NORWICH
City Council

Committee Name: Cabinet

Committee Date: 08/09/2021

Report Title: To award a contract for the installation of a **New District Heating System at Barnards Yard, Norwich**

Portfolio:	Councillor Harris - Deputy leader and social housing
Report from:	Executive director of community services
Wards:	**Mancroft**
OPEN PUBLIC ITEM	

Purpose
To consider awarding a contract for the installation of a new district heating system at Barnards Yard, Norwich.

Recommendation:

To approve the award of a contract for the installation of a new district heating system at Barnards Yard, Norwich to J Tomlinson Limited, from 27 September 2021 to 31 March 2022. The contract is valued at £1,829,505.02.

Please note: as set out in the risk section of the report, officers are seeking further information regarding the risks associated with the project. If necessary, further information will be provided to Cabinet.

Policy Framework

The Council has three corporate priorities, which are:

- People living well
- Great neighbourhoods, housing and environment
- Inclusive economy

This report meets the great neighbourhoods, housing and environment corporate priority.

This report addresses the good quality housing strategic action in the Corporate Plan.

This report helps to meet People living well adopted policy of the Council.

This report helps to meet the housing, regeneration, and development objective of the COVID-19 Recovery Plan.

Report Details

Identification of need

1. Investigations have taken place for the installation of a new ground source heat pump to replace the gas-powered plantroom at **Barnards Yard, Norwich, NR3 3DS** (a temporary solution following the disposal of Mary Chapman Court).

2. To determine that a ground source method utilising heat from water existing in boreholes would be suitable for Barnards Yard, trial core drilling was carried out at the site in June 2020. However, after further investigation, an alternative heat pump system utilising water as a renewable energy source which derives heat from the adjacent River Wensum, was found to be more viable. This report details the installation of the new system.

3. The new system will be a Water Source Heat Pump System (WSHP). WSHP systems are generally acknowledged to be more efficient than Ground or Air source devices as river temperatures are higher and more stable than ground or air temperatures and heat is transferred more efficiently from water.

4. Water will be removed from the Wensum (Abstraction) and pumped to a new plant room before it is returned to the Wensum (Discharged). A small amount of heat is taken from the abstracted water before it is discharged back into the river. At no point is the river water mixed with water to be used in the dwellings.

5. The new system will provide space and hot water heating to 85 dwellings from this renewable source. The previous fuel used to provide space heating and hot water was natural gas, a carbon generating fossil fuel. The new system will be electrically powered so no particulates will be created onsite by combustion. All electricity used on this development will be generated from a renewable source via our ESPO energy procurement.

6. The scheme will involve the removal of the existing temporary gas fired plant room located in the corner of the parking area within the courtyard.

7. It will be replaced with a permanent plant room constructed of brick with a double pitched tiled roof. The design and colour of materials will match the housing blocks at Barnards Yard.

8. This new plant room will house two custom built Titanium Heat Exchangers to extract the heat from the water 365 days a year strictly in line with the Environment Agency regulations. These will then feed five heat pumps which will work together to ensure balanced and monitored usage to maximise performance and life expectancy. The heat generated by the heat pumps will in turn heat water stored in buffer vessels within the plant room. This heated water will be pumped to each dwelling to provide space and hot water heating.
9. The existing original internal hot water and space heating pipework with radiators and associated plant will be stripped out (it was installed between 1976 -1982). All space heating and hot water pipework will be replaced. New larger radiators will be provided with individual temperature controls. Each dwelling will have its own individual combination Heat Interface Unit (HIU) that regulates space and hot water heating within each property. All communal pipework will be replaced and insulated to minimise heat loss.
10. A computerised Building Management System (BMS) will be installed in the new plant room. It will monitor the operation of the whole WSHP installation including the abstraction and discharge of water from the River Wensum in line with the EA requirements. It will include a remote monitoring dashboard to notify of any problems within the system and all data required to measure energy usage within the plant room and in each individual dwelling. This will enable energy usage to be accurately calculated and billed for each property.
11. This system is necessary to be able to calculate energy usage and the energy savings that will occur over the 20 years for which the Renewable Heat Incentive funding will be paid back to the council.
12. This system is also required to enable the council (as a Heat Network Operator) to comply with the new Heat Network (Metering and Billing) (Amendment) Regulations 2020.
13. The new plant room located within the car park area will have an impact on the existing car parking layout within Barnards Yard. The council have allocated funding for a separate scheme to rationalise the layout of car parking, planting and bin storage on the site. This scheme is not covered by this Cabinet Report. This scheme will be carried out in consultation with all stakeholders and funded using the Estate Aesthetics budget.

