**Question: A pavement base layer is to be constructed in 30 days. Find the necessary truck numbers.**

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| --- | --- |
| shift (hours/day) | 8+8  |
| Base layer density (t/m3) | 2 |
| Ѳtemporary (%) | 20 |
| Ѳpermenant (%) | 9.8 |
| Loader efficient (m3/saat) | 130 |
| Truck loading volume capacity (m3) | 6 |
| Truck engine power  | 250 |
| Truck empty weight (kgf) | 4250 |
| Load and unload time (minutes) | 2.75 |
| Wr (kgf/kgf) | 0.15 |
| Work site efficiency (%) | 85 |
| Project time duration (day) | 30  |
| Max. trafik speed (km/hour) | 60 |

Base Layer

15.250 mt

Lenght =14000 mt

8250 mt

Base Layer

12 mt

80 cm

Stone quarry

V0

Slope (%)= 0

**Answer:**

|  |
| --- |
| **Soil** |
| Excavated volume necessary (m3) | $$V0=\frac{Vk}{(1+Ѳk)}=\frac{134400}{(1+0.098)} 122404.37$$ |
| Excavated volume necessary per day (m3/day) | $$\frac{V0}{30}=\frac{122404,37}{30}=4080 $$ |
| **Loader** |
| Loader efficiency (m3/day) | 130 m3/day x (8+8) hours = 2080 |
| Loader number needed to complet the work in 30 days | $$\frac{4080}{2080}=1.96=2 $$ |
| Vdeparture (km/hours) | $$\frac{0.243x250}{14250x(0.15+0)}=28.42 $$ |
| Vreturn (km/hours) | $$\frac{0.243x250}{4250x(0.15+0)}=95>60 take 60 $$ |
| **Truck** |
| Load (tons) | $$\frac{2x6}{(1+0.2)}=10 $$ |
| t departure (minutes) | $$\frac{15.250}{2028,42}=0.537 hours=32.2 $$ |
| t return (minutes) | $$\frac{15.250}{60}=hours=15.25 $$ |
| One period time (minutes) | 32.20+15.25+2.75 (loading and unloading) = 50.20  |
| D truck efficiency (m3/day) | $$x=\frac{0.85x6x60x(8+8)}{\left(1+0.2\right)x50.20}=81.2$$ |
| Number of truck =$\frac{Deks}{Dtruck}$ | $$\frac{4160}{81.2}=51$$ |
| 2x2080 = 4160 m3 |