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| **IGCSE Geography - Protecting the Coastline – Hard & Soft Engineering Approaches** |

**Part 1 – Hard Engineering Approaches - A technique involving the construction of significant man-made structures to manage the coastline. e.g. sea walls and rock armour. They look artificial but can be constructed from either man-made or naturally occurring materials.**

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| **Image** | **How it works** | **Advantage** | **Disadvantage** |
|  | Groyne: Wooden or stone made barrier aimed at blocking the movement of beach sediment by LSD. Traps sand on the updrift side of the groyne.  | Very effective and preserves beach sediment, therefore protecting tourism economy of seaside resorts like Sitges (Spain).  | They don’t look very natural and can make the beach very difficult to travel over. They cost a lot of money, for example €230,000 per wooden groyne. Wood decays over time and so many places are moving to boulders.  |
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**Part 2 – Soft Engineering Approaches - A technique involving the construction of more environmentally friendly, less damaging, and arguably more sustainable management solutions. e.g. beach nourishment or managed retreat**

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| **Image** | **How it works** | **Advantage** | **Disadvantage** |
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