The benefits

14. This scheme has been awarded Non-Domestic Renewable Heat Incentive (NDRHI) funding via a TG:3 guarantee (tariff guarantee) already in place. The up-front capital costs of the scheme will be paid from the council's HRA Capital budget. The NDRHI will reimburse the council over a 20-year period. Minimum repayments are estimated at a total of £600,000 over the next 20 years, based on the energy savings calculated by the BMS system.

15. WSHP systems are generally acknowledged to be more efficient than Ground or Air source devices. This system is expected to produce 4.71Kw's of heat for every 1Kw of electricity purchased.

16. This scheme will provide significant reductions in CO2 emissions per annum. Compared to the existing gas fired system it is anticipated that annually 270 tonnes approx of carbon will **not** be emitted into the atmosphere. A mature tree can absorb up to 21kg of C02 per year. This equates to the work 12,857 fully grown trees would absorb every year. As one tonne of carbon has a volume of 556.2/m3 this scheme equates to almost 150,000 m3 of carbon reduction per annum.

17. This scheme involves the replacement of the existing basic mechanical controls. The existing systems are also poorly insulated. New installations within the dwellings will incorporate A-rated appliances with improved thermal insulation and efficient modern user controls.

18. There are no products of combustion or discharge of particulates into the courtyard area as the plant room will not require a flue outlet.

19. There are substantial savings on the cost of running the WSHP system when compared to the existing gas fired system. The existing gas system uses approximately £50,000 of gas per annum (calculated from utilities bills provided by NPSN). The new system powered by renewable electricity is expected to cost around £30,000 per annum (based on 19p per/Kwh electric). This equates to savings of approximately £20,000 per annum. For the 20-year duration of the NDRHI funding, this represents a saving on the cost of supplying energy of £400,000.

20. These savings will contribute towards the provision of affordable warmth and the alleviation of fuel poverty as running costs will be lower than at present.

21. The installation of a new metering and billing element will mean that residents can be accurately billed for the hot water and space heating that only they use.

22. The removal of water storage in dwellings will eliminate the need for inspections for the unvented cylinders, and reduces the risks associated with stored hot water such as contracting Legionnaire's disease and other associated conditions.

23. The Energy Performance Certificate will be improved by the ability to reduce energy consumption.

24. The single plant room used in a district heating system reduces maintenance as opposed to the use of 85 separate boilers within dwellings with all of the necessary visits, checks, repairs etc. associated with that type of system.

Procurement process

25. The procurement team have been working with NPS Norwich Ltd (NPSN) to look at the design and installation of the water source heat

pump at Barnards Yard, Norwich.

26. Initial views were that a ground source heat pump would be a solution. Procurement activity ensued and research into ground source heat pump frameworks identified a route available to the council via a specialist Fusion 21 Framework (Construction Works and Improvements framework – Lot 1A Housing internal and external refurbishment) as being able to provide a suitable supplier to carry out the works.

27. The framework allows a direct award and is compliant to Public Contract Regulations. The suppliers offering these services are accredited to the framework and have already been vetted and overall capability proven.

28. In January 2020, expressions of interest, via the Fusion 21 Framework, were invited for the two-stage project. In March 2020, Fusion 21 confirmed that the only framework supplier interested in the two-stage design and installation of this project was J Tomlinson Limited.

