The Turnover Dynamics of Residential Buildings

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ئائىلەم گە تەقدىم

For my family

ئۆلۈمدىن باشقىسى تاماشا

This is an Uyghur saying, a literal translation would be “as long as it is not death, anything else is (fun like) a party”

Declaration

This thesis has not been submitted in support of an application for another degree at this or any other university. It is the result of my own work and includes nothing that is the outcome of work done in collaboration except where specifically indicated. Many of the ideas in this thesis were the product of discussion with my supervisors Andrew Jarvis and Bronislaw Szerszynski.

Abstract

The construction and operation of buildings is one of the most resource-intensive elements of the economy, therefore buildings are a central focus of efforts to reduce energy use and hence greenhouse gas emissions. Because of their long-lasting nature, buildings are also important factors in deciding the inertia of economies, and determining the turning point of economies in net-zero transitions.

Traditionally buildings are assigned single representative timescales of the order of 80 years. However, building investments may be seen as investments in components, each having its own service life ranging from seconds to centuries, with returns expected over this interval. The aim of this thesis is to explore the relationship between investments in buildings and their turnover timescales, which I refer to as the investment-timescale distribution, and to identify its role in the capital inertia of the building sector in the climate transition.

In chapter 2, this investment-timescale distribution is first developed for a single building using the financial costs of components and their expected service life. This is then extended to a representative building (RB) by applying a well-established mortality function for the service life of each component. The resulting investment-timescale distribution of an RB is a near continuous yet multi-modal distribution with a first moment of 38 years, remarkably close to the expected working lifetime of its inhabitants.

I explore the implication of this investment-timescale distribution in chapter 3, in particular for the dynamic maintenance schedule and economic performance of an

RB in the UK. This is done by simulating maintenance costs to counter the depreciation of components as they approach their performance thresholds. I evaluate the performance of this simulation using return on investment (ROI). The result is a near stochastic maintenance schedule despite the deterministic nature of the simulation. This provides a strong indication as to why the interaction of timescale spectra with maintenance thresholds yields the complex and hard to predict maintenance dynamics we see in real property portfolios.

Finally, in chapter 4, I apply the investment-timescale dynamics to simulate the dynamics of energy demands and carbon liabilities of an RB. This simulation contrasts these dynamics under a net-zero carbon policy and a business-as-usual (BAU) scenario. The results show that, for new build, the longer-lived (>70 years) carbon-intensive components avoid much of their maintenance carbon liability if the economy decarbonizes in the interim. This also suggests that delaying currently carbon intensive construction until less carbon intensive options are developed should be considered during the transition to net-zero.

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To my family, especially my parents, I am profoundly grateful for the opportunities you've provided and your unwavering support. Words can't fully convey my gratitude, especially in English. Therefore, I've included something in Uyghur below, ensuring they have something within this thesis that resonates with them.

ئاپا، دادا، مىنى ئوقۇتقىنىڭلارغا، ياخشى پۇرسەت يارىتىپ بەرگىنىڭلارغا، قىينىچىلىق بولسىمۇ تىرىشقىنىڭلارغا، يەنە نۇرغۇن سانسىز قىلغانلىرىڭلارغا رەھمەت، مەڭگۈ رەھمەت ئېيتىپ بولالمايمەن.

Also to my dearest cousin, my best friend, سەبىلە who's been by my side through this entire thesis journey. Your constant support and understanding mean the world to me. Thanks for dealing with me, especially when I'm being a bit of a pain, and for sticking by me through thick and thin.

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And to God for not giving up on me.

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Glossary

Term	Definition
Investment	The allocation of resources, most often money, into a building and its components with the expectation of generating a future return.
Substructure	All components within a building that are invested in to ensure its function over a range of timescales, from seconds to centuries, including short term components like electricity used to switch on a lamp, to long-term components like windows and walls.
Timescale	The duration a component lasts until it either retires or is replaced by a new product.
Operation	The resources invested to keep the building running, e.g. electricity, heating, water.
Maintenance	The resources invested to repair or replace building components.
Return on investment (ROI)	The amount of rental return generated by the investment in a building relative to its cost.
Maintenance threshold	The performance level below which a building component must be repaired or replaced.
Representative building (RB)	A theoretical structure that stands in for a large cohort of buildings., capturing the typical characteristics and performance of the broader group.

1 Introduction

Buildings and dwellings are among the most essential structures people build, providing shelter from the elements, predators, and other people since ancient time. The built environment, however, is more than simply a structure; it is the physical expression and manifestation of countless economic, social, and environmental processes that are inextricably linked to human activities and changing societal needs. This has pushed the building sector to the forefront of the global economy, accounting for 13% of the world's GDP and it is expected to reach 15% in the near future (United Nations Environment Programme, 2020).

Because of their long-lasting nature, buildings are seen as fixed assets that impose a significant level of inertia within the economy (Fisch-Romito *et al.*, 2021; Seto *et al.*, 2016; Grubb, 1997). The creation of a building requires a long-term commitment to future resource use, and this is invariably longer than the amount of time that remains before, for example, net-zero emission target must be reached. Therefore, understanding the turnover dynamics of built structures is crucial in understanding their impact on any climate transition and their risks to carbon lock-in.

1.1 Turnover dynamics

1.1.1 Investments and turnover timescale

The term “investment” describes the allocation of resources, most often money, with the hope of making a profit or producing income in the future. It includes putting money into an asset or a business with the intention of generating returns that outweigh the original investment. And return is the growth in investment’s value over a certain period of time, frequently this is years or even decades.

The creation of buildings can be seen as an investment that lasts long enough to provide a net-positive, time-weighted future return, which is determined in part by their service life (OECD, 2001). However, buildings are not single components, but instead heterogeneous structures that are comprised of a vast number of components, each of which having their own lifetime. When investors make investment into buildings, they are essentially making investments in building substructures, and by extension are expecting returns over the timescales of these substructures. These can range from seconds to decades or more, given that it can be applied to every element of a built structure. For example, a carpet can be used for decades, whereas turning on a lamp would generate illumination in mere seconds. This calls into question the conventional division between building construction, operation, and maintenance, since all three can be seen as just investments with varying time lengths for returns. Therefore, it is important to specify the relationship between the size of investment and its turnover timescale, I call this the investment-timescale distribution.

There are good reasons to believe that this investment-timescale distribution is just as crucial to the operation of man-made structures as it is to natural ones. The replacement of cells in our bodies is something that we all go through on a daily basis. For example, although our hair is known to fall out on a regular basis, most of us do not become bald in the short or medium term. Similarly, our skins are continually being regenerated by new tissue, whereas providing blood samples or donating blood does not deplete our circulatory system. These examples demonstrate the replacing properties of human body cells and tissues that make up the whole human body. All cells and organs have their unique turnover rates hence lifetimes: red blood cells in our circulation last four months and then generate new cells; human lens cells and central nervous system neurons may live a whole human lifetime (Milo et al., 2010).

1.1.2 Dynamics and capital inertia

The lifetime of built structures, together with the diverse range of service lives of building components, contribute to the overall dynamic trait of the building system. Inertia of an object is usually described as its resistance to changes in its path, and this definition holds true for economies just as much as it does for any other collection of items, such as buildings. The creation of buildings and their components create a commitment to future profits, and that leads to inertia. According to Davidsdottir and Ruth (2004), the rate of capital turnover has the greatest impact on the modification of energy efficiency and carbon emission profiles. Investments in building components, spread over a range of lifetimes from seconds to centuries, may limit the pace of transition to an economy with net zero carbon emissions corresponding to the turnover rates of those components

(Jaccard and Rivers, 2007). Consequently, it is crucial to understand the inertia of built structures created by the dynamic investments made over an array of timescales in identifying the turning point in economies through the transition to net-zero.

There have been some studies tried to explore the relationship between capital stocks and their turnover timescales, hence capital inertia. Studies usually have focused on certain sections of the economy when trying to define the impact of inertia associated with a sudden shift in climate change, especially within the energy sector. Using capital assumption of energy power plants, Genna (2020) discovered that the economy is likely to increase its stock of fossil fuel-dependent investments until 2070, and hence that there is capital inertia owing to already-engaged fossil fuel reserves. Davis et al. (2010) calculated the contribution of existing carbon dioxide-emitting devices to future emissions and predicted total future CO_2 emissions from fossil fuel burning by existing infrastructure of 496 gigatonnes between 2010 and 2060, causing mean warming of 1.3°C above pre-industrial levels. Mercure et al. (2018) performed inertial analysis on stranded fossil fuel assets with an emphasis on technology lifecycles and found that, due to ongoing technological advancements worldwide, assets would become stranded regardless of whether new climate policies are implemented, despite the decline in the demand for fossil fuels. While Mercure et al. (2021) assessed the values of global human and produced capital in different sectors and compared their natural depreciation rates to those needed to meet climate objectives. Jaccard and Rivers (2007) investigated the relationship between the turnover rates of buildings (71.5 years), urban form (117 years), equipment (20-30 years), and various carbon

emission delay options, and indicated that an early reduction for long-lived capital assets is economically advantageous to avoid the impact of capital inertia. Inspired by this, Shalizi and Lecocq (2009) separated the capital stock into 4 groups each with their own lifetime: consumer durables with lifetime of 5-15 years; buildings including power plants and factories lasting 15-40 years; infrastructure such as road, rail, power distribution networks lasting 40 to 75 years; with land use and urban form lasting longer than a century. They concluded that assets last longer than 15 years had a direct impact on global greenhouse gas emissions in 2000, as the emissions from power plants and factories are usually from electricity and heat that take up 25% of total emissions; similarly, more than 10% of emissions are from transport systems with 40-75 years' lifetime; lastly, emissions from urban sectors take up more than 5% of total GHG emissions.

While the building stock has a considerable influence on the macro-level economy and carbon emissions, research exploring the dynamics of the building stock seem to be quite sparse. Yang and Kohler (2008) created simple models of infrastructure and building stocks using 2005 as the base year. The 2005 starting stock includes buildings built between 1978 and 2005 was considered to have numerous age cohorts. To predict stock evolution from 2005 to 2050 on a five-year basis, a cohort-based technique was used to identify the average age of buildings built after 2005. They found that building lifetime affects future mass flows and environmental consequences, even though their model did not explicitly reflect dynamic ageing. Hu et al. (2010) evaluated Chinese building stock using a normal lifespan distribution function. Population and per-capita floor area were used to estimate building stock. The authors examined national and city-level

possibilities of future demand for steel and concrete for Chinese residential structures. Huang et al. (2013) conducted a similar study making the assumption that the lifetime of concrete buildings follows a normal distribution, with an average lifespan of 30 years for brick-concrete buildings and 40 years for reinforced concrete buildings. The heterogeneity of building components and their corresponding service life, however, has not been specifically addressed in capital inertia research. Understanding the relationship between capital investments and the inertia of built structures would enable us to identify the key elements that have the greatest impact on the climate change trajectory of the building sector and potentially mitigate the risk of investing in assets that may turn unprofitable in the event that the economy must undergo a transition more rapidly than its investment inertia allows.

1.1.3 Survival analysis

Typically, an average service life is used for building components in LCA studies, instead of accounting for products' real exposure to a range of situations. Each component is assigned their own designed service life by their manufacturers, while in reality, some survive longer than expected and others retire sooner. Similar to human demography, while old buildings mature and eventually die, new buildings are created via investments, resulting in a distribution of building ages at any given moment. The age distribution of investments led to the development of vintage capital theory in the 1960s. This also developed to take into consideration the impact of vintage on productivity in models of growth and technological change (Solow, 1960). A vintage capital structure exists in an economy when machinery and equipment from various generations have varied

productivity or face distinct depreciation rates (Benhabib and Rustichini, 1991). Having said that, research and theory surrounding the evolution of capital stocks and their turnover timescales is noticeably absent from the vintage capital literature.

As mentioned before, turnover timescales of building substructures offer key understanding of the capital inertia of buildings and their resistance to climate policy. What matters is the probabilistic survival function of the population of items, not the expected service life of it. More efficient building maintenance and reduced environmental costs might result from a better knowledge of the survival times of building components (Silva, de Brito & Gaspar, 2016; Firląg & Piasecki, 2018). Consequently, it is common practice to take into account the retirement age of components as determined by a probabilistic survival function. The dynamics of investments in a building may be described as a collection of survival functions for all the individual components that make up the building. In the UK, it was widely assumed in economic modelling that all assets of a particular kind were retired simultaneously when they reached the average or expected service life for that group. A delayed linear mortality function was then implemented, with the assumption that all assets would be retired between the ages of 80 and 120% of their typical service life (Eurostat-OECD, 2013). However, more recently this approach has been replaced in national accounts methods with a symmetrical normal distribution with the 95% probability fall within two standard deviations of the mean is extensively used (Eurostat-OECD, 2013).

A variety of survival distribution functions are generally accessible for the purpose of describing the survival process across different areas. On the other hand, the literature on survival analysis of buildings is limited as there is little information available on the history of building stocks (Aksözen et al., 2016). Miatto et al. (2017) conducted tests on different probability density functions and discovered that the lognormal distribution provided the most accurate representation of a large amount of real data on building lifetime in Japan, where buildings have relatively short lifetime with an average lifetime of less than 30 years. They also studied Salford in the UK, where buildings are significantly older, and a Gompertz distribution was found to best suit those data.

When viewed as capital stock in national accounts (OECD, 2001), the assumed survival distribution of buildings differs between nations, being variously described by normal, Gompertz, Weibull, lognormal, and Winfrey distributions (OECD, 2001; OECD, 2009; Johnstone, 2001; Bohne et al., 2006; Müller, 2006; Aksözen et al., 2016). For example, Zhou et al. (2019) used the Weibull distribution to estimate the lifetimes of residential buildings in China. In the Netherlands, survival probabilities of buildings were best described by Weibull distributions (OECD, 2009). In this PhD I employ the widely used Gamma distributed mortality function of Schmalwasser and Schihlowski, (2006) which underpins the EU national accounting system. This is explained in detail in chapter 2.

1.1.4 BOQs and quantity estimates in building procurement

Before buildings are built it is invariably necessary to predict the construction costs so the investor can gauge affordability and select appropriate designs and

materials. This process is known as creating a bill of quantities (BOQ), and it is often performed by a quantity surveyor.

The BOQ is a detailed inventory of the building's components that includes not only the quantity, area, volume, and weight of each part, but also, and most importantly, the purchase and installation costs of each part. Given its proprietary nature, getting a BOQ from a quantity surveyor, architect, construction contractor, or organization is usually difficult. Since a BOQ is used for cost estimating and bidding tasks to subcontractors, it only provides the quantities for structural parts and their costs. It fails to include any further costs to make the building livable. As such, a basic BOQ is not very useful for a comprehensive analysis that covers every aspect of a building. Usually, domestic appliances and white goods are empirically catalogued using technical literature.

1.2 Depreciation and maintenance dynamics

Post construction, effective building maintenance planning for large building cohorts still is one of the most challenging works for building investors, partly because each building component has a large variety of service lives. Investment-timescale profiles are important when exploring what happens after a building is built.

1.2.1 Different forms of depreciation

Depreciation is the term used in national accounts to describe the decrease in the value of fixed capital as a result of wear and tear, damage, aging and obsolescence (Karabarbounis and Neiman, 2014). However, there is yet to be a worldwide

agreement on the right depreciation assumption even those these underpin all national accounting systems (OECD, 2001). In reality, a number of approaches have been used. In the US, National Income and Product Accounts (NIPA) formally recognized geometric depreciation as the 'default' assumption, whereas in the UK, Office for National Statistics (ONS) and a few other national statistical agencies, straight-line depreciation is the norm.

Geometric depreciation is assumed in all macroeconomic accounts of capital turnover where there is a relatively high level of aggregation such as at the cohort level. This includes all the components of that same type that are produced within a defined period of time and generally share certain traits (Sliker *et al.*, 2018). Oulton and Srinivasan (2003) used the geometric assumption in their empirical study for the UK fixed assets and concluded that "the geometric assumption is found to fit the facts quite well". According to Schmalwasser and Schihlowski (2006), members of comparable components cohorts follow similar retirement paths and so have common mortality functions, which is linked to the cohort's average service life. This underpins the application of geometric depreciation to building components at the cohort level in chapter 2.

1.2.2 Maintenance threshold

Buildings must comply to a number of performance standards throughout their life cycle, including safety, watertightness, foundation compatibility, aesthetic comfort, durability, and so on. However, there are times when the building components no longer function as expected after a certain amount of time has passed, and these are the times maintenance actions should be performed. According to Gaspar (2009), regardless of the simplicity of the concept of the

service life, it is incredibly challenging to estimate replacement of depreciated assets, or maintenance, through models because it varies depending on the performance criteria, which depends on time, place, investor as well as the cultural, financial, political, visual and environmental context of the buildings. According to Iselin and Lerner (1993), there is no adequately reasonable threshold for deciding whether or not to intervene in building decay, only subjective criteria. According to Aikivuori (1999), only 17% of performance threshold judgements are genuinely based on building degradation, whereas 44% of maintenance is completed based on subjective reasoning. In this PhD, six maintenance thresholds have been provided to show the different degrees of maintenance, while only one is chosen for the central simulations.

1.2.3 Maintenance

Traditionally, maintenance is described as work done on existing structures to retain, repair, or improve components of a building, its services and surroundings, to their original level while not falling below the acceptable performance level (Le et al., 2018). According to Chong et al. (2016), buildings require maintenance during more than 90% of its lifetime after construction and about 75% of overall spending is on maintenance. It is an important yet complex process.

Generally, maintenance studies are mostly focused on reactive/unplanned maintenance and preventive/planned maintenance. Reactive or corrective maintenance refers to the maintenance actions conducted after an equipment malfunctions, whereas preventive maintenance is the regular, scheduled maintenance actions to prevent failures.

A range of quantitative frameworks have emerged to evaluate maintenance dynamics. These largely fall in the domain of operational research. Gholami and Hafezalkotob (2018) combined data mining and time series models to predict a prognostic preventive maintenance scheduling based on past data and failure patterns. Kwak et al. (2004) ran a Monte Carlo simulation that examines condition-based preventive maintenance by having maintenance staff do a fixed-period inspection to identify failure on air-conditioning facilities. Kim et al. (2018) applied a multiple regression analysis, based on the payment record related to the maintenance of educational buildings, to create a maintenance determining model. Farahani et al. (2019) also used historical data on the spending expenditure of maintenance of four university buildings over a 42 year period to construct a life cycle cost (LCC) model. More complex mathematical models have also been used in maintenance planning. Kwon et al. (2020) developed maintenance models using case-based reasoning and generic algorithms. Konior and Stachoń (2021), and Otmani et al. (2020) used fuzzy sets and neural networks to handle the uncertainty and vagueness in predicting the occurrence of the wear process in maintenance studies. Quite often, the Building Information Modelling (BMI) framework, which is able to create a digital representation of building information usually within 3D models, is used when planning maintenance (Myungdo and Ung-Kyun, 2020; Leśniak et al., 2021; Zima et al., 2020). Nevertheless, even with maintenance planning in place, there is still a risk of reactive maintenance occurring, which further complicates maintenance estimation. This underlines that maintenance scheduling is inherently difficult to predict, and the reasons for this have not been fully articulated.

1.2.4 ROI

When an investment is made, there is generally an expectation of a return. Profitability is considered when investing in buildings by expecting an 'income' generated from the investment. Return On Investment (ROI) is used for measuring this additional 'income'. The term "return on investment" describes the amount of money gained (profit) from an investment relative to its original cost. It demonstrates how effectively and efficiently capital is being used to generate profits. By considering the ROI, investors may be able to determine whether funding a certain project is a viable decision. In the residential building sector, investors expect their returns through rental income (Bracke 2021; Mills, Molloy, and Zarutskie 2019) or avoided rents through ownership.

Resources are invested in the creation of a residential building, with a goal of producing returns over a range of timescales from seconds to centuries, even if those returns are only ever visible in aggregate through building productivity as expressed through say rents. For example, gas may be used to heat a space, which may have an impact for say hours. Electricity might be used to light up a room for less than a second. In both cases, resources are still being invested, and returns are expected over time by staying long enough while rental returns are received. However, the timescale of rental returns is significantly longer compared to the time it takes to light a room, consequently, consistent investment into the future is necessary to generate these returns.

Typically, studies calculate a property's ROI by dividing the annual income produced by the purchase price i.e. these are annual returns on investment, which

are akin to capital productivities. Chambers et al. (2021) manually collected financial data at the property level for the institutional real estate portfolios of four Oxford colleges from 1901 to 1983, found out that the average annual return is just under 5%/yr, and more than 90% of the returns are below 8%/yr. They also discovered, during the last two decades of their study period, the average annual returns for agricultural and residential properties are about 3%/yr, but the average annual return for commercial real estate is above 6%/yr. Jordà et al. (2019) analysed four main asset classes in the advanced economies from 1870 to 2015, resulting in an average ROI (including price change) of 7%/yr, which is indistinguishable from the annual returns on capital observed at the global scale (Jarvis pers comms). Findings from both studies reveal a disparity between the current average ROI prediction for 2022-2050 for all properties in the UK, which stands at 5.1% (Statista, 2021), highlighting the productivity gap the UK currently finds itself in.

Cumulative ROI represents the evolution of the initial investment over a specified time period. It serves as a reliable indicator in the estimation of the payback period for a debt, such as a mortgage. In this PhD, cumulative ROI is calculated by dividing cumulative rents by cumulative investments which are composed of investments in construction, operation and maintenance, then I use it to assess the maintenance strategy and find a suitable maintenance threshold for simulation.

1.3 Timescale dynamics in the net-zero transition

1.3.1 Decarbonisation of the building sector

The aim of the Paris Agreement is to limit the increase in global average temperature to less than 2 °C compared to pre-industrial levels, and to take actions to ensure that temperature rise remains below 1.5 °C (UNFCCC, 2015). The government of the UK has endorsed emission reduction targets that would result in achieving net-zero emissions by the year 2050 (European Parliament, 2020). This suggests a rapid decrease in global emissions over the next few decades (Rogelj et al., 2018).

Given that around 40% of energy-related worldwide carbon emissions are attributed to building and the construction industry (OECD, 2022), without a doubt, buildings are a primary target when it comes to reducing energy and carbon emissions (Röck et al., 2020). Even though climate change issues are often framed in the present tense, it is critical to understand the implications of today's construction and maintenance activities on the behaviour of buildings in the future. Investments in long-lasting capital stocks like buildings and the resulting emissions hold distinct features that set them apart from other forms of investment. Decisions about investments in buildings may establish energy and emission lock-in for extended periods, perhaps a century or more. Achieving a low carbon-built environment and meeting the 2050 net zero ambition requires a transformational shift in the construction sector. Therefore, understanding the turnover inertia of carbon emission in built structures is crucial in making climate decisions.

1.3.2 LCA and carbon dynamics

It is important to understand how resources are employed to build, maintain and operate buildings during any transitioning towards net-zero emission targets, as novel design tactics and corresponding new maintenance plannings might be necessary in addressing the current climate issues. The most well developed and widely itemized method for analysing environmental impacts associated with structures is life cycle analysis (LCA). It is a framework for quantifying and assessing the environmental consequences of a product or service system's life cycle from cradle to grave or similar (Nawarathna et al., 2021). Yet, most LCA studies have failed to include the dynamics of carbon emissions in the built sector. This is covered in more details in chapter 4. Similar to monetary investments, resources and carbon emissions in structures are also dynamic, because all resources, and associated carbon, flowing in to/out of the buildings during the construction period, are then having their substructures being maintained over a wide range of timescales. In this way, the separation between embodied carbon and operational carbon in LCA studies seems irrational, as resources are always being invested into the building only over different turnover times. Equally, this view could be applied to operation and maintenance as they are all just being allocated over different lengths of service life. More precisely, operation is essentially the maintenance of shorter-lived components, e.g. lighting up a room requires a continual 'maintenance' of electricity simply because lighting a room lasts seconds or less, and it is this framework that informs the estimates of operational and embodied energy and emissions which have become central to building performance assessments (Ibn-Mohammed et al., 2013). Therefore, the

traditional separation of construction, operation and maintenance phases is challenged in this PhD.

1.4 Thesis aims

This thesis seeks to comprehend the role of the dynamic characteristics of building investments in the capital inertia of the building sector during its transition towards net-zero. The focus will be on the relationship between the capital investments in buildings and their turnover timescales. It will also include the implication of the turnover dynamics in building maintenance and hence its long-term returns, as well as its impact in making carbon related decisions under the net-zero policy. The insights generated will provide a novel foundation for future work in both the economics and sustainability of buildings, holding significant relevance for various stakeholders, including policy makers, regulators, housing investors, and homeowners. More specifically, understanding carbon lock-in more accurately within the timescale framework will help policymakers identify the timescales that hinder the transition to a net-zero economy and help them create more effective policies. Regulators can benefit from the turnover dynamics perspective in making informed investment decisions to minimize carbon during the journey to net-zero. The turnover dynamics implied in maintenance also offers a practical framework for homeowners cooperating with utility companies in resource management, effective maintenance planning and service delivery, as rapid transitions necessitate swift changes in housing operations and maintenance practices. Housing investors should find the research valuable when making investment decisions about new housing constructions. Thus, this thesis not only

addresses academic inquiries by introducing the concept of investment-timescale distribution, but also provides practical knowledge for stakeholders in achieving net-zero target, bridging the gap between theoretical research and practical application.

To that purpose, three research chapters are presented covering the following objectives:

Chapter 2: How much and for how long? The investment-timescale distribution of residential buildings

This chapter specifies the relationship between the investments in building components and their turnover timescales to construct the investment-timescale distribution of a cohort-level representative building (RB).

Chapter 3: An investment-timescale perspective of the maintenance dynamics of residential buildings

This chapter uses the investment-timescale distribution of an RB from chapter 2 in conjunction with the performance threshold of a depreciation process, to simulate the dynamics of the maintenance schedule of the RB, and explores how the dynamic investment and maintenance affect the financial performance of a UK-based RB.

Chapter 4: Building inertia and climate change

This chapter applies timescale dynamics to the carbon emissions and energy use of the RB to create the associated carbon- and energy- timescale distributions.

From this, together with timescale-specified maintenance schedule, I quantify a cumulative carbon budget under a business-as-usual and 2050 net-zero scenario.

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2 How much and for how long? The investment-timescale distribution of residential buildings.

Abstract

Buildings are arguably the basic physical structure underpinning the functioning of society, and their creation and operation represents one of the largest capital investments that society makes. This investment can be seen as the production of a structure which has to last long enough to yield a net-positive, time-weighted future return, with the service life of the building defining this timescale. However, it is clear that buildings are themselves comprised of a vast array of components, each with their own service life. In this chapter, I approach buildings as assemblages of components, or substructures, with different average service lives ranging from seconds to centuries.

By considering the components of a building aggregated with respect to timescales, rather than conventional construction categories, I am able to define the turnover dynamics of a building through specifying the relationship between

turnover timescale and size of investment, something I refer to as the investment-timescale distribution. I estimate this distribution for a single development from its bill of quantities (BOQ), which gives us access to a monetized, >2000-component decomposition of a building. Borrowing from Chester et al. (2024), I then extend this single building analysis to the cohort level or representative building (RB) by recognising that the stated service life of any component is simply the first moment of its respective mortality function. Through assuming a well-established mortality function for assets that accounts for the observed correlation between first and second moments, I create the investment-timescale distribution for the associated population of buildings.

The result is a near continuous, yet multi-modal investment-timescale distribution for an RB which has an overall first moment of 38 years. The four component modes have representative timescales of <2 years, 9 years, 26 years and 53 years respectively, describing four aggregate classes of investments within the RB. Borrowing from Duffy and Henney (1989), and Brand (1994), I conceptualised these four timescales in the investment-timescale distribution as non-interacting shells, layered from the longest timescale material exterior to the shortest timescale information-rich interior. I speculate that this structure is necessary to create and maintain the high-information environments that people occupy, through buffering the ephemeral internal space of the building from its aggressive/variable external environment. I note that the 38-year mode is close to average working lifetimes, suggesting a strong link between the overall

investment pattern in buildings and the pattern of returns expected by its occupants.

2.1 Introduction

In the region of 13 percent of global GDP is attributed to the construction sector, and real estate comprises more than half of all capital wealth (Savills, 2023). Furthermore, around 40% of the raw material consumption, 40% of the global energy use, 25% of water use, 12% of land use and 33% of carbon emissions can be attributed to the building sector (Fumo et al., 2010; Monahan and Powell, 2011; Chang et al., 2012).

Because of their decades-long service lives, buildings are also key determinants of the inertia of economies, and this not only moderates growth, but also plays a critical role in determining the turning circle of economies when considering transitions to net-zero (Chester et al., 2024). As a result, it is becoming ever-more important to understand the dynamics of built structures from their inception in the design and construction process, through their operation and maintenance, and finally to their end of life. It is also important that, where possible, we set this in the context of the macro-economy that these built structures underpin, and the resource and climate change constraints emanating from this.

All capital investments are made with the intention of creating returns over a certain period of time. These are usually years, if not decades, into the future. The creation of a capital investment requires an investor to continue investing in the associated structures until they are prepared to give up the return or the return ceases. Consequently, this dedication to future activities results in inertia. Inertia,

as the resistance of an item to oppose changes in its trajectory, is equally applicable to economies and other physical objects, even if the inertia of an economy might be described differently from the inertia of a building.

The creation of a building can be viewed as an investment of finance and resources that results in a structure yielding returns over its service life (OECD, 2001). This was first demonstrated thermodynamically by Jarvis and King (2024), who showed how investments in energy efficiency can lead to increased energy use. Residential buildings are generally considered to have service lives in the region of 50-100 years (e.g. Giordano, 2012, Cuella-Franca & Azapagic, 2012, Aktas and Bilec, 2012). However, when finance and resources are invested to make a building, they are actually used to make an array of sub-structures, with the building consisting of a large number and array of these: walls, floors, foundations, finishes, etc.. Each of these substructures also has a unique service life, some of which are shorter and some longer than that of the building they serve. For example, carpets have service lives in the region of a decade (BCIS, 2006), whereas bricks can have service lives of centuries (BCIS, 2006). Given that this applies to every element of the overall built structure, a more accurate view of a building than simply a structure with a particular service life, is as a complex assemblage of substructures, each with their own service lives.

To understand the dynamics of buildings, following Chester et al., (2024), I propose that it is important to estimate what proportion of the overall investment is made into each substructure, and hence into each possible service life category. Knowing this 'investment-timescale distribution' should not only help quantify the

temporal distribution of future returns; it should also underpin the scheduling of the maintenance and operating costs implicit in any given building design. Specifically, a structure requires all its sub-structures to function, so all elements with service lives less than that of the structure must be replaced within the lifetime of the building, with the shorter-lived elements being replaced more frequently. This raises a critical issue: if maintenance is simply the replacement of substructures, then both the initial construction and the subsequent maintenance of a structure are both simply investments, albeit made at different times and in components defined at differing spatial and temporal scales.

We can extend this view to the operation of the building, with 'consumption' of energy, to run the building say, being simply an investment in maintaining the temperature gradient between inside and outside the building, with a service life of say hours. Although these utilities are driven by consumer behavior – motivated by factors such as thermal comfort, they play a critical role in impacting future value of a property and its inhabitants over a wide range of timescales. This view is appreciated in the concept of productive consumption, where consumptive actions that not only meet current needs but also contribute to future productivity (Winslow, 1951). Behrman and Deolalikar (1988) demonstrated this on a microeconomic level by empirically examining how expenditure on nutrition and health improve workers' efficiency and productivity. Hicks (1979) extended it to the macroeconomic level by analysing how consumptions in health, nutrition and education contribute to improvements in human capital, leading to improvements in productivity and economic growth. Wheeler (1980) further analysed these human needs in African, Asian and Latin American countries, nutrition, finding

that expenditure on nutrition, education and health have long-term effects to the overall economic output, especially in economies with lower per capita income. Steger (2002) explored this view from the economic growth perspective, exploring productive consumption with two distinguished models: human-capital model and labour-efficiency model, both implied consistency with empirical economic observation. In the context of building, adequate space heating, for example, is crucial in ensuring the building remains habitable, comfortable and maintaining occupants' satisfaction, which, in turn, enhances structure value and the future returns of both the building and its occupants. Therefore, by integrating operation within the investment-timescale dynamics, I acknowledge its important impact on future returns over all relevant timescales and not simply those greater than one year imposed by annual accounts. Certainly the investment-timescale perspective calls for this wider view of investment dynamics while ensuring a more accurate understanding of building investments and their turnover timescales.

Traditionally, construction, operation and maintenance of buildings are seen as three distinct phases, here I attempt to challenge this view, through considering the full spectrum of possible service lives associated with buildings and how financial and resource investments are distributed with respect to these.

The idea of a building being highly dynamic and changing through time has been discussed (Grant and Ries, 2013; Itard and Klunder, 2007; Jostein Hovde and Moser, 2004), but has seldom been quantified. Perhaps the most developed framework for doing this is within product survival analysis and the service-life data associated with this. The service life of a product is the period of time in which

a product is in use. Service life can help to decide the frequency of activities required to operate, maintain and replace products and systems (Grant & Ries, 2013). Products and materials have service-life predictions based on their composition, design and installation quality, as well as expected maintenance regime and environmental exposure (International Organization for Standardization (ISO 15686-1, 2000). Integrating product service life into dynamics Life Cycle Analysis (LCA) might help to enhance the representation of the building's operation phase and progress the evaluation of building's life cycle environmental impacts.

A number of studies have been undertaken to determine the impact of service life assumptions on LCA studies (Strand and Hovde, 1999; Graveline, 2005; Salazar and Sowlati, 2008; Thomsen and van der Flier, 2009). There is a lot of variation in building service-life estimation in LCA studies. Buildings as a whole, as well as their substructures, are considered dynamic due to the wide range of service lives of building components (Itard and Klunder, 2007). Duffy and Henny (1989) believed a buildings' initial life cycle should be 50 years, while Mithraratne and Vale (2004) modelled residential structures using a 100-year lifespan, compensating for changes in component service life via variation in periodic maintenance. Kellenberger and Althaus (2009) simplified their LCA by assuming an 80-year service life for building components in their study. According to Marteinsson (2003), the average lifetime of houses in Iceland are frequently assessed at 60-70 years. They also attempted some disaggregation of this, noting service lives for windows ranged from 5-10 years to 80 years. Nordby et al. (2009) stated that brick buildings from both Chinese and Roman empires have endured

for more than 1500 years, so that second- and third-service lives may be suitable for some materials. Huuhka and Lahdensivu (2016) did a statistical analysis on 50818 demolished buildings in Finland and concluded the average lifetime of residential buildings is 58 years. According to Paulsen (2003), depending on whether the determinant of service life is economic, aesthetic or functional, service life of flooring materials ranges from 5 to 40 years. Scheuer et al. (2003) measured the embodied energy of different materials with assigned lifespans and concluded that materials with a high replacement rate have high embodied energy. Islam et al. (2011) have compared yearly greenhouse gas emissions and embodied energy of buildings with different lifespans. Collinge et al. (2013) integrated temporal variability of processes in energy production industry and calculated time-adjusted climate change impact to underscore the importance of considering timescales in building LCA studies.

The majority of life cycle assessments, however, make an assumption about the stability of a structure's service life that is inconsistent with the nature of buildings (Verbeeck and Hens, 2010). Because buildings have a lengthy service life—some lasting longer than others—modeling structures requires special considerations (Borg et al., 2001). Buildings are difficult to model because of their scale, complexity, dynamic characteristics, and demands of the occupants (Scheuer et al, 2003). As such, a great deal of uncertainty has been associated with service life estimation (Lacasse and Sjostrom, 2005; Itard and Klunder, 2007; Bergsdal et al., 2007, Brattebø et al., 2009; Verbeeck and Hens, 2010). The service life of a building is influenced by many factors, such as its composition, the standard of its design

and installation, the frequency of planned maintenance for its materials and systems, and its surroundings, including temperature and exposure (ISO 15686 Part 1, 2000). In a lot of cases, it is also based on manufacturer's data and empirical in-situ performance (Renne et al., 2022). Furthermore, service life prediction specifies the kinds of activities needed for maintaining, repairing, and replacing of building materials and systems as well as how often they must be done. Establishing a more thorough understanding of the variable nature of structure lifetime is crucial as a consequence.

I propose that the investment-timescale distribution of a building provides an appropriate lens through we can start to quantify and understand these dynamics, since this would indicate the relative importance of each service life in the overall built structure, with large investments at particular timescales reflecting the importance of those timescales in the dynamic characteristics of the overall building. There is significant potential in it determining the importance of a structure or a class of structures in the inertia of an economy through the lock-in it represents into a particular pattern of energy use and emissions. For climate change this turns out to be a key consideration because capital inertia plays such an important role in determining the 'turning circle' of the economy when attempting to avoid future emissions in a transition scenario (Bertram et al., 2015).

2.2 Aims and objectives

In this chapter, I am going to construct the investment-timescale distribution of a particular residential building from the itemized bill of quantities (BOQ) used to

tender for the original construction. This will exploit proprietary data on the expected service lives of the building substructures itemized in the BOQs, and additional information on general operating costs, furnishings and fittings. From this I then estimate the investment-timescale distribution of an RB for a cohort of residential buildings sector within the UK macroeconomy. I do this by assuming that the expected service life of each substructure is simply the first moment of a more general timescale-dependent mortality function for that substructure class. Applying this mortality function to each of the itemized substructures allows us to reclassify the money invested into *named substructures*, into the money invested into *turnover timescales*, thereby constructing the investment-timescale distribution I am after. This investment-timescale distribution is used to decide the maintenance schedule that takes place post-construction and the spectrum of the return created (see Chapter 3), and their implication for reaching the net-zero carbon target of the Paris Agreement by 2050 (see Chapter 4).

2.3 Methodology

2.3.1 An expanded Bill of Quantities

Before most buildings are constructed, it is usual for the quantity surveyor attached to the project to produce a BOQ. This is an itemized list of the components of the building detailing not only the physical quantities of these components, but also the cost of each component to both purchase and install. The list is generally exhaustive given the BOQ is used to produce a bottom-up estimate of the projected construction cost of the overall project which is central to the tendering and

subsequent construction (Trainor, 2019). Unfortunately, this makes BOQ proprietary and hence very difficult to acquire by third parties.

Here I analyse the BOQ for a residential development comprised of 5 apartments and 5 houses, with a total internal floor area of 777 m^2. Although this development has an above UK average specification, the fact that it is comprised of 10 dwellings goes some way to alleviating an N=1 analysis when considering its representativeness per unit area costs. The BOQ is broken into 10 sections comprising frame and substructures, floors, roof, stairs, walls, windows, doors, finishes, fixtures & fittings and site preparation works. In total, there are ~2000 costed items within these 10 sections. For each item, a detailed description is given along with the estimated unit cost.

The BOQ only covers the construction phase of the building structure. What this overlooks are additional investments made in making the building habitable. As a result, I have added furniture and white goods costings derived from a popular furniture and appliances retailer (IKEA). Because I aim to account for all relevant timescales active in the turnover dynamics of buildings, I also include expenditures traditionally associated with their operation. Operational expenditures are those used to run the built structure, including for lighting, powering appliances, heating and cooling. I view these as investments in exactly the same way as construction costs: they are simply investments into relatively short-lived substructures. Take space heating for example. As touched on previously, this is the money invested in actively maintaining the desirable temperature difference between the inside and outside of the building, which although simple, is as much a substructure of the building as its walls. I take these

costs to be represented by the per unit area utility bills of an average UK house. The resultant investment distribution reflects a notional new residential building that has undergone no depreciations.

2.3.2 Product average lifetime assignment

For each component on the BOQ I assign an expected service life or design lifetime. I take central cases of lifetimes provided by the Building Cost Information Service (BCIS) Life Expectancy of Building Components (2006) guide, which presents the results of surveys of the expected lifetimes of common components in buildings. Where exact matches to components could not be found, a combination of manufacturer and published literature values were used. For the residual cases where items were cited as lasting the lifetime of the host building, a value of 75 years was assumed (Schmalwasser and Schidlowski, 2006). The lifetimes of excavation, disposal, temporary protection, cleaning & testing, and mechanical installation during construction period are assigned 1 year service lives because these activities/components are only required during construction. White goods and additional furnishings and fittings were assigned service lives in line with either manufacturer warranty or published literature values. In the absence of a literature on this, the running costs of appliances were assigned service lives based on the expected duration of the service provided. For example, investments made in vacuuming are assumed to be remade weekly, as are investments in washing clothes. Investments in warming a room are assumed to last hours, and those in lighting the room seconds.

2.3.3 Mortality functions and the representative building

Although it is often convenient to assume all products are retired once they achieve their expected service life, experience tells us that, similar to people, some assets retire before they reach their expected service life, while others may last much longer than expected. For an individual component of a building, we might view the retirement age as probabilistic, determined by a specific survival function (Volland et al., 2020). As a result, setting aside any maintenance effects (see Chapter 3), the dynamics of a specific building might be seen as a random draw from the array of probabilistic survival functions of all the ~2000 components comprising that building. Although such sampling might shed light on the possible variability in dynamics between say UK residential buildings, it is not very informative when attempting to shed light on the behavior of large cohorts of buildings as would interest someone attempting to make policy or investment decisions in this space. As a result, I take a different approach inspired by the recent work of Chester et al., (2024), where I incorporate the full dynamic of the mortality function of each of the ~2000 components of the building. While mortality functions usually effectively account for functional variability due to normal wear and tear, aging, foreseeable obsolescence due to technological changes, and risks of losses from accidental damages, they do not cover consumer-driven component replacement due to social reasons, such as changes in fashion and status preferences.

Each component of the building is represented by an amount invested to buy and install it, and an expected service life. I now apply a mortality function to this which retains the same expected (mean) service life, but distributes the investment over

a range of service lives from 0 – 250 years with varying likelihoods, attempting to reflect the likely survival characteristics of that component. Although mortality functions vary significantly between products and services (OECD, 1998), they are found to possess generic properties, and in particular that the second moment of the mortality function (say the standard deviation) is closely related to the first moment (say the mean). There is good reason for such a relationship in that the longer something last the greater the spectrum of ways it can both die or be protected to survive longer (shorter) than expected.

In this study I use the Schmalwasser and Schihlowski (2006) mortality function used by the German Federal Statistics Office because it captures the variance of the mortality function depending on the expected service life. Specifically, the fraction of total investment, f, is gamma distributed over timescales T with respect to the expected service life $\bar{T}$ (see Figure 2.1)

$$f = 9^9(8!)^{-1}\bar{T}^{-9}T^8e^{\frac{-9T}{\bar{T}}} \qquad (1)$$

The selection of this function was predicated on empirical motor vehicle registration data given this has always represented the most observed survival process in the economy. However, (1) has since been tested extensively on a broad range of sectoral classes through its adoption by the German Federal Statistics Office.

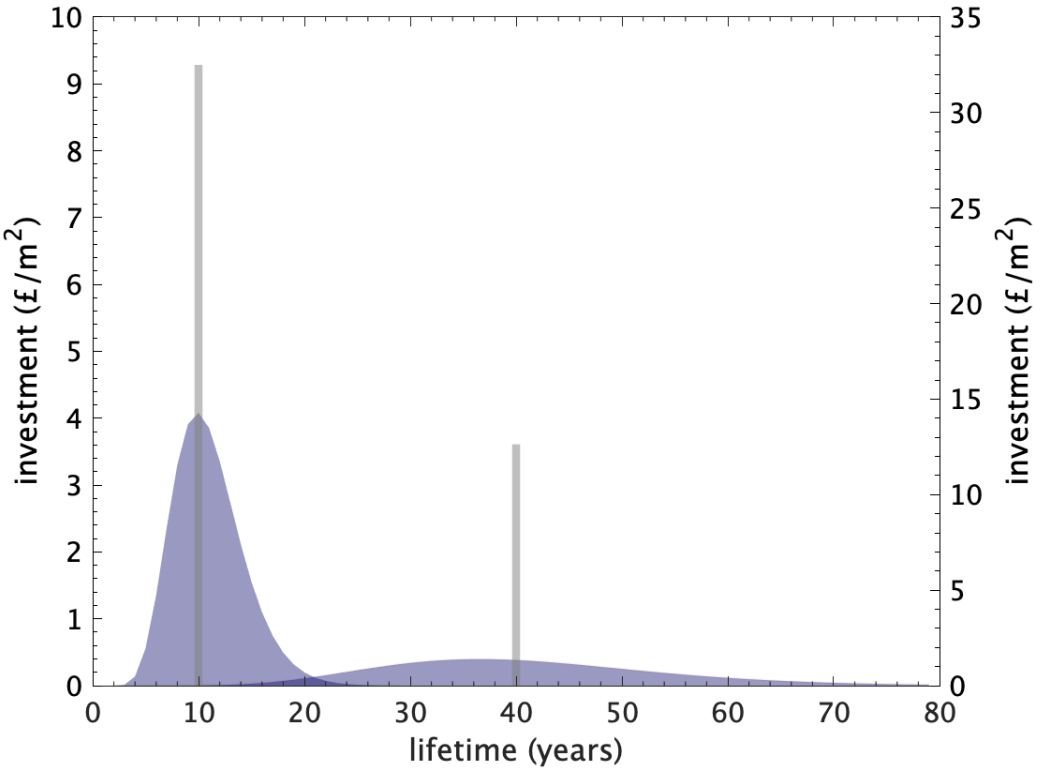

Figure 2.1 A schematic representation of the Schmalwasser and Schihlowski (2006) asset mortality function as used by the German Federal Statistics Office. The bar shows the first moment of the distribution (T in equation (1)), which represents the expected service life.

Having redistributed the investment in each component appropriately across all relevant timescales, I can now re-aggregate these investments for each of these timescales and hence produce the investment-timescale distribution that I am seeking.

The investment-timescale distribution I produce now no longer represents the single building covered by the BOQ. Instead, it represents the equivalent investment-timescale distribution of a very large cohort of these buildings exposed to the likely array of disturbances that give rise to patterns of mortality in line with the Schmalwasser and Schihlowski (2006) mortality function. As such, I argue that the investment-timescale distribution I produce is that for the Representative Building (RB) for that cohort i.e. it is a measure of the likely

turnover dynamics of the cohort. This is borrowed from the concept of representative agent in the economics, which refers to a typical decision-maker within a given category. It is also worth noting that the names of components now get lost at this point in the framework as I have re-aggregated investments on the basis of their turnover timescale as opposed to their name or conventional categorization (Chester et al., 2024). So any particular timescale in the distribution is comprised of all >2000 components but to varying degrees.

Through extending the analysis from the single building in the original BOQ to a cohort of buildings and consequently to cohorts of building components with similar timescales, I aim to serve the interest of decision makers in understanding the entire UK building sector rather than focusing on one single house. I also aim to extend the reach of my analysis. Because the RB is derived from an anonymous BOQ of a UK residential development, the primary focus of this research is on UK residential new builds. However, it is important to note that the methodology developed here is not confined to this specific context. The investment-timescale distribution approach can, in principle, be applied and tailored to other building categories and geographic locations. This flexibility allows the methodology to be adapted to suit various settings, enhancing its broader applicability.

2.4 Results

Figure 2.2 shows the investment-timescale distribution of both the individual components of the building specified by the BOQ (the grey vertical bars), and also the RB distribution derived from this (the black curve). Unsurprisingly, there is a clear concentration of expenditures on zero to one year timescale substructures

associated with what we commonly refer to as 'operating costs', but which I characterize as short-lived productive structures. Beyond this, components span service life timescales from 1 – 150 years or more, with varying levels of investment. After applying the mortality function and re-aggregating, I find the RB distribution is near continuous with two apparent modes at 1 and 27 years and a first moment (mean) of 37.8 years.

To explore this further I look for the minimum number of distributions that describe the full RB distribution. I achieve this by fitting multiples of equation 1 to the RB distribution, under the assumption that any sub-distribution will also follow the same Schmalwasser and Schihlowski (2006) mortality function – i.e. that their first and second moments are equal and gamma distributed. Again, the justification for this approximation is that the longer substructures last, the more likely they are to express either longer or shorter than expected service lives.

Figure 2.2 and Table 2.1 show the results of the partitioning of the RB distribution, which I find can be described by four sub-distributions. Again, the shortest of these is the approximate one-year expenditures associated with the operation of the RB as largely expressed through the utility bills. This accounts for about 14 percent of overall investments in the creation of the RB (Table 2.1). Obviously this proportion rises substantially post-construction, because the associated substructures turn over so rapidly and hence require near continual (in the context of the RB turnover dynamics) replacement and/or maintenance (see Chapter 3).

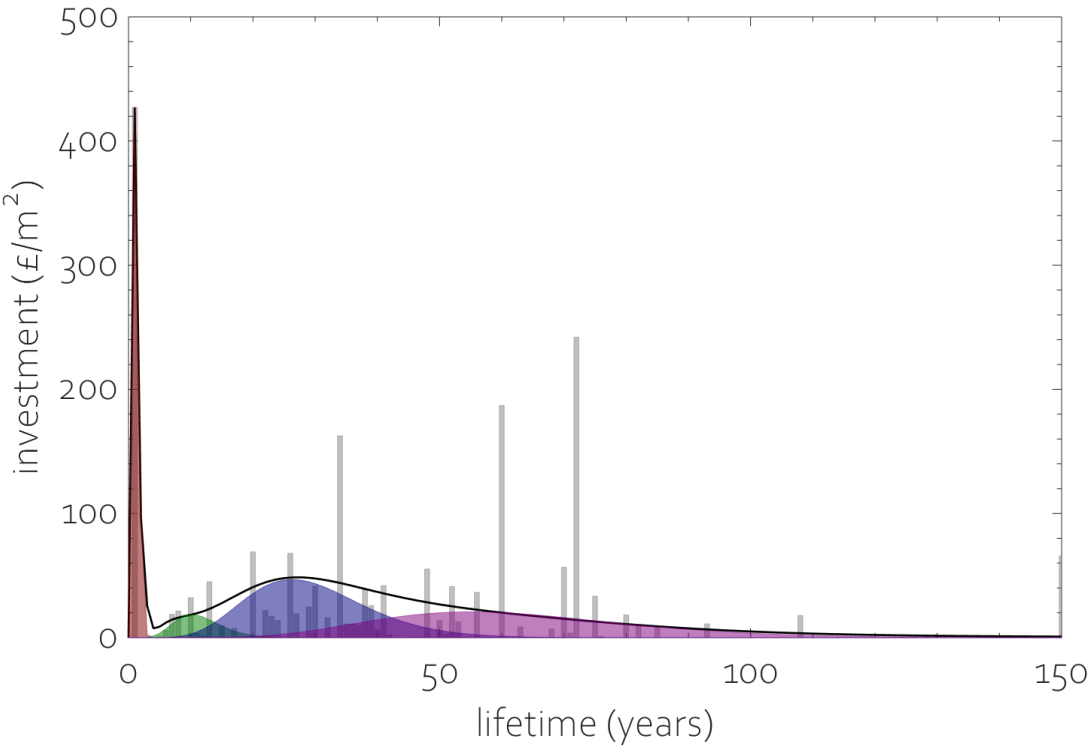

Figure 2.2 The investment-timescale distribution. Bars show investments in individual components of the building described by the BOQ. Black line is the distribution of the Representative Building (RB). Individual distributions under this (coloured) are an estimated partitioning of the RB distribution into four constituent distributions with representative timescales and contributions shown in Table 2.1.

Table 2.1 The partitioning of the Representative Building (RB) distribution shown in Figure 1. Here, equation (1) is used to describe each sub-distribution. Four sub-distributions were found to characterize the RB adequately, and these have been parameterized by fitting to the RB distribution using nonlinear least squares. Uncertainties are estimated 95 percent confidence intervals.

Timescale (years)		Relative contribution (percent)	
1.28	(1.27 - 1.29)	14.69	(13.53 - 13.92)
11.47	(10.85 - 12.10)	5.34	(4.43 - 5.55)
29.58	(28.99 - 30.17)	34.82	(31.32 - 33.74)

62.02	(60.39 - 63.66)	32.41	(28.86 - 31.68)

Figure 2.3 shows the breakdown of the ~ one-year expenditures, indicating how the operational costs can themselves be considered as investments spanning a continuous range of timescales from seconds to months, albeit with high turnover rates. Operational costs here are the costs needed for running the structure, reflected by the utility bills. For example, the use of washing machines, irons and vacuum cleaners etc. In the absence of more granular data, I partition the operational costs into three distinct timescales of hour, day, and week.

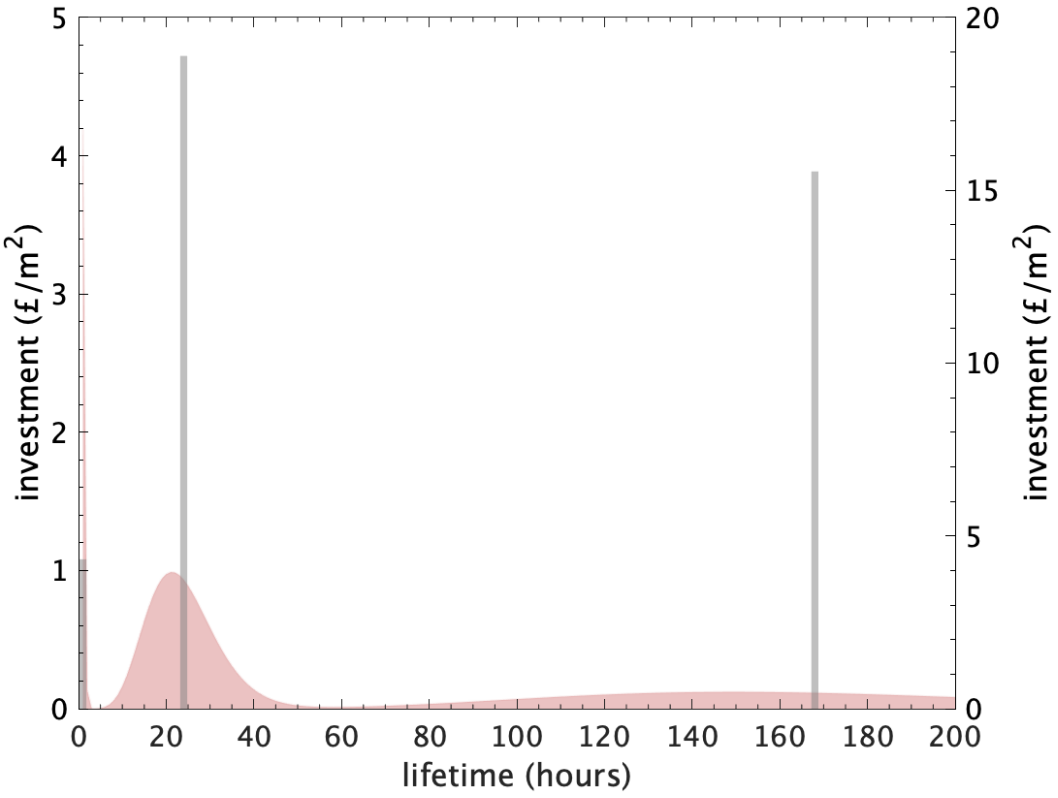

Figure 2.3 The lifetime distribution of monetary investment for operational products with service lives of less than a year.

Beyond the one-year investments I observe three further sub-distributions of RB timescales with first moments at 11, 30 and 60 years, accounting for 5.34, 34.82

and 32.41 percent of total investments (Figure 2.2 and Table 2.1). Although I have largely lost the named classes of substructures when re-aggregating to timescales, some putative cross-referencing with the BOQ classes can be attempted to understand likely named structures contributing to the four discrete distributions shown in Figure 2.2. Contrasting this with the BOQ, I find that the 11 year distribution is generally associated with white goods and finishings (carpets, PU foam undelay etc.). The 30-year distribution appears to coincide with electrical and water service provision (piping, cabling), ceramic wall tiles, roof covering and timber boarding. Finally, the 60-year timescale appears to correspond to the core structure of the building (natural stone walling, softwood staircases etc.).

2.5 Discussion and Conclusions

In this framework no distinction is made between what are construction costs and what is traditionally viewed as operational costs; all the expenditures I consider are assigned as investments made in the array of sub-structures that constitute the initial creation of an RB. The motive for this is to attempt to understand the dynamic range of a building and hence the relative importance of the timescales I should consider when accounting for its inertia.

Post-creation, substructures will of course be replaced on a range of timescales in order to maintain the functionality of the building, producing future maintenance costs (see chapter 3), but, I argue, although these should not be viewed as wholly distinct from the initial investment in the creation of a built structure given they are simply the turnover of substructures. The fact that some elements of a building are seen to turn over rapidly such that they require specific classification such as

'operational' is, I argue, simply the observer's perspective: people (particularly accountants and economists) tend to view processes with timescales of less than a year as transient *flows*, and ones of more than a year somewhat firmer *stocks* of investment. Even then, maintenance of the substructures of a building are seldom if ever viewed as investments, even though they clearly provide returns through supporting rents. This observer bias in whether something is seen as a flow or a stock has been known in geology for a long time and is often defined by the Deborah number (Reiner, 1964), which is a dimensionless number to describe the fluidity of materials under specific flow conditions relative to the timescale of the observer.

The investment-timescale distribution that I produced for the RB has a first moment of around 40 years. I note that this is also the average working lifetime of people, something that has changed very little over the past century (Ausubel and Grubler, 1995). I suggest that this is more than coincidence, indicating important links between the way that people invest in the places in which they live and the timescales over which they accumulate and benefit from these investments. This mean timescale is of course significantly less than the quoted expected service lives of residential buildings, which is invariably quoted in the range 70 – 90 years. However, this excludes consideration of what goes on *inside* buildings, something I attempt to explicitly capture. For example, not only do sectoral national accounts handle sub-one year expenditures as consumption, but also white goods are handled as a separate class to buildings, even though both are required to co-exist if they are to fulfill their respective functions. Certainly the pattern of 'operational' energy use is directly linked to both white-good devices and the thermal

properties of the building superstructure (Azari, 2019). I note that the average turnover timescale of the RB is larger than the amount of time left to meet the 2050 net-zero target, suggesting that a sizable portion of the investments in property are at risk in a rapid energy transition.

The distribution of investment timescales of the RB resembles the capital-timescale distribution of the US economy (Chester et al., 2024), with the US economy also being described by 4 representative timescales: one year 'consumptive' turnover, and capital turnover timescales of 7, 50 and 104 years. Chester et al. (2024), also found that these dynamics were remarkably stable over time, even though the sectoral classifications used by the Bureau of Economic Ananlysis evolved substantially over the past 80 years. For access and time reasons I have been restricted to analysing just one BOQ to date, so I am unable to comment on whether this stability over time is also true for a broad class of residential buildings. However, as with macrosystems like the US economy, I argue that patterns of investment with respect to timescales are far more likely to be stationary than the names of the things being invested in. One reason for this is because investments are hedged (invariably implicitly) to attempt to make returns robust, and spreading returns over timescales would represent an effective hedging strategy given attempting to generate returns over a spectrum of timescales is likely less vulnerable to unforeseen disturbance.

I also suggest the decomposition of a building into unique timescales bears some correspondence to the interpretation of building dynamics offered by Brand (1994), building on Duffy and Henney (1989). When I cross referred between the

RB timescales and the BOQ components, I find the 60-year timescale was associated with a building's exoskeleton, and successive timescales of 30 and 10 years associated with successively more transient layers within building. Within Brand's framework, this layering is critical for isolating the inner living space from the variance of the environment surrounding the building, with the internal living space being associated with the most rapid sub-annual turnover dynamics. That this layering is partially discrete, as are the timescale distributions, also points to the need for separation of function and the corresponding separation of timescales. I suggest such separation is a necessary condition for providing the functions of a space that is habitable for human beings.

This concept that complex structures operate over a range of discrete timescales to facilitate function is not only seen in buildings. There are good reasons to think that this form of investment-timescale distribution is as important to the functioning of natural systems as it is to man-made structures (Szerszynski, 2022). For example, this form of behavior is seen in the Earth system (Jarvis 2011; Jarvis and Li, 2010; Steffen et al., 2018; Williamson et al., 2016); in metabolic processes occurring inside cells (Rowland-Adams and Stefanovska, 2021); and in evolving living systems (Pocheville, 2018).

Having characterized the timescale distribution of the RB we are now better placed to explore the maintenance dynamics that this distribution implies (chapter 3), and from this explore the dynamics of the carbon liabilities entered in to when the decision to build buildings is made (chapter 4).

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3 An investment-timescale perspective of the maintenance dynamics of residential buildings.

Abstract

Robust yet efficient maintenance scheduling for large cohorts of buildings is challenging. This is in part because of the large array of service lives at play for the built sub-structures within any cohort of buildings. In Chapter 2, I showed that investments in these sub-structures can be aggregated with respect to these service lives (turnover timescales), which range from hours to centuries. Here, I build on this dynamic view of buildings to explore the implications of a given investment-timescale distribution for how maintenance costs play out after construction. Orthodox capital accounting and geometric depreciation tells us that the value invested at each timescale can be viewed as depreciating at a rate which is the inverse of the representative timescales, and that once some threshold is reached, re-investment through maintenance will be required, or at least desirable, in order to preserve the value and function of built structures. Rather

than giving rise to a steady stream of maintenance costs over time, the interaction of the spectrum of decay processes and a restoration threshold leads to rich dynamic effects expressed in a near stochastic schedule of maintenance costs. In line with experience, in some years no maintenance may be required, whereas in others a number of timescale thresholds are breached simultaneously, such that repair costs outweigh rental incomes. I find the associated annual maintenance costs are characterized by a clearly defined exponential probability distribution. Not surprisingly, the investment-timescale distribution at the point of construction is not preserved; instead, the cohort becomes a complex and ever-changing mix of new and older elements. Finally, I exploit this dynamic view of cohort-level maintenance dynamics to explore the aggregate Return On Investments (ROI) in construction, maintenance and operation, and the payback dynamics of these investments. This shows that ROI is increased and payback times decreased by tolerating ever increasing levels of capital depreciation, pointing to the obvious tradeoff between rental profitability and the use value of residential buildings.

3.1 Introduction

As the age of buildings continues to rise worldwide, maintenance costs have been recognized as an essential constraint on public and private finances (Kwon et al., 2019). Furthermore, the safety of buildings and the quality of the lives of their users are directly linked to maintenance schedules (Chan, 2019). Poor maintenance scheduling not only impacts on the physical and social function of built structures, but also can cause significant increases in overall maintenance costs (Kwon et al., 2019); Ighravwe & Oke, 2019). Because of these socioeconomic impacts, it is widely accepted that systematic maintenance planning, preferably at the point of construction of a building, is key to both the social and financial success of any such investment (Kim, Lee & Ahn, 2019; Yang, Hsieh & Kung, 2012; Arditi & Nawakorawit, 1999). Furthermore, because maintenance costs have such an important impact on public and private budgets, understanding the dynamics of these costs is also important for wider economic management, avoiding safety concerns arising, e.g. the UK RAAC scandal that is due to the use of reinforced autoclaved aerated concrete (RAAC) in ceilings that are now prone to collapse.

Globally, the construction sector is estimated to contribute 13% to global GDP (Oxford Economics, 2021) and building maintenance costs account for about 50% of the construction industry's turnover (Lateef, 2009). Maintenance costs account for about 75% of the total running costs of buildings (Booty, 2006), among which, costs for mechanical, electrical and plumbing alone can take up to 50% of a building's life cycle cost (Kwon et al., 2020; Khanzode, Fischer & Reed, 2007; Kwon et al., 2017). As a result, not only is maintenance vital to a buildings ongoing use,

because the associated costs are so significant there is pressure to attempt to minimize these costs over time in order to deliver appropriate returns on investment (Tiun, 2006; El-Haram and Honer, 2002; Minami, 2004). Furthermore, in addition to the level of investment in construction being a good predictor of levels of development (Bon, 1992), because newly commissioned infrastructure experiences relatively low maintenance costs compared to its mature counterparts, maintenance costs can, in part, be implicated in national growth statistics (National Infrastructure Commission, 2017). This makes the prediction of maintenance schedules and costs for buildings valuable.

Given their long-lasting service lives, buildings are also important drivers of economic inertia, which plays a crucial role in defining the transitioning route towards the net-zero carbon target (Chester et al., 2024). Maintenance activities are responsible for a sizable carbon emission in building sector. At the same time, a well-structured maintenance work provides a high possibility in modifying new and existing buildings as well as reducing their carbon footprint during operation (Pearce, 2006; Nelson, 2008), and hence their adaption to climate change. As a result, there is significant potential in understanding the turnover dynamics of built structures through their construction (Chapter 2), operation and maintenance. This chapter is the continuance of Chapter 2, describing the maintenance process of an RB after the creation of the investment-timescale distribution.

A range of studies try to categorise maintenance approaches and their optimal applications, and their categorisations vary in details but are mainly based on how and why maintenance happens. Preventive and reactive maintenance are the two

primary maintenance approaches that are taken into consideration. Preventive maintenance strives to keep a structure functioning at some level through regular inspections and repairs (Madureira et al., 2017) in order to actively manage degradation (Ruparathna, Hewage and Sadiq, 2018; Queensland Government, 2022; European Standard, 2017). In contrast, reactive maintenance is the necessary repair of an asset after failure (Muyingo, 2009; European Standard, 2017; Queensland Government, 2022; Ruparathna, Hewage and Sadiq, 2018). Over the long term, an effective preventive maintenance plan may lower overall maintenance costs when compared with a reactive strategy (Alamri and Mo, 2022), but also risks significant unnecessary costs (Eti et al., 2006). In contrast, reactive maintenance is an effective cost minimization strategy until undetected failures result in disproportionately large maintenance costs, including loss of function (Molęda et al., 2023). These arguments parallel wider discussions over planned versus reactive adaptation strategies (Sirvio, 2015; Shagluf et al., 2018; Molęda et al., 2023).

Accurately allocating maintenance funding is a well-known problem (Lee and Scott, 2008; Shah Ali, 2009). The fundamental difficulty in effective maintenance scheduling is, as with all investment, that money is spent on structures that inhabit an uncertain future, where numerous stochastic events act to either extend or shorten planned service lives. As a result, although seldom seen this way, maintenance costs share similar dilemmas with all investments decisions, and in many respects maintenance should itself be seen as a form of investment, albeit into building sub-structures in order to preserve value and use in the overall

structure. In this chapter, I explore the implications of the investment-timescale distribution identified in Chapter 2 on the depreciation dynamics and maintenance costs of residential buildings.

3.2 Decay, depreciation and maintenance dynamics

Understanding decay processes and the associated depreciation of buildings and their components underpins the study of maintenance activities. Unfortunately, when we look at individual buildings and sub-structures, we find that there are an array of possibilities for the time evolution of these decay processes. Firstly, items can function normally and then fail, either through endogenous malfunctioning, or because of some exogenous factor. For example, a house can be fully operational and then be burnt down through an internal electrical fault, or swept away by a catastrophic flood (blue line in Figure 3.1), this is known as one-hoss shay depreciation in economics. Secondly, structures can degrade progressively through use, leading to linear-like depreciation (grey line in Figure 3.1). This latter profile is particularly true when we consider the monetary value assigned to structures, which declines progressively as the remaining lifetime diminished. This is driven by both the increasing likelihood of failure as things age (Proschan, 1963), and the progressive loss of financial value which can be seen as the sum total of future perceived rents (Banz, 1981). This latter case describes the forward-looking view of capital value. Between these two end members there are of course an array of possible profiles for the use value of individual structures. For example, the value of an individual house would likely hold for approaching a decade with no maintenance, similarly, a light bulb delivers consistent rentals throughout its lifetime until the element burns out, then the stream of service abruptly ends; the

value of a vehicle is most likely to depreciate in a geometric or linear pattern (Storchmann, 2004).

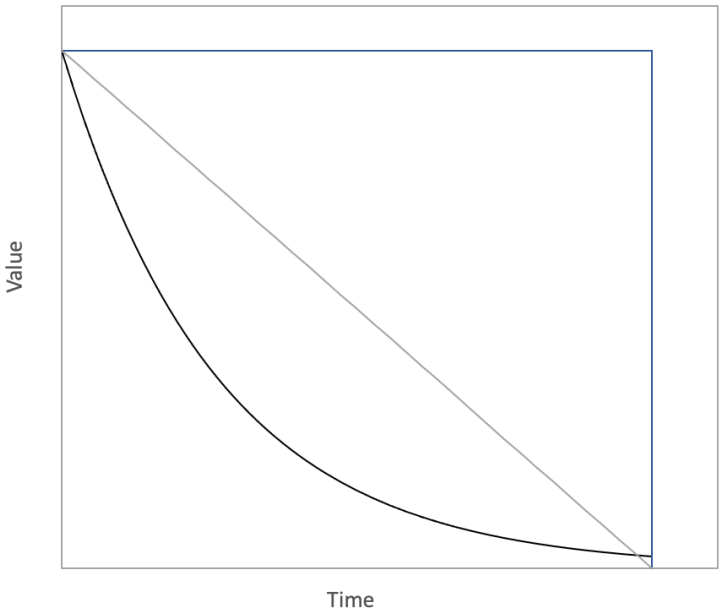

Figure 3.1 Common depreciation patterns: blue line is 'one-hoss shay' depreciation, grey line is straight-line depreciation, black line is geometric depreciation.

What happens in cohorts of similar structures is initially far more complex. Clearly the likelihood of encountering either an endogenous or exogenous catastrophic failure should rise with the amount of time deployed, and this is central to the understanding that the variance of a mortality function might be closely tied to the mean survival time as discussed in Chapter 2. It is also likely that members of a cohort might experience similar trajectories for the decline in value simply because of the shared function and environments of these structures. However, what is less well appreciated is that the turnover of a pool of structures can often be geometric, even though the individual items in the pool express non-geometric life histories (Sliker, 2018). This is certainly the assumption underpinning the

ubiquitous use of backward looking capital accounting at company, national and international level wealth accounts. Numerous studies also provided strong evidence for geometric depreciation in many asset cohorts (Jorgenson et al., 1987; Oliner, 1993; Jorgenson and Stiroh, 2000), which is why all inventory methods of asset capital value make the assumption that decay (depreciation) is proportional to the total pool asset value (OECD, 2009; Fraumeni, 1997). Wykoff and Hulten (1980) examined depreciation of sixteen classes of structure using large data sets, including 203 apartments, 526 factories, 1654 offices, 1666 retail buildings, 580 warehouses. They found that their economic values decline more rapidly in early years than the later years of their lifetimes, i.e. something akin to a geometric depreciation pattern. This is important because it means the turnover timescales presented in Chapter 2 can be viewed as cohort-level depreciation rates, and hence we can use these to represent the decay characteristics of a cohort-level Representative Building (RB). This is re-enforced by the fact that the investment-timescale distribution compiled in Chapter 2 groups all sub-structures with the same turnover timescale, independent of the name of the substructures being aggregated.

3.3 Modelling maintenance

Traditionally, the life of a building is considered to partition into construction, operation, maintenance, and decommissioning/demolition phases (Ngwepe and Aigbavboa, 2015). Construction and demolition are clearly defined points in time/space. However, as with biological organisms, the concepts of operation and maintenance are less clear. Building construction draws together a wide variety of components and in Chapter 2 we viewed these components as cohorts of

substructures with varying service lives that range from seconds to centuries. Each of these substructures can legitimately be seen as an investment in its own right: something that, like a building, is constructed, lives and then dies or is repurposed. As a result, the only thing that defines maintenance is that an overall structure and its function is preserved, although clearly this description applies equally to all and any of the substructures. Also, the separation between operational and maintenance investment simply comes down to perception of timescale, which for buildings is defined by timescales more (less) than one year.

By articulating the relationship between turnover rate and the amount of investment, I am able to characterize the turnover dynamics of a building and hence how fresh investments might be scheduled going forward. I name this the investment-timescale distribution of buildings. I arrive at a near continuous yet multi-modal distribution of the turnover dynamics of a representative building. The hierarchy of modes with different timescales could possibly represent prominent classes of investments in the building. Knowing the dynamics of an investment over different timescales helps me approach the temporal distribution of building maintenance in this chapter, as this fuller range of substructure investments and turnover timescales schedule the pattern of maintenance and identify the size of continuous maintenance investments that need to be made for running the structure along the timescale, and hence how it could be distributed over time.

There have been lots of mathematical and simulation models developed in maintenance scheduling. Nielsen and Sørensen (2011) used Bayesian updating to

optimize long term maintenance planning for offshore wind turbines and compared two different maintenance strategies with and without periodic imperfect inspections. Martorell et al. (2005), Miyamoto et al. (2000) and Fwa et al. (1994) have used genetic algorithm to find the optimum maintenance strategy for structures such as roads, bridges and generators. Pongpech et al. (2006) made the assumption that the failure rate of equipment follows a Weibull distribution, created a 4-parameter model of this and came up with a 4-stage procedure to optimise preventive maintenance strategies for used equipment under lease. Billinton and Pan (2000) built a Monte Carlo Simulation model, based on the assumption that a product's useful lifetime is exponentially distributed and its decay follows a Weibull distribution. This was used to assess the failure frequency and the optimal maintenance time period for a system with redundant components. Markovian probabilistic models were used by Marquez and Heguedas (2002) to discover the patterns of maintenance under realistic finite time periods. Although there has not been much research done on stochastic maintenance scheduling over the entire lifetime, some studies considered stochastic depreciation. Wang and Liu (2019) considered the stochasticity of depreciation process, used a probabilistic model and categorized the condition of components into multiple stages with different probabilities using a probability transition matrix to represent a dynamic maintenance framework that makes maintenance decisions with constraints on budget or reliability. After establishing three cost-based criteria for evaluating maintenance options across unlimited time period, Noortwijk (1998) applied gamma processes to simulate stochastic depreciation activities. Liu and Frangopol (2006) performed a comprehensive enumeration-based study of a bridge system to determine how the probabilities

of the failures of bridges might affect the entire highway network. Hu et al. (2022) proposed a Linear Programming-enhanced RollouT (LPRT) that takes both stochastic and constraint deterministic maintenance scheduling on infinite time horizons into account. Common to all these pieces of research is the theme that systematic maintenance scheduling over the entire service life of a system is difficult to simulate and hence prescribe either corrective and preventive maintenance schedules for.

3.4 Aims and objectives

In this chapter I provide a simple model showing the dynamic nature of maintenance in residential buildings to give a general insight into how maintenance activity is scheduled over time for an RB. The aim is to show that despite being deterministic, the interaction between maintenance thresholds and timescale distributions of substructures leads to near stochastic behaviour, hence in part explaining why maintenance is difficult to manage in asset portfolios. The research aims are delivered through the following objectives:

- To simulate the depreciation of building components taking into account performance thresholds leading to maintenance costs;
- To use Return on Investment to evaluate performance and constrain the simulation;
- To evaluate the pattern of maintenance costs resulting from this and compare it with observed maintenance scheduling issues.

3.5 Methodology

3.5.1 Building depreciation and maintenance simulations

Using the investment-timescale profile for an RB, as characterized in Chapter 2, the simulation described here attempts to characterize a wave of new investment in all or part of the UK housing stock, as opposed to the background of general maintenance occurring on this stock.

The RB is assumed to have an investment per unit area of 2500 £/m^2, which, because of the inclusion of the additional investments required to fully commission a house (see Chapter 2), is marginally higher than current (2023) UK median build costs of 2360 £/m^2 (Costmodelling, 2023). I take the UK median house size to be 94 m^2 (Ministry of Housing, 2018), which gives a new-built commissioning investment in the RB of 241,000 £. This is 14 percent less than current (2023) UK mean house price of 290,000 £ (Land Registry, 2023). I now describe the depreciation and subsequent restoration (maintenance) of the RB post commissioning.

Again borrowing from Chapter 2, the RB is comprised of N = 200 pools of value, where each pool represents grouped investments with the same turnover timescale, T, with timescales spanning 1 – 200 years. The financial value of the i'th pool, K_i, in any year t, post construction is assumed to follow the backward-looking stock conservation equation

$$K_i(t) = I_i(t) - (1 - T_i^{-1})K_i(t-1) \qquad (1)$$

where I_i is the annual investment in the i'th pool (£/m^2/yr), either initially during the construction phase, or subsequently through maintenance investments in the replacement or repair of substructures.

Following the initial investment $I_i(0)$ to create the RB, each pool depreciates from $K_i(0)$ at the geometric rate T_i^{-1}. Over time, and at differing rates, these pools of value decline until some fraction L of the initial commissioned value $K_i(0)$ is left. At this point, I assume the value of the pool is restored so that the maintenance of (investment in) the i'th pool is given by

$$I_i(t) = K_i(0) - K_i(t) | K_i(t) < LK_i(0)$$

$$I_i(t) = 0 | K_i(t) \geq LK_i(0) \qquad (2)$$

These investments to maintain value and hence function in the RB are into everything and anything in the i'th pool that share a common turnover timescale T, rather than into specific components such as windows or carpets, even if buying new windows and carpets is the outcome of this.

3.5.2 Returns on investment

I use Return On Investment (ROI) to evaluate the maintenance scheme and select an appropriate value of the maintenance threshold, L. I define ROI as cumulative rents divided by cumulative investments (construction and maintenance). I assume the RB generates rents either explicitly, or as avoided rents if I am considering owned/mortgaged property. Estimates of UK median rents vary widely, but there appears to be more consensus over the size rent as an annualized return on capital, which is in the region of 5 %/yr (Office for National Statistics,

2023). If the current (2023) median UK house price is 290,000 £ (Land Registry, 2023) this gives an RB annual rent of 14,500 £, or 154 £/m^2/yr. I do not attempt any discounting as I am not interested in the present-day value of future returns to investors. Instead, I am only interested in the actual monetary flows and hence the performance of the RB within the UK economy, independent of any ownership.

Although I explore ROIs associated with all levels of the maintenance threshold L, I focus in particular on the threshold value that produces a payback period equal to the average time it takes a UK mortgagee to pay off their mortgage, which is approximately 30 years (Money.co.uk., 2023). I assume ROI = 1 once payed off simply because enough rents have been produced to cover all investment costs at this point.

3.6 Results

Figure 3.2 shows the RB investment-timescale distribution taken from Chapter 2, but without the costs associated with the actual construction process. This is because they are associated with activities such as establishing temporary site compounds that are unlikely to be meaningfully replicated in subsequent maintenance operations.

Figure 3.3a shows the aggregate depreciation of the total RB invested capital value over time, starting from its initial condition of 2,500 £/m^2 and stabilizing at ~2,000 £/m^2 within the first decade. For this my central simulation I have used L = 0.7 which, as I will show, result in the 30 year ROI = 1 condition I take as representative (Figure 3.3c).

Figure 3.2 also shows the change in the investment-timescale profile from new to its equilibrium state some 200 years later. As can be seen, at equilibrium this distribution sits half-way between its new build upper bound of $K(0)$, and the lower bound of $LK(0)$. By way of illustration, also shown is the investment-timescale distribution taken 200 years into the simulation, showing the RB becomes comprised of a quite complex mix of new and old investments (red line in Figure 3.2).

Figure 3.3b shows the associated annual total maintenance investments in relation to annual rents. Despite the deterministic nature of the simulation, it becomes progressively more stochastic with time. I tested this variability by taking a sample from years 100 to 500 and found there is no significant autocorrelation (i.e. the series is serially independent), and that the sample approximates an exponential distribution. This is well illustrated by considering the pdf of annual net profits (Figure 3.4), which are simply annual maintenance investments taken away from the annual rent of 154 £/m^2/yr.

