



Prepared for:

East Riding of
Yorkshire Council

The Paul Site Hull

Electrical Infrastructure Feasibility Study

September 2012

East Riding of Yorkshire Council
Paull Site - Hull
Electrical Infrastructure
Feasibility Study

Contents Amendment Record

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1**Introduction**

URS Infrastructure and Environment were commissioned by Colliers International to carry out a study for East Riding of Yorkshire Council to investigate the feasibility of providing electrical infrastructure to the Paull site in Hull.

The Paull site is an 81 hectare green field site located on the North bank of the Humber Estuary. It is intended that the site will be used to accommodate Tier 1 supply chain partners of Siemens, who are currently in negotiations to develop an integrated manufacturing hub for offshore wind power.

Recommendations on how best to proceed are not within the scope of this report.

2 Electrical Infrastructure Options

2.1

General

The original commission from Colliers International to URS was to obtain quotations from various distribution authorities to deliver electrical power infrastructure to the Paull site. This was to enable East Ridings of Yorkshire Council to gain a greater understanding of the associated budget costs.

A meeting was then held at East Riding of Yorkshire Council offices in Brough on the 10th September 2012 attended by;

- Stephen Silvester - East Riding of Yorkshire Council (ERYC)
- Richard Lowther – Hull City Council (HCC)
- John Healy – URS

At this meeting ERYC and HCC stated that they were keen to explore alternative options with regards delivering power to the Paull Site.

ERYC and HCC advised that the British Petroleum (BP) Site adjacent the Paull site is currently serviced via a Private Power station owned by GDF Suez, and BP utilise only 8% of the substation capacity. ERYC further advised that BP operate their own electricity network taken from the GDF power station to service their requirements and the requirements of up to 8 further non BP end users on their site.

ERYC and HCC stated that they are in early discussions with BP looking into the feasibility of connecting into the BP infrastructure that currently serves the BP site to provide power to the Paull Site. This option would result in BP operating, maintaining and metering the end users on the Paull Site.

URS, ERYC and HCC went onto agree that the following options were to be used in order to form the basis of this feasibility study;

- Option 1 - Deliver power to the site based on the quotation received from Northern Power Grid (NPG)

- Option 2 - Deliver power to the site based on a quotation received from an (Independent Distribution Network Operator) IDNO
- Option 3- Obtain a direct feed from the GDF Suez Power station works by NPG (Paull site operated and maintained by NPG)
- Option 4 - Direct feed from the GDF Suez Power station works by IDNO (Paull site operated and maintained by IDNO)
- Option 5 – ERYC and HCC to own, operate and maintain a private electrical network (or employ somebody to do this) on the Paull site supplied from the EDF Suez Power station.

A further option of connecting into the BP infrastructure on the adjacent BP site to provide power to the Paull Site. (Paull Site operated and maintained by BP) is being explored by SS & RL. URS involvement is not required on this option, and is therefore not detailed further within this report.

Following the meeting URS confirmed with Colliers International that the methodology above was acceptable as a basis for which URS to proceed.

3 Design Criteria

3.1

Electrical Infrastructure – Design Assumptions

3.1.1

General

At the time of instruction and commencement of this report the layout of the Paull site was very speculative, and still remains so. In order to assess the feasibility of delivering electrical infrastructure to the site and the associated budget costs, baseline design assumptions had to be made in order to approach the electrical distribution companies.

Following conversations with ABP ports it was established that the site would house a number of relatively heavy industrial consumers. It was established that ABP ports had knowledge of similar site roughly 25% of the size of the Paull site with an electrical demand in the region of 8MVA. It was with this information that it was decided that for the purpose of obtaining budget costs an electrical demand of 30MVA would be used.

With the layout of the site being speculative and the need to offer the electrical distribution companies as much information as possible with regards to the end users the following end user requirements were given in order for budget costs to be provided.

