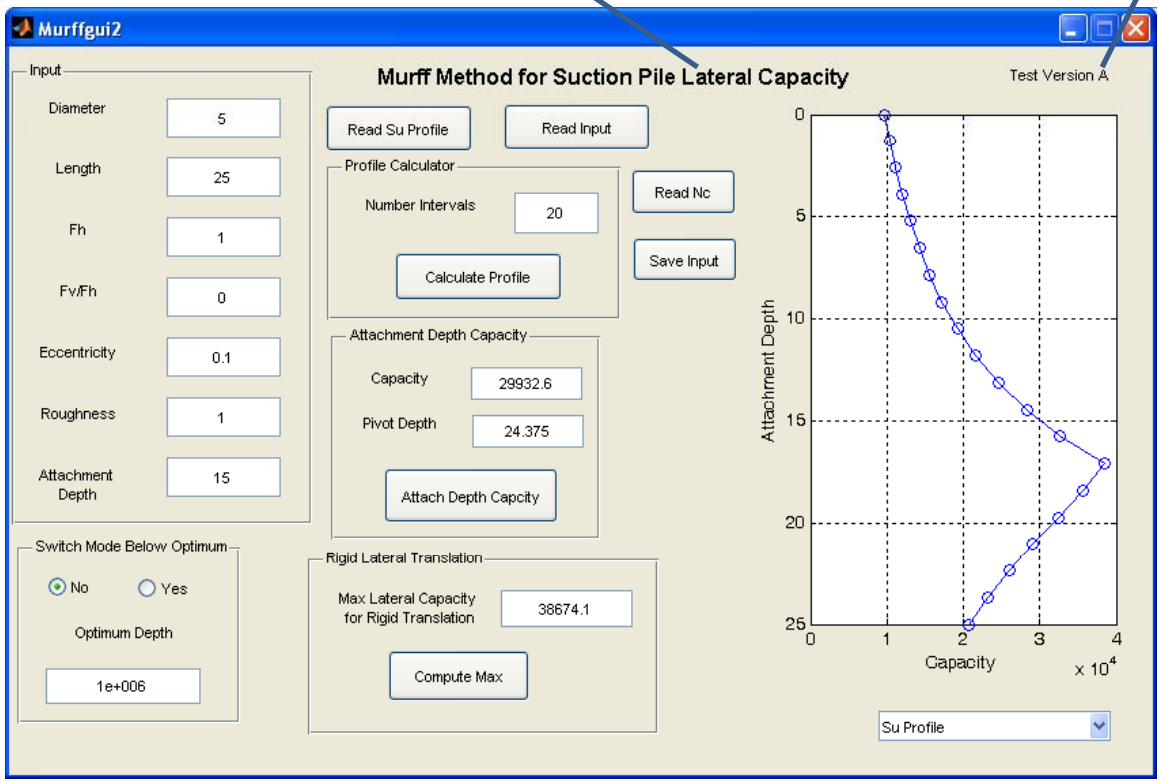
