
**JERSEY FUTURE HOSPITAL
CO004 – SITE OPTION REPORT**

**APPENDIX 6 Technical Site Appraisal
TN-M-001-6 - TECHNICAL NOTES –
MECHANICAL**

QUALITY ASSURANCE

Sign off: Peter Thomas

Position: Senior Engineer

Subject Jersey Future Hospital – Change Order 4 – Site Validation
TN-M-001 Technical Note - Water Pressure Adequacy for Sprinklers
Rev P4. Date 09.04.2015. Final Preliminary Issue

Date 9 April 2015 Job No/Ref 237035-00

1 Introduction

This technical note has been prepared to support the preparation of the Site Validation Exercise that forms Change Request Nr. 4 as part of the Jersey Future Hospital Scheme.

The four options being reviewed are:

- Option A - Dual Site Options
- Option B - Overdale Hospital Site, 100% New Build Option
- Option C - Existing General Hospital, 100% New Build Option
- Option D - Waterfront Site, 100% New Build Option

2 Commentary

Buildings and their contents are defined by a number of categories or hazard classifications. The volume of water stored is dependent on the building height and hazard classification. For the purposes of this technical note all of the building options have been classified as Ordinary Hazard 2.

Water supplies and pressures need to be capable of providing the required flow rates for the system and should have sufficient capacity to ensure that the sprinklers can remain in operation. Standard water pressure is available at all sites. There are no concerns of water pressure issues at this stage based on available information from suppliers.

2.1 Option A

Overdale Hospital

Water pressure for sprinkler system provided via pumps located in dedicated sprinkler pump plant room. Water supply provided from dedicated sprinkler storage tanks. Upgrade to existing incoming mains water supply required. Infrastructure is limited for high pressure supplies, but large capacity lower pressure supplies are available from Jersey Water tanks located nearby. New pipework would be required for supplying the site.

For guidance purposes only, minimum water volume capacity for sprinkler use in Ordinary Hazard 2 classification buildings with a maximum building height of 30m is approximately 125 m³.(i.e. 2no. tanks at 6 metres diameter and 3 meters high).

Existing General Hospital

Water pressure for sprinkler system provided via pumps located in dedicated sprinkler pump plant room. Water supply provided from dedicated sprinkler storage tanks. Upgrade to existing incoming

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mains water supplies required. Existing surrounding mains water infrastructure is sufficient for continuous supply.

For guidance purposes only, minimum water volume capacity for sprinkler use in Ordinary Hazard 2 classification buildings with a maximum building height of 45m is approximately 140 m³.(i.e. 2no. tanks at 6 metres diameter and 3.5 meters high).

2.2 Option B

Water pressure for sprinkler system provided via pumps located in dedicated sprinkler pump plant room. Water supply provided from dedicated sprinkler storage tanks. Upgrade to existing incoming mains water supply required. Infrastructure is limited for high pressure supplies, but large capacity lower pressure supplies are available from Jersey Water tanks located nearby. New pipework would be required for supplying the site. For guidance purposes only, minimum water volume capacity for sprinkler use in Ordinary Hazard 2 classification buildings with a maximum building height of 45m is approximately 140 m³.(i.e. 2no. tanks at 6 metres diameter and 3.5 meters high).

2.3 Option C

Water pressure for sprinkler system provided via pumps located in dedicated sprinkler pump plant room. Water supply provided from dedicated sprinkler storage tanks. Upgrade to existing incoming mains water supplies required. Existing surrounding mains water infrastructure is sufficient for continuous supply. For guidance purposes only, minimum water volume capacity for sprinkler use in Ordinary Hazard 2 classification buildings with a maximum building height of 45m is approximately 140 m³.(i.e. 2no. tanks at 6 metres diameter and 3.5 meters high).

2.4 Option D

Water pressure for sprinkler system provided via pumps located in dedicated sprinkler pump plant room. Water supply provided from dedicated sprinkler storage tanks. New incoming mains water supplies required. Jersey Water have yet to confirm that the existing surrounding mains water infrastructure is sufficient for continuous supply. For guidance purposes only, minimum water volume capacity for sprinkler use in Ordinary Hazard 2 classification buildings with a maximum building height of 45m is approximately 140 m³.(i.e. 2no. tanks at 6 metres diameter and 3.5 meters high).

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3 Risks/Opportunities

Height of buildings. – sprinkler tank volume is dependent on height of building relating to the Ordinary Hazard classification. Sizes indicated in this document are based on BS requirement.

Fire Engineer to advise final sprinkler system pressure and tank requirements required.

4 Derogations

N/A

Subject Jersey Future Hospital – Change Order 4 – Site Validation
TN-M-002 Technical Note - Medical Gas Storage
Rev P4. Date 09.04.2015. Final Preliminary Issue

Date 9 April 2015 Job No/Ref 237035-00

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The four options being reviewed are:

- Option A - Dual Site Options
- Option B - Overdale Hospital Site, 100% New Build Option
- Option C - Existing General Hospital, 100% New Build Option
- Option D - Waterfront Site, 100% New Build Option

This document should be read in conjunction with Mechanical Services High Level Description report and supportive drawings which details requirements further.

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TN-M-002 Technical Note - Medical Gas Storage
Rev P4. Date 09.04.2015. Final Preliminary Issue

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2 **Commentary**

2.1 **Option A**

Medical gas bottle storage area serving various hospital departments for both Existing General Hospital and Overdale Hospital sites. Access required for deliveries.

