ITEM No …11(A)…….

REPORT TO: **CITY DEVELOPMENT COMMITTEE – 7 MARCH 2022**

REPORT ON: **MANAGEMENT AND RENEWAL OF THIN WALLED CARBON STEEL PIPEWORK**

REPORT BY: **EXECUTIVE DIRECTOR OF CITY DEVELOPMENT**

REPORT NO: **78-2022**

1 PURPOSE OF REPORT

1.1 This report outlines a management and renewal strategy relating to thin walled carbon steel pipework installations and seeks approval for the accelerated replacement of remaining heating pipework and radiators within Dundee House. The report details reactive measures taken to date, and the requirement for immediate action to renew the heating system to mitigate future risks. The report also details the Head of Design and Property's assessment of the current condition of Dundee House and future monitoring arrangements.

2 RECOMMENDATION

2.1 It is recommended that the Committee:

a notes the issues relating to the use and premature failure of thin walled carbon steel installations within NHS facilities and the wider construction industry and the specific installation within Dundee House, including the works undertaken to date in carrying out reactive repairs;

b agrees to the replacement of the remaining Dundee House heating pipework and radiators in a way that minimises service disruption;

c in light of the urgency of the situation, delegates authority to the Executive Director of City Development and the Executive Director of Corporate Services to make suitable arrangements for the necessary remedial works to be carried out at the earliest possible time; and

d notes a further report will be submitted to the City Development Committee for Members to consider following the review of installations across the property portfolio.

3 FINANCIAL IMPLICATIONS

3.1 Short term responsive emergency repairs have been carried out at a cost of £45,000 to address the failures to the heating system within Dundee House, which has been met from the Revenue Budget 2021/2022 for Property Maintenance. There will be on going reactive repairs and associated costs until such time as the heating system is fully replaced.

3.2 The proposed heating pipework and radiator remedial programme as set out in this report is anticipated to cost in the region of £1.0 - £1.2m, inclusive of fees and contingency. The Council requires to proceed as early as possible to mitigate current risks.

3.3 The Executive Director of Corporate Services advises that £700k of the cost can be met from within the Property Development and Improvement Programme in the Service Provision section of the Capital Plan 2022-2027. The balance will be transferred from the Renewal and Repair Fund. It should be noted as at 31 March 2021, the amount held within the Renewal and Repair Fund for General Fund Services was to £3.306m.

3.4 Although Dundee House is predominantly occupied by council staff, Social Security Scotland currently occupy floor two, paying annual rental through the lease agreement. The council must consider any disruption caused to their operational service.

4 BACKGROUND

4.1 Thin Walled Carbon Steel Pipework

4.1.1 This material was widely specified and increasingly installed across the industry after its introduction in the late 1990's as it offered Health and Safety, cost and programming benefits over previously favoured alternatives. Due to the lighter nature of the material and its simplified installation method, it reduced site risks by eliminating the need for welding and hot works.

4.1.2 However, the construction industry has become aware that thin walled carbon steel was not as robust as mild steel and some other alternatives. Thin walled carbon steel requires very specific and stringent controls during transportation, storage, installation, commissioning and maintenance regimes, to avoid the development of performance and quality issues, in particular internal pipe corrosion.

4.1.3 The stringent parameters required during the construction phase management and handling of the material during storage, installation and specifically the initial commissioning processes were not widely understood or recognised during the initial years of the usage of the material. Any deviation from good practice and procedures could result in internal corrosion manifesting itself within a system which would not be apparent from visible inspections.

4.1.4 Since these issues emerged across the construction sector, partner organisations such as NHS Hospitals, Universities and other local authorities have identified significant risk of failure and are prioritising replacement work where instability assessments are deemed appropriate. Where thin walled carbon steel is specified and installed during the construction process, it requires stringent quality control and monitoring of the system to provide the level of performance expected for heating installations.

4.1.5 One notable case of premature failure of thin walled carbon steel occurred in Belfast Royal Infirmary, where the critical care facility was significantly delayed due to problems with corrosion to heating pipework identified during the commissioning process. NHS Wales has also published an estates and facilities alert paper issued to all NHS organisation in United Kingdom highlighting the susceptible nature of the material as a result of poor installation and commissioning practices.

4.2 Installation in Dundee House

4.2.1 The Dundee House project was procured on the basis of utilising external designers and cost consultants working with the successful contractor. The lead designer of Dundee House was won in competition by Edinburgh based architects, Reiach and Hall. The Dundee House heating and cooling systems installed during the construction period from 2009-2011 used thin walled carbon steel.

