DOES YOUR PROJECT PLANNING HAVE TIME TO SAVE TIME?

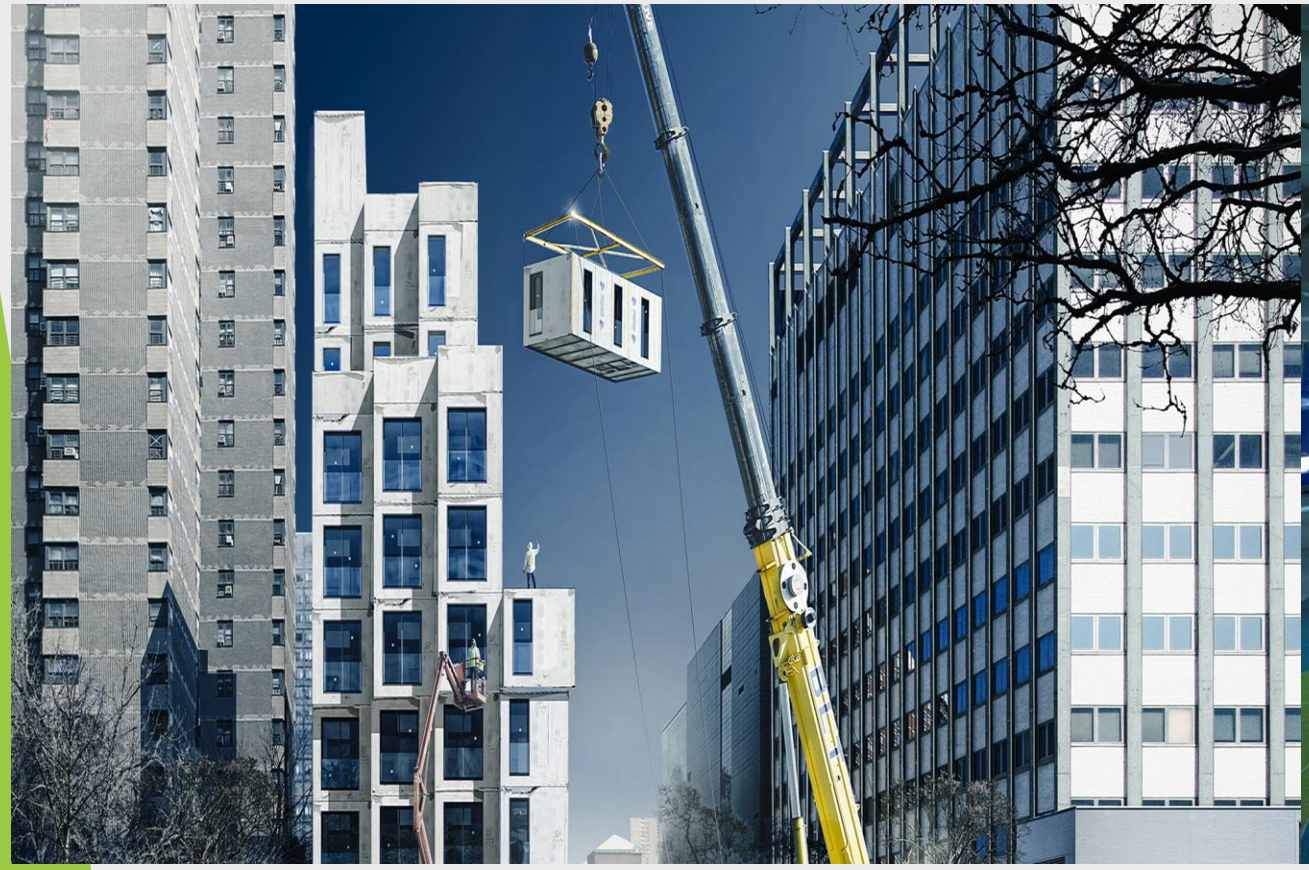
(SIGNIFICANT TIME)

VOLUMETRIC MEDICAL SUITES & CRITICAL AREAS:
OPPORTUNITIES FOR THE NEW DUNEDIN HOSPITAL
SEPTEMBER 2020


OT UNIT 03 - PARTIAL BUILD
MODULAR MEDICAL SOLUTIONS INC.
- PRODUCTION BAY 3
STERILE CORE - 04

Workstream 1: Volumetric solutions for critical surgical and clinical environments. Each module is factory-manufactured, including integrated MEP services, medical gas systems, and infection control finishes:

