

Why Does Your Project Need a Constructability Review?

 Ryan Stein

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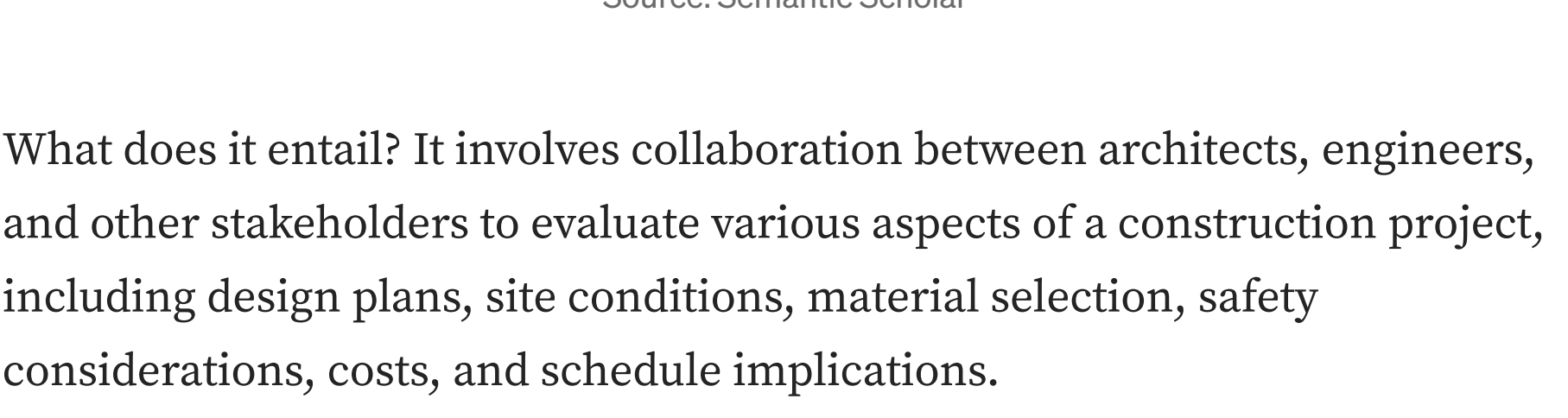


Constructability is a crucial aspect that determines the success or failure of a project. It's a term that might not be as familiar as design, engineering, or construction management, but its impact on the entire project lifecycle is undeniable.

Constructability isn't just about putting bricks and beams together; it's about assessing and optimizing every aspect of a project's design and planning for seamless execution in the real world. In an era of increasingly intricate building designs and ever-tightening construction schedules, assessing constructability becomes synonymous with successful project completion.

What is Constructability?

In simple terms, constructability is all about making sure that a building or construction project can be built easily and efficiently based on its design. It comes into the picture in the pre-planning phase, which involves looking at the plans and details to ensure that they work well when the construction begins. This minimizes problems, saves money since reworks are mitigated, and ensures timely and safe completion. It's like checking that all the pieces of a puzzle fit together perfectly before you start building!



