# Re: Pyramid stone?

***Source:*** http://sci.tech−archive.net/Archive/sci.archaeology/2005−07/msg00420.html


- *From*: Philip Deitiker <Nopdeitik@xxxxxxxxxxx>
- *Date*: 12 Jul 2005 14:57:04 GMT


In sci.archaeology, created a message ID
news:ofGdndIAv7fpIk7fRVnyrw@xxxxxxxxx:

> In article <1121064965.448461.257720
@g44g2000cwa.googlegroups.com>,
> frgn@xxxxxxxxxxx (Franz Gnaedinger) wrote:
>
>> how can you pull
>> granite beams weighing sixty tons (the ones for the ceiling
>> of the so−called King's Chamber) over a rubble ramp that
>> gives in?
>
> There is a good survey of proposed possible building
methods in "The
> Pyramids" by Miroslav Verner.

Just 60 tons?

2004 Queen Mary 2
Cunard Ltd.
150,000 tonnes
23 decks
length 1,132 feet (1/5th of a mile)
width 147.5 feet
top speed 30 knts.

So essentially your argument is that we can build 150,000 tonne ships on the banks of muddy shores then drop them into the drink, but moving a 60 ton stone 1/2500th that weight over sand is impossible.

The average home around here weighs about 60 tons and sits on a soft gooey mud called gumbo. They only sink about 1/8th inch per year.

Sand is one of the better materials to build a road bed on as long as there is no rain. you can get about 95% compaction readily easily, for example, as one adds layers of sand get someone with a sledge hammer to pack each layer, add water,

pack again, and so on. As one gets to the surface layers increasingly sized sand and pebble can be added, filled with sand an packed. when the road bed is about 2 feet or so over initial grade the surface can be leveled by filling in with decreasing sized sand grains and packed. One easy way to increase the stability of the sand is to occasionally add CaOH2 and volcanic ash mixture to the sand that has been packed. Other ways are to add stone aggregates and to pack the sand around with water and packing devices. Lie down a layer of flat stones about 1/2 meter square feet by 5 cm thick, spacing them about 1/4 inch a part, file with number 2 sand/Number 4 sand mixture, cover evenly with minimum depth 2 mm of a number 4 grade sand. Stagger another layer of paveing stones on top of that and fill with sand again. One can add a topping layer of any mortar (CaOH2 is fine) to lock the sand in an protect it from rain. the sides of the ramp would need to be protected by at least one layer of stone with mortar and a water resistent topping coat (mortar and fine sand). The surface can be sanded to make smooth.
On inclines the danger is that the top layer of stone will shift, this is easy enough to deal with occasional wooden or iron spikes into the road bed that brace surface stones. I could imagine such a road bed could support trucks carrying much more than 60 tonnes. The road bed will need occasional ma
One key notion of carry large weights is to spread the weight out, for example 18 wheeled tanker trucks carrying 10,000s of gallons of crude oil travel over gravel mud aggregate roads even under wet conditions. One can spread the weight out for dense objects by having a series of crossbeams under it to move the weight in front and behind the object.

If you want to go to expert level road beds of course you can use crushed igneous rock, like crushed granites, these are still found in some areas, like in the washes around granite domes. These granite particles pack very quickly and have good rigity after compaction, one does not need to add stone or lime. In many areas in the hill country this has been used as road bed and it lasts many years with occasional packing. Of course this can be improved on by adding graded rocks such as white marble, on top of which can be filled with calcium carbonate, flattened and then placing whatever type of road material. For interstate traffic now a days it is very common that such durable beds are covered with a 1 to 2 inch layer of asphalt topped with tar and then the standouts for the reinforcement 2 about 9 cm off the ground, which is then covered with 20 cm of concrete with no practical limit on how much weight can be supported. However for international airports the concrete poured from runways is considerably thicker.

We can consider the weight issue from that point of view. A

747 has a Max take off weight of 362875kg (362 tonnes) and the runway from which it takes off is supposed to be cabable of supporting that weight in case of an emergency abort or landing after takeoff, although theoretically the plane would jetteson at least 35% of its fuel (issues with the tail section of the longer 747s and ground contact). Landing trajectory is on a glide slope of 300 meters/ 5 kilometer and the landing speed of the 747 at that weight is about 200 mph (320 km/hr, 88 meter/second) therefore the wheels of the 747 would contact the runway at a verticle speed of about 5.28 meters per second, this decelerates to 0 within less than 1/4 a second, so or deceleration by about 3 g. This adds to the weight of 1 g for the aircraft and so that the total g force on landing of about 4 g, this has to be multiplied by the weight ofthe aircraft of about 300 tons make the initial landing force on the runway about 1200 tons by weight. This is factored into the thickness of the concrete used for the runways. Consider the weight by tire and the surface area at which the weight is tranferred to.
There was a recent incident here at IAH in which a Continental 737 30 minutes out lost its left engine, this resulted in an aborted flight and return to departure airport. By the time the aircraft had reached the runway the left engine was on fire and we can assume the that vanes of the turbine had been ground to bits. Therefore the right turbine was producing most of the power, on landing planes use both engine and thrust diverters to decelerate the aircraft, this allows the pilot to adjust vertical speed to near zero before hitting the runway since he can use both brakes and reverse thrusters to decelerate. You cannot 'reverse' thrust with one engine as the aircraft would spin off the runway. Therefore he had to come down 'hard' and use the brakes, about half of the tires had blown out by the time the plane had come to a full stop, passengers report a number of bumps and bruises on the landing.

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Philip

Evol. of Xchrom.
http://home.att.net/~DNAPaleoAnth/xlinked.htm
Pal. Anth. Group http://groups.yahoo.com/group/Paleoanthro/
Sci. Arch. Aux
http://groups.yahoo.com/group/sciarchauxilliary/

DNApaleoAnth at Att dot net
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- ***Follow−Ups***:
  - ♦ ***Re: Pyramid stone?***
    - ◊ *From:* Franz Gnaedinger
  - ♦ ***Re: Pyramid stone?***
    - ◊ *From:* stevewhittet
  - ♦ ***Re: Pyramid stone?***
    - ◊ *From:* rms

- ***References***:
  - ♦ ***Re: Pyramid stone?***
    - ◊ *From:* Franz Gnaedinger
  - ♦ ***Re: Pyramid stone?***
    - ◊ *From:* kenney

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