

## APPENDIX A

### DETAILED RESULTS OF PARAMITRIC STUDY CASES

#### A.1 General

In this Appendix, all figures which compare story shear forces and overturning moments obtained by numerical models (CFD) and analytical method (calculated according to ASCE7-05) are illustrated.

The comparison was concerned in the along-wind-induced story shear forces (Q) and story overturning moments (M) for each case.

#### A.2 Description of parametric study cases numbering

A summary of the assumed values for each parameter is given in fig.A.1.

So there are 112 cases in this study. The method of naming cases is as follows:

- a) the 1<sup>st</sup> section of name indicates to the terrain roughness (A and B for open terrain and suburban terrain roughness respectively ).
- b) the 2<sup>nd</sup> section of name indicates to the building plan aspect ratio (B:L) (such as 1:1 to 2.5:1).
- d) the 3<sup>rd</sup> section of name indicates to the building height (H) (such as 50 to 200).
- e) the 4<sup>th</sup> section of name indicates to the building fundamental period (T) (T1 and T2 for  $T_{\text{approximate}}$  and  $2T_{\text{approximate}}$  respectively).

Here is an example of the case name format (B\_1:1.5\_100\_T1)

That name indicates to case of suburban terrain roughness with building plan aspect ration equals 1:1.5 and the height of building is 100 m using the approximate building fundamental period  $T_{\text{approximate}}$  according to ASCE7-05.

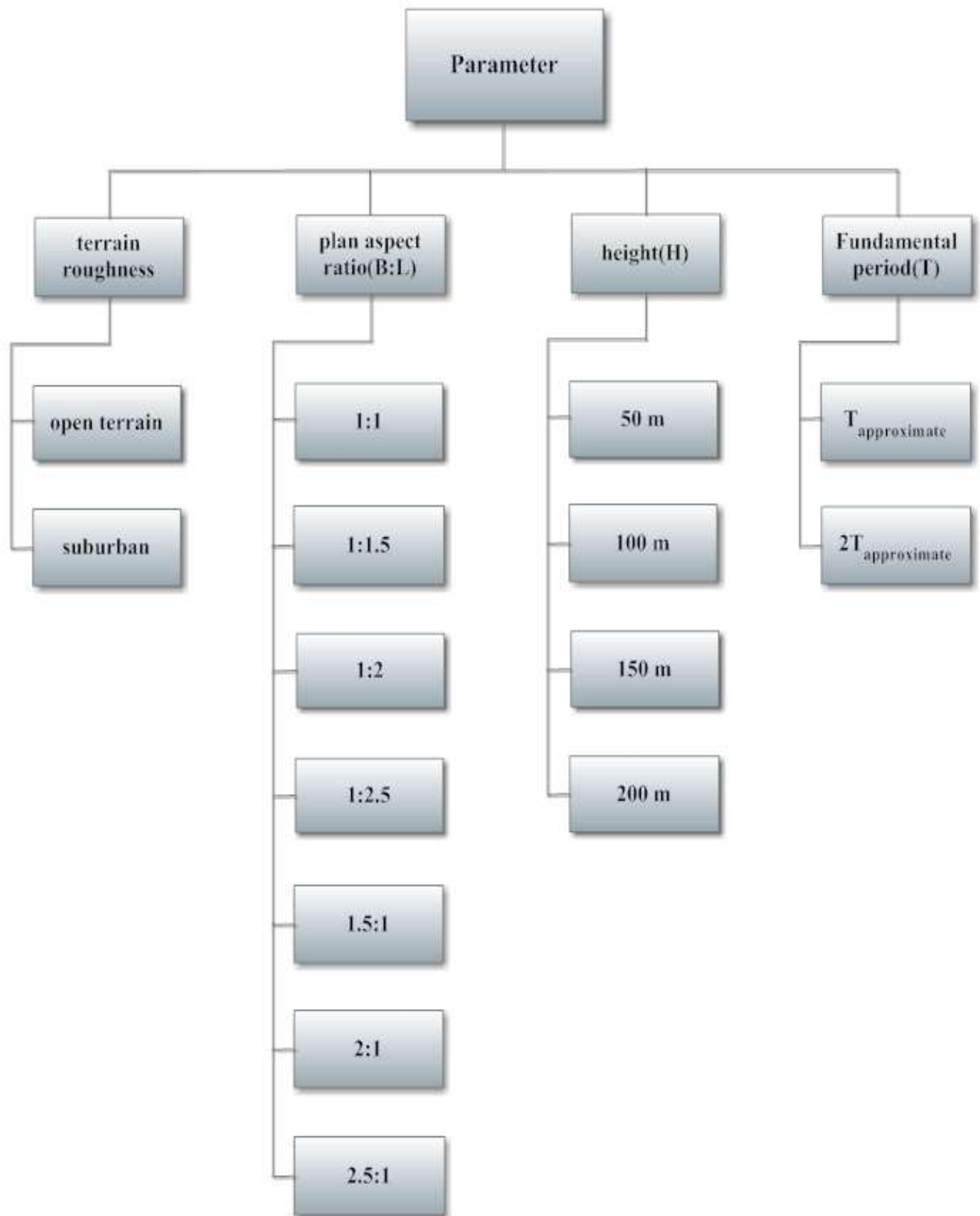


Fig.A.1. summary of variables considered in the parametric study

### A.3 Results for each case

Figures from A.2 to A.113 show comparison of story shear forces and overturning moments obtained by numerical models (CFD) and analytical method (calculated according to ASCE7-05) for each case in the parametric study.

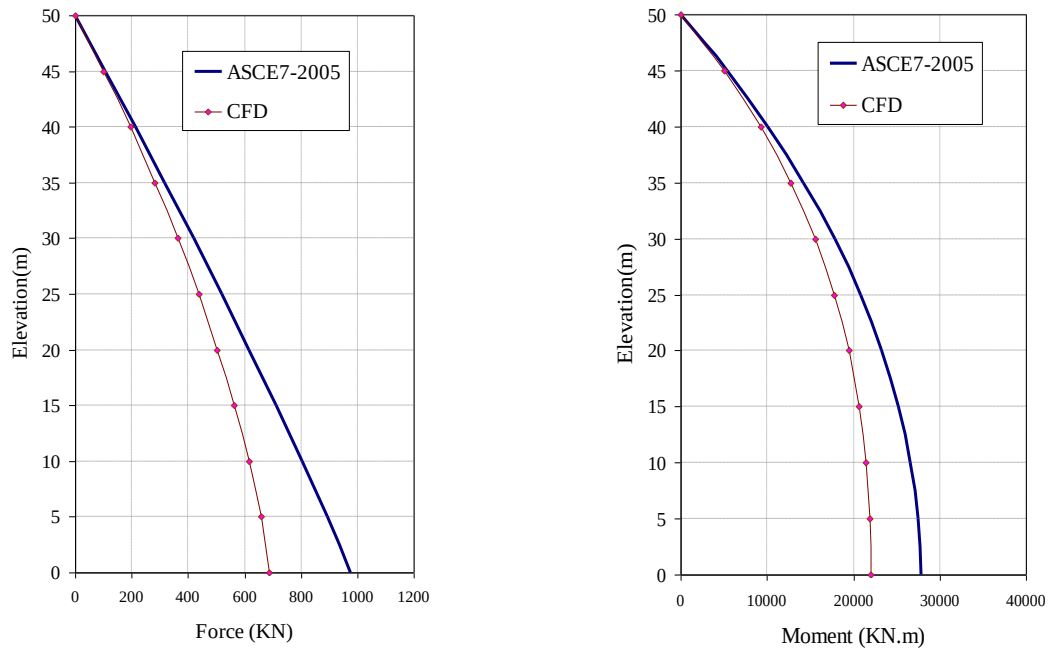


Fig.A.2. Case No. A\_1\_1\_50\_T1 (shear force and overturning moment)

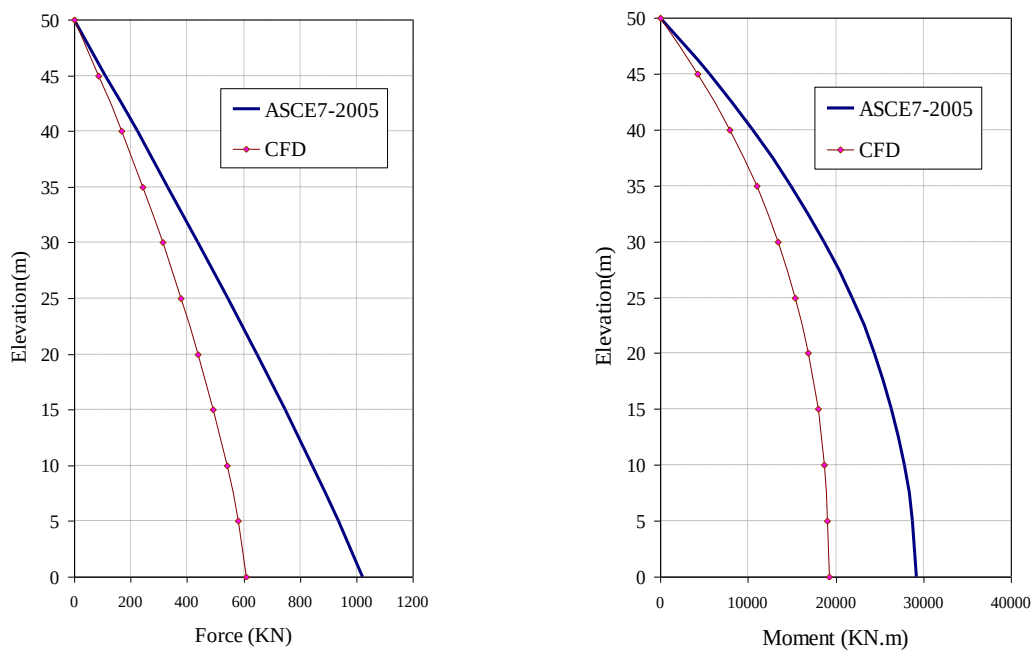


Fig.A.3. Case No. A\_1\_1\_50\_T2 (shear force and overturning moment)

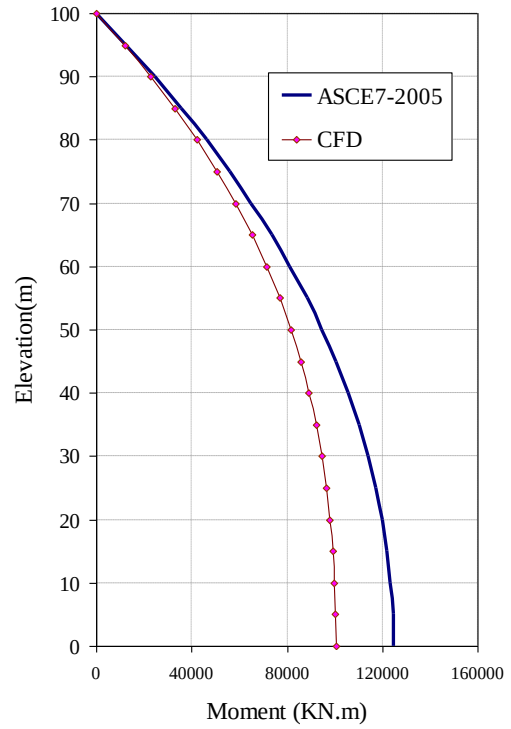
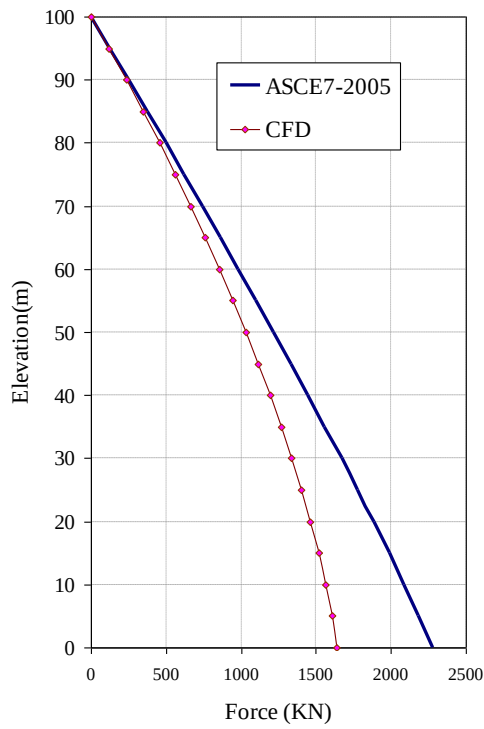


Fig.A.4. Case No. A\_1\_1\_100\_T1 (shear force and overturning moment)

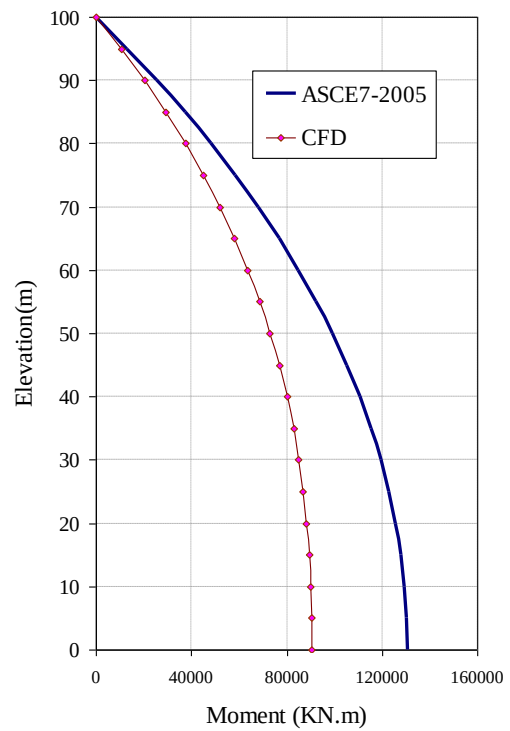
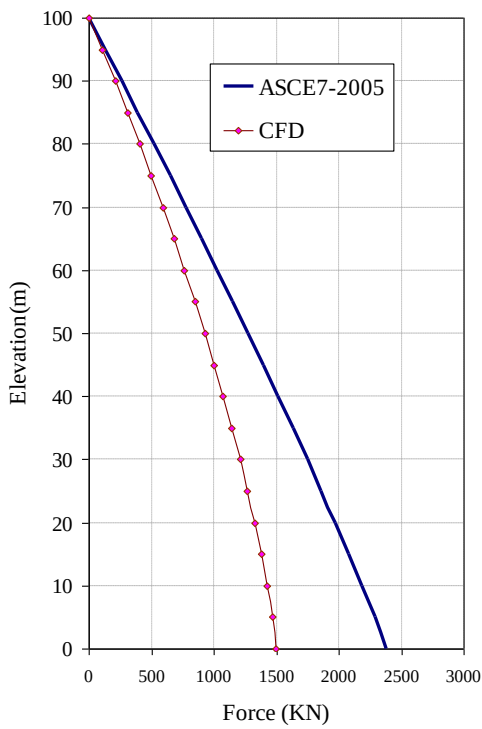


Fig.A.5. Case No. A\_1\_1\_100\_T2 (shear force and overturning moment)

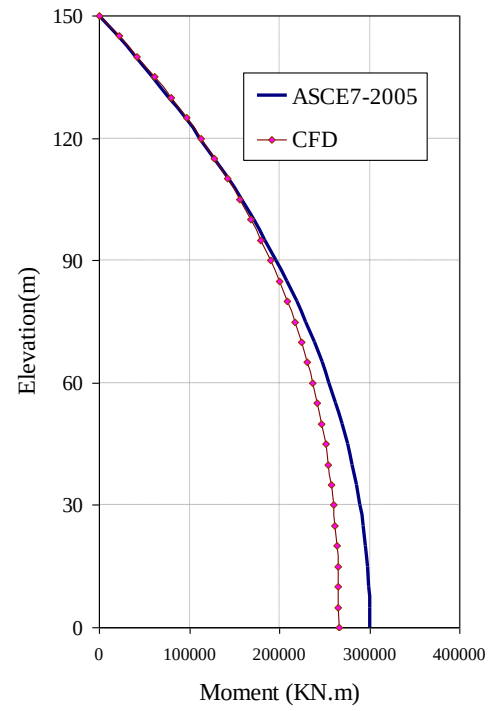
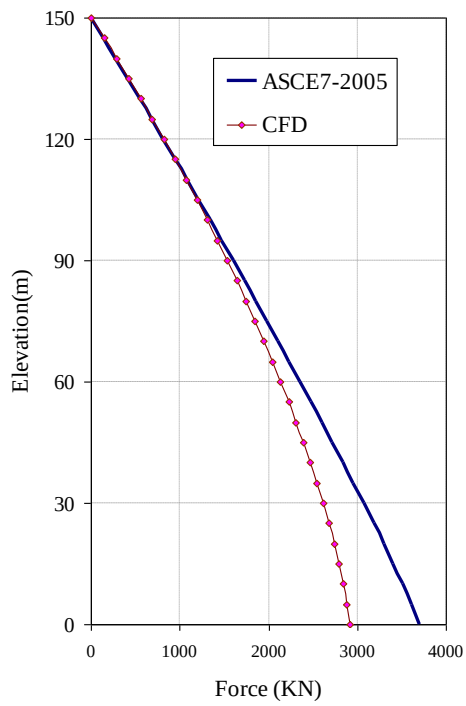


Fig.A.6. Case No. A\_1\_1\_150\_T1 (shear force and overturning moment)

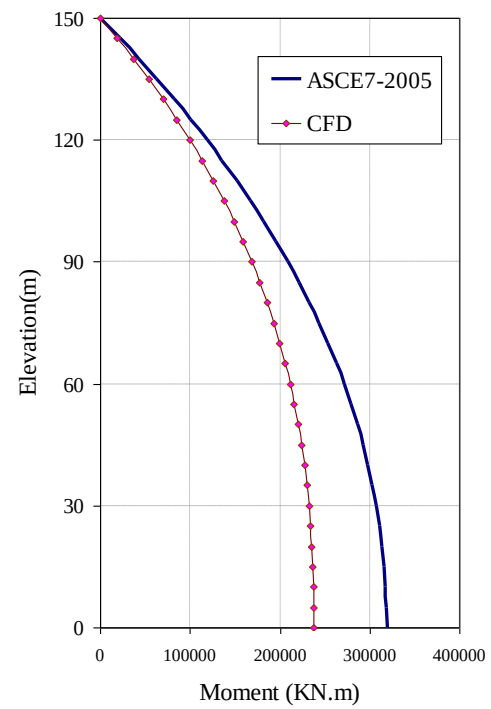
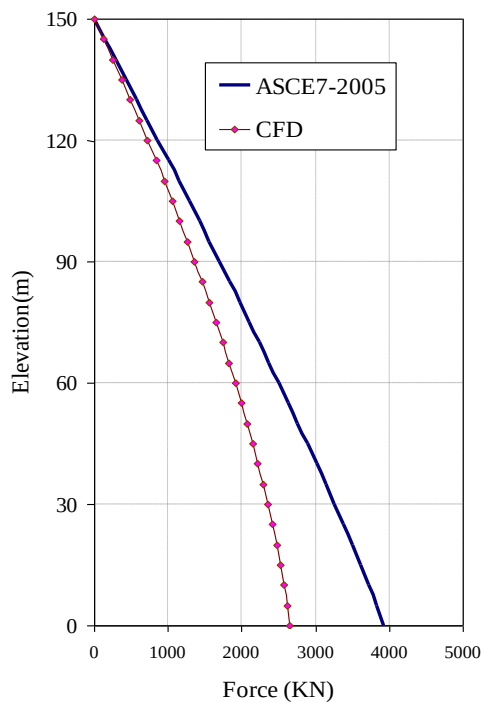


Fig.A.7. Case No. A\_1\_1\_150\_T2 (shear force and overturning moment)

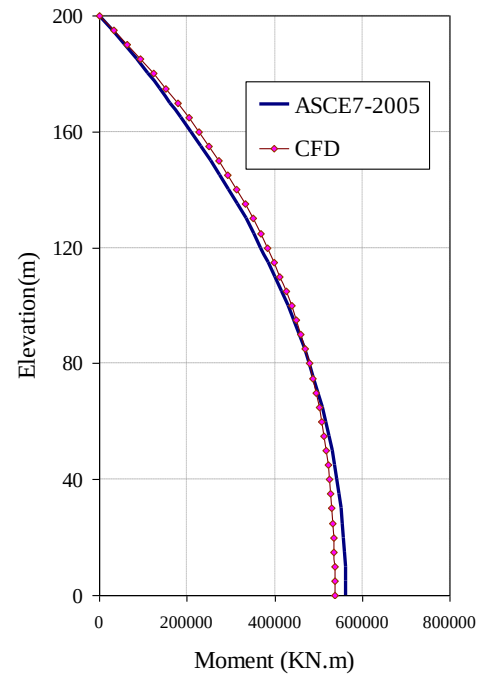
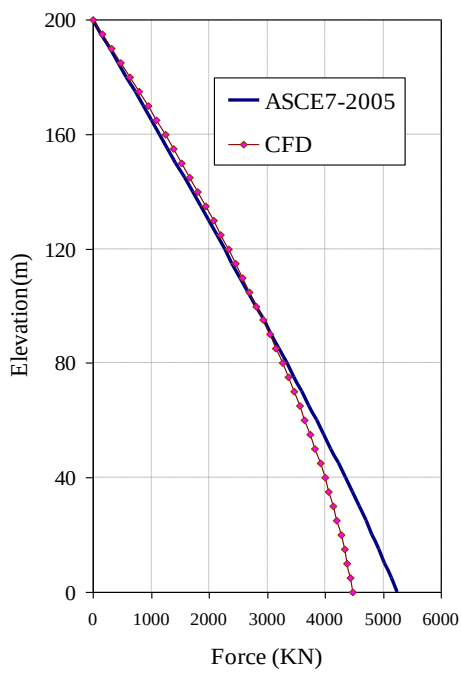


Fig.A.8. Case No. A\_1\_1\_200\_T1 (shear force and overturning moment)

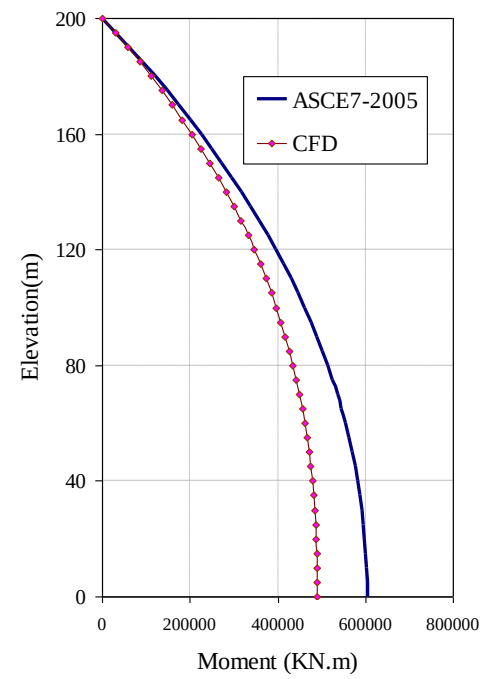
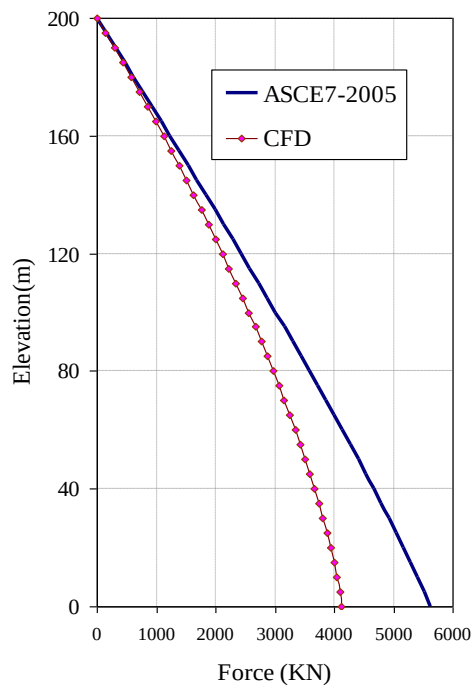


Fig.A.9. Case No. A\_1\_1\_200\_T2 (shear force and overturning moment)

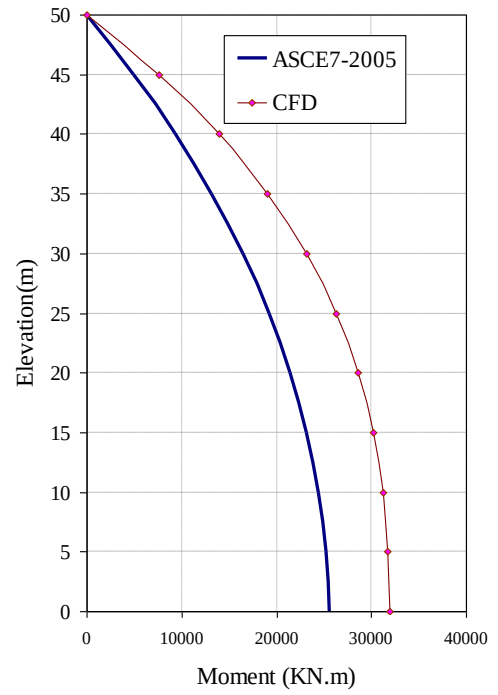
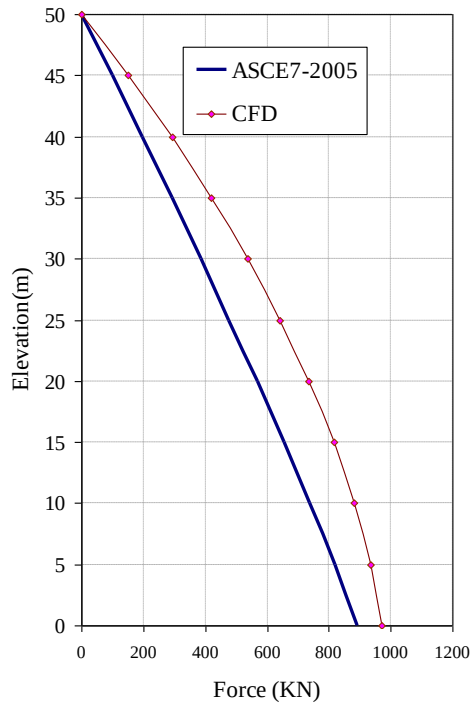


Fig.A.10. Case No. A\_1\_1.5\_50\_T1 (shear force and overturning moment)

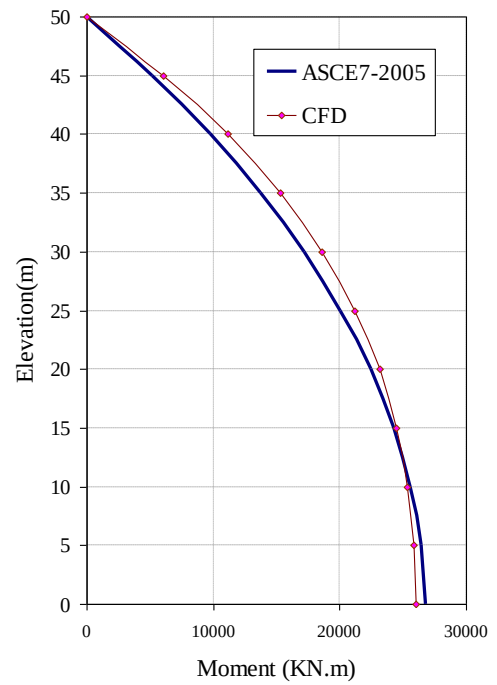
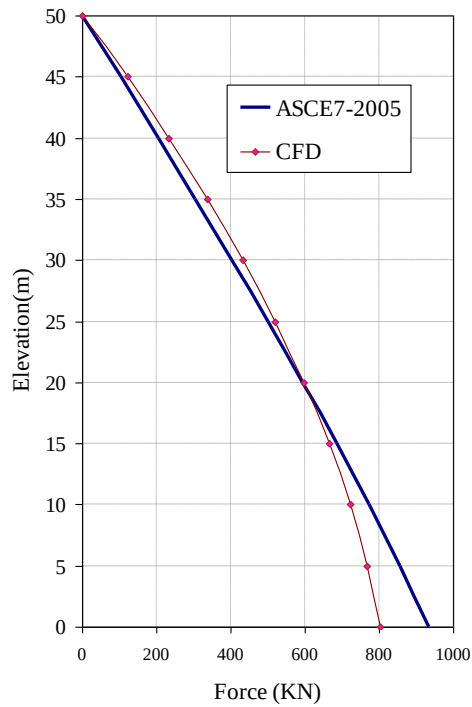


Fig.A.11. Case No. A\_1\_1.5\_50\_T2 (shear force and overturning moment)

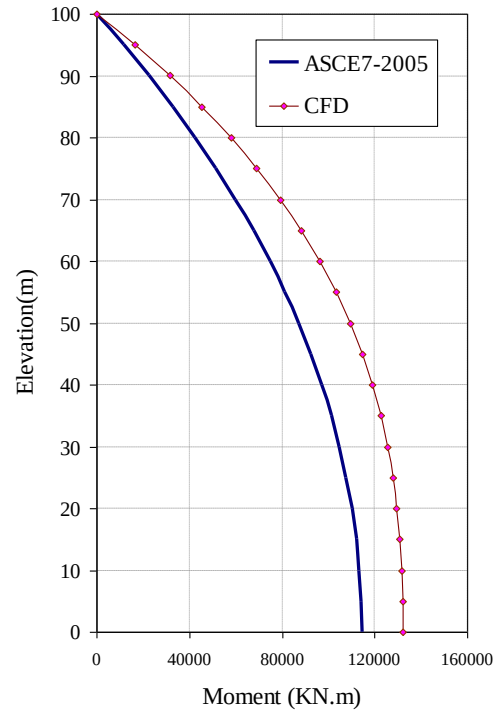
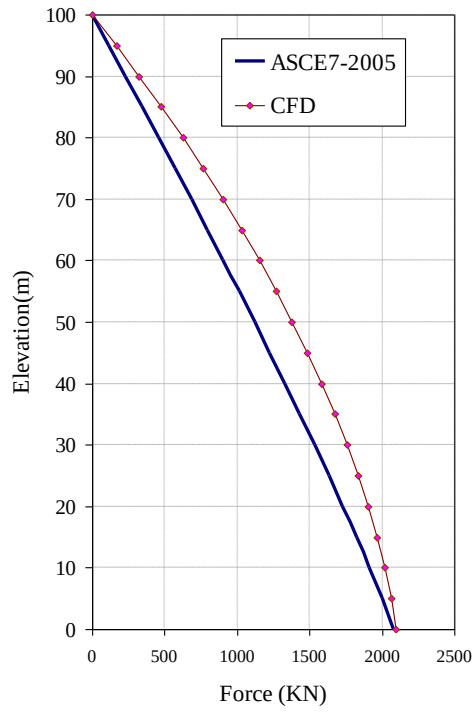


Fig.A.12. Case No. A\_1\_1.5\_100\_T1 (shear force and overturning moment)

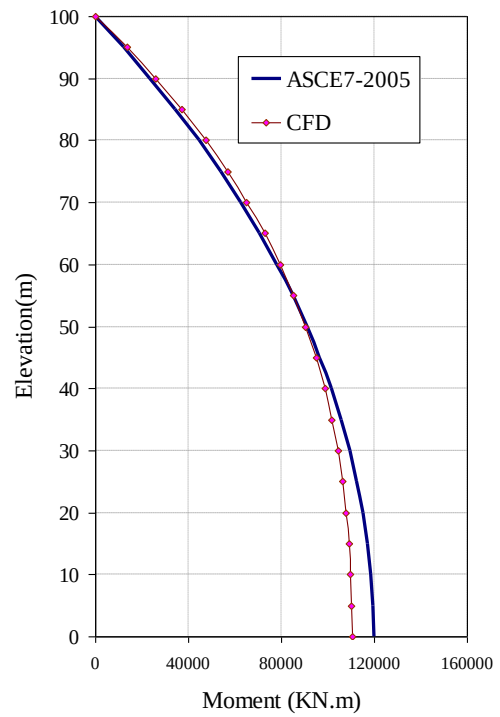
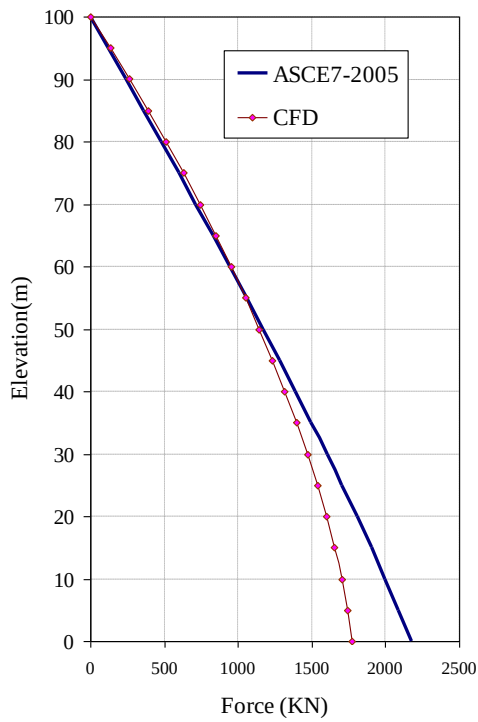


Fig.A.13. Case No. A\_1\_1.5\_100\_T2 (shear force and overturning moment)



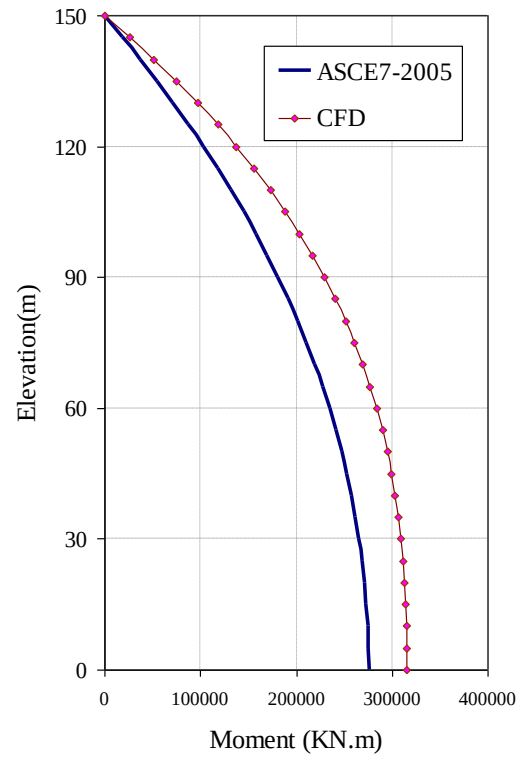
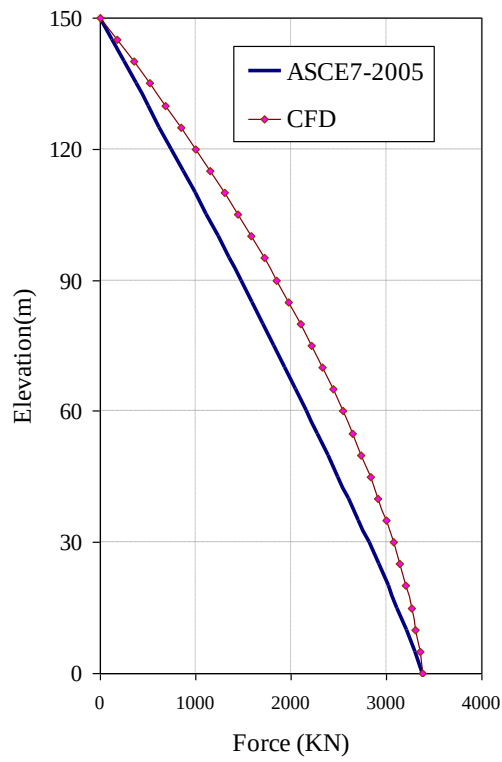


