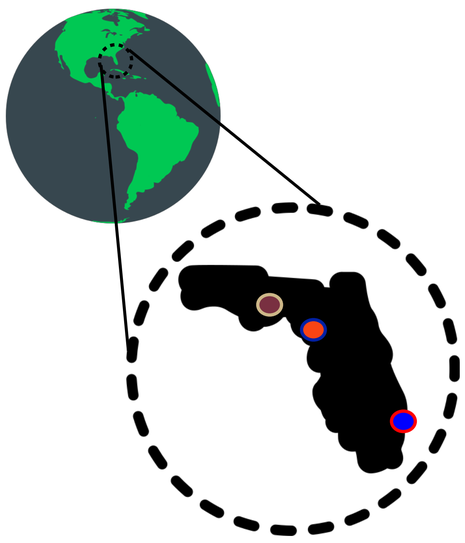
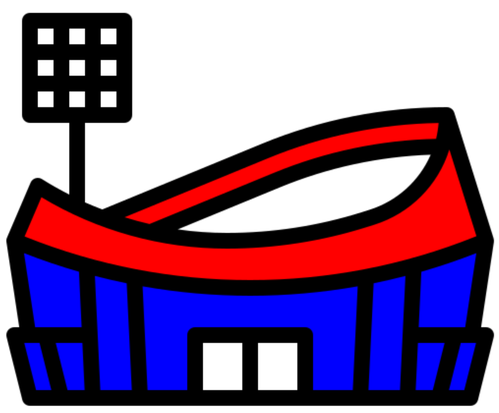
Visualizing Structural Integrity: A Flowchart Approach to Stadium Maintenance

The Second International Conference on Durability, Repair and Maintenance of Structures

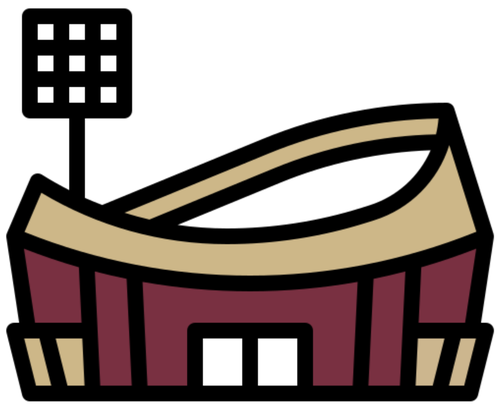
- Patrick St. Louis, 2025



Some Examples of Steel Stadiums within the Coastal State of Florida



FAU Stadium:
Located at Florida Atlantic University, this stadium uses 1,116 tons of structural steel for the press tower and scoreboard, and 1,800 tons of structural steel for the bleacher systems with a capacity of 30,000 seats.



Doak Campbell Stadium:
Located at Florida State University, this stadium is the second-largest in the Atlantic Coast Conference and features a brick façade with substantial steel that support a current seating capacity of 79,560.

Ben Hill Griffin Stadium:
Also known as “The Swamp,” located on the campus of the University of Florida. The use of steel has been crucial in various expansions and renovations over the years, allowing the stadium to accommodate 88,548 seats.

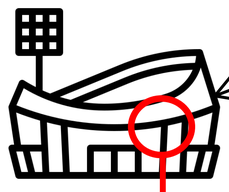
Steel is a popular choice due to its strength, durability, and flexibility in design. Localized or micro-environment conditions must be well understood for the ultimate durability of the design of a **Steel Stadium.**

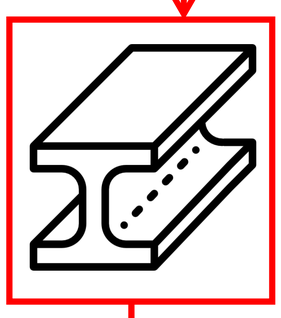
Protective Coatings *design and other strategies can prevent and treat steel corrosion.*

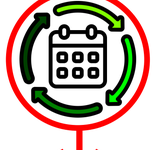
Football stadiums on college campuses serve as vibrant hubs of community spirit, fostering school pride and providing a central venue for students, alumni, and fans to come together and celebrate their shared passion for the sport **thus the importance of regular maintenance for the longevity and safety of these stadiums and their steel structures.**

After the Stadium Grand Opening:
Proactive Inspections Recommend - *for example an estimated time to walk and inspect a 50,000-seat stadium* can vary depending on the thoroughness, focus of the inspection and the specific areas being checked. On average, a comprehensive inspection might take 4 to 6 hours for reviewing **structural elements: Examining the stadium’s structural integrity, including walls, beams, and supports for signs of deterioration and corrosion.**