29. As described at Point 2 above, in June 2020 trial core drilling was carried out by J Tomlinson Limited and after further investigation the water source heat pump system was found to be more viable.

30. Through a compliant procurement process through the Fusion 21 framework, in March 2021, J Tomlinson Limited were awarded the contract to undertake the Stage 1 Pre-Construction Services Agreement to prepare the design and to secure the RHI funding. This also included significant involvement from the Environment Agency (EA), whose approval for the scheme was required, and a guaranteed Renewable Heat Incentive (RHI) tariff was secured.

31. The contract values of the trial core drilling process and Stage 1 of the project were not a key decision and Cabinet approval was not required.

32. The value of Stage 2 of the project however is a key decision and is the subject of this report.

33. On 21 July 2021, J Tomlinson Limited submitted their fully costed design proposal for the water source heat pump installation (Stage 2) as below:

1.	Works	£1,339,181.44
2.	Provisional sums and contingency	£118,000.00
3.	Preliminaries, Margin and Fusion 21 fees	£372,413.58
	OVERALL TOTAL	£1,829,595.02

34. A full evaluation of the proposal and costings submitted by J Tomlinson Limited was carried out by Fusion 21 and NPSN. It was concluded that the proposal provides the council with value for money and offers an exemplary solution for the replacement of the existing temporary gas heating system at Barnards Yard for the following key reasons:

- Fusion 21 confirms the Preliminaries and Margin elements align with those set out in the Framework and are compliant with the Framework terms and conditions.

- Fusion 21 agree that these costs be accepted by the council due to there being sufficient transparency in the open book approach to ensure value for money.

35. It should also be noted that J Tomlinson Limited have gained eight sustainability awards in the last three years for various schemes including energy efficiency projects with special commendations for large scale projects and RHI installations.

36. As they are the only supplier offering the services under the specialist Fusion 21 framework, we are recommending that J Tomlinson Limited be awarded the contract.

Consultation

37. Councillor Harris - Deputy leader and social housing has been briefed on the report.

38. Residents have received outline communication regarding the proposed scheme and access to a limited number of dwellings has been necessary to be able to fully design the scheme.

39. The process of designing the scheme has involved detailed discussion with the council's heads of service, housing officers, the home ownership team, procurement, planning department and finance.

40. Nplaw have also been consulted to clarify legal aspects of the scheme.

41. In addition, detailed consultation has taken place with the Environment Agency with regards to the design and for the obtaining of all permits and licences.

42. All those consulted have worked with NPSN and J Tomlinson Limited to complete the design proposal.

43. For Stage 1 J Tomlinson Limited entered into a JCT 16 Pre-Construction Services Agreement (PCSA) with the council via the Fusion 21 procurement framework. The PCSA covered all aspects of the investigation work, design, and the obtaining by J Tomlinson Ltd of all statutory permissions and approvals. This involved:

    - The submission of a pre-application to the Environment Agency for the installation of plant in the River Wensum. This outlined the scope of works and allowed the EA to assess the merits and the impact of the scheme on the River Wensum. The EA were positive and in agreement with the outline proposal.

- The submission of a full application for the scheme to the EA. The EA are responsible for the issuing of all licences and permits associated with the use of the River Wensum.

- Pre-consultation with the council's planning department and the submission of an application to the council for full planning permission for the scheme. This included the provision of reports by Arborists, Environmental Impact Assessment etc.

- The submission of an application for Building Regulations approval.

Implications

Financial and Resources

44. Any decision to reduce or increase resources or alternatively increase income must be made within the context of the council's stated priorities, as set out in its Corporate Plan 2019-22 and Budget.

45. On 21 July 2021, J Tomlinson Limited submitted their Stage 2 fully costed design proposal for the WSHP installation at Barnards Yard at a cost of £1,829,595.02. The cost is summarized at point 33 above.