Fig.A.14. Case No. A\_1\_1.5\_150\_T1 (shear force and overturning moment)

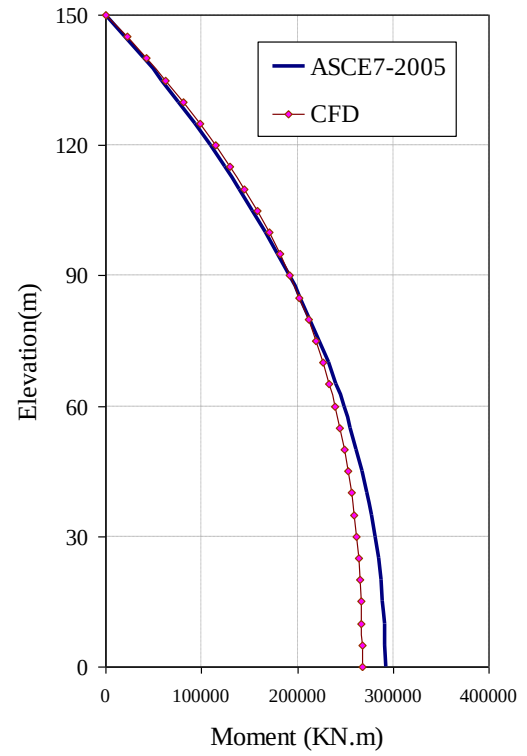
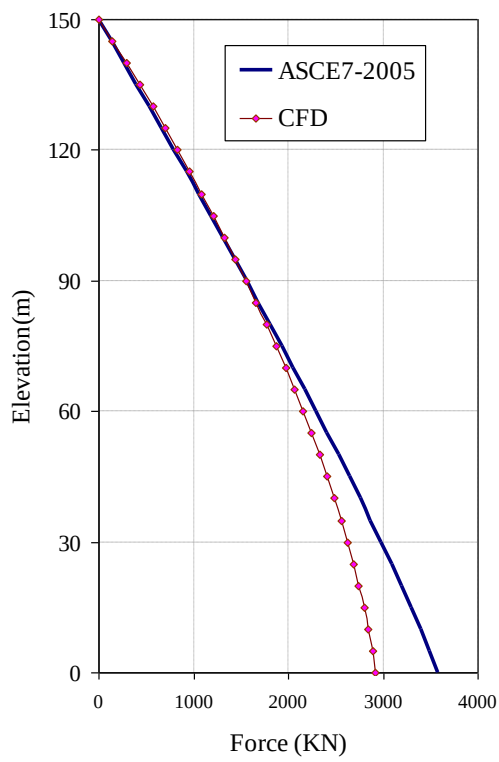


Fig.A.15. Case No. A\_1\_1.5\_150\_T2 (shear force and overturning moment)

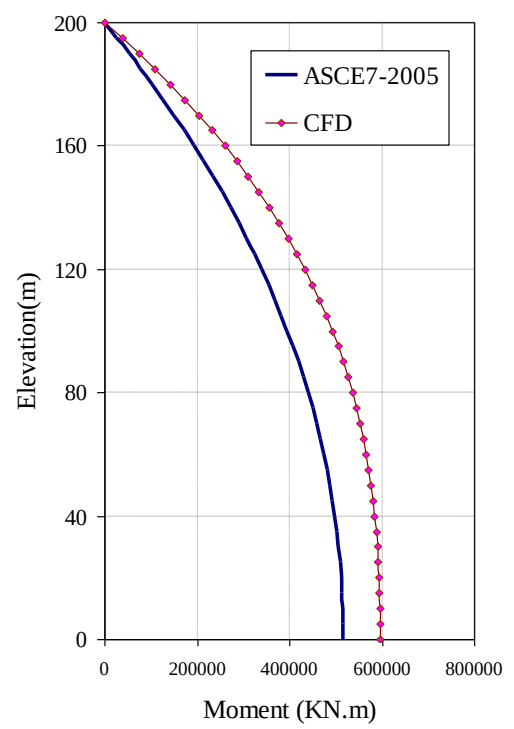
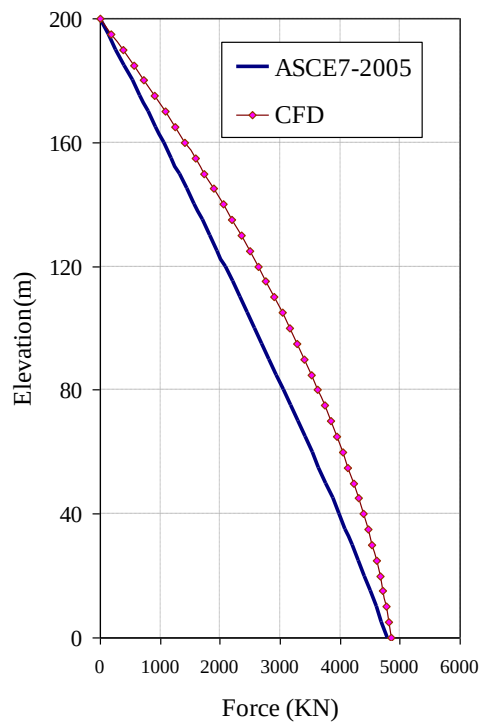


Fig.A.16. Case No. A\_1\_1.5\_200\_T1 (shear force and overturning moment)

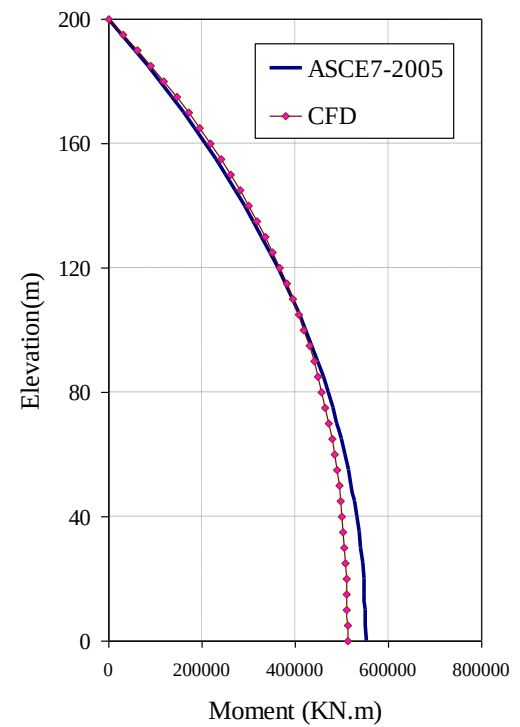
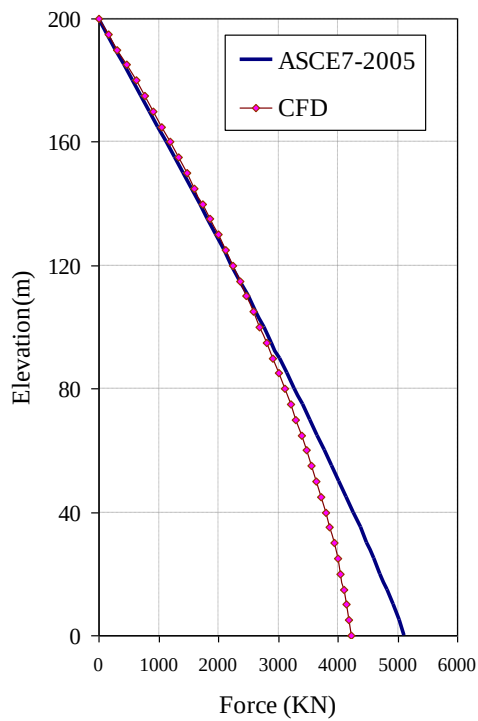


Fig.A.17. Case No. A\_1\_1.5\_200\_T2 (shear force and overturning moment)

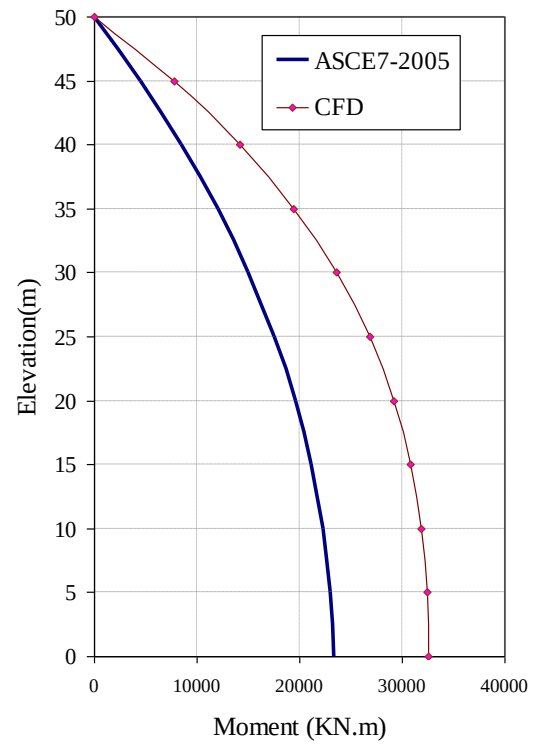
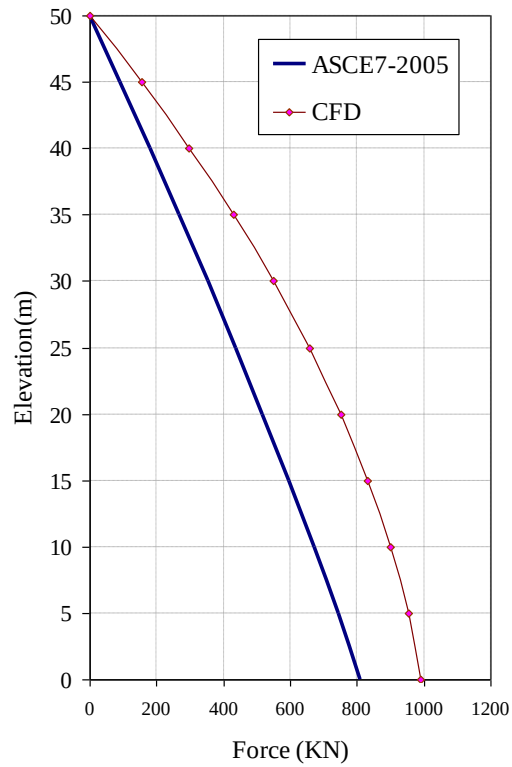


Fig.A.18. Case No. A\_1\_2\_50\_T1 (shear force and overturning moment)

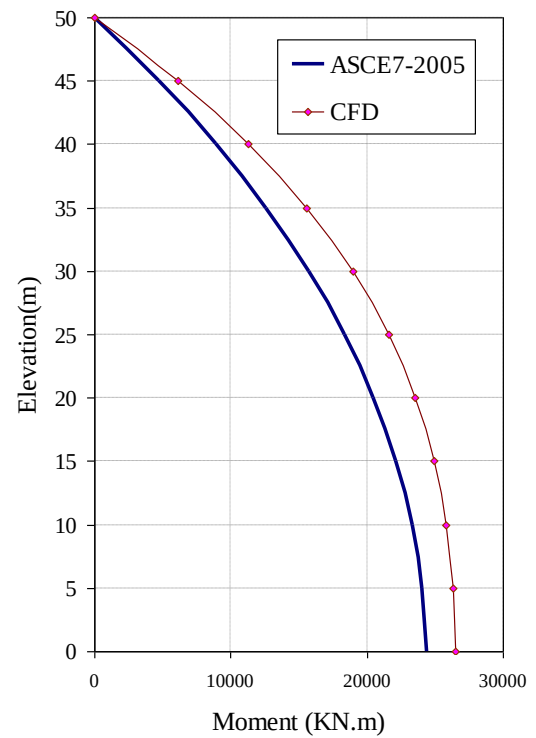
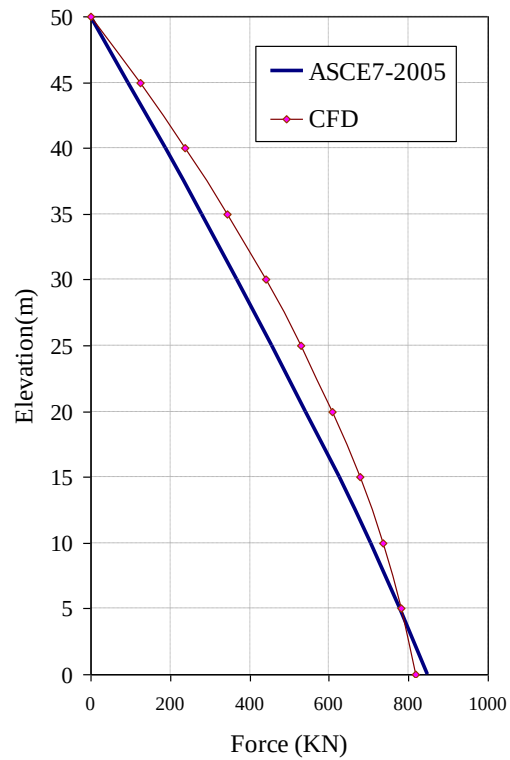


Fig.A.19. Case No. A\_1\_2\_50\_T2 (shear force and overturning moment)

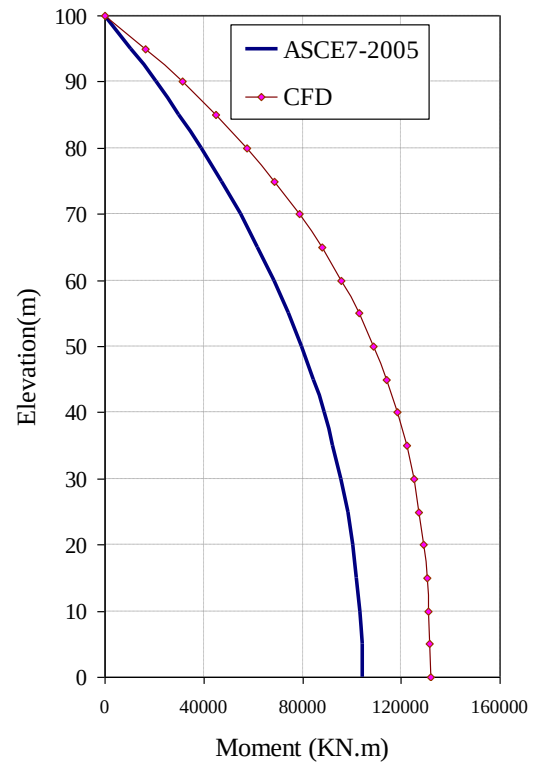
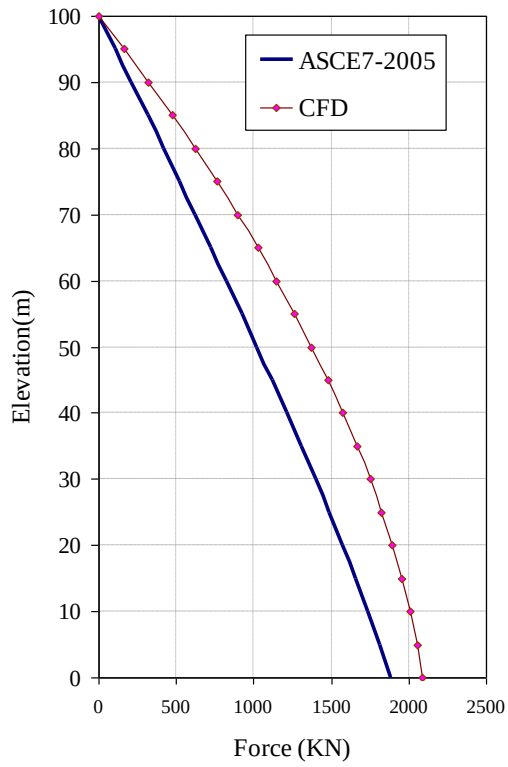


Fig.A.20. Case No. A\_1\_2\_100\_T1 (shear force and overturning moment)

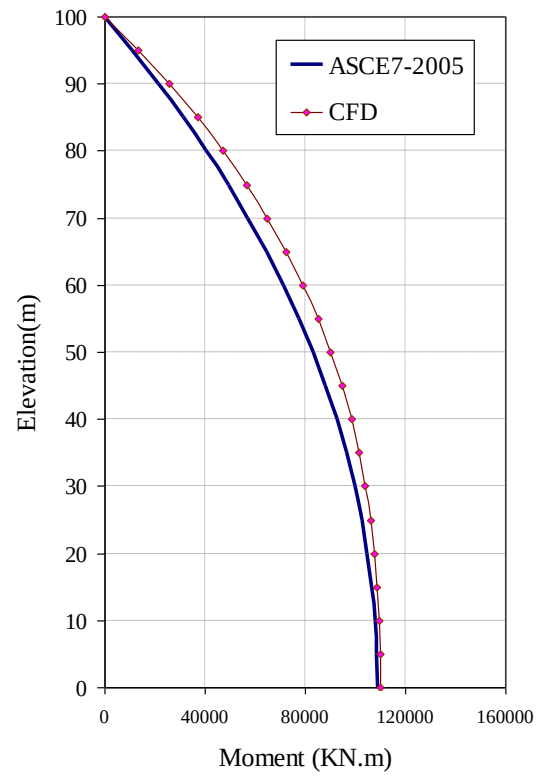
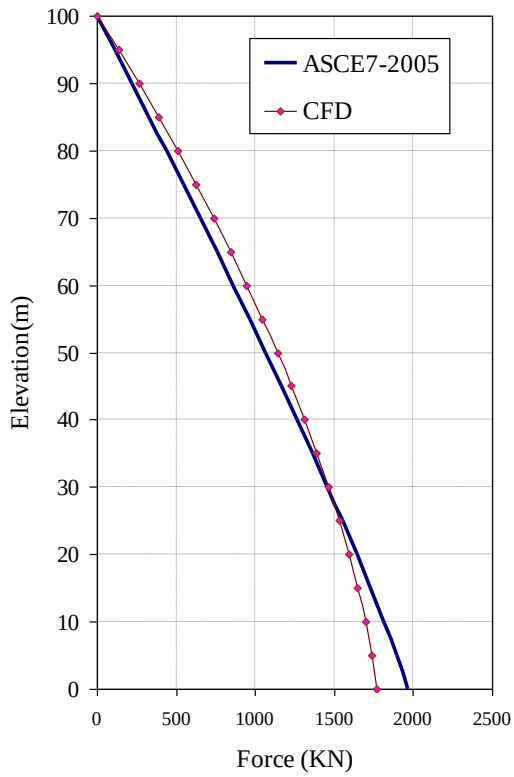


Fig.A.21. Case No. A\_1\_2\_100\_T2 (shear force and overturning moment)

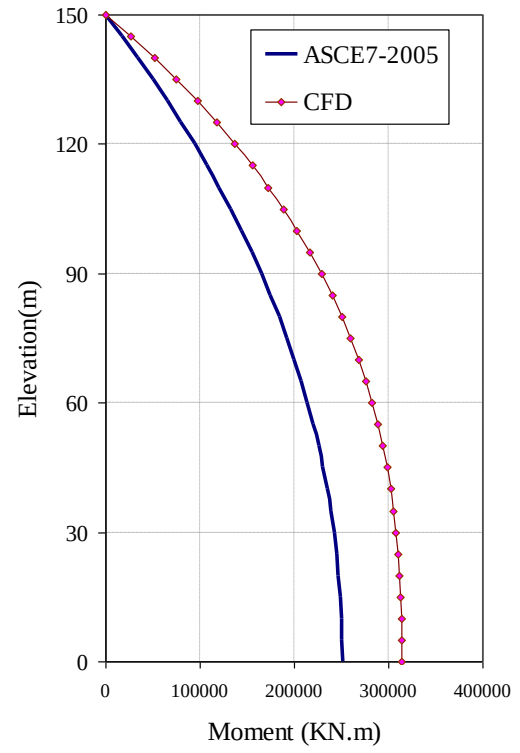
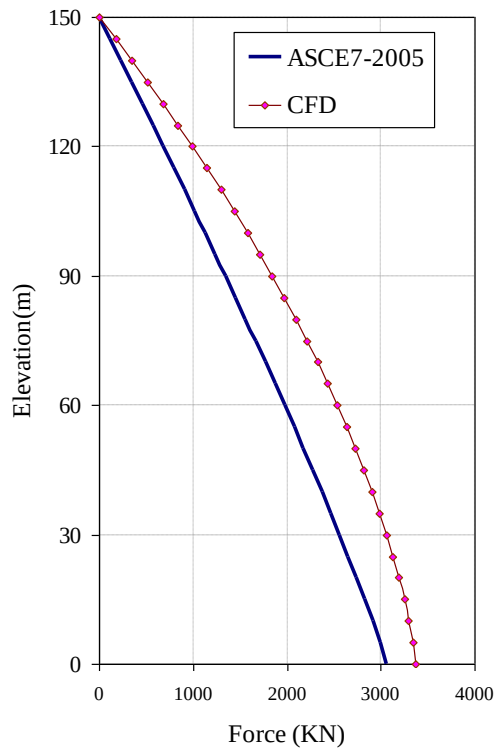


Fig.A.22. Case No. A\_1\_2\_150\_T1 (shear force and overturning moment)

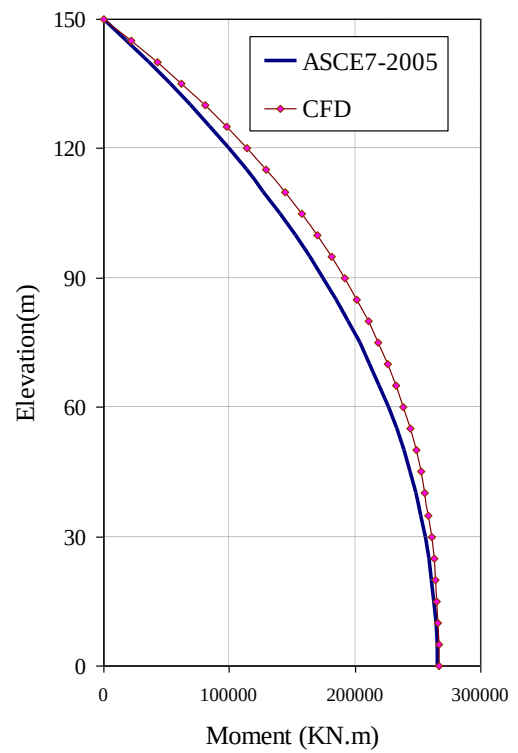
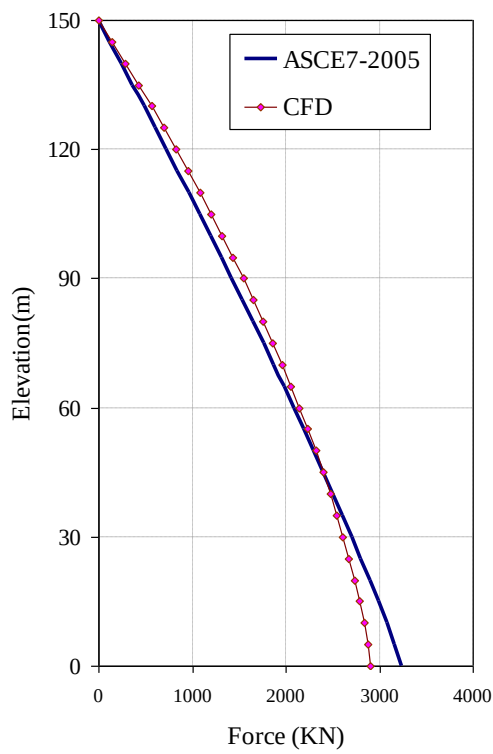


Fig.A.23. Case No. A\_1\_2\_150\_T2 (shear force and overturning moment)

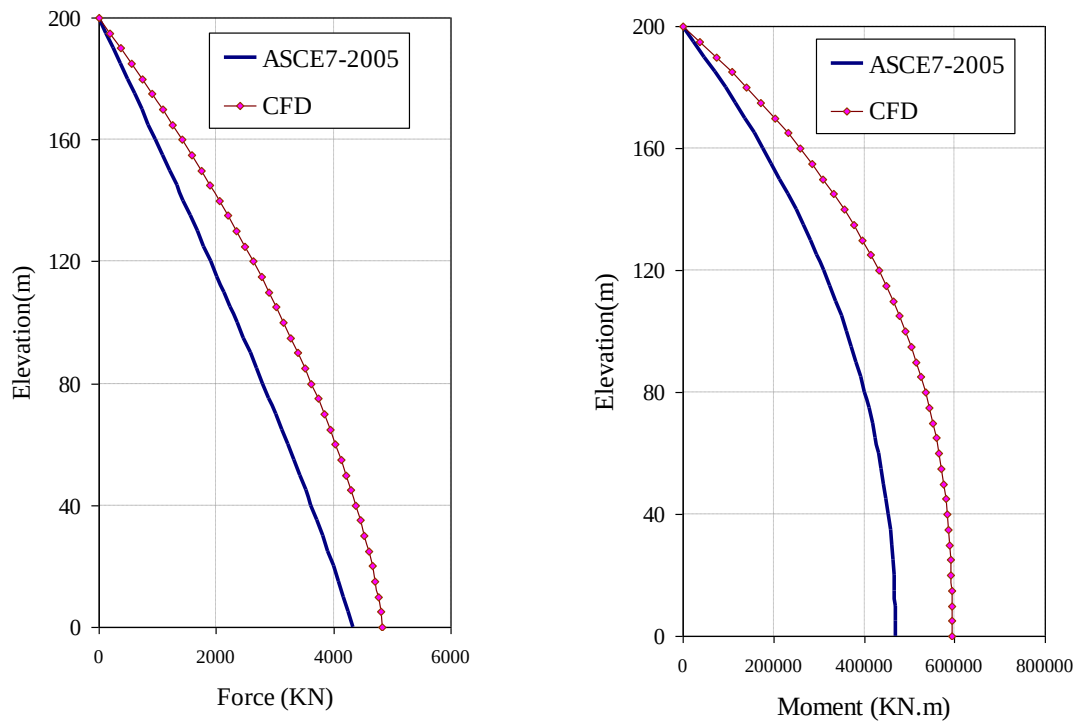


Fig.A.24. Case No. A\_1\_2\_200\_T1 (shear force and overturning moment)

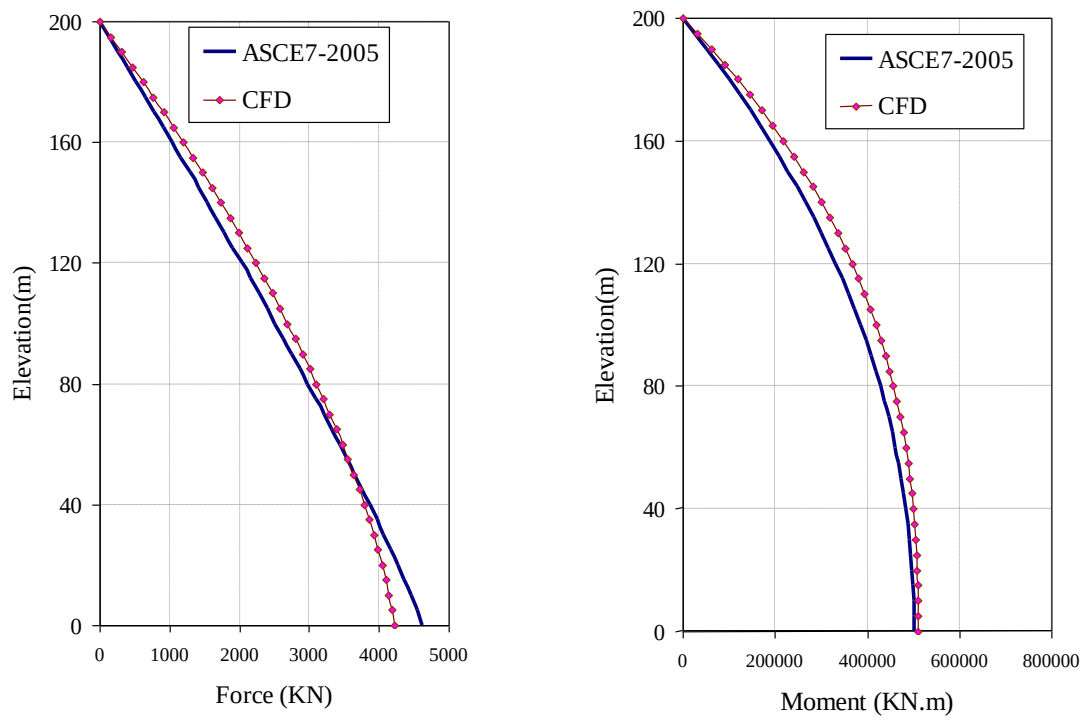


Fig.A.25. Case No. A\_1\_2\_200\_T2 (shear force and overturning moment)

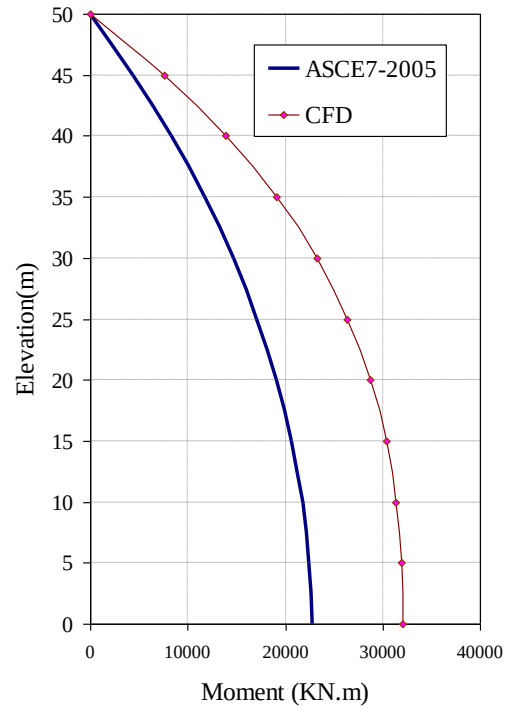
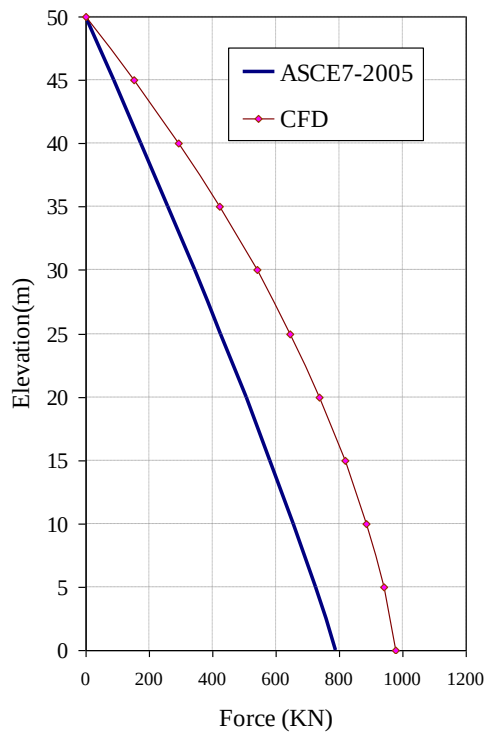


Fig.A.26. Case No. A\_1\_2.5\_50\_T1 (shear force and overturning moment)

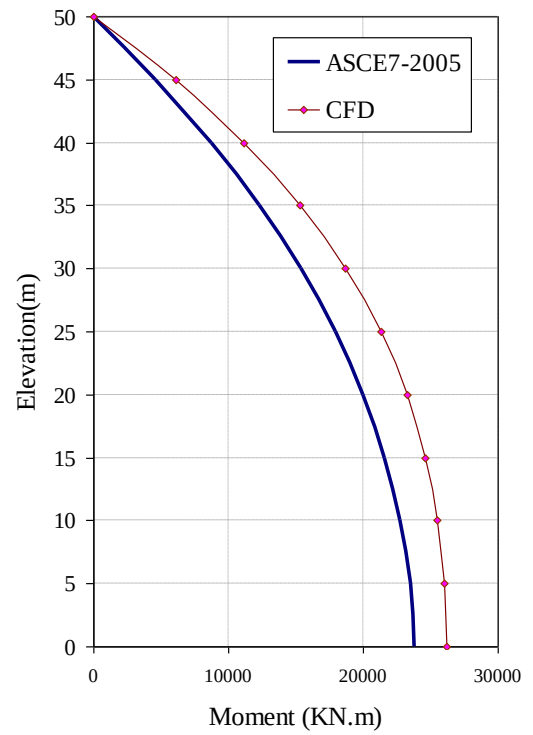
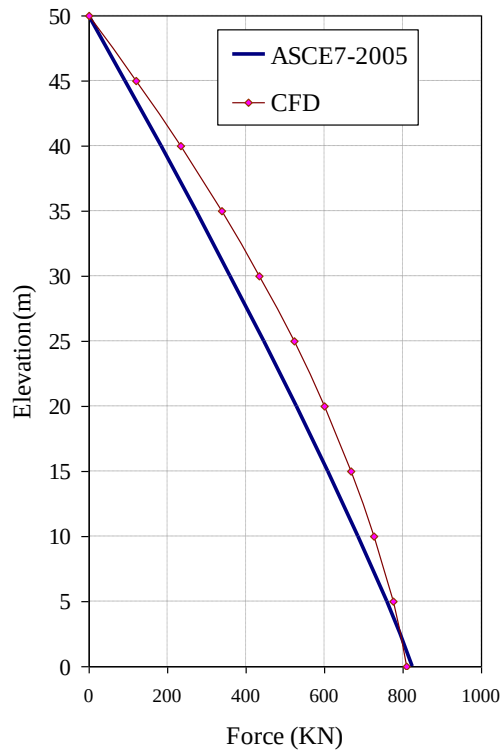


Fig.A.27. Case No. A\_1\_2.5\_50\_T2 (shear force and overturning moment)

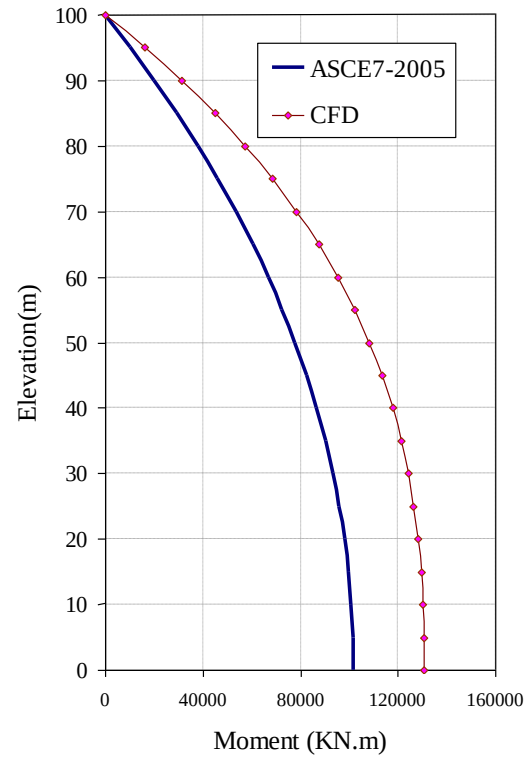
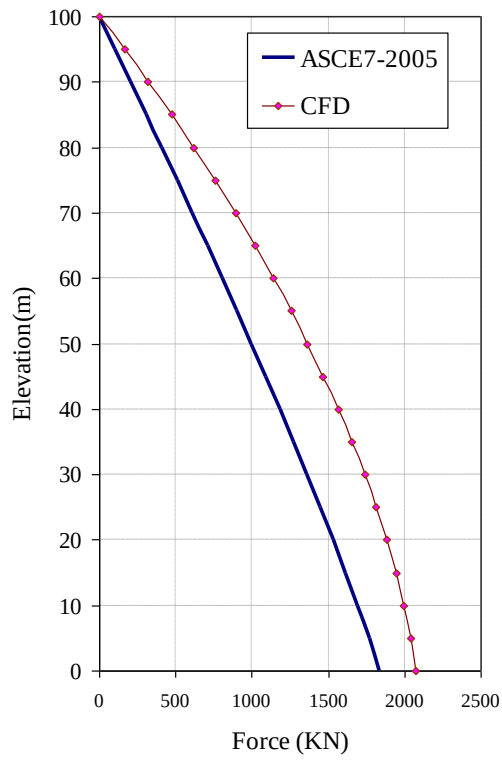


