The Shrewsbury and Telford Hospital NHS
NHS Trust

SaTH Sustainable Services Programme
Site-Wide Estates Impact of the Potential Solution

SERVICES	RSH as the Emergency and Acute Site
Heating	* Construction is over the existing subterraenean duct (contains steam main etc). * Existing boiler capacity inadequate to serve additional load. * Existing boilers and CHP are on contract with EnerG for approx another 6 years. * Connecting new build to existing boilers would not achieve BREEAM rating. * Existing CHP unit - site's heat baseload utilises the entire output. (see attached data sheet tab). Consider additional CHP unit. * There is a desire to de-steam the site when contract expires. * Existing steam main is c40 years old and susceptible to periodic failures. * See attached schedule of incoming services for info on gas main(s). Meter is adjacent to boilerhouse
	Currently served by 1 gas boiler and 1 CHP/waste heat boiler each providing steam. MTHW is taken from the CHP to heat DHWS calorifiers backed up by steam. A third boiler is not operational due to corrosion of tubes.
	Site winter load is met by 2 operational boilers but if 1 boiler or CHP is off line capacity is inadequate
	Backlog allowance includes a replacement boiler for resilience
	An additional boiler is required to satisfy the load of the new development rated at 1.2MW Include reconfiguration of boiler house to accommodate new plant (may duplicate cost allowances included in backlog)
	Additional CHP unit matchd to base load of the new building - 120kWe May be an extension of the EnerG contract
	Boiler plant is old innefficient and in poor condition, upgrades included in backlog maintenance schedule
	Replace steam main and condensate return in new service duct to carry additional load
	Additional Boiler to be installed as there is no spare capacity or resilience. New plant rooms should be sited above new modules.
	Ventilation plant will be located above departmental areas and included in the departmental costs
	Additional steam to LTHW heating calorifiers to be provided within the new development 3 @ 50% ie 3 @ 600kW each
Cooling/Ventilation	* Consider using (existing) chilled water system for cooling, rather than separate electric chillers.
	Chiller plant will be included within the departmental ventilation costs and it is anticipated will be an extension of the existing system
	Additional cost allowance should be included for additional adsorption chiller capacity to provide a heat load for CHP in summer to achieve a low carbon solution. Chiller rating 1200kW
	Additional cooling / Ventilation to be installed as there is no spare capacity in existing system,(this may have an impact on the electric infrastructure i.e. loadings on existing circuits)
DHWC/CWS	* Incoming water supply may need upgrading - presently 80mm incomer, located under old maternity (Copthorne Building) Replace with 2 new incoming 100mm mains (from separate network connections if possible) to feed central storage tanks

SERVICES	PRH as the Emergency and Acute Site
Heating	* Boiler capacity will need checking. * Distribution mains' capacity will need checking. * Existing boilers are on contract with MCL until Jan 2017. * Desire to de-steam when contract expires. * Connecting new build to existing boilers would not achieve BREEAM rating. * Gas incomer is at rear of site. See attached schedule for info on incoming services. Gas meter at max capacity.
	An additional boiler is required to satisfy the load of the new development rated at 1.6MW Include reconfiguration of boiler house to accommodate new plant (may duplicate cost allowances included in backlog)
	Additional 164kWe CHP unit matchd to base load of the new building. May be an extension of the existing contract
	Boiler plant upgrades included in backlog maintenance schedule
	Enhance steam main and condensate return in new service duct to carry additional load and creat a ring main configuration
	Increase heating plate packs to cope with extra load plus resilience, steam/LTHW pipe to be made to a ring to give resilience and access to carry out maintenance without major impact to service.
	Additional steam to LTHW heating calorifiers (plate heat exchangers)to be provided within the new development matched to the load requirements of the new building.
	Interconnect heating mains to existing to provide resilience
Cooling/Ventilation	* Consider absorption chiling as lead system, linked to CHP rather than electric chilling (which should be as back-up.
	Chiller plant will be included within the departmental ventilation costs and it is anticipated will be an extension of the existing system
	Additional cost allowance should be included for additional adsorption chiller capaacity to provide a heat load for CHP in summer to achieve a low carbon solution.
	Replace aged AHU to meet extra demand and current HTMs increase Abo chillier to meet BREEAM and replace inefficient DX units increase size of electric chillers for resilience and for back up to Abo during period of peak summer heat waves
	It is asume remedial works to ventilation and cooling systems are covered by the backlog allowance
DHWC/CWS	* Incoming water supply may need upgrading (80mm - see attached tab for info on incoming services). * Storage lagoons may be inadequate for any extension. * Need to confirm booster set capacity.
	Replace with 2 new incoming 100mm mains (from separate network connections if possible) to feed central storage tanks

