CITB ANALYSIS

South London Partnership: Construction labour analysis

TECHNICAL ANNEX

Assessing the needs for traditional and low carbon construction skills in support of the work carried out in the South London Partnership area

May 2023

CONTENTS

APPENDIX CONTENTS

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LIST OF TABLES

1.   INTRODUCTION

This document is a technical annex to the main *South London Partnership (SLP) construction labour analysis report*. It includes details on the borough-level analysis (sections 2 to7) underpinning the SLP area-wide results shown in the main report.

Results are presented in the following order.

- Croydon
- Kingston-Upon-Thames
- Merton
- Richmond-Upon-Thames
- Sutton
- Wandsworth

The report also includes information on the methodology adopted for estimating the construction labour demand (see Appendix A) as well a breakdown of the occupational groups which are used in the report (see Appendix B).

2.   LABOUR DEMAND IN CROYDON

2.1.   CONSTRUCTION LABOUR DEMAND

2.1.1.   Introduction

The following sections provide an estimate of the labour demand created by the construction investment across Croydon over the period 2023-2027. The results, prepared using the analysis described in Appendix A, are reported along with the labour demand generated as calculated by the Labour Forecasting Tool.

2.1.2.   Pipeline of known projects

We have analysed projects in the Glenigan database[1] and, where required, updated that list with any supplementary information provided by the Borough.

The review of the Glenigan database identified 123 projects in Croydon. Of these, 32 projects were removed due to missing dates along with five projects which were clearly identified as a consultancy project. Also excluded were one duplicate project and one project with missing information.

The Mean Value Theorem was applied to the remainder of the pipeline to identify the significant projects. The process identified 19 significant projects accounting for just over 86% of the total construction spend in the area. This allowed a detailed analysis of a large proportion of all the projects and a comprehensive consideration of the project types to which they were assigned.

Table 1 shows the number of significant projects within the Croydon area, the percentage of spend arising from the significant projects and the total spend. The construction spend shown in this table takes account of any adjustments for engineering works and any incomplete, duplicate or consultancy projects. Values are shown in 2022 prices, the base price used in the Glenigan database.

Table 1: Key data for significant projects in Croydon[2]

	Number of projects	Construction spend (£m – 2022 values)
Known projects	83	1,440
Significant projects	19	1,235
Percentage within significant projects	23%	86%

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[1] The Glenigan database allows contractors to identify leads and to carry out construction market analysis. For the purposes of this analysis we have used the Q4 2022 cut of data.
[2] The values in this table are the values from the Glenigan pipeline to which the construction element percentage has been applied and thus reflect the adjusted values of infrastructure projects values to distinguish between construction and engineering construction.

Appendix C provides a full breakdown of the significant projects and their construction values. The peak year for the Glenigan spend profile is 2023.

Table 2 shows the distribution by project type of new build spend for the total pipeline of known projects in 2023.

Table 2: New-build construction spend by project type in 2023

Project Type	Construction spend in 2023 (2022 values - £m)	% of total
New housing	182	47%
Private commercial	113	29%
Infrastructure	74	19%
Private industrial	10	3%
Public non-housing	7	2%
Total	386	100%

2.1.3. Estimate of total labour demand

As outlined in Appendix A, the known project pipeline may not include smaller projects or repair and maintenance work. Figure 1 shows the outputs of the analysis of future labour demand. The purple area shows the labour demand arising from the new build Glenigan projects. This is projected forward from the peak as shown in green. The grey area shows the likely labour demand arising from our estimate of new build work over and above that which is included in Glenigan. The total R&M workforce is shown in blue which includes any estimates of other R&M work not already included in Glenigan.

The total construction labour demand including the volume of R&M imputed from the CSN model is 5,680 people in 2023. The projected growth between 2023 and 2027 suggests that the labour demand in 2027 will be around 5,770 people.
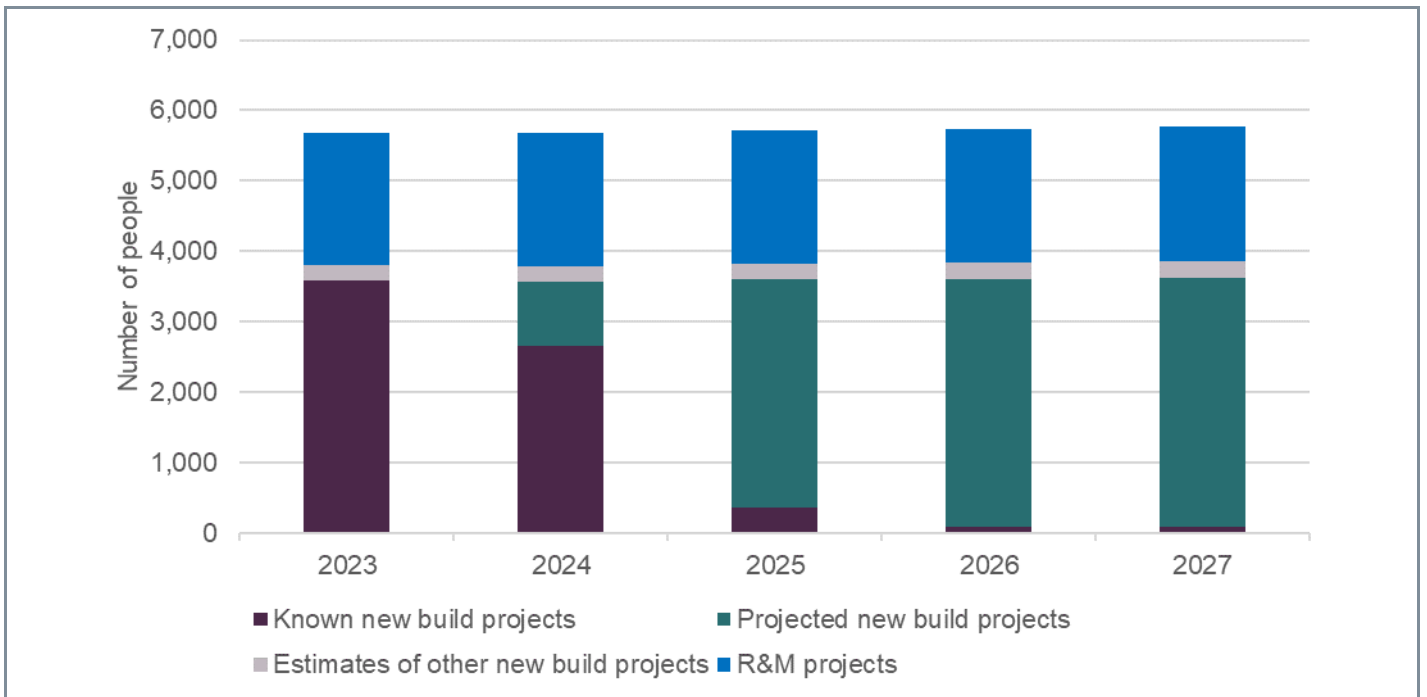
Figure 1: Total construction labour demand including estimates for both R&M and estimates of other work

For 2023 the detailed breakdown for each of the 28 occupational groups is shown in Figure 2. This shows the breakdown by occupation for both the pipeline of known projects, estimates of other work and R&M.
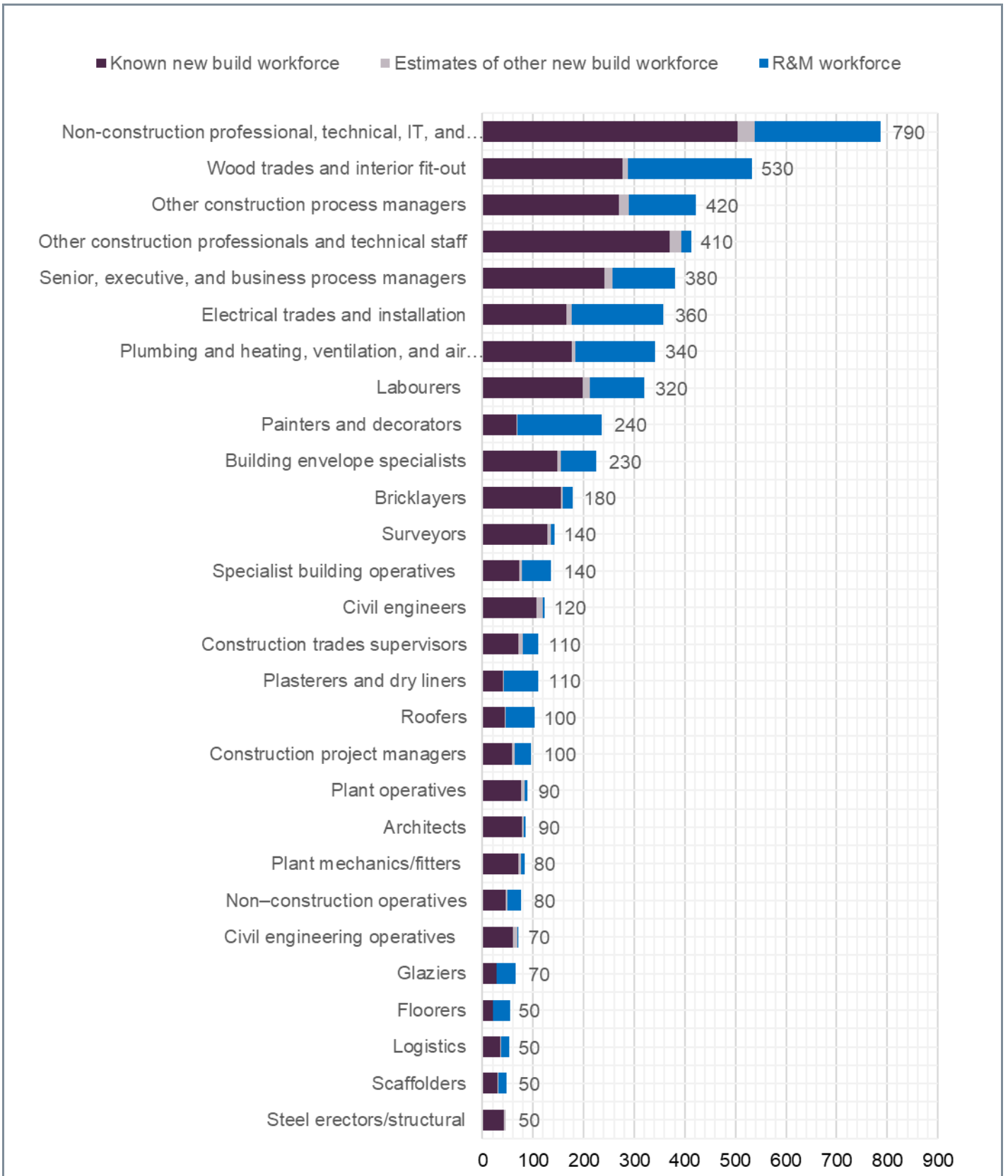
Figure 2: Construction labour demand by occupation in 2023

Table 3 shows the labour demand generated by the known projects and the estimates of other work in 2023.

Table 3: Labour demand by work type in 2023[3]

Project Type	Labour demand from known projects (people)	Labour demand from estimates of other work (people)	Total labour demand (people)	% of total in 2023
Private commercial	1,420	90	1,510	27%
New housing	1,390	-	1,390	24%
Non-housing R&M	-	1,080	1,080	19%
Housing R&M	250	550	800	14%
Infrastructure	530	130	660	12%
Private industrial	140	-	140	2%
Public non-housing	100	-	100	2%
Total	3,830	1,850	5,680	100%

2.1.4. Summary

- The labour demand arising from the construction spend in Croydon peaks at about 5,680 people in 2023, taking account of estimates of other work including R&M in addition to the pipeline of known projects.

- During 2023, the most labour-intensive occupation group is non-construction professional, technical, IT and other office–based staff with an annual demand of 790 people.

- The estimate of the three largest labour demands in the trade occupations for 2023 are as follows:

  - The trade occupation for which demand is highest is Wood trades and interior fit-out with 530 people;

  - Electrical trades and installation trades follow with 360 people;

  - Plumbing and heating, ventilation, and air conditioning trades rank third, with a demand of 340 people.

2.2. LOW CARBON SKILLS ANALYSIS

Figure 3 and Figure 4 show a breakdown of the performance ratings reported in EPCs published since 2013 for domestic and non-domestic properties in Croydon. Approximately 55% of the properties which have EPCs lodged since 2013 have a rating D and below. EPCs are not available for all the properties in the area, but we estimate that those lodged cover approximately 59% of all domestic properties in the borough's stock and 59% of all the non-domestic ones, based on the number of buildings in the borough.[4]
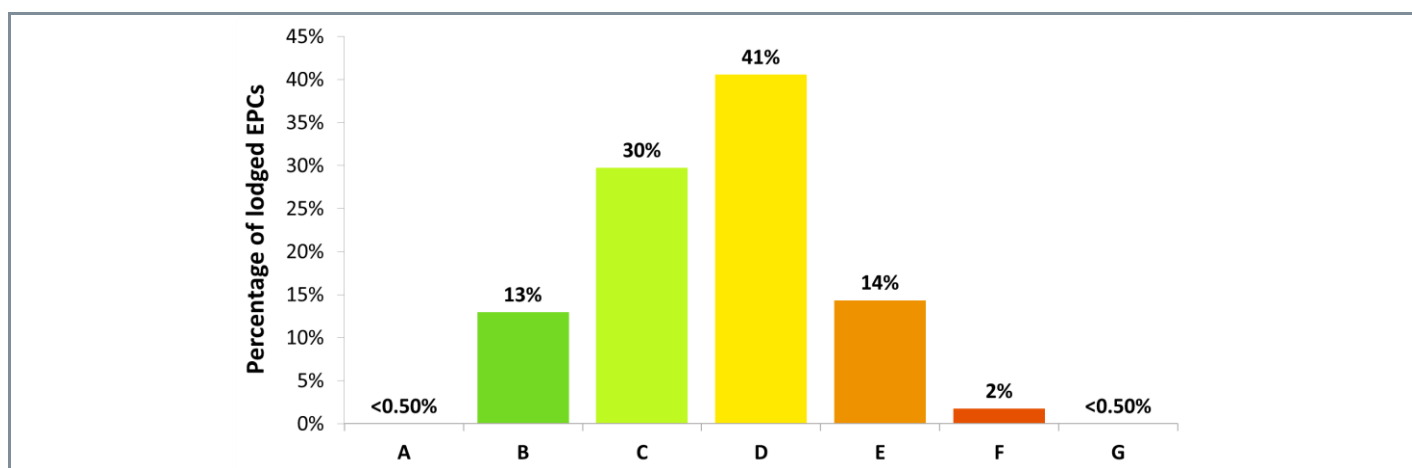
Figure 3: EPC profile of domestic properties in Croydon

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[3] Due to rounding totals might not correspond to the sum of the parts.
[4] Number of domestic buildings in the boroughs derived from Valuation Office Agency statistics.
Number of non-domestic buildings in the boroughs derived from Department for Business, Energy & Industrial Strategy data published as part of the National Energy Efficiency Data Framework.
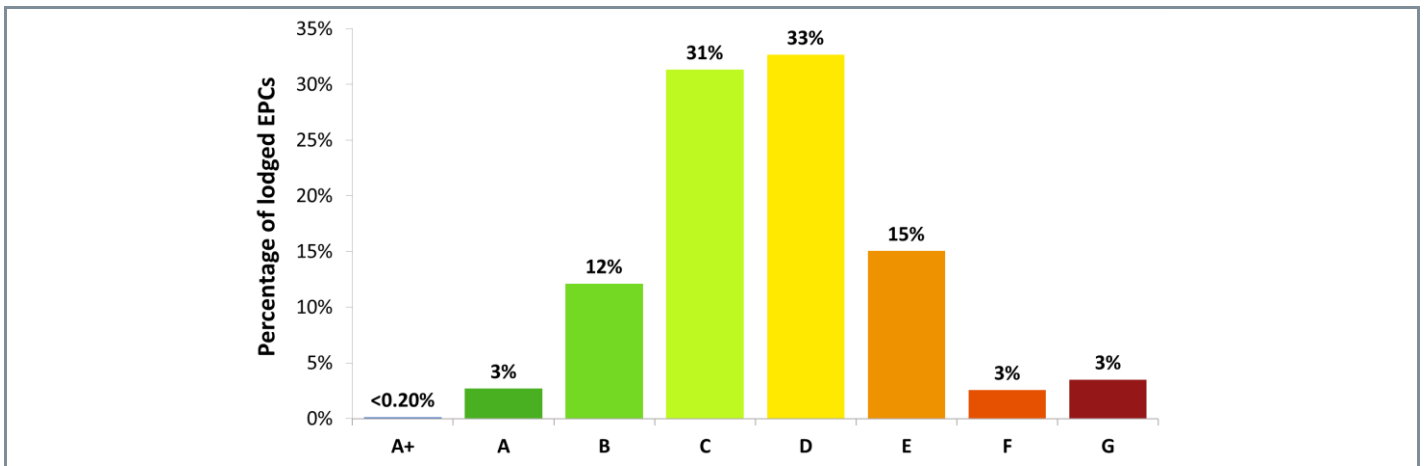
Figure 4: EPC profile of non-domestic properties in Croydon

The average number of people required on a yearly basis to deliver the recommended EPC interventions depends on how ambitious the implementation plans are. To illustrate this we considered two scenarios.

- Scenario 1: suggested interventions are being delivered over a 5-year period. This allowed us to align the low carbon skill demand analysis with the timeframe considered for the five-year period from 2023-27 for the wider construction demand analysis.

- Scenario 2: a less ambitious scenario allowing for delivery of the interventions over a 10-year period from 2023 to 2032.

Based on these scenarios, we estimated that the annual labour demand for low carbon skills needed to improve the energy performance of buildings rated D and below is between 3,550 and 1,770 over the next five to ten years. The average annual low carbon skills demand by occupation for energy efficiency interventions for these two scenarios is shown in Figure 5.

Figure 5: Low carbon skills demand by occupation: comparing delivery scenarios[5]

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[5] Building envelope specialists are any trade involved with the external cladding of a building other than bricklaying, for example, curtain walling. The include SOC Code 5319 - Construction and building trades not elsewhere classified.

Under Scenarios 1 and 2, the estimated low carbon skill needs could account for between 31% and 62% of the total construction labour demand in the borough over the 2023-27 period.

- The total demand for low carbon skills in the context of existing buildings retrofit to improve the energy performance of buildings rated D and below is between 3,550 and 1,770 over the next five to ten years.
- The estimate of the four largest low carbon skill demands are as follows.
  - Building envelope specialists: [6] 22% of the total demand
  - Construction trades supervisors: 11% of the total demand
  - Scaffolders: 9% of the total demand
  - Plumbing and heating, ventilation, and air conditioning trades: 9% of the total demand.

3. LABOUR DEMAND IN KINGSTON-UPON-THAMES

3.1. CONSTRUCTION LABOUR DEMAND

3.1.1. Introduction

The following sections provide an estimate of the labour demand created by the construction investment across Kingston-Upon-Thames over the period 2023-2027. The results, prepared using the analysis described in Appendix A, are reported along with the labour demand generated as calculated by the Labour Forecasting Tool.