Fig.A.28. Case No. A\_1\_2.5\_100\_T1 (shear force and overturning moment)

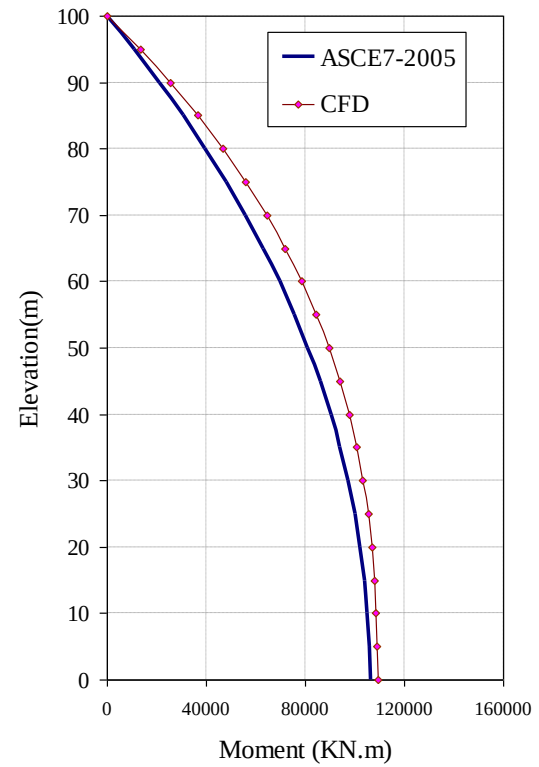
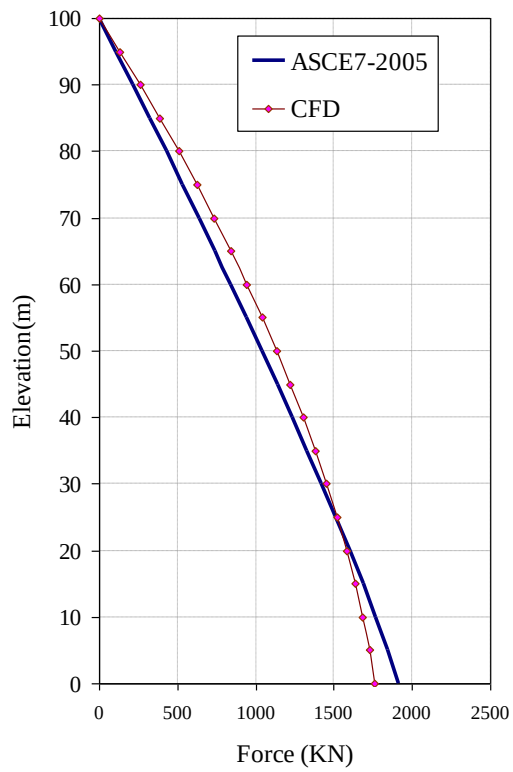


Fig.A.29. Case No. A\_1\_2.5\_100\_T2 (shear force and overturning moment)



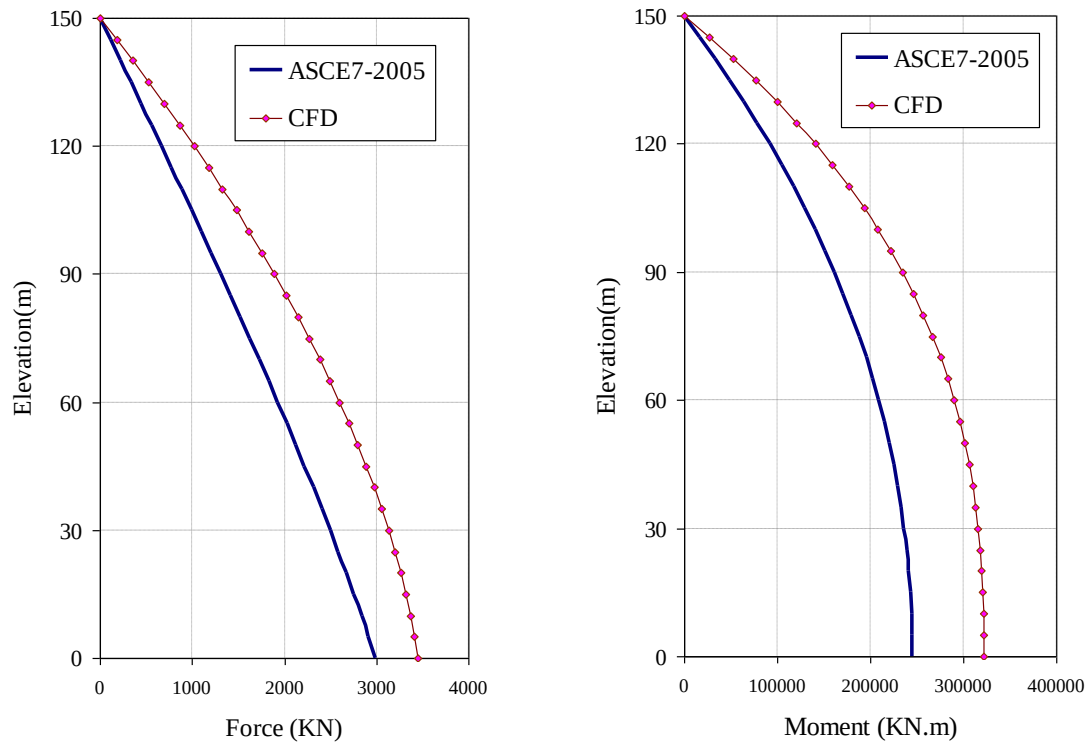


Fig.A.30. Case No. A\_1\_2.5\_150\_T1 (shear force and overturning moment)

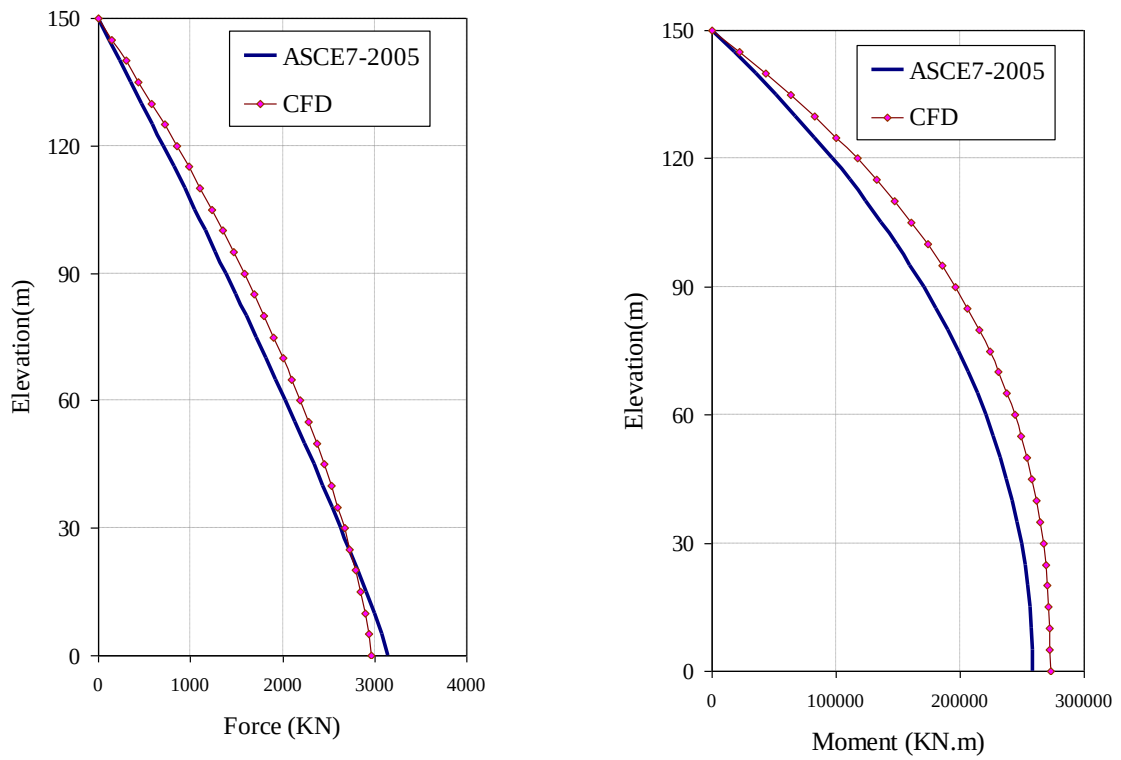


Fig.A.31. Case No. A\_1\_2.5\_150\_T2 (shear force and overturning moment)

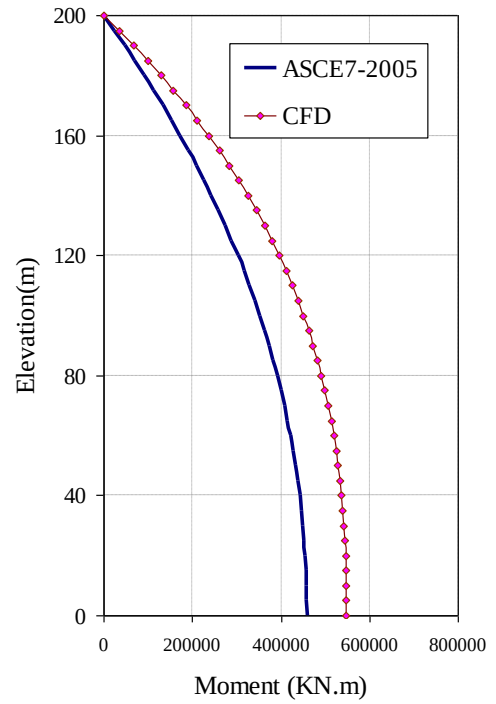
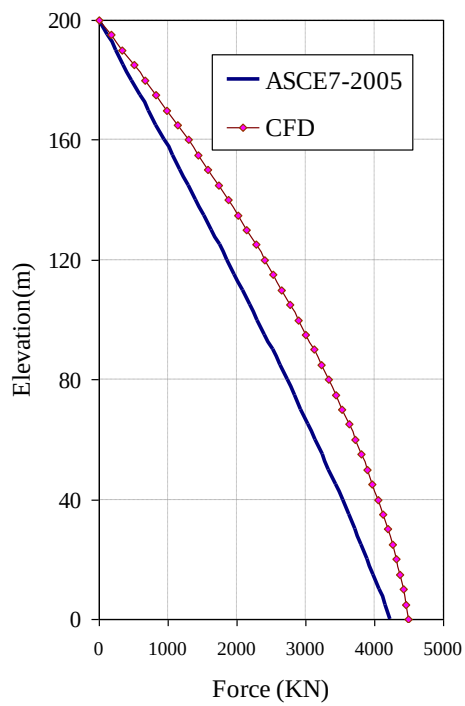


Fig.A.32. Case No. A\_1\_2.5\_200\_T1 (shear force and overturning moment)

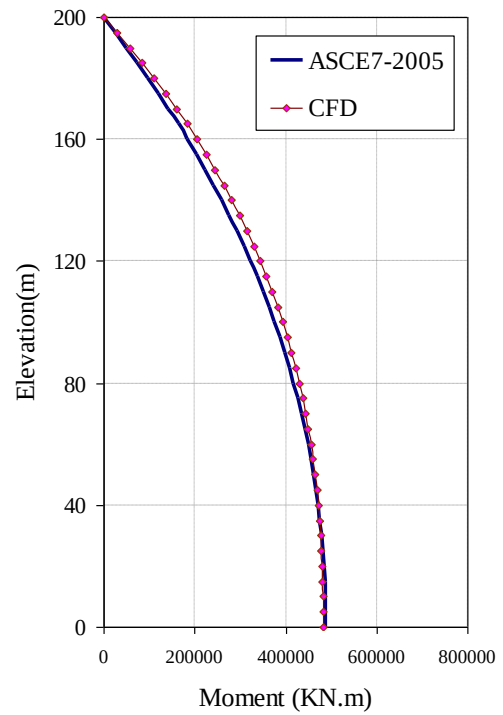
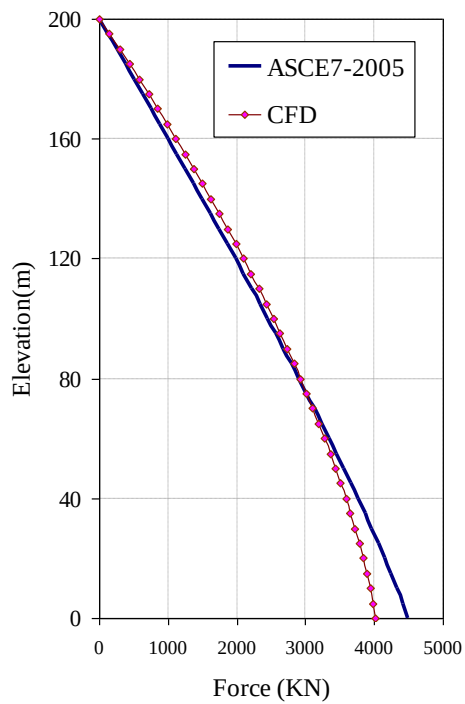


Fig.A.33. Case No. A\_1\_2.5\_200\_T2 (shear force and overturning moment)

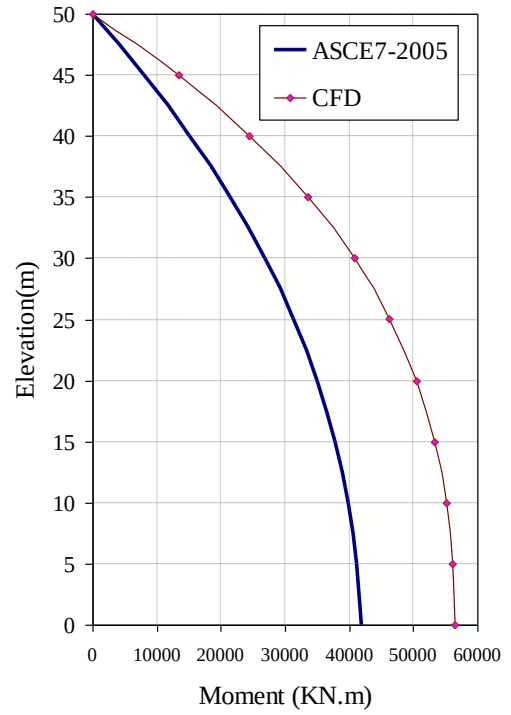
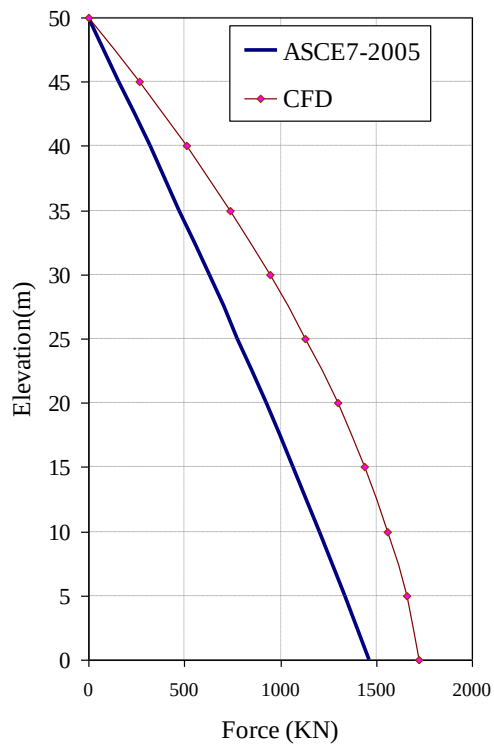


Fig.A.34. Case No. A\_1.5\_1\_50\_T1 (shear force and overturning moment)

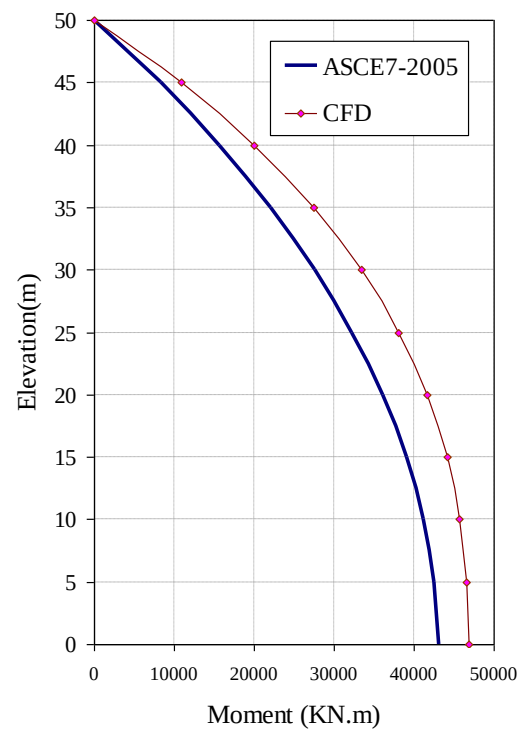
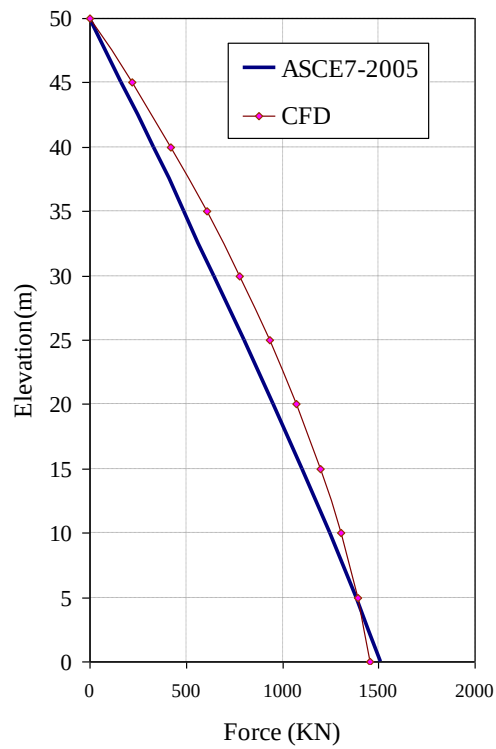


Fig.A.35. Case No. A\_1.5\_1\_50\_T2 (shear force and overturning moment)

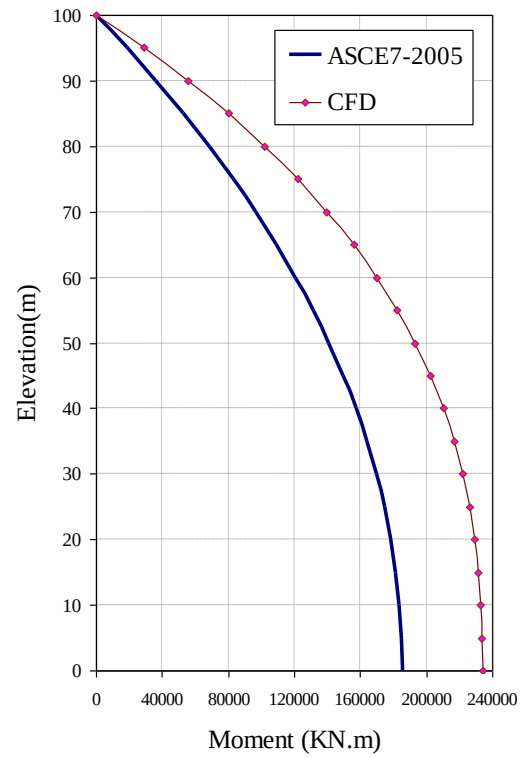
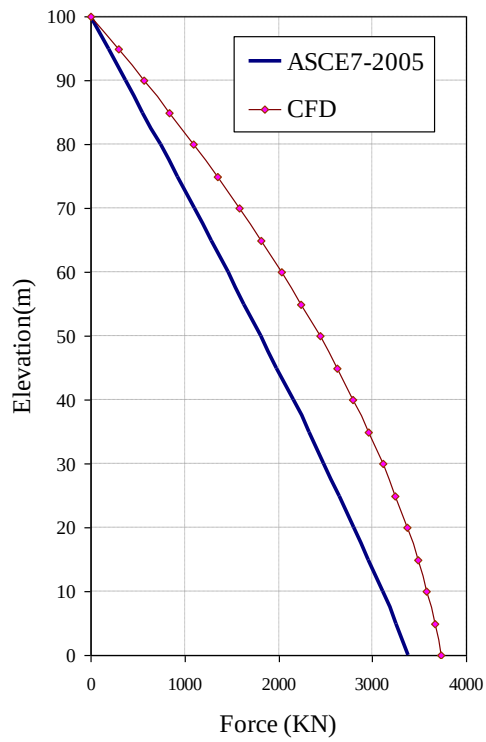


Fig.A.36. Case No. A\_1.5\_1\_100\_T1 (shear force and overturning moment)

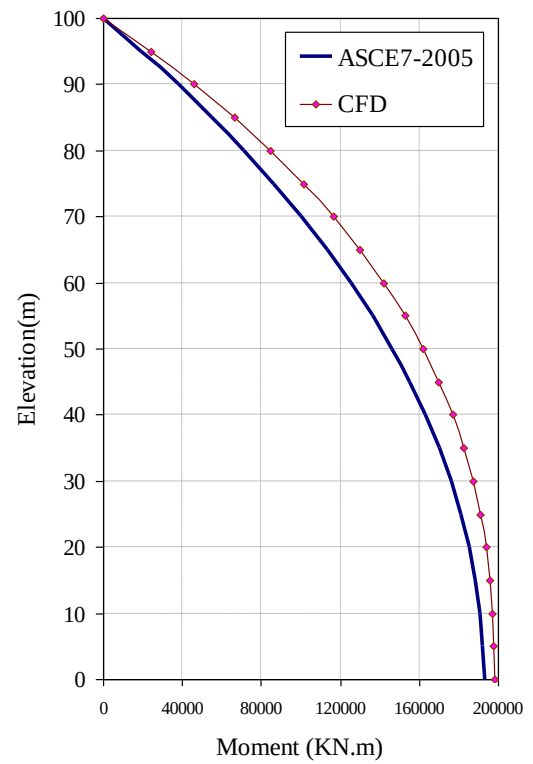
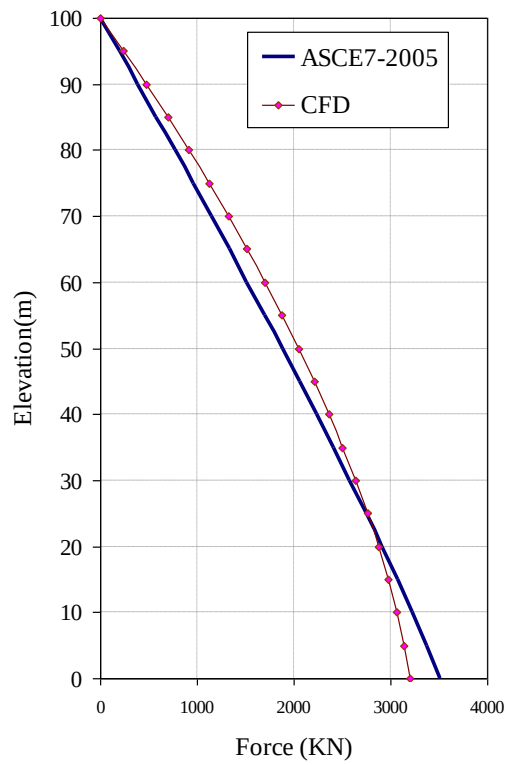


Fig.A.37. Case No. A\_1.5\_1\_100\_T2 (shear force and overturning moment)

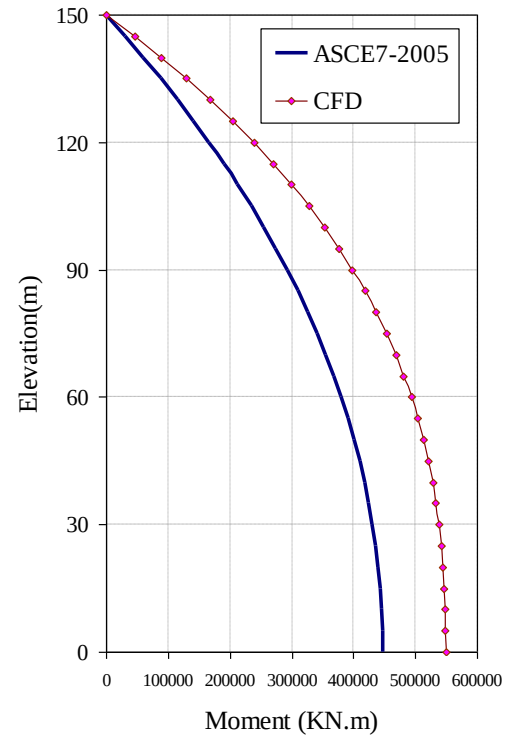
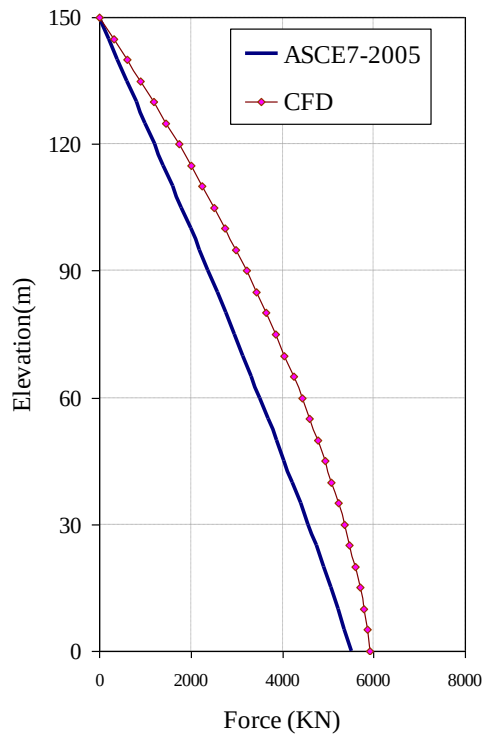


Fig.A.38. Case No. A\_1.5\_1\_150\_T1 (shear force and overturning moment)

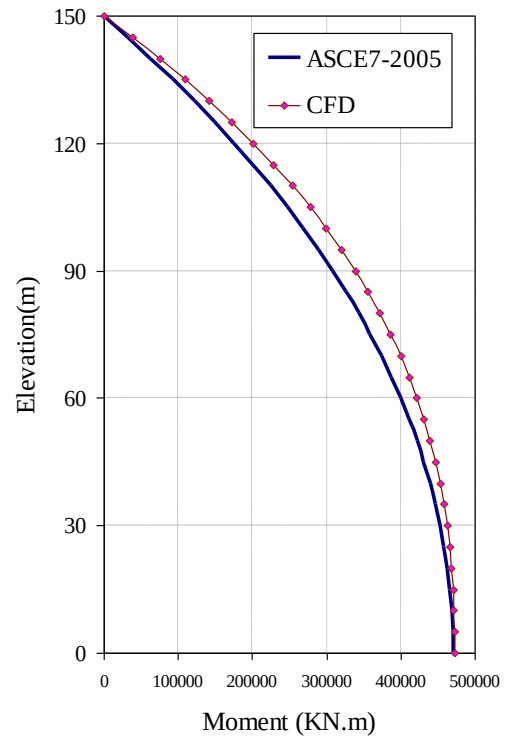
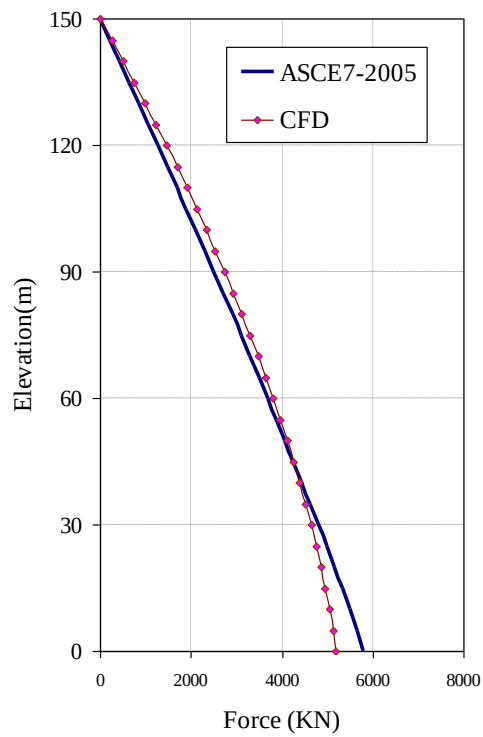


Fig.A.39. Case No. A\_1.5\_1\_150\_T2 (shear force and overturning moment)

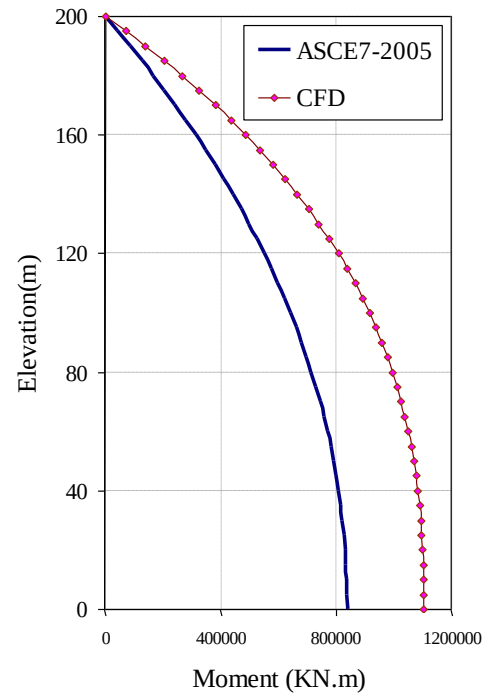
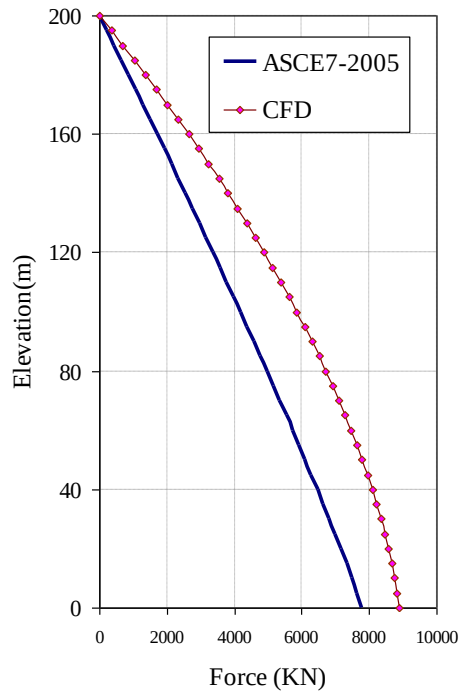


Fig.A.40. Case No. A\_1.5\_1\_200\_T1 (shear force and overturning moment)

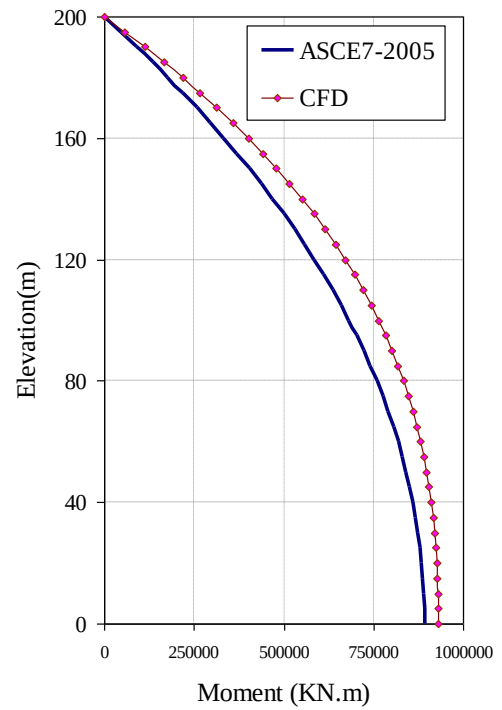
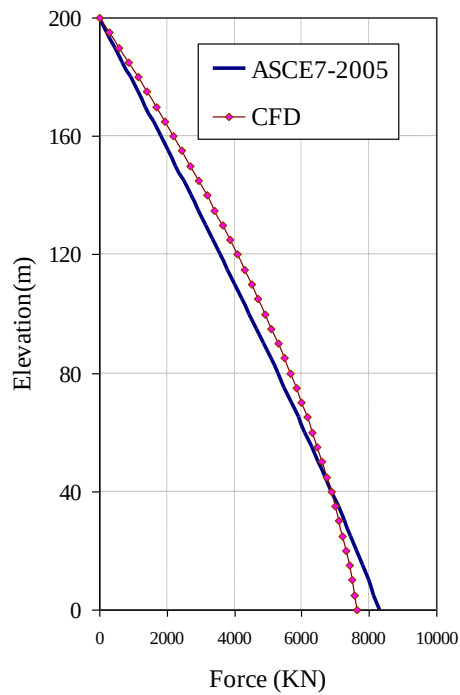


Fig.A.41. Case No. A\_1.5\_1\_200\_T2 (shear force and overturning moment)

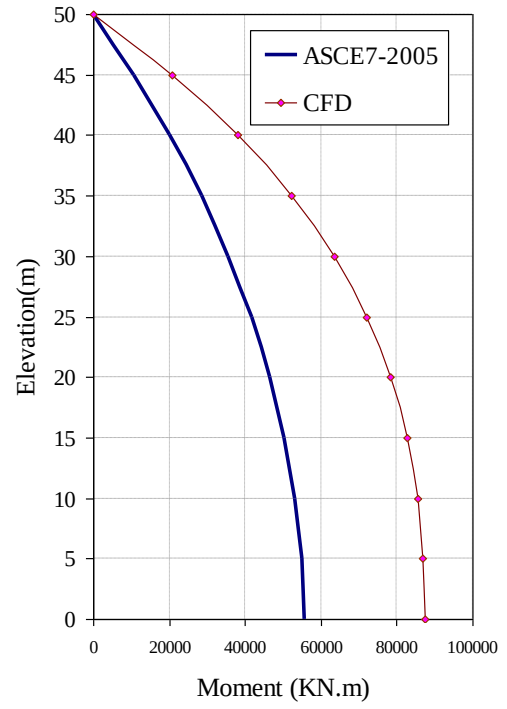
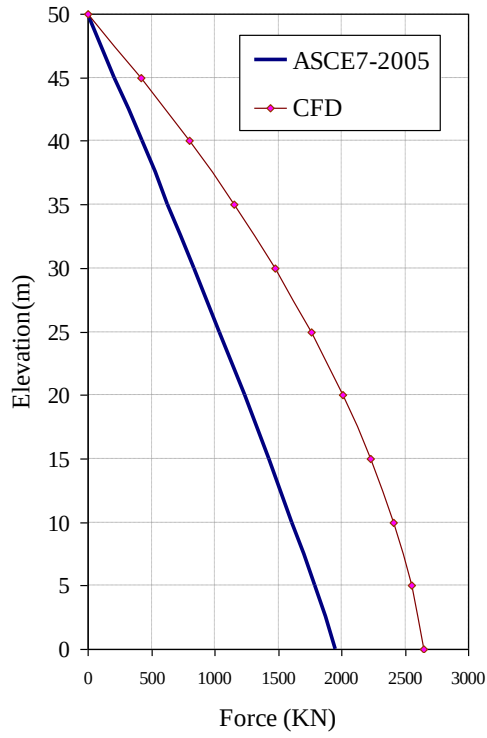