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SERVICES	RSH as the Emergency and Acute Site
	Water storage lagoons and booster station are located under maternity. Need to check capacity and suitability. Replace existing tanks with duplicate above ground GRP external tanks to meet water regulations. 2 tanks each 54m3 stored capacity
	Add cold water booster set comprising multiple pumps and pipework distribution to serve mains supplies to existing high level tanks and direct to new development
	New DHW generators to be installed siting in plant rooms above respective Pods. A new Large diameter Pipe connection would have to be made to the incoming mains.
	Additional steam to domestic HW calorifiers comprising duty, support and standby calorifiers each rated at 50% to be provided within the new development
Drainage	Existing drainage to be relocated because of the siting of the new build pods.. Existing drains to be upgraded to cope with the increase in flow. (drainage survey to be carried out)
Medical Gases	Additional Vacuum Plants would need to be installed. There is spare capacity for Medical Air plants from the treatment Centre.. Assessment to be carried out. (Whilst it is believed there is spare capacity in the medical air system it is unlikely to be adequate given the likely increase in usage of medical air) Any remedial works to existing medical gas systems will be included in the backlog figures
	Include a second liquid oxygen VIE installation to provide a second independent source of supply in a separate location to the present installation
	Extend oxygen distribution to serve new development and create a ring distribution to comply with HTM 02
	It is not anicipated that additional nitrous oxide will be required in the new development
	Include additional medical compressed air plant comprising multiple compressors
	It is not anticipated that surigal air plant will be required to serve the new development
	Include additional medical vacuum plant to serve the new development
	Include medical gas manifold room including oxygen & medical air manifolds to HTM 02
Pneumatic tube	Additional stations required. Zone 4 very busy. Aerocom Uk to advise.
	The existing pneumatic tube system should be extended to include additional terminals
Incoming electrical Supply LV/HV	* See attached schedule for info on incoming electrical service. * Proximity of generators to the new buildings; may need relocating. * Existing CHP unit (600 kWe) - site's electrical baseload utilises the entire output. Consider additional CHP unit.
	Replace HV/LV switchgear to meet new load demand and meet HTM 06-02
	Increase capacity of incoming elecrical supply including new main intake switchgear to 3000kVA

SERVICES	PRH as the Emergency and Acute Site
	Replace existing tanks with duplicate above ground GRP external tanks to meet water regulations. 2 tanks each 54m3 stored capacity
	Add new cold water booster set comprising multiple pumps and pipework distribution to serve mains supplies to existing high level tanks and direct to new development
Drainage	Replace old corroded pipe work to prevent blockages separate foul waste from shower waste where poss. to prevent foul waste over spilling in shower cubicle
	It is assumed remedial works to drainage is covered by the backlog allowance
	Divert existing drains from beneath the footprint of the new development
Medical Gases	Upgrade all med gas services to meet new demand give resilience and ring services for ease of access for maintenances and minimize disruption to services
	Include a second liquid oxygen VIE installation to provide a second independent source of supply in a separate location to the present installation - assume VIE leased
	Extend oxygen distribution to serve new development and create a ring distribution to comply with HTM 02
	It is not anicipated that additional nitrous oxide will be required in the new development
	Include additional medical compressed air plant comprising multiple compressors (this plant could be co-located with existing plant or located within and dedicated to the new building)
	Extend medical air distribution to new development or interconnect new dedicated plant to existing to provide resilience)
	It is not anticipated that surigal air plant will be required to serve the new development
	Include additional medical vacuum plant to serve the new development (this plant could be co-located with existing plant or located within and dedicated to the new building)
	Extend medical vacuum distribution to new development or interconnect new dedicated plant to existing to provide resilience)
	Include medical gas manifold room including oxygen & medical air manifolds to HTM 02
Pneumatic tube	Replace existing 160 mm with 110 system (It must be noted that the replacement of the 160 tube with a 110 tube is not as a result of the new development or a backlog issue but must be included to ensure consistency across the site whilst avoiding installing an inappropriate system in the new development)
	Extend pneumatic tube system to serve departments within the new development including XX No. terminals

