

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

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Project Objective

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

- 1) High-strength rebar
- 2) Prefabricated rebar assemblies, including headed anchorages
- 3) High-strength concrete

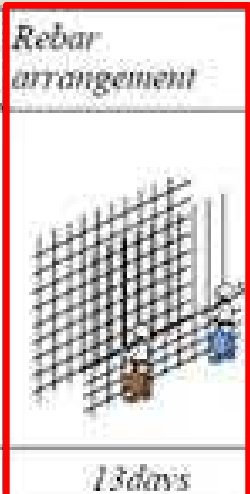

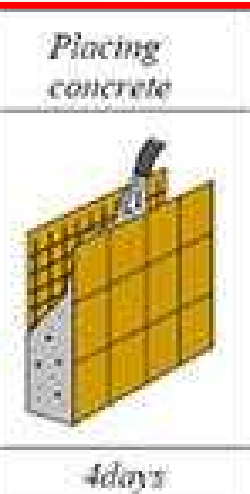
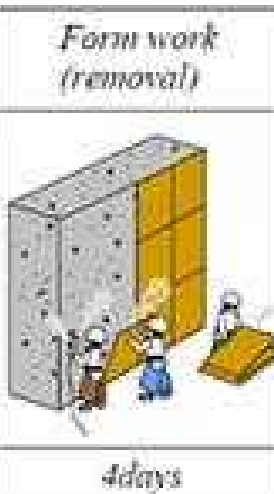
Work Structure	Rebar arrangement	Form work (assembling)	Placing concrete	Form work (removal)
RC		<i>Wooden form</i> 		
28days	13days	7days	4days	4days

Figure From:
MPR-2610 Rev 2
Sept. 2004



Project Tasks

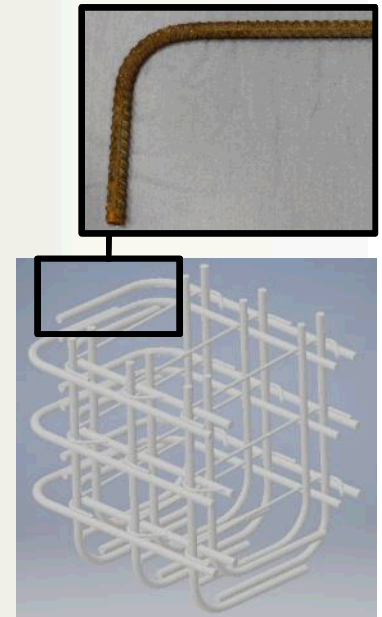
1. Evaluation of High-Strength Materials
2. Evaluation of Prefabricated Rebar Cages
3. Optimization, Modeling, and Design
4. Experimental Testing
5. Design/Modeling/Construction Recommendations

Prefabricated Rebar

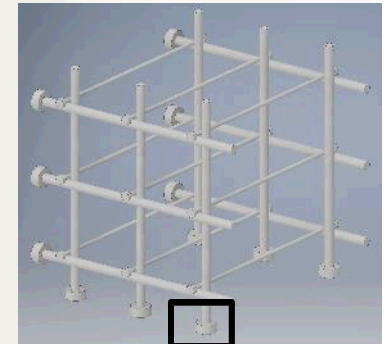
- Evaluating prefabricated rebar systems for:
 - transportability
 - liftability
 - modularity

**Most Congested
(current)**

*Multiple layers
of hooked
Grade 60 bars*



*Fewer layers
of headed high-
strength bars*



**Least Congested
(envisioned)**



Prefabricated Rebar Industry Survey

- Survey developed for designers, general contractors, and rebar fabricators to:
 - 1) Build the framework for a cost-benefit analysis to estimate the construction costs and times for prefabricated rebar systems as compared to erected in-place cages
 - 2) Aid in the selection of parameters for full or near-full scale tests for liftability of proposed prefabricated rebar systems

https://nd.qualtrics.com/jfe/form/SV_06Oku0ziD7iNKT3



**Questions?
Volunteers?**

<http://phsrc-nuclearwalls.nd.edu>

