STRUCTURAL ENGINEERING

To: Ryan

From: Ana

Subject: In plane horizontal shear loads for plank to wall connections

Date: November 29, 2019

- $F_{x,max}$: maximum value of reaction forces in positive X direction (East-West)
- $F_{x,min}$: maximum value of reaction forces in negative X direction (West-East)
- $F_{y,max}$: maximum value of reaction forces in positive Y direction (North-South)
- $F_{y,min}$: maximum value of reaction forces in negative Y direction (South-North)

Load case: Wind East-West (see fig.1)				
Wall description	$F_{x,max}$ kN/m	$F_{x,min}$ kN/m	$F_{y,max}$ kN/m	$F_{y,min}$ kN/m
East retaining wall	0.0	-28.19	3.79	-4.36
West retaining wall	0.0	-5.27	0.92	-0.93
North retaining wall	0.01	-0.95	1.34	-1.69
South retaining wall	0.0	-2.84	2.18	-1.86
Ramp East wall	0.0	-0.0	0.0	-0.29
Ramp West wall	0.0	0.0	0.0	-1.31
Ramp North wall	0.0	-2.35	0.0	-0.0
Ramp South wall	0.0	-18.1	0.0	-0.0
Stair 1 West wall	0.0	-0.0	0.0	-0.57
Stair 1 South wall	0.0	-4.22	0.0	-0.0
Stair 2 West wall	0.0	-0.0	0.0	-2.76
Stair 2 North wall	0.0	-5.48	0.04	0.0
Stair 2 South wall	0.0	-18.11	0.0	-0.26
Units: 1 kN/m = 0.0684 Klb/ft				

Load case: Wind North-South (see fig.2)				
Wall description	$F_{x,max}$ kN/m	$F_{x,min}$ kN/m	$F_{y,max}$ kN/m	$F_{y,min}$ kN/m
East retaining wall	1.7	-1.31	0.0	-1.56
West retaining wall	0.93	-1.24	0.0	-1.3
North retaining wall	3.84	-4.65	0.0	-25.87
South retaining wall	1.6	-1.76	0.0	-9.11
Ramp East wall	0.0	0.0	0.0	-16.44
Ramp West wall	0.0	-0.0	0.0	-2.83
Ramp North wall	1.08	0.0	0.0	-0.0
Ramp South wall	0.51	0.0	0.0	-0.0
Stair 1 West wall	0.0	-0.0	0.0	-2.29
Stair 1 South wall	0.0	-0.63	0.0	0.0
Stair 2 West wall	0.0	-0.0	0.0	-12.45
Stair 2 North wall	0.61	0.0	0.0	-0.04
Stair 2 South wall	0.0	-1.31	0.0	-0.06
Units: 1 kN/m = 0.0684 Klb/ft				

Load case: Wind West-East (see fig.3)				
Wall description	$F_{x,max}$ kN/m	$F_{x,min}$ kN/m	$F_{y,max}$ kN/m	$F_{y,min}$ kN/m
East retaining wall	28.19	0.0	4.36	-3.79
West retaining wall	5.27	0.0	0.93	-0.92
North retaining wall	0.95	-0.01	1.69	-1.34
South retaining wall	2.84	0.0	1.86	-2.18
Ramp East wall	0.0	0.0	0.29	0.0
Ramp West wall	0.0	-0.0	1.31	0.0
Ramp North wall	2.35	0.0	0.0	0.0
Ramp South wall	18.1	0.0	0.0	0.0
Stair 1 West wall	0.0	0.0	0.57	0.0
Stair 1 South wall	4.22	0.0	0.0	0.0
Stair 2 West wall	0.0	0.0	2.76	0.0
Stair 2 North wall	5.48	0.0	0.0	-0.04
Stair 2 South wall	18.11	0.0	0.26	0.0
Units: 1 kN/m = 0.0684 Klb/ft				

