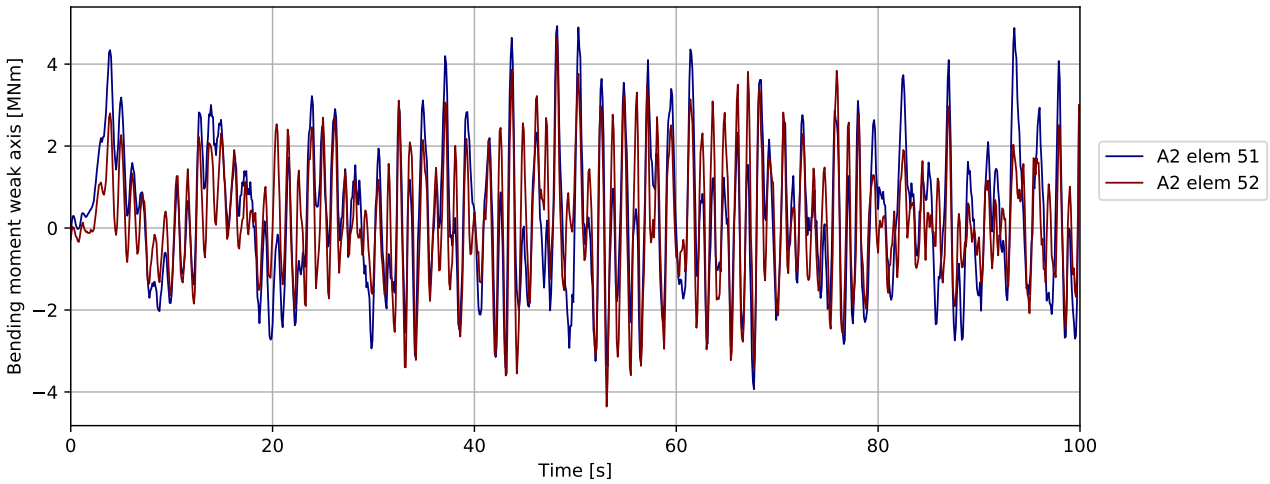


Figure 4.909: DH A35-A36 180deg - bridgegirder @ pylon: Bending moment weak axis [MNm]

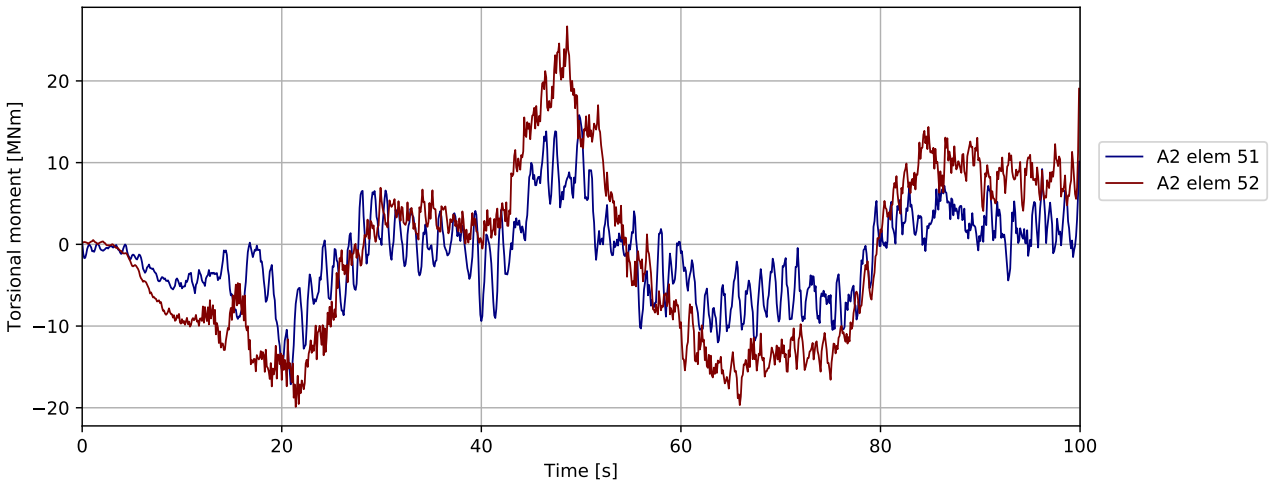


Figure 4.910: DH A35-A36 180deg - bridgegirder @ pylon: Torsional moment [MNm]

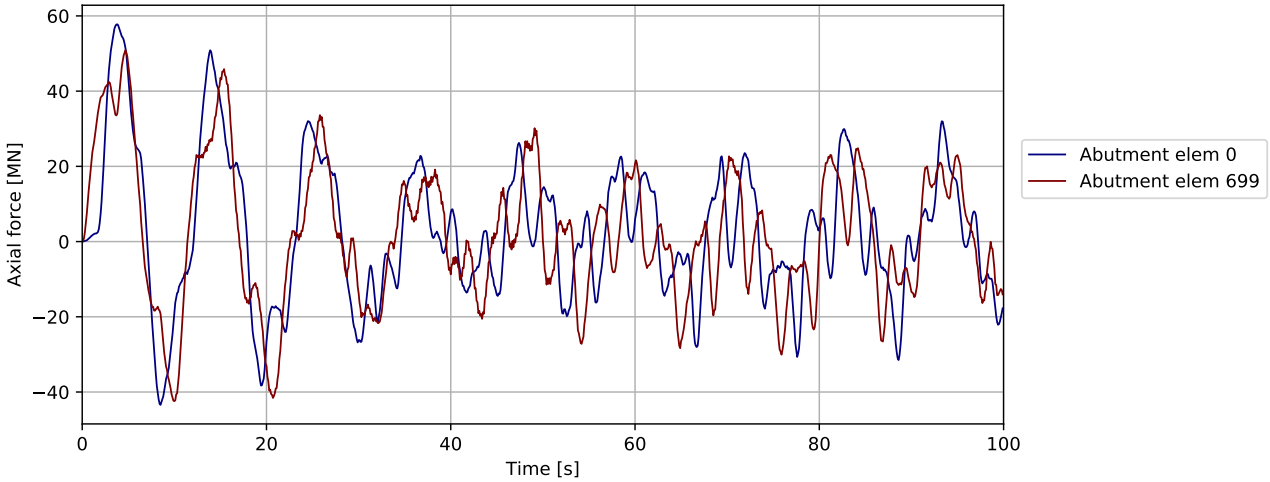


Figure 4.911: DH A35-A36 180deg - bridgegirder @abutments: Axial force [MN]

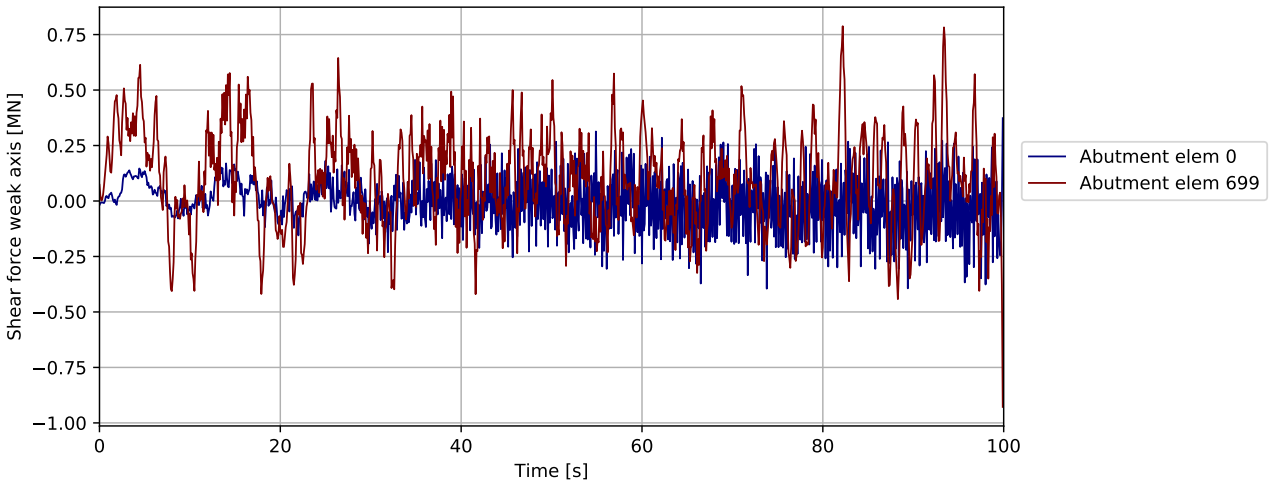


Figure 4.912: DH A35-A36 180deg - bridgegirder @abutments: Shear force weak axis [MN]

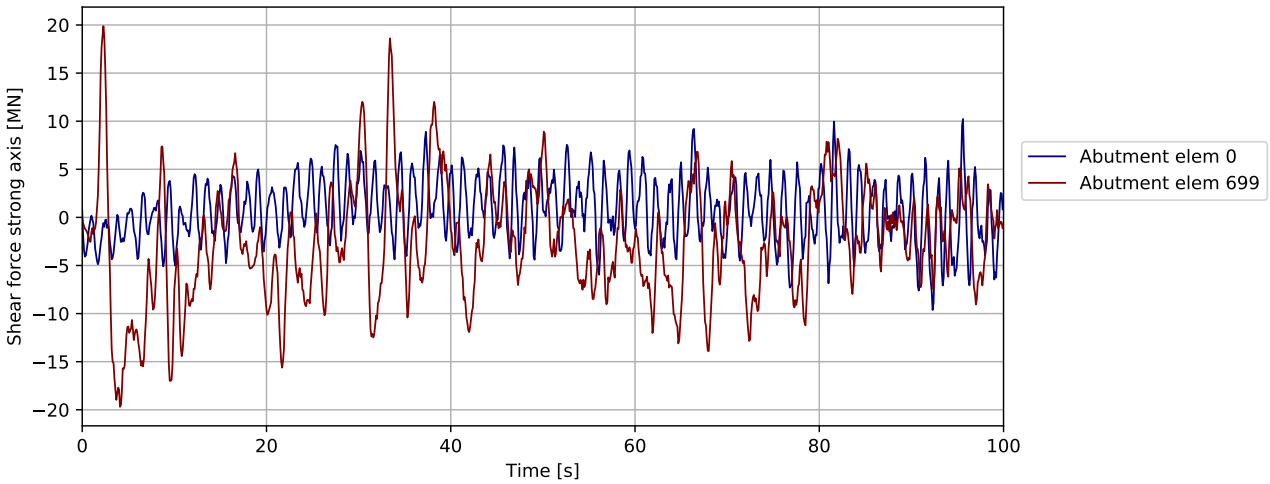


Figure 4.913: DH A35-A36 180deg - bridgegirder @abutments: Shear force strong axis [MN]

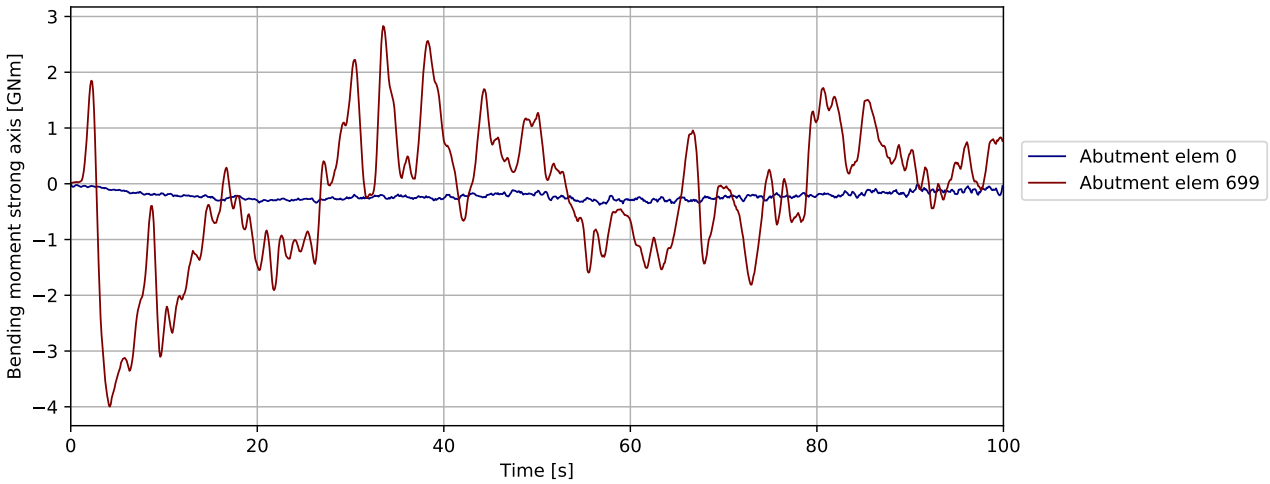


Figure 4.914: DH A35-A36 180deg - bridgegirder @abutments: Bending moment strong axis [GNm]

