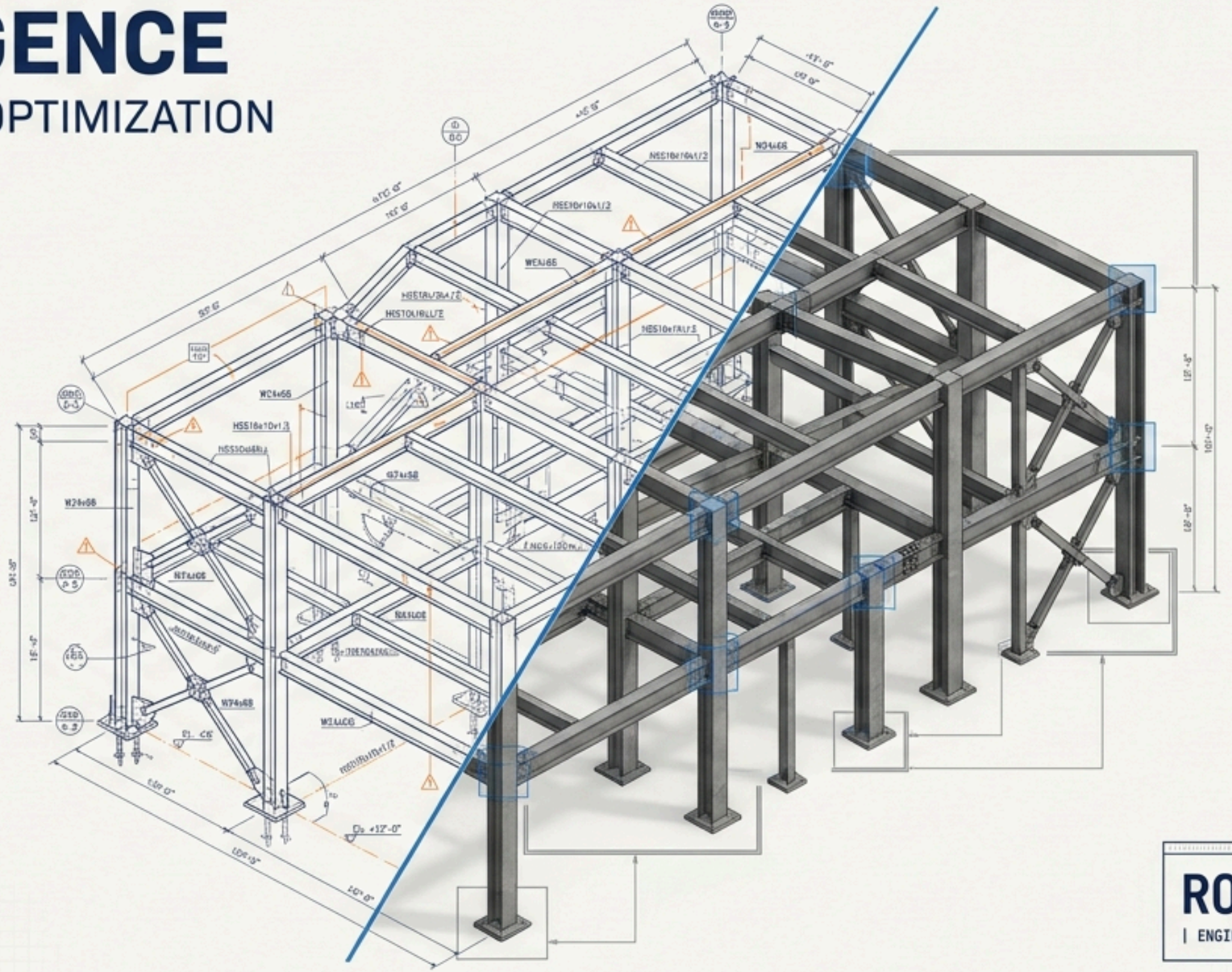
STRUCTURAL EXECUTION INTELLIGENCE

4D AND 5D BIM OPTIMIZATION

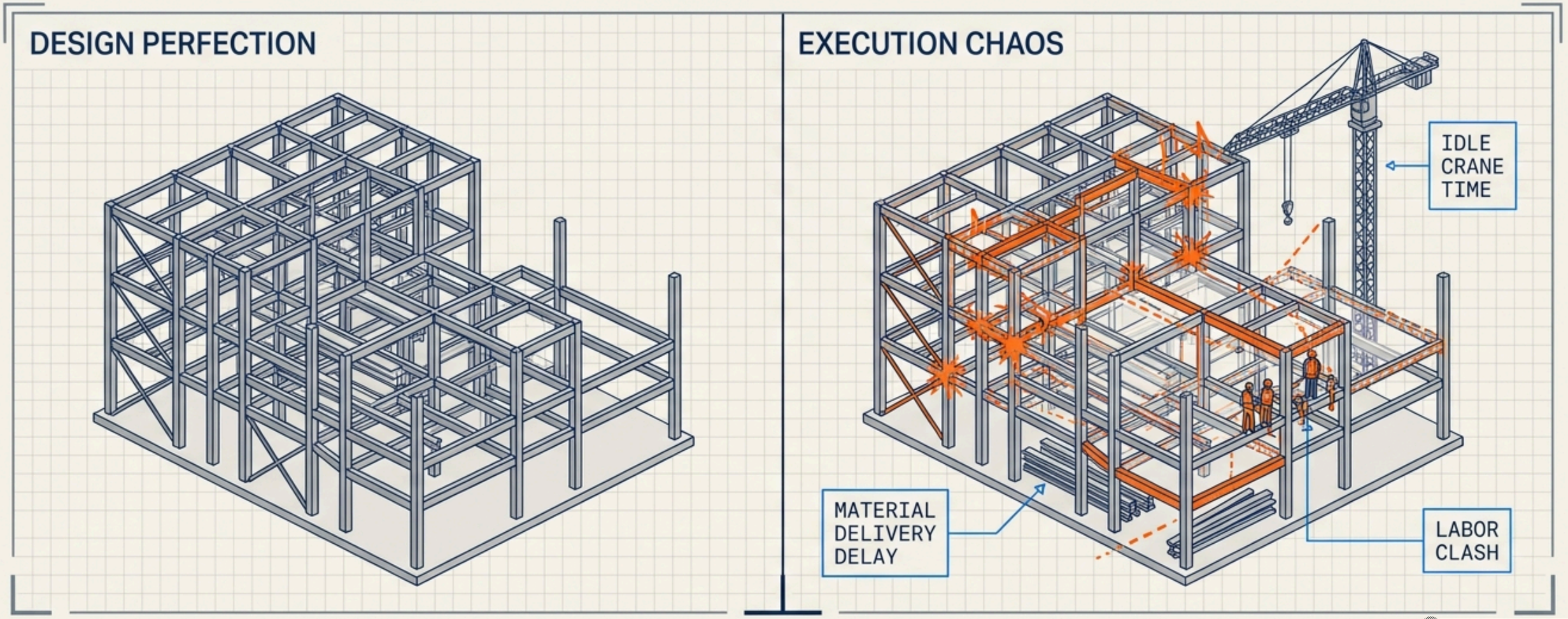


ROOTS BIM LLC

| ENGINEERING INTELLIGENCE | EXECUTION READY |

The Execution Gap: Where Perfect Models Fail

In structural construction, the greatest inefficiencies rarely originate from design errors. They emerge from poorly coordinated execution. A structurally sound model can still lead to costly delays when material deliveries, crane operations, labor deployment, and installation sequences are not synchronized.