3.1.2. Pipeline of known projects

We have analysed projects in the Glenigan database[7] and, where required, updated that list with any supplementary information provided by the Borough.

The review of the Glenigan database identified 62 projects in Kingston-Upon-Thames. Of these, 11 projects were removed due to missing dates along with two projects which were clearly identified as a consultancy project. Also excluded were four duplicate projects.

The Mean Value Theorem was applied to the remainder of the pipeline to identify the significant projects. The process identified 12 significant projects accounting for just over 84% of the total construction spend in the area. This allowed a detailed analysis of a large proportion of all the projects and a comprehensive consideration of the project types to which they were assigned.

Table 4 shows the number of significant projects within the Kingston-Upon-Thames area, the percentage of spend arising from the significant projects and the total spend. The construction spend shown in this table takes account of any adjustments for engineering works and any incomplete, duplicate or consultancy projects. Values are shown in 2022 prices, the base price used in the Glenigan database.

Table 4: Key data for significant projects in Kingston-Upon-Thames[8]

	Number of projects	Construction spend (£m – 2022 values)
Known projects	45	579
Significant projects	12	487
Percentage within significant projects	27%	84%

Appendix C provides a full breakdown of the significant projects and their construction values. The peak year for the Glenigan spend profile is 2023.

Table 5 shows the distribution by project type of new build spend for the total pipeline of known projects in 2023.

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[6] Building envelope specialists are any trade involved with the external cladding of a building other than bricklaying, for example, curtain walling. The include SOC Code 5319 - Construction and building trades not elsewhere classified.

[7] The Glenigan database allows contractors to identify leads and to carry out construction market analysis. For the purposes of this analysis we have used the Q4 2022 cut of data.

[8] The values in this table are the values from the Glenigan pipeline to which the construction element percentage has been applied and thus reflect the adjusted values of infrastructure projects values to distinguish between construction and engineering construction.

Table 5: New-build construction spend by project type in 2023

Project Type	Construction spend in 2023 (2022 values - £m)	% of total
New housing	67	46%
Private commercial	59	41%
Public non-housing	18	12%
Infrastructure	1	1%
Private industrial	0	0%
Total	145	100%

3.1.3. Estimate of total labour demand

As outlined in Appendix A, the known project pipeline may not include smaller projects or repair and maintenance work. Figure 6 shows the outputs of the analysis of future labour demand. The purple area shows the labour demand arising from the new build Glenigan projects. This is projected forward from the peak as shown in green. The grey area shows the likely labour demand arising from our estimate of new build work over and above that which is included in Glenigan. The total R&M workforce is shown in blue which includes any estimates of other R&M work not already included in Glenigan.

The total construction labour demand including the volume of R&M imputed from the CSN model is 2,390 people in 2023. The projected growth between 2023 and 2027 suggests that the labour demand in 2027 will be around 2,410 people.
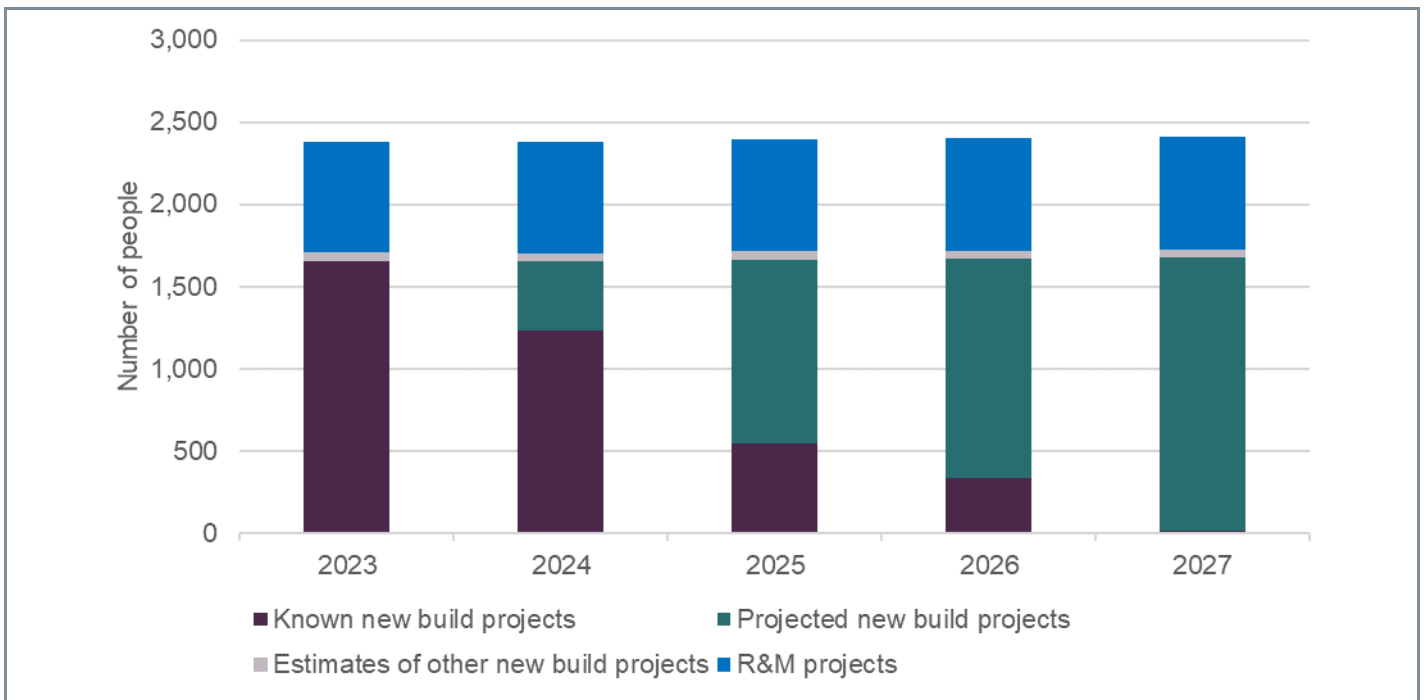
Figure 6: Total construction labour demand including estimates for both R&M and estimates of other work

For 2023 the detailed breakdown for each of the 28 occupational groups is shown in Figure 7. This shows the breakdown by occupation for both the pipeline of known projects, estimates of other work and R&M.
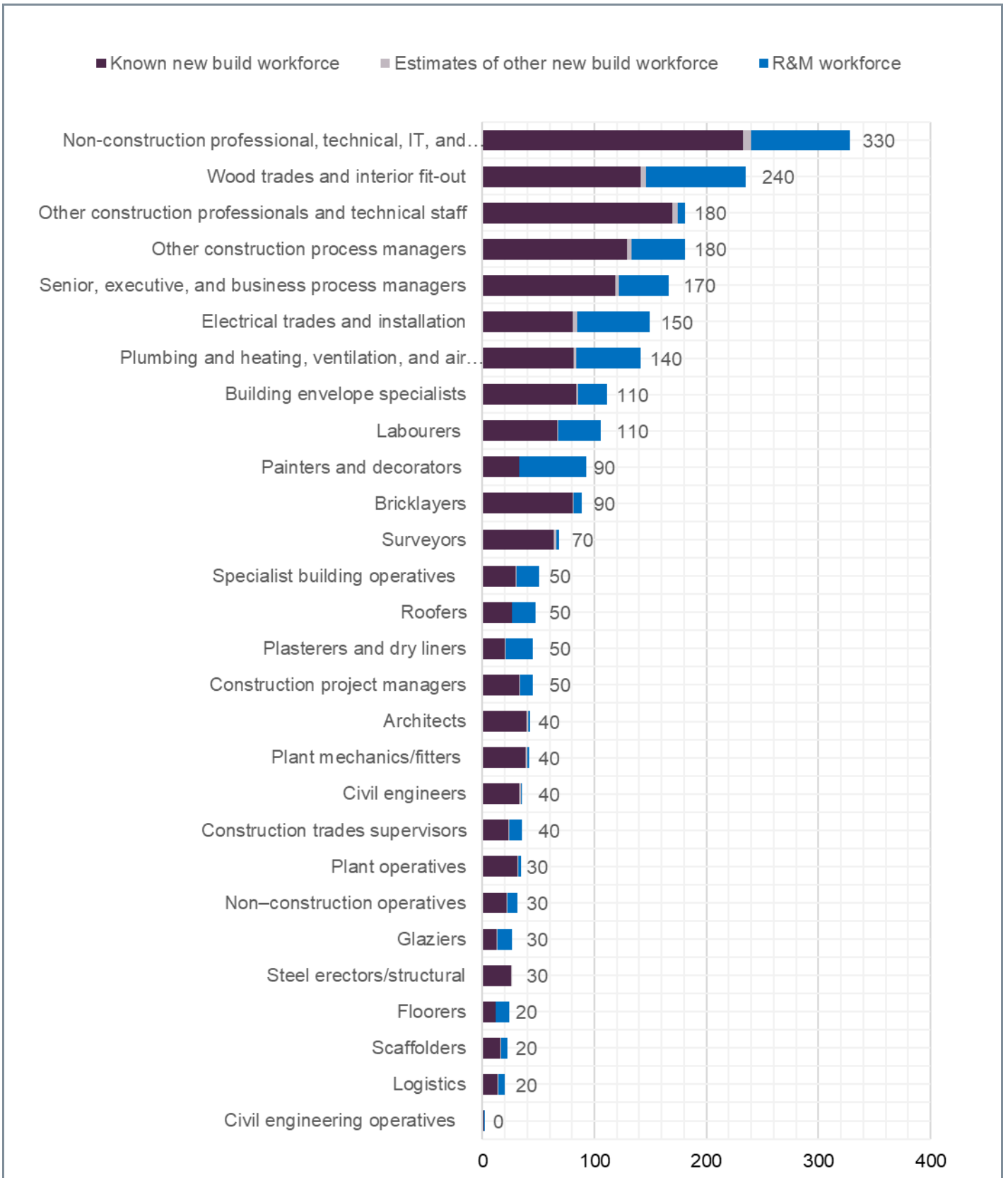
Figure 7: Construction labour demand by occupation in 2023

Table 6 shows the labour demand generated by the known projects and the estimates of other work in 2023.

Table 6: Labour demand by work type in 2023[9]

Project Type	Labour demand from known projects (people)	Labour demand from estimates of other work (people)	Total labour demand (people)	% of total in 2023
Private commercial	810	50	860	36%
New housing	590	-	590	25%
Non-housing R&M	-	380	380	16%
Housing R&M	190	110	300	13%
Public non-housing	260	-	260	11%
Infrastructure	-	-	-	0%
Private industrial	-	-	-	0%
Total	1,850	540	2,390	100%

3.1.4. Summary

- The labour demand arising from the construction spend in Kingston-Upon-Thames peaks at about 2,390 people in 2023, taking account of estimates of other work including R&M in addition to the pipeline of known projects.

- During 2023, the most labour-intensive occupation group is non-construction professional, technical, IT and other office–based staff with an annual demand of 330 people.

- The estimate of the three largest labour demands in the trade occupations for 2023 are as follows:

    - The trade occupation for which demand is highest is Wood trades and interior fit-out with 240 people;

    - Electrical trades and installation trades follow with 150 people;

    - Plumbing and heating, ventilation, and air conditioning trades rank third, with a demand of 140 people.

3.2.   LOW CARBON SKILLS ANALYSIS

Figure 8 and Figure 9 show a breakdown of the performance ratings reported in EPCs published since 2013 for domestic and non-domestic properties in Kingston-Upon-Thames. Approximately 59% of the domestic properties (as well as 53% of the non-domestic ones) which have EPCs lodged since 2013 have a rating D and below. EPCs are not available for all the properties in the area, but we estimate that the ones lodged cover approximately 59% of all domestic properties in the borough's stock and 56% of all the non-domestic ones, based on the number of buildings in the borough.[10]
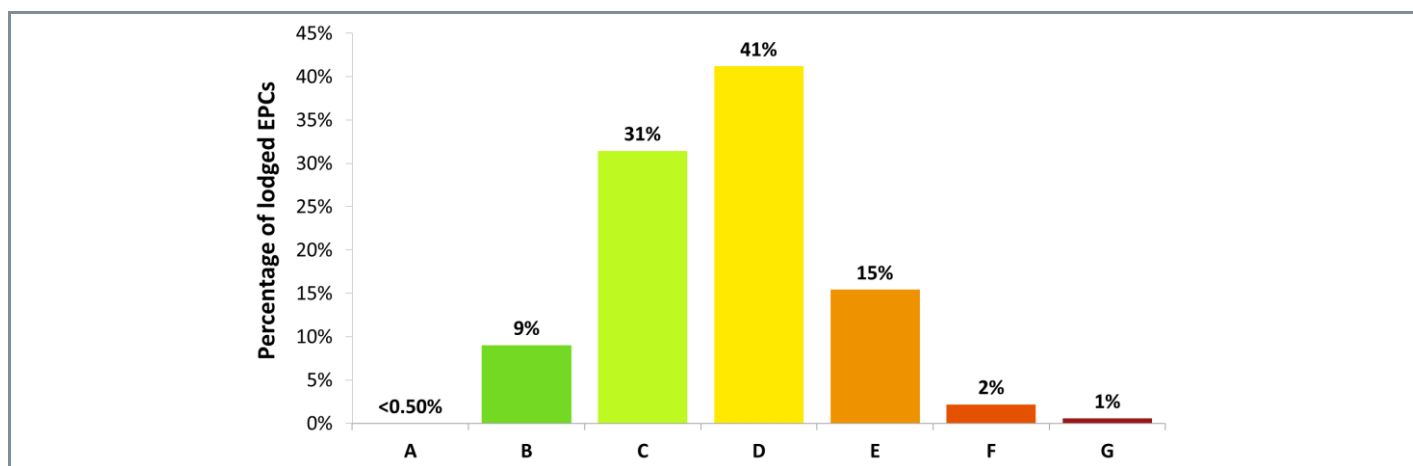
Figure 8: EPC profile of domestic properties in Kingston-Upon-Thames

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[9] Due to rounding totals might not correspond to the sum of the parts.
[10] Number of domestic buildings in the boroughs derived from Valuation Office Agency statistics.
Number of non-domestic buildings in the boroughs derived from Department for Business, Energy & Industrial Strategy data published as part of the National Energy Efficiency Data Framework.
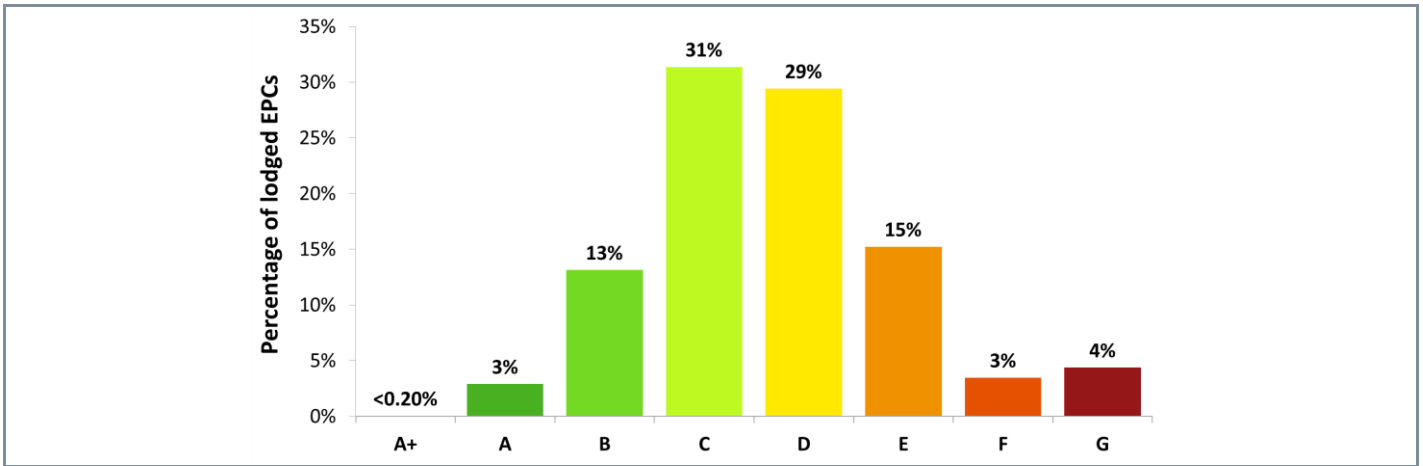
Figure 9: EPC profile of non-domestic properties in Kingston-Upon-Thames

The average number of people required on a yearly basis to deliver the recommended EPC interventions depends on how ambitious the implementation plans are. To illustrate this we considered two scenarios.

- Scenario 1: suggested interventions are being delivered over a 5-year period. This allowed us to align the low carbon skill demand analysis with the timeframe considered for the five-year period from 2023-27 for the wider construction demand analysis.

- Scenario 2: a less ambitious scenario allowing for delivery of the interventions over a 10-year period from 2023 to 2032.

Based on these scenarios, we estimated that the annual labour demand for low carbon skills needed to improve the energy performance of buildings rated D and below is between 1,630 and 810 over the next five to ten years. The average annual low carbon skills demand by occupation for energy efficiency interventions for these two scenarios is shown in Figure 10.

Figure 10: Low carbon skills demand by occupation: comparing delivery scenarios[11]

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[11] Building envelope specialists are any trade involved with the external cladding of a building other than bricklaying, for example, curtain walling. The include SOC Code 5319 - Construction and building trades not elsewhere classified.

Under Scenarios 1 and 2, the estimated low carbon skill needs could account for between 34% and 68% of the total construction labour demand in the borough over the 2023-27 period.

- The total demand for low carbon skills in the context of existing buildings retrofit to improve the energy performance of buildings rated D and below is between 1,630 and 810 over the next five to ten years.
- The estimate of the four largest low carbon skill demands are as follows.
  - Building envelope specialists:[12] 22% of the total demand
  - Construction trades supervisors: 10% of the total demand
  - Scaffolders: 9% of the total demand
  - Roofers: 9% of the total demand.

4.   LABOUR DEMAND IN MERTON

4.1.   CONSTRUCTION LABOUR DEMAND

4.1.1.   Introduction

The following sections provide an estimate of the labour demand created by the construction investment across Merton over the period 2023-2027. The results, prepared using the analysis described in Appendix A, are reported along with the labour demand generated as calculated by the Labour Forecasting Tool.

4.1.2.   Pipeline of known projects

We have analysed projects in the Glenigan database[13] and, where required, updated that list with any supplementary information provided by the Borough.

The review of the Glenigan database identified 64 projects in Merton. Of these, seven projects were removed due to missing dates along with one project which was clearly identified as a consultancy project. Also excluded were two duplicate projects.

The Mean Value Theorem was applied to the remainder of the pipeline to identify the significant projects. The process identified 12 significant projects accounting for just over 89% of the total construction spend in the area. This allowed a detailed analysis of a large proportion of all the projects and a comprehensive consideration of the project types to which they were assigned.

