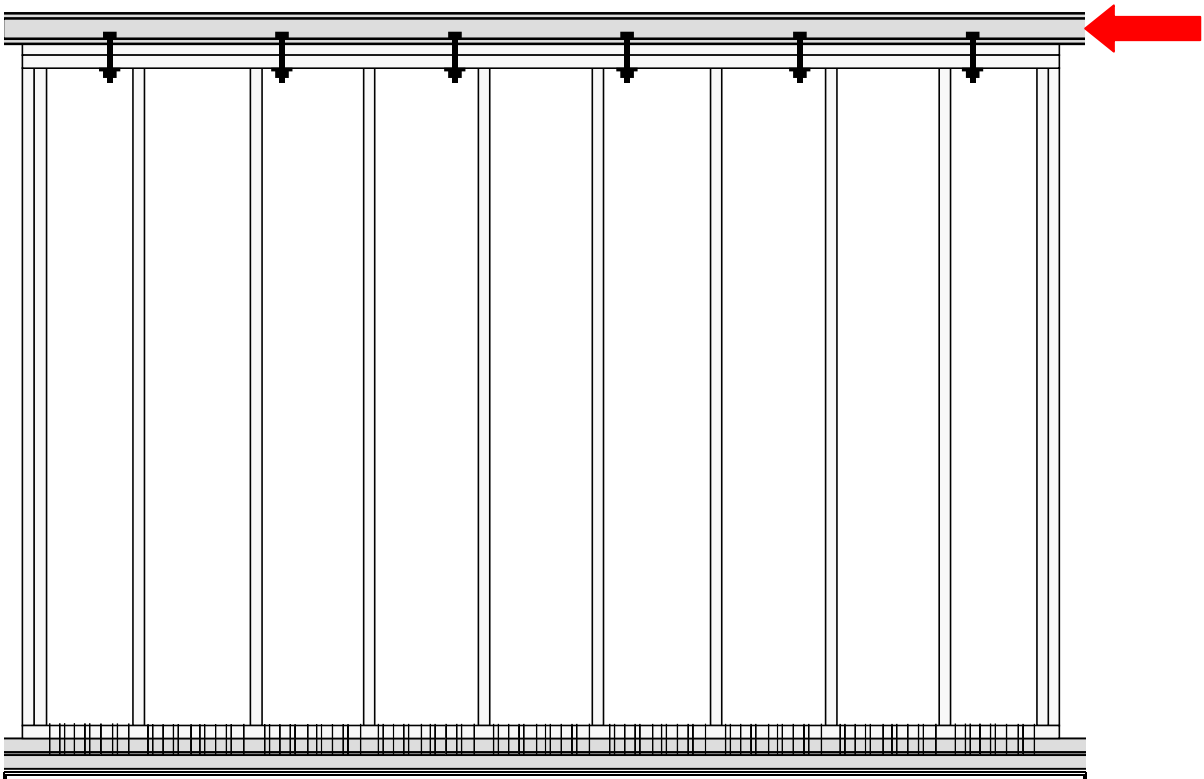
Walls 12NAm



Wall:	**12NAm1**	**No replication**
Manufactured:	**June 23, 1998**[1]	
MOE data files:	12nam2p.prn 12nam2s.prn	
MOE_{plates} (10^6 psi)	1.46	
MOE_{studs} (10^6 psi)	1.48	
$Density_{plates}$ (kg/m^3)	476	
$Density_{studs}$ (kg/m^3)	455	
Date tested:	**August 17, 1998**[2]	
Time tested:	12:13	
LTC files:	alex_m12	
Data files:	12NAm1.dat	
Excel files:	12NAm1_data	
Photo files:	831-836	

[1] Low quality of sheathing attachment: the edge distance was 3/8±1/8 in.

[2] The bottom plate was attached to the base with 3 rows of 16d nails at 3 in. o.c. one hour before the test.