- General Operating Theatres (ISO 7) ; Orthopedic Theatres (Laminar Flow, ISO 5)
- Trauma Operating Theatres; Cardiac Catheterize Laboratories; Endoscopy Suites
- Ophthalmic Procedure Rooms; Minor Procedure / Day Case Rooms
- Hybrid Operating Theatres (Imaging-Integrated)
- Dental Surgery Suites



Volumetric solutions for non-surgical critical infrastructure. Modules are delivered with fully integrated mechanical, electrical, and plumbing systems pre-tested at factory:

- Mechanical Plant Rooms (HVAC, Chillers, BMS)
- Commercial Kitchen Facilities (Food Safety Compliant)
- Building Management / Control Rooms
- Patient Ward Modules (Single/Multi-Bed)
- Sluice Rooms
- Staff Accommodation / On-Call Rooms
- Additional Bespoke Configurations Available

PROGRAMME ADVANTAGES

Volumetric construction delivers measurable schedule compression through parallel workflows and factory-controlled delivery.

30–50% Schedule Compression

Module fabrication runs concurrently with site preparation (foundations, services infrastructure), overlapping the critical path and compressing the overall programme.

Weather-Independent Production

Factory production is fully weather-independent, eliminating schedule risk. For Dunedin's climate conditions, this represents a material programme advantage.

25% Fewer Labour Hours

Factory production requires approximately 25% fewer labour hours than equivalent site construction. In the current skilled trades shortage, this is a significant programme risk mitigation.

This document presents a very high overview of the technical aspects of volumetric construction opportunities for the New Dunedin Hospital project. Key objectives include programme acceleration (estimated 3–6-month savings), cost reduction through factory-controlled manufacturing, and lifecycle future-proofing via modular pod architecture – a methodology not yet deployed at this scale in New Zealand.

Note: Volumetric methodologies are particularly advantageous for sites with constrained logistics, limited laydown areas, or remote access challenges.

Two workstreams are proposed: (1) Medical suite volumetric fit-outs – operating theatres, procedure rooms, and clinical environments; (2) Non-surgical volumetric solutions – plant rooms, clean rooms, kitchens, and ancillary support facilities.

A key ancillary opportunity for the hospital to consider is the focus on services standardization, modular services cassettes which require access consideration at design stage.

In the ever-evolving landscape of construction and facility management, efficiency and optimization are the keys to success. The traditional approach of handling each trade separately can be time-consuming and cost-ineffective. Enter the multi-trade rack system, a versatile solution that integrates various trades into a single framework. In this blog, we'll delve into the advantages of multi-trade rack systems and why they are becoming a game-changer in the industry.

1. Streamlined Installation
2. Space Efficiency
3. Improved Safety
4. Enhanced Accessibility
5. Increased Flexibility
6. Cost Savings
7. Environmental Sustainability
8. Project Timeline Acceleration
9. Future-Proofing

In conclusion, the advantages of multi-trade rack systems extend far beyond convenience. They offer a holistic approach to construction that combines efficiency, cost-effectiveness, safety, and adaptability. Whether you're a contractor, designer, or building owner, integrating multi-trade rack systems into your projects can pave the way for a smoother, more efficient, and ultimately more successful construction process.

- **SAFETY ADVANTAGES**
- *Factory environments dramatically reduce risk exposure for workers and minimise disruption to adjacent operational facilities.*
- **Up to 80% Reduction in Incident Rates**
- Factory environments eliminate working-at-height risk and weather exposure. Controlled conditions reduce incident rates by up to 80% compared to conventional construction sites.
- **80–90% Off-Site Construction**
- With the vast majority of construction activity occurring off-site, on-site disruption (noise, dust, traffic) is drastically reduced. Critical for projects adjacent to operational hospital facilities where patient care must be maintained.
- **Controlled Working Environment**
- Factory-based workforce operates in a controlled, well-lit environment with proper ergonomic workstations, and safety systems — eliminating the hazards inherent in open-air construction.


