

ENSURING GLOBAL PROJECT COMPETITIVENESS THROUGH
CONSTRUCTION & LOGISTICS EXCELLENCE



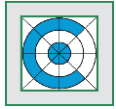
Lean Construction Logistics

An example of Lean Principles applied to
Construction Logistics

Introduction



- **Chris Brumby - Senior Project Manager - PM Group**
- Over 30 years experience in Construction and Project Management including 25 years in the Pharmaceutical and Healthcare sectors.
- Previous Employers include:
 - Local General Contractor
 - UK National Health Service
 - AstraZeneca
 - UK Local Authority
- Experienced in managing Alliance projects and applying Lean thinking to construction delivery.

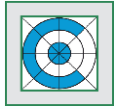


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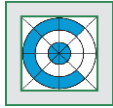
The Project Delivery Specialists



You can rely on our team
of over 2,200 people to deliver your
project successfully

- An integrated A&E design, project management and construction management firm
- Proven track record since 1973
- An employee-owned company
- Revenue of over €300 million
- 20 offices worldwide and projects in over 50 countries





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Sector Focus

Biopharma



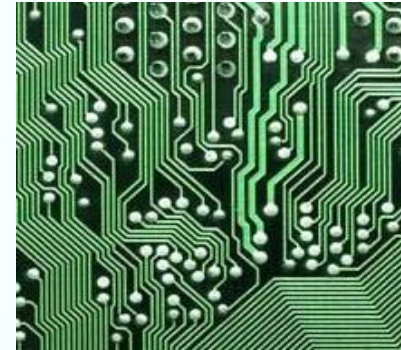
Food



**Mission
Critical**



**Advanced
Manufacturing**



**Medical
Technology**



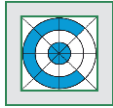
Healthcare



Energy



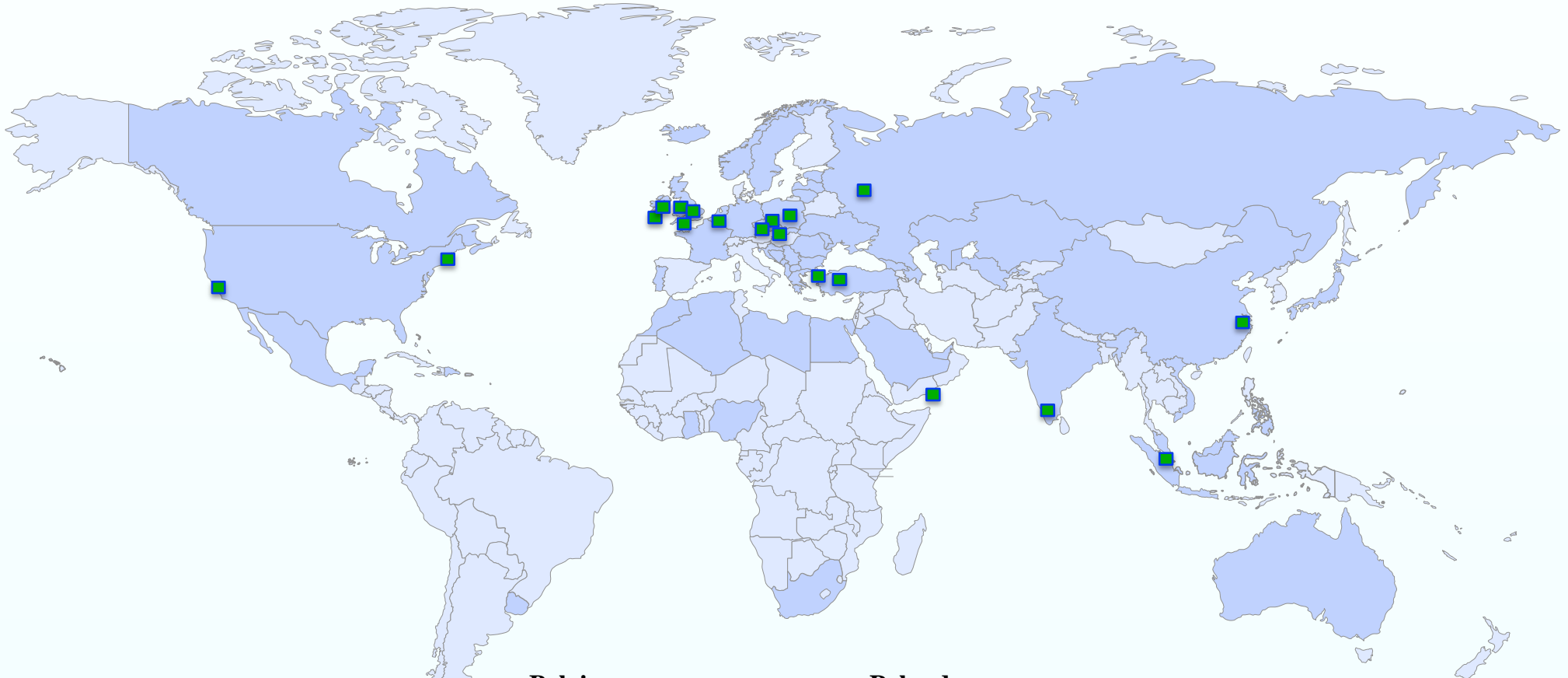
**International
Financial Institutions**



