Glyn Rhonwy Pumped Storage (EN010072)

PINS Reference: 10031993 Mike Vitkovitch

Deadline 6 – Submission

4 July 2016

FAO.Mr Cowperthwaite

Dear Sir,

Further to the Applicant's response to my submission on low frequency noise and ground borne vibration and noise I make the following comments:

I will await the Applicant's response to my Deadline 5 submissions regarding Noise and Ground Borne Vibration and Noise before responding in detail on these specific matters. However there are some other relevant points that I raise below:

Construction Methods and Programme

I have consistently taken issue with the lack of information from the Applicant on how the various parts of the project will be carried out.

There are many energy companies and investors operating in the UK and Europe, all keen to exploit every opportunity and location to install generating stations, be they powered by solar, wind, hydro or any other sources of energy. It is 30 years since the Dinorwig scheme was completed and yet the Glyn Rhonwy Quarry has failed to appear as a viable location for any facility of that type, apparently until now.

There is no doubt whatsoever that the concept and benefits of pumped storage in general, is a reality. The topography of the Glyn Rhonwy quarry provides a tempting situation where the benefit of height, quarry holes and materials suggest such a scheme is feasible. The concept is understandable. However I have major reservations that the practical reality is achievable within the time and physical space proposed by the Applicant.

Even at this stage, in response to the ExA's direct questions, the Applicant is unable to give informative responses, still relying on the statement that the information will be available 'once the Principal Contractor is appointed'. A scheme of this value (Claimed at £160m) would by any comparable project have had a design carried out in conjunction with an experienced contractor's input, particularly where the consultant are inexperienced in the concepts of tunnelling and quarry excavation.

Occasionally new information, previously unmentioned is suddenly presented by the Applicant. In his Deadline 5 response to my submissions SPH-GREX-SWQD5_01 page 8-9, it appears for the first time, that there are two sets of transformers, "*the first set will be underground*." I would be grateful if the Applicant can identify where in his submission these underground transformers are to be located. His drawings (2.06.6) show only transformers above ground. That the Applicant is finding it necessary to keep modifying his plans to keep up with the objections he received is surely unacceptable at this stage of the process. However, be they positioned above or below ground, as stated by my Expert Witness Mr Rupert Taylor, there should already be a full assessment of the

Ground Borne Vibration and Noise from these installations in place so that the Examination can properly assess the effects of this scheme.

It must surely be an implicit part of the process of Examination that the Applicant is able to demonstrate that the proposed scheme can in fact be constructed within the Order limits and that the effects on the environment can therefore be fully established. Otherwise the Examination process would be worthless.

However either the Applicant is either aware of the fact that the requirements of construction will require areas and durations well in excess of those indicated on the drawings submitted, or he is seriously lacking an understanding of the methodology and sequencing of the necessary processes involved.

This is analogous to proposing to build a block of flats which occupies the entire footprint of the available plot. To deal with the issue of the lack of site space and transport difficulties, the proposer is suggesting it could be built using a helicopter, the details and capacity of which are someone else's responsibility.(but the helicopter will of course be required to have silent rotors) There is no doubt that this is entirely plausible in theory, but will never happen in practice. A significant effect of using a helicopter would also be the time it takes to build the block of flats, several times that by using conventional means of cranage and delivery.

The 'Indicative Construction Programme' that has been given with the Application in Table 4-2 of the ES Vol 2A suggests a 4 year overall duration. In assessing the environmental effects of the project's construction time is a significant issue. Short duration high noise levels can be tolerated, but not if they continue for long periods. As every process in the construction is highly constrained in working space, some adjacent operations will not be able to be carried out at the same time, or individually take a considerably longer period to carry out. A classic example of this is the excavation of Q6. At a size of approximately 70 x 150 m and 70 m deep with vertical sides, the operations of drilling, blasting, removing broken slate, bolting and anchoring the rock, grouting, building and removing access ramps for these operations will be on top of each other throughout the operation. Lowering and raising plant, men, materials and waste slate will take several cranes working in close proximity. The operations of constructing the scour tower, valves and chambers are also shown as parallel activities. Does SPH believe that when blasting takes place all the other activities can be continuing? The whole area will have to be cleared of men and machines as there is no doubt the fly-rock will be travelling right across the hole.