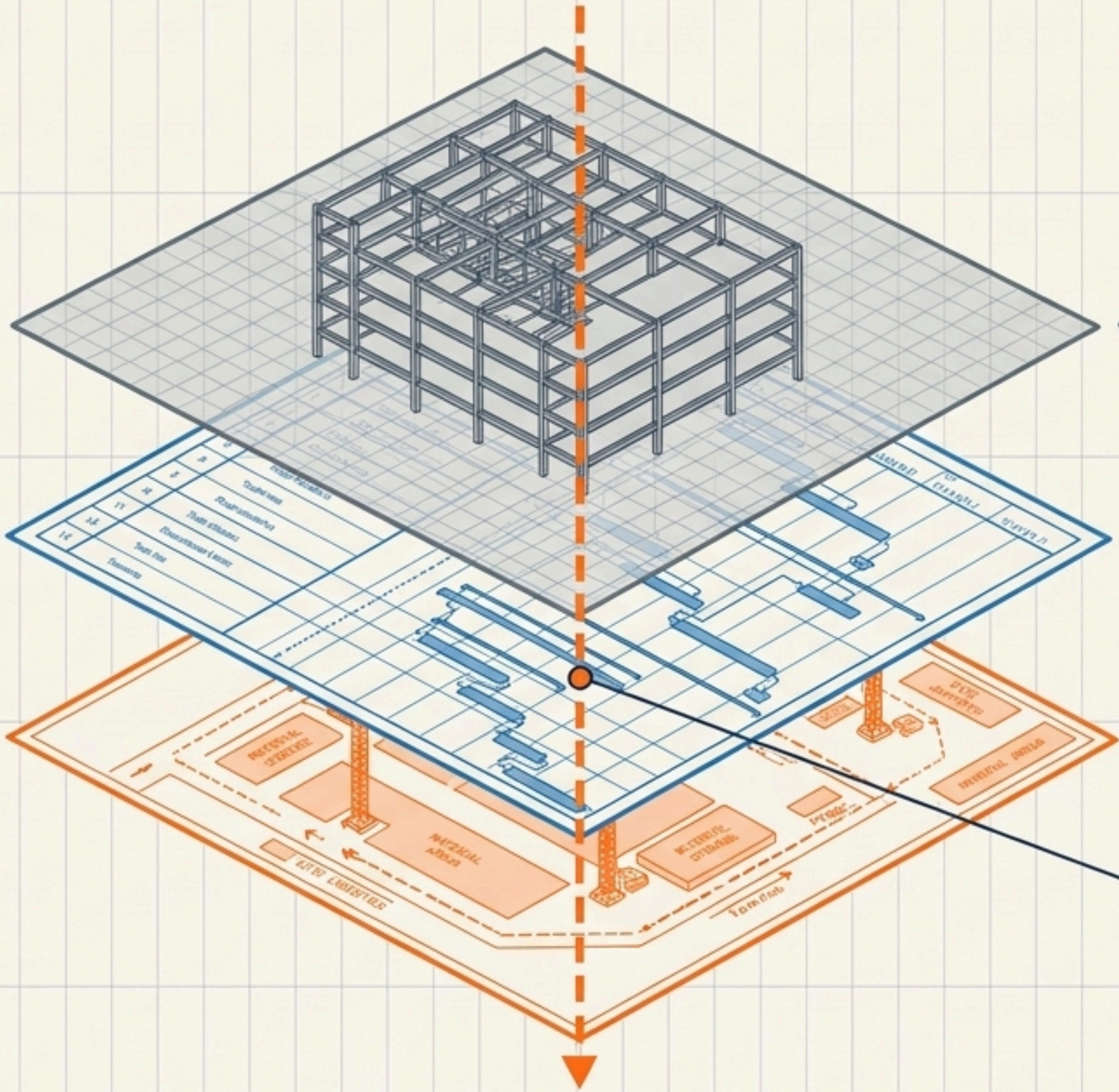


Paradigm Shift: From Siloed Data to Synchronized Systems

	Traditional Scheduling	Execution Intelligence (4D/5D BIM)
Visualization	Schedules exist separately from structural models; real-world impacts are difficult to see.	**Erection sequences are fully visualized before site mobilization.**
Bottleneck Detection	Resource conflicts and logistical clashes discovered reactively during construction.	**Conflicts identified virtually during critical structural activities.**
Financial Control	Separate cost databases and disconnected spreadsheets.	**Dynamic environments evaluate schedule impacts on project cash flow instantly.**

The 4D/5D Convergence Framework

At Roots BIM LLC, we transform structural models into intelligent construction simulations where time, cost, resources, and logistics operate as a single connected system.