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PM Group Office Network



**International
Office Network**

**Belgium
China
Czech Republic
India
Ireland**

**Poland
Russia
Saudi Arabia
Singapore
Slovakia**

**Turkey
United Kingdom
United States**

Snap shot of construction – Mar-14

- **45 Construction Projects**

- **13 Countries**

- **Belgium**

- **UK**

- **Ireland**

- **Russia**

- **Poland**

- **Czech**

- **Netherlands**

- **Slovakia**

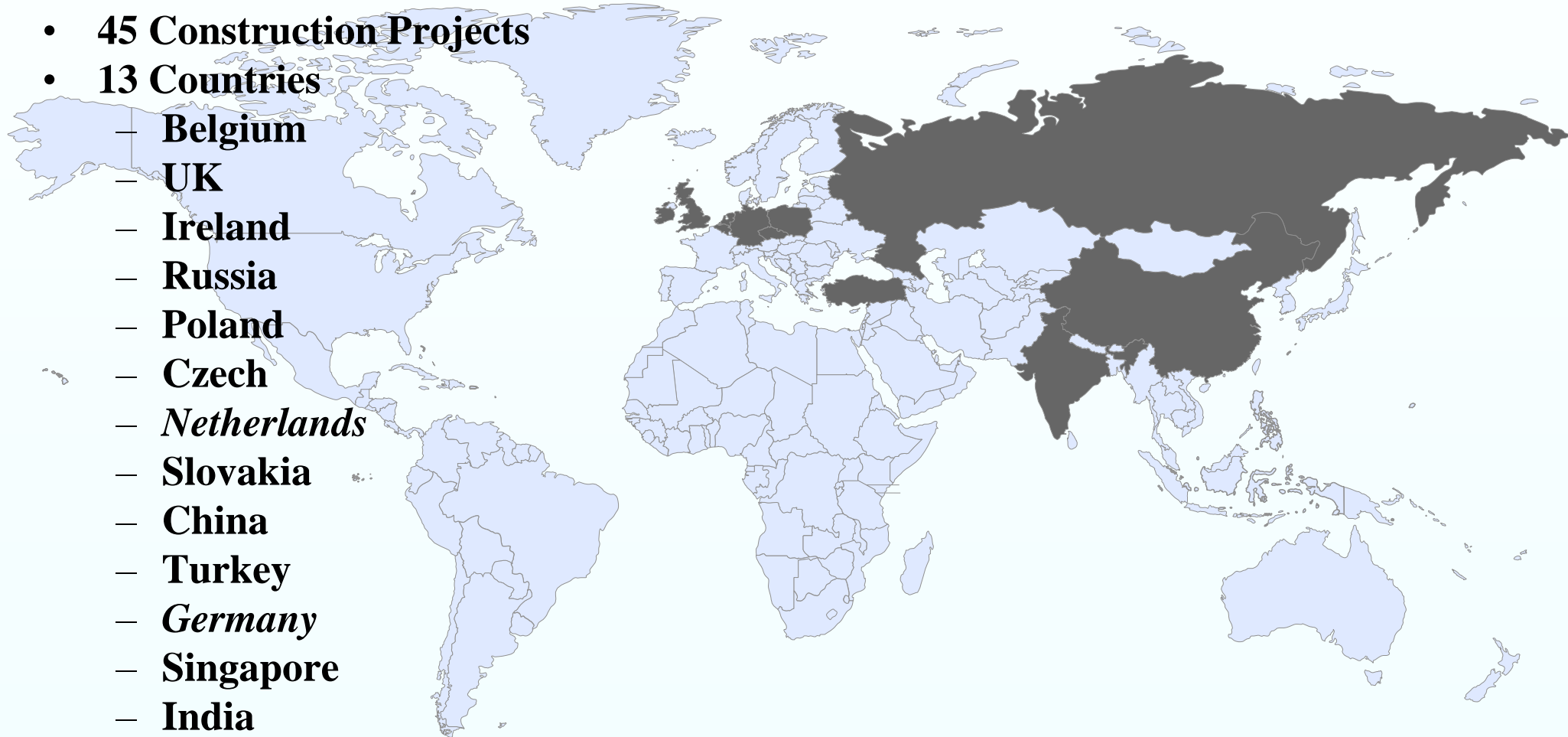
- **China**

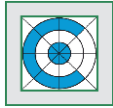
- **Turkey**

- **Germany**

- **Singapore**

- **India**



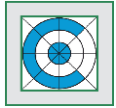


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Lean Construction





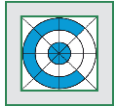
Lean Thinking – An Overview

- Lean Construction is...
 - Customer focused – specify value from the customer standpoint
 - Identify the value stream and remove wasted activities
 - Reliable, sustainable flow of work
 - Standardised processes/work steps
 - Appropriate measurement, analysis, and action i.e. continual improvement

Waste

- The waste of **Overproduction**
- The waste of **Waiting**
- The waste of **Transporting**
- The waste of **Inappropriate Processing**
- The waste of **Unnecessary Inventory**
- The waste of **Unnecessary Motion**
- The waste of **Defects**





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Other Wastes

- The Waste of **Untapped Human Potential**
- The Waste of **Inappropriate Systems**
- Wasted **Energy**
- Waste of **Materials** (Environmental)