Existing General Hospital medical gas bottle storage areas will remain in use and remain accessible throughout the phased construction work period. Access required for deliveries.

Existing Overdale Hospital medical gas bottle storage areas will remain in use and are to remain accessible throughout the phased construction work period.

2.2 **Option B**

Requirement for medical gas bottle storage rooms serving various hospital departments local to the medical gas plantrooms. Access required for deliveries.

2.3 **Option C**

Requirement for medical gas bottle storage rooms serving various hospital departments local to the medical gas plantrooms. Access required for deliveries.

Existing medical gas storage areas will remain in use and to remain accessible throughout the phased construction work period.

2.4 **Option D**

Requirement for medical gas storage bottle rooms serving various hospital departments local to the medical gas plantrooms. Access required for deliveries.

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3 Risks/Opportunities

Phased construction, including demolition of some areas where medical gas plant/storage accommodation is present, will occur in options A, B and C. New construction of replacement facilities prior to demolition and subsequent reconfiguration of infrastructure will be required in order to maintain these systems live throughout the works.

Good road access for regular medical gas bottles deliveries needs to be provided to Options A, B and C. This includes maintained provision of storage area throughout.

Hospital Medical Gases Approved Person to agree location of medical gas bottle storage locations for all Options.

4 Derogations

N/A

Subject Jersey Future Hospital – Change Order 4 – Site Validation
TN-M-003 Technical Note – Chimneys
Rev P2. Date 20.03.2015. Final Preliminary Issue

Date 20 March 2015 Job No/Ref 237035-00

1 Introduction

This technical note has been prepared to support the preparation of the Site Validation Exercise that forms Change Request Nr. 4 as part of the Jersey Future Hospital Scheme.

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TN-M-003 Technical Note – Chimneys
Rev P2. Date 20.03.2015. Final Preliminary Issue

Date 20 March 2015

Job No/Ref 237035-00

2 Commentary

2.1 Option A

Requirement for flue chimneys from oil or gas fired boilers serving both Existing General Hospital and Overdale Hospital sites. Chimney height to comply with health and safety legislation and building heights.

No chimneys are required for heating plant if electrical heating plant is installed in both Existing General Hospital and Overdale Hospital sites.

Existing General Hospital chimney flues will remain operational throughout the phased construction work period.

2.2 Option B

Requirement for flue chimneys from new oil or gas fired boilers. Chimney height to comply with health and safety legislation and building heights.

No chimneys are required for heating plant if electrical heating plant is installed.

2.3 Option C

Requirement for flue chimneys from new oil or gas fired boilers. Chimney height to comply with health and safety legislation and building heights.

No chimneys are required for heating plant if electrical heating plant is installed.

Existing General Hospital chimney flues will remain operational throughout the phased construction work period.

2.4 Option D

Requirement for flue chimneys from new oil or gas fired boilers. Chimney height to comply with health and safety legislation and building heights.

No chimneys are required for heating plant if electrical heating plant is installed.

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3 Risks/Opportunities

New chimney height to comply with health and safety legislation and building heights. Estimated to be at least 6m above the highest building in the local area.

Demolition of existing chimney on Options A and C following completion of the new hospitals.

4 Derogations

N/A

Subject Jersey Future Hospital – Change Order 4 – Site Validation
TN-M-004 Technical Note - Fire Hydrants
Rev P3. Date 02.04.2015. Final Preliminary Issue

Date 2 April 2015 Job No/Ref 237035-00

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Date 2 April 2015

Job No/Ref

237035-00

2 Commentary

2.1 Option A

Overdale Hospital

BS 9990:2015 states that generally a water supply capable of providing a minimum of 1500 litres per minute at all time is required.

Jersey Water have confirmed:

- 2no fire hydrants are on the Overdale Hospital site project and working on the average hydrant pressure they can deliver 1500 litres per minute but this may not always be possible during peak demand periods.
- Average fire hydrant pressure would be approximately 3 - 4 bar.

Fire Engineer, Fire Brigade and Building Control to determine location of fire hydrants.

Existing General Hospital

BS 9990:2015 states that generally a water supply capable of providing a minimum of 1500 litres per minute at all time is required.

Jersey Water have confirmed:

- Working on the average hydrant pressure they can deliver 1500 litres per minute, but this may not always be possible during peak demand periods.
- Average fire hydrant pressure would be approximately 3 - 4 bar.

Fire Engineer, Fire Brigade and Building Control to determine location of fire hydrants.

2.2 Option B

BS 9990:2015 states that generally a water supply capable of providing a minimum of 1500 litres per minute at all time is required.

Jersey Water have confirmed:

- 2no fire hydrants are on the Overdale Hospital site project and working on the average hydrant pressure they can deliver 1500 litres per minute but this may not always be possible during peak demand periods.
- Average fire hydrant pressure would be approximately 3 - 4 bar.

Fire Engineer, Fire Brigade and Building Control to determine location of fire hydrants.

2.3 Option C

BS 9990:2015 states that generally a water supply capable of providing a minimum of 1500 litres per minute at all time is required.

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Jersey Water have confirmed:

- Working on the average hydrant pressure they can deliver 1500 litres per minute, but this may not always be possible during peak demand periods.
- Average fire hydrant pressure would be approximately 3 - 4 bar.

Fire Engineer, Fire Brigade and Building Control to determine location of fire hydrants.

2.4 Option D

BS 9990:2015 states that generally a water supply capable of providing a minimum of 1500 litres per minute at all time is required.