Wall 12NAm1

Observations: This wall exhibited a very low performance due to the inadequate sheathing attachment. The peak load (3711 lbf.) was observed at approximately 1.0-in. deflection. Then, the resistance dropped quickly. The 20% load reduction was observed at 1.3-in. deflection. Sheathing unzipped from the bottom plate and the rest of the wall rocked away from the foundation as a rigid body as shown in Photo 831. The sheathing moved relative to the studs and top plate less than 0.03 in. as the graphs show.

Failure mode: Photos 832 through 835 illustrate details of the unzipped sheathing along the bottom plate. It is obvious that the wall could not provide adequate resistance with such a short edge distance of nailing.

Discussion: The shape of the load-deflection curve is similar to that of 12IAm walls: quick degradation soon after the peak load. The peak load is 1/3 less than the average peak load (4956 lbf.) developed by 12IAm walls. The peak load and failure occurred earlier due to the shorter edge distance of nails and the low density of the bottom plate (398 kg/m^3). The obvious reason for the quick wall degradation can be found looking at the graphs of sheathing displacement. The peak load is reached as soon as the first sheathing nails tear through the edge of the panel. The wall response entirely depends on the row of nails along the bottom plate.

Instrumentation: LVDT for measurement of stud uplift #3 was disconnected.

Table 12NAm1. Data summary.

Specimen	**12NAm1**	**Per unit length**	
Nails		**monotonic test**	
Wall length		**12.00ft.**	**3.657m**
Date:	8-17-1998.	**Time:**	12:13
		units	**12NAm1**
Peak unit load, v_{peak}		Kip/ft. KN/m	0.309 4.513
Drift at peak load, Δ_{peak}		in. mm	0.973 24.71
Yield unit load, v_{yield}		Kip/ft. KN/m	0.267 3.890
Drift at yield load, Δ_{yield}		in. mm	0.284 7.21
Proportional limit, $0.4v_{peak}$		Kip/ft. KN/m	0.124 1.805
Drift at prop. limit, $\Delta@0.4v_{peak}$		in. mm	0.132 3.35
Unit load at failure or $0.8v_{peak}$		Kip/ft. KN/m	0.247 3.609
Drift at failure, $\Delta_{failure}$		in. mm	1.269 32.22
Shear modulus, G $@0.4v_{peak}$		Kip/in. KN/mm	7.508 1.315
Work until failure per unit length		Kip·ft./ft. KN·m/m	0.025 0.111
Unit load, $v_{1/300}$ @ 0.32 in. (8.13 mm)		Kips/ft. KN/m	0.199 2.911
Unit load, $v_{1/200}$ @ 0.48 in.(12.19 mm)		Kips/ft. KN/m	0.243 3.548
Unit load, $v_{1/100}$ @ 0.96 in. (24.38 mm)		Kips/ft. KN/m	0.308 4.498
Unit load, $v_{1/60}$ @ 1.6 in. (40.64 mm)		Kips/ft. KN/m	**0.137** **1.992**