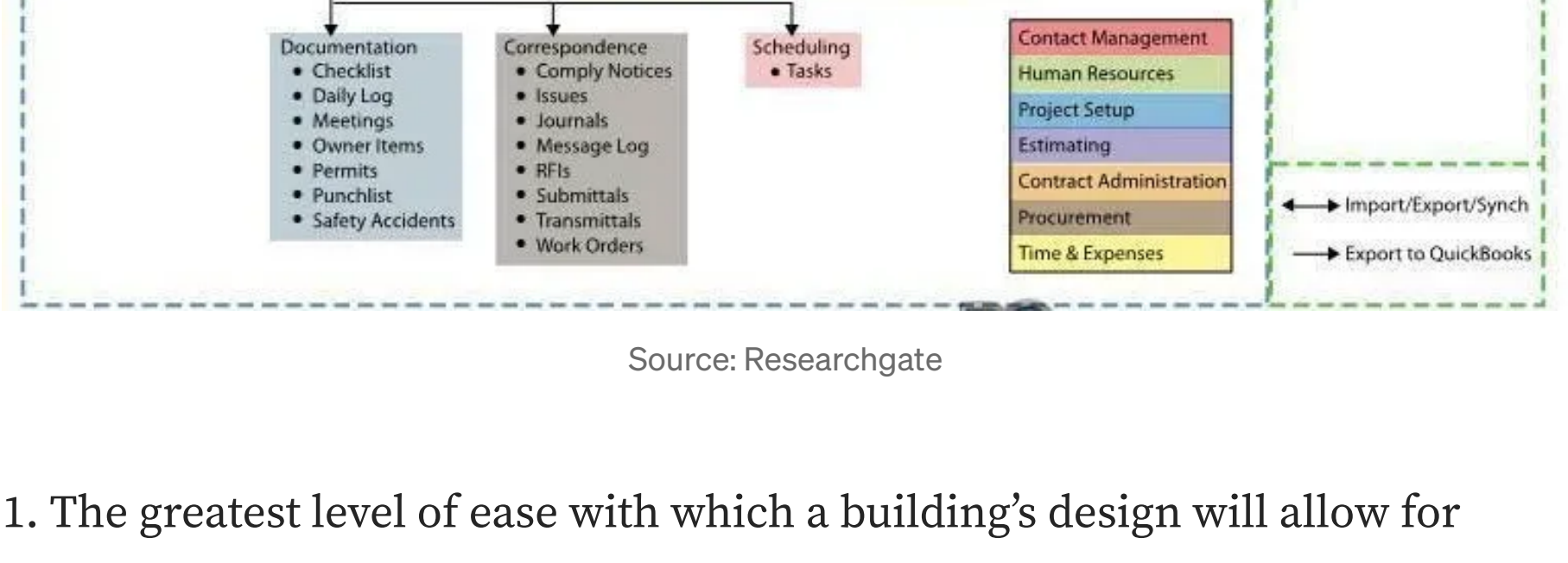
Source: Semantic Scholar

What does it entail? It involves collaboration between architects, engineers, and other stakeholders to evaluate various aspects of a construction project, including design plans, site conditions, material selection, safety considerations, costs, and schedule implications.

Once everything is in order, it can be said the constructability of a project is “optimized,” and the actual construction can begin without having to worry about major hiccups or unexpected complications.

The 3 Tenets of Constructability

Constructability can be summarized to achieve the assessment and implementation of three basic goals and practices:



Source: Researchgate

1. The greatest level of ease with which a building's design will allow for construction while still meeting [construction codes](#)
2. Team integration of construction knowledge during the design phase to determine the most efficient means to construct while still achieving design goals
3. Team integration of construction knowledge during building to ensure that the lowest level of environmental impact occurs during construction.

Significance of Constructability Analysis

The importance of constructability analysis cannot be overstated. It is a critical tool that helps to identify potential issues before construction begins, saving time, money, and resources, as well as ensuring the safety of workers and the public.

It helps to identify potential safety hazards and ensures that construction can be carried out in a way that minimizes risks. In addition, it helps to ensure that the project meets all regulatory requirements, including code and safety standards.

The following are some of the most important reviews (but not all) that should be performed during your project management:

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Design Stage

- Review (between contractor, client, consultants and architects/designers) whether the construction design is realistic or not; architects can sometimes get carried away, and contractors know what is feasible or not
- Review whether the design can be executed within budget
- Review whether the design will take longer to execute than time afforded to the project
- Focus on developing data-rich [clash-coordinated MEP models](#) for – Mechanical components

Planning Stage

- Review which materials will be necessary to complete the design, and which are the most cost effective while still achieving the design-vision
- Review which equipment is necessary to achieve construction, and which can be done without; eliminate luxury but non-essential construction equipment
- Perform a cost/benefit analysis on equipment quantity demands (i.e. will using one tractor for multiple roles which takes more time, saves more project money than investing in multiple tractors for accomplishing individual roles more quickly?)
- Review proposed site soil composition, and how it will impact building

Building Stage

- Review how quickly the contractor is performing the construction, whether it is on schedule or falling behind
- Review whether design expectations are being met
- Review how construction waste is being managed
- Review again if there is any extraneous, non-essential equipment being used during site construction

Discipline	Constructability Meeting Best Practices
Mechanical	Review the mechanical equipment and how they are to be installed in the final design. This includes any heavy lifting and the rigging plan to ensure the equipment will be properly lifted and placed into its final position.
Piping	Review how the new pipe will be installed in new or existing pipe racks. Isometrics need to reflect any requirements and restrictions due to the design of the pipe rack.
Electrical	Review the lifting and installation of the transformers, substation, and motor control center to ensure they can be lifted safely and placed into their final position. In addition, the meeting should review the electrical cable to make sure they don't overstress the cable when they are being installed in the cable trays.
Civil	Review the Cut and Fill design to minimize overall project costs for construction by reducing required construction hours.
Structural	Review the structural buildings and pipe rack layouts to provide crane access for equipment installation in the structural building and pipe installation in the pipe racks.
Instrumentation	Modify the structural steel and pipe racks to allow for the extrusion/installation of large instrumentation. This is a critical aspect of facility maintainability.
Fire Protection	Locate fire monitors and fire and gas detectors to ensure crane access is not blocked but safety and functionality are still maintained.