Jersey Water have confirmed:

- Working on the average hydrant pressure they can deliver 1500 litres per minute, but this may not always be possible during peak demand periods.
- Average fire hydrant pressure would be approximately 3 - 4 bar.

Fire Engineer, Fire Brigade and Building Control to determine location of fire hydrants.

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3 Jersey Water Information

Copy of fire hydrant information from Jersey Water.

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4 Risks/Opportunities

Loss of water pressure during peak demand.

5 Derogations

None identified at this stage.

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TN-M-005 Technical Note - Incoming Utilities & Diversions (Mechanical Services)
Rev P3. Date 02.04.2015. Final Preliminary Issue

Date 2 April 2015 Job No/Ref 237035-00

1 Introduction

This technical note has been prepared to support the preparation of the Site Validation Exercise that forms Change Request Nr. 4 as part of the Jersey Future Hospital Scheme.

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TN-M-005 Technical Note - Incoming Utilities & Diversions (Mechanical Services)
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Date 2 April 2015

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2 Commentary

2.1 Option A

2.1.1 Water

2.1.1.1 Incoming Mains Water Supply

Overdale Hospital

Upgrade to existing incoming mains water supplies required due to increased capacity. Jersey Water confirm that infrastructure is limited for high pressure supplies but it is not envisaged that this will be required for this site. Large capacity lower pressure supplies are available from Westmount tanks located nearby and it is intended that these will be utilised for the new building.

Jersey Water confirm that the existing surrounding mains water infrastructure is sufficient for continuous supply.

New pipework would be required for supplying the Overdale site. Booster sets and break tanks would be required to provide sufficient water pressure to the buildings.

Any offsite diversions required will be carried out by Jersey Water. Existing water mains below ground serving the existing buildings will either be diverted, replaced or relocated as part of the phased construction programme. *Refer to existing Jersey Water site pipework distribution layout shown later in this technical note.*

Existing General Hospital

Upgrade to existing incoming mains water supplies required due to increased capacity.

Jersey Water confirm that the existing surrounding mains water infrastructure is sufficient for continuous supply. Sufficient pressure is available, but booster sets and break tanks may still be required to provide sufficient water pressure to the buildings.

Offsite diversions not envisaged at this stage, but if required will be carried out by Jersey Water.

Existing water mains below ground serving the existing buildings will either be diverted, replaced or relocated as part of the phased construction programme.

Refer to existing Jersey Water site pipework distribution layout shown later in this technical note.

2.1.1.2 Incoming Mains Water Costs

Costs below for incoming mains gas supply have been provided by Jersey Water.

Site Option A	Description of Works	Cost (£)
Overdale Hospital	External upgrade works associated with the mains supply on Westmount Road 4no. new connections to hospital taken from mains supply on Westmount Road	£70,168.99 (excluding GST at 5%) for external upgrade works, and £14,803.10 (excluding GST at 5%) for 4no. new connections Above cost excludes excavation, backfilling and reinstatement of trenches. This work will not be carried out by Jersey Water or a contractor appointed by them, but to be carried out by the Main Contractor
General Hospital	There are no upgrade costs associated with this option. Jersey Water can re-use the existing mains water infrastructure	Jersey Water have confirmed that there are no costs associated with this option

2.1.2 Gas

2.1.2.1 Incoming Gas Supply

Overdale Hospital

Natural Gas is currently supplied to the existing site serving gas boilers and the kitchen in the Westmount Centre. However a new larger incoming gas main to site would be required with new gas meters (numbers and locations to be confirmed). New gas infrastructure required to site with works carried out on public highway by Jersey Gas, but trench work on site will be carried out by others.

Existing General Hospital

Natural Gas is currently supplied to the Pathology Laboratory and Kitchen only. However there is a large gas main located near the existing site routed along Gloucester St. (*refer to existing Jersey Gas site pipework distribution layout shown later in this technical note*). A new incoming gas main to the site would be required with new gas meters (numbers and locations to be confirmed). New connection required to new meter location off Kensington Place. Possible modifications and connections required to the existing gas infrastructure located around the site perimeter. Works carried out on public highway by Jersey Gas, but trench work on site will be carried out by others.

2.1.2.2 Incoming Gas Main Costs

Costs below for incoming mains gas supply have been provided by Jersey Gas.

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Site Option A	Description of Works	Cost (£)
Overdale Hospital	Provision of gas to gas meter positions (numbers and locations to be confirmed). Costs assume all trench work on site will be carried out by others. Works carried out on public highway by Jersey Gas. Costs include to primary meter emergency control valve, twin stream rig	Jersey Gas have confirmed that this will be at no cost to the customer subject to full appraisal
General Hospital	Provision of suitably sized service to specified meter location off Kensington Place, St Helier	Jersey Gas have confirmed that this will be at no cost to the customer subject to full appraisal

2.1.2.3 Gas Usage

The p/kWh cost below is based on Jersey Gas tariff confirmed in via email on 11th February 2015.

Jersey Gas have confirmed that there are no standing orders.

Jersey Gas have confirmed that the tariff is exclusive GST.

Plant efficiency up to 95%.

Site Option A	Annual Gas Usage (kWh/year)	Average Gas Price (p/per kWh)	Total Annual Cost (£)
Overdale Hospital	1,572,929.60	6.25p	£98,308.04
General Hospital	5,451,891.17	6.25p	£340,743.20

2.1.3 Fuel Oil

Fuel oil tank serving oil fired boilers and generators required.

