

Meeting 27th November

Jeremy

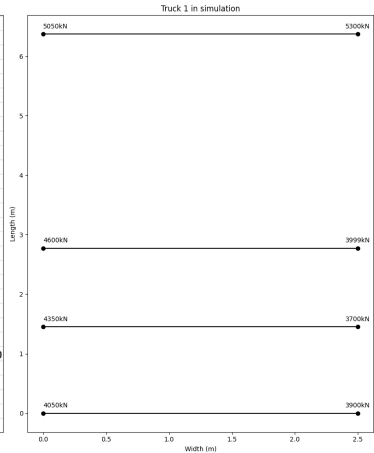
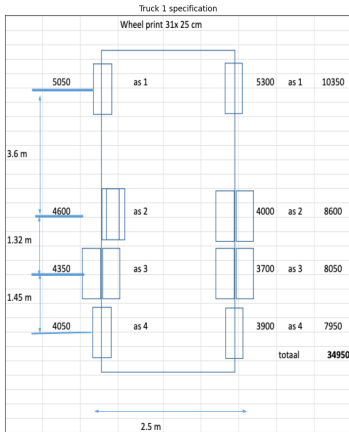
November 27, 2019

Outline

Dutch Main Road Network

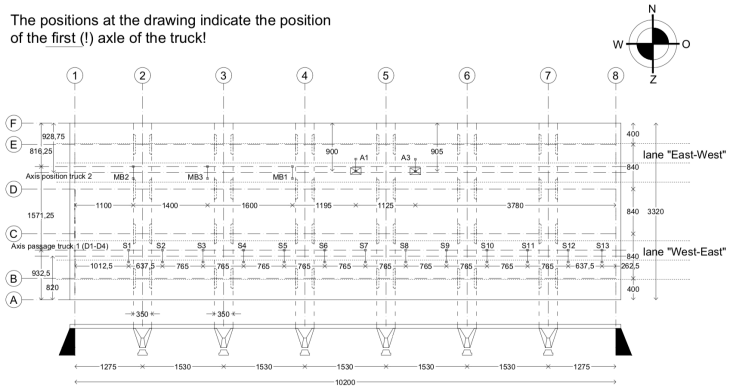
Stucture type	Number	Deck Area (m2)
Concrete bridge	3,131	3,319,002
Steel bridge (fixed)	88	301,997
Movable bridge	43	347,876
Tunnel	14	475,228
Aqueduct	7	86,491
Total	3,283	4,530,593

Verification: Truck 1



Verification: Truck positions

The positions at the drawing indicate the position of the first (!) axle of the truck!

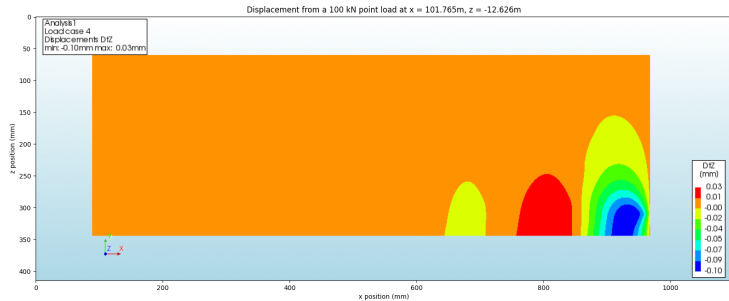


Fast Response Calculation

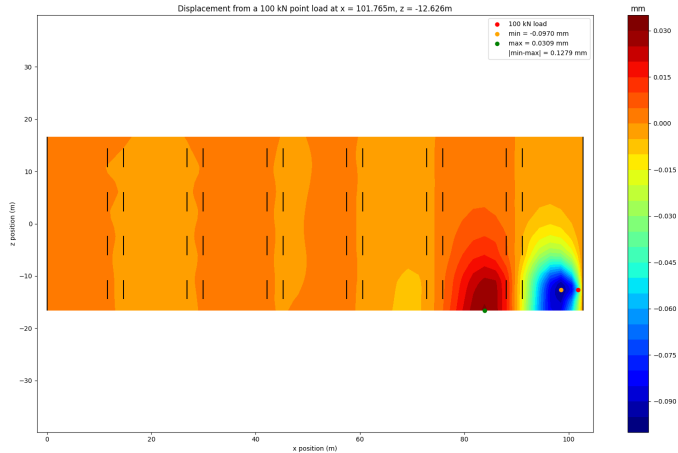
- ▶ Via Matrix multiplication
- ▶ Cluster not needed