Table 7 shows the number of significant projects within the Merton area, the percentage of spend arising from the significant projects and the total spend. The construction spend shown in this table takes account of any adjustments for engineering works and any incomplete, duplicate or consultancy projects. Values are shown in 2022 prices, the base price used in the Glenigan database.

Table 7: Key data for significant projects in Merton[14]

	Number of projects	Construction spend (£m – 2022 values)
Known projects	54	760
Significant projects	12	677
Percentage within significant projects	22%	89%

Appendix C provides a full breakdown of the significant projects and their construction values. The peak year for the Glenigan spend profile is 2023.

Table 8 shows the distribution by project type of new build spend for the total pipeline of known projects in 2023.

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[12] Building envelope specialists are any trade involved with the external cladding of a building other than bricklaying, for example, curtain walling. The include SOC Code 5319 - Construction and building trades not elsewhere classified.
[13] The Glenigan database allows contractors to identify leads and to carry out construction market analysis. For the purposes of this analysis we have used the Q4 2022 cut of data.
[14] The values in this table are the values from the Glenigan pipeline to which the construction element percentage has been applied and thus reflect the adjusted values of infrastructure projects values to distinguish between construction and engineering construction.

Table 8: New-build construction spend by project type in 2023

Project Type	Construction spend in 2023 (2022 values - £m)	% of total
New housing	150	73%
Private commercial	28	14%
Private industrial	22	11%
Public non-housing	5	2%
Infrastructure	1	0%
Total	206	100%

4.1.3. Estimate of total labour demand

As outlined in Appendix A, the known project pipeline may not include smaller projects or repair and maintenance work. Figure 11 shows the outputs of the analysis of future labour demand. The purple area shows the labour demand arising from the new build Glenigan projects. This is projected forward from the peak as shown in green. The grey area shows the likely labour demand arising from our estimate of new build work over and above that which is included in Glenigan. The total R&M workforce is shown in blue which includes any estimates of other R&M work not already included in Glenigan.

The total construction labour demand including the volume of R&M imputed from the CSN model is 2,810 people in 2023. The projected growth between 2023 and 2027 suggests that the labour demand in 2027 will be around 2,850 people.
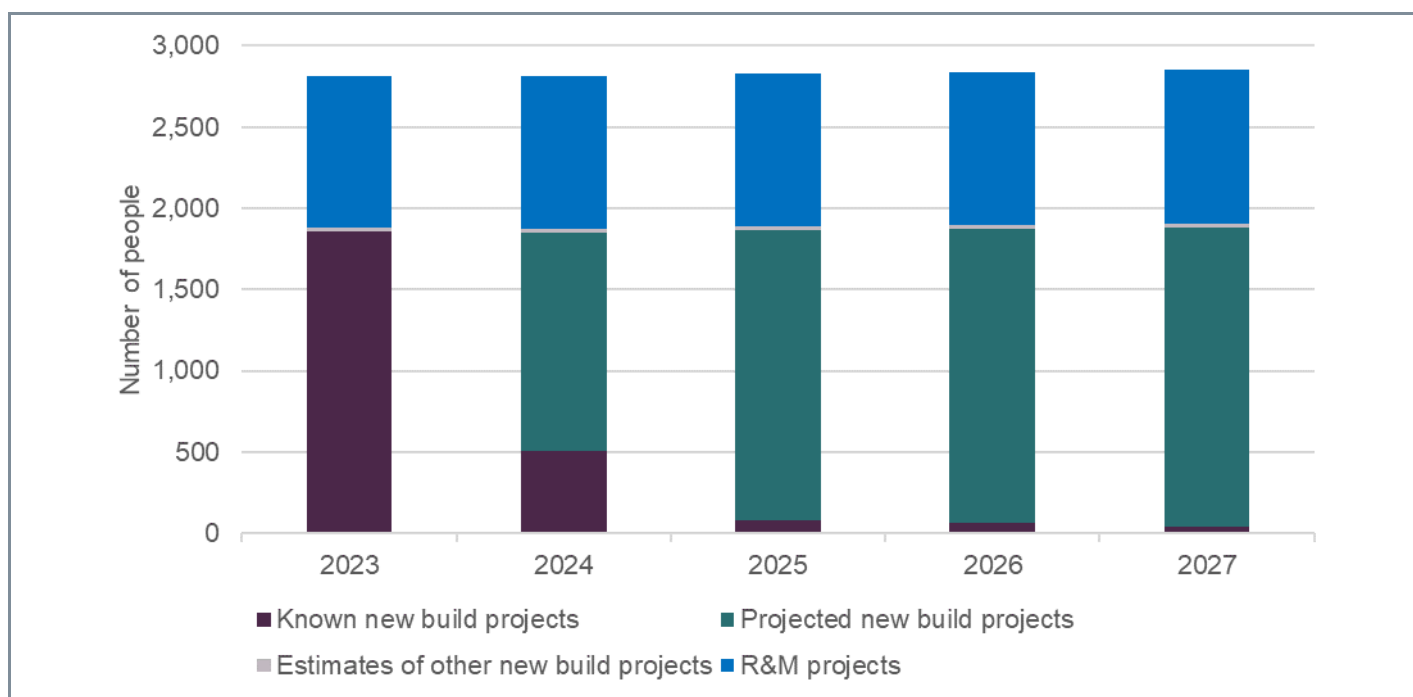
Figure 11: Total construction labour demand including estimates for both R&M and estimates of other work

For 2023 the detailed breakdown for each of the 28 occupational groups is shown in Figure 12. This shows the breakdown by occupation for both the pipeline of known projects, estimates of other work and R&M.
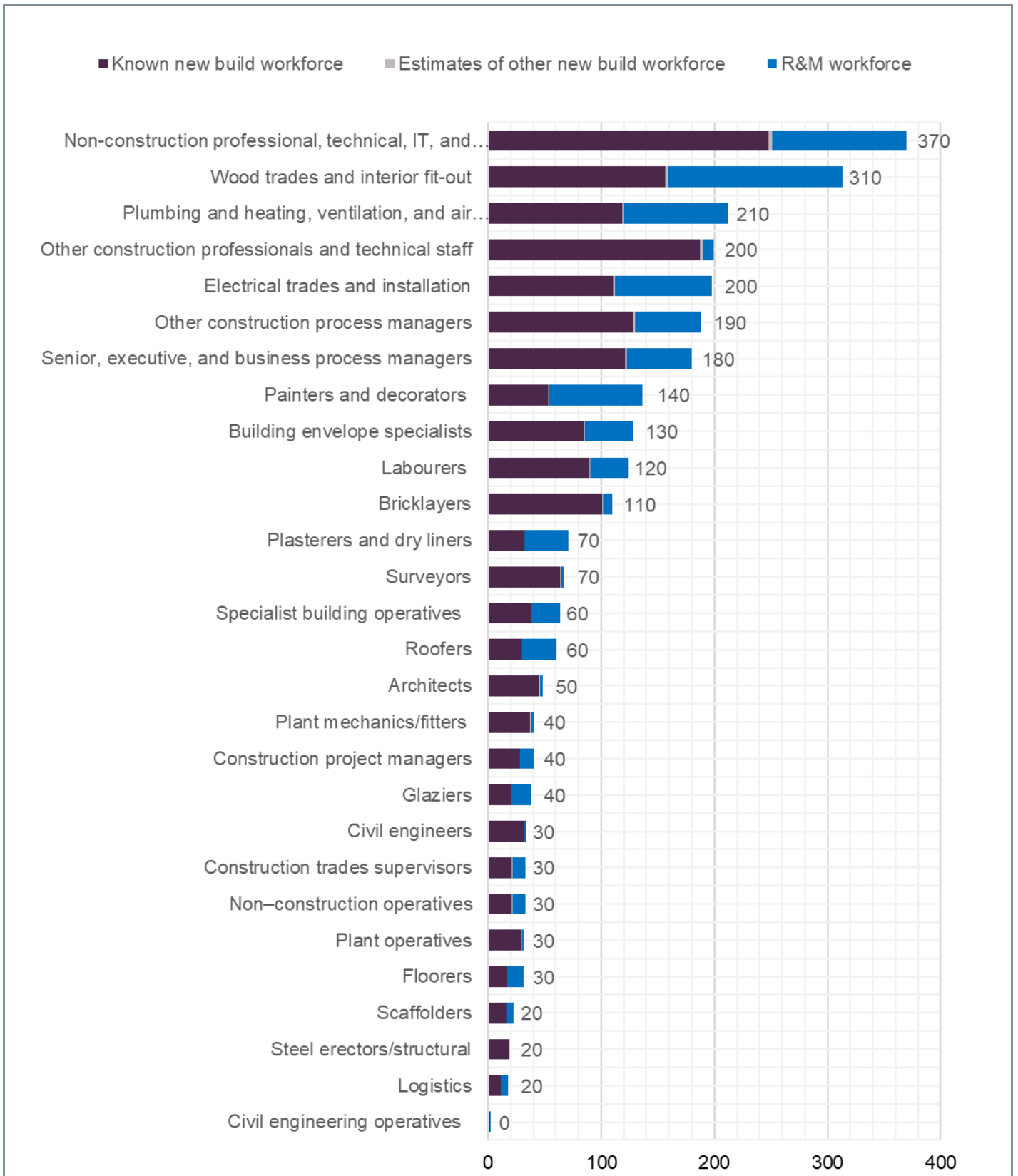
Figure 12: Construction labour demand by occupation in 2023

Table 9 shows the labour demand generated by the known projects and the estimates of other work in 2023.

Table 9: Labour demand by work type in 2023[15]

Project Type	Labour demand from known projects (people)	Labour demand from estimates of other work (people)	Total labour demand (people)	% of total in 2023
New housing	1,100	-	1,100	39%
Housing R&M	220	450	670	24%
Private commercial	370	20	390	14%
Private industrial	310	-	310	11%
Non-housing R&M	-	260	260	9%
Public non-housing	70	-	70	2%
Infrastructure	10	-	10	0%
Total	2,080	730	2,810	100%

4.1.4. Summary

- The labour demand arising from the construction spend in Merton peaks at about 2,810 people in 2023, taking account of estimates of other work including R&M in addition to the pipeline of known projects.

- During 2023, the most labour-intensive occupation group is non-construction professional, technical, IT and other office–based staff with an annual demand of 370 people.

- The estimate of the three largest labour demands in the trade occupations for 2023 are as follows:

  - The trade occupation for which demand is highest is Wood trades and interior fit-out with 310 people;

  - Plumbing and heating, ventilation, and air conditioning trades follow with 210 people;

  - Electrical trades and installation trades rank third, with a demand of 200 people.

4.2.   LOW CARBON SKILLS ANALYSIS

Figure 13 and Figure 14 show a breakdown of the performance ratings reported in EPCs published since 2013 for domestic and non-domestic properties in Merton. Approximately 57% of the domestic properties (as well as 52% of the non-domestic ones) which have EPCs lodged since 2013 have a rating D and below. EPCs are not available for all the properties in the area, but we estimate that the ones lodged cover approximately 56% of all domestic properties in the borough's stock and 53% of all the non-domestic ones, based on the number of buildings in the borough.[16]
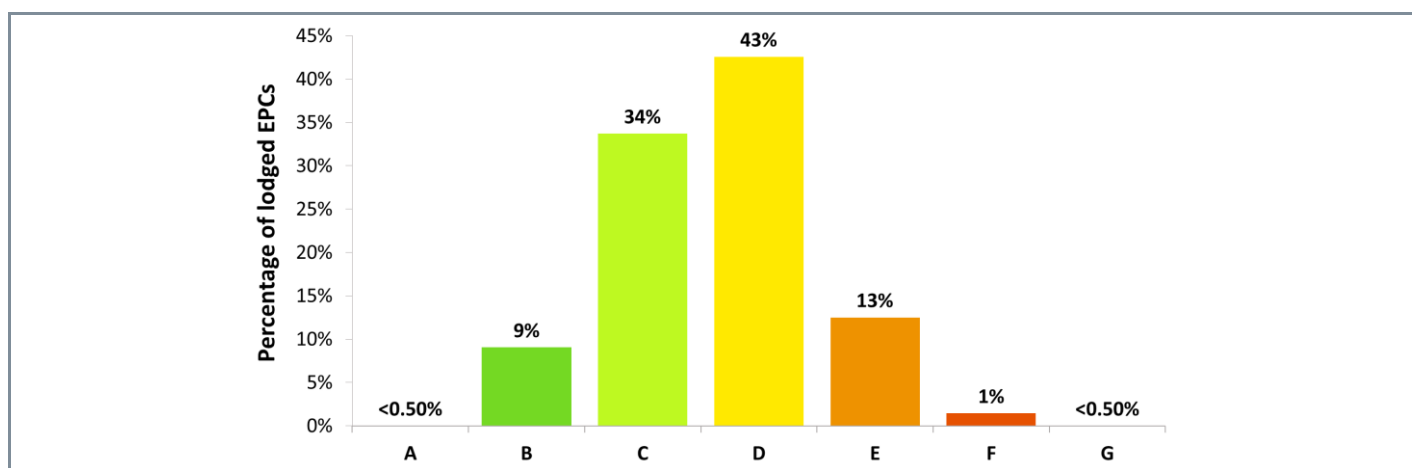
Figure 13: EPC profile of domestic properties in Merton

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[15] Due to rounding totals might not correspond to the sum of the parts.
[16] Number of domestic buildings in the boroughs derived from Valuation Office Agency statistics.
Number of non-domestic buildings in the boroughs derived from Department for Business, Energy & Industrial Strategy data published as part of the National Energy Efficiency Data Framework.
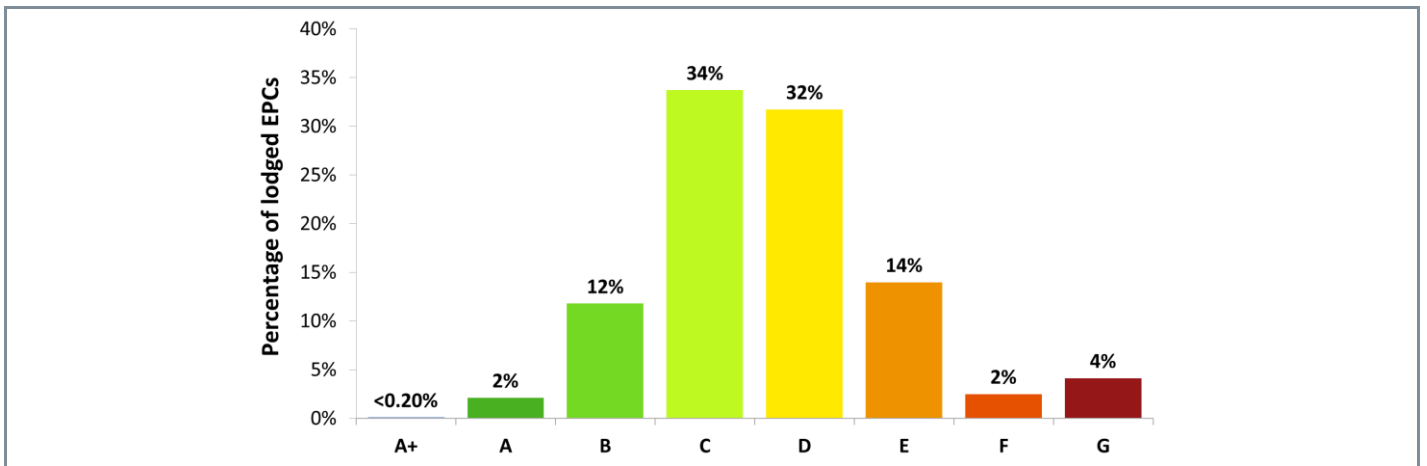
Figure 14: EPC profile of non-domestic properties in Merton

The average number of people required on a yearly basis to deliver the recommended EPC interventions depends on how ambitious the implementation plans are. To illustrate this we considered two scenarios.

- Scenario 1: suggested interventions are being delivered over a 5-year period. This allowed us to align the low carbon skill demand analysis with the timeframe considered for the five-year period from 2023-27 for the wider construction demand analysis.

- Scenario 2: a less ambitious scenario allowing for delivery of the interventions over a 10-year period from 2023 to 2032.

Based on these scenarios, we estimated that the annual labour demand for low carbon skills needed to improve the energy performance of buildings rated D and below is between 1,950 and 980 over the next five to ten years. The average annual low carbon skills demand by occupation for energy efficiency interventions for these two scenarios is shown in Figure 15.

Figure 15: Low carbon skills demand by occupation: comparing delivery scenarios[17]

[17] Building envelope specialists are any trade involved with the external cladding of a building other than bricklaying, for example, curtain walling. The include SOC Code 5319 - Construction and building trades not elsewhere classified.

Under Scenario 1 and 2, estimated low carbon skill needs could account, respectively, for between 69% and 35% of the total construction labour demand over the 2023-27 period.

- The total demand for low carbon skills in the context of existing buildings retrofit to improve the energy performance of buildings rated D and below is between 1,950 and 980 over the next five to ten years.
- The estimate of the four largest low carbon skill demands are as follows.
    - Building envelope specialists:[18] 24% of the total demand
    - Construction trades supervisors: 10% of the total demand
    - Plumbing and heating, ventilation, and air conditioning trades: 9% of the total demand
    - Scaffolders: 9% of the total demand.

5. LABOUR DEMAND IN RICHMOND-UPON-THAMES

5.1. CONSTRUCTION LABOUR DEMAND

5.1.1. Introduction

The following sections provide an estimate of the labour demand created by the construction investment across Richmond-Upon-Thames over the period 2023-2027. The results, prepared using the analysis described in Appendix A, are reported along with the labour demand generated as calculated by the Labour Forecasting Tool.

5.1.2. Pipeline of known projects

We have analysed projects in the Glenigan database[19] and, where required, updated that list with any supplementary information provided by the Borough.

The review of the Glenigan database identified 57 projects in Richmond-Upon-Thames. Of these, nine projects were removed due to missing dates along with five projects which ware clearly identified as a consultancy project.

The Mean Value Theorem was applied to the remainder of the pipeline to identify the significant projects. The process identified 14 significant projects accounting for just over 89% of the total construction spend in the area. This allowed a detailed analysis of a large proportion of all the projects and a comprehensive consideration of the project types to which they were assigned.

Table 10 shows the number of significant projects within the Richmond-Upon-Thames area, the percentage of spend arising from the significant projects and the total spend. The construction spend shown in this table takes account of any adjustments for engineering works and any incomplete or consultancy projects. Values are shown in 2022 prices, the base price used in the Glenigan database.