States of Jersey Fuel Oil contracts are tendered by the States of Jersey, Corporate Procurement Department which is for a three year period. The weekly prices per litre are adjusted and set against an agreed index. Currently the ‘average’ fuel oil cost per litre supplied by PDJ Ltd is 52.72p per litre based on December 2014 price.

Plant efficiency up to 95%.

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Site Option A	Annual Fuel Oil Usage (kWh/year)	Average Fuel Oil Cost (p/per litre)	Total Annual Cost (£)
Overdale Hospital	1,572,928.60	57.72p	£82,924.80
General Hospital	5,451,891.17	57.72p	£287,423.70

2.2 Option B

2.2.1 Water

2.2.1.1 Incoming Mains Water Supply

Upgrade to existing incoming mains water supplies required due to increased capacity. Jersey Water confirm that infrastructure is limited for high pressure supplies Large capacity lower pressure supplies are available from Westmount tanks located nearby. New pipework would be required for supplying the Overdale site. Booster sets and break tanks would be required to provide sufficient water pressure to the buildings. Any offsite diversions required will be carried out by Jersey Water. Existing water mains below ground serving the existing buildings will either be diverted, replaced or relocated as part of the phased construction programme. *Refer to existing Jersey Water site pipework distribution layout shown later in this technical note.*

2.2.1.2 Incoming Mains Water Costs

Costs below for incoming mains gas supply have been provided by Jersey Water.

Site Option B	Description of Works	Cost (£)
Overdale Hospital	External upgrade works associated with the mains supply on Westmount Road 4no. new connections to hospital taken from mains supply on Westmount Road	£70,168.99 (excluding GST at 5%) for external upgrade works, and £14,803.10 (excluding GST at 5%) for 4no. new connections Above cost excludes excavation, backfilling and reinstatement of trenches. This work will not be carried out by Jersey Water or a contractor appointed by them, but to be carried out by the Main Contractor

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2.2.2 Gas

2.2.2.1 Incoming Gas Supply

Natural Gas is currently supplied to the existing site serving gas boilers and the kitchen in the Westmount Centre. However a new larger incoming gas main to site would be required with new gas meters (numbers and locations to be confirmed). New gas infrastructure required to site with works carried out on public highway by Jersey Gas, but trench work on site will be carried out by others.

2.2.2.2 Incoming Gas Main Costs

Costs below for incoming mains gas supply have been provided by Jersey Gas.

Site Option B	Description of Works	Cost (£)
Overdale Hospital	Provision of gas to gas meter positions (numbers and locations to be confirmed). Costs assume all trench work on site will be carried out by others. Works carried out on public highway by Jersey Gas. Costs include to primary meter emergency control valve, twin stream rig	Jersey Gas have confirmed that this will be at no cost to the customer subject to full appraisal

2.2.2.3 Gas Usage

The p/kWh cost below is based on Jersey Gas tariff confirmed in via email on 11th February 2015.

Jersey Gas have confirmed that there are no standing orders.

Jersey Gas have confirmed that the tariff is exclusive GST.

Plant efficiency up to 95%.

Site Option B	Annual Gas Usage (kWh/year)	Average Gas Price (p/per kWh)	Total Annual Cost (£)
Overdale Hospital	7,875,277.95	6.25p	£492,204.87

2.2.3 Fuel Oil

Fuel oil tank serving oil fired boilers and generators required.

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States of Jersey Fuel Oil contracts are tendered by the States of Jersey, Corporate Procurement Department which is for a three year period. The weekly prices per litre are adjusted and set against an agreed index. Currently the ‘average’ fuel oil cost per litre supplied by PDJ Ltd is 52.72p per litre based on December 2014 price.

Plant efficiency up to 95%.

Site Option B	Annual Fuel Oil Usage (kWh/year)	Average Fuel Oil Cost (p/per litre)	Total Annual Cost (£)
Overdale Hospital	7,875,277.95	57.72p	£415,184.65

2.3 Option C

2.3.1 Water

2.3.1.1 Incoming Mains Water Supply

Upgrade to existing incoming mains water supplies required due to increased capacity. Jersey Water confirm that the existing surrounding mains water infrastructure is sufficient for continuous supply, but some work may need to be carried out to provide efficient supply. Sufficient pressure is available, but booster sets and break tanks may still be required to provide sufficient water pressure to the buildings. Offsite diversions not envisaged at this stage, but if required will be carried out by Jersey Water. Existing water mains below ground serving the existing buildings will either be diverted, replaced or relocated as part of the phased construction programme.

Refer to existing Jersey Water site pipework distribution layout shown later in this technical note.

2.3.1.2 Incoming Mains Water Costs

Costs below for incoming mains gas supply have been provided by Jersey Water.

Site Option C	Description of Works	Cost (£)
Existing General Hospital	There are no upgrade costs associated with this option. Jersey Water can re-use the existing mains water infrastructure	Jersey Water have confirmed that there are no costs associated with this option

2.3.2 Gas

2.3.2.1 Incoming Gas Supply

Natural Gas is currently supplied to the Pathology Laboratory and Kitchen only. However there is a large gas main located near the existing site routed along Gloucester St. (*refer to existing Jersey*

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Gas site pipework distribution layout shown later in this technical note). A new incoming gas main to the site would be required with new gas meters (numbers and locations to be confirmed). New connection required to new meter location off Kensington Place. Possible modifications and connections required to the existing gas infrastructure located around the site perimeter. Works carried out on public highway by Jersey Gas, but trench work on site will be carried out by others.

2.3.2.2 Incoming Gas Main

Costs below for incoming mains gas supply have been provided by Jersey Gas.

