

1.0 Introduction

Wood piling has been used to support heavy loads for centuries. Prehistoric man used wood piles that may still be seen in Swiss lakes where the underwater portions of the piles are perfectly preserved. Wood piles have been used continuously in Europe since medieval times. Many of the world's important structures are built on wood piles. These include much of the city of Venice (built in 1000 A.D.), London Bridge, Pont Notre-dame Bridge in Paris, Royal Palace in Amsterdam, Berlin Castle and Opera House, the Washington D.C. post office and the Empire State Building in New York.

Originally, most wood piles were limited to applications below the permanent groundwater level. In the late 1800s the railways in America started using pressure treated creosoted timber piles above the water line. Since that time treated wood piles have been used successfully in trestles, bridges, docks, piers, terminals and foundations for apartments, commercial and industrial buildings. In Canada, it is estimated that over 30,000 m³ of treated wood piling is produced annually.

As with all structural materials, the design and installation of wood piling should be done by those knowledgeable about the material. Geotechnical factors, structural properties, treating requirements and installation procedures must all be taken into account when wood piling is used on a project.

In these environmentally conscious times it makes sense to build with renewable materials. But it is not only for environmental reasons that wood piling makes sense. Advances in both wood treating technology and pile foundation design make treated wood piles a good choice for durable, strong and economical deep foundations.

Table of Contents

1.0	Introduction	1
2.0	Design of Piles	3
2.1	Introduction	3
2.2	Geotechnical Considerations	5
2.3	Structural Design	15
2.4	Wood Pile Design Calculation	25
3.0	Protection of Piles	29
3.1	Decay Mechanisms	29
3.2	Wood Protection	33
3.3	Environmental Considerations	39
4.0	Field Procedures	41
4.1	Driving	41
4.2	Static Testing	46
4.3	Field Treating	49
5.0	Specifying Wood Piles	51
5.1	Pile Foundations, General	51
5.2	Static Pile Tests	59
5.3	Wood Piles	63
6.0	Wood Pile Case Study	67
	Bibliography	71