- 2 No. large 8MVA consumers.
- 5 other 11kV customers
- 5 No. 11kv/400v substations for LV customers

4 Option 1 – Distribution Network Operator (Northern Power Grid) Quotation

4.1

General

URS contacted Northern Power Grid (NPG) the local Distribution Network Operator (DNO) to discuss the feasibility of delivering electrical infrastructure to the Paull site. URS presented to NPG the available site information and the agreed design criteria referenced in section 3 of this report. On receipt of this information NPG advised that due to the particular speculative nature of the site and the level of information available, they would only be able to provide a budget estimate. A budget estimate is defined by NPG as;

"A budget estimate is defined as a statement in writing, which may be provided without carrying out a site visit or a system studies, of the amount that we reasonably estimate we would require you to pay in respect of the relevant proposed connection if you were to require us to offer terms for making such a connection under section 16A (1) of the Electricity Act 1989 ("the Act)".

The budget estimate will not provide a formal Point of Connection as a network study will not be carried out, however the estimate will identify a likely source of the supply and the works associated to get it to site.

4.2

NPG Budget Estimate Quotation

The budget estimate for the delivery of Electrical Infrastructure to the Paull site is included with in the appendices of this document but summarised as follows;

- The costs provided are for the provision of new infrastructure and the diversion of existing
- The costs for the works is estimated at £7.9 million + VAT

- The quotation provided is a Budget estimate only showing indicative costs only. No network analysis or detailed electrical studies were carried out in the preparation of this quote.
- The Cost is based on a 30MVA demand for the site on a non phased occupation.
- The cost includes for a new 132/33kV transformer at NPG's Saltend Substation.
- The cost includes for using 2 No. existing 33kV circuit breakers at NPG's Saltend substation to feed the site.
- The cost includes for 2 No. new 33kV circuits supplied from the existing circuit breakers to a new 33kV/11kV substation to be built on site.
- The Cost includes the provision of the new 33kV/11kV Primary substation to be built on the site taking up approximately 50m x 50m area.
- Within the cost provision has been made for a number of different end user types including
 - 2 No. Large 8MVA customers
 - 5 No. 11kV customers
 - 5 No. 11kV/400V substations for LV customers
- The costs includes for the works to be provided along the most direct and economical route using the new highways and verges and footpaths and assuming that there are no abnormal ground conditions along that route.
- The cost is based on the assumption that NPG are able to obtain wayleaves/easements and any other statutory consent for the route that they are unable to place in the highways of verges/footpaths and on our site.

- The cost is based on the assumption that ABP will grant them an unencumbered freehold site, at nil cost, for any and all substation accommodation.
- The cost is based on the assumption that any excavation and reinstatement they do on our site will be in unmade ground.
- The cost includes an allowance for diverting the existing infrastructure currently crossing the site (overhead lines)

4.3

Proceeding with the NPG quote

If it was decided by ERCY and HCC to proceed with the NPG option a more detailed investigation would be required to be undertaken by NPG. At this stage NPG would need more detailed information with regards to;

- Actual Site Layouts
- More detailed end user demands
- More detailed dates for customer occupation and supply usage

NPG have stated within their budget estimate that if phased development of the site was possible it may open up other opportunities to develop the infrastructure which may lead to different costs.

It should be noted that the NPG have stated within their quotation that historically projects of this magnitude have been made available 2-3 years from acceptance of their formal quotation subject to terms and conditions of their offer.

4.4

Contestable and Non Contestable Works

The budget estimate received from NPG is built up with what is known as contestable and non contestable works;

Contestable works are works that can be carried out by the DNO or alternatively an Independent Connections Provider (ICP). Generally ICP's should be registered

under the electricity registration scheme. Contestable works generally comprise of the laying of cable jointing and plant/substation installations. Contestable works carried out by the ICP generally have to be installed to the host DNO's standards to enable them to be adopted.

Non contestable works can only be carried out by the host DNO or agents working directly on their behalf. This work is generally associated with the direct physical connection onto the DNO's existing distribution network.

In order to market test the NPG quotation URS approached an ICP (PN Daly's) to provide a cost option on the non contestable works.