Fig.A.42. Case No. A\_2\_1\_50\_T1 (shear force and overturning moment)

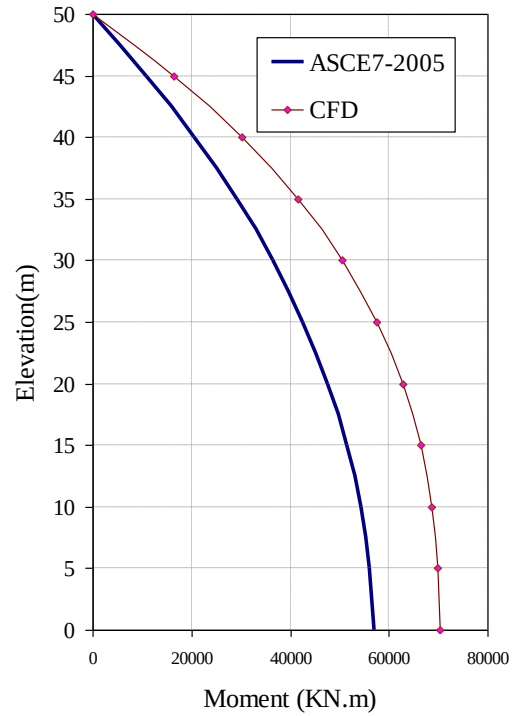
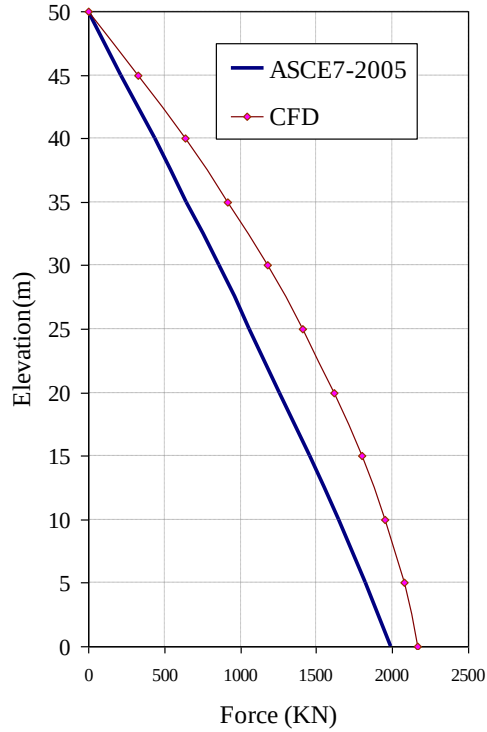


Fig.A.43. Case No. A\_2\_1\_50\_T2 (shear force and overturning moment)

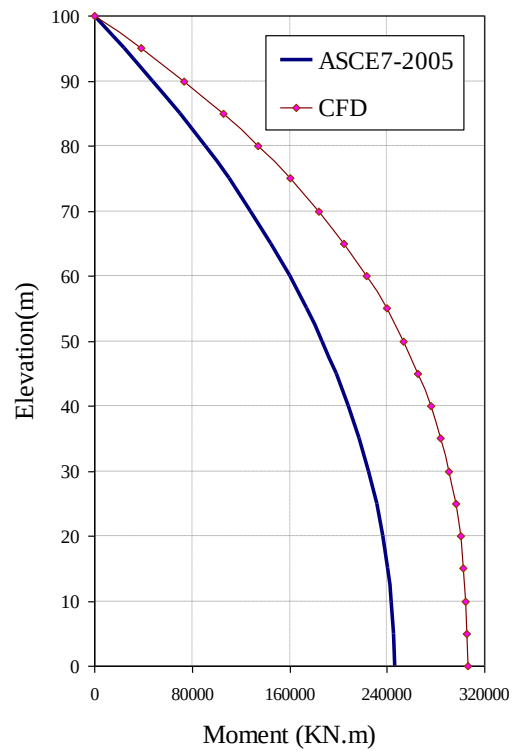
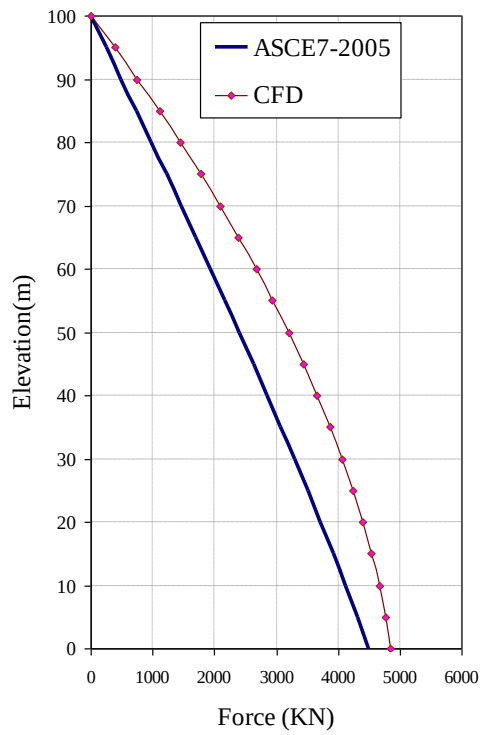


Fig.A.44. Case No. A\_2\_1\_100\_T1 (shear force and overturning moment)

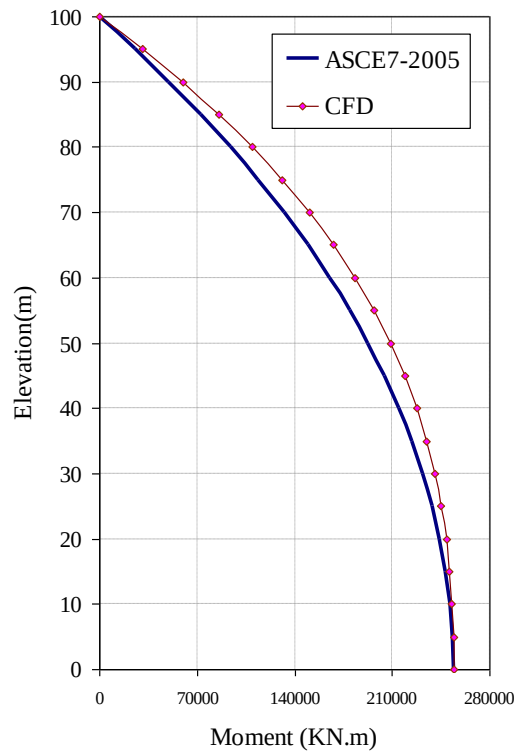
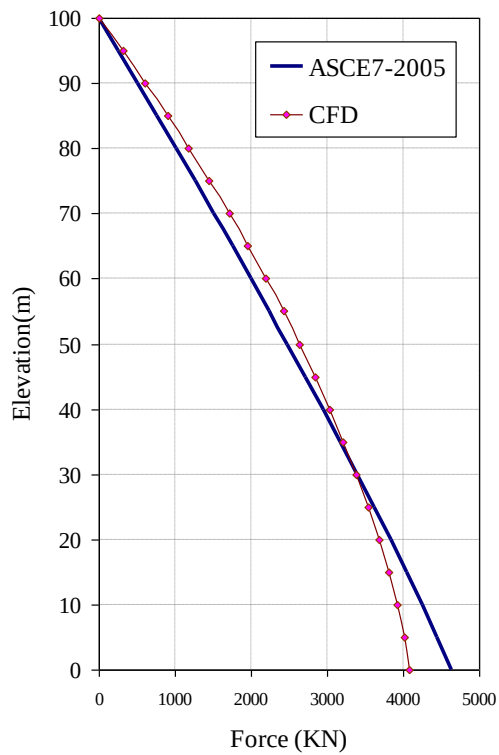


Fig.A.45. Case No. A\_2\_1\_100\_T2 (shear force and overturning moment)



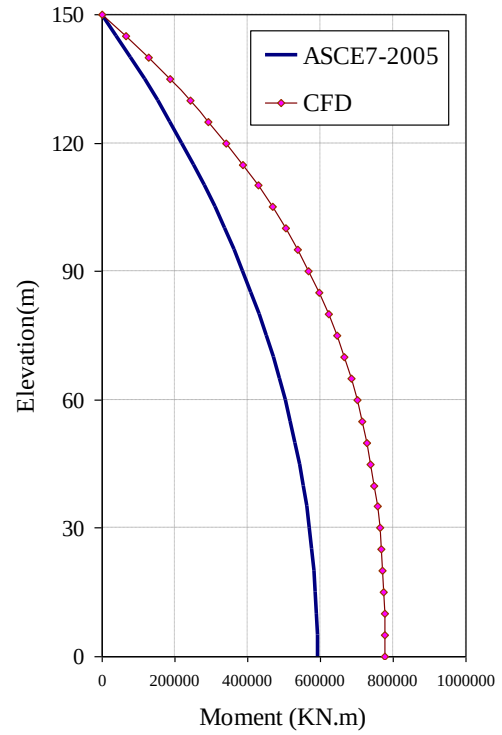
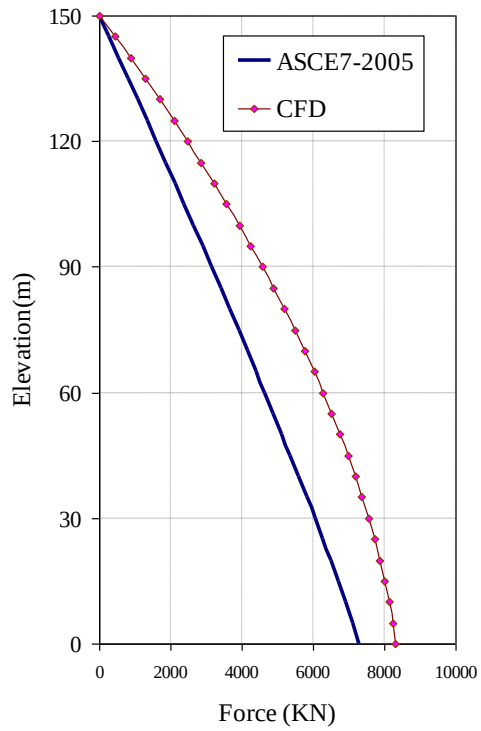


Fig.A.46. Case No. A\_2\_1\_150\_T1 (shear force and overturning moment)

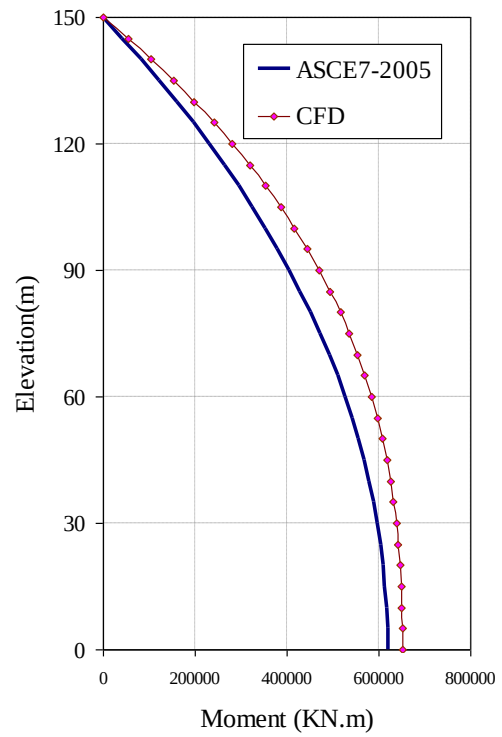
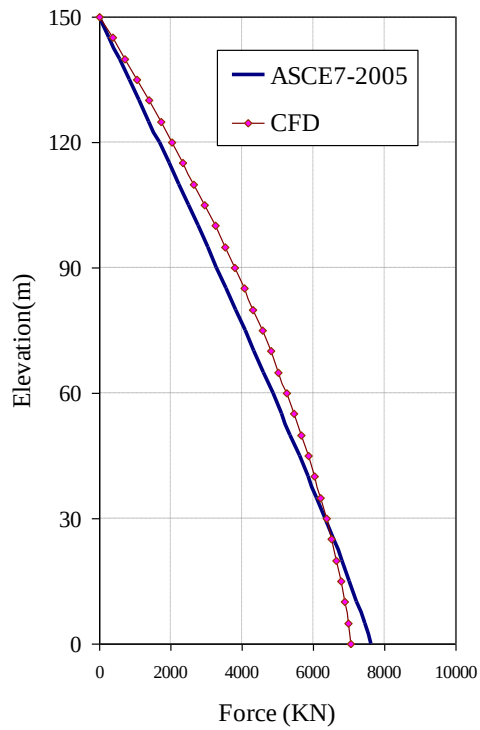


Fig.A.47. Case No. A\_2\_1\_150\_T2 (shear force and overturning moment)

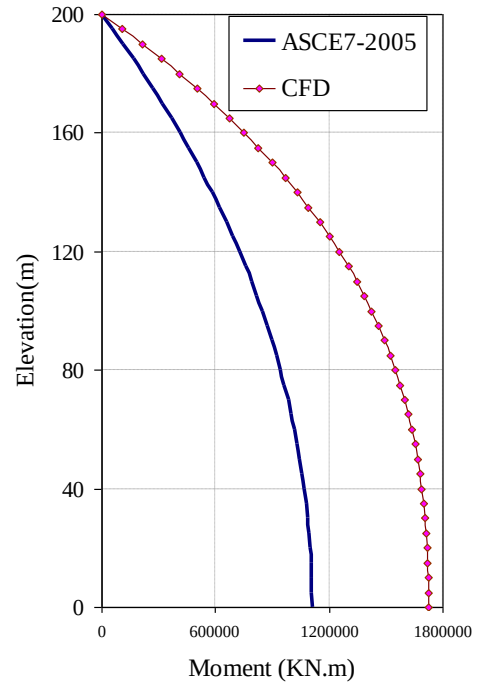
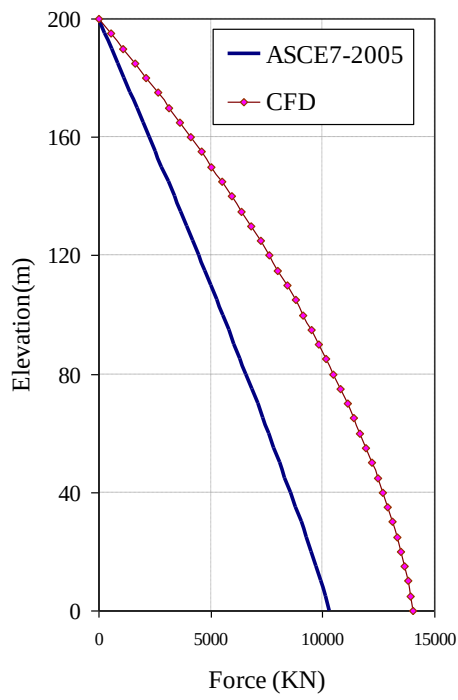


Fig.A.48. Case No. A\_2\_1\_200\_T1 (shear force and overturning moment)

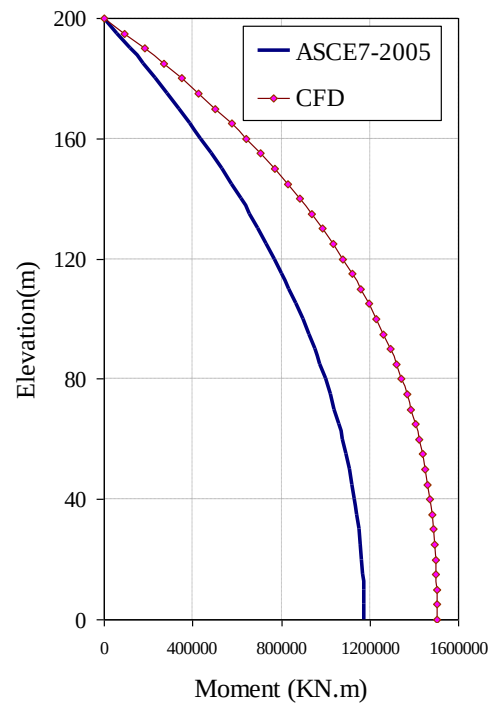
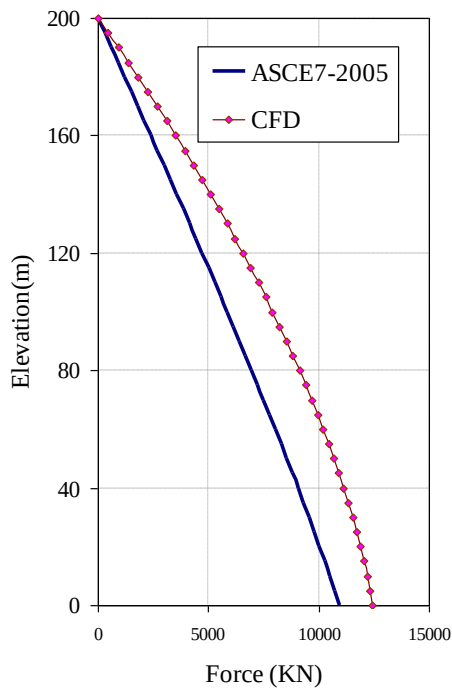


Fig.A.49. Case No. A\_2\_1\_200\_T2 (shear force and overturning moment)

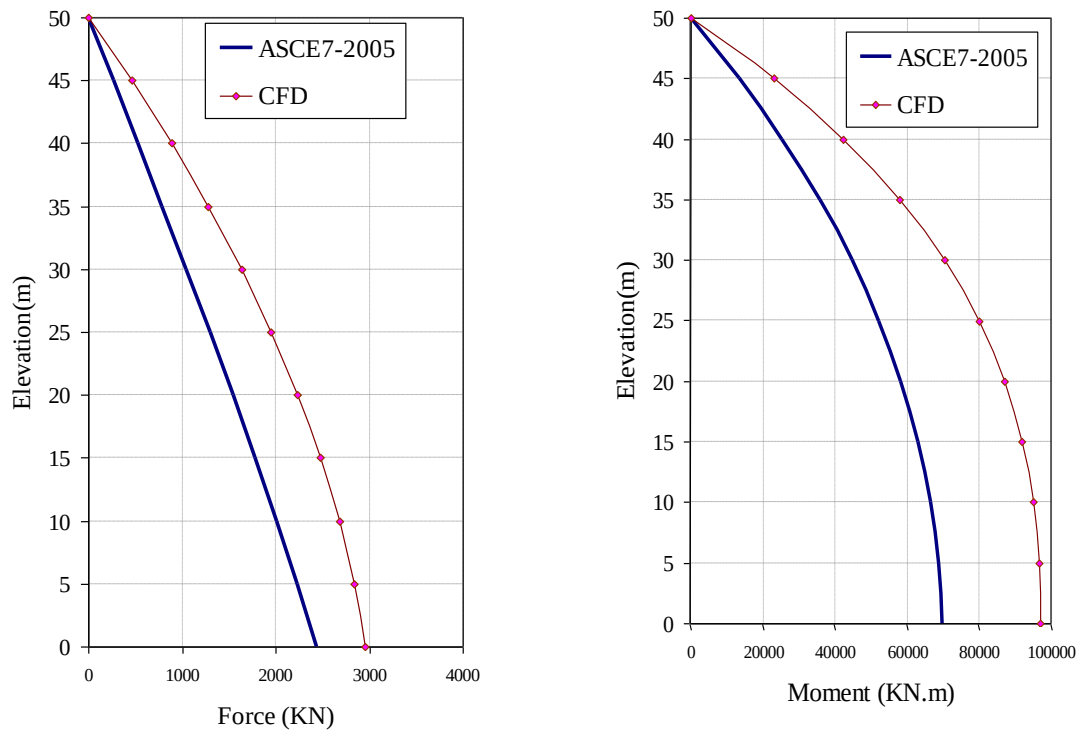


Fig.A.50. Case No. A\_2.5\_1\_50\_T1 (shear force and overturning moment)

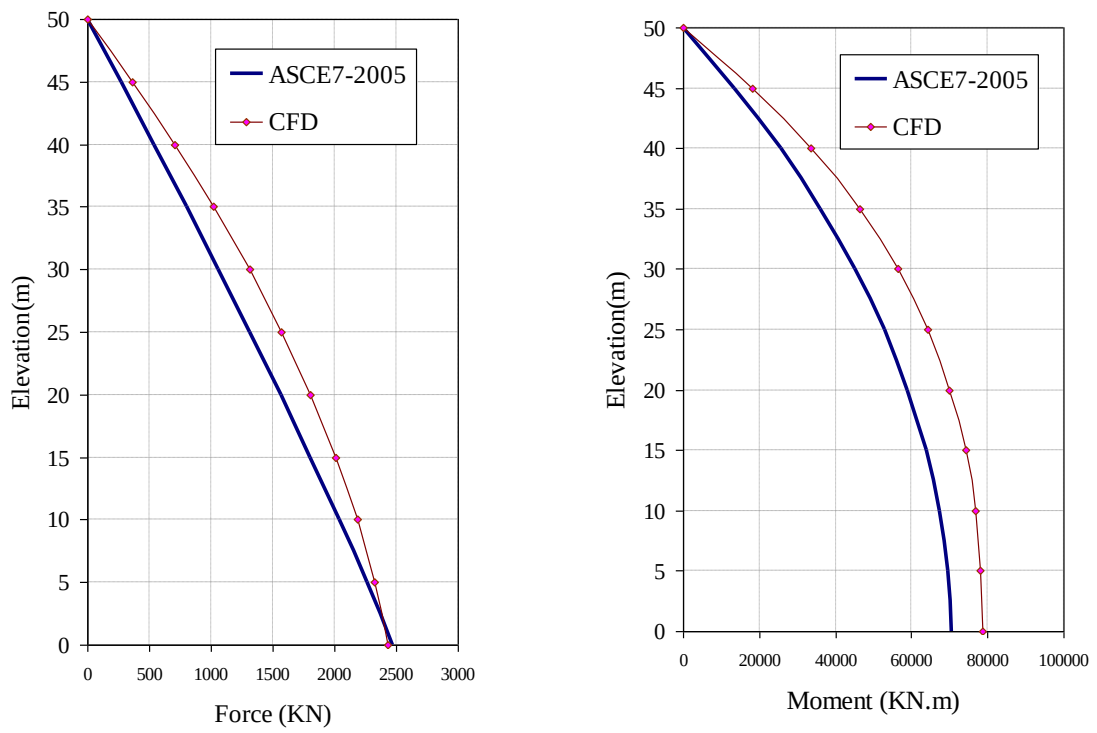


Fig.A.51. Case No. A\_2.5\_1\_50\_T2 (shear force and overturning moment)

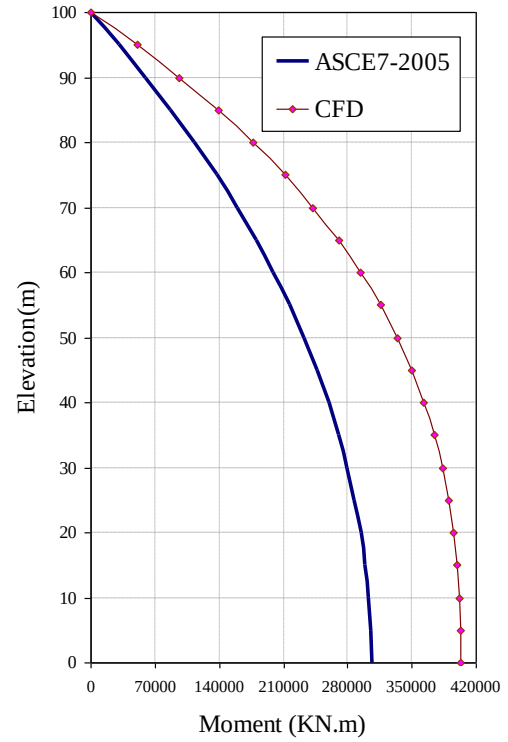
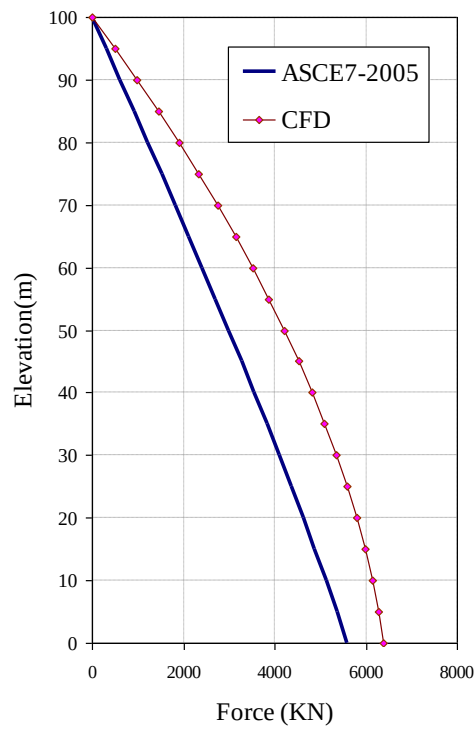


Fig.A.52. Case No. A\_2.5\_1\_100\_T1 (shear force and overturning moment)

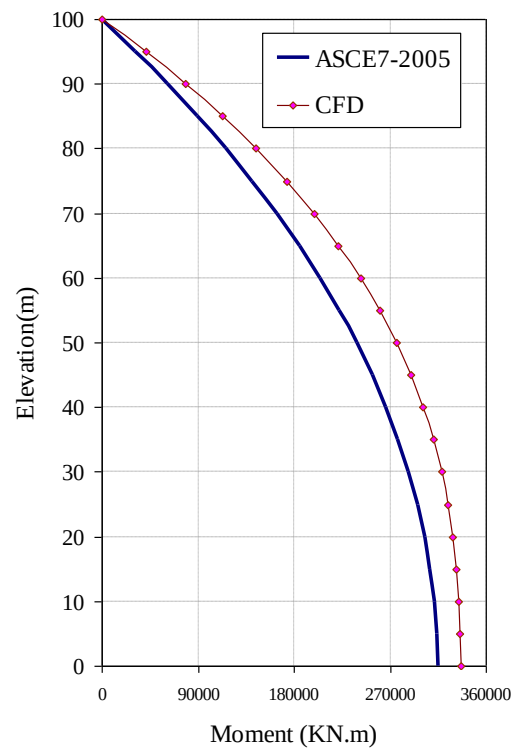
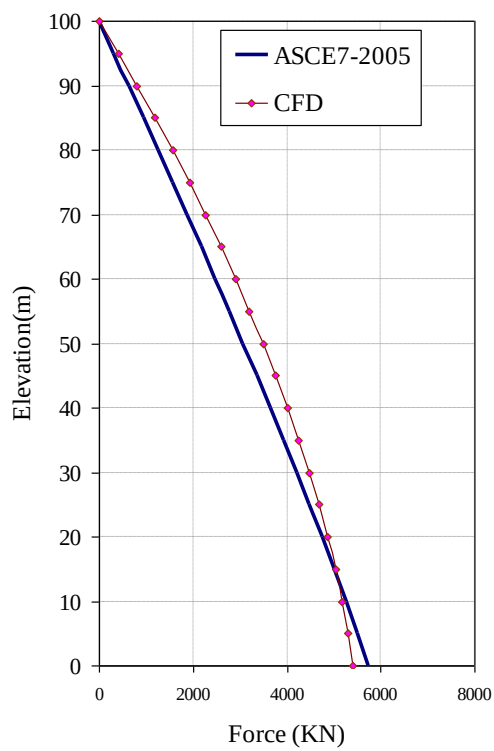


Fig.A.53. Case No. A\_2.5\_1\_100\_T2 (shear force and overturning moment)

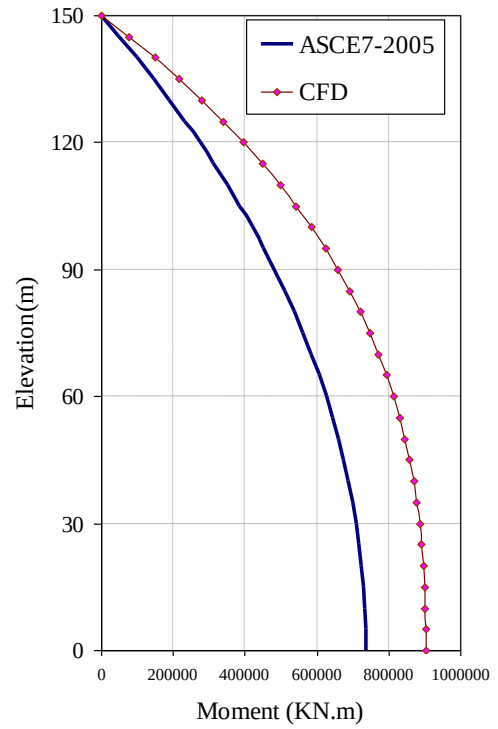
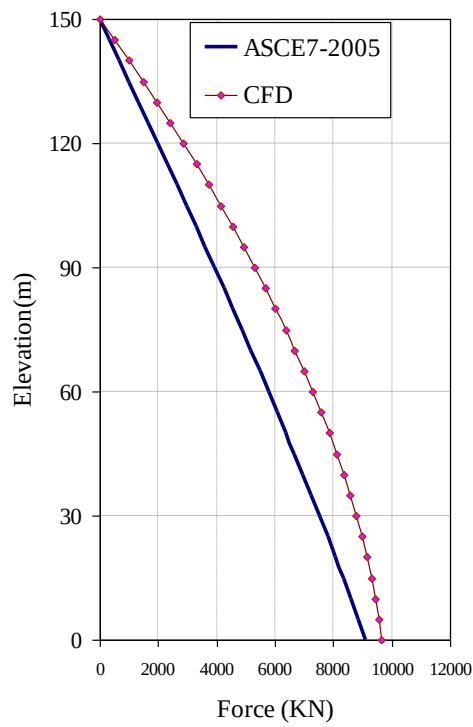


Fig.A.54. Case No. A\_2.5\_1\_150\_T1 (shear force and overturning moment)

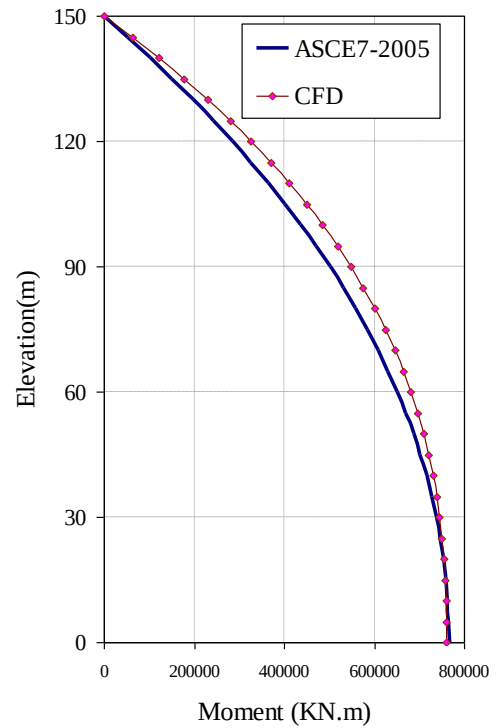
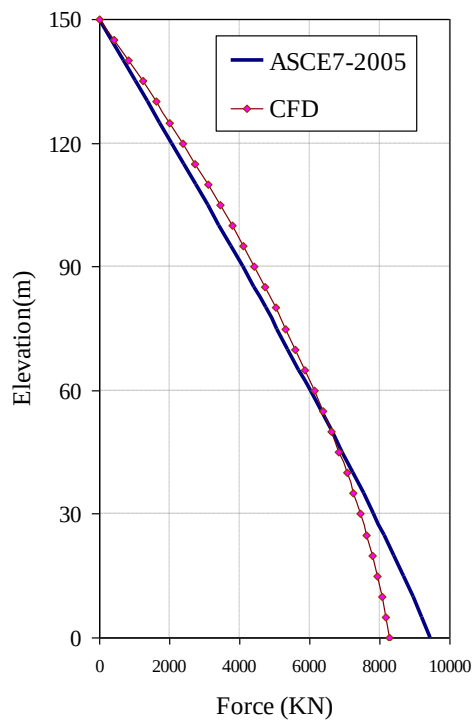


Fig.A.55. Case No. A\_2.5\_1\_150\_T2 (shear force and overturning moment)

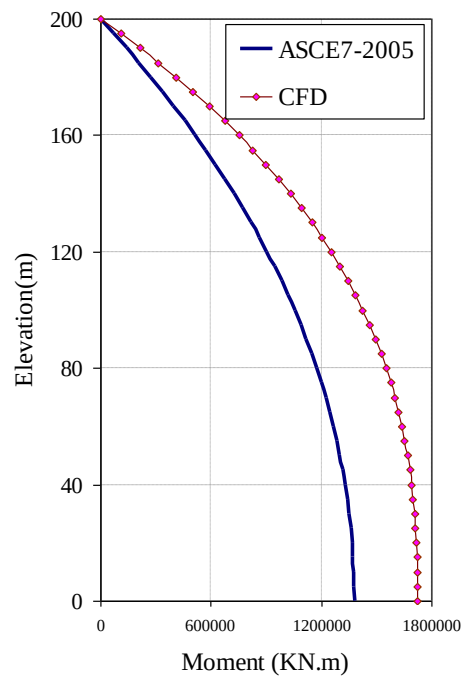
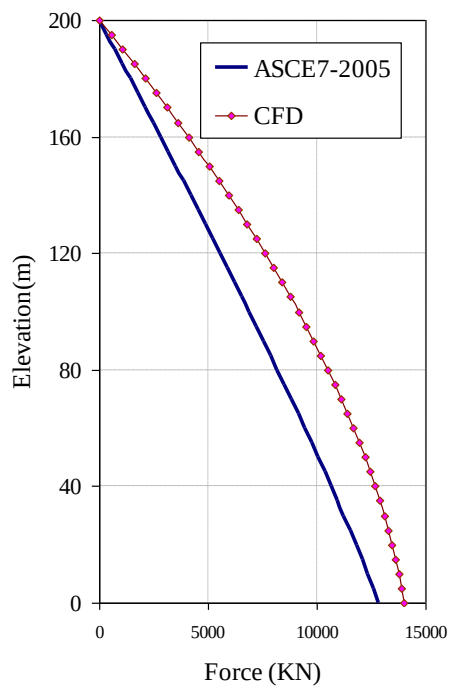


Fig.A.56. Case No. A\_2.5\_1\_200\_T1 (shear force and overturning moment)