Table 10: Key data for significant projects in Richmond-Upon-Thames[20]

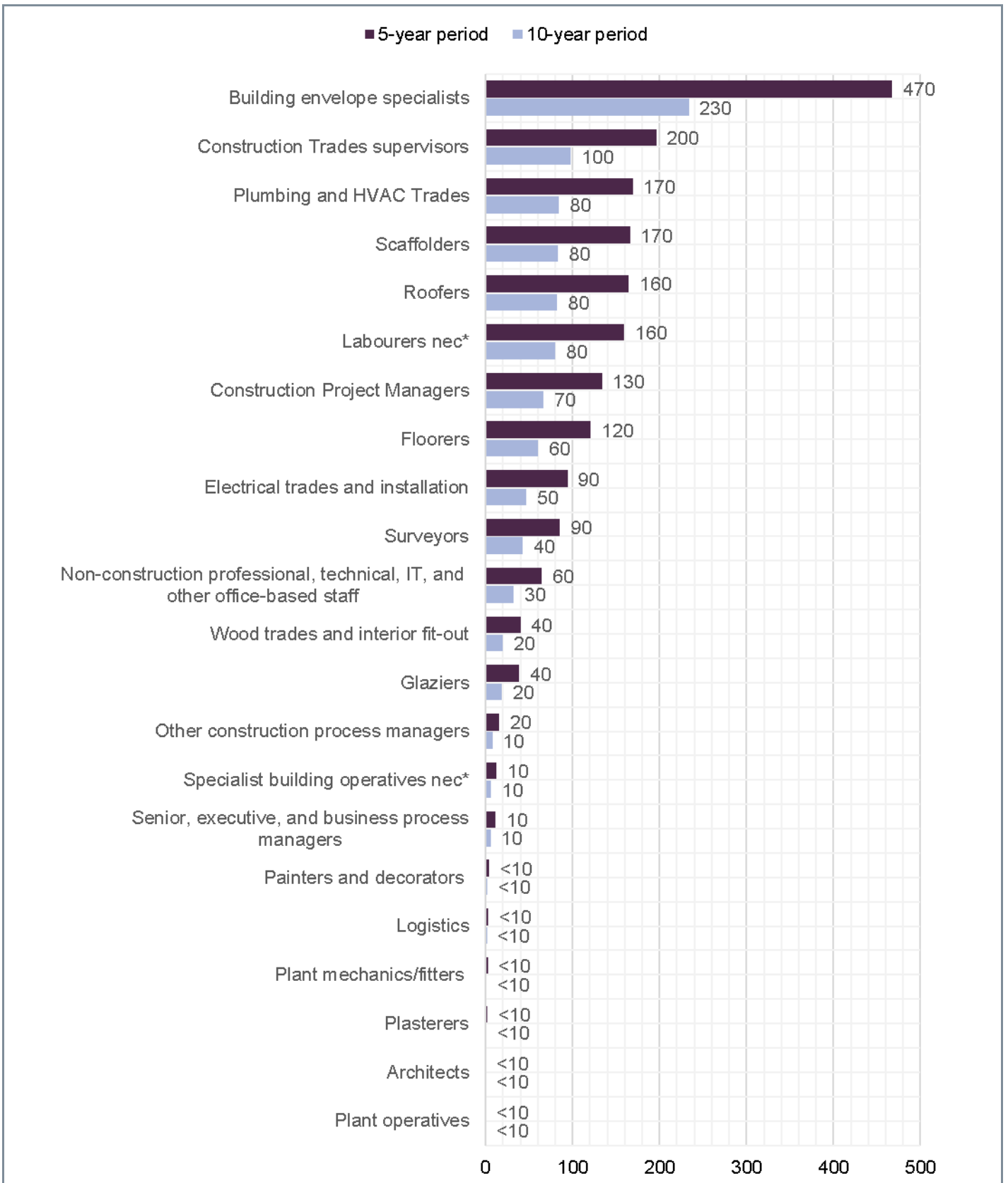|	Number of projects	Construction spend (£m – 2022 values)
Known projects	54	760
Significant projects	12	677
Percentage within significant projects	22%	89%

Appendix C provides a full breakdown of the significant projects and their construction values. The peak year for the Glenigan spend profile is 2023.

Table 11 shows the distribution by project type of new build spend for the total pipeline of known projects in 2023.

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[18] Building envelope specialists are any trade involved with the external cladding of a building other than bricklaying, for example, curtain walling. The include SOC Code 5319 - Construction and building trades not elsewhere classified.

[19] The Glenigan database allows contractors to identify leads and to carry out construction market analysis. For the purposes of this analysis we have used the Q4 2022 cut of data.

[20] The values in this table are the values from the Glenigan pipeline to which the construction element percentage has been applied and thus reflect the adjusted values of infrastructure projects values to distinguish between construction and engineering construction.

Table 11: New-build construction spend by project type in 2023

Project Type	Construction spend in 2023 (2022 values - £m)	% of total
Private commercial	43	47%
New housing	30	33%
Infrastructure	10	11%
Public non-housing	6	7%
Private industrial	2	2%
Total	91	100%

5.1.3. Estimate of total labour demand

As outlined in Appendix A, the known project pipeline may not include smaller projects or repair and maintenance work. Figure 16 shows the outputs of the analysis of future labour demand. The purple area shows the labour demand arising from the new build Glenigan projects. This is projected forward from the peak as shown in green. The grey area shows the likely labour demand arising from our estimate of new build work over and above that which is included in Glenigan. The total R&M workforce is shown in blue which includes any estimates of other R&M work not already included in Glenigan.

The total construction labour demand including the volume of R&M imputed from the CSN model is 1,590 people in 2023. The projected growth between 2023 and 2027 suggests that the labour demand in 2027 will be around 1,630 people.
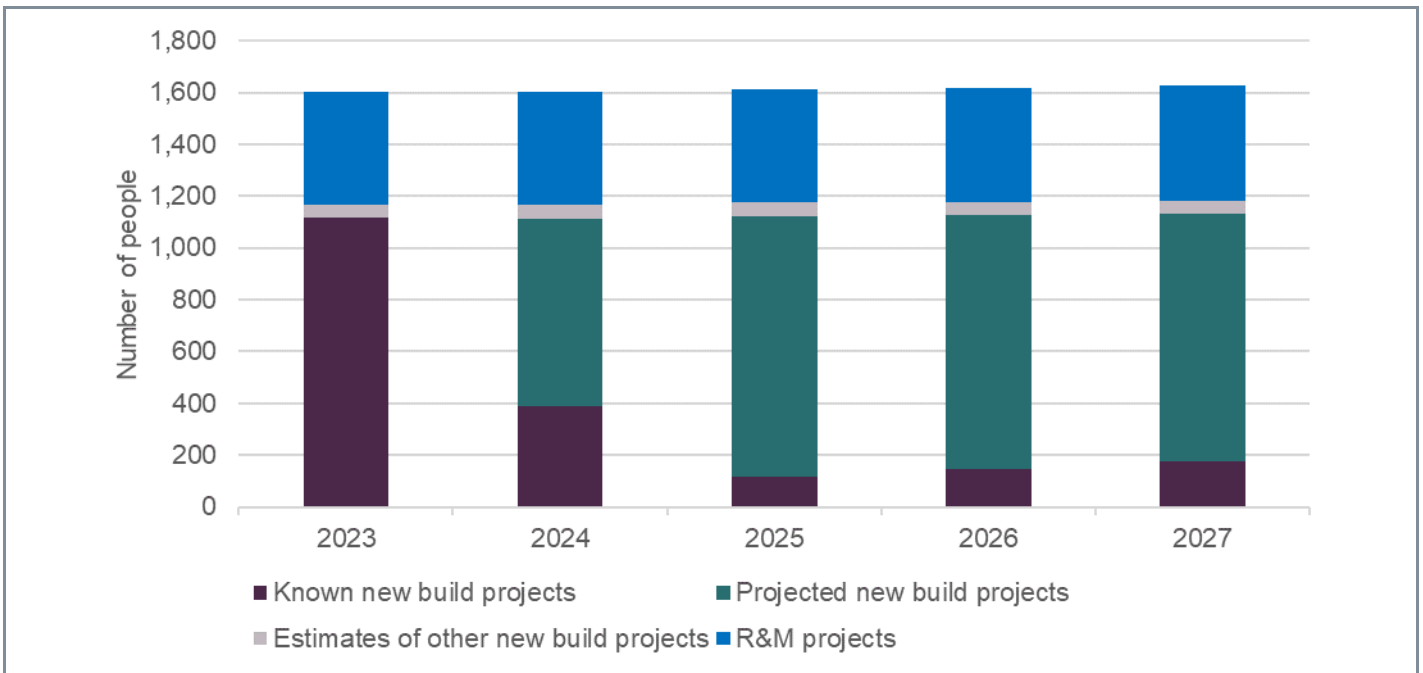
Figure 16: Total construction labour demand including estimates for both R&M and estimates of other work

For 2023 the detailed breakdown for each of the 28 occupational groups is shown in Figure 17. This shows the breakdown by occupation for both the pipeline of known projects, estimates of other work and R&M.
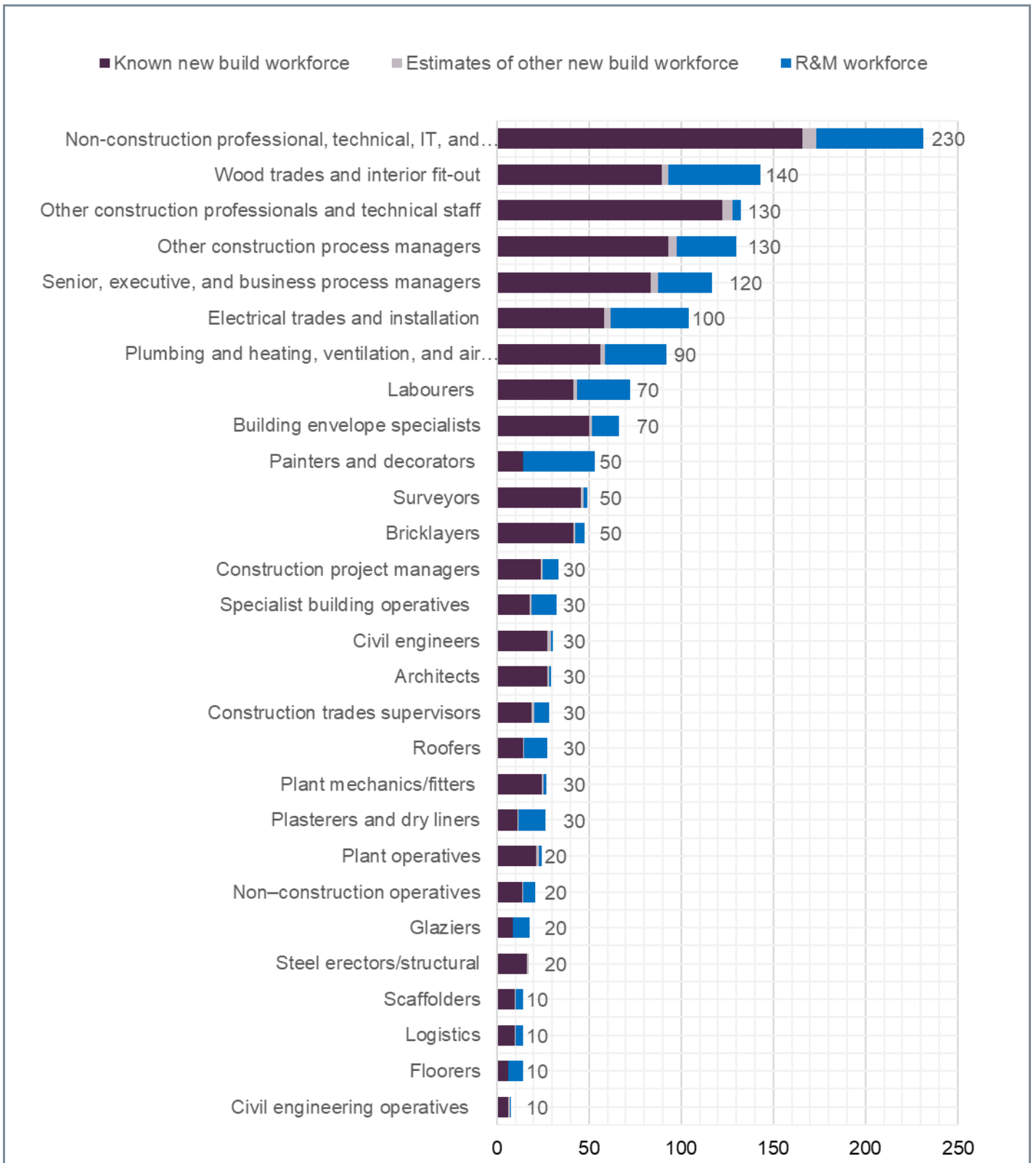
Figure 17: Construction labour demand by occupation in 2023

Table 12 shows the labour demand generated by the known projects and the estimates of other work in 2023.

Table 12: Labour demand by work type in 2023[21]

Project Type	Labour demand from known projects (people)	Labour demand from estimates of other work (people)	Total labour demand (people)	% of total in 2023
Private commercial	650	30	680	43%
Non-housing R&M	-	300	300	19%
New housing	280	-	280	18%
Housing R&M	20	110	130	8%
Infrastructure	80	20	100	6%
Public non-housing	80	-	80	5%
Private industrial	20	-	20	1%
Total	1,130	460	1,590	100%

5.1.4. Summary

- The labour demand arising from the construction spend in Richmond-Upon-Thames peaks at about 1,590 people in 2023, taking account of estimates of other work including R&M in addition to the pipeline of known projects.

- During 2023, the most labour-intensive occupation group is non-construction professional, technical, IT and other office–based staff with an annual demand of 230 people.

- The estimate of the three largest labour demands in the trade occupations for 2023 are as follows:

  - The trade occupation for which demand is highest is Wood trades and interior fit-out with 140 people;

  - Electrical trades and installation trades follow with 100 people;

  - Plumbing and heating, ventilation, and air conditioning trades rank third, with a demand of 90 people.

5.2. LOW CARBON SKILLS ANALYSIS

Figure 18 and Figure 19 show a breakdown of the performance ratings reported in EPCs published since 2013 for domestic and non-domestic properties in Richmond-Upon-Thames. Approximately 61% of the domestic properties (as well as 54% of the non-domestic ones) which have EPCs lodged since 2013 have a rating D and below. EPCs are not available for all the properties in the area, but we estimate that the ones lodged cover approximately 53% of all domestic properties in the borough's stock and 56% of all the non-domestic ones, based on the number of buildings in the borough.[22]
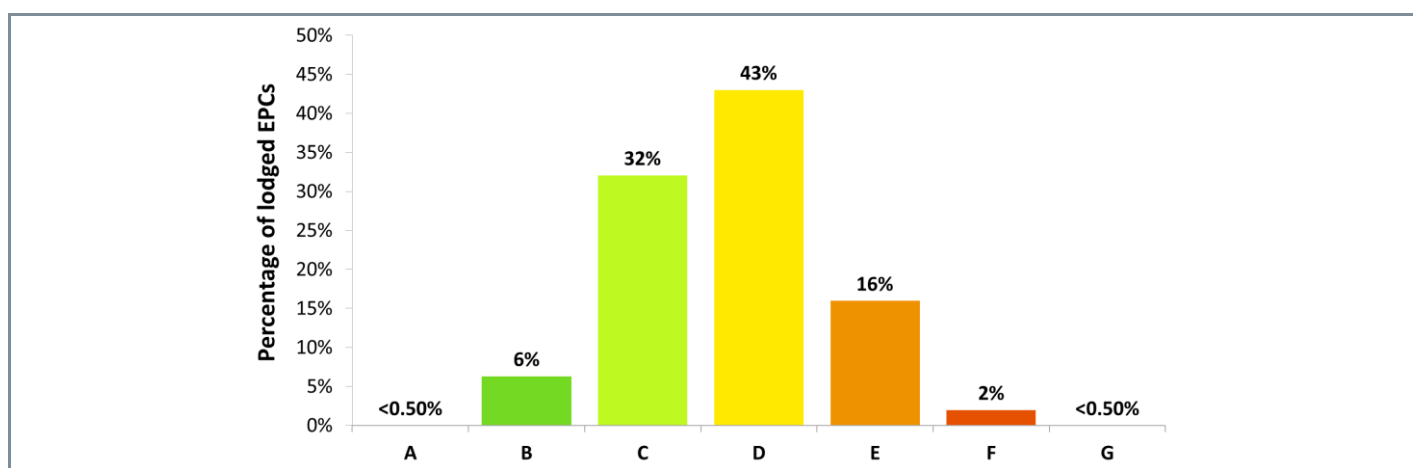
Figure 18: EPC profile of domestic properties in Richmond-Upon-Thames

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[21] Due to rounding totals might not correspond to the sum of the parts.
[22] Number of domestic buildings in the boroughs derived from Valuation Office Agency statistics.
Number of non-domestic buildings in the boroughs derived from Department for Business, Energy & Industrial Strategy data published as part of the National Energy Efficiency Data Framework.
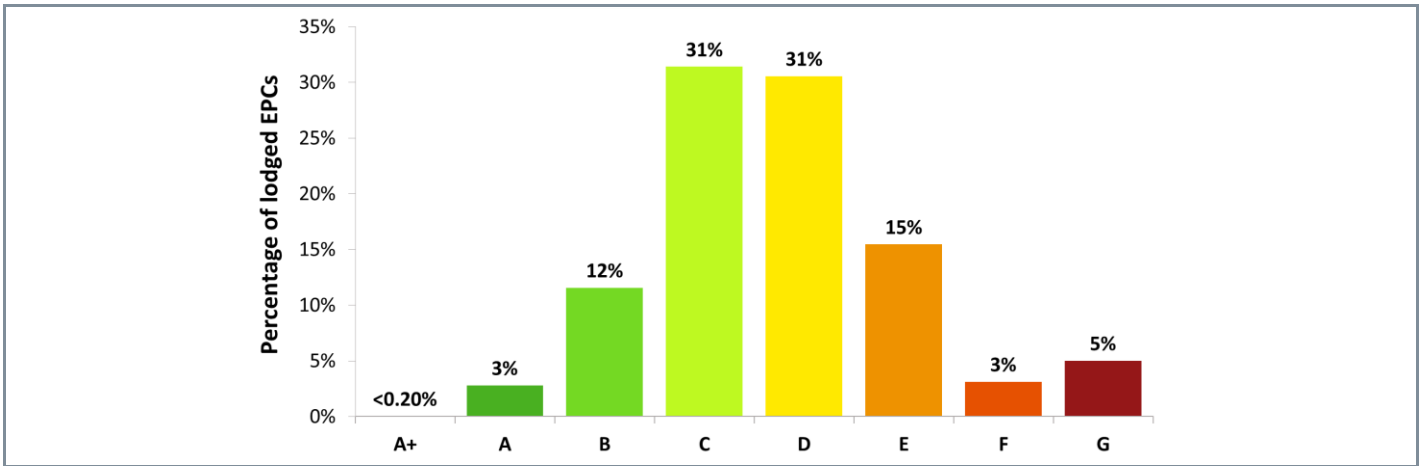
Figure 19: EPC profile of non-domestic properties in Richmond-Upon-Thames

The average number of people required on a yearly basis to deliver the recommended EPC interventions depends on how ambitious the implementation plans are. To illustrate this we considered two scenarios.