Figure 3.3c shows the time evolution of ROI for a range of values of L from zero to one and including 0.7. In each case, ROI increases with time reflecting the fact that rents accumulate faster than investments. Also, in all cases the RB ultimately achieves a state of profit (ROI>1), but the lower the maintenance threshold (i.e. the more that a cohort of components is allowed to decay before triggering maintenance), the greater the ROI and the shorter the payback time. More specifically, when L = 0, no maintenance is required; when L = 1, as long as there is any depreciation, it is restored back to its initial condition.

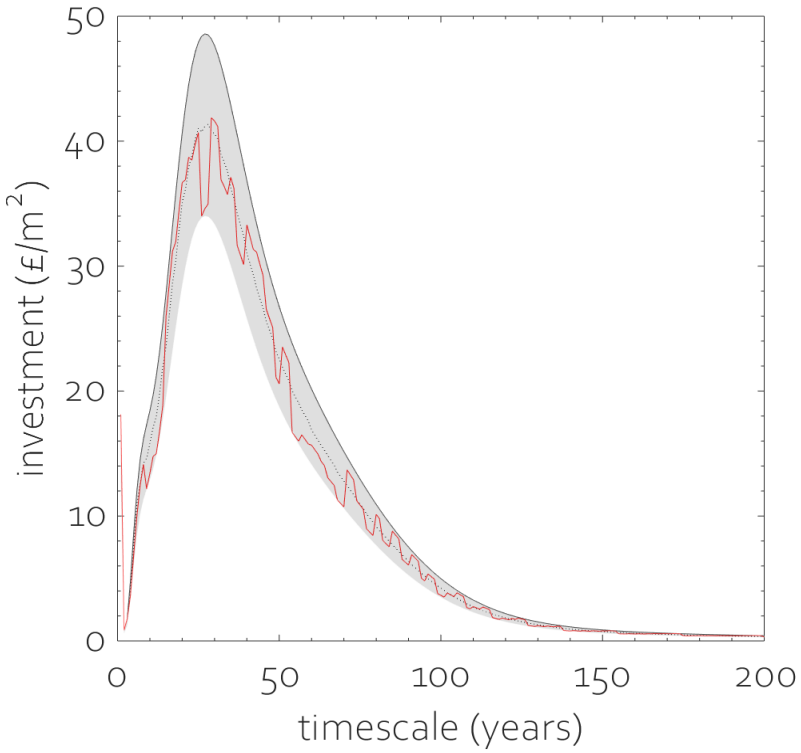

Figure 3.2 Capital value distribution with respect to timescale of the RB. The black line is the investment (capital)-timescale distribution in year zero. The grey patch is the range between no depreciation and full depreciation at the maintenance threshold within which any particular distribution might sit. The dashed line is the mean profile at equilibrium after ~200 years. The red line is a given year's profile. L = 0.7.

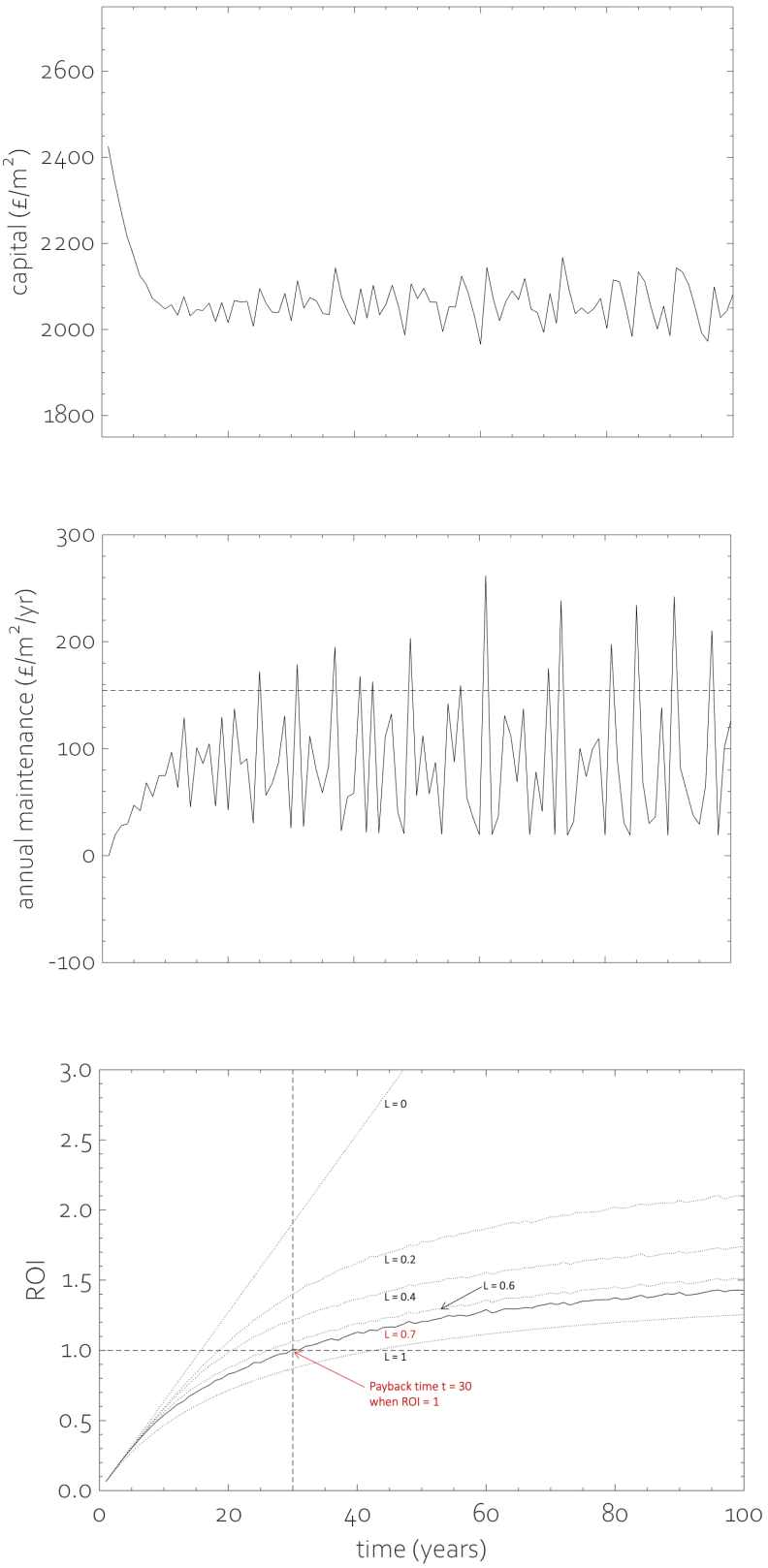
capital (£/m²)
2600
2400
2200
2000
1800
annual maintenance (£/m²/yr)
300
200
100
0
-100
ROI
3.0
2.5
2.0
1.5
1.0
0.5
0.0
L = 0
L = 0.2
L = 0.4
L = 0.6
L = 0.7
L = 1
Payback time t = 30
when ROI = 1
0
20
40
60
80
100
time (years)

Figure 3.3 a. Aggregate total capital value when L = 0.7. b. Annual investment in maintenance over time. The dashed line is an inflation-free annual rental income £154/m²/yr. c. ROI over time for different maintenance thresholds L= [0, 0.2, 0.4, 0.6, 0.7, 1]. L = 0.7 is highlighted and used in the central simulation giving payback time of 30 years.

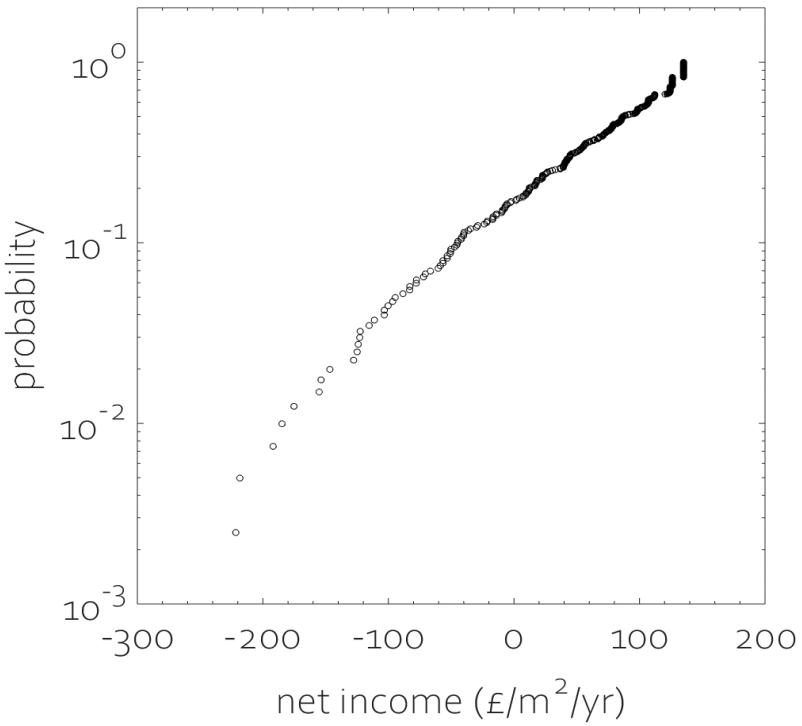

Figure 3.4 The probability distribution of annual net profit.

3.7 Discussion and Conclusions

The simulation I have explored is highly stylized, and describes a somewhat abstract scenario of the forward evolution of a large cohort of buildings all built around the same time. Perhaps the most obvious parallel to this is if, in a net-zero transition, a large wave of new built housing was initiated to replace stock that was not net-zero compatible. Alternatively, although the UK housing stock is a complex mix of new and old properties, as are the subcomponents of these properties, the simulation described above could describe the dynamics of the

new-built buildings within this cohort. It certainly should align with the dynamics of all new build in any given year.

The finance and economics of even an individual property can be a relatively complicated arrangement. However, I would argue that our 30 year payback time for UK houses is a reasonable approximation of how that finance is structured in general, given this is approximately how long it takes homeowners to pay down their mortgages (Office for National Statistics, 2020). Interestingly this is also very close to the median expected working life of a person (Ausubel and Grubler, 1995), and the two are clearly related because large debts like house mortgages are invariably paid off through wages, and there would be a tendency to spread such payments out as much as possible.

I also argued that, at the point the debt is resolved, ROI = 1. Through applying this constraint I arrive at a maintenance threshold of 70 percent i.e. total capital is allowed to depreciate by 30 percent from its commissioned state. This too feels reasonable and in line with experience, where in general houses are not preserved in their new-built state, but are instead allowed to partially decay, but to not stray too far from new. I note that the further you stray from new the bigger the ROI, hence the push on landlords to not over-invest in maintaining their properties. This of course is set against the house-users' experience, where newness is often desirable, but not always.

Of course, as society evolves, the things that are bought to maintain properties change and hence the character of any portfolio necessarily evolves alongside this. However, it appears that the investment-timescale distribution, particularly the

relative size of the investments across timescales, could be a somewhat stationary property of houses, as it is for entire economies (Chester et al., 2024). If so, then perhaps simulating costs over hundreds of years as I have here may not be so foolish, especially if I consider our monetary units are constant (inflation adjusted) rather than nominal. Added to this mixing of technology, Figure 3.2 also shows that the cohort becomes a rich mix of old and new investments, just like a real house is always a complex, ever-changing mixture of new and old elements throughout its lifetime.

The interaction of the performance threshold with the array of investment timescales generates complex dynamic effects, giving rise to near stochastic maintenance costs over time. I propose that this in part accounts for the difficulties people face when attempting maintenance scheduling for large estates (Ferreira, 2020). Siemes et al. (1985) mentioned the reason for maintenance schedule complexity may be related to the complex collection of decay processes in structures. For both landlords and homeowners, such behavior of buildings is problematic. For example, from Figure 3.4 I find that the probability that outgoings will be greater than rental incomes (or equivalent) is as high as 17 percent. Worse still, although this distribution has an upper bound of zero maintenance costs and hence a net profit equal to the rental income of 154 £/m^2/yr, it is only bounded by losses equal to $LK(0) = 0.7(2500) = 1750$ £/m^2/yr at the lower end i.e. more than 10 times the rental income. Of course, the probability of this worse case is vanishingly small because it would require all 200 pools of value to require restoration simultaneously, but this does highlight the wisdom of the saying ‘fix the roof while the sun is shining’. That these risks are exponentially distributed

presumably relates to the geometric depreciation set out in equation (1) and how this behavior interacts across timescales. In Chapter 2 I argued that spreading investments across timescales could act as a hedging strategy, attempting to ensure that returns were similarly spread in time and hence the ups and downs of the economy. However, I see here that this same timescale-spreading behavior also produces potentially important volatility in maintenance outlay.

What is not clear from our simulation is why buildings are generally assigned lifetimes in the region of 80 – 100 years in national accounts (Ji et al., 2021). Certainly there is a large proportion of the UK housing stock that is significantly beyond this threshold (Piddington *et al.*, 2020). I note from Figure 1c that ROI is approaching 1.5 around after a century, so although the net gains are modest, this shows residential buildings are themselves growth engines in an economy, even if traditionally activities in and around buildings are not viewed as investments, but rather are attached to consumption. Through bringing operational costs into the investment-timescale distribution as I have, this also acts to clarify my view that it is difficult, and probably ill conceived, to try and separate operations from maintenance as has traditionally been the case. If I did exclude the operational costs from investments, the ROI would rise and its payback time would shorten accordingly. Even in this way, the financial ROI of an RB would still not be comparable with the overall energy ROIs of economies which is in the region of 2.0 (Jarvis, 2018).

It is particularly vital that we better understand the investment dynamics of buildings as we plan to transition economies to meet climate objectives. Because

both the construction industry and housing are such significant contributors to GHG emissions (IEA, 2018), focusing on this portion of economic inertia is much needed. Furthermore, climate change is likely to have an impact on the decay rate of structures, requiring both new design strategies, and account for these climate-induced depreciations in maintenance scheduling (Giordano, 2012). In the 4th chapter of this PhD, I am going to use the investment inertia and dynamic view of maintenance developed here to investigate embedded energy and carbon commitments of residential buildings within the context of UK climate policy.

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decision Facility management Performance management SBE 82 Development of a Conceptual Framework for the Study of Building Maintenance Operation Processes in the Context of Facility Management. *Surveying and Built Environment*, 19(1), 81–101.

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4 Building inertia and climate change

Abstract

Residential buildings and their components make a significant contribution to both natural resource depletion and climate change. This burden is necessarily dynamic because, once a decision to build has been made, resources flow into a built structure on a broad range of timescales from seconds to centuries. Traditionally, these dynamics are partitioned into construction, operation and maintenance phases. Here I offer dynamically rich view of the resources and carbon emissions of buildings where the construction phase gives way to a timescale determined dynamic maintenance inventory. I use this inventory to specify the time history of carbon emissions post-construction under two different scenarios. The first Business-As-Usual scenario simply assumes the future replacement of elements of the building is like-for-like in terms of carbon. The second scenario assumes replacement elements decarbonise to net-zero 2050 in line with the current UK policy pledges to the Paris Agreement. I find that, for a new structure built in 2020, only shorter-lived substructures are replaced for achieving 2050 net-zero carbon, accounting for 20% of the building. Whereas the longer-lived (>70 years) high carbon components avoid a large amount of their maintenance carbon liabilities getting replaced. This implies that it may be wise to

consider postponing the investments in carbon-intensive constructions now, until more net-zero friendly alternatives are available.

4.1 Introduction

The construction industry is the largest sectoral contributor to GHG emissions, accounting for 40% of carbon emissions globally, as well as 40% of resource consumption and 40% of waste (IEA, 2018). In addition, the design lifetime of a residential building is generally long and hence building decisions represent substantial lock-in in the context of transitioning economies away from carbon dependency (Röck et al., 2020). The carbon footprint of buildings is generally partitioned into either that embedded in the construction process, or that associated with the subsequent operation. Building operational energy use has historically accounted for 80 % of a building's energy and carbon footprint, leading to around 33% of world final energy demand and 30% of global CO_2 emissions (Urge-Vorsatz et al., 2012). As a result, operational emissions have dominated climate impact evaluations and decision making in this sector (Ibn-Mohammed et al., 2013). However, it appears that the amount of operational energy used by buildings has, and is, projected to decrease dramatically as a result of the development of low carbon and energy-saving technologies (Sadineni, Madala & Boehm, 2011). As a result, the significance of embodied energy is growing in building research (Cellura et al. 2014; Monteiro and Freire 2012; Cuéllar-Franca and Azapagic 2012; Bernett, Kral, and Dogan 2021; Asadi et al. 2020). For example, Monahan and Powell (2011) evaluated the embodied carbon of a three bedroom, low-energy semi-detached home in the UK, focusing on the constructing stage. Likewise, Asif et al., (2007) conducted an LCA to compare the environmental implications of five common building materials (wood, aluminium, glass, concrete, and ceramic tiles) while Zhang et al. (2014) presented a life cycle analysis of the

embedded carbon in a single-family residential structure in Canada . Hammond and Jones (2008) targeted a variety of home and flat types in the UK again focusing on embedded carbon.

Despite the complexity and time-consuming nature of the environmental assessment of both embodied and operational phases, some studies have considered both. Hacker et al. (2008) took into account carbon from both the constructing and operating phases for an English two-bedroom semi-detached home to compare different weights of thermal mass, concluding that heavier thermal mass has higher embodied carbon and lower operational carbon. Rosa et al. (2012) did a full life cycle analysis of the three most common types of houses (detached, semi-detached and terraced houses) in the UK, the results showed that operational phase has the largest environmental impact and emphasised the significance of choices made during the construction phases, which affects how the house will be used to the end of its life. Zhang et al. (2014) compared the life cycle performance (in terms of carbon emissions and energy use) of different design setups and how they were spread out over the different stages of a building's life over 60 years, and found out operation phase has the biggest environmental impact in building life stages, whereas in the breakdown of building components, walls have the largest amount of carbon emission with roofs being the second most. Also, Keoleian, Blanchard and Reppe (2000) produced a comprehensive LCA for the energy use of a single-family dwelling, taking into account the construction, operation, and demolition phases, compared it with a functionally equivalent energy-efficient house, and the result shows that the majority of energy reduction happens during the operational stage. Cuéllar-Franca and Azapagic (2012)

examined the full life cycle environmental implications of three of the most usual housing styles in the UK, and again concluded that the operational stage has the largest environmental impacts. In each case, a detailed inventory of building materials and appliances, as well as a life cycle cost study, were created and carbon footprints in these studies have all been assigned based on their respective life cycle phases.

Although the combined embodied and operational impacts of buildings have been studied, the dynamics of carbon emissions from buildings has been overlooked, despite these dynamics being important when set against national and global decarbonisation schedules. The expected service lives of buildings are invariably long, so the buildings that are built now will be mostly likely to still be operating in 2050, when the entire UK economy is meant to have reach net-zero carbon. They are also comprised of a large number of sub-structures which themselves have substantial lifetimes, so the same lock-in effects apply to the replacement of these substructures. This dynamic for carbon emissions is captured in the maintenance dynamics of buildings, but these dynamics are complex and because of this, building-related Life Cycle Analysis (LCA) studies have concentrated on a particular stage of the building life cycle largely treating the building in question as static. When viewed dynamically, the distinction between what is embodied and what is operational can become somewhat arbitrary. After all, resource are allocated to (invested in) buildings across a broad spectrum of timescales from seconds to centuries. Although operational energy use and associated carbon liabilities are invariably seen as instantaneous dynamic free processes, they too can be assigned timescales and associated turnover dynamics. A room for example

appears to be created and maintained on timescales of decades. However, gas might be invested to warm the room with an effect persisting for hours, or electricity might be invested in a room to change the light quality with an effect persisting for seconds or less. In both cases, resources are still being invested, and returns are expected on these investments over some timescale. Once this is appreciated, I see that the distinction between construction, maintenance and operation that underpins mainstream building performance analysis like LCA is somewhat arbitrary, and that in practice, these three classes are simply an artificial partition of a continuous pattern of investments being made in the creation and use of a built structure, with results that endure on timescales ranging from seconds to centuries.

In this chapter, I plan to use the investment-timescale distributions and maintenance schedules developed in Chapters 2 and 3 to understand the energy and emissions schedules over a representative residential building's life cycle, and how these relate to, for example, the timetable set out to achieve future net-zero targets.

4.2 The net-zero transition and buildings

The Paris Agreement aims to keep global warming well below 2 °C over pre-industrial levels, and to pursue measures to keep temperature increases below 1.5 °C (United Nations Framework Convention on Climate Change, 2015). Long-term anthropogenic warming is largely caused by accumulated carbon emissions (Matthews and Caldeira, 2008; Allen et al., 2009; Meinshausen, 2009; Zickfeld et al., 2009). Emissions must be cut by 45% by 2030 and be at zero by 2050 if the

Paris Agreement's goal of keeping global warming below 1.5 °C is to be achieved (United Nations Framework Convention on Climate Change, 2018). In accordance with this, the governments of the UK and France, in addition to the European Parliament, have individually approved emission reduction goals that will achieve net-zero by the year 2050 (Stark et al., 2019; European Commission, 2018; European Parliament, 2020). In addition to the decarbonization of new investments, achieving net-zero is likely to require changing significant amounts of existing longer lived carbon-intensive structures over the next thirty years (Mercure et al., 2021).

The investment-timescale distribution of residential buildings could be a good indication on how the economic inertia of buildings affects this transition to net zero. A building is composed of long-lived and short-lived components with the purpose of producing net positive return on investment. The possibility that longer-lived investment might lose its usability before the end of its expected useful lifetime puts both the economic worth of that investment and the economic activity it is related to at risk (Mercure et al., 2018; Kefford et al., 2018) and this in turn affects the pace at which the economy might transition towards the net-zero. The turnover timescale of investment, according to Davidsdottir and Ruth (2004), is the primary driver of long-term changes in carbon emission and energy efficiency trajectories. Thus, it is important to understand the possible impact of investment-timescale dynamics on the goal of reaching net-zero carbon by 2050. Moreover, the turnover timescale of buildings, which will vary between individual buildings, has remained fairly steady roughly at 75 years (Schmalwasser and Schidlowski, 2006), which is significantly greater than the amount of time

remaining until the net-zero deadlines under the Paris Agreement must be reached.

4.3 Aims and objectives

The aim of this chapter is to apply the investment-timescale distribution to both energy and carbon emissions of a Representative Building to understand the temporal dynamics of building carbon emissions and to compare this with the carbon budgets thought to be consistent with the Paris Agreement. Unlike traditional building LCA, I will not partition emissions into construction, operation and maintenance phases. I instead provide a fully dynamic perspective determined by the timescale-determined replacement of substructures. I evaluate this framework by contrasting cumulative emissions from a Business-As-Usual and a net-zero 2050 scenario.

4.4 Methodology

4.4.1 Overview

The focus of this chapter is to calculate the quantity and timing of carbon coming the decision to build a building in 2020. I adopt the view that carbon emissions associated with maintaining a viable building are those produced from restoring substructures as I did for maintenance costs in Chapter 3, and that operational carbon or energy is also in this definition because it is solely the maintenance of shorter-lived substructures. To do this, the BOQ analysis underpinning the investment-timescale distribution in Chapter 2 is extended to include energy use and carbon emissions. From this the carbon and energy timescale distributions are constructed mirroring the investment-timescale distribution constructed in

Chapter 2. This is then used to run a dynamic simulation mirroring that used to construct the maintenance costs in Chapter 3, but for carbon. In this simulation 'repairs' are enacted using either the 2020 carbon-money intensities (the BAU scenario) or carbon-money intensities that are declining to zero by 2050 (the net-zero scenario).

4.4.2 Carbon and energy-timescale distribution

Embodied carbon and energy calculation often require an understanding of all the materials associated with the making of products. Given that the BOQ underpinning this thesis has provided specifications for the ~2000 products constituting the representative building, I start by constructing the equivalent to produce a Bill Of Materials (BOM). Embodied energy and carbon were assigned to each material/item in the BOM, using the Inventory of Carbon and Energy (ICE) database (Hammond and Jones, 2011). This database is a widely respected (Waldron et al., 2013; Crawford and Stephen, 2013; Cuéllar-Franca and Azapagic, 2012), and frequently used in building LCA studies (e.g. Moncaster and Symons, 2013; Din and Brotas, 2016; McGrath et al., 2013) given it provides process-based, cradle-to-factory gate energy and carbon intensities for more than 200 construction products. Because of the uncertainty in the literature ICE draws on, the database reports low, mean and high intensity cases and I use these to explore uncertainty in my final dynamic inventories.

As in Chapters 2 and 3, furniture, fixings and white goods are included in the inventory. The principle source of information for extending the BOM to these was the European Commission's Ecodesign Preparatory Studies (Eup-network.de,

2018). Literature values were used for items not otherwise detailed. In absence of literature values, Proprietary Environmental Product Declarations (EPDs) were used as a last resort given potential company bias (Minkov et al., 2015; Achenbach et al., 2016; Pacheco-Torgal et al., 2014). Because the specific material sources and manufacturing processes of the items were unclear, recycling was largely ignored except for metals, where the UK average recycled contents were used.

Utility bills are included in the inventory given these represent investment in our dynamic framework, albeit on timescales less than a year. Per unit floor area UK average house's annual electric, gas and water bills were used. Allocations of bills to different activities were made using the Waste and Resources Action Programme (WRAP) study: Reducing the Environmental and Cost Impacts of Electrical Products (2012), and the European Commission's Ecodesign Preparatory Studies (Eup-network.de, 2018).

Demolition is not included in this study due to general lack of robust data and because literature suggests the energy needed for demolition represents ~1% of the lifetime demand of a building (Crowther, 1999; Stephan, Crawford and De Myttenaere, 2012).

Having assigned energy and carbon costs, I construct the carbon (and energy)-timescale distribution as I did in Chapter 2 by replacing monetary costs of items and regrouping them with their estimated service lives. Again, I apply the same Schmalwasser and Schihlowski (2006) mortality function to the discrete items-based timescales to give the full carbon (energy) timescale distribution of the

Representative Building. As before, this assumes I can aggregate all carbon and energy liabilities with the same timescales.

Finally, I calculate the aggregate carbon, and energy intensities of each annually incremented timescale by dividing the energy and carbon used by the monetary investment in a particular timescale. These intensities are used to estimate emissions in the simulations, particularly in the decarbonisation scenario where carbon intensity falls over time.

4.4.3 Simulations

To explore the time history of carbon emissions associated with the RB I simulate a carbon emissions schedule in line with construction, maintenance and operation costs. In this simulation, the RB is constructed with the carbon-timescale distribution and then maintained following the dynamics set out in Chapter 3. Specifically, the RB is constructed in 2020 incurring full construction emissions (the area under the carbon-timescale distribution). After 2020, maintenance of each timescale class is done when its monetary value falls below 70 % of its construction value, again because this threshold was seen to produce credible return on investment performance in Chapter 3. Maintenance carbon emissions are calculated by multiplying monetary investments in each timescale by the carbon intensity of that timescale.

For the BAU scenario the timescale distribution of the carbon intensity is constant. In the net-zero scenario the intensity of this distribution declines linearly from its 2020 state to zero in 2050 following the idealized scenarios set out (UNEP and UNEP Copenhagen Climate Centre, 2021).

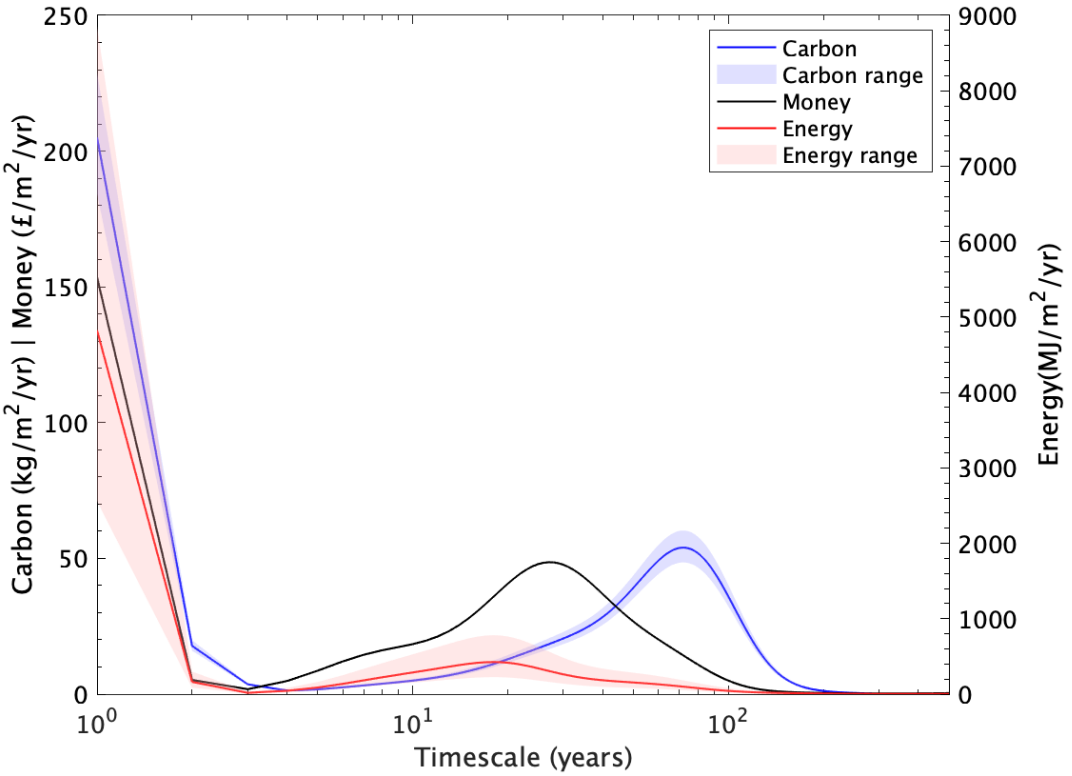
4.5 Results

4.5.1 Energy and carbon timescale distributions

Figure 4.1a shows the timescale distributions for energy, carbon and monetary investment in the creation of the RB. As with monetary investments, both energy and carbon produce similar multi-modal timescale distributions. For energy this has two components centred at ~1 and 18 years. Figure 4.1b shows the timescale distributions of the three intensities, carbon/money, carbon/energy and energy/money. The carbon/energy intensity is seen to peak at the ~100 year timescale and is associated with carbon intensive components such as concrete in core fabric of the building. In contrast, the timescale distribution of the energy/money intensity has three modes at 1, 12 and 180 years. The 1 year timescale represents both the construction work and the energy used for the subsequent operation. The 12 year mode possibly because of high energy demand of manufacturing of white goods. The 180 year mode is very likely to again be related to forming the main superstructure of the building.

The carbon liabilities are shifted to shorter timescales than their intensities, peaking in 72 years, reflecting the fact that although the principle carbon intense sub-structures live >100 years, monetary investments in them are low relatively i.e. they are financially cheap compared to their carbon liability. It is also interesting to note that although there are significant ~1 yr carbon liabilities associated with operating the building (Figure 4.1a), relative to investments in concrete products the intensities of this operational carbon is low (Figure 4.1b). This contrasts with energy, which has a maximum intensity at ~1 yr again associated with the construction and operation of the RB. Energy/money intensity

has two further modes at ~18 and ~120 years, the former largely associated with white goods and the latter the creation of the primary structures.



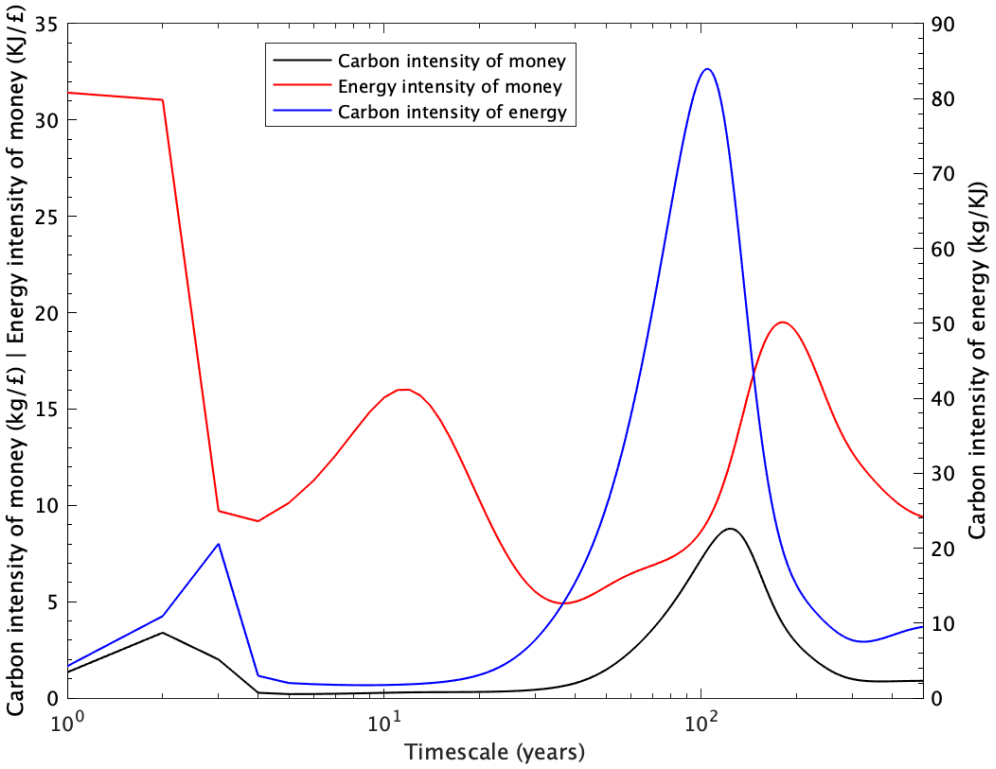


Figure 4.1 a. The timescale distributions for monetary investment, energy and carbon of a Representative Building. The patches are derived from the high-low ranges offered in the ICE database. b. The timescale distributions of energy/money, carbon/money and carbon/energy intensities.

4.5.2 Cumulative emissions

Figure 4.2a shows the cumulative carbon emissions of the RB post construction under the two scenarios of with, and without, carbon policy limits. It is not surprising to see that, under the BAU scenario, cumulative carbon of an RB simply increases at ~15 kg/m^2/yr given there is no decarbonisation of subsequent investments made into the operation and maintenance of the structure. The fluctuations about trend are due to the near stochastic maintenance schedule produced by the timescale distribution where in some years no maintenance is needed while in other years a few timescale groups require maintenance.

Under the net-zero 2050 scenario, cumulative emissions level off at ~7tC/m^2 by 2050 as operational and maintenance annual emissions decline in line with the projected carbon intensity of the wider economy. As shown in Figure 4.2b, in the 30 years between 2020 and 2050 the shorter-lived components require carbon investments for operation and maintenance. However, because of the decarbonisation of the wider economy, the bulk of the carbon liabilities in the longer-lived structures are avoided. This is illustrated in the BAU response post 2050 in Figure 4.2a which shows a steepening in the cumulative emissions as annual maintenance emissions rise in response to the ~70 year timescale for the RB being approached. This is important for climate policy given it suggests that there is an interaction between decarbonisation trajectories and the timescales and carbon intensities of new-build projects. This interaction would be further amplified by the nature of the substructures requiring replacement. In the net-zero simulation it is assumed that substructures can be decarbonized in line with the wider economy. However, replacements for, for example, concrete-based

substructures like those associated with the peak in carbon liabilities at ~70 years might make that difficult.

The carbon time history in Figure 4.2a also shows that the implementation of net-zero results in a ~60% reduction in the annual carbon emissions by 2030 relative to the BAU scenario, and achieves net-zero carbon by 2050. After 2070 items within the larger timescale classes are not likely to require maintenance by the end of building lifetime.

Figure 4.2b shows the carbon-timescale distribution of a building built in 2020 under the net-zero policy scenario, tracking its journey towards reaching zero emissions by 2050. It depicts the annual carbon emissions from operating and maintaining the building, showing a gradual decline to zero. It is clear that, shorter-lived components are the first to decarbonize due to their more frequent replacement cycles. Therefore, the majority of the decarbonisation is concentrated in short timescale classes, with 1-3 year timescales undergoing complete decarbonisation and other timescales only experiencing partial carbon reduction. In contrast, the larger timescales embedding larger amount of carbon, especially around ~70 years timescale, avoid decarbonization, as their lifetime exceed the timeframe remaining until the net-zero target is reached.

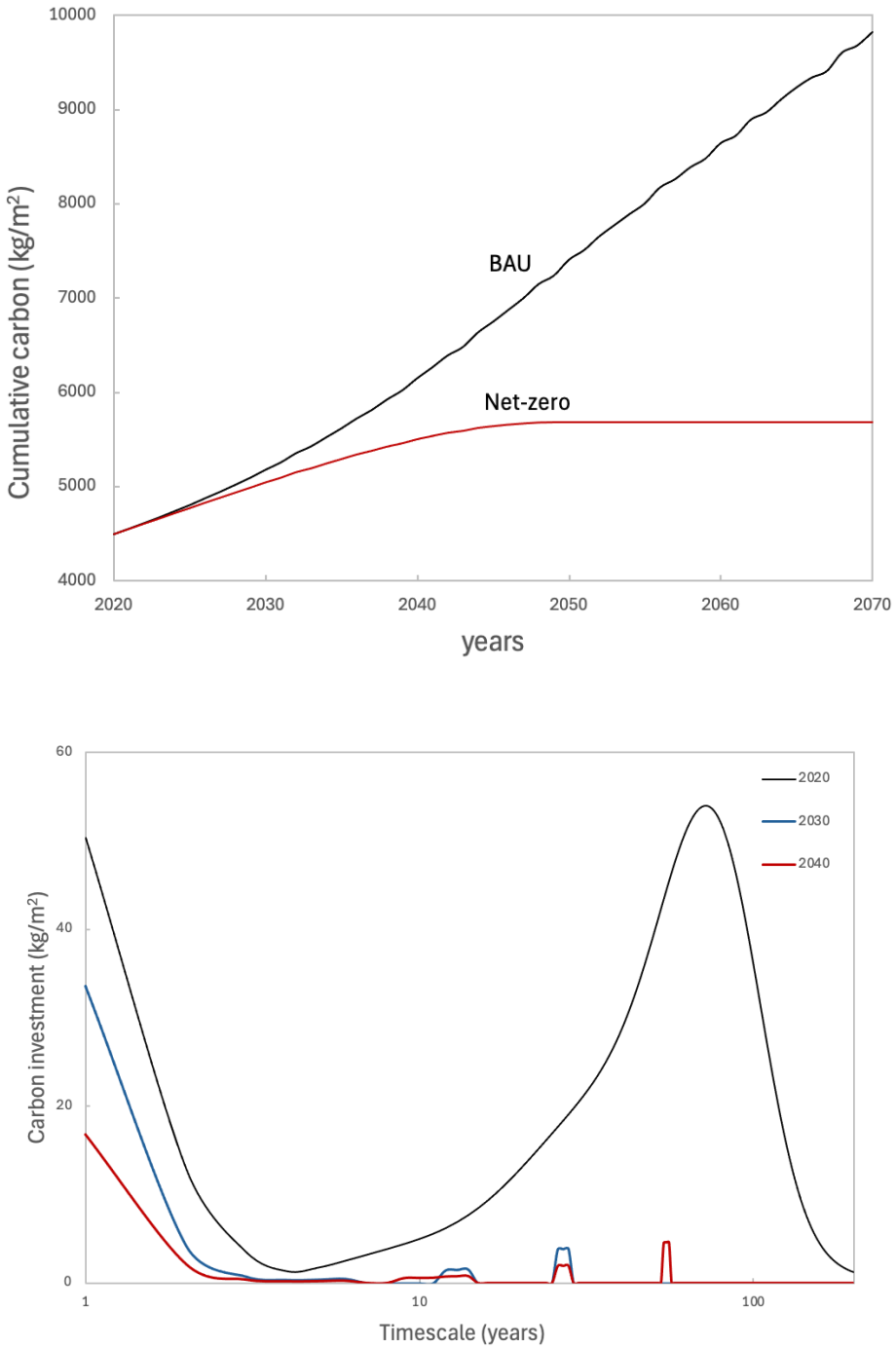


Figure 4.2 a. Cumulative carbon time histories under Business-As-Usual (black line) and net-zero 2050 scenarios (dark red line). b. Carbon-timescale distributions of an RB under the decarbonization scenario, when its newly built in 2020 (black line), in 2030 (blue line) and in 2040 (red line).

4.6 Discussion and Conclusions

Understanding the timescale distributions of recourse and carbon footprints are important, as long-lasting structures like buildings can result in carbon lock-in that will delay their transition to a net-zero carbon economy. That is why the required rapid transition to full decarbonization might require the removal of carbon-emitting assets by potentially removing assets ahead of planned retirement – otherwise known as stranded assets (Bos and Gupta, 2019). In this context it is also important to appreciate the interrelated nature of the timescales involved. For example, short term operational energy used to say warm a building depends on much longer timescale investments made into the fabric of the building. As a result, risks of asset stranding can be mitigated either by making adjustments in the construction phase, or through retrofitting structures, for example by adding more insulation.

The carbon-timescale inertia presented here shows not surprisingly that, all else remaining equal, the shorter-lived components would be the easiest to be decarbonized simply because they are replaced at a higher frequency, e.g. operational carbon emissions. This is in line with the findings of aforementioned study (Keoleian et al., 2000) that majority of the energy reduction happens in the operational stage, this is because of the short-lasting nature of operational carbon (energy). According to studies, operational carbon is important in the life cycle of a structure because energy use and carbon in the operational stage can account for up to 30%-90% of the total life cycle (Zhang et al., 2014; Cuéllar-Franca and Azapagic, 2012; Rosa et al., 2012). This is significantly influenced by user behaviors and wider socio-industrial dynamics. Consequently, the finding that

operational carbon emissions (including maintenance) of the RB account for 63% of total carbon emissions over a 50-year lifetime may vary depending on the case. The Climate Change Committee (CCC) has stated that, the UK is not on track to meet its carbon budget targets and stricter steps are needed (Dray, 2021). In response, one of the measures the UK government has taken is the Future Home Standards (FHS) that are coming into force in 2025, requiring new homes produce 75-80% less carbon emissions compared to current levels, by mandating actions such as no gas boilers and instead use low-carbon heating systems like heat pumps. This partially addresses the concern with short-term operational carbon reductions. However, the greatest carbon liabilities which lie in the longer lived (>70 year) skeletal fabric of buildings, often made from concrete, which complicates the pathway towards a decarbonized economy, as their lifetime outlast the time available to reach a net-zero economy . As a result, it appears the investment-timescale distribution is able to articulate the portion of remaining carbon-intensive timescales causing carbon lock-in during the journey of meeting net-zero.

This raises a further related point. Buildings constructed nearer in time to full decarbonisation of the economy will present less carbon liability simply by virtue of fact that the older a building is likely to be not only have used high carbon substructures, but also to be closer to the ~70 year threshold when these structures will require significant maintenance. Taken alone this suggests that central planning would probably be wiser to hold off on house building until a lower carbon economy emerged. However, there is an insufficiency of UK houses, as the housing stocks in the UK is the oldest among Europe and was constructed

with outdated materials and standards (Smith, 2021), making the current homes poorly suited to meet future climate targets. The CCC proposes that all new buildings must be constructed to zero carbon standard by 2025 (Climate Change Committee, 2019), addresses the challenge of decarbonizing long-lasting carbon intensive materials, and somewhat aligns with the observation of delaying new constructions until reaching a lower-carbon economy reduces the future carbon liability. However, decarbonizing the existing building stock remains critical, as 80% of the buildings that will exist in 2050 have already been built, with only 20% set to be built in the coming years (Warren et al., 2024). This underscores the urgent need for deep retrofitting of existing buildings, replacing traditional skeletal components with low-carbon alternatives.

The results also raise whether it is a good idea to design and build structures to survive as long as they do, given a rapidly transitioning economy would certainly benefit from the flexibility that short-lived structures afford. For example, modular or adaptable buildings with shorter lifetime that can easily be dismantled and upgraded to integrate new low-carbon technologies. Of course, there are economic and social reasons why investments in buildings are spread over such a large array of timescales, even if these reasons are currently not well articulated in the academic literature.

In conclusion, the investment-timescale framework within the climate context highlights the importance of the trade-off between durability and flexibility in new building design. It underscores the need for balanced, strategic guidelines that promote adaptable structures in response to the accelerating demand for decarbonization.

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5 Conclusion and future work

Building investments may be seen as resources allocated to the creation, maintenance, and operation of building substructures throughout a broad range of their turnover periods. These investments must also last long enough to provide a net-positive, time-weighted future return. This PhD presented the dynamic characteristics of investments in buildings and explored its implication in the dynamic maintenance schedule and its associated profitability, as well as determining the carbon liability of new build under the net-zero carbon policy. This chapter summarises the conclusion made in the thesis, considering the aims and objectives outlined in the previous chapters, and describes study limitations as well as areas of future works.

5.1 Conclusion

Chapter 2 established the investment-timescale distribution by looking into the relationship between the size of investment in building substructures and their turnover timescales. This is achieved by applying a mortality function for each cohort of substructures that have the same average service life, and aggregating them to form an assemblage that I say is representative of a large cohort of buildings – or a Representative Building (RB).

The investment-timescale distribution that is produced in this PhD is the first framework to view buildings through the spectrum of dynamics of their substructures. The definition of substructures is made necessarily wide to attempt include all objects and activities within a building. As a result, the investment-timescale distribution of an RB is a near-continuous, multi-modal distribution but with a first moment of around 40 years. This finding serves as an introduction to the notion that building construction, operation and maintenance are all essentially investments that spread across different turnover timescales from seconds to centuries. The ~40 years' average lifetime of building components very much mirrors average working lifetime of people (Ausubel and Grubler, 1995), showing possible deep connections between the behavior of buildings and the habitants that live inside them. As a result, the research in this thesis looks to contribute to the emerging field called of human-building interaction (HBI) (Alavi et al., 2019).

The investment-timescale distribution of the RB is the composite of 4 sub-timescale-distributions with representative service lives of around 1, 11, 30 and 62 years when considering monetary investments. This decomposition is somewhat in line with Brand's (1994) elaboration of building "shearing layers", a concept coined by Duffy and Henney (1989), which are composed of site (>300 years), structure (30-300years), skin (20 years), services (7-15 years), space plan (3-30 years), and stuff (1 day – 1 month) (Brand, 1994). According to Duffy, the reason for this layering is that "… there isn't such thing as a building. A building properly conceived is several layers of longevity of built components", (Brand, 1994). This form of disaggregation of turnover rates has also happened in larger

scales. Jaccard and Rivers (2007) disaggregated capital stocks to 3 hierarchies according to their turnover rates into urban form (beyond a century), housing stock (71.5 years) and equipment (20-30 years). The capital-timescale distribution for the US economy shows a similar effect, with the US economy being determined by one year consumptive turnover, as well as 7, 50, 104 years capital turnover (Chester et al., 2024). Therefore it appears this concept of systems being comprised of a range of discrete turnover timescales is important in understanding the functioning of complex structures. It is as important for the functioning of man-made structures as it is for the natural ones, our bodies, for example, consist of about 200 distinct cell types that form various human tissues, each with its own unique rate of turnover. Cell turnover occurs when cells undergo damage or die, requiring the body to generate new cells as replacements.

Chapter 3 constructed a dynamic maintenance schedule, by letting the investments depreciate at a rate inverse to their timescales until they hit a predetermined threshold and then restoring them. From this cohort-level maintenance schedule the overall ROI of the investments during construction, operation and maintenance, and its associated payback time could be evaluated. The resulting dynamic maintenance schedule that is produced by the interaction of investment-timescale distribution and maintenance threshold, exhibits near-stochasticity over time, providing one explanation for why maintenance scheduling has proven so difficult. This stochastic nature of built structures may also be related to the unpredictable fluctuations happen in the economy.

The maintenance threshold was kept at 70% in the simulation, because ROI reaches one when applying this restriction, making the payback time of the RB 30 years. This 70% threshold that allows depreciation of 30% from its initial value, and seems consistent with reality, as properties usually depreciate partially but still not too far from its new state. It is not a coincidence that 30 years' payback time is in line with the homeowners' mortgage payoff time in the UK (Office for National Statistics, 2020). Additionally, this payback time is also close to the average turnover timescale of building substructures from chapter 2, and the average working lifetime of an individual (Ausubel and Grubler, 1995). Again, there appears to be strong connections between these three, not least because mortgages are generally paid off with earnings over working lifetimes.

Chapter 4 extended the implication of the investment-timescale distribution to the climate change by evaluating the dynamics energy use and carbon emissions resulting from turnover timescales. This involved applying the maintenance dynamics from chapter 3 to create a carbon time history under the net-zero policy scenario and compared with Business-As-Usual.

The carbon-timescale inertia shown in chapter 4 reveals that, unsurprisingly, the components with shorter lifetimes are the more readily decarbonised due to their more frequent replacement, emphasizing the importance of carbon-intensive short-lasting investments in achieving a 2050 decarbonization goal for a 2020 level new building. Furthermore, it also shows that the most carbon intensive components, usually found in the skeleton of structure and made with concrete, have a lifetime of >70 years, can be delayed from decarbonisation if the route to a net-zero economy is shorter than 70 years. This is somewhat echoing with what

Mercure et al. (2021) found that the more carbon-intensive economic sectors, such as energy supply and transportation, are the first to be decarbonised in the net-zero carbon scenario. This implies that delaying construction until economies have decarbonized is a potentially valuable strategy. This brings up an additional aspect. Buildings built closer to the full decarbonisation of the economy will have less carbon liability simply because the older a building is, the more likely it is to have used high carbon substructures and to be closer to the 70 year threshold when these structures will need significant maintenance. This implies that it would be more prudent for central planning to delay housing construction until a more environmentally friendly economy is established.

5.2 Limitations and future work

The investment-timescale distribution in the built structure is a novel and interesting concept. However, there have been limitations in this PhD that may be addressed and expanded in future research works. The fact that only one BOQ was used because of the profound difficulty in obtaining them and the time required to analyse them question the works reproducibility. Analysing more BOQs from different locations and housing types should lead to a more robust model on building turnover dynamics. Although the carbon- and energy- timescale distributions include lower and higher scenarios, a comprehensive uncertainty analysis could have been conducted by using Monte Carlo simulation for all the distributions.

Given the rapid accumulation of new long-lived carbon-intensive capital assets in rapidly evolving economies such as China and India, focusing on these economies

should be a priority when evaluating and preventing carbon lock-in. Fast transition may accelerate the vulnerability of these economies to asset stranding, enhancing the significance of the turnover dynamics of their capital stocks in the discussion of stranded assets.

The investment-timescale distribution could also provide a powerful way of interrogating a range of complex systems other than buildings or built structures. There are approximately 3.72×10^{13} cells in an adult body (Bianco et al., 2013), with a range of turnover rates and survival timescales. The implication of investment-timescale dynamics in the regeneration and death of cells and tissues could help to better understand how the human body functions and interacts with its surroundings.

5.3 Reference

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5.4 Appendices

Appendix

Title	BOQ expansion
Description	This workbook contains expanded bill of quantities (BOQ), with assigned carbon emissions, energy and service life. All service life data is derived from BCIS (2006) Life Expectancy of Building Components. Surveyors' experiences of buildings in use, unless otherwise specified All carbon and energy data are derived from the Inventory of Carbon and Energy (Hammond & Jones, 2011), unless otherwise specified.

Tabs	Description
Money investmen	Financial cost of each item in the BOQ, already included in the original BOQ
Energy investmen	Embodied energy calculated using ICE database
Carbon inventory	Embodied carbon calculated using ICE database

Abbreviations

BOQ	Bill of quantities
BOM	Bill of materials
LCI	Life cycle inventory

Original Bill of Quantities

	Description	Qty	Unit	Rate	£ p
	Bill 1 Contractors Site Work				
	SITE WORKS				
	A01 PREAMBLES				
	Any specification clause mentioned in this Bill of Quantities refers to the Specifications prepared by Eric Cole Architecture, Craddys or the Employers Requirements. It should be noted that potentially there are alternative specifications for the same works requiring different products or standards. The Contractor should satisfy themselves that the specification references provided are the requirements that they consider comply with the Employers Requirements and Brief				
A	generally all of the above	1	ITEM	£0.00	£0.00
	A13 DESCRIPTION OF THE WORK				
	Preliminaries and Preambles				
	The Contractor and Sub Contractors should allow for all works identified within the appended Preliminaries Standard Bill; which includes for all attendances, support works and restriction on the works				
B	generally	1	ITEM	£0.00	£0.00
	A40 PRELIMINARIES				
	Time related preliminaries				
	As required for the works, defined and specified by Contractor				
C	generally	0	Week	£0.00	£0.00
	Fixed cost preliminaries				
	As required for the works, defined and specified by Contractor				
D	generally	1	ITEM	£0.00	£0.00
	On costs				
	As required for the works, defined and specified by the Contractor				
E	overheads	1	ITEM	£0.00	£0.00
F	profit	1	ITEM	£0.00	£0.00
G	price increases / inflation	1	ITEM	£0.00	£0.00
	Fees and Charges				
	As required for the works, defined and specified by the Contractor				
H	Planning Fees	1	ITEM	£0.00	£0.00
I	Building Regulation Inspection Fees and Costs	1	ITEM	£0.00	£0.00

J	Performance Bond	1	ITEM	£0.00	£0.00
K	Insurances	1	ITEM	£0.00	£0.00
	Page Total 1/1				**£0.00**
	Bill 1 Contractors Site Work				
A	Managing, maintaining and recording compliance with the obligations of CDM 2015	1	ITEM	£0.00	£0.00
B	others (specify)	1	ITEM	£0.00	£0.00
	A46 DESIGN FEES				
	Pre and Post Contract Design Fees				
	Pre Contract				
C	Architect	1	ITEM	£0.00	£0.00
D	Structural and Civil Engineer	1	ITEM	£0.00	£0.00
E	Services Consultant	1	ITEM	£0.00	£0.00
F	BREEAM Consultant	1	ITEM	£0.00	£0.00
G	Building Control	1	ITEM	£0.00	£0.00
H	Acoustic Consultant	1	ITEM	£0.00	£0.00
I	Highways Consultant	1	ITEM	£0.00	£0.00
J	Pre demolition surveys	1	ITEM	£0.00	£0.00
K	Principal Designer	1	ITEM	£0.00	£0.00
L	Principal Contractor	1	ITEM	£0.00	£0.00
M	Others (specify)	1	ITEM	£0.00	£0.00
	Post Contract				
N	Architect	1	ITEM	£0.00	£0.00
O	Structural and Civil Engineer	1	ITEM	£0.00	£0.00
P	Services Consultant	1	ITEM	£0.00	£0.00
Q	BREEAM Consultant	1	ITEM	£0.00	£0.00
R	Building Control	1	ITEM	£0.00	£0.00
S	Acoustic Consultant	1	ITEM	£0.00	£0.00
T	Highways Consultant	1	ITEM	£0.00	£0.00
U	Pre demolition surveys	1	ITEM	£0.00	£0.00
V	Principal Designer	1	ITEM	£0.00	£0.00
W	Principal Contractor	1	ITEM	£0.00	£0.00
X	Others (specify)	1	ITEM	£0.00	£0.00
	Page Total 1/2				**£0.00**
	Bill 1 Contractors Site Work				
	A54 CLIENT PROVISIONAL SUMS				

Include the following defined Employers Provisional Sums, the Contractor must account for the following works in his programme; should the Contractor require any further information to assist in the programming he must contact the CA.

There are no defined provisional sums identified in the documents

A	Contractor to make allowances as required	1	ITEM	£0.00	£0.00
B	Add for Main Contractors profit: _____%	0		£0.00	£0.00
C	Add for Main Contractors overhead: _____%	0		£0.00	£0.00
D	Allow for general attendance	1	ITEM	£0.00	£0.00

Include the following (un)defined Employers Provisional Sums, the Contractor must account for the following works in his programme; should the Contractor require any further information to assist in the programming he must contact the CA.

There are no undefined provisional sums identified in the documents

E	Contractor to make allowances as required	1	ITEM	£0.00	£0.00
F	Add for Main Contractors profit: _____%	0		£0.00	£0.00
G	Add for Main Contractors overhead: _____%	0		£0.00	£0.00
H	Allow for general attendance	1	ITEM	£0.00	£0.00

A55 DAYWORKS

Include the following undefined Employers Provisional Sums for Dayworks; as defined by the RICS and BEC

Labour

I	Include the sum of £_____.__ for the cost of labour	1	ITEM	£0.00	£0.00
J	Add for Main Contractors profit: _____%	0		£0.00	£0.00
K	Add for Main Contractors overhead: _____%	0		£0.00	£0.00

Products

L	Include the sum of £_____.__ for the cost of products	1	ITEM	£0.00	£0.00
M	Add for Main Contractors profit: _____%	0		£0.00	£0.00
N	Add for Main Contractors overhead: _____%	0		£0.00	£0.00

Equipment

O	Include the sum of £_____.__ for the cost of plant (equipment)	1	ITEM	£0.00	£0.00
P	Add for Main Contractors profit: _____%	0		£0.00	£0.00
Q	Add for Main Contractors overhead: _____%	0		£0.00	£0.00

A56 CONTRACTORS PROVISIONAL SUMS

The Contractor is to list below all works for which they wish to include a Provisional Sum

Defined - scope to be clarified below

A	Subcontractor personnel transport and materials transport	1	ITEM	£70,500.00	£70,500.00

Undefined - scope to be clarified below

B	generally	1	ITEM	£0.00	£0.00

Page Total 1/4 **£70,500.00**

Bill 2 Site Preparation

SITE PREPARATION Risk

EXCAVATION RISK ITEMS

Excavating Risk; (Contractor to note: the following elements have been described but not quantified as this is an element of contractor's risk - Contractor to complete the risk design)

To reduce levels

A	soft spots; including filling all soft spots with approved granular fill material, compacting and proof rolling - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00

Extra over excavation irrespective of depth for excavating

B	next existing services - to be priced as rate only per cubic metre	0	m	£0.00	£0.00
C	around existing services crossing excavations - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
D	archeological digging on site; complete including the risk of time loss and all elements pertaining to the archeological dig	1	ITEM	£0.00	£0.00

Extra over excavation irrespective of depth for breaking out and removal off site all spoils

E	rock - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
F	concrete - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
G	reinforced concrete - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
H	brickwork blockwork or stonework - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
I	contaminated material - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00

Disposal Risk

Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters

J	off site	1	ITEM	£0.00	£0.00

Excavated material

K	soft spot material - to be priced as rate only per cubic metre of inert	0	m3	£0.00	£0.00
L	extra over off site disposal for the disposal of contaminated material; Contractor to develop	0	m3	£0.00	£0.00
	Page Total 2/1				**£0.00**
	Bill 2 Site Preparation				
	Site Preparation				
	A13 DESCRIPTION OF THE WORK				
	Demolition activities				
	The Contractor and Sub Contractors should allow for all works identified within the appended Demolitions Standard Bill; which includes for all attendances, isolation of services, provision of hoardings, site surveys and investigations				
A	generally	1	ITEM	£0.00	£0.00
	C21 TOXIC HAZARD WASTE REMOVAL				
	Removal of materials hazardous to health				
	Carry out Type 3 / refurbishment and demolition survey of all areas affected by the works; including those likely to be affected by the services installations				
B	generally	1	ITEM	£0.00	£0.00
	Remove all materials identified in Type 3 / demolition and refurbishment survey as hazardous to health; in manner appropriate to the material and dispose off site to facility suitable for the material				
C	generally	1	ITEM	£0.00	£0.00
	Guano Removal				
	Removal all pigeon guano and associated debris from site				
D	generally	1	ITEM	£0.00	£0.00
	UXO Survey				
	Carry out full UXO survey, and act upon all findings as may be required				
E	generally	1	ITEM	£0.00	£0.00
	All other materials hazardous to Health				
	Identify all other materials retained within the working areas, make safe and or remove from working areas as appropriate				
F	removal of all other materials not suitable for general waste	1	ITEM	£0.00	£0.00
G	generally	1	ITEM	£0.00	£0.00
H	sharps removal (internal and external)	1	ITEM	£0.00	£0.00
	Page Total 2/2				**£0.00**

Bill 2 Site Preparation

C90 ALTERATIONS - SPOT ITEMS

Demolitions to external areas generally

Allow for all works to break out, demolish and remove from site; leaving the site with all voids filled with well compacted granular material, safe and level

A	removal of all stockpiles of debris, waste and the like	1	ITEM	£0.00	£0.00

D20 EXCAVATING AND FILLING

Site Preparation

Protect all tress retained on site

B	generally	1	ITEM	£0.00	£0.00

Removing contaminated ground

Ground infected with Buddleia; allow for the excavation, segregation and subsequent treatment of all spoil, roots and vegetation relating to plant growth

C	generally - Provisional Quantity	50	m2	£0.00	£0.00

Excavating

To reduce levels

D	no details - Provisional Quantity	279	m3	£3.24	£903.96

Disposal

Excavated material

E	off site; it has been assumed all excavated material to be taken off site; inert non hazardous - Provisional Quantity	140	m3	£35.65	£4,991.00
F	on site; in stock piles suitable for reuse	140	m3	£6.48	£907.20

Selected excavated material

Filling to make up levels; compacting in layers

G	over 250mm average thick	140	m3	£8.64	£1,209.60

Surface Treatments

Compacting ground

H	generally	2678	m2	£0.76	£2,035.28

Page Total 2/3 **£10,047.04**

Bill 3 Substructures

Excavation RISK

EXCAVATION RISK ITEMS

Excavating Risk; (Contractor to note: the following elements have been described but not quantified as this is an element of contractor's risk - Contractor to complete the risk design)

To reduce levels

A	soft spots; including filling all soft spots with approved granular fill material, compacting and proof rolling - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
	Extra over excavation irrespective of depth for excavating				
B	next existing services - to be priced as rate only per cubic metre	0	m	£0.00	£0.00
C	around existing services crossing excavations - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
D	archeological digging on site; complete including the risk of time loss and all elements pertaining to the archeological dig	1	ITEM	£0.00	£0.00
	Extra over excavation irrespective of depth for breaking out and removal off site all spoils				
E	rock - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
F	concrete - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
G	reinforced concrete - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
H	brickwork blockwork or stonework - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
I	contaminated material - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
	Disposal Risk				
	Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters				
J	off site	1	ITEM	£199.84	£199.84
	Excavated material				
K	soft spot material - to be priced as rate only per cubic metre of inert	0	m3	£0.00	£0.00
L	extra over off site disposal for the disposal of contaminated material; Contractor to develop	0	m3	£0.00	£0.00
	Page Total 3/1				**£199.84**
	Bill 3 Substructures				
	D20 EXCAVATING AND FILLING				
	Excavating				
	Ground beams; from formation level				
A	not exceeding 1.00m deep	348	m3	£6.48	£2,255.04
	Pits, pad foundations 1 nr; from formation level				
B	1.00m maximum depth	2	m3	£12.96	£25.92
	Working space allowance; complete with backfilling with approved well compacted material; including all design, maintenance and removal as required				

C	pits	4	m2	£6.48	£25.92
D	trenches	980	m2	£4.32	£4,233.60
	Earthwork support				
	To faces of excavation; including all additional backfilling with well compacted granular material, making good as required, designed, supplied and installed, maintained and removed by specialist Sub Contractor				
E	1.00m maximum depth; distance between opposing faces not exceeding 2.00m	980	m2	£3.24	£3,175.20
F	1.00m maximum depth; distance between opposing faces 2.00 to 4.00m	4	m2	£5.40	£21.60
	Disposal				
	Excavated material				
G	off site; it has been assumed all excavated material to be taken off site; to be treated as inert hazardous material	350	m3	£35.65	£12,477.50
	Surface Treatments				
	Compacting ground				
H	generally	668	m2	£0.76	£507.68
	Compacting bottoms of excavations				
I	generally	433	m2	£0.76	£329.08
	D30 PILING				
	Bored Cast-in-place piles; as Craddys drawings				
	Bored cast-in-place piles to site generally; in various locations; deemed to include the transport to site and from site of all plant, materials and equipment required for the piling operations; all plant movements on site; all setting out; concrete, reinforcement and formwork; all ancillary piling operations required to satisfy the piling design; designed and installed by specialist Sub Contractor				
J	generally 300mm diameter	117	Nr	£834.44	£97,629.48
	Page Total 3/2				**£120,681.02**
	Bill 3 Substructures				
	Items extra over piling				
	Contractor to make allowance for any required pile probing on the line of the existing deep drainage line				
A	generally	1	ITEM	Included	Included
	Move piling rig to different piling points				
	Make allowance to move piling rig from position to position including moving to new position as identified on engineers pile layout;				
B	generally; 117nr piles	1	ITEM	Included	Included
	Cutting off tops of piles				

Cutting off tops of piles; Heights to be developed by contractor as to construction methods on site

C	300mm diameter piles; cutting length to be developed by contractor; below top of pilemat	117	Nr	£19.44	£2,274.48

Disposal

Surplus excavated material; based on piles to be 12.00m deep; material taken to be inert non hazardous

D	disposal off site	99	m3	£35.65	£3,529.35

Authorised delays

Rig standing time

E	generally	12	hr	Included	Included

Pile tests; as required by the design

Testing piles to the satisfaction of the Employers Representative for the works

F	as required by the design	1	ITEM	Included	Included

Attendances on piling

Piling mat; designed to suit the piling rig(s) for the project; provide, lay and level (note area measured allows for the full site area); Contractor to to note: the pilemat is the same size as the building footprint; no allowance has been made for any additional pilemat beyond the building footprint; Contractor to note: Make allowance for excavation for the pilemat, removal of soil and import of suitable pilemat material - Top of concrete foundations is formation level for excavation

G	based on marked up drawing, taken to be nominally 600mm thick; assumed to be constructed using imported approved well compacted granular material; compaction to engineers requirements; top of pile mat taken to be 600mm above top of pile caps	1117	m2	£34.57	£38,614.69

Page Total 3/3 **£44,418.52**

Bill 3 Substructures

Disposal of piling mat on completion of the piling operations; it is assumed that the pilemat is to be removed completely; and making allowance for compacting and preparing for new works

A	generally	1117	m2	£22.69	£25,344.73

General attendances on the piling Sub Contractor

B	as required	1	ITEM	£297.07	£297.07

Special attendances on the piling Sub Contractor

C	as required	1	ITEM	£297.07	£297.07

E10 MIXING / CASTING / CURING IN SITU CONCRETE

Plain concrete grade Gen 1

	Blinding concrete				
D	not exceeding 150mm thick	11	m3	£149.07	£1,639.77
	Filling to hollow walls				
E	not exceeding 150mm thick	27	m3	£149.07	£4,024.89
	Plain concrete grade Gen 3				
	Mass fill concrete				
F	generally	2	m3	£156.64	£313.28
	Reinforced concrete grade FND2z				
	Foundations				
G	generally	228	m3	£182.56	£41,623.68
	Isolated foundations				
H	generally	1	m3	£182.56	£182.56
	Grouting				
	Combextra or similar approved non shrink grout to holding down bolt assemblies and plates				
I	generally	18	Nr	£19.44	£349.92
	E20 FORMWORK FOR IN SITU CONCRETE				
	Formwork, basic finish				
	Sides of ground beams and edges of beds				
J	not exceeding 250mm high	8	m	£23.77	£190.16
K	500 to 1000mm high	1202	m	£30.25	£36,360.50
	Circular mortices				
L	forming holding down bolt assembly cones and the like; measured per assembly	18	Nr	£27.01	£486.18
	Page Total 3/4				**£111,109.81**
	Bill 3 Substructures				
	Cordek anti heave boards				
	Claymaster board; 50mm thick to sides of foundations				
A	500 to 1000mm high	134	m	£20.52	£2,749.68
	Cordek Cellcore HXB 18/24 heave protection				
B	to underside of foundations	79	m2	£16.20	£1,279.80
	E30 REINFORCEMENT FOR IN SITU CONCRETE				
	Reinforcement - no details				
	High tensile steel deformed square bar reinforcement to B.S.4449 grade 460; bars				
C	H10	3.83	T	£1,593.36	£6,102.57
D	H12	0.55	T	£1,636.57	£900.11

E	H16	3.28	T	£1,712.18	£5,615.95
F	H20	4.95	T	£1,795.36	£8,887.03
G	H25	4.66	T	£1,847.21	£8,608.00

E41 WORKED FINISHES/CUTTING TO IN SITU CONCRETE

Worked finishes

Power floating

H	generally	3	m2	£10.80	£32.40

E42 ACCESSORIES CAST INTO IN SITU CONCRETE

Casting in holding down bolts

Cast in holding down bolts supplied by others, complete with all formwork, setting out and the like

I	measured as sets	18	Nr	£27.01	£486.18

E60 PRECAST/COMPOSITE CONCRETE DECKING

Beam and Block; as specification notes

RMC pre cast concrete beam and dense aggregate block floor; including all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork sleeper walls

J	nominally 150mm thick	671	m2	£69.00	£46,299.00

Extra over for

K	holes for services and drainage	52	Nr	£5.00	£260.00
L	provision of additional supports for stair cases	6	Nr	£100.00	£600.00
M	provision of additional supports for lift shaft	1	Nr	£100.00	£100.00

Page Total 3/5 **£81,920.72**

Bill 3 Substructures

F10 BRICK/BLOCK WALLING

Blockwork; as specification notes

Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond; laid flat

A	100mm thick	415	m2	£22.80	£9,462.00
B	215mm thick; assumed to be 100mm blocks laid flat	76	m2	£45.58	£3,464.08
C	215mm thick; assumed to be 100mm blocks laid flat; in piers	2	m2	£45.58	£91.16

Extra over blockwork for

D	cutting blockwork to course 100mm thick	619	m	£5.00	£3,095.00
E	cutting blockwork to course 215mm thick	113	m	£10.00	£1,130.00

Brickwork below DPC

	Engineering bricks; manufacturer and product reference to be agreed; 7.5N/mm2 compressive strength; half lap stretcher bond; flush joints; walls				
F	half brick thick	62	m2	£72.20	£4,476.40
	F30 ACCESSORIES AND SUNDRY ITEMS FOR BRICK, BLOCK AND STONE WALLING				
	Forming cavities; as specification notes				
	Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre				
G	125mm wide	220	m2	£3.60	£792.00
	Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre; and rigid insulation board; Celotex CG5000 50mm thick				
H	100mm wide	19	m2	£11.54	£219.26
	Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre; and rigid insulation board; Celotex CG5000 75mm thick				
I	125mm wide	55	m2	£16.04	£882.20
	Damp proof courses; as specification notes				
	Visqueen Zedex Housing grade damp proof course; bedding in cement mortar				
J	not exceeding 225mm wide	87	m2	£16.45	£1,431.15
	Page Total 3/6				**£25,043.25**
	Bill 3 Substructures				
	Telescopic vents				
	Glidevale Limited ZLAB airbrick with ZLPS periscope vent; colour Anthracite; building in as work proceeds				
A	generally	223	Nr	£16.50	£3,679.50
	Page Total 3/7				**£3,679.50**
	Bill 4 Frame				
	Frame				
	A44 TEMPORARY WORKS				
	Temporary Bracing and propping				
	Provision of all required temporary bracing, propping and other equipment required to maintain stability of the steel frame during erection until complete as necessary, designed, manufactured, installed and removed by specialist Sub Contractor				
A	generally	1	ITEM	Included	Included
	F31 PRECAST CONCRETE SILLS/LINTELS/COPINGS/FEATURES				

Pre cast concrete GEN3 padstones

Pre cast concrete padstones, building in as work proceeds

B	440 x 215 x 100mm	18	Nr	£60.00	£1,080.00
C	600 x 215 x 100mm	5	Nr	£77.50	£387.50
D	900 x 215 x 100mm	3	Nr	£130.00	£390.00
E	440 / 440 x 215 x 100mm L shaped	3	Nr	£135.00	£405.00

G10 STRUCTURAL STEEL FRAMING

Fabricated steelwork to B.S.4360

All steelwork is to be designed, manufactured, supplied and erected by specialist Sub Contractor; including, but not limited to, all surface treatments; factory applied finishes; localised repairs and the like as required following installation; making good following installation; in accordance with specifications prepared by Craddys and the National Steelwork Specifications

F	Supply and erect all steelwork required for the Coombe Shute, Stoke Gabriel Housing project; including all galvanising as may be required	1	ITEM	£35,137.64	£35,137.64

The following is presented for the purpose of check quantities; and is measured from the drawings provided; and makes no allowance for design development; resizing for optimum efficiency and the like; and is the total of steelwork shown on the drawings

Columns

G	weight not exceeding 40kg/m	0.77	T	Included	Included
H	weight not exceeding 40kg/m; square hollow section	0.19	T	Included	Included
I	weight not exceeding 40kg/m; galvanised	0.41	T	Included	Included
J	weight not exceeding 40kg/m; galvanised; square hollow section	0.75	T	Included	Included

Page Total 4/1 **£37,400.14**

Bill 4 Frame

Beams

A	weight not exceeding 40kg/m	6.21	T	Included	Included
B	weight not exceeding 40kg/m; square hollow section	0.06	T	Included	Included
C	weight not exceeding 40kg/m; galvanised	1.51	T	Included	Included
D	weight not exceeding 40kg/m; galvanised; rectangular hollow section	0.44	T	Included	Included
E	weight 40 to 100kg/m	0.7	T	Included	Included

Holding down bolts

F	complete assemblies	28	Nr	Included	Included

	Fittings				
G	generally; assessed at 17.5% of all steelwork	1.92	T	Included	Included
	Framing and erection				
	On site				
H	all works required to erect steel framework on site	12.96	T	Included	Included
	Cold bridging				
	Allow for all works necessary to eliminate cold bridging within the design of the steel frame; by use of proprietary fittings and equipment				
I	generally - no details	1	ITEM	Included	Included
	G12 ISOLATED STRUCTURAL METAL MEMBERS				
	Isolated structural and secondary steelwork				
	Steelwork designed, manufactured, supplied and installed by specialist Sub Contractor				
J	additional framing and supports to external and internal walls	1	ITEM	Included	Included
K	additional framing and supports to roof structure, including all cleader rails and the like	1	ITEM	Included	Included
L	additional framing and supports to curtain walling, removable panels and the like	1	ITEM	Included	Included
M	additional framing and supports to mechanical and electrical installations	1	ITEM	Included	Included
N	windposts, WP3, nominally 2.40m long	2	Nr	£415.00	£830.00
	M60 PAINTING/CLEAR FINISHING EXTERNALLY				
	Bitumen paint to steelwork				
	Prepare, touch up primer and apply two coats of approved bitumen based paint (RIW or similar) to steelwork, general surfaces				
O	generally over 300mm - provisional quantity	5	m2	£16.20	£81.00
	Page Total 4/2				**£911.00**
	Bill 4 Frame				
	Painting to external steelwork				
	Prepare, touch up primer and apply two coats of approved exterior grade gloss paint to steelwork, general surfaces				
A	generally over 300mm - provisional quantity	35	m2	£10.00	£350.00
	M61 INTUMESCENT COATINGS FOR FIRE PROTECTION OF STEELWORK				
	Intumescent painting				
	Nulifire or similar approved intumescent paint finish to exposed surfaces; to achieve one hour fire rating; general surfaces of structural metalwork				

B	over 300mm girth - Provisional Quantity - measured to all surfaces of all steelwork	239	m2	£8.00	£1,912.00
	Page Total 4/3				**£2,262.00**
	Bill 5 Upper Floors				
	Upper Floors				
	E60 PRECAST/COMPOSITE CONCRETE DECKING				
	Pre cast concrete floors				
	RMC or similar approved hollow core pre cast concrete floor planks; including all grouting of ends of hollows, all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork walls				
A	nominally 150mm thick	48	m2	£69.00	£3,312.00
	RMC or similar approved hollow core acoustic rated pre cast concrete floor planks; including all grouting of ends of hollows, all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork walls				
B	nominally 150mm thick	407	m2	£69.00	£28,083.00
	G20 CARPENTRY/TIMBER FRAMING/FIRST FIXING				
	TJI floor joists				
	Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings, blockings and the like as required to complete installation				
C	to suit upper floor area of 50.49m2; unit 1	1	ITEM	£2,253.00	£2,253.00
D	to suit upper floor area of 56.18m2; unit 2	1	ITEM	£2,343.00	£2,343.00
E	to suit upper floor area of 54.39m2; unit 3	1	ITEM	£2,178.00	£2,178.00
F	to suit upper floor area of 54.39m2; unit 4	1	ITEM	£2,178.00	£2,178.00
G	to suit upper floor area of 54.41m2; unit 10	1	ITEM	£3,052.00	£3,052.00
	Extra over for				
H	trimmers or additional joists to suit unit 1, 2.44m long	2	Nr	£12.00	£24.00
I	trimmers or additional joists to suit unit 3, 3.12m long	2	Nr	£15.00	£30.00
J	trimmers or additional joists to suit unit 4, 3.12m long	2	Nr	£15.00	£30.00
	Sawn softwood				
	Sawn softwood, for exterior use; preservative treated; grade C24				
K	50 x 150mm joists	98	m	£4.90	£480.20
L	50 x 150mm joists; fixed to steel frame with and including bolts	41	m	£5.35	£219.35

	Page Total 5/1				**£44,182.55**
	Bill 5 Upper Floors				
	Fixings; galvanised mild steel				
	Straps; to suit upper floors; plugged and screwed to masonry walls; nailed to joists				
A	nominally 1750mm long, 50 x 3mm; bent once	129	Nr	£9.00	£1,161.00
	Joist hangers, external quality, nailed				
B	to suit 150 x 50mm joists	160	Nr	£2.40	£384.00
	K11 RIGID SHEET FLOORING/SHEATHING/LININGS/CASINGS				
	Floor boarding				
	Chipboard to B.S..5669 part 2; tongued and grooved flooring panels, all joints secret screwed to joists and glued, all joints offset; floors				
C	over 300mm wide	270	m2	£8.03	£2,168.10
	K20 TIMBER BOARD FLOORING/SHEATHING/LININGS/CASINGS				
	Balcony flooring - no details				
	Assumed to be hardwood ribbed decking boards; screw fixed to timber joists; 125 x 19mm section; with nominal 5mm gap between boards; complete with anti slip finish; preservative treated				
D	over 300mm wide	23	m2	£94.30	£2,168.90
	P10 SUNDRY INSULATION/PROOFING WORK/FIRE STOPS				
	Fire breaks				
	Rockwool or similar approved cavity fire breaks; at perimeter of upper floors; nominally 200 x 300mm section				
E	horizontal	327	m	£20.75	£6,785.25
	Page Total 5/2				**£12,667.25**
	Bill 6 Roof				
	Roof				
	G20 CARPENTRY/TIMBER FRAMING/FIRST FIXING				
	Structural softwood				
	Sawn softwood, preservative treated; grade C24; pitched roof members				
A	150 x 50mm, C24 timber joists at 400mm centres; to porches	41	m	£4.90	£200.90
B	150 x 50mm, C24 timber joists at 400mm centres; to dormers	65	m	£5.10	£331.50
C	175 x 50mm, C24 timber joists at 400mm centres; to unit 5 to 9	913	m	£5.88	£5,368.44
D	250 x 25mm, C24 timber ridges; to unit 5 to 9	15	m	£6.38	£95.70