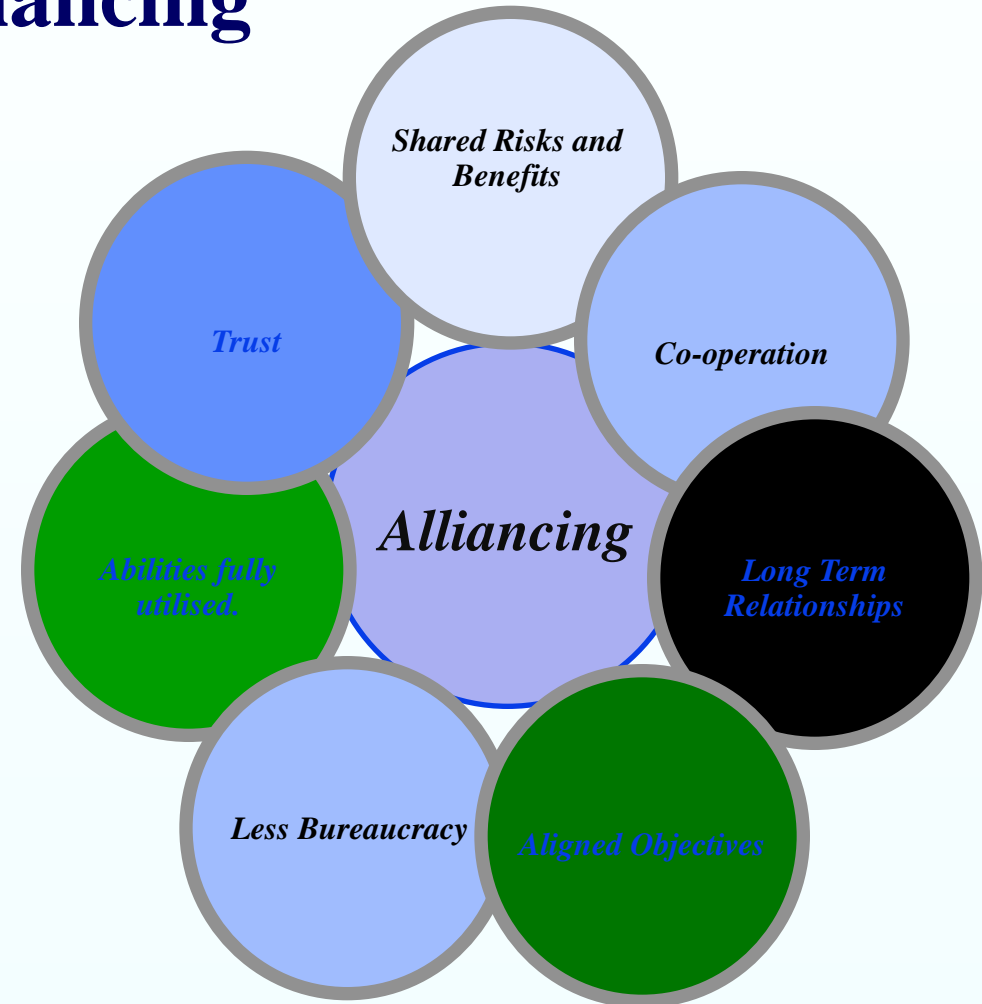
The Project

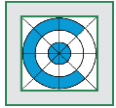
- Pharma Process R&D Laboratories
- Located UK
- 13,000 m²
- 4 floors
- Laboratories – Offices – Plant
- 250 Fume Cupboards
- Value approx. €80M
- Sanctioned Feb 2007
- Completed Sept 2009



Alliancing

Alliancing is an Innovative Project Strategy which promotes closer relationships between construction suppliers and customers.





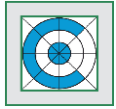
The Traditional Approach

- Trade contractors responsible for own materials management.
- Single waste contractor but little integration with trade contractors
- Welfare provided and maintained by Main Contractor
- Other aspects provided by main or trade contractors with little sharing of resource and limited co-ordination:
 - Gateman Stores Lift & hoist operators Security
 - General labourers Manual handling equipment Cleaners
- Often seen as a secondary concern and not proactively managed.

The Lean Approach

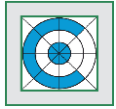
- A dedicated logistics team providing an integrated service covering:-
 - All logistics and materials handling - goods receiving, storage, distribution to workface, provision of shared equipment.
 - All housekeeping, cleaning, waste-away, recycling and reuse.
 - All traffic management and security.





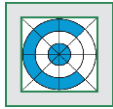
Benefits

- Reduction in attendant labour content of main/trade contractor packages
 - Dedicated team, sharing of resources
 - Specialised approach – skilled in manual handling and knowledgeable of standard working methods and procedures
- Improved productivity of direct/trade labour through reduced waiting time
 - Materials and equipment delivered to the workface
 - Just in time
- Reduction in damage to finished elements of the building
 - Logistics team responsible for moving materials and equipment
 - Also responsible for protection of finishes



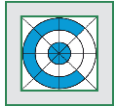
Benefits

- Reduced materials cost through the elimination of waste and shrinkage
 - Well managed stores
 - Reduced damages
 - Reduced loss/theft
 - Challenge to quantity and timing of deliveries
- Removed a key portion of site management time
 - Construction Management team able to focus on safety, schedule, quality and cost.
 - Supervisors time spent chasing and managing deliveries virtually eliminated.
- Maximised segregation and recycling of waste
 - Reduced waste to landfill and minimised waste disposal costs.



