

# TIMBER PILE REHABILITATION USING CARBON FIBER REINFORCEMENT

PORTLAND, OR



## Project Background:

A residential complex comprised of six apartment buildings, was experiencing structural challenges due to deteriorating timber piles supporting the structures. The buildings, situated on a steep hillside, relied on these piles for foundational stability. Over time, environmental factors led to significant degradation of the timber, necessitating an effective and efficient rehabilitation solution.

## Challenges:

- **Deterioration of Timber Piles:** The timber piles exhibited extensive rot and cross-sectional loss, compromising their load-bearing capacity.
- **Access Constraints:** The steep hillside location posed logistical challenges for conventional repair methods, requiring a minimally invasive approach.



## Solution:

After a thorough assessment, Carbon Fiber Reinforced Polymer (CFRP) was selected for the rehabilitation due to its high strength-to-weight ratio and adaptability in reinforcing timber structures. SRS developed a detailed repair plan utilizing CFRP to restore the piles' structural integrity while ensuring minimal disruption to the site.

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# CARBON FIBER STRENGTHENING SYSTEMS



## The Repair Process

- **Surface Preparation:** The deteriorated areas of the timber piles were carefully removed to eliminate all rotted material, ensuring a stable base for repairs.
- **Wood Preservative Treatment:** The exposed timber was treated with a specialized wood preservative to prevent future decay and enhance durability.
- **Epoxy Grouting:** Deteriorated sections were filled with SRS-2000 Structural Epoxy Paste, to restore the original geometry and provide a solid substrate for the CFRP application.
- **CFRP Wrapping:** Bidirectional carbon fiber wraps (SRS-660BI) were applied over the epoxy-filled piles, significantly improving strength and durability.



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## CASE STUDY

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## Results

The CFRP reinforcement effectively restored the structural integrity of the timber piles, reinstating their load-bearing capacity and extending their service life. This minimally invasive method proved to be both practical and efficient, particularly given the site's challenging topography and environmental conditions.

## Conclusion

This case demonstrates the effectiveness of CFRP in rehabilitating deteriorated timber piles, offering a durable solution that addresses both structural and logistical challenges. The successful application in this project underscores the potential of CFRP in similar structural rehabilitation scenarios.

For more detailed information on this project and other case studies, visit [Structural Reinforcement Solutions CFRP Case Study Gallery](#).

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