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SERVICES	RSH as the Emergency and Acute Site
	Install additional sub-station dedicated to new development including duty/standby transformers rated at 1 MVA
Back up generator UPS/IPS	* Note proximity of generators.
	Generator House to be relocated along with bulk oil tanks. Generator capacitiy (2 x 1250 + 600 = 3100 Kva). Max logged recordings 600amps / 750 Kva. Nb. Generators are available to back up Broad crown set @ old Maternity if required. Recommend load recordings taken on existing transformers Catering,Gynae, + treatment Center to determine spare capacity.
	Relocate existing generators to clear site of new development including oil storage tanks
	Install an additional 2 No. generators each rated at 600kVAVA to provide 100% support at N+1 to the new development. Enhance oil storage capacity to include new generators
	It is assumed that any enhancements to existing generator provision will be covered by the backlog allowances
Fire alarms	Additional out stations required to existing Static Systems (925 system)
	Fire alarm and detection will be included in the departmental allowances.
	Include upgrade to the central alarm panel & network to accommodate the additional zones
Security Systems	Door access system required.
	Include card access system within the new development
	Include intruder alarms to ground floor day only spaces - (very limited)
	Include CCTV to internal circulation areas and external access, building perimeter and car park areas
	Include staff attack system to ED & OPD areas
BMS	* Existing BMS (Seachange) on contract with EnerG for approx another 6 years. * BMS 'head-end' is in existing Estates building
	A new BMS outstation will be required on any new build. This would be tagged on to the existing front end and graphics would also need to be updated.
Asbestos	A pre-demolision survey would need to be carry out would refurbishing or taggijng on any new build on to existing.
Car parking/Roadways	Additional car parking to be made available due to the loss of existing. Considerations to be made to its locallity, on site, off site or multilevel. Road ways to be diverted around new build, possibly to avoid building over exiting ducts.
	Street lighting + carpaking lighting to be reconfigured
	Install external lighting to all new roadways, access routes and carpark areas

SERVICES	PRH as the Emergency and Acute Site
Incoming electrical Supply LV/HV	* See attached schedule for info on incoming electrical service. * Existing CHP unit (600 kWe) - site's electrical baseload utilises the entire output. Consider additional CHP unit.
	Replace HV/LV switchgear to meet new load demand and meet HTM 06-02
	Increase capacity of incoming elecrical supply including new main intake switchgear to 2500kVA
	Install additional sub-station dedicated to new development including duty/standby transformers rated at 1 MVA
Back up generator UPS/IPS	Generators will only supply essential supply need to upgrade to supply N+1 (note oil tanks will also need to be increased to maintain running time to 100hrs?) fit UPS/IPS to cat 5 equipment/areas
	Install an additional 2 No. generators each rated at 1 MVA to provide 100% support at N+1 to the new development. Enhance oil storage capacity to include new generators
	It is assumed that any enhancements to existing generator provision will be covered by the backlog allowances
Fire alarms	Capture fire compartment back log to refurb areas consider more door hold magnets where access & egress of trolleys & beds
	Include upgrade to the central alarm panel & network to accommodate the additional zones
	Fire alarm and detection will be included in the departmental allowances.
	Include upgrade to the central alarm panel & network to accommodate the additional zones
Security Systems	Extend cameras & door locking system to vulnerable areas
	Include card access system within the new development
	Include intruder alarms to ground floor day only spaces - very limited
	Include CCTV to internal circulation areas and external access, building perimeter and car park areas
	Include staff attack system to ED & OPD areas

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SERVICES	RSH as the Emergency and Acute Site
Ducts	Ducts to be refurbished M & E services repaired / replaced to ensure continity of supplies to Hospital / Departments Options 4-9
	Main service duct from energy centre to main hospital building is beneath the footprint of the new development and will need to be replaced including all services. Assumed to be included in backlog allowance
	Secondary service duct to the south of the site is in poor condition and requires replacement. This is not as a result of the new development and whislt resilience would be improved by the reinstatement of ring mains it is a preference but not essential. Assumed to be included in backlog allowance
Estates office/Workshop	To be re-sited to suit either remote or integral. Option 4 - 9
Loading Bay	To be re-sited to a move suitable position. Consideration to be made which side of the hospital this needs to be built. As operation / service entrances calls would change.Option 4-9
MES	· Increase in Bed store Capacity required to cover the increase in ward capacity · RO System within ITU will need replumbing to the appropriate area within new ITU, including the Pex Distribution loop, 100% redundancy and appropriate drainage for RO water. · Transferral of PRH staff to RSH to undertake the increase in workload. To determine most efficient use of MES Staff to cover equipment maintenance tasks · Cabling and switch transferral for ITU monitoring stations. · Increase in Licencing for central station within A&E to cover extra capacity from RSH transfers, plus transferral of central station and associated infrastructure. · Availability of Maternity Workshop for testing of incubators and other maternity equipment to prevent long distance transferral of these items to minimise risk of damage Infrastructure capacity for W&C networking items for monitoring systems including CTG monitoring etc.
IT/data	IT/Data networks within departmental areas will be covered by the departmental allowances
	New hub rooms with active equipment will be required in each departmental area
	It is assumed a new enhanced data centre will be required to support the existing facility including expansion of the existing unit
Other	Water firing main to be considered
hydrant main	Extend external hydrant main including additional hydrants
IPS/UPS	IPS/UPS to critical care areas - assumed included in departmental costs?

