

Route Map for New Home Delivery



Created by
The Housing Forum Futures Network
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Route Map for New Home Delivery

The Housing Forum Futures Network



The Housing Forum Futures Network

The Housing Forum has set up The Futures Network for prospective future leaders from member organisations who are at an early and promising stage of their career development.

Joining the Futures Network involves engagement in regular membership and mentoring activities, and participation in research projects and evidence-based output delivery which both individuals and the housing industry need, to widen diversity and to build new and lasting professional networks.

The Futures Network 2021-22 and 2022-23 cohorts have produced The Route Map for New Home Delivery.

For more information visit:

www.housingforum.org.uk/future-network/

Why the Route Map for New Home Delivery?	2
Chapter 1: Project inception and commissioning	5
Chapter 2: Procurement	9
Chapter 3: Design	13
Chapter 4: Planning	17
Chapter 5: Pre-construction	21
Chapter 6: Manufacturing	25
Chapter 7: Construction and handover	29
Chapter 8: Use (post-occupancy and management)	33
Examples of excellence	36
Acknowledgements	38

Why the Route Map for New Home Delivery?

Why the Route Map for New Home Delivery?

Individuals in The Housing Forum Futures Network work in all parts of the housing and construction sector and have identified a need to develop an approach that links all the key stages of new home development to provide an understanding of the whole development process.

We hope that the *Route Map for New Home Delivery* will be used as part of the induction learning process for people who are new to roles in the housing and construction sector, or who want to learn more about what happens in other parts of the construction process that they may not be involved with.

Most larger schemes are likely to involve a mixture of tenures, developed and managed by different agencies. The focus of many of our members is on the affordable, social and shared ownership sectors so this Route Map has been written on the assumption that a registered provider is the developer, though the stages of building new housing are common to all types of housing. Private housebuilders tend to build out schemes themselves however, rather than contract out the construction process.

The Route Map sets out the processes involved in the construction of new homes embracing partnering principles, team building and the early engagement of the supply chain and manufacturing process which are at the centre of The Housing Forum's development ethos. The steps in the *RIBA Plan of Works*¹ have been helpful reference points as it is the process which pulls all the disciplines in construction together. That said, there are some differences. We begin with the project inception stage followed by procurement. The importance of the client's project vision is a high-level reference point throughout.

Beginning in this way supports value-based procurement and allows for longer-term frameworks which help bring in key specialisms earlier. The RIBA Plan of Work indicates the first four steps (up to Technical Design) will generally be taken one after another, but our approach highlights the overlapping nature of these processes.

Methodology

The Futures Network began by mapping the new home development process against what are widely recognised steps.

A questionnaire was sent to The Housing Forum's members to gather their insights which were analysed by The Futures Network. They then worked with sector experts to create a first draft of the Route Map, which was presented at a workshop with findings tested and challenged by a range of senior industry figures, drawn from all areas of the new home development process.

Overarching message

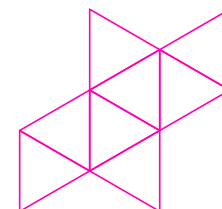
A key lesson from this research is that the stages of housebuilding cannot be treated in isolation or as a linear sequence of activities. Whilst we break down the activities into eight stages, it is clear from research and discussions that these overlap.

Early engagement of design, supply chain, procurement, contractors are all necessary to ensure a development meets the client brief, to deliver quality homes that provide excellent resident experience.

For example, if design is not considered at project inception and viability stages then it may be overlooked in procurement, which may not deliver quality.

Equally, not engaging the supply chain from the earliest stages to align project vision and goals with the practical aspects of design and delivery including key product specifications and project timetables.

¹ RIBA Plan of Work (architecture.com) - <https://www.architecture.com/knowledge-and-resources/resources-landing-page/riba-plan-of-work>



The Route Map – Chapters 1-8 breakdown

1. Project inception and commissioning

Sets out how a detailed project brief and most appropriate team comes together to plan the new housing development.

2. Procurement

Focuses on how the organisation who wants to develop a scheme goes about finding contracting organisations to build it. This will ensure the delivery of a financially viable project for all stakeholders.

3. Design

Examines the creation of a detailed plan and design for the housing to be built. This requires understanding of the site, defining opportunities and constraints, setting a realistic programme and adopting a collaborative approach, while ensuring costing is viable.