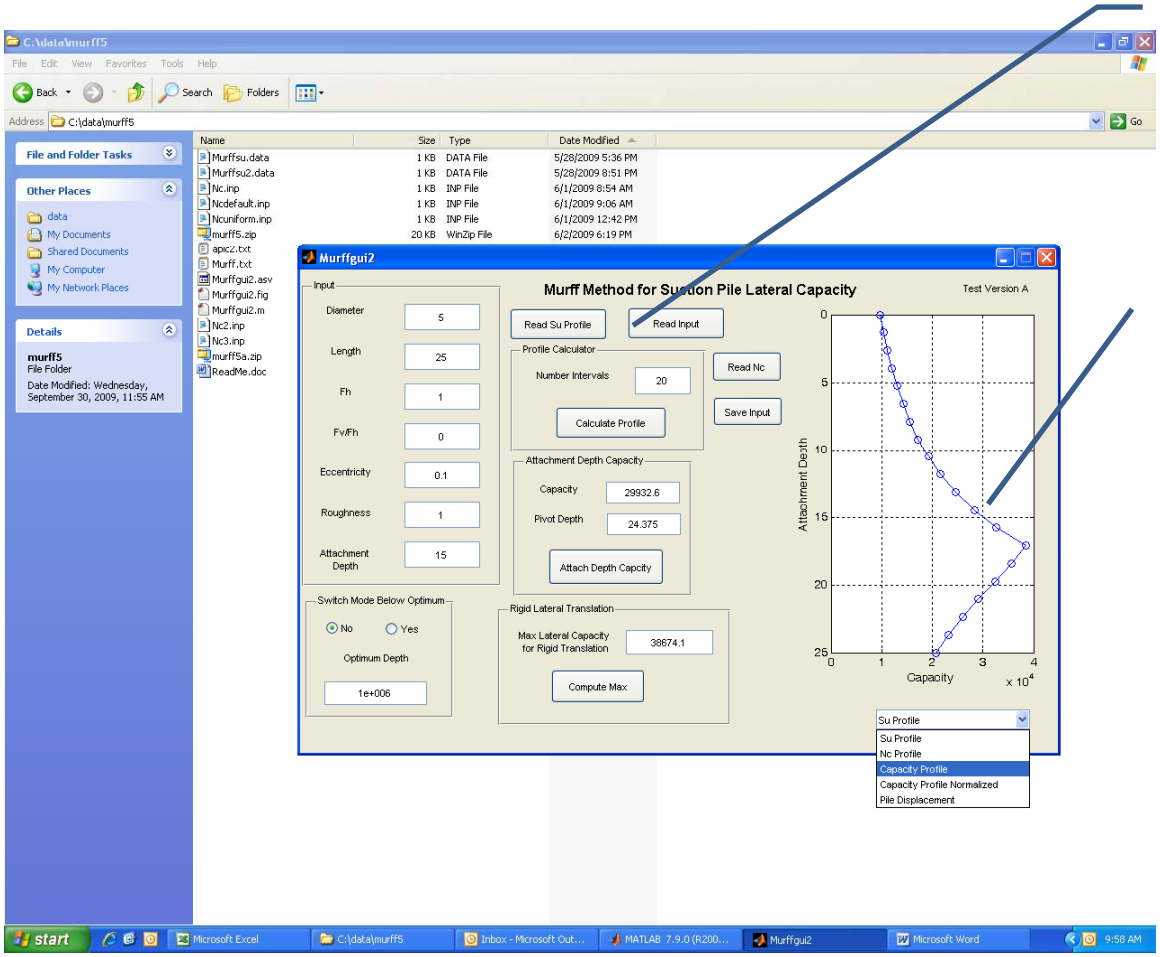
MATLAB Suction Pile GUI