There is even a difficulty in finding a commercially available crane that can lift a 30 T excavator 70m down a quarry hole as the cable lengths become too large for conventional crane drums. Not only that the rate at which load can be raised or lowered dictates the volume of excavated material that can be removed in a daytime. With the 575,000 cm of surplus material being removed from Q6 (Table 4-1 refers) in one year, even with 365x 12 hour days, this amounts to a continual process lifting and lowering 130cubic metres per hour (200T/ hour equivalent) . The Applicant should be asked to demonstrate how this is ever going to be possible. The size of cable drum, lift height, weight being lifted and rate of lift are all readily available crane parameters. With limited rise and fall rates for the crane hook, shifting 100T/hour will be no mean feat.

It is not without thought that the original quarry works used tunnels and inclines to move material in and out of the quarry holes. The only other alternative is to construct a haul road from the quarry bottom.

Can the Applicant please be asked to explain how removing the surplus material will be carried out?

All this adds to the construction time, the costs, the noise and the disturbance to the locality. In general I can see that the confines of the site mean a construction programme duration of double that shown by the Applicant in Table 4-2 will be required, with the associated increase in noise and disruption to the community.

The proposed hydro- electric scheme is completely different from a windfarm proposal where the processes of moving and installing masts, blades and generators and the construction needs are modular, time repeatable and the principles easily transferrable from one scheme to another. The Glyn Rhonwy scheme is a bespoke installation in an incredibly constrained environment where the engineering requirements will determine the progress and viability of the project.

I use the Applicant's own information to demonstrate this matter further.

The indicative timeline Vol 2A Ch4 Table 4-2 for the project is significant in as much as it informs the duration of the construction noise and disturbance. It suggests that during Year 2, during the peak of construction, the following main activities will be ongoing on around the Q6 site:

Excavation of the Q6 reservoir, grouting, blasting, drilling.

Constructing the dam and waste spoil heaps,

Excavating of the penstock tunnel and chambers.

Excavation of the turbine hall.

For these processes there will be a requirement for the removal of over 2000 T/day of material up from the reservoir excavation, to a crushing and grading area (located where?) and up onto the rising dam crest/ temporar slate heap. In discussions on access roads the Applicant indicates that he requires a 10% gradient for haulage, so how where is this 1+km long haul road to be located both inside and outside Q6? From the processing area waste slate will then need to be hauled up onto the temporary slate storage area 50m above ground level, awaiting completion of the penstock lining before moving down to the lower Access Shaft then up to Q1 'by conveyor'. The programme suggests that all of the excavated material from the reservoir and tunnelling will be stockpiled to the north of Q6. One has to ask why the Applicant has not provided a plan and sections showing this tip. The maximum width of ground area available between the completed Q6 reservoir excavation and the northern Order boundary is 150m. For the sake of argument, with side slopes of 1:1.5 the temporary tip cannot exceed a height of 47m allowing for a minimum 10m wide access track along its top. At this steep slope the material is getting close to at its natural angle of repose, that is to say, on the borderline of stability. With side slopes of 1:1.5 my own calculations suggest that the storage of even the Applicants own figure of 650,000m^3 of slate will, allowing for side slopes at 1:1.5 require a tip ON LEVEL GROUND of 240 length. I attach a plan 'Q6 Temporary Stockpile Size' illustrating this point which includes calculations. However it is clear that the bedrock is rising at about 1:5 up the hill, the general slope of the hillside around the whole quarry. A slate tip starting level with the Clegir Road could have a crest width of 150m as it is level with the ground at this point. However the crest must slope away and narrow in width if it is to maintain its 150m maximum footprint width.

I attach a scan of an overlay on the Applicant's drawing titled 'Q6 Temporary Tip MV' illustrating its size and location. The possible width of this stockpile is limited by the sides of the Q6 excavation and the adjoining garage/property to the north. The length is limited by the outcrops of bedrock

below the Clegir Road and the Order limits. It will be a high and dominating structure visible above the Lake View' restaurant and the A4086.

Furthermore no assessment of the noise and dust created from the working of this huge tip have been made by the Applicant. His Q6 noise pattern ignores the loading and tipping of wagons, noises that cannot be mitigated. The height of the tip means that a 360 degree area will be affected by the noise, affecting Llanberis village and all the properties up and down the lake. He currently suggests a narrow cone of noise affecting Fachwen. This is a complete and self evident underestimation of reality achieved by not showing the full size of his works. If consent is given for this project , the working on this tip must not be allowed to carry on outside of the working day. Although an 'average' noise level may not be exceeded it will be the frequent, but randomly timed scrapping out of truck bodies and crashing of slate waste that will keep people awake. Even using a 'conveyor' the material will need to be loaded onto trucks and moved to be deposited in each area of the tip.