- Scenario 1: suggested interventions are being delivered over a 5-year period. This allowed us to align the low carbon skill demand analysis with the timeframe considered for the five-year period from 2023-27 for the wider construction demand analysis.

- Scenario 2: a less ambitious scenario allowing for delivery of the interventions over a 10-year period from 2023 to 2032.

Based on these scenarios, we estimated that the annual labour demand for low carbon skills needed to improve the energy performance of buildings rated D and below is between 1,950 and 980 over the next five to ten years. The average annual low carbon skills demand by occupation for energy efficiency interventions for these two scenarios is shown in Figure 20.

Figure 20: Low carbon skills demand by occupation: comparing delivery scenarios[23]

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[23] Building envelope specialists are any trade involved with the external cladding of a building other than bricklaying, for example, curtain walling. The include SOC Code 5319 - Construction and building trades not elsewhere classified.

Under Scenario 1 and 2, estimated low carbon skill needs could account, respectively, for between 134% and 68% of the total construction labour demand over the 2023-27 period.

- The total demand for low carbon skills in the context of existing buildings retrofit to improve the energy performance of buildings rated D and below is between 2,150 and 1,080 over the next five to ten years.
- The estimate of the four largest low carbon skill demands are as follows.
    - Building envelope specialists:[24] 25% of the total demand
    - Construction trades supervisors: 10% of the total demand
    - Scaffolders: 8% of the total demand
    - Roofers: 8% of the total demand.

6. LABOUR DEMAND IN SUTTON

6.1. CONSTRUCTION LABOUR DEMAND

6.1.1. Introduction

The following sections provide an estimate of the labour demand created by the construction investment across Sutton over the period 2023-2027. The results, prepared using the analysis described in Appendix A, are reported along with the labour demand generated as calculated by the Labour Forecasting Tool.

6.1.2. Pipeline of known projects

We have analysed projects in the Glenigan database[25] and, where required, updated that list with any supplementary information provided by the Borough.

The review of the Glenigan database identified 49 projects in Sutton. Of these, three projects were removed due to missing dates along with three projects which were clearly identified as a consultancy project. Also excluded was one project with missing information.

The Mean Value Theorem was applied to the remainder of the pipeline to identify the significant projects. The process identified 13 significant projects accounting for just over 80% of the total construction spend in the area. This allowed a detailed analysis of a large proportion of all the projects and a comprehensive consideration of the project types to which they were assigned.

Table 13 shows the number of significant projects within the Sutton area, the percentage of spend arising from the significant projects and the total spend. The construction spend shown in this table takes account of any adjustments for engineering works and any incomplete, duplicate or consultancy projects. Values are shown in 2022 prices, the base price used in the Glenigan database.
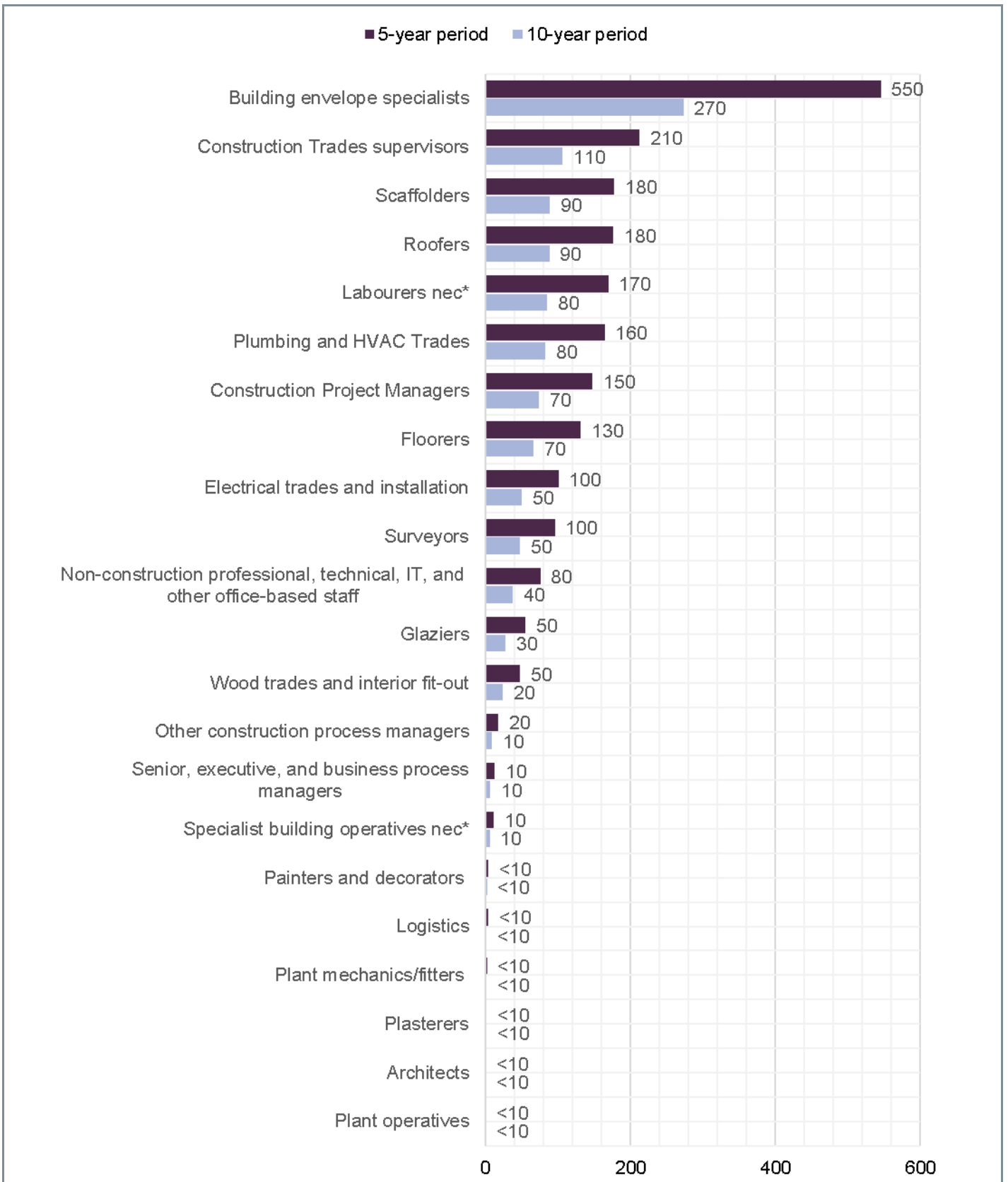
Table 13: Key data for significant projects in Sutton[26]

	Number of projects	Construction spend (£m – 2022 values)
Known projects	42	229
Significant projects	13	183
Percentage within significant projects	31%	80%

Appendix C provides a full breakdown of the significant projects and their construction values. The peak year for the Glenigan spend profile is 2023.

Table 14 shows the distribution by project type of new build spend for the total pipeline of known projects in 2023.

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[24] Building envelope specialists are any trade involved with the external cladding of a building other than bricklaying, for example, curtain walling. The include SOC Code 5319 - Construction and building trades not elsewhere classified.
[25] The Glenigan database allows contractors to identify leads and to carry out construction market analysis. For the purposes of this analysis we have used the Q4 2022 cut of data.
[26] The values in this table are the values from the Glenigan pipeline to which the construction element percentage has been applied and thus reflect the adjusted values of infrastructure projects values to distinguish between construction and engineering construction.

Table 14: New-build construction spend by project type in 2023

Project Type	Construction spend in 2023 (2022 values - £m)	% of total
New housing	36	53%
Private commercial	15	22%
Infrastructure	8	12%
Public non-housing	7	10%
Private industrial	2	3%
Total	68	100%

6.1.3. Estimate of total labour demand

As outlined in Appendix A, the known project pipeline may not include smaller projects or repair and maintenance work. Figure 21 shows the outputs of the analysis of future labour demand. The purple area shows the labour demand arising from the new build Glenigan projects. This is projected forward from the peak as shown in green. The grey area shows the likely labour demand arising from our estimate of new build work over and above that which is included in Glenigan. The total R&M workforce is shown in blue which includes any estimates of other R&M work not already included in Glenigan.

The total construction labour demand including the volume of R&M imputed from the CSN model is 1,110 people in 2023. The projected growth between 2023 and 2027 suggests that the labour demand in 2027 will be around 1,140 people.

Figure 21: Total construction labour demand including estimates for both R&M and estimates of other work

For 2023 the detailed breakdown for each of the 28 occupational groups is shown in Figure 22. This shows the breakdown by occupation for both the pipeline of known projects, estimates of other work and R&M.
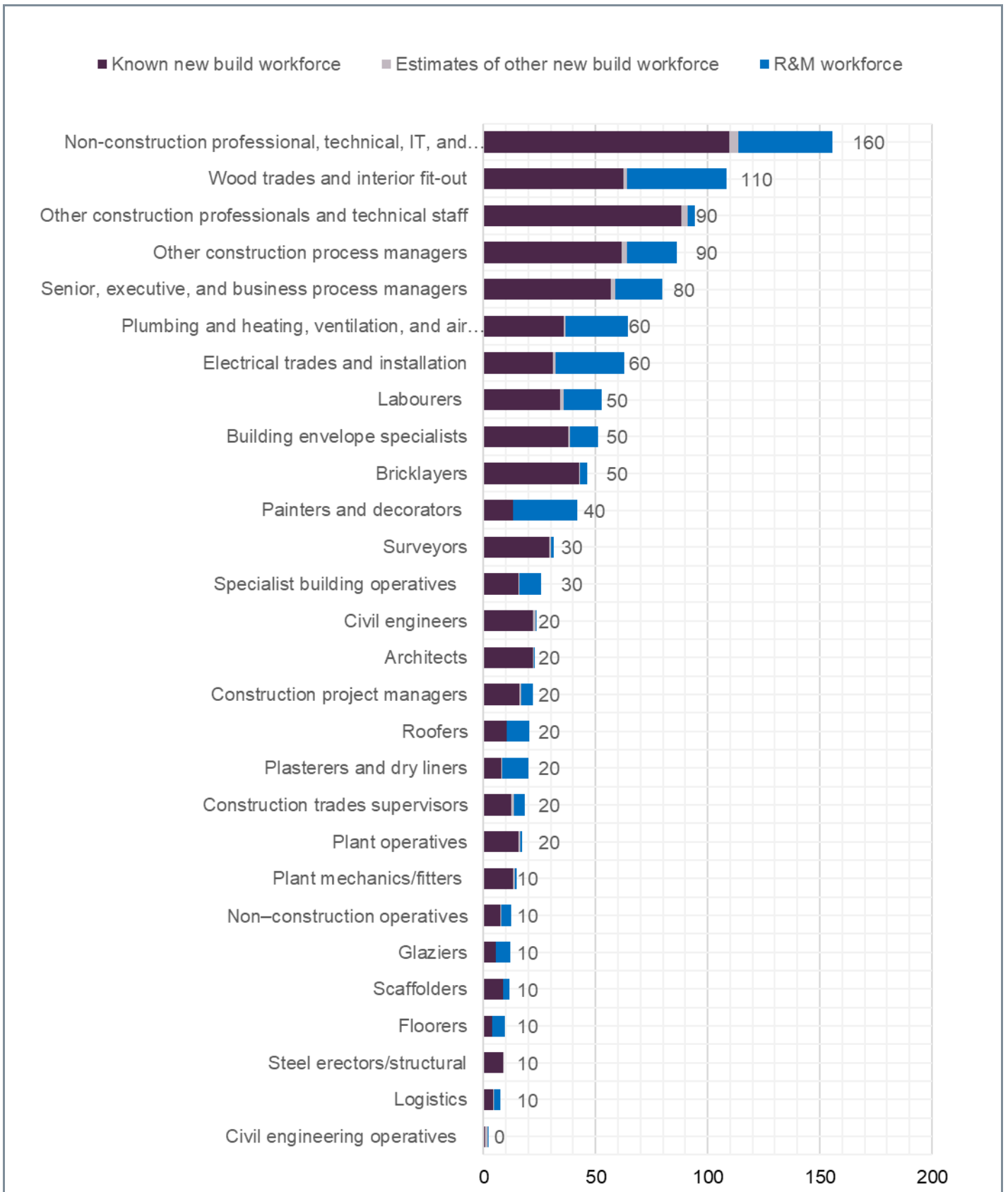
Figure 22: Construction labour demand by occupation in 2023

Table 15 shows the labour demand generated by the known projects and the estimates of other work in 2023.

Table 15: Labour demand by work type in 2023[27]

Project Type	Labour demand from known projects (people)	Labour demand from estimates of other work (people)	Total labour demand (people)	% of total in 2023
New housing	300	-	300	27%
Private commercial	230	10	240	22%
Non-housing R&M	-	160	160	14%
Housing R&M	80	80	160	14%
Infrastructure	120	10	130	12%
Public non-housing	90	-	90	8%
Private industrial	30	-	30	3%
Total	850	260	1,110	100%

6.1.4. Summary

- The labour demand arising from the construction spend in Sutton peaks at about 1,110 people in 2023, taking account of estimates of other work including R&M in addition to the pipeline of known projects.

- During 2023, the most labour-intensive occupation group is non-construction professional, technical, IT and other office–based staff with an annual demand of 160 people.

- The estimate of the three largest labour demands in the trade occupations for 2023 are as follows:

  - the trade occupation for which demand is highest is Wood trades and interior fit-out with 110 people;

  - Plumbing and heating, ventilation, and air conditioning trades follow with 60 people;

  - Electrical trades and installation trades rank third, with a demand of 60 people.

6.2. LOW CARBON SKILLS ANALYSIS

Figure 23 and Figure 24 show a breakdown of the performance ratings reported in EPCs published since 2013 for domestic and non-domestic properties in Sutton. Approximately 56% of the domestic properties (as well as 52% of the non-domestic ones) which have EPCs lodged since 2013 have a rating D and below. EPCs are not available for all the properties in the area, but we estimate that the ones lodged cover approximately 56% of all domestic properties in the borough's stock and 63% of all the non-domestic ones, based on the number of buildings in the borough.[28]
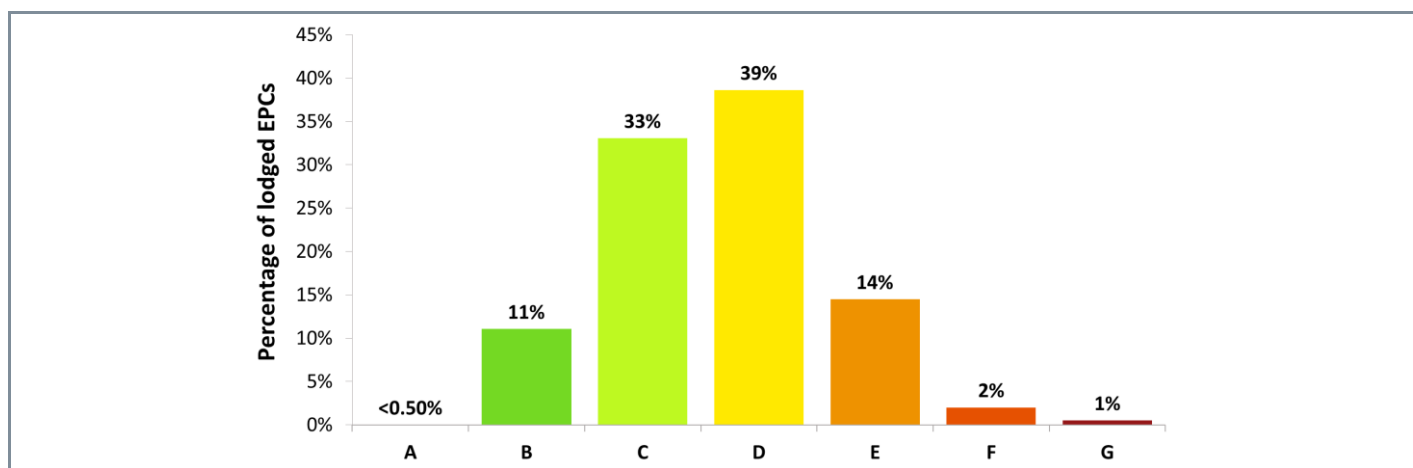
Figure 23: EPC profile of domestic properties in Sutton

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[27] Due to rounding totals might not correspond to the sum of the parts.
[28] Number of domestic buildings in the boroughs derived from Valuation Office Agency statistics.
Number of non-domestic buildings in the boroughs derived from Department for Business, Energy & Industrial Strategy data published as part of the National Energy Efficiency Data Framework.
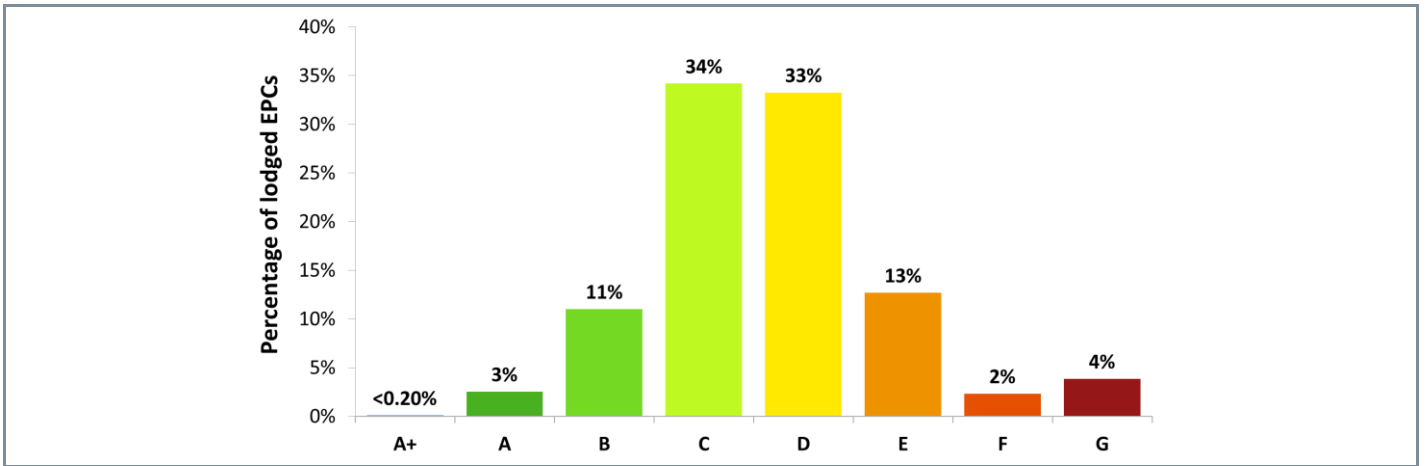
Figure 24: EPC profile of non-domestic properties in Sutton

The average number of people required on a yearly basis to deliver the recommended EPC interventions depends on how ambitious the implementation plans are. To illustrate this we considered two scenarios.

- Scenario 1: suggested interventions are being delivered over a 5-year period. This allowed us to align the low carbon skill demand analysis with the timeframe considered for the five-year period from 2023-27 for the wider construction demand analysis.