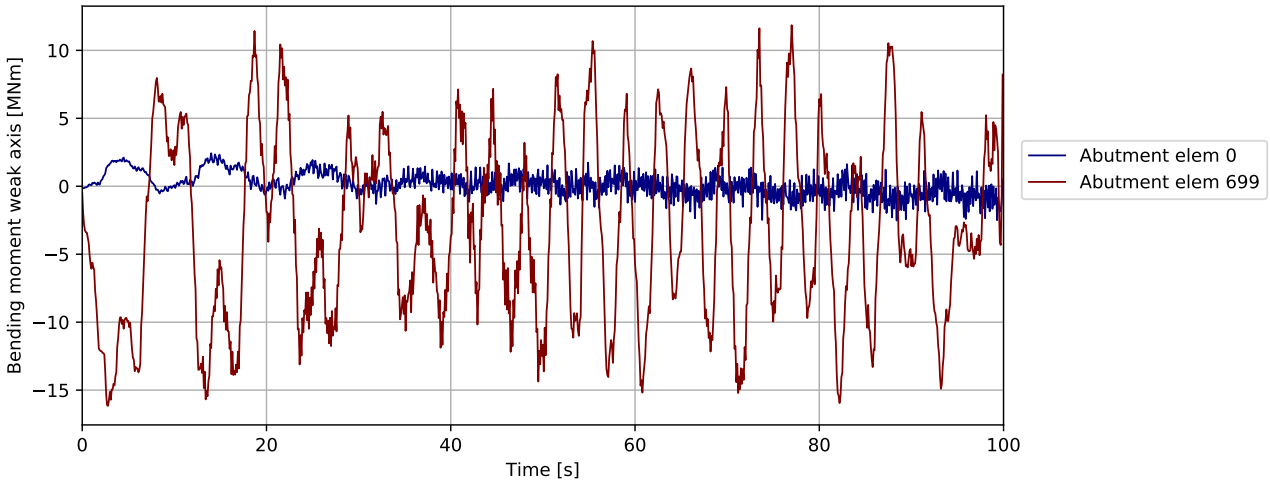


Figure 4.915: DH A35-A36 180deg - bridgegirder @abutments: Bending moment weak axis [MNm]

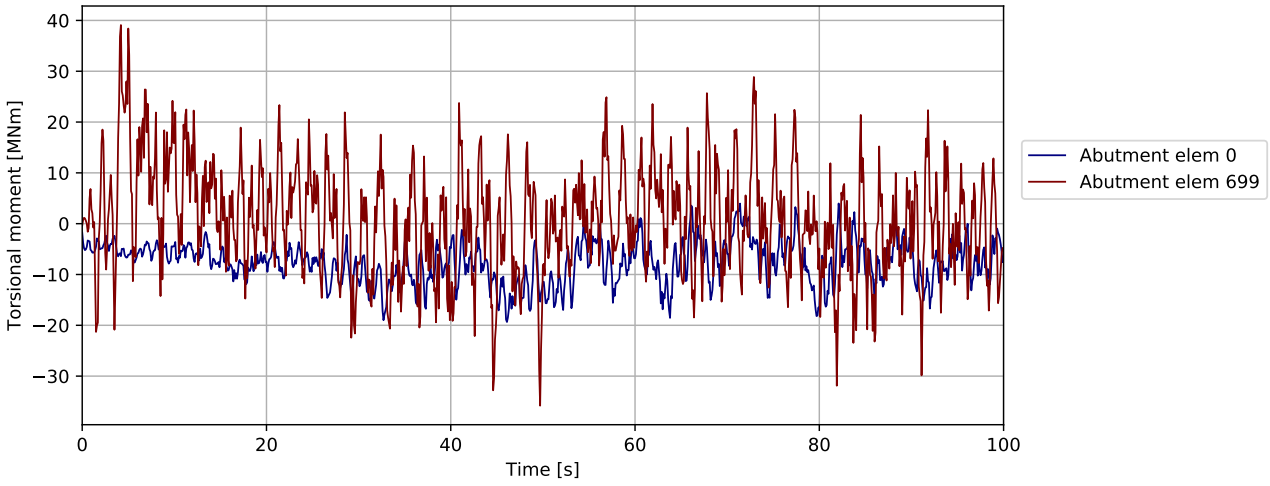


Figure 4.916: DH A35-A36 180deg - bridgegirder @abutments: Torsional moment [MNm]

Note : Compressive spring force is negative

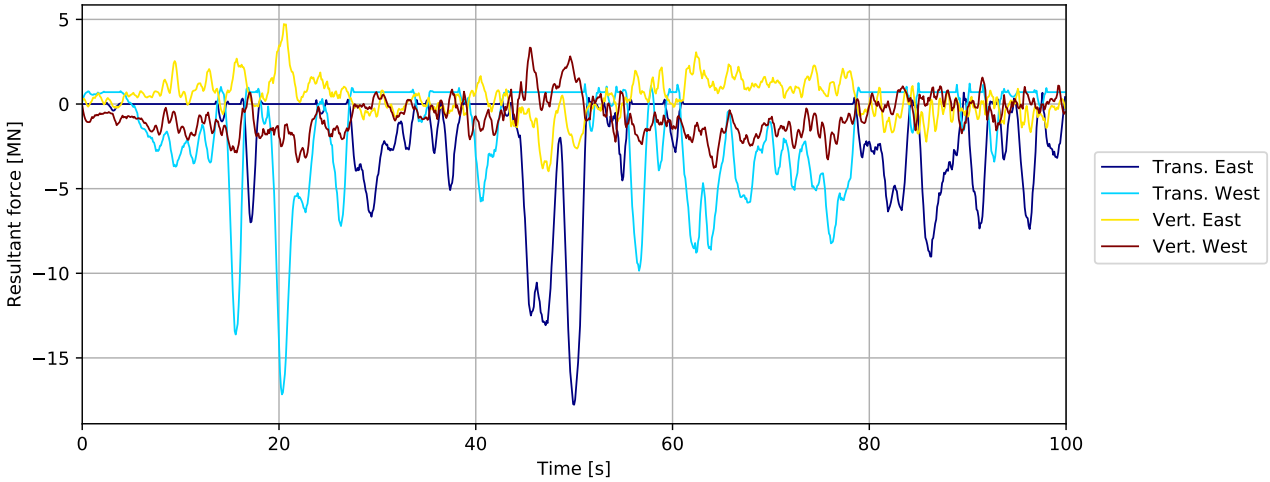


Figure 4.917: DH A35-A36 180deg - bridgegirder supports in tower: Resultant force [MN]

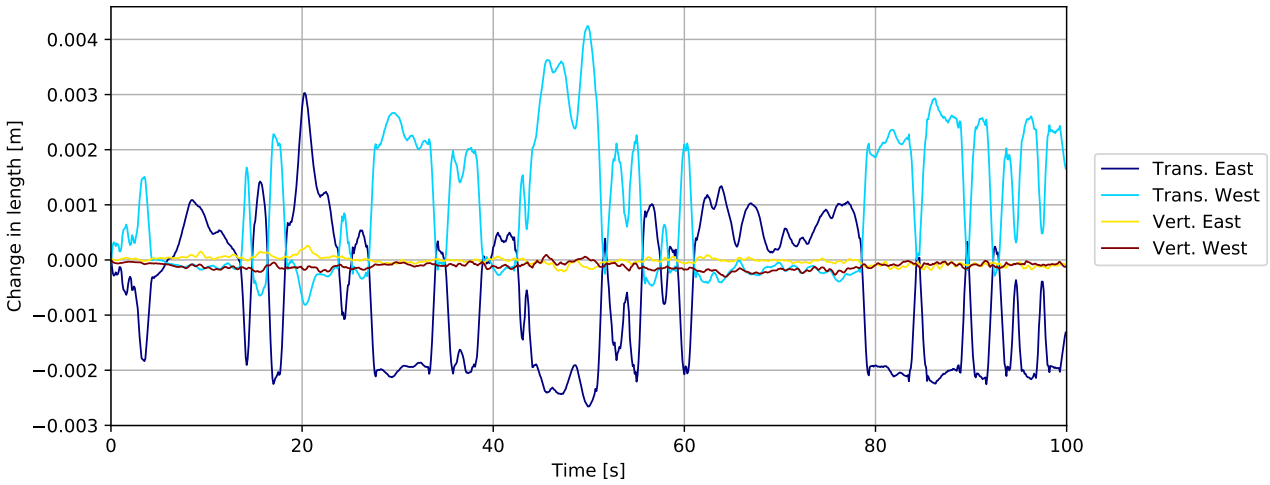


Figure 4.918: DH A35-A36 180deg - bridgegirder supports in tower: Change in length [m]