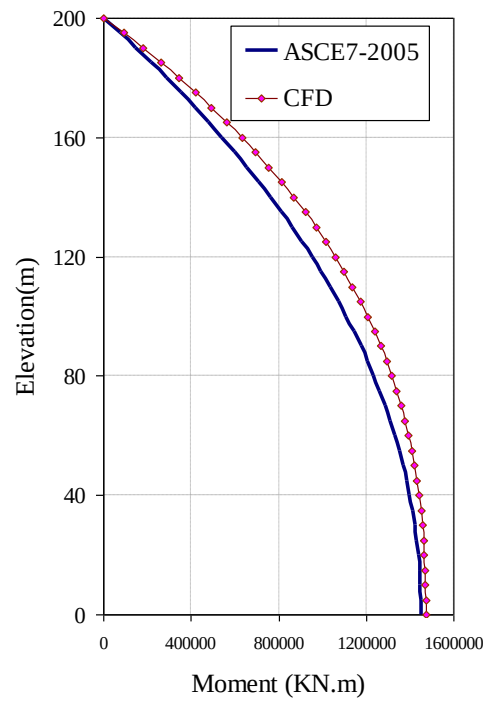
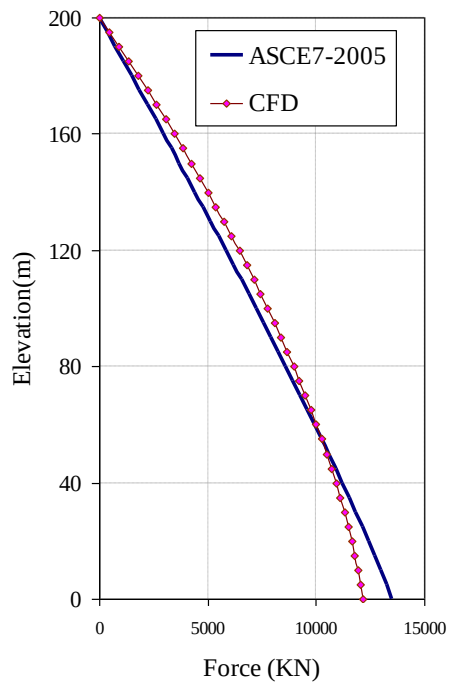


Fig.A.57. Case No. A\_2.5\_1\_200\_T2 (shear force and overturning moment)

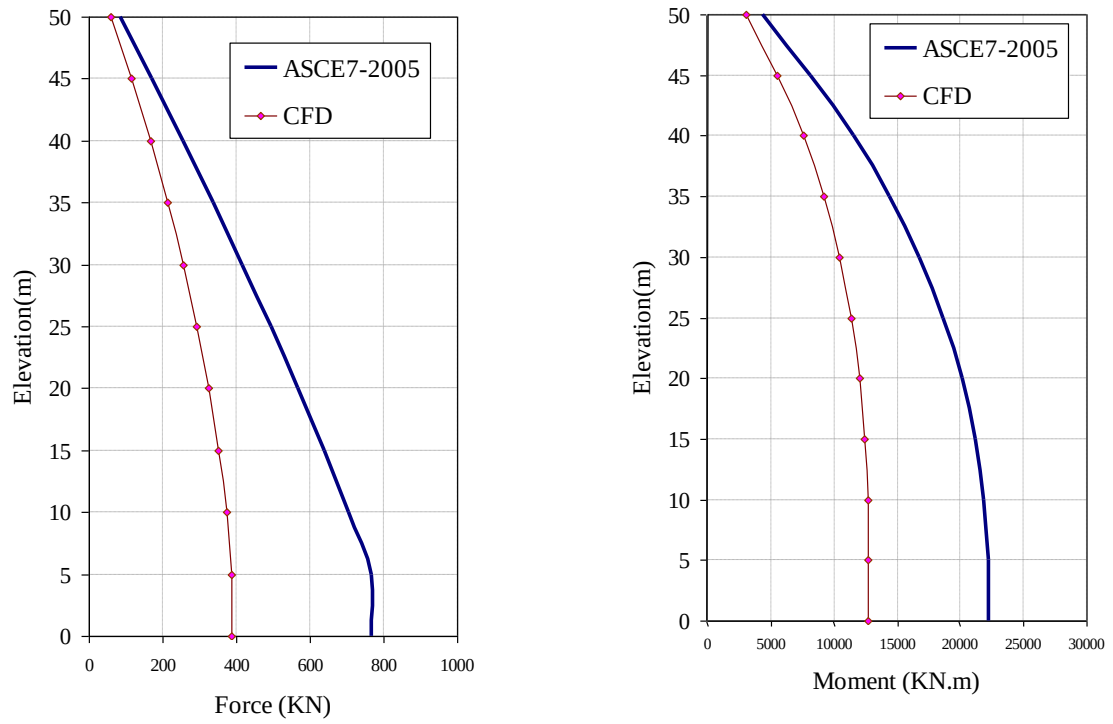


Fig.A.58. Case No. B\_1\_1\_50\_T1 (shear force and overturning moment)

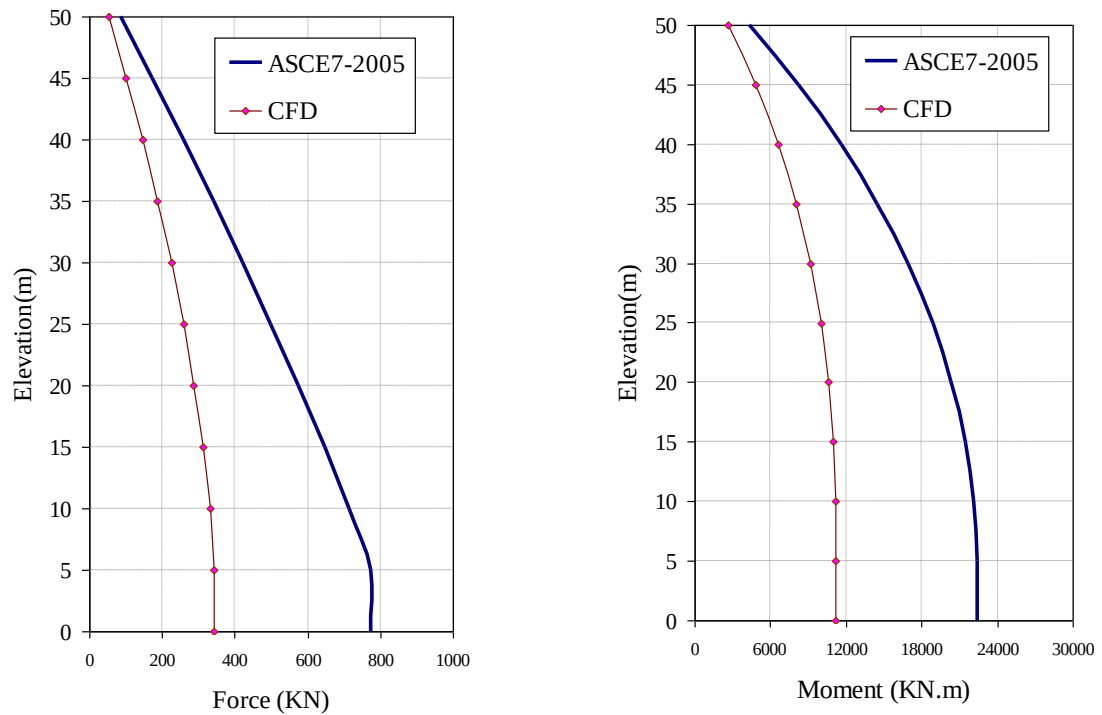


Fig.A.59. Case No. B\_1\_1\_50\_T2 (shear force and overturning moment)

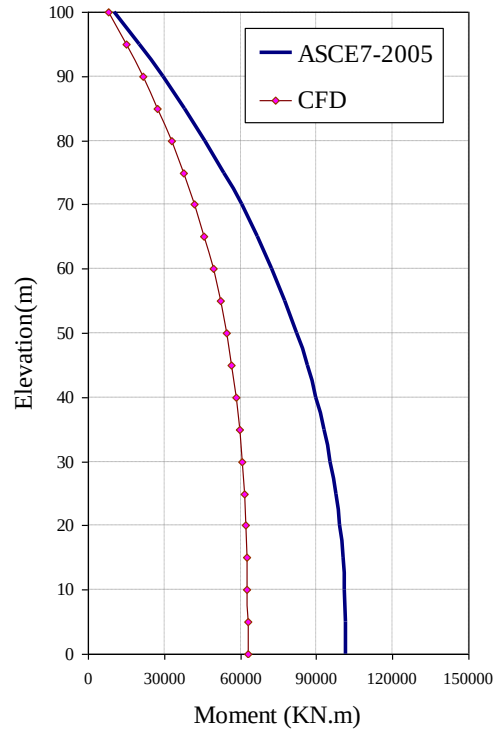
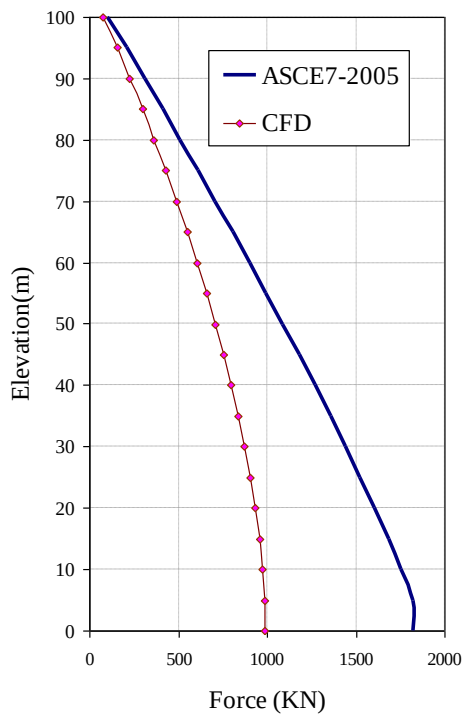


Fig.A.60. Case No. B\_1\_1\_100\_T1 (shear force and overturning moment)

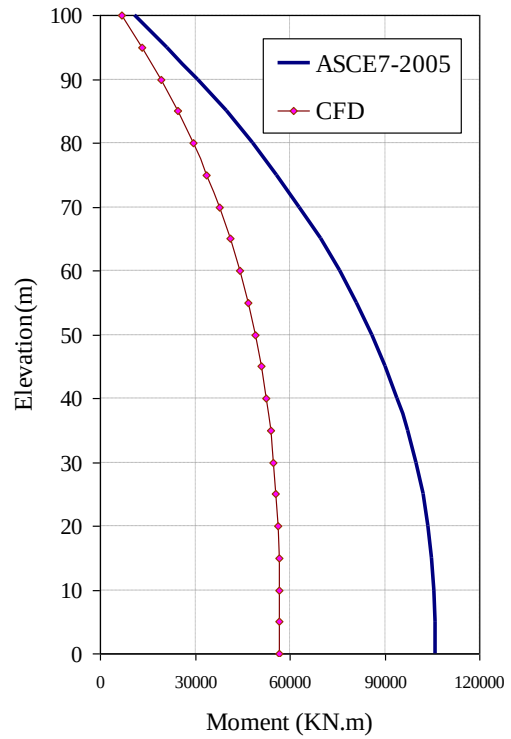
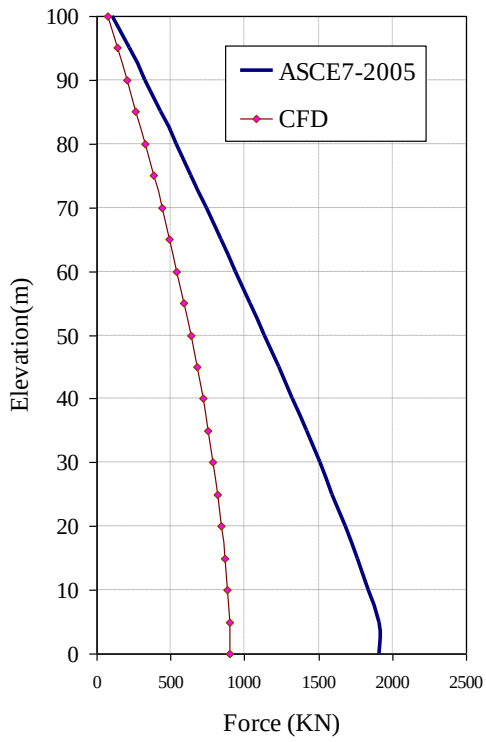


Fig.A.61. Case No. B\_1\_1\_100\_T2 (shear force and overturning moment)



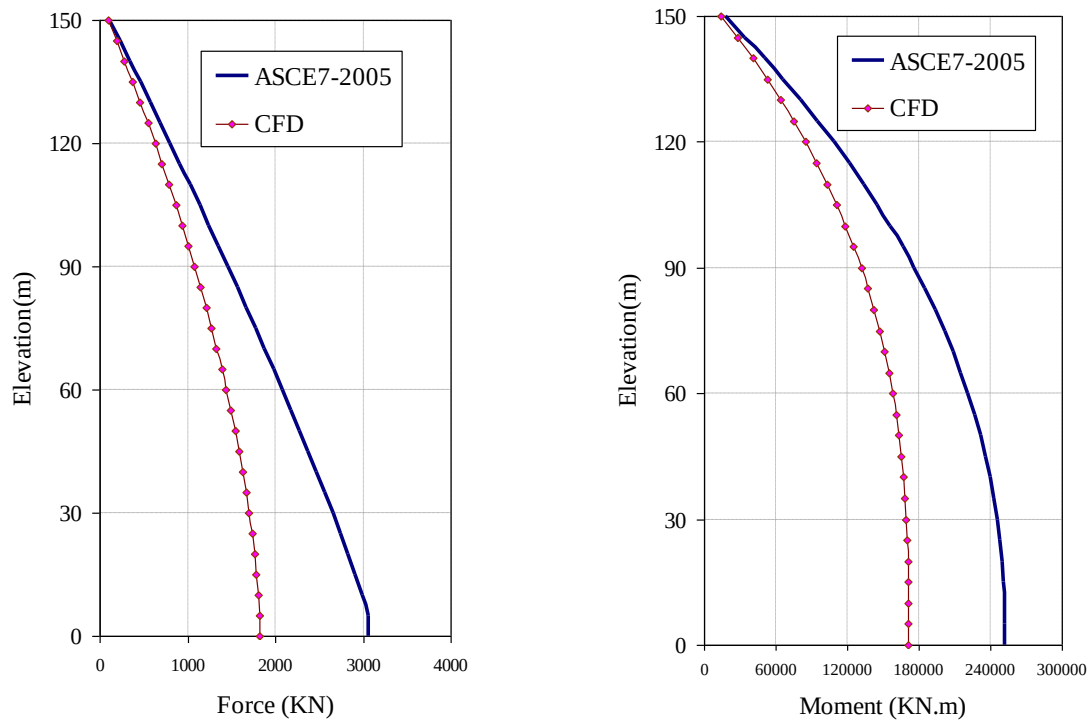


Fig.A.62. Case No. B\_1\_1\_150\_T1 (shear force and overturning moment)

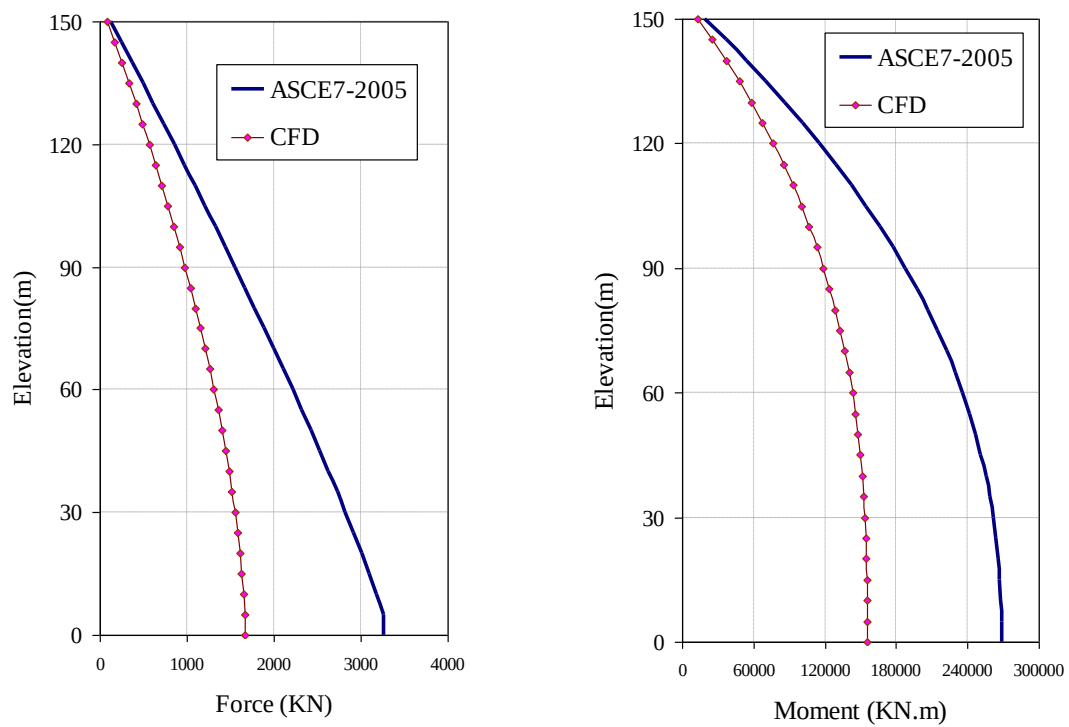


Fig.A.63. Case No. B\_1\_1\_150\_T2 (shear force and overturning moment)

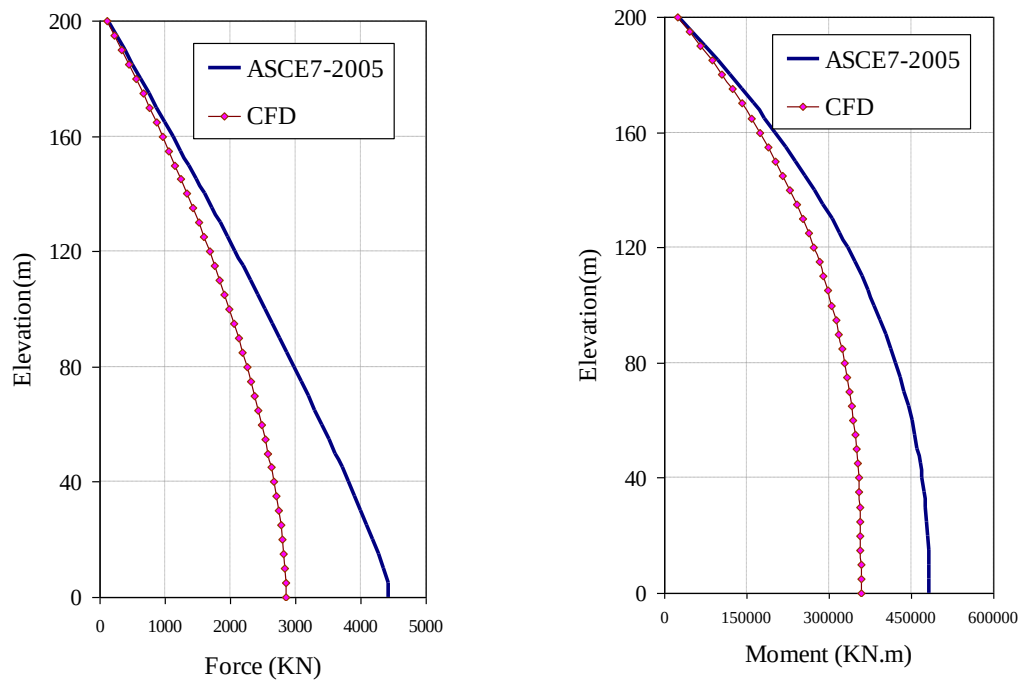


Fig.A.64. Case No. B\_1\_1\_200\_T1 (shear force and overturning moment)

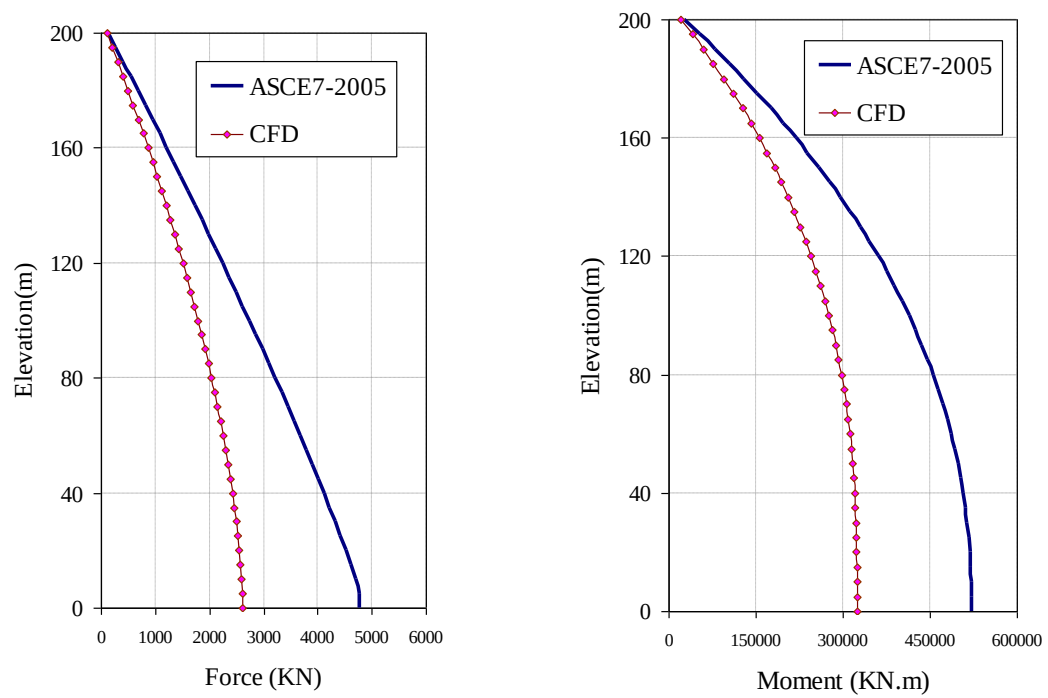


Fig.A.65. Case No. B\_1\_1\_200\_T2 (shear force and overturning moment)

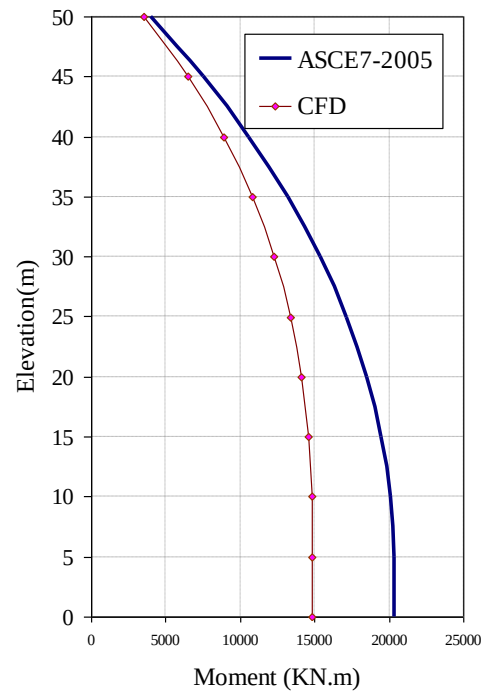
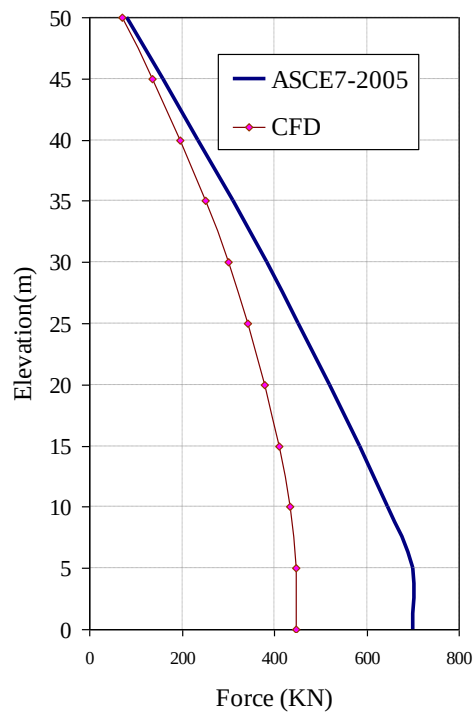


Fig.A.66. Case No. B\_1\_1.5\_50\_T1 (shear force and overturning moment)

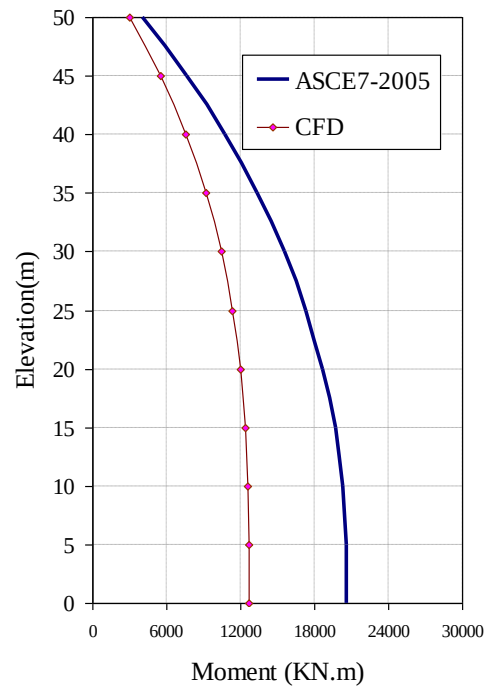
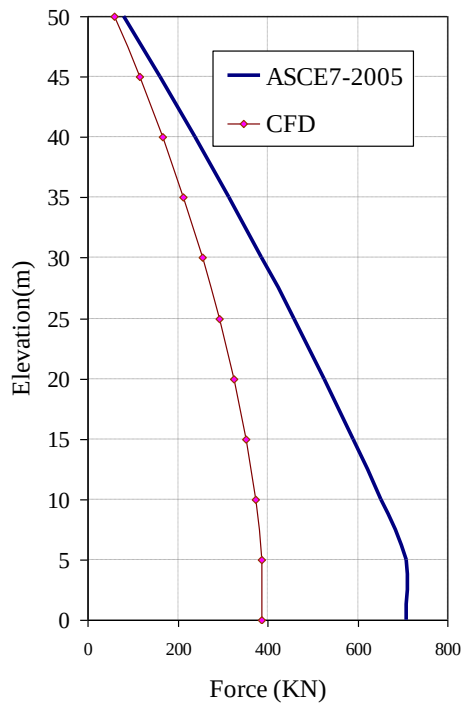


Fig.A.67. Case No. B\_1\_1.5\_50\_T2 (shear force and overturning moment)

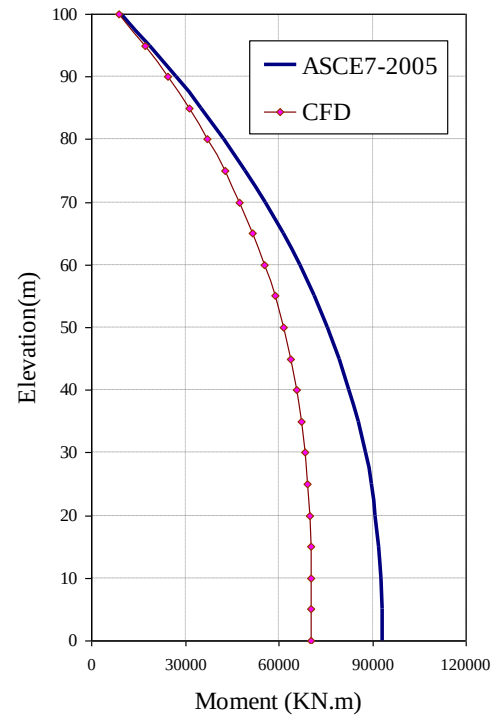
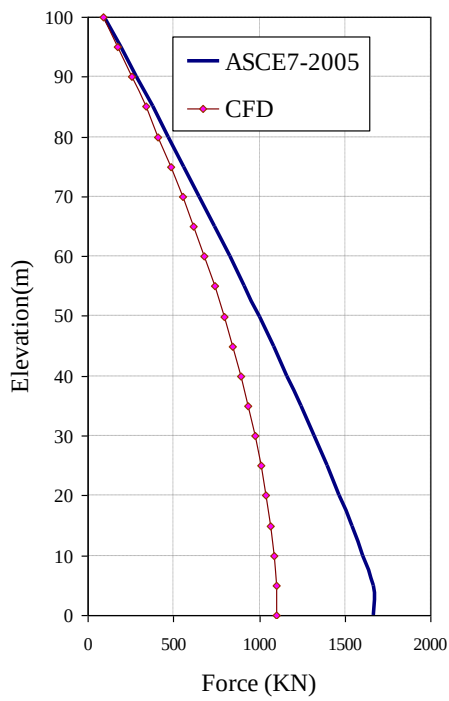


Fig.A.68. Case No. B\_1\_1.5\_100\_T1 (shear force and overturning moment)

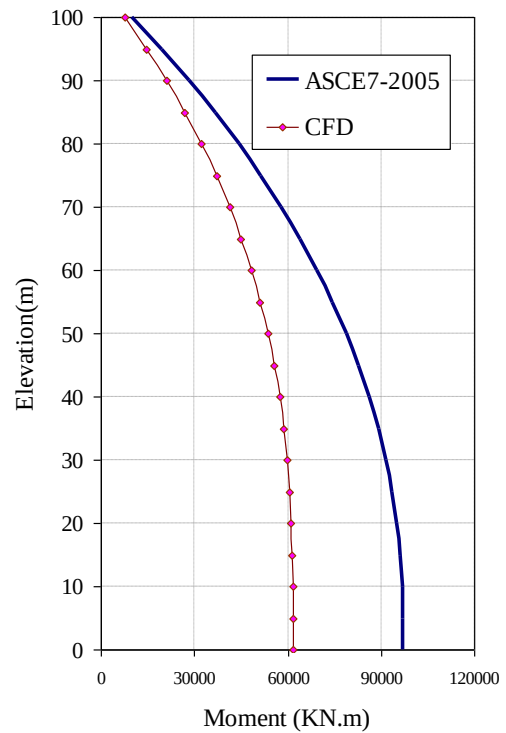
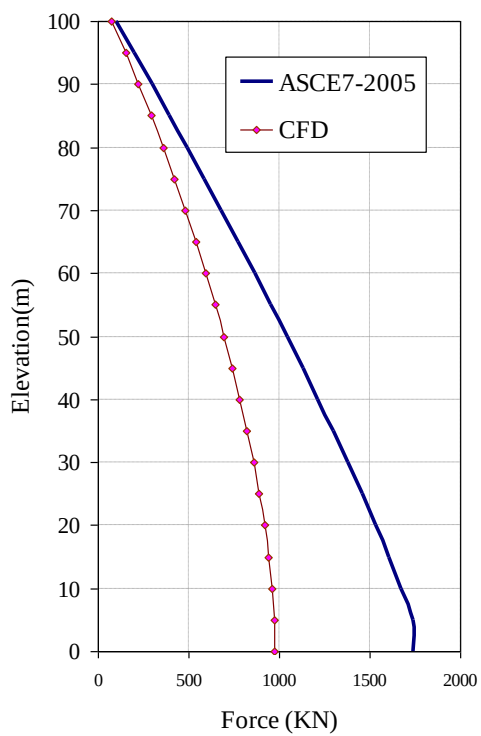


Fig.A.69. Case No. B\_1\_1.5\_100\_T2 (shear force and overturning moment)

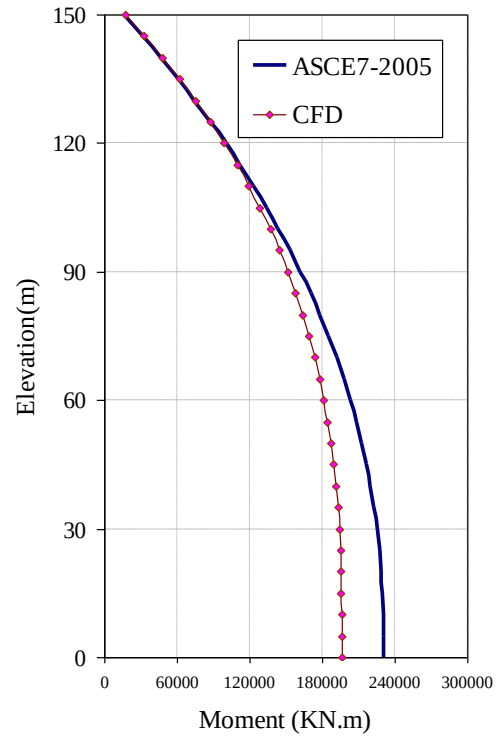
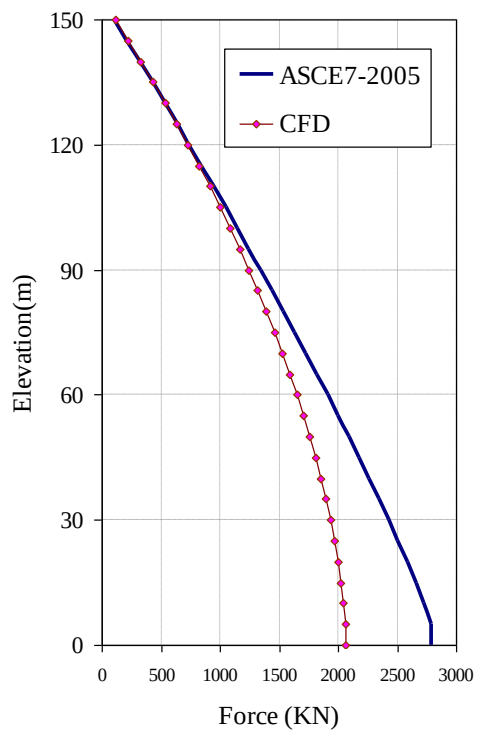


Fig.A.70. Case No. B\_1\_1.5\_150\_T1 (shear force and overturning moment)

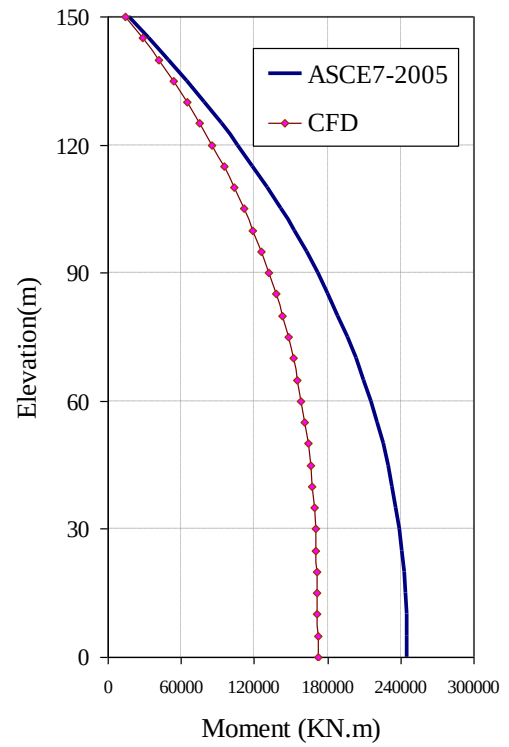
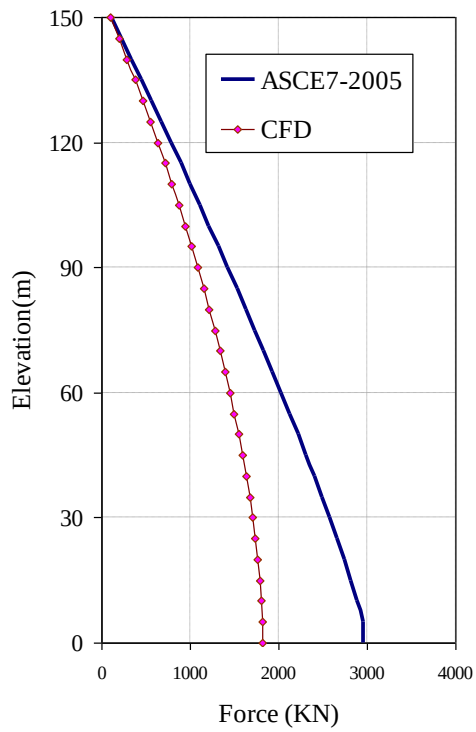