SERVICES	PRH as the Emergency and Acute Site
BMS	* Existing BMS is a Trend system. Any new BMS must be Trend and be integrated with existing. It must include for head-end upgrade to graphics etc. Plant rooms should each include BMS display panel.
	Replace old actuators and hard ware tie system to Telephone switchboard so that switch can be remote Assumed to be included in backlog allowance
	A new BMS would be included in the new development and included in the plant costs.Include on cost to upgrade front end & graphics
Car parking/Roadways	Although there is in the scheme, planned for a multi-storey car park considerations need to be given for disable parking and ambulance parking for both WHA and WML services plus drop off for taxis and the public. Road and parking in staff side also needs improving and increasing to meet new demands. More safer means of getting across car park into the building Bus route and buses passing via main entrance?
Ducts	N/A (only duct work is from pump house to boiler house)
Estates office/Workshop	Due to increase of loading bay and post /mail room moving from the main entrance consideration need to be given to move estates away from prime spot of delivery are and loading bay. Etsates may also need to increase in size to cope with extra stock items and larger workforce
Loading Bay	Increase size of loading bay and stores to accommodate extra deliveries and demand, reorganise waste and hazardous waste using estates compound and stores have poters move to estates and mail room so services post are taken away from the front end of the hospital
Other	*Nurse call system old and obsolete so cannot be added but needs to be replaced with Static Codem system. It is asumed replacement nurse all system is included in the backlog allowance *R/O unit water treatment plant also need replacing It is assumed the replacement of the RO unit is included in the backlog allowance *Asbestos although not big issue as RSH but there is low level ACM that needs to be removed in pipe work under cloak and roof soffits so small amount of sums needs to be set a side Asbetos surveys & clearance assumed to be included elswhere? *Window frames old and obsolete single panel will not meet Breeam Window upgrades assumed to be covered in building works *Refurbishment wards need Emergency light upgrade to P4 to meet fire regs (1 lux min) Included in refurbishment allowance *All containment at full capacity especially ELV system (IT trunking)

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SERVICES	RSH as the Emergency and Acute Site
Photovoltaic panels	Photovoltaic panels to reduce carbon emmissions to match base electrical load

SERVICES	PRH as the Emergency and Acute Site
	New containment assumed to be included in refurbishment allowance
Helipad	Currently helipad has just being refurbished with night lights but consideration for how patient is transferred along Helipad to ED (may need better lighting smoother road surface better traffic control)
	Include in external building works?
Medical Records	May need more room to contain extra med records possible add another level to existing portacabin
Decontamination/ Queensway	need to turn off AHU for servicing hence maybe we purchase more spare instruments during the shut downs periods or in event of machines in annual service testing or breakdowns **Med gas :** no impact just reorder spare bottles **Generator:** No impact (may need bigger storage tank) **BMS** : No impact (however currently BMS is obsolete hence needs upgrading) **Others** If we don't run on 24/7 we would need to extend building to allow for new washers and sterilizers build new clean rooms and prep room increase size of loading bay As stated earlier they should be no impact to which ever site is hot only impact is when theatre list increase regardless of which site this is from and in this case I believe it could be covered with extended hours however it is best to consult with manager of Queensway Duncan Brown who will have a much better understanding of workloads and demands and possible with theatre managers Consideration may be needed for extra storage area for extra trolley loads stock and chemicals drums estates spares as no doubt pressures will be greater to maintain extra work demands
MES	· Increase in Bed store Capacity required to cover the increase in ward capacity · Complete RO system to be added to ITU with Pex distribution loop, Drainage and ring main to support dialysis patients, this would need 100% redundancy · Transferral of RSH staff to PRH to undertake the increase in workload. · Cabling and switch transferral for ITU monitoring stations. · Increase in Licencing for central station within A&E to cover extra capacity from RSH transfers · Reconfiguration of MES on-call service to ensure appropriate numbers of staff are available at PRH
IT/data	IT/Data networks within departmental areas will be covered by the departmental allowances
	New hub rooms with active equipment will be required in each departmental area
	It is assumed a new enhanced data centre will be required to support the existing facility including expansion of the existing unit
Others	
hydrant main	Extend external hydrant main including additional hydrants
IPS/UPS	IPS/UPS to critical care areas - assumed included in departmental costs?
Photovoltaic panels	Photovoltaic panels to reduce carbon emmissions to match base electrical load