Site Option C	Description of Works	Cost (£)
Existing General Hospital	Provision of suitably sized service to specified meter location off Kensington Place, St Helier	Jersey Gas have confirmed that this will be at no cost to the customer subject to full appraisal.

2.3.2.3 Gas Usage

The p/kWh cost below is based on Jersey Gas tariff confirmed in via email on 11th February 2015.

Jersey Gas have confirmed that there are no standing orders.

Jersey Gas have confirmed that the tariff is exclusive GST.

Plant efficiency up to 95%.

Site Option C	Annual Gas Usage (kWh/year)	Average Gas Price (p/per kWh)	Total Annual Cost (£)
Existing General Hospital	7,875,277.95	6.25p	£492,204.87

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2.3.3 Fuel Oil

Fuel oil tank serving oil fired boilers and generators required.

States of Jersey Fuel Oil contracts are tendered by the States of Jersey, Corporate Procurement Department which is for a three year period. The weekly prices per litre are adjusted and set against an agreed index. Currently the ‘average’ fuel oil cost per litre supplied by PDJ Ltd is 52.72p per litre based on December 2014 price.

Plant efficiency up to 95%.

Site Option C	Annual Fuel Oil Usage (kWh/year)	Average Fuel Oil Cost (p/per litre)	Total Annual Cost (£)
Existing General Hospital	7,875,277.95	57.72p	£415,184.65

2.4 Option D

2.4.1 Water

2.4.1.1 Incoming Mains Water Supply

A new incoming mains water supply is required to the site and provided by Jersey Water. However at this stage Jersey Water have yet to confirm that the existing surrounding mains water infrastructure is sufficient for continuous supply. Booster sets and break tanks may be required to provide sufficient water pressure within the buildings. Consideration is to be given to possible existing supplies serving other buildings in the area located on the Waterfront site.

2.4.1.2 Incoming Mains Water Costs

Costs below for incoming mains gas supply have been provided by Jersey Water.

Site Option C	Description of Works	Cost (£)
Waterfront Site	New supply connection to the Jersey Water network and bulk meter	£9,500.50 (excluding GST at 5%) for new connection and bulk meter (note that Jersey Water have stated that this is a budget cost). Above cost excludes excavation, backfilling and reinstatement of trenches. This work will not be carried out by Jersey Water or a contractor appointed by them, but to be carried out by the Main Contractor

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2.4.2 Gas

2.4.2.1 Incoming Gas Supply

Natural Gas is not currently supplied to the existing site. However there is a gas main located near the existing site routed along La Route de la Liberation near to the site. If required, a new incoming mains gas supply would be provided by Jersey Gas with new gas meters (numbers and locations to be confirmed). Modifications and connections would be required to the existing gas infrastructure located around the site perimeter. Works carried out on public highway by Jersey Gas, but trench work on site will be carried out by others. Consideration is to be given to possible existing supplies serving other buildings in the area located on the Waterfront site with possible diversions required.

2.4.2.2 Incoming Gas Main

Costs below for incoming mains gas supply have been provided by Jersey Gas.

Site Option D	Description of Works	Cost (£)
Waterfront Site	Provision of gas to gas meter position. At this stage, costs assume all trench work on site will be carried out by others. Works carried out on public highway by Jersey Gas. Cost include meter rig, meters - suitable housing to be provided by others. No costs have been included for any outlet pipework	Jersey Gas have confirmed that this will be at no cost to the customer subject to full appraisal.

2.4.2.3 Gas Usage

The p/kWh cost below is based on Jersey Gas tariff confirmed in via email on 11th February 2015.

Jersey Gas have confirmed that there are no standing orders.

Jersey Gas have confirmed that the tariff is exclusive GST.

Plant efficiency up to 95%.

Site Option C	Annual Gas Usage (kWh/year)	Average Gas Price (p/per kWh)	Total Annual Cost (£)
Waterfront Site	7,875,277.95	6.25p	£492,204.87

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Plant efficiency up to 95%.

Site Option D	Annual Fuel Oil Usage (kWh/year)	Average Fuel Oil Cost (p/per litre)	Total Annual Cost (£)
Waterfront Site	7,875,277.95	57.72p	£415,184.65

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3 Jersey Water Quotations

Copy of mains water supply costs from Jersey Water.

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4 Jersey Gas Quotations

4.1 Incoming Gas Supply

Copy of incoming gas supply costs from Jersey Gas.

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6 Jersey Water Layouts

6.1 Overdale Hospital Mains Water Site Layout



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6.2 Existing General Hospital Mains Water Site Layout



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6.3 Waterfront Site

Mains water site layout and distribution information not available from Jersey Water.