Fig.A.71. Case No. B\_1\_1.5\_150\_T2 (shear force and overturning moment)

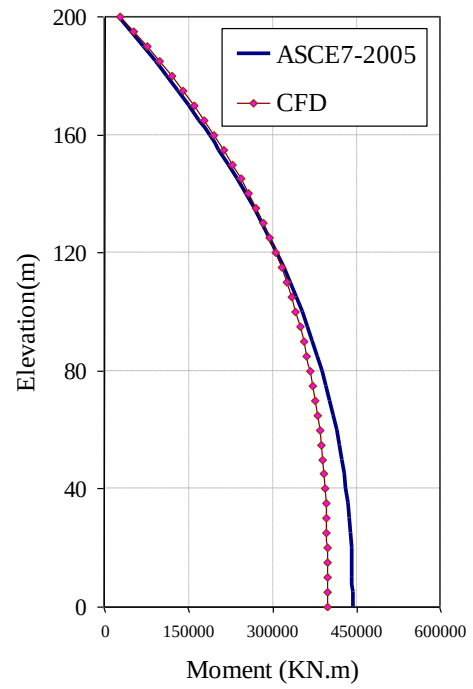
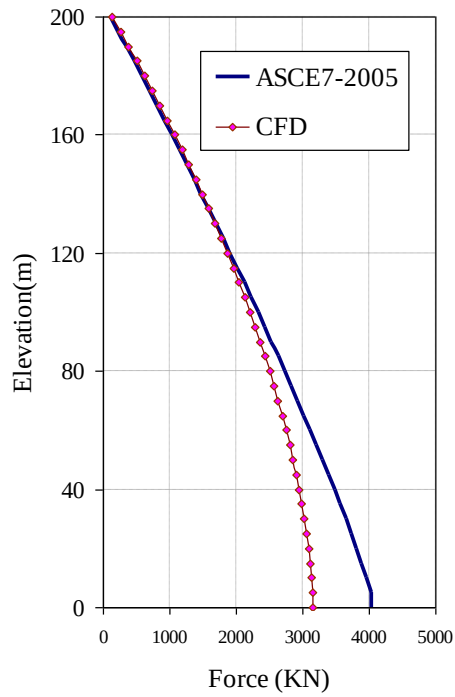


Fig.A.72. Case No. B\_1\_1.5\_200\_T1 (shear force and overturning moment)

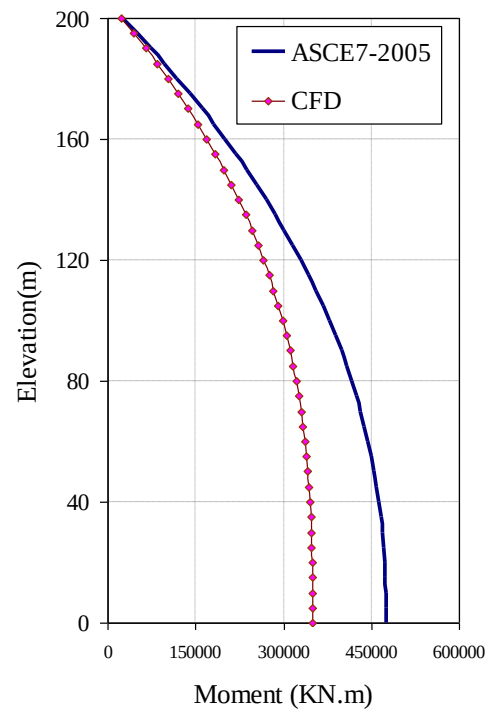
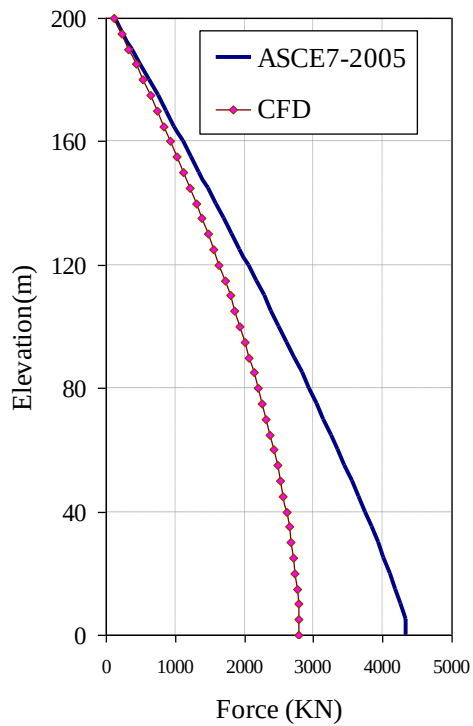


Fig.A.73. Case No. B\_1\_1.5\_200\_T2 (shear force and overturning moment)

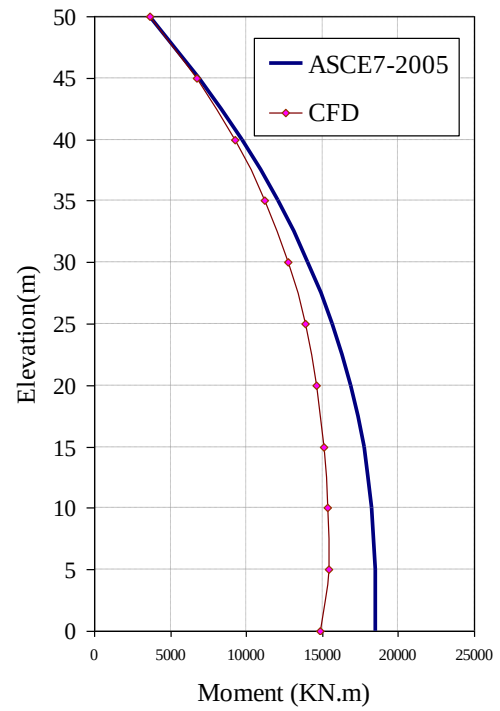
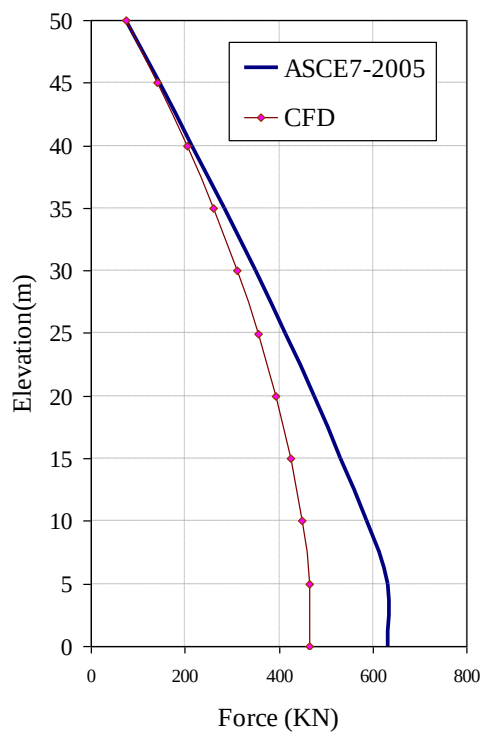


Fig.A.74. Case No. B\_1\_2\_50\_T1 (shear force and overturning moment)

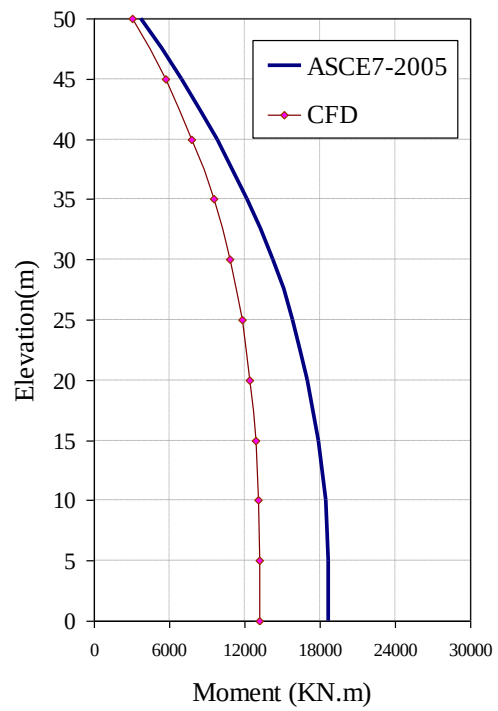
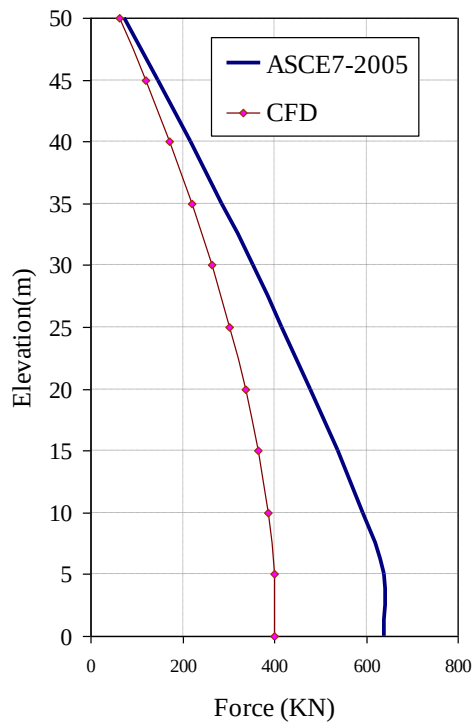


Fig.A.75. Case No. B\_1\_2\_50\_T2 (shear force and overturning moment)

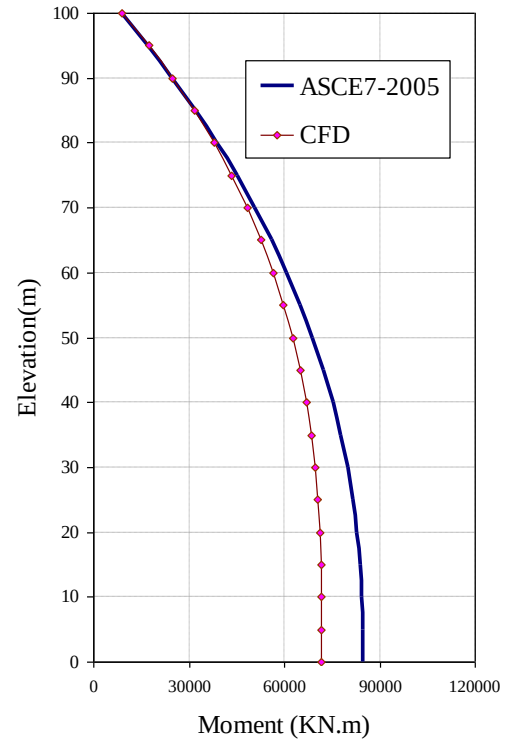
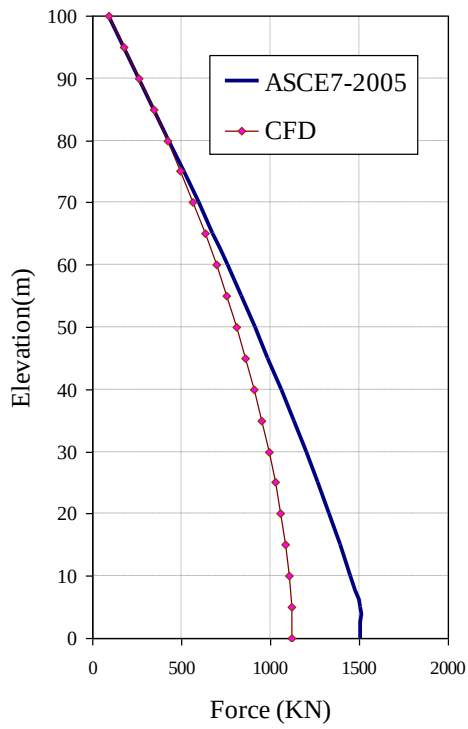


Fig.A.76. Case No. B\_1\_2\_100\_T1 (shear force and overturning moment)

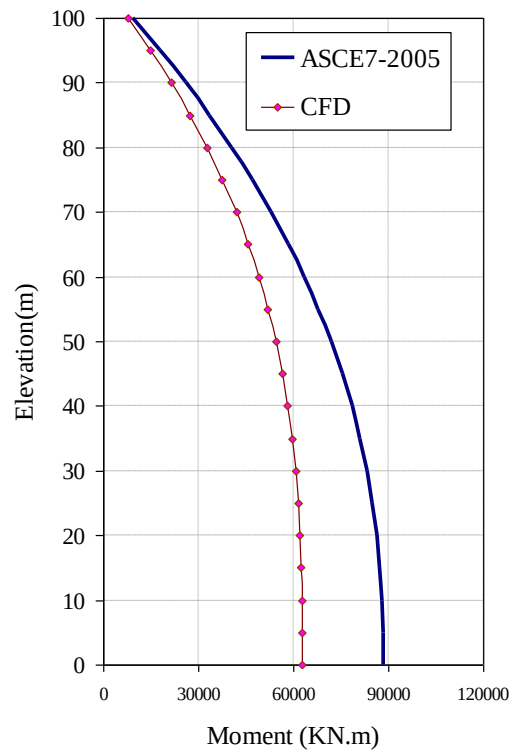
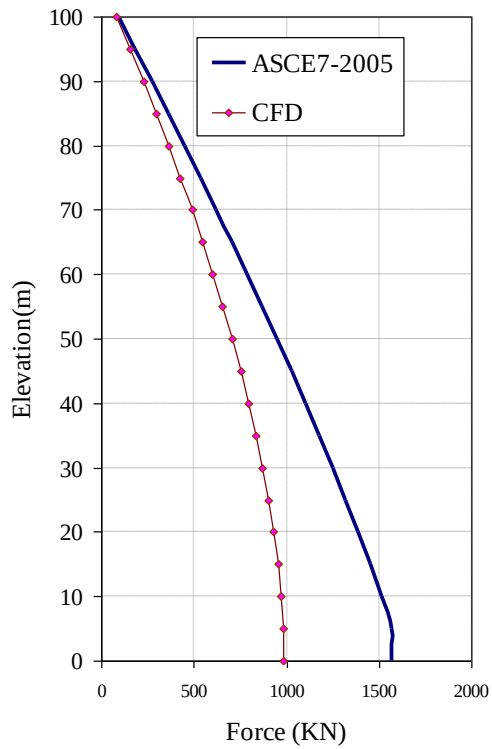


Fig.A.77. Case No. B\_1\_2\_100\_T2 (shear force and overturning moment)



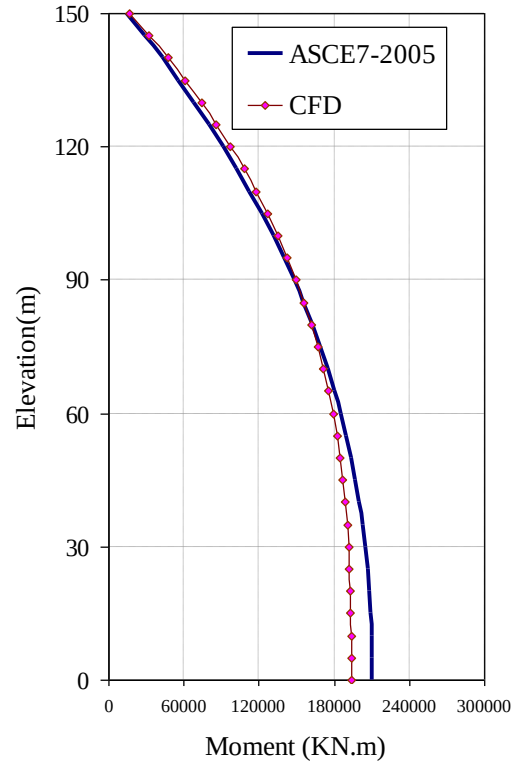
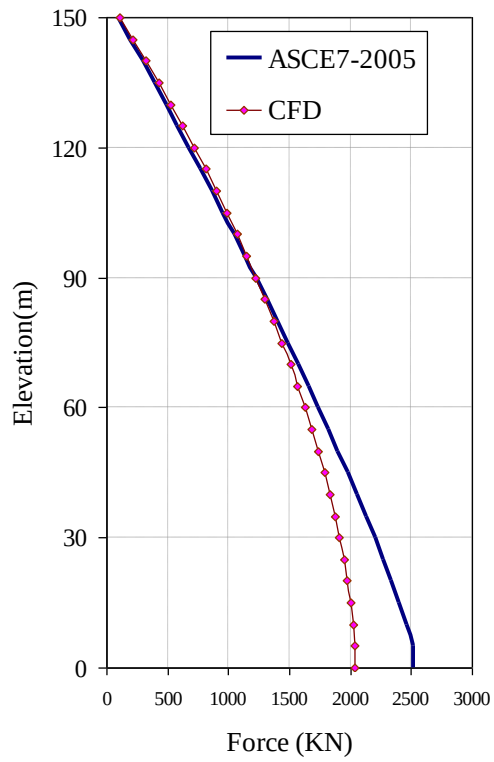


Fig.A.78. Case No. B\_1\_2\_150\_T1 (shear force and overturning moment)

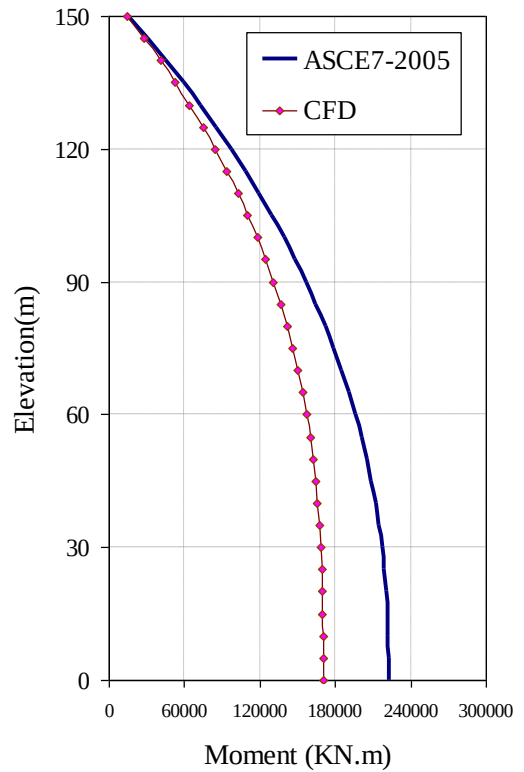
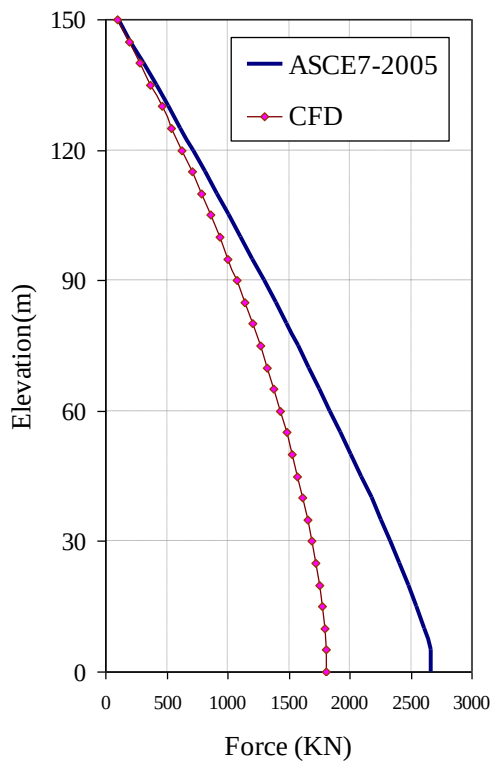


Fig.A.79. Case No. B\_1\_2\_150\_T2 (shear force and overturning moment)

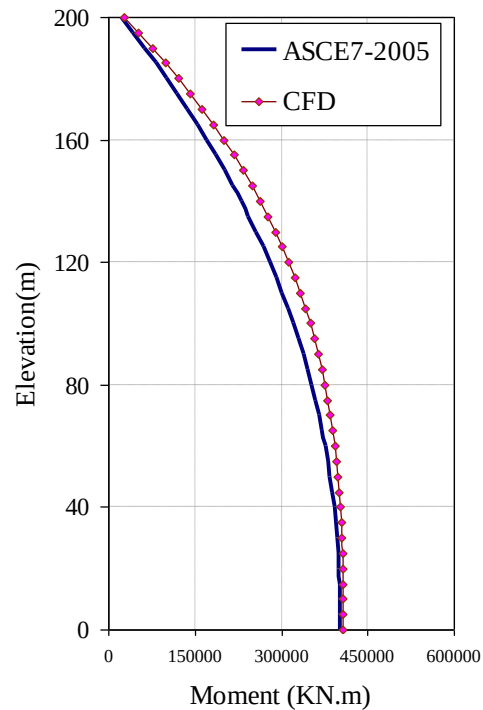
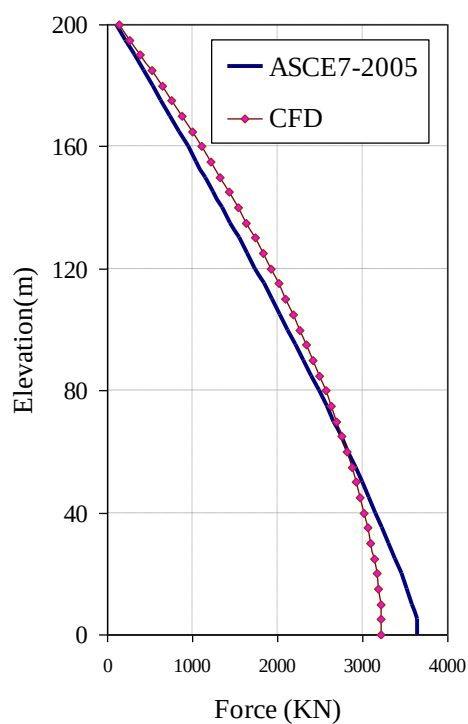


Fig.A.80. Case No. B\_1\_2\_200\_T1 (shear force and overturning moment)

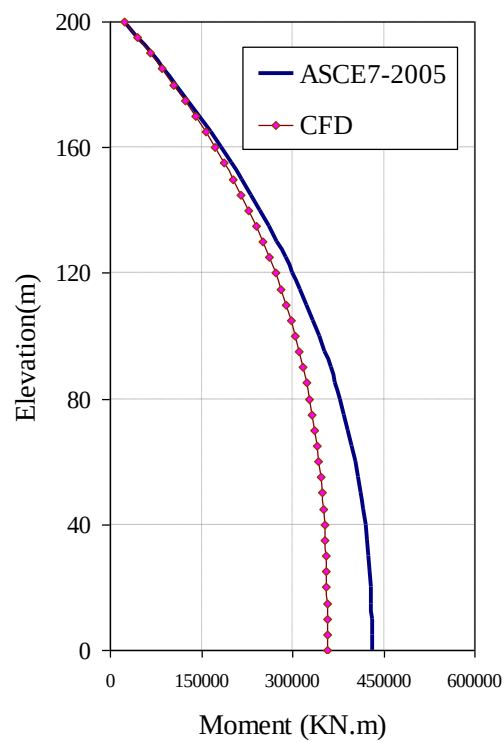
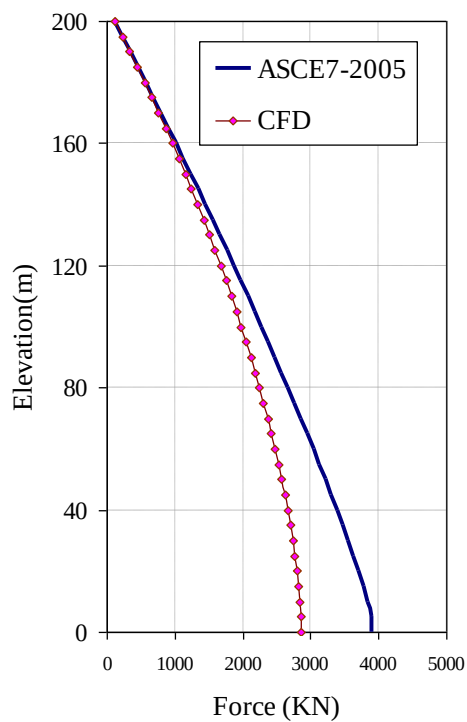


Fig.A.81. Case No. B\_1\_2\_200\_T2 (shear force and overturning moment)

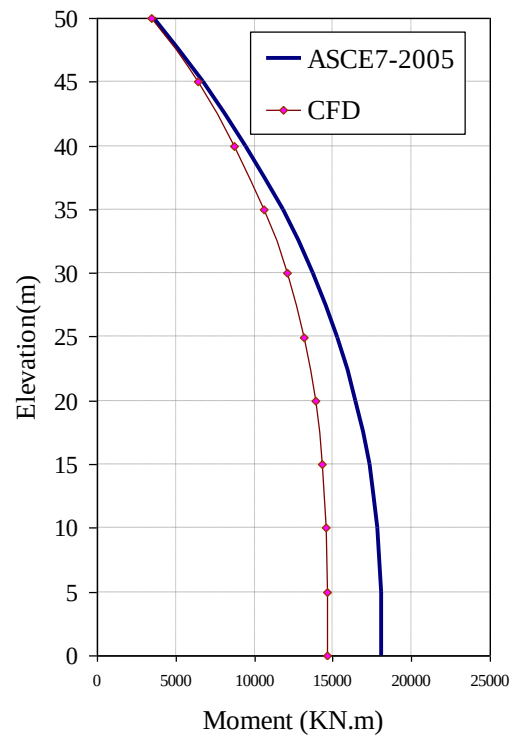
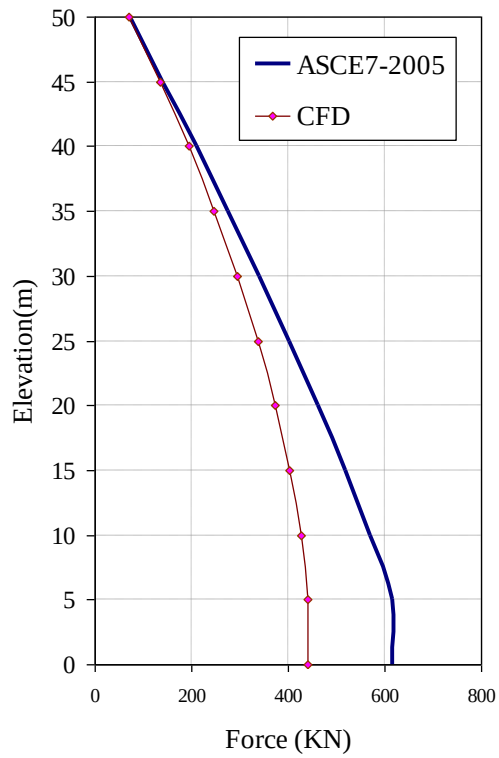


Fig.A.82. Case No. B\_1\_2.5\_50\_T1 (shear force and overturning moment)

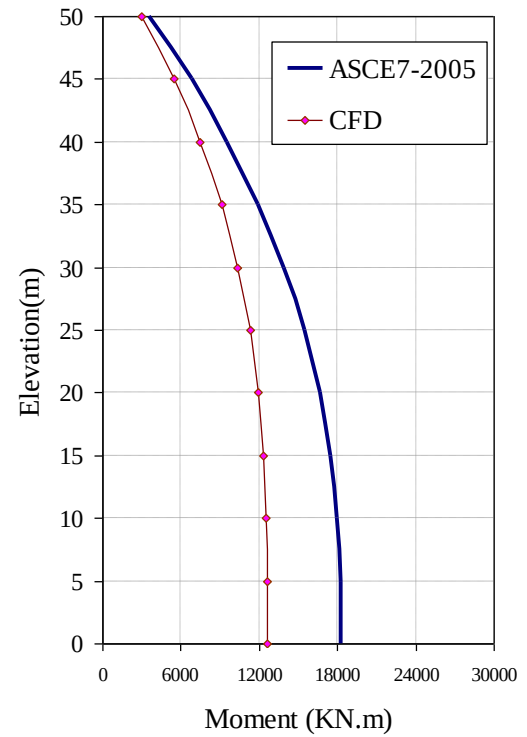
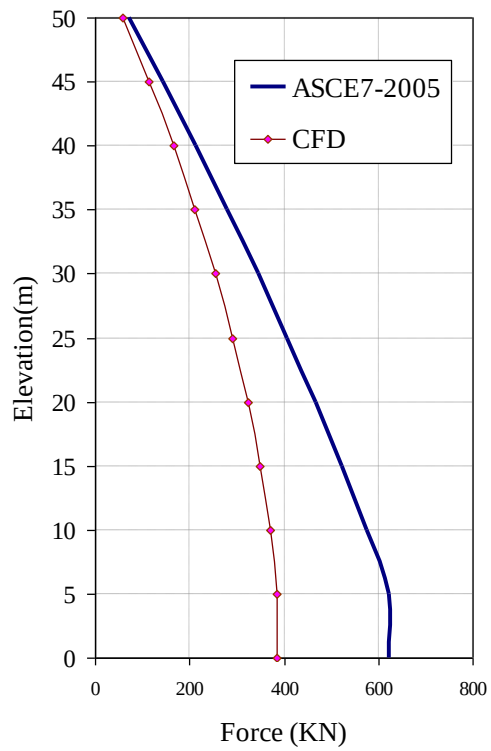


Fig.A.83. Case No. B\_1\_2.5\_50\_T2 (shear force and overturning moment)

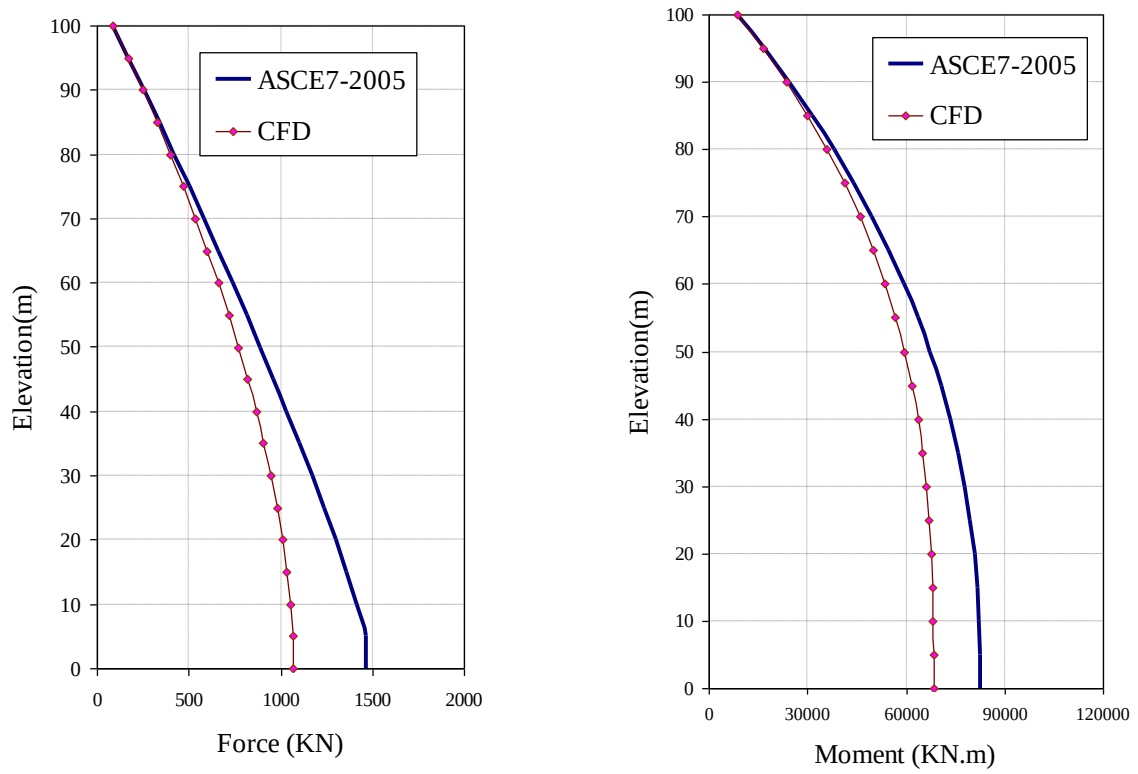


Fig.A.84. Case No. B\_1\_2.5\_100\_T1 (shear force and overturning moment)

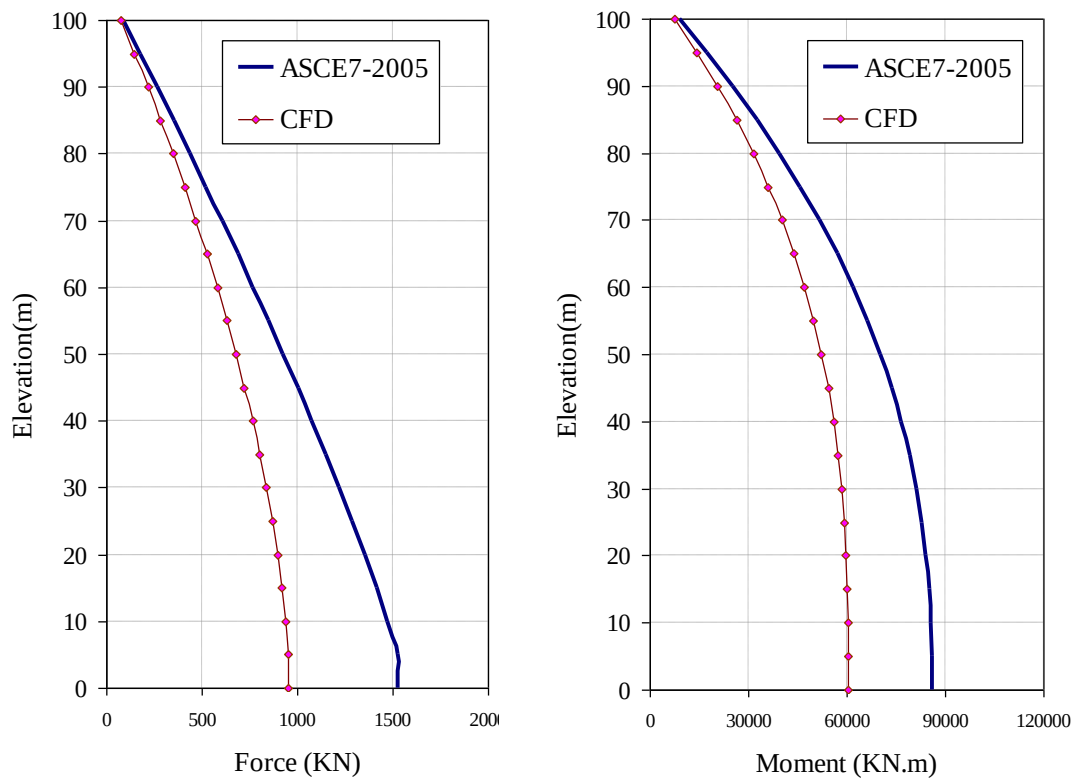


Fig.A.85. Case No. B\_1\_2.5\_100\_T2 (shear force and overturning moment)