4. Planning

Deals with obtaining planning permission to avoid any delays and additional costs.

5. Pre-construction

Details how a the fully coordinated and resolved technical design is finalised in line with client and regulatory requirements, drawing on input from specialists and engineers.

6. Manufacturing

Looks at how the products needed to build houses are sourced and manufactured. This may be via a complex supply chain.

7. Construction and handover

Follows the commencement of the building works and navigating the build programme and sets to deliver a development at the highest quality standard within the agreed contract price and timescales, and ready for occupation.

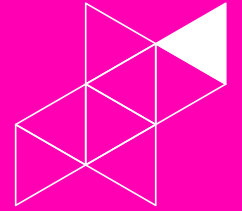
8. Use (post-occupancy and management)

Focuses on the use, maintenance and upkeep of the homes. This will ensure the longevity of the lifecycle of the homes as well as the health and wellbeing of the people who live in them.





Route Map for New Home Delivery



Chapter 1 Project inception and commissioning

This is the stage where a team comes together to outline the purpose and parameters of the project (the project brief), as well as how it fits within the budget and wider development strategy and business plan.

Route Map for New Home Delivery

Chapter 1

Project inception and commissioning

Inputs

- A site with potential for residential development with connectivity to supporting infrastructure and amenities
- A project and placemaking vision and objectives statement (including design principles, commercial and quality parameters)
- A budget made up of associated public and private funding, taking into account sales related income
- Identification of the most appropriate team – the internal commissioning team and the external legal and technical architects and engineers – with clear roles and responsibilities to take this stage forward
- Sales and marketing feedback from previous developments and market intelligence
- Housing management feedback from previous developments, a list of preferred key specification components and housing needs data relating to the location of the site identified
- Identification of project risks and constraints.

Outputs

- Internal and external project team identified and commissioned
- Site property boundaries and legal constraints identified
- A responsibility matrix
- A risk and opportunities register
- Planning policy requirements identified and understood
- Community and customer engagement planned and commenced
- Site surveys and technical reports commenced
- Baseline appraisal, risk and constraints studies and feasibility and viability studies underway
- Feasibility designs to inform the planning application
- A communications plan with wider stakeholders identified
- In principle approval to proceed at the correct governance level, with an approved draft budget, financial model and affordability envelope
- A detailed brief, which can be referred to throughout the entire life of the project.

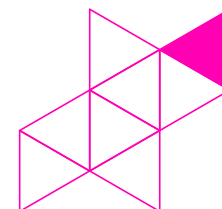
What happens and why is it important?

Establishing a clear project brief and commissioning the most appropriate team is critical to successful project inception and ensuring the project is set up for the best outcome.

A project and placemaking vision statement is fundamental to achieving a quality outcome. The project vision allows the developing organisation to set out reference points for the conception, delivery and management of the project. This is the stage to think broadly about diversity and inclusivity, how these will be reflected in the project and the impact on the local community and what needs to happen from procurement onwards to build this in.

It is at this stage that those commissioning the housing set out their requirements, alongside those of any funders and viability constraints. Key project inception and execution plans are drawn up and the high-level programme is developed. This includes the desired deliverables, scope, design and quality principles.

A responsibility matrix and risks and constraints are then mapped which means that a procurement strategy can start to be determined. This is important to ensure time discipline, awareness of key milestones by the entire team, identification of constraints and the building in of flexibility.



Be aware of what can go wrong

Issues that can seriously undermine the project at this stage include ambiguity over priorities, a lack of understanding of what needs to go into the brief; leading to wrong solutions and underestimating the level of risk.

Knowing where the project's funding is coming from is critical for shaping the project brief and team requirements. If affordable housing requiring grant funding is included in the project vision, then early engagement with Homes England or the GLA is advisable so that project failure due to inadequate grant support can be avoided.

What can be improved?

Once the project brief is drafted it can be 'tested' for effectiveness at an **initial project launch meeting with the project team**, who can help to establish a clear communications framework and identify and work through high-risk elements. The team should ask and understand the answers to the questions 'Why is this project necessary?' 'Why are we doing it?' and 'How does it fulfil the business plan?' This approach ensures the project brief is sufficiently focused and that everyone understands their role in its delivery.