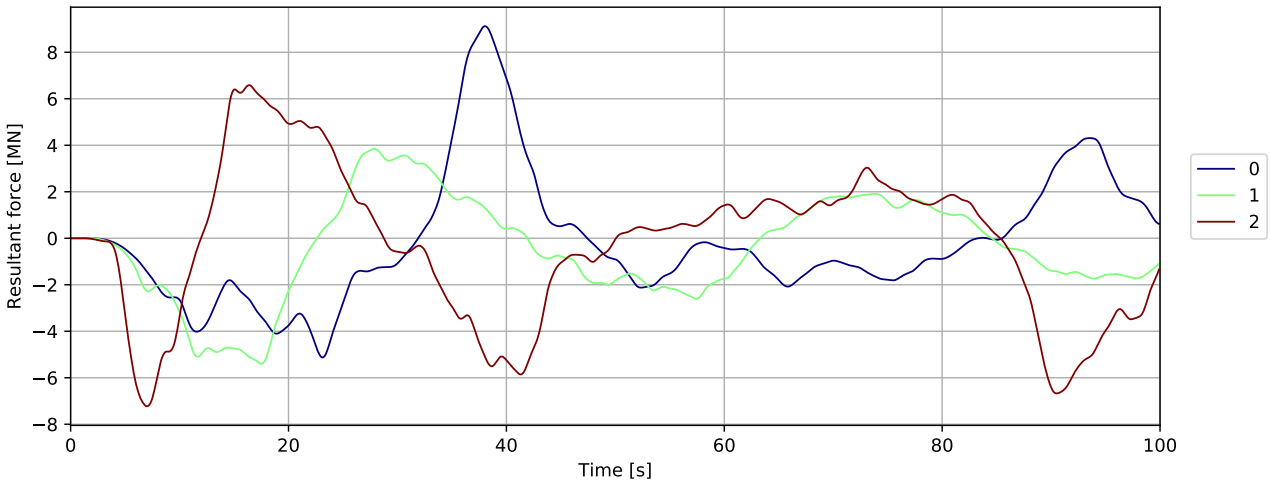


Figure 4.919: Mooring force

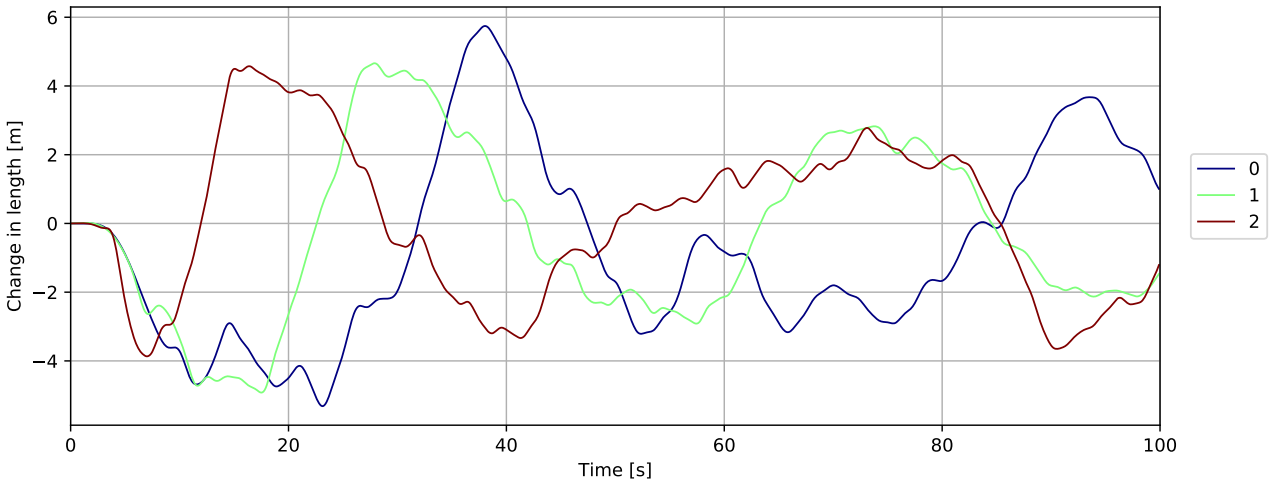


Figure 4.920: Mooring displacement

## 4.21 Deck house A35-A36 180deg

### 4.21.1 Overall response

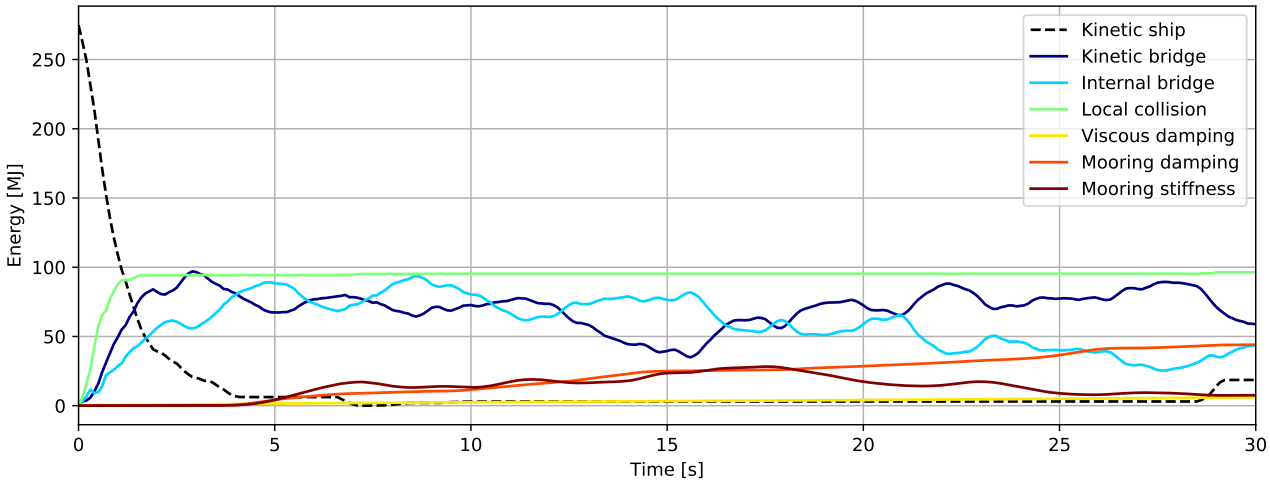


Figure 4.921: Energy [MJ] - initial phase

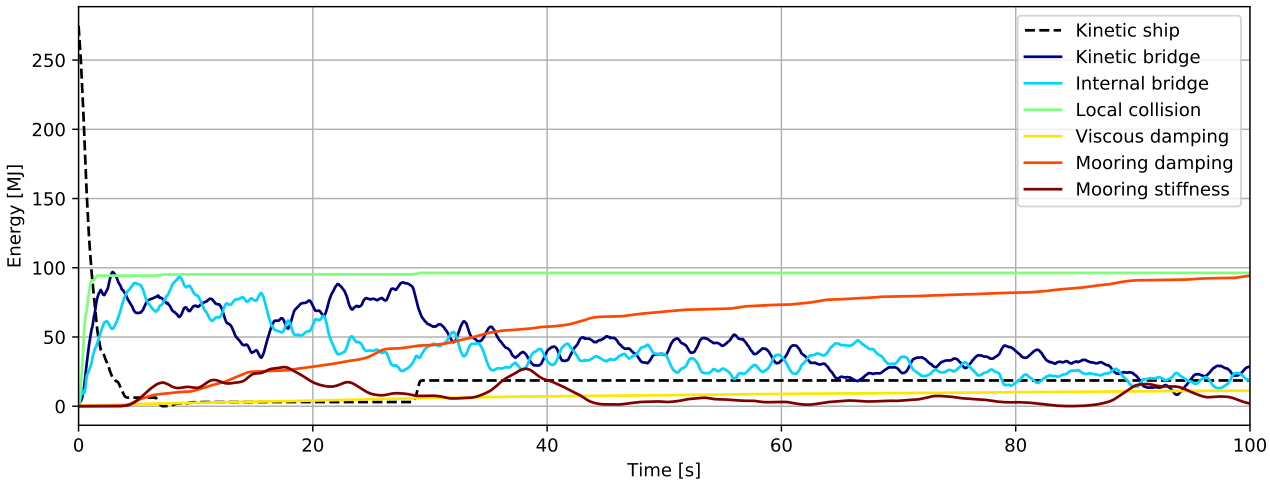


Figure 4.922: Energy [MJ]

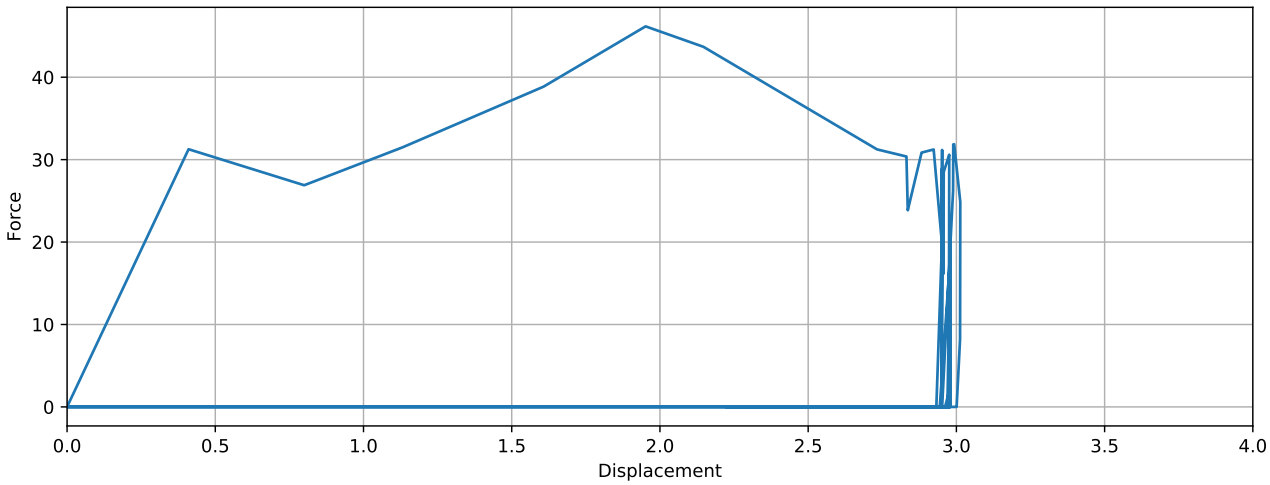


Figure 4.923: Simulated local collision force-displacement

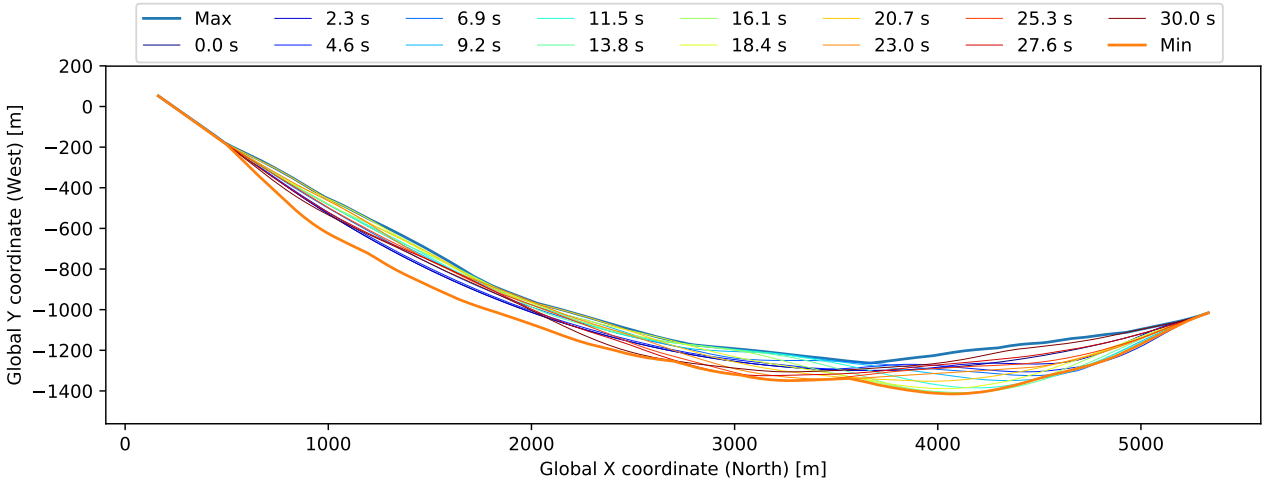


Figure 4.924: Bridgegirder deflection (10x displacment scaling)

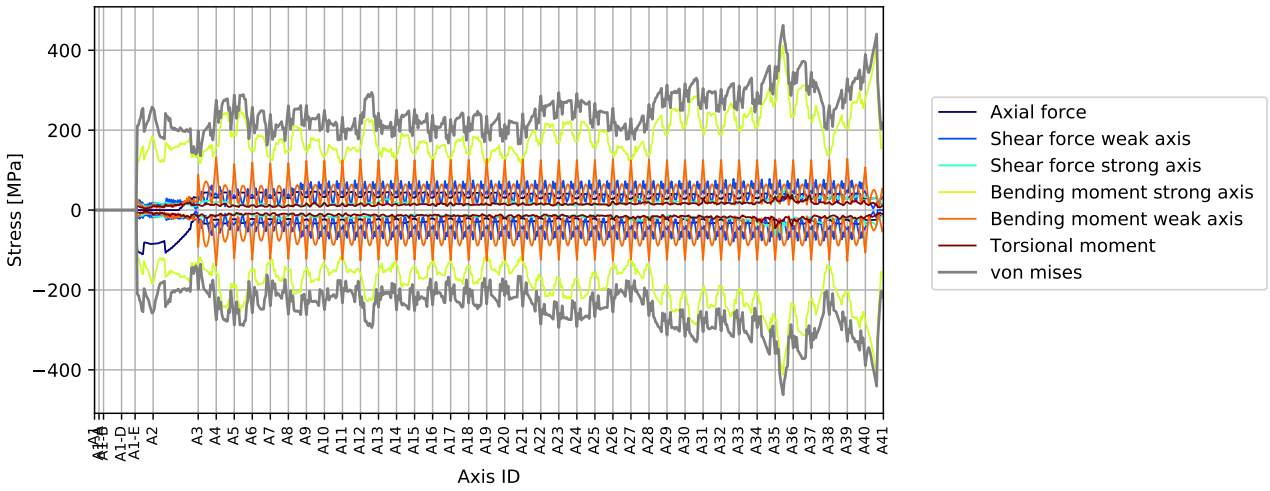


Figure 4.925: Stress envelope from all force components

### 4.21.2 Envelope plots

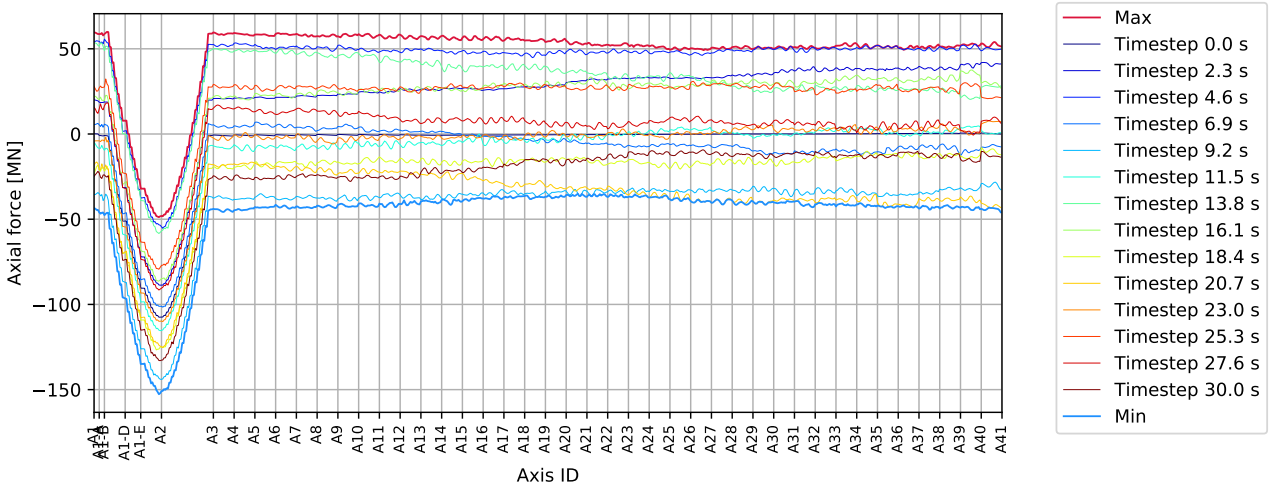


Figure 4.926: DH A35-A36 180deg - bridgegirder : Axial force [MN]