Costs provided by the ICP are listed below;

- 2 No. 15/30MVA 33/11.5kV YNyn6 Transformers Installed - £671,648.00
- 1 No. 13 Panel 2000amp FKI Eclipse Switchboard - £242,000.00
- 2. No.33kV Cable Circuits each up to 4kM route length with pilot - £842,090.00
- 1 No. Set of Control/ Indication Equipment - £123,000.00
- 4. No. 11kV Feeder Circuits to establish. Two 8MVA loads. 1.0 & 1.5kM - £600,000.00
- 6. No. 11kV Feeder Circuits to establish. 3 HV rings.(3kM Common Trench) -£675,000.00
- 5. No. HV Metered Substations Average 2.5MVA. - £240,000.00
- 5. No. 1000kVA Network Substations - £500,000.00
- **Sub -Total - £3,893,738.00**
- Contractors On Costs and Mark Up etc add 15% - £584,061
- **Revised Total - £4,477,799.00**

In review of the costs it should be noted that they exclude the following.

- Non – contestable works including the provision of a new 132/33kV substation and associated 33kV circuit breakers located at the Saltend substation
- Existing infrastructure diversions
- Civil works associated with the provision of a new 33kV primary substation on the Paull site (Electrical Equipment and apparatus included.)

5 **Option 2 - Independent Distribution Network Operator (Energetics) Quotation.**

5.1

General

An Independent Distribution Network Operator (IDNO) is defined by Ofgem as an electricity distributor whose licences were granted after 1 October 2001. DNO's evolved from the old Public Electricity suppliers each with a distribution area in which they were formally incumbent. Unlike a DNO an IDNO does not have distribution service area.

IDNO's are licensed to distribute energy for the purpose of giving supply to a premises. IDNO's generally own and operate electricity networks, which are often extensions to the existing distribution networks. IDNO's are regulated similarly to DNO's and have to operate to similar charters as the DNO's to maintain and reinstate supplies to customers supplied of their distribution Network.

The latest information on Ofgem's website indicates that there are only 6 IDNO's with distribution licences operating. URS approached 1 of these 6 IDNO's (Energetics) to provide a quotation for the delivery of electrical infrastructure to the Paull site.

URS provided Energetics with the same criteria as given to NPG, in order to obtain a comparable quotation.

5.2

Energetics Budget Estimate Quotation

The budget estimate provide by Energetics for the delivery of Electrical Infrastructure to the Paull site is included with in the appendices of this document but summarised as follows;

- The costs provided are for the provision of new infrastructure and diversion of existing site infrastructure on site.

- The costs include estimated sums for non-contestable works to be carried out by the Host DNO (NPG). These being provision and connection of a 132kV/33kV transformer and connection at the Saltend Power Station and assumed electrical infrastructure site diversion costs.
- The costs for the works is estimated at £4,912,877 + VAT
- The quotation provided is a Budget estimate showing indicative costs only. No network analysis or detailed electrical studies were carried out in the preparation of this quote.
- The Cost is based on a 30MVA demand for the site on a non phased occupation.
- The cost includes for 2 No. new 33kV circuits supplied from existing circuit breakers to a new 33kV/11kV substation to be built on site.
- The Cost includes the provision of the new 33kV/11kV Primary substation to be built on the site taking up approximately 40m x 50m area.
- Within the cost provision has been made for a number of different end user types including
 - 2 No. Large 8MVA customers
 - 5 No. 11kV customers
 - 5 No. 11kV/400V substations for LV customers
- The costs includes for the works to be provided along the most direct and economical route using the new highways and verges and footpaths and assuming that there are no abnormal ground conditions along that route.
- The cost is based on the assumption that ABP will grant them an unencumbered freehold site, at nil cost, for any and all substation accommodation.

- It has been assumed that the primary substation site will be level, free of excessive water and with reasonable ground conditions and not requiring piled foundations.
- It has been assumed that Energetics will obtain full planning consent for the primary substation based on containerised switchboard and free standing primary transformers sited on concrete plinth and bunds.

5.3

Additional Items to consider when procuring the electrical infrastructure through Energetics

IDNO's are afforded greater flexibility in some of their commercial approaches than DNO's and as a result of this IDNO's can offer certain benefits that may be of interest to the client.