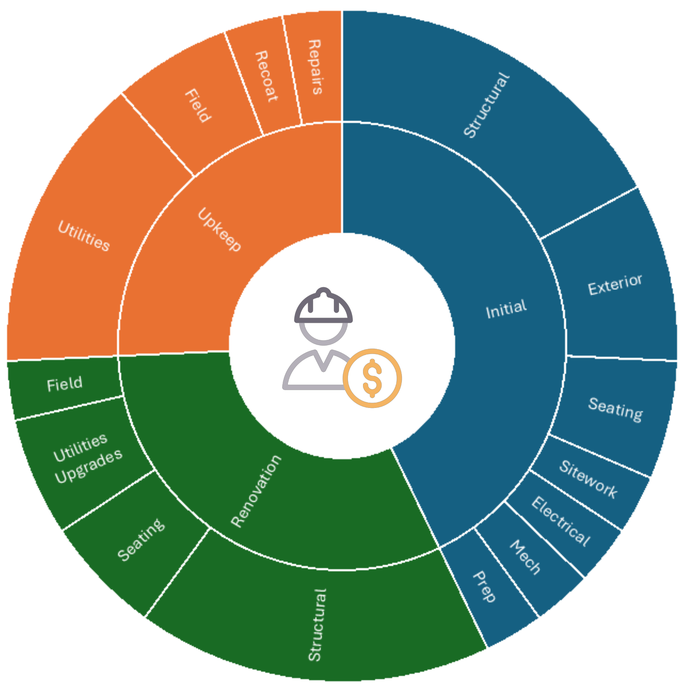
Collaboration with architects, engineers, and facility managers ideal to ensure a cohesive maintenance strategy.



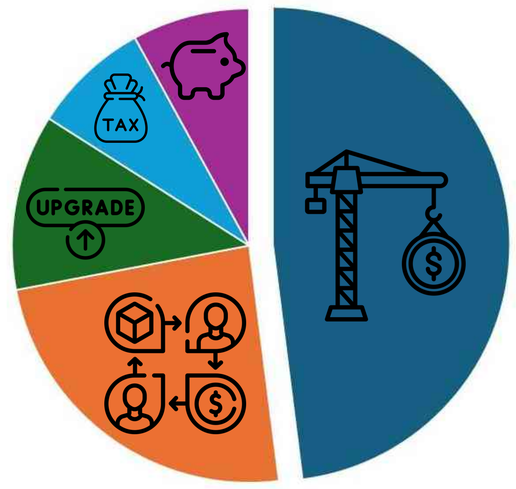




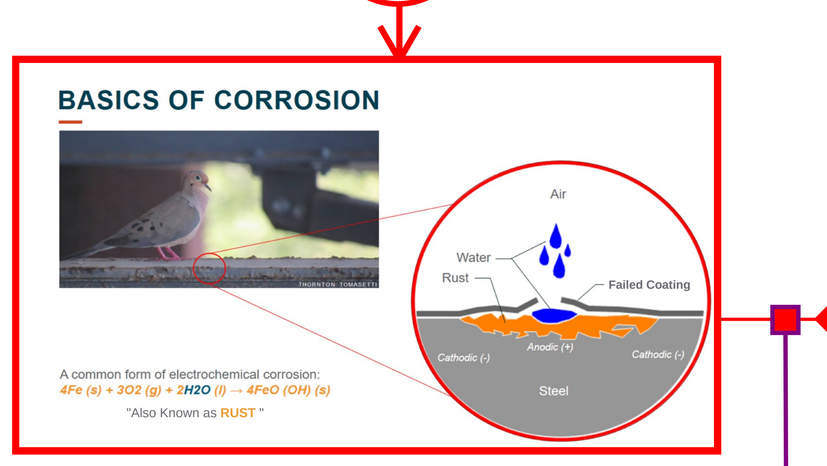
Estimated Life Cycle Costs of the Average 50,000 Seat Outdoor Stadium in a Coastal Climate

