Concrete Pour Planning: Truck Loads, Trucks and Layer Return Time

Truck loads and number of transit mixers to keep a pump supplied, pour duration, and the time to return to a layer, compared with the concrete's setting time.

Method: Pour logistics and layer return time

Input parameters

Unit system: SI

Parameter	Value	Unit
Pour volume	240.00	m³
Transit mixer capacity	7.0000	m³
Placing rate	30.000	m³/h
Truck round-trip cycle time	75.000	min
Plan area of one layer	300.00	m²
Layer thickness	400.00	mm
Initial setting time at site conditions	3.0000	h

Calculated results

Parameter	Value	Unit
Truck loads	35.000	
Pour duration	8.0000	h
Trucks needed	6.0000	
Layer return time	240.00	min
Return time to setting time	133.33	%

Notes for this case

• Trucks = ⌈q·t_c/c⌉ keeps the pump fed; layer return time = A_l·t_l/q must stay well below the setting time (a ratio below about 60–70 %) or retarder, more pumps or a smaller layer area is needed to avoid cold joints. Add a standby truck for long pours.

Formula and method

$$n_l = \left\lceil \frac{V}{c} \right\rceil, \quad n_t = \left\lceil \frac{q t_c}{c} \right\rceil, \quad t_r = \frac{A_l t_l}{q}$$

Variables

V	Pour volume	m³
c	Transit mixer capacity	m³
q	Placing rate	m³/s
t_c	Truck round-trip cycle time	s
A_l	Plan area of one layer	m²
t_l	Layer thickness	m
t_{set}	Initial setting time at site conditions	s
n_l	Truck loads	-
t_p	Pour duration	s
n_t	Trucks needed	-
t_r	Layer return time	s

t_r/t_{set}	Return time to setting time	-

Method and standards

Pour planning.

Assumptions and limits

- Steady supply and placing rate.

References

Pour logistics and layer return time

Report details

Report reference	FCC-NXJA-ST30 (the same inputs always give the same reference)
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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/civil/quantities/concrete-pour-planning

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.