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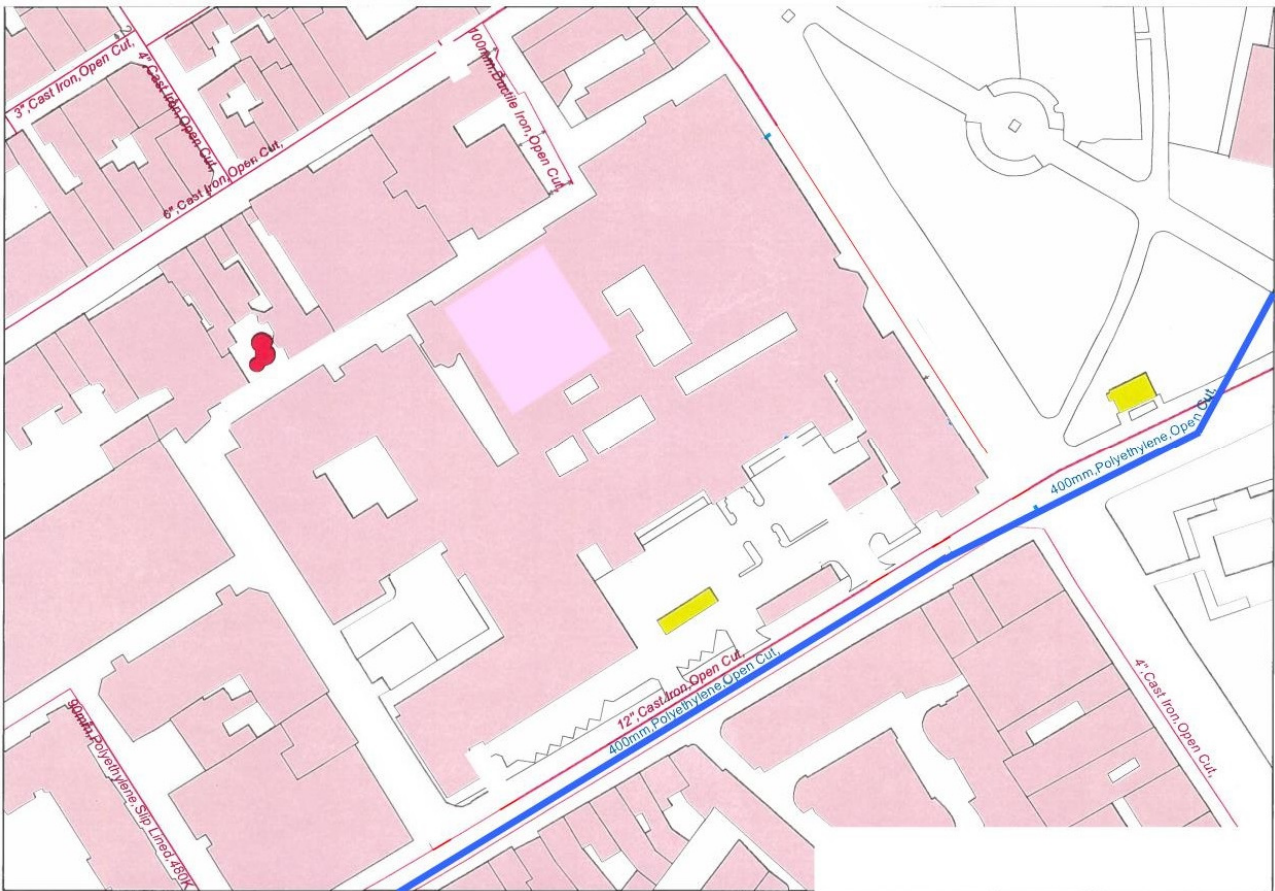
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7 Jersey Gas Layouts

7.1 Existing General Hospital



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8 Risks/Opportunities

Jersey Gas have confirmed that given the information so far, they anticipate that the gas installation to site Options A, B, C and D would be at no cost to the developer (subject to a full appraisal).

Jersey Water have confirmed that given the information so far, they anticipate that the mains water installation to site Options A (existing hospital) and C would be at no cost.

As stated above, States of Jersey Fuel Oil contracts are tendered by the States of Jersey, Corporate Procurement Department for a three year period. The weekly prices per litre are adjusted and set against an agreed index. Future fuel costs may fluctuate depending on market conditions.

9 Derogations

N/A

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1 Introduction

This technical note has been prepared to support the preparation of the Site Validation Exercise that forms Change Request Nr. 4 as part of the Jersey Future Hospital Scheme.

The four options being reviewed are:

- Option A - Dual Site Options
- Option B - Overdale Hospital Site, 100% New Build Option
- Option C - Existing General Hospital, 100% New Build Option
- Option D - Waterfront Site, 100% New Build Option

This Technical Note has been prepared in conjunction with a separate Heating Options Appraisal report which is has been developed to ascertain the proposed heating fuel source and systems for the buildings.

This document therefore does not detail the specific systems and fuel sources used for heating and incoming services capacities are not defined at this time.

This document has been prepared as a general overview of systems to pre-feasibility level of detail and will be developed in subsequent design stages once the preferred option is established.

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2 Commentary

2.1 Option A

2.1.1 Incoming Mains Water

An incoming mains domestic water supply will be provided to each of the hospital sites from the Jersey Water mains network. The current systems serving each hospital will require to be upgraded to accommodate the larger site supply capacities required.

2.1.2 Heating

The primary heating loads for each of the hospital sites will generally be generated via heating plant located in new energy centres. The total heating plant capacity for Overdale Hospital has been estimated as 1.6 MW and 5.6 MW for the Existing Hospital. For both hospital sites, the heating generated will be distributed around the hospital buildings via a number of dedicated heating circuits.

2.1.3 Ventilation

The ventilation strategy for each of the hospitals will include a variety of different systems specifically selected to meet clinical requirements and ensure an energy efficient solution.

Separate air systems will generally be provided to each of the departments requiring mechanical ventilation to minimise re-circulation between departments, limit disruption during maintenance or plant failure and simplify provision for operation on emergency power or upon receipt of a fire alarm. Some clinical departments such as operating theatres and isolation rooms located in the Existing Hospital will have dedicated air handling plant.

2.1.4 Cooling

Cooling plant located within external enclosures at roof level will be used for the provision of space cooling for each of the sites. The cooling circuits will be provided to serve the air handling plant for cooling and dehumidifying purposes.