Asset Values – Ofgem through its licensing allow IDNO's to utilise future revenue from their networks to reduce the capital costs of the installation. DNO's are prohibited from doing this as the revenues from their approved use of system charges must be invested wholly in the maintenance and improvement of existing networks. IDNO's can offer a asset value refund scheme where the developer enters into an agreement with the IDNO and shares the risk of some of the future revenues from their networks.

Flexible Payment Terms – DNO's generally require full upfront payment in advance of the commencement of works. IDNO's can offer a more flexible payment approach tailored to suit the client's requirements.

5.4

Proceeding with the IDNO quote

If it was decided by ERCY and HCC to proceed with the IDNO option similarly to proceeding with the DNO a more detailed investigation would be required to be undertaken by the IDNO. At this stage the IDNO would need more detailed information with regards to;

- Actual Site Layouts
- More detailed end user demands

- More detailed dates for customer occupation and supply usage

It should be noted that the IDNO have anticipated a typical project duration of 20-22 months subject to necessary legal permissions being timelessly granted.

6 **Option 3 – NPG to provide a supply from the GDF Suez Power station**

6.1

General

ERYC and HCC asked URS to investigate the possibility of NPG providing the electrical infrastructure to the site from the GDF Suez Power station located on the adjacent BP site. This request is based on the assumption that there may be a commercial benefit in obtaining power from the GDF Suez power station as it is geographically closer to the Paull site than the Saltend Power station, which NPG have suggested as the point of connection onto their network within their budget estimates.

As part of this option the desire would be for NPG to operate and maintain the site distribution network. in the same accord as to how they operate and maintain their existing distribution network.

Following discussions with NPG, they advised that they would not be able to offer any estimates to supply power to the site from the GDF Suez substation. NPG advised that they provide power through strict licensing obligations particularly relating to the maintaining and reinstating of power supplies to customers. As the GDF Suez power station is private and would not operate under the same licensing regulations imposed on them, NPG would not be able to guarantee they could fulfil their own licensing requirements for any distribution network supplied from this substation. A typical example of this would be if the GDF Suez power station failed, NPG would not be in control of the reinstatement of supplies to the power station and therefore not be able to guarantee reinstatement of supplies within their license obligations.

7 **Option 4 – IDNO (Energetics) to provide a supply from the GDF Suez Power station**

7.1

General

ERYC and HCC asked URS to investigate the possibility of an IDNO providing the electrical infrastructure to the site from the GDF Suez Power station located on the adjacent BP site. This request is based on the assumption that there may be a commercial benefit in obtaining power from the GDF Suez power station as it is geographically closer to the Paull site than the Saltend Power station.

As part of this option the desire would be for the IDNO to operate and maintain the site distribution network, in the same accord as to how they operate and maintain their existing distribution network.

Following discussions with Energetics, they advised that they would not be able to offer any estimates to supply power to the site from the GDF Suez substation. Energetics advised that similarly to the DNO, they provide power through strict licensing obligations particularly relating to the maintaining and reinstating of power supplies to customers. As the GDF Suez power station is private and would not operate under the same licensing regulations imposed on Energetics, Energetics would not be able to guarantee they could fulfil their own licensing requirements for any distribution network supplied from this substation. A typical example of this would be if the GDF Suez power station failed, Energetics would not be in control of the reinstatement of supplies to the power station and therefore not be able to guarantee reinstatement of supplies within their license obligations.

8 Option 5 – ERYC & HCC to own, operate and maintain an electrical network

8.1

General

ERYC and HCC asked URS to investigate the feasibility of ERYC and HCC running a private network supplied from the GDF Suez power Station located on the adjacent BP site.

A number of private networks operate around the UK and they are often set up and owned by developers as they are often assumed as profitable to them. There are opportunities in running a private network but there are also risks and uncertainties that must be mitigated against in order to maximise these opportunities.

The legal and commercial scenarios associated with running, operating and maintaining a private network are numerous and specific to each development, and fall outside the scope of this feasibility study.

