



Resident's Environmental Protection Association
 The Old lamb
 Potter Row
 South Heath
 Bucks
 HP16 9LT
 6 July 2015

Dear Neil,

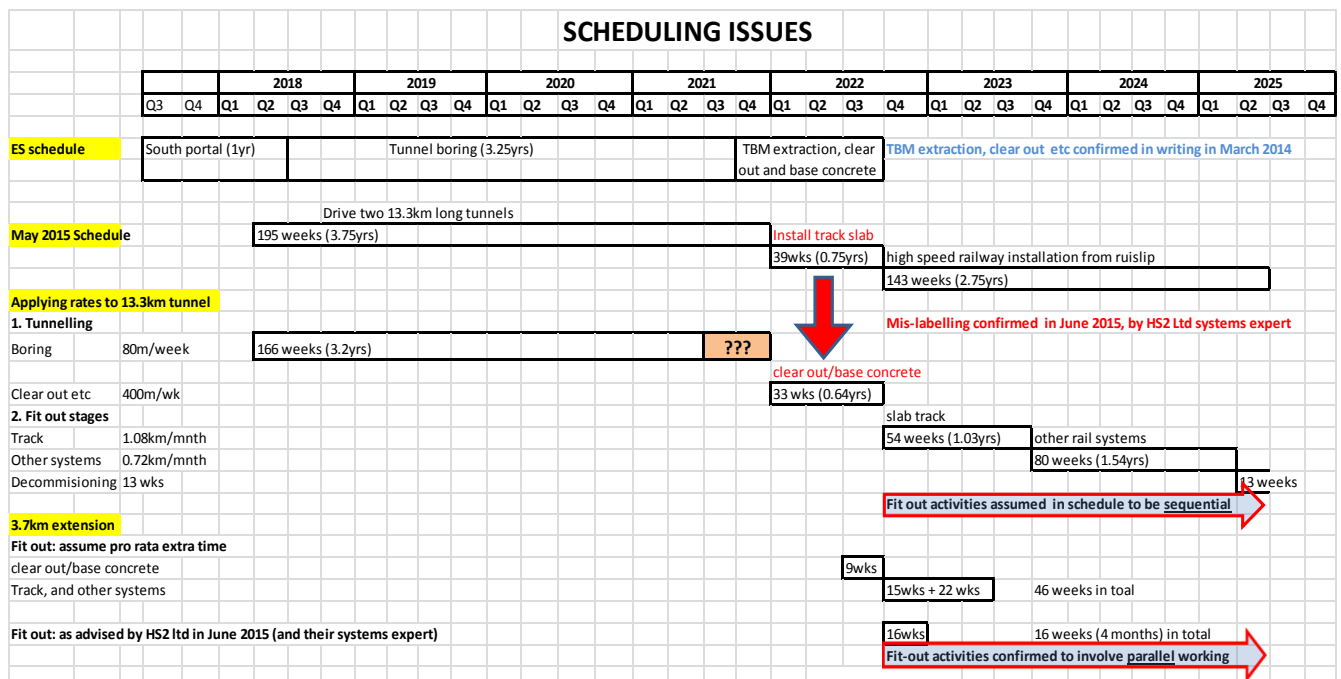
Re REPA tunnel and scheduling

In my letter of 30 June, to which we have not yet had any response, I said that REPA would write separately on the apparent anomalies with the May 2015 schedule.

In our view there are two issues with your schedule that are relevant to REPA:

- The tunnelling process continues to take 3.75 years while the fit-out and base concrete is confirmed as no longer done in this period, leaving an unexplained 6 months
- The fit-out process is excessively protracted, as indicated by your own estimate that a 3.7km extension is assumed to take greatly less than a pro rata extension to the time.

These two scheduling issues are set out in the schematic below



You will recall that Alex Aronberg, your rail systems expert from Parsons Brinckerhoff, explained that

- Despite the 0.75 years of activity being labelled 'install track slab' in the May 2015 schedule this in fact represented the clearing of the tunnels and the installation of the base concrete.

- The track slab stage (when the concrete form into which the rails and sleepers are fitted, and then the rails and sleepers installed) is actually part of the 2.75 years labelled “railway installation”.
- The “railway installation” stage includes 3 months for decommissioning the installation site.

This suggests that of the 3.5 years for fit-out in the May 2015 schedule, only 3.25 is strictly fit-out (as de-commissioning need not happen before commissioning activities commence), and 2.5yrs after clear out is complete.