Source: MDPI

Benefits Of Prioritizing Constructability

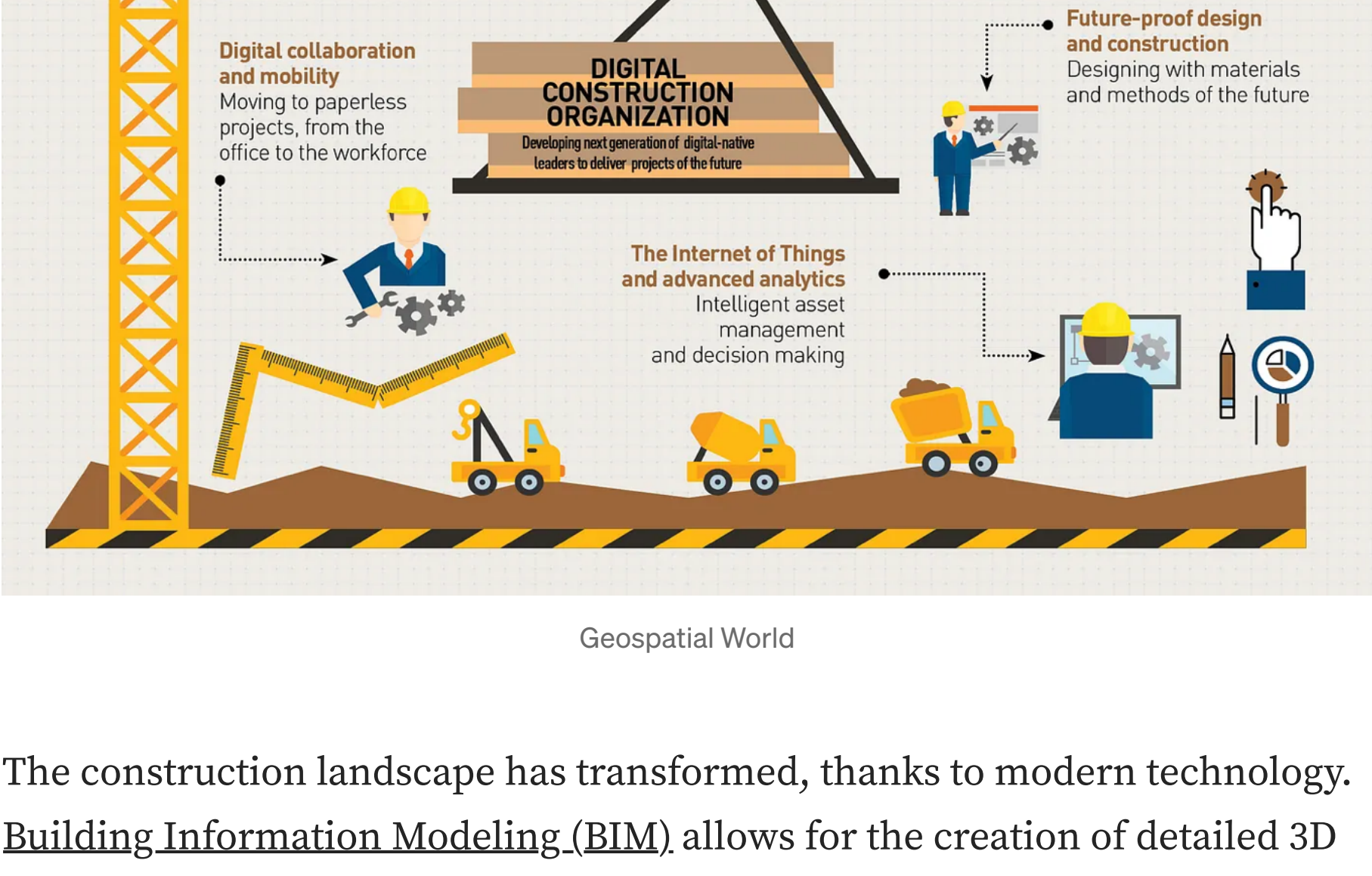
Prioritizing constructability in construction projects brings a range of benefits that impact project outcomes and overall success.