Listed below are a number of considerations that would have to be made if it was decided that ERYC and HCC want to operate and maintain their own Private Network.

License and Legal issues – The requirement for licensing regarding the supply and distribution of electrical energy are specific to each individual circumstance. ERYC and HCC should establish immediately what licensing and legal obligations would be imposed upon them in running a private network.

Security of Supply – As the point of connection for the private network would be a private power station, the obligations imposed on the Host DNO and any IDNO by Ofgem with regards to supply resilience may not apply. ERYC and HCC would have to consider an agreement with the private substation owner regarding reinstatement times and durations of any outages at the power station. This obligation would then need to be made clear and outlined to any future tenant on the site within their supply agreement.

Operations and Maintenance – If ERYC and HCC do not have the capability in house, they will have to employ external authorised personnel/company to operate

and maintain the HV asset, under a COMA (Control Operation and Maintenance Agreement). COMA agreements are generally contracted over a period of time such as a year, 5 years 10 years and must always be in place. As the asset for the Paull site will be quite large this could be potentially a significant ongoing cost.

Billing and Metering - If ERYC and HCC do not have the capability in house, they would need to set up a metering and billing system for the tenant's electrical usage. It would be possible to employ an external company to carry out this facility.

Wayleaves – It is likely that the routing of any infrastructure/cabling from the private power station would have to be routed through the BP site. As the infrastructure/cabling would be an ERYC and HCC asset, a wayleave agreement would be required to be put in place with BP to allow them to access the assets at any time.

Design of the network – In order to install a private electricity distribution network ERYC and HCC would need to comprehensively understand and be in full receipt of all relevant information that would effect the selection and detailed design of the electrical distribution network. To achieve this it would be recommended that a full network study is carried out on the EDF power station to assist in making an informed decision on any electrical infrastructure investment.

Capital cost – The capital cost of providing the private electricity network asset may vary from that of the ones provided by the DNO and IDNO. Firm capital costs would only be able to be appreciated once a network study and detailed design has been carried out.

It is recommended that if this option is deemed suitable for further investigation a full detailed study is commissioned to include the following;

- Detailed electrical network study of the private power station, relating to the proposed point of connection of the private electricity network.
- Detailed discussions with the private power station owner, with particular regard to their network configuration, supply resilience, commercial charges for usage, supply reservation
- Detailed discussions with BP, with particular regard to wayleaves

- Detailed investigation in the legal obligations and potential license issues associated with supplying and distributing energy.
- Metering and billing strategy
- Opportunities in employing an external company to manage operate and maintain the network.
- Opportunities in employing an external company to manage and operate billing and metering.
- Potential for running renewable/sustainable energy sources

9 Summary

9.1 *General*

The findings of the study firstly suggest that it is feasible to provide a 30MVA power supply to the site.

The budget costs provided back from the DNO (7.9 Million + VAT) and the IDNO (£4,912,877 + VAT) vary significantly with the IDNO quote being approximately 62% of the DNO quote. This level of variation may be attributed to each organisations methodology in preparing the budget costs and their consideration to risk.

It is also possible that the variation in costs can be attributed to the speculative nature of the information provided. It is possible that if formal quotations were applied for based on more robust information, the quotations would be closer together.

The budget costs received back from the Independent Connections Provider (£4,477,799.00) are in closer accord to the costs provided by the IDNO. It should be recognised however that the ICP quotation is for contestable works only and excludes the provision of a new 132/33kV substation and associated switchgear, existing infrastructure diversions and civil works associated with the provision of a new 33kV primary substation.

Estimated timescales to carry out the complete works from order vary from 20-22 months by the IDNO to 2-3 years by the DNO. To get to the point where an order is being placed a formal application would have to be made based on more robust information, including site layouts and more accurate loadings. These timescales should be acknowledged and considered for future planning and programming.

The costs provided by the DNO and IDNO are based of full occupation and 30MVA demand on day 1. If the occupation of the site was to be phased, there may commercial benefits which could result in different quotations.