3D Geometry: The Structure

4D Scheduling: Time & Resources

5D Logistics: Cost & Site Planning

CONVERGENCE

Pillar 1: Time-Cost-Resource Linked Sequencing

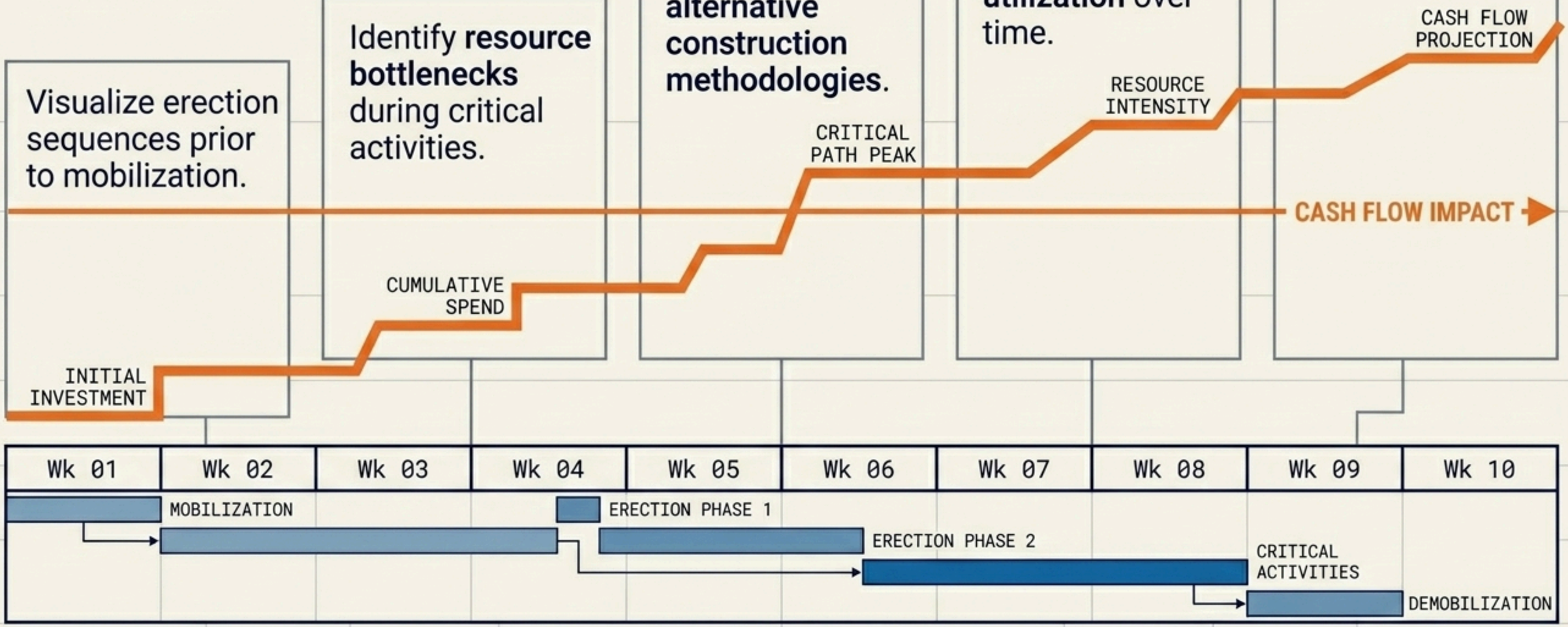
Visualize erection sequences prior to mobilization.

Identify **resource bottlenecks** during critical activities.

Simulate **alternative construction methodologies**.

Forecast **labor** and **equipment utilization** over time.