It is impossible to prevent the surface of a tip of this size from drying out and as all the material is 'as dug' it will be covered in dust. This will dry and blow in which ever direction the wind is blowing. The Principal Contractor will be unable to control this with tip side slopes of nearly 100m length.

Given my earlier Deadline 5 submission on the effects of over break and bulking factors, it is apparent that there will be insufficient space to safely store the surplus slate prior to transportation. The scale of work involved in this application is unsuited to the proposed location.

There is no indication of where the other construction materials are to be transported, processed and stored during prior to deposition in the permanent or temporary works. There is no indication of how excavated slate from the turbine hall and penstock is to be removed from the shafts but this can practically only be by 200T mobile crane and skip in each location each of which will require a significant footprint on the ground and clear working space, a stockpile area, and supporting services. The restrictive effect of excavating and lining the turbine hall less than 35m away from the main tunnelling access shaft cannot be underestimated. Safety zones around the excavation edges will be the first consideration. In addition there will be a continuous requirement for multiple project offices, workforce canteen and welfare facilities, fresh water tanks, car and lorry parking and workshops, fuel and materials stores, compressor and ventilation fan houses, a concrete batching plant with multiple aggregate bins and silos, concrete waste recycling/washout facilities, a temporary substation to say nothing of the space required for crushing and grading slate and other imported materials.

And yet the only available space for these will be area south-west of the dam at Q6 which also forms the main road entrance to the lower site. There is insufficient space for managing a project of this size and as with any other major project, the Applicant should be providing details of where and how all these facilities are to be located.

The significance of this to the Examination is the fact that without details of the construction methodology the areas required for temporary works and support equipment cannot be assessed. Without this construction methodology the rates of progress cannot be assessed. Without details of the how tunnelling and tunnel access is to maintained through all the processes of excavation, lining, conveyor/shaft elevators, the reality of what space will be required and for what period of time, cannot be assessed. These all directly impact on the construction period, how much land is required to support the construction works, and how this ultimately will impact on the environment and the local communities. It is highly unlikely that available working space exists within the Order Limits to

enable completion of the works within the stated periods. The Applicant has measured his documentation around the final finished scheme and not adequately considered the time/space issues required to construct them. This is the 'quiet helicopter to build a block of flats' analogy; it might work in theory but certainly not achievable in practice.

I find it significant that the Applicant is remaining silent on all these matters and implore the ExA to seek more information from the Applicant on the construction work and how these use the available land areas. Without this information it is not possible to assess the effects of the scheme on the environment and community.