- Scenario 2: a less ambitious scenario allowing for delivery of the interventions over a 10-year period from 2023 to 2032.

Based on these scenarios, we estimated that the annual labour demand for low carbon skills needed to improve the energy performance of buildings rated D and below is between 1,790 and 980 over the next five to ten years. The average annual low carbon skills demand by occupation for energy efficiency interventions for these two scenarios is shown in Figure 25.

Figure 25: Low carbon skills demand by occupation: comparing delivery scenarios[29]

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[29] Building envelope specialists are any trade involved with the external cladding of a building other than bricklaying, for example, curtain walling. The include SOC Code 5319 - Construction and building trades not elsewhere classified.

Under Scenario 1 and 2, estimated low carbon skill needs could account, respectively, for between160% and 79% of the total construction labour demand over the 2023-27 period.

- The total demand for low carbon skills in the context of existing buildings retrofit to improve the energy performance of buildings rated D and below is between 1,790 and 980 over the next five to ten years.
- The estimate of the four largest low carbon skill demands are as follows.
    - Building envelope specialists:[30] 21% of the total demand
    - Construction trades supervisors: 11% of the total demand
    - Scaffolders: 9% of the total demand
    - Plumbing and heating, ventilation, and air conditioning trades: 9% of the total demand.

7. LABOUR DEMAND IN WANDSWORTH

7.1. CONSTRUCTION LABOUR DEMAND

7.1.1. Introduction

The following sections provide an estimate of the labour demand created by the construction investment across Wandsworth over the period 2023-2027. The results, prepared using the analysis described in Appendix A, are reported along with the labour demand generated as calculated by the Labour Forecasting Tool.

7.1.2. Pipeline of known projects

We have analysed projects in the Glenigan database[31] and, where required, updated that list with any supplementary information provided by the Borough.

The review of the Glenigan database identified 166 projects in Wandsworth. Of these, eight projects were removed due to missing dates along with five projects which were clearly identified as a consultancy project. Also excluded were one duplicate project.

The Mean Value Theorem was applied to the remainder of the pipeline to identify the significant projects. The process identified 29 significant projects accounting for just over 94% of the total construction spend in the area. This allowed a detailed analysis of a large proportion of all the projects and a comprehensive consideration of the project types to which they were assigned.
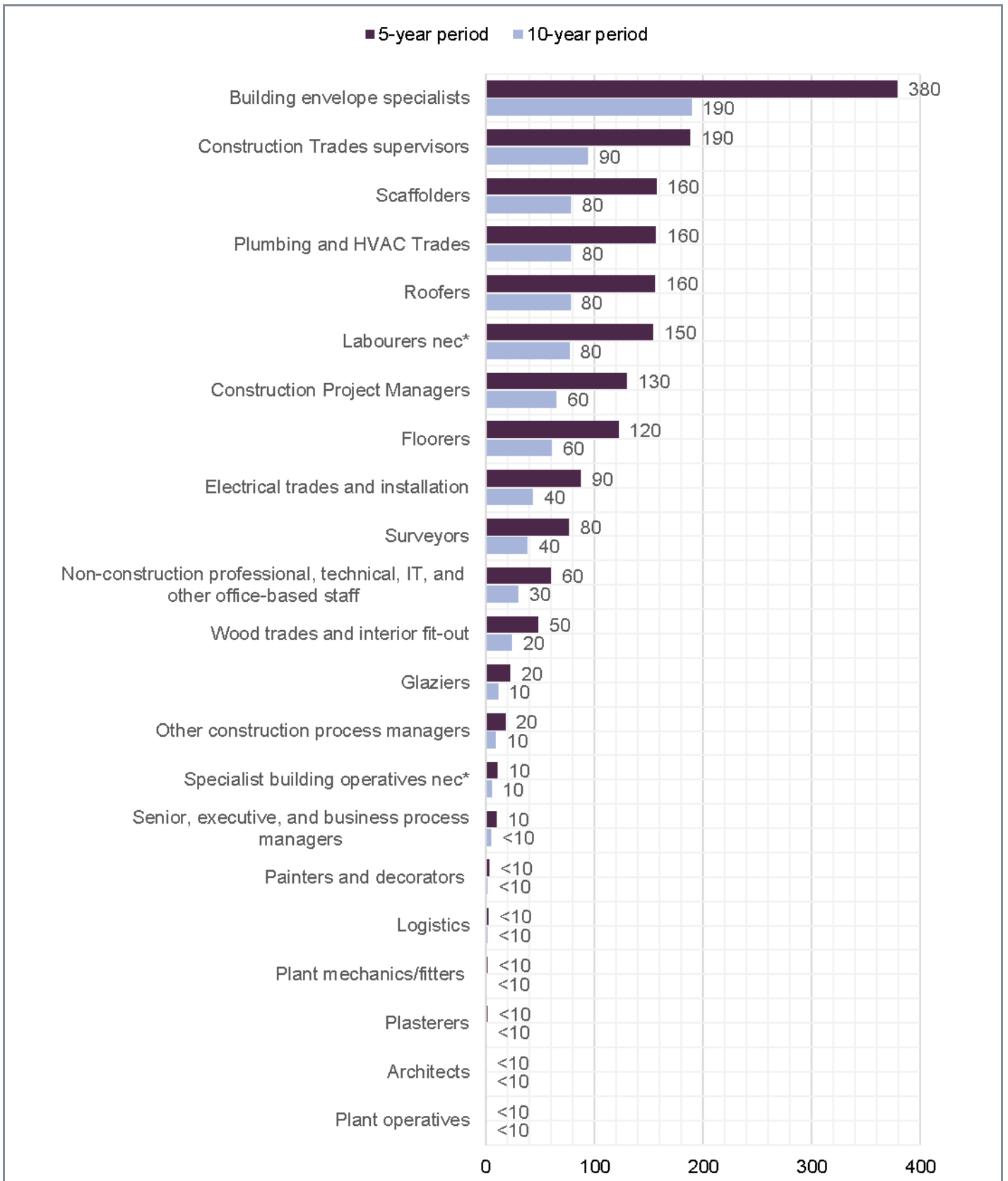
Table 16 shows the number of significant projects within the Wandsworth area, the percentage of spend arising from the significant projects and the total spend. The construction spend shown in this table takes account of any adjustments for engineering works and any incomplete, duplicate or consultancy projects. Values are shown in 2022 prices, the base price used in the Glenigan database.

Table 16: Key data for significant projects in Wandsworth[32]

	Number of projects	Construction spend (£m – 2022 values)
Known projects	146	7,262
Significant projects	29	6,859
Percentage within significant projects	20%	94%

Appendix C provides a full breakdown of the significant projects and their construction values. The peak year for the Glenigan spend profile is 2023.

Table 17 shows the distribution by project type of new build spend for the total pipeline of known projects in 2023.

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[30] Building envelope specialists are any trade involved with the external cladding of a building other than bricklaying, for example, curtain walling. The include SOC Code 5319 - Construction and building trades not elsewhere classified.

[31] The Glenigan database allows contractors to identify leads and to carry out construction market analysis. For the purposes of this analysis we have used the Q4 2022 cut of data.

[32] The values in this table are the values from the Glenigan pipeline to which the construction element percentage has been applied and thus reflect the adjusted values of infrastructure projects values to distinguish between construction and engineering construction.

Table 17: New-build construction spend by project type in 2023

Project Type	Construction spend in 2023 (2022 values - £m)	% of total
New housing	517	55%
Private commercial	347	37%
Infrastructure	44	5%
Public non-housing	22	2%
Private industrial	5	1%
Total	935	100%

7.1.3. Estimate of total labour demand

As outlined in Appendix A, the known project pipeline may not include smaller projects or repair and maintenance work. Figure 26 shows the outputs of the analysis of future labour demand. The purple area shows the labour demand arising from the new build Glenigan projects. This is projected forward from the peak as shown in green. The grey area shows the likely labour demand arising from our estimate of new build work over and above that which is included in Glenigan. The total R&M workforce is shown in blue which includes any estimates of other R&M work not already included in Glenigan.

The total construction labour demand including the volume of R&M imputed from the CSN model is 15,210 people in 2023. The projected growth between 2023 and 2027 suggests that the labour demand in 2027 will be around 15,450 people.
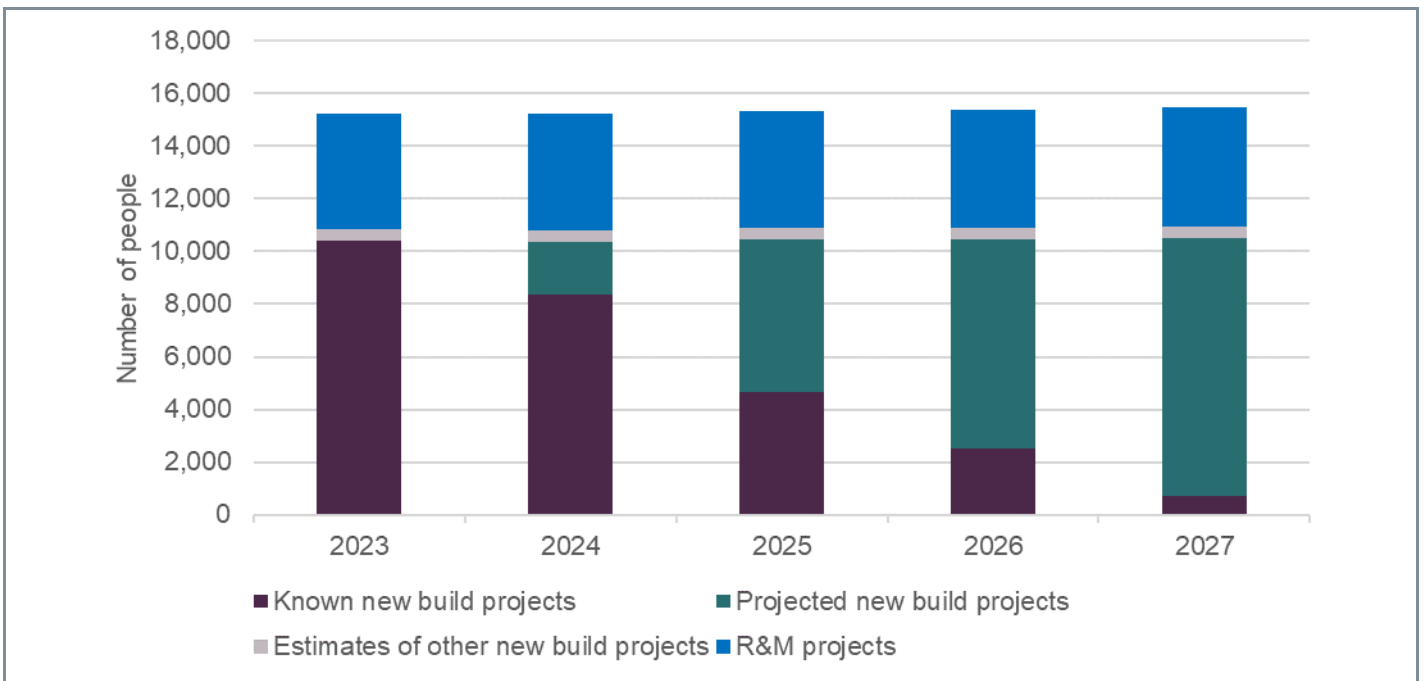
Figure 26: Total construction labour demand including estimates for both R&M and estimates of other work

For 2023 the detailed breakdown for each of the 28 occupational groups is shown in Figure 27. This shows the breakdown by occupation for both the pipeline of known projects, estimates of other work and R&M.
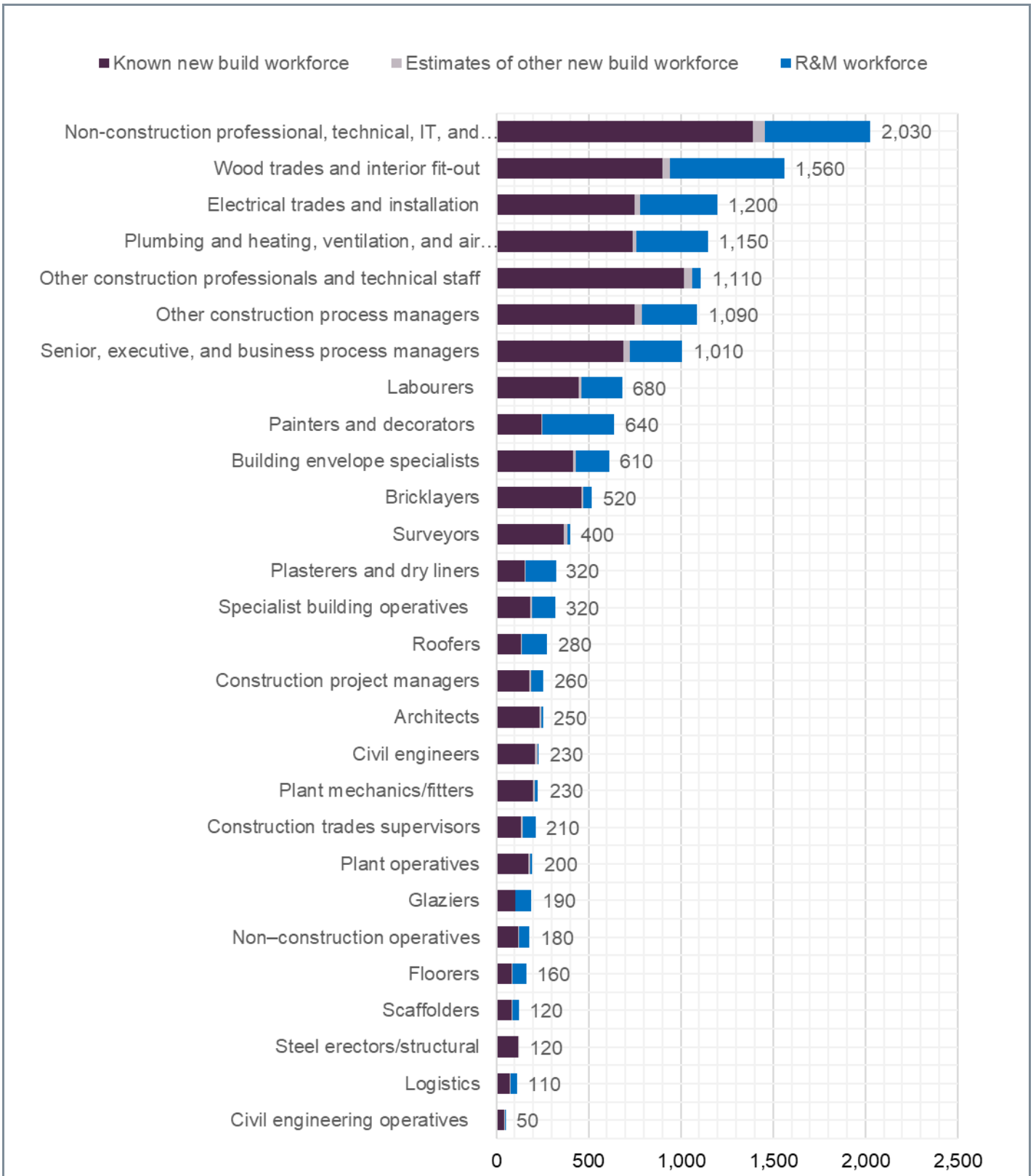
Figure 27: Construction labour demand by occupation in 2023

Table 18 shows the labour demand generated by the known projects and the estimates of other work in 2023.

Table 18: Labour demand by work type in 2023[33]

Project Type	Labour demand from known projects (people)	Labour demand from estimates of other work (people)	Total labour demand (people)	% of total in 2023
Private commercial	5,180	360	5,540	36%
New housing	4,470	-	4,470	29%
Housing R&M	220	2,060	2,280	15%
Non-housing R&M	-	2,110	2,110	14%
Infrastructure	330	80	410	3%
Public non-housing	330	-	330	2%
Private industrial	70	-	70	0%
Total	10,600	4,610	15,210	100%

7.1.4. Summary

- The labour demand arising from the construction spend in Wandsworth peaks at about 15,210 people in 2023, taking account of estimates of other work including R&M in addition to the pipeline of known projects.

- During 2023, the most labour-intensive occupation group is non-construction professional, technical, IT and other office–based staff with an annual demand of 2,030 people.

- The estimate of the three largest labour demands in the trade occupations for 2023 are as follows:

  - the trade occupation for which demand is highest is Wood trades and interior fit-out with 1,560 people;

  - Electrical trades and installation trades follow with 1.200 people;

  - Plumbing and heating, ventilation, and air conditioning trades rank third, with a demand of 1,150 people.