46. The existing 2021-2022 HRA capital budget for Central Heating Upgrades - Boilers Communal allocated £1.4m for the installation of the new district heating system which is insufficient for the costs submitted by J Tomlinson Limited. The budget was based on a previous design for the installation of a ground source heat pump system which involved the use of an array of approx. 40 boreholes. After detailed investigation this method was seen to be impractical. The alternative design using a WSHP was developed as detailed in this report. Unallocated budget in the Heating Upgrades - Boilers Communal budget approved from the existing HRA capital programme for 2021-22 will however allow the increased costs required to deliver the Barnards Yard installation to be funded.

47. The scheme has subsequently been awarded Non-Domestic Renewable Heat Incentive (NDRHI) funding via a TG:3 guarantee (tariff guarantee) already in place. The up-front capital costs of the scheme will be paid from the council's HRA Capital budget. The NDRHI will reimburse the council over a 20-year period. Minimum repayments are estimated at a total of £600,000 over the next 20 years, based on the energy savings calculated by the BMS system.

48. NPSN have calculated that the scheme does still represent value for money when the factors detailed below are taken into account.

49. The submitted cost breakdown has allowed for the substantial increase in prices (related to the supply of materials, labour and plant etc.) due to the demand in the construction industry because of national schemes starting up after the end of restrictions imposed by the Covid 19 pandemic and Brexit.

50. It is estimated that over the next 20 years a minimum £600k of the forecast cost of the installation will be recovered via the approved RHI funding agreement.

51. The total cost includes for the upgrading of all of the internal space and hot water heating systems within the dwellings. As these systems are now over 40 years old, the upgrades would have been included in a planned upgrades programme.

52. After a full evaluation of the design and costings, including a full breakdown of all summary lines as submitted by J Tomlinson Limited, Fusion 21 and NPSN conclude that the proposal submitted provides an exemplary and value for money solution for the replacement of the existing temporary gas heating system at Barnards Yard.

53. The contract is due to commence on 27 September 2021 and is due for completion by 31 March 2022. The completion date of 31 March 2022 is critical to enable the council to access the Renewable Heat Incentive funding. The works will be undertaken using the JCT Intermediate form of building contract.

Legal

54. This contract will be in compliance with the Public Contracts Regulations 2015.

Statutory Considerations

Consideration:	**Details of any implications and proposed measures to address:**
Equality and Diversity	Neutral
Health, Social and Economic Impact	The numerous benefits to health relating to Climate Change and the provision of a system that will be cheaper to run for tenants and leaseholders is outlined above.
Crime and Disorder	Neutral
Children and Adults Safeguarding	The supplier and all associated sub-contractors must adhere to the councils Safeguarding Policy statement.
Environmental Impact	This scheme is an innovative and ground-breaking scheme and is one of less than half a dozen taking place in the UK. Its impact on • climate change by the use of technology to de-carbonise

	• sustainability by the use of renewable energy • the significant reduction of pollution • the removal of a fossil fuel as an energy source • the reduction in heating bills are all outlined in this Cabinet Report

Risk Management

The risk table below describes the key risks. Officers are seeking further information regarding the risks associated with the project. If necessary, further information will be provided to Cabinet.

Risk	**Consequence**	**Controls Required**
Operational problems during the Construction Phase	Impact upon contractor. Impact upon tenants/leaseholders	J Tomlinson Limited are a multi award winning supplier of renewable solutions to various customers. They have a significant portfolio of successfully completed schemes for other Local Authorities. This scheme has been carefully designed in association with NPS Norwich Ltd and the council. A detailed construction phase programme is being developed to enable an effective delivery of this scheme. A Resident Liaison Officer will be on site during the scheme working with residents and providing essential communication throughout the construction phase. This scheme is a notifiable scheme with regards to the CDM regulations. A Construction Phase Plan will be put in place to manage health and safety during the works.
Financial Risk	Cost increases due to overruns, increase in	The total cost of the scheme includes an