On white board

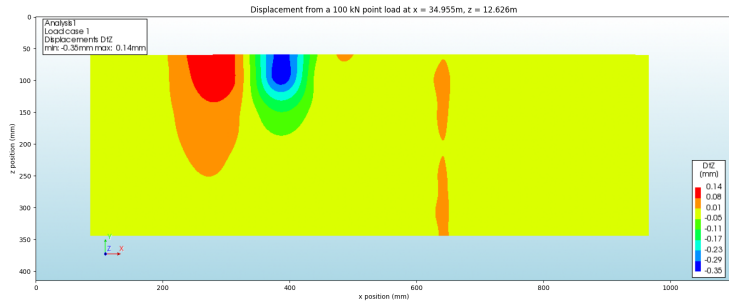
Verification: Contour A



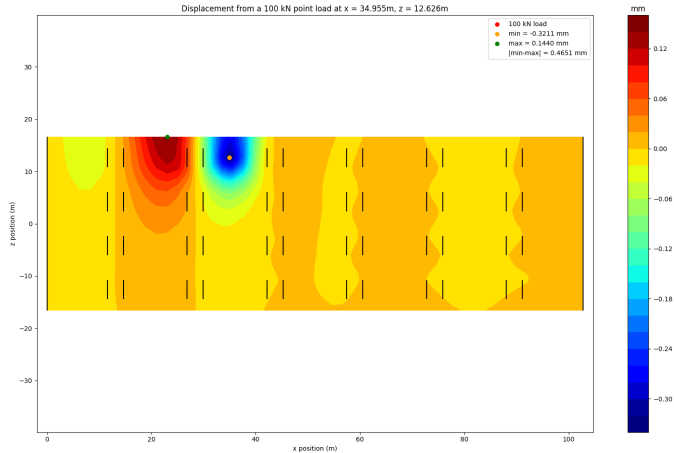
Verification: Contour A



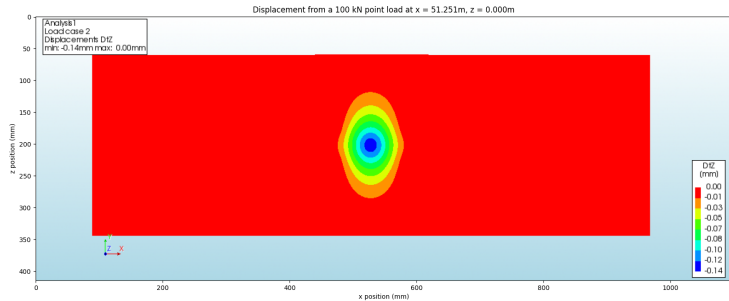
Verification: Contour B



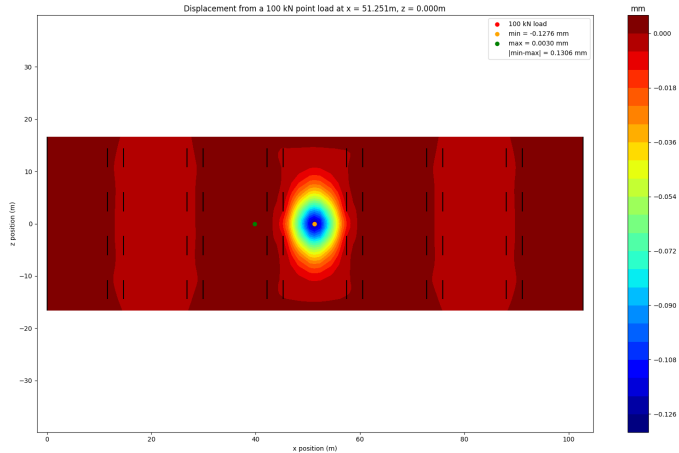
Verification: Contour B



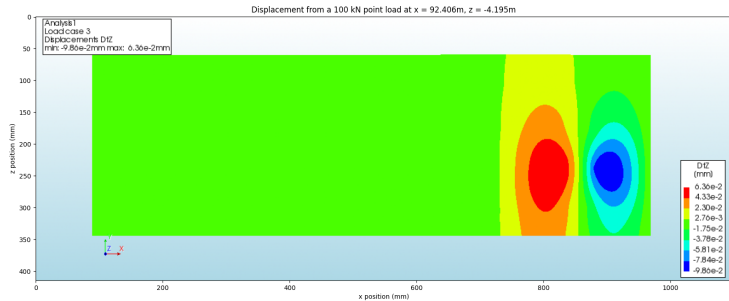
Verification: Contour C



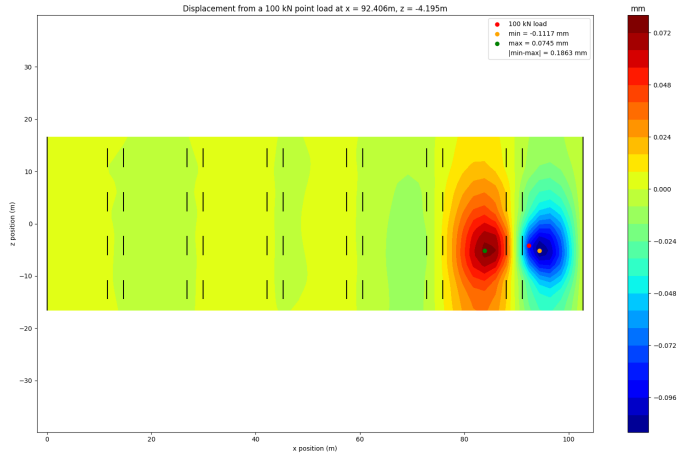
Verification: Contour C



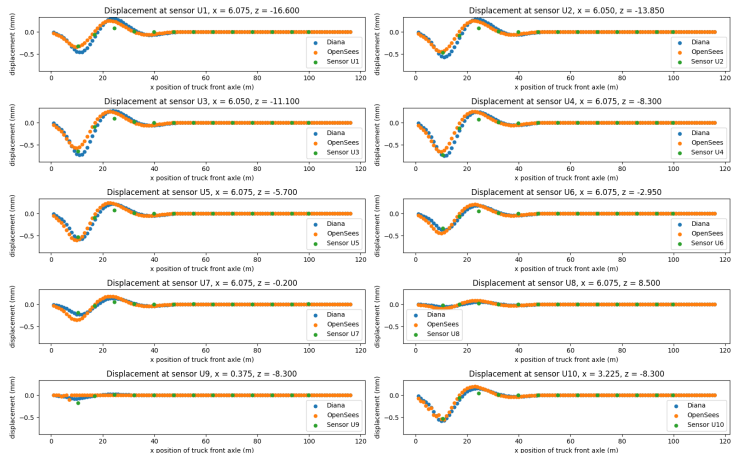
Verification: Contour D



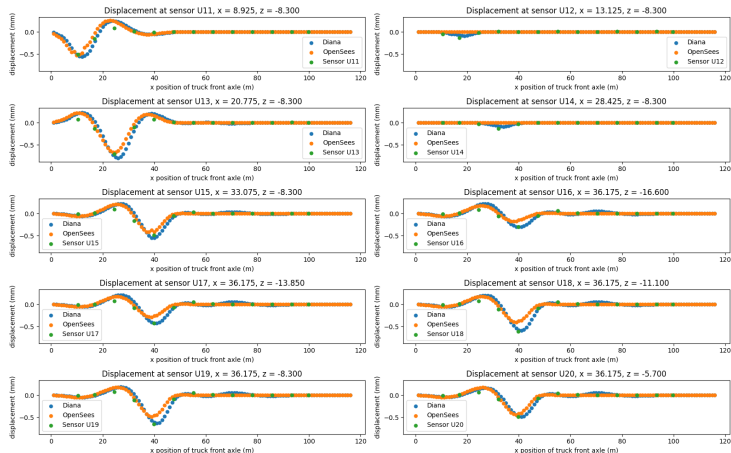
Verification: Contour D



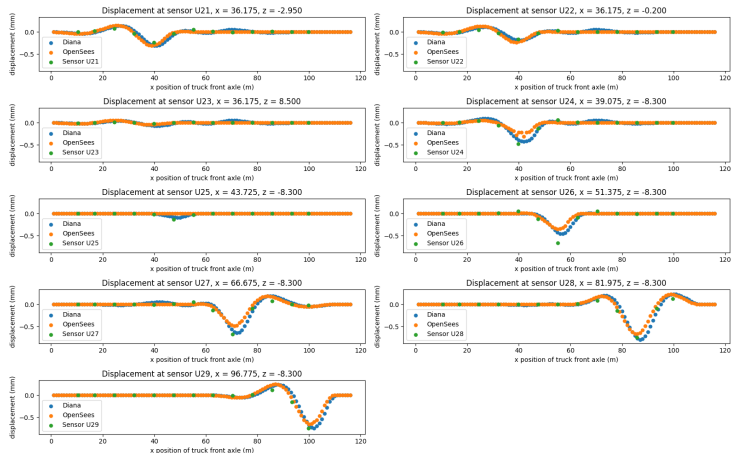
Verification: Displacement



Verification: Displacement

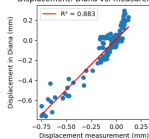


Verification: Displacement

