Prefabricated High-Strength Rebar Systems with High-Performance Concrete for Accelerated Construction of Nuclear Concrete Structures

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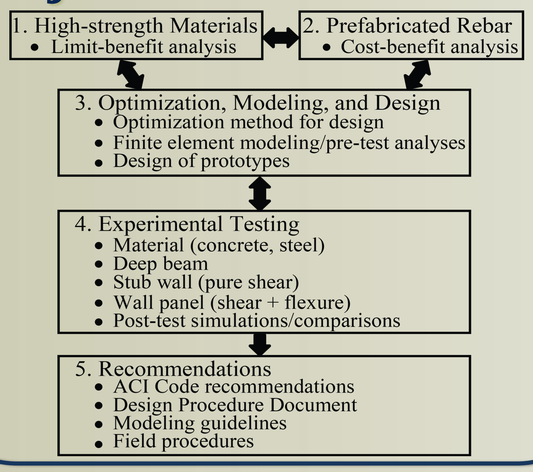
Primary Objectives

Reduce field construction times and fabrication costs of reinforced concrete nuclear structures through:

1) **High-strength reinforcing steel bars (rebar)**
2) **Prefabricated rebar assemblies, including headed anchorages**
3) **High-strength concrete**

Project Tasks

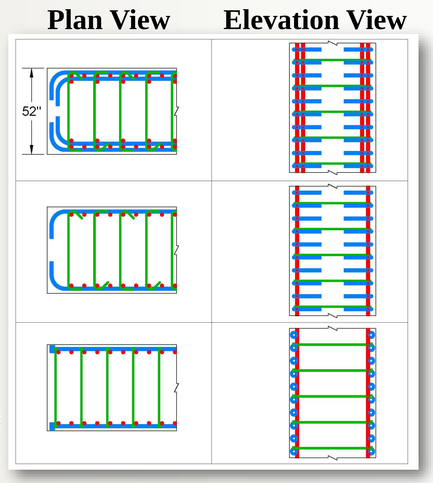


Potential Benefits

Most Congested (current) — **Multiple layers of hooked conventional bars**

Fewer layers of hooked high-strength bars

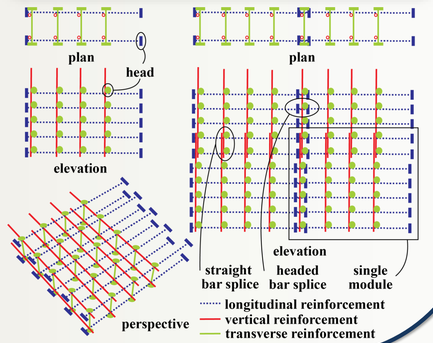
Least Congested (envisioned) — **Fewer layers of headed high-strength bars**



Development of prefabricated rebar assemblies for:

1) **Transportability**
2) **Lift-ability**
3) **Modularity**

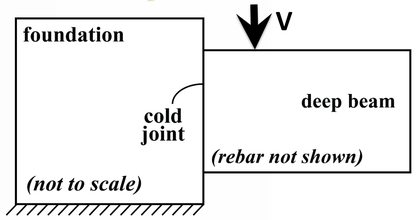
towards reduced field construction times & enhances quality control



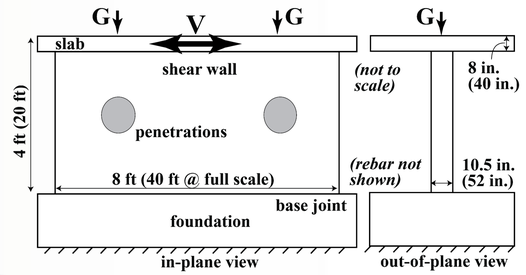
Experimental Testing

Material Tests

Deep Beam Tests

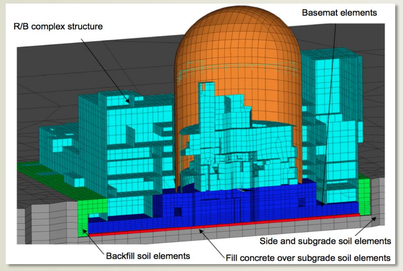


Wall Panel Tests



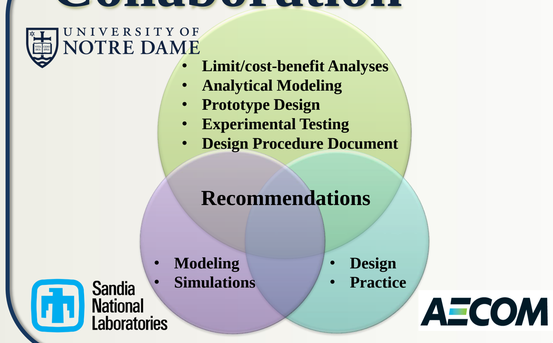
Scope

- **Explore effectiveness, code conformity, and viability of existing high-strength materials**
- **Focus on shear walls (ACI 349) – most common lateral load resisting members in nuclear structures (pressure vessels not in scope)**
- **Aim to reduce complexities in rebar to improve construction quality and ease of inspection**



US-APWR Design Control Doc.

Collaboration



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