	Sawn softwood, preservative treated; grade C24; dormer wall construction					
E	100 x 50mm, C24 timber joists at 400mm centres	267	m	£4.37	£1,166.79
	Sawn softwood, preservative treated; bolted to timber beams; plates					
F	100 x 50mm	30	m	£5.37	£161.10
	Sawn softwood, preservative treated; bolted to steel beams; plates					
G	100 x 50mm	183	m	£5.37	£982.71
	Sawn softwood, preservative treated; bolted to masonry with resin anchors at 300mm centres; plates					
H	100 x 50mm	10	m	£5.37	£53.70
	Sawn softwood, preservative treated; bedded in mortar; plates					
I	100 x 50mm	287	m	£4.82	£1,383.34
J	100 x 50mm; to verges	60	m	£4.37	£262.20
	Sawn softwood, preservative treated; framing to eaves and verges					
K	nominally 50 x 50mm	1235	m	£3.04	£3,754.40
L	nominally 50 x 50mm; plugged and screwed to masonry walls	378	m	£3.04	£1,149.12
	Trusses; as Employers Requirements					
	Roof trusses, designed, manufactured, supplied and installed by specialist Sub Contractor, complete with all bracings, fixings, central walkway boards; openings for access hatches and the like as required to complete installation					
M	total roof area - on plan; garage units for 7 to 9	90	m2	£35.00	£3,150.00
N	total roof area - on plan; timber store	8	m2	£35.00	£280.00
	Page Total 6/1				**£18,339.90**
	Bill 6 Roof					
A	total roof area - on plan; car port	56	m2	£35.00	£1,960.00
B	total roof area - on plan; units 1 and 2, including 4 dormers	168	m2	£34.76	£5,839.68
C	total roof area - on plan; units 3 and 4, including central shallow pitched valley	157	m2	£26.25	£4,121.25
D	total roof area - on plan; unit 10	104	m2	£27.83	£2,894.32
	Plywood layboards					
	Assumed to be 12mm plywood; nailed to trusses					
E	nominally 300mm wide	158	m	£10.00	£1,580.00
	Fixings					

	Straps; assumed to be galvanised mild steel; fixed to timber and masonry				
F	assumed to be 1700 x 50 x 3mm, bent once; to verges	50	Nr	£9.20	£460.00
G	assumed to be 1200 x 50 x 3mm, bent once; to plates	228	Nr	£8.38	£1,910.64
	Joist hangers, shoes, brackets and the like				
H	as required to complete installation	1	ITEM	£500.00	£500.00
	H62 NATURAL SLATING				
	Roof slating; as planning drawings				
	Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt / breather membrane and the like to complete installation				
I	pitch 25 degrees	68	m2	£45.00	£3,060.00
J	pitch 35 degrees	914	m2	£35.00	£31,990.00
	Abutments; complete with all additional battens, including over sized or cut slates to suit				
K	pitched at 35 degrees	71	m	£12.00	£852.00
L	horizontal to tops of pitch	10	m	£8.00	£80.00
M	horizontal to bottom of pitch	23	m	£8.00	£184.00
	Eaves; complete with tilting fillet, ventilation, dressing felt / breather membrane into gutter				
N	including approved slip course of slates	318	m	£13.00	£4,134.00
	Verges; complete with undercloak, dressed tiles and mortar as required; including oversized slates to suit				
O	generally	60	m	£23.00	£1,380.00
	Page Total 6/2				**£60,945.89**
	Bill 6 Roof				
	Ridges; dry ridge system with all fixings, ventilation and the like, including additional battens				
A	generally	103	m	£31.00	£3,193.00
	Hips; dry ridge system with all fixings, ventilation and the like, including additional battens				
B	generally	185	m	£45.00	£8,325.00
	Valleys; cutting to both sides of valley (liner measured elsewhere) complete with all additional battens				
C	generally	54	m	£34.00	£1,836.00
	Holes				
D	generally	1	ITEM	£100.00	£100.00
	Hip irons				

E	generally	36	Nr	£7.00	£252.00
	H71 LEAD SHEET COVERINGS/FLASHINGS				
	Code 4 lead flashings; as Employer Requirements				
	Flashings to abutments; complete with dressing into masonry as required; finishing with one coat of patination oil				
F	stepped flashing to pitched abutment from roof tiles to masonry; dressing up face of masonry and over slates; girth nominally 350mm	15	m	£53.00	£795.00
G	horizontal flashing to abutment from roof tiles to masonry; dressing up face of masonry and over slates; girth nominally 300mm	7	m	£33.00	£231.00
H	horizontal flashing to flat roof skirting to masonry; dressing up face of masonry and over skirting; girth nominally 300mm	42	m	£33.00	£1,386.00
I	soakers to flashing to pitched abutment from roof tiles to masonry; dressing under and over slates and up face of masonry; nominally soakers of 300 x 400mm	61	Nr	£5.00	£305.00
	Code 5 lead flashings				
	Flashings to valleys; complete with dressing onto timber battens and over plywood; finishing with one coat of patination oil				
J	valley lining; nominally 450mm girth; bent five times; fixed to battens; in lengths not exceeding 1.50m, with 150mm lap	54	m	£69.00	£3,726.00
	Page Total 6/3				**£20,149.00**
	Bill 6 Roof				
A	secret gutter valley lining; nominally 450mm girth; bent five times; fixed to battens; in lengths not exceeding 1.50m, with 150mm lap	64	m	£69.00	£4,416.00
	J42 SINGLE LAYER PLASTICS ROOF COVERINGS				
	Flat roof coverings; no details				
	Assumed to be Sarnafil or similar approved single ply warm roof covering; complete with all required vapour barriers, insulation, breather membranes, fleeces, fixings, trims, seals and the like; laid on pre cast concrete planks; designed, manufactured and installed by specialist Sub Contractor				
B	pitch not exceeding 4 degrees	44	m2	£81.00	£3,564.00
C	pitch 5 degrees; with standing seam effect rolls at 600mm centres	32	m2	£81.00	£2,592.00
	Skirtings; complete with all required insulation and the like; dressing up face of walls / parapets and the like; make good as required; including all cappings, trims, formers				
D	not exceeding 200mm girth	42	m	£30.00	£1,260.00

	Flashings; complete with all required insulation and the like; dressing up roof trusses behind slates; make good as required; including all cappings, trims, formers				
E	400 to 600mm girth	44	m	£30.00	£1,320.00
	Eaves; complete with all required insulation and the like; dressing over and into gutter; make good as required; including all cappings, trims, formers				
F	200 to 400mm girth	9	m	£30.00	£270.00
	Approved paving slabs, on and including pedestals as required to provide working terrace to flat roof, no details				
G	pitch not exceeding 4 degrees	34	m2	£40.00	£1,360.00
	Page Total 6/4				**£14,782.00**
	Bill 6 Roof				
	K11 RIGID SHEET FLOORING/SHEATHING/LININGS/CASINGS				
	Softwood and plywood fascias and soffits; as Employers Requirements				
	Softwood fascias; fixed to timber framing (measured elsewhere); complete with all trims, supports and the like to complete installation; assumed to be 22mm thick				
A	fascia, nominally 250mm deep	318	m	£8.15	£2,591.70
B	verge fascia, nominally 250mm deep	60	m	£9.15	£549.00
	Softwood soffits; fixed to timber framing (measured elsewhere); complete with all trims, ventilators, supports and the like to complete installation				
C	soffit, nominally 250mm wide; assumed to be 15mm thick	378	m	£9.15	£3,458.70
	Dormer window framing				
	WBP plywood; fixed to timber frame (measured elsewhere); vertical, nominally 18mm thick				
D	to dormer faces and cheeks; over 300mm wide	40	m2	£25.64	£1,025.60
E	to dormer faces and cheeks; not exceeding 300mm wide	25	m	£11.29	£282.25
	Render board				
	Cementious render board, on and including approved battens to provide ventilation gap fixed to plywood substrate				
F	to dormer faces and cheeks; over 300mm wide	40	m2	£20.69	£827.60
G	to dormer faces and cheeks; not exceeding 300mm wide	25	m	£12.17	£304.25
	M60 PAINTING/CLEAR FINISHING EXTERNALLY				
	Painting fascias and soffits; as Employers Requirements				

	Assumed to be Dulux Trade Exterior Gloss, prime, prepare, apply two undercoats and two finish coats; general surfaces				
H	over 300mm girth	189	m2	£12.50	£2,362.50
	P10 SUNDRY INSULATION/PROOFING WORK/FIRE STOPS				
	Roof insulation; as Employers Requirements				
	Assumed to be Rockwool or similar approved mineral fibre insulation quilt, nominally 400mm thick overall				
I	horizontal, between joists nominally 150mm thick	429	m2	£2.10	£900.90
J	horizontal, over joists nominally 100mm thick	429	m2	£1.80	£772.20
K	horizontal, over joists nominally 150mm thick	429	m2	£2.10	£900.90
	Page Total 6/5				**£13,975.60**
	Bill 6 Roof				
	Assumed to be Rockwool or similar approved mineral fibre insulation quilt, nominally 100mm thick overall				
A	vertical, between studs nominally 100mm thick	40	m2	£4.00	£160.00
	Assumed to be Kingspan or similar approved rigid insulation boards, nominally 175mm thick overall				
B	pitched, between joists nominally 75mm thick	287	m2	£23.00	£6,601.00
C	pitched, between joists nominally 100mm thick	287	m2	£25.00	£7,175.00
	R10 RAINWATER PIPEWORK/GUTTERS				
	Gravity rainwater drainage system; as Employers Requirements				
	Black uPVC rainwater pipes; complete with all elbows, connections, brackets, fixings and the like as required				
D	nominally 75mm diameter	233	m	£6.91	£1,610.03
	Extra over for				
E	connection to below ground drainage	41	Nr	£12.25	£502.25
F	off set bends, 250mm	41	Nr	£9.10	£373.10
	Black uPVC rainwater gutters; complete with all elbows, connections, brackets, fixings and the like as required				
G	half round, nominally 100mm diameter	318	m	£8.13	£2,585.34
	Extra over for				
H	ends	46	Nr	£5.10	£234.60
I	running outlets	41	Nr	£7.15	£293.15
J	bends	29	Nr	£7.15	£207.35
	Testing and commissioning				

Allow for all works to carry out full test and commission of rain water goods

K	as required	1	ITEM	£600.00	£600.00

Page Total 6/6 **£20,341.82**

Bill 7 Stairs

Stairs

L30 STAIRS /WALKWAYS /BALUSTRADES

Wrot softwood staircases; as Employers Requirements

Softwood framed staircases; with MDF treads and plywood risers; complete framed installation; including wall and open strings; supplied with and including approved balustrades to all open strings and stairwell openings, Oak Burbridge Section Handrails, Circular Oak ball feature to square newel posts; designed, manufactured and installed by specialist Sub Contractor

A	treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of five treads, quarter landing, one tread, quarter landing and five treads; balustrade to landing return; unit 1	1	Nr	£2,818.00	£2,818.00
B	treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of thirteen treads; balustrade to landing return; unit 2	1	Nr	£2,660.00	£2,660.00
C	treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of thirteen treads; balustrade to landing return; unit 3	1	Nr	£2,709.00	£2,709.00
D	treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of thirteen treads; balustrade to landing return; unit 4	1	Nr	£2,709.00	£2,709.00
E	treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of three winder treads, six straight treads and three winder treads; unit 10	1	Nr	£3,676.00	£3,676.00

Pre cast concrete stairs; no details

Complete installation of precast concrete stair and landings; designed to approved British Standards and Engineers requirements; landings suitable to receive screed as required; to incorporate lifting eyes for craning as required; including all secondary steelwork, fixings and the like; designed, manufactured and installed by specialist Sub Contractor; fixed as manufacturers recommendations to adjacent structures

F	stairs to units 5 to 9; comprising of three flights of two, six and five treads with two quarter landings with one corner splayed; 950mm wide treads; 2650m overall rise; ground to first floor	1	Nr	£5,340.00	£5,340.00

Page Total 7/1 **£19,912.00**

	Bill 7 Stairs				
A	stairs to units 5 to 9; comprising of three flights of two, six and five treads with two quarter landings with one corner splayed; 950mm wide treads; 2625m overall rise; first to second floor	1	Nr	Included	Included
	Balustrading; no details				
	Assumed to be polyester powder coated mild steel framed with vertical pilasters; complete with handrail to match; fixed to concrete; designed, manufactured and installed by specialist Sub Contractor				
B	raking	10	m	£436.55	£4,365.50
C	horizontal	4	m	£476.47	£1,905.88
	Extra over for				
D	ends	4	Nr	£40.22	£160.88
E	connection to balustrade	2	Nr	£40.22	£80.44
F	bends	6	Nr	£40.22	£241.32
G	ramps	14	Nr	£80.44	£1,126.16
	Handrails; no details				
	Assumed to be polyester powder coated handails on brackets to masonry walls; designed, manufactured and installed by specialist Sub Contractor				
H	raking	8	m	£173.32	£1,386.56
I	horizontal	8	m	£173.32	£1,386.56
	Extra over for				
J	ends	2	Nr	£40.22	£80.44
K	bends	8	Nr	£40.22	£321.76
L	ramps	10	Nr	£80.44	£804.40
	M60 PAINTING/CLEAR FINISHING				
	Painting stair strings				
	Assumed to be ICI Dulux Trade Satinwood or similar approved; touch up primer, undercoat and two coats of finish paint				
M	over 300mm girth	5	m2	£15.00	£75.00
	Painting staircases and balustrades				
	Prepare, touch up primer and apply one undercoat and one gloss finishing coat of oil paint; general surfaces; strings				
N	over 300mm girth	9	m2	£15.00	£135.00
	Page Total 7/2				**£12,069.90**
	Bill 7 Stairs				
A	not exceeding 300mm girth	27	m	£4.00	£108.00

	Prepare, touch up primer and apply one undercoat and one gloss finishing coat of oil paint; balustrades; measured both sides					
B	over 300 girth	66	m2	£15.00	£990.00
	P20 UNFRAMED ISOLATED TRIMS/SKIRTINGS/SUNDRY ITEMS					
	Cover panels to stair strings					
	Assumed to be MDF; factory primed; mechanically fixed to pre cast concrete stair strings					
C	nominally 19mm thick; 350mm high; all edges rounded	12	m	£20.17	£242.04
	Page Total 7/3				**£1,340.04**
	Bill 8 External Walls					
	EXTERNAL WALLS					
	F10 BRICK/BLOCK WALLING					
	Blockwork; as specification notes					
	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond					
A	100mm thick	2228	m2	£22.80	£50,798.40
B	100mm thick, fair faced one side	94	m2	£24.30	£2,284.20
C	100mm thick, fair faced both sides	40	m2	£26.30	£1,052.00
D	215mm thick; two skins of 100mm blockwork tied together with ties at the rate of five per square metre and central joint fully filled with mortar; fair faced one side	6	m2	£56.11	£336.66
E	100mm thick, in piers, overall 215mm thick; fair faced to three sides	5	m2	£50.11	£250.55
F	100mm thick, in piers, overall 215mm thick; fair faced to four sides	4	m2	£51.11	£204.44
G	100mm thick, in piers, overall 335mm thick; fair faced to three sides	2	m2	£77.91	£155.82
H	100mm thick, in piers, overall 440mm thick; fair faced to three sides	1	m2	£104.21	£104.21
	Extra over blockwork for					
I	cutting blockwork to course 100mm thick	501	m	£5.00	£2,505.00
J	cutting blockwork to course 100mm thick; raking	21	m	£10.00	£210.00
	Brickwork below DPC					
	Engineering bricks; manufacturer and product reference to be agreed; 7.5N/mm2 compressive strength; half lap stretcher bond; flush joints; walls					
K	half brick thick	59	m2	£70.82	£4,178.38
	F20 NATURAL STONE RUBBLE WALLING					

Natural stone walling; no details

Assumed to be limestone or similar walling to match boundary walls; in cement mortar; complete with facing to suit wall thickness, including trimming and the like of stone; random courses; brushed finish

L	nominally 100mm thick	22	m2	£143.35	£3,153.70

Page Total 8/1 **£65,233.36**

Bill 8 External Walls

F22 CAST STONE ASHLAR WALLING/DRESSINGS

Stonework; as elevation drawings; no details

Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 425mm wide; 55mm deep; splayed top edge with two throats to underside; coppings

A	generally	26	m	£97.00	£2,522.00

Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 125mm thick; 215mm deep; splayed bottom edge with throating; lintels

B	to suit opening 1248mm wide	2	Nr	£270.00	£540.00

Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills

C	to suit opening 685mm wide	9	Nr	£95.00	£855.00
D	to suit opening 1135mm wide	6	Nr	£138.00	£828.00
E	to suit opening 1248mm wide	19	Nr	£150.00	£2,850.00
F	to suit opening 1360mm wide	2	Nr	£157.50	£315.00
G	to suit opening 1698mm wide	1	Nr	£205.00	£205.00
H	to suit opening 1810mm wide	4	Nr	£212.00	£848.00
I	to suit opening 2710mm wide	1	Nr	£310.00	£310.00

F30 ACCESSORIES AND SUNDRY ITEMS FOR BRICK, BLOCK AND STONE WALLING

Forming cavities; as specification notes

Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre; and approved cavity wall insulation 75mm thick

J	125mm wide	1187	m2	£14.06	£16,689.22

Cavity trays; as specification notes

Visqueen Zedex Housing grade damp proof course; bedding in cement mortar

K	over 225mm wide	311	m2	£16.45	£5,115.95

	Cavity closers; no details				
	Assumed to be Kingspan or similar approved Thermabate cavity closer system, complete with all required insulation, brackets and the like; suitable for use in party walls				
L	100mm wide, vertical	248	m	£8.15	£2,021.20
	Page Total 8/2				**£33,099.37**
	Bill 8 External Walls				
A	100mm wide, horizontal	150	m	£8.15	£1,222.50
	Weepholes				
	Rytons Rytweep or similar approved; building in as work proceeds				
B	generally	611	Nr	£1.78	£1,087.58
	Lintels				
	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of				
C	to suit structural opening 572mm wide; in cavity wall	6	Nr	£23.17	£139.02
D	to suit structural opening 685mm wide; in cavity wall	16	Nr	£25.39	£406.24
E	to suit structural opening 910mm wide; in cavity wall	1	Nr	£32.63	£32.63
F	to suit structural opening 1022mm wide; in cavity wall	6	Nr	£33.63	£201.78
G	to suit structural opening 1135mm wide; in cavity wall	10	Nr	£36.06	£360.60
H	to suit structural opening 1248mm wide; in cavity wall	28	Nr	£41.92	£1,173.76
I	to suit structural opening 1360mm wide; in cavity wall	5	Nr	£45.32	£226.60
J	to suit structural opening 1585mm wide; in cavity wall	2	Nr	£58.17	£116.34
K	to suit structural opening 1698mm wide; in cavity wall	2	Nr	£60.18	£120.36
L	to suit structural opening 1810mm wide; in cavity wall	7	Nr	£84.37	£590.59
	IG Lintels, building in as work proceeds; reference L1/HD or similar; to suit structural opening of				
M	to suit structural opening 2373mm wide; in cavity wall	2	Nr	£111.14	£222.28
N	to suit structural opening 2485mm wide; in 215mm thick wall	5	Nr	£145.06	£725.30
O	to suit structural opening 2598mm wide; in cavity wall	1	Nr	£150.06	£150.06
	Page Total 8/3				**£6,775.64**

Bill 8 External Walls

A	to suit structural opening 2710mm wide; in cavity wall	1	Nr	£150.06	£150.06
B	to suit structural opening 2935mm wide; in cavity wall	6	Nr	£155.47	£932.82

G20 CARPENTRY/TIMBER FRAMING/FIRST FIXING

Sawn softwood; to timber store

Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members

C	125 x 125mm posts	18	m	£10.80	£194.40
D	125 x 50mm rails	26	m	£5.45	£141.70

Sawn softwood; to car port

Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members

E	150 x 150mm posts	18	m	£11.33	£203.94
F	300 x 200mm beams	40	m	£37.50	£1,500.00
G	200 x 150mm bracings - assumed to be dowelled mortice and tenon jointed	20	m	£19.35	£387.00
H	200 x 150mm curved entrance bracings - assumed to be dowelled mortice and tenon jointed	3	m	£33.35	£100.05

Sawn softwood; to Unit 9

Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members

I	50 x 100mm	73	m	£4.17	£304.41

Fixings

Assumed to be stainless steel shoes, resin bolted to concrete floor slab; complete with all required fixings, bolts and the like

J	to suit 125 x 125mm post	8	Nr	£87.50	£700.00
K	to suit 150 x 150mm post	8	Nr	£87.50	£700.00

Truss clips; to accept rails; nailed as required

L	to suit 125 x 50mm rails	44	Nr	£2.27	£99.88

Page Total 8/4 **£5,414.26**

Bill 8 External Walls

H30 FIBRE CEMENT PROFILED SHEET CLADDING/COVERING /SIDING

Unit 9 vertical cladding; no details

Assumed to be profiled large format cladding panels; including all insulation, vapour barriers, breather membranes, brackets, fixings and the like to complete installation; wall claddings; designed, supplied and installed by specialist Sub Contractor

A	vertical	13	m2	£280.32	£3,644.16

	Abutments; as required, no details; to roof profile, to head and sill				
B	generally	26	m	£31.90	£829.40
	Trims to windows and the like				
C	generally	5	m	£31.90	£159.50
	Holes				
D	no details	1	ITEM	£1,000.00	£1,000.00
	H41 GLASS REINFORCED PLASTICS PANEL CLADDING / FEATURES				
	Chimney; no details				
	Approved timber framed or Glass Reinforced Plastic off site manufactured chimney unit with brickwork to match below DPC; including capping and two chimney pots, blanking panels and the like; all framing, flashings, trims and all necessary fixings to complete installation				
E	generally	2	Nr	£800.00	£1,600.00
	Entrance Porch; no details				
	Approved timber framed or Glass Reinforced Plastic off site manufactured entrance porch with slate roofing to match main roof; including supporting framing fixed to masonry walls; all framing, flashings, trims and all necessary fixings to complete installation				
F	generally; 2.00m wide; 900mm projection, to unit 2	1	Nr	£609.95	£609.95
G	generally; 2.30m wide; 900mm projection, to units 3 and 4	2	Nr	£609.95	£1,219.90
H	generally; 3.47m wide; 600mm projection, to units 5 to 9	1	Nr	£609.95	£609.95
	Page Total 8/5				**£9,672.86**
	Bill 8 External Walls				
	K21 TIMBER STRIP / BOARD FINE FLOORING / LININGS				
	Timber boarding; as Employers Requirements				
	James Hardiplank timber effect Fibre Cement boarding; complete with all required battens, counter battens, framing and the like to complete installation in strict compliance with the manufacturers recommendations; walls				
A	over 300mm wide	109	m2	£65.99	£7,192.91
B	not exceeding 300mm wide	32	m	£34.30	£1,097.60
C	over 300mm wide; to soffits; complete with 100mm of apporved insulation board	9	m2	£78.66	£707.94
	Abutments; complete with all additional framing and the like				
D	to render	22	m	£17.09	£375.98

	Finished external angles; complete with feature trim and the like				
E	external angles generally	59	m	£13.59	£801.81
	Sills; complete with feature trim and the like				
F	sills generally	48	m	£13.59	£652.32
	Holes				
G	generally	1	ITEM	£100.00	£100.00
	Raking cutting to tops of walls				
H	generally	20	m	£4.00	£80.00
	Timber boarding; to timber store				
	Assumed to be preservative treated tongue and groove horizontal boarding; in 19 x 150mm planks, secret fixed to timber framing; walls				
I	over 300mm wide	21	m2	£65.79	£1,381.59
	Finished external angles; complete with feature trim and the like				
J	external angles generally	13	m	£20.30	£263.90
	Sills; complete with feature trim and the like				
K	sills generally	8	m	£7.84	£62.72
	Raking cutting to tops of walls				
L	generally	6	m	£4.84	£29.04
	Timber boarding; to car port				
	Assumed to be preservative treated tongue and groove horizontal boarding; in 19 x 150mm planks, secret fixed to timber framing; walls				
M	over 300mm wide	44	m2	£65.79	£2,894.76
	Page Total 8/6				**£15,640.57**
	Bill 8 External Walls				
	Finished external angles; complete with feature trim and the like				
A	external angles generally	5	m	£13.09	£65.45
	Finished ends; complete with feature trim and the like				
B	open abutments generally	5	m	£13.09	£65.45
	Sills; complete with feature trim and the like				
C	sills generally	20	m	£13.09	£261.80
	L30 STAIRS /WALKWAYS /BALUSTRADES				
	Juliet Balcony; no details				
	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; fixed to masonry walls with approved brackets; designed, manufactured and installed by specialist Sub Contractor				

D	2710mm long; 1100mm high; to unit 2	1	Nr	£2,149.31	£2,149.31
	Balustrades; no details				
	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; designed, manufactured and installed by specialist Sub Contractor				
E	500mm high; to unit 10	6	m	£607.95	£3,647.70
F	1100mm high; to unit 3 and 4	17	m	£623.25	£10,595.25
G	1500mm high; to unit 3 and 4; obscure glass	3	m	£1,001.89	£3,005.67
	Extra over for				
H	ends / abutments to walls	5	Nr	£95.91	£479.55
I	bends	4	Nr	£95.91	£383.64
J	junctions	1	Nr	£95.91	£95.91
	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; designed, manufactured and installed by specialist Sub Contractor				
K	1100mm high; to unit 3 and 4	24	m	£586.86	£14,084.64
	Extra over for				
L	ends / abutments to walls	8	Nr	£95.91	£767.28
M	bends	8	Nr	£95.91	£767.28
	Page Total 8/7				**£36,368.93**
	Bill 8 External Walls				
	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS				
	Through colour render; as Employers Requirements				
	Proprietary two coat render system; to blockwork, through colour, applied in strict accordance with the manufacturers recommendations by specialist Sub Contractor				
A	over 300mm wide	954	m2	£26.00	£24,804.00
B	not exceeding 300mm wide	338	m	£8.00	£2,704.00
	Waterproof proprietary two coat render system; to blockwork, through colour, applied in strict accordance with the manufacturers recommendations by specialist Sub Contractor				
C	over 300mm wide	80	m2	£52.00	£4,160.00
D	not exceeding 300mm wide	26	m	£10.00	£260.00
	Approved beads to suit render system				
E	external angle beads	495	m	£1.15	£569.25
F	bellcast stop bead	230	m	£1.15	£264.50

Page Total 8/8 **£32,761.75**

Bill 9 Windows and External Doors

Windows and external doors

L10 WINDOWS / ROOFLIGHTS / SCREENS / LOUVRES

Templates

Allow for taking site dimensions and producing templates for windows as required; at the discretion of the Contractor

A	generally to all openings	1	ITEM	£0.00	£0.00

Drawings

Before commencement of manufacture fully detailed and annotated manufacturing drawings are to be submitted for approval

B	generally	1	ITEM	£0.00	£0.00

Cleaning of all window assemblies

Allow for works required in response to a Risk Assessment on the safe access and cleaning of all window assemblies

C	generally	1	ITEM	£0.00	£0.00

Manifestation

Contractor to make provision for appropriate manifestation to windows as required

D	generally	1	ITEM	£0.00	£0.00

Windows; as employers requirements

Sashless Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; designed, manufactured and installed by specialist Sub Contractor; to suit structural opening of approximately

E	570 x 1210mm; plots 5, 6, 7, 8 and 9; reference W03, W05, W08, W13, W19 and W21; comprising of 1Nr obscure glazed fixed pane	6	Nr	£10,004.50	£60,027.00
F	685 x 685mm; plot 10; reference W08; comprising of 1Nr side opening pane	1	Nr	£35.00	£35.00
G	685 x 685mm; plot 10; references W04 and W07; comprising of 1Nr obscure glazed side opening pane	2	Nr	£35.00	£70.00

Page Total 9/1 **£60,132.00**

Bill 9 Windows and External Doors

A	685 x 1060mm; plots 3 and 4; references W02, W05, W07, W08, W13 and W14; comprising of 1Nr obscure glazed fixed pane	6	Nr	£35.00	£210.00

B	685 x 1060mm; plots 1 and 2; references W04, W15 and W16; comprising of 1Nr obscure glazed fixed pane	3	Nr	£35.00	£105.00
C	685 x 1210mm; plot 10; reference W01; comprising of 1Nr side opening pane	1	Nr	£35.00	£35.00
D	685 x 1210mm; plot 10; reference W02; egress window comprising of 1Nr side opening pane	1	Nr	£35.00	£35.00
E	685 x 1210mm; plot 10; reference W05; comprising of 1Nr obscure glazed side opening pane	1	Nr	£35.00	£35.00
F	685 x 1810mm; plot 10; reference W06; comprising of 1Nr obscure glazed fixed pane	1	Nr	£38.00	£38.00
G	1023 x 1210mm; plots 5, 6, 7, 8 and 9; references W24, W25 and W26; comprising of 1Nr side opening pane and 1Nr fixed pane	3	Nr	£38.00	£114.00
H	1023 x 1210mm; plots 5, 6, 7, 8 and 9; reference W23; egress window comprising of 1Nr side opening pane and 1Nr fixed pane	1	Nr	£38.00	£38.00
I	1135 x 1060mm; plots 1 and 2; reference W09; comprising of 2Nr side opening panes	1	Nr	£38.00	£38.00
J	1135 x 1360mm; plots 1 and 2; references W05, W06 and W11; comprising of 2Nr side opening panes	3	Nr	£38.00	£114.00
K	1135 x 1360mm; plots 1 and 2; reference W12; egress window comprising of 2Nr side opening panes	1	Nr	£38.00	£38.00
L	1135 x 1660mm; plots 1 and 2; reference W08; comprising of 2Nr side opening panes	1	Nr	£38.00	£38.00
M	1248 x 685mm; plots 1 and 2; reference W10; comprising of 1Nr obscure glazed bottom opening pane	1	Nr	£35.00	£35.00
N	1248 x 1210mm; plots 3 and 4; references W01 and W06; comprising of 1Nr side opening pane and 1Nr fixed pane	2	Nr	£38.00	£76.00
	Page Total 9/2				**£949.00**

Bill 9 Windows and External Doors

A	1248 x 1210mm; plots 5, 6, 7, 8 and 9; references W04, W06, W07, W11, W12, W16, W20, W22 and W33; comprising of 1Nr side opening pane and 1Nr fixed pane	9	Nr	£38.00	£342.00
B	1248 x 1210mm; plots 3 and 4; references W03, W04, W09, W10, W11 and W12; egress window comprising of 1Nr side opening pane and 1Nr fixed pane	6	Nr	£38.00	£228.00
C	1248 x 1210mm; plots 5, 6, 7, 8 and 9; references W01, W02, W09, W10, W14, W15, W17 and W18; egress window comprising of 1Nr side opening pane and 1Nr fixed pane	8	Nr	£38.00	£304.00
D	1248 x 1210mm; plot 10; reference W12; comprising of 1Nr side opening pane and 1Nr fixed pane	1	Nr	£38.00	£38.00

E	1360 x 1210mm; plots 1 and 2; references W13 and W17; egress window comprising of 2Nr side opening panes and 1Nr fixed pane	2	Nr	£38.00	£76.00
F	1360 x 1210mm; plot 10; reference W10; comprising of 2Nr side opening panes and 1Nr fixed pane	1	Nr	£38.00	£38.00
G	1698 x 1210mm; plots 1 and 2; reference W02; comprising of 2Nr obscure glazed side opening panes and 1Nr obscure glazed fixed pane	1	Nr	£38.00	£38.00
H	1698 x 1210mm; plot 10; reference W11; comprising of 2Nr obscure glazed side opening panes and 1Nr obscure glazed fixed pane	1	Nr	£38.00	£38.00
I	1810 x 1210mm; plots 1 and 2; reference W01; comprising of 2Nr side opening panes and 1Nr fixed pane	1	Nr	£38.00	£38.00
J	1810 x 1210mm; plot 10; reference W09; comprising of 2Nr side opening panes and 1Nr fixed pane	1	Nr	£38.00	£38.00
K	1810 x 1210mm; plots 1 and 2; reference W03, W07 and W14; egress windows comprising of 2Nr side opening panes and 1Nr fixed pane	3	Nr	£38.00	£114.00
L	1810 x 1210mm; plot 10; reference W03; egress windows comprising of 2Nr side opening panes and 1Nr fixed pane	1	Nr	£38.00	£38.00
	Page Total 9/3				**£1,330.00**

Bill 9 Windows and External Doors

Velux windows; as employers requirements

Velux Integra or similar approved; centre pivot rooflight; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; designed, manufactured and installed by specialist Sub Contractor; to suit structural opening of approximately

A	550 x 980mm; plots 5, 6, 7, 8 and 9; references W35, W36 and W37	3	Nr	£585.00	£1,755.00
B	660 x 1398mm; plots 5, 6, 7, 8 and 9; references W27, W28, W29, W30, W31 and W32	6	Nr	£690.00	£4,140.00

Rooflight; as employers requirements

The Rooflight Company Plateau Slimline Profile or similar approved; flat rooflight; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; designed, manufactured and installed by specialist Sub Contractor; to suit structural opening of approximately

C	669 x 690mm; plots 5, 6, 7, 8 and 9; reference W34	1	Nr	£1,438.00	£1,438.00

Triangle roof element; as employers requirements

No details of manufacturer or product reference; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; designed, manufactured and installed by specialist Sub Contractor; to suit structural opening of approximately

D	2900 x 1020mm (maximum height); plots 5, 6, 7, 8 and 9; reference W40	1	Nr	£165.00	£165.00

Page Total 9/4 **£7,498.00**

Bill 9 Windows and External Doors

L20 DOORS /SHUTTERS /HATCHES

Templates

Allow for taking site dimensions and producing templates for all doors and door and screen combinations as required; at the discretion of the Contractor

A	generally to all openings	1	ITEM	£0.00	£0.00

Drawings

Before commencement of manufacture fully detailed and annotated manufacturing drawings are to be submitted for approval

B	generally	1	ITEM	£0.00	£0.00

Cleaning of all door assemblies

Allow for works required in response to a Risk Assessment on the safe access and cleaning of all doors assemblies

C	generally	1	ITEM	£0.00	£0.00

Manifestation

Manifestation to doors

D	generally	1	ITEM	£0.00	£0.00

Patio / French doorset; as employers requirements

Profile 22 uPVC or similar approved; glazed with Ovolo beads; complete installation including all packing, trims, framing, flashings, EPDM seals (minimum of 300mm wide), vapour barriers, connections, concealed fixings, sealant, antifinger traps, weathered threshold, safety devices, pockets, ironmongery, accessories and the like deemed necessary to complete the installation; designed, manufactured and installed by specialist Sub-Contractor; to suit structural openings of approximately

E	1810 x 2110; plot 10; reference ED02; safety glazed single door with 2Nr safety glazed side lights and 2Nr top hung opening vents	1	Nr	£1,183.15	£1,183.15

F	2730 x 2110; plots 1 and 2; reference ED05; double door with 6Nr side lights and 2Nr top hung opening vents	1	Nr	£1,183.15	£1,183.15
G	2940 x 2110; plots 3 and 4; references ED05 and ED06; safety glazed double door with 6Nr safety glazed side lights and 2Nr top hung opening vents	2	Nr	£1,183.15	£2,366.30
	Page Total 9/5				**£4,732.60**
	Bill 9 Windows and External Doors				
A	2940 x 2110; plots 5, 6, 7, 8 and 9; references ED02, ED03, ED04, ED05, ED06 and ED07; safety glazed double door with 2Nr safety glazed side lights and 2Nr top hung opening vents	6	Nr	£1,291.98	£7,751.88
	Front doorset; as employers requirements				
	Sashless Window Company Limited or similar approved; European Oak with a Light Oak finish; PAS 24 door; complete installation including all packing, trims, framing, flashings, EPDM seals (minimum of 300mm wide), vapour barriers, connections, concealed fixings, sealant, antifinger traps, weathered threshold, safety devices, pockets, ironmongery, accessories and the like deemed necessary to complete the installation; designed, manufactured and installed by specialist Sub-Contractor; to suit structural openings of approximately				
B	1023 x 2110; plots 1 and 2; reference ED02; single door with 1Nr obscure glazed vision panel	1	Nr	£95.00	£95.00
C	1023 x 2110; plots 1 and 2; reference ED01; single door with 2Nr obscured safety glazed vision panels	1	Nr	£95.00	£95.00
D	1023 x 2110; plots 3 and 4; reference ED01; single door with 1Nr obscure glazed vision panel	1	Nr	£95.00	£95.00
E	1023 x 2110; plots 3 and 4; reference ED02; single door with 4Nr obscure glazed vision panels	1	Nr	£95.00	£95.00
F	1023 x 2110; plot 10; reference ED01; single door deemed to include 4Nr obscure glazed vision panels	1	Nr	£95.00	£95.00
	Page Total 9/6				**£8,226.88**
	Bill 9 Windows and External Doors				
	Front doorset to apartments; FD30S; as employers requirements				
	Vicaima Oak EX5.1 or similar approved; assumed to be PAS 24; timber veneered; complete installation including all packing, trims, framing, flashings, EPDM seals (minimum of 300mm wide), vapour barriers, connections, concealed fixings, sealant, antifinger traps, weathered threshold, safety devices, pockets, ironmongery, accessories and the like deemed necessary to complete the installation; designed, manufactured and installed by specialist Sub-Contractor; to suit structural openings of approximately				

A	1023 x 2110; plots 5, 6, 7, 8 and 9; references ED08, ED09, ED10, ED12 and ED13; single door	5	Nr	£638.95	£3,194.75
	Front doorset to common parts; as employers requirements				
	No details of manufacturer or product reference; solid oak high quality bespoke glazed feature front door; assumed to be PAS 24; complete installation including all packing, trims, framing, flashings, EPDM seals (minimum of 300mm wide), vapour barriers, connections, concealed fixings, sealant, antifinger traps, weathered threshold, safety devices, pockets, ironmongery, accessories and the like deemed necessary to complete the installation; designed, manufactured and installed by specialist Sub-Contractor; to suit structural openings of approximately				
B	1023 x 2110; plots 5, 6, 7, 8 and 9; reference ED01, single door	1	Nr	£95.00	£95.00
	Bi-fold doorset; as employers requirements				
	Visofold 1000 Series or similar approved; white aluminium doors; complete installation including all packing, trims, framing, flashings, EPDM seals (minimum of 300mm wide), vapour barriers, connections, concealed fixings, sealant, antifinger traps, weathered threshold, safety devices, pockets, ironmongery, accessories and the like deemed necessary to complete the installation; designed, manufactured and installed by specialist Sub-Contractor; to suit structural openings of approximately				
C	2373 x 2110; plots 1 and 2; references ED03 and ED04; safety glazed	2	Nr	£2,775.86	£5,551.72
	Page Total 9/7				**£8,841.47**
	Bill 9 Windows and External Doors				
A	3610 x 2110; plots 3 and 4; references ED03 and ED04; safety glazed	2	Nr	£3,577.66	£7,155.32
B	2598 x 2110; plot 10; reference ED03	1	Nr	£2,835.32	£2,835.32
	Garage doorset; as employers requirements				
	Garador or standard 8070 frame or similar approved; recessed with Sherwood metal door with laminated oak finish; complete installation including all packing, trims, framing, flashings, connections, concealed fixings, sealant, weathered threshold, safety devices, pockets, ironmongery, accessories and the like deemed necessary to complete the installation; designed, manufactured and installed by specialist Sub-Contractor; to suit structural openings of approximately				
C	2579 x 2194; plot 10; reference ED04	1	Nr	£1,500.00	£1,500.00
D	2485 x 2185; garage block; reference ED01, 02, 03, 04	4	Nr	£1,195.00	£4,780.00
	Shed door; as drawing 15.131.GA.001				

	External timber door to match timber boarding; cross ledged and braced; complete installation including all packing, trims, framing, concealed fixings, sealant, antifinger traps, weathered threshold, safety devices, ironmongery, accessories and the like deemed necessary to complete the installation; designed, manufactured and installed by specialist Sub-Contractor; to suit structural openings of approximately				
E	1022.5 x 2110; garage block; reference ED05	1	Nr	£1,094.00	£1,094.00
	M60 PAINTING/CLEAR FINISHING				
	Painting timber window boards; no details				
	No details of manufacturer or product reference; assumed to prepare surfaces and apply one initial coat and two finishing coats as recommended by the manufacturer				
F	not exceeding 300mm girth	33	m	£4.00	£132.00
	Page Total 9/8				**£17,496.64**
	Bill 9 Windows and External Doors				
	P20 UNFRAMED ISOLATED TRIMS/SKIRTINGS/SUNDRY ITEMS				
	Window boards; as Employers Requirements				
	MDF window boards; factory primed; including all required softwood packers and the like				
A	generally; 25 x 250mm; bullnosed profile	33	m	£21.00	£693.00
	Veneered timber window boards; factory primed; including all required softwood packers and the like				
B	generally; 25 x 250mm; bullnosed profile	66	m	£27.00	£1,782.00
	Page Total 9/9				**£2,475.00**
	Bill 10 Internal Walls				
	INTERNAL WALLS				
	F10 BRICK/BLOCK WALLING				
	Blockwork; as specification notes				
	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond; laid flat				
A	100mm thick	162	m2	£22.80	£3,693.60
B	100mm thick; in party walls	446	m2	£22.80	£10,168.80
C	215mm thick; assumed to be 100mm blocks laid flat	16	m2	£45.58	£729.28
	Extra over blockwork for				
D	cutting blockwork to course 100mm thick	137	m	£5.00	£685.00
E	cutting blockwork to course 100mm thick; raking	78	m	£10.00	£780.00
F	cutting blockwork to course 215mm thick	6	m	£10.00	£60.00

F30 ACCESSORIES AND SUNDRY ITEMS FOR BRICK, BLOCK AND STONE WALLING

Forming cavities; as specification notes

Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre; and approved cavity wall insulation 100mm thick

G	100mm wide	263	m2	£18.91	£4,973.33

Cavity closers; no details

Assumed to be Kingspan or similar approved Thermabate cavity closer system, complete with all required insulation, brackets and the like; suitable for use in party walls

H	100mm wide, vertical	21	m	£8.15	£171.15

Lintels

Pre cast concrete lintels; 100 x 215mm deep; building in as work proceeds

I	to suit structural opening 930mm wide	8	Nr	£31.75	£254.00
J	to suit structural opening 1025mm wide	10	Nr	£32.75	£327.50
K	to suit structural opening 1115mm wide	3	Nr	£35.97	£107.91
L	to suit structural opening 1275mm wide	1	Nr	£39.65	£39.65

G20 CARPENTRY/TIMBER FRAMING/FIRST FIXING

Sawn softwood

Sawn softwood, preservative treated, grade C24, wall or partition members

M	nominally 45 x 89mm	3718	m	£4.10	£15,243.80
N	nominally 45 x 89mm; fixed to screed or floor boards	274	m	£4.10	£1,123.40

Page Total 10/1 **£38,357.42**

Bill 10 Internal Walls

K10 PLASTERBOARD DRY LINING / PARTITIONS / CEILINGS

Partition linings; as Employers Requirements

Standard assumed 12.5mm thick plasterboard linings to timber framing (framing measured elsewhere), complete with all fixings, sealant, trims and the like; all joints taped and filled to receive plaster skim (skim measured elsewhere)

A	generally - measured over openings	1385	m2	£4.90	£6,786.50

Moisture resistant or cement particle board linings assumed 12.5mm thick to timber framing (framing measured elsewhere), complete with all fixings, sealant, trims and the like; all joints taped and filled to receive plaster skim (skim measured elsewhere)

B	generally - measured over openings	370	m2	£6.40	£2,368.00

	Gyproc Soundblock board linings, two layers assumed 12.5mm thick to timber framing (framing measured elsewhere), complete with all fixings, sealant, trims and the like; all joints staggered between layers, taped and filled to receive plaster skim (skim measured elsewhere)				
C	generally - measured over openings	38	m2	£11.70	£444.60
	Angles; complete with all required additional boarding and the like; measured to both sides of walls				
D	generally	417	m	£2.00	£834.00
E	generally, 45 degree	83	m	£2.00	£166.00
	Fair ends; complete with all required additional boarding and the like				
F	generally	42	m	£3.00	£126.00
	Abutments; to masonry walls; complete with all required sealant and the like; measured to both sides of walls				
G	generally	635	m	£1.00	£635.00
	Extra over partitions for				
H	deflection heads; nominally 15mm allowance	341	m	£1.20	£409.20
I	putty pads to partitions; allowance only	211	Nr	£4.50	£949.50
J	provision of plywood linings between stud framing to accept heavy fixings, future equipment and the like	431	m2	£9.85	£4,245.35
K	installation of approved acoustic insulation between studs assumed to be Isover 50mm thick	847	m2	£2.70	£2,286.90
L	forming opening for single leaf floors	65	Nr	£5.00	£325.00
M	forming opening for pairs of doors	13	Nr	£5.00	£65.00
N	forming opening for wardrobe doors	6	Nr	£5.00	£30.00
	Page Total 10/2				**£19,671.05**
	Bill 10 Internal Walls				
	Soil pipe casings; no details				
	Allow for forming soil pipe casings, comprising of approved 38 x 38mm timber framing at 600mm centres vertically, with vertical framing at all corners and abutments; lining with two layers of Gyproc Soundblock board, staggered joints, all joints taped and filled for skim plaster (measured elsewhere); filling all voids with approved acoustic insulation				
A	two faces, overall girth not exceeding 600mm	86	m	£35.65	£3,065.90
B	three faces, overall girth 600 to 900mm	4	m	£43.67	£174.68
	Page Total 10/3				**£3,240.58**
	Bill 11 Internal Doors				
	Internal Doors				

L20 DOORS /SHUTTERS /HATCHES

Internal Doorsets; as Employers Requirements

Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay; EX5.1/01 or equal and approved; including cut outs for ironmongery as necessary, fitting of all necessary acoustic and fire sealing and the like as required to complete the installation; to suit door type of

A	single door to plot 1 and 2; 838 x 1981mm; reference ID01, ID02, ID03, ID05, ID06	5	Nr	£253.43	£1,267.15
B	single door to plot 1 and 2; 626 x 1981mm; reference ID07	1	Nr	£303.98	£303.98
C	double door to plot 1 and 2; 839 x 2100mm; reference ID09	1	Nr	£474.75	£474.75
D	single door to plot 3 and 4; 838 x 1981mm; reference ID02, ID03, ID06, ID07, ID08	5	Nr	£241.48	£1,207.40
E	single door to plot 3 and 4; 686 x 1981mm; reference ID01, ID05, ID10	3	Nr	£248.38	£745.14
F	single door to plots 5,6,7,8 and 9; 838 x 1981mm; reference ID01, ID03, ID04, ID07, ID11, ID13, ID14, ID16; assumed to be fire rated 30 minutes	8	Nr	£256.43	£2,051.44
G	single door to plot 5,6,7,8 and 9; 726 x 1981mm; reference ID17; assumed to be fire rated 30 minutes	1	Nr	£285.08	£285.08
H	double door to plot 5,6,7,8 and 9; 1062 x 1981mm; reference ID06, ID10; assumed to be fire rated 30 minutes	2	Nr	£485.20	£970.40
I	single door to plot 10; 838 x 1981mm; reference ID01, ID02, ID04, ID07, ID09	5	Nr	£244.48	£1,222.40
J	single door to plot 10; 626 x 1981mm; reference ID06	1	Nr	£306.98	£306.98
K	single door to plot 10; 762 x 1981mm; reference ID03	1	Nr	£239.43	£239.43
L	double door to plot 10; 1070 x 1981mm; reference ID05, ID08	2	Nr	£451.45	£902.90

Page Total 11/1 **£9,977.05**

Bill 11 Internal Doors

Vicaima or similar approved; internal doors to living rooms, product reference Vicaima Oak with fully glazed infill panel; EX5.1/1/DFG16 or equal and approved; including cut outs for ironmongery as necessary, fitting of all necessary acoustic and fire sealing and the like as required to complete the installation; to suit door type of

A	single door to plot 1 and 2; 838 x 1981mm; reference ID04, ID08	2	Nr	£403.06	£806.12
B	single door to plot 3 and 4; 838 x 1981mm; reference ID04, ID09	2	Nr	£403.06	£806.12
C	single door to plot 5,6,7,8 and 9; 838 x 1981mm; reference ID05, ID12, ID22, ID29; assumed to be fire rated 30 minutes	4	Nr	£592.43	£2,369.72

D	single door to plot 10; 838 x 1981mm; reference ID11	1	Nr	£592.43	£592.43
	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; including cut outs for ironmongery as necessary, fitting of all necessary acoustic and fire sealing and the like as required to complete the installation; to suit door type of				
E	single door to plot 1 and 2; 838 x 1981mm; reference ID10, ID11, ID12, ID13, ID15, ID18, ID19, ID20, ID21, ID22	10	Nr	£205.97	£2,059.70
F	single door to plot 3 and 4; 838 x 1981mm; reference ID12, ID13, ID14, ID15, ID16, ID17, ID18, ID21, ID22, ID23, ID24	11	Nr	£205.97	£2,265.67
G	single door to plot 3 and 4; 762 x 1981mm; reference ID19	1	Nr	£201.40	£201.40
H	single door to plot 5,6,7,8 and 9; 838 x 1981mm; reference ID18, ID20, ID21, ID24, ID27, ID30, ID31, ID33, ID34, ID35, ID36, ID37, ID38; assumed to be fire rated 30 minutes	13	Nr	£217.92	£2,832.96
I	single door to plot 5,6,7,8 and 9; 626 x 1447mm; reference ID39, ID42, ID45; assumed to be fire rated 30 minutes	3	Nr	£249.02	£747.06
J	double door to plot 5,6,7,8 and 9; 1062 x 1981mm; reference ID23, ID28; assumed to be fire rated 30 minutes	2	Nr	£482.46	£964.92
K	single door to plot 10; 838 x 1981mm; reference ID12	1	Nr	£205.97	£205.97
	Page Total 11/2				**£13,852.07**
	Bill 11 Internal Doors				
	Vicaima or similar approved; internal doors to boiler cupboards, product reference Vicaima performance door; including cut outs for ironmongery as necessary, fitting of all necessary acoustic and fire sealing and the like as required to complete the installation; to suit door type of				
A	single door to plot 1 and 2; 838 x 1981mm; 33 dB acoustic rating; fire rated; reference ID14	1	Nr	£254.52	£254.52
B	single door to plot 1 and 2; 726 x 1981mm; 33 dB acoustic rating; fire rated; reference ID17	1	Nr	£299.49	£299.49
C	double door to plot 3 and 4; 839 x 1981mm; 33 dB acoustic rating; fire rated; reference ID11	1	Nr	£262.52	£262.52
D	single door to plot 3 and 4; 762 x 1981mm; 33 dB acoustic rating; fire rated; reference ID20	1	Nr	£299.49	£299.49
E	single door to plot 5,6,7,8 and 9; 926 x 1447mm; 33 dB acoustic rating; fire rated; reference ID02, ID15, ID19, ID32, ID43	5	Nr	£541.68	£2,708.40
	Internal Doorsets - Sliding Wardrobe; as manufacturers specifications				

Sliderobe or similar approved; internal sliding wardrobe doors to bedrooms; no product reference; including all standard components, cut outs for ironmongery as necessary, fitting of all necessary acoustic and fire sealing and the like as required to complete the installation; to suit

F	sliderobe door to plot 1 and 2; 2Nr sliding leaves within structural opening of 1828.8 x 2375mm; reference ID23	1	Nr	£620.00	£620.00
G	sliderobe door to plot 1 and 2; 2Nr sliding leaves within structural opening of 1440 x 2375mm; reference ID24, ID25	2	Nr	£620.00	£1,240.00
H	sliderobe door to plot 3 and 4; 2Nr sliding leaves within structural opening of 2435 x 2375mm; reference ID25, ID26	2	Nr	£620.00	£1,240.00
I	sliderobe door to plot 5,6,7,8 and 9; 2Nr sliding leaves within structural opening of 1828.8 x 2000mm; reference ID40, ID41	2	Nr	£620.00	£1,240.00
J	sliderobe door to plot 10; 2Nr sliding leaves within structural opening of 1825 x 2025mm; reference ID10	1	Nr	£620.00	£620.00

Page Total 11/3 **£8,784.42**

Bill 11 Internal Doors

Access Hatches; as employers requirements

UPVC White loft hatch; no product reference; with hook on system for extension ladder; provide a 900 x 900mm hatch or similar approved; insulated; full factory finish; including cut outs for ironmongery as necessary, fitting of all necessary acoustic and fire sealing and the like as required to complete the installation; to suit access hatch of

A	plot 1 and 2; 900 x 900 mm	2	Nr	£135.00	£270.00
B	plot 3 and 4; 900 x 900 mm	2	Nr	£135.00	£270.00
C	plot 10; 900 x 900 mm	1	Nr	£135.00	£135.00

M60 PAINTING/CLEAR FINISHING

Painting timber; as employers requirements

Dulux water based satin paint or similar approved; colour white; prepare surfaces and apply number of coats as recommended by the manufacturer

D	plot 1 and 2; not exceeding 300mm girth	101	m	£2.65	£267.65
E	plot 3 and 4; not exceeding 300mm girth	115	m	£2.65	£304.75
F	plot 5,6,7,8 and 9; not exceeding 300mm girth	174	m	£2.65	£461.10
G	plot 10; not exceeding 300mm girth	53	m	£2.65	£140.45

P20 UNFRAMED ISOLATED TRIMS/SKIRTINGS/SUNDRY ITEMS

Architraves; as employers requirements

Hardwood architraves; 20 x 75mm to match skirtings; finished with DUlux water based satin paint as M60; including all fixings as required to complete installation

H	plot 1 and 2; not exceeding 300mm girth	187	m	£6.70	£1,252.90
I	plot 3 and 4; not exceeding 300mm girth	229	m	£6.70	£1,534.30
J	plot 5,6,7,8 and 9; not exceeding 300mm girth	349	m	£6.70	£2,338.30
K	plot 10; not exceeding 300mm girth	106	m	£6.70	£710.20

P21 IRONMONGERY

Ironmongery; Internal Doorsets as employers requirements

Denleigh Ironmongery or similar approved; product reference LR220; Doorset pack to internal doors; including 3Nr 100mm hinges (grade to match weight of door), 1Nr lever latch, 1Nr door stop

L	single doors; plot 1 and 2; generally	13	Nr	£56.70	£737.10
M	double doors; plot 1 and 2; generally	2	Nr	£35.00	£70.00
N	single doors; plot 3 and 4; generally	15	Nr	£58.64	£879.60

Page Total 11/4 **£9,371.35**

Bill 11 Internal Doors

A	double doors; plot 3 and 4; generally	2	Nr	£35.00	£70.00
B	single doors; plot 5,6,7,8 and 9; generally	18	Nr	£68.91	£1,240.38
C	double doors; plot 5,6,7,8 and 9; generally	18	Nr	£35.00	£630.00
D	single doors; plot 10; generally	6	Nr	£63.98	£383.88
E	double doors; plot 10; generally	4	Nr	£35.00	£140.00

Denleigh Ironmongery or similar approved; product reference LR220; Doorset pack to bathroom doors; including 3Nr 100mm hinges (grade to match weight of door), 1Nr lever latch, 1Nr thumb turn indicator bolt, 1Nr door stop

F	single doors; plot 1 and 2; generally	7	Nr	£29.00	£203.00
G	single doors; plot 3 and 4; generally	8	Nr	£29.00	£232.00
H	single doors; plot 5,6,7,8 and 9; generally	11	Nr	£29.00	£319.00
I	single doors; plot 10; generally	3	Nr	£29.00	£87.00

P22 SEALANT JOINTS

Bedding and pointing to door frames

Bedding and pointing with approved polysulphide sealant; to suit fire and acoustic rating

J	plot 1 and 2	101	m	£1.25	£126.25
K	plot 3 and 4	115	m	£1.25	£143.75
L	plot 5,6,7,8 and 9; fire rated 30 minutes	174	m	£1.99	£346.26
M	plot 10	53	m	£1.25	£66.25

	Page Total 11/5					**£3,987.77**
	Bill 12 Wall Finishes					
	Wall Finishes					
	K10 PLASTERBOARD DRY LINING / PARTITIONS / CEILINGS					
	Linings to Blockwork; as Employers Requirements					
	Standard assumed 12.5mm thick plasterboard linings fixed with plasterboard dabs to masonry (measured elsewhere), complete with all fixings, sealant, trims and the like; all joints taped and filled to receive plaster skim (skim measured elsewhere)					
A	generally, over 300mm wide	1654	m2	£8.40	£13,893.60
B	generally, not exceeding 300mm wide	356	m	£5.30	£1,886.80
	Moisture resistant or cement particle board linings assumed 12.5mm thick to timber framing (framing measured elsewhere), complete with all fixings, sealant, trims and the like; all joints taped and filled to receive plaster skim (skim measured elsewhere)					
C	generally; over 300mm wide	218	m2	£6.40	£1,395.20
D	generally, not exceeding 300mm wide	66	m	£4.25	£280.50
	Bathroom pipe casings and boxings; no details					
	Allow for forming pipe casings and low level boxings, comprising of approved 38 x 38mm timber framing at 600mm centres vertically, with vertical framing at all corners and abutments and 450mm centres horizontally; lining with one layer of Gyproc Soundblock board and one layer of moisture resistant board, staggered joints, all joints taped and filled for skim plaster (measured elsewhere)					
E	generally; over 300mm wide	80	m2	£43.04	£3,443.20
F	generally; not exceeding 300mm wide	27	m	£23.87	£644.49
	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS					
	Plaster skim to plasterboard; as Employers Requirements					
	Plaster; one coat skim of gypsum board finish plaster; 3mm thick; trowelling smooth; walls					
G	over 300mm wide	3666	m2	£5.00	£18,330.00
H	not exceeding 300mm wide	645	m	£3.00	£1,935.00
	Beads					
	Galvanised steel beads; fixed with plasterboard screws					
I	thin angle bead	778	m	£1.65	£1,283.70
	Page Total 12/1					**£43,092.49**
	Bill 12 Wall Finishes					

	M40 STONE /CONCRETE /QUARRY /CERAMIC TILING/MOSAIC				
	Ceramic tiling to bathrooms; as Employers Requirements				
	Large format ceramic wall tiles; complete with approved adhesive and coloured grout; no details				
A	over 300mm wide	312	m2	£46.00	£14,352.00
B	not exceeding 300mm wide	42	m	£13.80	£579.60
	Beads				
	Stainless steel perimeter trim beads, bedding in adhesive				
C	generally	209	m	£9.00	£1,881.00
	Sealant				
	Approved sanitary grade white sealant to internal joints and the like				
D	generally; 8 x 8mm fillet	305	m	£0.92	£280.60
	M60 PAINTING/CLEAR FINISHING				
	Painting to plaster; as Employers Requirements				
	Assumed to be Dulux Trade Diamond Matt Emulsion or similar, prepare, seal, apply undercoat and two finishing coats				
E	over 300 girth	3459	m2	£4.35	£15,046.65
	Assumed to be Dulux Trade Diamond Silk Emulsion or similar, prepare, seal, apply undercoat and two finishing coats				
F	over 300 girth	283	m2	£4.35	£1,231.05
	Page Total 12/2				**£33,370.90**
	Bill 13 Floor Finishes				
	Floor Finishes				
	K20 TIMBER BOARD FLOORING/SHEATHING/LININGS/CASINGS				
	Timber flooring; as employers requirements				
	Harlech select oak lacquered , 5mm thick veneered floor or similar approved; pre-finished 189mm wide; timber floor is to be of type suitable for use above an under floor heating system; including all required sealant and the like as required to complete the installation				
A	over 300mm wide	176	m2	£130.00	£22,880.00
	M10 SAND CEMENT /CONCRETE SCREEDS /FLOORING				
	Screed construction; no details				
	No details of manufacturer or product reference; complete installation as recommended by manufacturer				

B	level or to falls only not exceeding 15 degrees from horizontal	803	m2	£14.00	£11,242.00
C	level or to falls only not exceeding 15 degrees from horizontal; to garage; Provisional Quantity	16	m2	£14.00	£224.00
D	level or to falls only not exceeding 15 degrees from horizontal; landings	3	m2	£14.00	£42.00
	Extra over for				
E	perimeter isolation strip including mastic sealant where required	1095	m	£1.50	£1,642.50
F	forming recess for entrance matting	4	m2	£10.00	£40.00
G	construction joints	1	ITEM	Included	Included
H	forming holes for shower gullies	1	ITEM	Included	Included
I	Visqueen 1000gauge DPM separating membrane	803	m2	£1.00	£803.00
J	2000 gauge DPM	483	m2	£1.50	£724.50
	Trowelling smooth				
K	generally	803	m2	Included	Included
	M12 TROWELLED BITUMEN /RESIN /RUBBER /LATEX FLOORING				
	Latex cement; no details				
	Latex smoothing compound				
L	level or to falls only not exceeding 15 degrees from horizontal - Provisional Quantity	738	m2	£6.54	£4,826.52
M	level or to falls only not exceeding 15 degrees from horizontal - Provisional Quantity; landings	3	m2	£6.54	£19.62
	Page Total 13/1				**£42,444.14**
	Bill 13 Floor Finishes				
	Liquid DPM; Assumption				
	Liquid damp proof membrane; trowelling smooth; vinyl and rubber floors				
A	level or to falls only not exceeding 15 degrees from horizontal - Provisional Quantity	738	m2	£8.74	£6,450.12
B	level or to falls only not exceeding 15 degrees from horizontal - Provisional Quantity; landings	3	m2	£8.74	£26.22
	M40 STONE /CONCRETE /QUARRY /CERAMIC TILING/MOSAIC				
	Ceramic floor tiling; as employers requirements				
	No details of manufacturer or product reference; tiles to be laid on a de-coupling membrane such as ditramat; floors				
C	level or to falls	104	m2	£66.00	£6,864.00
	Tiled skirting - no details; Provisional Quantity				

D	generally	184	m	£11.45	£2,106.80
	M50 RUBBER /PLASTIC /CORK /LINO /CARPET TILING /SHEETING				
	Carpet; as employers requirements				
	New Oaklands 80/20/50oz or similar approved on and including PU foam underlay; colour assumed to be chosen by client; including all perimeter grippers, joints and the like as required to complete the installation				
E	over 300mm wide	778	m2	£44.45	£34,582.10
F	risers; not exceeding 300mm wide	96	m	£14.99	£1,439.04
G	treads; not exceeding 300mm wide	79	m	£14.99	£1,184.21
H	winder treads; over 300mm wide average	2	m2	£19.99	£39.98
	Stair nosings; no details				
	No details; complete installation as specified/recommended by manufacturer or as approved				
I	generally - to all staircases	91	m	£19.99	£1,819.09
J	generally; winder stairs	6	m	£29.99	£179.94
	Page Total 13/2				**£54,691.50**
	Bill 13 Floor Finishes				
	Edgings, Cover strips and Trims; as Employers Requirements				
	No details of manufacturer or product reference; secure with edge of covering gripped; matching fasteners used where exposed; including all fixings, adhesives, accessories and the like as required to complete the installation				
A	generally; wood to carpet; to match wood flooring	62	m	£17.50	£1,085.00
B	generally; wood to tile; to match wood flooring	8	m	£17.50	£140.00
C	generally; wood to wood; to match wood flooring	11	m	£17.50	£192.50
D	generally; carpet to tile; metal in gold or silver	17	m	£9.50	£161.50
	M60 PAINTING/CLEAR FINISHING				
	Painting skirtings; no details				
	Dulux Trade water based satin or similar approved; white; prepare and prime surfaces before application				
E	not exceeding 300mm girth	839	m	£2.85	£2,391.15
	Paint to enhanced skirtings in hallways				
F	not exceeding 300mm girth	103	m	£3.00	£309.00
	N10 GENERAL FIXTURES /FURNISHINGS /EQUIPMENT				

	Entrance matting; as Employers Requirements					
	Coir entrance matwell mat; colour assumed to be chosen by client; l;aid flush with floor finishes					
G	over 300mm wide	4	m2	£81.10	£324.40
	Entrance matting frame; as Employers Requirements					
	To suit entrance matting					
H	generally	17	m	£24.35	£413.95
	P10 sundry insulation/ proofing work/ firestops					
	Insulation; as drawing number ECL.DET.01					
	Rigid insulation boards; to achieve U Values; tight butt joints; 150mm thick					
I	over 300mm wide	483	m2	£12.95	£6,254.85
	Page Total 13/3				**£11,272.35**
	Bill 13 Floor Finishes					
	P20 UNFRAMED ISOLATED TRIMS/SKIRTINGS/SUNDRY ITEMS					
	Skirtings; as employers requirements					
	No details of manufacturer or product reference; MDF 20mm x 120mm deep square edge; prepare and prime ready for on-site painting (measured elsewhere); woodscrews assumed to be countersunk and pelleted at 450mm centres					
A	18mm x 144mm	839	m	£8.06	£6,762.34
	No details of manufacturer or product reference; enhanced skirtings to be considered subject to architectural design					
B	generally; to hallways	103	m	£8.57	£882.71
	P22 sealant joints					
	Sealant to tiled and timber floors; as employers requirements					
	Sealant joint between bottom of skirting and tiled / timber floors, nominally 6 x 6mm fillet					
C	generally	305	m	£1.25	£381.25
	Sealant joint between top of skirting walls, nominally 6 x 6mm fillet					
D	generally	943	m	£1.25	£1,178.75
	P99 SUNDRIES					
	Protection					
	Temporary protection of finishes/floors					
E	generally	1057	m2	£2.50	£2,642.50
F	generally; treads	79	m	£3.00	£237.00
G	generally; risers	91	m	£3.00	£273.00

H	generally; winder treads	2	m2	£2.50	£5.00
I	generally; winder risers	6	m	£3.00	£18.00
	Cleaning				
	Cleaning covered floors; floors free from paint spills, plaster snots, stains and the like				
J	generally	1057	m2	£1.50	£1,585.50
K	generally; treads	79	m	£1.00	£79.00
L	generally; risers	91	m	£1.00	£91.00
M	generally; winder treads	2	m2	£1.50	£3.00
N	generally; winder risers	6	m	£1.00	£6.00
	Page Total 13/4				**£14,145.05**
	Bill 14 Ceiling Finishes				
	Ceiling Finishes				
	K10 PLASTERBOARD DRY LINING / PARTITIONS / CEILINGS				
	Plasterboard ceiling; as employers requirements				
	Lafarge standard 15mm wallboard or similar approved; board to be fixed to timber joists; joints taped with filled to receive plaster skim coat finish (measured elsewhere); complete installation including all channels, noggins, clips, hangers, trims, penetrations, sealing, insulation, beads, fixings, accessories and the like as recommended by the manufacturer to complete the installation				
A	generally	293	m2	£5.70	£1,670.10
B	generally; raking	13	m2	£7.25	£94.25
	Extra over for				
C	pattresses; (allowed for 1nr per 5m2 of ceiling areas) - Provisional Quantities	61	Nr	£4.50	£274.50
D	flush access panels	1	ITEM	£500.00	£500.00
E	Contractor to make allowance for fixing around services	1	ITEM	£500.00	£500.00
F	moisture resistant board in lieu of standard board	25	m2	£1.35	£33.75
	Plasterboard ceiling; as employers requirements				
	Lafarge standard 15mm vapour check wallboard or similar approved; fixed to timber joists; joints taped and filled to receive plaster skim coat finish (measured elsewhere); complete installation including all channels, noggins, clips, hangers, trims, penetrations, sealing, insulation, beads, fixings, accessories and the like as recommended by the manufacturer to complete the installation				
G	generally	273	m2	£7.20	£1,965.60
H	generally; sloping	187	m2	£7.20	£1,346.40

Extra over for

I	pattresses; (allowed for 1nr per 5m2 of ceiling areas) - Provisional Quantities	84	Nr	£4.50	£378.00
J	flush access panels	1	ITEM	£500.00	£500.00
K	Contractor to make allowance for fixing around services	1	ITEM	£500.00	£500.00
L	moisture resistant board in lieu of standard board	49	m2	£1.35	£66.15

Page Total 14/1 **£7,828.75**

Bill 14 Ceiling Finishes

Plasterboard suspended ceiling; no details

Assumed to be an British Gypsum Casoline MF suspended ceiling system or similar approved; Gypframe hangers fixed to pre cast concrete plank soffit; nominally 150mm suspension depth; lined with one layer of 15mm Soundbloc plasterboard; taped and jointed to receive plaster skim coat finish (measured elsewhere); including 100mm of acoustic insulation over; complete installation including all channels, noggins, clips, hangers, trims, penetrations, sealing, insulation, beads, fixings, accessories and the like as recommended by the manufacturer to complete the installation

A	generally	340	m2	£21.30	£7,242.00
B	generally; raking	5	m2	£25.00	£125.00

Extra over for

C	pattresses; (allowed for 1nr per 5m2 of ceiling areas) - Provisional Quantities	69	Nr	£4.50	£310.50
D	flush access panels	1	ITEM	£500.00	£500.00
E	Contractor to make allowance for fixing around services	1	ITEM	£500.00	£500.00
F	moisture resistant board in lieu of standard board	30	m2	£1.35	£40.50

M20 PLASTERED /RENDERED /ROUGHCAST COATINGS

Plaster skim; as employers requirements

Plaster skim coat finish; nominally 3mm thick; to plasterboard; trowelled smooth

G	over 300mm wide	906	m2	£5.00	£4,530.00
H	over 300mm wide; raking to soffits	205	m2	£5.00	£1,025.00

M31 FIBROUS PLASTER

Plaster coving; as employers requirements

No details of manufacturer or product reference; assumed to be a standard Gyproc coving system or similar approved; painted to match ceiling (measured elsewhere); complete installation including all sealant to both edges, temporary works and the like as required to complete the installation

I	generally; 125mm girth	1109	m	£3.85	£4,269.65
J	corners	470	Nr	£0.50	£235.00
	Page Total 14/2				**£18,777.65**
	Bill 14 Ceiling Finishes				
	M60 PAINTING/CLEAR FINISHING				
	Paint to plasterboard ceilings; as employers requirements				
	Dulux Pure brilliant White emulsion or similar approved; prepare surfaces and apply one mist and two full coats of matt emulsion as recommended by the manufacturer				
A	over 300mm wide	1009	m2	£3.35	£3,380.15
	Paint to plaster coving; as employers requirements				
	Dulux Pure brilliant White emulsion or similar approved; prepare surfaces, prime and apply one mist and two full coats of matt emulsion as recommended by the manufacturer				
B	not exceeding 300mm wide	1109	m	£1.00	£1,109.00
	Paint to bathroom ceilings; as employers requirements				
	Dulux Pure brilliant White emulsion or similar approved for wet environments; prepare surfaces and apply one mist and two full coats of matt emulsion as recommended by the manufacturer				
C	over 300mm wide	103	m2	£4.35	£448.05
	Page Total 14/3				**£4,937.20**
	Bill 15 Fixtures & Fittings				
	FIXTURES AND FITTINGS				
	N10 GENERAL FIXTURES/ FURNISHINGS/ EQUIPMENT				
	Attendance on Client fit-out				
	Provide all required general and special attendance for Client fit-out works; no scope of works identified, allow as required				
A	generally	1	ITEM	£0.00	£0.00
	Mirrors				
	Class C mirrors, silver backed, fixed to walls with adhesive pads				
B	assumed to be 0.60 x 0.90m	10	Nr	£60.00	£600.00
C	1.20 x 1.60m	10	Nr	£211.20	£2,112.00
	Airing cupboard shelves; as Employers Requirements				

	PAR softwood shelving units, with wall mounted battens, full depth; allowance for area of 2.00m2 each				
D	generally	20	Nr	£64.78	£1,295.60
	Portable fire extinguishers; assumption				
	Portable fire extinguishers; Contractor to submit proposal of type, capacity and supports for approval; supplier and design all to be confirmed / agreed				
E	generally	1	ITEM	£650.00	£650.00
	Fire blankets; assumption				
	Fire blankets; Contractor to submit proposal of type and size for approval; supports by mounting brackets; supplier and design all to be confirmed / agreed				
F	generally	1	ITEM	£650.00	£650.00
	N11 DOMESTIC KITCHEN FITTINGS				
	Kitchen installations; as Employers Requirements				
	Manhattan Kitchens or similar approved; units in accordance with kitchen designs drawings; colours and handles to clients approvals; one wall unit to be lockable; 1 nr 600mm removable base unit; complete installation including all fixings, brackets, connection, plumbing, sealant, accessories and the like as required to complete the installation; designed, manufactured and installed by specialist sub-contractor				
G	generally	10	Nr	£0.00	£0.00
	Page Total 15/1				**£5,307.60**
	Bill 15 Fixtures & Fittings				
	Worktops; as Employers Requirements				
	Manhattan 40mm thick worktop or similar approved; with strip joints; complete installation including all fixings, ends, sealant, accessories and the like as required to complete the installation; designed, manufactured and installed by specialist sub-contractor				
A	as required to suit kitchens	10	Nr	£0.00	£0.00
	Extra over for				
B	cut outs for sinks	10	Nr	£0.00	£0.00
	Sinks; as Employers Requirements				
	No details of manufacturer or product reference; stainless steel single bowl and drainer of 0.9mm minimum thickness; Bristan Java single flow monoblock mixer (chrome); including all plumbing, connections, wastes, traps, sealant, fixings and the like as required to complete the installation				
C	generally	10	Nr	£0.00	£0.00
	Appliances; as Employers Requirements				

	No details of manufacturer or product reference; washer / dryer; including all connections, plumbing and the like as required to complete the installation				
D	generally; assumed to be 1Nr per apartment	10	Nr	£0.00	£0.00
	Vent-Axia Solo Plus extractor or similar approved; flush mounted; isolator switch with humidistat and condensation control; including all fixings, accessories and the like as required to complete the installation				
E	generally; assumed to be 1Nr per apartment	10	Nr	£0.00	£0.00
	Spaces for appliances; as finishes schedule				
	Spaces for appliances; including all connections, plumbing and the like as required to complete the installation				
F	space for oven	10	Nr	£0.00	£0.00
G	space for fridge freezer	10	Nr	£0.00	£0.00
	N14 GENERAL SIGNAGE SYSTEMS				
	General directional signage; assumption				
	Provide and fix general directional signage as required				
H	generally	1	ITEM	£250.00	£250.00
	External building signage; assumption				
	Provide and fix external signage as required				
I	generally	1	ITEM	£250.00	£250.00
	Page Total 15/2				**£500.00**
	Bill 15 Fixtures & Fittings				
	N15 fire and safety signage systems				
	Fire signage systems				
	No details of manufacturer or product reference; adhesive vinyl sheet sign; wall mounted, self adhesive; dimensions as architects recommendations; assumed to provide a suitable fire signage system to all fire escape route areas as required including ceiling / wall mounting brackets as required				
A	generally	1	ITEM	£250.00	£250.00
	Illuminated fire exit signage system				
	Provide a suitable fire signage system to all fire escape route areas as required; including ceiling / wall mounting brackets as required; manufacturer, product reference, symbols and dimensions all to be determined				
B	generally	1	ITEM	£250.00	£250.00
	Page Total 15/3				**£500.00**
	Bill 17 Above Ground Drainage				
	Above Ground Drainage				

R11 FOUL DRAINAGE ABOVE GROUND

Above ground drainage installations; as detailed in the specifications, Employers Requirements (and drawings) for the Mechanical Engineering Services; for The Mill Pool, Coombe Shute

Include a sum for the execution of the Above Ground Drainage Installations generally for the construction of the housing units; including the completion of the design as required; the manufacture, supply and installation of all components required for the completion of the installation; by specialist Sub Contractor

A	in accordance with the design criteria provided by the employer's representative - Units 1 and 2	1	ITEM	Included	Included
B	in accordance with the design criteria provided by the employer's representative - Units 3 and 4	1	ITEM	Included	Included
C	in accordance with the design criteria provided by the employer's representative - Units 5 to 9	1	ITEM	Included	Included
D	in accordance with the design criteria provided by the employer's representative - Unit 10	1	ITEM	Included	Included
E	attendance on the installation of the above ground drainage	1	ITEM	Included	Included
F	special attendance on the installation of the above ground drainage	1	ITEM	Included	Included

Page Total 17/1 **£0.00**

Bill 18 Mechanical Installations

MECHANICAL INSTALLATIONS

S, T, U MECHANICAL INSTALLATIONS

Mechanical Installations; as detailed in the specifications, Employers Requirements (and drawings) for the Mechanical Engineering Services; for The Mill Pool, Combe Shute

Include a sum for the execution of the Mechanical Installations generally for the construction of the housing units; including the completion of the design as required; the manufacture, supply and installation of all components required for the completion of the installation; by specialist Sub Contractor

A	in accordance with the design criteria provided by the employer's representative - Units 1 and 2	1	ITEM	£99,590.00	£99,590.00
B	in accordance with the design criteria provided by the employer's representative - Units 3 and 4	1	ITEM	Included	Included
C	in accordance with the design criteria provided by the employer's representative - Units 5 to 9	1	ITEM	Included	Included

D	in accordance with the design criteria provided by the employer's representative - Unit 10	1	ITEM	Included	Included
E	attendance on the Mechanical Installation contractor	1	ITEM	Included	Included
F	special attendance on the Mechanical Installation contractor	1	ITEM	Included	Included
	Page Total 18/1				**£99,590.00**

Bill 19 Electrical Installations

ELECTRICAL INSTALLATIONS

V, W ELECTRICAL INSTALLATIONS

Electrical Installations; as detailed in the specifications, Employers Requirements (and drawings) for the Electrical Engineering Services; for The Mill Pool, Coombe Shute

Include a sum for the execution of the Electrical Installations generally for the construction of the housing units; including the completion of the design as required; the manufacture, supply and installation of all components required for the completion of the installation; by specialist Sub Contractor

A	in accordance with the design criteria provided by the employer's representative - Units 1 and 2	1	ITEM	£74,724.24	£74,724.24
B	in accordance with the design criteria provided by the employer's representative - Units 3 and 4	1	ITEM	Included	Included
C	in accordance with the design criteria provided by the employer's representative - Units 5 to 9	1	ITEM	Included	Included
D	in accordance with the design criteria provided by the employer's representative - Unit 10	1	ITEM	Included	Included
E	lightning protection installation in accordance with the design criteria provided by the employer's representative	1	ITEM	Included	Included
F	attendance on the Electrical Installation contractor	1	ITEM	Included	Included
G	special attendance on the Electrical Installation contractor	1	ITEM	Included	Included
	Page Total 19/1				**£74,724.24**

Bill 20 Lift Installation

LIFT INSTALLATIONS

X10 LIFTS

Lift Installations; as detailed in the Employers Requirements and specifications (and drawings) for the Lift Installations and associated works for the design and construction of The Mill Pool, Coombe Shute

Platform lift; supplied, manufactured, designed and installed by a client approved manufacturer; complete with internal finishes, handrails, DDA compliant controls and access all as required; access doors; all operating equipment as required; by specialist Sub Contractor

A	access lift; three floors served, ground, first and second floor; opening on one side; including all front enclosure	1	Nr	£21,385.00	£21,385.00

Extra over for

B	fire fighting lift if required	1	ITEM	Declined	Declined

Installation generally

Testing

C	allow for testing on completion and provide test certificate	1	ITEM	Included	Included

Commissioning

D	allow for commissioning on completion	1	ITEM	Included	Included

Operating and maintenance manuals

E	provide number of copies as detailed in the Employers Requirements	1	ITEM	Included	Included

Main Contractors Attendances / Works

All works

F	Provision and installation of lifting beam fixed to structure as required	1	Nr	Declined	Declined
G	Marking positions of and cutting or forming holes mortices and chases in the structure	1	ITEM	Declined	Declined
H	Lighting to lift shaft	1	Nr	Declined	Declined
I	Ventilation to top of shaft, provision of suitable external louvre or vent, complete with ducting as may be required	1	Nr	Declined	Declined
J	Installation and fixing in of Halfen or similar slot channels to accept lift framework	1	ITEM	Declined	Declined
K	Installation or secondary steelwork / timber to allow for installation of lift framework to upper levels	1	ITEM	Declined	Declined
L	Painting within passenger lift shaft with sealer and one coat white masonry paint as required	54	m2	£4.00	£216.00