The DNO and IDNO both stated that they would not be able to supply the site via a private point of connection namely the GDF Suez private power station. The DNO and IDNO advised that they provide power through strict licensing obligations particularly relating to the maintaining and reinstating of power supplies to customers. As the GDF Suez power station is private it would not operate under the same licensing regulations imposed on the DNO and IDNO, therefore they would not be able to guarantee they could fulfil their own licensing requirements for any distribution network supplied from this substation

The option for ERYC and HCC to own and operate a private network is one that if deemed suitable to them should be subject to a further detailed study and a network analysis on the private power station to mitigate and risks and uncertainties.

APPENDIX A – NPG BUDGET ESTIMATE

Your Ref:

Our Ref: Enq 5198055

Mr John Healy
Principal Engineer
URS Infrastructure & Environment UK
Brunel House
54 Princess St
Manchester
M1 6HS

31 July 2012

Dear John,

Job	
Original	
Enclosures	
Action	
URS MANCHESTER	
- 3 AUG 2012	
Copy	

Proposed Speculative development at Paul, Nr Hedon, Hull.

Thank you for your enquiry regarding indicative costs for us to provide new infrastructure and divert the existing infrastructure for a new speculative development at the site shown above.

We calculate our indicative costs by making assumptions about the work we will need to do based on similar work we have carried out in the past. We have not visited this site, analysed our electricity Network in the area or carried out any detailed electrical studies.

The data in this letter is based on the information you have been able to provide us with at this time, it is provided for the purpose of guidance only, therefore, this data should not be interpreted as a true cost or a formal quotation for any work we may need to carry out on our Network to provide the infrastructure for you.

You have requested that, we provide an indication of the costs to provide infrastructure with an overall capacity of 30 MVA at this site which will be required by a number of different end users and to divert our existing infrastructure from the site. Please note, the capacity you have requested at this stage seems very high based on the area of land that you are looking to develop. Unless you have some specific enquiries from end users, you may wish to consider revising this figure or consider phasing the development which may open other opportunities to develop the infrastructure with different costs.

A brief overview has now been carried out, and I can advise you that, for the purposes of general guidance an indicative figure for us to provide the new and divert the existing infrastructure requested will be in the region of £7.9 million plus VAT. This figure includes a figure of £1.26 million for capitalised maintenance of the infrastructure due to the site being speculative. When you can confirm to us the actual end users who will be moving onto the site prior to you making a formal application to us to install this infrastructure then we will be in a position to re assess the capitalised maintenance figure .

If you are aware of any other developments in this area that may impact on the tentative proposals shown above, please advise this to me and we would be happy to consider some form of joint approach between your and other development/s to minimise overall costs if this would assist you.

The guidance we provide is based on the following assumptions and that any proposed infrastructure is likely to be provided by:

Installing a second 132/33 kV transformer at our Saltend substation. At this time there is only one transformer. The second transformer is required to meet the level of electrical security for the overall capacity when your new demand on our Network is added to the existing demand on it.

Subject to their suitability, we proposed to use two existing 33 kV circuit breakers at our Saltend substation to feed this site. From these circuit breakers, we will install two new 33 kV underground circuits to your site and connect them into a new 33/11 kV primary substation to be established on your site.

In general terms, the primary substation will consist of two 33/11 kV transformers, feeding an 11 kV distribution circuit board. There will also be protection and control equipment housed in their own part of the substation building. The space required for this Primary substation will be circa 50 x 50 metres.

Without more detailed information from you, we have based our indicative figure on this primary substation being in the centre of your site.

From the 11 kV distribution board in the primary substation, in our indicative figure, we have allowed for;

The two 8 MVA dual fed connections circa 1 kilometre and 1.5 kilometres from the primary substation you requested.

Three 11 kV ring circuits (circa 7 kilometres) to distribute the balance of the capacity you have requested. Connected to these circuits, we have allowed for five, 11 kV customer substations and five 11 kV/Low Voltage substations which could either be for an individual customer or more likely feeding a number of customers requiring lower electrical capacity than the others. The space requirement for these substations is 7 x 7 metres.