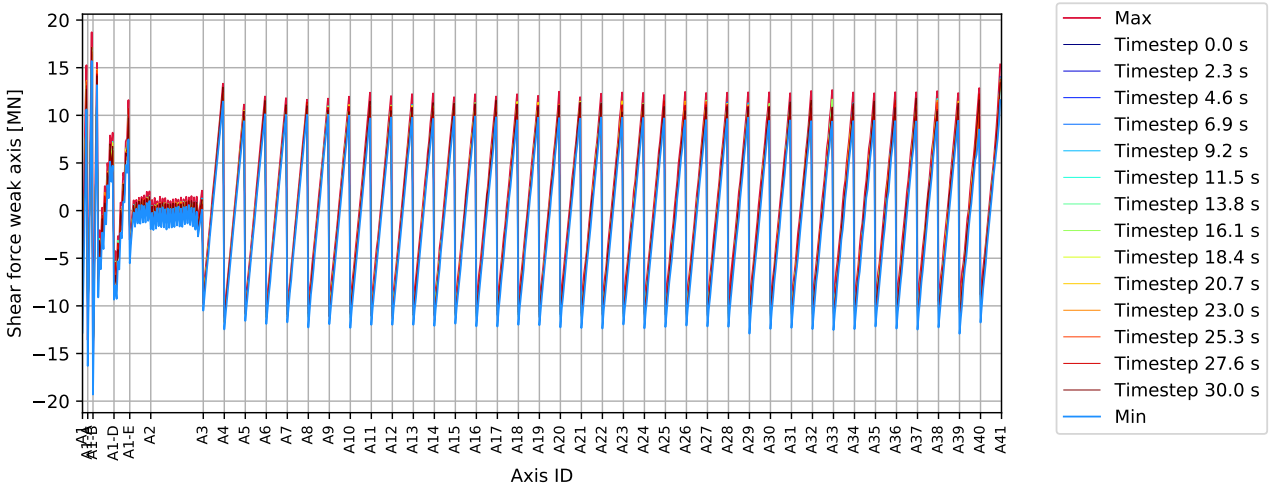


Figure 4.927: DH A35-A36 180deg - bridgegirder : Shear force weak axis [MN]

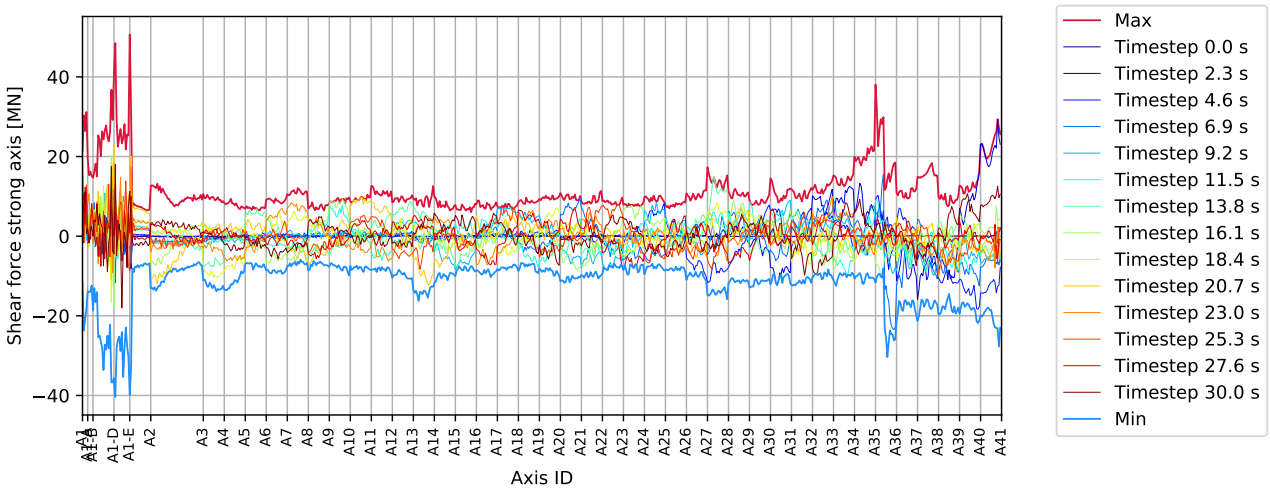


Figure 4.928: DH A35-A36 180deg - bridgegirder : Shear force strong axis [MN]

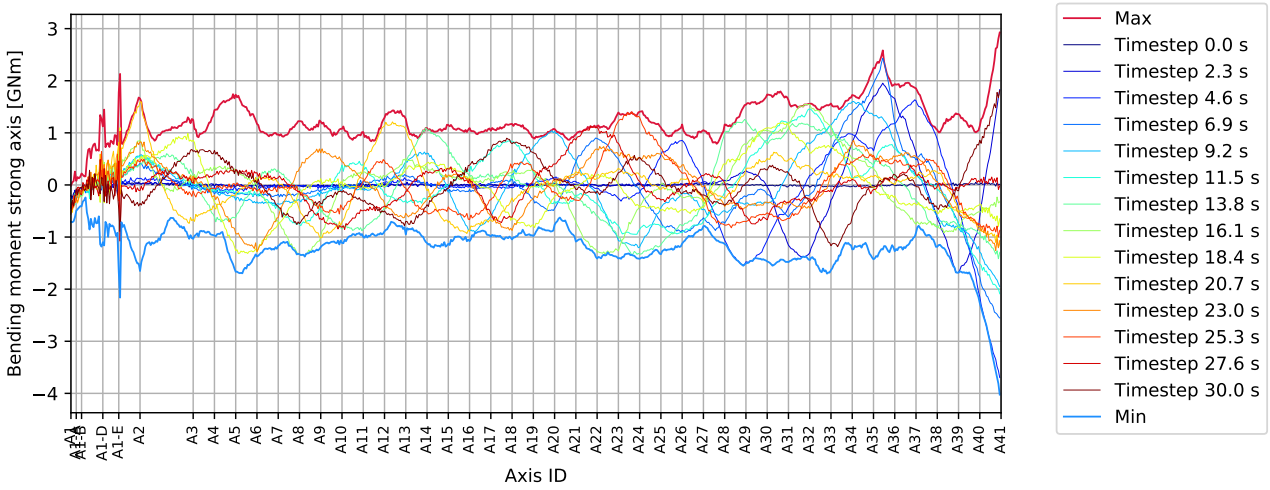


Figure 4.929: DH A35-A36 180deg - bridgegirder : Bending moment strong axis [GNm]

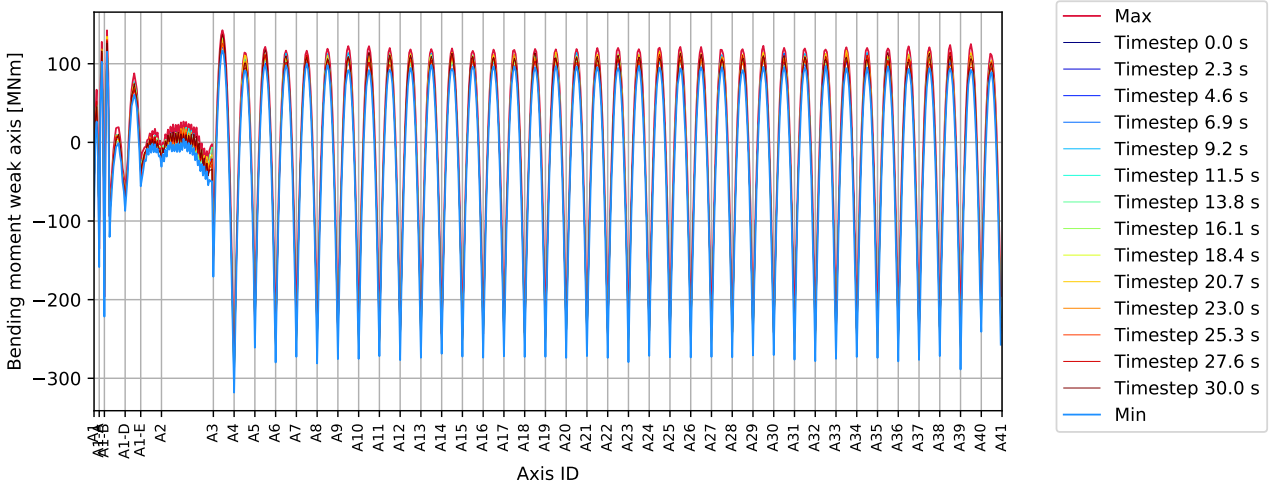


Figure 4.930: DH A35-A36 180deg - bridgegirder : Bending moment weak axis [MNm]

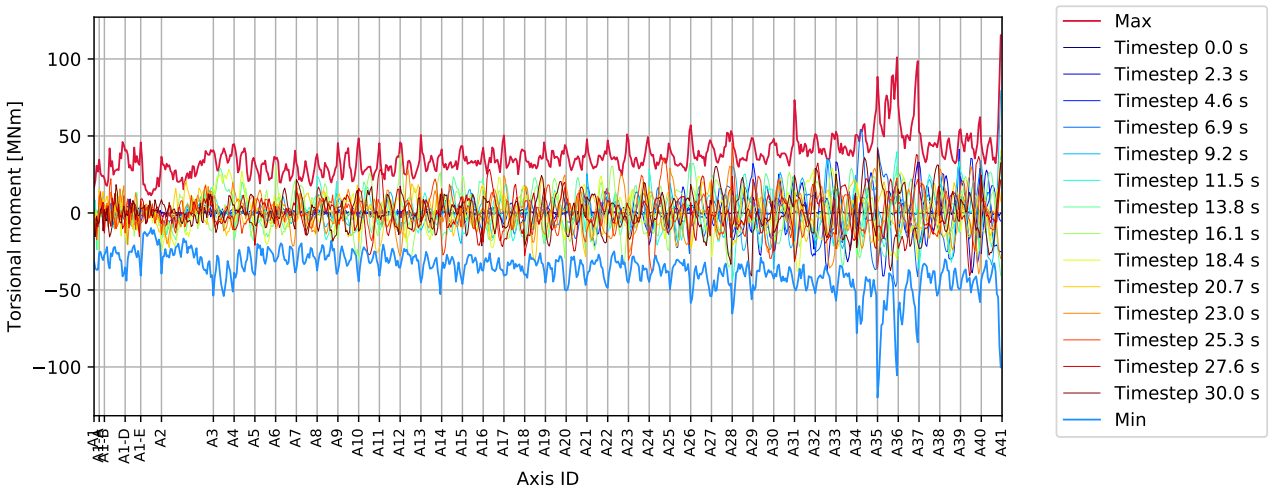


Figure 4.931: DH A35-A36 180deg - bridgegirder : Torsional moment [MNm]

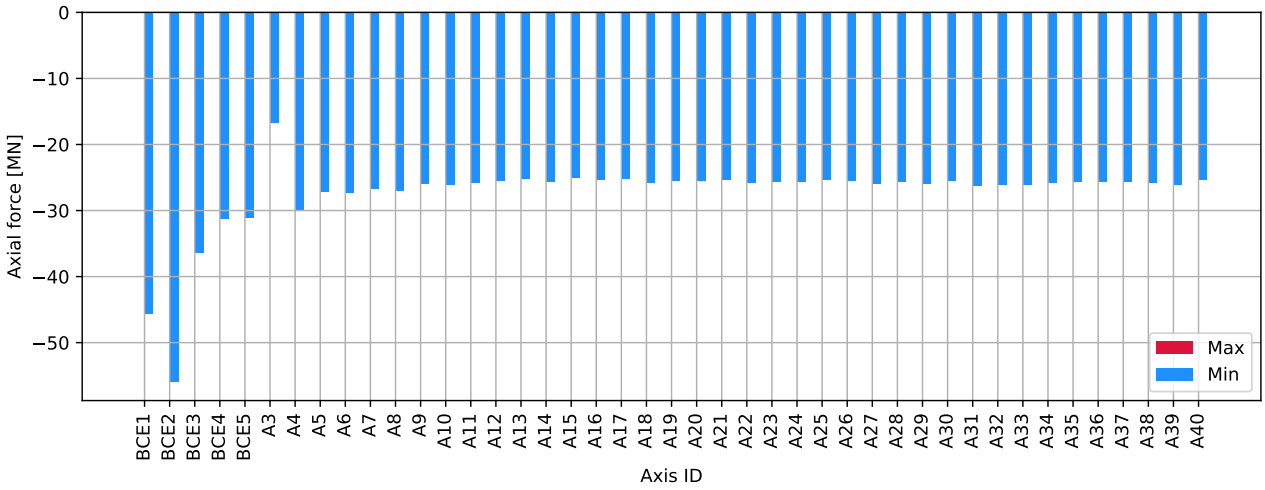


Figure 4.932: DH A35-A36 180deg - columns bottom : Axial force [MN]