Page Total 20/1 **£21,601.00**

Bill 21 BWIC with Services

BWIC WITH SERVICES

M60 PAINTING/CLEAR FINISHING

Painting copper pipework

No details of manufacturer or product reference; assumed to prepare, prime and apply one undercoat and two finishing coats of paint; general surfaces

A	not exceeding 300mm girth - Provisional Quantity	160	m	£2.65	£424.00

P12 FIRE STOPPING

Fire stopping works

Fire stopping works provided; assumed requirements and specification; Fire stopping generally comprising of Rockwool Intumescent mineral wool; fixed in place with intumescent sealant and pastes; and for larger holes filled with proprietary quick setting fire proof cement based slurries

B	generally; at locations of penetrations through internal walls	1	ITEM	Included	Included
C	generally; within cavities of external walls	1	ITEM	Included	Included
D	generally; penetrations in cavities to ceiling	1	ITEM	Included	Included

P22 SEALANT JOINTS

Air Sealing

Carry out all works required to achieve air pressure test standards, as appropriate to the Employers Requirements

E	provision of sealant and the like to all locations to achieve air sealing	1	ITEM	Included	Included

P31 BUILDERS WORK IN CONNECTION WITH SERVICES

Works as required to enable the completion of services installations

As required for the completion of the services installation, including the forming of chases, holes, sinkings, pits, pattresses, blockings, trenches and the like, fire sealing on completion as may be necessary

F	all BWIC for the electrical installations as defined by the performance specification for the electrical works	1	ITEM	£10,000.00	£10,000.00
G	all BWIC for the mechanical installations as defined by the performance specification for the mechanical works	1	ITEM	Included	Included
H	all BWIC for the above ground drainage and rainwater pipes as defined by the performance specification for the mechanical works	1	ITEM	Included	Included

Page Total 21/1 **£10,424.00**

Bill 21 BWIC with Services

A	all BWIC for the lightning protection installations as defined by the performance specification for the mechanical works	1	ITEM	Included	Included
B	provision of lightning protection rod pits and housing; Provisional Quantity	9	Nr	Included	Included

Page Total 21/2 **£0.00**

Bill 22 External Works

Excavation RISK

EXCAVATION RISK ITEMS

Excavating Risk; (Contractor to note: the following elements have been described but not quantified as this is an element of contractor's risk - Contractor to complete the risk design)

To reduce levels

A	soft spots; including filling all soft spots with approved granular fill material, compacting and proof rolling - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00

Extra over excavation irrespective of depth for excavating

B	next existing services - to be priced as rate only per cubic metre	0	m	£0.00	£0.00
C	around existing services crossing excavations - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
D	archeological digging on site; complete including the risk of time loss and all elements pertaining to the archeological dig	1	ITEM	£0.00	£0.00

Extra over excavation irrespective of depth for breaking out and removal off site all spoils

E	rock - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
F	concrete - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
G	reinforced concrete - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
H	brickwork blockwork or stonework - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
I	contaminated material - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00

Disposal Risk

Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters

J	off site	1	ITEM	£199.84	£199.84

Excavated material

K	soft spot material - to be priced as rate only per cubic metre of inert	0	m3	£0.00	£0.00
L	extra over off site disposal for the disposal of contaminated material; Contractor to develop	0	m3	£0.00	£0.00

Page Total 22/1 **£199.84**

Bill 22 External Works

External Works

D20 EXCAVATING AND FILLING

Excavating

Trenches; over 300mm wide

A	1.00m maximum depth	119	m3	£12.96	£1,542.24
	Pits, tree pits 12 nr				
B	1.00m maximum depth	12	m3	£16.20	£194.40
	Working space allowance to excavations; complete with all additional excavation, disposal, backfilling with well compacted approved granular material, all additional earthwork support and the like				
C	pits	48	m2	£6.48	£311.04
D	trenches	226	m2	£3.24	£732.24
	Earthwork support				
	To faces of excavation; including all additional backfilling with well compacted granular material, making good as required, designed, supplied and installed, maintained and removed by specialist Sub Contractor				
E	1.00m maximum depth; distance between opposing faces not exceeding 2.00m	274	m2	£3.24	£887.76
	Disposal				
	Excavated material				
F	off site; it has been assumed all excavated material to be taken off site; to be treated as inert hazardous material	131	m3	£35.65	£4,670.15
	Imported topsoil				
	Filling to excavations				
G	over 250mm average thick	12	m3	£36.73	£440.76
	Filling to make up levels				
H	not exceeding 250mm average thick	78	m3	£36.73	£2,864.94
I	over 250mm average thick	71	m3	£36.73	£2,607.83
	Surface Treatments				
	Compacting ground				
J	generally	12	m2	£0.76	£9.12
	Compacting bottoms of excavations				
K	generally	148	m2	£0.76	£112.48
	E10 MIXING / CASTING / CURING IN SITU CONCRETE				
	Plain concrete grade Gen 1				
	Blinding concrete				
L	not exceeding 150mm thick	7	m3	£149.07	£1,043.49
	Page Total 22/2				**£15,416.45**
	Bill 22 External Works				
	Reinforced concrete grade FND2z				

	Foundations				
A	generally	61	m3	£182.56	£11,136.16
	E20 FORMWORK FOR IN SITU CONCRETE				
	Formwork, basic finish				
	Sides of ground beams and edges of beds				
B	250 to 500mm high	202	m	£23.77	£4,801.54
C	250 to 500mm high; curved on plan	54	m	£25.93	£1,400.22
	E30 REINFORCEMENT FOR IN SITU CONCRETE				
	Steel fabric reinforcement to B.S.4483				
	Fabric				
D	generally, B785	136	m2	£14.04	£1,909.44
	F10 BRICK/BLOCK WALLING				
	Blockwork				
	Dense aggregate blockwork; nominally 7.3 N/mm2 ion cement mortar; no details; walls				
E	assumed to be 215mm thick	20	m2	£45.58	£911.60
	F20 NATURAL STONE RUBBLE WALLING				
	Stonework boundary walls				
	Natural stone rubble walling, assumed to match adjacent walls; faced both sides; complete with all required facework; in lime mortar				
F	nominally 350mm thick	173	m2	£385.04	£66,611.92
	Cappings to stone walls; hit and miss faced stones to provide rampart format to match adjacent walls				
G	generally	89	m	£98.04	£8,725.56
H	generally; curved on plan	27	m	£108.04	£2,917.08
	L30 STAIRS /WALKWAYS /BALUSTRADES				
	External handrails; no details				
	Assumed to be polyester powder coated galvanised mild steel handrails; fixed to masonry walls as required, designed, manufactured and installed by specialist Sub Contractor				
I	raking	6	m	£176.24	£1,057.44
	Extra over for				
J	ends	8	Nr	£40.22	£321.76
	Page Total 22/3				**£99,792.72**
	Bill 22 External Works				
	Q10 KERBS /EDGINGS /CHANNELS /PAVING ACCESSORIES				
	Kerbs; as drawing 0011				

	Pre cast concrete kerbs, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching				
A	kerbs, HB2	63	m	£33.49	£2,109.87
B	kerbs, HB2; curved on plan; radius over 12.00m	5	m	£37.81	£189.05
C	kerbs, BN; conservation format to match pavings	139	m	£38.89	£5,405.71
D	kerbs, BN; conservation format to match pavings; curved on plan; radius not exceeding 12.00m	9	m	£48.61	£437.49
E	kerbs, BN; conservation format to match pavings; curved on plan; radius over 12.00m	33	m	£51.85	£1,711.05
F	path edgings	201	m	£20.52	£4,124.52
G	path edgings; curved on plan	7	m	£22.69	£158.83
	Extra over for				
H	drop kerbs; HB2 to BN	2	Nr	£32.41	£64.82
	Q20 HARDCORE /GRANULAR /CEMENT BOUND BASES /SUB BASES TO ROADS /PAVINGS				
	Granular material type 1				
	Filling to make up levels				
I	not exceeding 250mm average thick	52	m3	£42.13	£2,190.76
J	over 250mm average thick	290	m3	£42.13	£12,217.70
	Granular material type 6F2				
	Filling to make up levels				
K	not exceeding 250mm average thick	207	m3	£36.73	£7,603.11
	Surface treatments				
	Compacting filling				
L	generally	2002	m2	£0.76	£1,521.52
	Q21 IN SITU CONCRETE ROADS /PAVINGS				
	Reinforced concrete external slabs				
	Beds; air entrained concrete PAV 2				
M	not exceeding 150mm thick	6	m3	£178.24	£1,069.44
	Basic finish formwork				
	Edges of beds				
N	not exceeding 250mm high	53	m	£23.77	£1,259.81
	Steel fabric reinforcement to B.S..4483				
	Fabric				
O	reference A252	37	m2	£14.04	£519.48
	Page Total 22/4				**£40,583.16**
	Bill 22 External Works				

	Designed joints					
	Isolation joints; comprising of 25mm thick bitumen impregnated woodfibre board; with 25 x 25mm sealant to top					
A	to suit 150mm thick slab	53	m	£12.96	£686.88
	Worked finishes; no details					
	Assumed to be brush and spade finish					
B	generally	37	m2	£6.48	£239.76
	Separation membrane					
	Assumed to be 1000 gauge polythene sheeting on and including 25mm of sand blinding					
C	generally	37	m2	£4.32	£159.84
	Q22 COATED MACADAM /ASPHALT ROADS /PAVINGS					
	Tarmac road surfacing as drawing 2301					
	Binder course open bin 40/60 AC20; to BS EN 13108-1					
D	level or to falls; 60mm thick	828	m2	£15.77	£13,057.56
	Q23 GRAVEL /HOGGIN /WOODCHIP ROADS /PAVINGS					
	Gravel margins - no details					
	Assumed to be locally sourced rounded gravel to match location; laid on and including weed suppressant membrane; spread and level and compact					
E	level or to falls; nominally 75mm thick	13	m2	£16.20	£210.60
	Q25 SLAB BRICK BLOCK SETT COBBLE PAVINGS					
	Block paving; to roads and parking bays					
	Marshalls Tegular Block Paving Harvest or similar approved standard 200 x 100 x 80mm block pavings; on and including 30mm thick sand laying bed; pavings					
F	level or to falls	801	m2	£59.41	£47,587.41
	Extra over for parking delineation					
G	level or to falls	113	m	£16.20	£1,830.60
	Block paving; to pavements					
	Marshalls Tegular Block Paving Harvest or similar approved standard 200 x 100 x 80mm block pavings; on and including 30mm thick sand laying bed; pavings					
H	level or to falls	85	m2	£59.41	£5,049.85
	Page Total 22/5				**£68,822.50**
	Bill 22 External Works					
	Rumble strip					

	Comprising of Charcon or similar cropped finish granite blocks 100 x 100 x 100mm; bedding and pointing in Ultracrete flow point rapid setting mortar to concrete bed (measured elsewhere)					
A	level or to falls	5	m2	£64.81	£324.05
	Paving slabs					
	Assumed to be Marshalls Saxon or similar approved standard 450 x 450 x 50mm block pavings; on and including 30mm thick sand laying bed; pavings					
B	level or to falls; to roads	28	m2	£48.61	£1,361.08
	Assumed to be Marshalls Saxon or similar approved standard 450 x 450 x 50mm block pavings; on and including 30mm thick sand laying bed; pavings					
C	level or to falls; to pavements and access routes	91	m2	£48.61	£4,423.51
D	level or to falls; to private pavements and access routes	64	m2	£48.61	£3,111.04
	Extra over for					
E	forming steps; set of two risers; nominally 900mm wide	2	Nr	£124.23	£248.46
F	forming steps; set of five risers; nominally 900mm wide	1	Nr	£297.07	£297.07
G	forming steps; set of eight risers; nominally 900mm wide	1	Nr	£621.14	£621.14
	Q30 SEEDING/TURFING					
	Cultivating					
	Surface of ground					
H	nominally 100mm thick to seeded areas	518	m2	N/A	N/A
	Surface applications					
	General surfaces; weed killer and fertiliser					
I	generally	518	m2	N/A	N/A
	Seeding					
	General surfaces; approved grass seed					
J	generally; amenity area grass seed	518	m2	N/A	N/A
	Page Total 22/6					**£10,386.35**
	Bill 22 External Works					
	Maintenance					
	Provision of maintenance of all soft landscaped areas; for a period of twelve months from Practical Completion or final planting works whichever is the latter; complete with all regular trimming, cutting and the like, disposing of all arisings; replacement of all loses					
A	generally	1	ITEM	N/A	N/A

	Q31 PLANTING					
	Cultivating					
	Surface of filling, topsoil; No detail; Contractor to submit proposal for approval					
B	nominally 250mm deep - infill planting	159	m2	N/A	N/A
	Surface applications					
	General surfaces; weed killer and fertiliser					
C	generally	159	m2	N/A	N/A
	Planting of trees, shrubs and the like					
	Planting requirements to suit site plan					
D	Shrub and hedge planting	159	m2	N/A	N/A
E	Trees	12	Nr	N/A	N/A
	Maintenance					
	Provision of maintenance of all soft landscaped areas; for a period of twelve months from Practical Completion or final planting works whichever is the latter; complete with all regular trimming, cutting and the like, disposing of all arisings; replacement of all loses					
F	generally	1	ITEM	N/A	N/A
	Q40 FENCING					
	Close boarded Fencing					
	Softwood close boarded fencing, comprising of softwood feather edge boards 100 x 25mm; three 75 x 50mm rails and 100 x 100mm posts at 2.40m centres; timber gravel boards; including all foundations, temporary works and the like					
G	1200mm high	32	m	£29.36	£939.52
H	1800mm high	17	m	£34.72	£590.24
I	2000mm high, boundary fence	43	m	£38.96	£1,675.28
	Extra over for					
J	single leaf gates, complete with additional posts and ironmongery, 1800mm high	5	Nr	£197.49	£987.45
	Page Total 22/7					**£4,192.49**
	Bill 22 External Works					
	Gates					
	Set of approved cast iron gates; including posts, foundations, ironmongery and the like; factory finished as may be required; no details; to entrance of communal garden					
A	assumed to be 1200mm high; nominally 1800mm wide	1	Nr	£2,000.00	£2,000.00
	Bin store access					

	Set of approved fencing and cast iron gates; including posts, foundations, ironmongery and the like; factory finished as may be required; no details; to entrance of communal bin store				
B	assumed to be 1200mm high; gate nominally 1200mm wide, with two sets of fencing to match nominally 300mm long each	1	Nr	£1,200.00	£1,200.00
	Q50 SITE/STREET FURNITURE/EQUIPMENT				
	External seat				
	Limited information; assumed to be of timber construction on galvanised steel frame; complete with all required foundations and the like, temporary works and disposal of surplus materials				
C	generally	1	Nr	£662.04	£662.04
	Page Total 22/8				**£3,862.04**
	Bill 23 Foul Drainage				
	Preambles and EXCAVATION RISK ITEMS				
	A13 DESCRIPTION OF THE WORK				
	Drainage activities				
	The Contractor and Sub Contractors should allow for all works identified within the appended Drainage Standard Bill; which includes for all attendances, site surveys and investigations				
A	generally	1	ITEM	£216.05	£216.05
	The Contractor and Sub Contractor should familiarise themselves as to the condition of the existing drainage lines. The contractor to make allowance for possible repairs to the existing drainage lines including revamping existing manholes to suit				
B	generally	1	ITEM	£216.05	£216.05
	R12 FOUL DRAINAGE BELOW GROUND				
	Trench excavation risk				
	Extra over excavation irrespective of depth for breaking out - to be priced as rate only per cubic metre				
C	rock	0	m3	£0.00	£0.00
D	concrete	0	m3	£0.00	£0.00
E	reinforced concrete	0	m3	£0.00	£0.00
F	brickwork, blockwork or stonework	0	m3	£0.00	£0.00
	Extra over trench excavations; irrespective of depth and size for				
G	excavating soft spots; disposal of surplus material and filling with approved fill to formation level of trench - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
H	next existing service - to be priced as rate only per metre	0	m3	£0.00	£0.00

I	around existing service crossing excavation - to be priced as rate only per crossing	0	m3	£0.00	£0.00
	Page Total 23/1				**£432.10**
	Bill 23 Foul Drainage				
	FOUL DRAINAGE - Below Ground Floor				
	R12 DRAINAGE BELOW GROUND				
	Excavating trenches for drainage pipes; complete with the disposal of surplus materials; backfilling with Type 1				
	For pipes; not exceeding 200mm nominal diameter				
A	average depth 500 to 750mm	114	m	£32.41	£3,694.74
	Type Z Concrete surround				
	Beds and surrounds				
B	to suit 100mm diameter pipe	114	m	£25.93	£2,956.02
	Below ground drainage pipe				
	Approved PVC / Clay pipes to BS4660 and BS 5481, for PVC or BS EN 295 for vitrified clay pipes; complete with all flexible couplings and fittings as required				
C	100mm nominal size	114	m	£11.88	£1,354.32
	Extra over for				
D	bends, 100mm	38	Nr	£30.25	£1,149.50
E	rocker pipes, 100mm; to manholes	19	Nr	£30.25	£574.75
F	rest bends, 100mm; complete with concrete base	19	Nr	£34.57	£656.83
G	connection to soil pipes	19	Nr	£37.81	£718.39
	Sundry items				
	Marker tape, non degradable; red with black lettering				
H	laid in trench 450mm above pipe	114	m	£1.08	£123.12
	Page Total 23/2				**£11,227.67**
	Bill 23 Foul Drainage				
	FOUL DRAINAGE - Diversion Works				
	C90 ALTERATIONS - SPOT ITEMS				
	To various locations off site				
	Remove existing drainage installations, including all required excavation, breaking out, disposal of pipework and the like; backfilling trenches with well compacted granular material, including selected excavated material as required; make good				
A	cap off and seal existing pipework	1	ITEM	£59.41	£59.41

B	remove manholes; assumed to be masonry construction, assumed to be not exceeding 2.00m deep	1	Nr	£448.30	£448.30

R12 DRAINAGE BELOW GROUND

Excavating trenches for drainage pipes; complete with the disposal of surplus materials; backfilling with Type 1

For pipes; 225mm nominal diameter

C	average depth 750 to 1000mm - outside of site boundary	25	m	£34.57	£864.25
D	average depth 1000 to 1250mm	18	m	£38.89	£700.02
E	average depth 1250 to 1500mm	24	m	£42.13	£1,011.12
F	average depth 1500 to 1750mm	17	m	£47.53	£808.01
G	average depth 1750 to 2000mm	19	m	£51.85	£985.15

Type S granular surround

Beds and surrounds

H	to suit 225mm diameter pipe	103	m	£11.88	£1,223.64

Below ground drainage pipe

UltraRib Twinwall plastic pipes to BS4660 and BS 5481; complete with all flexible couplings and fittings as required

I	225mm nominal size	103	m	£17.28	£1,779.84

Extra over for

J	bends, 225mm	10	Nr	£30.25	£302.50
K	rocker pipes, 225mm; to manholes	16	Nr	£30.25	£484.00
L	junction 100 x 225 x 225mm	1	Nr	£37.81	£37.81
M	junction 150 x 225 x 225mm	1	Nr	£37.81	£37.81

Sundry items

Marker tape, non degradable; red with black lettering

N	laid in trench 450mm above pipe	103	m	£1.08	£111.24

Page Total 23/3 **£8,853.10**

Bill 23 Foul Drainage

R15 MANHOLES

Concrete manholes

Concrete manhole; circular; precast concrete shaft - chamber sections to be bedded with mortar, proprietary bitumen or resin mastic sealant; 150mm thick GEN3 concrete surround; complete installation including provision of safety equipment, all excavation, temporary works, disposal, concrete beds, surround, benching; brick raising course; pre cast concrete base, concrete topping, step irons, riser and cover units, channel ware, rocker pipes and the like; to accept manhole cover and frame

A	1200mm diameter manhole; depth not exceeding 1250mm; assumed D400 recessed cover	1	Nr	£1,528.54	£1,528.54
B	1200mm diameter manhole; depth not exceeding 1500mm; assumed D400 recessed cover	2	Nr	£1,701.38	£3,402.76
C	1200mm diameter manhole; depth not exceeding 1750mm; assumed D400 recessed cover	2	Nr	£1,824.53	£3,649.06
D	1200mm diameter manhole; depth not exceeding 2000mm; assumed D400 recessed cover	1	Nr	£1,993.05	£1,993.05

R26 WORKS TO EXISTING MANHOLES AND DRAIN RUNS

Works to existing combined drainage scheme

Works to existing combined drainage manhole (subject to approval); excavate down the side of the existing manhole and create a new connection into existing drainage manhole; complete installation including all excavation, temporary works; disposal, concrete beds, surround, benching, channel ware and the like; making good all trades and testing as required; including all excavations adjacent to the drainage runs that may be required, making good, temporary works and the like, maintain flow at all times, provision of safety equipment to suit

E	works to existing manhole; remove exit pipes and install new 225mm pipe; manhole construction unknown; assumed to be masonry, depth to invert not exceeding 1000mm	1	Nr	£1,420.52	£1,420.52
F	works to existing manhole; remove exit pipes and install new 225mm pipe; manhole construction unknown; assumed to be masonry, depth to invert not exceeding 2000mm	1	Nr	£1,636.57	£1,636.57

Page Total 23/4 **£13,630.50**

Works to existing combined drainage pipework (subject to approval); excavate to locate existing pipe run and create a new connection into existing drainage; complete installation including all excavation, temporary works; disposal; making good all trades and testing as required; including all excavations adjacent to the drainage runs that may be required, making good, temporary works and the like, maintain flow at all times, provision of safety equipment to suit

A	works to existing pipework, at location of existing manhole, connect existing entry pipework to new pipework for manhole to be abandoned and removed; pipe nominally 2.00m to invert, existing 225mm diameter pipe	1	Nr	£837.19	£837.19

Page Total 23/5 **£837.19**

FOUL DRAINAGE - TO EXTERNAL WORKS

R12 DRAINAGE BELOW GROUND

Excavating trenches for drainage pipes; complete with the disposal of surplus materials; backfilling with Type 1

For pipes; not exceeding 200mm nominal diameter

A	average depth 500 to 750mm	4	m	£32.41	£129.64
B	average depth 750 to 1000mm	29	m	£34.57	£1,002.53
C	average depth 1000 to 1250mm	28	m	£38.89	£1,088.92

Type S granular surround

Beds and surrounds

D	to suit 100mm diameter pipe	28	m	£11.88	£332.64

Type Z Concrete surround

Beds and surrounds

E	to suit 100mm diameter pipe	34	m	£25.93	£881.62

Below ground drainage pipe

Approved PVC / Clay pipes to BS4660 and BS 5481, for PVC or BS EN 295 for vitrified clay pipes; complete with all flexible couplings and fittings as required

F	100mm nominal size	62	m	£11.88	£736.56

Extra over for

G	bends, 100mm	11	Nr	£30.25	£332.75
H	rocker pipes, 100mm; to manholes	16	Nr	£30.25	£484.00
I	external yard gully, complete with trap, grating and cover, bed and surround in concrete	1	Nr	£237.65	£237.65

Sundry items

Marker tape, non degradable; red with black lettering

J	laid in trench 450mm above pipe	62	m	£1.08	£66.96

R15 MANHOLES

Preformed Hepworth polypropylene sectional units - Inspection chambers

Excavate, support, spoil and concrete surround for; 475mm diameter. polypropylene inspection chamber; complete including setting base in concrete on concrete slab at correct levels; to accept and including approved manhole covers Class D400; 450mm diameter; to suit manhole

K	manhole not exceeding 750mm deep	3	Nr	£394.29	£1,182.87
L	manhole not exceeding 1000mm deep	5	Nr	£480.71	£2,403.55

Page Total 23/6 **£8,879.69**

	Bill 23 Foul Drainage				
	FOUL DRAINAGE - TESTING				
	R99 DRAINAGE TESTS				
	Inspections and testing as required				
	CCTV inspection to all pipelines				
A	generally	1	ITEM	£810.18	£810.18
	Testing of manholes and pipelines				
B	generally	1	ITEM	£378.08	£378.08
	Cleaning of pipelines				
C	as required	1	ITEM	£324.07	£324.07
	Operating and maintenance manuals				
D	as required	1	ITEM	£270.06	£270.06
	Record drawings				
E	as required	1	ITEM	£194.44	£194.44
	Page Total 23/7				**£1,976.83**
	Bill 24 Storm Drainage				
	Preambles and EXCAVATION RISK ITEMS				
	A13 DESCRIPTION OF THE WORK				
	Drainage activities				
	The Contractor and Sub Contractors should allow for all works identified within the appended Drainage Standard Bill; which includes for all attendances, site surveys and investigations				
A	generally	1	ITEM	£216.05	£216.05
	The Contractor and Sub Contractor should familiarise themselves as to the condition of the existing drainage lines. The contractor to make allowance for possible repairs to the existing drainage lines including revamping existing manholes to suit				
B	generally	1	ITEM	£216.05	£216.05
	The contract is advised that there are no drainage depths indicated on the drawings or pipe sizes, and therefore all depths, pipe sizes and the like in this Bill should be taken to be provisional and subject to verification.				
C	generally	1	ITEM	£0.00	£0.00
	R12 Storm DRAINAGE BELOW GROUND				
	Trench excavation risk				
	Extra over excavation irrespective of depth for breaking out - to be priced as rate only per cubic metre				
D	rock	0	m3	£0.00	£0.00
E	concrete	0	m3	£0.00	£0.00

F	reinforced concrete	0	m3	£0.00	£0.00
G	brickwork, blockwork or stonework	0	m3	£0.00	£0.00
	Extra over trench excavations; irrespective of depth and size for				
H	excavating soft spots; disposal of surplus material and filling with approved fill to formation level of trench - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
I	next existing service - to be priced as rate only per metre	0	m3	£0.00	£0.00
J	around existing service crossing excavation - to be priced as rate only per crossing	0	m3	£0.00	£0.00
	Page Total 24/1				**£432.10**
	Bill 24 Storm Drainage				
	Storm DRAINAGE - TO EXTERNAL WORKS				
	Q10 KERBS /EDGINGS /CHANNELS /PAVING ACCESSORIES				
	Aco Drains; thresholds				
	ACO channels or equal other approved with ductile iron grating to load class D400; complete including excavation, disposal and concrete bed and surround as indicated on detail drawing				
A	generally; laid straight	35	m	£156.64	£5,482.40
	Extra over slotted drain system for:				
B	ends	26	Nr	£27.01	£702.26
C	outlet connection 100mm diameter	13	Nr	£41.05	£533.65
	Dished channels; as drawing 50037-0011 revision B				
	In situ concrete ST4 foundation to receive pennant / granite setts 200 x 100 x 100mm bedded and pointed in approved mortar; complete including excavation, disposal and concrete bed and surround as indicated on detail drawing				
D	generally; laid straight	49	m	£73.46	£3,599.54
	R12 DRAINAGE BELOW GROUND				
	Excavating trenches for drainage pipes; complete with the disposal of surplus materials; backfilling with Type 1				
	For pipes; not exceeding 200mm nominal diameter				
E	average depth 750 to 1000mm	229	m	£34.57	£7,916.53
F	average depth 1000 to 1250mm	23	m	£38.89	£894.47
G	average depth 1250 to 1500mm	68	m	£42.13	£2,864.84
	For pipes; 225mm nominal diameter				
H	average depth 1250 to 1500mm	21	m	£51.85	£1,088.85

I	average depth 1500 to 1750mm	68	m	£56.17	£3,819.56			
	For pipes; 300mm nominal diameter							
J	average depth 1250 to 1500mm	4	m	£57.25	£229.00		£57.25	
K	average depth 1500 to 1750mm	12	m	£62.65	£751.80			£62.65
	Type S granular surround							
	Beds and surrounds							
L	to suit 100mm diameter pipe	7	m	£11.88	£83.16			
M	to suit 150mm diameter pipe	83	m	£14.04	£1,165.32			
N	to suit 225mm diameter pipe	89	m	£16.20	£1,441.80			
O	to suit 300mm diameter pipe	16	m	£20.52	£328.32		£20.52	£20.52
	Page Total 24/2				**£30,901.50**			
	Bill 24 Storm Drainage							
	Type Z Concrete surround							
	Beds and surrounds							
A	to suit 100mm diameter pipe	194	m	£25.93	£5,030.42			
B	to suit 150mm diameter pipe	34	m	£28.09	£955.06			
	Below ground drainage pipe							
	Approved PVC / Clay pipes to BS4660 and BS 5481, for PVC or BS EN 295 for vitrified clay pipes; complete with all flexible couplings and fittings as required							
C	100mm nominal size	202	m	£11.88	£2,399.76			
D	150mm nominal size	117	m	£14.04	£1,642.68			
E	225mm nominal size	89	m	£17.28	£1,537.92			
F	300mm nominal size	16	m	£25.93	£414.88		£25.93	£25.93
	Extra over for							
G	bends, 100mm	130	Nr	£27.01	£3,511.30			
H	bends, 150mm	65	Nr	£30.25	£1,966.25			
I	bends, 225mm	24	Nr	£32.41	£777.84			
J	bends, 300mm	3	Nr	£41.05	£123.15			
K	rocker pipes, 100mm; to manholes	27	Nr	£27.01	£729.27			
L	rocker pipes, 150mm; to manholes	18	Nr	£30.25	£544.50			
M	rocker pipes, 225mm; to manholes	14	Nr	£32.41	£453.74			
N	rocker pipes, 300mm; to manholes	6	Nr	£38.89	£233.34			
O	junctions, 100 x 100 x 100mm	14	Nr	£37.81	£529.34			
P	junctions, 100 x 150 x 150mm	2	Nr	£37.81	£75.62			
Q	junctions, 100 x 225 x 225mm	12	Nr	£41.05	£492.60			
R	junctions, 100 x 300 x 300mm	1	Nr	£49.69	£49.69			

S	junctions, 150 x 150 x 150mm	7	Nr	£37.81	£264.67
T	junctions, 150 x 225 x 225mm	5	Nr	£41.05	£205.25
U	external yard gully, complete with trap, grating and cover, bed and surround in concrete; 150mm outlet	5	Nr	£237.65	£1,188.25
V	rodding eye, complete with frame and cover, bed and surround in concrete; 100mm outlet	2	Nr	£118.83	£237.66
W	connection to rainwater pipes	37	Nr	£48.61	£1,798.57
X	rest bend, complete with concrete bed and surround; 100mm	37	Nr	£31.33	£1,159.21

Road gully

Pre cast concrete road gully; including all excavation, grating, frame, stopper, concrete bed and surround and the like to complete the installation

Y	to suit 150mm diameter outlet	10	Nr	£253.86	£2,538.60

Page Total 24/3 **£28,859.57**

Bill 24 Storm Drainage

Sundry items

Marker tape, non degradable; red with black lettering

A	laid in trench 450mm above pipe	62	m	£1.08	£66.96

R15 MANHOLES

Concrete manholes

Concrete manhole; circular; precast concrete shaft - chamber sections to be bedded with mortar, proprietary bitumen or resin mastic sealant; 150mm thick GEN3 concrete surround; complete installation including provision of safety equipment, all excavation, temporary works, disposal, concrete beds, surround, benching; brick raising course; pre cast concrete base, concrete topping, step irons, riser and cover units, channel ware, rocker pipes and the like; to accept manhole cover and frame

B	1200mm diameter manhole; depth not exceeding 1250mm; assumed D400 recessed cover	1	Nr	£1,528.54	£1,528.54
C	1200mm diameter manhole; depth not exceeding 1500mm; assumed D400 recessed cover	2	Nr	£1,701.38	£3,402.76
D	1200mm diameter manhole; depth not exceeding 1750mm; assumed D400 recessed cover	2	Nr	£1,824.53	£3,649.06
E	1200mm diameter manhole; depth not exceeding 2000mm; assumed D400 cover	2	Nr	£1,993.05	£3,986.10

Headwalls

	Athlon precast concrete headwall; complete installation including all excavation, temporary works; disposal, concrete beds, surround; including all guarding, galvanised gratings and the like				
F	150mm diameter pipe outlet; depth to invert not exceeding 1.50m	1	Nr	£324.07	£324.07
G	300mm diameter pipe outlet; depth to invert not exceeding 1.75m	1	Nr	£378.08	£378.08
	Preformed Hepworth polypropylene sectional units - Inspection chambers				
	Excavate, support, spoil and concrete surround for; 475mm diameter. polypropylene inspection chamber; complete including setting base in concrete on concrete slab at correct levels; to accept and including approved manhole covers Class D400; 450mm diameter; to suit manhole				
H	manhole not exceeding 1000mm deep	10	Nr	£480.71	£4,807.10
I	manhole not exceeding 1250mm deep	3	Nr	£556.32	£1,668.96
J	manhole not exceeding 1500mm deep	1	Nr	£658.95	£658.95
	Page Total 24/4				**£20,470.58**
	Bill 24 Storm Drainage				
A	manhole not exceeding 1750mm deep 3.00 Nr	0		£0.00	£0.00
	Page Total 24/5				**£0.00**
	Bill 24 Storm Drainage				
	Storm DRAINAGE - TESTING				
	R99 DRAINAGE TESTS				
	Inspections and testing as required				
	CCTV inspection to all pipelines				
A	generally	1	ITEM	£810.18	£810.18
	Testing of manholes and pipelines				
B	generally	1	ITEM	£378.08	£378.08
	Cleaning of pipelines				
C	as required	1	ITEM	£324.07	£324.07
	Operating and maintenance manuals				
D	as required	1	ITEM	£270.06	£270.06
	Record drawings				
E	as required	1	ITEM	£199.84	£199.84
	Page Total 24/6				**£1,982.23**
	Bill 25 External Services				
	EXCAVATING RISK ITEMS				
	D20 EXCAVATING AND FILLING				

Trench excavation risk

Extra over excavation irrespective of depth for breaking out - to be priced as rate only per cubic metre

A	rock	0	m3	£0.00	£0.00
B	concrete	0	m3	£0.00	£0.00
C	reinforced concrete	0	m3	£0.00	£0.00
D	brickwork, blockwork or stonework	0	m3	£0.00	£0.00

Extra over trench excavations; irrespective of depth and size for

E	excavating soft spots; disposal of surplus material and filling with approved fill to formation level of trench - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00
F	next existing service - to be priced as rate only per metre	0	m	£0.00	£0.00
G	around existing service crossing excavation - to be priced as rate only per crossing	0	Nr	£0.00	£0.00

Page Total 25/1 **£0.00**

Bill 25 External Services

external services

A40 MANAGEMENT AND STAFF

Survey site

As may be required; identify the location, size, type and all other relevant information on the location of existing services likely to be affected by the works, both buried and overhead; mark in a visible manner on site and maintain markings

A	to the site area and surrounding	1	ITEM	£0.00	£0.00

The Contractor should note that there is no allowance for the excavation of combined trenches within the project

B	generally	1	ITEM	£0.00	£0.00

P30 TRENCHES/PIPEWAYS/PIT FOR BURIED MECHANICAL SERVICES

Excavating trenches for Water

Excavating trenches including all temporary works, disposal of surplus, backfilling with suited material; for piped services

C	services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	116	m	£38.89	£4,511.24
D	extra over for excavation in highways, including all works to breakout existing surfaces, make good and reinstate on completion of works, temporary fencing, diversions and the like	12	m	£156.64	£1,879.68

Excavating trenches for Gas

	Excavating trenches including all temporary works, disposal of surplus, backfilling with suited material; for piped services				
E	services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	136	m	£38.89	£5,289.04
F	extra over for excavation in highways, including all works to breakout existing surfaces, make good and reinstate on completion of works, temporary fencing, diversions and the like	7	m	£156.64	£1,096.48
	Disposal				
	Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters				
G	generally	1	ITEM	£199.84	£199.84
	Bed and surround for pipes				
	Bed and surround; to water pipes				
H	to suit one pipes nominal size not exceeding 100mm diameter - Provisional Quantity	116	m	£12.96	£1,503.36
	Page Total 25/2				**£14,479.64**
	Bill 25 External Services				
	Bed and surround; to gas pipes				
A	to suit one pipe nominal size not exceeding 100mm diameter - Provisional Quantity	136	m	£12.96	£1,762.56
	Ducts				
	MDPE or Puriton ducts for Water supplies, laid in trenches complete with draw cords and the like - Provisional Quantity				
B	32mm diameter; or similar	116	m	£8.64	£1,002.24
	MDPE or Puriton ducts for Gas supplies, laid in trenches complete with draw cords and the like - Provisional Quantity				
C	63mm diameter; or similar	136	m	£8.64	£1,175.04
	Pits				
	Excavate pit for connection of water pipes; at connection to local meter / building locations / existing mains				
D	generally - Provisional Quantity	7	Nr	£51.85	£362.95
	Excavate pit for connection of gas pipes; at connection to local meter / building locations / existing mains - Provisional Quantity				
E	generally	7	Nr	£51.85	£362.95
	Meters				
	Meters to approved regulations; installed in accordance with manufacturers recommendations				
F	gas - Provisional Quantity	10	Nr	£0.00	£0.00

G	water - Provisional Quantity	10	Nr	£0.00	£0.00
	Site isolation valve and utility governor				
	Site isolation valve and utility governor to approved regulations; installed in accordance with manufacturers recommendations				
H	gas - Provisional Quantity	1	Nr	£0.00	£0.00
	Sundries				
	Identification tapes - ' WATER PIPE BELOW'				
I	generally - Provisional Quantity	116	m	£1.08	£125.28
	Identification tapes - ' GAS PIPE BELOW'				
J	generally - Provisional Quantity	136	m	£1.08	£146.88
	Page Total 25/3				**£4,937.90**
	Bill 25 External Services				
	P30 TRENCHES/PIPEWAYS/PITS FOR BURIED ELECTRICAL SERVICES				
	Excavating trenches for BT				
	Excavating trenches including all temporary works, disposal of surplus, backfilling with suited material; for cabled services				
A	services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity; assumed to be two ducts	149	m	£38.89	£5,794.61
B	attendance on the relocation of telegraph pole	1	Nr	£297.07	£297.07
	Excavating trenches for data				
	Excavating trenches including all temporary works, disposal of surplus, backfilling with suited material; for cabled services				
C	services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	149	m	£38.89	£5,794.61
	Excavating trenches for power supplies				
	Excavating trenches including all temporary works, disposal of surplus, backfilling with suited material; for cabled services				
D	services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	256	m	£38.89	£9,955.84
E	services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity - connections to buildings	48	m	£38.89	£1,866.72
	Excavating trenches including all temporary works, disposal of surplus, backfilling with suited material; for the removal of existing services				
F	services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	208	m	£38.89	£8,089.12
	Excavating trenches for street lighting				

	Excavating trenches including all temporary works, disposal of surplus, backfilling with suited material; for cabled services				
G	services not exceeding 200mm; depth not exceeding 1250mm - no details	89	m	£38.89	£3,461.21
	Disposal				
	Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters				
H	generally	1	ITEM	£199.84	£199.84
	Page Total 25/4				**£35,459.02**
	Bill 25 External Services				
	Bed and surround for cables				
	Bed and surround; to electrical cables				
A	to suit single duct nominal size not exceeding 200mm diameter	304	m	£11.88	£3,611.52
	Bed and surround; to BT ducts				
B	to suit single duct nominal size not exceeding 200mm diameter	298	m	£11.88	£3,540.24
	Bed and surround; to communications ducts				
C	to suit single duct nominal size not exceeding 200mm diameter	298	m	£11.88	£3,540.24
	Bed and surround; to street lighting cables				
D	to suit single duct nominal size not exceeding 200mm diameter - no details	89	m	£11.88	£1,057.32
	Ducts				
	Ducts for Power supplies, laid in trenches; complete with draw cords and the like				
E	100mm diameter, or similar	304	m	£8.64	£2,626.56
	Ducts for BT supplies, laid in trenches; complete with draw cords and the like				
F	100mm diameter, or similar	298	m	£8.64	£2,574.72
	Ducts for communication supplies, laid in trenches; complete with draw cords and the like				
G	100mm diameter, or similar	298	m	£8.64	£2,574.72
	Ducts for street lighting supplies, laid in trenches; complete with draw cords and the like				
H	50mm diameter, or similar	89	m	£8.64	£768.96
	Pits				
	Excavate pit for connection of services; at connection to local meter / building locations / lighting				
I	electrical - Provisional Quantity	22	Nr	£51.85	£1,140.70
J	BT - Provisional Quantity	3	Nr	£51.85	£155.55

K	communications - Provisional Quantity	3	Nr	£51.85	£155.55
L	street lighting - no details	6	Nr	£51.85	£311.10
	Meters				
	Meters to approved regulations; installed in accordance with manufacturers recommendations				
M	power - Provisional Quantity	11	Nr	£0.00	£0.00
	Page Total 25/5				**£22,057.18**
	Bill 25 External Services				
	Attendance				
	Excavate pit for base to lighting standard; complete with all temporary works; concrete bed and surround; setting standard in place				
A	lighting standards - no details	6	Nr	£59.41	£356.46
	Sundries				
	Identification tapes - 'POWER CABLE BELOW'				
B	generally	394	m	£1.08	£425.52
	Identification tapes - 'COMMUNICATION DUCTS BELOW'				
C	generally	592	m	£1.08	£639.36
	Y10 INCOMING SERVICES				
	Utility Company Supplies				
	Allow for all Utility Company costs for the provision of new gas supply, including attendance				
D	connecting from existing gas supplies to meter locations adjacent buildings as required	1	ITEM	£0.00	£0.00
	Allow for all Utility Company costs for the provision of new water supply, including attendances				
E	connecting existing mains water supply to meter locations for buildings supplies as required	1	ITEM	£0.00	£0.00
	Allow for all Utility Company costs for the provision of new electrical supply, including attendance as may be required				
F	connecting from existing electrical supply to meter locations for buildings supplies as required;	1	ITEM	£0.00	£0.00
G	works to existing substation, including all diversion works and the like	1	ITEM	£0.00	£0.00
	Allow for all Utility Company(ies) costs for the provision of new telephone/data supplies, including attendance				
H	connecting from existing telephone/data supplies to connection points within the buildings as required	1	ITEM	£0.00	£0.00

I	allow for all works to relocate telegraph poles and associated diversion works	1	ITEM	£0.00	£0.00
	Allow for all Utility Company(ies) costs for the provision of new communication/data supplies, including attendance				
J	connecting from existing communication/data supplies to connection points within the buildings as required	1	ITEM	£0.00	£0.00
	Page Total 25/6				**£1,421.34**

1 Kettle LCI

https://doi.org/10.1016/j.scitotenv.2017.12.262

Metal kettl	Mass (kg)	kWh	MJ	ICE Low	ICE central	ICE high		Results Low	Central	High	EC low	EC central	EC high
Stainless st	0.645			11	56.7	82		7.095	36.5715	52.89	6.15	6.15	6.15
Brass	0.024			16.8	80.7	239	aeneral br	0.4032	1.9368	5.736	2.64	2.64	2.64
copper	0.019			2.4	69.02	152.71	General va	0.0456	1.31138	2.90149	0.84	2.71	3.81
aluminium													
tin													
silver													
PP	0.419			80.57	115.1	149.63	Injection n	33.75883	48.2269	62.69497	3.43	3.43	3.43
PVC	0.577			66.57	95.1	123.63	Injection n	38.41089	54.8727	71.33451	3.1	3.1	3.1
Nylon	0.036			84.35	120.5	156.65	Nylon (6) v	3.0366	4.338	5.6394	9.14	9.14	9.14
POM													
Polycarbonate													
ABS													
High density polyurethane													
Silicon	0.001												
Water	14			0.2	0.2	0.2		2.8	2.8	2.8			
Production													
Injection moulding (ba			2.3					2.3	2.3	2.3			
Injection moulding (ele		0.8	2.88					2.88	2.88	2.88			
Metal stamping (heat)			0.03					0.03	0.03	0.03			
Metal stamping electr		0.3	1.08					1.08	1.08	1.08			
Heat			0.04					0.04	0.04	0.04			
Electricity		0.1	0.36					0.36	0.36	0.36			
							total	92.24012	156.7728	210.6864	7.60098	7.63651	7.65741

2 Sofa

https://gryphon4.environdec.com/system/data/files/6/14194/S-P-01279%20EPD%20Pasenow%20Sofa.pdf

	Mass	ICE values MJ/kg Low	Central	High		Results Low	central	high	EC low	central	high	
Wood	14.7	0.33	5.38	16	General va	0.00165	0.0269	0.08	0.72	0.72	0.72	
Steel	24.2	14.07	20.1	26.13	General va	340.494	486.42	632.346	0.47	1.46	2.89	
PVC	0.005	15.1	70.61	120	General va	12.4575	58.25325	99	3.1	3.1	3.1	
Steel	3.04	14.07	20.1	26.13	General va	42.7728	61.104	79.4352	0.72	0.72	0.72	
Textiles	0.825	53.7	103.83	380	Cotton val	1261.95	2440.005	8930				
Synthetic ti	6.76	53.7	103.83	380	Used polyo	43.8192	84.72528	310.08	3.43	3.43	3.43	polystyrene
Polyuretha	23.5	65.2	80.1	110	General va	1532.2	1882.35	2585	4.84	4.84	4.84	
Steel	0.816	31.25	31.25	95.7	General va	25.5	25.5	78.0912	0.72	0.72	0.72	
Packaging not included												
	73.846				Total	3259.195	5038.384	12714.03	161.67662	185.6346	220.24062	

3 Double bed

http://dx.doi.org/10.1016/j.scitotenv.2017.03.107 0048-9697/© 2017 Elsevier B.V. All rights reserved

Assumed mattress included

	m3	kg	Notes	ICE values MJ/kg				Low	central	high	CE low	central	high
MDF	0.083618	64.80395	775kg/m3	9.96	11.02	11.9	General va	645.4473	714.139529	771.167	0.74	0.74	0.74
Steel		12.01		14.07	20.1	26.13	General va	168.9807	241.401	313.8213	0.72	0.72	0.72
Textiles		1.01		27.1	146.38	350	Cotton val	27.371	147.8438	353.5			
PU		4.19		65.2	80.1	110	General va	273.188	335.619	460.9	4.84	4.84	4.84
Paper		0.27		12	28.2	42		3.24	7.614	11.34	1.49	1.49	1.49
ABS		0.2		66.71	95.3	1238.9		13.342	19.06	247.78	3.76	3.76	3.76
Packaging not considered													
		82.48395					Total	1131.569	1465.677329	2158.508	78.036023	78.036023	78.036023

4 Fridge/Freezer

Appliance Remanufacturing and Energy Savings Avid Boustani1, Sahil Sahni1, Timothy Gutowski, Steven Graves

http://web.mit.edu/ebm/www/Publications/MITEI-1-a-2010.pdf

	Mass (kg)	ICE values (MJ/kg) low	central	high		Results low	central	high	CE low	central	high
Aluminium	0.39	124	155	186		48.36	60.45	72.54	1.81	9.16	12.79
Copper	0.92	2.4	69.02	152.71		2.208	63.4984	140.4932	0.84	2.71	3.81
Zinc	0.02	8.46	59.8	105.76		0.1692	1.196	2.1152	3.09	3.09	3.09
Stainless st	7.42	11	56.7	82		81.62	420.714	608.44	6.15	6.15	6.15
Steel	15.4	14.07	20.10	26.13		216.678	309.54	402.402	0.72	0.72	0.72
ABS	0.87	66.71	95.3	123.89		58.0377	82.911	107.7843	3.76	3.76	3.76
PVC	6.666	54.04	77.2	100.36		360.2306	514.6152	668.9998	3.1	3.1	3.1
PP	8.81	80.57	115.1	149.63		709.8217	1014.031	1318.24	3.43	3.43	3.43
PE	0.02	58.17	83.1	108.03		1.1634	1.662	2.1606	2.54	2.54	2.54
PS	1	62.02	88.6	115.18		62.02	88.6	115.18	3.43	3.43	3.43
			12.5		Nylon (Polyami de) 6						
PA	0.2	8.75		16.25		1.75	2.5	3.25	9.14	9.14	9.14
Bitumen	9.5	35.7	51	66.3		339.15	484.5	629.85	0.43	0.49	0.55
ABS	0.57	66.71	95.3	123.89		38.0247	54.321	70.6173	3.76	3.76	3.76
PP	0.39	80.57	115.1	149.63		31.4223	44.889	58.3557	3.43	3.43	3.43
EPS	1.018	62.02	88.6	115.18		63.13636	90.1948	117.2532	4.39	4.39	4.39
PE-foil	0.169	71.47	102.1	132.73		12.07843	17.2549	22.43137	2.54	2.54	2.54
					DOI: 10.1109/ISSST.2015.7368767						
			151								
Electronics	0.41	151		151	7	61.91	61.91	61.91			
					Total	2087.78	3312.787	4402.023	130.18858	135.3455	138.34318

5 Domestic oven https://www.eup-network.de/fileadmin/user_upload/Lot22_Task4_Final.pdf

Material	KG	kv database (MJ/kg) Low	central	high	Notes	Results Low	Central	High	CE low	central	high	
Stainless st	22.492	11	56.7	82		247.412	1275.296	1844.344	6.15	6.15	6.15	
Glass fibre	0.45	16.5	28	42		7.425	12.6	18.9	1.54	1.54	1.54	
glass	4.12	10.5	15	19.5		43.26	61.8	80.34	0.91	0.91	0.91	
Galvanisec	0.23	15.82	22.6	29.38		3.6386	5.198	6.7574	1.54	1.54	1.54	
PVC	0.1935	54.04	77.2	100.36		10.45674	14.9382	19.41966	3.1	3.1	3.1	
Copper	1.407	2.4	69.02	152.71		3.3768	97.11114	214.863	0.84	2.71	3.81	
Aluminium	0.0276	124	155	186		3.4224	4.278	5.1336	1.81	9.16	12.79	
iron	0.1932	11.7	25	36.3		2.26044	4.83	7.01316	2.03	2.03	2.03	
					Printed control board							
Electronic	0.125	151	151	151		18.875	18.875	18.875	http://ecodesignbacs.eu/sites/ecodesignbacs.eu/files/attachments/EcodesignStakeholderMeet4BAC5x5f.pdf			
kg	29.2383				Total	340.13	1494.9	2215.6	145.346082	148.18	149.82792	

6 Microwave oven https://www.eup-network.de/fileadmin/user_upload/Lot22_Task4_Final.pdf

Row Label	Sum of Ma	ICE database values (MJ/kg) Low	central	high		Results Low	Central	High	CE low	central	high
ABS	0.423	66.71	95.3	123.89		28.21833	40.3119	52.40547	3.76	3.76	3.76
Aluminium	0.0548	124	155	186		6.7952	8.494	10.1928	1.81	9.16	12.79
Ceramic	0.0742	2.5	10	29.1		0.1855	0.742	2.15922	0.7	0.7	0.7
Controller	0.01					0	0	0			
Copper	2.2848	2.4	69.02	152.71		5.48352	157.6969	348.9118	0.84	2.71	3.81
Door switc	0.023					0	0	0			
Glass	1.164	2.56	18.5	62.1		2.97984	21.534	72.2844	0.91	0.91	0.91
HV canaci	0.159					0	0	0			
HV diode	0.008					0	0	0			
Iron	2.4748	11.7	25	36.3		28.95516	61.87	89.83524	2.03	2.03	2.03
Lamp	0.007					0	0	0			
LDPE	0.019					0	0	0			
Mains filte	0.033					0	0	0			
PA	0.026	97.02	138.6	180.18	PA66	2.52252	3.6036	4.68468	9.14	9.14	9.14
PC	0.015	79.03	112.9	146.77	Polycarbon	1.18545	1.6935	2.20155	7.62	7.62	7.62
PCBA	0.3				Polycarbon	0	0	0			
Powder pai	0.216					0	0	0			
PP	0.172	80.57	115.1	149.63		13.85804	19.7972	25.73636	3.43	3.43	3.43
PS	0.025	60.48	86.4	112.32		1.512	2.16	2.808	3.43	3.43	3.43
PVC	0.1824	54.04	77.2	100.36		9.856896	14.08128	18.30566	3.1	3.1	3.1
sheet galva	4.451	15.82	22.6	29.38		70.41482	100.5926	130.7704	1.54	1.54	1.54
Steel	0.052	11	56.7	82		0.572	2.9484	4.264	0.72	0.72	0.72
		Electronic components (see below)				1418.19	1418.19	1418.19	https://www.eup-network.de/fileadmin/user_upload/Produktgruppen/Methodology_wrap_study/MEErP_study_by_vhk/20110819_Ecoreport_2011_MEErP.xls		
					Total	1853.715	2182.75	39.03	18.22899	22.90435	25.616554

7 Toaster https://books.google.co.uk/books?id=8dfPrX_5M7QC&pg=PA219&lpg=PA219&dq=toaster+bill+of+materials&source=bl&ots=nLA6qOft8s&sig=8gu5vuxt7JOm5r7387UAktOwzXA&hl=en&sa=X&ved=2ahUKEwiC7b-C0prCAhVFaxQKHe0fCxEQ6AEwCXoECAQQAQ#v=onepage&q=toaster%20bill%20of%20materials&f=fal

	Mass (kg)	ICE database values (MJ/kg) Low	central	high	Notes	Results Low	Central	High	CE low	central	high
PP	0.24	71.05	101.5	131.95		17.052	24.36	31.668	3.34	3.34	3.34
					Nickel value used	0.342					
Nichrome	0.003	114	164	194	stainless s	10.23	52.731	76.26	6.15	6.15	6.15
Low carbon steel	0.93	11	56.7	82		3.19725	4.5675	5.93775	4.84	4.84	4.84
Polyurethane	0.045	71.05	101.5	131.95		0.0264	0.75922	1.67981	0.84	2.71	3.81
Copper	0.011	2.4	69.02	152.71		2.62885	3.7555	4.88215	4.26	4.26	4.26
Phenolic	0.037	71.05	101.5	131.95	PP rigid h	0.5043	2.421	7.17	2.64	2.64	2.64
Brass	0.03	16.81	80.7	239							
					Total	33.9808	89.0862	128.17971	6.98496	7.00553	7.01763

8 Iron

	Mass (kg)	ICE values Low	Central	High	Notes	Results Low	Central	High	CE low	central	high
PP	0.15	71.05	101.5	131.95		10.6575	15.225	19.7925	3.34	3.34	3.34
					Nickel value used	3.42					
Nichrome	0.03	114	164	194		4.92	5.82				
Stainless s	0.8	11	56.7	82		8.8	45.36	65.6	6.15	6.15	6.15
Polyurethe	0.18	71.05	101.5	131.95		12.789	18.27	23.751	4.84	4.84	4.84
Copper	0.05	2.4	69.02	152.71		0.12	3.451	7.6355	0.84	2.71	3.81
Phenolic	0.037	71.05	101.5	131.95	PP rigid h	2.62885	3.7555	4.88215	4.26	4.26	4.26
Brass	0.03	16.81	80.7	239		0.5043	2.421	7.17	2.64	2.64	2.64
					total	38.9107	93.4025	134.651	6.57102	6.66452	6.71952

	Description	Qty	Unit	Rate	£ p	Lifespan			Volume/are	Density	Note	Material used if not s	EE (MJ/Kg)			E (MJ)			
A	Subcontractor personnel transport and materials transport	1	ITEM	£70,500.00	£70,500.00	1	1	1											
	Description	**Qty**	**Unit**	**Rate**	**£ p**	**Lifespan**	**reference from BCIS (2006)**		**Volume/are**	**Density**	**Note**	**Material used if not**	**EE (MJ/Kg)**			**E (MJ)**			
						low	mean	high		referen	reference from ICE if not specified		low	central	high	low	central	high	
D	Excavating To reduce levels no details - Provisional Quantity	279	m3	£3.24	£903.96	500	750	1000		2050		soil	0.15	0.45	0.73	85792.5	257377.5	417523.5	284.722
E	Disposal Excavated material off site; it has been assumed all excavated material to be taken off site; inert non hazardous - Provisional Quantity	140	m3	£35.65	£4,991.00	1	1	1		2050		soil	0.15	0.45	0.73	43050	129150	209510	25.8766
F	Disposal Excavated material on site; in stock piles suitable for reuse	140	m3	£6.48	£907.20	1	1	1		2050		soil	0.15	0.45	0.73	43050	129150	209510	142.361
G	Selected excavated materia Filling to make up levels; compacting in layers over 250mm average thick	140	m3	£8.64	£1,209.60	1	1	1		2050		soil	0.15	0.45	0.73	43050	129150	209510	106.771
H	Surface Treatments Compacting ground generally	2678	m2	£0.76	£2,035.28	1	1	1	535.6	2050	Soil compaction depth is 20cm	soil	0.15	0.45	0.73	164697	494091	801525.4	
J	Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters, off site	1	ITEM	£199.84	£199.84	1	1	1											
A	Excavating Ground beams; from formation level, not exceeding 1.00m deep	348	m3	£6.48	£2,255.04	100	150	200		2300		Reinforced concrete l	0.77	0.85	0.91	616308	680340	728364	
B	Pits, pad foundations 1 nr; from formation level 1.00m maximum depth	2	m3	£12.96	£25.92	100	150	200		2300		Reinforced concrete l	0.77	0.85	0.91	3542	3910	4186	
C	Working space allowance; complete with backfilling with approved well compacted material; including all design, maintenance and removal as required pits	4	m2	£6.48	£25.92	1	1	1		2050		soil	0.15	0.45	0.73	1230	3690	5986	142.361
D	Working space allowance; complete with backfilling with approved well compacted material; including all design, maintenance and removal as required trenches	980	m2	£4.32	£4,233.60	1	1	1		2050		soil	0.15	0.45	0.73	301350	904050	1466570	213.542
E	including all additional backfilling with well compacted granular material, making good as	980	m2	£3.24	£3,175.20	100	300	500	980	2240		sand and gravel, crus	0.05	0.081	0.15	109760	177811.2	329280	
F	Earthwork support To faces of excavation; including all additional backfilling with well compacted granular material, making good as required, designed, supplied and installed, maintained and removed by specialist Sub Contractor 1.00m maximum depth; distance between opposing faces 2.00 to 4.00m	4	m2	£5.40	£21.60	100	300	500	4	2240			0.05	0.081	0.15	448	725.76	1344	
G	Disposal Excavated material off site; it has been assumed all excavated material to be taken off site; to be treated as inert hazardous material	350	m3	£35.65	£12,477.50	1	1	1		2050		soil	0.15	0.45	0.73	107625	322875	523775	25.8766
H	Surface Treatments Compacting ground generally	668	m2	£0.76	£507.68	1	1	1	133.6	2050	20cm depth	soil	0.15	0.45	0.73	41082	123246	199932.4	242.763
I	Compacting bottoms of excavations generally	433	m2	£0.76	£329.08	1	1	1	86.6	2050		soil	0.15	0.45	0.73	26629.5	79888.5	129596.9	242.763
J	Bored cast-in-place piles to site generally; in various locations; deemed to include the transport to site and from site of all plant, materials and equipment required for the piling operations; all plant movements on site; all setting out; concrete, reinforcement and formwork; all ancillary piling operations required to satisfy the piling design; designed and installed by specialist Sub Contractor generally 300mm diameter	117	Nr	£834.44	£97,629.48	500	750	1000	396.7704	2300	Height using 12m		0.77	0.85	0.91	702680.3784	775686.132	830440.45	
C	Cutting off tops of piles; Heights to be developed by contractor as to construction methods on site 300mm diameter piles; cutting length to be developed by contractor; below top of pilemat	117	Nr	£19.44	£2,274.48	1	1	1	2.479815	2300	Height using 75mm		0.77	0.85	0.91	4391.752365	4848.03833	5190.2528	
D	Disposal Surplus excavated material; based on piles to be 12.00m deep; material taken to be inert non hazardous disposal off site	99	m3	£35.65	£3,529.35	1	1	1		2050		soil	0.15	0.85	0.91	30442.5	172507.5	184684.5	48.878
G	Piling mat; designed to suit the piling rig(s) for the project; provide, lay and level (note area measured allows for the full site area); Contractor to to note: the pilemat is the same size as the building footprint; no allowance has been made for any additional pilemat beyond the building footprint; Contractor to note: Make allowance for excavation for the pilemat, removal of soil and import of suitable pilemat material - Top of concrete foundations is formation level for excavation based on marked up drawing, taken to be nominally 600mm thick; assumed to be constructed using imported approved well compacted granular material; compaction to engineers requirements; top of pile mat taken to be 600mm above top of pile caps	1117	m2	£34.57	£38,614.69	1	1	1	670.2	2240		natural gravels, clean	0.05	0.0081	0.51	75062.4	12160.1088	765636.48	
A	Disposal of piling mat on completion of the piling operations; it is assumed that the pilemat is to be removed completely; and making allowance for compacting and preparing for new works generally	1117	m2	£22.69	£25,344.73	1	1	1											

B	General attendances on the piling Sub Contractor as required	1	ITEM	£297.07	£297.07	1	1	1											
C	Special attendances on the piling Sub Contractor as required	1	ITEM	£297.07	£297.07	1	1	1											
D	Plain concrete grade Gen 1 Blinding concrete not exceeding 150mm thick	11	m3	£149.07	£1,639.77	100	150	200		1760		Gen 1 concrete	0.59	0.65	0.7	11422.4	12584	13552	7.67425
E	Filling to hollow walls not exceeding 150mm thick	27	m3	£149.07	£4,024.89	100	150	200		1040		hollow medweight	0.59	0.65	0.7	16567.2	18252	19656	4.53478
F	Plain concrete grade Gen 3 Mass fill concrete generally	2	m3	£156.64	£313.28	100	150	200		1900		Gen 3 concrete	0.68	0.75	0.81	2584	2850	3078	9.09729
G	Reinforced concrete grade FND2z Foundations generally	228	m3	£182.56	£41,623.68	100	150	200		2300		RC 25/30 concrete	0.77	0.85	0.91	403788	445740	477204	10.7088
H	Isolated foundations generally	1	m3	£182.56	£182.56	100	150	200		1900		Gen 1	0.59	0.65	0.7	1121	1235	1330	6.7649
J	E20 FORMWORK FOR IN SITU CONCRETE Formwork, basic finish Sides of ground beams and edges of beds not exceeding 250mm high	8	m	£23.77	£190.16	47	70	110	0.1	480	Formwork can be timber, steel, ¡	timber, 50mm depth	0.72	7.11	21.3	34.56	341.28	1022.4	
K	E20 FORMWORK FOR IN SITU CONCRETE Formwork, Sides of ground beams and edges of beds basic finish 500 to 1000mm high	1202	m	£30.25	£36,360.50	47	70	110	90.15	480		timber, 100mm dept	0.72	7.11	21.3	31155.84	307663.92	921693.6	8.46149
A	Claymaster board; 50mm thick to sides of foundations, 500 to 1000mm high	134	m	£20.52	£2,749.68	64	108	178	5.025	21.5	density range of 11 to 32 kg/m3	Expanded polystyren	62.02	88.6	115.18	6700.48575	9572.1225	12443.759	
B	Cordek Cellcore HXB 18/24 heave protection to underside of foundations	79	m2	£16.20	£1,279.80	500	750	1000	52.14	21.5	density range of 11 to 32 kg/m3	Expanded polystyren	62.02	88.6	115.18	69525.0402	99321.486	129117.93	
C	E30 REINFORCEMENT FOR IN SITU CONCRETE High tensile steel deformed square bar reinforcement to B.S.4449 grade 460; bars H10	3.83	T	£1,593.36	£6,102.57	47	60	100					12.18	17.4	22.62	46649.4	66642	86634.6	10.9203
D	E30 REINFORCEMENT FOR IN SITU CONCRETE High tensile steel deformed square bar reinforcement to B.S.4449 grade 460; bars H12	0.55	T	£1,636.57	£900.11	47	60	100					12.18	17.4	22.62	6699	9570	12441	10.632
E	E30 REINFORCEMENT FOR IN SITU CONCRETE High tensile steel deformed square bar reinforcement to B.S.4449 grade 460; bars H16	3.28	T	£1,712.18	£5,615.95	47	60	100					12.18	17.4	22.62	39950.4	57072	74193.6	10.1625
F	E30 REINFORCEMENT FOR IN SITU CONCRETE High tensile steel deformed square bar reinforcement to B.S.4449 grade 460; bars H20	4.95	T	£1,795.36	£8,887.03	47	60	100					12.18	17.4	22.62	60291	86130	111969	9.69165
G	E30 REINFORCEMENT FOR IN SITU CONCRETE High tensile steel deformed square bar reinforcement to B.S.4449 grade 460; bars H25	4.66	T	£1,847.21	£8,608.00	47	60	100					12.18	17.4	22.62	56758.8	81084	105409.2	9.41961
H	E41 WORKED FINISHES/CUTTING TO IN SITU CONCRETE, Power floating, generally	3	m2	£10.80	£32.40	1	1	1	0.6	2100	Finishing screed, made of sharp ¡	Cement screed	3.157	4.51	5.863	3977.82	5682.6	7387.38	
J	RMC pre cast concrete beam and dense aggregate block floor; including all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork sleeper walls, nominally 150mm thick	671	m2	£69.00	£46,299.00	47	72	100	100.65	2200		concrete precast	1.2	2.18	3.8	265716	482717.4	841434	
K	RMC pre cast concrete beam and dense aggregate block floor; including all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork sleeper walls, holes for services and drainage	52	Nr	£5.00	£260.00	500	750	1000		2200			1.2	2.18	3.8				
L	RMC pre cast concrete beam and dense aggregate block floor; including all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork sleeper walls, provision of additional supports for stair cases	6	Nr	£100.00	£600.00	500	750	1000											
M	RMC pre cast concrete beam and dense aggregate block floor; including all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork sleeper walls, provision of additional supports for lift shaft	1	Nr	£100.00	£100.00	500	750	1000											
A	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher担架 bond; laid flat, 100mm thick	415	m2	£22.80	£9,462.00	52	72	101	41.5	2200			0.525	0.75	0.975	47932.5	68475	89017.5	
B	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher担架 bond; laid flat, 215mm thick; assumed to be 100mm blocks laid flat	76	m2	£45.58	£3,464.08	52	72	101	16.34	2200			0.525	0.75	0.975	18872.7	26961	35049.3	
C	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher担架 bond; laid flat, 215mm thick; assumed to be 100mm blocks laid flat; in piers	2	m2	£45.58	£91.16	52	72	101	0.43	2200			0.525	0.75	0.975	496.65	709.5	922.35	
D	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher担架 bond; laid flat, Extra over blockwork for cutting blockwork to course 100mm thick	619	m	£5.00	£3,095.00	52	72	101											
E	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher担架 bond; laid flat, Extra over blockwork for cutting blockwork to course 215mm thick	113	m	£10.00	£1,130.00	52	72	101											
F	Engineering bricks; manufacturer and product reference to be agreed; 7.5N/mm2 compressive strength; half lap stretcher bond; flush joints; walls, half brick thick	62	m2	£72.20	£4,476.40	70	93	131	6.355	1920	half brick thick is 102.5mm		0.63	3	6	7687.008	36604.8	73209.6	
G	Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre, 125mm wide	220	m2	£3.60	£792.00	50	75	100	27.5	7850			11	56.7	82	2374625	12240112.5	17701750	15454.7
H	Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre; and rigid insulation board; Celotex CG5000 50mm thick, 100mm wide	19	m2	£11.54	£219.26	50	75	100	1.9	7850			11	56.7	82	164065	845680.5	1223030	3856.98
I	Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre; and rigid insulation board; Celotex CG5000 75mm thick, 125mm wide	55	m2	£16.04	£882.20	50	75	100	6.875	7850			11	56.7	82	593656.25	3060028.13	4425437.5	3468.63
J	Visqueen Zedex Housing grade damp proof course; bedding in cement mortar, not exceeding 225mm wide	87	m2	£16.45	£1,431.15	50	75	100	19.575	1650			0.1	1.54	3.49	3229.875	49740.075	112722.64	34.7553
A	Telescopic vents 通风口, Glidevale Limited ZLAB airbrick 空心砖 with ZLPS periscope潜望镜; colour Anthracite; building in as work proceeds, generally	223	Nr	£16.50	£3,679.50				0.335615	400		aerated brick	1.37	1.37	1.37	183.91702	183.91702	183.91702	0.04998
B	Frame, Pre cast concrete padstones, building in as work proceeds, 440 x 215 x 100mm	18	Nr	£60.00	£1,080.00	50	75	100	0.17028	1900			1.2	2.18	3.8	388.2384	705.29976	1229.4216	0.65306
C	Frame, Pre cast concrete padstones, building in as work proceeds, 600 x 215 x 100mm	5	Nr	£77.50	£387.50	50	75	100	0.0645	1900			1.2	2.18	3.8	147.06	267.159	465.69	
D	Frame, Pre cast concrete padstones, building in as work proceeds, 900 x 215 x 100mm	3	Nr	£130.00	£390.00	50	75	100	0.05805	1900			1.2	2.18	3.8	132.354	240.4431	419.121	
E	Frame, Pre cast concrete padstones, building in as work proceeds, 440 / 440 x 215 x 100mm L shaped	3	Nr	£135.00	£405.00	50	75	100	0.05676	1900			1.2	2.18	3.8	129.4128	235.09992	409.8072	
F	G10 STRUCTURAL STEEL FRAMING, All steelwork is to be designed, manufactured, supplied and erected by specialist Sub Contractor; including, but not limited to, all surface treatments; factory applied finishes; localised repairs and the like as required following installation; making good following installation; in accordance with specifications prepared by Craddys and the National Steelwork Specifications. Supply and erect all steelwork required for the Coombe Shute, Stoke Gabriel Housing project; including all galvanising as may be required	1	ITEM	£35,137.64	£35,137.64	50	75	100											
G	Columns, weight not exceeding 40kg/m	0.77	T	Included	Included	47	70	110					14.07	20.1	26.13	10833.9	15477	20120.1	
H	G10 STRUCTURAL STEEL FRAMING, Columns, weight not exceeding 40kg/m; square hollow section	0.19	T	Included	Included	47	70	110					14.07	20.1	26.13	2673.3	3819	4964.7	
I	G10 STRUCTURAL STEEL FRAMING, Columns, weight not exceeding 40kg/m; galvanised	0.41	T	Included	Included	47	70	110					14.07	20.1	26.13	5768.7	8241	10713.3	
J	G10 STRUCTURAL STEEL FRAMING, Columns, weight not exceeding 40kg/m; galvanised; square hollow section	0.75	T	Included	Included	47	70	110					14.07	20.1	26.13	10552.5	15075	19597.5	
A	G10 STRUCTURAL STEEL FRAMING, Beams, weight not exceeding 40kg/m	6.21	T	Included	Included	47	70	110					14.07	20.1	26.13	87374.7	124821	162267.3	
B	G10 STRUCTURAL STEEL FRAMING, Beams, weight not exceeding 40kg/m; square hollow section	0.06	T	Included	Included	47	70	110					14.07	20.1	26.13	844.2	1206	1567.8	
C	G10 STRUCTURAL STEEL FRAMING, Beams, weight not exceeding 40kg/m; galvanised	1.51	T	Included	Included	47	70	110					14.07	20.1	26.13	21245.7	30351	39456.3	

D	G10 STRUCTURAL STEEL FRAMING, Beams, weight not exceeding 40kg/m; galvanised; rectangular hollow section	0.44	T	Included	Included	47	70	110					14.07	20.1	26.13	6190.8	8844	11497.2
E	G10 STRUCTURAL STEEL FRAMING, Beams, weight 40 to 100kg/m	0.7	T	Included	Included	47	70	110					14.07	20.1	26.13	9849	14070	18291
G	Fittings, generally; assessed at 17.5% of all steelwork	1.92	T	Included	Included	47	70	110					14.07	20.1	26.13	27014.4	38592	50169.6
H	Framing and erection, all works required to erect steel framework on site	12.96	T	Included	Included	49	73	113					14.07	20.1	26.13	182347.2	260496	338644.8
I	Allow for all works necessary to eliminate cold bridging within the design of the steel frame; by use of proprietary fittings and equipment, generally - no details	1	ITEM	Included	Included	83	83	83										
J	Isolated structural and secondary steelwork additional framing and supports to external and internal walls	1	ITEM	Included	Included													
K	Isolated structural and secondary steelwork additional framing and supports to roof structure, including all cleader rails and the like	1	ITEM	Included	Included													
L	Isolated structural and secondary steelwork additional framing and supports to curtain walling, removable panels and the like	1	ITEM	Included	Included													
M	additional framing and supports to mechanical and electrical installations additional framing and supports to mechanical and electrical installations	1	ITEM	Included	Included													
N	additional framing and supports to mechanical and electrical installations windposts, WP3, nominally 2.40m long	2	Nr	£415.00	£830.00	50	75	100	Steel beam				14.07	20.1	26.13			
O	Prepare, touch up primer and apply two coats of approved bitumen based paint (RIW or similar) to steelwork, general surfaces, generally over 300mm - provisional quantity	5	m2	£16.20	£81.00	12	18	26	0.0005	2400		double coat paint	35.7	51	66.3	42.84	61.2	79.56
A	Prepare, touch up primer and apply two coats of approved exterior grade gloss paint to steelwork, general surfaces, generally over 300mm - provisional quantity	35	m2	£10.00	£350.00	49	73	113				double coat paint						
B	Nulifire or similar approved intumescent膨胀的 paint finish to exposed surfaces; to achieve one hour fire rating; general surfaces of structural metalwork, over 300mm girth 周长 - Provisional Quantity - measured to all surfaces of all steelwork	239	m2	£8.00	£1,912.00							single coat paint						
A	RMC or similar approved hollow core pre cast concrete floor planks 厚木板; including all grouting 灌浆 of ends of hollows, all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork walls, nominally 150mm thick	48	m2	£69.00	£3,312.00	47	72	108	7.2	1040			1.2	2.18	3.8	8985.6	16323.84	28454.4
B	RMC or similar approved hollow core acoustic rated pre cast concrete floor planks; including all grouting of ends of hollows, all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork walls, nominally 150mm thick	407	m2	£69.00	£28,083.00	42	72	108	61.05	1040			1.2	2.18	3.8	76190.4	138412.56	241269.6
C	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, to suit upper floor area of 50.49m2; unit 1	1	ITEM	£2,253.00	£2,253.00	35	60	95	1.3080949	650		Laminated Veener lu	0.72	7.11	21.3	612.1884226	6045.36067	18110.574
D	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, to suit upper floor area of 56.18m2; unit 2	1	ITEM	£2,343.00	£2,343.00	35	60	95	1.2013021	650			0.72	7.11	21.3	562.2094034	5551.81786	16632.028
E	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, to suit upper floor area of 54.39m2; unit 3	1	ITEM	£2,178.00	£2,178.00	35	60	95	1.1653937	650			0.72	7.11	21.3	545.404231	5385.86678	16134.875
F	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, to suit upper floor area of 54.39m2; unit 4	1	ITEM	£2,178.00	£2,178.00	35	60	95	1.1653937	650			0.72	7.11	21.3	545.404231	5385.86678	16134.875
G	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, to suit upper floor area of 54.41m2; unit 10	1	ITEM	£3,052.00	£3,052.00	35	60	95	1.1653937	650			0.72	7.11	21.3	545.404231	5385.86678	16134.875
H	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, trimmers or additional joists to suit unit 1, 2.44m long	2	Nr	£12.00	£24.00	35	60	95	0.1933773	650			0.72	7.11	21.3	90.50058202	893.693247	2677.3089
I	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, trimmers or additional joists to suit unit 3, 3.12m long	2	Nr	£15.00	£30.00	35	60	95	0.5148438	650			0.72	7.11	21.3	240.9468872	2379.35051	7128.0121
J	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, trimmers or additional joists to suit unit 4, 3.12m long	2	Nr	£15.00	£30.00	35	60	95	0.6702918	650			0.72	7.11	21.3	313.6965512	3097.75344	9280.1896
K	Sawn 锯开的 softwood, for exterior use; preservative treated; grade C24, 50 x 150mm joists	98	m	£4.90	£480.20	42	71	109	0.735	630			0.3	5.55	13	138.915	2569.9275	6019.65
L	Sawn 锯开的 softwood, for exterior use; preservative treated; grade C24, 50 x 150mm joists; fixed to steel frame with and including bolts	41	m	£5.35	£219.35	42	71	109	0.3075	630			0.3	5.55	13	58.1175	1075.17375	2518.425
A	Fixings; galvanised mild steel, Straps; to suit upper floors; plugged and screwed to masonry walls; nailed to joists nominally 1750mm long, 50 x 3mm; bent once	129	Nr	£9.00	£1,161.00	35	60	95	0.0338625	7800			15.82	22.6	29.38	4178.49705	5969.2815	7760.066
B	Fixings; galvanised mild steel, Joist hangers, external quality, nailed, to suit 150 x 50mm joists	160	Nr	£2.40	£384.00	35	60	95	0.9152	7800			15.82	22.6	29.38	112932.0192	161331.456	209730.89
C	Floor boarding, Chipboard to B.S..5669 part 2; tongued and grooved flooring panels, all joints secret screwed to joists and glued, all joints offset; floors, over 300mm wide	270	m2	£8.03	£2,168.10	32	51	69	81	650		particle board	10	24.8	39	526500	1305720	2053350
D	Balcony flooring Assumed to be hardwood ribbed decking boards; screw fixed to timber joists; 125 x 19mm section; with nominal 5mm gap between boards; complete with anti slip finish; preservative treated, over 300mm wide	23	m2	£94.30	£2,168.90	42	71	109	6.9	700			0.72	10.4	16	3477.6	50232	77280
E	Rockwool or similar approved cavity fire breaks; at perimeter of upper floors; nominally 200 x 300mm section, horizontal	327	m	£20.75	£6,785.25	50	75	100	19.62	100			16.8	16.8	16.8	32961.6	32961.6	32961.6