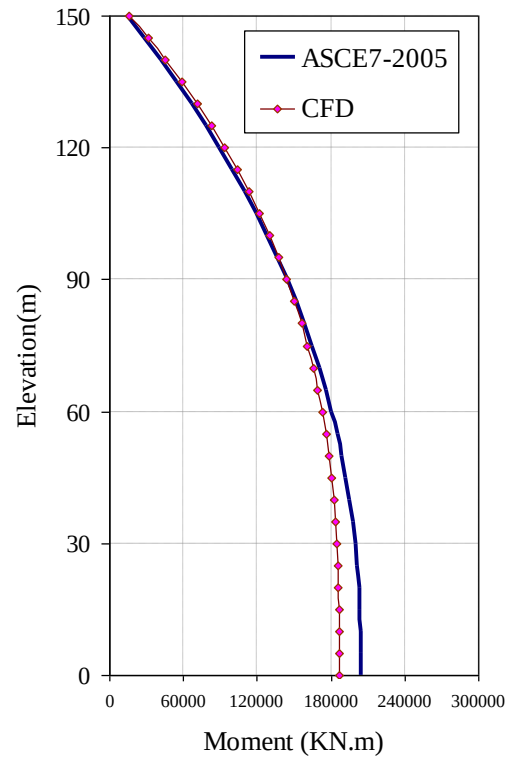
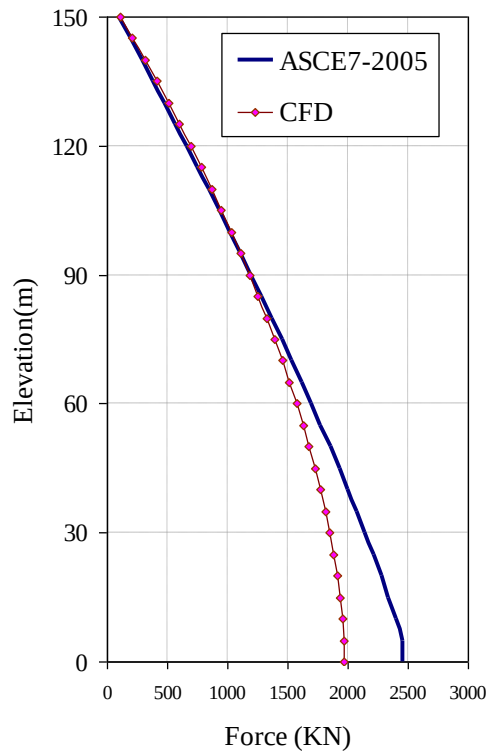


Fig.A.86. Case No. B\_1\_2.5\_150\_T1 (shear force and overturning moment)

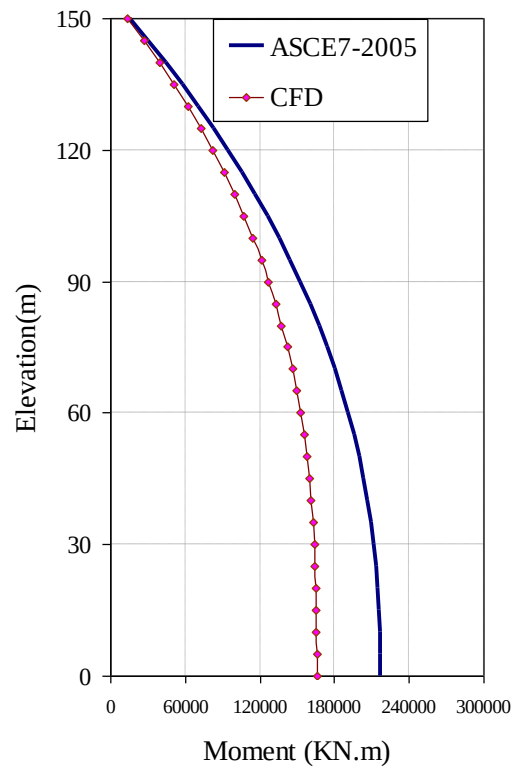
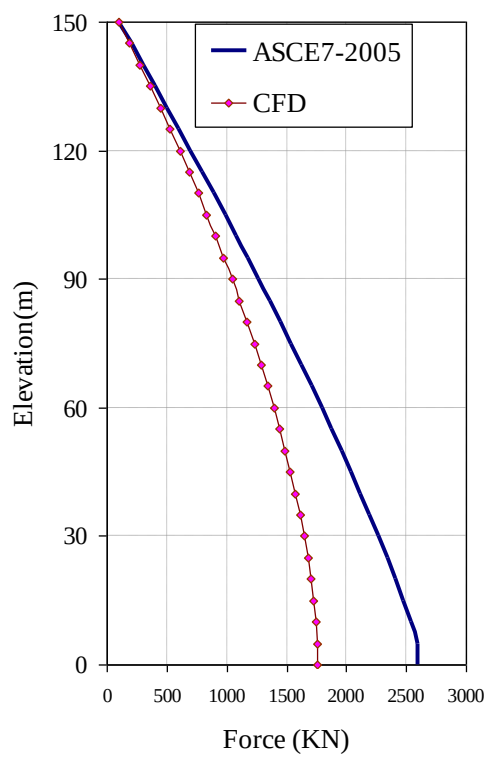


Fig.A.87. Case No. B\_1\_2.5\_150\_T2 (shear force and overturning moment)

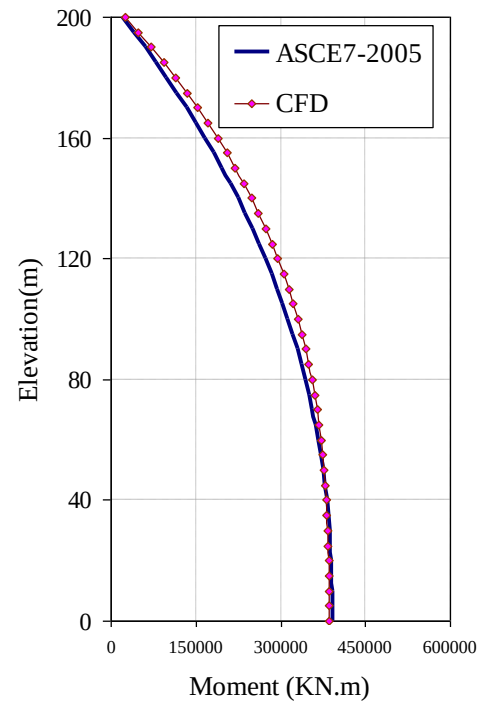
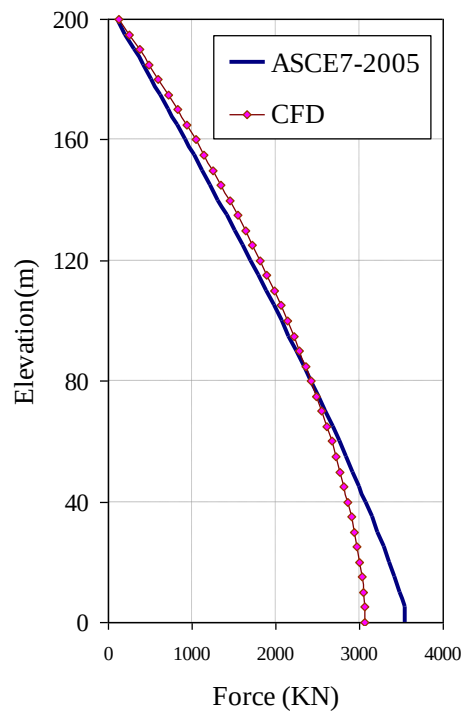


Fig.A.88. Case No. B\_1\_2.5\_200\_T1 (shear force and overturning moment)

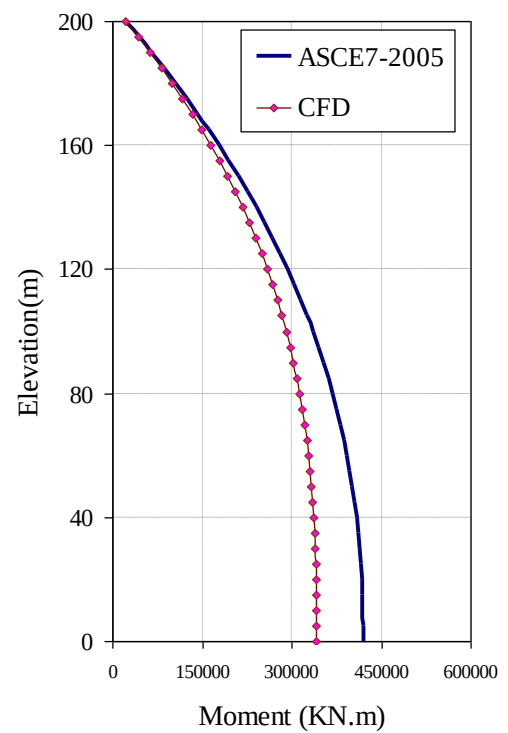
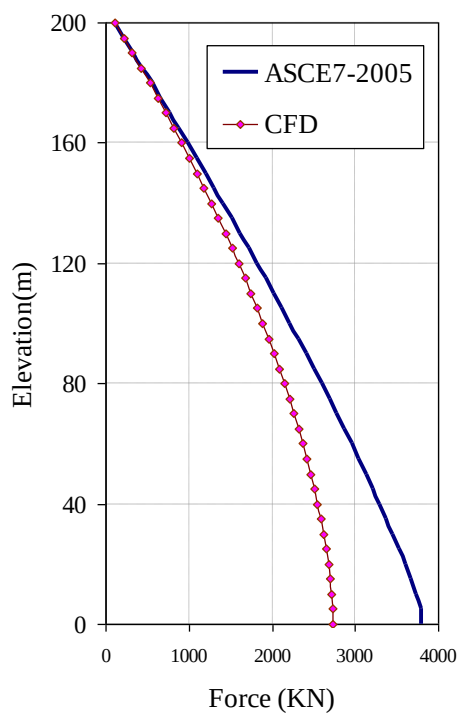


Fig.A.89. Case No. B\_1\_2.5\_200\_T2 (shear force and overturning moment)

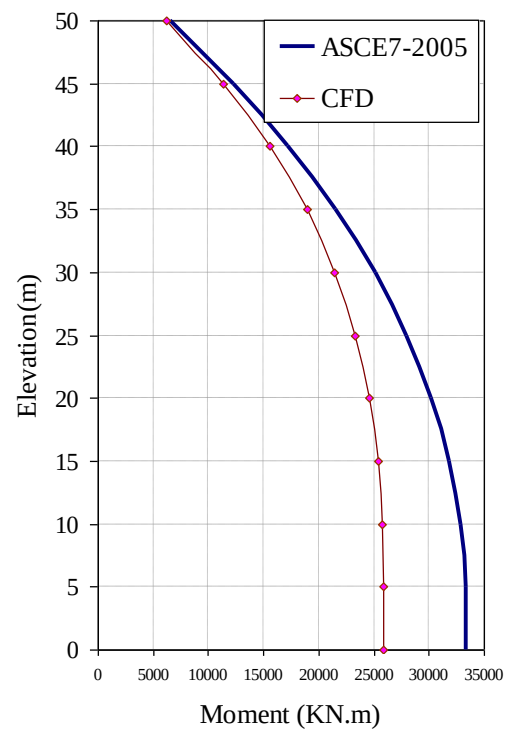
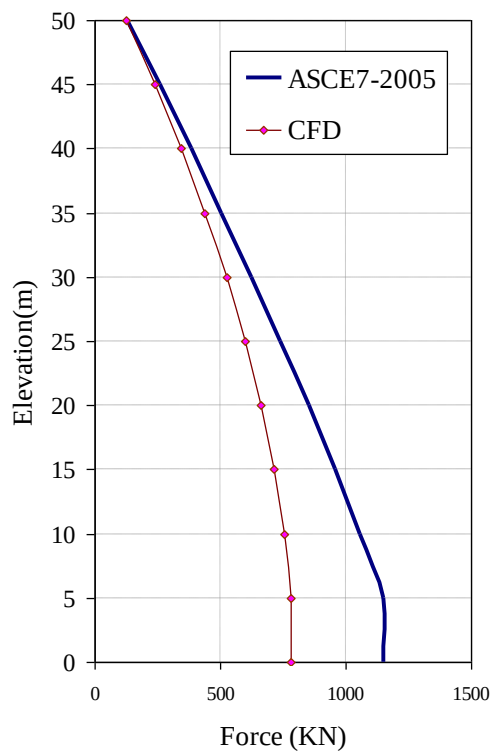


Fig.A.90. Case No. B\_1.5\_1\_50\_T1 (shear force and overturning moment)

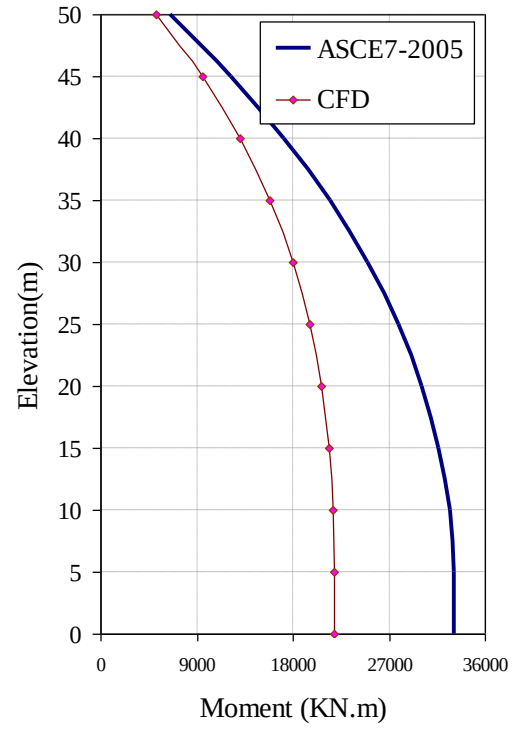
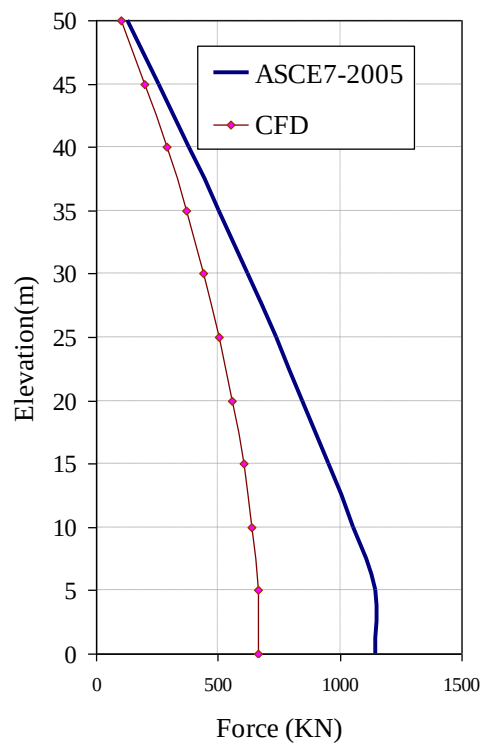


Fig.A.91. Case No. B\_1.5\_1\_50\_T2 (shear force and overturning moment)

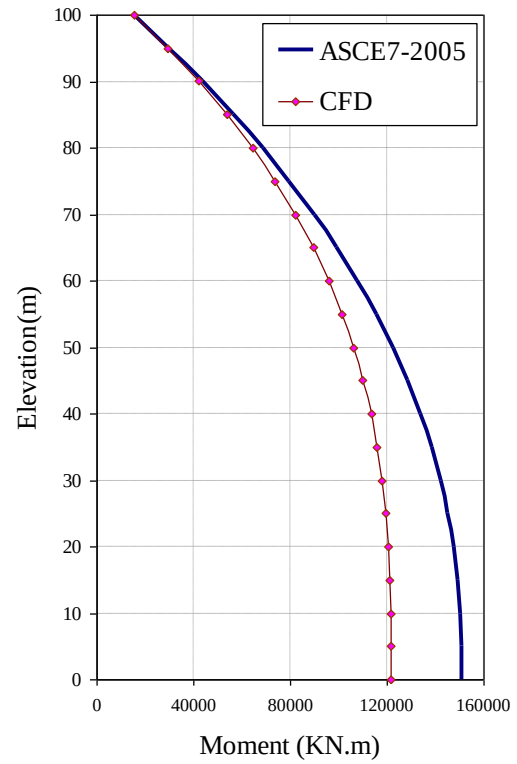
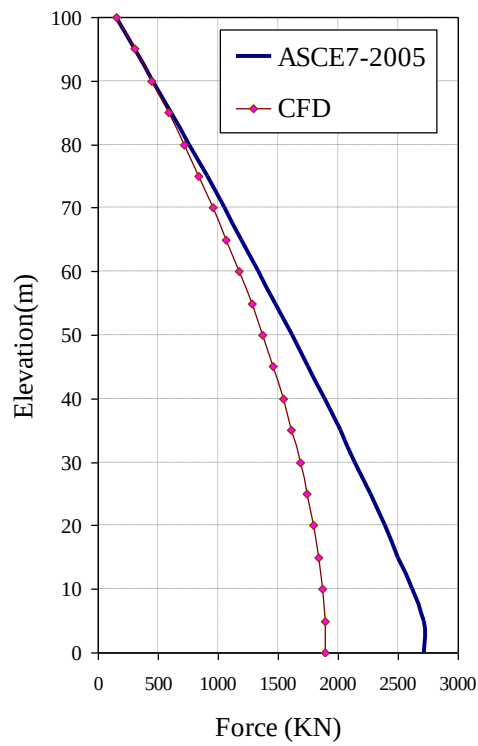


Fig.A.92. Case No. B\_1.5\_1\_100\_T1 (shear force and overturning moment)

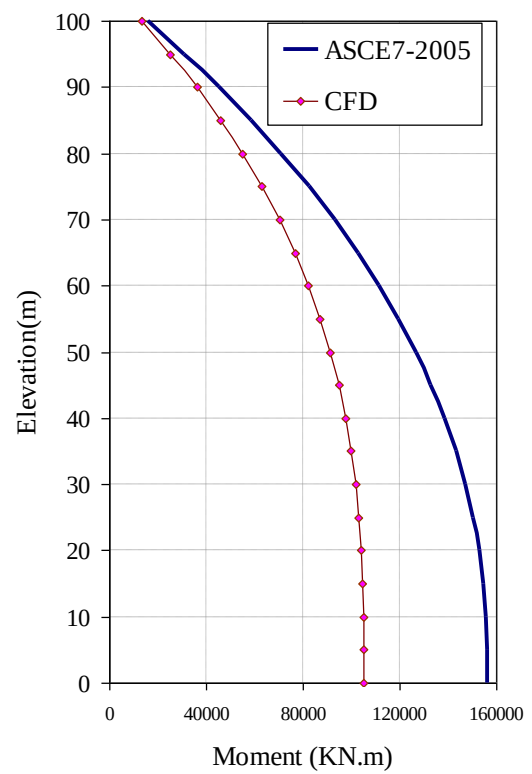
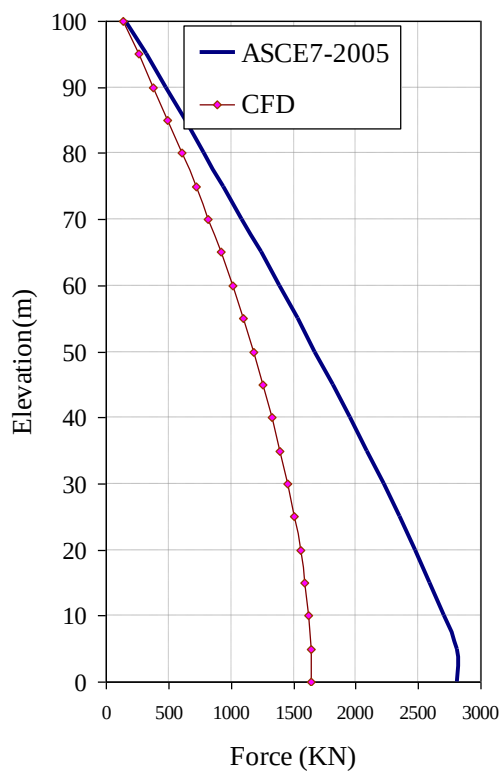


Fig.A.93. Case No. B\_1.5\_1\_100\_T2 (shear force and overturning moment)



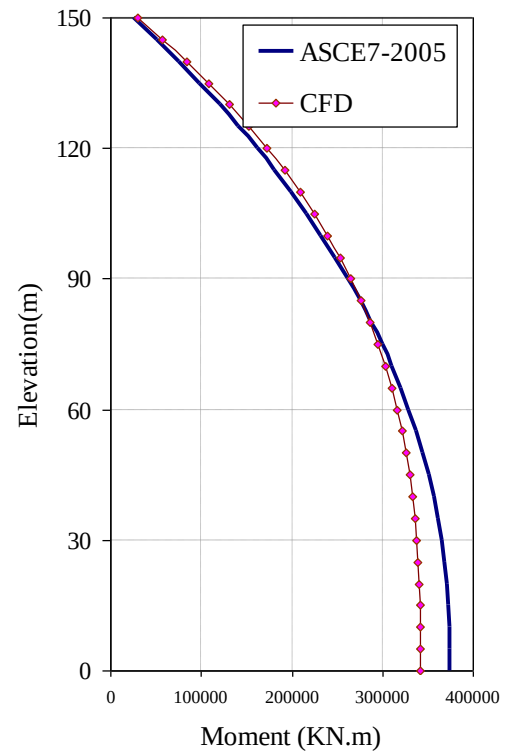
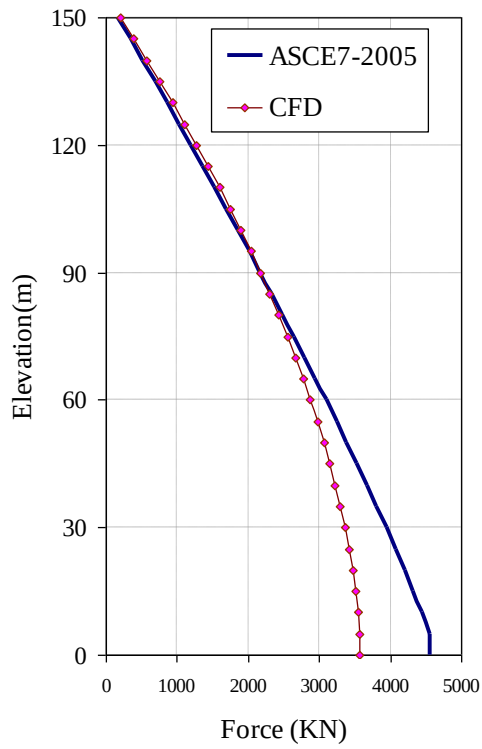


Fig.A.94. Case No. B\_1.5\_1\_150\_T1 (shear force and overturning moment)

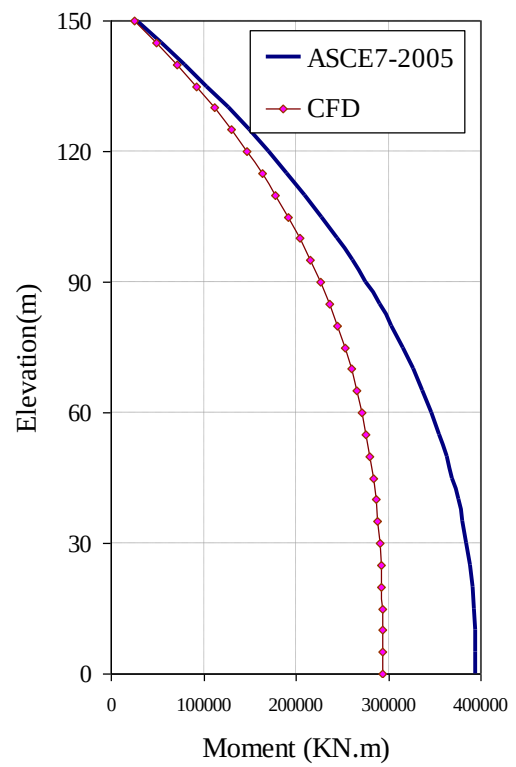
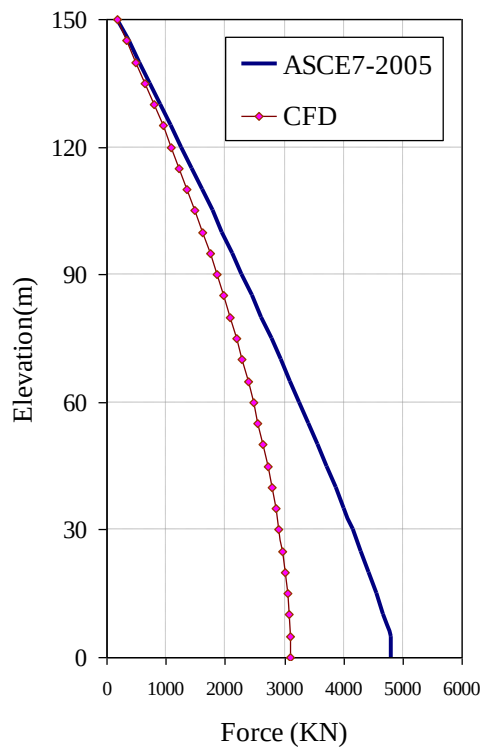


Fig.A.95. Case No. B\_1.5\_1\_150\_T2 (shear force and overturning moment)

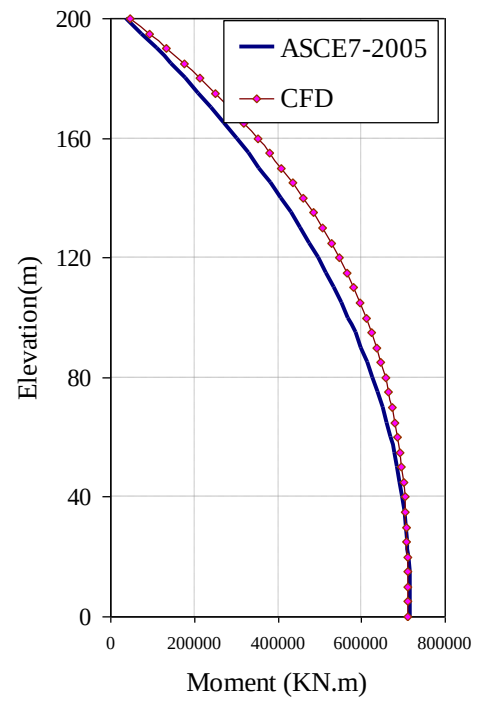
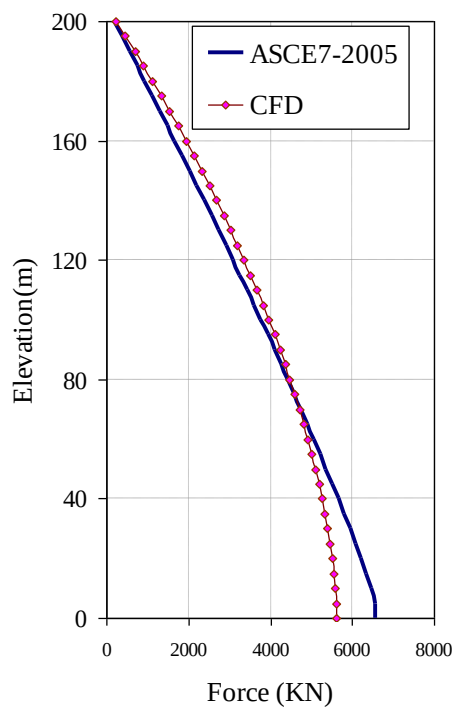


Fig.A.96. Case No. B\_1.5\_1\_200\_T1 (shear force and overturning moment)

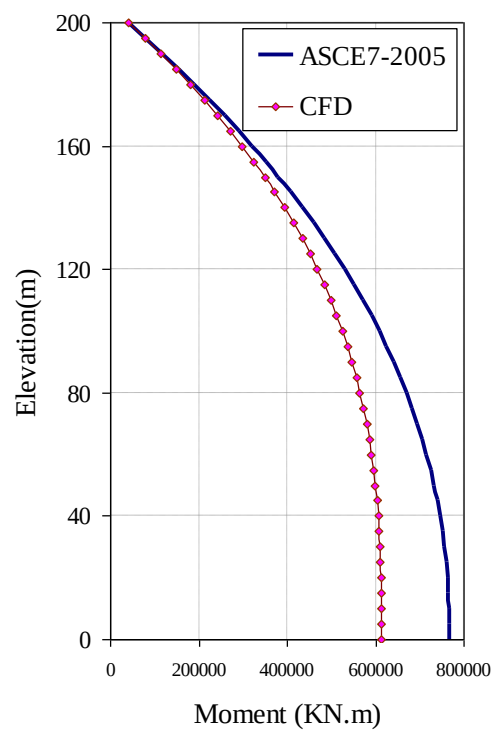
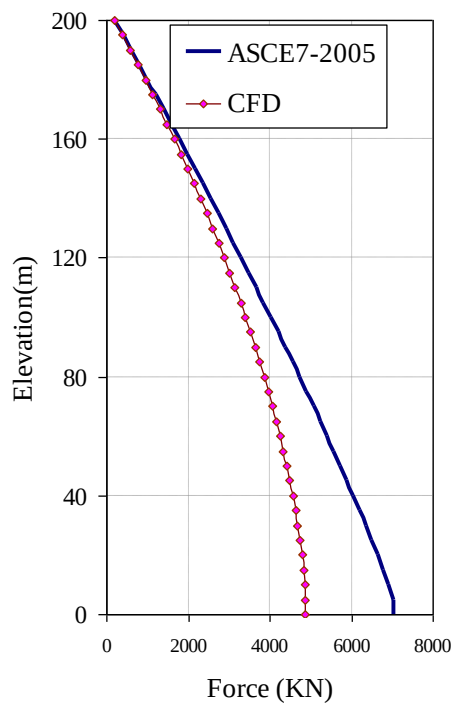


Fig.A.97. Case No. B\_1.5\_1\_200\_T2 (shear force and overturning moment)

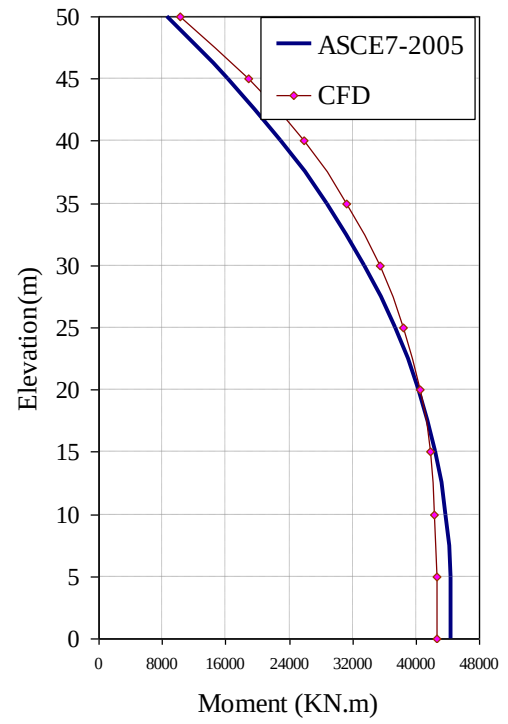
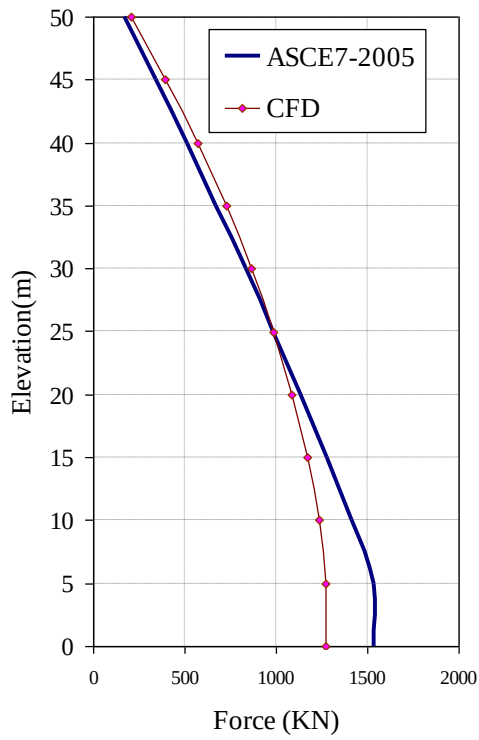


Fig.A.98. Case No. B\_2\_1\_50\_T1 (shear force and overturning moment)

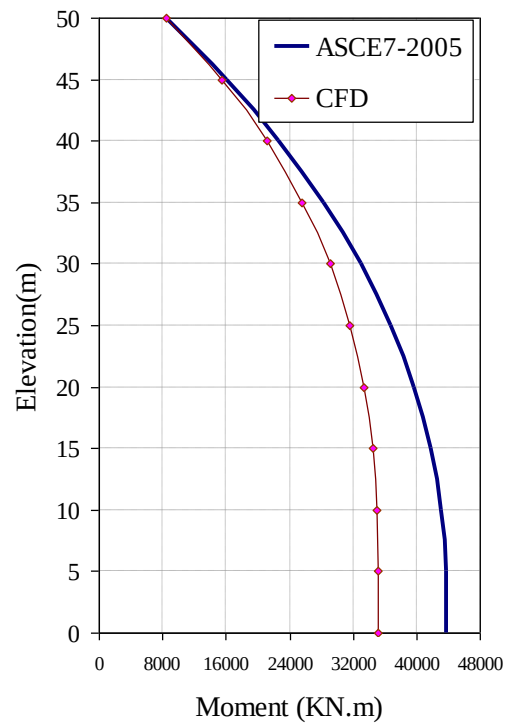
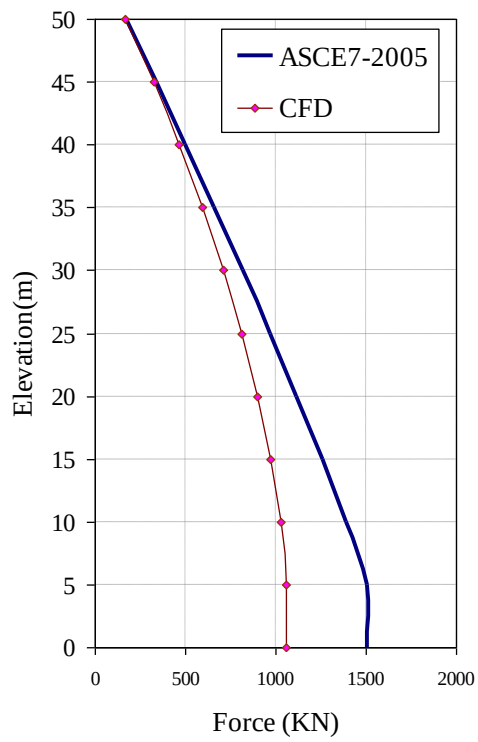


Fig.A.99. Case No. B\_2\_1\_50\_T2 (shear force and overturning moment)