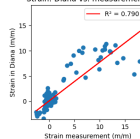


Verification: Displacement

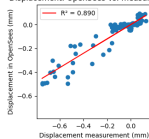
Displacement: Diana vs. measurements



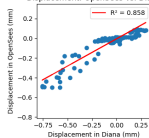
Strain: Diana vs. measurements



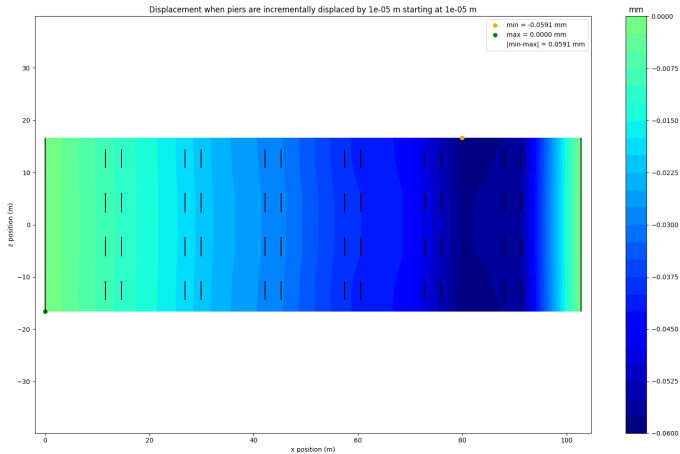
Displacement: OpenSees vs. measurements



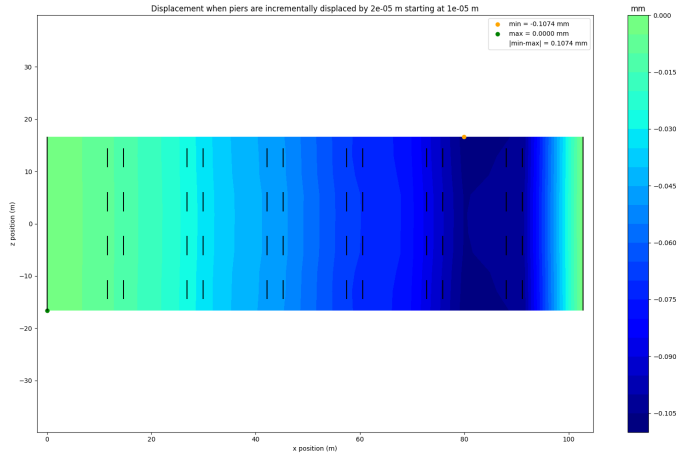
Displacement: OpenSees vs. Diana



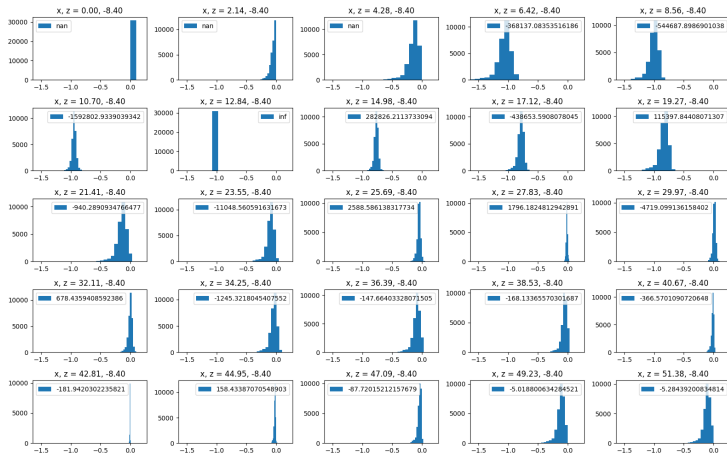
Pier Settlement



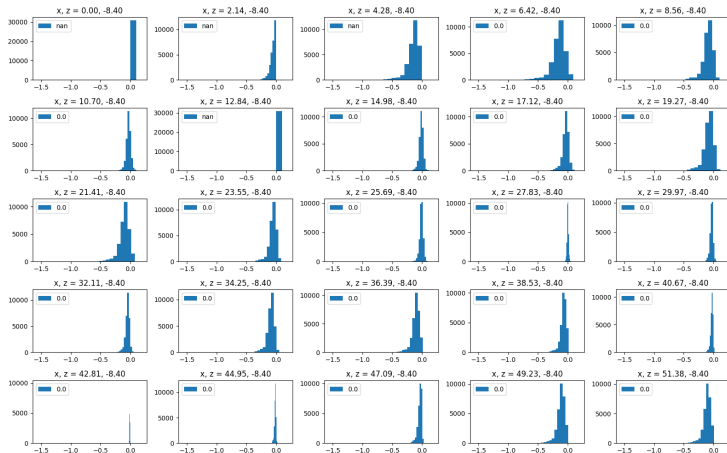
Pier Settlement



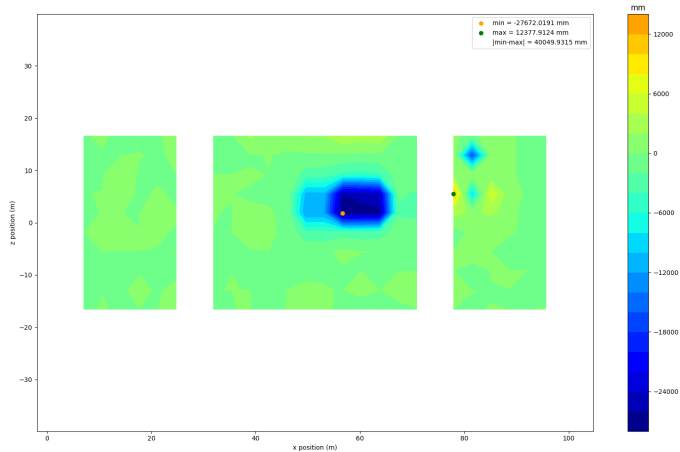
Response Distributions: Healthy



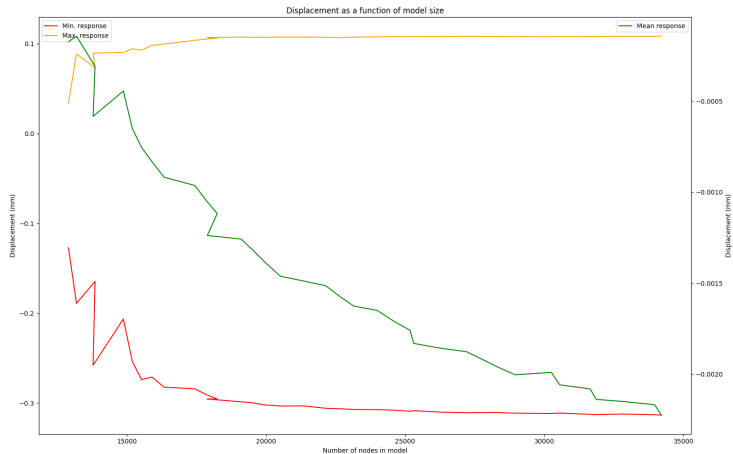
Response Distributions: Healthy



Pier Settlement: Compared to Healthy Distributions



Verification: Convergence



