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Date 1st February 2016
To "Lee Dance, South East Water"
From Alastair Smith
Subject **National Grid Technical Queries on Jacobs report on Review of Alternative RCP Routes in Area of Interaction with Broad Oak Reservoir Scheme**

Technical Queries received from National Grid, 8th January 2016 to Lee Dance at South East Water. Lee Dance requested Jacobs to provide responses to the Queries raised.

Technical Queries raised against;

- Report; Jacobs report B14000AG-BORStudy-1055, Review of Alternative RCP Routes in Area of Interaction with Broad Oak Reservoir Scheme, rev 0 dated 19th November 2015 and
- Updated drawings from Appendix A (updated with study stage 1b reservoir design), drawings raised to rev 1 dated 21st Dec 2015;

Responses provided below against NG requests (black text) ([Responses in Blue Text](#)).

Technical Queries on Jacobs Alternative Route Proposal (20th November/22nd December 2015)

Jacobs Comment; The queries raised are in our opinion typical for the level of detail in design at stage 4.3 (of NG, Network Development Process Map Enabling Document, UK BP/TP500 Issue 2 Jan 2014) and beyond the level of design detail developed for the scheme as proposed in the consultation documentation published in February 2015 (considered to be at stage 4.2 of TP500). It is our understanding that design development will have been undertaken by NG during the consultation period for their proposed RCP alignment toward attaining stage 4.3 gateway approval.

Jacobs undertook a review of alternative routes against the published design detail as an evaluation of options in the area of interaction with the Broad Oak Reservoir scheme. Development of the proposed design and that of any alternative options would be expected to be undertaken by the NG designers on the RCP scheme.

Jacobs' evaluation considered design aspects required for promoting the alternative routing options through stage 4.3 (of TP500) design development taking account of considerable background knowledge and experience of delivering designs for NG through this and latter design gateways. Whilst assumptions were made as to the detail of design as proposed for the alternatives the detailed design would follow during stage 4.3 of TP500. The assumptions were built into the cost evaluation to ensure option evaluation would be valid in line with NG's stage 4.2 of TP500.

Jacobs have endeavoured to answer as fully as possible in context of the level of option developing undertaken.

OHL (Southern Route)

- Confirm the pylon types proposed including angles, heights/widths.

Jacobs Response; Towers have been assumed to be of L8C construction. The heights have been assumed to be within the heights of the RCP proposed scheme, heights at this stage are yet to be finalised due to possible variations in land topography and clearance requirements. Detailed review of widths has not been evaluated at this stage but assumed to be broadly in line with the proposed RCP design. All but pylon PC12 would be the same type.

<u>Pylon</u>	<u>As NG Proposed RCP</u>	<u>Alternative Southern OHL route</u>
PC7	D30	D30
PC8	D60	D60
PC9	D30 (up to 10°)	D30 (up to 10°)
PC10	D	D
PC11	D	D
PC12	D30 (up to 10°)	D30 (10 to 30°)

- What design assumptions have been considered for the adjacent spans from a pylon design and span length perspective on the re-routed line, i.e. the spans beyond PC6 and PC12?

Jacobs Response; Prior to tower PC6 and beyond PC12 the OHL has been assumed to continue as per the original RCP project route.

- What assumptions have been made with regard to construction of the alternative route i.e. access to construct the pylons, pulling positions for stringing conductors, operational and maintenance access and future re-conductoring?

Jacobs Response; Access routes for the construction of towers PC6 – PC12 would use existing proposed access routes identified within the RCP project consultation documents, with the routes being extended to the revised pylon positions. No obstacles to this being feasible are identified. The pulling position is anticipated to be located at PC8 with PC7 and PC9 attaching as pull-through towers. Maintenance access is as per RCP proposal consultation documents, with the routes being extended to the revised pylon positions.

Trenched Cable Option

- Confirm the pylon types proposed for PC8 and PC10 including angles, heights/widths and in the case of PC10 how do the OHL conductors from PC10 connect to the cable sealing end in the Cable Sealing End (CSE) compound? It is not clear if they connect by OHL gantry to the cable sealing end or to a sealing end platform?

Jacobs Response; Pylon heights have been assumed to be within the limits of the RCP proposed design published in consultation documents, heights at this stage are yet to be finalised due to possible variations in land topography and clearance requirements. Termination Pylon Type assumed to be DJT (or DT). The OHL conductors had been assumed to be

transferred via OHL gantry to the cable sealing end at PC10 and direct to anchor blocks at PC8. The angles of the termination towers (as per revision 1 option drawings) are assumed to be 0° at PC8 and between 30° and 60° at PC10.

- Confirm the dimensions of the CSE compound

Jacobs Response; The compound has been assumed to be 30m x 10m at this stage.

- Dimension of construction swathe proposed?

Jacobs Response; The construction swathe was not considered to be the major factor in identifying technically feasible alternatives as the routes are within SEW land ownership and as such the landowner is in agreement to facilitating the construction swathe.

- What ambient ground temperature has been assumed?

Jacobs Response; Ambient Winter/Summer ground temperature of 10°C had been assumed at 6m depth.

HDD Cable Option.

- What assumptions have been made for cable pulling tension positions and areas for the launch and receive pits?

Jacobs Response; The areas required for the launch pits have been assumed at this stage to be approximately 20m x 20m and for the reception pit approximately 20m x 5m. The choice of launch pit site and cable tension pulling end can be established during design development with consideration of access routes as proposed RCP route to pylons PC8 and PC10. Consideration should seek to avoid additional vehicles through the village of Broad Oak and limiting noise at residential receptors during construction. Pylon PC10 would appear to be the most likely site with these considerations taken into account.

- Confirm the pylon types proposed for PC8 and PC10 including angles, heights/widths and in the case of PC10 how do the OHL conductors from PC10 connect to the cable sealing end in the Cable Sealing End (CSE) compound? It is not clear if they connect by OHL gantry to the cable sealing end or to a sealing end platform?

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