



AQUIND Limited

AQUIND INTERCONNECTOR

First Written Question Responses – Appendix
3 - Proposed Site Level and Earthworks
Design Approach (MG1.1.6)

The Infrastructure Planning (Examination Procedure) Rules 2010, Rule 8(1)(b)
The Planning Act 2008

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1. SUMMARY

- 1.1.1.1. The ground investigations undertaken in relation to the Converter Station Area identified Head Deposits, which predominately consisted of gravelly Clays sometimes becoming clayey Gravel, overlaying Structureless Grade D Chalk which overlay Structured Chalk.
- 1.1.1.2. The proposed 85.10metres Above Ordnance Datum ('m AOD') finished building level was calculated based on the recommendation of the flood risk assessment and, the site-specific initial cut and fill study to;
1. Ensure the platform level lies within Structureless Chalk to minimise impact on the SPZ1.
 2. Make allowance within Structureless Chalk for installation of below ground services such as drainage, low-voltage ('LV') and high-voltage ('HV') cable ducts, drawpits and trenches.
 3. Maximise retention of the excavated material on site to minimise offsite disposal and a lower environmental impact.
- 1.1.1.3. The ground investigation data supports the proposed platform level, which ensure the below ground services lie within the Structureless Chalk, as seen in plates 1 and 2 below. To mitigate the risk of aquifer contamination, the bulk earthwork shall remain within the Structureless Chalk. The Converter Station site level will be reviewed and adjusted as necessary at the detailed design stage to suit the design requirement of the below ground services such as LV and HV ducts and draw pits and drainage to ensure all excavations will remain within the Structureless Chalk and the Structured Chalk will not be exposed. This requirement is reflected in the Surface Water and Aquifer Contamination Mitigation Strategy, located at Appendix 7 to the OOCEMP (APP-505) and secured via the same.
- 1.1.1.4. To ensure the building height will not exceed the parameter envelope assessed when the site level reviewed and confirmed, an AOD threshold 111.10 meters is provided for by the Converter Station and Telecommunications Building Parameter Plan [APP-012], which is required to be complied with in accordance with DCO Requirement 5. Amendments would be made to roof profile design to address any refinement to the site level for the Converter Station and ensure the building height does not exceed the parameter envelope assessed.

2. SPZ1 DESIGN CONSTRAINTS AND LIMITATIONS

- 2.1.1.1. The proposed Converter Station site slopes gradually from the north to the south. The Converter Station Area is known to be underlain by a Principal Aquifer (Chalk), designated as a Source Protection Zone 1 ('SPZ1'). Following discussion with the Environment Agency and Portsmouth Water, the SPZ1 requires a considered approach to mitigate any potential contamination, turbidity or groundwater issues caused by construction and operation activities over the design life of the development.
- 2.1.1.2. The ground investigation found that the proposed Converter Station is directly underlain by Head Deposits consisting predominantly of gravelly clays; sometimes becoming clayey gravel. Generally, underlying the Head Deposits are Structureless Grade D Chalk, predominately described as grade Dm (matrix-dominated) with occasional interbedded layers of Dc (clast-dominated). Below the Structureless Grade D Chalk, chalk quality and grade will broadly improve with depth and become Structured Chalk Grades C to A.
- 2.1.1.3. Groundwater was not encountered during the ground investigation; the deepest exploratory location was 30metres below ground level (m bgl). Portsmouth Water informed the groundwater to be approximately 40-50m bgl. The unsaturated zone of the aquifer is considered to be in the Structured Chalk between the groundwater and the Structured-Unstructured Chalk Boundary.
- 2.1.1.4. The Converter Station is located in Flood Zone 1 with no watercourses in the near vicinity, therefore there is no requirement to consider the impact of climate change in relation to peak river flows or sea level rise. Peak rainfall allowances as a result of climate change are considered and the proposed surface water drainage strategy at the Converter Station has been designed to manage surface water run-off generated up to and including the 1 in 100-year return period pluvial event with an allowance for climate change. In addition, the Converter Station external building thresholds/entrances are to have a threshold of up to 300 mm above proposed converter station general site/platform level subject to detailed design, to provide resilience against any potential extreme rainfall events exceeding the design standard or localised reduction in capacity of the drainage system associated to local blockages or failure.

- 2.1.1.5. Deep excavations into the Structured Chalk Grade C to A are likely to increase the risk of contamination to the SPZ1. Therefore, to mitigate risk of creating pathways to the aquifer, the excavation must be kept to a maximum depth within the Structureless Chalk strata. Also, consideration must be given to the method of construction of the embankments from a landscaping perspective to allow natural slope of 1:4 to tie-in the developed area to the existing landscape and to avoid any hard engineering solutions such as retaining structures or slope strengthening (i.e. soil nails and rock bolts).