4.2.2 The Policy and Resources Committee on 27 April 2009, approved the report 244-2009 for Dundee House – Construction Tender and Total Cost (article XVII refers). This report detailed the external procurement process adopted in relation to the construction of Dundee House, through the OJEU Two Stage Tender approach contained with the City Council approved Capital budget of £34m at that time.

4.2.3 The construction contract was awarded to Bovis Lend Lease. As part of this contract with the heating services design and installation sub-contracted by Bovis Lend Lease as the main

contractor to Crown House for the design and installation, with Buro Happold their sub-consultant as the specialist services designer.

4.3 Pipework and Radiator Issues in Dundee House

4.3.1 All external thin walled carbon steel pipework on the roof of Dundee House has been previously replaced with mild steel pipework in the recent past to address identified corrosion issues.

4.3.2 Subsequent to this the vertical pipework had to be replaced following a leak caused by a failure in the crimped joint to one of the rising mains which resulted in full closure of Dundee House for several days in late 2019.

4.3.3 As part of the process for any replacement and repair works to thin walled carbon steel pipework, recommended guidance requires several processes of draining, cleaning and flushing the entire pipework system. These processes may have, through flushing the system, served to displace internal sediment and corrosion deposits and exposed inherent deterioration of the internal face of the carbon steel pipework leading to accelerated failures.

4.3.4 As a consequence of the progressive corrosion to the thin walled carbon steel pipework, Dundee House has incurred six pipework failures in recent months and 80 radiators to date within Dundee House have developed pin hole failures, with leaks appearing at random throughout the building. Council mechanical services engineers have liaised with the original radiator manufacturer and other technical experts to identify the root cause and any contributing factors to diagnose the issues.

4.3.5 Frequent visual inspections of the pipe and radiator network continue to be undertaken daily, to identify any new weaknesses or failures in the system. It is essential to manage this health and safety risk to ensure that the power and data distribution network in Dundee House is protected, avoiding any damage and subsequent disruption to the services of the Council and their sub-tenant.

4.3.6 Council officers have contacted technical colleagues within the Scottish Government to discuss with them the issues encountered in Dundee House. The issues will be assessed and assimilated with other relevant technical information to assist with managing similar risks.

4.4 Works Required

4.4.1 To date, reactive works have been undertaken where failures have occurred, but as there have been significant failures, officers now recommend the expedited replacement of the remaining heating pipework and radiator system.

4.4.2 The mechanical engineering team is currently finalising the design for the replacement of the remaining thin walled carbon steel heating pipework and radiator components within Dundee House.

4.4.3 In order to minimise the impact of these works, and prevent closure periods, in the building, the replacement contract requires to be carried out between April and September when heat demand is at its lowest and works will be undertaken on a phased basis. As part of the replacement strategy the wet heating system will periodically be taken out of action and the heating and cooling in Dundee House will rely on the in-situ warm air system, to provide some limited background heating, until the pipework and radiator replacement is complete.

4.4.4 All Council properties are inspected regularly by experienced officers with relevant technical qualifications. In view of the issues identified, the Head of Design and Property has instructed

a review of all systems and the fabric of Dundee House. No other risk of this level has been identified.

5 WIDER PROPERTY ESTATE – OVERVIEW AND STRATEGY

5.1 Following the issues with the pipework in Dundee House, the Head of Design and Property has instructed a review of installations across the extended Council property portfolio. Thin walled carbon steel pipework has been utilised by the Council over a number of years with installations in a number of premises across the estate. Initial data gathering has not identified any requirement for immediate action similar to Dundee House. A report on the installations once finalised will be brought back to City Development Committee.

5.2 A leak detection system is being developed and if required will be installed in vulnerable premises.

5.3 Health and Safety Contractor reports are currently being commissioned on the various systems across the council estate. Water quality and condition testing has also been undertaken to identify any concerning corrosion levels. The Head of Design and Property is closely monitoring all relevant properties.

5.4 Where an installation has been performing as expected for a prolonged period of time, based on lifecycle expectancy, it will be replaced at the appropriate time as part of any associated mechanical and electrical services upgrades.

5.5 A robust system management strategy is being developed and will be implemented by the property team. Systems not presently exhibiting any concerning early warning signs will continue to be monitored and will be planned for replacement within the normal building lifecycle. Any systems which are negatively impacted by the presence of the carbon steel materials will be managed appropriately, with any required works being developed and progressed through the Operational Capital project delivery programme.

6 POLICY IMPLICATIONS

6.1 This report has been subject to an assessment of any impacts on Equality and Diversity, Fairness and Poverty, Environment and Corporate Risk. There are no major issues.

7 CONSULTATIONS

7.1 The Council Management Team have been consulted in the preparation of this report.

8 BACKGROUND PAPERS

8.1 None.

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