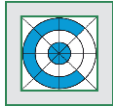
Lean Principles Used

- Improved process flow – enabled better flow of the value adding work.
- Levelled out the workload – deliveries planned and scheduled throughout the day (Demand smoothing)
- Batch sizing – only sufficient materials for one days activity delivered to the work face.
- Standardised tasks –one process for receipt, storage and distribution of materials.
 - Managed by dedicated team
 - Formed basis for continual improvement
- Workplace Organisation – site kept clean and tidy and well managed
 - Enabled efficient and effective execution of the value stream activities.



Lean Principles Used

- Kanban – (customer pull) next day materials requested by trade operatives, reduced inventories in site stores and at the work face.
- Visual Control – live delivery schedule display in project office
- Develop exceptional people – dedicated team trained in manual handling and use of plant and motivated to provide an excellent service.
- Respect Network of Partners and Suppliers – to work well the co-operation of all trade contractors is required and they need to be trained and encouraged to use the logistics process.
- Overall Equipment Effectiveness (OEE) – manual handling equipment utilisation optimised

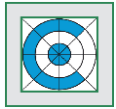


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A different way of thinking.....



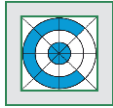


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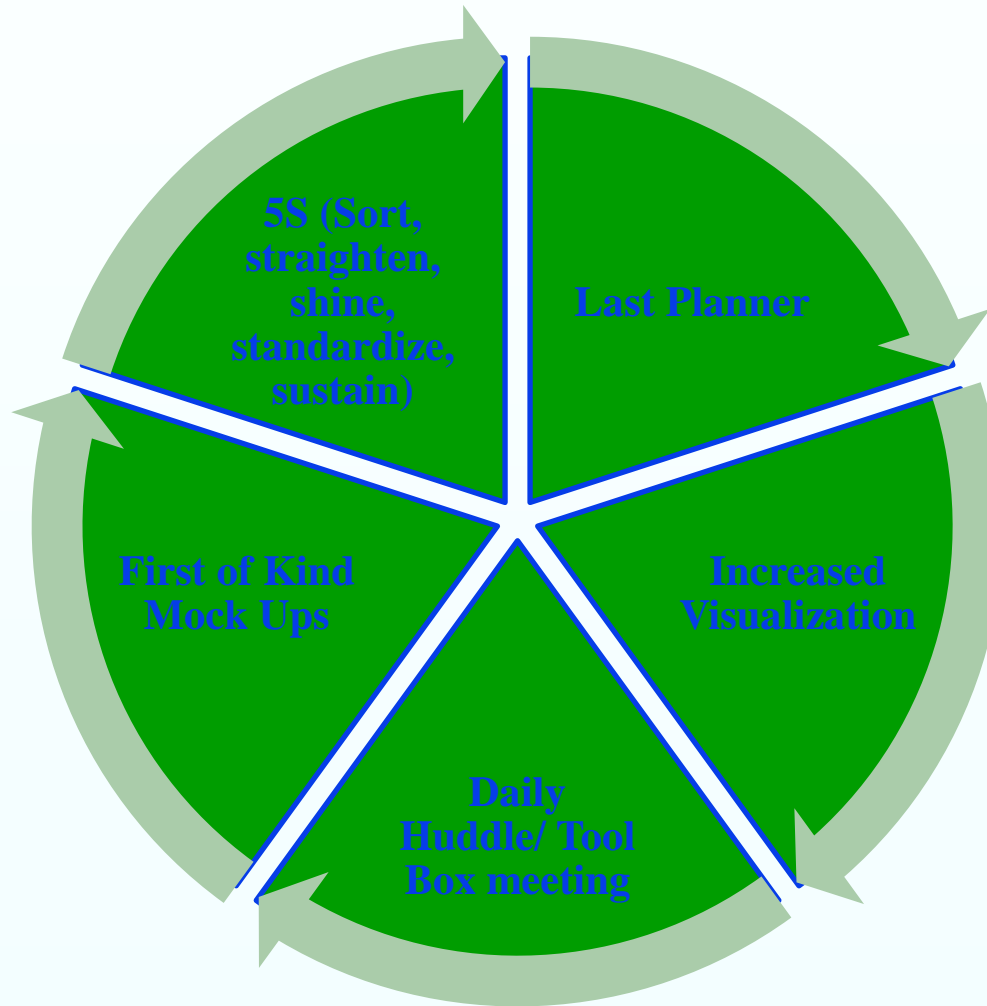


Remote control tele-handler loading pre-assembled office pods on 4th level.....