Only for lateral capacity, no interaction with vertical component

This is a test version. It's up to you to verify results



Suction Pile GUI



You can read and write input to files for later use The shear strength (Su) profile must be read in.

A plot area to display results chosen from drop-down menu

You can figure out the nomenclature for data entry in the input files by looking at the examples included

Suction Pile GUI

Geometry Info

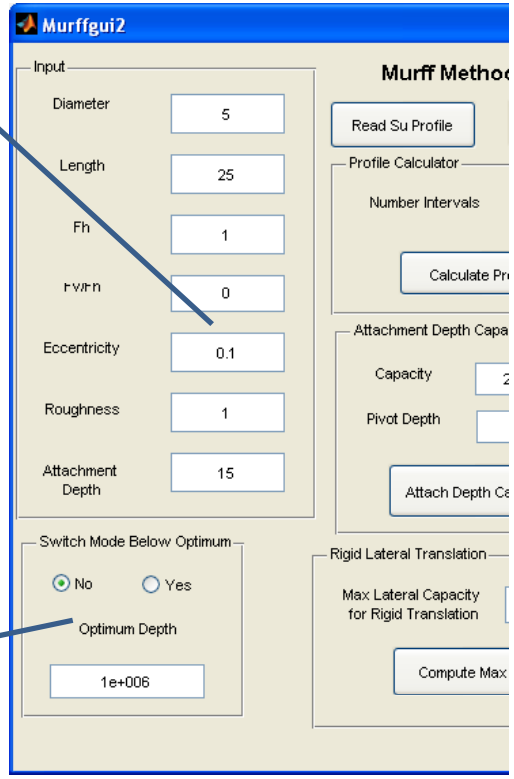
Use Fh = 1

Fv/Fh = Load inclination

Eccentricity = Attachment point distance from pile axis

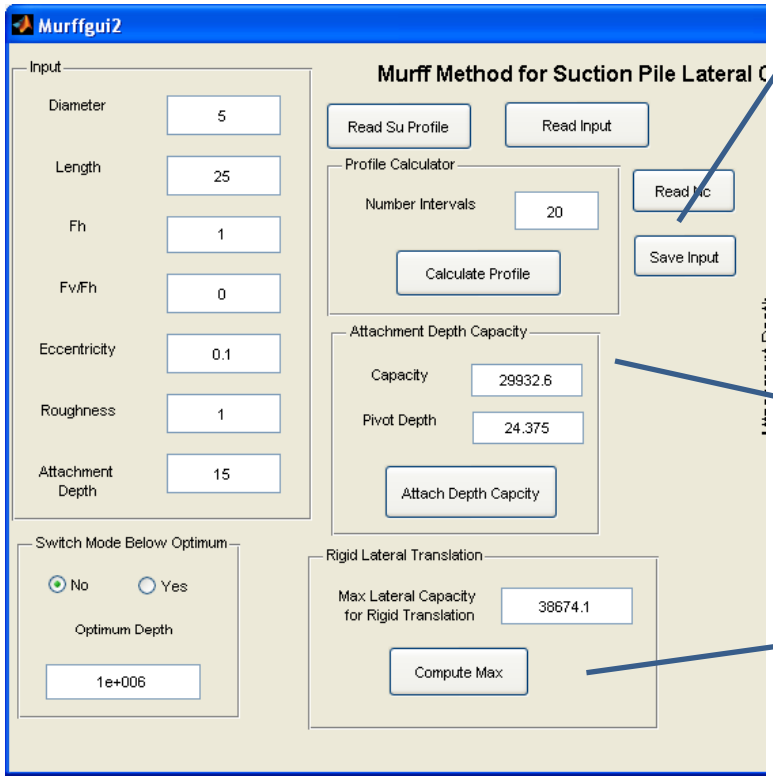
Roughness = 0<r<1 for interpolating between Nc profiles for smooth and rough conditions

Attachment Depth = Distance from top; if eccentricity is also used, then effective depth will increase in the case of an inclined load (Fv/Fh > 0)



The "Switch Mode" was added at one time when there was a problem with solution convergence when load was below the optimum point, but I think I fixed that. You likely can ignore this.

Suction Pile GUI



You can supply your own Nc Profiles (smooth for r=0 and rough for r=1 needed) or use the Defaults
Can also Save “Input”

You can calculate capacity profile for a number of depths or just for the Attachment Depth

Calculate the max lateral capacity for rigid translation

Get Started

- Read in Su profile (Murffsu.data or Murffsu2.data
- Read input (Murff.txt, or apic2.txt)
- Click “Calculate Profile”
- Click “Attach Depth Capacity”
- Click “Compute Max”
- Examine plots from pull-down menu
- Change Input data and experiment
- Read different Nc profiles (Nc.inp, Ncuniform.inp)

Interesting Reading

Andersen, K.H., and J.D. Murff, 2003. Study on Deepwater Anchor Design Practice – First Year Report to API.

Andersen, K.H., J.D. Murff and M. Randolph, 2003. Deepwater Anchor Design Practice – Phase II Report to API/Deepstar.

Aubeny, C.P., J.D. Murff, and S.K. Moon, 2001. Lateral Undrained Resistance of Suction Caisson Anchors, International Journal of Offshore and Polar Engineering, Vol. 11, No. 3, 211-219.

Aubeny, C.P., S. Han, and J.D. Murff, 2003. Inclined Load Capacity of Suction Caissons, International Journal for Numerical and Analytical Methods in Geomechanics, Vol. 27, No. 14, pp. 1235-1254

Aubeny, C., S.W. Han, and J.D. Murff, 2003. Suction Caisson Capacity in Anisotropic Purely Cohesive Soil, International Journal of Geomechanics, ASCE, Vol. 3 No. 2, pp 225-235.

Murff, J.D., and J.M. Hamilton, 1993. P-Ultimate for Undrained analysis of Laterally Loaded Piles, ASCE Journal of Geotechnical Engineering, Vol 119, No 1, 91-107.

Randolph, M.F., and G.T. Houslby, 1984. The Limiting Pressure on a Circular Pile Loaded Laterally in Cohesive Soil, Geotechnique, Vol 34, No 4, 613-623.

Sharma, R.R., 2004. Ultimate Capacity of Suction Caisson in Normally and Lightly Overconsolidated Clays, M.S. Thesis, Texas A&M University.