3. PROPOSED SITE LEVEL & EARTHWORKS DESIGN APPROACH

- 3.1.1.1. To create a suitable area for construction of the Converter Station, it is proposed to cut the platform into the gentle hill slope. To demonstrate the likely impact of different platform levels on the cut/fill quantities and the slope stability, earthwork modelling was undertaken for the proposed site based on initial 84.80m AOD (higher limit) and 84.30m AOD (lower limit) site level. The recommendation of the flood risk assessment is to set the finished floor level 300mm above finished site level, therefore at 85.1m AOD or 84.6m AOD respectively.
- 3.1.1.2. It was concluded, from comparing the results for both of the proposed site levels, that although the difference in the visual impact of the two proposed site levels are negligible, considering the site slope north to south, the lower site level will generate significantly higher quantities of excavated material to dispose off-site and therefore, will have much higher environmental impact in this regard. The higher platform level also provided the benefit of less imported material requirements and remaining higher within the Structureless Chalk, allowing for the drainage, HV and LV cables to be located in the Structureless Chalk. Therefore 84.80m AOD has been identified to be a suitable indicative converter station site level, correlating to a finished floor level of 85.10m AOD.
- 3.1.1.3. The converter station external building threshold of 300mm that is included in the assessment, as explained above, is based on the worst-case parameters for groundwater and flooding. The preliminary ground investigation data supported the indicative platform level, which allows for the below ground services to be located within the Structureless Chalk, as seen in plate 1 and 2. The indicative platform level is closest to the Structured Chalk to the north at the toe of the cutting at approximately 2 metres clearance, informed from the closest exploratory location which is approximately 34 metres south of the cutting toe.