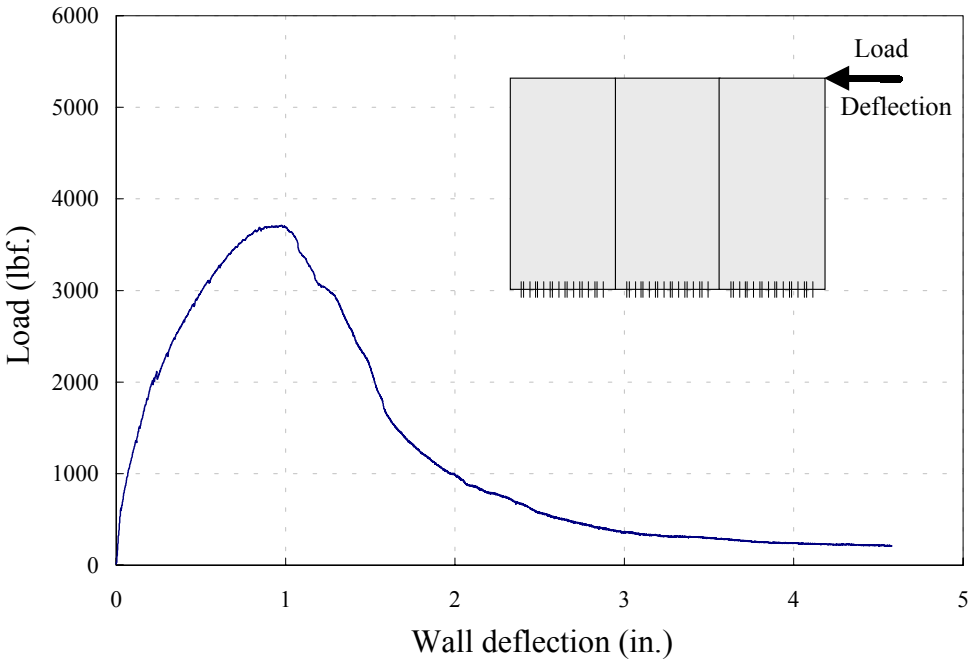


Figure 12NAm1- a. Observed load-deflection curve[1].

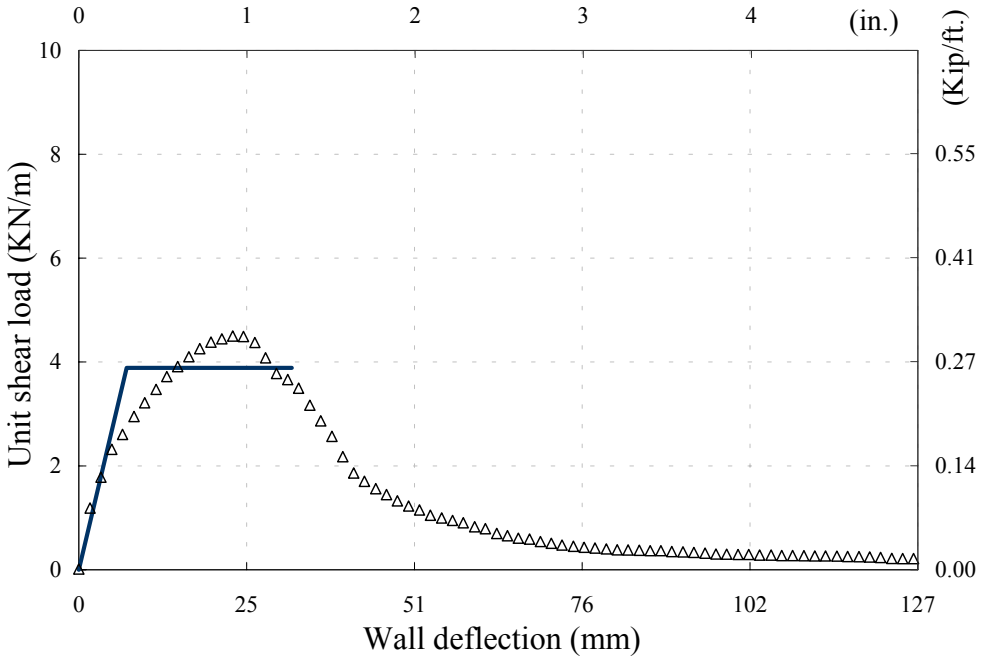


Figure 12NAm1- b. Unit load-deflection and EEEP curves[2].

[1] The scale of the graph varies between test series.
[2] The scale of the graph is uniform between test series for comparison purposes.