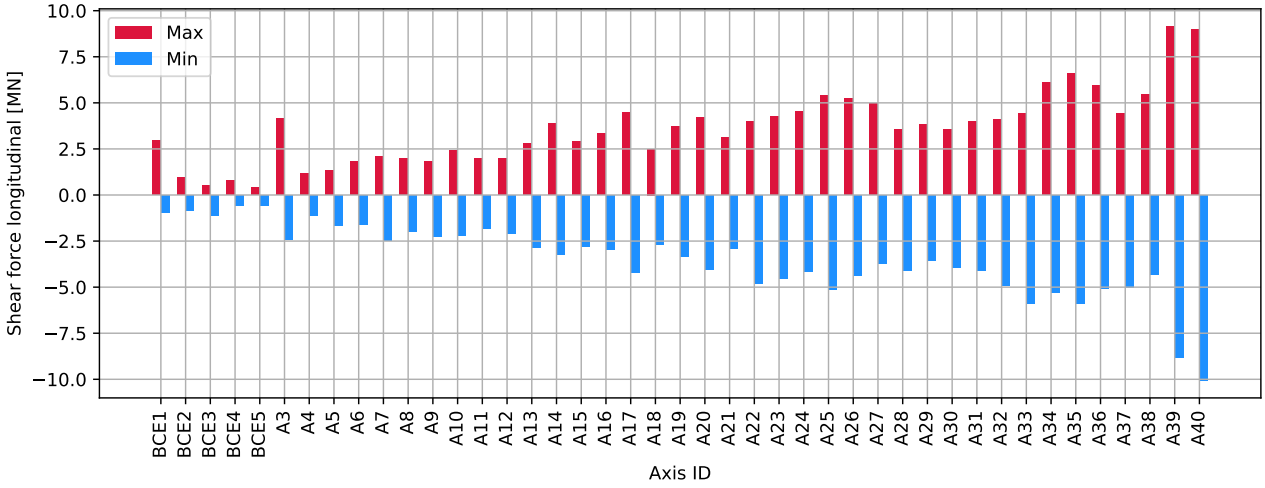


Figure 4.933: DH A35-A36 180deg - columns bottom : Shear force longitudinal [MN]

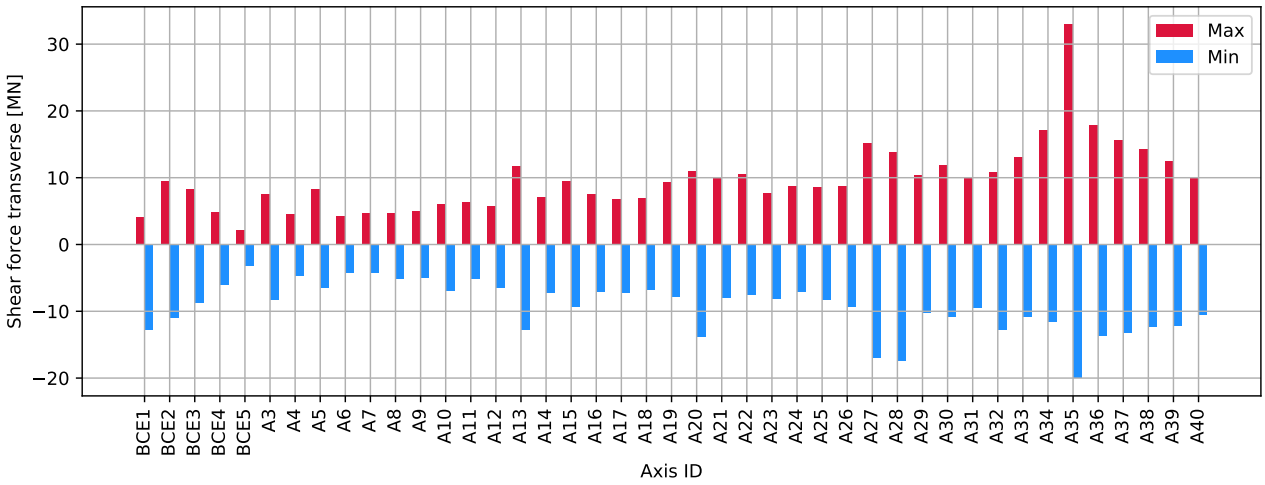


Figure 4.934: DH A35-A36 180deg - columns bottom : Shear force transverse [MN]

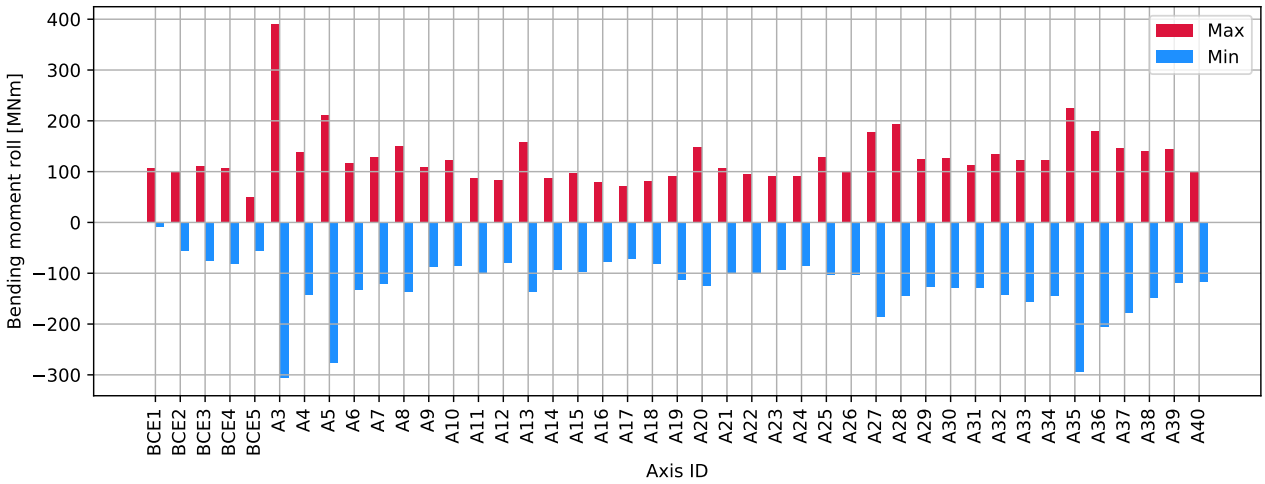


Figure 4.935: DH A35-A36 180deg - columns bottom : Bending moment roll [MNm]

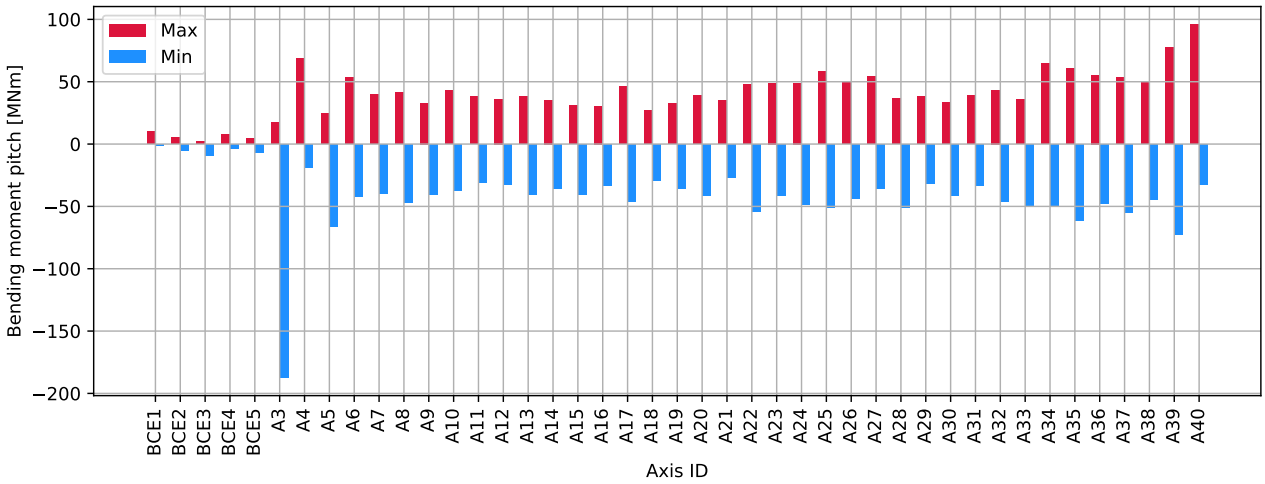


Figure 4.936: DH A35-A36 180deg - columns bottom : Bending moment pitch [MNm]

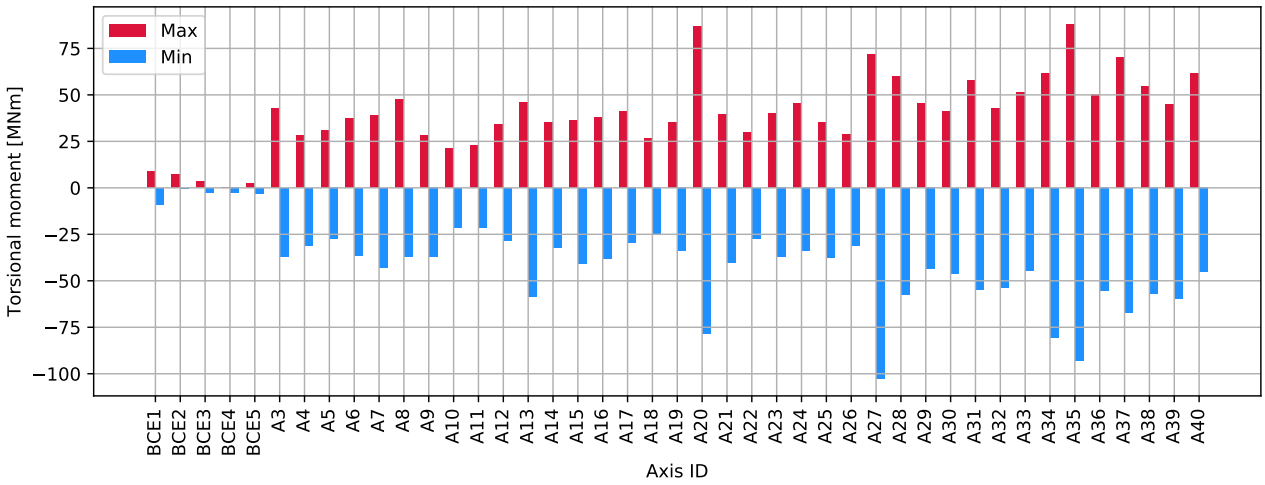


Figure 4.937: DH A35-A36 180deg - columns bottom : Torsional moment [MNm]

