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# CHAPTER 7

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## EARTH-RETAINING STRUCTURES

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INTRODUCTION	7.2
TYPES OF RETAINING STRUCTURES	7.3
Steel Sheet Piling	7.3
Slide Rail Systems	7.5
Soldier Pile Walls with Horizontal Lagging	7.7
Micropile Walls	7.9
<i>Advantages and Limitations</i>	7.11
<i>Types of Micropile Walls</i>	7.11
<i>Equipment and Materials</i>	7.11
<i>Installation Procedures</i>	7.11
Secant Pile Walls	7.12
<i>Advantages and Limitations</i>	7.12
<i>Construction Sequence</i>	7.13
<i>Types of Secant Pile Walls</i>	7.13
<i>Equipment</i>	7.14
<i>Concrete Mix Design</i>	7.14
<i>Wall Construction Methods</i>	7.14
<i>Quality-Control Measures</i>	7.15
Deep Soil Mix Walls	7.16
<i>Advantages and Limitations.</i>	7.16
<i>Equipment</i>	7.17
<i>Soil-Cement Mix Design</i>	7.18
<i>Wall Construction Method</i>	7.18
<i>Quality Control</i>	7.18
Soil Nail Walls	7.19
<i>Construction Methods</i>	7.20
Vertical Wood Sheeting Walls	7.23
Trench Boxes and Shielding	7.24
Diaphragm Walls	7.26
RETAINING WALL BRACING SYSTEMS	7.29
Wales	7.30
Tiepoint/Thru-Tie Connections	7.30
Internal Bracing	7.32
Tieback Anchor Systems	7.34
Tieback Anchor Tendons	7.34
Drilling for Tieback Anchors	7.36
Grouted Tieback Anchors	7.38
Mechanical Tieback Anchors	7.39
Berms	7.41

<b>FREEZING AND GROUTING</b>	<b>7.41</b>
<b>Ground Freezing</b>	<b>7.42</b>
<i>Advantages and Limitations</i>	<i>7.43</i>
<i>Freezing Method</i>	<i>7.43</i>
<i>Quality Control</i>	<i>7.43</i>
<b>Jet Grouting</b>	<b>7.44</b>
<i>Advantages and Limitations</i>	<i>7.44</i>
<i>Equipment</i>	<i>7.44</i>
<i>Grout Mix Design</i>	<i>7.44</i>
<i>Installation Method</i>	<i>7.45</i>
<i>Quality Control</i>	<i>7.45</i>
<b>EVALUATION OF SITE CONDITIONS</b>	<b>7.46</b>
<b>Topography</b>	<b>7.46</b>
<b>Soil and Groundwater</b>	<b>7.46</b>
<b>Rock</b>	<b>7.47</b>
<b>Adjacent Structures and Utilities</b>	<b>7.47</b>
<b>DESIGN</b>	<b>7.49</b>
<b>Earth-Pressure Theories</b>	<b>7.49</b>
<b>Cantilever Wall Design</b>	<b>7.51</b>
<b>Anchored/Braced Wall Design</b>	<b>7.55</b>
<b>Soldier Pile Design</b>	<b>7.59</b>
<b>Lagging Design</b>	<b>7.60</b>
<b>Steel Sheet Piling Design</b>	<b>7.62</b>
<b>Commonly Used Pressure Distributions</b>	<b>7.62</b>
<b>Base Stability</b>	<b>7.65</b>
<b>Moment Reduction</b>	<b>7.66</b>
<b>Allowable Overstress</b>	<b>7.72</b>
<b>Factors of Safety</b>	<b>7.72</b>
<b>Load and Resistance Factor Design</b>	<b>7.73</b>
<b>BIBLIOGRAPHY</b>	<b>7.74</b>

## **INTRODUCTION**

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The purpose of an earth-retaining structure is to create a safe excavation into which a permanent structure can be built or to be the permanent earth-retaining structure itself. This chapter focuses on temporary earth-retaining structures. The type of earth-retaining structure and method of installation are dependent upon many factors: the principal factors being the type of soil encountered, the elevation of groundwater, the depth of excavation supported, the proximity of existing structures that might be affected, and, if more than one system can be used, their relative cost and time required for installation.

Special procedures and equipment have been developed in localized geographical areas to take advantage of local conditions, thus permitting economical installation of retaining structures under those special conditions. Contractors and engineers should be particularly careful in analyzing these special methods to be sure that the conditions at their site will permit them to be used.

Temporary retaining methods can be discussed as two separate items: the structure in contact with the soil and the bracing system that holds the structure in place. Shallow excavations may allow cantilevered construction; deeper excavations will require some form of lateral support or bracing. There are also methods such as freezing and grouting, which change the soil into structural elements and can often be designated as self-supporting systems.