We have allowed a nominal 1 kilometre of low Voltage circuit at this stage, as without a layout of the proposed site there is no way of gauging your actual requirements.

We are able to provide the work along the most direct and economical route using the new highways and verges/footpaths and there are no abnormal ground conditions along that route/s.

We are able to obtain wayleaves/easements and any other statutory consent for the route that we are unable to place in the highways of verges/footpaths and on your site.

You grant us an unencumbered freehold site, at nil cost to us, for any and all substation accommodation.

Any excavation and reinstatement we do on your site will be in unmade ground.

This guidance is also based upon present network conditions, which are subject to change without notification. Any changes to the use of our Network or planned work being cancelled may have significant effect on costs.

Should you wish to proceed with this project and would like a more detailed investigation to be undertaken leading to a formal connection offer, please confirm your full requirements to;

Northern Powergrid (Yorkshire) plc
Connections Department
Cargo Fleet Lane
Middlesborough
TS3 8DG

They will arrange for a detailed survey to be carried out, when completed, a formal quotation for any work will be sent to you detailing the charges and terms of contract.

Historically, projects of this magnitude have been made available circa 2 - 3 years from us receiving your acceptance of our formal connection offer subject to the terms and conditions within such an offer.

I hope this information helps with the progress of your project and look forward to discussing this in more detail in the near future.

Please contact me if you need further help or clarification.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Ian Atkinson', written in a cursive style.

Ian Atkinson
Commercial Engineer

31 July 2012

APPENDIX B – ENERGETICS BUDGET ESTIMATE

Our ref: 6109
Energetics Contact: David Thomson
E: david.thomson@energetics-uk.com



International House
Stanley Boulevard
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Technology Park
Glasgow G72 0BN

t: 01698 404949
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e: info@energetics-uk.com
www.energetics-uk.com

Mr John Healy
URS Infrastructure & Environment UK
Brunel House,
54 Princess St,
Manchester,
M1 6HS,
United Kingdom

24th September 2012

Dear Mr Healy,

Budget Cost
Paull Development, Port of Hull – 30MVA Electrical Infrastructure

With reference to the above site and the provision of utility services, I now have the pleasure of submitting our budget costs for your consideration.

Our proposal has been budget costed to your correspondence, email dated 23rd August 2012

A brief summary of our proposal, including project responsibilities is provided overleaf, along with details of certain exclusions and assumptions we have made in producing this information.

At times appropriate to your project proceeding, we would welcome the opportunity to develop a formal design and price for your consideration.

I trust this information is of interest and I look forward to hearing from you at your earliest convenience. Should you wish to discuss any aspect in greater detail please do not hesitate to contact me on the telephone number or at the email address above.

Yours sincerely,

D. Thomson

David Thomson
Major Projects Manager

Service Details

Energetics Design & Build undertake to provide the following service:

Primary Substation

- Undertake full civil construction to accommodate Primary substation (approx dimensions circa 40metres by 50metres) equipment inclusive of;
 - Transformer Plinth & bunds
 - Foundations for Containerised Switchboard
 - Oil interceptor tanks and associated aqua sentry pumps/ control gear
 - All drainage within Primary substation compound
 - Access roads and hardstanding areas within compound
 - Perimeter Fencing and lighting
 - Cableways and trenchwork within compound
 - Earthing design and installation of earth nest
- Supply &Install 2 no. 16/32 MVA 33/11kV CER Transformers
- Supply &Install 13 panel containerised primary switchboard
 - 2 no. Transformer CB's
 - 1 no. Bus Section
 - 6 no. Feeder CB's OC&EF Protection
 - 4 no. Unit Protected Feeders
- Supply &Install AVC panels
- Supply &Install RTU/ SCADA equipment
- Supply &Install 11kV Transformer single core cabling and multicore
- Supply &Install associated Battery Charges & LV wiring throughout

33kV Cabling

- Supply &Install dual circuit 33kV xlpe cable from new Primary substation to assumed POC at Saltend GSP inclusive of;
 - Off-site route length approx 1,500metres to site entrance, surface types are combination of verge & carriageway.
 - On site route length approx 500m (centre of development), surface type is unmade ground.
 - Installation of 2 no. multicore pilot cables along route.