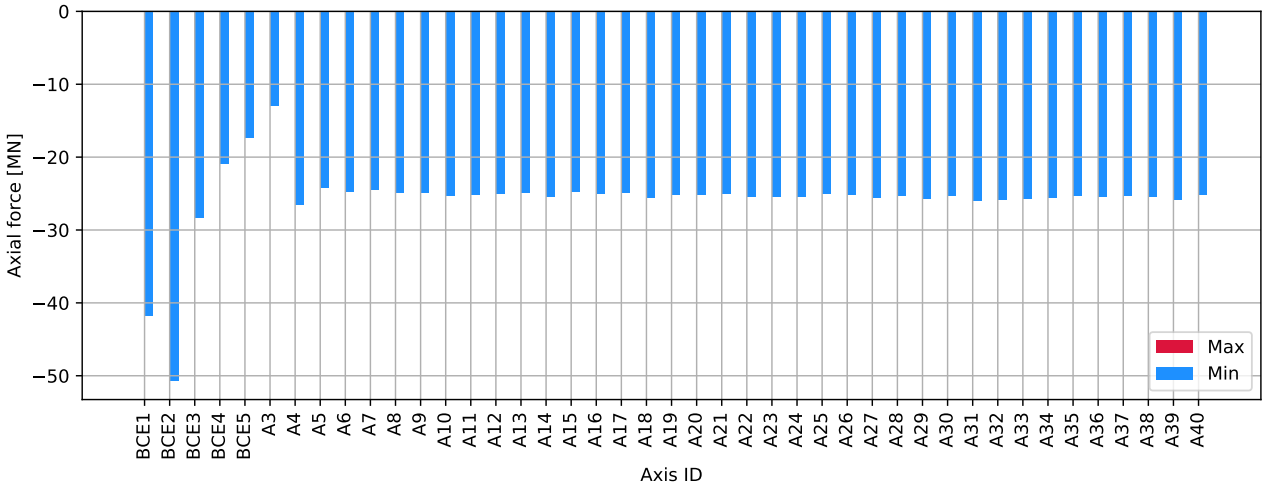


Figure 4.938: DH A35-A36 180deg - columns top : Axial force [MN]

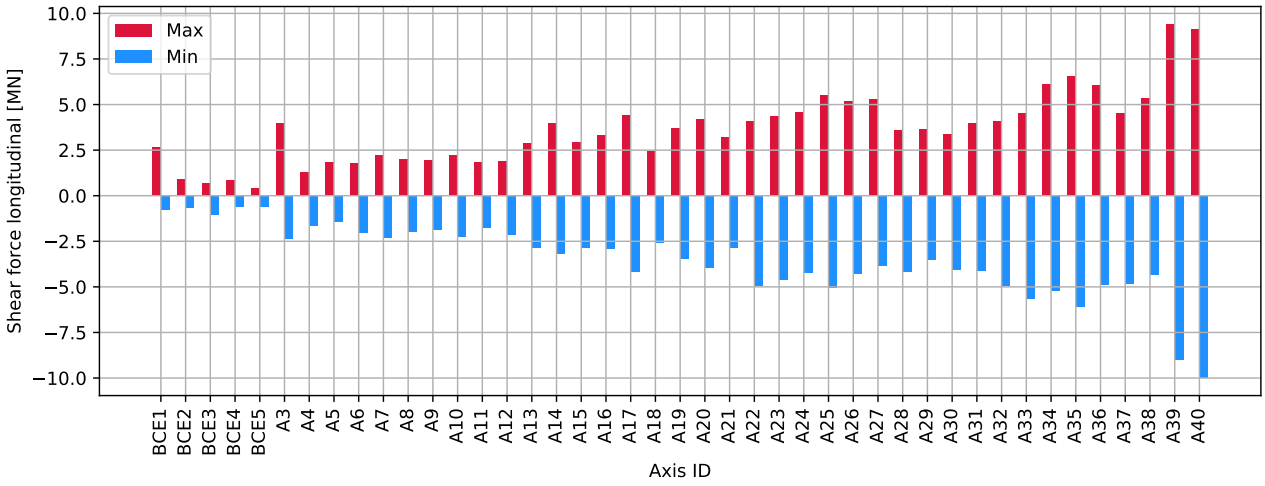


Figure 4.939: DH A35-A36 180deg - columns top : Shear force longitudinal [MN]

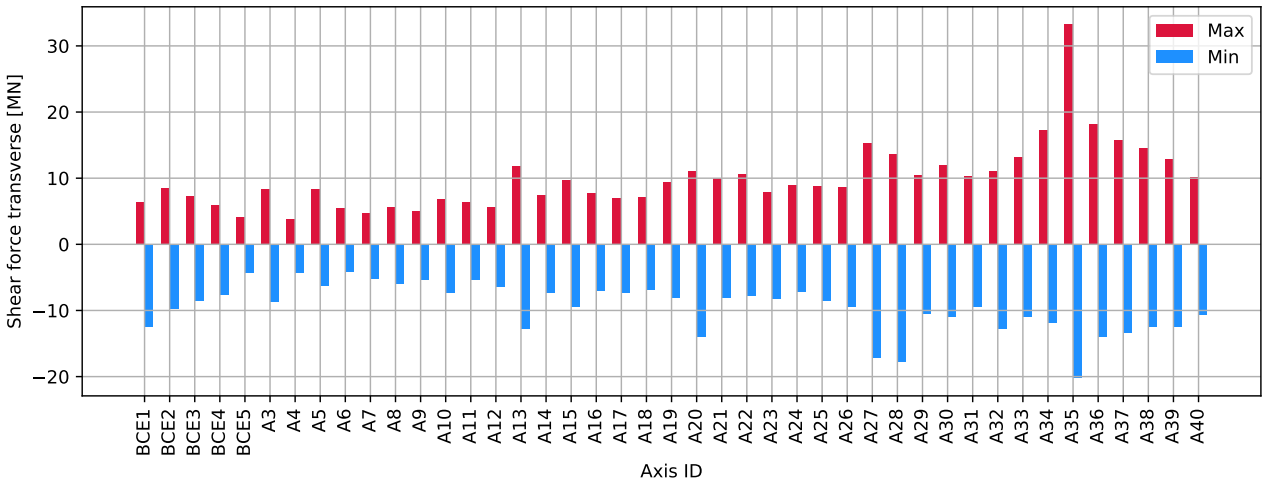


Figure 4.940: DH A35-A36 180deg - columns top : Shear force transverse [MN]

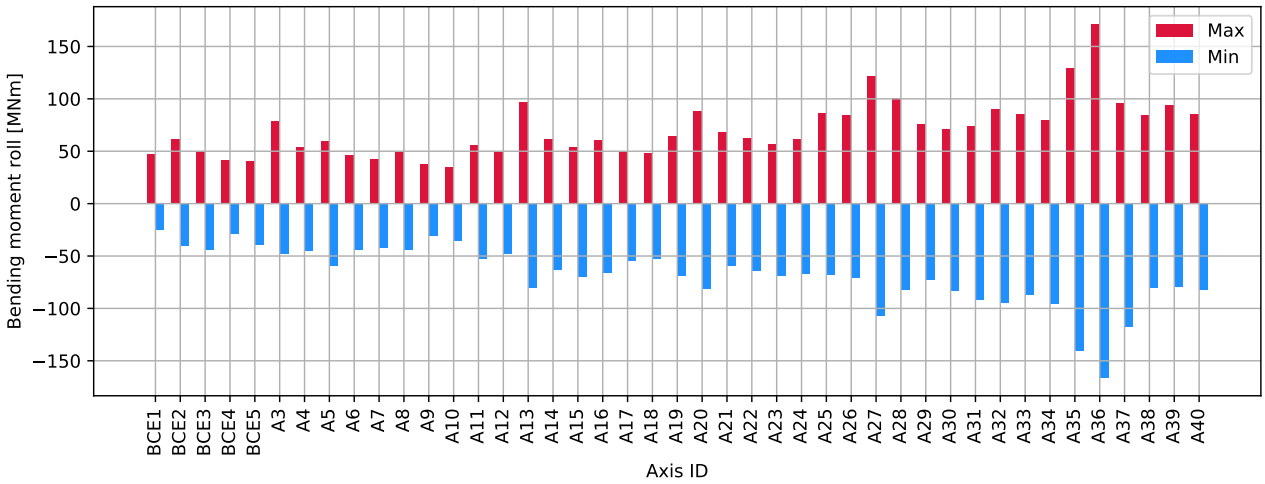


Figure 4.941: DH A35-A36 180deg - columns top : Bending moment roll [MNm]

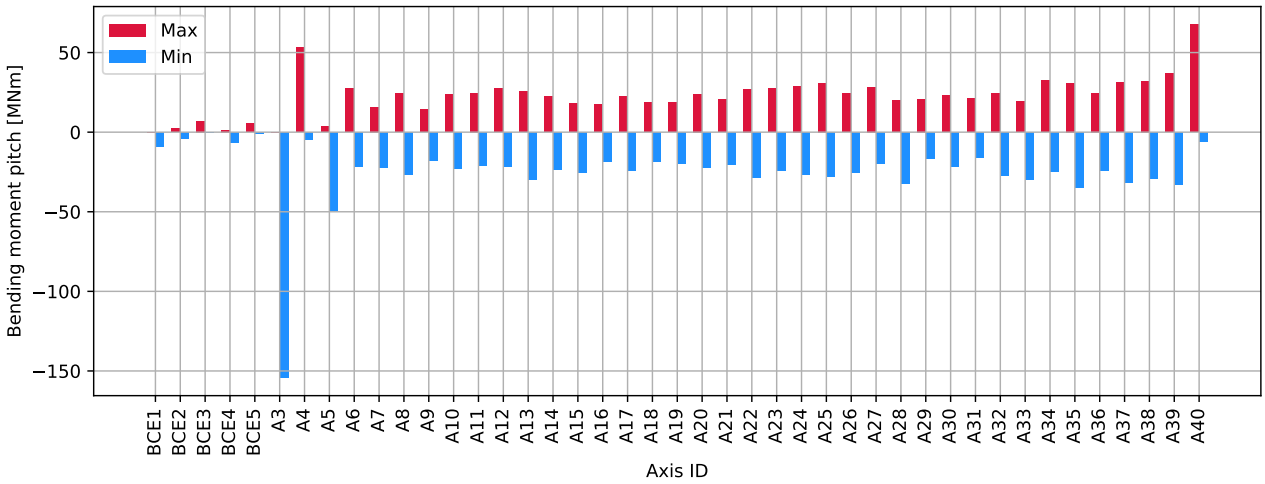


Figure 4.942: DH A35-A36 180deg - columns top : Bending moment pitch [MNm]

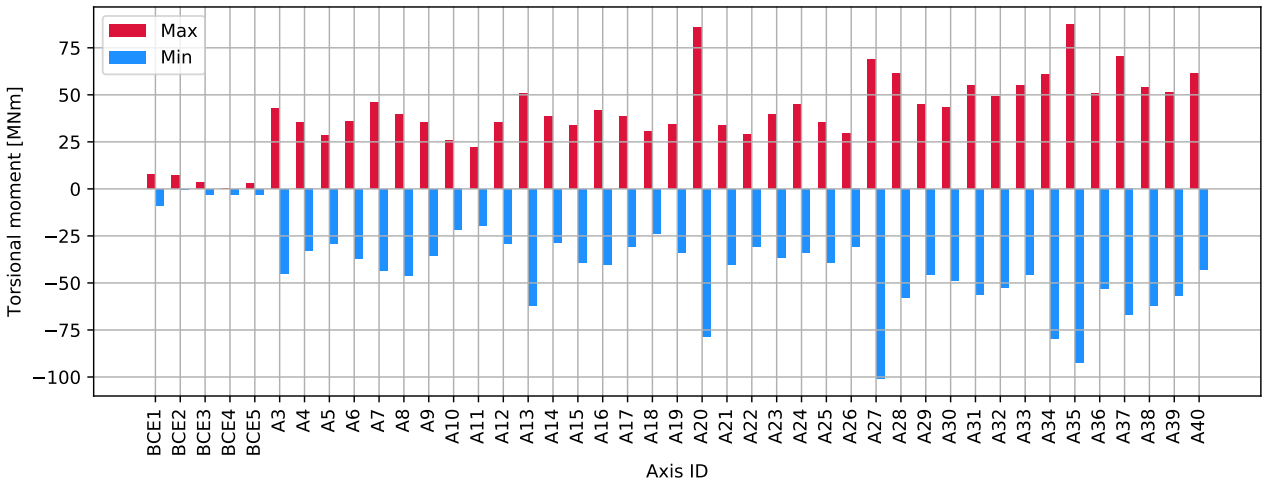


Figure 4.943: DH A35-A36 180deg - columns top : Torsional moment [MNm]