- **Cost Savings:** Identifying and addressing issues early in the planning and design phase can help avoid costly changes and delays during construction.
- **Faster Project Delivery:** Constructability assessments lead to smoother construction processes, reducing the likelihood of delays. When designs are tailored for ease of construction, projects can be completed on time.
- **Minimized Rework:** Identifying and resolving issues early eliminates the need for rework. This can significantly reduce project expenses and prevent project timelines from being extended.
- **Enhanced Safety:** Prioritizing constructability also means considering safety from the start. By identifying and mitigating safety hazards during the planning phase, safer work environments can be created.
- **Improved Quality:** Constructability reviews ensure that the design and planning align with practical construction requirements, leading to higher-quality construction with minimum defects.
- **Optimized Resource Allocation:** This allows for better resource allocation, such as labor, equipment, and materials, resulting in more efficient resource management.
- **Enhanced Collaboration:** Prioritizing constructability encourages collaboration among architects, engineers, contractors, and other project stakeholders. It fosters a cooperative project environment.
- **Risk Mitigation:** By proactively addressing constructability challenges, the risk of unexpected problems arising during construction is reduced. This helps in maintaining project schedules and budgets, ultimately mitigating project delay risks and cost overruns.
- **Client Satisfaction:** Clients benefit from projects that are completed on time, within budget, and with high-quality results.
- **Sustainable Construction:** Sustainability aspects can be considered ensuring that projects are environmentally friendly and energy efficient. This aligns with the growing trend toward achieving net zero and sustainability.

Assessing constructability is a comprehensive approach that not only improves project efficiency and cost-effectiveness but also enhances safety, quality, and client satisfaction.

Today, constructability itself has become easier owing to technology. Tools like Building Information Modeling and Artificial Intelligence (AI) provide us with valuable data to enhance the decision-making process, improve visualization, and streamline projects.

How Technology is Transforming Constructability



Geospatial World

The construction landscape has transformed, thanks to modern technology. [Building Information Modeling \(BIM\)](#) allows for the creation of detailed 3D models that not only visualize the design but also simulate the entire construction process.

Furthermore, Artificial Intelligence (AI) algorithms can analyze vast datasets, historical project data, and real-time variables to forecast potential construction challenges. This foresight allows project teams to proactively address issues before they escalate, leading to smoother project execution.

3D printing is solidifying its footing in the industry. In assessing the constructability of such projects, AI can help in the material selection process.

As technology evolves and collaboration thrives, the construction industry is poised for a future where constructability will ensure timely, efficient, safer, and sustainable project delivery.

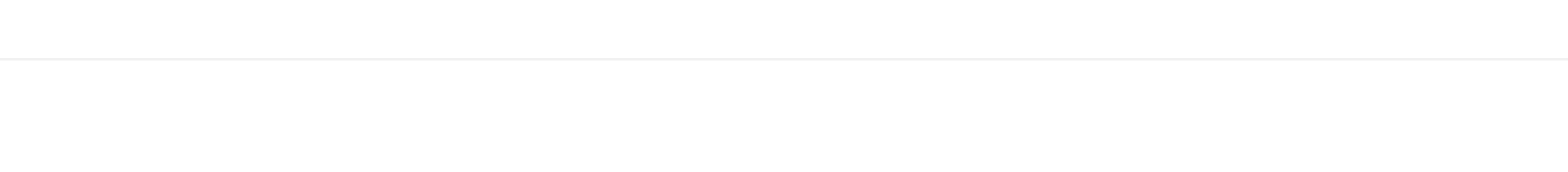
Ready to Incorporate Constructability?

On average, projects that use constructability are more likely to finish on time and save the project money. The collaborative efforts between parties involved, along with enhanced communication, and mutual agreement between all parties before moving forward each step of the way enhances efficiency.

By reducing waste and saving on energy expenditure, while keeping costs low, will turn you into a scion in the building sector. Take full advantage of constructability while the other guys are still lagging behind.

You may also like to read:

- [Guide to the BIM Quality Assurance and Validation](#)
- [How 3D Laser Scanning Is Used in Reality Capture of Buildings?](#)



 **Written by Ryan Stein**

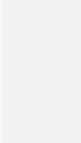
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I am a renowned author, speaker and educator on Building Information Modeling (BIM) technology in the AEC industry.

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