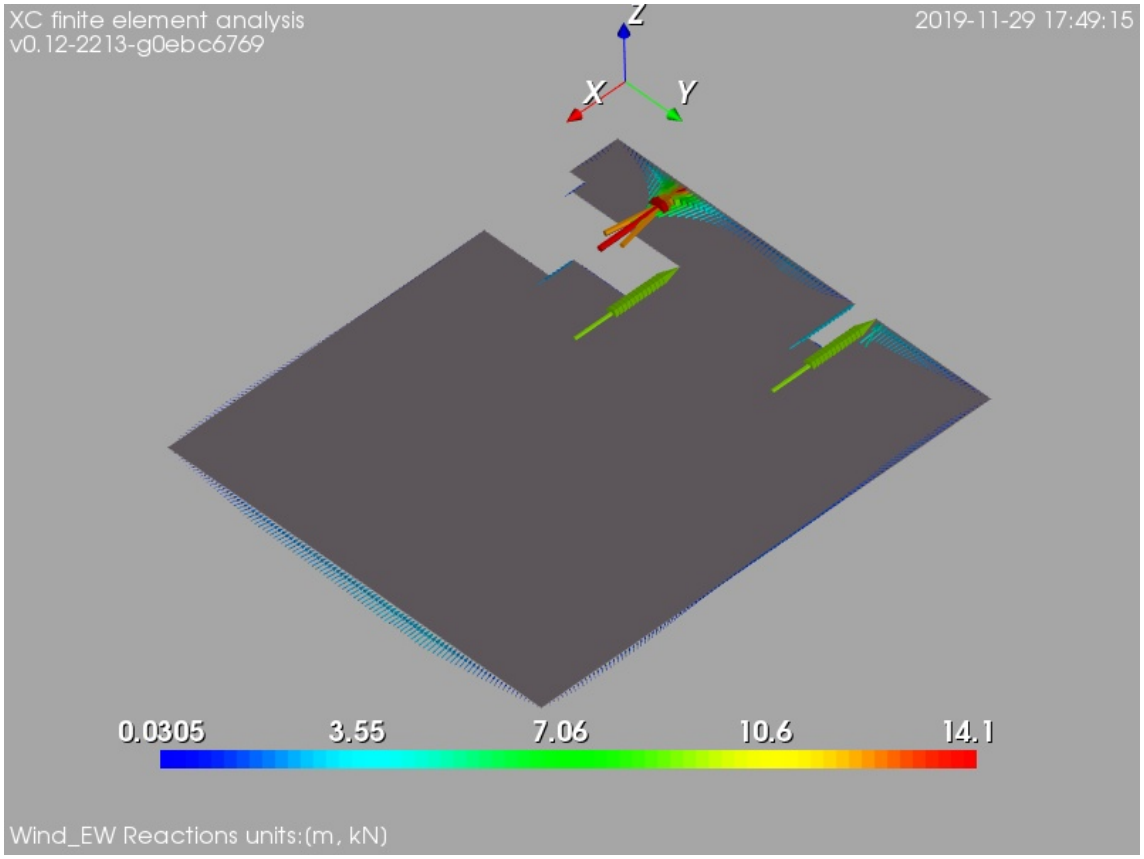

Figure 1: Load case: Wind East-West. First floor, horizontal reactions at nodes (1 node every 0.5 m).

Load case: Wind South-North (see fig.4)				
Wall description	$F_{x,max}$ kN/m	$F_{x,min}$ kN/m	$F_{y,max}$ kN/m	$F_{y,min}$ kN/m
East retaining wall	1.31	-1.7	1.56	0.0
West retaining wall	1.24	-0.93	1.3	0.0
North retaining wall	4.65	-3.84	25.87	0.0
South retaining wall	1.76	-1.6	9.11	0.0
Ramp East wall	0.0	-0.0	16.44	0.0
Ramp West wall	0.0	0.0	2.83	0.0
Ramp North wall	0.0	-1.08	0.0	-0.0
Ramp South wall	0.0	-0.51	0.0	-0.0
Stair 1 West wall	0.0	0.0	2.29	0.0
Stair 1 South wall	0.63	0.0	0.0	-0.0
Stair 2 West wall	0.0	0.0	12.45	0.0
Stair 2 North wall	0.0	-0.61	0.04	0.0
Stair 2 South wall	1.31	0.0	0.06	0.0
Units: 1 kN/m = 0.0684 Klb/ft				