Early involvement of manufacturers who will support the realisation of the preferred project specification adds value. Although manufacturing is shown as Chapter 5, earlier involvement from the right people at this stage with the project, will mean design standards and criteria are met, as well as ensuring any risks to the budget and timescale are apparent from the start.

Earlier investment in specialist professional support to deal with the risks, constraints and opportunities afforded by the site helps avoid complications arising later. Suitable legal, design and engineering consultants should be commissioned as early as possible. Appointing a professional team familiar with the local planning authority's personnel, preferred processes and policies can also help.

Involving those who are likely to be managing the housing is helpful. Any operations teams that will take manage the housing and provide maintenance services once the housing is built should be involved at this stage. This will ensure less of a hard landing for them and customers. The result of not having the right people involved will be dissatisfied customers, multiple callouts and additional costs.

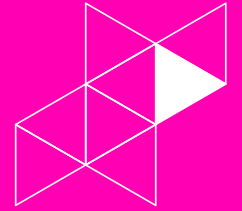
Involving those who may sell the housing is critical to ensure that market trends and purchaser preferences are built in early, whilst value is optimised.

Working from the outset with realistic budgets for the building costs to meet the quality of project required is essential. Engaging cost consultants with local and current experience can help here.





Route Map for New Home Delivery



Chapter 2 Procurement

This stage focuses how the organisation who wants to build the housing goes about finding contracting organisations to build it. This will ensure the delivery of a financially viable project for all stakeholders.

The aim is to ensure a financially viable and successful project is delivered for all stakeholders. Moving away from a lowest price wins assessment of tenders is key to ensuring projects remain on budget and programme.

Procurement

Inputs

- A well-developed financial model that includes the schedule of accommodation, values, initial cost information and budget
- Build cost estimates
- Anticipated sales and rent valuations, based on market knowledge
- The funding strategy – how the development will be funded, for example via self-delivery, funding via a joint venture or grant funding from Homes England or the GLA
- A project vision that sets out objectives, the scope of work, background to the project and timescales etc.

Outputs

- If a two-stage tender process is adopted, the main contractor will be appointed early and will be ready to work up the specification with the client and consultant team
- A fully developed design specification ready to go to market, at least for negotiated procurement procedures
- A realistic programme to allow for accurate pricing and any perceived challenges should be raised at tender stage and worked through to mitigate the impact on the project
- A development budget supported by a thorough assessment of deliverables
- Agreement on which party is best placed to manage risk and or how risk is shared so that this can be discussed and agreed at tender stage.

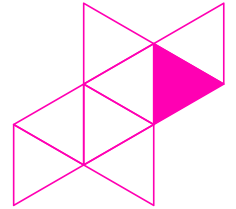
What happens and why is it important?

Firstly, procurement strategies are agreed, confirming whether public procurement rules apply, any internal procedures which need to be followed, whether there will be more than one tender stage, what the evaluation and selection criteria will be, and the tender documents are drafted. The formal appointment of the design team and other professionals (such as procurement consultants and employer's agents) are made at this stage, whether or not there was earlier involvement.

A transparent and clear tender process with all the required scheme documentation to allow for accurate pricing and programming is set out. A contractor's design programme should form part of the tender submission to ensure that the project programme is adhered to.

Further assessment of viability is undertaken utilising the information captured at project inception. This is important to ensure the project remains viable and to avoid delays.

Early engagement and detailed briefing of the design and consultant teams – architects, civil and structural engineers, surveyors, and planners – allows them to have a full understanding of the project and project budget. This should minimise price caveats and promote transparency in appointments and building contracts, thus avoiding uncertainty and delays. Ideally, contractors should get involved early in the process to assist with price certainty and reducing risk during design and planning. Ultimately, having detailed engagement to set design and quality principles is essential to avoid a race to the bottom on pricing once tendering takes place.



Be aware of what can go wrong

A lack of in-house skill and understanding of all aspects of the development can lead to gaps or missed opportunities to head off potential issues at an early stage.

Long lead-in periods for projects in the public sector run the risk of the viability position changing. For instance, changes in political administration in local authorities can lead to differing priorities or budgets.

Accepting heavily caveated tenders, for example those including large provisional sums, can give rise to price and programme uncertainty. An unclear scope and specification at the outset will lead to inaccurate pricing.