A	Sawn softwood, preservative 防腐剂 treated; grade C24; pitched roof members, 150 x 50mm, C24 timber joists at 400mm centres; to porches	41	m	£4.90	£200.90	49	82	114	0.3075	630	0.72	7.4	13	139.482	1433.565	2518.425
B	Sawn softwood, preservative 防腐剂 treated; grade C24; pitched roof members, 150 x 50mm, C24 timber joists at 400mm centres; to dormers	65	m	£5.10	£331.50	49	82	114	0.4875	630	0.72	7.4	13	221.13	2272.725	3992.625
C	Sawn softwood, preservative 防腐剂 treated; grade C24; pitched roof members, 175 x 50mm, C24 timber joists at 400mm centres; to unit 5 to 9	913	m	£5.88	£5,368.44	49	82	114	7.98875	630	0.72	7.4	13	3623.697	37243.5525	65427.863
D	Sawn softwood, preservative 防腐剂 treated; grade C24; pitched roof members, 250 x 25mm, C24 timber ridges 带钢单向皱纹; to unit 5 to 9	15	m	£6.38	£95.70	49	82	114	0.09375	630	0.72	7.4	13	42.525	437.0625	767.8125
E	Sawn softwood, preservative treated: grade C24; dormer 屋顶采光窗 wall construction, 100 x 50mm, C24 timber joists at 400mm centres	267	m	£4.37	£1,166.79	49	82	114	1.335	630	0.72	7.4	13	605.556	6223.77	10933.65
F	Sawn softwood, preservative treated; bolted 用螺栓固定 to timber beams; plates, 100 x 50mm	30	m	£5.37	£161.10	23	37	53	0.15	630	0.72	7.4	13	68.04	699.3	1228.5
G	Sawn softwood, preservative treated; bolted to steel beams; plates, 100 x 50mm	183	m	£5.37	£982.71	23	37	53	0.915	630	0.72	7.4	13	415.044	4265.73	7493.85
H	Sawn softwood, preservative treated; bolted to masonry with resin anchors at 300mm centres; plates, 100 x 50mm	10	m	£5.37	£53.70	23	37	53	0.05	630	0.72	7.4	13	22.68	233.1	409.5
I	Sawn softwood, preservative treated; bedded in mortar; plates, 100 x 50mm	287	m	£4.82	£1,383.34	23	37	53	1.435	630	0.72	7.4	13	650.916	6689.97	11752.65
J	Sawn softwood, preservative treated; bedded in mortar; plates, 100 x 50mm; to verges	60	m	£4.37	£262.20	23	37	53	0.3	630	0.72	7.4	13	136.08	1398.6	2457
K	Sawn softwood, preservative treated; framing to eaves 屋檐 and verges , nominally 50 x 50mm	1235	m	£3.04	£3,754.40	23	37	53	3.0875	630	0.72	7.4	13	1400.49	14393.925	25286.625
L	Sawn softwood, preservative treated; framing to eaves 屋檐 and verges , nominally 50 x 50mm; plugged and screwed to masonry walls	378	m	£3.04	£1,149.12	23	37	53	0.945	630	0.72	7.4	13	428.652	4405.59	7739.55
M	Roof trusses, designed, manufactured, supplied and installed by specialist Sub Contractor, complete with all bracings 紧固装置, fixings, central walkway boards; openings for access hatches 舱口 and the like as required to complete installation. total roof area - on plan; garage units for 7 to 9	90	m2	£35.00	£3,150.00	23	37	53								
N	Roof trusses, designed, manufactured, supplied and installed by specialist Sub Contractor, complete with all bracings 紧固装置, fixings, central walkway boards; openings for access hatches 舱口 and the like as required to complete installation. total roof area - on plan; timber store	8	m2	£35.00	£280.00	23	37	53								
A	Roof trusses, designed, manufactured, supplied and installed by specialist Sub Contractor, complete with all bracings 紧固装置, fixings, central walkway boards; openings for access hatches 舱口 and the like as required to complete installation. total roof area - on plan; car port 简易车库	56	m2	£35.00	£1,960.00	30	60	80								
B	Roof trusses, designed, manufactured, supplied and installed by specialist Sub Contractor, complete with all bracings 紧固装置, fixings, central walkway boards; openings for access hatches 舱口 and the like as required to complete installation. total roof area - on plan; units 1 and 2, including 4 dormers	168	m2	£34.76	£5,839.68	30	60	80								
C	Roof trusses, designed, manufactured, supplied and installed by specialist Sub Contractor, complete with all bracings 紧固装置, fixings, central walkway boards; openings for access hatches 舱口 and the like as required to complete installation. total roof area - on plan; units 3 and 4, including central shallow pitched valley	157	m2	£26.25	£4,121.25	30	60	80								
D	Roof trusses, designed, manufactured, supplied and installed by specialist Sub Contractor, complete with all bracings 紧固装置, fixings, central walkway boards; openings for access hatches 舱口 and the like as required to complete installation. total roof area - on plan; unit 10	104	m2	£27.83	£2,894.32	30	60	80								
E	Assumed to be 12mm plywood; nailed to trusses nominally 300mm wide	158	m	£10.00	£1,580.00	23	36	49	0.5688	700	10	15	20	3981.6	5972.4	7963.2
F	Straps; assumed to be galvanised mild steel; fixed to timber and masonry, assumed to be 1700 x 50 x 3mm, bent once; to verges	50	Nr	£9.20	£460.00	24	34	42	0.01275	7800	15.82	22.6	29.38	1573.299	2247.57	2921.841
G	Straps; assumed to be galvanised mild steel; fixed to timber and masonry	228	Nr	£8.38	£1,910.64	24	34	42	0.04104	7800	15.82	22.6	29.38	5064.17184	7234.5312	9404.8906
H	Joist hangers 小梁挂铁, shoes, brackets and the like, as required to complete installation	1	ITEM	£500.00	£500.00	24	34	42								
I	Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, pitch 斜度 25 degrees	68	m2	£45.00	£3,060.00	17	26	36	0.34	1600	0.1	0.5	1	54.4	272	544
J	Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, pitch 35 degrees	914	m2	£35.00	£31,990.00	17	26	36	22.85	1600	0.1	0.5	1	3656	18280	36560
K	Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, Abutments邻接; complete with all additional battens, including over sized or cut slates to suit, pitched at 35 degrees	71	m	£12.00	£852.00	17	26	36	0.06745	1600	0.1	0.5	1	10.792	53.96	107.92
L	Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, Abutments邻接; complete with all additional battens, including over sized or cut slates to suit, horizontal to tops of pitch	10	m	£8.00	£80.00	17	26	36	0.0095	1600	0.1	0.5	1	1.52	7.6	15.2
M	Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, Abutments邻接; complete with all additional battens, including over sized or cut slates to suit, horizontal to bottom of pitch	23	m	£8.00	£184.00	17	26	36	0.02185	1600	0.1	0.5	1	3.496	17.48	34.96
N	Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, Eaves; complete with tilting fillet, ventilation, dressing felt / breather membrane into gutter, including approved slip course of slates	318	m	£13.00	£4,134.00	17	26	36	64.395	1600	0.1	0.5	1	10303.2	51516	103032
O	Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, Verges; complete with undercloak 粘土砖屑, dressed tiles and mortar as required; including oversized slates to suit generally	60	m	£23.00	£1,380.00	17	26	36		1600	0.1	0.5	1			
A	Roof Ridges; dry ridge 脊 system with all fixings, ventilation and the like, including additional battens, generally	103	m	£31.00	£3,193.00	17	26	36		1600	0.1	0.5	1			
B	Roof Hips; dry ridge system with all fixings, ventilation and the like, including additional battens, generally	185	m	£45.00	£8,325.00	17	26	36		1600	0.1	0.5	1			
C	Roof Valleys; cutting to both sides of valley (liner measured elsewhere) complete with all additional battens, generally	54	m	£34.00	£1,836.00	17	26	36		1600	0.1	0.5	1			
D	Roof Holes, generally	1	ITEM	£100.00	£100.00	17	26	36		1600	0.1	0.5	1			

E	Roof Hip irons, generally	36	Nr	£7.00	£252.00	17	26	36	0.081	7870				11.7	24.62	36.3	7458.399	15694.5114	23140.161
F	Code 4 lead flashings; Flashings to abutments; complete with dressing into masonry as required; finishing with one coat of patination oil, stepped flashing to pitched abutment from roof tiles to masonry; dressing up face of masonry and over slates; girth nominally 350mm	15	m	£53.00	£795.00	32	60	82	0.00945	11340				16	25.2	33	1714.608	2700.5076	3536.379
G	Code 4 lead flashings; Flashings to abutments; complete with dressing into masonry as required; finishing with one coat of patination oil, horizontal flashing to abutment from roof tiles to masonry; dressing up face of masonry and over slates; girth nominally 300mm	7	m	£33.00	£231.00	32	60	82	0.00378	11340				16	25.2	33	685.8432	1080.20304	1414.5516
H	Code 4 lead flashings; Flashings to abutments; complete with dressing into masonry as required; finishing with one coat of patination oil, horizontal flashing to flat roof skirting to masonry; dressing up face of masonry and over skirting; girth nominally 300mm	42	m	£33.00	£1,386.00	32	60	82	0.02268	11340				16	25.2	33	4115.0592	6481.21824	8487.3096
I	Code 4 lead flashings; Flashings to abutments; complete with dressing into masonry as required; finishing with one coat of patination oil, soakers to flashing to pitched abutment from roof tiles to masonry; dressing under and over slates and up face of masonry; nominally soakers of 300 x 400mm	61	Nr	£5.00	£305.00	32	60	82	0.013176	11340				15	25.2	33	2241.2376	3765.27917	4930.7227
J	Code 5 lead flashings. Flashings to valleys; complete with dressing onto timber battens and over plywood; finishing with one coat of patination oil, valley lining; nominally 450mm girth; bent five times; fixed to battens; in lengths not exceeding 1.50m, with 150mm lap	54	m	£69.00	£3,726.00	32	60	82	0.054432	11340				15	25.2	33	9258.8832	15554.9238	20369.543
A	Bill 6 Roof, secret gutter valley lining; nominally 450mm girth; bent five times; fixed to battens; in lengths not exceeding 1.50m, with 150mm lap	64	m	£69.00	£4,416.00	32	60	82	0.064512	11340				15	25.2	33	10973.4912	18435.4652	24141.681
B	Assumed to be Sarnafil or similar approved single ply 板层 warm roof covering; complete with all required vapour barriers, insulation, breather membranes, fleeces 抓绒, fixings, trims, seals and the like; laid on pre cast concrete planks; designed, manufactured and installed by specialist Sub Contractor, pitch not exceeding 4 degrees	44	m2	£81.00	£3,564.00	17	30	43	0.0528	1380				54.04	77.2	100.36	3937.57056	5625.1008	7312.631
C	Assumed to be Sarnafil or similar approved single ply 板层 warm roof covering; complete with all required vapour barriers, insulation, breather membranes, fleeces 抓绒, fixings, trims, seals and the like; laid on pre cast concrete planks; designed, manufactured and installed by specialist Sub Contractor, pitch 5 degrees; with standing seam effect rolls at 600mm centres	32	m2	£81.00	£2,592.00	17	30	43	0.0384	1380				55.44	79.2	102.96	2937.87648	4196.9664	5456.0563
D	Roof covering Skirtings 基板; complete with all required insulation and the like; dressing up face of walls / parapets 扶手 and the like; make good as required; including all cappings, trims, formers, not exceeding 200mm girth	42	m	£30.00	£1,260.00	17	30	43	0.1512	1380				55.44	79.2	102.96	11567.88864	16525.5552	21483.222
E	Roof covering Flashings; complete with all required insulation and the like; dressing up roof trusses behind slates; make good as required; including all cappings, trims, formers, 400 to 600mm girth	44	m	£30.00	£1,320.00	17	30	43	0.0396	1380				55.44	79.2	102.96	3029.68512	4328.1216	5626.5581
F	Roof covering Eaves; complete with all required insulation and the like; dressing over and into gutter; make good as required; including all cappings, trims, formers, 200 to 400mm girth	9	m	£30.00	£270.00	17	30	43	0.00648	1380				55.44	79.2	102.96	495.766656	708.23808	920.7095
G	Roof covering Approved paving slabs, on and including pedestals 基座 as required to provide working terrace to flat roof, no details, pitch not exceeding 4 degrees	34	m2	£40.00	£1,360.00	50	75	100	2.04	1380				55.44	79.2	102.96	156074.688	222963.84	289852.99
A	Softwood fascias; fixed to timber framing (measured elsewhere); complete with all trims, supports and the like to complete installation; assumed to be 22mm thick, fascia, nominally 250mm deep	318	m	£8.15	£2,591.70	5	10	15	1.749	630				0.72	7.4	13	793.3464	8153.838	14324.31
B	Softwood fascias; fixed to timber framing (measured elsewhere); complete with all trims, supports and the like to complete installation; assumed to be 22mm thick, verge fascia, nominally 250mm deep	60	m	£9.15	£549.00	5	10	15	0.33	630				0.72	7.4	13	149.688	1538.46	2702.7
C	Softwood soffits; fixed to timber framing (measured elsewhere); complete with all trims装饰, ventilators通风口, supports and the like to complete installation, soffit, nominally 250mm wide; assumed to be 15mm thick	378	m	£9.15	£3,458.70	5	10	15	1.4175	630				0.72	7.4	13	642.978	6608.385	11609.325
D	Dormer window framing WBP plywood; fixed to timber frame (measured elsewhere); vertical, nominally 18mm thick, to dormer faces and cheeks; over 300mm wide	40	m2	£25.64	£1,025.60	41	68	107	0.72	620				10	15	20	4464	6696	8928
E	Dormer window framing WBP plywood; fixed to timber frame (measured elsewhere); vertical, nominally 18mm thick, to dormer faces and cheeks; not exceeding 300mm wide	25	m	£11.29	£282.25	41	68	107	0.135	620				10	15	20	837	1255.5	1674
F	Cementious 水泥 render board, on and including approved battens to provide ventilation gap fixed to plywood substrate, to dormer faces and cheeks; over 300mm wide	40	m2	£20.69	£827.60				0.4	1860				1.42	5.32	11.73	1056.48	3958.08	8727.12
G	Cementious 水泥 render board, on and including approved battens to provide ventilation gap fixed to plywood substrate, to dormer faces and cheeks; not exceeding 300mm wide	25	m	£12.17	£304.25				0.075	1860				1.42	5.32	11.73	198.09	742.14	1636.335
H	Painting fascias and soffits; Assumed to be Dulux Trade Exterior Gloss, prime, prepare, apply two undercoats and two finish coats; general surfaces, over 300mm girth	189	m2	£12.50	£2,362.50	6	6	6						21	21	21	3969	3969	3969
I	Roof insulation; Assumed to be Rockwool or similar approved mineral fibre insulation quilt, nominally 400mm thick overall, horizontal, between joists nominally 150mm thick	429	m2	£2.10	£900.90	50	75	100	64.35	100				16.8	16.8	16.8	108108	108108	108108
J	Roof insulation; Assumed to be Rockwool or similar approved mineral fibre insulation quilt, nominally 400mm thick overall, horizontal, over joists nominally 100mm thick	429	m2	£1.80	£772.20	50	75	100	42.9	100				16.8	16.8	16.8	72072	72072	72072
K	Roof insulation; Assumed to be Rockwool or similar approved mineral fibre insulation quilt, nominally 400mm thick overall, horizontal, over joists nominally 150mm thick	429	m2	£2.10	£900.90	50	75	100	64.35	100				16.8	16.8	16.8	108108	108108	108108
A	Roof insulation; Assumed to be Rockwool or similar approved mineral fibre insulation quilt, nominally 400mm thick overall, vertical, between studs nominally 100mm thick	40	m2	£4.00	£160.00	50	75	100	4	100				16.8	16.8	16.8	6720	6720	6720
B	Roof insulation, Assumed to be Kingspan or similar approved rigid insulation boards, nominally 175mm thick overall, pitched, between joists nominally 75mm thick	287	m2	£23.00	£6,601.00	17	22	31	21.525	30		Polystyrene		31.5	45	58.5	20341.125	29058.75	37776.375
C	Roof insulation, Assumed to be Kingspan or similar approved rigid insulation boards, nominally 175mm thick overall, pitched, between joists nominally 100mm thick	287	m2	£25.00	£7,175.00	17	22	31	28.7	30				31.5	45	58.5	27121.5	38745	50368.5
D	Gravity rainwater drainage system; Black uPVC rainwater pipes; complete with all elbows, connections, brackets, fixings and the like as required, nominally 75mm diameter	233	m	£6.91	£1,610.03	18	26	35	0.256067	1380	Asif et al. (2005)	pvc pipe		69.4	94.7	120	24524.04872	33464.372	42404.695
E	Gravity rainwater drainage system; Black uPVC rainwater pipes; complete with all elbows, connections, brackets, fixings and the like as required, connection to below ground drainage	41	Nr	£12.25	£502.25	18	26	35			Asif et al. (2005)								
F	Gravity rainwater drainage system; Black uPVC rainwater pipes; complete with all elbows, connections, brackets, fixings and the like as required, off set bends, 250mm	41	Nr	£9.10	£373.10	18	26	35			Asif et al. (2005)								

G	Black uPVC rainwater gutters; complete with all elbows, connections, brackets, fixings and the like as required, half round, nominally 100mm diameter	318	m	£8.13	£2,585.34	18	26	35	0.474297	1380	Asif et al. (2005)			69.4	94.7	120	45424.37228	61983.9777	78543.583
H	Black uPVC rainwater gutters; complete with all elbows, connections, brackets, fixings and the like as required, ends	46	Nr	£5.10	£234.60	18	26	35			Asif et al. (2005)								
I	Black uPVC rainwater gutters; complete with all elbows, connections, brackets, fixings and the like as required, running outlets	41	Nr	£7.15	£293.15	18	26	35			Asif et al. (2005)								
J	Black uPVC rainwater gutters; complete with all elbows, connections, brackets, fixings and the like as required, bends	29	Nr	£7.15	£207.35	18	26	35			Asif et al. (2005)								
K	Testing and commissioning, as required	1	ITEM	£600.00	£600.00	1	1	1											
A	Softwood framed staircases; with MDF treads and plywood risers; treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of five treads, quarter landing, one tread, quarter landing and five treads; balustrade to landing return; unit 1	1	Nr	£2,818.00	£2,818.00	32	62	76		630				0.72	7.4	13			
B	Softwood framed staircases; with MDF treads and plywood risers; treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of thirteen treads; balustrade to landing return; unit 2	1	Nr	£2,660.00	£2,660.00	32	62	76		630				0.72	7.4	13			
C	Softwood framed staircases; with MDF treads and plywood risers; treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of thirteen treads; balustrade to landing return; unit 3	1	Nr	£2,709.00	£2,709.00	32	62	76		630				0.72	7.4	13			
D	Softwood framed staircases; with MDF treads and plywood risers; treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of thirteen treads; balustrade to landing return; unit 4	1	Nr	£2,709.00	£2,709.00	32	62	76		630				0.72	7.4	13			
E	Softwood framed staircases; with MDF treads and plywood risers; treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of three winder treads, six straight treads and three winder treads; unit 10	1	Nr	£3,676.00	£3,676.00	32	62	76		630				0.72	7.4	13			
F	Complete installation of precast concrete stair and landings; designed to approved British Standards and Engineers requirements; stairs to units 5 to 9; comprising of three flights of two, six and five treads with two quarter landings with one corner splayed; 950mm wide treads; 2650m overall rise; ground to first floor	1	Nr	£5,340.00	£5,340.00	42	73	95	stairs structure: concrete			stairs structure: conc		0.99	1.1	1.17			
A	Complete installation of precast concrete stair and landings; designed to approved British Standards and Engineers requirements; stairs to units 5 to 9; comprising of three flights of two, six and five treads with two quarter landings with one corner splayed; 950mm wide treads; 2625m overall rise; first to second floor	1	Nr	Included	Included														
B	Balustrading扶手; Assumed to be polyester 聚酯纤维 powder coated mild steel framed with vertical pilasters; complete with handrail to match; raking	10	m	£436.55	£4,365.50	15	20	25											
C	Balustrading扶手; Assumed to be polyester 聚酯纤维 powder coated mild steel framed with vertical pilasters; complete with handrail to match; horizontal	4	m	£476.47	£1,905.88	15	20	25											
D	Balustrading扶手; Assumed to be polyester 聚酯纤维 powder coated mild steel framed with vertical pilasters; complete with handrail to match; ends	4	Nr	£40.22	£160.88	15	20	25											
E	Balustrading扶手; Assumed to be polyester 聚酯纤维 powder coated mild steel framed with vertical pilasters; complete with handrail to match; connection to balustrade 扶手	2	Nr	£40.22	£80.44	15	20	25											
F	Balustrading扶手; Assumed to be polyester 聚酯纤维 powder coated mild steel framed with vertical pilasters; complete with handrail to match; bends	6	Nr	£40.22	£241.32	15	20	25											
G	Balustrading扶手; Assumed to be polyester 聚酯纤维 powder coated mild steel framed with vertical pilasters; complete with handrail to match; ramps 斜坡	14	Nr	£80.44	£1,126.16	15	20	25											
H	Assumed to be polyester powder coated handrails on brackets to masonry walls; raking	8	m	£173.32	£1,386.56	15	20	25											
I	Assumed to be polyester powder coated handrails on brackets to masonry walls; horizontal	8	m	£173.32	£1,386.56	15	20	25											
J	Assumed to be polyester powder coated handrails on brackets to masonry walls; ends	2	Nr	£40.22	£80.44	15	20	25											
K	Assumed to be polyester powder coated handrails on brackets to masonry walls; bends	8	Nr	£40.22	£321.76	15	20	25											
L	Assumed to be polyester powder coated handrails on brackets to masonry walls; ramps	10	Nr	£80.44	£804.40	15	20	25											
M	Painting stair strings 楼梯梁 Assumed to be ICI Dulux Trade Satinwood or similar approved; touch up primer, undercoat and two coats of finish paint, over 300mm girth	5	m2	£15.00	£75.00	6	6	6						21	21	21	105	105	105
N	Painting staircases and balustrades. Prepare, touch up primer and apply one undercoat and one gloss finishing coat of oil paint; general surfaces; strings, over 300mm girth	9	m2	£15.00	£135.00									21	21	21	189	189	189
A	Painting staircases and balustrades. Prepare, touch up primer and apply one undercoat and one gloss finishing coat of oil paint; not exceeding 300mm girth	27	m	£4.00	£108.00														
B	Prepare, touch up primer and apply one undercoat and one gloss finishing coat of oil paint; balustrades; measured both sides, over 300 girth	66	m2	£15.00	£990.00									21	21	21	1386	1386	1386
C	Cover panels to stair strings. Assumed to be MDF; factory primed; mechanically fixed to pre cast concrete stair strings, nominally 19mm thick; 350mm high; all edges rounded	12	m	£20.17	£242.04	21	36	48	0.0798	510		softwood		11	11	11	447.678	447.678	447.678
A	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond, 100mm thick	2228	m2	£22.80	£50,798.40	52	72	101	222.8	2200				0.525	0.75	0.975	257334	257334	257334
B	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond, 100mm thick, fair faced one side	94	m2	£24.30	£2,284.20	52	72	101	9.4	2200				0.525	0.75	0.975	10857	10857	10857
C	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond, 100mm thick, fair faced both sides	40	m2	£26.30	£1,052.00	52	72	101	4	2200				0.525	0.75	0.975	4620	4620	4620
D	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond, 215mm thick; two skins of 100mm blockwork tied together with ties at the rate of five per square metre and central joint fully filled with mortar; fair faced one side	6	m2	£56.11	£336.66	52	72	101	1.2	2200				0.525	0.75	0.975	1386	1386	1386
E	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond, 100mm thick, in piers, overall 215mm thick; fair faced to three sides	5	m2	£50.11	£250.55	52	72	101	1.075	2200				0.525	0.75	0.975	1241.625	1241.625	1241.625
F	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond, 100mm thick, in piers, overall 215mm thick; fair faced to four sides	4	m2	£51.11	£204.44	52	72	101	0.86	2200				0.525	0.75	0.975	993.3	993.3	993.3
G	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond, 100mm thick, in piers, overall 335mm thick; fair faced to three sides	2	m2	£77.91	£155.82	52	72	101	0.67	2200				0.525	0.75	0.975	773.85	773.85	773.85
H	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond, 100mm thick, in piers, overall 440mm thick; fair faced to three sides	1	m2	£104.21	£104.21	52	72	101											

I	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond, cutting blockwork to course 100mm thick	501	m	£5.00	£2,505.00	52	72	101		2200		0.525	0.75	0.975				
J	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond, cutting blockwork to course 100mm thick; raking	21	m	£10.00	£210.00	52	72	101										
K	Engineering bricks; manufacturer and product reference to be agreed; 7.5N/mm2 compressive strength; half lap stretcher bond; flush joints; walls, half brick thick =102.5 mm	59	m2	£70.82	£4,178.38	70	93	131	6.0475	2000		0.63	3	6	7619.85	36285	72570	
L	Natural stone walling; Assumed to be limestone or similar walling to match boundary walls; in cement mortar; complete with facing to suit wall thickness, including trimming and the like of stone; random courses; brushed finish, nominally 100mm thick	22	m2	£143.35	£3,153.70	43	60	79	2.2	1900		0.7	0.85	1.01	2926	3553	4221.8	
A	Stonework; Assumed to be cast stone to match adjacent邻近的 environment; bedding in mortar; building in as work proceeds; nominally 425mm wide; 55mm deep; splayed top edge with two throats to underside; coppings, generally	26	m	£97.00	£2,522.00	43	60	79	0.60775	470		1.2	2.18	3.8	342.771	622.70065	1085.4415	
B	Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 125mm thick; 215mm deep; splayed bottom edge with throating; lintels, to suit opening 1248mm wide	2	Nr	£270.00	£540.00	43	60	79	0.06708	470		1.2	2.18	3.8	37.83312	68.730168	119.80488	
C	Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 685mm wide	9	Nr	£95.00	£855.00	43	60	79	0.1988213	470		1.2	2.18	3.8	112.135185	203.712253	355.09475	
D	Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 1135mm wide	6	Nr	£138.00	£828.00	43	60	79	0.2196225	470		1.2	2.18	3.8	123.86709	225.025214	392.24579	
E	Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 1248mm wide	19	Nr	£150.00	£2,850.00	43	60	79	0.764712	470		1.2	2.18	3.8	431.297568	783.523915	1365.7756	
F	Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 1360mm wide	2	Nr	£157.50	£315.00	43	60	79	0.08772	470		1.2	2.18	3.8	49.47408	89.877912	156.66792	
G	Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 1698mm wide	1	Nr	£205.00	£205.00	43	60	79	0.0547605	470		1.2	2.18	3.8	30.884922	56.1076083	97.802253	
H	Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 1810mm wide	4	Nr	£212.00	£848.00	43	60	79	0.23349	470		1.2	2.18	3.8	131.68836	239.233854	417.01314	
I	Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 2710mm wide	1	Nr	£310.00	£310.00	43	60	79	0.087075	470		1.2	2.18	3.8	49.1103	89.217045	155.51595	
J	Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre; and approved cavity wall insulation 75mm thick, 125mm wide	1187	m2	£14.06	£16,689.22	52	72	101	0.0232949	8000		40.2	48.36	51.48	7491.6318	9012.32124	9593.7613	assumming diameter of steel wall tie is 5mm
K	Cavity trays; Visqueen Zedex Housing grade damp proof course; bedding in cement mortar, over 225mm wide	311	m2	£16.45	£5,115.95	52	72	101	69.975	1650		0.1	1.54	3.49	11545.875	177806.475	402951.04	
L	Cavity closers; Assumed to be Kingspan or similar approved Thermabate cavity closer system, complete with all required insulation, brackets and the like; suitable for use in party walls, 100mm wide, vertical	248	m	£8.15	£2,021.20	50	75	100	0.7936	1380		69.4	94.7	120	76004.6592	103712.41	131420.16	
A	Cavity closers; Assumed to be Kingspan or similar approved Thermabate cavity closer system, complete with all required insulation, brackets and the like; suitable for use in party walls, 100mm wide, horizontal	150	m	£8.15	£1,222.50	50	75	100	0.48	1380		69.4	94.7	120	45970.56	62729.28	79488	
B	Weepholes 排水孔, Rytons Rytweep or similar approved; building in as work proceeds, generally	611	Nr	£1.78	£1,087.58	52	72	101	0.0407293									
C	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 572mm wide; in cavity wall	6	Nr	£23.17	£139.02	50	75	100	0.0004832	7800	https://iglintels.com/product/l1: 88*1.6	6	29.36	77	22.61495808	110.662528	290.2253	
D	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 685mm wide; in cavity wall	16	Nr	£25.39	£406.24	50	75	100	0.0015432	7800	https://iglintels.com/product/l1: 88*1.6	6	29.36	77	72.2202624	353.397817	926.8267	
E	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 910mm wide; in cavity wall	1	Nr	£32.63	£32.63	50	75	100	0.0001281	7800	https://iglintels.com/product/l1: 88*1.6	6	29.36	77	5.9963904	29.342337	76.953677	
F	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1022mm wide; in cavity wall	6	Nr	£33.63	£201.78	50	75	100	0.0008634	7800	https://iglintels.com/product/l1: 88*1.6	6	29.36	77	40.40644608	197.722209	518.54939	
G	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1135mm wide; in cavity wall	10	Nr	£36.06	£360.60	50	75	100	0.0159808	7800	https://iglintels.com/product/l1: 88*1.6	6	29.36	77	747.90144	3659.73105	9598.0685	
H	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1248mm wide; in cavity wall	28	Nr	£41.92	£1,173.76	50	75	100	0.0049201	7800	https://iglintels.com/product/l1: 88*1.6	6	29.36	77	230.2613914	1126.74574	2955.0212	
I	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1360mm wide; in cavity wall	5	Nr	£45.32	£226.60	50	75	100	0.001156	7800	https://iglintels.com/product/l1: 85*2.0	6	29.36	77	54.1008	264.733248	694.2936	
J	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1585mm wide; in cavity wall	2	Nr	£58.17	£116.34	50	75	100	0.0005389	7800	https://iglintels.com/product/l1: 85*2.0	6	29.36	77	25.22052	123.412411	323.66334	
K	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1698mm wide; in cavity wall	2	Nr	£60.18	£120.36	50	75	100	0.0007267	7800	https://iglintels.com/product/l1: 107*2.0	6	29.36	77	34.0116192	166.43019	436.48245	
L	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1810mm wide; in cavity wall	7	Nr	£84.37	£590.59	50	75	100	0.0027114	7800	https://iglintels.com/product/l1: 107*2.0	6	29.36	77	126.892584	620.927711	1628.4548	
M	IG Lintels, building in as work proceeds; reference L1/HD or similar; to suit structural opening of; to suit structural opening 2373mm wide; in cavity wall	2	Nr	£111.14	£222.28	50	75	100	0.0014238	7800	https://iglintels.com/product/l1: 150*2.0	6	29.36	77	66.63384	326.06159	855.13428	

N	IG Lintels, building in as work proceeds; reference L1/HD or similar; to suit structural opening of; to suit structural opening 2485mm wide; in 215mm thick wall	5	Nr	£145.06	£725.30	50	75	100	0.0052334	7800	https://iglintels.com/product/l1: 162*2.6	6	29.36	77	244.923588	1198.49276	3143.186
O	IG Lintels, building in as work proceeds; reference L1/HD or similar; to suit structural opening of; to suit structural opening 2598mm wide; in cavity wall	1	Nr	£150.06	£150.06	50	75	100	0.0010943	7800	https://iglintels.com/product/l1: 162*2.6	6	29.36	77	51.21219168	250.598325	657.22313
A	IG Lintels, building in as work proceeds; reference L1/HD or similar; to suit structural opening of; to suit structural opening 2710mm wide; in cavity wall	1	Nr	£150.06	£150.06	50	75	100	0.0011415	7800	https://iglintels.com/product/l1: 162*2.6	6	29.36	77	53.4199536	261.40164	685.55607
B	IG Lintels, building in as work proceeds; reference L1/HD or similar; to suit structural opening of; to suit structural opening 2935mm wide; in cavity wall	6	Nr	£155.47	£932.82	50	75	100	0.0078294	7800	https://iglintels.com/product/l1: 171*2.6	6	29.36	77	366.4162008	1792.99661	4702.3412
C	Sawn softwood; to timber store; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members; 125 x 125mm posts	18	m	£10.80	£194.40	39	56	72	0.28125	550		0.72	7.4	13	111.375	1144.6875	2010.9375
D	Sawn softwood; to timber store; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members; 125 x 50mm rails	26	m	£5.45	£141.70	39	56	72	0.1625	550		0.72	7.4	13	64.35	661.375	1161.875
E	Sawn softwood; to car port; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members; 150 x 150mm posts	18	m	£11.33	£203.94	39	56	72	0.405	550		0.72	7.4	13	160.38	1648.35	2895.75
F	Sawn softwood; to car port; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members; 300 x 200mm beams	40	m	£37.50	£1,500.00	39	56	72	2.4	550		0.72	7.4	13	950.4	9768	17160
G	Sawn softwood; to car port; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members; 200 x 150mm bracings - assumed to be dowelled mortice and tenon jointed	20	m	£19.35	£387.00	39	56	72	0.6	550		0.72	7.4	13	237.6	2442	4290
H	Sawn softwood; to car port; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members; 200 x 150mm curved entrance bracings - assumed to be dowelled mortice and tenon jointed	3	m	£33.35	£100.05	39	56	72	0.09	550		0.72	7.4	13	35.64	366.3	643.5
I	Sawn softwood; to car port; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members; 50 x 100mm	73	m	£4.17	£304.41	39	56	72	0.365	550		0.72	7.4	13	144.54	1485.55	2609.75
J	Fixings; Assumed to be stainless steel shoes, resin bolted to concrete floor slab; complete with all required fixings, bolts and the like; to suit 125 x 125mm post	8	Nr	£87.50	£700.00												
K	Fixings; Assumed to be stainless steel shoes, resin bolted to concrete floor slab; complete with all required fixings, bolts and the like; to suit 150 x 150mm post	8	Nr	£87.50	£700.00												
L	Truss clips; to accept rails; nailed as required; to suit 125 x 50mm rails	44	Nr	£2.27	£99.88												
A	H30 FIBRE CEMENT PROFILED SHEET CLADDING/COVERING /SIDING; Assumed to be profiled large format cladding panels; including all insulation, vapour barriers, breather membranes, brackets, fixings and the like to complete installation; wall claddings; vertical	13	m2	£280.32	£3,644.16	24	38	49	0.26	350		7.28	10.4	13.52	662.48	946.4	1230.32
B	H30 FIBRE CEMENT PROFILED SHEET CLADDING/COVERING /SIDING; Abutments; as required, no details; to roof profile, to head and sill; generally	26	m	£31.90	£829.40	24	38	49	0.0624	350		7.28	10.4	13.52	158.9952	227.136	295.2768
C	H30 FIBRE CEMENT PROFILED SHEET CLADDING/COVERING /SIDING; Trims to windows and the like; generally	5	m	£31.90	£159.50	24	38	49									
D	H30 FIBRE CEMENT PROFILED SHEET CLADDING/COVERING /SIDING; Holes, no details	1	ITEM	£1,000.00	£1,000.00	24	38	49									
E	H41 GLASS REINFORCED PLASTICS PANEL CLADDING / FEATURES; Approved timber framed or Glass Reinforced Plastic off site manufactured chimney unit with brickwork to match below DPC; including capping and two chimney pots, blanking panels and the like; generally	2	Nr	£800.00	£1,600.00	24	37	48									
F	H41 GLASS REINFORCED PLASTICS PANEL CLADDING / FEATURES; Approved timber framed or Glass Reinforced Plastic off site manufactured entrance porch with slate roofing to match main roof; including supporting framing fixed to masonry walls; generally; 2.00m wide; 900mm projection, to unit 2	1	Nr	£609.95	£609.95	24	37	48									
G	H41 GLASS REINFORCED PLASTICS PANEL CLADDING / FEATURES; Approved timber framed or Glass Reinforced Plastic off site manufactured entrance porch with slate roofing to match main roof; including supporting framing fixed to masonry walls; generally; 2.30m wide; 900mm projection, to units 3 and 4	2	Nr	£609.95	£1,219.90	24	37	48									
H	H41 GLASS REINFORCED PLASTICS PANEL CLADDING / FEATURES; Approved timber framed or Glass Reinforced Plastic off site manufactured entrance porch with slate roofing to match main roof; including supporting framing fixed to masonry walls; generally; 3.47m wide; 600mm projection, to units 5 to 9	1	Nr	£609.95	£609.95	24	37	48									
A	Timber boarding; James Hardiplank timber effect Fibre Cement boarding; over 300mm wide	109	m2	£65.99	£7,192.91	17	29	42	0.872	1300	https://www.jameshardie.co.uk/en/cladding/hardiepl	7.28	10.4	13.52	8252.608	11789.44	15326.272
B	Timber boarding; James Hardiplank timber effect Fibre Cement boarding; not exceeding 300mm wide	32	m	£34.30	£1,097.60	17	29	42	0.256	1300	https://www.jameshardie.co.uk/en/cladding/hardiepl	7.28	10.4	13.52	2422.784	3461.12	4499.456
C	Timber boarding; James Hardiplank timber effect Fibre Cement boarding; over 300mm wide; to soffits; complete with 100mm of approved insulation board	9	m2	£78.66	£707.94	17	29	42	0.072	1300	https://www.jameshardie.co.uk/en/cladding/hardiepl	7.28	10.4	13.52	681.408	973.44	1265.472
D	Timber boarding; Abutments; complete with all additional framing and the like; to render	22	m	£17.09	£375.98	17	29	42	0.0528	1300	https://www.jameshardie.co.uk/en/cladding/hardiepl	7.28	10.4	13.52	499.6992	713.856	928.0128
E	Timber boarding; Finished external angles; complete with feature trim and the like; external angles generally	59	m	£13.59	£801.81	17	29	42									
F	Timber boarding; Sills; complete with feature trim and the like; sills generally	48	m	£13.59	£652.32	17	29	42									
G	Timber boarding; Holes, generally	1	ITEM	£100.00	£100.00	17	29	42									
H	Timber boarding; Raking cutting to tops of walls, generally	20	m	£4.00	£80.00	17	29	42									
I	Timber boarding; to timber store; Assumed to be preservative treated tongue and groove 凹槽 horizontal boarding; in 19 x 150mm planks, secret fixed to timber framing; walls; over 300mm wide	21	m2	£65.79	£1,381.59	17	29	42	0.399	480		0.72	7.11	21.3	137.8944	1361.7072	4079.376
J	Timber boarding; to timber store; Finished external angles; complete with feature trim and the like; external angles generally	13	m	£20.30	£263.90	17	29	42	0.0312	480		0.72	7.11	21.3	10.78272	106.47936	318.9888
K	Timber boarding; to timber store; Sills基石; complete with feature trim and the like; sills generally	8	m	£7.84	£62.72	17	29	42									
L	Timber boarding; to timber store; Raking cutting to tops of walls; generally	6	m	£4.84	£29.04	17	29	42									
M	Timber boarding; to car port; Assumed to be preservative treated tongue and groove horizontal boarding; in 19 x 150mm planks, secret fixed to timber framing; walls; over 300mm wide	44	m2	£65.79	£2,894.76	17	29	42	0.836	480		0.72	7.11	21.3	288.9216	2853.1008	8547.264
A	Timber boarding; to car port; Finished external angles; complete with feature trim and the like; external angles generally	5	m	£13.09	£65.45	17	29	42	0.012	480		0.72	7.11	21.3	4.1472	40.9536	122.688
B	Timber boarding; to car port; Finished ends; complete with feature trim and the like; open abutments generally	5	m	£13.09	£65.45	17	29	42	0.012	480		0.72	7.11	21.3	4.1472	40.9536	122.688

C	Timber boarding; to car port; Sills; complete with feature trim and the like; sills generally	20	m	£13.09	£261.80	17	29	42	0.048	480		0.72	7.11	21.3	16.5888	163.8144	490.752
D	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; fixed to masonry walls with approved brackets; 2710mm long; 1100mm high; to unit 2	1	Nr	£2,149.31	£2,149.31	15	20	25	0.0049014	8000		40.2	48.36	51.48	1576.294871	1896.2592	2018.5985
E	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; 500mm high; to unit 10	6	m	£607.95	£3,647.70	15	20	25	0.0108518	8000		40.2	48.36	51.48	3489.951744	4198.35986	4469.2218
F	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; 1100mm high; to unit 3 and 4	17	m	£623.25	£10,595.25	15	20	25	3.074688	8000		40.2	48.36	51.48	988819.6608	1189535.29	1266279.5
G	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; 1500mm high; to unit 3 and 4; obscure glass	3	m	£1,001.89	£3,005.67	15	20	25	0.542592	8000		40.2	48.36	51.48	174497.5872	209917.993	223461.09
H	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; ends / abutments to walls	5	Nr	£95.91	£479.55	15	20	25									
I	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; bends	4	Nr	£95.91	£383.64	15	20	25									
J	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; junctions	1	Nr	£95.91	£95.91	15	20	25									
K	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; 1100mm high; to unit 3 and 4	24	m	£586.86	£14,084.64	15	20	25	4.340736	8000		40.2	48.36	51.48	1395980.698	1679343.94	1787688.7
L	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; ends / abutments to walls	8	Nr	£95.91	£767.28	15	20	25									
M	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; bends	8	Nr	£95.91	£767.28	15	20	25									
A	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS; Proprietary two coat render system; to blockwork, through colour, over 300mm wide	954	m2	£26.00	£24,804.00	32	52	81	9.54	1900		0.1	1.54	3.49	1812.6	27914.04	63259.74
B	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS; Proprietary two coat render system; to blockwork, through colour, not exceeding 300mm wide	338	m	£8.00	£2,704.00	32	52	81	1.014	1900		0.1	1.54	3.49	192.66	2966.964	6723.834
C	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS; Waterproof proprietary two coat render system; to blockwork, through colour, over 300mm wide	80	m2	£52.00	£4,160.00	32	52	81	0.8	1900		0.1	1.54	3.49	152	2340.8	5304.8
D	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS; Waterproof proprietary two coat render system; to blockwork, through colour, not exceeding 300mm wide	26	m	£10.00	£260.00	32	52	81	0.078	1900		0.1	1.54	3.49	14.82	228.228	517.218
E	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS; Waterproof proprietary two coat render system; to blockwork, through colour, Approved beads to suit render system, external angle beads	495	m	£1.15	£569.25	32	52	81									
F	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS; Waterproof proprietary two coat render system; to blockwork, through colour, Approved beads to suit render system, bellcast stop bead	230	m	£1.15	£264.50	32	52	81									
E	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 570 x 1210mm; plots 5, 6, 7, 8 and 9; reference W03, W05, W08, W13, W19 and W21; comprising of 1Nr obscure glazed fixed pane	6	Nr	£10,004.50	£60,027.00	22	34	45	4.104	30		12.3	16.81	25.09	1514.376	2069.6472	3089.0808
F	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 685 x 685mm; plot 10; reference W08; comprising of 1Nr side opening pane	1	Nr	£35.00	£35.00	22	34	45	0.469225	30		12.3	16.81	25.09	173.144025	236.630168	353.18566
G	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 685 x 685mm; plot 10; references W04 and W07; comprising of 1Nr obscure glazed side opening pane	2	Nr	£35.00	£70.00	22	34	45	0.93845	30		12.3	16.81	25.09	346.28805	473.260335	706.37132
A	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 685 x 1060mm; plots 3 and 4; references W02, W05, W07, W08, W13 and W14; comprising of 1Nr obscure glazed fixed pane	6	Nr	£35.00	£210.00	22	34	45	4.3566	30		12.3	16.81	25.09	1607.5854	2197.03338	3279.2128
B	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation;685 x 1060mm; plots 1 and 2; references W04, W15 and W16; comprising of 1Nr obscure glazed fixed pane	3	Nr	£35.00	£105.00	22	34	45	2.1783	30		12.3	16.81	25.09	803.7927	1098.51669	1639.6064

C	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation;685 x 1210mm; plot 10; reference W01; comprising of 1Nr side opening pane	1	Nr	£35.00	£35.00	22	34	45	0.82885	30		12.3	16.81	25.09	305.84565	417.989055	623.8754
D	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation;685 x 1210mm; plot 10; reference W02; egress window comprising of 1Nr side opening pane	1	Nr	£35.00	£35.00	22	34	45	0.82885	30		12.3	16.81	25.09	305.84565	417.989055	623.8754
E	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 685 x 1210mm; plot 10; reference W05; comprising of 1Nr obscure glazed side opening pane	1	Nr	£35.00	£35.00	22	34	45	0.82885	30		12.3	16.81	25.09	305.84565	417.989055	623.8754
F	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 685 x 1810mm; plot 10; reference W06; comprising of 1Nr obscure glazed fixed pane	1	Nr	£38.00	£38.00	22	34	45	1.23985	30		12.3	16.81	25.09	457.50465	625.256355	933.2351
G	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1023 x 1210mm; plots 5, 6, 7, 8 and 9; references W24, W25 and W26; comprising of 1Nr side opening pane and 1Nr fixed pane	3	Nr	£38.00	£114.00	22	34	45	3.71349	30		12.3	16.81	25.09	1370.27781	1872.71301	2795.1439
H	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1023 x 1210mm; plots 5, 6, 7, 8 and 9; reference W23; egress window comprising of 1Nr side opening pane and 1Nr fixed pane	1	Nr	£38.00	£38.00	22	34	45	1.23783	30		12.3	16.81	25.09	456.75927	624.237669	931.71464
I	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1135 x 1060mm; plots 1 and 2; reference W09; comprising of 2Nr side opening panes	1	Nr	£38.00	£38.00	22	34	45	1.2031	30		12.3	16.81	25.09	443.9439	606.72333	905.57337
J	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1135 x 1360mm; plots 1 and 2; references W05, W06 and W11; comprising of 2Nr side opening panes	3	Nr	£38.00	£114.00	22	34	45	4.6308	30		12.3	16.81	25.09	1708.7652	2335.31244	3485.6032
K	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1135 x 1360mm; plots 1 and 2; reference W12; egress window comprising of 2Nr side opening panes	1	Nr	£38.00	£38.00	22	34	45	1.5436	30		12.3	16.81	25.09	569.5884	778.43748	1161.8677
L	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1135 x 1660mm; plots 1 and 2; reference W08; comprising of 2Nr side opening panes	1	Nr	£38.00	£38.00	22	34	45	1.8841	30		12.3	16.81	25.09	695.2329	950.15163	1418.1621

M																			
	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1248 x 685mm; plots 1 and 2; reference W10; comprising of 1Nr obscure glazed bottom opening pane	1	Nr	£35.00	£35.00	22	34	45	0.85488	30		12.3	16.81	25.09	315.45072	431.115984	643.46818		
N																			
	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1248 x 1210mm; plots 3 and 4; references W01 and W06; comprising of 1Nr side opening pane and 1Nr fixed pane	2	Nr	£38.00	£76.00	22	34	45	3.02016	30		12.3	16.81	25.09	1114.43904	1523.06669	2273.2744		
A	Bill 9 Windows and External Doors; 1248 x 1210mm; plots 5, 6, 7, 8 and 9; references W04, W06, W07, W11, W12, W16, W20, W22 and W33; comprising of 1Nr side opening pane and 1Nr fixed pane	9	Nr	£38.00	£342.00	22	34	45	13.59072	30		12.3	16.81	25.09	5014.97568	6853.8001	10229.735		
B	Bill 9 Windows and External Doors; 1248 x 1210mm; plots 3 and 4; references W03, W04, W09, W10, W11 and W12; egress window comprising of 1Nr side opening pane and 1Nr fixed pane	6	Nr	£38.00	£228.00	22	34	45	9.06048	30		12.3	16.81	25.09	3343.31712	4569.20006	6819.8233		
C	Bill 9 Windows and External Doors; 1248 x 1210mm; plots 5, 6, 7, 8 and 9; references W01, W02, W09, W10, W14, W15, W17 and W18; egress window comprising of 1Nr side opening pane and 1Nr fixed pane	8	Nr	£38.00	£304.00	22	34	45	12.08064	30		12.3	16.81	25.09	4457.75616	6092.26675	9093.0977		
D	Bill 9 Windows and External Doors; 1248 x 1210mm; plot 10; reference W12; comprising of 1Nr side opening pane and 1Nr fixed pane	1	Nr	£38.00	£38.00	22	34	45	1.51008	30		12.3	16.81	25.09	557.21952	761.533344	1136.6372		
E	Bill 9 Windows and External Doors; 1360 x 1210mm; plots 1 and 2; references W13 and W17; egress window comprising of 2Nr side opening panes and 1Nr fixed pane	2	Nr	£38.00	£76.00	22	34	45	3.2912	30		12.3	16.81	25.09	1214.4528	1659.75216	2477.2862		
F	Bill 9 Windows and External Doors; 1360 x 1210mm; plot 10; reference W10; comprising of 2Nr side opening panes and 1Nr fixed pane	1	Nr	£38.00	£38.00	22	34	45	1.6456	30		12.3	16.81	25.09	607.2264	829.87608	1238.6431		
G	Bill 9 Windows and External Doors; 1698 x 1210mm; plots 1 and 2; reference W02; comprising of 2Nr obscure glazed side opening panes and 1Nr obscure glazed fixed pane	1	Nr	£38.00	£38.00	22	34	45	2.05458	30		12.3	16.81	25.09	758.14002	1036.12469	1546.4824		
H	Bill 9 Windows and External Doors; 1698 x 1210mm; plot 10; reference W11; comprising of 2Nr obscure glazed side opening panes and 1Nr obscure glazed fixed pane	1	Nr	£38.00	£38.00	22	34	45	2.05458	30		12.3	16.81	25.09	758.14002	1036.12469	1546.4824		
I	Bill 9 Windows and External Doors; 1810 x 1210mm; plots 1 and 2; reference W01; comprising of 2Nr side opening panes and 1Nr fixed pane	1	Nr	£38.00	£38.00	22	34	45	2.1901	30		12.3	16.81	25.09	808.1469	1104.46743	1648.4883		
J	Bill 9 Windows and External Doors; 1810 x 1210mm; plot 10; reference W09; comprising of 2Nr side opening panes and 1Nr fixed pane	1	Nr	£38.00	£38.00	22	34	45	2.1901	30		12.3	16.81	25.09	808.1469	1104.46743	1648.4883		
K	Bill 9 Windows and External Doors; 1810 x 1210mm; plots 1 and 2; reference W03, W07 and W14; egress windows comprising of 2Nr side opening panes and 1Nr fixed pane	3	Nr	£38.00	£114.00	22	34	45	6.5703	30		12.3	16.81	25.09	2424.4407	3313.40229	4945.4648		
L	Bill 9 Windows and External Doors; 1810 x 1210mm; plot 10; reference W03; egress windows comprising of 2Nr side opening panes and 1Nr fixed pane	1	Nr	£38.00	£38.00	22	34	45	4.3802	30		12.3	16.81	25.09	1616.2938	2208.93486	3296.9765		
A	Velux windows; 550 x 980mm; plots 5, 6, 7, 8 and 9; references W35, W36 and W37	3	Nr	£585.00	£1,755.00	24	35	45	1.617	30		12.3	16.81	25.09	596.673	815.4531	1217.1159		
B	Velux windows; 660 x 1398mm; plots 5, 6, 7, 8 and 9; references W27, W28, W29, W30, W31 and W32	6	Nr	£690.00	£4,140.00	24	35	45	5.53608	30		12.3	16.81	25.09	2042.81352	2791.84514	4167.0074		
C	The Rooflight Company Plateau Slimline Profile or similar approved; flat rooflight; 669 x 690mm; plots 5, 6, 7, 8 and 9; reference W34	1	Nr	£1,438.00	£1,438.00	24	35	45	0.447561	30		12.3	16.81	25.09	165.150009	225.705012	336.87916		
D	Triangle roof element; 2900 x 1020mm (maximum height); plots 5, 6, 7, 8 and 9; reference W40	1	Nr	£165.00	£165.00	24	35	45	2.958	30		12.3	16.81	25.09	1091.502	1491.7194	2226.4866		
E	Patio / French doorset; Profile 22 uPVC or similar approved; glazed with Ovolo beads玻璃粉; 1810 x 2110; plot 10; reference ED02; safety glazed single door with 2Nr safety glazed side lights and 2Nr top hung opening vents	1	Nr	£1,183.15	£1,183.15	22	32	41	0.076382	1400		69.4	69.4	69.4	7421.27512	7421.27512	7421.2751		
F	Patio / French doorset; Profile 22 uPVC or similar approved; glazed with Ovolo beads玻璃粉; 2730 x 2110; plots 1 and 2; reference ED05; double door with 6Nr side lights and 2Nr top hung opening vents	1	Nr	£1,183.15	£1,183.15	22	32	41	0.115206	1400		69.4	69.4	69.4	11193.41496	11193.415	11193.415		
G	Patio / French doorset; Profile 22 uPVC or similar approved; glazed with Ovolo beads玻璃粉; 2940 x 2110; plots 3 and 4; references ED05 and ED06; safety glazed double door with 6Nr safety glazed side lights and 2Nr top hung opening vents	2	Nr	£1,183.15	£2,366.30	22	32	41	0.248136	1400		69.4	69.4	69.4	24108.89376	24108.8938	24108.894		
A	Patio / French doorset; Profile 22 uPVC or similar approved; glazed with Ovolo beads玻璃粉; 2940 x 2110; plots 5, 6, 7, 8 and 9; references ED02, ED03, ED04, ED05, ED06 and ED07; safety glazed double door with 2Nr safety glazed side lights and 2Nr top hung opening vents	6	Nr	£1,291.98	£7,751.88	22	32	41	0.744408	1400		69.4	69.4	69.4	72326.68128	72326.6813	72326.681		
B	Sashless 无窗框的 Window Company Limited or similar approved; European Oak with a Light Oak finish; PAS 24 door; 1023 x 2110; plots 1 and 2; reference ED02; single door with 1Nr obscure glazed vision panel	1	Nr	£95.00	£95.00	25	39	50	0.0755486	700		0.33	5.38	16	17.45171505	284.515839	846.14376		
C	Sashless 无窗框的 Window Company Limited or similar approved; European Oak with a Light Oak finish; PAS 24 door; 1023 x 2110; plots 1 and 2; reference ED01; single door with 2Nr obscured safety glazed vision panels	1	Nr	£95.00	£95.00	25	39	50	0.0755486	700		0.33	5.38	16	17.45171505	284.515839	846.14376		
D	Sashless 无窗框的 Window Company Limited or similar approved; European Oak with a Light Oak finish; PAS 24 door; 1023 x 2110; plots 3 and 4; reference ED01; single door with 1Nr obscure glazed vision panel	1	Nr	£95.00	£95.00	25	39	50	0.0755486	700		0.33	5.38	16	17.45171505	284.515839	846.14376		
E	Sashless 无窗框的 Window Company Limited or similar approved; European Oak with a Light Oak finish; PAS 24 door; 1023 x 2110; plots 3 and 4; reference ED02; single door with 4Nr obscure glazed vision panels	1	Nr	£95.00	£95.00	25	39	50	0.0755486	700		0.33	5.38	16	17.45171505	284.515839	846.14376		
F	Sashless 无窗框的 Window Company Limited or similar approved; European Oak with a Light Oak finish; PAS 24 door; 1023 x 2110; plot 10; reference ED01; single door deemed to include 4Nr obscure glazed vision panels	1	Nr	£95.00	£95.00	25	39	50	0.0755486	700		0.33	5.38	16	17.45171505	284.515839	846.14376		
A	Front doorset to apartments; FD30S; Vicaima Oak EX5.1 or similar approved; assumed to be PAS 24; timber veneered; 1023 x 2110; plots 5, 6, 7, 8 and 9; references ED08, ED09, ED10, ED12 and ED13; single door	5	Nr	£638.95	£3,194.75	25	39	50	0.3777428	700		0.33	5.38	16	87.25857525	1422.5792	4230.7188		
B	Front doorset to apartments; FD30S; solid oak high quality bespoke glazed feature front door; 1023 x 2110; plots 5, 6, 7, 8 and 9; reference ED01, single door	1	Nr	£95.00	£95.00	25	39	50	0.0755486	700		0.33	5.38	16	17.45171505	284.515839	846.14376		

C	Front doorset to apartments; FD30S; Visofold 1000 Series or similar approved; white aluminium doors; 2373 x 2110; plots 1 and 2; references ED03 and ED04; safety glazed	2	Nr	£2,775.86	£5,551.72	15	30	38	0.3504921	2700		124	155	186	117344.7551	146680.944	176017.13
A	Front doorset to apartments; FD30S; Visofold 1000 Series or similar approved; white aluminium doors; 3610 x 2110; plots 3 and 4; references ED03 and ED04; safety glazed	2	Nr	£3,577.66	£7,155.32	15	30	38	0.533197	2700		124	155	186	178514.3556	223142.945	267771.53
B	Front doorset to apartments; FD30S; Visofold 1000 Series or similar approved; white aluminium doors; 2598 x 2110; plot 10; reference ED03	1	Nr	£2,835.32	£2,835.32	15	30	38	0.1918623	2700		124	155	186	64235.49804	80294.3726	96353.247
C	Garador or standard 8070 frame or similar approved; recessed with Sherwood metal door with laminated oak finish; 2579 x 2194; plot 10; reference ED04	1	Nr	£1,500.00	£1,500.00	15	30	38	0.2546247	2700		124	155	186	85248.33952	106560.424	127872.51
D	Garador or standard 8070 frame or similar approved; recessed with Sherwood metal door with laminated oak finish; 2485 x 2185; garage block; reference ED01, 02, 03, 04	4	Nr	£1,195.00	£4,780.00	15	30	38	0.9773505	2700		124	155	186	327216.9474	409021.184	490825.42
E	External timber door to match timber boarding; 1022.5 x 2110; garage block; reference ED05	1	Nr	£1,094.00	£1,094.00	20	30	40	0.0647243	700		0.33	5.38	16	14.95130175	243.751526	724.9116
F	M60 PAINTING/CLEAR FINISHING, not exceeding 300mm girth	33	m	£4.00	£132.00												
A	MDF window boards; factory primed; generally; 25 x 250mm; bullnosed profile	33	m	£21.00	£693.00												
B	Veneered timber window boards; generally; 25 x 250mm; bullnosed profile	66	m	£27.00	£1,782.00												
A	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond; laid flat	162	m2	£22.80	£3,693.60	52	72	101	16.2	2200		0.525	0.75	0.975	18711	26730	34749
B	100mm thick; in party walls	446	m2	£22.80	£10,168.80	52	72	101	44.6	2200		0.525	0.75	0.975	51513	73590	95667
C	Dense aggregate blockwork; 7.3N/mm2 in cement mortar; stretcher bond; laid flat; 215mm thick; assumed to be 100mm blocks laid flat	16	m2	£45.58	£729.28	52	72	101	3.44	2200		0.525	0.75	0.975	3973.2	5676	7378.8
D	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond; laid flat; cutting blockwork to course 100mm thick	137	m	£5.00	£685.00	52	72	101									
E	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond; laid flat; cutting blockwork to course 100mm thick; raking	78	m	£10.00	£780.00	52	72	101									
F	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond; laid flat; cutting blockwork to course 215mm thick	6	m	£10.00	£60.00	52	72	101									
G	Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre; 100mm wide	263	m2	£18.91	£4,973.33	52	72	101	0.0051614	8000		11	56.7	82	454.201	2341.1997	3385.862
H	Cavity closers; 100mm wide, vertical	21	m	£8.15	£171.15	50	75	100									
I	Pre cast concrete lintels; 100 x 215mm deep; building in as work proceeds, to suit structural opening 930mm wide	8	Nr	£31.75	£254.00	51	76	106	0.15996	850		1.2	2.18	3.8	163.1592	296.40588	516.6708
J	Pre cast concrete lintels; 100 x 215mm deep; building in as work proceeds, to suit structural opening 1025mm wide	10	Nr	£32.75	£327.50	51	76	106	0.220375	850		1.2	2.18	3.8	224.7825	408.354875	711.81125
K	Pre cast concrete lintels; 100 x 215mm deep; building in as work proceeds, to suit structural opening 1115mm wide	3	Nr	£35.97	£107.91	51	76	106	0.0719175	850		1.2	2.18	3.8	73.35585	133.263128	232.29353
L	Pre cast concrete lintels; 100 x 215mm deep; building in as work proceeds, to suit structural opening 1275mm wide	1	Nr	£39.65	£39.65	51	76	106	0.0274125	850		1.2	2.18	3.8	27.96075	50.7953625	88.542375
M	Sawn softwood, preservative treated, grade C24, wall or partition members, nominally 45 x 89mm	3718	m	£4.10	£15,243.80	39	56	72	14.89059	630		0.3	5.55	13	2814.32151	52064.9479	121953.93
N	Sawn softwood, preservative treated, grade C24, wall or partition members, nominally 45 x 89mm; fixed to screed or floor boards	274	m	£4.10	£1,123.40	39	56	72	1.09737	630		0.3	5.55	13	207.40293	3836.95421	8987.4603
A	Standard assumed 12.5mm thick plasterboard linings to timber framing (framing measured elsewhere), generally - measured over openings	1385	m2	£4.90	£6,786.50	39	56	72	17.3125	950		1.4	1.8	3.2	23025.625	29604.375	52630
B	Moisture resistant or cement particle board linings assumed 12.5mm thick to timber framing (framing measured elsewhere), generally - measured over openings	370	m2	£6.40	£2,368.00	39	56	72	4.625	950		1.4	1.8	3.2	6151.25	7908.75	14060
C	Gyproc Soundblock board linings, two layers assumed 12.5mm thick to timber framing (framing measured elsewhere), generally - measured over openings	38	m2	£11.70	£444.60	26	39	51	0.475	950		1.4	1.8	3.2	631.75	812.25	1444
D	Gyproc Soundblock board linings, two layers assumed 12.5mm thick to timber framing (framing measured elsewhere), Angles; complete with all required additional boarding and the like; measured to both sides of walls, generally	417	m	£2.00	£834.00												
E	Gyproc Soundblock board linings, two layers assumed 12.5mm thick to timber framing (framing measured elsewhere), Angles; complete with all required additional boarding and the like; measured to both sides of walls, generally, 45 degree	83	m	£2.00	£166.00												
F	Gyproc Soundblock board linings, two layers assumed 12.5mm thick to timber framing (framing measured elsewhere), Fair ends; complete with all required additional boarding and the like, generally	42	m	£3.00	£126.00												
G	Gyproc Soundblock board linings, two layers assumed 12.5mm thick to timber framing (framing measured elsewhere), Abutments; to masonry walls; complete with all required sealant and the like; measured to both sides of walls, generally	635	m	£1.00	£635.00												
H	deflection heads; nominally 15mm allowance	341	m	£1.20	£409.20												
I	putty油灰 pads to partitions; allowance only	211	Nr	£4.50	£949.50												
J	provision of plywood linings between stud framing to accept heavy fixings, future equipment and the like	431	m2	£9.85	£4,245.35												
K	installation of approved acoustic insulation between studs assumed to be Isover 50mm thick	847	m2	£2.70	£2,286.90												
L	forming opening for single leaf floors	65	Nr	£5.00	£325.00												
M	forming opening for pairs of doors	13	Nr	£5.00	£65.00												
N	forming opening for wardrobe doors	6	Nr	£5.00	£30.00												
A	Allow for forming soil pipe casings, comprising of approved 38 x 38mm timber framing构架 at 600mm centres vertically, with vertical framing at all corners and abutments; lining with two layers of Gyproc Soundblock board, two faces, overall girth not exceeding 600mm	86	m	£35.65	£3,065.90	18	22	33	1.548	950		1.4	1.8	3.2	2058.84	2647.08	4705.92
B	Allow for forming soil pipe casings, comprising of approved 38 x 38mm timber framing构架 at 600mm centres vertically, with vertical framing at all corners and abutments; lining with two layers of Gyproc Soundblock board, three faces, overall girth 600 to 900mm	4	m	£43.67	£174.68	18	22	33	90	950		1.4	1.8	3.2	119700	153900	273600
A	ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 1 and 2; 838 x 1981mm; reference ID01, ID02, ID03, ID05, ID06	5	Nr	£253.43	£1,267.15	28	41	53	0.2905137	700		0.33	5.38	16	67.10865315	1094.07441	3253.7529
B	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 1 and 2; 626 x 1981mm; reference ID07	1	Nr	£303.98	£303.98	28	41	53	0.0434037	700		0.33	5.38	16	10.02625701	163.458372	486.12155
C	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; double door to plot 1 and 2; 839 x 2100mm; reference ID09	1	Nr	£474.75	£474.75	28	41	53	0.0616665	700		0.33	5.38	16	14.2449615	232.236039	690.6648

D	ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 3 and 4; 838 x 1981mm; reference ID02, ID03, ID06, ID07, ID08	5	Nr	£241.48	£1,207.40	28	41	53	0.2905137	700		0.33	5.38	16	67.10865315	1094.07441	3253.7529
E	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 3 and 4; 686 x 1981mm; reference ID01, ID05, ID10	3	Nr	£248.38	£745.14	28	41	53	0.1426914	700		0.33	5.38	16	32.96172033	537.375925	1598.144
F	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plots 5,6,7,8 and 9; 838 x 1981mm; reference ID01, ID03, ID04, ID07, ID11, ID13, ID14, ID16; assumed to be fire rated 30 minutes	8	Nr	£256.43	£2,051.44	28	41	53	0.4648218	700		0.33	5.38	16	107.373845	1750.51905	5206.0046
G	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 5,6,7,8 and 9; 726 x 1981mm; reference ID17; assumed to be fire rated 30 minutes	1	Nr	£285.08	£285.08	28	41	53	0.0503372	700		0.33	5.38	16	11.62789551	189.569933	563.77675
H	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; double door to plot 5,6,7,8 and 9; 1062 x 1981mm; reference ID06, ID10; assumed to be fire rated 30 minutes	2	Nr	£485.20	£970.40	28	41	53	0.1472675	700		0.33	5.38	16	34.01880174	554.609556	1649.3964
I	ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 10; 838 x 1981mm; reference ID01, ID02, ID04, ID07, ID09	5	Nr	£244.48	£1,222.40	28	41	53	0.2905137	700		0.33	5.38	16	67.10865315	1094.07441	3253.7529
J	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 10; 626 x 1981mm; reference ID06	1	Nr	£306.98	£306.98	28	41	53	0.0434037	700		0.33	5.38	16	10.02625701	163.458372	486.12155
K	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 10; 762 x 1981mm; reference ID03	1	Nr	£239.43	£239.43	28	41	53	0.0528333	700		0.33	5.38	16	12.20448537	198.970095	591.73262
L	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; double door to plot 10; 1070 x 1981mm; reference ID05, ID08	2	Nr	£451.45	£902.90	28	41	53	0.1483769	700		0.33	5.38	16	34.2750639	558.787405	1661.8213
A	Vicaima or similar approved; internal doors to living rooms, product reference Vicaima Oak with fully glazed infill panel; EX5.1/1/DFG16 or equal and approved; single door to plot 1 and 2; 838 x 1981mm; reference ID04, ID08	2	Nr	£403.06	£806.12	28	41	55	0.1162055	700		0.33	5.38	16	26.84346126	437.629762	1301.5012
B	Vicaima or similar approved; internal doors to living rooms, product reference Vicaima Oak with fully glazed infill panel; EX5.1/1/DFG16 or equal and approved; single door to plot 3 and 4; 838 x 1981mm; reference ID04, ID09	2	Nr	£403.06	£806.12	28	41	55	0.1162055	700		0.33	5.38	16	26.84346126	437.629762	1301.5012
C	Vicaima or similar approved; internal doors to living rooms, product reference Vicaima Oak with fully glazed infill panel; EX5.1/1/DFG16 or equal and approved; single door to plot 5,6,7,8 and 9; 838 x 1981mm; reference ID05, ID12, ID22, ID29; assumed to be fire rated 30 minutes	4	Nr	£592.43	£2,369.72	28	41	55	0.2324109	700		0.33	5.38	16	53.68692252	875.259525	2603.0023
D	Vicaima or similar approved; internal doors to living rooms, product reference Vicaima Oak with fully glazed infill panel; EX5.1/1/DFG16 or equal and approved; single door to plot 10; 838 x 1981mm; reference ID11	1	Nr	£592.43	£592.43	28	41	55	0.0581027	700		0.33	5.38	16	13.42173063	218.814881	650.75058
E	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; single door to plot 1 and 2; 838 x 1981mm; reference ID10, ID11, ID12, ID13, ID15, ID18, ID19, ID20, ID21, ID22	10	Nr	£205.97	£2,059.70	28	41	55	0.5810273	700		0.33	5.38	16	134.2173063	2188.14881	6507.5058
F	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; single door to plot 3 and 4; 838 x 1981mm; reference ID12, ID13, ID14, ID15, ID16, ID17, ID18, ID21, ID22, ID23, ID24	11	Nr	£205.97	£2,265.67	28	41	55	0.63913	700		0.33	5.38	16	147.6390369	2406.96369	7158.2563
G	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; single door to plot 3 and 4; 762 x 1981mm; reference ID19	1	Nr	£201.40	£201.40	28	41	55	0.0528333	700		0.33	5.38	16	12.20448537	198.970095	591.73262
H	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; single door to plot 5,6,7,8 and 9; 838 x 1981mm; reference ID18, ID20, ID21, ID24, ID27, ID30, ID31, ID33, ID34, ID35, ID36, ID37, ID38; assumed to be fire rated 30 minutes	13	Nr	£217.92	£2,832.96	28	41	55	0.7553355	700		0.33	5.38	16	174.4824982	2844.59346	8459.7575
I	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; single door to plot 5,6,7,8 and 9; 626 x 1447mm; reference ID39, ID42, ID45; assumed to be fire rated 30 minutes	3	Nr	£249.02	£747.06	28	41	55	0.0951113	700		0.33	5.38	16	21.97071261	358.189193	1065.2467
J	first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; double door to plot 5,6,7,8 and 9; 1062 x 1981mm; reference ID23, ID28; assumed to be fire rated 30 minutes	2	Nr	£482.46	£964.92	28	41	55	147.26754	700		0.33	5.38	16	34018.80174	554609.556	1649396.4
K	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; single door to plot 10; 838 x 1981mm; reference ID12	1	Nr	£205.97	£205.97	28	41	55	0.0581027	700		0.33	5.38	16	13.42173063	218.814881	650.75058
A	Vicaima or similar approved; internal doors to boiler cupboards, product reference Vicaima performance door; single door to plot 1 and 2; 838 x 1981mm; 33 dB acoustic rating; fire rated; reference ID14	1	Nr	£254.52	£254.52	28	41	53	0.0581027	700		0.33	5.38	16	13.42173063	218.814881	650.75058
B	Vicaima or similar approved; internal doors to boiler cupboards, product reference Vicaima performance door; single door to plot 1 and 2; 726 x 1981mm; 33 dB acoustic rating; fire rated; reference ID17	1	Nr	£299.49	£299.49	28	41	53	0.0503372	700		0.33	5.38	16	11.62789551	189.569933	563.77675
C	Vicaima or similar approved; internal doors to boiler cupboards, product reference Vicaima performance door; double door to plot 3 and 4; 839 x 1981mm; 33 dB acoustic rating; fire rated; reference ID11	1	Nr	£262.52	£262.52	28	41	53	0.0581721	700		0.33	5.38	16	13.43774702	219.075997	651.52713
D	Vicaima or similar approved; internal doors to boiler cupboards, product reference Vicaima performance door; single door to plot 3 and 4; 762 x 1981mm; 33 dB acoustic rating; fire rated; reference ID20	1	Nr	£299.49	£299.49	28	41	53	0.0528333	700		0.33	5.38	16	12.20448537	198.970095	591.73262
E	boiler cupboards, product reference Vicaima performance door; single door to plot 5,6,7,8 and 9; 926 x 1447mm; 33 dB acoustic rating; fire rated; reference ID02, ID15, ID19, ID32, ID43	5	Nr	£541.68	£2,708.40	28	41	53	0.2344864	700		0.33	5.38	16	54.16634685	883.075594	2626.2471
F	slideробе door to plot 1 and 2; 2Nr sliding leaves within structural opening of 1828.8 x 2375mm; reference ID23	1	Nr	£620.00	£620.00	28	41	53	0.130302	700		0.33	5.38	16	30.099762	490.717332	1459.3824
G	slideробе door to plot 1 and 2; 2Nr sliding leaves within structural opening of 1440 x 2375mm; reference ID24, ID25	2	Nr	£620.00	£1,240.00	28	41	53	0.2052	700		0.33	5.38	16	47.4012	772.7832	2298.24
H	slideробе door to plot 3 and 4; 2Nr sliding leaves within structural opening of 2435 x 2375mm; reference ID25, ID26	2	Nr	£620.00	£1,240.00	28	41	53	0.3469875	700		0.33	5.38	16	80.1541125	1306.75493	3886.26

I	sliderobe door to plot 5,6,7,8 and 9; 2Nr sliding leaves within structural opening of 1828.8 x 2000mm; reference ID40, ID41	2	Nr	£620.00	£1,240.00	28	41	53	0.219456	700		0.33	5.38	16	50.694336	826.471296	2457.9072
J	sliderobe door to plot 10; 2Nr sliding leaves within structural opening of 1825 x 2025mm; reference ID10	1	Nr	£620.00	£620.00	28	41	53	0.1108688	700		0.33	5.38	16	25.61068125	417.531713	1241.73
A	UPVC White loft hatch; plot 1 and 2; 900 x 900 mm	2	Nr	£135.00	£270.00	18	26	35	0.0405	1380	Asif et al. (2005)	69.4	94.7	120	3878.766	5292.783	6706.8
B	UPVC White loft hatch; plot 3 and 4; 900 x 900 mm	2	Nr	£135.00	£270.00	18	26	35	0.0405	1380	Asif et al. (2005)	69.4	94.7	120	3878.766	5292.783	6706.8
C	UPVC White loft hatch; plot 10; 900 x 900 mm	1	Nr	£135.00	£135.00	18	26	35	0.02025	1380	Asif et al. (2005)	69.4	94.7	120	1939.383	2646.3915	3353.4
D	Dulux water based satin缎子 paint or similar approved; plot 1 and 2; not exceeding 300mm girth	101	m	£2.65	£267.65	6	6	6	30.3			10.5	10.5	10.5	318.15	318.15	318.15
E	Dulux water based satin缎子 paint or similar approved; plot 3 and 4; not exceeding 300mm girth	115	m	£2.65	£304.75	6	6	6	34.5			10.5	10.5	10.5	362.25	362.25	362.25
F	Dulux water based satin缎子 paint or similar approved; plot 5,6,7,8 and 9; not exceeding 300mm girth	174	m	£2.65	£461.10	6	6	6	52.2			10.5	10.5	10.5	548.1	548.1	548.1
G	Dulux water based satin缎子 paint or similar approved; plot 10; not exceeding 300mm girth	53	m	£2.65	£140.45	6	6	6	15.9			10.5	10.5	10.5	166.95	166.95	166.95
H	Hardwood architraves; 20 x 75mm to match skirtings; finished with DUlux water based satin paint as M60; plot 1 and 2; not exceeding 300mm girth	187	m	£6.70	£1,252.90	29	48	63	0.2805	700		0.33	5.38	16	64.7955	1056.363	3141.6
I	Hardwood architraves; 20 x 75mm to match skirtings; finished with DUlux water based satin paint as M60; plot 3 and 4; not exceeding 300mm girth	229	m	£6.70	£1,534.30	29	48	63	0.3435	700		0.33	5.38	16	79.3485	1293.621	3847.2
J	Hardwood architraves; 20 x 75mm to match skirtings; finished with DUlux water based satin paint as M60; plot 5,6,7,8 and 9; not exceeding 300mm girth	349	m	£6.70	£2,338.30	29	48	63	0.5235	700		0.33	5.38	16	120.9285	1971.501	5863.2
K	Hardwood architraves; 20 x 75mm to match skirtings; finished with DUlux water based satin paint as M60; plot 10; not exceeding 300mm girth	106	m	£6.70	£710.20	29	48	63	0.159	700		0.33	5.38	16	36.729	598.794	1780.8
L	Denleigh Ironmongery or similar approved; single doors; plot 1 and 2; generally	13	Nr	£56.70	£737.10	12	17	24	0.000312	7870		11.7	25	36.3	28.728648	61.386	89.132472
M	Denleigh Ironmongery or similar approved; double doors; plot 1 and 2; generally	2	Nr	£35.00	£70.00	12	17	24	0.000048	7870		11.7	25	36.3	4.419792	9.444	13.712688
N	Denleigh Ironmongery or similar approved; single doors; plot 3 and 4; generally	15	Nr	£58.64	£879.60	12	17	24	0.00036	7870		11.7	25	36.3	33.14844	70.83	102.84516
A	Denleigh Ironmongery or similar approved; double doors; plot 3 and 4; generally	2	Nr	£35.00	£70.00	12	17	24	0.000048	7870		11.7	25	36.3	4.419792	9.444	13.712688
B	Denleigh Ironmongery or similar approved; single doors; plot 5,6,7,8 and 9; generally	18	Nr	£68.91	£1,240.38	12	17	24	0.000432	7870		11.7	25	36.3	39.778128	84.996	123.41419
C	Denleigh Ironmongery or similar approved; double doors; plot 5,6,7,8 and 9; generally	18	Nr	£35.00	£630.00	12	17	24	0.000432	7870		11.7	25	36.3	39.778128	84.996	123.41419
D	Denleigh Ironmongery or similar approved; single doors; plot 10; generally	6	Nr	£63.98	£383.88	12	17	24	0.000144	7870		11.7	25	36.3	13.259376	28.332	41.138064
E	Denleigh Ironmongery or similar approved; double doors; plot 10; generally	4	Nr	£35.00	£140.00	12	17	24	0.000096	7870		11.7	25	36.3	8.839584	18.888	27.425376
F	Denleigh Ironmongery or similar approved; single doors; plot 1 and 2; generally	7	Nr	£29.00	£203.00	12	17	24	0.000168	7870		11.7	25	36.3	15.469272	33.054	47.994408
G	Denleigh Ironmongery or similar approved; single doors; plot 3 and 4; generally	8	Nr	£29.00	£232.00	12	17	24	0.000192	7870		11.7	25	36.3	17.679168	37.776	54.850752
H	Denleigh Ironmongery or similar approved; single doors; plot 5,6,7,8 and 9; generally	11	Nr	£29.00	£319.00	12	17	24	0.000264	7870		11.7	25	36.3	24.308856	51.942	75.419784
I	Denleigh Ironmongery or similar approved; single doors; plot 10; generally	3	Nr	£29.00	£87.00	12	17	24	0.000072	7870		11.7	25	36.3	6.629688	14.166	20.569032
J	Bedding and pointing with approved polysulphide sealant; to suit fire and acoustic rating, plot 1 and 2	101	m	£1.25	£126.25	5	15	25	1.01	1700	https://pad.doncaster.gov.uk/NPSPublicDocs/005161	8	8	8	13736	13736	13736
K	Bedding and pointing with approved polysulphide sealant; to suit fire and acoustic rating, plot 3 and 4	115	m	£1.25	£143.75	5	15	25	0.0115	1700	https://pad.doncaster.gov.uk/NPSPublicDocs/005161	8	8	8	156.4	156.4	156.4
L	Bedding and pointing with approved polysulphide sealant; to suit fire and acoustic rating, plot 5,6,7,8 and 9; fire rated 30 minutes	174	m	£1.99	£346.26	5	15	25	0.0174	1700	https://pad.doncaster.gov.uk/NPSPublicDocs/005161	8	8	8	236.64	236.64	236.64
M	Bedding and pointing with approved polysulphide sealant; to suit fire and acoustic rating, plot 10	53	m	£1.25	£66.25	5	15	25	0.0053	1700	https://pad.doncaster.gov.uk/NPSPublicDocs/005161	8	8	8	72.08	72.08	72.08
A	Standard assumed 12.5mm thick plasterboard linings fixed with plasterboard dabs to masonry (measured elsewhere), generally, over 300mm wide	1654	m2	£8.40	£13,893.60	26	39	51	20.675	950		1.4	1.8	3.2	27497.75	35354.25	62852
B	Standard assumed 12.5mm thick plasterboard linings fixed with plasterboard dabs to masonry (measured elsewhere), generally, not exceeding 300mm wide	356	m	£5.30	£1,886.80	26	39	51	1.335	950		1.4	1.8	3.2	1775.55	2282.85	4058.4
C	Moisture resistant or cement particle board linings assumed 12.5mm thick to timber framing, generally; over 300mm wide	218	m2	£6.40	£1,395.20	28	42	53	2.725	350		7.28	10.4	13.52	6943.3	9919	12894.7
D	Moisture resistant or cement particle board linings assumed 12.5mm thick to timber framing, generally, not exceeding 300mm wide	66	m	£4.25	£280.50	28	42	53	0.2475	350		7.28	10.4	13.52	630.63	900.9	1171.17
E	Allow for forming pipe casings包装 and low level boxings, comprising of approved 38 x 38mm timber framing at 600mm centres vertically, with vertical framing at all corners and abutments and 450mm centres horizontally; lining with one layer of Gyproc Soundblock board and one layer of moisture resistant board, generally; over 300mm wide	80	m2	£43.04	£3,443.20	41	68	107	1.2	950		1.4	1.8	3.2	1596	2052	3648
F	Allow for forming pipe casings包装 and low level boxings, comprising of approved 38 x 38mm timber framing at 600mm centres vertically, with vertical framing at all corners and abutments and 450mm centres horizontally; lining with one layer of Gyproc Soundblock board and one layer of moisture resistant board, generally; not exceeding 300mm wide	27	m	£23.87	£644.49	41	68	107	0.1215	950		1.4	1.8	3.2	161.595	207.765	369.36
G	Plaster; one coat skim of gypsum board finish plaster; 3mm thick; trowelling抹平 smooth; walls, over 300mm wide	3666	m2	£5.00	£18,330.00	23	38	48	10.998	950		1.4	1.8	3.2	14627.34	18806.58	33433.92
H	Plaster; one coat skim of gypsum board finish plaster; 3mm thick; trowelling抹平 smooth; walls, not exceeding 300mm wide	645	m	£3.00	£1,935.00	23	38	48	0.5805	950		1.4	1.8	3.2	772.065	992.655	1764.72
I	thin angle bead	778	m	£1.65	£1,283.70												
A	Large format ceramic陶瓷的 wall tiles; complete with approved adhesive and coloured grout; over 300mm wide	312	m2	£46.00	£14,352.00	16	27	41	1.56	2000		2.5	12	19.5	7800	37440	60840
B	Large format ceramic陶瓷的 wall tiles; complete with approved adhesive and coloured grout; not exceeding 300mm wide	42	m	£13.80	£579.60	16	27	41	0.063	2000		2.5	12	19.5	315	1512	2457
C	Stainless steel perimeter边缘 trim装饰 beads, generally	209	m	£9.00	£1,881.00												
D	Approved sanitary grade white sealant to internal joints and the like, generally; 8 x 8mm fillet	305	m	£0.92	£280.60				0.01952	1700		8	8	8	265.472	265.472	265.472
E	Assumed to be Dulux Trade Diamond Matt Emulsion or similar, over 300 girth	3459	m2	£4.35	£15,046.65	5	8	12	1037.7			10.5	10.5	10.5	36319.5	36319.5	36319.5
F	Assumed to be Dulux Trade Diamond Matt Emulsion or similar, over 300 girth	283	m2	£4.35	£1,231.05	5	8	12	84.9			10.5	10.5	10.5	2971.5	2971.5	2971.5
A	Harlech select oak lacquered涂漆, 5mm thick veneered 薄片镶面 floor or similar approved; over 300mm wide	176	m2	£130.00	£22,880.00	29	48	63	0.528	700		0.33	5.38	16	121.968	1988.448	5913.6
B	Screed construction; level or to falls only not exceeding 15 degrees from horizontal	803	m2	£14.00	£11,242.00	30	48	63	56.21	2100		0.931	1.33	1.729	109896.171	156994.53	204092.89
C	Screed construction; level or to falls only not exceeding 15 degrees from horizontal; to garage; Provisional Quantity	16	m2	£14.00	£224.00	30	48	63	1.12	2100		0.931	1.33	1.729	2189.712	3128.16	4066.608
D	Screed construction; level or to falls only not exceeding 15 degrees from horizontal; landings	3	m2	£14.00	£42.00	30	48	63	0.21	2100		0.931	1.33	1.729	410.571	586.53	762.489
E	Screed construction; perimeter isolation strip including mastic sealant where required	1095	m	£1.50	£1,642.50	30	48	63									
F	Screed construction; forming recess壁凹 for entrance matting	4	m2	£10.00	£40.00	30	48	63									
G	Screed construction; construction joints	1	ITEM	Included	Included												
H	Screed construction; forming holes for shower gullies 水沟	1	ITEM	Included	Included												
I	Visqueen 1000gauge厚度／直径 DPM separating membrane	803	m2	£1.00	£803.00	10	20	30	0.2409	32		100	134.18	183	770.88	1034.36678	1410.7104