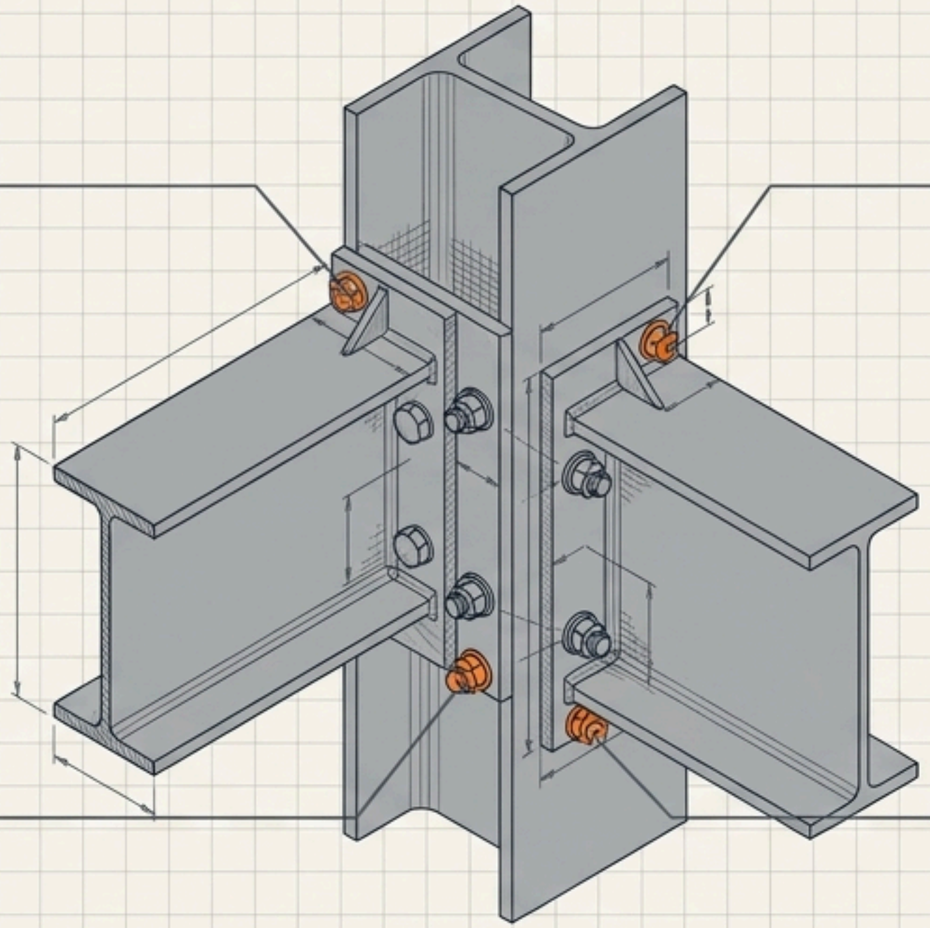
Evaluate schedule impacts on overall project cash flow.



Anatomy of a Predictive Sequence

[4D]
Installation Date:
Week 14, Day 2

[Resource]
Manpower:
4-Man Erection Crew



[Logistics] Equipment:
Tower Crane Lift Req.

[5D] Cost Impact:
Linked Cash Flow Value

The result is a predictive structural execution model where every beam, column, truss, and connection is definitively linked to installation dates, manpower requirements, and associated costs.

Pillar 2: Crane Path & Logistics Planning

For large structural projects, cranes are the most expensive and operationally critical assets on site. Using BIM-driven logistics simulations, we engineer safe, optimized operations.