PM – Lean Construction Tools



Key Benefits

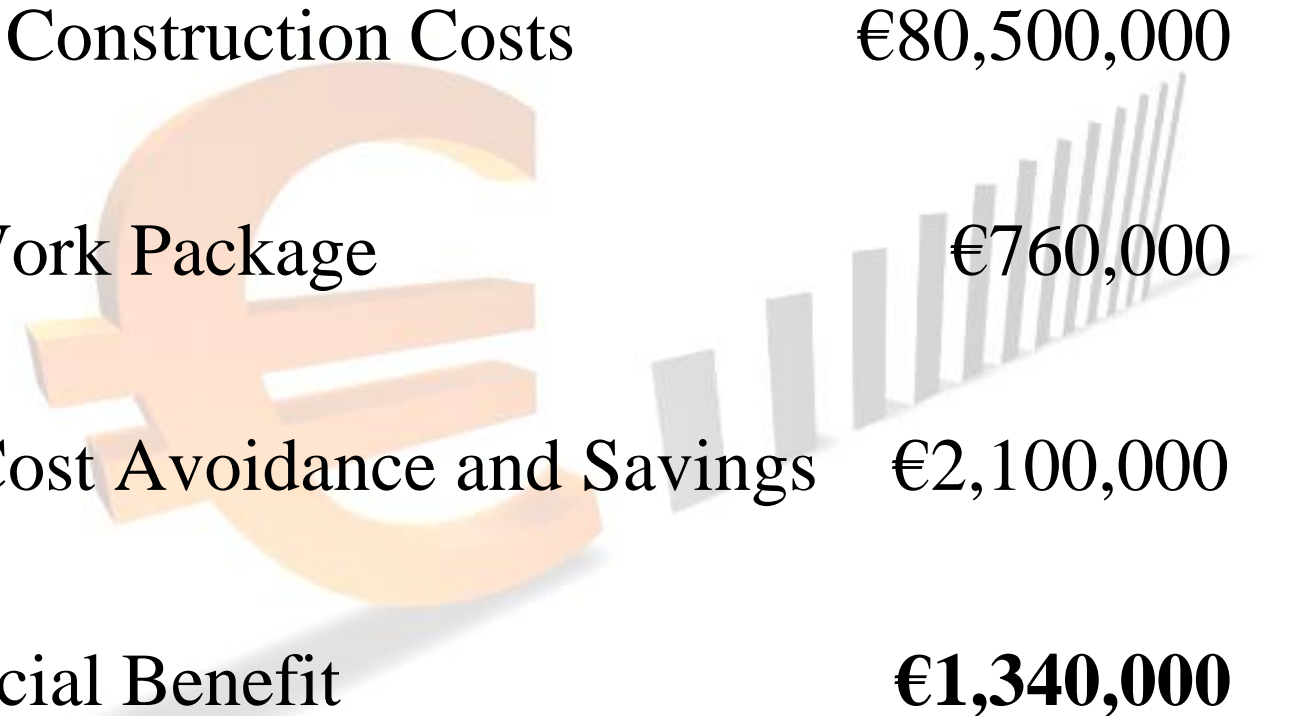
- Improved flow of work – with materials and plant delivered to the work face just in time, operatives not distracted from value adding activities, supervisors able to focus on schedule and planning.
- Clean, tidy well managed site – safer and more efficient
- Less damage and loss of materials

Resulting in:

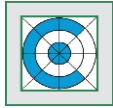
- Reduced overall schedule
- Significant cost benefits



Costs



• Design and Construction Costs	€80,500,000	
• Logistics Work Package	€760,000	
• Identified Cost Avoidance and Savings	€2,100,000	
• Total Financial Benefit	€1,340,000	1.66%



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The project delivery specialists

MILAN. ITALY, JUNE 19-20, 2014

4TH ANIMP'S CONSTRUCTION SECTION & ECI 2014 ANNUAL CONFERENCE
with the collaboration of ANIMP's Logistic Section