7.2. LOW CARBON SKILLS ANALYSIS

Figure 28 and Figure 29 show a breakdown of the performance ratings reported in EPCs published since 2013 for domestic and non-domestic properties in Wandsworth. Approximately 44% of the domestic properties (as well as 51% of the non-domestic ones) which have EPCs lodged since 2013 have a rating D and below. EPCs are not available for all the properties in the area, but we estimate that the ones lodged cover approximately 67% of all domestic properties in the borough's stock and 56% of all the non-domestic ones, based on the number of buildings in the borough.[34]
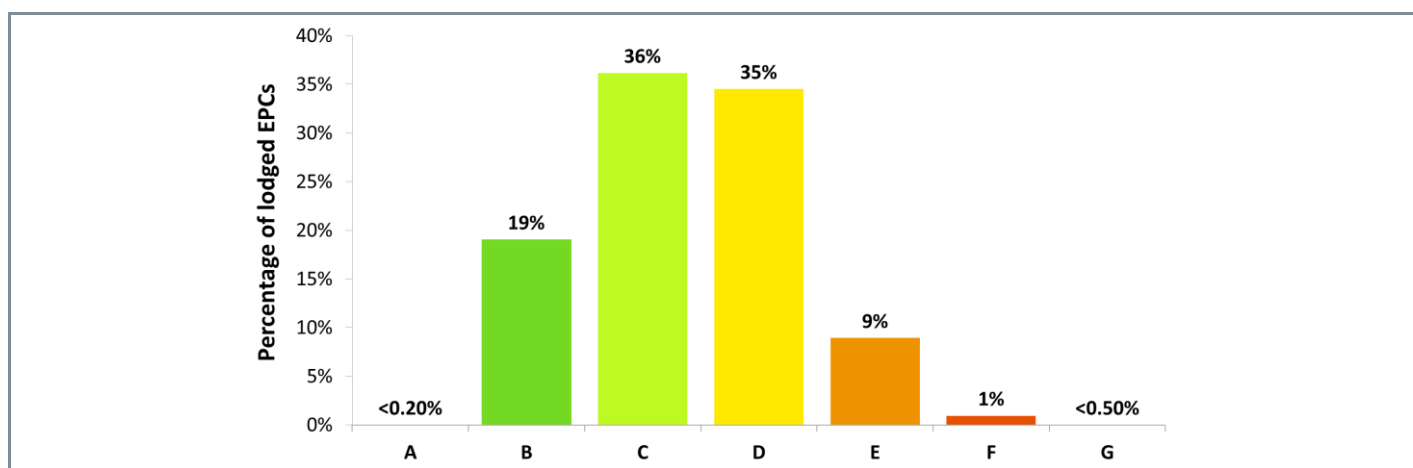
Figure 28: EPC profile of domestic properties in Wandsworth

[33] Due to rounding totals might not correspond to the sum of the parts.
[34] Number of domestic buildings in the boroughs derived from Valuation Office Agency statistics.
Number of non-domestic buildings in the boroughs derived from Department for Business, Energy & Industrial Strategy data published as part of the National Energy Efficiency Data Framework.
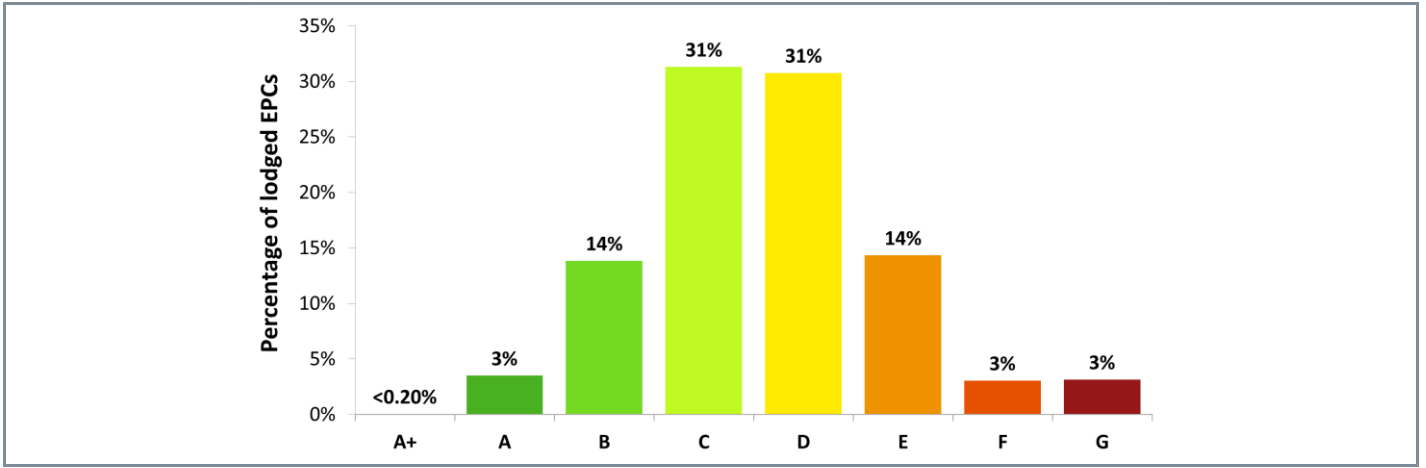
Figure 29: EPC profile of non-domestic properties in Wandsworth

The average number of people required on a yearly basis to deliver the recommended EPC interventions depends on how ambitious the implementation plans are. By way of example, we considered two scenarios.

- Scenario 1: suggested interventions are being delivered over a 5-year period. This allowed us to align the low carbon skill demand analysis with the timeframe considered for the wider construction demand analysis which focussed on the 2023-27 5-year period.

- Scenario 2: a less ambitious scenario whereby the suggested interventions are delivered over a 10-year period spanning from 2023 to 2032.

We estimated that the total demand for low carbon skills needed to improve the energy performance of buildings rated D and below is between 2,180 and 1,090 over the next five to ten years. The average annual low carbon skills demand by occupation for energy efficiency interventions for these two scenarios is shown in Figure 30.
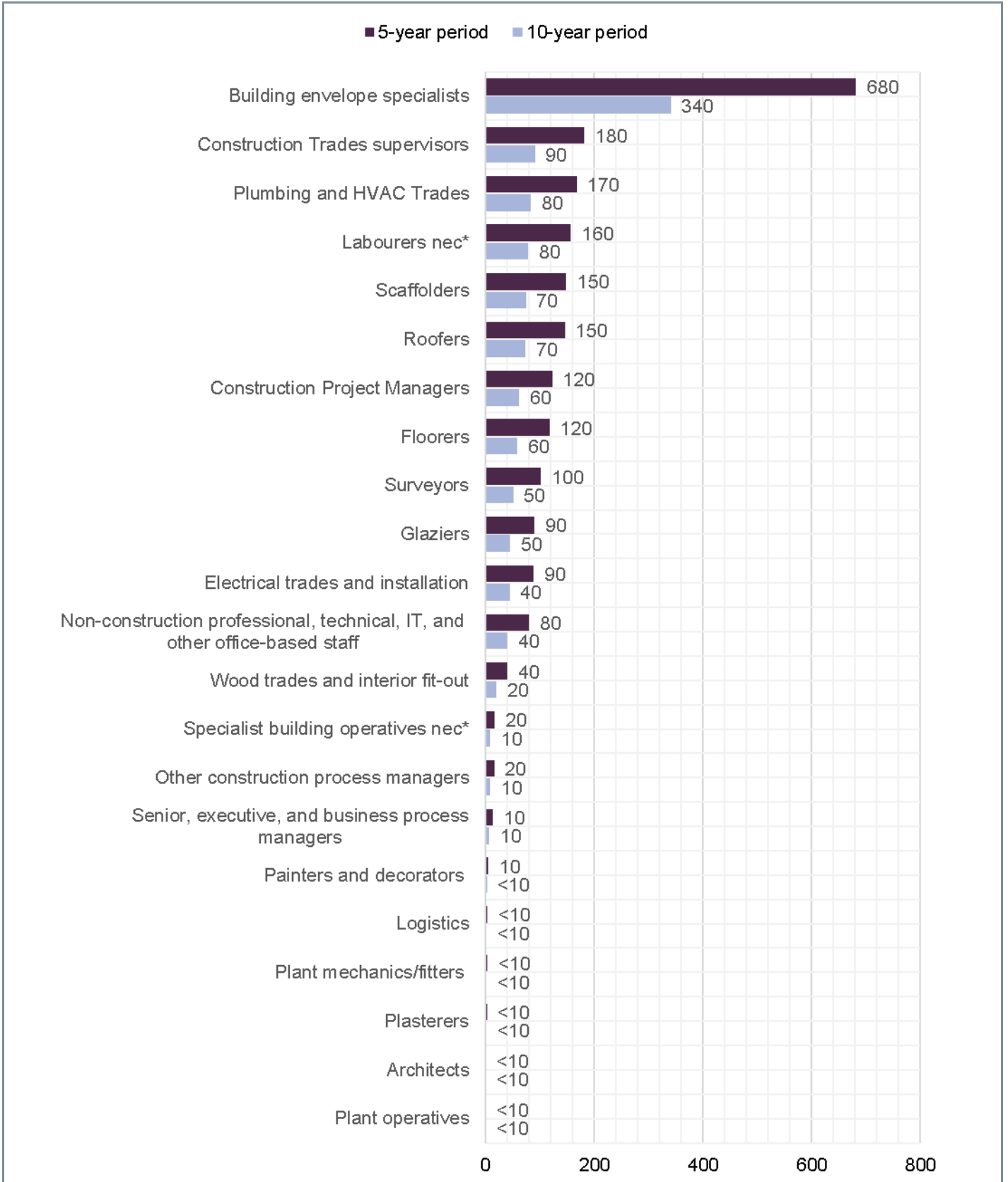
Figure 30: Low carbon skills demand by occupation: comparing delivery scenarios[35]

Under Scenario 1 and 2, estimated low carbon skill needs could account, respectively, for between14% and 7% of the total construction labour demand over the 2023-27 period.

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[35] Building envelope specialists are any trade involved with the external cladding of a building other than bricklaying, for example, curtain walling. The include SOC Code 5319 - Construction and building trades not elsewhere classified.

- The total demand for low carbon skills in the context of existing buildings retrofit to improve the energy performance of buildings rated D and below is between 2,180 and 1,090 over the next five to ten years.
- The estimate of the four largest low carbon skill demands are as follows.
    - Building envelope specialists:[36] 31% of the total demand
    - Construction trades supervisors: 8% of the total demand
    - Plumbing and heating, ventilation, and air conditioning trades: 8% of the total demand
    - Labourers nec[37]: 7% of the total demand.

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[36] Building envelope specialists are any trade involved with the external cladding of a building other than bricklaying, for example, curtain walling. The include SOC Code 5319 - Construction and building trades not elsewhere classified.
[37] nec = not elsewhere classified

APPENDIX CONTENTS

LIST OF TABLES

APPENDIX A. DEMAND ANALYSIS METHODOLOGY

Introduction

The Construction Skills Network (CSN) provides labour market intelligence for the construction industry. Developed by Experian on behalf of CITB it forecasts labour demand in each of 12 UK regions and provides forecasts of how the industry will change year on year. It is not designed however to predict labour demand at a sub-regional level. For this purpose, we use our prize-winning Labour Forecasting Tool (LFT) developed on behalf of CITB. Labour demand is calculated by converting the volume of construction activity forecast to take place in any geographical region into forecast labour demand using labour coefficients (the number of person years required to produce £1m of output). For the sake of consistency with ONS terminology the 'volume of activity' is referred to as 'output' throughout this report. The following sections describe:

- the sources of data we use;
- how the output is calculated;
- how we deal with the absence of comprehensive data that is the typical situation beyond the first year or two of our analysis;
- how we reconcile any differences between the results produced by the LFT and those produced by the CSN;
- the steps we take to deal with any shortcomings in the sources of data; and
- how the LFT converts output into labour demand.

Calculating construction output

Data sources

The principal source of data is the Glenigan database.

Glenigan

The original purpose of the Glenigan database is to allow contractors to identify leads and to carry out construction market analysis. It is updated every quarter to provide details of planning applications from local authorities supplemented with additional project-specific data. Of particular relevance to this report, it provides a description of each project, its name, location, value, and in most cases, projected start and end dates. It contains many tens of thousands of projects. The Glenigan pipeline does not identify every single project in an area: projects which are small (typically but not exclusively those less than £250,000 in value), and most that involve repair and maintenance are not included.

We have used the latest available cut of Glenigan data excluding those projects which are already complete. We have included in our analysis only those projects shown to be at the following planning stages because there is a reasonable probability that these projects will be realised in practice.

- Planning not required
- Detail plans granted
- Reserved matters granted
- Application for reserved matters
- Plans approved on appeal
- Listed building consent

The values of some infrastructure projects given in the Glenigan database are the total value of construction and engineering works. In these cases, since the scope of this study is limited to the construction sector, an estimate of the engineering value has been calculated and subtracted from the total value. This provides what we have termed the construction value. The percentages applied to the total value of each infrastructure project type to derive the construction value are shown in Table A1. The construction/engineering proportions have been validated through work we have undertaken for other clients and have been used in the production of Infrastructure UK's National Infrastructure Plan for Skills and the Construction Skills Network forecasts.

An initial review of the projects in the pipeline is carried out to ensure that only projects which have (a) a defined value and (b) defined start and end dates, are considered in the analysis, and that no projects are duplicated. For example "major leads" and "frameworks" may include smaller projects that are separately identified in the database.

Because of the size of the database, it is impossible to review the details of every project. Instead, we identify the small number of projects that represent the greatest value, the so-called significant projects. To do this, we use the Mean Value Theorem developed at the University of Dundee which states that maximum information from any set of data is obtained simply by considering the data whose value is greater than the average. This is a version of the Pareto rule which suggests that 80% of the value in a data set is contained within the 20% of items whose value is the greatest. The significant projects are then thoroughly inspected to make sure that the information reported in the Glenigan database is consistent and accurate as far as can be ascertained. Any anomalies are resolved, if necessary by returning to the source of the data. Since this process typically picks up the projects whose value represents 80% of the total, the scope for any errors in the remaining data to have a significant impact is severely limited.

Table A1: Proportion of total value related to construction

Infrastructure type	Sub-type	Construction value as a proportion of total value
Flooding	Flooding	90%
Transport	Bridges	100%
	Road tunnel	100%
	Roads	100%
	Air traffic control	100%
	Airports	100%
	Ports	90%
	Stations (underground/Network Rail)	80%
	Mixed rail	55%
	Electrification	35%
	Underground/DLR (not incl. stations)	35%
	Rail maintenance	10%
	Trams	55%
	Contactless ticketing	20%
Water	Water/wastewater treatment works	90%
Communications	Broadband/Digital infrastructure	20%
Energy	Photovoltaics	80%
	Generation (biomass)	50%
	Generation (energy from Waste)	50%
	Generation (nuclear)	50%
	Undefined electricity generation	40%
	Generation (fossil fuel)	25%
	Generation (renewables - offshore)	20%
	Generation (renewables - onshore)	10%
	Gas Transmission/distribution	30%
	Electricity transmission/distribution	25%
	Interconnectors	20%
	Nuclear decommissioning	60%
	Smart meters	0%
	Oil and gas	10%
Mining	Mining	80%
General infrastructure	General infrastructure	100%

For the significant projects, the project descriptions in the database are assigned the most appropriate project type to be used when the data is input to the LFT (each type is driven by a different underlying model). Cases where a project consists of more than one type are broken down into multiple forecasts which are assigned specific project types to more closely predict the labour demand. This takes account of the different types of work which may exist within a single project, e.g. mixed developments comprising residential, commercial and industrial buildings. For the non-significant projects, the default project type defined in the Glenigan pipeline is applied.

In order to maintain consistency with the CSN we have limited our forecast to the same time period as the most recently published CSN forecast.

Construction Skills Network (CSN) data

The CSN model produced by Experian also uses Glenigan as a major source of data relating to the volume of construction activity in the UK. Experian supplement the Glenigan data with market intelligence collected by a variety of means including a series of 'Observatories' held every six months in each region, at which representatives of the industry are invited to comment on the validity of Experian's data and findings. In Experian's annual CSN report, their estimate of the output in each of the following sectors is published:

- Public housing
- Private housing
- Infrastructure
- Public non-housing
- Industrial
- Commercial
- Housing repair and maintenance
- Non-housing repair and maintenance

Aligning the Glenigan pipeline with CSN output

The following process is undertaken to ensure that the value of work in the Glenigan pipeline is aligned with output as measured by the CSN.

1. Considering the UK region within which the local area lies, identify only the new build in the known projects by removing all repair and maintenance projects.

2. Compare the output identified in the known projects as new build at the regional level with the CSN new build at the regional level sector by sector e.g. residential, non-residential, infrastructure etc.

3. If in any sector the known new-build regional output for the peak year is more or less than that forecast by the CSN for the same year then the value of each new build known project is factored by the following ratio:

$$\frac{Value\ of\ CSN\ new\ build\ at\ regional\ level\ for\ given\ sector}{Value\ of\ known\ new\ build\ projects\ at\ regional\ level\ for\ given\ sector}$$

The outputs calculated in this way are referred to as 'factored new build outputs'

This process takes account of both projects (typically less than £250k in value) not included in the known projects and those whose value or probability of realisation is over-optimistic.

4. To take account of housing repair and maintenance (R&M) at the local area level, it is assumed that the proportion of the total output represented by housing R&M is the same at the local area level as it is at the regional level in the CSN. The Glenigan new build factored housing output is therefore multiplied by the following ratio:

$$\frac{Value\ of\ CSN\ housing\ R\&M\ at\ regional\ level}{Value\ of\ CSN\ new\ build\ housing\ at\ regional\ level}$$

to derive the output in housing R&M to be added to the factored new build output

5. The non-housing R&M to be added to the factored new build non-housing output is calculated in a similar way.

Dealing with the 'cliff edge'

As the time horizon extends there is less clarity on what is planned. As a result, the number of known projects declines the further into the future we look. This apparently declining workload is highly unlikely to reflect the total

amount of work that will take place in the future. It is almost certain that there will be additional projects that come on stream which are yet to be identified. To overcome this 'cliff edge' effect we assume, based on an analysis of historical data, that the future workforce is approximately equal to the peak. It should be noted that the peak labour demand refers to the current "snapshot" of the scheduled construction spend. It is prudent to expect that, should the investment in future years follow the same pattern, the peak labour demand figures are likely to be roughly similar assuming the mix of projects remains consistent. The peak has, therefore, been extrapolated forwards to create a more likely scenario of the ongoing workforce by reflecting the employment growth rate based on the CSN employment forecast for the whole London region.

A consequence of this approach is the implicit assumption that the proportions of people in each occupation in the additional projects remain unchanged year on year.

Calculating total labour demand

Our Labour Forecasting Tool is used to determine the labour demand generated by the construction outputs in the peak year. The LFT can determine the labour demand generated by a pipeline of construction projects given only the project types, their start and end dates and their locations. It quantifies the month-by-month demand in each of the 28 occupational groups shown in Appendix B. To do this, it uses labour coefficients (person years to produce £1m of output) derived from historical ONS data. The labour coefficients are updated annually as new data becomes available, and indexed to take account of different locations and changes in prices.

There are different labour coefficients for each occupation and for each of the following project types:

- residential
- non-residential
- infrastructure
- residential R&M
- non-residential R&M

Infrastructure projects can be broken down into the types shown in Table A1.

APPENDIX B.   OCCUPATIONAL DEFINITIONS

Reference is made in this report to a range of occupational aggregates for construction occupations. This appendix contains details of the 166 individual occupations which are aggregated into 28 occupational aggregates.