J	2000 gauge DPM	483	m2	£1.50	£724.50	10	20	30	0.1449	32			100	134.18	183	463.68	622.165824	848.5344				
K	Trowelling smooth, generally	803	m2	Included	Included																	
L	Latex smoothing compound, level or to falls only not exceeding 15 degrees from horizontal - Provisional Quantity	738	m2	£6.54	£4,826.52	18	29	40	2.214	2100			3.157	4.51	5.863	14678.1558	20968.794	27259.432				
M	Latex smoothing compound, level or to falls only not exceeding 15 degrees from horizontal - Provisional Quantity; landings	3	m2	£6.54	£19.62	18	29	40	0.009	2100			3.157	4.51	5.863	59.6673	85.239	110.8107				
A	Liquid damp proof membrane; trowelling smooth; vinyl and rubber floors, level or to falls only not exceeding 15 degrees from horizontal - Provisional Quantity	738	m2	£8.74	£6,450.12	10	20	30	2.214	32			100	134.18	183	7084.8	9506.38464	12965.184				
B	Liquid damp proof membrane; trowelling smooth; vinyl and rubber floors, level or to falls only not exceeding 15 degrees from horizontal - Provisional Quantity; landings	3	m2	£8.74	£26.22	10	20	30	0.009	32			100	134.18	183	28.8	38.64384	52.704				
C	Ceramic floor tiling; level or to falls	104	m2	£66.00	£6,864.00	10	20	30	0.52	1900			2.5	12	19.5	2470	11856	19266				
D	Ceramic floor tiling; Tiled skirting - generally	184	m	£11.45	£2,106.80	11	18	25	flexible tile vinyl													
E	New Oaklands 80/20/50oz or similar approved on and including PU foam underlay; over 300mm wide	778	m2	£44.45	£34,582.10	8	13	19					58.8	84	109.2	60964.08	84047.34	103652.94	PU foam E	65.2	80.1	110
F	New Oaklands 80/20/50oz or similar approved on and including PU foam underlay; risers; not exceeding 300mm wide	96	m	£14.99	£1,439.04	7	11	16	28.8				58.8	84	109.2	2256.768	3111.264	4095.36				
G	New Oaklands 80/20/50oz or similar approved on and including PU foam underlay; treads; not exceeding 300mm wide	79	m	£14.99	£1,184.21	7	11	16	23.7				58.8	84	109.2	1857.132	2560.311	3370.14				
H	New Oaklands 80/20/50oz or similar approved on and including PU foam underlay; winder treads; over 300mm wide average	2	m2	£19.99	£39.98	7	11	16					58.8	84	109.2	156.72	216.06	284.4				
I	Stair nosings, generally - to all staircases	91	m	£19.99	£1,819.09	7	11	16														
J	Stair nosings, generally; winder stairs	6	m	£29.99	£179.94	7	11	16														
A	generally; wood to carpet; to match wood flooring	62	m	£17.50	£1,085.00																	
B	generally; wood to tile; to match wood flooring	8	m	£17.50	£140.00																	
C	generally; wood to wood; to match wood flooring	11	m	£17.50	£192.50																	
D	generally; carpet to tile; metal in gold or silver	17	m	£9.50	£161.50																	
E	Dulux Trade water based satin or similar approved; not exceeding 300mm girth	839	m	£2.85	£2,391.15	29	48	63	251.7				10.5	10.5	10.5	2642.85	2642.85	2642.85				
F	Dulux Trade water based satin or similar approved; Paint to enhanced skirtings in hallways, not exceeding 300mm girth	103	m	£3.00	£309.00	29	48	63	30.9				10.5	10.5	10.5	324.45	324.45	324.45				
G	Coir entrance matwell mat; over 300mm wide	4	m2	£81.10	£324.40	5	7	10			Polypropylene		130.9	187	243.1	523.6	748	972.4				
H	Entrance matting frame; generally	17	m	£24.35	£413.95	41	68	107														
I	Rigid坚硬的 insulation boards; to achieve U Values; tight butt joints; 150mm thick, over 300mm wide	483	m2	£12.95	£6,254.85	50	85	120	72.45	1890			27	45	63	3697123.5	6161872.5	8626621.5				
A	Skirtings; MDF, 18mm x 144mm	839	m	£8.06	£6,762.34	21	36	48	2.174688	510			11	11	11	12199.99968	12199.9997	12200				
B	Skirtings; MDF, generally; to hallways	103	m	£8.57	£882.71	21	36	48														
C	Sealant joint between bottom of skirting and tiled / timber floors, nominally 6 x 6mm fillet, generally	305	m	£1.25	£381.25	5	15	25	0.01098	1700			8	8	8	149.328	149.328	149.328				
D	Sealant joint between bottom of skirting and tiled / timber floors, nominally 6 x 6mm fillet, generally	943	m	£1.25	£1,178.75	5	15	25	0.033948	1700			8	8	8	461.6928	461.6928	461.6928				
E	Temporary protection of finishes/floors, generally	1057	m2	£2.50	£2,642.50	1	1	1	2.114	920			45	61.67	78.34	87519.6	119940.75	152361.9				
F	Temporary protection of finishes/floors, generally; treads	79	m	£3.00	£237.00	1	1	1		920			45	61.67	78.34							
G	Temporary protection of finishes/floors, generally; risers	91	m	£3.00	£273.00	1	1	1		920			45	61.67	78.34							
H	Temporary protection of finishes/floors, generally; winder treads	2	m2	£2.50	£5.00	1	1	1	0.004	920			45	61.67	78.34	165.6	226.9456	288.2912				
I	Temporary protection of finishes/floors, generally; winder risers	6	m	£3.00	£18.00	1	1	1		920			45	61.67	78.34							
J	Cleaning covered floors; generally	1057	m2	£1.50	£1,585.50	1	1	1														
K	Cleaning covered floors; generally; treads	79	m	£1.00	£79.00	1	1	1														
L	Cleaning covered floors; generally; risers	91	m	£1.00	£91.00	1	1	1														
M	Cleaning covered floors; generally; winder treads	2	m2	£1.50	£3.00	1	1	1														
N	Cleaning covered floors; generally; winder risers	6	m	£1.00	£6.00	1	1	1														
A	Plasterboard ceiling; Lafarge standard 15mm wallboard or similar approved; generally	293	m2	£5.70	£1,670.10	24	40	50	4.395	950			1.4	1.8	3.2	5845.35	7515.45	13360.8				
B	Plasterboard ceiling; Lafarge standard 15mm wallboard or similar approved; generally; raking	13	m2	£7.25	£94.25	24	40	50	0.195	950			1.4	1.8	3.2	259.35	333.45	592.8				
C	Plasterboard ceiling; pattresses; (allowed for 1nr per 5m2 of ceiling areas) - Provisional Quantities	61	Nr	£4.50	£274.50	24	40	50														
D	Plasterboard ceiling; flush access panels	1	ITEM	£500.00	£500.00	24	40	50														
E	Plasterboard ceiling; Contractor to make allowance for fixing around services	1	ITEM	£500.00	£500.00	1	1	1														
F	Plasterboard ceiling; moisture resistant board in lieu代替 of standard board	25	m2	£1.35	£33.75																	
G	Plasterboard ceiling; Lafarge standard 15mm vapour check wallboard or similar approved; generally	273	m2	£7.20	£1,965.60	24	40	50	4.095	950			1.4	1.8	3.2	5446.35	7002.45	12448.8				
H	Plasterboard ceiling; Lafarge standard 15mm vapour check wallboard or similar approved; generally; sloping	187	m2	£7.20	£1,346.40	24	40	50	2.805	950			1.4	1.8	3.2	3730.65	4796.55	8527.2				
I	Plasterboard ceiling; pattresses; (allowed for 1nr per 5m2 of ceiling areas) - Provisional Quantities	84	Nr	£4.50	£378.00	24	40	50														
J	Plasterboard ceiling; flush access panels	1	ITEM	£500.00	£500.00	24	40	50														
K	Plasterboard ceiling; Contractor to make allowance for fixing around services	1	ITEM	£500.00	£500.00	1	1	1														
L	Plasterboard ceiling; moisture resistant board in lieu of standard board	49	m2	£1.35	£66.15				0.735	950			1.4	1.8	3.2	259.35	333.45	592.8				
A	Plasterboard suspended ceiling; Assumed to be an British Gypsum Casoline MF suspended ceiling system or similar approved; generally	340	m2	£21.30	£7,242.00	17	26	37	5.1	950			1.4	1.8	3.2	259.35	333.45	592.8				
B	Plasterboard suspended ceiling; Assumed to be an British Gypsum Casoline MF suspended ceiling system or similar approved; generally; raking	5	m2	£25.00	£125.00	17	26	37	0.075	950			1.4	1.8	3.2	259.35	333.45	592.8				
C	Plasterboard suspended ceiling; pattresses; (allowed for 1nr per 5m2 of ceiling areas) - Provisional Quantities	69	Nr	£4.50	£310.50	17	26	37														
D	Plasterboard suspended ceiling; flush access panels	1	ITEM	£500.00	£500.00	17	26	37														
E	Plasterboard suspended ceiling; Contractor to make allowance for fixing around services	1	ITEM	£500.00	£500.00	1	1	1														
F	Plasterboard suspended ceiling; moisture resistant board in lieu of standard board	30	m2	£1.35	£40.50				0.45	950			1.4	1.8	3.2	259.35	333.45	592.8				
G	Plaster skim coat finish; nominally 3mm thick; over 300mm wide	906	m2	£5.00	£4,530.00	23	38	48	2.718	950			1.4	1.8	3.2	259.35	333.45	592.8				
H	Plaster skim coat finish; nominally 3mm thick; over 300mm wide; raking to soffits	205	m2	£5.00	£1,025.00	23	38	48	0.615	950			1.4	1.8	3.2	259.35	333.45	592.8				
I	Plaster coving; generally; 125mm girth	1109	m	£3.85	£4,269.65																	
J	Plaster coving; corners	470	Nr	£0.50	£235.00																	
A	Paint to plasterboard ceilings; Dulux Pure brilliant White emulsion乳胶 or similar approved; over 300mm wide	1009	m2	£3.35	£3,380.15	4	7	11					10.5	10.5	10.5	10594.5	10594.5	10594.5				
B	Paint to plasterboard ceilings; Dulux Pure brilliant White emulsion乳胶 or similar approved; not exceeding 300mm wide	1109	m	£1.00	£1,109.00	4	7	11	332.7				10.5	10.5	10.5	3493.35	3493.35	3493.35				
C	Paint to plasterboard ceilings; Dulux Pure brilliant White emulsion乳胶 or similar approved; over 300mm wide	103	m2	£4.35	£448.05	4	7	11					10.5	10.5	10.5	1081.5	1081.5	1081.5				
A	generally	1	ITEM	£0.00	£0.00																	
B	Class C mirrors, silver backed, fixed to walls with adhesive pads; assumed to be 0.60 x 0.90m	10	Nr	£60.00	£600.00	5	7	10	0.0324	2500			12.3	16.81	25.09	996.3	1361.61	2032.29				
C	Class C mirrors, silver backed, fixed to walls with adhesive pads; 1.20 x 1.60m	10	Nr	£211.20	£2,112.00	5	7	10	0.1152	2500			12.3	16.81	25.09	3542.4	4841.28	7225.92				
D	PAR softwood shelving units, with wall mounted battens, full depth; allowance for area of 2.00m2 each; generally	20	Nr	£64.78	£1,295.60	10	20	30	1.04	550			0.72	7.4	13	411.84	4232.8	7436				
E	Portable fire extinguishers; generally	1	ITEM	£650.00	£650.00	10	15	18	5.23125	2500			16.5	28	42	215789.0625	366187.5	549281.25				
F	Fire blankets; generally	1	ITEM	£650.00	£650.00	7	7	7	0.00162	2500			16.5	28	42	66.825	113.4	170.1				
G	Kitchen installations; generally	10	Nr	£0.00	£0.00																	
A	Manhattan 40mm thick worktop or similar approved; as required to suit kitchens	10	Nr	£0.00	£0.00				0.744	700			0.33	5.38	16	171.864	2801.904	8332.8				
B	Manhattan 40mm thick worktop or similar approved; cut outs for sinks	10	Nr	£0.00	£0.00																	

C	stainless steel single bowl and drainer of 0.9mm minimum thickness; Bristan Java single flow monoblock mixer (chrome); generally	10	Nr	£0.00	£0.00												
D	generally; assumed to be 1Nr per apartment	10	Nr	£0.00	£0.00												
E	generally; assumed to be 1Nr per apartment	10	Nr	£0.00	£0.00												
F	space for oven	10	Nr	£0.00	£0.00												
G	space for fridge freezer	10	Nr	£0.00	£0.00												
H	General directional signage; generally	1	ITEM	£250.00	£250.00	10	20	30	0.0000189	2700		124	155	186	6.32772	7.90965	9.49158
I	General directional signage; generally	1	ITEM	£250.00	£250.00	10	20	30	0.0000189	2700		124	155	186	6.32772	7.90965	9.49158
A	Fire signage systems, generally	1	ITEM	£250.00	£250.00	10	20	30	0.0000189	2700		124	155	186	6.32772	7.90965	9.49158
B	Fire signage systems, generally	1	ITEM	£250.00	£250.00	10	20	30	0.0000189	2700		124	155	186	6.32772	7.90965	9.49158
A	Above Ground Drainage Installations generally for the construction of the housing units; in accordance with the design criteria provided by the employer's representative - Units 1 and 2	1	ITEM	Included	Included												
B	Above Ground Drainage Installations generally for the construction of the housing units; in accordance with the design criteria provided by the employer's representative - Units 3 and 4	1	ITEM	Included	Included												
C	Above Ground Drainage Installations generally for the construction of the housing units; in accordance with the design criteria provided by the employer's representative - Units 5 to 9	1	ITEM	Included	Included												
D	Above Ground Drainage Installations generally for the construction of the housing units; in accordance with the design criteria provided by the employer's representative - Unit 10	1	ITEM	Included	Included												
E	attendance on the installation of the above ground drainage	1	ITEM	Included	Included												
F	special attendance on the installation of the above ground drainage	1	ITEM	Included	Included												
A	Mechanical Installations; in accordance with the design criteria provided by the employer's representative - Units 1 and 2	1	ITEM	£99,590.00	£99,590.00	1	1	1									
B	Mechanical Installations; in accordance with the design criteria provided by the employer's representative - Units 3 and 4	1	ITEM	Included	Included												
C	Mechanical Installations; in accordance with the design criteria provided by the employer's representative - Units 5 to 9	1	ITEM	Included	Included												
D	Mechanical Installations; in accordance with the design criteria provided by the employer's representative - Unit 10	1	ITEM	Included	Included												
E	attendance on the Mechanical Installation contractor	1	ITEM	Included	Included												
F	special attendance on the Mechanical Installation contractor	1	ITEM	Included	Included												
A	Electrical Installations; in accordance with the design criteria provided by the employer's representative - Units 1 and 2	1	ITEM	£74,724.24	£74,724.24	20	30	43	Used electrical circuit								
B	Electrical Installations; in accordance with the design criteria provided by the employer's representative - Units 3 and 4	1	ITEM	Included	Included												
C	Electrical Installations; in accordance with the design criteria provided by the employer's representative - Units 5 to 9	1	ITEM	Included	Included												
D	Electrical Installations; in accordance with the design criteria provided by the employer's representative - Unit 10	1	ITEM	Included	Included												
E	Electrical Installations; lightning protection installation in accordance with the design criteria provided by the employer's representative	1	ITEM	Included	Included												
F	attendance on the Electrical Installation contractor	1	ITEM	Included	Included												
G	special attendance on the Electrical Installation contractor	1	ITEM	Included	Included												
A	Lift Installations; access lift; three floors served, ground, first and second floor; opening on one side; including all front enclosure	1	Nr	£21,385.00	£21,385.00	19	26	34									
B	Lift Installations; fire fighting lift if required	1	ITEM	Declined	Declined												
C	allow for testing on completion and provide test certificate	1	ITEM	Included	Included												
D	allow for commissioning on completion	1	ITEM	Included	Included												
E	provide number of copies as detailed in the Employers Requirements	1	ITEM	Included	Included												
F	Main Contractors Attendances / Works; Provision and installation of lifting beam fixed to structure as required	1	Nr	Declined	Declined												
G	Main Contractors Attendances / Works; Marking positions of and cutting or forming holes mortices and chases in the structure	1	ITEM	Declined	Declined												
H	Lighting to lift shaft	1	Nr	Declined	Declined												
I	Ventilation to top of shaft, provision of suitable external louvre or vent, complete with ducting as may be required	1	Nr	Declined	Declined												
J	Installation and fixing in of Halfen or similar slot channels to accept lift framework	1	ITEM	Declined	Declined												
K	Installation or secondary steelwork / timber to allow for installation of lift framework to upper levels	1	ITEM	Declined	Declined												
L	Painting within passenger lift shaft with sealer and one coat white masonry paint as required	54	m2	£4.00	£216.00	5	8	11									
A	Painting copper pipework; not exceeding 300mm girth - Provisional Quantity	160	m	£2.65	£424.00	28	46	58	0.0288	8600		42	42	42	10402.56	10402.56	10402.56
B	Fire stopping works; generally; at locations of penetrations through internal walls	1	ITEM	Included	Included												
C	Fire stopping works; generally; within cavities of external walls	1	ITEM	Included	Included												
D	Fire stopping works; generally; penetrations in cavities to ceiling	1	ITEM	Included	Included												
E	Air Sealing; provision of sealant and the like to all locations to achieve air sealing	1	ITEM	Included	Included												
F	Builders work in connection with services; all BWIC for the electrical installations as defined by the performance specification for the electrical works	1	ITEM	£10,000.00	£10,000.00	20	30	43									
G	Builders work in connection with services; all BWIC for the mechanical installations as defined by the performance specification for the mechanical works	1	ITEM	Included	Included												
H	Builders work in connection with services; all BWIC for the above ground drainage and rainwater pipes as defined by the performance specification for the mechanical works	1	ITEM	Included	Included												
A	Builders work in connection with services; all BWIC for the lightning protection installations as defined by the performance specification for the mechanical works	1	ITEM	Included	Included												
B	Builders work in connection with services; provision of lightning protection rod pits and housing; Provisional Quantity	9	Nr	Included	Included												
A	Excavating Risk; soft spots; including filling all soft spots with approved granular fill material, compacting and proof rolling - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00												
B	Excavating Risk; Extra over excavation irrespective of depth for excavating; next existing services - to be priced as rate only per cubic metre	0	m	£0.00	£0.00												
C	Excavating Risk; Extra over excavation irrespective of depth for excavating; around existing services crossing excavations - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00												
D	Excavating Risk; archeological digging on site; complete including the risk of time loss and all elements pertaining to the archeological dig	1	ITEM	£0.00	£0.00												
E	Excavating Risk; Extra over excavation irrespective of depth for breaking out and removal off site all spoils; rock - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00												

F	Excavating Risk; Extra over excavation irrespective of depth for breaking out and removal off site all spoils; concrete - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00													
G	Excavating Risk; Extra over excavation irrespective of depth for breaking out and removal off site all spoils; reinforced concrete - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00													
H	Excavating Risk; Extra over excavation irrespective of depth for breaking out and removal off site all spoils; brickwork blockwork or stonework - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00													
I	Excavating Risk; Extra over excavation irrespective of depth for breaking out and removal off site all spoils; contaminated material - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00													
J	Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters; off site	1	ITEM	£199.84	£199.84	1	1	1										
K	Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters; Excavated material; soft spot material - to be priced as rate only per cubic metre of inert	0	m3	£0.00	£0.00													
L	Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters; Excavated material; extra over off site disposal for the disposal of contaminated material; Contractor to develop	0	m3	£0.00	£0.00													
A	Excavating, Trenches; over 300mm wide, 1.00m maximum depth	119	m3	£12.96	£1,542.24	500	750	1000		2050		soil	0.15	0.45	0.73	36592.5	109777.5	178083.5
B	Excavating, Pits, tree pits 12 nr, 1.00m maximum depth	12	m3	£16.20	£194.40	500	750	1000		2050		soil	0.15	0.45	0.73	3690	11070	17958
C	Excavating pits	48	m2	£6.48	£311.04	500	750	1000		2240		sand	0.05	0.081	0.15	5376	8709.12	16128
D	Excavating trenches	226	m2	£3.24	£732.24	500	750	1000		2240		sand	0.05	0.081	0.15	25312	41005.44	75936
E	Earthwork support, To faces of excavation; 1.00m maximum depth; distance between opposing faces not exceeding 2.00m	274	m2	£3.24	£887.76	500	750	1000		2240		sand	0.05	0.081	0.15	30688	49714.56	92064
F	Excavated material; off site; it has been assumed all excavated material to be taken off site; to be treated as inert hazardous material	131	m3	£35.65	£4,670.15	1	1	1		2050		soil	0.15	0.45	0.73	40282.5	120847.5	196041.5
G	Filling to excavations; over 250mm average thick	12	m3	£36.73	£440.76	100	300	500		2050		soil	0.15	0.45	0.73	3690	11070	17958
H	Imported topsoil. Filling to make up levels; not exceeding 250mm average thick	78	m3	£36.73	£2,864.94	100	300	500		2050		soil	0.15	0.45	0.73	23985	71955	116727
I	Imported topsoil. over 250mm average thick	71	m3	£36.73	£2,607.83	100	300	500		2050		soil	0.15	0.45	0.73	21832.5	65497.5	106251.5
J	Compacting ground; generally	12	m2	£0.76	£9.12	500	750	1000										
K	Compacting bottoms of excavations; generally	148	m2	£0.76	£112.48	500	750	1000										
L	Blinding concrete; not exceeding 150mm thick	7	m3	£149.07	£1,043.49	100	150	200		1300		in situ concrete	0.525	0.75	0.975	4777.5	6825	8872.5
A	Foundations; generally	61	m3	£182.56	£11,136.16	64	108	178		2300			0.525	0.75	0.975	73657.5	105225	136792.5
B	Formwork for in situ concrete, Sides of ground beams and edges of beds, 250 to 500mm high	202	m	£23.77	£4,801.54	47	70	110	2.525	480		timber, 50mm depth	0.72	7.11	21.3	872.64	8617.32	25815.6
C	Formwork for in situ concrete, Sides of ground beams and edges of beds, 250 to 500mm high; curved on plan	54	m	£25.93	£1,400.22	47	70	110	4.05	480		timber, 100mm depti	0.72	7.11	21.3	1399.68	13821.84	41407.2
D	Steel fabric reinforcement to B.S.4483, generally, B785	136	m2	£14.04	£1,909.44	46	70	108										
E	Dense aggregate blockwork; nominally 7.3 N/mm2 ion cement mortar; assumed to be 215mm thick	20	m2	£45.58	£911.60	52	72	101	4.3	2200		cement mortar	0.525	0.75	0.975	4966.5	7095	9223.5
F	Natural stone rubble walling, nominally 350mm thick	173	m2	£385.04	£66,611.92	43	60	79	60.55	1900			0.7	0.85	1.01	80531.5	97788.25	116195.45
G	Cappings to stone walls; generally	89	m	£98.04	£8,725.56	43	60	79	0.623	1900			0.7	0.85	1.01	828.59	1006.145	1195.537
H	Cappings to stone walls; generally; curved on plan	27	m	£108.04	£2,917.08	43	60	79	0.189	1900			0.7	0.85	1.01	251.37	305.235	362.691
I	External handrails; Assumed to be polyester powder coated galvanised mild steel handrails; fixed to masonry walls as required, raking	6	m	£176.24	£1,057.44	15	20	25										
J	External handrails; Extra over for, ends	8	Nr	£40.22	£321.76	15	20	25										
A	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, kerbs, HB2	63	m	£33.49	£2,109.87	60	80	100	2.88225	850	https://travisperkins.scene7.com/is/content/travisperkin		1.2	2.18	3.8	2939.895	5340.80925	9309.6675
B	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, kerbs, HB2; curved on plan; radius over 12.00m	5	m	£37.81	£189.05	60	80	100	0.22875	850	https://travisperkins.scene7.com/is/content/travisperkin		1.2	2.18	3.8	233.325	423.87375	738.8625
C	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, kerbs, BN; conservation format to match pavings	139	m	£38.89	£5,405.71	60	80	100	6.35925	850	https://travisperkins.scene7.com/is/content/travisperkin		1.2	2.18	3.8	6486.435	11783.6903	20540.378
D	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, kerbs, BN; conservation format to match pavings; curved on plan; radius not exceeding 12.00m	9	m	£48.61	£437.49	60	80	100	0.41175	850	https://travisperkins.scene7.com/is/content/travisperkin		1.2	2.18	3.8	419.985	762.97275	1329.9525
E	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, kerbs, BN; conservation format to match pavings; curved on plan; radius over 12.00m	33	m	£51.85	£1,711.05	60	80	100	1.50975	850	https://travisperkins.scene7.com/is/content/travisperkin		1.2	2.18	3.8	1539.945	2797.56675	4876.4925
F	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, path edgings	201	m	£20.52	£4,124.52	60	80	100	9.19575	850	https://travisperkins.scene7.com/is/content/travisperkin		1.2	2.18	3.8	9379.665	17039.7248	29702.273
G	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, path edgings; curved on plan	7	m	£22.69	£158.83	60	80	100	0.32025	850	https://travisperkins.scene7.com/is/content/travisperkin		1.2	2.18	3.8	326.655	593.42325	1034.4075
H	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, extra over for, drop kerbs; HB2 to BN	2	Nr	£32.41	£64.82	60	80	100	0.086925	850	https://travisperkins.scene7.com/is/content/travisperkin		1.2	2.18	3.8	88.6635	161.072025	280.76775
I	Granular material, filling to make up levels, not exceeding 250mm average thick	52	m3	£42.13	£2,190.76	100	300	500		2240		sand	0.05	0.081	0.15	5824	9434.88	17472
J	Granular material, filling to make up levels, over 250mm average thick	290	m3	£42.13	£12,217.70	100	300	500		2240		sand	0.05	0.081	0.15	32480	52617.6	97440
K	Granular material, filling to make up levels, not exceeding 250mm average thick	207	m3	£36.73	£7,603.11	100	300	500		2240		sand	0.05	0.081	0.15	23184	37558.08	69552
L	Compacting filling, generally	2002	m2	£0.76	£1,521.52	100	300	500										
M	Reinforced concrete external slabs, beds, not exceeding 150mm thick	6	m3	£178.24	£1,069.44	20	35	45		2300			0.525	0.75	0.975	7245	10350	13455
N	Reinforced concrete external slabs, edges of beds, not exceeding 250mm high	53	m	£23.77	£1,259.81	47	70	110	0.6625	2300			0.525	0.75	0.975	799.96875	1142.8125	1485.6563
O	Steel fabric reinforcement to B.S..4483, reference A252	37	m2	£14.04	£519.48													
A	Isolation joints; comprising of 25mm thick bitumen impregnated灌注 woodfibre board; with 25 x 25mm sealant to top, to suit 150mm thick slab	53	m	£12.96	£686.88	50	75	100	7.95	180			13.8	23	32.2	19747.8	32913	46078.2
B	Assumed to be brush and spade finish, generally	37	m2	£6.48	£239.76													
C	Assumed to be 1000 gauge厚度 polythene聚乙烯 sheeting on and including 25mm of sand blinding, generally	37	m2	£4.32	£159.84													
D	Tarmac road surfacing, Binder course open bin, level or to falls; 60mm thick	828	m2	£15.77	£13,057.56	14	23	32	49.68	1700			2.751	3.93	5.109	232338.456	331912.08	431485.7
E	Gravel margins, level or to falls; nominally 75mm thick	13	m2	£16.20	£210.60	14	23	32	0.975	2150		sandstone	1	1	1	2096.25	2096.25	2096.25
F	Marshalls Tegular Block Paving Harvest or similar approved standard 200 x 100 x 80mm block pavings; level or to falls	801	m2	£59.41	£47,587.41	22	34	46	64.08	1920			0.63	3	6	77511.168	369100.8	738201.6
G	Block paving; to roads and parking bays, extra over for parking delineationlevel or to falls	113	m	£16.20	£1,830.60	22	34	46										

H	Marshalls Tegular Block Paving Harvest or similar approved standard 200 x 100 x 80mm block pavings; level or to falls	85	m2	£59.41	£5,049.85	22	34	46	6.8	1920			0.63	3	6	8225.28	39168	78336
A	Comprising of Charcon or similar cropped finish granite blocks 100 x 100 x 100mm; bedding and pointing in Ultracrete flow point rapid setting mortar to concrete bed level or to falls	5	m2	£64.81	£324.05	5	10	15	0.5	2880			11	11	11	15840	15840	15840
B	Assumed to be Marshalls Saxon or similar approved standard 450 x 450 x 50mm block pavings; on and including 30mm thick sand laying bed; level or to falls; to roads	28	m2	£48.61	£1,361.08	22	34	46	1.4	1920			0.63	3	6	1693.44	8064	16128
C	Assumed to be Marshalls Saxon or similar approved standard 450 x 450 x 50mm block pavings; on and including 30mm thick sand laying bed; level or to falls; to pavements and access routes	91	m2	£48.61	£4,423.51	22	34	46	4.55	1920			0.63	3	6	5503.68	26208	52416
D	Assumed to be Marshalls Saxon or similar approved standard 450 x 450 x 50mm block pavings; on and including 30mm thick sand laying bed; level or to falls; to private pavements and access routes	64	m2	£48.61	£3,111.04	22	34	46	3.2	1920			0.63	3	6	3870.72	18432	36864
E	Paving slabs, extra over for, forming steps; set of two risers; nominally 900mm wide	2	Nr	£124.23	£248.46	22	34	46										
F	Paving slabs, extra over for, forming steps; set of five risers; nominally 900mm wide	1	Nr	£297.07	£297.07	22	34	46										
G	Paving slabs, extra over for, forming steps; set of eight risers; nominally 900mm wide	1	Nr	£621.14	£621.14	22	34	46										
H	Cultivating, surface of ground, nominally 100mm thick to seeded areas	518	m2	N/A	N/A													
I	Cultivating, general surfaces; weed killer and fertiliser, generally	518	m2	N/A	N/A													
J	Seeding, generally; amenity area grass seed	518	m2	N/A	N/A													
A	Provision of maintenance of all soft landscaped areas; for a period of twelve months from Practical Completion or final planting works whichever is the latter; complete with all regular trimming, cutting and the like, generally	1	ITEM	N/A	N/A													
B	Cultivating, surface of filling, topsoil, nominally 250mm deep - infill planting	159	m2	N/A	N/A													
C	Cultivating, weed killer and fertiliser, generally	159	m2	N/A	N/A													
D	Shrub and hedge planting	159	m2	N/A	N/A													
E	Trees planting	12	Nr	N/A	N/A													
F	Provision of maintenance of all soft landscaped areas; for a period of twelve months from Practical Completion or final planting works whichever is the latter; complete with all regular trimming, cutting and the like, generally	1	ITEM	N/A	N/A													
G	Softwood close boarded fencing, comprising of softwood feather edge boards 100 x 25mm; three 75 x 50mm rails and 100 x 100mm posts at 2.40m centres; timber gravel boards; 1200mm high	32	m	£29.36	£939.52	11	19	31										
H	Softwood close boarded fencing, comprising of softwood feather edge boards 100 x 25mm; three 75 x 50mm rails and 100 x 100mm posts at 2.40m centres; timber gravel boards; 1800mm high	17	m	£34.72	£590.24	11	19	31										
I	Softwood close boarded fencing, comprising of softwood feather edge boards 100 x 25mm; three 75 x 50mm rails and 100 x 100mm posts at 2.40m centres; timber gravel boards; 2000mm high, boundary fence	43	m	£38.96	£1,675.28	11	19	31										
J	Close boarded Fencing, single leaf gates, complete with additional posts and ironmongery, 1800mm high	5	Nr	£197.49	£987.45	17	27	40	steel fencing									
A	Set of approved cast iron gates; including posts, foundations, ironmongery and the like; assumed to be 1200mm high; nominally 1800mm wide	1	Nr	£2,000.00	£2,000.00	17	27	40	steel fencing									
B	Set of approved cast iron gates; including posts, foundations, ironmongery and the like; assumed to be 1200mm high; gate nominally 1200mm wide, with two sets of fencing to match nominally 300mm long each	1	Nr	£1,200.00	£1,200.00	17	27	40										
C	external seat, assumed to be of timber construction on galvanised steel frame; generally	1	Nr	£662.04	£662.04	10	15	20	personal estimation									
A	All works identified within the appended Drainage Standard Bill; which includes for all attendances, site surveys and investigations, generally	1	ITEM	£216.05	£216.05	1	1	1										
B	Possible repairs to the existing drainage lines including revamping existing manholes to suit, generally	1	ITEM	£216.05	£216.05	1	1	1										
C	rock	0	m3	£0.00	£0.00													
D	concrete	0	m3	£0.00	£0.00													
E	reinforced concrete	0	m3	£0.00	£0.00													
F	brickwork, blockwork or stonework	0	m3	£0.00	£0.00													
G	excavating soft spots; disposal of surplus material and filling with approved fill to formation level of trench - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00													
H	next existing service - to be priced as rate only per metre	0	m3	£0.00	£0.00													
I	around existing service crossing excavation - to be priced as rate only per crossing	0	m3	£0.00	£0.00													
A	Excavating trenches for drainage pipes; complete with the disposal of surplus materials; for pipes; not exceeding 200mm nominal diameter, average depth 500 to 750mm	114	m	£32.41	£3,694.74	41	63	84	14.25	2050	soil	0.15	0.45	0.73	4381.875	13145.625	21325.125
B	Excavating trenches for drainage pipes; complete with the disposal of surplus materials; beds and surrounds, to suit 100mm diameter pipe	114	m	£25.93	£2,956.02	41	63	82	0.57	2050	soil	0.15	0.45	0.73	175.275	525.825	853.005
C	Below ground drainage pipe, approved PVC / Clay pipes, 100mm nominal size	114	m	£11.88	£1,354.32	35	53	70	0.1145472	37	pvc	47.25	67.5	87.75	200.2571424	286.081632	371.90612
D	Below ground drainage pipe, bends, 100mm	38	Nr	£30.25	£1,149.50	35	53	70										
E	Below ground drainage pipe, rocker pipes, 100mm; to manholes	19	Nr	£30.25	£574.75	35	53	70										
F	Below ground drainage pipe, rest bends, 100mm; complete with concrete base	19	Nr	£34.57	£656.83	35	53	70										
G	Below ground drainage pipe, connection to soil pipes	19	Nr	£37.81	£718.39	35	53	70										
H	Marker tape, non degradable; red with black lettering, laid in trench 450mm above pipe	114	m	£1.08	£123.12	1	1	1										
A	Remove existing drainage installations, cap off and seal existing pipework	1	ITEM	£59.41	£59.41	1	1	1										
B	Remove existing drainage installations, remove manholes; assumed to be masonry construction, assumed to be not exceeding 2.00m deep	1	Nr	£448.30	£448.30	1	1	1										
C	Excavating trenches for drainage pipes; average depth 750 to 1000mm - outside of site boundary	25	m	£34.57	£864.25	500	750	1000	5.0625	2050	soil	0.15	0.45	0.73	1556.71875	4670.15625	7576.0313
D	Excavating trenches for drainage pipes; average depth 1000 to 1250mm	18	m	£38.89	£700.02	500	750	1000	4.55625	2050	soil	0.15	0.45	0.73	1401.046875	4203.14063	6818.4281
E	Excavating trenches for drainage pipes; average depth 1250 to 1500mm	24	m	£42.13	£1,011.12	500	750	1000	7.56	2050	soil	0.15	0.45	0.73	2324.7	6974.1	11313.54
F	Excavating trenches for drainage pipes; average depth 1500 to 1750mm	17	m	£47.53	£808.01	500	750	1000	6.215625	2050	soil	0.15	0.45	0.73	1911.304688	5733.91406	9301.6828
G	Excavating trenches for drainage pipes; average depth 1750 to 2000mm	19	m	£51.85	£985.15	500	750	1000	8.015625	2050	soil	0.15	0.45	0.73	2464.804688	7394.41406	11995.383
H	Excavating trenches for drainage pipes; beds and surrounds, to suit 225mm diameter pipe	103	m	£11.88	£1,223.64	500	750	1000	1.15875	2240	sand	0.05	0.081	0.15	129.78	210.2436	389.34
I	UltraRib Twinwall plastic pipes , 225mm nominal size	103	m	£17.28	£1,779.84	35	53	70	0.2328624	37	pvc	47.25	67.5	87.75	407.1016908	581.573844	756.046
J	Below ground drainage pipe, bends, 225mm	10	Nr	£30.25	£302.50	35	53	70										
K	Below ground drainage pipe, rocker pipes, 225mm; to manholes	16	Nr	£30.25	£484.00	35	53	70										
L	Below ground drainage pipe, junction 100 x 225 x 225mm	1	Nr	£37.81	£37.81	35	53	70										
M	Below ground drainage pipe, junction 150 x 225 x 225mm	1	Nr	£37.81	£37.81	35	53	70										

N	Marker tape, non degradable; red with black lettering, laid in trench 450mm above pipe	103	m	£1.08	£111.24	1	1	1											
A	Concrete manhole 1200mm diameter manhole; depth not exceeding 1250mm; assumed D400 recessed cover	1	Nr	£1,528.54	£1,528.54	50	50	50	0.7065	850			1.2	2.18	3.8	720.63	1309.1445	2281.995	
B	Concrete manhole 1200mm diameter manhole; depth not exceeding 1500mm; assumed D400 recessed cover	2	Nr	£1,701.38	£3,402.76	50	50	50	1.6956	850			1.2	2.18	3.8	1729.512	3141.9468	5476.788	
C	Concrete manhole 1200mm diameter manhole; depth not exceeding 1750mm; assumed D400 recessed cover	2	Nr	£1,824.53	£3,649.06	50	50	50	1.9782	850			1.2	2.18	3.8	2017.764	3665.6046	6389.586	
D	Concrete manhole 1200mm diameter manhole; depth not exceeding 2000mm; assumed D400 recessed cover	1	Nr	£1,993.05	£1,993.05	50	50	50	1.1304	850			1.2	2.18	3.8	1153.008	2094.6312	3651.192	
E	works to existing manhole; remove exit pipes and install new 225mm pipe; manhole construction unknown; assumed to be masonry, depth to invert not exceeding 1000mm	1	Nr	£1,420.52	£1,420.52	50	50	50											
F	works to existing manhole; remove exit pipes and install new 225mm pipe; manhole construction unknown; assumed to be masonry, depth to invert not exceeding 2000mm	1	Nr	£1,636.57	£1,636.57	50	50	50											
A	works to existing pipework, at location of existing manhole, connect existing entry pipework to new pipework for manhole to be abandoned and removed; pipe nominally 2.00m to invert, existing 225mm diameter pipe	1	Nr	£837.19	£837.19	35	53	70											
A	Excavating trenches for drainage pipes; average depth 500 to 750mm	4	m	£32.41	£129.64	500	750	1000	0.5	2050	soil		0.15	0.45	0.73	153.75	461.25	748.25	
B	Excavating trenches for drainage pipes; average depth 750 to 1000mm	29	m	£34.57	£1,002.53	500	750	1000	5.075	2050	soil		0.15	0.45	0.73	1560.5625	4681.6875	7594.7375	
C	Excavating trenches for drainage pipes; average depth 1000 to 1250mm	28	m	£38.89	£1,088.92	500	750	1000	6.3	2050	soil		0.15	0.45	0.73	1937.25	5811.75	9427.95	
D	Excavating trenches for drainage pipes; beds an surrounds, to suit 100mm diameter pipe	28	m	£11.88	£332.64	500	750	1000	0.14	2240	sand		0.05	0.081	0.15	15.68	25.4016	47.04	
E	Excavating trenches for drainage pipes; beds an surrounds, to suit 100mm diameter pipe	34	m	£25.93	£881.62	500	750	1000	0.17	2240	sand		47.25	67.5	87.75	17992.8	25704	33415.2	
F	PVC / Clay pipes 100mm nominal size	62	m	£11.88	£736.56	35	53	70	0.0622976	37	pvc		47.25	67.5	87.75	108.9117792	155.588256	202.26473	
G	Below ground drainage pipe, bends, 100mm	11	Nr	£30.25	£332.75	35	53	70											
H	Below ground drainage pipe, rocker pipes, 100mm; to manholes	16	Nr	£30.25	£484.00	35	53	70											
I	Below ground drainage pipe, external yard gully, complete with trap, grating and cover, bed and surround in concrete	1	Nr	£237.65	£237.65	35	53	70											
J	Marker tape, non degradable; red with black lettering, laid in trench 450mm above pipe	62	m	£1.08	£66.96	1	1	1											
K	manhole not exceeding 750mm deep	3	Nr	£394.29	£1,182.87	50	50	50											
L	manhole not exceeding 1000mm deep	5	Nr	£480.71	£2,403.55	50	50	50											
A	CCTV inspection to all pipelines, generally	1	ITEM	£810.18	£810.18	1	1	1											
B	Testing of manholes and pipelines, generally	1	ITEM	£378.08	£378.08	1	1	1											
C	Cleaning of pipelines, as required	1	ITEM	£324.07	£324.07	1	1	1											
D	Operating and maintenance manuals, as required	1	ITEM	£270.06	£270.06	1	1	1											
E	Record drawings, as required	1	ITEM	£194.44	£194.44	1	1	1											
A	All works identified within the appended Drainage Standard Bill; generally	1	ITEM	£216.05	£216.05	1	1	1											
B	Possible repairs to the existing drainage lines, generally	1	ITEM	£216.05	£216.05	1	1	1											
A	ACO channels or equal other approved with ductile iron grating to load class D400; complete including excavation, disposal and concrete bed and surround, generally; laid straight	35	m	£156.64	£5,482.40	50	60	70	personal estimation										
B	Extra over slotted drain system for: ends	26	Nr	£27.01	£702.26	50	60	70											
C	Extra over slotted drain system for: outlet connection 100mm diameter	13	Nr	£41.05	£533.65	50	60	70											
D	In situ concrete ST4 foundation to receive pennant / granite setts 200 x 100 x 100mm bedded and pointed in approved mortar; generally; laid straight	49	m	£73.46	£3,599.54	50	60	70											
E	Excavating trenches for drainage pipes; For pipes; not exceeding 200mm nominal diameter, average depth 750 to 1000mm	229	m	£34.57	£7,916.53	500	750	1000	40.075	2050	soil		0.15	0.45	0.73	12323.0625	36969.1875	59972.238	
F	Excavating trenches for drainage pipes; For pipes; not exceeding 200mm nominal diameter, average depth 1000 to 1250mm	23	m	£38.89	£894.47	500	750	1000	5.175	2050	soil		0.15	0.45	0.73	1591.3125	4773.9375	7744.3875	
G	Excavating trenches for drainage pipes; For pipes; not exceeding 200mm nominal diameter, average depth 1250 to 1500mm	68	m	£42.13	£2,864.84	500	750	1000	18.7	2050	soil		0.15	0.45	0.73	5750.25	17250.75	27984.55	
H	Excavating trenches for drainage pipes; For pipes; 225mm nominal diameter, average depth 1250 to 1500mm	21	m	£51.85	£1,088.85	500	750	1000	6.496875	2050	soil		0.15	0.45	0.73	1997.789063	5993.36719	9722.5734	
I	Excavating trenches for drainage pipes; For pipes; 225mm nominal diameter, average depth 1500 to 1750mm	68	m	£56.17	£3,819.56	500	750	1000	24.8625	2050	soil		0.15	0.45	0.73	7645.21875	22935.6563	37206.731	
J	Excavating trenches for drainage pipes; For pipes; 300mm nominal diameter, average depth 1250 to 1500mm	4	m	£57.25	£229.00	500	750	1000	1.65	2050	soil		0.15	0.45	0.73	507.375	1522.125	2469.225	
K	Excavating trenches for drainage pipes; For pipes; 300mm nominal diameter, average depth 1500 to 1750mm	12	m	£62.65	£751.80	500	750	100	5.85	2050	soil		0.15	0.45	0.73	1798.875	5396.625	8754.525	
L	Excavating trenches for drainage pipes; Beds and surrounds, to suit 100mm diameter pipe	7	m	£11.88	£83.16	500	750	1000	0.035	2240	sand		0.05	0.081	0.15	3.92	6.3504	11.76	
M	Excavating trenches for drainage pipes; Beds and surrounds, to suit 150mm diameter pipe	83	m	£14.04	£1,165.32	500	750	1000	0.6225	2240	sand		0.05	0.081	0.15	69.72	112.9464	209.16	
N	Excavating trenches for drainage pipes; Beds and surrounds, to suit 225mm diameter pipe	89	m	£16.20	£1,441.80	500	750	1000	1.00125	2240	sand		0.05	0.081	0.15	112.14	181.6668	336.42	
O	Excavating trenches for drainage pipes; Beds and surrounds, to suit 300mm diameter pipe	16	m	£20.52	£328.32	500	750	1000	0.24	2240	sand		0.05	0.081	0.15	26.88	43.5456	80.64	
A	Storm drainage, beds and surrounds, to suit 100mm diameter pipe	194	m	£25.93	£5,030.42	500	750	1000											
B	Storm drainage, beds and surrounds, to suit 150mm diameter pipe	34	m	£28.09	£955.06	500	750	1000											
C	Below ground drainage pipe, PVC / Clay pipes, 100mm nominal size	202	m	£11.88	£2,399.76	35	53	70	0.2029696	37	pvc		47.25	67.5	87.75	354.8416032	506.916576	658.99155	
D	Below ground drainage pipe, PVC / Clay pipes, 150mm nominal size	117	m	£14.04	£1,642.68	35	53	70	0.1763424	37	pvc		47.25	67.5	87.75	308.2906008	440.415144	572.53969	
E	Below ground drainage pipe, PVC / Clay pipes, 225mm nominal size	89	m	£17.28	£1,537.92	35	53	70	0.2012112	37	pvc		47.25	67.5	87.75	351.7674804	502.524972	653.28246	
F	Below ground drainage pipe, PVC / Clay pipes, 300mm nominal size	16	m	£25.93	£414.88	35	53	70	0.0482304	37	pvc		47.25	67.5	87.75	84.3187968	120.455424	156.59205	
G	Below ground drainage pipe, bends, 100mm	130	Nr	£27.01	£3,511.30	35	53	70											
H	Below ground drainage pipe, bends, 150mm	65	Nr	£30.25	£1,966.25	35	53	70											
I	Below ground drainage pipe, bends, 225mm	24	Nr	£32.41	£777.84	35	53	70											
J	Below ground drainage pipe, bends, 300mm	3	Nr	£41.05	£123.15	35	53	70											
K	Below ground drainage pipe, rocker pipes, 100mm; to manholes	27	Nr	£27.01	£729.27	35	53	70											
L	Below ground drainage pipe, rocker pipes, 150mm; to manholes	18	Nr	£30.25	£544.50	35	53	70											
M	Below ground drainage pipe, rocker pipes, 225mm; to manholes	14	Nr	£32.41	£453.74	35	53	70											
N	Below ground drainage pipe, rocker pipes, 300mm; to manholes	6	Nr	£38.89	£233.34	35	53	70											
O	Below ground drainage pipe, junctions, 100 x 100 x 100mm	14	Nr	£37.81	£529.34	35	53	70											
P	Below ground drainage pipe, junctions, 100 x 150 x 150mm	2	Nr	£37.81	£75.62	35	53	70											
Q	Below ground drainage pipe, junctions, 100 x 225 x 225mm	12	Nr	£41.05	£492.60	35	53	70											
R	Below ground drainage pipe, junctions, 100 x 300 x 300mm	1	Nr	£49.69	£49.69	35	53	70											
S	Below ground drainage pipe, junctions, 150 x 150 x 150mm	7	Nr	£37.81	£264.67	35	53	70											
T	Below ground drainage pipe, junctions, 150 x 225 x 225mm	5	Nr	£41.05	£205.25	35	53	70											
U	Below ground drainage pipe, external yard gully, complete with trap, grating and cover, bed and surround in concrete; 150mm outlet	5	Nr	£237.65	£1,188.25	35	53	70											
V	Below ground drainage pipe, rodding eye, complete with frame and cover, bed and surround in concrete; 100mm outlet	2	Nr	£118.83	£237.66	35	53	70											
W	Below ground drainage pipe, connection to rainwater pipes	37	Nr	£48.61	£1,798.57	35	53	70											

X	Below ground drainage pipe, rest bend, complete with concrete bed and surround; 100mm	37	Nr	£31.33	£1,159.21	35	53	70										
Y	Pre cast concrete road gully; to suit 150mm diameter outlet	10	Nr	£253.86	£2,538.60	500	750	1000										
A	Marker tape, non degradable; red with black lettering; laid in trench 450mm above pipe	62	m	£1.08	£66.96	1	1	1										
B	Concrete manhole; 1200mm diameter manhole; depth not exceeding 1250mm; assumed D400 recessed cover	1	Nr	£1,528.54	£1,528.54	50	50	50	0.7065									
C	Concrete manhole; 1200mm diameter manhole; depth not exceeding 1500mm; assumed D400 recessed cover	2	Nr	£1,701.38	£3,402.76	50	50	50	1.6956									
D	Concrete manhole; 1200mm diameter manhole; depth not exceeding 1750mm; assumed D400 recessed cover	2	Nr	£1,824.53	£3,649.06	50	50	50	1.9782									
E	Concrete manhole; 1200mm diameter manhole; depth not exceeding 2000mm; assumed D400 cover	2	Nr	£1,993.05	£3,986.10	50	50	50	2.2608									
F	Athlon precast concrete headwall; 150mm diameter pipe outlet; depth to invert not exceeding 1.50m	1	Nr	£324.07	£324.07													
G	Athlon precast concrete headwall; 300mm diameter pipe outlet; depth to invert not exceeding 1.75m	1	Nr	£378.08	£378.08													
H	manhole not exceeding 1000mm deep	10	Nr	£480.71	£4,807.10	50	50	50										
I	manhole not exceeding 1250mm deep	3	Nr	£556.32	£1,668.96	50	50	50										
J	manhole not exceeding 1500mm deep	1	Nr	£658.95	£658.95	50	50	50										
A	manhole not exceeding 1750mm deep 3.00 Nr	0		£0.00	£0.00													
A	CCTV inspection to all pipelines, generally	1	ITEM	£810.18	£810.18	1	1	1										
B	Testing of manholes and pipelines, generally	1	ITEM	£378.08	£378.08	1	1	1										
C	Cleaning of pipelines, as required	1	ITEM	£324.07	£324.07	1	1	1										
D	Operating and maintenance manuals, as required	1	ITEM	£270.06	£270.06	1	1	1										
E	Record drawings, as required	1	ITEM	£199.84	£199.84	1	1	1										
A	rock	0	m3	£0.00	£0.00													
B	concrete	0	m3	£0.00	£0.00													
C	reinforced concrete	0	m3	£0.00	£0.00													
D	brickwork, blockwork or stonework	0	m3	£0.00	£0.00													
E	excavating soft spots; disposal of surplus material and filling with approved fill to formation level of trench - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00													
F	next existing service - to be priced as rate only per metre	0	m	£0.00	£0.00													
G	around existing service crossing excavation - to be priced as rate only per crossing	0	Nr	£0.00	£0.00													
A	to the site area and surrounding	1	ITEM	£0.00	£0.00													
B	generally	1	ITEM	£0.00	£0.00													
C	Excavating trenches for Water, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	116	m	£38.89	£4,511.24	500	750	1000	29	2050	soil	0.15	0.45	0.73	8917.5	26752.5	43398.5	
D	Excavating trenches for Water, extra over for excavation in highways, including all works to breakout existing surfaces, make good and reinstate on completion of works, temporary fencing, diversions and the like	12	m	£156.64	£1,879.68	500	750	1000										
E	Excavating trenches for Gas, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	136	m	£38.89	£5,289.04	500	750	1000	34	2050	soil	0.15	0.45	0.73	10455	31365	50881	
F	Excavating trenches for Gas, extra over for excavation in highways, including all works to breakout existing surfaces, make good and reinstate on completion of works, temporary fencing, diversions and the like	7	m	£156.64	£1,096.48	500	750	1000										
G	Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters, generally	1	ITEM	£199.84	£199.84	1	1	1										
H	Bed and surround; to water pipes, to suit one pipes nominal size not exceeding 100mm diameter - Provisional Quantity	116	m	£12.96	£1,503.36	500	750	1000	1.16	2050	soil	0.15	0.45	0.73	356.7	1070.1	1735.94	
A	Bed and surround; to gas pipes, to suit one pipe nominal size not exceeding 100mm diameter - Provisional Quantity	136	m	£12.96	£1,762.56	500	750	1000	1.36	2050	soil	0.15	0.45	0.73	418.2	1254.6	2035.24	
B	MDPE or Puriton ducts for Water supplies, 32mm diameter; or similar	116	m	£8.64	£1,002.24	18	24	34	0.1147356	940		58.17	83.1	108.03	6273.719661	8962.45666	11651.194	
C	MDPE or Puriton ducts for Gas supplies, 63mm diameter; or similar	136	m	£8.64	£1,175.04	18	24	34	0.1345176	940		58.17	83.1	108.03	7355.395464	10507.7078	13660.02	
D	Excavate pit for connection of water pipes; generally - Provisional Quantity	7	Nr	£51.85	£362.95	500	750	1000										
E	Excavate pit for connection of gas pipes; generally	7	Nr	£51.85	£362.95	500	750	1000										
F	Meters, gas - Provisional Quantity	10	Nr	£0.00	£0.00													
G	Meters, water - Provisional Quantity	10	Nr	£0.00	£0.00													
H	Site isolation valve and utility governor, gas - Provisional Quantity	1	Nr	£0.00	£0.00													
I	Identification tapes - ' WATER PIPE BELOW', generally - Provisional Quantity	116	m	£1.08	£125.28	1	1	1										
J	Identification tapes - ' GAS PIPE BELOW', generally - Provisional Quantity	136	m	£1.08	£146.88	1	1	1										
A	Excavating trenches for BT, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity; assumed to be two ducts	149	m	£38.89	£5,794.61	500	750	1000	37.25	2050	soil	0.15	0.45	0.73	11454.375	34363.125	55744.625	
B	Excavating trenches for BT, attendance on the relocation of telegraph pole	1	Nr	£297.07	£297.07	500	750	1000										
C	Excavating trenches for data, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	149	m	£38.89	£5,794.61	500	750	1000	37.25	2050	soil	0.15	0.45	0.73	11454.375	34363.125	55744.625	
D	Excavating trenches for power supplies, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	256	m	£38.89	£9,955.84	500	750	1000	64	2050	soil	0.15	0.45	0.73	19680	59040	95776	
E	Excavating trenches for power supplies, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity - connections to buildings	48	m	£38.89	£1,866.72	500	750	1000	12	2050	soil	0.15	0.45	0.73	3690	11070	17958	
F	Excavating trenches for power supplies, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	208	m	£38.89	£8,089.12	500	750	1000	52	2050	soil	0.15	0.45	0.73	15990	47970	77818	
G	Excavating trenches for street lighting, services not exceeding 200mm; depth not exceeding 1250mm - no details	89	m	£38.89	£3,461.21	500	750	1000	22.25	2050	soil	0.15	0.45	0.73	6841.875	20525.625	33297.125	
H	Disposal, surface water, generally	1	ITEM	£199.84	£199.84	1	1	1										
A	Bed and surround; to electrical cables, to suit single duct nominal size not exceeding 200mm diameter	304	m	£11.88	£3,611.52	500	750	1000	12.16	2050	soil	0.15	0.45	0.73	3739.2	11217.6	18197.44	
B	Bed and surround; to BT ducts, to suit single duct nominal size not exceeding 200mm diameter	298	m	£11.88	£3,540.24	500	750	1000	11.92	2050	soil	0.15	0.45	0.73	3665.4	10996.2	17838.28	
C	Bed and surround; to communications ducts, to suit single duct nominal size not exceeding 200mm diameter	298	m	£11.88	£3,540.24	500	750	1000	11.92	2050	soil	0.15	0.45	0.73	3665.4	10996.2	17838.28	
D	Bed and surround; to street lighting cables, to suit single duct nominal size not exceeding 200mm diameter - no details	89	m	£11.88	£1,057.32	500	750	1000	3.56	2050	soil	0.15	0.45	0.73	1094.7	3284.1	5327.54	
E	Ducts for Power supplies, 100mm diameter, or similar	304	m	£8.64	£2,626.56	18	24	34	0.47728	940		58.17	83.1	108.03	26097.57494	37282.2499	48466.925	
F	Ducts for BT supplies, 100mm diameter, or similar	298	m	£8.64	£2,574.72	18	24	34	0.46786	940		58.17	83.1	108.03	25582.49123	36546.416	47510.341	
G	Ducts for communication supplies, 100mm diameter, or similar	298	m	£8.64	£2,574.72	18	24	34	0.46786	940		58.17	83.1	108.03	25582.49123	36546.416	47510.341	
H	Ducts for street lighting supplies, 50mm diameter, or similar	89	m	£8.64	£768.96	18	24	34	0.069865	940		58.17	83.1	108.03	3820.204227	5457.43461	7094.665	
I	Excavate pit for connection of services; electrical - Provisional Quantity	22	Nr	£51.85	£1,140.70	500	750	1000										
J	Excavate pit for connection of services; BT - Provisional Quantity	3	Nr	£51.85	£155.55	500	750	1000										
K	Excavate pit for connection of services; communications - Provisional Quantity	3	Nr	£51.85	£155.55	500	750	1000										
L	Excavate pit for connection of services; street lighting - no details	6	Nr	£51.85	£311.10	500	750	1000										
M	Meters, power - Provisional Quantity	11	Nr	£0.00	£0.00													
A	Excavate pit for base to lighting standard; lighting standards - no details	6	Nr	£59.41	£356.46	1	1	1										
B	Identification tapes - 'POWER CABLE BELOW', generally	394	m	£1.08	£425.52	1	1	1										

C	Identification tapes - 'COMMUNICATION DUCTS BELOW', generally	592	m	£1.08	£639.36	1	1	1							
D	Utility Company costs for the provision of new gas supply, connecting from existing gas supplies to meter locations adjacent buildings as required	1	ITEM	£0.00	£0.00										
E	Utility Company costs for the provision of new water supply, connecting existing mains water supply to meter locations for buildings supplies as required	1	ITEM	£0.00	£0.00										
F	Utility Company costs for the provision of new electrical supply, connecting from existing electrical supply to meter locations for buildings supplies as required;	1	ITEM	£0.00	£0.00										
G	Utility Company costs for the provision of new electrical supply, works to existing substation, including all diversion works and the like	1	ITEM	£0.00	£0.00										
H	Utility Company(ies) costs for the provision of new telephone/data supplies, connecting from existing telephone/data supplies to connection points within the buildings as required	1	ITEM	£0.00	£0.00										
I	Utility Company(ies) costs for the provision of new telephone/data supplies, allow for all works to relocate telegraph poles and associated diversion works	1	ITEM	£0.00	£0.00										
J	Utility Company(ies) costs for the provision of new communication/data supplies, connecting from existing communication/data supplies to connection points within the buildings as required	1	ITEM	£0.00	£0.00										
	Bathrooms: toilets	10	ITEM	£150.00	£1,500.00	10	20	30		https://www.screwfix.com/p/ideal-standard-della-close-coupled-toilet-dual-flush-6ltr/63		706.27	2825.00	8220.77	
	Bathroom shower bath	10	ITEM	£150.00	£1,500.00	10	15	20		https://www.wickes.co.uk/Wickes-Standard-Bath-Front-Panel---Gloss-White-		978.88	1398.4	1817.92	
	Bathroom sink	10	ITEM	£60.00	£600.00	15	20	25		https://www.wickes.co.uk/Wickes-Single-Bowl-Kitchen-Stainless-Steel-Sink+Drainer/p/141535		450	1800	5238	
	Bathroom tap	10	ITEM	£20.00	£200.00	10	20	30		https://www.wickes.co.uk/Wickes-Messina-Mono-Mixer-Kitchen-Sink-Tap-Brushed-Nickel/p/417803		700	1000	1300	
	Bathroom mirror	10	ITEM	£20.00	£200.00	10	15	20							
	Bathroom undersink cupboards	10	ITEM	£260.00	£2,600.00	10	20	30			Veneer particle board				
	formaldehyde, 0.5 stainless steel each	10	ITEM	£20.00	£200.00	3	5	7		https://www.screwfix.com/p/ideal-standard-della-soft-close-toilet-seat-urea-formaldeh		2043.35	3124	4102.65	
	Boiler	10	ITEM	£500.00	£5,000.00	5	10	15		https://iopscience.iop.org/article/10.1088/1757-899X/161/1/012094		520794.00	532728.00	544662.00	
	Electrical Installations; Switches and sockets, 6 lightswitches and spotlights & traditional shapes), all halogen 7	10	ITEM	£30.00	£300.00	20	30	40				357.9446	612.25	1034.6052	
	Extractor fans (bathrooms)	10	ITEM	£14.00	£140.00	0.6	2	4.2		http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590		6434.042553	10348.6213	14263.2	
	Kitchen cupboards	10	ITEM	£40.00	£400.00	9	13	18		http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590		2650.80	2650.80	2650.80	
	Kitchen worktop	10	ITEM	£100.00	£1,000.00	10	15	25			Veneer particle board	70351.23528	117252.059	164152.88	
	Kitchen sink	10	ITEM	£50.00	£500.00	5	10	15			Veneer particle board	14470.542	24117.57	33764.598	
	Kitchen tap	10	ITEM	£60.00	£600.00	15	20	25		https://www.wickes.co.uk/Wickes-Single-Bowl-Kitchen-Stainless-Steel-Sink+Drainer/p/141535		450	1800	5238	
		10	ITEM	£20.00	£200.00	10	20	30		https://www.wickes.co.uk/Wickes-Messina-Mono-Mixer-Kitchen-Sink-Tap-Brushed-Nickel/p/417803		700	1000	1300	
	Dishwasher	10	ITEM	£160.00	£1,600.00	7	10	13		see BOM		8671.30	33127.90	44020.20	
	Oven	10	ITEM	£120.00	£1,200.00	12	15	20		see BOM		3401.2698	14949.2674	22156.458	
	Gas hob, 4 ring	10	ITEM	£70.00	£700.00	15	17	19		https://doi.org/10.1016/j.jclepro.2018.03.140 0959-6526		4582.43	6426.215	8270	
	Cooker hood	10	ITEM	£50.00	£500.00	10	14	18		http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590		6326.50	6326.50	6326.50	
	Toaster	10	ITEM	£15.00	£150.00	2	4	6		http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590		339.81	890.86	1281.80	
	Kettle	10	ITEM	£10.00	£100.00	3	4.4	9		http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590		718.912	1567.4728	2106.8637	
	Microwave	10	ITEM	£40.00	£400.00	5	8	10		http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590		10489.8	18537.1538	21827.496	
	Fridge	10	ITEM	£100.00	£1,000.00	10	12.5	15		http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590		52026.86	53013.43	54000	
	Iron	10	ITEM	£20.00	£200.00	4	5.5	7		http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590		389.1965	934.025	1346.5115	
	Washing machine	10	ITEM	£250.00	£2,500.00	5	7.5	10		http://web.mit.edu/ebm/www/Publications/9_Paper.pdf		26540	37600	46780	
	Three seater sofa	10	ITEM	£400.00	£4,000.00	5	10	15		https://oecotextiles.wordpress.com/2010/01/06/embodied-energy-needed-to-make-o		27120	42786.37	96933.984	
	Televisions	10	ITEM	£300.00	£3,000.00	4	7	10		https://ec.europa.eu/docsroom/documents/107/attachments/1/translations/en/renditions/native		41737.76	55860	56220	
	TV stand glass	10	ITEM	£100.00	£1,000.00	10	15	20			Glass, metal steel, plastic sleeve	2809.93125	4014.1875	5218.4438	
	Dining table and chairs	10	ITEM	£300.00	£3,000.00	5	10	15			Softwood	737.756135	5478.619	13726.094	
	Bedroom wardrobes (2)	10	ITEM	£300.00	£3,000.00	20	40	60			Oak				
	Vacuum cleaner	10	ITEM	£50.00	£500.00	3	5	7.4		http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590		3369.6	4464	6739.2	
	Curtains	10	ITEM	£50.00	£500.00	5	7.5	10			Fabric cotton, stainless steel	4568.319731	27168.877	49576.138	
	Double bed + mattress	10	ITEM	£400.00	£4,000.00	5	10	15		see BOM		22631.38084	29313.5466	43170.166	
Water		10	ITEM	£420.00	£4,200.00	1	1	1	2210.5263	own house measurement		442105.2632	442105.263	442105.26	1 m3 water = 1.9GBP
Electricity and gas		10	ITEM	£1,020.00	£10,200.00	1	1	1		own house measurement		757467	757467	757467	

	Description	Qty	Unit	Rate	£ p	Lifespan low	Lifespan mean	Lifespan high	Volume/arı	Density kg/m3 reference from ICE if not specified	Note	Weight (kg)	EC (kgCO2e/kg) low	EC (kgCO2e/kg) central	EC (kgCO2e/kg) high	Embodied carbon/kg low	Embodied carbon/kg central	Embodied carbon/kg high
A	Subcontractor personnel transport and materials transport	1	ITEM	£70,500.00	£70,500.00	1	1	1										
D	Excavating To reduce levels no details - Provisional Quantity	279	m3	£3.24	£903.96	500	750	1000		2050			0.024	0.024	0.024	13726.8	13726.8	13726.8
E	Disposal Excavated material off site; it has been assumed all excavated material to be taken off site; inert non hazardous - Provisional Quantity	140	m3	£35.65	£4,991.00	1	1	1		2050			0.024	0.024	0.024	6888	6888	6888
F	Disposal Excavated material on site; in stock piles suitable for reuse	140	m3	£6.48	£907.20	1	1	1		2050			0.024	0.024	0.024	6888	6888	6888
G	Selected excavated materia Filling to make up levels; compacting in layers over 250mm average thick	140	m3	£8.64	£1,209.60	1	1	1		2050			0.024	0.024	0.024	6888	6888	6888
H	Surface Treatments Compacting ground generally	2678	m2	£0.76	£2,035.28	1	1	1	535.6	2050			0.024	0.024	0.024	26351.52	26351.52	26351.52
J	Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters, off site	1	ITEM	£199.84	£199.84	1	1	1										
A	Excavating Ground beams; from formation level, not exceeding 1.00m deep	348	m3	£6.48	£2,255.04	100	150	200		2300			0.115	0.13	0.14	92046	104052	112056
B	Pits, pad foundations 1 nr; from formation level 1.00m maximum depth	2	m3	£12.96	£25.92	100	150	200		2300			0.115	0.13	0.14	529	598	644
C	Working space allowance; complete with backfilling with approved well compacted material; including all design, maintenance and removal as required pits	4	m2	£6.48	£25.92	1	1	1		2050			0.024	0.024	0.024			
D	Working space allowance; complete with backfilling with approved well compacted material; including all design, maintenance and removal as required trenches	980	m2	£4.32	£4,233.60	1	1	1		2050			0.024	0.024	0.024		48216	
E	Earthwork support To faces of excavation; including all additional backfilling with well compacted granular material, making good as required, designed, supplied and installed, maintained and removed by specialist Sub Contractor 1.00m maximum depth; distance between opposing faces	980	m2	£3.24	£3,175.20	100	300	500	980	2240			0.0051	0.0051	0.0051	11195.52	11195.52	11195.52
F	Earthwork support To faces of excavation; including all additional backfilling with well compacted granular material, making good as required, designed, supplied and installed, maintained and removed by specialist Sub Contractor 1.00m maximum depth; distance between opposing faces	4	m2	£5.40	£21.60	100	300	500	4	2240			0.0051	0.0051	0.0051	45.696	45.696	45.696
G	Disposal Excavated material off site; it has been assumed all excavated material to be taken off site; to be treated as inert hazardous material	350	m3	£35.65	£12,477.50	1	1	1		2050			0.024	0.024	0.024	17220	17220	17220
H	Surface Treatments Compacting ground generally	668	m2	£0.76	£507.68	1	1	1	133.6	2050			0.024	0.024	0.024	6573.12	6573.12	6573.12
I	Compacting bottoms of excavations	433	m2	£0.76	£329.08	1	1	1	86.6	2050			0.024	0.024	0.024	4260.72	4260.72	4260.72
J	Bored cast-in-place piles to site generally; in various locations; deemed to include the transport to site and from site of all plant, materials and equipment required for the piling operations; all plant movements on site; all setting out; concrete, reinforcement and formwork; all ancillary piling operations required to satisfy the piling design; designed and installed by specialist Sub Contractor generally 300mm	117	Nr	£834.44	£97,629.48	500	750	1000	396.7704	2300			0.115	0.13	0.14	104945.771	118634.35	127760.069
C	Cutting off tops of piles; Heights to be developed by contractor as to construction methods on site 300mm diameter piles; cutting length to be developed by contractor; below top of pilemat	117	Nr	£19.44	£2,274.48	1	1	1	2.479815	2300			0.115	0.13	0.14	655.911068	741.464685	798.50043
D	Disposal Surplus excavated material; based on piles to be 12.00m deep; material taken to be inert non hazardous disposal off site	99	m3	£35.65	£3,529.35	1	1	1		2050			0.024	0.024	0.024	4870.8	4870.8	4870.8
G	Piling mat; designed to suit the piling rig(s) for the project; provide, lay and level (note area measured allows for the full site area); Contractor to to note: the pilemat is the same size as the building footprint; no allowance has been made for any additional pilemat beyond the building footprint; Contractor to note: Make allowance for excavation for the pilemat, removal of soil and import of suitable pilemat material - Top of concrete foundations is formation level for excavation based on marked up drawing, taken to be nominally 600mm thick; assumed to be constructed using imported approved well compacted granular material; compaction to engineers	1117	m2	£34.57	£38,614.69	1	1	1	670.2	2240			0.0051	0.0051	0.0051	7656.3648	7656.3648	7656.3648
A	Disposal of piling mat on completion of the piling operations; it is assumed that the pilemat is to be removed completely; and making allowance for compacting and preparing for new works generally	1117	m2	£22.69	£25,344.73	1	1	1										
B	General attendances on the piling Sub Contractor as required	1	ITEM	£297.07	£297.07	1	1	1										
C	Special attendances on the piling Sub Contractor as required	1	ITEM	£297.07	£297.07	1	1	1										
D	Plain concrete grade Gen 1 Blinding concrete not exceeding 150mm thick	11	m3	£149.07	£1,639.77	100	150	200		1760			0.082	0.094	0.104	1587.52	1819.84	2013.44
E	Filling to hollow walls not exceeding 150mm thick	27	m3	£149.07	£4,024.89	100	150	200		1040			0.082	0.094	0.104	2302.56	2639.52	2920.32
F	Plain concrete grade Gen 3 Mass fill concrete generally	2	m3	£156.64	£313.28	100	150	200		1900			0.07	0.096	0.123	266	364.8	467.4
G	Reinforced concrete grade FND2z Foundations generally	228	m3	£182.56	£41,623.68	100	150	200		2300			0.081	0.111	0.14	42476.4	58208.4	73416
H	Isolated foundations generally	1	m3	£182.56	£182.56	100	150	200		1760			0.082	0.094	0.104	144.32	165.44	183.04
J	E20 FORMWORK FOR IN SITU CONCRETE Formwork, basic finish Sides of ground beams and edges of beds not exceeding	8	m	£23.77	£190.16	47	70	110	0.1	480			0.72	0.72	0.72	34.56	34.56	34.56
K	E20 FORMWORK FOR IN SITU CONCRETE Formwork, Sides of ground beams and edges of beds basic finish 500 to 1000mm	1202	m	£30.25	£36,360.50	47	70	110	90.15	480			0.72	0.72	0.72	31155.84	31155.84	31155.84
A	Claymaster board; 50mm thick to sides of foundations, 500 to 1000mm high	134	m	£20.52	£2,749.68	64	108	178	5.025	21.5			3.29	3.29	3.29	355.443375	355.443375	355.443375
B	Cordek Cellcore HXB 18/24 heave protection to underside of foundations	79	m2	£16.20	£1,279.80	500	750	1000	52.14	21.5			3.29	3.29	3.29	3688.1229	3688.1229	3688.1229
C	E30 REINFORCEMENT FOR IN SITU CONCRETE High tensile steel deformed square bar reinforcement to B.S.4449	3.83	T	£1,593.36	£6,102.57	47	60	100	Steel bar?				0.45	1.4	2.77	1723.5	5362	10609.1
D	E30 REINFORCEMENT FOR IN SITU CONCRETE High tensile steel deformed square bar reinforcement to B.S.4449	0.55	T	£1,636.57	£900.11	47	60	100					0.45	1.4	2.77	247.5	770	1523.5
E	E30 REINFORCEMENT FOR IN SITU CONCRETE High tensile steel deformed square bar reinforcement to B.S.4449	3.28	T	£1,712.18	£5,615.95	47	60	100					0.45	1.4	2.77	1476	4592	9085.6
F	E30 REINFORCEMENT FOR IN SITU CONCRETE High tensile steel deformed square bar reinforcement to B.S.4449	4.95	T	£1,795.36	£8,887.03	47	60	100					0.45	1.4	2.77	2227.5	6930	13711.5
G	E30 REINFORCEMENT FOR IN SITU CONCRETE High tensile steel deformed square bar reinforcement to B.S.4449	4.66	T	£1,847.21	£8,608.00	47	60	100					0.45	1.4	2.77	2097	6524	12908.2
H	E41 WORKED FINISHES/CUTTING TO IN SITU CONCRETE, Power floating, generally	3	m2	£10.80	£32.40	1	1	1	0.6	2100			0.74	0.74	0.74	932.4	932.4	932.4
J	RMC pre cast concrete beam and dense aggregate block floor; including all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork sleeper walls, nominally 150mm thick	671	m2	£69.00	£46,299.00	47	72	100	100.65	2200			0.224	0.224	0.224	49600.32	49600.32	49600.32
K	RMC pre cast concrete beam and dense aggregate block floor; including all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork sleeper walls, holes for services and drainage	52	Nr	£5.00	£260.00	500	750	1000		2200								
L	RMC pre cast concrete beam and dense aggregate block floor; including all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork sleeper walls, provision of additional supports for	6	Nr	£100.00	£600.00	500	750	1000										
M	RMC pre cast concrete beam and dense aggregate block floor; including all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork sleeper walls, provision of additional supports for	1	Nr	£100.00	£100.00	500	750	1000										
A	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher担架 bond; laid flat, 100mm thick	415	m2	£22.80	£9,462.00	52	72	101	41.5	2200			0.0749	0.107	0.1391	6838.37	9769.1	12699.83
B	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher担架 bond; laid flat, 215mm thick; assumed to be 100mm blocks laid flat	76	m2	£45.58	£3,464.08	52	72	101	16.34	2200			0.0749	0.107	0.1391	2692.5052	3846.436	5000.3668
C	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher担架 bond; laid flat, 215mm thick; assumed to be 100mm blocks laid flat; in	2	m2	£45.58	£91.16	52	72	101	0.43	2200			0.0749	0.107	0.1391	70.8554	101.222	131.5886
D	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher担架 bond; laid flat, Extra over blockwork for cutting blockwork to course 100mm thick	619	m	£5.00	£3,095.00	52	72	101										
E	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher担架 bond; laid flat, Extra over blockwork for cutting blockwork to course 215mm thick	113	m	£10.00	£1,130.00	52	72	101										