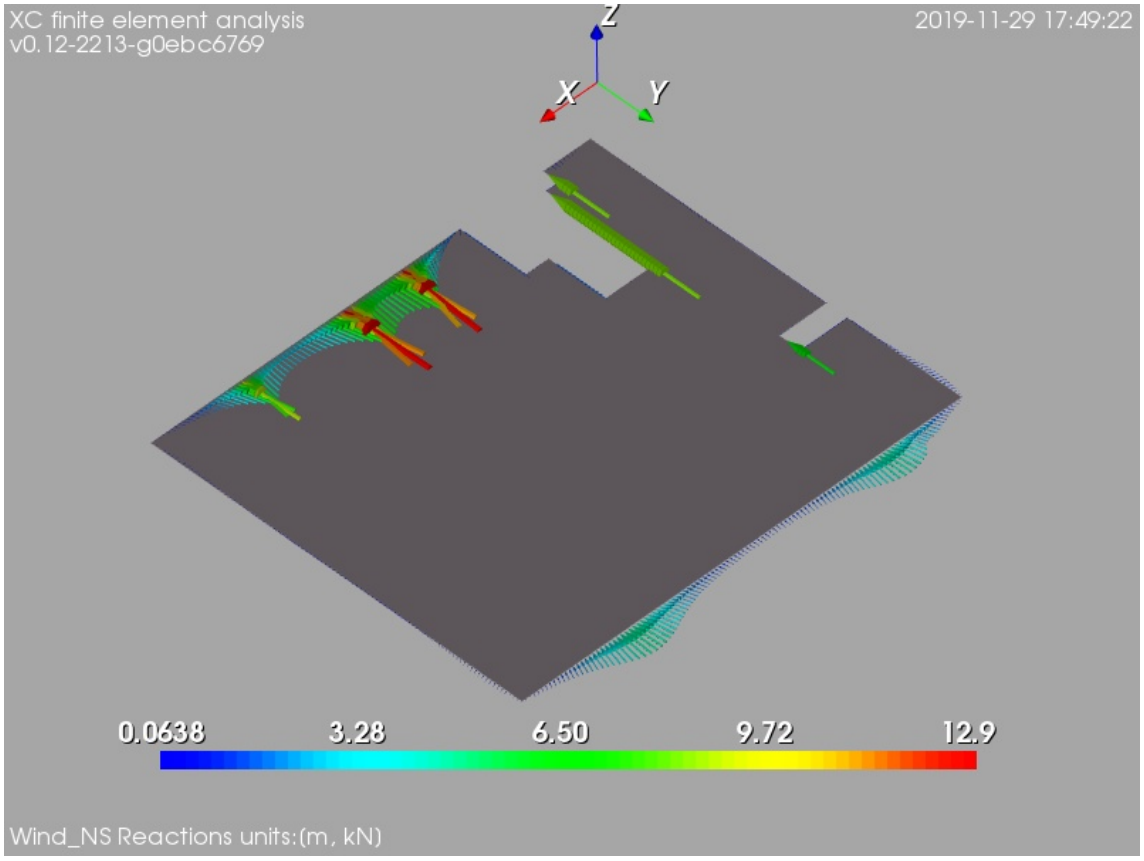

Figure 2: Load case: Wind North-South. First floor, horizontal reactions at nodes (1 node every 0.5 m).

