

12th Annual Conference on Lean Construction



Lean Construction Principles in Infrastructure Construction

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Applying Lean Construction to Heavy Construction

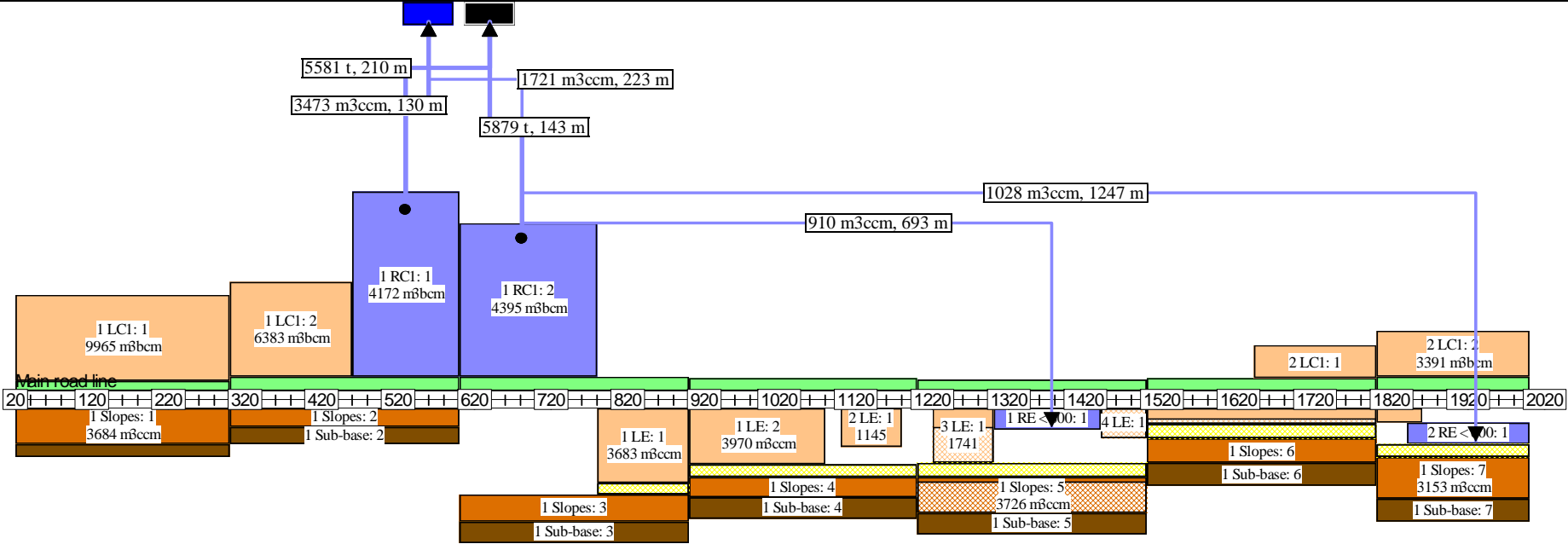
- Minimisation of material flow costs
 - Optimized mass haul distances & stockpiling
- Maximisation of work flow
 - Efficient work chain planning
- Accurate information flow
 - A unified reporting system
 - Information to counterparts according to their need
- Control of work flow
 - Monitoring actual vs. planned work
 - Forecasting problems and correcting them before they cause costs.