11kV Distribution

- Supply &Install 3 no. 11kV ring mains throughout the development. For costing purposes we have allowed 7,000 metres total cable length based on unmade ground conditions.
- Supply &Install 5 no. 11kV customer supply metering RMU's inclusive of emergency stop button and meter panel. Space requirements are circa 5metres by 3 metres
- Supply &Install 5 no. 11kV 100kVA Package substations. Space requirements are circa 5metres by 5 metres
- Supply &Install approx 1,000 metres of Low Voltage cabling based on unmade ground conditions.
- Supply &Install 2 no. 11kV 8MVA unit protected dual fed customer supplies (5 panel boards). For costing purposes we have allowed 5,000 metres total cable length (1,500 metres & 1,000 metres from primary switchboard) based on unmade ground conditions.

33kV Point of Connection

For budget costing purposes we have assumed the 33kV POC to be at the boundary fence of Saltend GSP. We note that it is proposed that the supply will be derived from 2 no. Existing 33kV circuit breakers on the Grid switchboard. As such we have estimated the non contestable works to be undertaken by Northern Power Grid as follows;

- Supply & Install 2 no. 33kV cable circuits from the existing switchboard to the boundary fence of Saltend GSP.
- Make off 2 no. 33kV cable end boxes.
- Make off 2 no. 33kV straight joints.
- Supply & Install 2 no. multicore pilot cables including jointing and termination.
- SCADA and metering modifications
- Protection Modifications (as necessary)

As these works will be wholly undertaken by NPG we have included an estimated cost only at this juncture.

132/33kV Grid Transformer

We note that NPG propose to install a second Grid Transformer to accommodate the additional demand & security of supply requirements for the Paull Development. As these works will be wholly undertaken by NPG we have included an estimated cost only at this juncture.

Diversions of existing OHL through site

Within this budget cost we have included costs associated with the diversion of the existing overhead line through the site.

We have based our costs on the assumption that we will install a new 11kV cable circuit around the periphery of the development approx route length of 1,900m. The cable will be terminated in pole boxes on the existing wood poles directly adjacent to the site boundary. Our estimate includes a provisional sum for the non-contestable cost for works to be undertaken by UKPG.

General Assumptions/ Exclusions

- We are able to achieve a direct route off-site alongside existing carriageway & road verges and obtain permissions/easements for the same.
- We have assumed no abnormal ground conditions i.e. rock throughout the excavations.
- We are granted unencumbered freehold site, at nil cost, for any and all substation accommodation.
- The primary substation site will be level, free of excessive water and with reasonable ground conditions not requiring piled foundations.
- We obtain full planning consent for the primary substation based on containerised switchboard and free standing primary transformers sited on concrete plinth & bunds.

Project Timescales

The following is a list of the approximate lead times for the major plant items.

Plant Item	Delivery Time
Primary Transformer (on placing order post tender period)	12 to 14 months
Containerised Switchboard	10 months
Unit Protected switchboard	6 months

To assist in project planning, it is anticipated that the typical project duration will be around 20 to 22 months subject to necessary legal permissions being timeously granted.

Budget Costs

The table below provides our estimated costs for the aforementioned services

Table 1

Description of Works	Total Cost (Excl VAT)
POC non-contestable costs (33kV cabling and 2 no. straight joints etc)	£260,000
Installation of Grid Transformer 132/33kV (estimated non-contestable costs)	£750,000
Provision of primary substation and associated HV/LV distribution	£3,902,877
TOTAL (exc. VAT)	£ 4,912,877

Asset Values

As a licensed Independent Distribution Network Operator (IDNO), Energetics is able to offer asset value refunds based on size and type of connected load.

For this project the refunds could be in the order of **£1,000,000** subject to agreements with the developer in respect to risk sharing and time scales of the refund period.

We would be happy to present the various options available to you at an appropriate time.