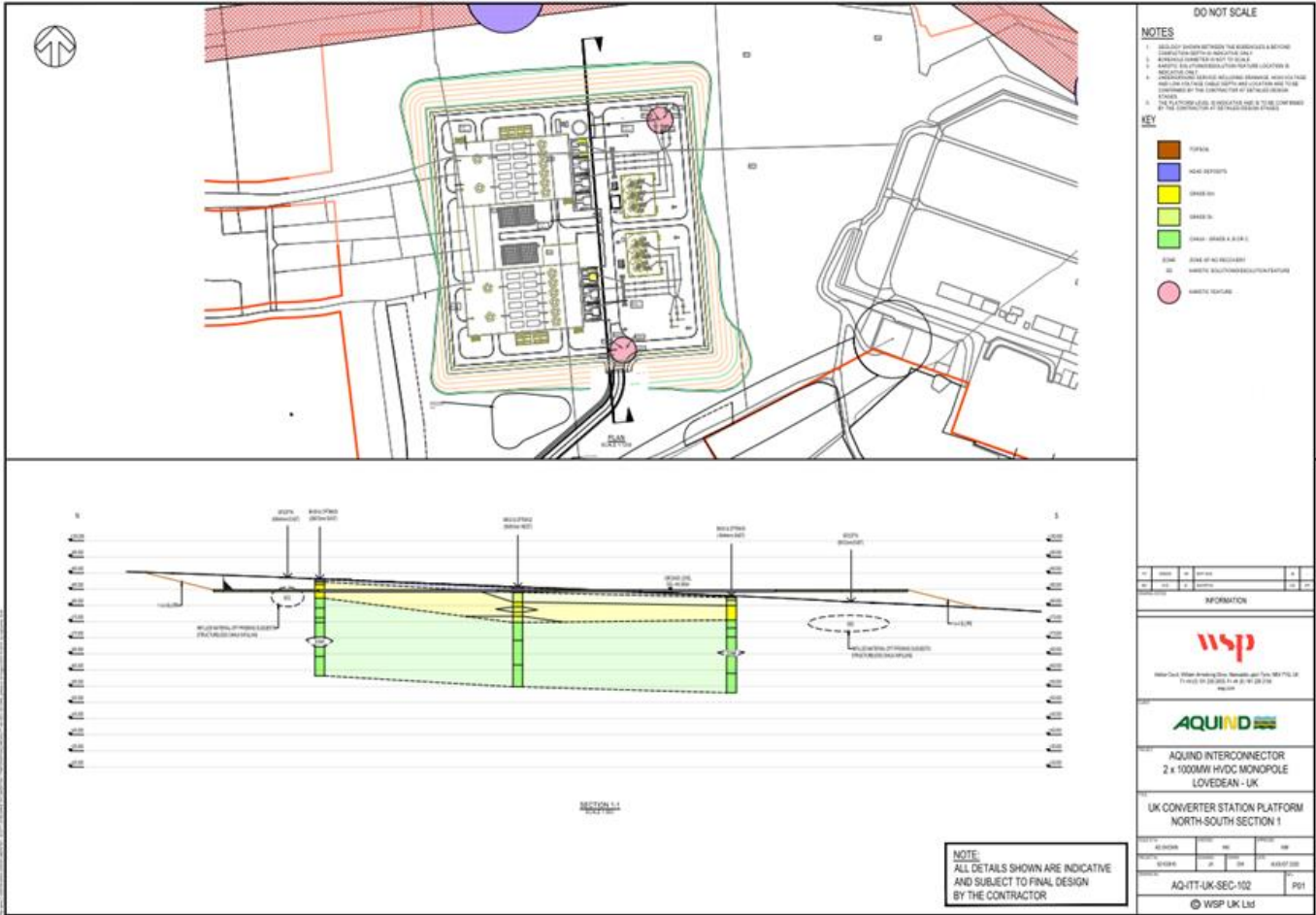


Plate 1 - Converter Station Platform, North-South Section

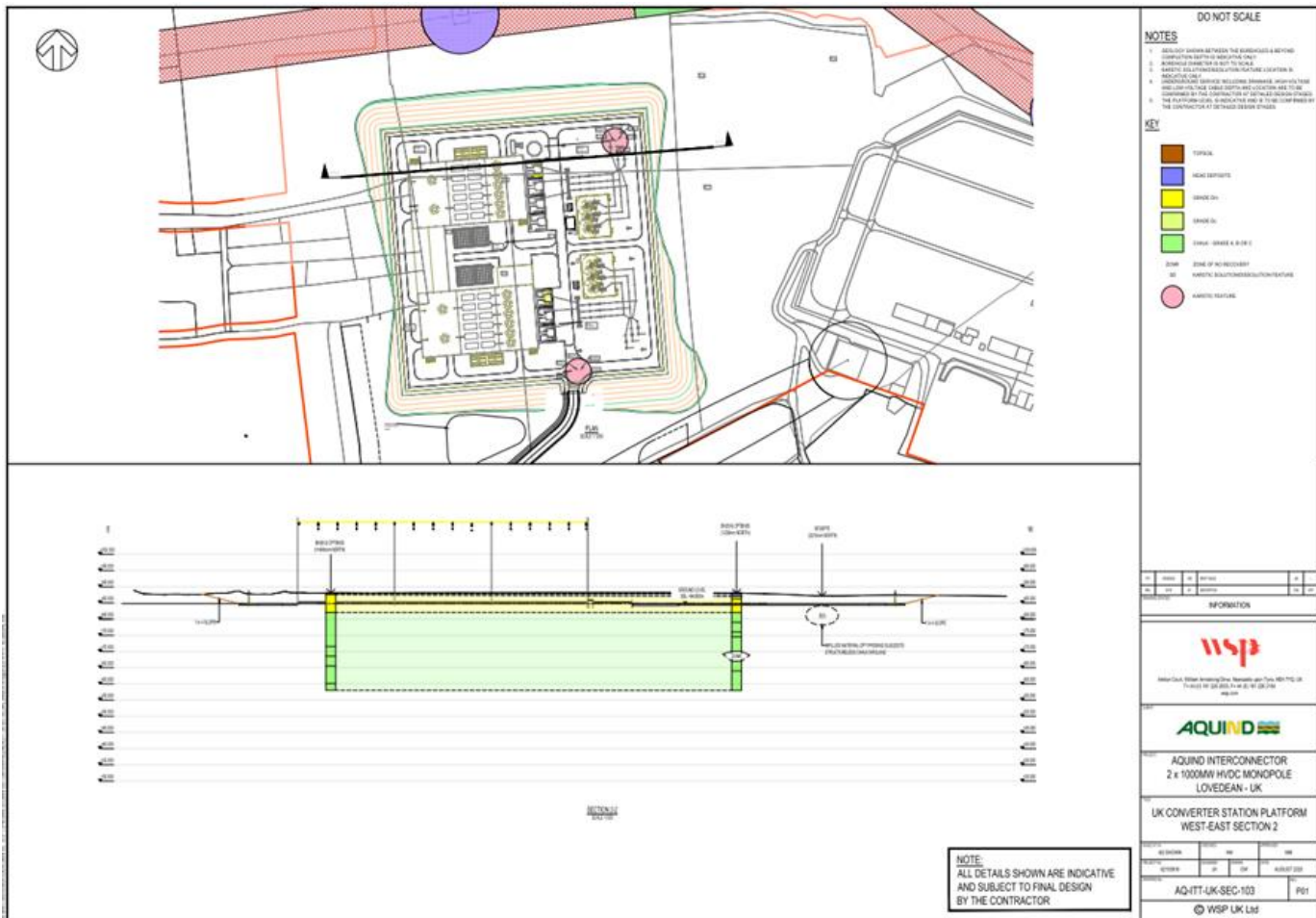


Plate 2 - Converter Station Platform, West-East Section

- 3.1.1.4. The Application has been developed on the basis of the Rochdale Envelope approach in accordance with the guidance contained within the Planning Inspectorate’s Advice Note 9: Rochdale Envelope.
- 3.1.1.5. The Application confirms the Order Limits and the maximum design parameters for the Proposed Development, as well as clearly identifying what the Proposed Development will comprise, which allows the ES to assess the Proposed Development on the basis of the likely worst case adverse effects.
- 3.1.1.6. During detailed design, if anticipated the cutting could expose the Structured Chalk the platform level may require refinement, which may also require further construction methodologies and sequencing mitigation to manage the risk of exposing the Structured Chalk. Construction methodologies, mitigation and management will be to industry guidance (CIRIA Report C574) with the review and approval from Portsmouth Water and Environment Agency.