	project costs, unforeseen costs arising etc.	allowance for Covid 19 and Brexit related issues. In addition, the total cost of the scheme includes contingency and provisional sums to mitigate as best as possible against unforeseen costs arising.
Compliance	Faulty or non-compliant installation that could affect the supply of hot water/space heating etc.	The scheme will be Contract Administrated by NPS Norwich Ltd. All installations will be carried out strictly in accordance with the provisions of the Building Regulations, planning permission etc. Regular site meetings will take place to ensure that service is maintained at all times.
Security	Risk to residents and their possessions during the works. Risk to contractor/sub-contractors and plant/materials etc. during the works.	Security will be a significant component in forming the CDM Construction Phase Plan to ensure that the consequences detailed are mitigated.
Legal	Non-compliance with legislation could result in a sub-standard installation. In addition, legal non-compliance may result in delays.	Nplaw have been consulted regarding the proposed scheme. All works will be compliant with current construction/ planning regulations.
Political, Reputational	The installation of a sub-standard, poorly executed installation that has a negative impact on residents would be detrimental politically and reputationally to the council.	As detailed above this scheme has been carefully and thoroughly planned, designed and procured. The contractor is a multi award winning supplier working in conjunction with NPS Norwich Ltd. All works will be carried out in accordance with construction, planning and Environment

		Agency recommendations.

Other Options Considered

Other heat options considered were:

55. **Do nothing:** The current gas-powered heating installation is a temporary solution, following the disposal of Mary Chapman Court. The current plantroom is of metal clad construction and has temporary planning permission. Planners have advised that an extension to the current permission is unlikely to be granted, therefore a permanent solution is required. The installation of permanent 'renewable' system was a condition of the planning consent. This option was not recommended.

56. **Installation of a Ground Source Heat Pump System Using Boreholes:** This method was investigated in June 2020 and, although viable, would prove to be very disruptive and the civil engineering works risks identified could not be mitigated through the design of the scheme. The number and spacing of the boreholes and the depth of core drilling (up to 100m deep) incorporated too much risk. The number of boreholes required to meet the required performance meant that boreholes would not be confined to the parking area. The impact on the site would be detrimental. In addition, the cost of this type of installation has been calculated by J Tomlinson Limited to substantially exceed £2 million pounds.

The procurement options considered were:

57. **Do nothing:** See point 56 above. This was not the recommended option.

58. **In house provision:** The council does not have any existing in-house resources. This was not the recommended option.

59. **Joint venture provision:** The works are not able to be delivered by the council's current joint ventures or partnerships at this time. This was not the recommended option.

60. **Identify a single supplier to award the contract to without competition:** This route would be contrary to Contract Procedures due to the contract value. This was not the recommended option.

61. **Utilise an existing framework:** Research into Ground Source Heat Pump frameworks identified a specialist framework via Fusion 21 as being able to provide a suitable supplier to carry out the works. These frameworks are quick and easy to use and are compliant to the Public Contract Regulations. The suppliers offering these services are accredited to the framework and have already been vetted and overall capability proven. Expressions of interest via the Fusion 21 framework resulted in J Tomlinson Limited being the only framework supplier interested in both the trial core drilling element and the overall project. **This was the recommended approach.**

62. **Establish competitively tendered contract with one supplier by running a competitive procurement exercise looking for a single supplier to meet the council's requirements:** The project included highly specialised works which had been identified within a suitable framework so was not required. Therefore, this was not the recommended option.

Reasons for the decision/recommendation

63. **'The benefits'** referred to in the **'Report Details'** above itemise the significant improvements that this scheme will bring to tenants and leaseholders.

64. It will mean improved energy efficiency and comfort within the dwellings. The use of electricity generated from a renewable source to provide hot water and space heating will reduce bills and contribute towards reducing fuel poverty. The new metering and billing system will mean that tenants pay for what they use with the new system providing a cheaper energy than natural gas.

65. This innovative and ambitious scheme will cause a substantial reduction in the release of CO2 into the atmosphere and will make a contribution towards the de-carbonisation of the council's assets.

Appendices:

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