IAS presentation: November Plan

Week 1	Writing	Sensor cost emails/research
Week 2	Writing	Try standard classifiers
Week 3	Verification plot 1	Collect strain
Week 4	Verification plot 2	Classifiers

IAS presentation: December Plan

December week 1	writing	add temperature to model
December week 2	writing	add soil creep to model
December week 4	writing	

Actual November

- ▶ Writing
- ▶ Pier displacement in 3D
- ▶ Speed up response calculation
 - ▶ Traffic (vehicle) sampling **much** faster
 - ▶ Response to traffic via matrix multiplication
- ▶ Collect distribution of responses
- ▶ Quantify distribution of responses
- ▶ Verification
 - ▶ Plot for each displacement sensor
 - ▶ Regression plots
 - ▶ Convergence plot

December: Overview

- ▶ Writing
- ▶ Fully verified

(In other words: free up Jan/Feb for classification!)

December: Timeline

Dynamic timeline:

- <https://github.com/barischrooneyj/bridge-dss/issues/104>

Goal	Note
Strain verified (5th Dec)	Post-processing step
Pier displacement verified (5th Dec)	Against AxisVM
Location classifier (5th Dec)	
Mesh refinement, obey material properties	Improves model accuracy
Mesh refinement, density++ around load	Improves model accuracy
Parallelization	14days -> 4days
Choose number of unit load simulations	Parameter selection
Add temperature to model	"Noise" in classification
Add cracked concrete to model	Small change (change E)
15k good words (12k current, 10k good)	Pre-alpha draft