Table B1: Occupation definitions

Occupations included within construction occupational aggregates (Four-digit codes refer to Office for National Statistics Standard Occupational Classification Codes).	
1 Senior, executive, and business process managers[38]	
(1115) Chief executives and senior officials (1131) Financial managers and directors (1132) Marketing and sales directors (1133) Purchasing managers and directors (1135) Human resource managers and directors (1251) Property, housing and estate managers (1136) Information technology and telecommunications directors (2150) Research and development managers	(1162) Managers and directors in storage and warehousing (1259) Managers and proprietors in other services nec (1139) Functional managers and directors nec (2133) IT specialist managers (2134) IT project and programme managers (3538) Financial accounts managers (3545) Sales accounts and business development managers
2 Construction project managers[38]	
(2436) Construction project managers and related professionals	
3 Other construction process managers[38]	
(1121) Production managers and directors in manufacturing (1122) Production managers and directors in construction (1161) Managers and directors in transport and distribution (1255) Waste disposal and environmental services managers	(3567) Health and safety officers (3550) Conservation and environmental associate professionals
4 Non-construction professional, technical, IT, and other office–based staff (excl. managers)[38]	
(3131) IT operations technicians (3132) IT user support technicians (3534) Finance and investment analysts and advisers (3535) Taxation experts (3537) Financial and accounting technicians (3563) Vocational and industrial trainers and instructors (3539) Business and related associate professionals nec (3520) Legal associate professionals (3565) Inspectors of standards and regulations (2136) Programmers and software development professionals (2139) Information technology and telecommunications professionals nec (3544) Estate agents and auctioneers (2413) Solicitors (2419) Legal professionals nec (2421) Chartered and certified accountants (2424) Business and financial project management professionals (2423) Management consultants and business analysts (4216) Receptionists (4217) Typists and related keyboard occupations (3542) Business sales executives (4122) Book-keepers, payroll managers and wages clerks (4131) Records clerks and assistants (4133) Stock control clerks and assistants (7213) Telephonists (7214) Communication operators (4215) Personal assistants and other secretaries (7111) Sales and retail assistants (7113) Telephone salespersons	(3541) Buyers and procurement officers (3562) Human resources and industrial relations officers (4121) Credit controllers (4214) Company secretaries (7129) Sales related occupations nec (7211) Call and contact centre occupations (7219) Customer service occupations nec (9219) Elementary administration occupations nec (2111) Chemical scientists (2112) Biological scientists and biochemists (2113) Physical scientists (3111) Laboratory technicians (3421) Graphic designers (2463) Environmental health professionals (2135) IT business analysts, architects and systems designers (2141) Conservation professionals (2142) Environment professionals (2425) Actuaries, economists and statisticians (2426) Business and related research professionals (4124) Finance officers (4129) Financial administrative occupations nec (4138) Human resources administrative occupations (4151) Sales administrators (4159) Other administrative occupations nec (4162) Office supervisors (7130) Sales supervisors (7220) Customer service managers and supervisors (4161) Office managers
5 Construction trades supervisors[39]	
(5250) Skilled metal, electrical and electronic trades supervisors (5330) Construction and building trades supervisors	
6 Wood trades and interior fit-out[39]	
(5315) Carpenters and joiners (8121) Paper and wood machine operatives	(5442) Furniture makers and other craft woodworkers (5319) Construction and building trades nec (25%)
7 Bricklayers[39]	
(5312) Bricklayers and masons	

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[38] Managerial, professional & office based staff
[39] Skilled trades & operatives

8 Building envelope specialists[39]	
(5319) Construction and building trades nec (50%)	

9 Painters and decorators[39]	
(5323) Painters and decorators	(5319) Construction and building trades nec (5%)

10 Plasterers[39]	
(5321) Plasterers	

11 Roofers[39]	
(5313) Roofers, roof tilers and slaters	

12 Floorers[39]	
(5322) Floorers and wall tillers	

13 Glaziers[39]	
(5316) Glaziers, window fabricators and fitters	(5319) Construction and building trades nec (5%)

14 Specialist building operatives not elsewhere classified (nec)[39]	
(8149) Construction operatives nec (100%)	(9132) Industrial cleaning process occupations
(5319) Construction and building trades nec (5%)	(5449) Other skilled trades nec

15 Scaffolders[39]	
(8141) Scaffolders, stagers and riggers	

16 Plant operatives[39]	
(8221) Crane drivers	(8222) Fork-lift truck drivers
(8129) Plant and machine operatives nec	(8229) Mobile machine drivers and operatives nec

17 Plant mechanics/fitters[39]	
(5223) Metal working production and maintenance fitters	(9139) Elementary process plant occupations nec
(5224) Precision instrument makers and repairers	(5222) Tool makers, tool fitters and markers-out
(5231) Vehicle technicians, mechanics and electricians	(5232) Vehicle body builders and repairers

18 Steel erectors/structural fabrication[39]	
(5311) Steel erectors	(5319) Construction and building trades nec (5%)
(5215) Welding trades	(5211) Smiths and forge workers
(5214) Metal plate workers, and riveters	(5221) Metal machining setters and setter-operators

19 Labourers nec[39]	
(9120) Elementary construction occupations (100%)	

20 Electrical trades and installation[39]	
(5241) Electricians and electrical fitters	(5242) Telecommunications engineers
(5249) Electrical and electronic trades nec	

21 Plumbing and heating, ventilation, and air conditioning trades[39]	
(5314) Plumbers and heating and ventilating engineers	(5319) Construction and building trades nec (5%)
(5216) Pipe fitters	(5225) Air-conditioning and refrigeration engineers

22 Logistics[39]	
(8211) Large goods vehicle drivers	(3541) Buyers and purchasing officers (50%)
(8212) Van drivers	(4134) Transport and distribution clerks and assistants
(9260) Elementary storage occupations	

23 Civil engineering operatives not elsewhere classified (nec)[39]	
(8142) Road construction operatives (8143) Rail construction and maintenance operatives	(8123) Quarry workers and related operatives
24 Non–construction operatives[39]	
(8117) Metal making and treating process operatives (8119) Process operatives nec (8125) Metal working machine operatives (8126) Water and sewerage plant operatives (8132) Assemblers (vehicles and metal goods) (8133) Routine inspectors and testers (8139) Assemblers and routine operatives nec	(9249) Elementary security occupations nec (9233) Cleaners and domestics (9232) Street cleaners (5113) Gardeners and landscape gardeners (6232) Caretakers (9241) Security guards and related occupations (3319) Protective service associate professionals nec
25 Civil engineers[38]	
(2121) Civil engineers	
26 Other construction professionals and technical staff[38]	
(2122) Mechanical engineers (2123) Electrical engineers (2126) Design and development engineers (2127) Production and process engineers (2461) Quality control and planning engineers (2129) Engineering professionals nec (3112) Electrical and electronics technicians (3113) Engineering technicians (3114) Building and civil engineering technicians	(3119) Science, engineering and production technicians nec (3121) Architectural and town planning technicians (3122) Draughtspersons (3115) Quality assurance technicians (2432) Town planning officers (2124) Electronics engineers (2435) Chartered architectural technologists (3531) Estimators, valuers and assessors (3116) Planning, process and production technicians
27 Architects[38]	
(2431) Architects	
28 Surveyors[38]	
(2433) Quantity surveyors (2434) Chartered surveyors	

APPENDIX C. SIGNIFICANT GLENIGAN PROJECTS IN EACH BOROUGH

This appendix provides a list of all the significant projects analysed. The projects appear in the following as they were put into the LFT.

Table C1: Significant Glenigan projects in Croydon

WLC ID	Heading	Local Authority	Project Value (£m)	Start date	End date	Project Type
1	378 Flats/67 Houses & Commercial Units	Croydon	293.7	01/10/2020	01/10/2023	New housing, Private Commercial, Infrastructure
2	817 CoLiving Units & 120 Flats	Croydon	188.5	14/12/2020	17/11/2023	New housing, Private Commercial, Private Commercial
3	Shopping Centre(New/Refurb)	Croydon	90.0	04/09/2023	20/01/2025	Private Commercial, Infrastructure
4	Highway Maintenance Contract	Croydon	130.0	17/12/2018	06/11/2028	Infrastructure
5	359 Flats & Commercial Units	Croydon	69.5	31/03/2023	22/11/2024	New housing, Private Commercial
6	Offices/Estate Management/Retail Building	Croydon	50.6	07/07/2023	07/07/2025	Private Commercial
7	Office (Fit Out)	Croydon	40.0	03/04/2023	02/12/2024	Private Commercial
8	232 Flats & Shop/Office/Restaurant Units	Croydon	46.2	28/06/2021	25/03/2024	Private Commercial, New housing
9	Croydon Junction (Improvements)	Croydon	50.0	24/07/2023	13/10/2025	Infrastructure
10	155 Flats	Croydon	22.0	10/10/2022	09/10/2023	New housing
11	Streetscape (Upgrade)	Croydon	30.0	13/03/2023	11/03/2024	Infrastructure
12	75 Flats	Croydon	20.6	03/04/2023	24/03/2025	New housing
13	116 Flats	Croydon	17.8	08/11/2021	20/11/2023	New housing
14	106 Flats	Croydon	16.7	13/02/2023	13/02/2025	New housing
15	230 Flats	Croydon	14.2	13/03/2023	04/11/2024	New housing
16	Industrial & Warehouse	Croydon	7.3	18/04/2023	24/11/2023	Private Industrial
17	Retail/Education (Conversion)	Croydon	4.6	09/02/2023	25/05/2023	Private Commercial
18	Temporary Classrooms	Croydon	2.5	05/09/2022	03/07/2023	Public Non-housing
19	Care Home (Extension/Alterations)	Croydon	1.7	09/11/2022	20/04/2023	Public Non-housing

Table C2: Significant Glenigan projects in Kingston-Upon-Thames

WLC ID	Heading	Local Authority	Project Value (£m)	Start date	End date	Project Type
1	Office & Residential	Kingston-Upon-Thames	186.1	24/01/2022	25/01/2027	Private Commercial, New housing
2	452 Residential Units/1 Community/1 Office/1 Retail Unit	Kingston-Upon-Thames	64.8	04/10/2022	28/05/2024	New housing, Private Commercial, Private Commercial, Public Non-housing
3	Leisure Centre	Kingston-Upon-Thames	53.0	10/05/2023	04/12/2024	Private Commercial
4	211 Residential Units	Kingston-Upon-Thames	41.7	15/07/2021	16/07/2023	New housing
5	80 Flats/5 Town Houses & 1 Retail & 1 Office Units	Kingston-Upon-Thames	20.7	20/09/2021	14/08/2023	New housing, Private Commercial, Private Commercial
6	Residential Units (Refurbishment)	Kingston-Upon-Thames	10.0	05/06/2023	01/04/2024	Housing R&M
7	Themed Land	Kingston-Upon-Thames	7.5	25/07/2022	24/04/2023	Private Commercial
8	University Main Building (Refurbishment)	Kingston-Upon-Thames	5.9	25/04/2022	24/04/2023	Public Non-housing
9	Send School	Kingston-Upon-Thames	3.4	15/08/2022	13/10/2023	Public Non-housing
10	Nursing Home	Kingston-Upon-Thames	3.4	27/06/2022	14/08/2023	Public Non-housing
11	Hospital (Refurbishment)	Kingston-Upon-Thames	1.7	17/10/2022	19/04/2023	Public Non-housing
12	Education Centre (Conversion)	Kingston-Upon-Thames	0.9	21/10/2022	03/03/2023	Public Non-housing

Table C3: Significant Glenigan projects in Merton

WLC ID	Heading	Local Authority	Project Value (£m)	Start date	End date	Project Type
1	604 Homes	Merton	265.3	08/02/2020	08/02/2024	New housing
2	456 Flats & 1 Office	Merton	76.2	22/05/2023	16/09/2024	New housing, Private Commercial
3	135 Flats/Homeless Hostel & Commercial Units	Merton	34.4	14/07/2021	03/07/2023	New housing, New housing, Private Commercial
4	201 Residential Units & Commercial Units	Merton	34.1	15/05/2023	10/04/2028	New housing
5	93 Flats/87 Houses & 1 Community Centre	Merton	23.8	19/08/2022	17/08/2023	New housing, Public Non-housing
6	Sports Club (Extension/Alterations)	Merton	22.2	01/08/2022	26/05/2023	Private Industrial
7	Office Building	Merton	16.0	04/10/2021	06/02/2023	Private Commercial
8	Club House	Merton	13.5	24/11/2021	17/04/2023	Private Commercial
9	Flats & Restaurant (Alterations)	Merton	12.9	13/03/2023	04/03/2024	Housing R&M
10	57 Houses/50 Flats/2 Tennis Courts	Merton	10.3	30/06/2023	29/12/2023	New housing, Public Non-housing
11	Supermarket (Extension/Alterations)	Merton	10.3	14/04/2023	13/10/2023	Private Commercial
12	Office Accommodation (Extension/Alterations)	Merton	8.3	31/03/2023	22/03/2024	Private Commercial

Table C4: Significant Glenigan projects in Richmond-Upon-Thames

WLC ID	Heading	Local Authority	Project Value (£m)	Start date	End date	Project Type
1	410 Flats/42 Houses & 1 Community/Leisure Facility	Richmond-Upon-Thames	145.5	01/09/2023	01/09/2033	New housing, Public Non-housing
2	45 Flats & Commercial Units	Richmond-Upon-Thames	33.3	14/04/2023	10/05/2024	New housing, Private Commercial
3	Commercial Unit (Extension/Alterations)	Richmond-Upon-Thames	17.5	13/04/2023	23/05/2024	Private Commercial
4	Commercial Space (Fit Out)	Richmond-Upon-Thames	9.4	07/11/2022	24/01/2024	Private Commercial
5	182 Flats/30 Houses	Richmond-Upon-Thames	8.5	10/07/2023	10/03/2025	New housing
6	Film Making Purposes	Richmond-Upon-Thames	5.5	03/10/2022	25/09/2023	Private Commercial
7	30 Residential Units & 1 Nursery	Richmond-Upon-Thames	5.2	24/02/2023	22/03/2024	New housing, Public Non-housing
8	Swimming Pool (Extension/Alterations)	Richmond-Upon-Thames	5.0	27/03/2023	06/05/2024	Private Commercial
9	Road Bridge (Refurbishment)	Richmond-Upon-Thames	5.0	03/04/2023	01/01/2024	Infrastructure
10	Tech Hub Development	Richmond-Upon-Thames	3.9	06/07/2023	06/04/2024	Private Commercial
11	91 Care Facility/Health Care/Leisure Centre Units	Richmond-Upon-Thames	3.1	26/06/2023	22/07/2024	New housing, Private Commercial, Public Non-housing
12	Railway Station Works	Richmond-Upon-Thames	2.9	10/04/2023	09/10/2023	Infrastructure
13	School Teaching Building (Extension)	Richmond-Upon-Thames	1.2	17/07/2023	17/03/2024	Public Non-housing
14	School Classroom Block (Extension)	Richmond-Upon-Thames	1.0	15/08/2022	07/04/2023	Public Non-housing

Table C5: Significant Glenigan projects in Sutton

WLC ID	Heading	Local Authority	Project Value (£m)	Start date	End date	Project Type
1	281 Flats & Commercial Units	Sutton	33.7	13/07/2023	13/10/2025	New housing
2	Retail Use	Sutton	30.0	23/09/2023	23/05/2026	Private Commercial
3	92 Flats	Sutton	20.5	05/09/2022	15/01/2024	New housing
4	Waste Processing Building	Sutton	11.7	20/02/2023	20/05/2024	Infrastructure
5	149 Flats & Commercial Units Conversion/Extension)	Sutton	7.9	16/03/2023	11/07/2024	Housing R&M, Private Commercial
6	Special Needs School	Sutton	5.4	06/02/2023	09/09/2024	Public Non-housing
7	40 Offices & 2 Fitness Studios (Conversion)	Sutton	5.0	31/03/2023	29/03/2024	Private Commercial
8	23 Caravan Pitches/1 Community Hall	Sutton	5.0	01/07/2023	01/07/2024	Private Commercial
9	113 Flats & 1 Indoor Play Facility	Sutton	4.2	17/05/2023	06/11/2024	New housing, Public Non-housing
10	23 Flats	Sutton	4.2	07/11/2022	26/01/2024	New housing
11	Hospital (Refurbishment)	Sutton	4.0	31/01/2022	31/07/2023	Public Non-housing
12	Nursing Home	Sutton	3.2	22/12/2023	22/06/2024	Public Non-housing
13	Commercial Unit (Conversion)	Sutton	1.6	09/09/2022	03/02/2023	Private Commercial

Table C6: Significant Glenigan projects in Wandsworth

WLC ID	Heading	Local Authority	Project Value (£m)	Start date	End date	Project Type
1	1915 Flats & Commercial units	Wandsworth	2,655.1	14/11/2016	14/11/2026	New housing, Private Commercial
2	2550 Homes & Commercial Units	Wandsworth	800.9	17/12/2018	25/12/2028	New housing, Private Commercial
3	520 Homes, Hotel & Office	Wandsworth	770.7	31/01/2017	28/10/2024	New housing, Private Commercial, Private Commercial
4	842 Flats/Nursery/Retail/Cafe/Commercial Units	Wandsworth	270.4	11/07/2016	28/06/2024	New housing, Private Commercial
5	118 Flats & Commercial Units	Wandsworth	182.7	24/04/2023	28/04/2025	New housing, Private Commercial
6	517 Residential Units & Commercial Units	Wandsworth	135.0	01/05/2020	01/04/2023	New housing, Private Commercial
7	Hotel	Wandsworth	120.0	03/04/2023	01/04/2026	Private Commercial
8	480 Residential Units & Commercial Units	Wandsworth	101.7	24/08/2021	14/03/2024	New housing, Private Commercial, Private Commercial, Private Commercial
9	Highway Works	Wandsworth	98.0	01/11/2019	23/04/2027	Infrastructure
10	123 Residential Units & 4 Commercial Units	Wandsworth	83.1	07/07/2023	07/10/2025	New housing, Private Commercial
11	Residential Units/Commercial Units	Wandsworth	83.1	28/07/2023	28/07/2028	New housing, Private Commercial
12	Office & Commercial Units	Wandsworth	66.7	01/12/2021	14/08/2023	Private Commercial, Public Non-housing
13	Student Accommodation & Commercial Units	Wandsworth	62.9	01/09/2021	31/07/2024	Public Non-housing, Private Commercial
14	806 Residential Units & 1 Commercial Unit	Wandsworth	50.5	07/07/2023	07/01/2026	New housing, Private Commercial
15	Mixed Use Development	Wandsworth	48.6	08/04/2019	08/04/2025	New housing
16	Department Store (Extension/Alterations)	Wandsworth	32.0	01/08/2021	01/01/2023	Private Commercial
17	106 Residential Units	Wandsworth	28.9	22/08/2022	17/09/2024	New housing
18	2550 Resdiential Units & Commercial Units	Wandsworth	23.2	28/07/2023	28/03/2026	New housing
19	Residential Units/Retail Units	Wandsworth	22.2	20/03/2023	15/04/2024	New housing, Private Commercial
20	Footway Bridge	Wandsworth	22.0	03/04/2023	03/04/2024	Infrastructure
21	164 Flats & 26 Houses/Commercial Units	Wandsworth	20.4	01/01/2022	01/08/2024	New housing, Public Non-housing, Private Commercial
22	5 Shared Living/Hotel/Office/Cafe/Community	Wandsworth	19.1	22/03/2021	24/02/2023	New housing, Private Commercial, Private Commercial, Public Non-housing

WLC ID	Heading	Local Authority	Project Value (£m)	Start date	End date	Project Type
23	Mental Health Hospital Buildings/Retail & Commercial Units	Wandsworth	17.5	14/01/2019	24/02/2023	Public Non-housing
24	Residential Units & Commercial Units	Wandsworth	16.7	07/04/2023	07/04/2024	New housing, Private Commercial
25	57 Flats & 1 Community Centre	Wandsworth	15.6	08/08/2022	31/03/2024	New housing
26	227 Residential Units & Commercial Units	Wandsworth	14.4	28/07/2023	28/03/2025	New housing
27	29 Residential Units	Wandsworth	11.6	06/02/2023	26/02/2024	New housing
28	Supermarket (Extension/Alterations)	Wandsworth	8.5	17/07/2022	15/03/2023	Private Commercial
29	Enabling Works	Wandsworth	6.0	31/10/2022	10/03/2023	Infrastructure

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Version	Date	Details of modifications
Rev A	31 March 2023	First issue
Rev B	12 May 2023	Final version