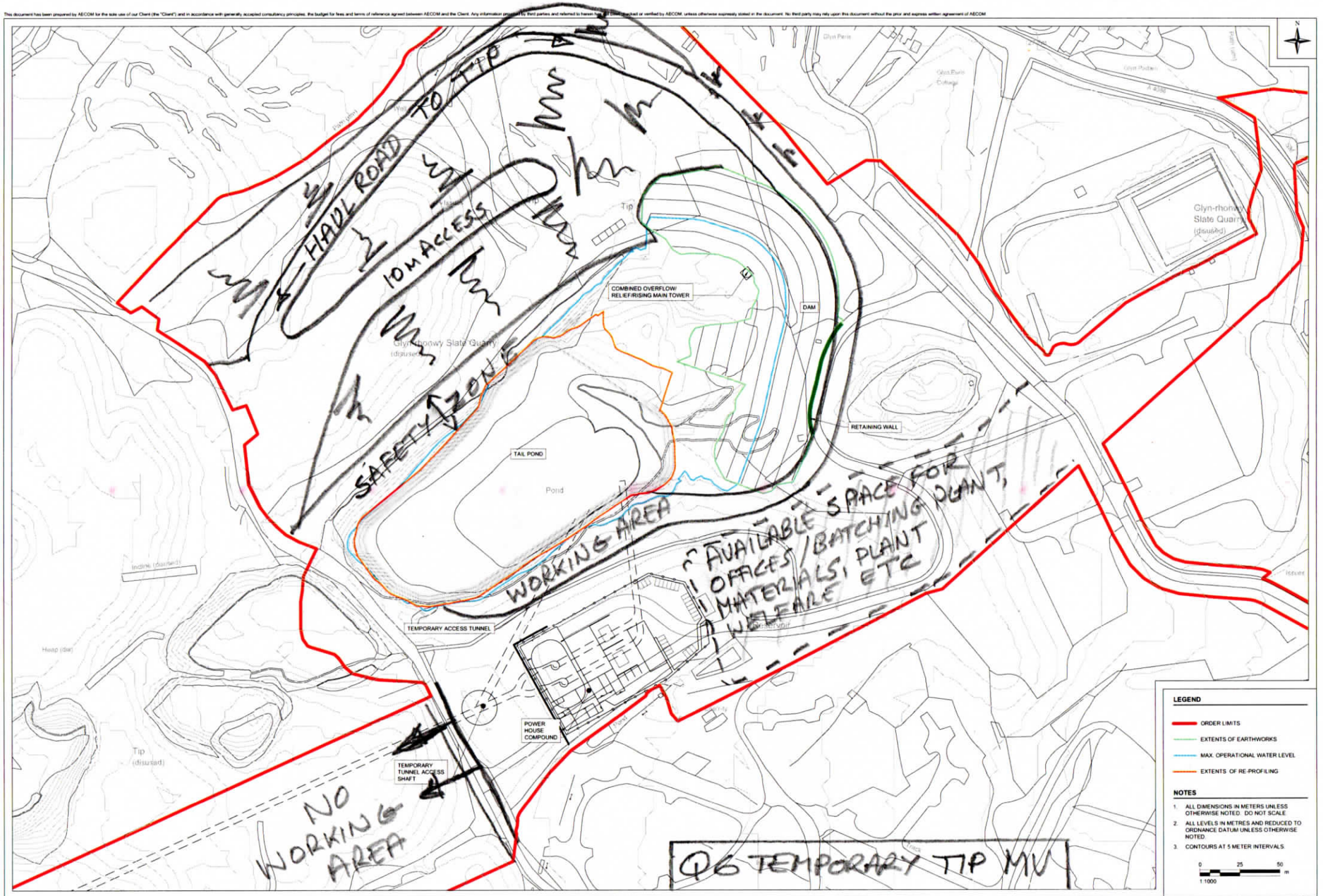
Ffordd Cefn Ddu

The ExA will be aware that the proposals for the Ffordd Cefn Ddu, or 'Green Road' widening was taken to public consultation on 29th July 2016. This was not done in the village hall as one would reasonable expect, but some 2 miles for Waunfawr. Many issues became evident, not the least being that it became clear in discussions that the proposed HGV management system could not operate as suggested by the Applicant's Management Plan. During the construction of the widening, residents would be unable to reach their homes other than on foot. Once the widening was complete residents would have to phone and check it was safe for them to drive out onto the road. For the elderly residents and those at home during the day, these were certainly not feasible options. The proposed change in junction priority at Groeslon would create a dangerous situation as side visibility is limited by properties on the corner. The priority has been long established in the current direction for this very reason. It was apparent that those that attended the Consultation saw nothing but difficulties with the proposals and were against it in principle. In a village poll 90% of the Waunfawr respondents were against the scheme and this has been mirrored by the Waunfawr and Caeathro Community Council who have recently discussed and voted against the revised 2015 scheme.

When pushed, the Applicant advised that the 4 metre width required for the proposed widening of the 'Green Road' was based upon discussions with a 'specialist haulier'. He advised that 4 m would be required for the abnormal loads " with a margin for driver error". However it was admitted that no such discussions had been entered into with one of the many large hauliers who move aggregates around the county and understand the needs of HGV's and how best to manage HGV traffic in such situations. The information is out there, but for some unknown reason the Applicant is reluctant to seek that advice and then include it within his submission. The opinion of all who oppose this project is that the reality of what is achievable is being kept from the Examination because it fails to support the current documentation. The same situation exists with the timescale, unsupported and inaccurate forecasts for tunnel progress, a Indicative Construction Programme that shows operations being carried out side by side when this is physically impossible (for example lining the tunnel at the same time as transporting slate from Q6 to Q1). The Applicant claims that the scheme will cost £160m to deliver but without the engineering information how can he have arrived at any figure at all. Time costs money and underestimating the project duration significantly underestimates the cost, and therefore the viability of the project.

The Applicant has provided insufficient information to show how the project can be delivered within the Order limits and the Indicative Programme and the ExA is therefore unable to make an assessment of the full effects of this scheme on the environment and community.