ULTRA SLIDE


OPRITECH


EXIT

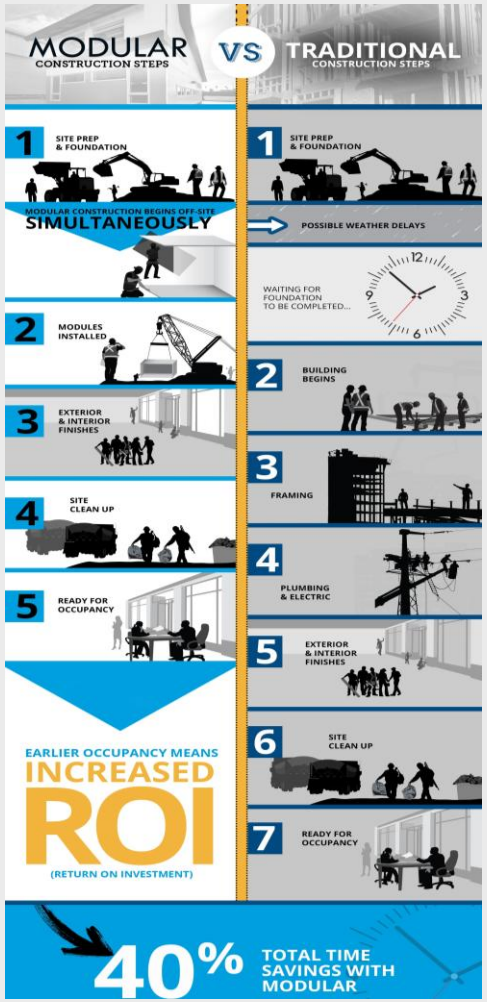
INTEGRATION REQUIREMENTS

- Integration Requirements: Achieving the full programme and cost benefits of volumetric construction requires that all design consultants – architectural, structural, MEP, and clinical planning teams – are formally briefed to evaluate modular options during the concept design phase (RIBA Stage 2 or equivalent).

- Critical Path Consideration: Engineering teams that default to conventional construction methodologies at the design stage effectively preclude volumetric options. This represents a missed opportunity to deliver measurable time, cost, and quality improvements for the project.

- Action Required: Volumetric construction must be specified as a mandatory design consideration from project inception. Retrospective integration after detailed design is technically and commercially impractical.

FUTURE-PROOFING & LIFECYCLE



Lifecycle Consideration: All healthcare infrastructure has a defined operational lifespan, driven by technological obsolescence, changing clinical standards, population growth, and physical degradation of building systems.

Hospital refurbishment programmes are among the most complex and disruptive capital projects in any healthcare system. Volumetric methodology offers a transformative alternative: entire clinical modules can be disconnected, removed, and replaced **if the modular pod architecture is designed for future disconnection and replacement from the outset. This requires standardised service connection points and structural interface details.**

This level of lifecycle adaptability is not achievable with conventional monolithic construction methods.

Additionally, we propose evaluating a **leasing model** incorporating scheduled equipment refresh cycles for critical clinical areas. This operational expenditure approach would replace full capital acquisition, spreading cost over the asset lifecycle.
This model substantially de-risks the project for both the DHB and clinical end-users by ensuring equipment currency without large capital outlay events.

QUALITY ADVANTAGES

Factory-controlled manufacturing delivers precision, consistency, and clinical-grade environments.

±2mm Factory Tolerances

Factory-controlled manufacturing delivers tolerances of ±2mm versus typical site tolerances of ±10mm — a 5x improvement in dimensional accuracy.

90–95% Complete on Arrival

Modules undergo factory acceptance testing (FAT) before dispatch. This reduces on-site damage risk to finishes, fixtures, and pre-installed medical equipment.

Repeatable Precision

Hospitals contain high volumes of identical room types. Factory production lines deliver consistent quality with progressive efficiency gains across the production run, fully customizable to project specifications.

COST ADVANTAGES

Volumetric construction delivers cost certainty, waste reduction, and tighter commercial control.

Cost Certainty at Contract Stage

All materials are procured and stored at the factory prior to production, locking in costs and eliminating material price escalation risk inherent in conventional staged procurement.

Up to 90% Waste Reduction

Factory manufacturing reduces material waste through precision cutting, inventory control, and repeatable processes. Workstation-based production eliminates the productivity losses of conventional site operations.

Fewer Variations & Change Orders

Permanent modular construction projects experience statistically fewer change orders (NIBS), translating to tighter cost control and faster delivery.

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