What can be improved?

Set realistic timescales. Artificial or unrealistic deadlines should be avoided. A key responsibility identified in the Hackitt Report was for clients to “allow enough time”². Clients should resist having to condense important parts of the programme to compensate for delays upstream. However, in the current inflationary environment it is also particularly important to avoid delays. Completing the financial modelling as soon as possible provides greater certainty over the viability of a project.

A transparent and clear tender process with all the required scheme documentation provided at this stage allows for accurate pricing and programme. Clients should review price submissions, and should consider querying bids which appear abnormally low, or which contain price components which appear off-market. For contracting authorities, the *inter partes* procedure for reviewing abnormally low tenders set out in the Public Contracts Regulations 2015 should be followed ahead of rejecting any bid that appears abnormally low.

Ensure small and medium-sized enterprises (SMEs) are considered. The procurement strategy should be set out to make sure SMEs are included.

Consider an alternative approach to get the most advantageous bids. For example, consider whether working in a partnership or joint venture may be appropriate for a particular project.

Consider alternative price evaluation methodologies (ie, avoid the 'lowest price equals highest marks' approach to price evaluation) to give more of a focus on quality and value over the lowest price, which may fail to deliver the brief in full.

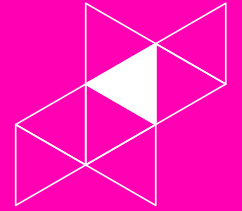
Safeguarding viability is important as changes happen. Viability should be checked at every stage and make sure there is clear visibility of the assumptions and decisions made, so these can be evidenced and tracked.

² Independent Review of Building Regulations and Fire Safety: final report - Department of Levelling Up Housing and Communities, May 2018
<https://www.gov.uk/government/publications/independent-review-of-building-regulations-and-fire-safety-final-report>





Route Map for New Home Delivery



Chapter 3 Design

The design of new housing is typically undertaken by a design team employed by a client. This may be a contractor-developer who constructs the buildings themselves, or a developer or registered provider may separately employ a contractor to undertake the construction.

The initial stages of design therefor sometimes form part of tender documentation to engage a builder, with more detailed designs developed afterwards.

Route Map for New Home Delivery

Chapter 3

Design

Inputs

- A clear team structure with decision making status
- A design brief including scope of services, appointment documentation, employer's requirements, site boundary plan and constraints, cost plan, design programme, and a design and construction risk register
- Clarify which Building Regulations apply. For low rise and standardised development, NHBC Standards apply; for high rise and more complex development, engagement with NHBC Major Projects is needed
- Site information – ground investigations, conveyance plans and boundary lines
- Funding requirements (if applicable).

Outputs

- A set of drawings/report information which fully communicates the design at that stage and is coordinated through all disciplines
- A Bill of Quantities, which is a detailed, itemised pricing document reflecting the design at that stage to be used to inform the next stages of work
- Reports produced for the client team's sign-off
- A Building Information Model (BIM) with increasing level of detail and resolution for each stage
- A schedule or agreed mechanism for scheduling ongoing meetings between the design team, client and contractors.

What happens and why is it important?

A design team will have been appointed during procurement. This may be a firm of architects or there may be a design team sitting within the contracting housebuilding firm.

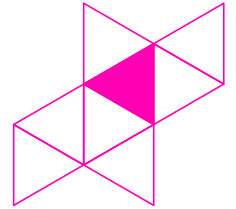
The design stage includes assessment of feasibility, initial concept design (which informs the land value in bid situations), planning (up to RIBA Stage 3) and detailed design (RIBA Stage 4). The original project client brief needs to be tested and the viability and costs checked at this stage with checks continuing throughout the design stages.

The process of designing housing inevitably overlaps with the process of gaining planning permission (Chapter 4). Engagement with key partners is critical to support the planning stages with pre-application meetings held with planners to review local planning policy requirements. These include joint-venture development partners, funders and estate management providers. Communications, community engagement, stakeholder and wider client group engagement are maintained.

At pre-planning, the design team will guide the project through the process and engagement strategy. Following receipt of planning permission, the project will enter a stage of detailed design where each element of the design and its construction are reviewed ready for building works. The design team input will be needed to resolve queries and review design throughout the planning process.