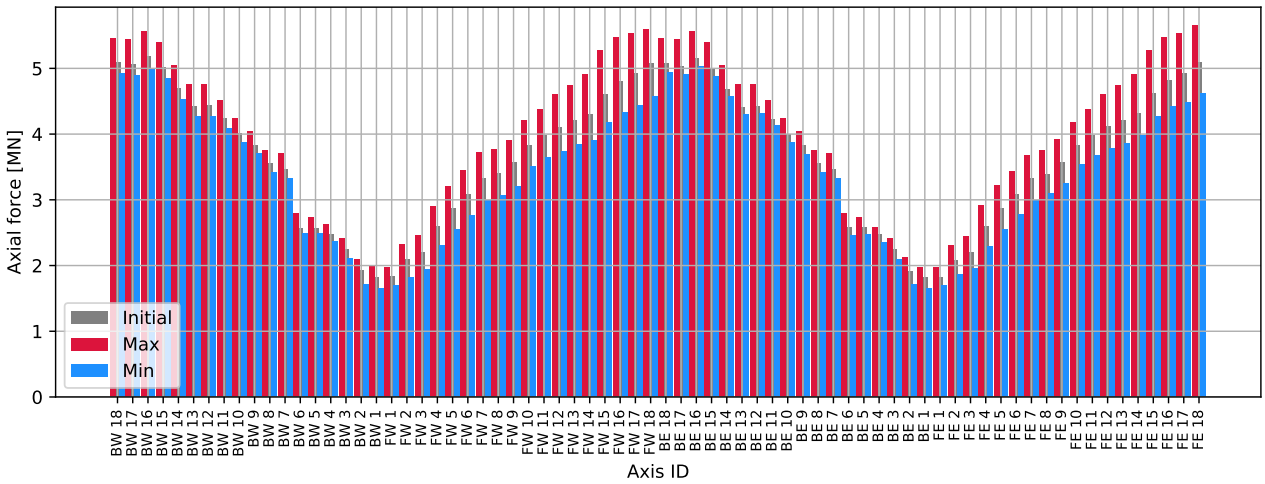


Figure 4.944: DH A35-A36 180deg - cables : Axial force [MN]

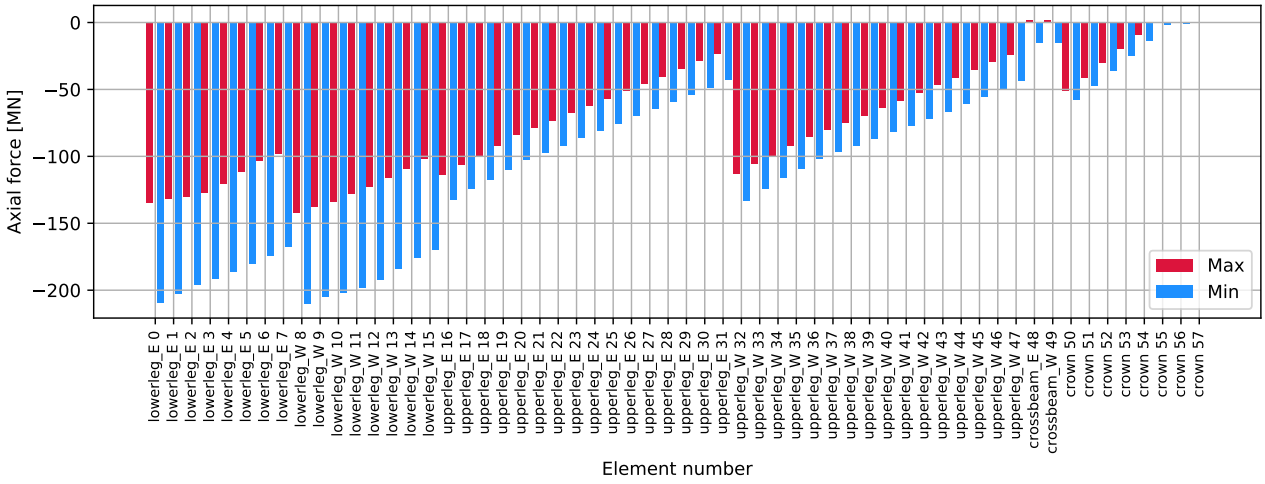


Figure 4.945: DH A35-A36 180deg - tower: Axial force [MN]

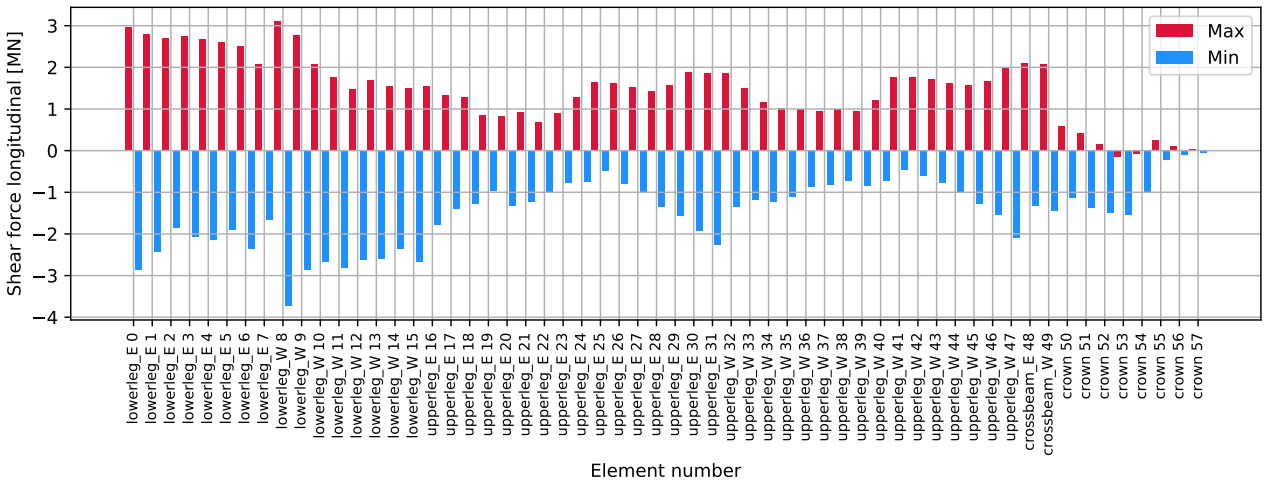


Figure 4.946: DH A35-A36 180deg - tower: Shear force longitudinal [MN]

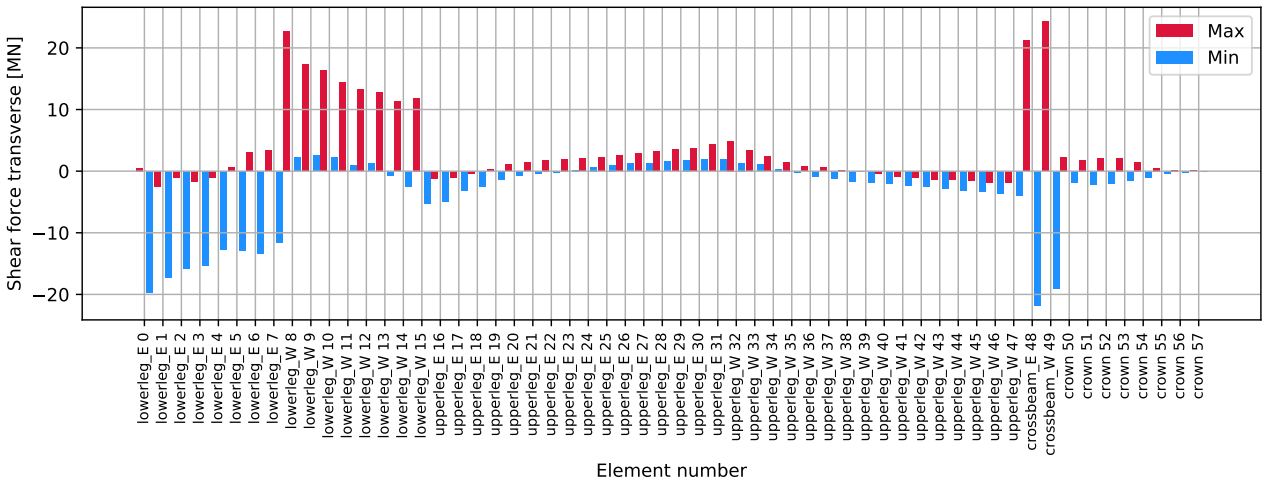


Figure 4.947: DH A35-A36 180deg - tower: Shear force transverse [MN]

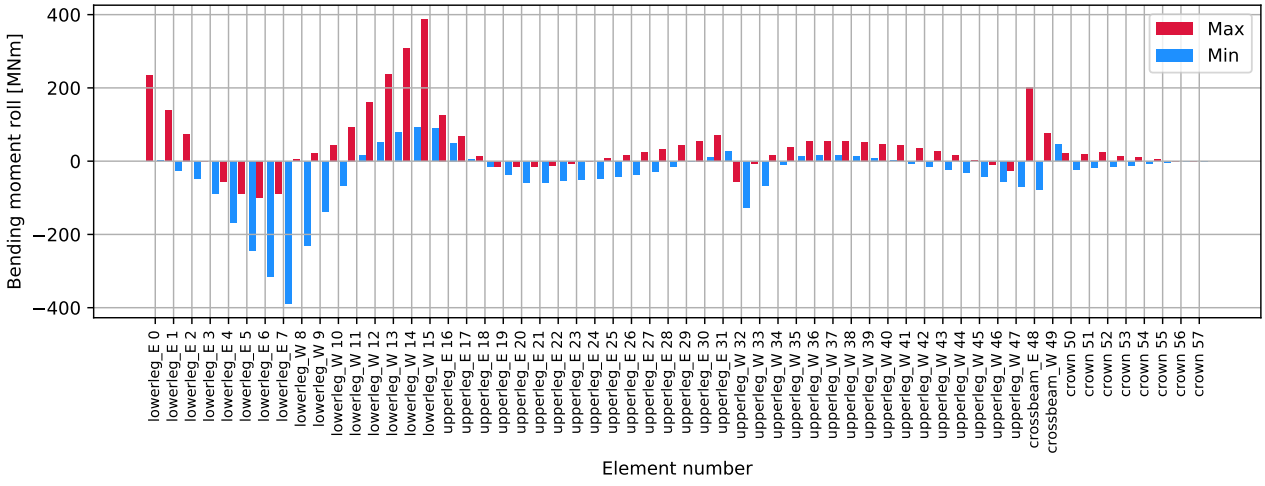


Figure 4.948: DH A35-A36 180deg - tower: Bending moment roll [MNm]

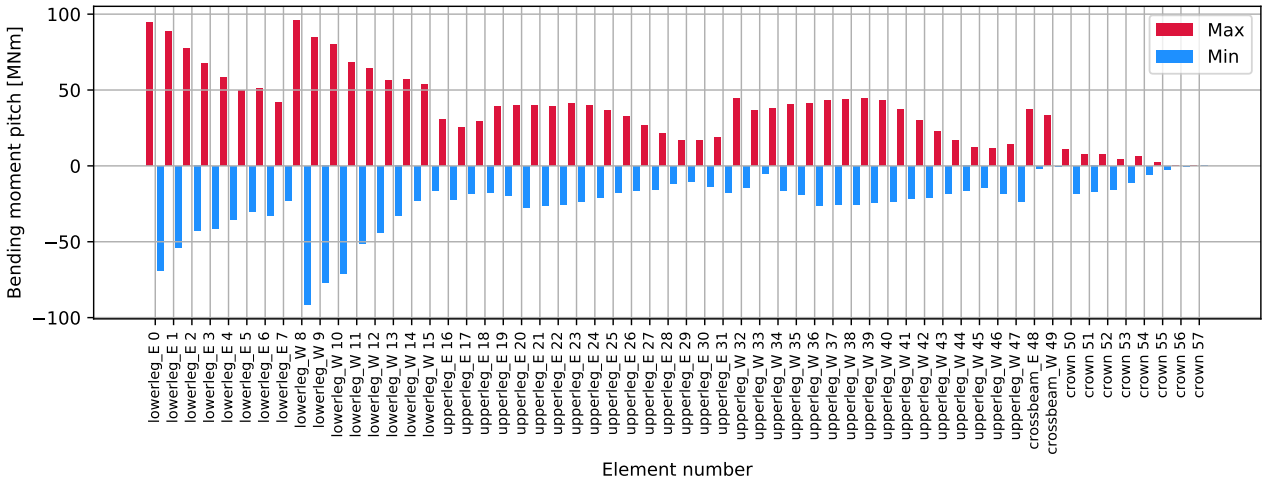


Figure 4.949: DH A35-A36 180deg - tower: Bending moment pitch [MNm]