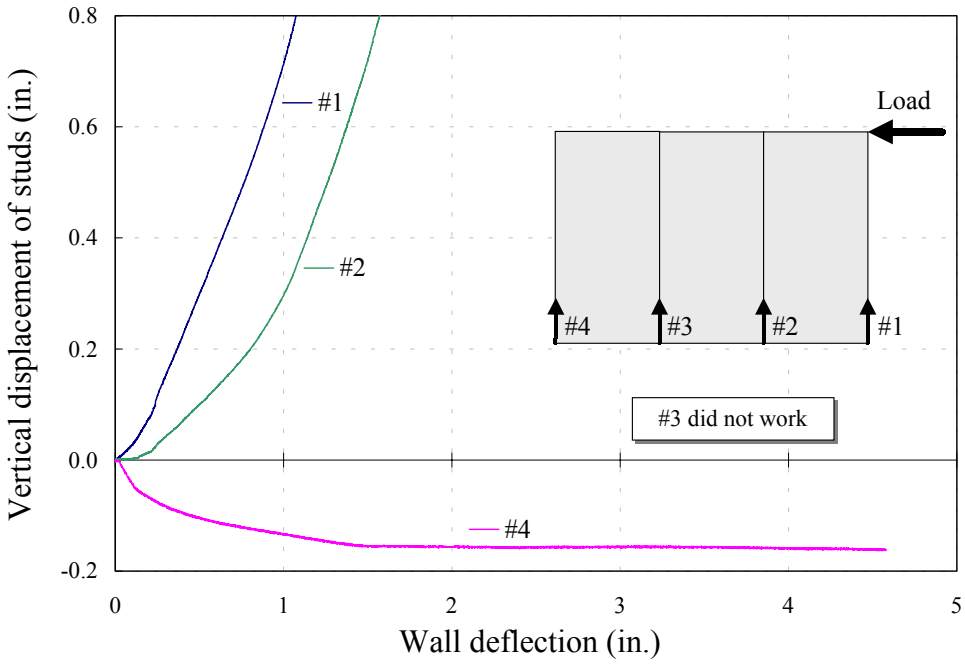


Figure 12NAm1- c. Vertical displacement of studs.

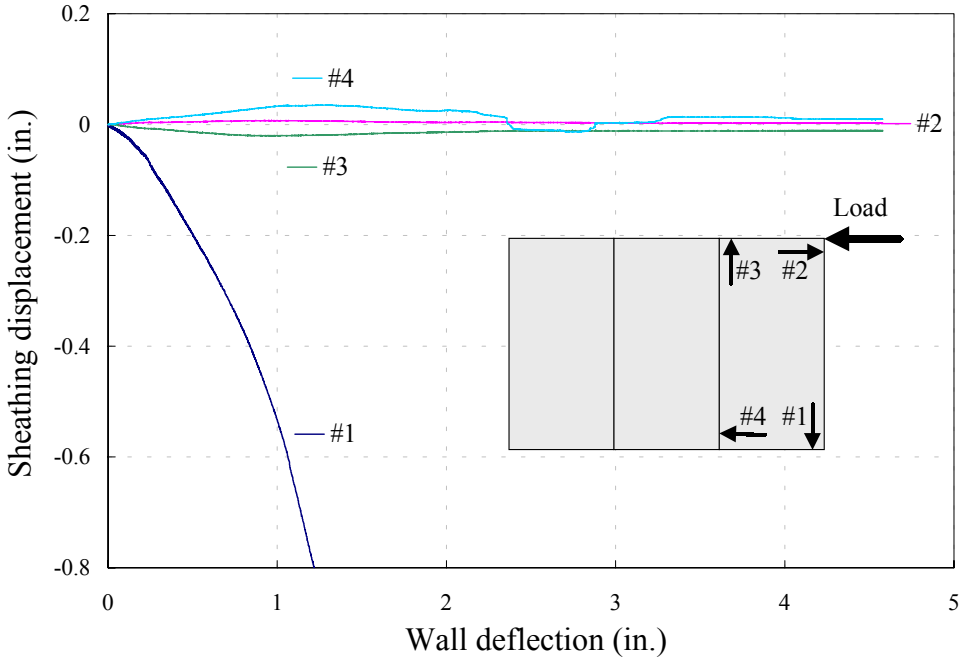


Figure 12NAm1- d. Sheathing displacement.