F	Engineering bricks; manufacturer and product reference to be agreed; 7.5N/mm2 compressive strength; half lap stretcher bond; flush joints; walls, half	62	m2	£72.20	£4,476.40	70	93	131	6.355	1920		0.24	0.24	0.24		2928.384	2928.384	2928.384
G	Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre, 125mm wide	220	m2	£3.60	£792.00	50	75	100	27.5	7850		6.15	6.15	6.15		1327631.25	1327631.25	1327631.25
H	Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre; and rigid insulation board; Celotex CG5000 50mm thick, 100mm wide	19	m2	£11.54	£219.26	50	75	100	1.9	7850		6.15	6.15	6.15		91727.25	91727.25	91727.25
I	Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre; and rigid insulation board; Celotex CG5000 75mm thick, 125mm wide	55	m2	£16.04	£882.20	50	75	100	6.875	7850		6.15	6.15	6.15		331907.813	331907.813	331907.813
J	Visqueen Zedex Housing grade damp proof course; bedding in cement mortar, not exceeding 225mm wide	87	m2	£16.45	£1,431.15	50	75	100	19.575									
A	Telescopic vents 通风口, Gildevale Limited ZLAB airbrick 空心砖 with ZLPS periscope潜望镜; colour Anthracite;	223	Nr	£16.50	£3,679.50				0.335615	840		0.24	0.24	0.24		67.659984	67.659984	67.659984
B	Frame, Pre cast concrete padstones, building in as work proceeds, 440 x 215 x	18	Nr	£60.00	£1,080.00	50	75	100	0.17028	1900		0.18	0.18	0.18		58.23576	58.23576	58.23576
C	Frame, Pre cast concrete padstones, building in as work proceeds, 600 x 215 x	5	Nr	£77.50	£387.50	50	75	100	0.0645	1900		0.18	0.18	0.18		22.059	22.059	22.059
D	Frame, Pre cast concrete padstones, building in as work proceeds, 900 x 215 x	3	Nr	£130.00	£390.00	50	75	100	0.05805	1900		0.18	0.18	0.18		19.8531	19.8531	19.8531
E	Frame, Pre cast concrete padstones, building in as work proceeds, 440 / 440 x 215 x 100mm L shaped	3	Nr	£135.00	£405.00	50	75	100	0.05676	1900		0.18	0.18	0.18		19.41192	19.41192	19.41192
F	G10 STRUCTURAL STEEL FRAMING, All steelwork is to be designed, manufactured, supplied and erected by specialist Sub Contractor; including, but not limited to, all surface treatments; factory applied finishes; localised repairs and the like as required following installation; making good following installation; in accordance with specifications prepared by Craddys and the National Steelwork Specifications. Supply and erect all steelwork required for the Coombe Shute, Stoke Gabriel Housing project; including all galvanising as may be	1	ITEM	£35,137.64	£35,137.64	50	75	100									37843.2	
G	Columns, weight not exceeding 40kg/m	0.77	T	Included	Included	47	70	110				0.47	1.46	2.89		361.9	1124.2	2225.3
H	G10 STRUCTURAL STEEL FRAMING, Columns, weight not exceeding 40kg/m; square hollow section	0.19	T	Included	Included	47	70	110				0.47	1.46	2.89		89.3	277.4	549.1
I	G10 STRUCTURAL STEEL FRAMING, Columns, weight not exceeding 40kg/m;	0.41	T	Included	Included	47	70	110				0.47	1.46	2.89		192.7	598.6	1184.9
J	G10 STRUCTURAL STEEL FRAMING, Columns, weight not exceeding 40kg/m; galvanised; square hollow section	0.75	T	Included	Included	47	70	110				0.47	1.46	2.89		352.5	1095	2167.5
A	G10 STRUCTURAL STEEL FRAMING, Beams, weight not exceeding 40kg/m	6.21	T	Included	Included	47	70	110				0.47	1.46	2.89		2918.7	9066.6	17946.9
B	G10 STRUCTURAL STEEL FRAMING, Beams, weight not exceeding 40kg/m; square hollow section	0.06	T	Included	Included	47	70	110				0.47	1.46	2.89		28.2	87.6	173.4
C	G10 STRUCTURAL STEEL FRAMING, Beams, weight not exceeding 40kg/m; galvanised	1.51	T	Included	Included	47	70	110				0.47	1.46	2.89		709.7	2204.6	4363.9
D	G10 STRUCTURAL STEEL FRAMING, Beams, weight not exceeding 40kg/m; galvanised; rectangular hollow section	0.44	T	Included	Included	47	70	110				0.47	1.46	2.89		206.8	642.4	1271.6
E	G10 STRUCTURAL STEEL FRAMING, Beams, weight 40 to 100kg/m	0.7	T	Included	Included	47	70	110				0.47	1.46	2.89		329	1022	2023
G	Fittings, generally; assessed at 17.5% of all steelwork	1.92	T	Included	Included	47	70	110				0.47	1.46	2.89		902.4	2803.2	5548.8
H	Framing and erection, all works required to erect steel framework on site	12.96	T	Included	Included	49	73	113				0.47	1.46	2.89		6091.2	18921.6	37454.4
I	Allow for all works necessary to eliminate cold bridging within the design of the steel frame; by use of proprietary fittings and equipment, generally - no details	1	ITEM	Included	Included	83	83	83										
J	Isolated structural and secondary steelwork additional framing and supports to external and internal walls	1	ITEM	Included	Included													
K	Isolated structural and secondary steelwork additional framing and supports to roof structure, including all cleader rails and the like	1	ITEM	Included	Included													
L	Isolated structural and secondary steelwork additional framing and supports to curtain walling, removable panels and additional framing and supports to mechanical and electrical installations additional framing and supports to mechanical and electrical installations	1	ITEM	Included	Included													
M	additional framing and supports to mechanical and electrical installations windposts, WP3, nominally 2.40m long	1	ITEM	Included	Included													
N	Prepare, touch up primer and apply two coats of approved bitumen based paint (RIW or similar) to steelwork, general surfaces, generally over 300mm -	2	Nr	£415.00	£830.00	50	75	100	Steel beam									
O	Prepare, touch up primer and apply two coats of approved exterior grade gloss paint to steelwork, general surfaces, generally over 300mm - provisional	5	m2	£16.20	£81.00	12	18	26				0.87	0.87	0.87	(kgCO2/Sqm)	4.35	4.35	4.35
A	Nulifire or similar approved intumescent膨胀的 paint finish to exposed surfaces; to achieve one hour fire rating; general surfaces of structural metalwork, over 300mm girth 周长 - Provisional	35	m2	£10.00	£350.00	49	73	113				0.87	0.87	0.87	(kgCO2/Sqm)	30.45	30.45	30.45
B	Quantity - measured to all surfaces of all RMC or similar approved hollow core pre cast concrete floor planks 厚木板; including all grouting 灌浆 of ends of hollows, all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork walls, nominally 150mm	239	m2	£8.00	£1,912.00							0.44	0.44	0.44	(kgCO2/Sqm)	105.16	105.16	105.16
C	RMC or similar approved hollow core acoustic rated pre cast concrete floor planks; including all grouting of ends of hollows, all grouting joints, straps, infills and the like, designed, manufactured and installed by specialist Sub Contractor; laid on blockwork walls, nominally 150mm	48	m2	£69.00	£3,312.00	47	72	108	7.2	1040		0.18	0.18	0.18		1347.84	1347.84	1347.84
D	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, to suit upper floor area of 50.49m2; unit 1	407	m2	£69.00	£28,083.00	42	72	108	61.05	1040		0.18	0.18	0.18		11428.56	11428.56	11428.56
E	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, to suit upper floor area of 56.18m2; unit 2	1	ITEM	£2,253.00	£2,253.00	35	60	95	1.3080949	650		0.65	0.65	0.65		552.670104	552.670104	552.670104
F	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, to suit upper floor area of 54.39m2; unit 3	1	ITEM	£2,343.00	£2,343.00	35	60	95	1.2013021	650		0.65	0.65	0.65		507.550156	507.550156	507.550156
G	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, to suit upper floor area of 54.39m2; unit 4	1	ITEM	£2,178.00	£2,178.00	35	60	95	1.1653937	650		0.65	0.65	0.65		492.37882	492.37882	492.37882
H	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, to suit upper floor area of 54.41m2; unit 10	1	ITEM	£2,178.00	£2,178.00	35	60	95	1.1653937	650		0.65	0.65	0.65		492.37882	492.37882	492.37882
I	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, trimmers or additional joists to suit unit 1,	1	ITEM	£3,052.00	£3,052.00	35	60	95	1.1653937	650		0.65	0.65	0.65		492.37882	492.37882	492.37882
	TJI floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, trimmers or additional joists to suit unit 3,	2	Nr	£12.00	£24.00	35	60	95	0.1933773	650		0.65	0.65	0.65		81.7019143	81.7019143	81.7019143
		2	Nr	£15.00	£30.00	35	60	95	0.5148438	650		0.65	0.65	0.65		217.521495	217.521495	217.521495

J	Tjl floor joists. Designed floor joists, to suit span, locations and loadings for the domestic properties, including the design, manufacture, supply and installation, complete with all joist hangers, fixings, supports, bracings 支撑, blockings and the like as required to complete installation, trimmers or additional joists to suit unit 4,	2	Nr	£15.00	£30.00	35	60	95	0.6702918	650		0.65	0.65	0.65	283.198275	283.198275	283.198275
K	Sawn 锯开的 softwood, for exterior use; preservative treated; grade C24, 50 x 150mm joists	98	m	£4.90	£480.20	42	71	109	0.735	630		0.59	0.59	0.59	273.1995	273.1995	273.1995
L	Sawn 锯开的 softwood, for exterior use; preservative treated; grade C24, 50 x 150mm joists; fixed to steel frame with and including bolts	41	m	£5.35	£219.35	42	71	109	0.3075	630		0.59	0.59	0.59	114.29775	114.29775	114.29775
A	Fixings; galvanised mild steel, Straps; to suit upper floors; plugged and screwed to masonry walls; nailed to joists nominally 1750mm long, 50 x 3mm; bent once	129	Nr	£9.00	£1,161.00	35	60	95	0.0338625	7800		1.54	1.54	1.54	406.75635	406.75635	406.75635
B	Fixings; galvanised mild steel, Joist hangers, external quality, nailed, to suit 150 x 50mm joists	160	Nr	£2.40	£384.00	35	60	95	0.9152	7800		1.54	1.54	1.54	10993.3824	10993.3824	10993.3824
C	Floor boarding, Chipboard to B.S..5669 part 2; tongued and grooved flooring panels, all joints secret screwed to joists and glued, all joints offset; floors, over	270	m2	£8.03	£2,168.10	32	51	69	81	650		0.86	0.86	0.86	45279	45279	45279
D	Balcony flooring Assumed to be hardwood ribbed decking boards; screw fixed to timber joists; 125 x 19mm section; with nominal 5mm gap between boards;	23	m2	£94.30	£2,168.90	42	71	109	6.9	700		0.87	0.87	0.87	4202.1	4202.1	4202.1
E	complete with anti slip finish; preservative Rockwool or similar approved cavity fire breaks; at perimeter of upper floors;	327	m	£20.75	£6,785.25	50	75	100	19.62	100		1.12	1.12	1.12	2197.44	2197.44	2197.44
A	nominally 200 x 300mm section, horizontal Sawn softwood, preservative 防腐剂 treated; grade C24; pitched roof members, 150 x 50mm, C24 timber joists at 400mm centres; to porches	41	m	£4.90	£200.90	49	82	114	0.3075	630		0.59	0.59	0.59	114.29775	114.29775	114.29775
B	Sawn softwood, preservative 防腐剂 treated; grade C24; pitched roof members, 150 x 50mm, C24 timber joists at 400mm centres; to dormers	65	m	£5.10	£331.50	49	82	114	0.4875	630		0.59	0.59	0.59	181.20375	181.20375	181.20375
C	Sawn softwood, preservative 防腐剂 treated; grade C24; pitched roof members, 175 x 50mm, C24 timber joists at 400mm centres; to unit 5 to 9	913	m	£5.88	£5,368.44	49	82	114	7.98875	630		0.59	0.59	0.59	2969.41838	2969.41838	2969.41838
D	Sawn softwood, preservative 防腐剂 treated; grade C24; pitched roof members, 250 x 25mm, C24 timber ridges 用锯单向键位; to unit 5 to 9	15	m	£6.38	£95.70	49	82	114	0.09375	630		0.59	0.59	0.59	34.846875	34.846875	34.846875
E	Sawn softwood, preservative treated; grade C24; dormer 屋顶采光窗 wall construction, 100 x 50mm, C24 timber joists at 400mm centres	267	m	£4.37	£1,166.79	49	82	114	1.335	630		0.59	0.59	0.59	496.2195	496.2195	496.2195
F	Sawn softwood, preservative treated; bolted 用螺栓固定 to timber beams; plates, 100 x 50mm	30	m	£5.37	£161.10	23	37	53	0.15	630		0.59	0.59	0.59	55.755	55.755	55.755
G	Sawn softwood, preservative treated; bolted to steel beams; plates, 100 x 50mm	183	m	£5.37	£982.71	23	37	53	0.915	630		0.59	0.59	0.59	340.1055	340.1055	340.1055
H	Sawn softwood, preservative treated; bolted to masonry with resin anchors at 300mm centres; plates, 100 x 50mm	10	m	£5.37	£53.70	23	37	53	0.05	630		0.59	0.59	0.59	18.585	18.585	18.585
I	Sawn softwood, preservative treated; bedded in mortar; plates, 100 x 50mm	287	m	£4.82	£1,383.34	23	37	53	1.435	630		0.59	0.59	0.59	533.3895	533.3895	533.3895
J	Sawn softwood, preservative treated; bedded in mortar; plates, 100 x 50mm; to	60	m	£4.37	£262.20	23	37	53	0.3	630		0.59	0.59	0.59	111.51	111.51	111.51
K	Sawn softwood, preservative treated; framing to eaves 屋檐 and verges ,	1235	m	£3.04	£3,754.40	23	37	53	3.0875	630		0.59	0.59	0.59	1147.62375	1147.62375	1147.62375
L	nominally 50 x 50mm Sawn softwood, preservative treated; framing to eaves 屋檐 and verges ,	378	m	£3.04	£1,149.12	23	37	53	0.945	630		0.59	0.59	0.59	351.2565	351.2565	351.2565
M	nominally 50 x 50mm; plugged and Roof trusses, designed, manufactured, supplied and installed by specialist Sub Contractor, complete with all bracings 紧固装置, fixings, central walkway boards; openings for access hatches 舱口 and the like as required to complete installation.																
N	total roof area - on plan; garage units for 7 Roof trusses, designed, manufactured, supplied and installed by specialist Sub Contractor, complete with all bracings 紧固装置, fixings, central walkway boards; openings for access hatches 舱口 and the like as required to complete installation.	90	m2	£35.00	£3,150.00	23	37	53									
A	total roof area - on plan; timber store Roof trusses, designed, manufactured, supplied and installed by specialist Sub Contractor, complete with all bracings 紧固装置, fixings, central walkway boards; openings for access hatches 舱口 and the like as required to complete installation.	8	m2	£35.00	£280.00	23	37	53									
B	total roof area - on plan; car port 简易车库 Roof trusses, designed, manufactured, supplied and installed by specialist Sub Contractor, complete with all bracings 紧固装置, fixings, central walkway boards; openings for access hatches 舱口 and the like as required to complete installation.	56	m2	£35.00	£1,960.00	30	60	80									
C	total roof area - on plan; units 1 and 2, including 4 dormers Roof trusses, designed, manufactured, supplied and installed by specialist Sub Contractor, complete with all bracings 紧固装置, fixings, central walkway boards; openings for access hatches 舱口 and the like as required to complete installation.	168	m2	£34.76	£5,839.68	30	60	80									
D	total roof area - on plan; units 3 and 4, including central shallow pitched valley Roof trusses, designed, manufactured, supplied and installed by specialist Sub Contractor, complete with all bracings 紧固装置, fixings, central walkway boards; openings for access hatches 舱口 and the like as required to complete installation.	157	m2	£26.25	£4,121.25	30	60	80									
E	total roof area - on plan; unit 10 Assumed to be 12mm plywood; nailed to	104	m2	£27.83	£2,894.32	30	60	80									
F	trusses nominally 300mm wide Straps; assumed to be galvanised mild steel; fixed to timber and masonry,	158	m	£10.00	£1,580.00	23	36	49	0.5688	700		1.1	1.1	1.1	437.976	437.976	437.976
G	assumed to be 1700 x 50 x 3mm, bent Straps; assumed to be galvanised mild	50	Nr	£9.20	£460.00	24	34	42	0.01275	7800		1.54	1.54	1.54	153.153	153.153	153.153
H	steel; fixed to timber and masonry Joist hangers 小梁挂钩, shoes, brackets	228	Nr	£8.38	£1,910.64	24	34	42	0.04104	7800		1.54	1.54	1.54	492.97248	492.97248	492.97248
I	and the like, as required to complete Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, pitch 斜度 25	1	ITEM	£500.00	£500.00	24	34	42									
J	Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, pitch 35 degrees	68	m2	£45.00	£3,060.00	17	26	36	1.7	1600		0.007	0.035	0.063	19.04	95.2	171.36
K	Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, Abutments邻接;	914	m2	£35.00	£31,990.00	17	26	36	22.85	1600		0.007	0.035	0.063	255.92	1279.6	2303.28
L	complete with all additional battens, including over sized or cut slates to suit, Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, Abutments邻接;	71	m	£12.00	£852.00	17	26	36	0.06745	1600		0.007	0.035	0.063	0.75544	3.7772	6.79896
M	complete with all additional battens, including over sized or cut slates to suit, Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, Abutments邻接;	10	m	£8.00	£80.00	17	26	36	0.0095	1600		0.007	0.035	0.063	0.1064	0.532	0.9576
N	complete with all additional battens, including over sized or cut slates to suit, Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, Eaves; complete	23	m	£8.00	£184.00	17	26	36	0.02185	1600		0.007	0.035	0.063	0.24472	1.2236	2.20248
O	with tilting fillet, ventilation, dressing felt / breather membrane into gutter, including approved slip course of slates Natural slate roofing (no details); complete with approved battens (38 x 25mm) fixed to and including approved felt 毛毡/ breather membrane and the like to complete installation, Verges; complete with undercloak 勒脚防雨层, dressed tiles and mortar as required; including	318	m	£13.00	£4,134.00	17	26	36	64.395	1600		0.007	0.035	0.063	721.224	3606.12	6491.016
A	oversized slates to suit generally Roof Ridges; dry ridge 脊 system with all fixings, ventilation and the like, including	60	m	£23.00	£1,380.00	17	26	36		1600		0.007	0.035	0.063			
B	additional battens, generally Roof Hips; dry ridge system with all fixings, ventilation and the like, including additional battens, generally	103	m	£31.00	£3,193.00	17	26	36		1600		0.007	0.035	0.063			
		185	m	£45.00	£8,325.00	17	26	36		1600		0.007	0.035	0.063			

C	Roof Valleys; cutting to both sides of valley (liner measured elsewhere) complete with all additional battens, generally	54	m	£34.00	£1,836.00	17	26	36		1600		0.007	0.035	0.063				
D	Roof Holes, generally	1	ITEM	£100.00	£100.00	17	26	36		1600		0.007	0.035	0.063				
E	Roof Hip irons, generally	36	Nr	£7.00	£252.00	17	26	36	0.081	7870		2.03	2.03	2.03		1294.0641	1294.0641	1294.0641
F	Code 4 lead flashings; Flashings to abutments; complete with dressing into masonry as required; finishing with one coat of patination oil, stepped flashing to pitched abutment from roof tiles to masonry; dressing up face of masonry and over slates; girth nominally 350mm	15	m	£53.00	£795.00	32	60	82	0.00945	11340		1.67	1.67	1.67		178.96221	178.96221	178.96221
G	Code 4 lead flashings; Flashings to abutments; complete with dressing into masonry as required; finishing with one coat of patination oil, horizontal flashing to abutment from roof tiles to masonry; dressing up face of masonry and over	7	m	£33.00	£231.00	32	60	82	0.00378	11340		1.67	1.67	1.67		71.584884	71.584884	71.584884
H	Code 4 lead flashings; Flashings to abutments; complete with dressing into masonry as required; finishing with one coat of patination oil, horizontal flashing to flat roof skirting to masonry; dressing up face of masonry and over skirting; girth	42	m	£33.00	£1,386.00	32	60	82	0.02268	11340		1.67	1.67	1.67		429.509304	429.509304	429.509304
I	Code 4 lead flashings; Flashings to abutments; complete with dressing into masonry as required; finishing with one coat of patination oil, soakers to flashing to pitched abutment from roof tiles to masonry; dressing under and over slates and up face of masonry; nominally soakers	61	Nr	£5.00	£305.00	32	60	82	0.013176	11340		1.67	1.67	1.67		249.524453	249.524453	249.524453
J	Code 5 lead flashings. Flashings to valleys; complete with dressing onto timber battens and over plywood; finishing with one coat of patination oil, valley lining; nominally 450mm girth; bent five times; fixed to battens; in lengths not exceeding	54	m	£69.00	£3,726.00	32	60	82	0.054432	11340		1.67	1.67	1.67		1030.82233	1030.82233	1030.82233
A	Bill 6 Roof, secret gutter valley lining; nominally 450mm girth; bent five times; fixed to battens; in lengths not exceeding 1.50m, with 150mm lap	64	m	£69.00	£4,416.00	32	60	82	0.064512	11340		1.67	1.67	1.67		1221.71535	1221.71535	1221.71535
B	Assumed to be Sarnafil or similar approved single ply 板层 warm roof covering; complete with all required vapour barriers, insulation, breather membranes, fleeces 抓绒, fixings, trims, seals and the like; laid on pre cast concrete planks; designed, manufactured and installed by specialist Sub Contractor, pitch not exceeding 4	44	m2	£81.00	£3,564.00	17	30	43	0.0528	1380		3.1	3.1	3.1		225.8784	225.8784	225.8784
C	Assumed to be Sarnafil or similar approved single ply 板层 warm roof covering; complete with all required vapour barriers, insulation, breather membranes, fleeces 抓绒, fixings, trims, seals and the like; laid on pre cast concrete planks; designed, manufactured and installed by specialist Sub Contractor, pitch 5 degrees; with standing seam effect rolls at 600mm	32	m2	£81.00	£2,592.00	17	30	43	0.0384	1380		3.1	3.1	3.1		164.2752	164.2752	164.2752
D	Roof covering Skirtings 基座; complete with all required insulation and the like; dressing up face of walls / parapets 扶手 and the like; make good as required; including all cappings, trims, formers, not	42	m	£30.00	£1,260.00	17	30	43	0.1512	1380		3.1	3.1	3.1		646.8336	646.8336	646.8336
E	Roof covering Flashings; complete with all required insulation and the like; dressing up roof trusses behind slates; make good as required; including all cappings, trims, formers, 400 to 600mm girth	44	m	£30.00	£1,320.00	17	30	43	0.0396	1380		3.1	3.1	3.1		169.4088	169.4088	169.4088
F	Roof covering Eaves; complete with all required insulation and the like; dressing over and into gutter; make good as required; including all cappings, trims, formers, 200 to 400mm girth	9	m	£30.00	£270.00	17	30	43	0.00648	1380		3.1	3.1	3.1		27.72144	27.72144	27.72144
G	Roof covering Approved paving slabs, on and including pedestals 基座 as required to provide working terrace to flat roof, no details, pitch not exceeding 4 degrees	34	m2	£40.00	£1,360.00	50	75	100	2.04	1380		3.1	3.1	3.1		8727.12	8727.12	8727.12
A	Softwood fascias; fixed to timber framing (measured elsewhere); complete with all trims, supports and the like to complete installation; assumed to be 22mm thick, fascia, nominally 250mm deep	318	m	£8.15	£2,591.70	5	10	15	1.749	630		0.59	0.59	0.59		650.1033	650.1033	650.1033
B	Softwood fascias; fixed to timber framing (measured elsewhere); complete with all trims, supports and the like to complete installation; assumed to be 22mm thick, verge fascia, nominally 250mm deep	60	m	£9.15	£549.00	5	10	15	0.33	630		0.59	0.59	0.59		122.661	122.661	122.661
C	Softwood soffits; fixed to timber framing (measured elsewhere); complete with all trims装饰, ventilators通风口, supports and the like to complete installation, soffit, nominally 250mm wide; assumed to be 15mm thick	378	m	£9.15	£3,458.70	5	10	15	1.4175	630		0.59	0.59	0.59		526.88475	526.88475	526.88475
D	Dormer window framing WBP plywood; fixed to timber frame (measured elsewhere); vertical, nominally 18mm thick, to dormer faces and cheeks; over	40	m2	£25.64	£1,025.60	41	68	107	0.72	700		1.1	1.1	1.1		554.4	554.4	554.4
E	Dormer window framing WBP plywood; fixed to timber frame (measured elsewhere); vertical, nominally 18mm thick, to dormer faces and cheeks; not	25	m	£11.29	£282.25	41	68	107	0.135	700		1.1	1.1	1.1		103.95	103.95	103.95
F	Cementious 水泥 render board, on and including approved battens to provide ventilation gap fixed to plywood substrate, to dormer faces and cheeks; over 300mm	40	m2	£20.69	£827.60				0.4	1860		0.74	0.74	0.74		550.56	550.56	550.56
G	Cementious 水泥 render board, on and including approved battens to provide ventilation gap fixed to plywood substrate, to dormer faces and cheeks; not exceeding 300mm wide	25	m	£12.17	£304.25				0.075	1860		0.74	0.74	0.74		103.23	103.23	103.23
H	Painting fascias and soffits; Assumed to be Dulux Trade Exterior Gloss, prime, prepare, apply two undercoats and two finish coats; general surfaces, over 300mm girth	189	m2	£12.50	£2,362.50	6	6	6				0.87	0.87	0.87	(kgCO2/Sqm)	164.43	164.43	164.43
I	Roof insulation; Assumed to be Rockwool or similar approved mineral fibre insulation quilt, nominally 400mm thick overall, horizontal, between joists nominally 150mm thick	429	m2	£2.10	£900.90	50	75	100	64.35	100		1.12	1.12	1.12		7207.2	7207.2	7207.2
J	Roof insulation; Assumed to be Rockwool or similar approved mineral fibre insulation quilt, nominally 400mm thick overall, horizontal, over joists nominally 100mm	429	m2	£1.80	£772.20	50	75	100	42.9	100		1.12	1.12	1.12		4804.8	4804.8	4804.8
K	Roof insulation; Assumed to be Rockwool or similar approved mineral fibre insulation quilt, nominally 400mm thick overall, horizontal, over joists nominally 150mm	429	m2	£2.10	£900.90	50	75	100	64.35	100		1.12	1.12	1.12		7207.2	7207.2	7207.2
A	Roof insulation; Assumed to be Rockwool or similar approved mineral fibre insulation quilt, nominally 400mm thick overall, vertical, between studs nominally 100mm	40	m2	£4.00	£160.00	50	75	100	4	100		1.12	1.12	1.12		448	448	448
B	Roof insulation, Assumed to be Kingspan or similar approved rigid insulation boards, nominally 175mm thick overall, pitched, between joists nominally 75mm thick	287	m2	£23.00	£6,601.00	17	22	31	21.525	30		3.29	3.29	3.29		2124.5175	2124.5175	2124.5175
C	Roof insulation, Assumed to be Kingspan or similar approved rigid insulation boards, nominally 175mm thick overall, pitched, between joists nominally 100mm thick	287	m2	£25.00	£7,175.00	17	22	31	28.7	30		3.29	3.29	3.29		2832.69	2832.69	2832.69
D	Gravity rainwater drainage system; Black uPVC rainwater pipes; complete with all elbows, connections, brackets, fixings and the like as required, nominally 75mm	233	m	£6.91	£1,610.03	18	26	35	0.256067	1430		3.23	3.23	3.23		1182.74787	1182.74787	1182.74787
E	Gravity rainwater drainage system; Black uPVC rainwater pipes; complete with all elbows, connections, brackets, fixings and the like as required, connection to below ground drainage	41	Nr	£12.25	£502.25	18	26	35										
F	Gravity rainwater drainage system; Black uPVC rainwater pipes; complete with all elbows, connections, brackets, fixings and the like as required, off set bends, 250mm	41	Nr	£9.10	£373.10	18	26	35										
G	Black uPVC rainwater gutters; complete with all elbows, connections, brackets, fixings and the like as required, half round, nominally 100mm diameter	318	m	£8.13	£2,585.34	18	26	35	0.474297	1430		3.23	3.23	3.23		2190.73041	2190.73041	2190.73041
H	Black uPVC rainwater gutters; complete with all elbows, connections, brackets, fixings and the like as required, ends	46	Nr	£5.10	£234.60	18	26	35										
I	Black uPVC rainwater gutters; complete with all elbows, connections, brackets, fixings and the like as required, running	41	Nr	£7.15	£293.15	18	26	35										
J	Black uPVC rainwater gutters; complete with all elbows, connections, brackets, fixings and the like as required, bends	29	Nr	£7.15	£207.35	18	26	35										
K	Testing and commissioning, as required	1	ITEM	£600.00	£600.00	1	1	1										
A	Softwood framed staircases; with MDF treads and plywood risers; treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of five treads, quarter landing, one tread, quarter landing and five treads;	1	Nr	£2,818.00	£2,818.00	32	62	76		630		0.59	0.59	0.59				
B	Softwood framed staircases; with MDF treads and plywood risers; treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of thirteen treads; balustrade	1	Nr	£2,660.00	£2,660.00	32	62	76		630		0.59	0.59	0.59				

C	Softwood framed staircases; with MDF treads and plywood risers; treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of thirteen treads; balustrade	1	Nr	£2,709.00	£2,709.00	32	62	76		630		0.59	0.59	0.59			
D	Softwood framed staircases; with MDF treads and plywood risers; treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of thirteen treads; balustrade	1	Nr	£2,709.00	£2,709.00	32	62	76		630		0.59	0.59	0.59			
E	Softwood framed staircases; with MDF treads and plywood risers; treads nominally 900mm wide; floor to floor height of 2775mm; ground to first floor; comprising of three winder treads, six straight treads and three winder treads;	1	Nr	£3,676.00	£3,676.00	32	62	76		630		0.59	0.59	0.59			
F	Complete installation of precast concrete stair and landings; designed to approved British Standards and Engineers requirements; stairs to units 5 to 9; comprising of three flights of two, six and five treads with two quarter landings with one corner splayed; 950mm wide treads; 2650m overall rise; ground to first floor	1	Nr	£5,340.00	£5,340.00	42	73	95	stairs structure: concrete			0.155	0.174	0.188			
A	Complete installation of precast concrete stair and landings; designed to approved British Standards and Engineers requirements; stairs to units 5 to 9; comprising of three flights of two, six and five treads with two quarter landings with one corner splayed; 950mm wide treads; 2625m overall rise; first to second floor	1	Nr	Included	Included												
B	Balustrading扶手; Assumed to be polyester 聚酯纤维 powder coated mild steel framed with vertical pilasters; complete with handrail to match; raking	10	m	£436.55	£4,365.50	15	20	25									
C	Balustrading扶手; Assumed to be polyester 聚酯纤维 powder coated mild steel framed with vertical pilasters; complete with handrail to match; horizontal	4	m	£476.47	£1,905.88	15	20	25									
D	Balustrading扶手; Assumed to be polyester 聚酯纤维 powder coated mild steel framed with vertical pilasters; complete with handrail to match; ends	4	Nr	£40.22	£160.88	15	20	25									
E	Balustrading扶手; Assumed to be polyester 聚酯纤维 powder coated mild steel framed with vertical pilasters; complete with handrail to match; connection to	2	Nr	£40.22	£80.44	15	20	25									
F	Balustrading扶手; Assumed to be polyester 聚酯纤维 powder coated mild steel framed with vertical pilasters; complete with handrail to match; bends	6	Nr	£40.22	£241.32	15	20	25									
G	Balustrading扶手; Assumed to be polyester 聚酯纤维 powder coated mild steel framed with vertical pilasters; complete with handrail to match; ramps 斜坡	14	Nr	£80.44	£1,126.16	15	20	25									
H	Assumed to be polyester powder coated handrails on brackets to masonry walls;	8	m	£173.32	£1,386.56	15	20	25									
I	Assumed to be polyester powder coated handrails on brackets to masonry walls; horizontal	8	m	£173.32	£1,386.56	15	20	25									
J	Assumed to be polyester powder coated handrails on brackets to masonry walls;	2	Nr	£40.22	£80.44	15	20	25									
K	Assumed to be polyester powder coated handrails on brackets to masonry walls;	8	Nr	£40.22	£321.76	15	20	25									
L	Assumed to be polyester powder coated handrails on brackets to masonry walls;	10	Nr	£80.44	£804.40	15	20	25									
M	Painting stair strings 楼梯梁 Assumed to be ICI Dulux Trade Satinwood or similar approved; touch up primer, undercoat and two coats of finish paint, over 300mm girth	5	m2	£15.00	£75.00	6	6	6				0.87	0.87	0.87	4.35	4.35	4.35
N	Painting staircases and balustrades. Prepare, touch up primer and apply one undercoat and one gloss finishing coat of oil paint; general surfaces; strings, over	9	m2	£15.00	£135.00	6	6	6				0.87	0.87	0.87	7.83	7.83	7.83
A	Painting staircases and balustrades. Prepare, touch up primer and apply one undercoat and one gloss finishing coat of oil paint; not exceeding 300mm girth	27	m	£4.00	£108.00							0.87	0.87	0.87			
B	Prepare, touch up primer and apply one undercoat and one gloss finishing coat of oil paint; balustrades; measured both sides, over 300 girth	66	m2	£15.00	£990.00	6	6	6				0.87	0.87	0.87	57.42	57.42	57.42
C	Cover panels to stair strings. Assumed to be MDF; factory primed; mechanically fixed to pre cast concrete stair strings,	12	m	£20.17	£242.04	21	36	48	0.0798	575		0.74	0.74	0.74	33.9549	33.9549	33.9549
A	nominally 19mm thick; 350mm high; all Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar;																
B	stretcher bond, 100mm thick Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar;	2228	m2	£22.80	£50,798.40	52	72	101	222.8	2200		0.0749	0.107	0.1391	36712.984	52447.12	68181.256
C	stretcher bond, 100mm thick, fair faced one side Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar;	94	m2	£24.30	£2,284.20	52	72	101	9.4	2200		0.7749	1.107	1.4391	16024.932	22892.76	29760.588
D	stretcher bond, 100mm thick, fair faced both sides Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar;	40	m2	£26.30	£1,052.00	52	72	101	4	2200		1.4749	2.107	2.7391	12979.12	18541.6	24104.08
E	stretcher bond, 215mm thick; two skins of 100mm blockwork tied together with ties at the rate of five per square metre and central joint fully filled with mortar; fair faced one side Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar;	6	m2	£56.11	£336.66	52	72	101	1.2	2200		2.1749	3.107	4.0391	5741.736	8202.48	10663.224
F	stretcher bond, 100mm thick, in piers, overall 215mm thick; fair faced to three Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar;	5	m2	£50.11	£250.55	52	72	101	1.075	2200		2.8749	4.107	5.3391	6799.1385	9713.055	12626.9715
G	stretcher bond, 100mm thick, in piers, overall 215mm thick; fair faced to four Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar;	4	m2	£51.11	£204.44	52	72	101	0.86	2200		3.5749	5.107	6.6391	6763.7108	9662.444	12561.1772
H	stretcher bond, 100mm thick, in piers, overall 335mm thick; fair faced to three Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar;	2	m2	£77.91	£155.82	52	72	101	0.67	2200		4.2749	6.107	7.9391	6301.2026	9001.718	11702.2334
I	stretcher bond, 100mm thick, in piers, overall 440mm thick; fair faced to three Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar;	1	m2	£104.21	£104.21	52	72	101				4.9749	7.107	9.2391			
J	stretcher bond, cutting blockwork to course 100mm thick Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar;	501	m	£5.00	£2,505.00	52	72	101		2200		5.6749	8.107	10.5391			
K	stretcher bond, cutting blockwork to course 100mm thick; raking	21	m	£10.00	£210.00	52	72	101									
L	Engineering bricks; manufacturer and product reference to be agreed; 7.5N/mm2 compressive strength; half lap stretcher bond; flush joints; walls, half Natural stone walling; Assumed to be limestone or similar walling to match boundary walls; in cement mortar; complete with facing to suit wall thickness, including trimming and the like of stone;	59	m2	£70.82	£4,178.38	70	93	131	6.0475	2000		0.24	0.24	0.24	2902.8	2902.8	2902.8
A	random courses; brushed finish, nominally 100mm thick Stonework; Assumed to be cast stone to match adjacent邻近的 environment; bedding in mortar; building in as work proceeds; nominally 425mm wide; 55mm deep; splayed top edge with two throats	22	m2	£143.35	£3,153.70	43	60	79	2.2	2180		0.079	0.079	0.079	378.884	378.884	378.884
B	to underside; coppings, generally Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds;	26	m	£97.00	£2,522.00	43	60	79	0.60775	470		0.0749	0.107	0.1391	21.3946233	30.5637475	39.7328718
C	nominally 125mm thick; 215mm deep; splayed bottom edge with throating; lintels, to suit opening 1248mm wide Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds;	2	Nr	£270.00	£540.00	43	60	79	0.06708	470		0.0749	0.107	0.1391	2.36141724	3.3734532	4.38548916
D	nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 685mm wide Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds;	9	Nr	£95.00	£855.00	43	60	79	0.1988213	470		0.0749	0.107	0.1391	6.99910446	9.99872066	12.9983369
E	nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 1135mm wide Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds;	6	Nr	£138.00	£828.00	43	60	79	0.2196225	470		0.0749	0.107	0.1391	7.73137087	11.0448155	14.3582602
F	nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 1248mm wide Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds;	19	Nr	£150.00	£2,850.00	43	60	79	0.764712	470		0.0749	0.107	0.1391	26.9201565	38.4573665	49.9945764
	nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 1360mm wide	2	Nr	£157.50	£315.00	43	60	79	0.08772	470		0.0749	0.107	0.1391	3.08800716	4.4114388	5.73487044

G	Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 1698mm wide	1	Nr	£205.00	£205.00	43	60	79	0.0547605	470			0.0749	0.107	0.1391	1.92773388	2.75390555	3.58007721
H	Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 1810mm wide	4	Nr	£212.00	£848.00	43	60	79	0.23349	470			0.0749	0.107	0.1391	8.21954847	11.7422121	15.2648757
I	Stonework; Assumed to be cast stone to match adjacent environment; bedding in mortar; building in as work proceeds; nominally 150mm thick; 215mm deep; splayed top edge and stools to both ends with throating to underside; sills, to suit opening 2710mm wide	1	Nr	£310.00	£310.00	43	60	79	0.087075	470			0.0749	0.107	0.1391	3.06530123	4.37900175	5.69270228
J	Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre; and approved cavity wall insulation 75mm thick, 125mm wide	1187	m2	£14.06	£16,689.22	52	72	101	148.375	8000			6.15	6.15	6.15	7300050	7300050	7300050
K	Cavity trays; Visqueen Zedex Housing grade damp proof course; bedding in cement mortar, over 225mm wide	311	m2	£16.45	£5,115.95	52	72	101	69.975	1650								
L	Cavity closers; Assumed to be Kingspan or similar approved Thermabate cavity closer system, complete with all required insulation, brackets and the like; suitable for use in party walls, 100mm wide, vertical	248	m	£8.15	£2,021.20	50	75	100	0.7936	1380			3.16	3.16	3.16	3460.73088	3460.73088	3460.73088
A	Cavity closers; Assumed to be Kingspan or similar approved Thermabate cavity closer system, complete with all required insulation, brackets and the like; suitable for use in party walls, 100mm wide,	150	m	£8.15	£1,222.50	50	75	100	0.48	1380			3.16	3.16	3.16	2093.184	2093.184	2093.184
B	Weepholes 排水孔, Rytons Rytweep or similar approved; building in as work proceeds, generally	611	Nr	£1.78	£1,087.58	52	72	101	0.0407293									
C	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 572mm wide; in cavity wall	6	Nr	£23.17	£139.02	50	75	100	0.0004832	7800	https://iglintels.com/product/l1s-100/		0.47	1.46	2.89	1.77150505	5.50297313	10.8928715
D	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 685mm wide; in cavity wall	16	Nr	£25.39	£406.24	50	75	100	0.0015432	7800			0.47	1.46	2.89	5.65725389	17.5735972	34.7860931
E	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 910mm wide; in cavity wall	1	Nr	£32.63	£32.63	50	75	100	0.0001281	7800			0.47	1.46	2.89	0.46971725	1.45912166	2.88826138
F	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1022mm wide; in cavity wall	6	Nr	£33.63	£201.78	50	75	100	0.0008634	7800			0.47	1.46	2.89	3.16517161	9.83223521	19.4624382
G	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1135mm wide; in cavity wall	10	Nr	£36.06	£360.60	50	75	100	0.0159808	7800			0.47	1.46	2.89	58.5856128	181.98935	360.239194
H	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1248mm wide; in cavity wall	28	Nr	£41.92	£1,173.76	50	75	100	0.0049201	7800			0.47	1.46	2.89	18.0371423	56.0302719	110.909237
I	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1360mm wide; in cavity wall	5	Nr	£45.32	£226.60	50	75	100	0.001156	7800			0.47	1.46	2.89	4.237896	13.164528	26.058552
J	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1585mm wide; in cavity wall	2	Nr	£58.17	£116.34	50	75	100	0.0005389	7800			0.47	1.46	2.89	1.9756074	6.1369932	12.1478838
K	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1698mm wide; in cavity wall	2	Nr	£60.18	£120.36	50	75	100	0.0007267	7800			0.47	1.46	2.89	2.6642435	8.27616067	16.3822632
L	IG Lintels, building in as work proceeds; reference L1/S or similar; to suit structural opening of; to suit structural opening 1810mm wide; in cavity wall	7	Nr	£84.37	£590.59	50	75	100	0.0027114	7800			0.47	1.46	2.89	9.93991908	30.8771954	61.119928
M	IG Lintels, building in as work proceeds; reference L1/HD or similar; to suit structural opening of; to suit structural opening 2373mm wide; in cavity wall	2	Nr	£111.14	£222.28	50	75	100	0.0014238	7800			0.47	1.46	2.89	5.2196508	16.2142344	32.0952996
N	IG Lintels, building in as work proceeds; reference L1/HD or similar; to suit structural opening of; to suit structural opening 2485mm wide; in 215mm thick	5	Nr	£145.06	£725.30	50	75	100	0.0052334	7800			0.47	1.46	2.89	19.1856811	59.5980731	117.971528
O	IG Lintels, building in as work proceeds; reference L1/HD or similar; to suit structural opening of; to suit structural opening 2598mm wide; in cavity wall	1	Nr	£150.06	£150.06	50	75	100	0.0010943	7800			0.47	1.46	2.89	4.01162168	12.4616333	24.6672057
A	IG Lintels, building in as work proceeds; reference L1/HD or similar; to suit structural opening of; to suit structural opening 2710mm wide; in cavity wall	1	Nr	£150.06	£150.06	50	75	100	0.0011415	7800			0.47	1.46	2.89	4.18456303	12.9988554	25.730611
B	IG Lintels, building in as work proceeds; reference L1/HD or similar; to suit structural opening of; to suit structural opening 2935mm wide; in cavity wall	6	Nr	£155.47	£932.82	50	75	100	0.0078294	7800			0.47	1.46	2.89	28.7026024	89.1612755	176.49047
C	Sawn softwood; to timber store; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members; 125 x 125mm posts	18	m	£10.80	£194.40	39	56	72	0.28125	630			0.59	0.59	0.59	104.540625	104.540625	104.540625
D	Sawn softwood; to timber store; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members; 125 x 50mm rails	26	m	£5.45	£141.70	39	56	72	0.1625	630			0.59	0.59	0.59	60.40125	60.40125	60.40125
E	Sawn softwood; to car port; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members; 150 x 150mm posts	18	m	£11.33	£203.94	39	56	72	0.405	630			0.59	0.59	0.59	150.5385	150.5385	150.5385
F	Sawn softwood; to car port; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members; 300 x 200mm beams	40	m	£37.50	£1,500.00	39	56	72	2.4	630			0.59	0.59	0.59	892.08	892.08	892.08
G	Sawn softwood; to car port; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members; 200 x 150mm bracings - assumed to be dowelled mortice and	20	m	£19.35	£387.00	39	56	72	0.6	630			0.59	0.59	0.59	223.02	223.02	223.02
H	Sawn softwood; to car port; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition members; 200 x 150mm curved entrance bracings - assumed to be dowelled mortice	3	m	£33.35	£100.05	39	56	72	0.09	630			0.59	0.59	0.59	33.453	33.453	33.453
I	Sawn softwood; to car port; Sawn softwood; preservative treated, assumed to be grade C24, wall or partition	73	m	£4.17	£304.41	39	56	72	0.365	630			0.59	0.59	0.59	135.6705	135.6705	135.6705
J	Fixings; Assumed to be stainless steel shoes, resin bolted to concrete floor slab; complete with all required fixings, bolts and the like; to suit 125 x 125mm post	8	Nr	£87.50	£700.00													
K	Fixings; Assumed to be stainless steel shoes, resin bolted to concrete floor slab; complete with all required fixings, bolts and the like; to suit 150 x 150mm post	8	Nr	£87.50	£700.00													
L	Truss clips; to accept rails; nailed as required; to suit 125 x 50mm rails	44	Nr	£2.27	£99.88													
A	H30 FIBRE CEMENT PROFILED SHEET CLADDING/COVERING /SIDING; Assumed to be profiled large format cladding panels; including all insulation, vapour barriers, breather membranes, brackets, fixings and the like to complete installation; wall claddings; vertical	13	m2	£280.32	£3,644.16	24	38	49	0.26	350			1.09	1.09	1.09	99.19	99.19	99.19
B	H30 FIBRE CEMENT PROFILED SHEET CLADDING/COVERING /SIDING; Abutments; as required, no details; to roof profile, to head and sill; generally	26	m	£31.90	£829.40	24	38	49	0.0624	350			1.09	1.09	1.09	23.8056	23.8056	23.8056
C	H30 FIBRE CEMENT PROFILED SHEET CLADDING/COVERING /SIDING; Trims to windows and the like; generally	5	m	£31.90	£159.50	24	38	49										
D	H30 FIBRE CEMENT PROFILED SHEET CLADDING/COVERING /SIDING; Holes, no details	1	ITEM	£1,000.00	£1,000.00	24	38	49										
E	H41 GLASS REINFORCED PLASTICS PANEL CLADDING / FEATURES; Approved timber framed or Glass Reinforced Plastic off site manufactured chimney unit with brickwork to match below DPC; including capping and two chimney pots, blanking panels and the like; generally	2	Nr	£800.00	£1,600.00	24	37	48										
F	H41 GLASS REINFORCED PLASTICS PANEL CLADDING / FEATURES; Approved timber framed or Glass Reinforced Plastic off site manufactured entrance porch with slate roofing to match main roof; including supporting framing fixed to masonry walls; generally; 2.00m wide; 900mm projection, to unit 2	1	Nr	£609.95	£609.95	24	37	48										

G	H41 GLASS REINFORCED PLASTICS PANEL CLADDING / FEATURES; Approved timber framed or Glass Reinforced Plastic off site manufactured entrance porch with slate roofing to match main roof; including supporting framing fixed to masonry walls; generally; 2.30m wide; 900mm projection, to units 3 and 4	2	Nr	£609.95	£1,219.90	24	37	48									
H	H41 GLASS REINFORCED PLASTICS PANEL CLADDING / FEATURES; Approved timber framed or Glass Reinforced Plastic off site manufactured entrance porch with slate roofing to match main roof; including supporting framing fixed to masonry walls; generally; 3.47m wide; 600mm projection, to units 5 to 9	1	Nr	£609.95	£609.95	24	37	48									
A	Timber boarding; James Hardiplank timber effect Fibre Cement boarding; over 300mm wide	109	m2	£65.99	£7,192.91	17	29	42	0.872	1300		1.09	1.09	1.09	1235.624	1235.624	1235.624
B	Timber boarding; James Hardiplank timber effect Fibre Cement boarding; not exceeding 300mm wide	32	m	£34.30	£1,097.60	17	29	42	0.256	1300		1.09	1.09	1.09	362.752	362.752	362.752
C	Timber boarding; James Hardiplank timber effect Fibre Cement boarding; over 300mm wide; to soffits; complete with 100mm of approved insulation board	9	m2	£78.66	£707.94	17	29	42	0.072	1300		1.09	1.09	1.09	102.024	102.024	102.024
D	Timber boarding; Abutments; complete with all additional framing and the like; to	22	m	£17.09	£375.98	17	29	42	0.0528	1300		1.09	1.09	1.09	74.8176	74.8176	74.8176
E	Timber boarding; Finished external angles; complete with feature trim and the like; external angles generally	59	m	£13.59	£801.81	17	29	42									
F	Timber boarding; Sills; complete with feature trim and the like; sills generally	48	m	£13.59	£652.32	17	29	42									
G	Timber boarding; Holes, generally	1	ITEM	£100.00	£100.00	17	29	42									
H	Timber boarding; Raking cutting to tops of walls, generally	20	m	£4.00	£80.00	17	29	42									
I	Timber boarding; to timber store; Assumed to be preservative treated tongue and groove 凹槽 horizontal boarding; in 19 x 150mm planks, secret fixed to timber framing; walls; over 300mm wide	21	m2	£65.79	£1,381.59	17	29	42	0.399	480		0.72	0.72	0.72	137.8944	137.8944	137.8944
J	Timber boarding; to timber store; Finished external angles; complete with feature trim and the like; external angles generally	13	m	£20.30	£263.90	17	29	42	0.0312	480		0.72	0.72	0.72	10.78272	10.78272	10.78272
K	Timber boarding; to timber store; Sills基石; complete with feature trim and the like; sills generally	8	m	£7.84	£62.72	17	29	42									
L	Timber boarding; to timber store; Raking cutting to tops of walls; generally	6	m	£4.84	£29.04	17	29	42									
M	Timber boarding; to car port; Assumed to be preservative treated tongue and groove horizontal boarding; in 19 x 150mm planks, secret fixed to timber framing; walls; over 300mm wide	44	m2	£65.79	£2,894.76	17	29	42	0.836	480		0.72	0.72	0.72	288.9216	288.9216	288.9216
A	Timber boarding; to car port; Finished external angles; complete with feature trim and the like; external angles generally	5	m	£13.09	£65.45	17	29	42	0.012	480		0.72	0.72	0.72	4.1472	4.1472	4.1472
B	Timber boarding; to car port; Finished ends; complete with feature trim and the like; open abutments generally	5	m	£13.09	£65.45	17	29	42	0.012	480		0.72	0.72	0.72	4.1472	4.1472	4.1472
C	Timber boarding; to car port; Sills; complete with feature trim and the like;	20	m	£13.09	£261.80	17	29	42	0.048	480		0.72	0.72	0.72	16.5888	16.5888	16.5888
D	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; fixed to masonry walls with approved brackets; 2710mm long; 1100mm high; to unit 2	1	Nr	£2,149.31	£2,149.31	15	20	25	0.0049014	8000		6.15	6.15	6.15	241.149588	241.149588	241.149588
E	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; 500mm high; to unit 10	6	m	£607.95	£3,647.70	15	20	25	0.0108518	8000		6.15	6.15	6.15	533.910528	533.910528	533.910528
F	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; 1100mm high; to unit 3 and 4	17	m	£623.25	£10,595.25	15	20	25	3.074688	8000		6.15	6.15	6.15	151274.65	151274.65	151274.65
G	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; 1500mm high; to unit 3 and 4; obscure	3	m	£1,001.89	£3,005.67	15	20	25	0.542592	8000		6.15	6.15	6.15	26695.5264	26695.5264	26695.5264
H	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; ends / abutments to walls	5	Nr	£95.91	£479.55	15	20	25									
I	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets;	4	Nr	£95.91	£383.64	15	20	25									
J	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets;	1	Nr	£95.91	£95.91	15	20	25									
K	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; 1100mm high; to unit 3 and 4	24	m	£586.86	£14,084.64	15	20	25	4.340736	8000		6.15	6.15	6.15	213564.211	213564.211	213564.211
L	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets; ends / abutments to walls	8	Nr	£95.91	£767.28	15	20	25									
M	Assumed to be stainless steel framed balustrading, with safety laminated glass infill panels; clamp fixed at base to masonry walls with approved brackets;	8	Nr	£95.91	£767.28	15	20	25									
A	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS; Proprietary two coat render system; to blockwork, through colour, over 300mm wide	954	m2	£26.00	£24,804.00	32	52	81	9.54	1900		0.174	0.174	0.174	3153.924	3153.924	3153.924
B	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS; Proprietary two coat render system; to blockwork, through colour, not exceeding 300mm wide	338	m	£8.00	£2,704.00	32	52	81	1.014	1900		0.174	0.174	0.174	335.2284	335.2284	335.2284
C	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS; Waterproof proprietary two coat render system; to blockwork, through colour, over 300mm wide	80	m2	£52.00	£4,160.00	32	52	81	0.8	1900		0.174	0.174	0.174	264.48	264.48	264.48
D	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS; Waterproof proprietary two coat render system; to blockwork, through colour, not exceeding 300mm wide	26	m	£10.00	£260.00	32	52	81	0.078	1900		0.174	0.174	0.174	25.7868	25.7868	25.7868
E	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS; Waterproof proprietary two coat render system; to blockwork, through colour, Approved beads to suit render system, external angle beads	495	m	£1.15	£569.25	32	52	81									
F	M20 PLASTERED /RENDERED /ROUGHCAST COATINGS; Waterproof proprietary two coat render system; to blockwork, through colour, Approved beads to suit render system, bellcast stop bead	230	m	£1.15	£264.50	32	52	81									
E	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 570 x 1210mm; plots 5, 6, 7, 8 and 9; reference W03, W05, W08, W13, W19 and W21;	6	Nr	£10,004.50	£60,027.00	22	34	45	0.08208	140		0.91	0.91	0.91	10.456992	10.456992	10.456992
F	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 685 x 685mm; plot 10; reference W08;	1	Nr	£35.00	£35.00	22	34	45	0.0093845	140		0.91	0.91	0.91	1.1955853	1.1955853	1.1955853
G	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 685 x 685mm; plot 10; references W04 and W07; comprising of 1Nr obscure glazed	2	Nr	£35.00	£70.00	22	34	45	0.018769	140		0.91	0.91	0.91	2.3911706	2.3911706	2.3911706

A	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 685 x 1060mm; plots 3 and 4; references W02, W05, W07, W08, W13 and W14;	6	Nr	£35.00	£210.00	22	34	45	0.087132	140	0.91	0.91	0.91	11.1006168	11.1006168	11.1006168
B	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation;685 x 1060mm; plots 1 and 2; references W04, W15 and W16; comprising of 1Nr obscure	3	Nr	£35.00	£105.00	22	34	45	0.043566	140	0.91	0.91	0.91	5.5503084	5.5503084	5.5503084
C	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation;685 x 1210mm; plot 10; reference W01;	1	Nr	£35.00	£35.00	22	34	45	0.016577	140	0.91	0.91	0.91	2.1119098	2.1119098	2.1119098
D	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation;685 x 1210mm; plot 10; reference W02; egress window comprising of 1Nr side opening	1	Nr	£35.00	£35.00	22	34	45	0.016577	140	0.91	0.91	0.91	2.1119098	2.1119098	2.1119098
E	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 685 x 1210mm; plot 10; reference W05;	1	Nr	£35.00	£35.00	22	34	45	0.016577	140	0.91	0.91	0.91	2.1119098	2.1119098	2.1119098
F	comprising of 1Nr obscure glazed side																
G	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 685 x 1810mm; plot 10; reference W06;	1	Nr	£38.00	£38.00	22	34	45	0.024797	140	0.91	0.91	0.91	3.1591378	3.1591378	3.1591378
H	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1023 x 1210mm; plots 5, 6, 7, 8 and 9; references W24, W25 and W26; comprising of 1Nr	3	Nr	£38.00	£114.00	22	34	45	0.0742698	140	0.91	0.91	0.91	9.46197252	9.46197252	9.46197252
I	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1023 x 1210mm; plots 5, 6, 7, 8 and 9; reference W23; egress window comprising of 1Nr	1	Nr	£38.00	£38.00	22	34	45	0.0247566	140	0.91	0.91	0.91	3.15399084	3.15399084	3.15399084
J	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1135 x 1060mm; plots 1 and 2; reference W09;	1	Nr	£38.00	£38.00	22	34	45	0.024062	140	0.91	0.91	0.91	3.0654988	3.0654988	3.0654988
K	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1135 x 1360mm; plots 1 and 2; references W05, W06 and W11; comprising of 2Nr side	3	Nr	£38.00	£114.00	22	34	45	0.092616	140	0.91	0.91	0.91	11.7992784	11.7992784	11.7992784
L	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1135 x 1360mm; plots 1 and 2; reference W12; egress window comprising of 2Nr side	1	Nr	£38.00	£38.00	22	34	45	0.030872	140	0.91	0.91	0.91	3.9330928	3.9330928	3.9330928
M	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1135 x 1660mm; plots 1 and 2; reference W08;	1	Nr	£38.00	£38.00	22	34	45	0.037682	140	0.91	0.91	0.91	4.8006868	4.8006868	4.8006868
	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1248 x 685mm; plots 1 and 2; reference W10; comprising of 1Nr obscure glazed bottom	1	Nr	£35.00	£35.00	22	34	45	0.0170976	140	0.91	0.91	0.91	2.17823424	2.17823424	2.17823424

N	Sashless无窗框的 Windows Company Limited; white flush casement timber windows; handles to match style of internal door handles and be of brushed stainless steel; complete unit comprising all framing, EPDM seals (minimum of 300mm wide), ironmongery, opening restrictors, insulated infill panels, aluminium sill and head flashings, sill and head ends, sealant internally and externally, trickle vents and the like as required to complete the installation; 1248 x 1210mm; plots 3 and 4; references W01 and W06; comprising of 1Nr side opening	2	Nr	£38.00	£76.00	22	34	45	0.0604032	140	0.91	0.91	0.91	7.69536768	7.69536768	7.69536768
A	Bill 9 Windows and External Doors; 1248 x 1210mm; plots 5, 6, 7, 8 and 9; references W04, W06, W07, W11, W12, W16, W20, W22 and W33; comprising of 1Nr side opening pane and 1Nr fixed pane	9	Nr	£38.00	£342.00	22	34	45	0.2718144	140	0.91	0.91	0.91	34.6291546	34.6291546	34.6291546
B	Bill 9 Windows and External Doors; 1248 x 1210mm; plots 3 and 4; references W03, W04, W09, W10, W11 and W12; egress window comprising of 1Nr side opening pane and 1Nr fixed pane	6	Nr	£38.00	£228.00	22	34	45	0.1812096	140	0.91	0.91	0.91	23.086103	23.086103	23.086103
C	Bill 9 Windows and External Doors; 1248 x 1210mm; plots 5, 6, 7, 8 and 9; references W01, W02, W09, W10, W14, W15, W17 and W18; egress window comprising of 1Nr side opening pane and 1Nr fixed pane	8	Nr	£38.00	£304.00	22	34	45	0.2416128	140	0.91	0.91	0.91	30.7814707	30.7814707	30.7814707
D	Bill 9 Windows and External Doors; 1248 x 1210mm; plot 10; reference W12; comprising of 1Nr side opening pane and	1	Nr	£38.00	£38.00	22	34	45	0.0302016	140	0.91	0.91	0.91	3.84768384	3.84768384	3.84768384
E	Bill 9 Windows and External Doors; 1360 x 1210mm; plots 1 and 2; references W13 and W17; egress window comprising of 2Nr side opening panes and 1Nr fixed pane	2	Nr	£38.00	£76.00	22	34	45	0.065824	140	0.91	0.91	0.91	8.3859776	8.3859776	8.3859776
F	Bill 9 Windows and External Doors; 1360 x 1210mm; plot 10; reference W10; comprising of 2Nr side opening panes and	1	Nr	£38.00	£38.00	22	34	45	0.032912	140	0.91	0.91	0.91	4.1929888	4.1929888	4.1929888
G	Bill 9 Windows and External Doors; 1698 x 1210mm; plots 1 and 2; reference W02; comprising of 2Nr obscure glazed side opening panes and 1Nr obscure glazed	1	Nr	£38.00	£38.00	22	34	45	0.0410916	140	0.91	0.91	0.91	5.23506984	5.23506984	5.23506984
H	Bill 9 Windows and External Doors; 1698 x 1210mm; plot 10; reference W11; comprising of 2Nr obscure glazed side opening panes and 1Nr obscure glazed	1	Nr	£38.00	£38.00	22	34	45	0.0410916	140	0.91	0.91	0.91	5.23506984	5.23506984	5.23506984
I	Bill 9 Windows and External Doors; 1810 x 1210mm; plots 1 and 2; reference W01; comprising of 2Nr side opening panes and 1Nr fixed pane	1	Nr	£38.00	£38.00	22	34	45	0.043802	140	0.91	0.91	0.91	5.5803748	5.5803748	5.5803748
J	Bill 9 Windows and External Doors; 1810 x 1210mm; plot 10; reference W09; comprising of 2Nr side opening panes and	1	Nr	£38.00	£38.00	22	34	45	0.043802	140	0.91	0.91	0.91	5.5803748	5.5803748	5.5803748
K	Bill 9 Windows and External Doors; 1810 x 1210mm; plots 1 and 2; reference W03, W07 and W14; egress windows comprising of 2Nr side opening panes and 1Nr fixed	3	Nr	£38.00	£114.00	22	34	45	0.131406	140	0.91	0.91	0.91	16.7411244	16.7411244	16.7411244
L	Bill 9 Windows and External Doors; 1810 x 1210mm; plot 10; reference W03; egress windows comprising of 2Nr side opening panes and 1Nr fixed pane	1	Nr	£38.00	£38.00	22	34	45	4.3802	140	0.91	0.91	0.91	558.03748	558.03748	558.03748
A	Velux windows; 550 x 980mm; plots 5, 6, 7, 8 and 9; references W35, W36 and W37	3	Nr	£585.00	£1,755.00	24	35	45	0.03234	140	0.91	0.91	0.91	4.120116	4.120116	4.120116
B	Velux windows; 660 x 1398mm; plots 5, 6, 7, 8 and 9; references W27, W28, W29, W30, W31 and W32	6	Nr	£690.00	£4,140.00	24	35	45	0.1107216	140	0.91	0.91	0.91	14.1059318	14.1059318	14.1059318
C	The Rooflight Company Plateau Slimline Profile or similar approved; flat rooflight; 669 x 690mm; plots 5, 6, 7, 8 and 9;	1	Nr	£1,438.00	£1,438.00	24	35	45	0.0089512	140	0.91	0.91	0.91	1.14038543	1.14038543	1.14038543
D	Triangle roof element; 2900 x 1020mm (maximum height); plots 5, 6, 7, 8 and 9; reference W40	1	Nr	£165.00	£165.00	24	35	45	0.05916	140	0.91	0.91	0.91	7.536984	7.536984	7.536984
E	Patio / French doorset; Profile 22 uPVC or similar approved; glazed with Ovolo beads;玻璃粉; 1810 x 2110; plot 10; reference ED02; safety glazed single door with 2Nr safety glazed side lights and 2Nr top hung opening vents	1	Nr	£1,183.15	£1,183.15	22	32	41	0.076382	1430	3.1	3.1	3.1	338.601406	338.601406	338.601406
F	Patio / French doorset; Profile 22 uPVC or similar approved; glazed with Ovolo beads;玻璃粉; 2730 x 2110; plots 1 and 2; reference ED05; double door with 6Nr side lights and 2Nr top hung opening vents	1	Nr	£1,183.15	£1,183.15	22	32	41	0.115206	1430	3.1	3.1	3.1	510.708198	510.708198	510.708198
G	Patio / French doorset; Profile 22 uPVC or similar approved; glazed with Ovolo beads;玻璃粉; 2940 x 2110; plots 3 and 4; references ED05 and ED06; safety glazed double door with 6Nr safety glazed side lights and 2Nr top hung opening vents	2	Nr	£1,183.15	£2,366.30	22	32	41	0.248136	1430	3.1	3.1	3.1	1099.98689	1099.98689	1099.98689
A	Patio / French doorset; Profile 22 uPVC or similar approved; glazed with Ovolo beads;玻璃粉; 2940 x 2110; plots 5, 6, 7, 8 and 9; references ED02, ED03, ED04, ED05, ED06 and ED07; safety glazed double door with 2Nr safety glazed side lights and 2Nr top hung opening vents	6	Nr	£1,291.98	£7,751.88	22	32	41	0.744408	1430	3.1	3.1	3.1	3299.96066	3299.96066	3299.96066
B	Sashless 无窗框的 Window Company Limited or similar approved; European Oak with a Light Oak finish; PAS 24 door; 1023 x 2110; plots 1 and 2; reference ED02; single door with 1Nr obscure glazed vision panel	1	Nr	£95.00	£95.00	25	39	50	0.0755486	700	0.72	0.72	0.72	38.0764692	38.0764692	38.0764692
C	Sashless 无窗框的 Window Company Limited or similar approved; European Oak with a Light Oak finish; PAS 24 door; 1023 x 2110; plots 1 and 2; reference ED01; single door with 2Nr obscured safety glazed	1	Nr	£95.00	£95.00	25	39	50	0.0755486	700	0.72	0.72	0.72	38.0764692	38.0764692	38.0764692
D	Sashless 无窗框的 Window Company Limited or similar approved; European Oak with a Light Oak finish; PAS 24 door; 1023 x 2110; plots 3 and 4; reference ED01; single door with 1Nr obscure glazed vision panel	1	Nr	£95.00	£95.00	25	39	50	0.0755486	700	0.72	0.72	0.72	38.0764692	38.0764692	38.0764692
E	Sashless 无窗框的 Window Company Limited or similar approved; European Oak with a Light Oak finish; PAS 24 door; 1023 x 2110; plots 3 and 4; reference ED02; single door with 4Nr obscure glazed vision panels	1	Nr	£95.00	£95.00	25	39	50	0.0755486	700	0.72	0.72	0.72	38.0764692	38.0764692	38.0764692
F	Sashless 无窗框的 Window Company Limited or similar approved; European Oak with a Light Oak finish; PAS 24 door; 1023 x 2110; plot 10; reference ED01; single door deemed to include 4Nr obscure glazed	1	Nr	£95.00	£95.00	25	39	50	0.0755486	700	0.72	0.72	0.72	38.0764692	38.0764692	38.0764692
A	Front doorset to apartments; FD30S; Vicaima Oak EX5.1 or similar approved; assumed to be PAS 24; timber veneered; 1023 x 2110; plots 5, 6, 7, 8 and 9;	5	Nr	£638.95	£3,194.75	25	39	50	0.3777428	700	0.72	0.72	0.72	190.382346	190.382346	190.382346
B	references ED08, ED09, ED10, ED12 and Front doorset to apartments; FD30S; solid oak high quality bespoke glazed feature front door; 1023 x 2110; plots 5, 6, 7, 8 and 9; reference ED01, single door	1	Nr	£95.00	£95.00	25	39	50	0.0755486	700	0.72	0.72	0.72	38.0764692	38.0764692	38.0764692
C	Front doorset to apartments; FD30S; Visofold 1000 Series or similar approved; white aluminium doors; 2373 x 2110; plots 1 and 2; references ED03 and ED04; safety	2	Nr	£2,775.86	£5,551.72	15	30	38	0.3504921	2700	1.81	9.16	12.79	1712.85489	8668.37062	12103.5437
A	Front doorset to apartments; FD30S; Visofold 1000 Series or similar approved; white aluminium doors; 3610 x 2110; plots 3 and 4; references ED03 and ED04; safety	2	Nr	£3,577.66	£7,155.32	15	30	38	0.533197	2700	1.81	9.16	12.79	2605.73374	13187.0282	18412.892
B	Front doorset to apartments; FD30S; Visofold 1000 Series or similar approved; white aluminium doors; 2598 x 2110; plot 10; reference ED03	1	Nr	£2,835.32	£2,835.32	15	30	38	0.1918623	2700	1.81	9.16	12.79	937.63106	4745.1384	6625.58081
C	Garador or standard 8070 frame or similar approved; recessed with Sherwood metal door with laminated oak finish; 2579 x 2194; plot 10; reference ED04	1	Nr	£1,500.00	£1,500.00	15	30	38	0.2546247	2700	1.81	9.16	12.79	1244.35076	6297.37734	8792.95373
D	Garador or standard 8070 frame or similar approved; recessed with Sherwood metal door with laminated oak finish; 2485 x 2185; garage block; reference ED01, 02, 03,	4	Nr	£1,195.00	£4,780.00	15	30	38	0.9773505	2700	1.81	9.16	12.79	4776.31189	24171.8326	33750.8448
E	External timber door to match timber boarding; 1022.5 x 2110; garage block; reference ED05	1	Nr	£1,094.00	£1,094.00	20	30	40	0.0647243	700	0.72	0.72	0.72	32.621022	32.621022	32.621022
F	M60 PAINTING/CLEAR FINISHING, not exceeding 300mm girth	33	m	£4.00	£132.00											
A	MDF window boards; factory primed; generally; 25 x 250mm; bullnosed profile	33	m	£21.00	£693.00											
B	Veneered timber window boards; generally; 25 x 250mm; bullnosed profile	66	m	£27.00	£1,782.00											
A	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond; laid flat	162	m2	£22.80	£3,693.60	52	72	101	16.2	2200	0.0749	0.107	0.1391	2669.436	3813.48	4957.524
B	100mm thick; in party walls	446	m2	£22.80	£10,168.80	52	72	101	44.6	2200	0.0749	0.107	0.1391	7349.188	10498.84	13648.492
C	Dense aggregate blockwork; 7.3N/mm2 in cement mortar; stretcher bond; laid flat; 215mm thick; assumed to be 100mm blocks laid flat	16	m2	£45.58	£729.28	52	72	101	3.44	2200	0.0749	0.107	0.1391	566.8432	809.776	1052.7088
D	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond; laid flat; cutting blockwork to course 100mm thick	137	m	£5.00	£685.00	52	72	101								
E	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond; laid flat; cutting blockwork to course 100mm thick; raking	78	m	£10.00	£780.00	52	72	101								
F	Dense aggregate blockwork; 7.3N/mm2 nominally 100mm thick; in cement mortar; stretcher bond; laid flat; cutting blockwork to course 215mm thick	6	m	£10.00	£60.00	52	72	101								

G	Forming cavities in hollow walls; complete with Ancon stainless steel HRT4 safety ties at the rate of five per square metre; 100mm wide	263	m2	£18.91	£4,973.33	52	72	101	131.5	8000	6.15	6.15	6.15	6469800	6469800	6469800
H	Cavity closers; 100mm wide, vertical	21	m	£8.15	£171.15	50	75	100								
I	Pre cast concrete lintels; 100 x 215mm deep; building in as work proceeds, to suit structural opening 930mm wide	8	Nr	£31.75	£254.00	51	76	106	0.15996	850	0.18	0.18	0.18	24.47388	24.47388	24.47388
J	Pre cast concrete lintels; 100 x 215mm deep; building in as work proceeds, to suit structural opening 1025mm wide	10	Nr	£32.75	£327.50	51	76	106	0.220375	850	0.18	0.18	0.18	33.717375	33.717375	33.717375
K	Pre cast concrete lintels; 100 x 215mm deep; building in as work proceeds, to suit structural opening 1115mm wide	3	Nr	£35.97	£107.91	51	76	106	0.0719175	850	0.18	0.18	0.18	11.0033775	11.0033775	11.0033775
L	Pre cast concrete lintels; 100 x 215mm deep; building in as work proceeds, to suit structural opening 1275mm wide	1	Nr	£39.65	£39.65	51	76	106	0.0274125	850	0.18	0.18	0.18	4.1941125	4.1941125	4.1941125
M	Sawn softwood, preservative treated, grade C24, wall or partition members, nominally 45 x 89mm	3718	m	£4.10	£15,243.80	39	56	72	14.89059	630	0.59	0.59	0.59	5534.8323	5534.8323	5534.8323
N	Sawn softwood, preservative treated, grade C24, wall or partition members, nominally 45 x 89mm; fixed to screed or	274	m	£4.10	£1,123.40	39	56	72	1.09737	630	0.59	0.59	0.59	407.892429	407.892429	407.892429
A	Standard assumed 12.5mm thick plasterboard linings to timber framing (framing measured elsewhere), generally - measured over openings	1385	m2	£4.90	£6,786.50	39	56	72	17.3125	950	0.39	0.39	0.39	6414.28125	6414.28125	6414.28125
B	Moisture resistant or cement particle board linings assumed 12.5mm thick to timber framing (framing measured elsewhere), generally - measured over	370	m2	£6.40	£2,368.00	39	56	72	4.625	950	0.39	0.39	0.39	1713.5625	1713.5625	1713.5625
C	Gyproc Soundblock board linings, two layers assumed 12.5mm thick to timber framing (framing measured elsewhere), generally - measured over openings	38	m2	£11.70	£444.60	26	39	51	0.475	950	0.39	0.39	0.39	175.9875	175.9875	175.9875
D	Gyproc Soundblock board linings, two layers assumed 12.5mm thick to timber framing (framing measured elsewhere), Angles; complete with all required additional boarding and the like; measured to both sides of walls, generally	417	m	£2.00	£834.00											
E	Gyproc Soundblock board linings, two layers assumed 12.5mm thick to timber framing (framing measured elsewhere), Angles; complete with all required additional boarding and the like; measured to both sides of walls, generally, 45 degree	83	m	£2.00	£166.00											
F	Gyproc Soundblock board linings, two layers assumed 12.5mm thick to timber framing (framing measured elsewhere), Fair ends; complete with all required additional boarding and the like, generally	42	m	£3.00	£126.00											
G	Gyproc Soundblock board linings, two layers assumed 12.5mm thick to timber framing (framing measured elsewhere), Abutments; to masonry walls; complete with all required sealant and the like; measured to both sides of walls, generally	635	m	£1.00	£635.00											
H	deflection heads; nominally 15mm	341	m	£1.20	£409.20											
I	putty油灰 pads to partitions; allowance	211	Nr	£4.50	£949.50											
J	provision of plywood linings between stud framing to accept heavy fixings, future equipment and the like	431	m2	£9.85	£4,245.35											
K	installation of approved acoustic insulation between studs assumed to be Isover 50mm thick	847	m2	£2.70	£2,286.90											
L	forming opening for single leaf floors	65	Nr	£5.00	£325.00											
M	forming opening for pairs of doors	13	Nr	£5.00	£65.00											
N	forming opening for wardrobe doors	6	Nr	£5.00	£30.00											
A	Allow for forming soil pipe casings, comprising of approved 38 x 38mm timber framing构架 at 600mm centres vertically, with vertical framing at all corners and abutments; lining with two layers of Gyproc Soundblock board, two faces,	86	m	£35.65	£3,065.90	18	22	33	1.548	950	0.39	0.39	0.39	573.534	573.534	573.534
B	Allow for forming soil pipe casings, comprising of approved 38 x 38mm timber framing构架 at 600mm centres vertically, with vertical framing at all corners and abutments; lining with two layers of Gyproc Soundblock board, three faces,	4	m	£43.67	£174.68	18	22	33	90	950	0.39	0.39	0.39	33345	33345	33345
A	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 1 and 2; 838 x 1981mm;	5	Nr	£253.43	£1,267.15	28	41	53	0.2905137	700	0.72	0.72	0.72	146.41888	146.41888	146.41888
B	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 1 and 2; 626 x 1981mm;	1	Nr	£303.98	£303.98	28	41	53	0.0434037	700	0.72	0.72	0.72	21.8754698	21.8754698	21.8754698
C	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; double door to plot 1 and 2; 839 x 2100mm;	1	Nr	£474.75	£474.75	28	41	53	0.0616665	700	0.72	0.72	0.72	31.079916	31.079916	31.079916
D	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 3 and 4; 838 x 1981mm;	5	Nr	£241.48	£1,207.40	28	41	53	0.2905137	700	0.72	0.72	0.72	146.41888	146.41888	146.41888
E	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 3 and 4; 686 x 1981mm;	3	Nr	£248.38	£745.14	28	41	53	0.1426914	700	0.72	0.72	0.72	71.9164807	71.9164807	71.9164807
F	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plots 5,6,7,8 and 9; 838 x 1981mm; reference ID01, ID03, ID04, ID07, ID11, ID13, ID14, ID16; assumed to be fire rated	8	Nr	£256.43	£2,051.44	28	41	53	0.4648218	700	0.72	0.72	0.72	234.270207	234.270207	234.270207
G	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 5,6,7,8 and 9; 726 x 1981mm; reference ID17; assumed to be fire rated	1	Nr	£285.08	£285.08	28	41	53	0.0503372	700	0.72	0.72	0.72	25.3699538	25.3699538	25.3699538
H	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; double door to plot 5,6,7,8 and 9; 1062 x 1981mm; reference ID06, ID10; assumed to be fire	2	Nr	£485.20	£970.40	28	41	53	0.1472675	700	0.72	0.72	0.72	74.2228402	74.2228402	74.2228402
I	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 10; 838 x 1981mm; reference	5	Nr	£244.48	£1,222.40	28	41	53	0.2905137	700	0.72	0.72	0.72	146.41888	146.41888	146.41888
J	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 10; 626 x 1981mm; reference	1	Nr	£306.98	£306.98	28	41	53	0.0434037	700	0.72	0.72	0.72	21.8754698	21.8754698	21.8754698
K	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; single door to plot 10; 762 x 1981mm; reference	1	Nr	£239.43	£239.43	28	41	53	0.0528333	700	0.72	0.72	0.72	26.6279681	26.6279681	26.6279681
L	Vicaima or similar approved; internal doors to ground floors, product reference Vicaima Oak with veneer inlay镶嵌; EX5.1/01 or equal and approved; double door to plot 10; 1070 x 1981mm; reference	2	Nr	£451.45	£902.90	28	41	53	0.1483769	700	0.72	0.72	0.72	74.7819576	74.7819576	74.7819576
A	Vicaima or similar approved; internal doors to living rooms, product reference Vicaima Oak with fully glazed infill panel; EX5.1/1/DFG16 or equal and approved; single door to plot 1 and 2; 838 x 1981mm;	2	Nr	£403.06	£806.12	28	41	55	0.1162055	700	0.72	0.72	0.72	58.5675518	58.5675518	58.5675518
B	Vicaima or similar approved; internal doors to living rooms, product reference Vicaima Oak with fully glazed infill panel; EX5.1/1/DFG16 or equal and approved; single door to plot 3 and 4; 838 x 1981mm;	2	Nr	£403.06	£806.12	28	41	55	0.1162055	700	0.72	0.72	0.72	58.5675518	58.5675518	58.5675518
C	Vicaima or similar approved; internal doors to living rooms, product reference Vicaima Oak with fully glazed infill panel; EX5.1/1/DFG16 or equal and approved; single door to plot 5,6,7,8 and 9; 838 x 1981mm; reference ID05, ID12, ID22, ID29; assumed to be fire rated 30 minutes	4	Nr	£592.43	£2,369.72	28	41	55	0.2324109	700	0.72	0.72	0.72	117.135104	117.135104	117.135104
D	Vicaima or similar approved; internal doors to living rooms, product reference Vicaima Oak with fully glazed infill panel; EX5.1/1/DFG16 or equal and approved; single door to plot 10; 838 x 1981mm;	1	Nr	£592.43	£592.43	28	41	55	0.0581027	700	0.72	0.72	0.72	29.2837759	29.2837759	29.2837759
E	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; single door to plot 1 and 2; 838 x 1981mm; reference ID10, ID11, ID12, ID13, ID15,	10	Nr	£205.97	£2,059.70	28	41	55	0.5810273	700	0.72	0.72	0.72	292.837759	292.837759	292.837759
F	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; single door to plot 3 and 4; 838 x 1981mm; reference ID12, ID13, ID14, ID15, ID16,	11	Nr	£205.97	£2,265.67	28	41	55	0.63913	700	0.72	0.72	0.72	322.121535	322.121535	322.121535