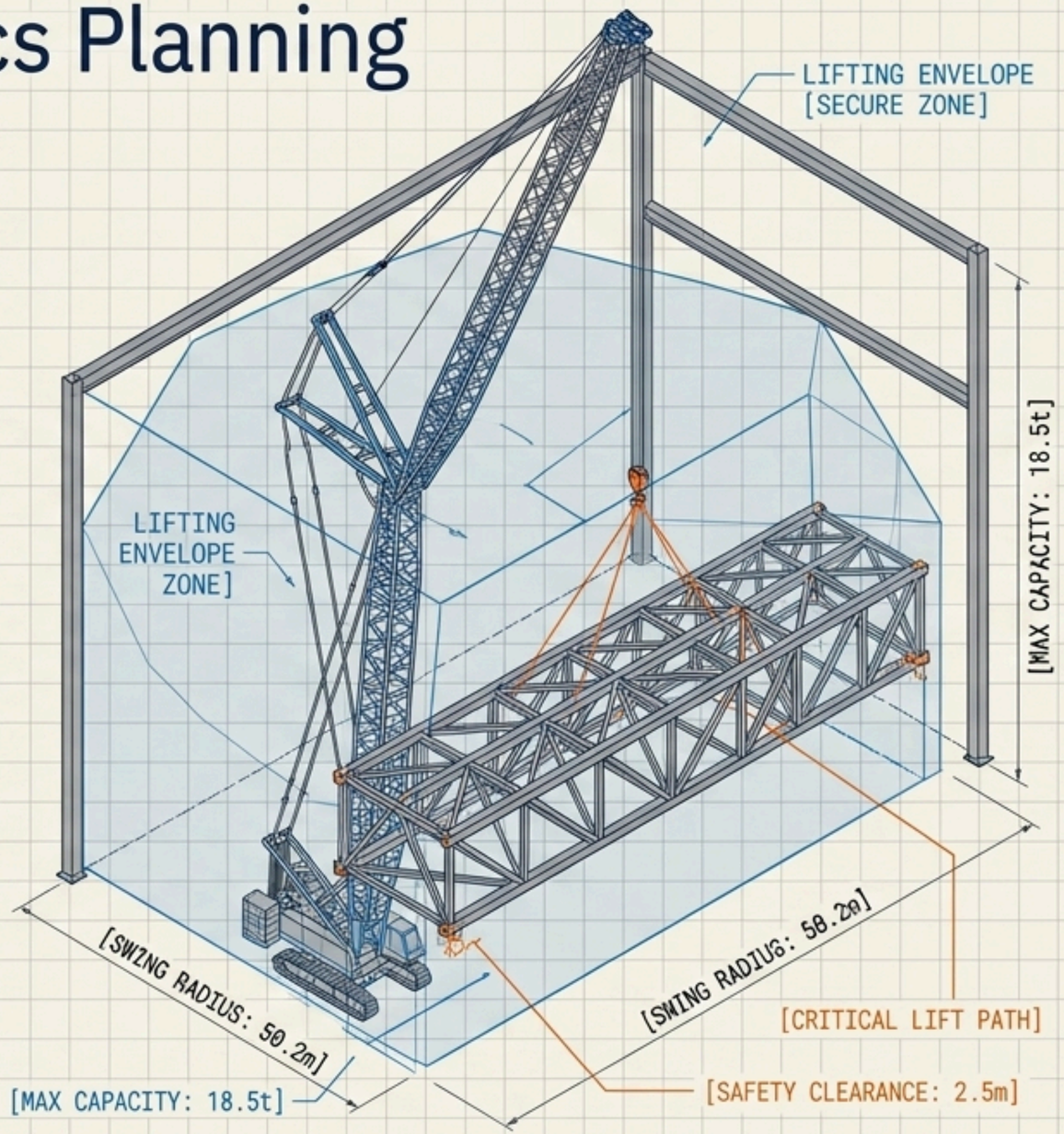
EVALUATION CRITERIA:

01 / Evaluates safe lifting paths for oversized structural members.

02 / Calculates precise crane swing radii and lifting envelopes.

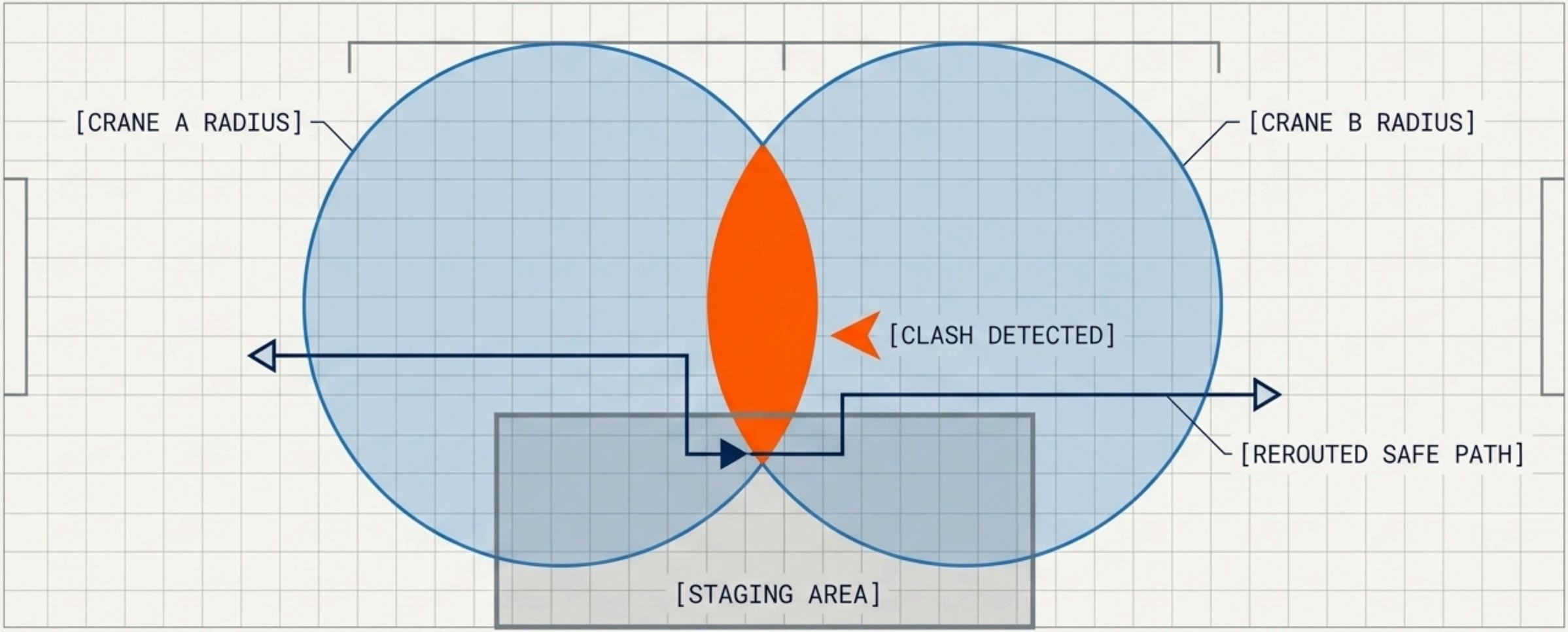
03 / Develops multi-crane coordination strategies.