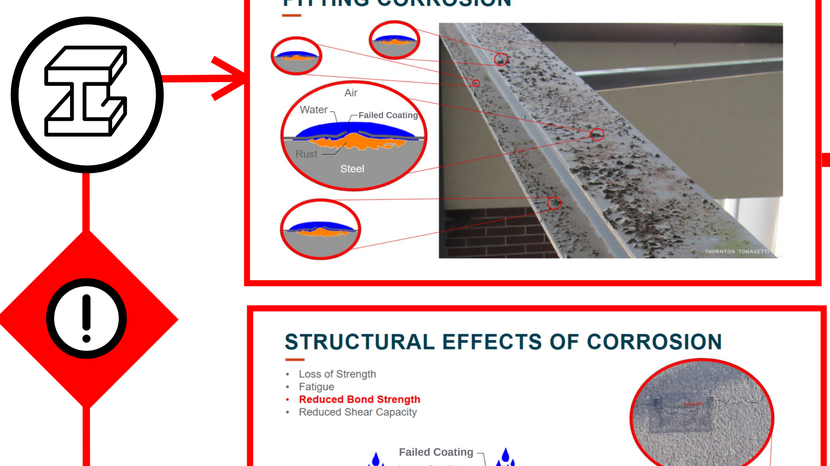


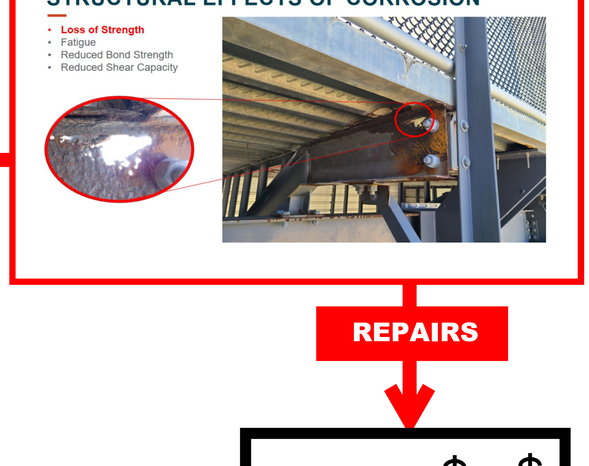
The life cycle costs of a 50,000-seat outdoor stadium are significant, with **structural construction** expenses from initial construction alone accounts for 50-60% throughout the milestones of a stadium life cycle. These costs encompass initial building expenses, materials, labor, and site preparation. ***To safeguard this substantial investment, proactive maintenance is essential, ensuring the longevity and optimal performance of the stadium.***

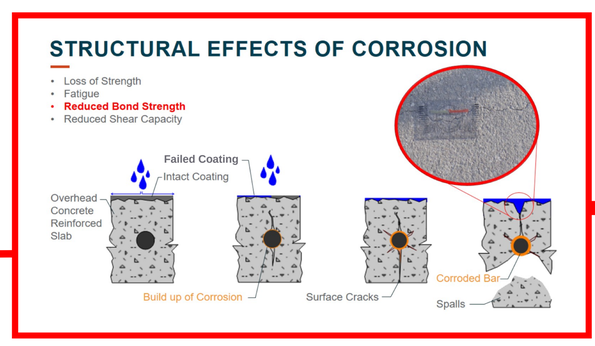


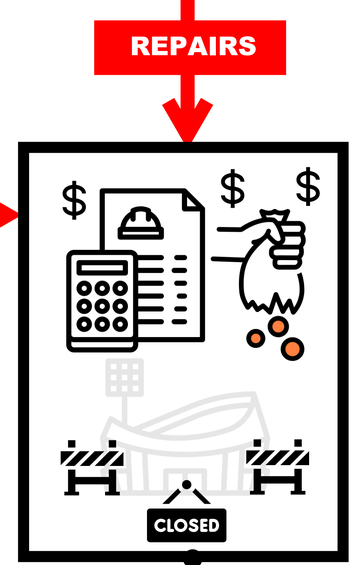
Major costs allocated over the life cycle of a stadium to keep the stadium functional. **Construction Costs - Maintenance & Operations - Renovations & Upgrades - Insurance & Taxes - Contingency Fund**

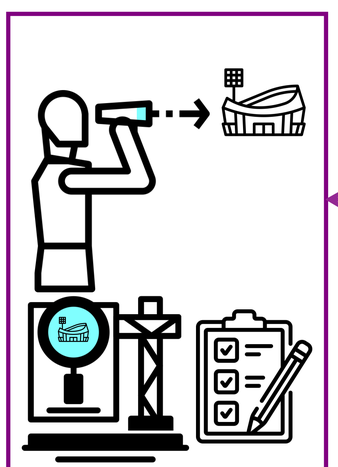












~ Environmental Considerations ~

Sustainable eco-friendly cleaning products and recycling materials.
Energy - efficient systems within the stadium.
Use of technology to detect issues early.
Maintenance management software to schedule and track activities.

Investment of AI Drone flight, remote sensing technologies in structural health monitoring (SHM) and other methodologies as **proactive measures, can significantly extend the lifespan of a steel structure, potentially adding 10-20 years to its service life.** This not only helps in avoiding costly replacements but also ensures the structure remains safe and functional.

Source: “Remote Sensing in Structural Health Monitoring” by Yang Yang

Traditional Method

Drone Method

Non-destructive evaluation (NDE) methods that assess and provide real-time information for mitigating hazards to develop effective rehabilitation strategies.

Sources : “Structural Durability & Health Monitoring” by Various

Thornton Tomasetti