G	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; single door to plot 3 and 4; 762 x 1981mm;	1	Nr	£201.40	£201.40	28	41	55	0.0528333	700		0.72	0.72	0.72		26.6279681	26.6279681	26.6279681
H	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; single door to plot 5,6,7,8 and 9; 838 x 1981mm; reference ID18, ID20, ID21, ID24, ID27, ID30, ID31, ID33, ID34, ID35, ID36, ID37, ID38; assumed to be fire rated 30 minutes	13	Nr	£217.92	£2,832.96	28	41	55	0.7553355	700		0.72	0.72	0.72		380.689087	380.689087	380.689087
I	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; single door to plot 5,6,7,8 and 9; 626 x 1447mm; reference ID39, ID42, ID45; assumed to be	3	Nr	£249.02	£747.06	28	41	55	0.0951113	700		0.72	0.72	0.72		47.9361002	47.9361002	47.9361002
J	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; double door to plot 5,6,7,8 and 9; 1062 x 1981mm; reference ID23, ID28; assumed to be fire	2	Nr	£482.46	£964.92	28	41	55	147.26754	700		0.72	0.72	0.72		74222.8402	74222.8402	74222.8402
K	Vicaima or similar approved; internal doors to first floors, product reference Vicaima Oak N1000 plain doors with no inlay; EX5.1/01 or equal and approved; single door to plot 10; 838 x 1981mm; reference	1	Nr	£205.97	£205.97	28	41	55	0.0581027	700		0.72	0.72	0.72		29.2837759	29.2837759	29.2837759
A	Vicaima or similar approved; internal doors to boiler cupboards, product reference Vicaima performance door; single door to plot 1 and 2; 838 x 1981mm; 33 dB acoustic rating; fire rated; reference ID14	1	Nr	£254.52	£254.52	28	41	53	0.0581027	700		0.72	0.72	0.72		29.2837759	29.2837759	29.2837759
B	Vicaima or similar approved; internal doors to boiler cupboards, product reference Vicaima performance door; single door to plot 1 and 2; 726 x 1981mm; 33 dB acoustic rating; fire rated; reference ID17	1	Nr	£299.49	£299.49	28	41	53	0.0503372	700		0.72	0.72	0.72		25.3699538	25.3699538	25.3699538
C	Vicaima or similar approved; internal doors to boiler cupboards, product reference Vicaima performance door; double door to plot 3 and 4; 839 x 1981mm; 33 dB acoustic rating; fire rated; reference ID11	1	Nr	£262.52	£262.52	28	41	53	0.0581721	700		0.72	0.72	0.72		29.3187208	29.3187208	29.3187208
D	Vicaima or similar approved; internal doors to boiler cupboards, product reference Vicaima performance door; single door to plot 3 and 4; 762 x 1981mm; 33 dB acoustic rating; fire rated; reference ID20	1	Nr	£299.49	£299.49	28	41	53	0.0528333	700		0.72	0.72	0.72		26.6279681	26.6279681	26.6279681
E	Vicaima or similar approved; internal doors to boiler cupboards, product reference Vicaima performance door; single door to plot 5,6,7,8 and 9; 926 x 1447mm; 33 dB acoustic rating; fire rated; reference ID02,	5	Nr	£541.68	£2,708.40	28	41	53	0.2344864	700		0.72	0.72	0.72		118.18112	118.18112	118.18112
F	sliderobe door to plot 1 and 2; 2Nr sliding leaves within structural opening of 1828.8 x 2375mm; reference ID23	1	Nr	£620.00	£620.00	28	41	53	0.130302	700		0.72	0.72	0.72		65.672208	65.672208	65.672208
G	sliderobe door to plot 1 and 2; 2Nr sliding leaves within structural opening of 1440 x 2375mm; reference ID24, ID25	2	Nr	£620.00	£1,240.00	28	41	53	0.2052	700		0.72	0.72	0.72		103.4208	103.4208	103.4208
H	sliderobe door to plot 3 and 4; 2Nr sliding leaves within structural opening of 2435 x 2375mm; reference ID25, ID26	2	Nr	£620.00	£1,240.00	28	41	53	0.3469875	700		0.72	0.72	0.72		174.8817	174.8817	174.8817
I	sliderobe door to plot 5,6,7,8 and 9; 2Nr sliding leaves within structural opening of 1828.8 x 2000mm; reference ID40, ID41	2	Nr	£620.00	£1,240.00	28	41	53	0.219456	700		0.72	0.72	0.72		110.605824	110.605824	110.605824
J	sliderobe door to plot 10; 2Nr sliding leaves within structural opening of 1825 x 2025mm; reference ID10	1	Nr	£620.00	£620.00	28	41	53	0.1108688	700		0.72	0.72	0.72		55.87785	55.87785	55.87785
A	UPVC White loft hatch; plot 1 and 2; 900 x 900 mm	2	Nr	£135.00	£270.00	18	26	35	0.0405	1430		3.1	3.1	3.1		179.5365	179.5365	179.5365
B	UPVC White loft hatch; plot 3 and 4; 900 x 900 mm	2	Nr	£135.00	£270.00	18	26	35	0.0405	1430		3.1	3.1	3.1		179.5365	179.5365	179.5365
C	UPVC White loft hatch; plot 10; 900 x 900	1	Nr	£135.00	£135.00	18	26	35	0.02025	1430		3.1	3.1	3.1		89.76825	89.76825	89.76825
D	Dulux water based satin眼子 paint or similar approved; plot 1 and 2; not exceeding 300mm girth	101	m	£2.65	£267.65	6	6	6	30.3			0.44	0.44	0.44	(kgCO2/Sqm)	13.332	13.332	13.332
E	Dulux water based satin眼子 paint or similar approved; plot 3 and 4; not exceeding 300mm girth	115	m	£2.65	£304.75	6	6	6	34.5			0.44	0.44	0.44		15.18	15.18	15.18
F	Dulux water based satin眼子 paint or similar approved; plot 5,6,7,8 and 9; not exceeding 300mm girth	174	m	£2.65	£461.10	6	6	6	52.2			0.44	0.44	0.44		22.968	22.968	22.968
G	Dulux water based satin眼子 paint or similar approved; plot 10; not exceeding	53	m	£2.65	£140.45	6	6	6	15.9			0.44	0.44	0.44		6.996	6.996	6.996
H	Hardwood architraves; 20 x 75mm to match skirtings; finished with DUlux water based satin paint as M60; plot 1 and 2; not exceeding 300mm girth	187	m	£6.70	£1,252.90	29	48	63	0.2805	700		0.72	0.72	0.72		141.372	141.372	141.372
I	Hardwood architraves; 20 x 75mm to match skirtings; finished with DUlux water based satin paint as M60; plot 3 and 4; not exceeding 300mm girth	229	m	£6.70	£1,534.30	29	48	63	0.3435	700		0.72	0.72	0.72		173.124	173.124	173.124
J	Hardwood architraves; 20 x 75mm to match skirtings; finished with DUlux water based satin paint as M60; plot 5,6,7,8 and 9; not exceeding 300mm girth	349	m	£6.70	£2,338.30	29	48	63	0.5235	700		0.72	0.72	0.72		263.844	263.844	263.844
K	Hardwood architraves; 20 x 75mm to match skirtings; finished with DUlux water based satin paint as M60; plot 10; not exceeding 300mm girth	106	m	£6.70	£710.20	29	48	63	0.159	700		0.72	0.72	0.72		80.136	80.136	80.136
L	Denleigh Ironmongery or similar approved; single doors; plot 1 and 2; generally	13	Nr	£56.70	£737.10	12	17	24	0.000312	7870		2.03	2.03	2.03		4.9845432	4.9845432	4.9845432
M	Denleigh Ironmongery or similar approved; double doors; plot 1 and 2; generally	2	Nr	£35.00	£70.00	12	17	24	0.000048	7870		2.03	2.03	2.03		0.7668528	0.7668528	0.7668528
N	Denleigh Ironmongery or similar approved; single doors; plot 3 and 4; generally	15	Nr	£58.64	£879.60	12	17	24	0.00036	7870		2.03	2.03	2.03		5.751396	5.751396	5.751396
A	Denleigh Ironmongery or similar approved; double doors; plot 3 and 4; generally	2	Nr	£35.00	£70.00	12	17	24	0.000048	7870		2.03	2.03	2.03		0.7668528	0.7668528	0.7668528
B	Denleigh Ironmongery or similar approved; single doors; plot 5,6,7,8 and 9; generally	18	Nr	£68.91	£1,240.38	12	17	24	0.000432	7870		2.03	2.03	2.03		6.9016752	6.9016752	6.9016752
C	Denleigh Ironmongery or similar approved; double doors; plot 5,6,7,8 and 9; generally	18	Nr	£35.00	£630.00	12	17	24	0.000432	7870		2.03	2.03	2.03		6.9016752	6.9016752	6.9016752
D	Denleigh Ironmongery or similar approved; single doors; plot 10; generally	6	Nr	£63.98	£383.88	12	17	24	0.000144	7870		2.03	2.03	2.03		2.3005584	2.3005584	2.3005584
E	Denleigh Ironmongery or similar approved; double doors; plot 10; generally	4	Nr	£35.00	£140.00	12	17	24	0.000096	7870		2.03	2.03	2.03		1.5337056	1.5337056	1.5337056
F	Denleigh Ironmongery or similar approved; single doors; plot 1 and 2; generally	7	Nr	£29.00	£203.00	12	17	24	0.000168	7870		2.03	2.03	2.03		2.6839848	2.6839848	2.6839848
G	Denleigh Ironmongery or similar approved; single doors; plot 3 and 4; generally	8	Nr	£29.00	£232.00	12	17	24	0.000192	7870		2.03	2.03	2.03		3.0674112	3.0674112	3.0674112
H	Denleigh Ironmongery or similar approved; single doors; plot 5,6,7,8 and 9; generally	11	Nr	£29.00	£319.00	12	17	24	0.000264	7870		2.03	2.03	2.03		4.2176904	4.2176904	4.2176904
I	Denleigh Ironmongery or similar approved; single doors; plot 10; generally	3	Nr	£29.00	£87.00	12	17	24	0.000072	7870		2.03	2.03	2.03		1.1502792	1.1502792	1.1502792
J	Bedding and pointing with approved polysulphide sealant; to suit fire and acoustic rating, plot 1 and 2	101	m	£1.25	£126.25	5	15	25	1.01	1700		0.435	0.435	0.435	kgCO2/m	43.935	43.935	43.935
K	Bedding and pointing with approved polysulphide sealant; to suit fire and acoustic rating, plot 3 and 4	115	m	£1.25	£143.75	5	15	25	0.0115	1700		0.435	0.435	0.435		50.025	50.025	50.025
L	Bedding and pointing with approved polysulphide sealant; to suit fire and acoustic rating, plot 5,6,7,8 and 9; fire	174	m	£1.99	£346.26	5	15	25	0.0174	1700		0.435	0.435	0.435		75.69	75.69	75.69
M	Bedding and pointing with approved polysulphide sealant; to suit fire and acoustic rating, plot 10	53	m	£1.25	£66.25	5	15	25	0.0053	1700		0.435	0.435	0.435		23.055	23.055	23.055
A	Standard assumed 12.5mm thick plasterboard linings fixed with plasterboard dabs to masonry (measured elsewhere), generally, over 300mm wide	1654	m2	£8.40	£13,893.60	26	39	51	20.675	950		0.39	0.39	0.39		7660.0875	7660.0875	7660.0875
B	Standard assumed 12.5mm thick plasterboard linings fixed with plasterboard dabs to masonry (measured elsewhere), generally, not exceeding	356	m	£5.30	£1,886.80	26	39	51	1.335	950		0.39	0.39	0.39		494.6175	494.6175	494.6175
C	Moisture resistant or cement particle board linings assumed 12.5mm thick to timber framing, generally; over 300mm	218	m2	£6.40	£1,395.20	28	42	53	2.725	350		1.09	1.09	1.09		1039.5875	1039.5875	1039.5875
D	Moisture resistant or cement particle board linings assumed 12.5mm thick to timber framing, generally, not exceeding 300mm wide	66	m	£4.25	£280.50	28	42	53	0.2475	350		1.09	1.09	1.09		94.42125	94.42125	94.42125
E	Allow for forming pipe casings包裹 and low level boxings, comprising of approved 38 x 38mm timber framing at 600mm centres vertically, with vertical framing at all corners and abutments and 450mm centres horizontally; lining with one layer of Gyproc Soundblock board and one layer of moisture resistant board, generally; over	80	m2	£43.04	£3,443.20	41	68	107	1.2	950		0.39	0.39	0.39		444.6	444.6	444.6
F	Allow for forming pipe casings包裹 and low level boxings, comprising of approved 38 x 38mm timber framing at 600mm centres vertically, with vertical framing at all corners and abutments and 450mm centres horizontally; lining with one layer of Gyproc Soundblock board and one layer of moisture resistant board, generally; not exceeding 300mm wide	27	m	£23.87	£644.49	41	68	107	0.1215	950		0.39	0.39	0.39		45.01575	45.01575	45.01575
G	Plaster; one coat skim of gypsum board finish plaster; 3mm thick; trowelling抹平 smooth; walls, over 300mm wide	3666	m2	£5.00	£18,330.00	23	38	48	10.998	950		0.39	0.39	0.39		4074.759	4074.759	4074.759
H	Plaster; one coat skim of gypsum board finish plaster; 3mm thick; trowelling抹平 smooth; walls, not exceeding 300mm wide	645	m	£3.00	£1,935.00	23	38	48	0.5805	950		0.39	0.39	0.39		215.07525	215.07525	215.07525
I	thin angle bead	778	m	£1.65	£1,283.70													
A	Large format ceramic陶瓷的 wall tiles; complete with approved adhesive and coloured grout; over 300mm wide	312	m2	£46.00	£14,352.00	16	27	41	1.56	2000		0.78	0.78	0.78		2433.6	2433.6	2433.6

B	Large format ceramic陶瓷的 wall tiles; complete with approved adhesive and coloured grout; not exceeding 300mm	42	m	£13.80	£579.60	16	27	41	0.063	2000		0.78	0.78	0.78		98.28	98.28	98.28
C	Stainless steel perimeter边缘 trim装饰 beads, generally	209	m	£9.00	£1,881.00													
D	Approved sanitary grade white sealant to internal joints and the like, generally; 8 x 8mm fillet	305	m	£0.92	£280.60				0.01952	1700		0.435	0.435	0.435	(kgCO2/m)	132.675	132.675	132.675
E	Assumed to be Dulux Trade Diamond Matt Emulsion or similar, over 300 girth	3459	m2	£4.35	£15,046.65	5	8	12	1037.7			0.44	0.44	0.44	(kgCO2/Sqm)	1521.96	1521.96	1521.96
F	Assumed to be Dulux Trade Diamond Matt Emulsion or similar, over 300 girth	283	m2	£4.35	£1,231.05	5	8	12	84.9			0.44	0.44	0.44	(kgCO2/Sqm)	124.52	124.52	124.52
A	Harlech select oak lacquered涂漆, 5mm thick veneered 薄片镶嵌 floor or similar approved; over 300mm wide	176	m2	£130.00	£22,880.00	29	48	63	0.528	700		0.72	0.72	0.72		266.112	266.112	266.112
B	Screed construction; level or to falls only not exceeding 15 degrees from horizontal	803	m2	£14.00	£11,242.00	30	48	63	56.21	2100		0.221	0.221	0.221		26087.061	26087.061	26087.061
C	Screed construction; level or to falls only not exceeding 15 degrees from horizontal; to garage; Provisional Quantity	16	m2	£14.00	£224.00	30	48	63	1.12	2100		0.221	0.221	0.221		519.792	519.792	519.792
D	Screed construction; level or to falls only not exceeding 15 degrees from horizontal; landings	3	m2	£14.00	£42.00	30	48	63	0.21	2100		0.221	0.221	0.221		97.461	97.461	97.461
E	Screed construction; perimeter isolation strip including mastic sealant where	1095	m	£1.50	£1,642.50	30	48	63										
F	Screed construction; forming recess壁凹 for entrance matting	4	m2	£10.00	£40.00	30	48	63										
G	Screed construction; construction joints	1	ITEM	Included	Included													
H	Screed construction; forming holes for shower gullies 水沟	1	ITEM	Included	Included													
I	Visqueen 1000gauge厚度／直径 DPM separating membrane	803	m2	£1.00	£803.00	10	20	30	0.2409	32		4.2	4.2	4.2		32.37696	32.37696	32.37696
J	2000 gauge DPM	483	m2	£1.50	£724.50	10	20	30	0.1449	32		4.2	4.2	4.2		19.47456	19.47456	19.47456
K	Trowelling smooth, generally	803	m2	Included	Included													
L	Latex smoothing compound, level or to falls only not exceeding 15 degrees from horizontal - Provisional Quantity	738	m2	£6.54	£4,826.52	18	29	40	2.214	2100		0.74	0.74	0.74		3440.556	3440.556	3440.556
M	Latex smoothing compound, level or to falls only not exceeding 15 degrees from horizontal - Provisional Quantity; landings	3	m2	£6.54	£19.62	18	29	40	0.009	2100		0.74	0.74	0.74		13.986	13.986	13.986
A	Liquid damp proof membrane; trowelling smooth; vinyl and rubber floors, level or to falls only not exceeding 15 degrees from horizontal - Provisional Quantity	738	m2	£8.74	£6,450.12	10	20	30	2.214	32		4.2	4.2	4.2		297.5616	297.5616	297.5616
B	Liquid damp proof membrane; trowelling smooth; vinyl and rubber floors, level or to falls only not exceeding 15 degrees from horizontal - Provisional Quantity; landings	3	m2	£8.74	£26.22	10	20	30	0.009	32		4.2	4.2	4.2		1.2096	1.2096	1.2096
C	Ceramic floor tiling; level or to falls	104	m2	£66.00	£6,864.00	10	20	30	0.52	1700		0.78	0.78	0.78		689.52	689.52	689.52
D	Ceramic floor tiling; Tiled skirting -	184	m	£11.45	£2,106.80	11	18	25	flexible tile vinyl									
E	New Oaklands 80/20/50oz or similar approved on and including PU foam underlay; over 300mm wide	778	m2	£44.45	£34,582.10	8	13	19				4.38	4.38	4.38	(kgCO2/Sqm)	3407.64	3407.64	3407.64
F	New Oaklands 80/20/50oz or similar approved on and including PU foam underlay; risers; not exceeding 300mm	96	m	£14.99	£1,439.04	7	11	16	28.8			4.38	4.38	4.38		126.144	126.144	126.144
G	New Oaklands 80/20/50oz or similar approved on and including PU foam underlay; treads; not exceeding 300mm	79	m	£14.99	£1,184.21	7	11	16	23.7			4.38	4.38	4.38		103.806	103.806	103.806
H	New Oaklands 80/20/50oz or similar approved on and including PU foam underlay; winder treads; over 300mm wide	2	m2	£19.99	£39.98	7	11	16				4.38	4.38	4.38		8.76	8.76	8.76
I	Stair nosings, generally - to all staircases	91	m	£19.99	£1,819.09	7	11	16										
J	Stair nosings, generally; winder stairs	6	m	£29.99	£179.94	7	11	16										
A	generally; wood to carpet; to match wood flooring	62	m	£17.50	£1,085.00													
B	generally; wood to tile; to match wood flooring	8	m	£17.50	£140.00													
C	generally; wood to wood; to match wood flooring	11	m	£17.50	£192.50													
D	generally; carpet to tile; metal in gold or	17	m	£9.50	£161.50													
E	Dulux Trade water based satin or similar approved; not exceeding 300mm girth	839	m	£2.85	£2,391.15	29	48	63	251.7			0.44	0.44	0.44	(kgCO2/Sqm)	110.748	110.748	110.748
F	Dulux Trade water based satin or similar approved; Paint to enhanced skirtings in hallways, not exceeding 300mm girth	103	m	£3.00	£309.00	29	48	63	30.9			0.44	0.44	0.44	(kgCO2/Sqm)	13.596	13.596	13.596
G	Coir entrance matwell mat; over 300mm	4	m2	£81.10	£324.40	5	7	10				6.26	6.26	6.26	(kgCO2/Sqm)			
H	Entrance matting frame; generally	17	m	£24.35	£413.95	41	68	107										
I	Rigid坚硬的 insulation boards; to achieve U Values; tight butt joints; 150mm thick, over 300mm wide	483	m2	£12.95	£6,254.85	50	85	120	72.45	1890		16.5	16.5	16.5		2259353.25	2259353.25	2259353.25
A	Skirtings; MDF, 18mm x 144mm	839	m	£8.06	£6,762.34	21	36	48	2.174688	575		0.74	0.74	0.74		925.329744	925.329744	925.329744
B	Skirtings; MDF, generally; to hallways	103	m	£8.57	£882.71	21	36	48										
C	Sealant joint between bottom of skirting and tiled / timber floors, nominally 6 x 6mm fillet, generally	305	m	£1.25	£381.25	5	15	25	0.01098	1700		0.435	0.435	0.435	(kgCO2/m)	132.675	132.675	132.675
D	Sealant joint between bottom of skirting and tiled / timber floors, nominally 6 x 6mm fillet, generally	943	m	£1.25	£1,178.75	5	15	25	0.033948	1700		0.435	0.435	0.435	(kgCO2/m)	410.205	410.205	410.205
E	Temporary protection of finishes/floors, generally	1057	m2	£2.50	£2,642.50	1	1	1	2.114	920								
F	Temporary protection of finishes/floors, generally; treads	79	m	£3.00	£237.00	1	1	1		920								
G	Temporary protection of finishes/floors, generally; risers	91	m	£3.00	£273.00	1	1	1		920								
H	Temporary protection of finishes/floors, generally; winder treads	2	m2	£2.50	£5.00	1	1	1	0.004	920								
I	Temporary protection of finishes/floors, generally; winder risers	6	m	£3.00	£18.00	1	1	1		920								
J	Cleaning covered floors; generally	1057	m2	£1.50	£1,585.50	1	1	1										
K	Cleaning covered floors; generally; treads	79	m	£1.00	£79.00	1	1	1										
L	Cleaning covered floors; generally; risers	91	m	£1.00	£91.00	1	1	1										
M	Cleaning covered floors; generally; winder treads	2	m2	£1.50	£3.00	1	1	1										
N	Cleaning covered floors; generally; winder risers	6	m	£1.00	£6.00	1	1	1										
A	Plasterboard ceiling; Lafarge standard 15mm wallboard or similar approved;	293	m2	£5.70	£1,670.10	24	40	50	4.395	950		0.39	0.39	0.39		1628.3475	1628.3475	1628.3475
B	Plasterboard ceiling; Lafarge standard 15mm wallboard or similar approved; generally; raking	13	m2	£7.25	£94.25	24	40	50	0.195	950		0.39	0.39	0.39		72.2475	72.2475	72.2475
C	Plasterboard ceiling; pattresses; (allowed for 1nr per 5m2 of ceiling areas) - Provisional Quantities	61	Nr	£4.50	£274.50	24	40	50										
D	Plasterboard ceiling; flush access panels	1	ITEM	£500.00	£500.00	24	40	50										
E	Plasterboard ceiling; Contractor to make allowance for fixing around services	1	ITEM	£500.00	£500.00	1	1	1										
F	Plasterboard ceiling; moisture resistant board in lieu代替 of standard board	25	m2	£1.35	£33.75													
G	Plasterboard ceiling; Lafarge standard 15mm vapour check wallboard or similar approved; generally	273	m2	£7.20	£1,965.60	24	40	50	4.095	950		0.39	0.39	0.39		1517.1975	1517.1975	1517.1975
H	Plasterboard ceiling; Lafarge standard 15mm vapour check wallboard or similar approved; generally; sloping	187	m2	£7.20	£1,346.40	24	40	50	2.805	950		0.39	0.39	0.39		1039.2525	1039.2525	1039.2525
I	Plasterboard ceiling; pattresses; (allowed for 1nr per 5m2 of ceiling areas) - Provisional Quantities	84	Nr	£4.50	£378.00	24	40	50										
J	Plasterboard ceiling; flush access panels	1	ITEM	£500.00	£500.00	24	40	50										
K	Plasterboard ceiling; Contractor to make allowance for fixing around services	1	ITEM	£500.00	£500.00	1	1	1										
L	Plasterboard ceiling; moisture resistant board in lieu of standard board	49	m2	£1.35	£66.15				0.735	950		0.39	0.39	0.39		272.3175	272.3175	272.3175
A	Plasterboard suspended ceiling; Assumed to be an British Gypsum Casoline MF suspended ceiling system or similar	340	m2	£21.30	£7,242.00	17	26	37	5.1	950		0.39	0.39	0.39		1889.55	1889.55	1889.55
B	Plasterboard suspended ceiling; Assumed to be an British Gypsum Casoline MF suspended ceiling system or similar approved; generally; raking	5	m2	£25.00	£125.00	17	26	37	0.075	950		0.39	0.39	0.39		27.7875	27.7875	27.7875
C	Plasterboard suspended ceiling; pattresses; (allowed for 1nr per 5m2 of ceiling areas) - Provisional Quantities	69	Nr	£4.50	£310.50	17	26	37										
D	Plasterboard suspended ceiling; flush access panels	1	ITEM	£500.00	£500.00	17	26	37										
E	Plasterboard suspended ceiling; Contractor to make allowance for fixing around	1	ITEM	£500.00	£500.00	1	1	1										
F	Plasterboard suspended ceiling; moisture resistant board in lieu of standard board	30	m2	£1.35	£40.50				0.45	950		0.39	0.39	0.39		166.725	166.725	166.725
G	Plaster skim coat finish; nominally 3mm thick; over 300mm wide	906	m2	£5.00	£4,530.00	23	38	48	2.718	950		0.39	0.39	0.39		1007.019	1007.019	1007.019
H	Plaster skim coat finish; nominally 3mm thick; over 300mm wide; raking to soffits	205	m2	£5.00	£1,025.00	23	38	48	0.615	950		0.39	0.39	0.39		227.8575	227.8575	227.8575
I	Plaster coving; generally; 125mm girth	1109	m	£3.85	£4,269.65													
J	Plaster coving; corners	470	Nr	£0.50	£235.00													
A	Paint to plasterboard ceilings; Dulux Pure brilliant White emulsion乳胶 or similar approved; over 300mm wide	1009	m2	£3.35	£3,380.15	4	7	11				0.44	0.44	0.44	(kgCO2/Sqm)	443.96	443.96	443.96
B	Paint to plasterboard ceilings; Dulux Pure brilliant White emulsion乳胶 or similar approved; not exceeding 300mm wide	1109	m	£1.00	£1,109.00	4	7	11	332.7			0.44	0.44	0.44	(kgCO2/Sqm)	146.388	146.388	146.388
C	Paint to plasterboard ceilings; Dulux Pure brilliant White emulsion乳胶 or similar approved; over 300mm wide	103	m2	£4.35	£448.05	4	7	11				0.44	0.44	0.44	(kgCO2/Sqm)	45.32	45.32	45.32
A	generally	1	ITEM	£0.00	£0.00													
B	Class C mirrors, silver backed, fixed to walls with adhesive pads; assumed to be 0.60 x 0.90m	10	Nr	£60.00	£600.00	5	7	10	0.0324	2500		0.91	0.91	0.91		73.71	73.71	73.71
C	Class C mirrors, silver backed, fixed to walls with adhesive pads; 1.20 x 1.60m	10	Nr	£211.20	£2,112.00	5	7	10	0.1152	2500		0.91	0.91	0.91		262.08	262.08	262.08
D	PAR softwood shelving units, with wall mounted battens, full depth; allowance for area of 2.00m2 each; generally	20	Nr	£64.78	£1,295.60	10	20	30	1.04	550		0.59	0.59	0.59		337.48	337.48	337.48
E	Portable fire extinguishers; generally	1	ITEM	£650.00	£650.00	10	15	18	5.23125	2500		0.91	0.91	0.91		11901.0938	11901.0938	11901.0938
F	Fire blankets; generally	1	ITEM	£650.00	£650.00	7	7	7	0.00162	2500		0.91	0.91	0.91		3.6855	3.6855	3.6855
G	Kitchen installations; generally	10	Nr	£0.00	£0.00													
A	Manhattan 40mm thick worktop or similar approved; as required to suit kitchens	10	Nr	£0.00	£0.00				0.744	700		0.87	0.87	0.87		453.096	453.096	453.096

B	Manhattan 40mm thick worktop or similar approved; cut outs for sinks	10	Nr	£0.00	£0.00				0.744	700		0.87	0.87	0.87	453.096	453.096	453.096
C	stainless steel single bowl and drainer of 0.9mm minimum thickness; Bristan Java single flow monoblock mixer (chrome);	10	Nr	£0.00	£0.00												
D	generally; assumed to be 1Nr per	10	Nr	£0.00	£0.00												
E	generally; assumed to be 1Nr per	10	Nr	£0.00	£0.00												
F	space for oven	10	Nr	£0.00	£0.00												
G	space for fridge freezer	10	Nr	£0.00	£0.00												
H	General directional signage; generally	1	ITEM	£250.00	£250.00	10	20	30	0.0000189	2700		1.81	9.16	12.79	0.0923643	0.4674348	0.6526737
I	General directional signage; generally	1	ITEM	£250.00	£250.00	10	20	30	0.0000189	2700		1.81	9.16	12.79	0.0923643	0.4674348	0.6526737
A	Fire signage systems, generally	1	ITEM	£250.00	£250.00	10	20	30	0.0000189	2700		1.81	9.16	12.79	0.0923643	0.4674348	0.6526737
B	Fire signage systems, generally	1	ITEM	£250.00	£250.00	10	20	30	0.0000189	2700		1.81	9.16	12.79	0.0923643	0.4674348	0.6526737
A	Above Ground Drainage Installations generally for the construction of the housing units; in accordance with the design criteria provided by the employer's representative - Units 1 and 2	1	ITEM	Included	Included												
B	Above Ground Drainage Installations generally for the construction of the housing units; in accordance with the design criteria provided by the employer's representative - Units 3 and 4	1	ITEM	Included	Included												
C	Above Ground Drainage Installations generally for the construction of the housing units; in accordance with the design criteria provided by the employer's	1	ITEM	Included	Included												
D	Above Ground Drainage Installations generally for the construction of the housing units; in accordance with the design criteria provided by the employer's	1	ITEM	Included	Included												
E	attendance on the installation of the above ground drainage	1	ITEM	Included	Included												
F	special attendance on the installation of the above ground drainage	1	ITEM	Included	Included												
A	Mechanical Installations; in accordance with the design criteria provided by the employer's representative - Units 1 and 2	1	ITEM	£99,590.00	£99,590.00	1	1	1									
B	Mechanical Installations; in accordance with the design criteria provided by the employer's representative - Units 3 and 4	1	ITEM	Included	Included												
C	Mechanical Installations; in accordance with the design criteria provided by the employer's representative - Units 5 to 9	1	ITEM	Included	Included												
D	Mechanical Installations; in accordance with the design criteria provided by the employer's representative - Unit 10	1	ITEM	Included	Included												
E	attendance on the Mechanical Installation contractor	1	ITEM	Included	Included												
F	special attendance on the Mechanical Installation contractor	1	ITEM	Included	Included												
A	Electrical Installations; in accordance with the design criteria provided by the employer's representative - Units 1 and 2	1	ITEM	£74,724.24	£74,724.24	20	30	43	Used electrical circuit								
B	Electrical Installations; in accordance with the design criteria provided by the employer's representative - Units 3 and 4	1	ITEM	Included	Included												
C	Electrical Installations; in accordance with the design criteria provided by the employer's representative - Units 5 to 9	1	ITEM	Included	Included												
D	Electrical Installations; in accordance with the design criteria provided by the employer's representative - Unit 10	1	ITEM	Included	Included												
E	Electrical Installations; lightning protection installation in accordance with the design criteria provided by the employer's representative	1	ITEM	Included	Included												
F	attendance on the Electrical Installation contractor	1	ITEM	Included	Included												
G	special attendance on the Electrical Installation contractor	1	ITEM	Included	Included												
A	Lift Installations; access lift; three floors served, ground, first and second floor; opening on one side; including all front enclosure	1	Nr	£21,385.00	£21,385.00	19	26	34									
B	Lift Installations; fire fighting lift if required	1	ITEM	Declined	Declined												
C	allow for testing on completion and provide test certificate	1	ITEM	Included	Included												
D	allow for commissioning on completion	1	ITEM	Included	Included												
E	provide number of copies as detailed in the Employers Requirements	1	ITEM	Included	Included												
F	Main Contractors Attendances / Works; Provision and installation of lifting beam fixed to structure as required	1	Nr	Declined	Declined												
G	Main Contractors Attendances / Works; Marking positions of and cutting or forming holes mortices and chases in the	1	ITEM	Declined	Declined												
H	Lighting to lift shaft	1	Nr	Declined	Declined												
I	Ventilation to top of shaft, provision of suitable external louvre or vent, complete with ducting as may be required	1	Nr	Declined	Declined												
J	Installation and fixing in of Halfen or similar slot channels to accept lift framework	1	ITEM	Declined	Declined												
K	Installation or secondary steelwork / timber to allow for installation of lift framework to upper levels	1	ITEM	Declined	Declined												
L	Painting within passenger lift shaft with sealer and one coat white masonry paint as	54	m2	£4.00	£216.00	5	8	11									
A	Painting copper pipework; not exceeding 300mm girth - Provisional Quantity	160	m	£2.65	£424.00	28	46	58	48			0.44	0.44	0.44	21.12	21.12	21.12
B	Fire stopping works; generally; at locations of penetrations through internal walls	1	ITEM	Included	Included												
C	Fire stopping works; generally; within cavities of external walls	1	ITEM	Included	Included												
D	Fire stopping works; generally; penetrations in cavities to ceiling	1	ITEM	Included	Included												
E	Air Sealing; provision of sealant and the like to all locations to achieve air sealing	1	ITEM	Included	Included												
F	Builders work in connection with services; all BWIC for the electrical installations as defined by the performance specification for the electrical works	1	ITEM	£10,000.00	£10,000.00	20	30	43									
G	Builders work in connection with services; all BWIC for the mechanical installations as defined by the performance specification for the mechanical works	1	ITEM	Included	Included												
H	Builders work in connection with services; all BWIC for the above ground drainage and rainwater pipes as defined by the performance specification for the mechanical works	1	ITEM	Included	Included												
A	Builders work in connection with services; all BWIC for the lightning protection installations as defined by the performance specification for the mechanical works	1	ITEM	Included	Included												
B	Builders work in connection with services; provision of lightning protection rod pits and housing; Provisional Quantity	9	Nr	Included	Included												
A	Excavating Risk; soft spots; including filling all soft spots with approved granular fill material, compacting and proof rolling - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00												
B	Excavating Risk; Extra over excavation irrespective of depth for excavating; next existing services - to be priced as rate only per cubic metre	0	m	£0.00	£0.00												
C	Excavating Risk; Extra over excavation irrespective of depth for excavating; around existing services crossing excavations - to be priced as rate only per	0	m3	£0.00	£0.00												
D	Excavating Risk; archeological digging on site; complete including the risk of time loss and all elements pertaining to the	1	ITEM	£0.00	£0.00												
E	Excavating Risk; Extra over excavation irrespective of depth for breaking out and removal off site all spoils; rock - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00												
F	Excavating Risk; Extra over excavation irrespective of depth for breaking out and removal off site all spoils; concrete - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00												
G	Excavating Risk; Extra over excavation irrespective of depth for breaking out and removal off site all spoils; reinforced concrete - to be priced as rate only per	0	m3	£0.00	£0.00												
H	Excavating Risk; Extra over excavation irrespective of depth for breaking out and removal off site all spoils; brickwork blockwork or stonework - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00												
I	Excavating Risk; Extra over excavation irrespective of depth for breaking out and removal off site all spoils; contaminated material - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00												
J	Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters; off site	1	ITEM	£199.84	£199.84	1	1	1									
K	Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters; Excavated material; soft spot material - to be priced as rate only per	0	m3	£0.00	£0.00												

L	Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters; Excavated material; extra over off site disposal for the disposal of contaminated material; Contractor to	0	m3	£0.00	£0.00													
A	Excavating, Trenches; over 300mm wide, 1.00m maximum depth	119	m3	£12.96	£1,542.24	500	750	1000		2050		0.024	0.024	0.024		5854.8	5854.8	5854.8
B	Excavating, Pits, tree pits 12 nr, 1.00m maximum depth	12	m3	£16.20	£194.40	500	750	1000		2050		0.024	0.024	0.024		590.4	590.4	590.4
C	Excavating pits	48	m2	£6.48	£311.04	500	750	1000		2240		0.0051	0.0051	0.0051		548.352	548.352	548.352
D	Excavating trenches	226	m2	£3.24	£732.24	500	750	1000		2240		0.0051	0.0051	0.0051		2581.824	2581.824	2581.824
E	Earthwork support, To faces of excavation; 1.00m maximum depth; distance between opposing faces not exceeding 2.00m	274	m2	£3.24	£887.76	500	750	1000		2240		0.0051	0.0051	0.0051		3130.176	3130.176	3130.176
F	Excavated material; off site; it has been assumed all excavated material tol to be taken off site; to be treated as inert hazardous material	131	m3	£35.65	£4,670.15	1	1	1		2050		0.024	0.024	0.024		6445.2	6445.2	6445.2
G	Filling to excavations; over 250mm average thick	12	m3	£36.73	£440.76	100	300	500		2050		0.024	0.024	0.024		590.4	590.4	590.4
H	Imported topsoil. Filling to make up levels; not exceeding 250mm average thick	78	m3	£36.73	£2,864.94	100	300	500		2050		0.024	0.024	0.024		3837.6	3837.6	3837.6
I	Imported topsoil. over 250mm average	71	m3	£36.73	£2,607.83	100	300	500		2050		0.024	0.024	0.024		3493.2	3493.2	3493.2
J	Compacting ground; generally	12	m2	£0.76	£9.12	500	750	1000										
K	Compacting bottoms of excavations;	148	m2	£0.76	£112.48	500	750	1000										
L	Blinding concrete; not exceeding 150mm	7	m3	£149.07	£1,043.49	100	150	200		2100		221.76	221.76	221.76	(kgCO2/m3)	1552.32	1552.32	1552.32
A	Foundations; generally	61	m3	£182.56	£11,136.16	64	108	178		2300		0.0749	0.107	0.1391		10508.47	15012.1	19515.73
B	Formwork for in situ concrete, Sides of ground beams and edges of beds, 250 to	202	m	£23.77	£4,801.54	47	70	110	3.7875	480		8.034	8.034	8.034	(kgCO2/m2)	608.5755	608.5755	608.5755
C	Formwork for in situ concrete, Sides of ground beams and edges of beds, 250 to 500mm high; curved on plan	54	m	£25.93	£1,400.22	47	70	110	2.025	480		8.034	8.034	8.034	(kgCO2/m2)	162.6885	162.6885	162.6885
D	Steel fabric reinforcement to B.S.4483, generally, B785	136	m2	£14.04	£1,909.44	46	70	108				10.245	10.245	10.245	(kgCO2/m2)	1393.32	1393.32	1393.32
E	Dense aggregate blockwork; nominally 7.3 N/mm2 ion cement mortar; assumed to be 215mm thick	20	m2	£45.58	£911.60	52	72	101	4.3	2200		0.0749	0.107	0.1391		708.554	1012.22	1315.886
F	Natural stone rubble walling, nominally 350mm thick	173	m2	£385.04	£66,611.92	43	60	79	60.55	1900								
G	Cappings to stone walls; generally	89	m	£98.04	£8,725.56	43	60	79	0.623	1900								
H	Cappings to stone walls; generally; curved on plan	27	m	£108.04	£2,917.08	43	60	79	0.189	1900								
I	External handrails; Assumed to be polyester powder coated galvanised mild steel handrails; fixed to masonry walls as required, raking	6	m	£176.24	£1,057.44	15	20	25										
J	External handrails; Extra over for, ends	8	Nr	£40.22	£321.76	15	20	25										
A	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and	63	m	£33.49	£2,109.87	60	80	100	2.88225	850		0.18	0.18	0.18		440.98425	440.98425	440.98425
B	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, kerbs, HB2; curved on plan;	5	m	£37.81	£189.05	60	80	100	0.22875	850		0.18	0.18	0.18		34.99875	34.99875	34.99875
C	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, kerbs, BN; conservation format	139	m	£38.89	£5,405.71	60	80	100	6.35925	850		0.18	0.18	0.18		972.96525	972.96525	972.96525
D	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, kerbs, BN; conservation format to match pavings; curved on plan; radius	9	m	£48.61	£437.49	60	80	100	0.41175	850		0.18	0.18	0.18		62.99775	62.99775	62.99775
E	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, kerbs, BN; conservation format to match pavings; curved on plan; radius	33	m	£51.85	£1,711.05	60	80	100	1.50975	850		0.18	0.18	0.18		230.99175	230.99175	230.99175
F	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, path edgings	201	m	£20.52	£4,124.52	60	80	100	9.19575	850		0.18	0.18	0.18		1406.94975	1406.94975	1406.94975
G	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, path edgings; curved on plan	7	m	£22.69	£158.83	60	80	100	0.32025	850		0.18	0.18	0.18		48.99825	48.99825	48.99825
H	Pre cast concrete kerbs侧石, edgings and channels to B.S..340; bedding and flush jointing in cement mortar (1:3); plain concrete (1:3:6) foundations and haunching, extra over for, drop kerbs; HB2	2	Nr	£32.41	£64.82	60	80	100	0.086925	850		0.18	0.18	0.18		13.299525	13.299525	13.299525
I	Granular material, filling to make up levels, not exceeding 250mm average thick	52	m3	£42.13	£2,190.76	100	300	500		2240		0.0051	0.0051	0.0051		594.048	594.048	594.048
J	Granular material, filling to make up levels, over 250mm average thick	290	m3	£42.13	£12,217.70	100	300	500		2240		0.0051	0.0051	0.0051		3312.96	3312.96	3312.96
K	Granular material, filling to make up levels, not exceeding 250mm average thick	207	m3	£36.73	£7,603.11	100	300	500		2240		0.0051	0.0051	0.0051		2364.768	2364.768	2364.768
L	Compacting filling, generally	2002	m2	£0.76	£1,521.52	100	300	500										
M	Reinforced concrete external slabs, beds, not exceeding 150mm thick	6	m3	£178.24	£1,069.44	20	35	45		2300		0.198	0.198	0.198		2732.4	2732.4	2732.4
N	Reinforced concrete external slabs, edges of beds, not exceeding 250mm high	53	m	£23.77	£1,259.81	47	70	110	0.6625	2300		0.198	0.198	0.198		24136.2	24136.2	24136.2
O	Steel fabric reinforcement to B.S..4483, reference A252	37	m2	£14.04	£519.48													
A	Isolation joints; comprising of 25mm thick bitumen impregnated灌注 woodfibre board; with 25 x 25mm sealant to top, to suit 150mm thick slab	53	m	£12.96	£686.88	50	75	100	7.95	180		0.74	0.74	0.74				
B	Assumed to be brush and spade finish, generally	37	m2	£6.48	£239.76													
C	Assumed to be 1000 gauge厚度 polythene聚乙烯 sheeting on and including 25mm of sand blinding, generally	37	m2	£4.32	£159.84													
D	Tarmac road surfacing, Binder course open bin, level or to falls; 60mm thick	828	m2	£15.77	£13,057.56	14	23	32	49.68	1700								
E	Gravel margins, level or to falls; nominally 75mm thick	13	m2	£16.20	£210.60	14	23	32	0.975	2150		0.06	0.06	0.06		125.775	125.775	125.775
F	Marshalls Tegular Block Paving Harvest or similar approved standard 200 x 100 x 80mm block pavings; level or to falls	801	m2	£59.41	£47,587.41	22	34	46	64.08	1920		0.24	0.24	0.24		29528.064	29528.064	29528.064
G	Block paving; to roads and parking bays, extra over for parking delineationlevel or	113	m	£16.20	£1,830.60	22	34	46										
H	Marshalls Tegular Block Paving Harvest or similar approved standard 200 x 100 x 80mm block pavings; level or to falls	85	m2	£59.41	£5,049.85	22	34	46	6.8	1920		0.24	0.24	0.24		3133.44	3133.44	3133.44
A	Comprising of Charcon or similar cropped finish granite blocks 100 x 100 x 100mm; bedding and pointing in Ultracrete flow point rapid setting mortar to concrete bed level or to falls	5	m2	£64.81	£324.05	5	10	15	0.5	2880		0.7	0.7	0.7		1008	1008	1008
B	Assumed to be Marshalls Saxon or similar approved standard 450 x 450 x 50mm block pavings; on and including 30mm thick sand laying bed; level or to falls; to	28	m2	£48.61	£1,361.08	22	34	46	1.4	1920		0.24	0.24	0.24		645.12	645.12	645.12
C	Assumed to be Marshalls Saxon or similar approved standard 450 x 450 x 50mm block pavings; on and including 30mm thick sand laying bed; level or to falls; to pavements and access routes	91	m2	£48.61	£4,423.51	22	34	46	4.55	1920		0.24	0.24	0.24		2096.64	2096.64	2096.64
D	Assumed to be Marshalls Saxon or similar approved standard 450 x 450 x 50mm block pavings; on and including 30mm thick sand laying bed; level or to falls; to private pavements and access routes	64	m2	£48.61	£3,111.04	22	34	46	3.2	1920		0.24	0.24	0.24		1474.56	1474.56	1474.56
E	Paving slabs, extra over for, forming steps; set of two risers; nominally 900mm wide	2	Nr	£124.23	£248.46	22	34	46										
F	Paving slabs, extra over for, forming steps; set of five risers; nominally 900mm wide	1	Nr	£297.07	£297.07	22	34	46										
G	Paving slabs, extra over for, forming steps; set of eight risers; nominally 900mm wide	1	Nr	£621.14	£621.14	22	34	46										
H	Cultivating, surface of ground, nominally 100mm thick to seeded areas	518	m2	N/A	N/A													
I	Cultivating, general surfaces; weed killer and fertiliser, generally	518	m2	N/A	N/A													
J	Seeding, generally; amenity area grass seed	518	m2	N/A	N/A													
A	Provision of maintenance of all soft landscaped areas; for a period of twelve months from Practical Completion or final planting works whichever is the latter; complete with all regular trimming, cutting and the like, generally	1	ITEM	N/A	N/A													
B	Cultivating, surface of filling, topsoil, nominally 250mm deep - infill planting	159	m2	N/A	N/A													
C	Cultivating, weed killer and fertiliser, generally	159	m2	N/A	N/A													
D	Shrub and hedge planting	159	m2	N/A	N/A													
E	Trees planting	12	Nr	N/A	N/A													
F	Provision of maintenance of all soft landscaped areas; for a period of twelve months from Practical Completion or final planting works whichever is the latter; complete with all regular trimming, cutting and the like, generally	1	ITEM	N/A	N/A													
G	Softwood close boarded fencing, comprising of softwood feather edge boards 100 x 25mm; three 75 x 50mm rails and 100 x 100mm posts at 2.40m centres; timber gravel boards; 1200mm high	32	m	£29.36	£939.52	11	19	31										

H	Softwood close boarded fencing, comprising of softwood feather edge boards 100 x 25mm; three 75 x 50mm rails and 100 x 100mm posts at 2.40m centres; timber gravel boards; 1800mm high	17	m	£34.72	£590.24	11	19	31										
I	Softwood close boarded fencing, comprising of softwood feather edge boards 100 x 25mm; three 75 x 50mm rails and 100 x 100mm posts at 2.40m centres; timber gravel boards; 2000mm high,	43	m	£38.96	£1,675.28	11	19	31										
J	Close boarded Fencing, single leaf gates, complete with additional posts and ironmongery, 1800mm high	5	Nr	£197.49	£987.45	17	27	40	steel fencing									
A	Set of approved cast iron gates; including posts, foundations, ironmongery and the like; assumed to be 1200mm high; nominally 1800mm wide	1	Nr	£2,000.00	£2,000.00	17	27	40	steel fencing									
B	Set of approved cast iron gates; including posts, foundations, ironmongery and the like; assumed to be 1200mm high; gate nominally 1200mm wide, with two sets of fencing to match nominally 300mm long	1	Nr	£1,200.00	£1,200.00	17	27	40										
C	external seat, assumed to be of timber construction on galvanised steel frame; generally	1	Nr	£662.04	£662.04	10	15	20	personal estimation									
A	All works identified within the appended Drainage Standard Bill; which includes for all attendances, site surveys and investigations, generally	1	ITEM	£216.05	£216.05	1	1	1										
B	Possible repairs to the existing drainage lines including revamping existing manholes to suit, generally	1	ITEM	£216.05	£216.05	1	1	1										
C	rock	0	m3	£0.00	£0.00													
D	concrete	0	m3	£0.00	£0.00													
E	reinforced concrete	0	m3	£0.00	£0.00													
F	brickwork, blockwork or stonework	0	m3	£0.00	£0.00													
G	excavating soft spots; disposal of surplus material and filling with approved fill to formation level of trench - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00													
H	next existing service - to be priced as rate only per metre	0	m3	£0.00	£0.00													
I	around existing service crossing excavation - to be priced as rate only per crossing	0	m3	£0.00	£0.00													
A	Excavating trenches for drainage pipes; complete with the disposal of surplus materials; for pipes; not exceeding 200mm nominal diameter, average depth 500 to 750mm	114	m	£32.41	£3,694.74	41	63	84	14.25	2050		0.024	0.024	0.024	701.1	701.1	701.1	
B	Excavating trenches for drainage pipes; complete with the disposal of surplus materials; beds and surrounds, to suit 100mm diameter pipe	114	m	£25.93	£2,956.02	41	63	82	0.57	2050		0.024	0.024	0.024	28.044	28.044	28.044	
C	Below ground drainage pipe, approved PVC / Clay pipes, 100mm nominal size	114	m	£11.88	£1,354.32	35	53	70	0.1145472	37		3.23	3.23	3.23	13.6895359	13.6895359	13.6895359	
D	Below ground drainage pipe, bends,	38	Nr	£30.25	£1,149.50	35	53	70										
E	Below ground drainage pipe, rocker pipes, 100mm; to manholes	19	Nr	£30.25	£574.75	35	53	70										
F	Below ground drainage pipe, rest bends, 100mm; complete with concrete base	19	Nr	£34.57	£656.83	35	53	70										
G	Below ground drainage pipe, connection to soil pipes	19	Nr	£37.81	£718.39	35	53	70										
H	Marker tape, non degradable; red with black lettering, laid in trench 450mm above	114	m	£1.08	£123.12	1	1	1										
A	Remove existing drainage installations, cap off and seal existing pipework	1	ITEM	£59.41	£59.41	1	1	1										
B	Remove existing drainage installations, remove manholes; assumed to be masonry construction, assumed to be not exceeding 2.00m deep	1	Nr	£448.30	£448.30	1	1	1										
C	Excavating trenches for drainage pipes; average depth 750 to 1000mm - outside of site boundary	25	m	£34.57	£864.25	500	750	1000	5.0625	2050		0.024	0.024	0.024	249.075	249.075	249.075	
D	Excavating trenches for drainage pipes; average depth 1000 to 1250mm	18	m	£38.89	£700.02	500	750	1000	4.55625	2050		0.024	0.024	0.024	224.1675	224.1675	224.1675	
E	Excavating trenches for drainage pipes; average depth 1250 to 1500mm	24	m	£42.13	£1,011.12	500	750	1000	7.56	2050		0.024	0.024	0.024	371.952	371.952	371.952	
F	Excavating trenches for drainage pipes; average depth 1500 to 1750mm	17	m	£47.53	£808.01	500	750	1000	6.215625	2050		0.024	0.024	0.024	305.80875	305.80875	305.80875	
G	Excavating trenches for drainage pipes; average depth 1750 to 2000mm	19	m	£51.85	£985.15	500	750	1000	8.015625	2050		0.024	0.024	0.024	394.36875	394.36875	394.36875	
H	Excavating trenches for drainage pipes; beds and surrounds, to suit 225mm	103	m	£11.88	£1,223.64	500	750	1000	1.15875	2240		0.0051	0.0051	0.0051	13.23756	13.23756	13.23756	
I	UltraRib Twinwall plastic pipes , 225mm nominal size	103	m	£17.28	£1,779.84	35	53	70	0.2328624	37		3.23	3.23	3.23	27.8293854	27.8293854	27.8293854	
J	Below ground drainage pipe, bends,	10	Nr	£30.25	£302.50	35	53	70										
K	Below ground drainage pipe, rocker pipes, 225mm; to manholes	16	Nr	£30.25	£484.00	35	53	70										
L	Below ground drainage pipe, junction 100 x 225 x 225mm	1	Nr	£37.81	£37.81	35	53	70										
M	Below ground drainage pipe, junction 150 x 225 x 225mm	1	Nr	£37.81	£37.81	35	53	70										
N	Marker tape, non degradable; red with black lettering, laid in trench 450mm above	103	m	£1.08	£111.24	1	1	1										
A	Concrete manhole 1200mm diameter manhole; depth not exceeding 1250mm; assumed D400 recessed cover	1	Nr	£1,528.54	£1,528.54	50	50	50	0.7065	850		0.242	0.242	0.242	145.32705	145.32705	145.32705	
B	Concrete manhole 1200mm diameter manhole; depth not exceeding 1500mm; assumed D400 recessed cover	2	Nr	£1,701.38	£3,402.76	50	50	50	1.6956	850		0.242	0.242	0.242	348.78492	348.78492	348.78492	
C	Concrete manhole 1200mm diameter manhole; depth not exceeding 1750mm; assumed D400 recessed cover	2	Nr	£1,824.53	£3,649.06	50	50	50	1.9782	850		0.242	0.242	0.242	406.91574	406.91574	406.91574	
D	Concrete manhole 1200mm diameter manhole; depth not exceeding 2000mm; assumed D400 recessed cover	1	Nr	£1,993.05	£1,993.05	50	50	50	1.1304	850		0.242	0.242	0.242	232.52328	232.52328	232.52328	
E	works to existing manhole; remove exit pipes and install new 225mm pipe; manhole construction unknown; assumed to be masonry, depth to invert not exceeding 1000mm	1	Nr	£1,420.52	£1,420.52	50	50	50							0	0	0	
F	works to existing manhole; remove exit pipes and install new 225mm pipe; manhole construction unknown; assumed to be masonry, depth to invert not exceeding 2000mm	1	Nr	£1,636.57	£1,636.57	50	50	50							0	0	0	
A	works to existing pipework, at location of existing manhole, connect existing entry pipework to new pipework for manhole to be abandoned and removed; pipe nominally 2.00m to invert, existing 225mm diameter pipe	1	Nr	£837.19	£837.19	35	53	70							0	0	0	
A	Excavating trenches for drainage pipes; average depth 500 to 750mm	4	m	£32.41	£129.64	500	750	1000	0.5	2050		0.024	0.024	0.024	24.6	24.6	24.6	
B	Excavating trenches for drainage pipes; average depth 750 to 1000mm	29	m	£34.57	£1,002.53	500	750	1000	5.075	2050		0.024	0.024	0.024	249.69	249.69	249.69	
C	Excavating trenches for drainage pipes; average depth 1000 to 1250mm	28	m	£38.89	£1,088.92	500	750	1000	6.3	2050		0.024	0.024	0.024	309.96	309.96	309.96	
D	Excavating trenches for drainage pipes; beds an surrounds, to suit 100mm	28	m	£11.88	£332.64	500	750	1000	0.14	2240		0.0051	0.0051	0.0051	1.59936	1.59936	1.59936	
E	Excavating trenches for drainage pipes; beds an surrounds, to suit 100mm	34	m	£25.93	£881.62	500	750	1000	0.17	2240		0.0051	0.0051	0.0051	1.94208	1.94208	1.94208	
F	PVC / Clay pipes 100mm nominal size	62	m	£11.88	£736.56	35	53	70	0.0622976	37		3.23	3.23	3.23	7.44518618	7.44518618	7.44518618	
G	Below ground drainage pipe, bends,	11	Nr	£30.25	£332.75	35	53	70										
H	Below ground drainage pipe, rocker pipes, 100mm; to manholes	16	Nr	£30.25	£484.00	35	53	70										
I	Below ground drainage pipe, external yard gully, complete with trap, grating and cover, bed and surround in concrete	1	Nr	£237.65	£237.65	35	53	70										
J	Marker tape, non degradable; red with black lettering, laid in trench 450mm above	62	m	£1.08	£66.96	1	1	1										
K	manhole not exceeding 750mm deep	3	Nr	£394.29	£1,182.87	50	50	50										
L	manhole not exceeding 1000mm deep	5	Nr	£480.71	£2,403.55	50	50	50										
A	CCTV inspection to all pipelines, generally	1	ITEM	£810.18	£810.18	1	1	1										
B	Testing of manholes and pipelines,	1	ITEM	£378.08	£378.08	1	1	1										
C	Cleaning of pipelines, as required	1	ITEM	£324.07	£324.07	1	1	1										
D	Operating and maintenance manuals, as required	1	ITEM	£270.06	£270.06	1	1	1										
E	Record drawings, as required	1	ITEM	£194.44	£194.44	1	1	1										
A	All works identified within the appended Drainage Standard Bill; generally	1	ITEM	£216.05	£216.05	1	1	1										
B	Possible repairs to the existing drainage lines, generally	1	ITEM	£216.05	£216.05	1	1	1										
A	ACO channels or equal other approved with ductile iron grating to load class D400; complete including excavation, disposal and concrete bed and surround, generally; laid straight	35	m	£156.64	£5,482.40	50	60	70	personal estimation									
B	Extra over slotted drain system for: ends	26	Nr	£27.01	£702.26	50	60	70										
C	Extra over slotted drain system for: outlet connection 100mm diameter	13	Nr	£41.05	£533.65	50	60	70										
D	In situ concrete ST4 foundation to receive pennant / granite setts 200 x 100 x 100mm bedded and pointed in approved mortar; generally; laid straight	49	m	£73.46	£3,599.54	50	60	70										
E	Excavating trenches for drainage pipes; For pipes; not exceeding 200mm nominal diameter, average depth 750 to 1000mm	229	m	£34.57	£7,916.53	500	750	1000	40.075	2050		0.024	0.024	0.024	1971.69	1971.69	1971.69	
F	Excavating trenches for drainage pipes; For pipes; not exceeding 200mm nominal diameter, average depth 1000 to 1250mm	23	m	£38.89	£894.47	500	750	1000	5.175	2050		0.024	0.024	0.024	254.61	254.61	254.61	
G	Excavating trenches for drainage pipes; For pipes; not exceeding 200mm nominal diameter, average depth 1250 to 1500mm	68	m	£42.13	£2,864.84	500	750	1000	18.7	2050		0.024	0.024	0.024	920.04	920.04	920.04	
H	Excavating trenches for drainage pipes; For pipes; 225mm nominal diameter, average depth 1250 to 1500mm	21	m	£51.85	£1,088.85	500	750	1000	6.496875	2050		0.024	0.024	0.024	319.64625	319.64625	319.64625	
I	Excavating trenches for drainage pipes; For pipes; 225mm nominal diameter, average depth 1500 to 1750mm	68	m	£56.17	£3,819.56	500	750	1000	24.8625	2050		0.024	0.024	0.024	1223.235	1223.235	1223.235	

J	Excavating trenches for drainage pipes; For pipes; 300mm nominal diameter, average depth 1250 to 1500mm	4	m	£57.25	£229.00	500	750	1000	1.65	2050		0.024	0.024	0.024	81.18	81.18	81.18
K	Excavating trenches for drainage pipes; For pipes; 300mm nominal diameter, average depth 1500 to 1750mm	12	m	£62.65	£751.80	500	750	100	5.85	2050		0.024	0.024	0.024	287.82	287.82	287.82
L	Excavating trenches for drainage pipes; Beds and surrounds, to suit 100mm	7	m	£11.88	£83.16	500	750	1000	0.035	2240		0.0051	0.0051	0.0051	0.39984	0.39984	0.39984
M	Excavating trenches for drainage pipes; Beds and surrounds, to suit 150mm	83	m	£14.04	£1,165.32	500	750	1000	0.6225	2240		0.0051	0.0051	0.0051	7.11144	7.11144	7.11144
N	Excavating trenches for drainage pipes; Beds and surrounds, to suit 225mm	89	m	£16.20	£1,441.80	500	750	1000	1.00125	2240		0.0051	0.0051	0.0051	11.43828	11.43828	11.43828
O	Excavating trenches for drainage pipes; Beds and surrounds, to suit 300mm	16	m	£20.52	£328.32	500	750	1000	0.24	2240		0.0051	0.0051	0.0051	2.74176	2.74176	2.74176
A	Storm drainage, beds and surrounds, to suit 100mm diameter pipe	194	m	£25.93	£5,030.42	500	750	1000									
B	Storm drainage, beds and surrounds, to suit 150mm diameter pipe	34	m	£28.09	£955.06	500	750	1000									
C	Below ground drainage pipe, PVC / Clay pipes, 100mm nominal size	202	m	£11.88	£2,399.76	35	53	70	0.2029696	37		3.23	3.23	3.23	24.2568969	24.2568969	24.2568969
D	Below ground drainage pipe, PVC / Clay pipes, 150mm nominal size	117	m	£14.04	£1,642.68	35	53	70	0.1763424	37		3.23	3.23	3.23	21.0746802	21.0746802	21.0746802
E	Below ground drainage pipe, PVC / Clay pipes, 225mm nominal size	89	m	£17.28	£1,537.92	35	53	70	0.2012112	37		3.23	3.23	3.23	24.0467505	24.0467505	24.0467505
F	Below ground drainage pipe, PVC / Clay pipes, 300mm nominal size	16	m	£25.93	£414.88	35	53	70	0.0482304	37		3.23	3.23	3.23	5.7640151	5.7640151	5.7640151
G	Below ground drainage pipe, bends,	130	Nr	£27.01	£3,511.30	35	53	70									
H	Below ground drainage pipe, bends,	65	Nr	£30.25	£1,966.25	35	53	70									
I	Below ground drainage pipe, bends,	24	Nr	£32.41	£777.84	35	53	70									
J	Below ground drainage pipe, bends,	3	Nr	£41.05	£123.15	35	53	70									
K	Below ground drainage pipe, rocker pipes, 100mm; to manholes	27	Nr	£27.01	£729.27	35	53	70									
L	Below ground drainage pipe, rocker pipes, 150mm; to manholes	18	Nr	£30.25	£544.50	35	53	70									
M	Below ground drainage pipe, rocker pipes, 225mm; to manholes	14	Nr	£32.41	£453.74	35	53	70									
N	Below ground drainage pipe, rocker pipes, 300mm; to manholes	6	Nr	£38.89	£233.34	35	53	70									
O	Below ground drainage pipe, junctions, 100 x 100 x 100mm	14	Nr	£37.81	£529.34	35	53	70									
P	Below ground drainage pipe, junctions, 100 x 150 x 150mm	2	Nr	£37.81	£75.62	35	53	70									
Q	Below ground drainage pipe, junctions, 100 x 225 x 225mm	12	Nr	£41.05	£492.60	35	53	70									
R	Below ground drainage pipe, junctions, 100 x 300 x 300mm	1	Nr	£49.69	£49.69	35	53	70									
S	Below ground drainage pipe, junctions, 150 x 150 x 150mm	7	Nr	£37.81	£264.67	35	53	70									
T	Below ground drainage pipe, junctions, 150 x 225 x 225mm	5	Nr	£41.05	£205.25	35	53	70									
U	Below ground drainage pipe, external yard gully, complete with trap, grating and cover, bed and surround in concrete;	5	Nr	£237.65	£1,188.25	35	53	70									
V	Below ground drainage pipe, rodding eye, complete with frame and cover, bed and surround in concrete; 100mm outlet	2	Nr	£118.83	£237.66	35	53	70									
W	Below ground drainage pipe, connection to rainwater pipes	37	Nr	£48.61	£1,798.57	35	53	70									
X	Below ground drainage pipe, rest bend, complete with concrete bed and surround; 100mm	37	Nr	£31.33	£1,159.21	35	53	70									
Y	Pre cast concrete road gully; to suit 150mm diameter outlet	10	Nr	£253.86	£2,538.60	500	750	1000									
A	Marker tape, non degradable; red with black lettering; laid in trench 450mm	62	m	£1.08	£66.96	1	1	1									
B	Concrete manhole; 1200mm diameter manhole; depth not exceeding 1250mm; assumed D400 recessed cover	1	Nr	£1,528.54	£1,528.54	50	50	50	0.7065								
C	Concrete manhole; 1200mm diameter manhole; depth not exceeding 1500mm; assumed D400 recessed cover	2	Nr	£1,701.38	£3,402.76	50	50	50	1.6956								
D	Concrete manhole; 1200mm diameter manhole; depth not exceeding 1750mm; assumed D400 recessed cover	2	Nr	£1,824.53	£3,649.06	50	50	50	1.9782								
E	Concrete manhole; 1200mm diameter manhole; depth not exceeding 2000mm; assumed D400 cover	2	Nr	£1,993.05	£3,986.10	50	50	50	2.2608								
F	Athlon precast concrete headwall; 150mm diameter pipe outlet; depth to invert not exceeding 1.50m	1	Nr	£324.07	£324.07												
G	Athlon precast concrete headwall; 300mm diameter pipe outlet; depth to invert not exceeding 1.75m	1	Nr	£378.08	£378.08												
H	manhole not exceeding 1000mm deep	10	Nr	£480.71	£4,807.10	50	50	50									
I	manhole not exceeding 1250mm deep	3	Nr	£556.32	£1,668.96	50	50	50									
J	manhole not exceeding 1500mm deep	1	Nr	£658.95	£658.95	50	50	50									
A	manhole not exceeding 1750mm deep 3.00 Nr	0		£0.00	£0.00												
A	CCTV inspection to all pipelines, generally	1	ITEM	£810.18	£810.18	1	1	1									
B	Testing of manholes and pipelines,	1	ITEM	£378.08	£378.08	1	1	1									
C	Cleaning of pipelines, as required	1	ITEM	£324.07	£324.07	1	1	1									
D	Operating and maintenance manuals, as required	1	ITEM	£270.06	£270.06	1	1	1									
E	Record drawings, as required	1	ITEM	£199.84	£199.84	1	1	1									
A	rock	0	m3	£0.00	£0.00												
B	concrete	0	m3	£0.00	£0.00												
C	reinforced concrete	0	m3	£0.00	£0.00												
D	brickwork, blockwork or stonework	0	m3	£0.00	£0.00												
E	excavating soft spots; disposal of surplus material and filling with approved fill to formation level of trench - to be priced as rate only per cubic metre	0	m3	£0.00	£0.00												
F	next existing service - to be priced as rate only per metre	0	m	£0.00	£0.00												
G	around existing service crossing excavation - to be priced as rate only per crossing	0	Nr	£0.00	£0.00												
A	to the site area and surrounding	1	ITEM	£0.00	£0.00												
B	generally	1	ITEM	£0.00	£0.00												
C	Excavating trenches for Water, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	116	m	£38.89	£4,511.24	500	750	1000	29	2050		0.024	0.024	0.024	1426.8	1426.8	1426.8
D	Excavating trenches for Water, extra over for excavation in highways, including all works to breakout existing surfaces, make good and reinstate on completion of works, temporary fencing, diversions and	12	m	£156.64	£1,879.68	500	750	1000									
E	Excavating trenches for Gas, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	136	m	£38.89	£5,289.04	500	750	1000	34	2050		0.024	0.024	0.024	1672.8	1672.8	1672.8
F	Excavating trenches for Gas, extra over for excavation in highways, including all works to breakout existing surfaces, make good and reinstate on completion of works, temporary fencing, diversions and the like	7	m	£156.64	£1,096.48	500	750	1000									
G	Surface water; including the treatment of the water to remove all sediment; pollutants and the like before leaving the site perimeters, generally	1	ITEM	£199.84	£199.84	1	1	1									
H	Bed and surround; to water pipes, to suit one pipes nominal size not exceeding 100mm diameter - Provisional Quantity	116	m	£12.96	£1,503.36	500	750	1000	1.16	2050		0.024	0.024	0.024	57.072	57.072	57.072
A	Bed and surround; to gas pipes, to suit one pipe nominal size not exceeding 100mm diameter - Provisional Quantity	136	m	£12.96	£1,762.56	500	750	1000	1.36	2050		0.024	0.024	0.024	66.912	66.912	66.912
B	MDPE or Puriton ducts for Water supplies, 32mm diameter; or similar	116	m	£8.64	£1,002.24	18	24	34	0.1147356	940		2.54	2.54	2.54	273.942719	273.942719	273.942719
C	MDPE or Puriton ducts for Gas supplies, 63mm diameter; or similar	136	m	£8.64	£1,175.04	18	24	34	0.1345176	940		2.54	2.54	2.54	321.174222	321.174222	321.174222
D	Excavate pit for connection of water pipes; generally - Provisional Quantity	7	Nr	£51.85	£362.95	500	750	1000									
E	Excavate pit for connection of gas pipes; generally	7	Nr	£51.85	£362.95	500	750	1000									
F	Meters, gas - Provisional Quantity	10	Nr	£0.00	£0.00												
G	Meters, water - Provisional Quantity	10	Nr	£0.00	£0.00												
H	Site isolation valve and utility governor, gas - Provisional Quantity	1	Nr	£0.00	£0.00												
I	Identification tapes - ' WATER PIPE BELOW', generally - Provisional Quantity	116	m	£1.08	£125.28	1	1	1									
J	Identification tapes - ' GAS PIPE BELOW', generally - Provisional Quantity	136	m	£1.08	£146.88	1	1	1									
A	Excavating trenches for BT, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity; assumed to be two ducts	149	m	£38.89	£5,794.61	500	750	1000	37.25	2050		0.024	0.024	0.024	1832.7	1832.7	1832.7
B	Excavating trenches for BT, attendance on the relocation of telegraph pole	1	Nr	£297.07	£297.07	500	750	1000									
C	Excavating trenches for data, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	149	m	£38.89	£5,794.61	500	750	1000	37.25	2050		0.024	0.024	0.024	1832.7	1832.7	1832.7
D	Excavating trenches for power supplies, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	256	m	£38.89	£9,955.84	500	750	1000	64	2050		0.024	0.024	0.024	3148.8	3148.8	3148.8
E	Excavating trenches for power supplies, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity - connections to buildings	48	m	£38.89	£1,866.72	500	750	1000	12	2050		0.024	0.024	0.024	590.4	590.4	590.4
F	Excavating trenches for power supplies, services not exceeding 200mm; depth not exceeding 1250mm - Provisional Quantity	208	m	£38.89	£8,089.12	500	750	1000	52	2050		0.024	0.024	0.024	2558.4	2558.4	2558.4
G	Excavating trenches for street lighting, services not exceeding 200mm; depth not exceeding 1250mm - no details	89	m	£38.89	£3,461.21	500	750	1000	22.25	2050		0.024	0.024	0.024	1094.7	1094.7	1094.7
H	Disposal, surface water, generally	1	ITEM	£199.84	£199.84	1	1	1									
A	Bed and surround; to electrical cables, to suit single duct nominal size not exceeding 200mm diameter	304	m	£11.88	£3,611.52	500	750	1000	12.16	2050		0.024	0.024	0.024	598.272	598.272	598.272
B	Bed and surround; to BT ducts, to suit single duct nominal size not exceeding 200mm diameter	298	m	£11.88	£3,540.24	500	750	1000	11.92	2050		0.024	0.024	0.024	586.464	586.464	586.464

C	Bed and surround; to communications ducts, to suit single duct nominal size not exceeding 200mm diameter	298	m	£11.88	£3,540.24	500	750	1000	11.92	2050			0.024	0.024	0.024		586.464	586.464	586.464
D	Bed and surround; to street lighting cables, to suit single duct nominal size not exceeding 200mm diameter - no details	89	m	£11.88	£1,057.32	500	750	1000	3.56	2050			0.024	0.024	0.024		175.152	175.152	175.152
E	Ducts for Power supplies, 100mm diameter, or similar	304	m	£8.64	£2,626.56	18	24	34	0.47728	940			2.54	2.54	2.54		1139.55373	1139.55373	1139.55373
F	Ducts for BT supplies, 100mm diameter, or similar	298	m	£8.64	£2,574.72	18	24	34	0.46786	940			2.54	2.54	2.54		1117.06254	1117.06254	1117.06254
G	Ducts for communication supplies, 100mm diameter, or similar	298	m	£8.64	£2,574.72	18	24	34	0.46786	940			2.54	2.54	2.54		1117.06254	1117.06254	1117.06254
H	Ducts for street lighting supplies, 50mm diameter, or similar	89	m	£8.64	£768.96	18	24	34	0.069865	940			2.54	2.54	2.54		166.809674	166.809674	166.809674
I	Excavate pit for connection of services; electrical - Provisional Quantity	22	Nr	£51.85	£1,140.70	500	750	1000											
J	Excavate pit for connection of services; BT - Provisional Quantity	3	Nr	£51.85	£155.55	500	750	1000											
K	Excavate pit for connection of services; communications - Provisional Quantity	3	Nr	£51.85	£155.55	500	750	1000											
L	Excavate pit for connection of services; street lighting - no details	6	Nr	£51.85	£311.10	500	750	1000											
M	Meters, power - Provisional Quantity	11	Nr	£0.00	£0.00														
A	Excavate pit for base to lighting standard; lighting standards - no details	6	Nr	£59.41	£356.46	1	1	1											
B	Identification tapes - 'POWER CABLE BELOW', generally	394	m	£1.08	£425.52	1	1	1											
C	Identification tapes - 'COMMUNICATION DUCTS BELOW', generally	592	m	£1.08	£639.36	1	1	1											
D	Utility Company costs for the provision of new gas supply, connecting from existing gas supplies to meter locations adjacent buildings as required	1	ITEM	£0.00	£0.00														
E	Utility Company costs for the provision of new water supply, connecting existing mains water supply to meter locations for buildings supplies as required	1	ITEM	£0.00	£0.00														
F	Utility Company costs for the provision of new electrical supply, connecting from existing electrical supply to meter locations for buildings supplies as required;	1	ITEM	£0.00	£0.00														
G	Utility Company costs for the provision of new electrical supply, works to existing substation, including all diversion works	1	ITEM	£0.00	£0.00														
H	Utility Company(ies) costs for the provision of new telephone/data supplies, connecting from existing telephone/data supplies to connection points within the buildings as required	1	ITEM	£0.00	£0.00														
I	Utility Company(ies) costs for the provision of new telephone/data supplies, allow for all works to relocate telegraph poles and associated diversion works	1	ITEM	£0.00	£0.00														
J	Utility Company(ies) costs for the provision of new communication/data supplies, connecting from existing communication/data supplies to connection points within the buildings as	1	ITEM	£0.00	£0.00														
	Bathrooms: toilets	10	ITEM	£150.00	£1,500.00	10	20	30			https://www.sciencedirect.cc	84.75		0.7				593.25	
	Bathroom shower bath	10	ITEM	£150.00	£1,500.00	10	15	20			https://www.wickes.co.uk	1.6		3.42				54.72	
	Bathroom sink	10	ITEM	£60.00	£600.00	15	20	25			https://www.wickes.co.uk/Wickes-Single-Bowl-	18.5		0.7				129.5	
	Bathroom mirror	10	ITEM	£20.00	£200.00	10	15	20											
	cupboards	10	ITEM	£260.00	£2,600.00	10	20	30				29		0.74				214.6	
	formaldehyde, 0.5 stainless steel each	10	ITEM	£20.00	£200.00	3	5	7			https://www.sciencedirect.cc	3.25		3.42				111.15	
	Boiler	10	ITEM	£500.00	£5,000.00	5	10	15			https://www.sciencedirec	50		1.46				730	
	Electrical Installations; Switches and sockets, 6 capsule, spotlights & traditional shapes), all	10	ITEM	£30.00	£300.00	20	30	40				0.178+0.607		2.64+3.1				23.5162	
	Extractor fans (bathrooms)	10	ITEM	£14.00	£140.00	0.6	2	4.2			http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590								
	Kitchen cupboards	10	ITEM	£40.00	£400.00	9	13	18			http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590	1.46+9.16+3.31						30.635	
	Kitchen worktop	10	ITEM	£100.00	£1,000.00	10	15	25									518.813109	518.813109	518.813109
	Kitchen sink	10	ITEM	£50.00	£500.00	5	10	15				104.86		0.86				901.796	
		10	ITEM	£60.00	£600.00	15	20	25			https://www.wickes.co.uk/Wickes-Single-Bowl-Kitchen-Stainless-Steel-	18.5		0.7				129.5	
	Kitchen tap	10	ITEM	£20.00	£200.00	10	20	30			https://www.wickes.co.u	1.27		2.64				33.528	
	Dishwasher	10	ITEM	£160.00	£1,600.00	7	10	13			see BOM								
	Oven	10	ITEM	£120.00	£1,200.00	12	15	20			see BOM						1453.46082	1481.80032	1498.2792
	Gas hob, 4 ring	10	ITEM	£70.00	£700.00	15	17	19			https://www.sciencedirect.com/science/article/pii/S2213138822003071								
	Cooker hood	10	ITEM	£50.00	£500.00	10	14	18			http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590								
	Toaster	10	ITEM	£15.00	£150.00	2	4	6			http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590						69.8496	70.0553	70.1763
	Kettle	10	ITEM	£10.00	£100.00	3	4.4	9			http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590						76.0098	76.3651	76.5741
	Fridge	10	ITEM	£100.00	£1,000.00	10	12.5	15			http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590						1301.8858	1353.4548	1383.4318
	Iron	10	ITEM	£20.00	£200.00	4	5.5	7			http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590						65.7102	66.6452	67.1952
	Washing machine	10	ITEM	£250.00	£2,500.00	5	7.5	10			http://web.mit.edu/ebm/www/Publications/9_Paper.pdf							1493.323	
	Three seater sofa	10	ITEM	£400.00	£4,000.00	5	10	15			https://oecotextiles.wordpress.com/2010/01/06/embodied-energy-needed-to-make-one-sofa/						1616.766	1856.3462	2202.4062
	Televisions	10	ITEM	£300.00	£3,000.00	4	7	10			- https://ec.europa.eu/docsr oomidocuments/107/attach							814.099	
	TV stand glass	10	ITEM	£100.00	£1,000.00	10	15	20									221.804175	221.804175	221.804175
	Dining table and chairs	10	ITEM	£300.00	£3,000.00	5	10	15									666.656271	666.656271	666.656271
	Bedroom wardrobes (2)	10	ITEM	£300.00	£3,000.00	20	40	60				90		0.86				1548	
	Vacuum cleaner	10	ITEM	£50.00	£500.00	3	5	7.4			http://researcharchive.vuw.ac.nz/xmlui/handle/10063/6590							86.3185	
	Curtains	10	ITEM	£50.00	£500.00	5	7.5	10									679.679314	67.9679314	67.9679314
	Double bed + mattress	10	ITEM	£400.00	£4,000.00	5	10	15			see BOM						780.36023	780.36023	780.36023
Water		10	ITEM	£420.00	£4,200.00	1	1	1	2210.5263		https://assets.publishing.service.gov.uk/	6.2t/Ml =	6.2	kg/m3			13705.2632	13705.2632	13705.2632
Electricity and gas		10	ITEM	£1,020.00	£10,200.00	1	1	1	5578.25	kwh electricity	https://www.eia.gov/tools/faqs/faq.php	0.92 pound/k	0.414	kg/kwh	electricity		23093.955	23093.955	23093.955

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