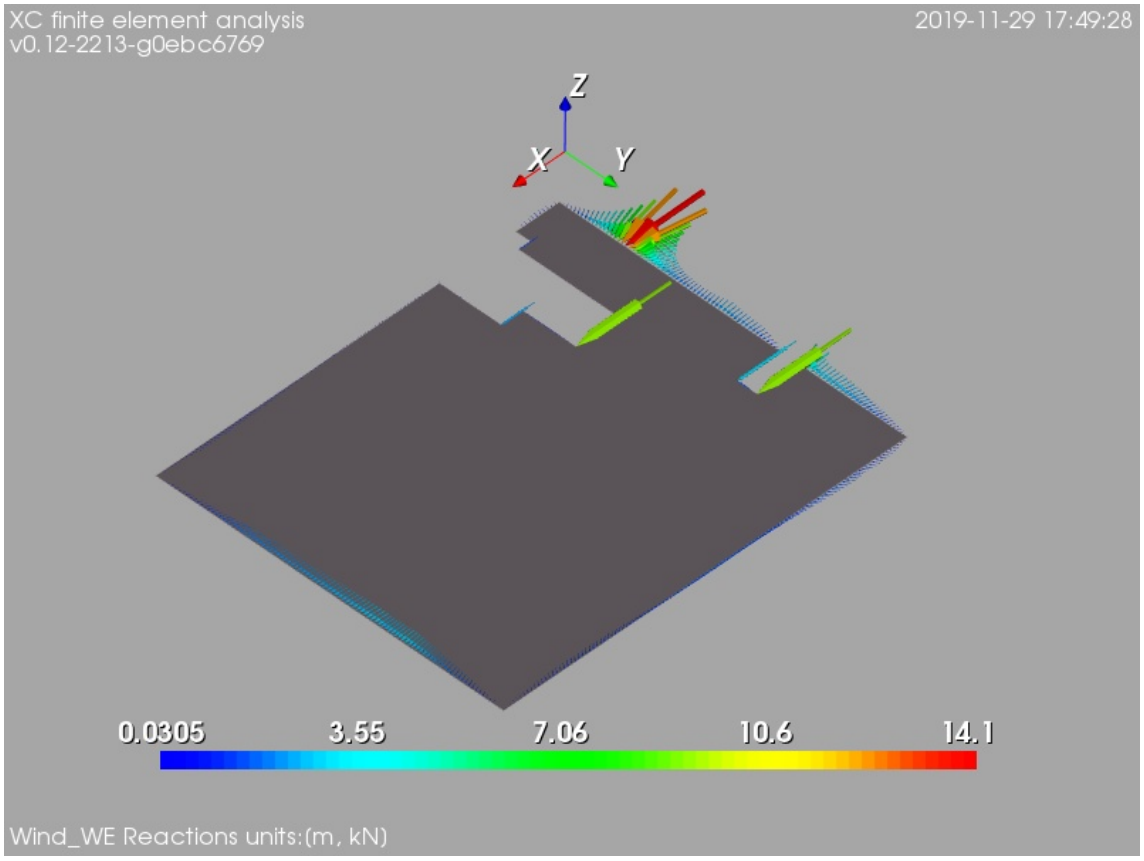

Figure 3: Load case: Wind West-East. First floor, horizontal reactions at nodes (1 node every 0.5 m).

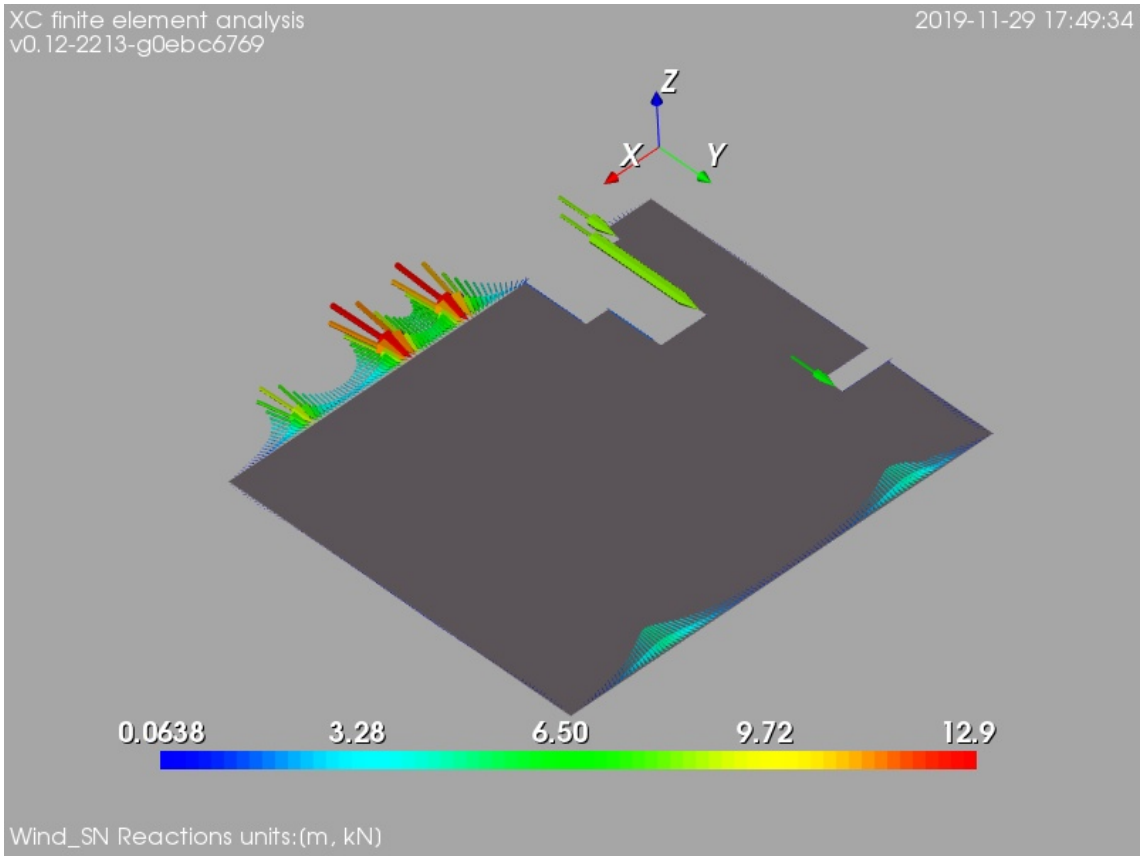

Figure 4: Load case: Wind South-North. First floor, horizontal reactions at nodes (1 node every 0.5 m).