DYNARoad software makes it possible to apply these principles more efficiently



Minimisation of material flow costs

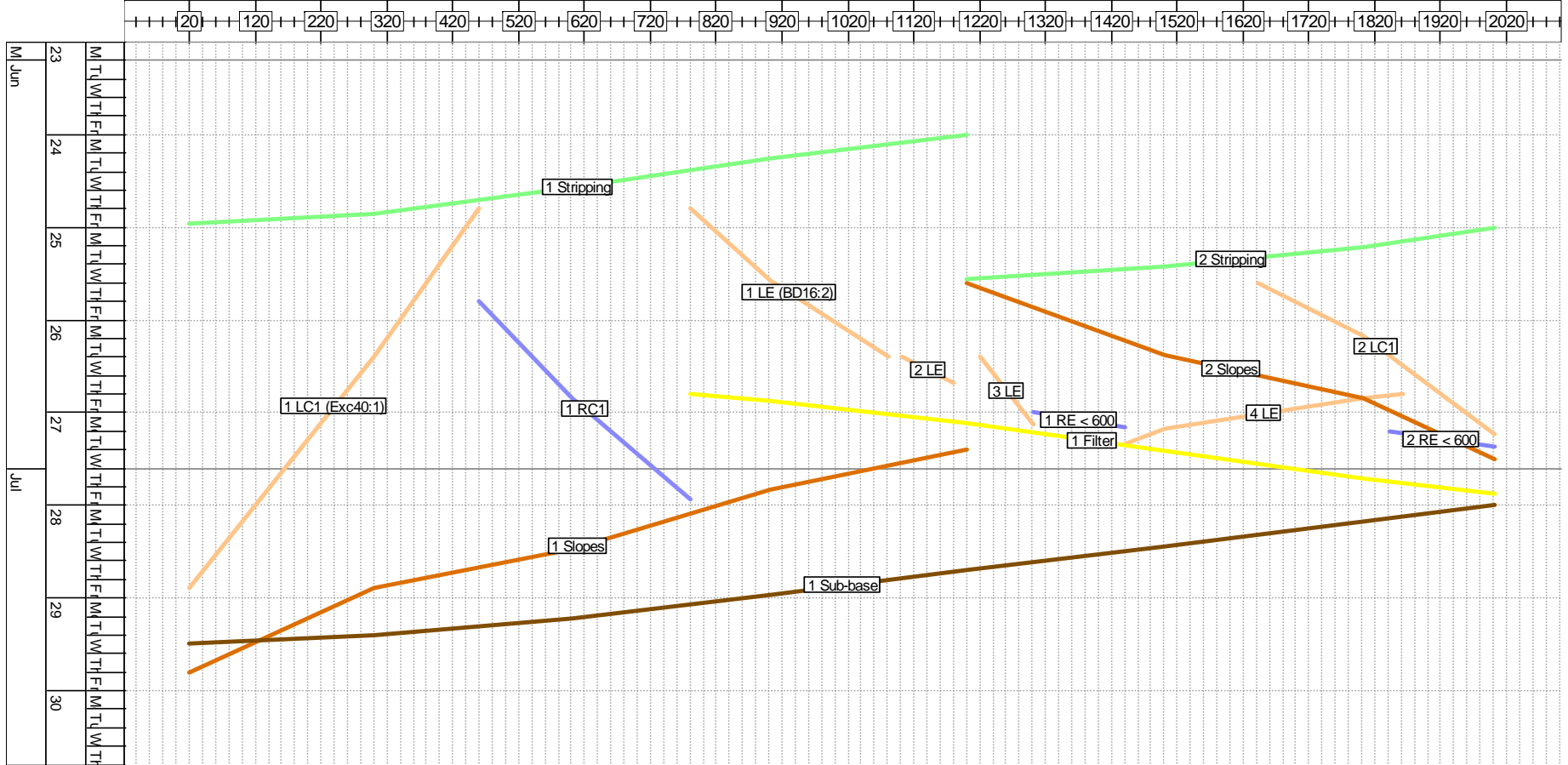
- Scheduling problems
 - The sequence of tasks greatly affects total costs
 - Certain tasks must be completed simultaneously
- Methods
 - Mass haul plan
 - All hauls are planned beforehand
 - The aim is to minimise mass haul distances for the whole project
 - The mass haul plan must be integrated with the schedule



Client: O Client

Road-Time Chart version 7.7.2004 10:03

Project Project
Planner:



Planned: Actuals: Forecast:

Work scheduling mode
DYNARoad2 v1.1502

Rekisteröintietod: Demo / DSS Ltd

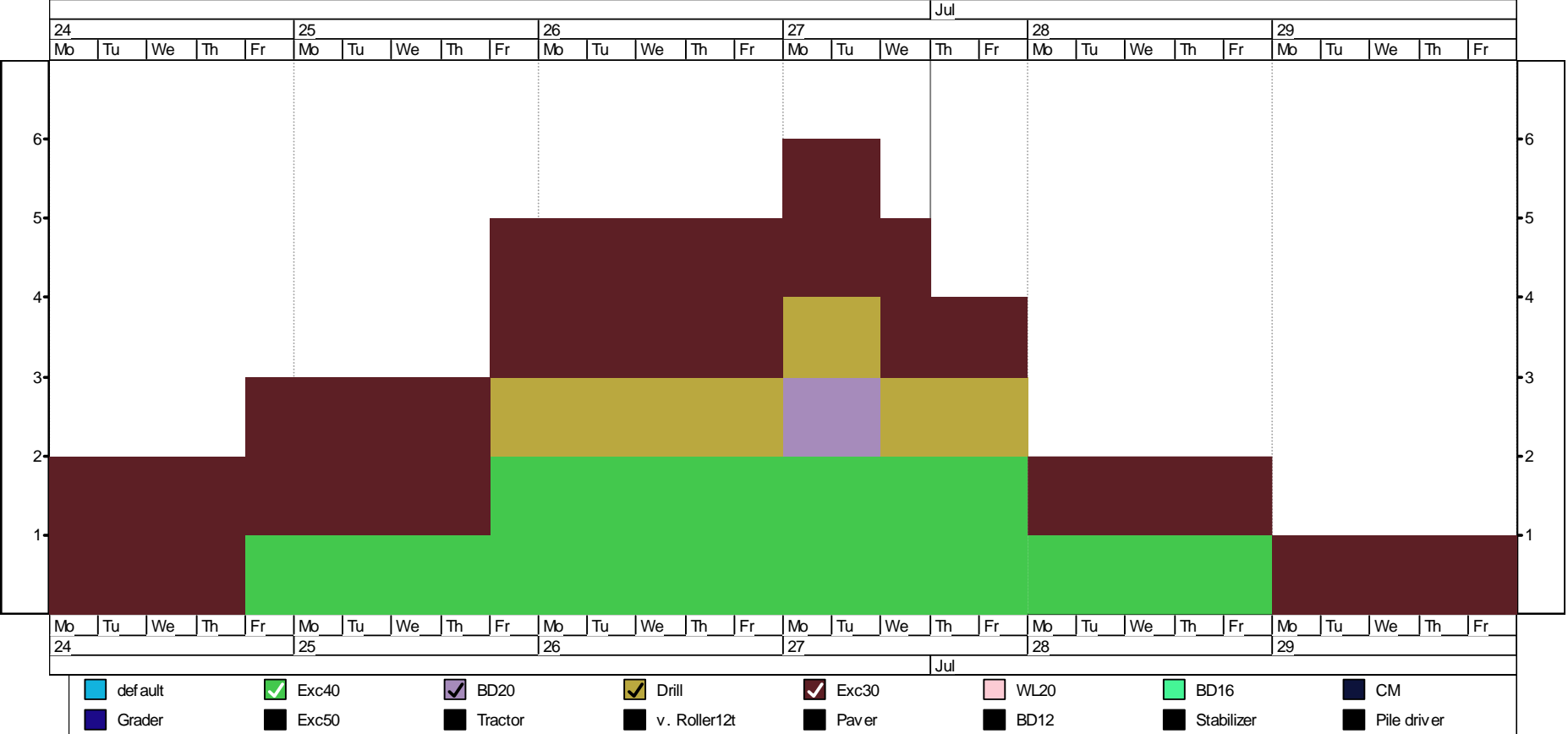
Aug 5, 2004

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Maximisation of work flow

- The schedule can be planned in at least two different ways
 - Tasks have predefined timing and durations and the resources are selected according to those.
 - Tasks have predefined resources and their duration is calculated through their production rates.
- Method 1 is used widely and leads to wait and inefficient resource use.
- Method 2 ensures the availability of required resources and enables work chain planning to minimize wait and resource hoarding.