However this seems to leave the tunnel boring process inexplicably long:

- Tunnel boring for 13.3km at 80m/week takes 3.25 years.
- The tunnel boring process has a 3.75 year duration in the May 2015 schedule. Previously in the ES the whole process had a 4.25 year duration – but after 3.25 years the TBMs were removed, and the remaining year was tunnel clear out, base concrete installation and other aspects of fit out (as the schematic shows, and you confirmed to us in writing in March 2014).
- This also matches the information in the Tunnel Guide you issued in June 2015, which gives 400m/week as the rate for tunnel clear out and stage one concreting, which is clearly treated in the Guide as part of the tunnelling process rather than fit-out. At 400m/week, clearing and stage 1 concreting would take 33 weeks, ie about 8 months.

But if the tunnel clearing and stage 1 concreting is not within the 3.75 yrs tunnel boring activity, **what fills out the additional half year** (Q3, and Q4 of 2021 in the schematic)?

It is likely that there will be some interval between launching the first TBM and the second, so there is likely to be a corresponding lag between the first TBM extraction and the second. Plausibly this would take only a couple of months. We had assumed that this time (and the rest of the six months) would be used productively by commencing clearing and stage 1 concreting, but your May 2015 schedule (as explained at our meeting) indicates otherwise.

It is a scheduled hiatus.

The second issue is about the duration of the fit-out.

The 3.25 years of fit-out (shown in the schematic) is the sequential sum of the tunnel clear-out and base concreting (400m/week), followed by the track (1.08km/month), in turn followed by the remaining railway fit-out (0.72km/month). For a 13.3km tunnel these times are: 0.64 years, 1.03 years and 1.54 years – totalling 3.21 years (3.25 years to the nearest quarter) if done strictly sequentially.

In practice fit-out processes can and are done in parallel, with potential for a major reduction in fit-out duration, as Alex confirmed at our meeting.

There are numerous activities that need to occur in the fit-out, with some of the activities depending upon the preceding process having occurred before that process can commence. For example the slip-form concrete needs to be in place before the rails and sleepers can be placed on top of it. But even then it is not necessary to complete one stage in its entirety before commencing the next, even when the activities are inherently sequential. The tunnel comprises an extended worksite, with the potential for different parts of the site to have different operations and stages of the fit-out occurring simultaneously. This is true even if there is access to the tunnel from only one end. With the Chiltern Tunnel, access is available from both ends (if it is required).

Your own estimate of the fit-out time for the Liberty Lane REPA tunnel extension (3.7km) is given as 4 months instead of the 11 months (or 8.5 months excluding clear out) which would arise if it were on a pro-rata basis. Alex explained this discrepancy as your ability to overlap activities. If the same

approach is applied to the entire fit-out, the duration would be 1.2 years, rather than the 2.5 years assumed in the schedule, again confirmed by Alex.

Perhaps there would be practical difficulties in packing the different activities in so tightly, and the small incremental time partly reflects that the necessary lags between processes (that avoid faster processing catching up slower ones) do not need *pro rata* extension to allow for greater tunnel length. Notwithstanding, the modest addition to fit-out duration that you think the extension requires is indicative that the current schedule is needlessly long.

It would be helpful were you to explain in detail why you feel the fit-out process is so protracted, and how your detailed schedule is supposed to work. On the face of it you are making processes entirely sequential that can be largely concurrent.

I am sure that you appreciate that minimising the duration of fit-out is valuable to the overall cost of HS2. The later tunnelling can be done against a given completion time, the later commitment of a major expense is scheduled, and hence the lower the NPV cost of the project. It is therefore surprising that HS2 Ltd seem to have adopted a needlessly lengthy fit-out schedule, with concomitant unnecessary cost.

As you may be aware we have enlisted an expert advisor on fit-out (Sean Ring) who was unable to be with us at our last meeting. As you know, we cannot see how the timings in your schedule are justified.

Finally we discussed at our meeting the option of fitting the extended tunnel out from both ends, which would save sufficient time ie over a year. Scheduling (boring and fit out) would then cease to be an issue for our extension. It was agreed that this option would be provided as part of the HS2 Ltd analysis of the extension to Leather Lane. Can you let us know when it will be available, as it is now most urgent?

If scheduling were no longer an issue then the principal matter between us would be cost.

Yours Sincerely



Hilary Wharf

Copies

Cheryl Gillan, MP Chesham and Amersham
Marianne Bowtell, Petition Analyst, Country South
Neil Caulfield, clerk to the Select Committee
Chairman of Select Committee (via Neil Caulfield)

Sent by e-mail

Neil.cowie@hs2.org.uk

Marianne.Bowtell@hs2.org.uk

cheryl.gillan.mp@parliament.uk

CAULFIELDN@parliament.uk