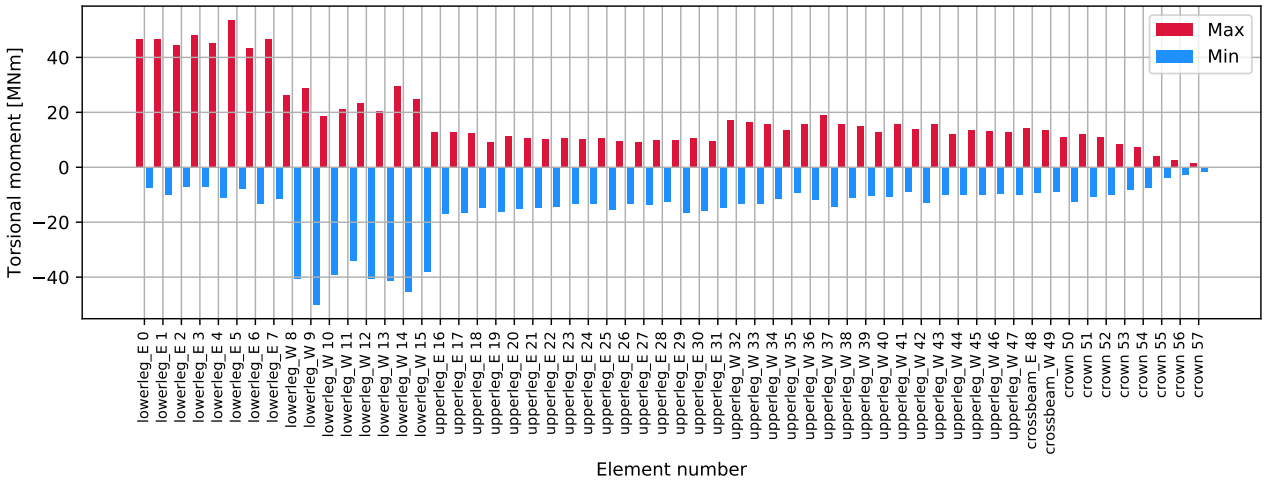


Figure 4.950: DH A35-A36 180deg - tower: Torsional moment [MNm]

### 4.21.3 Time series

Note : Time series are filtered using a Saviotzky-Golay filter for increased readability of the time history plots. Hence, maximum values that occur due to a rapid vibration are not shown in the plots. For maximum values, refer to the tabulated data.
All elements are numbered from South to North, bottom to top

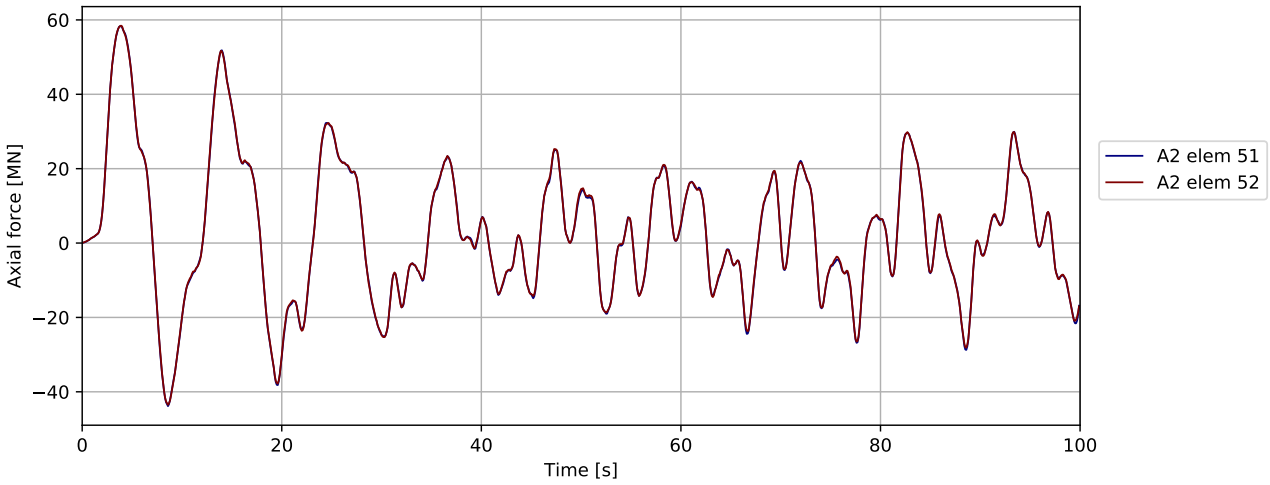


Figure 4.951: DH A35-A36 180deg - bridgegirder @ pylon: Axial force [MN]

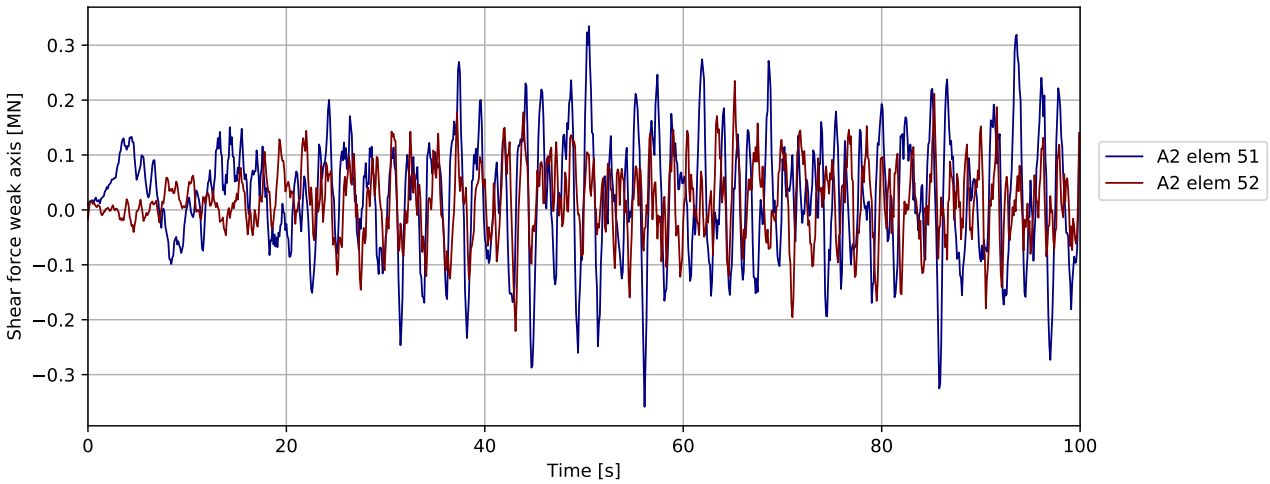


Figure 4.952: DH A35-A36 180deg - bridgegirder @ pylon: Shear force weak axis [MN]

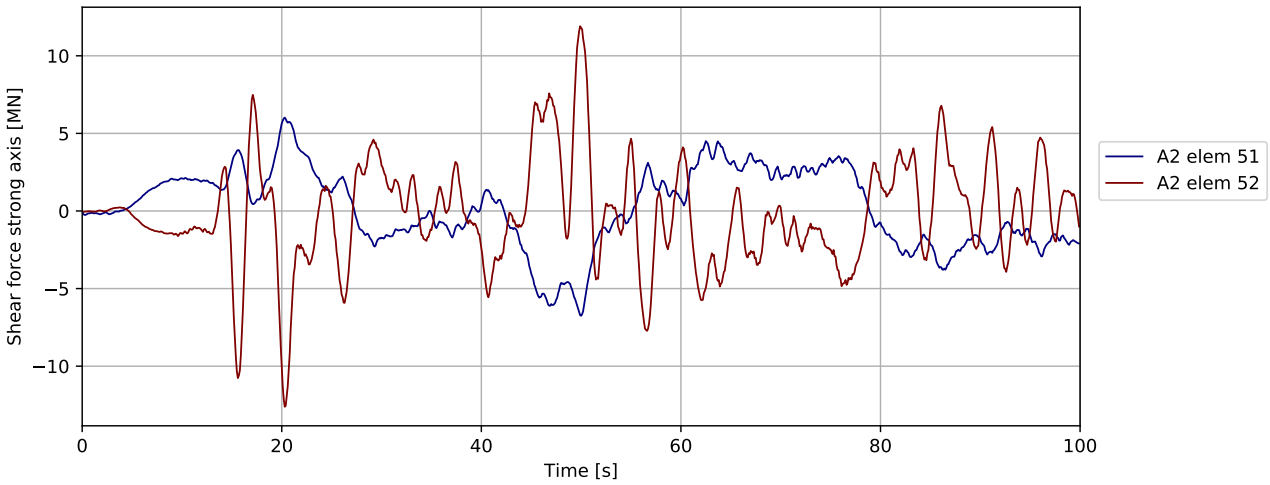


Figure 4.953: DH A35-A36 180deg - bridgegirder @ pylon: Shear force strong axis [MN]

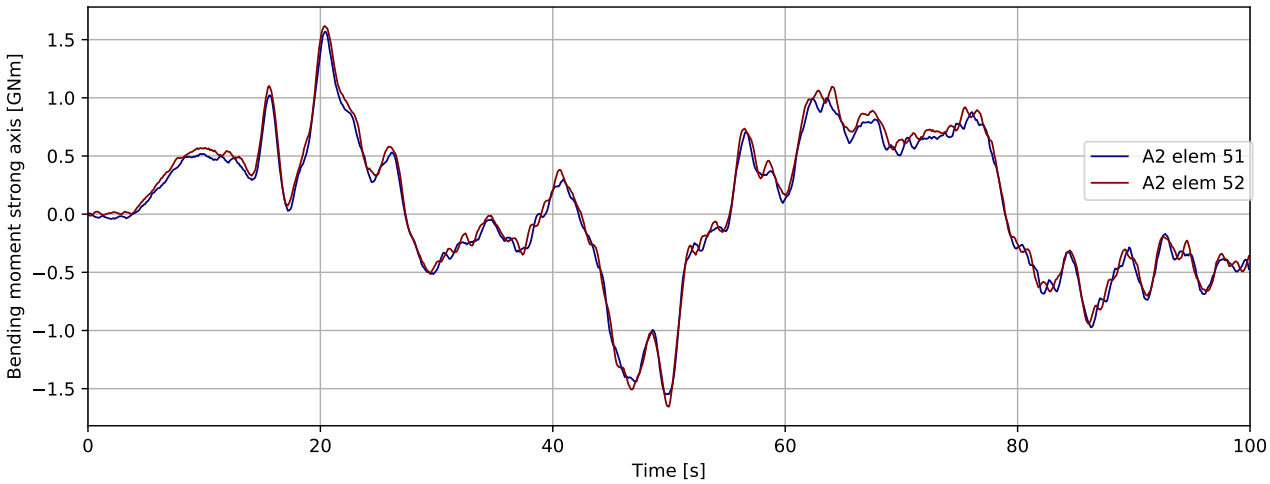


Figure 4.954: DH A35-A36 180deg - bridgegirder @ pylon: Bending moment strong axis [GNm]

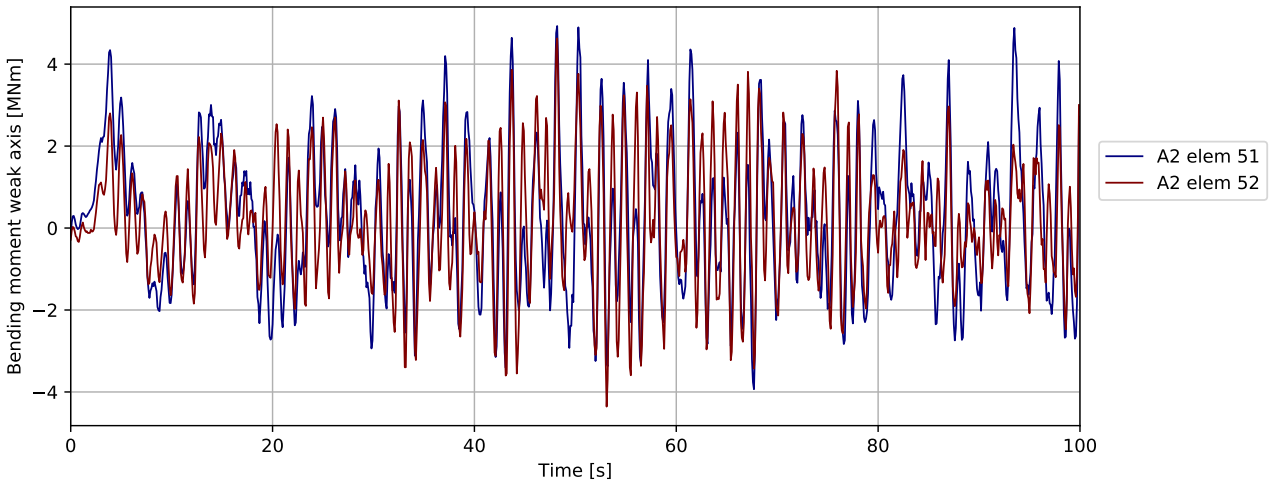


Figure 4.955: DH A35-A36 180deg - bridgegirder @ pylon: Bending moment weak axis [MNm]