Separate self-contained cooling systems will be provided to serve cooling units within the communications rooms, medical equipment as applicable and where required by the room data sheets such as operating theatres and isolation rooms, mainly located in the Existing Hospital.

2.1.5 Public Health

Boosted domestic water supplies will be provided from the storage tanks serving the whole of each hospital site. The domestic water supplies will be delivered at the point of discharge at a suitable pressure for the sanitary appliances or equipment.

From the domestic water booster pump sets, a boosted domestic cold feed will be run through each hospital site separate from the boosted domestic cold water mains, to feed the domestic hot water plate heat exchangers or calorifiers within the plantrooms located in the hospitals.

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For both sites the domestic hot water will be generated by the use of plate heat exchangers or calorifiers. These units will be fed from the primary heating mains. The domestic hot water plant will be located in local plantrooms around each hospital. Each plantroom will provide hot water to predetermined areas within each of the hospitals.

2.1.6 Above Ground Drainage Systems

The buildings of each hospital will be provided with secondary ventilated stack soil and waste installation from the foul water under slab drainage system, to terminate above roof level. Generally the sanitary plumbing system will be routed throughout the buildings by gravity utilising a series of horizontal and vertical soil and vent pipes. Specialist drainage will be provided to departments such as labs and pharmacy and radiology

2.1.7 Medical Gases

The Existing Hospital will be provided with Medical Oxygen generated from a Pressure Swing Absorber (PSA) plant. The primary PSA plant will be located at one end of the hospital site, sized for the full oxygen demand. A secondary PSA plant will be located at the opposite end of the hospital site, sized for the full oxygen demand. A manifold and emergency supply manifold to be located at ground level in the centre of the hospital site. The primary and secondary plant will be connected to a ring main providing a secure supply of oxygen.

The Overdale Hospital site will also be provided with Medical Oxygen however due to the lower capacity required consideration will be given to either a smaller capacity Pressure Swing Absorber (PSA) plant or local bottled supply. The plant and distribution will be arranged to provide a secure supply of oxygen.

Medical Air at a nominal pressure of 4 bar will be provided from packaged medical compressor plant located in dedicated plantrooms for both the Existing Hospital and Overdale Hospital sites. The primary 4 bar Medical Air triplex plant will be located at one end of the hospital site, sized for the full demand. A secondary 4 bar Medical Air triplex plant will be located at the opposite end of the hospital site, sized for the full demand. A manifold and emergency reserve manifold to be located at ground level in the centre of the hospital site. The primary and secondary plant will be connected to a ring main providing a secure supply of 4 bar medical air.

Surgical Air at a nominal pressure of 7 bar will be provided from packaged medical compressor plant located in dedicated plantrooms serving the Existing Hospital only. The primary 7 bar Surgical Air triplex plant will be located at one end of the hospital site, sized for the full demand. A secondary 7 bar Surgical Air triplex plant will be located at the opposite end of the hospital site, sized for the full demand. A manifold and emergency reserve manifold to be located at ground level in the centre of the hospital site. The primary and secondary plant will be connected to a ring main providing a secure supply of 7 bar surgical air.

Medical Vacuum will be provided from packaged vacuum plant located in dedicated plantrooms both at the Existing Hospital and Overdale Hospital sites. The primary Vacuum triplex plant will be located at one end of the hospital site, sized for the full demand. A secondary Vacuum triplex plant will be located at the opposite end of the hospital site, sized for the full demand. The primary and secondary plant will be connected to a ring main providing a secure Vacuum supply.

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A piped nitrous oxide supply will be provided from an automatic cylinder manifold installation located within dedicated manifold rooms. It is anticipated that on the Existing Hospital will require this supply. Manifold room(s) with back up / emergency supply manifolds will be provided.

Where anaesthetic gases are required within a department such as operating theatre suites, and treatment suites, anaesthetic gas scavenging systems will be provided local to that department. The exhaust from the unit will discharge to a suitable safe location. Only the Existing Hospital will have an anaesthetic gas scavenging system.

Specialist gases such as compressed air and bottled gases associated with the laboratory, pharmacy and workshop areas will be provided from local plant and bottled supplies to suit the individual requirements. This will apply to both the Existing Hospital and Overdale Hospital sites.

The medical gases installation will be HTM 02-01 compliant.

2.1.8 Pneumatic Tube

A new pneumatic tube system will be provided to serve both the Existing Hospital and Overdale Hospital. A linear coupler server and exhausters will be located in a dedicated internal plantroom in the Existing Hospital. However it is expected that the plantroom at Overdale Hospital will only need to accommodate diverting stations and exhausters because of the smaller system required. Each plantroom will be strategically located within their respective hospitals based upon system capacity and departmental transport volume requirements and times.

2.1.9 Fire Systems

A fire main will be routed around each site to supply fire hydrants. The main will be fed directly from the local Jersey Water mains water network, subject to adequate flow rates being available. Fire hydrants will be provided in locations agreed with the fire officer to provide firefighting facilities.

The main hospital buildings will be provided with a Sprinkler system. Sprinkler pumps located in a dedicated plantroom will deliver water from large storage tanks to the sprinkler system.

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2.2 Options B/C/D

2.2.1 Incoming Mains Water

A new duplicate incoming mains domestic water supply will be provided to the hospital from the Jersey Water mains network. For Options B and C, the current system will require to be upgraded to accommodate the larger site supply capacity required. For Option a new system will need to be provided to serve the hospital site.