04 / Optimizes site access and transportation logistics.



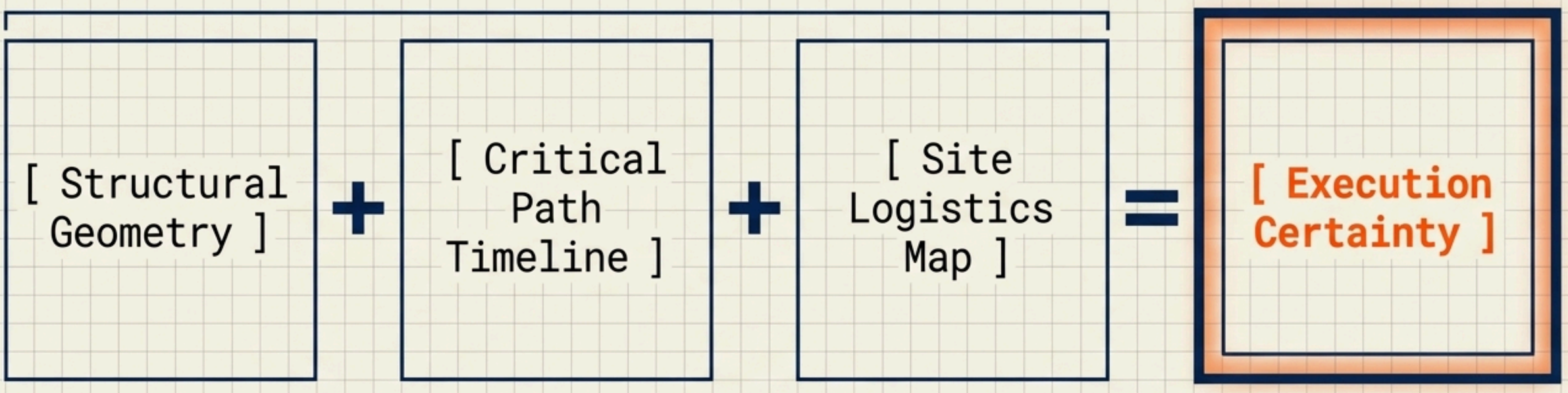
Virtual Risk Resolution

Instead of discovering conflicts during active construction, project teams resolve them virtually. We simulate potential clashes with temporary and permanent structures, mapping staging and laydown areas to reduce idle crane time, minimize safety risks, and maximize site productivity.



The Synthesis: From Reactive to Data-Driven

Integration Equation



The true value of 4D/5D BIM is converting structural construction into a data-driven operation. Every sequence, lift, delivery, and expenditure is analyzed before work begins. We do not simply visualize construction—we engineer predictable outcomes.

Execution Certainty.

Maximum Efficiency, Minimum Disruption.

Synchronize structure, schedule, and site logistics before breaking ground.
Ensure your structural projects move from concept to completion exactly as planned.