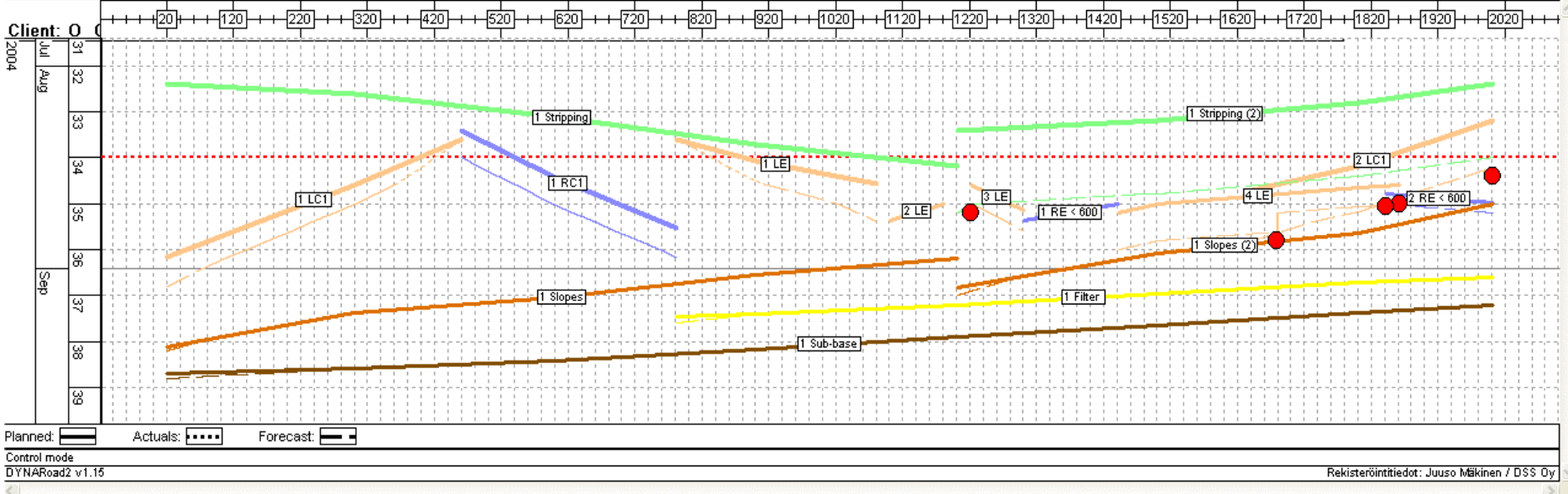
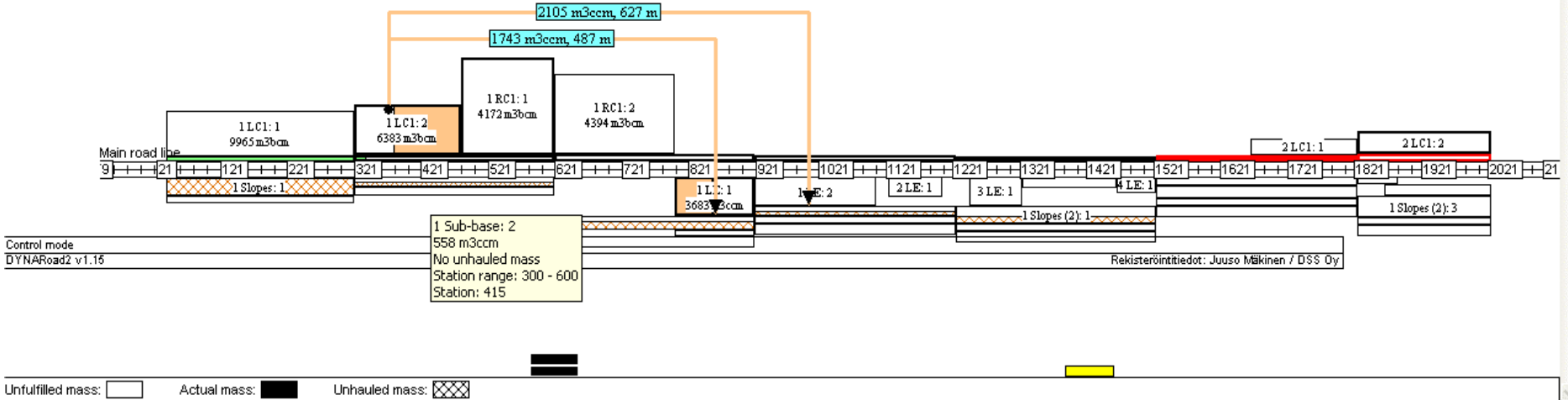
Accurate information flow

- All counterparts must be informed according to their needs
 - The Customer requires large scale data concerning the schedule and costs for the whole project
 - Contractor Management requires detailed information especially on cost build up
 - On-site personnel need detailed information on schedule progress and cost build-up
 - Sub-contractors need information concerning only their own work
- All data must be generated from the same database and filtered according to need



Control of work flow

- Production planning and scheduling is of no use unless the production is monitored and controlled
 - Control through actual production data which is compared to the planned production
- Cut amount and quality changes
 - Uncertainty and difficulty in keeping to the original schedule
- Objective is to identify time and location of problems in production as early as possible
 - Production is altered so that the schedule can be maintained
 - Change in one task leads often to changes in several succeeding tasks





Lean Construction in Practise

- DYNARoad system in use in several projects
- Two stages:
 - Schedule, mass haul and resource use planning
 - Procuring of subcontractors
 - Project feasibility tested
 - Weekly task planning
 - Schedule and tasks locked six weeks in advance
 - Schedule checked manually three weeks in advance
 - Optimisation goes on constantly



Conclusions

- Largest gain achieved in tender calculation
 - Improves risk prediction accuracy
- System has assisted in finding new, more cost-effective and less risky methods
- Procurement process improved
- Production is shifted so that the original plans can be completed, not the other way around



Thank You!