Mike Vitkovitch



Client: Snowdonia Pumped Hydro

Project: GLYN RHONWY PUMPED STORAGE DEVELOPMENT CONSENT ORDER

2.05.4 Indicative Site Layout Plan of Power House, Tailrace and Q6 Configuration (Sheet 4 of 5)

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Verified		Approved	CA
Date	07.08.15	Scale @ A1	1:1000
Drawing No.		2.05.4	A1

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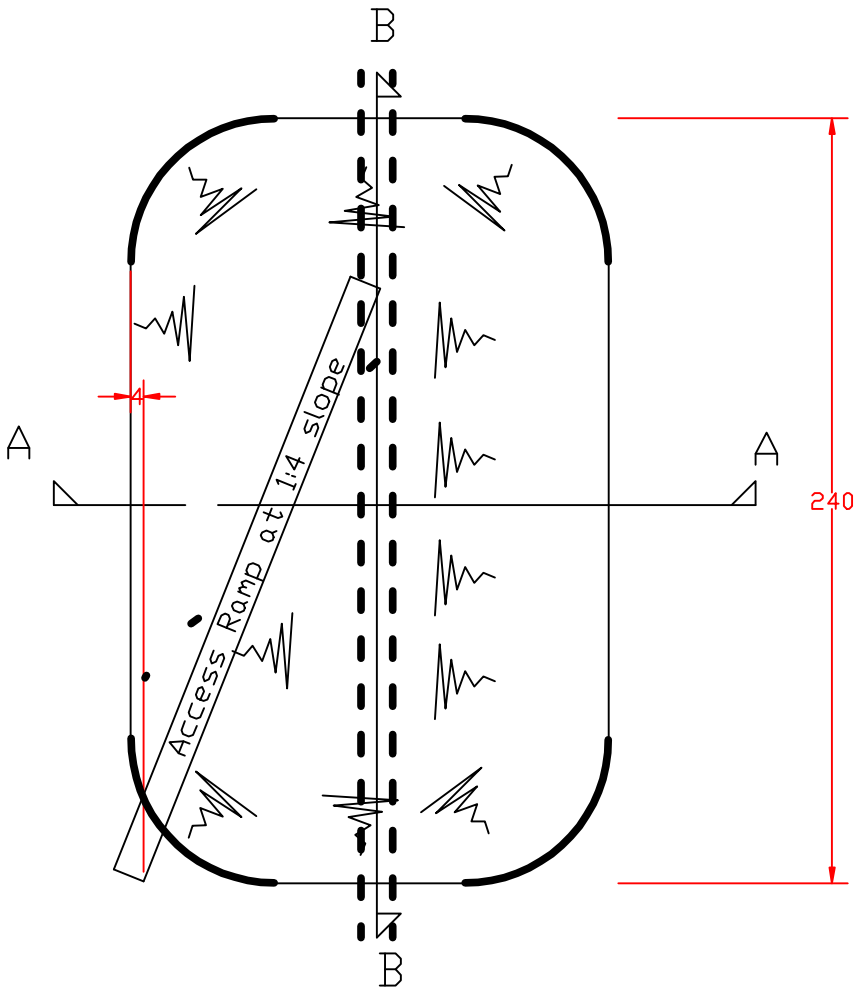
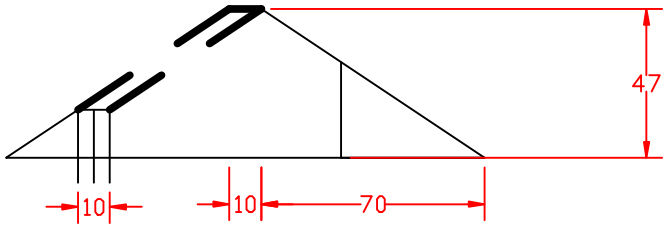
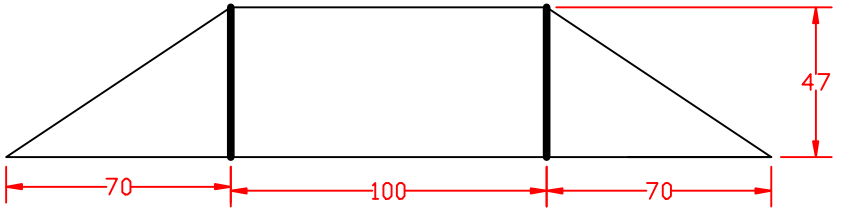


Plan on Temporary Tip



Section AA



Section BB

Area of side slopes 70x47=3290sqm
Area of centre 100x47= 4700sqm
Area of Cross Section BB = 7990sqm
over 10m centre width on AA = 79,900 cubic metres

Area of side slopes on AA 70x47 = 3290 sqm
Additional side volume on Section AA is 100x3290 = 329,000cubic metres
Plus 4 conical corners totalling $70 \times 70 \times 47 \times \frac{22}{7} / 3$ = 241,266 cm

Maximum possible capacity of temporary stockpile 650,167 cubic metres
without any reduction for access track volume.

Q6 Temporary Slate Tip