2.2.2 Heating

The primary heating loads for each of the hospital sites will generally be generated via heating plant located in new energy centres. The total boiler capacity has been estimated as 7.8 MW. The heating generated will be distributed around the hospital buildings via a number of dedicated heating circuits.

2.2.3 Ventilation

The ventilation strategy for the hospital will include a variety of different systems specifically selected to meet clinical requirements and ensure an energy efficient solution.

Separate air systems will generally be provided to each of the departments requiring mechanical ventilation to minimise re-circulation between departments, limit disruption during maintenance or plant failure and simplify provision for operation on emergency power or upon receipt of a fire alarm. Some clinical departments such as operating theatres and isolation rooms will have dedicated air handling plant.

2.2.4 Cooling

Cooling plant located within external enclosures at roof level will be used for the provision of space cooling for the hospital. The cooling circuits will be provided to serve the air handling plant for cooling and dehumidifying purposes.

Separate self-contained cooling systems will be provided to serve cooling units within the communications rooms, medical equipment as applicable and where required by the room data sheets such as operating theatres and isolation rooms.

2.2.5 Public Health

Boosted domestic water supplies will be provided from the storage tanks serving the whole of the hospital. The domestic water supplies will be delivered at the point of discharge at a suitable pressure for the sanitary appliances or equipment.

From the domestic water booster pump sets, a boosted domestic cold feed will be run through the hospital separate from the boosted domestic cold water mains, to feed the domestic hot water plate heat exchangers or calorifiers within the plantrooms located in the hospital.

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The domestic hot water will be generated by the use of plate heat exchangers or calorifiers. These units will be fed from the primary heating mains. The domestic hot water plant will be located in local plantrooms around the hospital. Each plantroom will provide hot water to predetermined areas within the hospital.

2.2.6 Above Ground Drainage Systems

The buildings will be provided with a secondary ventilated stack soil and waste installation from the foul water under slab drainage system, to terminate above roof level. Generally the sanitary plumbing system will be routed throughout the building by gravity utilising a series of horizontal and vertical soil and vent pipes. Specialist drainage will be provided to departments such as labs and pharmacy and radiology.

2.2.7 Medical Gases

Medical Oxygen will be generated from a Pressure Swing Absorber (PSA) plant. The primary PSA plant will be located at one end of the hospital site, sized for the full oxygen demand. A secondary PSA plant will be located at the opposite end of the hospital site, sized for the full oxygen demand. A manifold and emergency supply manifold to be located at ground level in the centre of the hospital site. The primary plant, secondary plant and manifolds will be connected to a ring main providing a secure supply of oxygen.

Medical Air at a nominal pressure of 4 bar will be provided from packaged medical compressor plant located in dedicated plantrooms. The primary 4 bar Medical Air triplex plant will be located at one end of the hospital site, sized for the full demand. A secondary 4 bar Medical Air triplex plant will be located at the opposite end of the hospital site, sized for the full demand. A manifold and emergency reserve manifold to be located at ground level in the centre of the hospital site. The primary plant, secondary plant and manifolds will be connected to a ring main providing a secure supply of 4 bar medical air.

Surgical Air at a nominal pressure of 7 bar will be provided from packaged medical compressor plant located in dedicated plantrooms. The primary 7 bar Surgical Air triplex plant will be located at one end of the hospital site, sized for the full demand. A secondary 7 bar Surgical Air triplex plant will be located at the opposite end of the hospital site, sized for the full demand. A manifold and emergency reserve manifold to be located at ground level in the centre of the hospital site. The primary plant, secondary plant and manifolds will be connected to a ring main providing a secure supply of 7 bar surgical air.

Medical Vacuum will be provided from packaged vacuum plant located in dedicated plantrooms. Each set of medical vacuum plant will supply the requirements of the various departments local to the plantroom.

Medical Vacuum will be provided from packaged vacuum plant located in dedicated plantrooms. . The primary Vacuum triplex plant will be located at one end of the hospital site, sized for the full demand. A secondary Vacuum triplex plant will be located at the opposite end of the hospital site, sized for the full demand. The primary and secondary plant will be connected to a ring main providing a secure Vacuum supply.

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A piped nitrous oxide supply will be provided from an automatic cylinder manifold installation located within dedicated manifold rooms. Manifold room(s) with back up / emergency supply manifolds will be provided

Where anaesthetic gases are required within a department such as operating theatre suites, and treatment suites, anaesthetic gas scavenging systems will be provided local to that department. The exhaust from the unit will discharge to a suitable safe location.

Specialist gases such as compressed air and bottled gases associated with the laboratory, pharmacy and workshop areas will be provided from local plant and bottled gas manifolds to suit the individual requirements.

The medical gases installation will be HTM 02-01 compliant.

2.2.8 Pneumatic Tube

A new pneumatic tube system will be provided to serve the hospital. A linear coupler server and exhausters will be located in a dedicated internal plantroom. The plantroom will be strategically located within the hospital based upon system capacity and departmental transport volume requirements and times.

2.2.9 Fire Systems

A fire main will be routed around the site to supply fire hydrants. The main will be fed directly from the local Jersey Water mains water network, subject to adequate flow rates being available. Fire hydrants will be provided in locations agreed with the fire officer to provide firefighting facilities.

The main hospital buildings will be provided with a Sprinkler system. Sprinkler pumps located in a dedicated plantroom will deliver water from two large storage tanks to the sprinkler system.

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3 Risks and Derogations

N/A