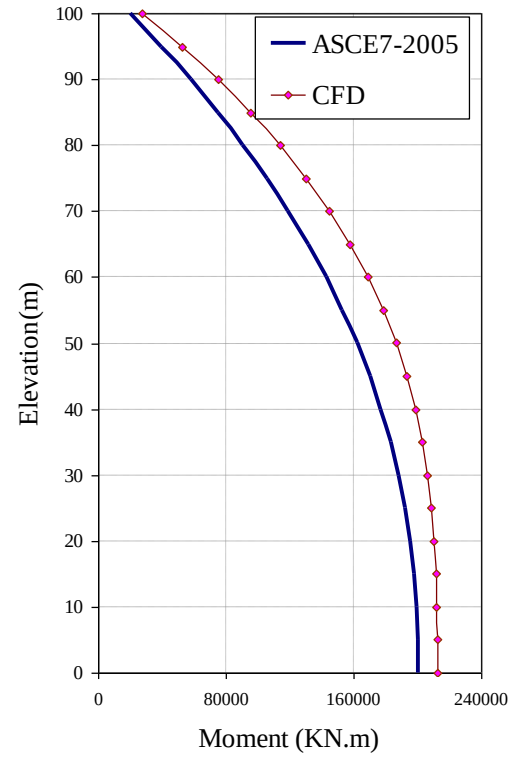
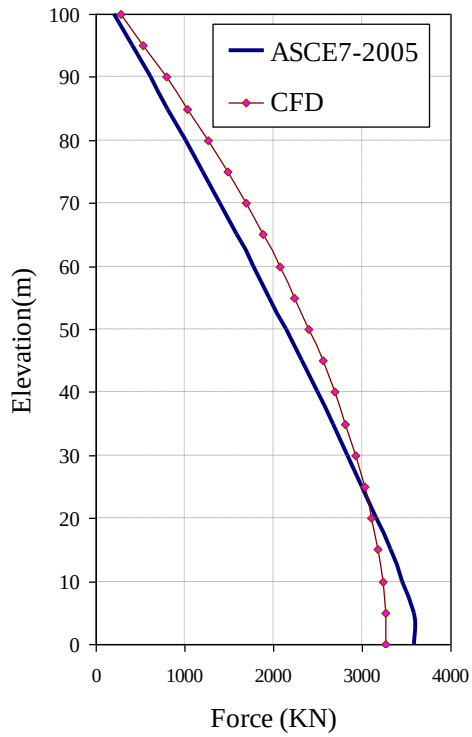


Fig.A.100. Case No. B\_2\_1\_100\_T1 (shear force and overturning moment)

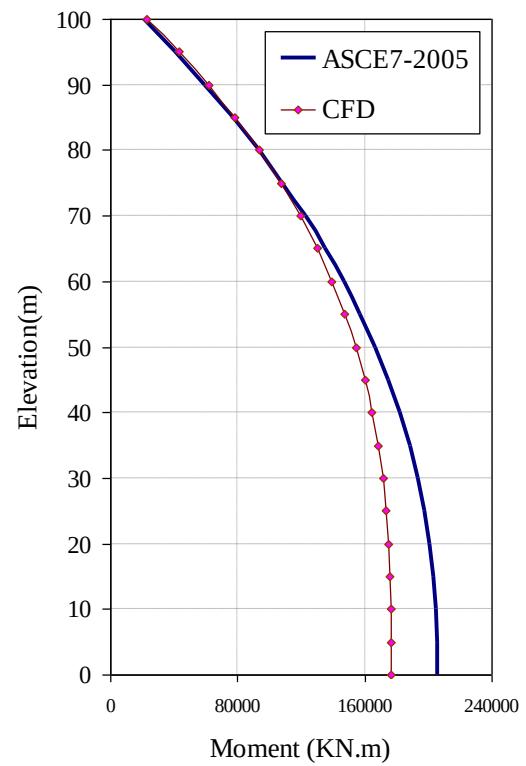
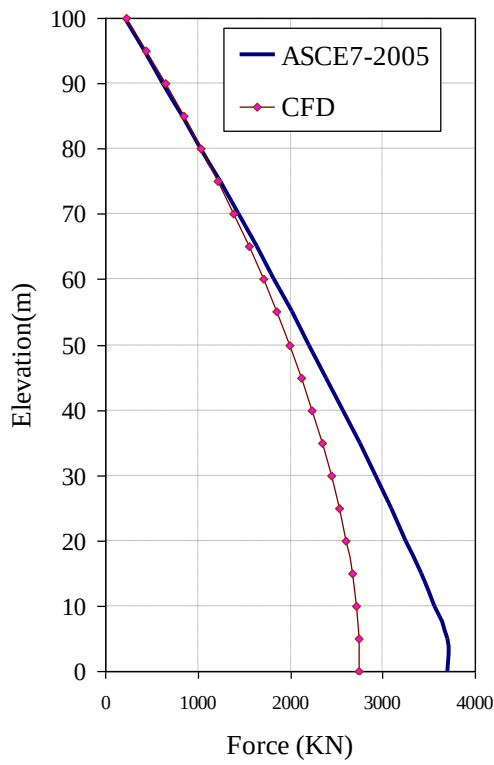


Fig.A.101. Case No. B\_2\_1\_100\_T2 (shear force and overturning moment)

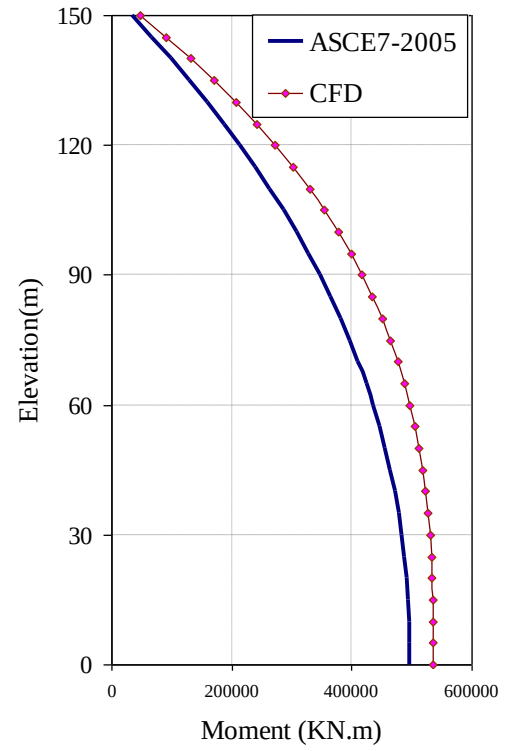
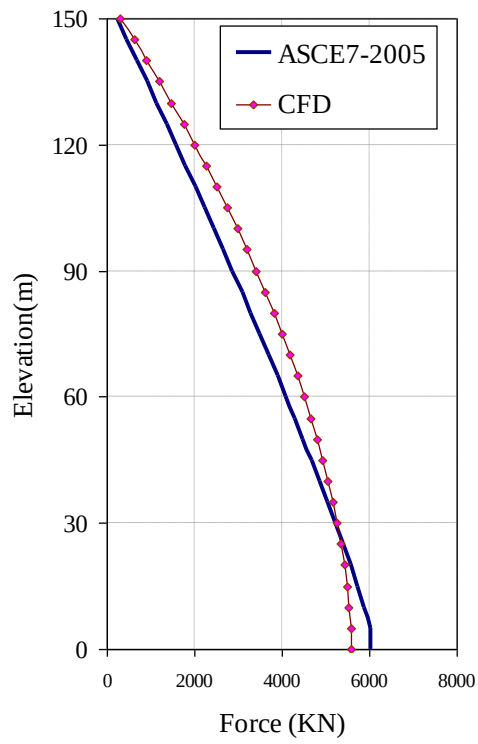


Fig.A.102. Case No. B\_2\_1\_150\_T1 (shear force and overturning moment)

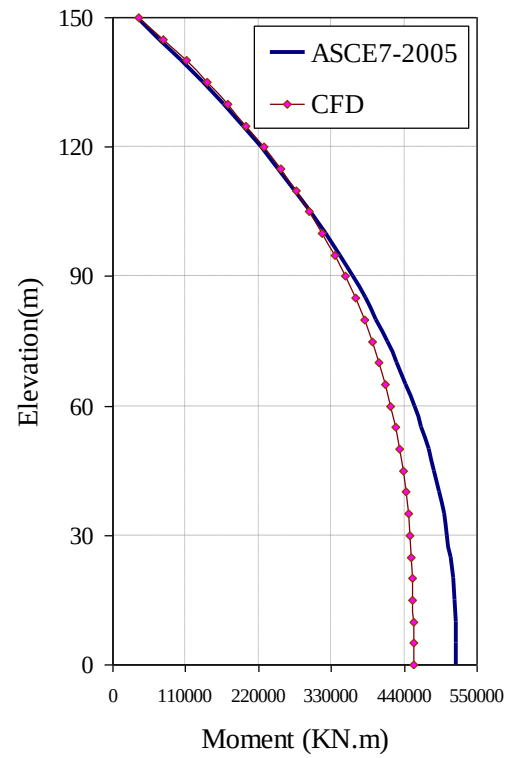
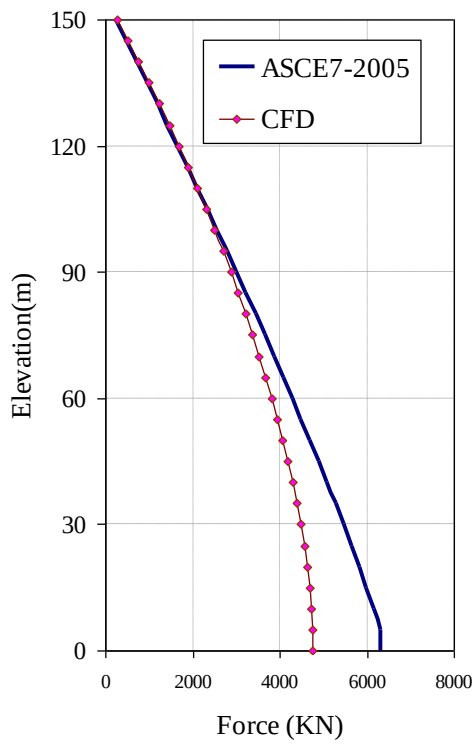


Fig.A.103. Case No. B\_2\_1\_150\_T2 (shear force and overturning moment)

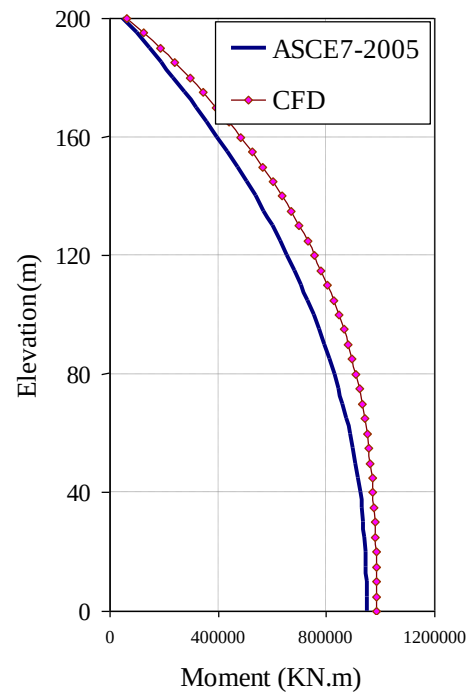
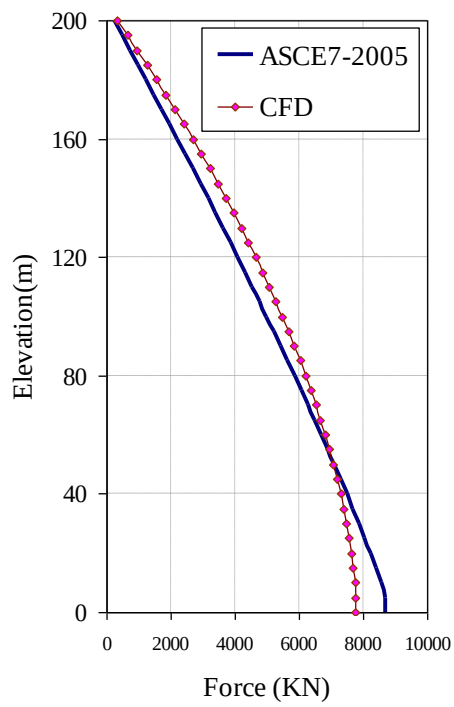


Fig.A.104. Case No. B\_2\_1\_200\_T1 (shear force and overturning moment)

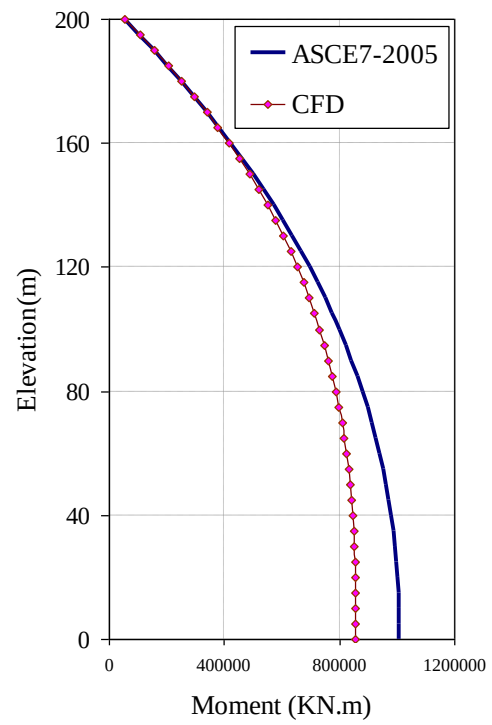
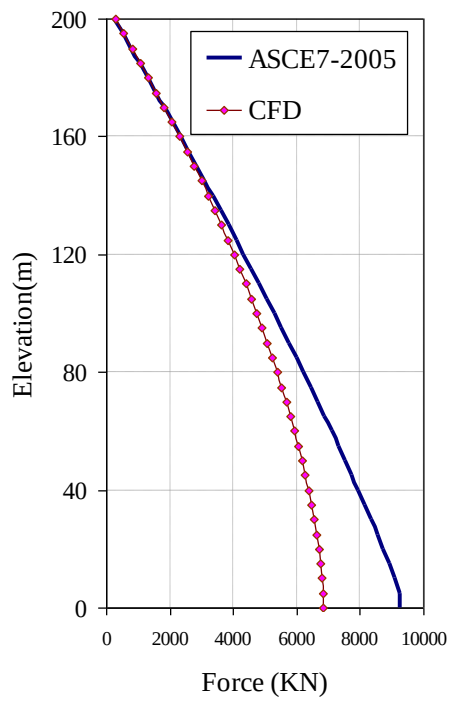


Fig.A.105. Case No. B\_2\_1\_200\_T2 (shear force and overturning moment)

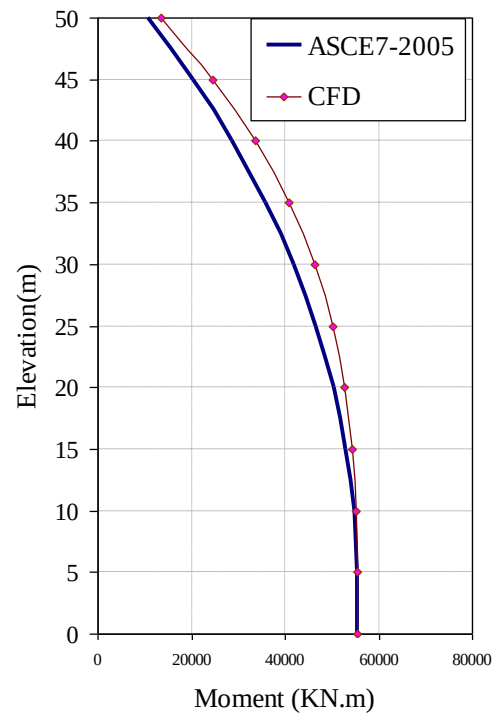
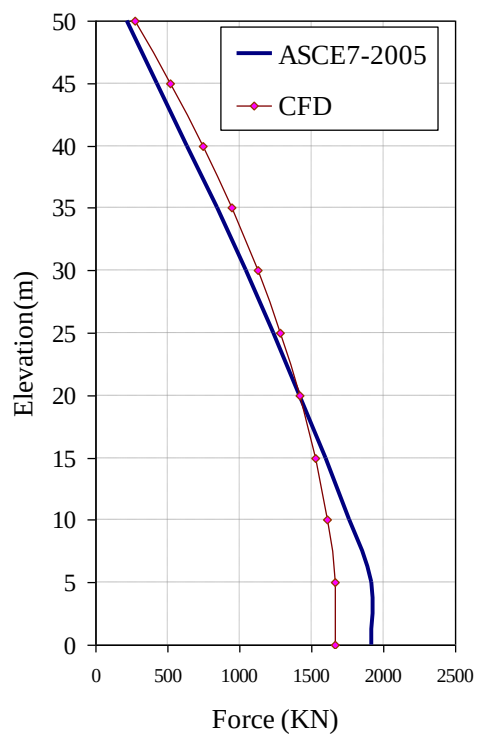


Fig.A.106. Case No. B\_2.5\_1\_50\_T1 (shear force and overturning moment)

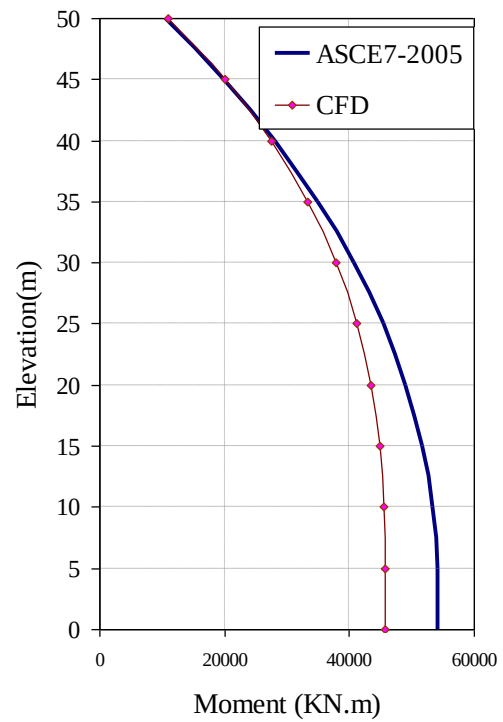
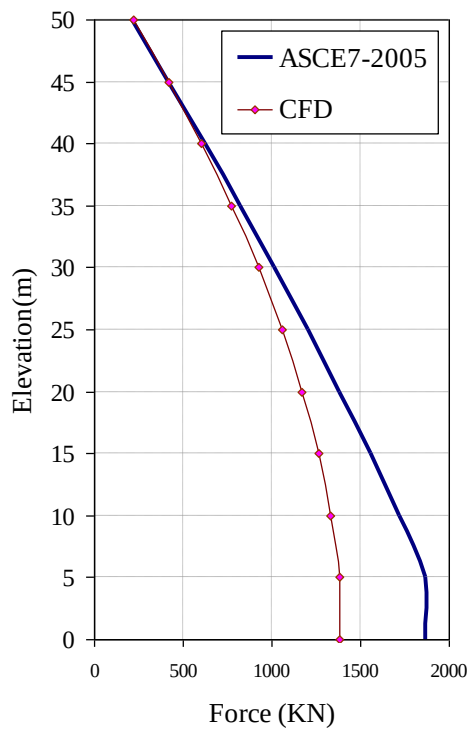


Fig.A.107. Case No. B\_2.5\_1\_50\_T2 (shear force and overturning moment)

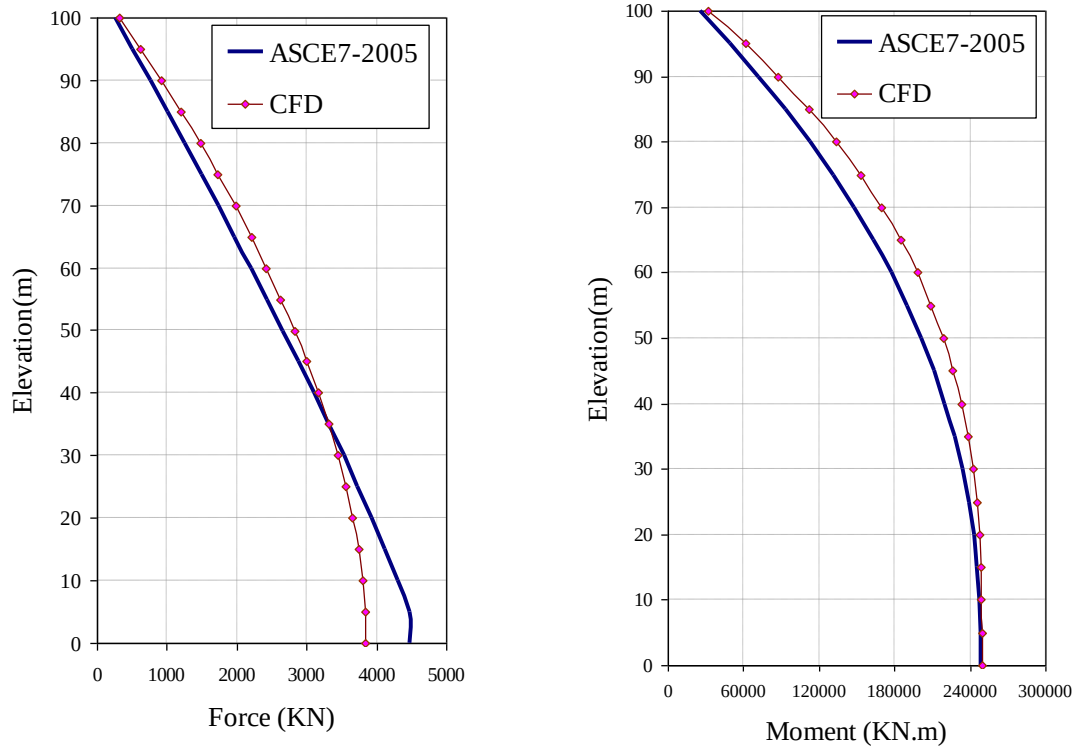


Fig.A.108. Case No. B\_2.5\_1\_100\_T1 (shear force and overturning moment)

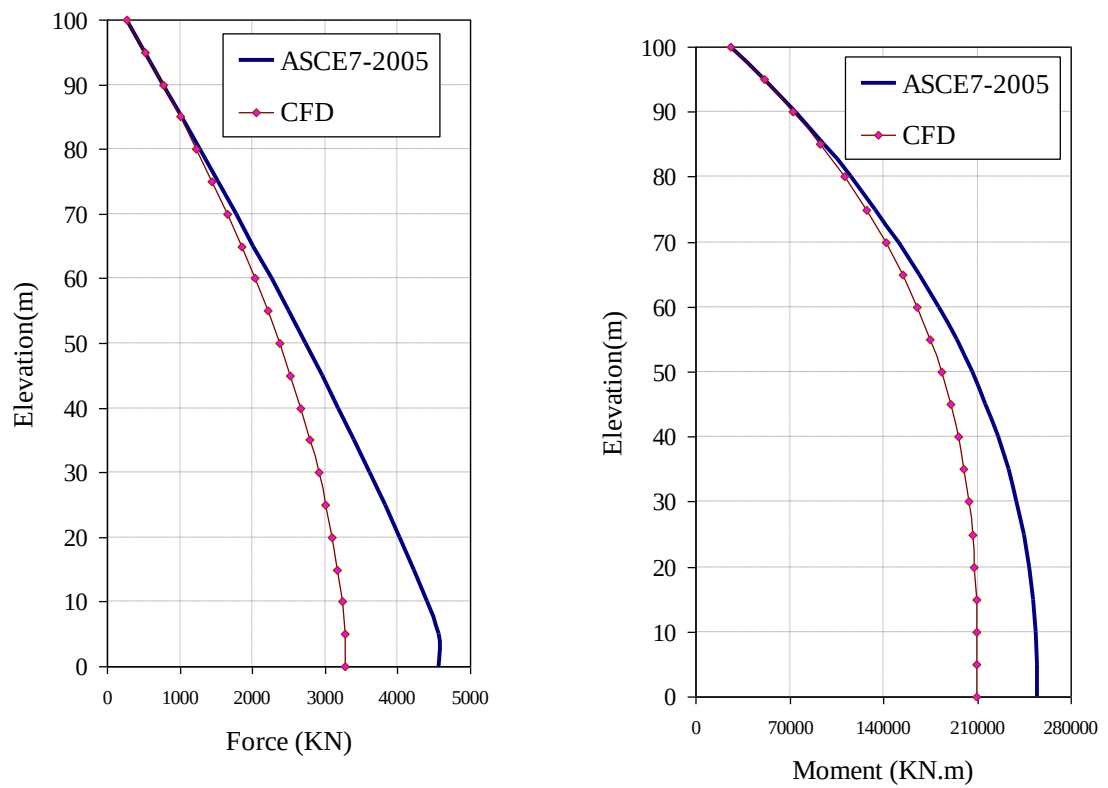


Fig.A.109. Case No. B\_2.5\_1\_100\_T2 (shear force and overturning moment)



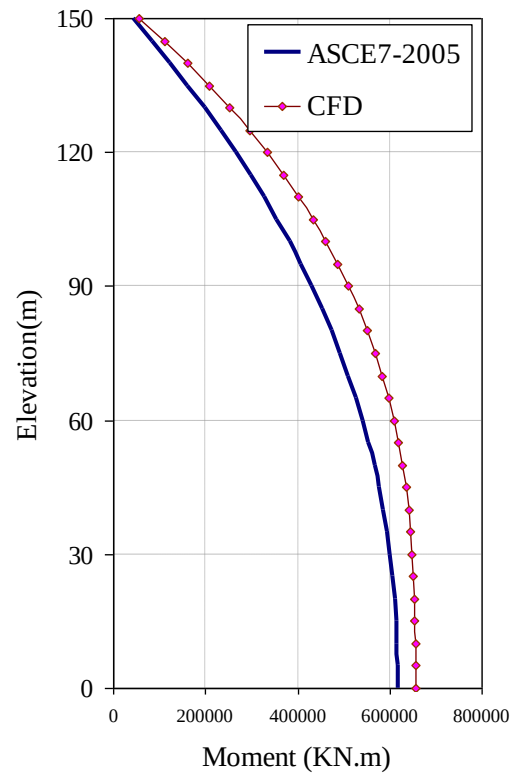
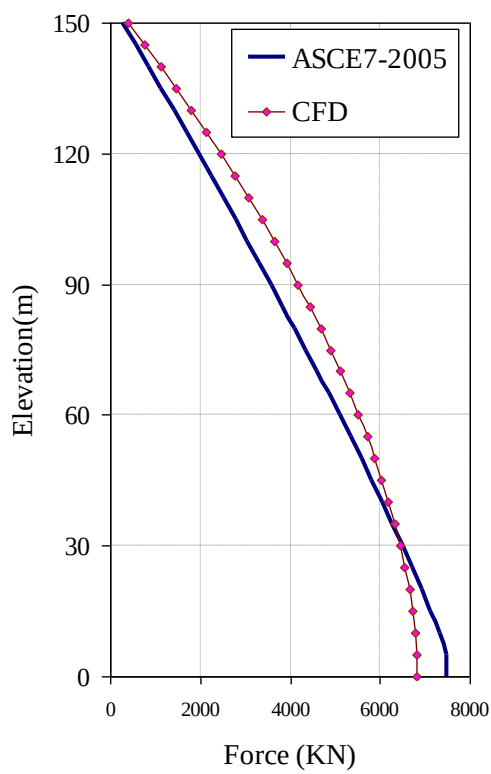


Fig.A.110. Case No. B\_2.5\_1\_150\_T1 (shear force and overturning moment)

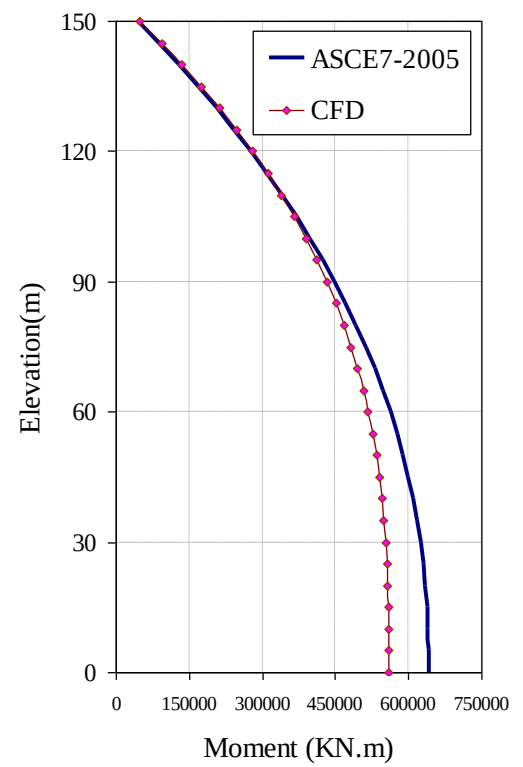
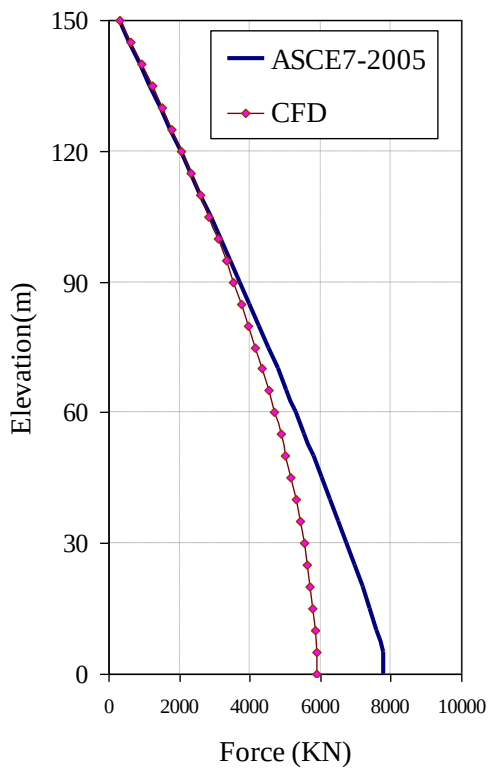


Fig.A.111. Case No. B\_2.5\_1\_150\_T2 (shear force and overturning moment)

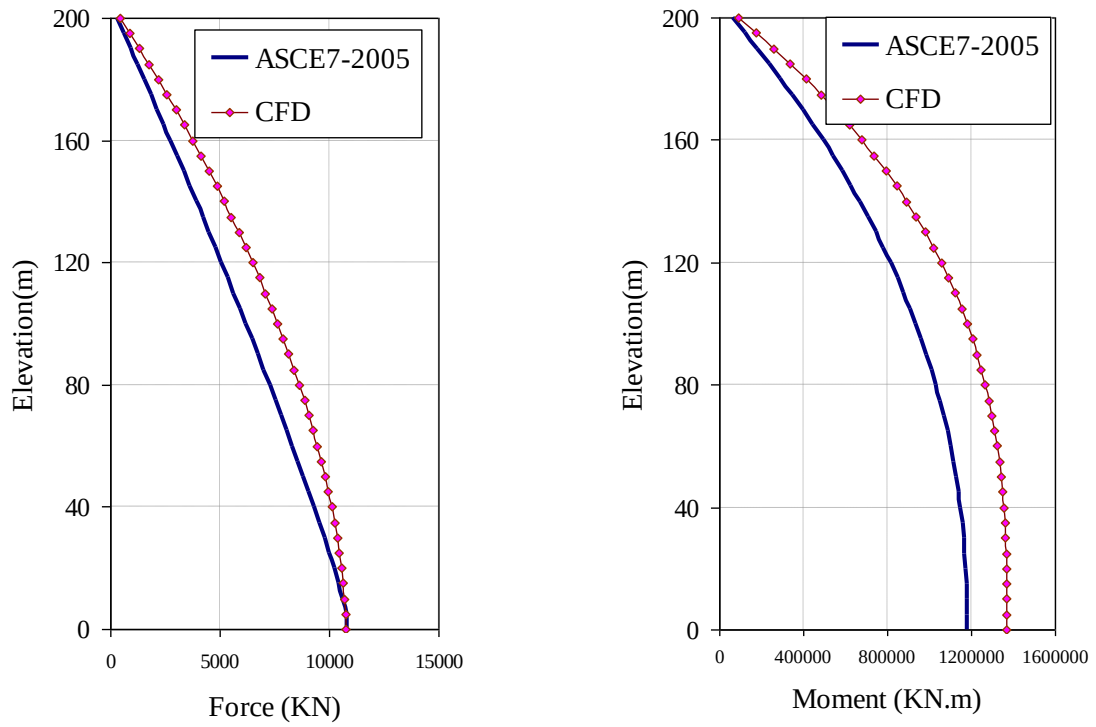


Fig.A.112. Case No. B\_2.5\_1\_200\_T1 (shear force and overturning moment)

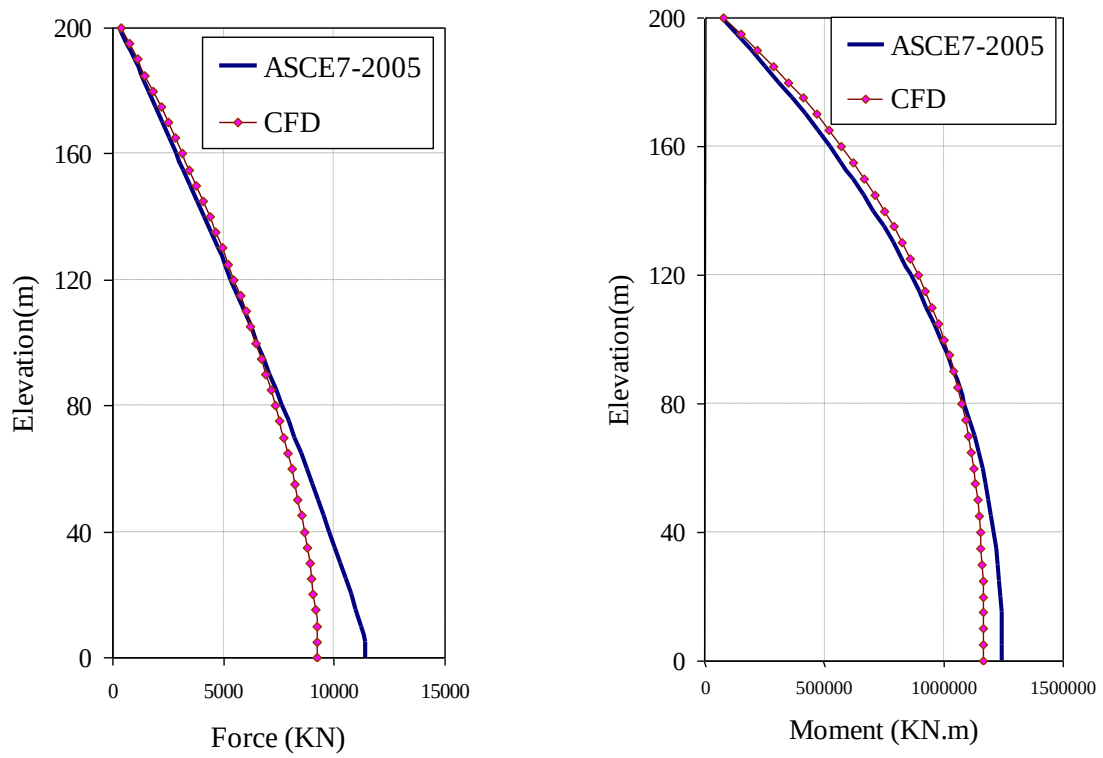


Fig.A.113. Case No. B\_2.5\_1\_200\_T2 (shear force and overturning moment)