At key milestones, typically aligned with the RIBA stages, a quantity surveyor will check the proposals are in line with the budget. This is usually monitored via a set of KPIs for elements such as floor area efficiencies, wall-to-floor ratios, materials and variation in dwelling types. This helps ensure viability and creates a realistic and achievable outcome, reducing abortive work.

Risks are mitigated by understanding site constraints through survey work, analysis and site visits. Assessment of design risk and compliance with Building Regulations are undertaken and it is at this stage that the construction methodology is defined.



Be aware of what can go wrong

During the planning process there is a requirement to assess the proposals for their impact on the environment, such as microclimate (wind), daylight and sunlight. Negative results from the assessment will require an amendment to the design to rectify and potentially protract the design programme. The design process can also suffer if feedback from design review panels does not align with the ongoing design process and dialogue with the local planning authority, causing delays.

Good design can take time. Programmes that are unachievable or too rapid can create the opportunity for errors. Also, project management that is divisive rather than collaborative can create poor outcomes. Late appointments to the design team can cause abortive work or redesign and an inadequate scope of services will leave gaps in design development. A frequently changing agenda from the client and supply chain pressures can cause weak points in project delivery.

There is a risk of not achieving quality of design. This will include homes not designed to meet the client's brief or business plan or those that are unfeasible or unviable to deliver. Uncoordinated designs, lack of communication in design teams and not understanding the site constraints and opportunities will not deliver the best results.

What can be improved?

Clear and concise client leadership, instruction and project management is vital to delivering quality in design. Design continuity requires a consistent architectural and wider design team supported by a structure for making decisions during the design stages of a project.

Regular meetings to ensure that all are working towards a common goal with updates to the RIBA work stage reports as the design progresses. Accurate and coordinated design removes additional costs or abortive works.

Realistic design stage programmes, allowing for amendments to reflect project changes and project management processes will facilitate the team to do a good job. Scope of services for all disciplines should be shared to all parties. Due diligence is needed prior to contract signing.

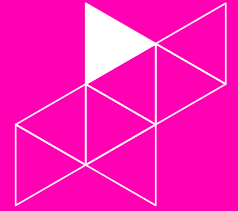
Uniform design standards for affordable housing and market housing and standardisation in design will offer benefits through strategic procurement that will help achieve design quality. Design can be future proofed with carbon neutrality enshrined within new housing. Construction outcomes can be improved using BIM and incorporation of modern methods of construction and an outline National Building Specification will help inform detailed/technical design stages.

Effective use of models and assessments can help. This including risk registers used to check the unknown elements on a project, BIM with clash detection, embodied carbon assessments carried out at each stage and the supply chain involved throughout.





Route Map for New Home Delivery



Chapter 4 Planning

The granting of planning permission is essential for any development. A rejected application will add considerable delays and costs. Statutory consultees, local engagement and reserve matters all need to be considered. Potential areas of objection should be identified and discussed prior to submission.

Route Map for New Home Delivery

Chapter 4

Planning

Inputs

- The client brief
- Detailed site plans (existing and proposed)
- Technical surveys eg, topographical, ecological, daylight and sunlight
- Design and Access statement
- Ownership certificate and Land Registry Title and Plan
- Community Infrastructure Levy (CIL) or Section 106 liabilities and contributions confirmed in the business plan
- Visual and townscape assessments
- Evidence to support the design in the context of planning policy and local needs.

Outputs

- Planning consent to develop the housing
- Agreed RIBA Stage 3 design
- Planning conditions
- Legal agreements covering Section 106 and Section 278 and any CIL payment schedule
- Renewed land valuation – this may be sought at the point of planning approval if ownership is to change hands.

What happens and why is it important?

Planning permission is required prior to construction works commencing. There should be engagement with the local planning authority, and local policies must be understood. Potential areas of objection should be identified and discussed at the pre-application stage, prior to submission of the application. For larger schemes, applicants should run design review workshops and community engagement events prior to submission.

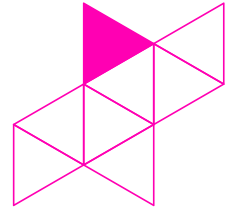
A pre-application submission can be used as an opportunity to agree with the local planning authority what is required in terms of submission documents and agree timescales that both sides will work to. This will include discussion of likely Section 106 and Section 278 contributions to include the affordable housing offer.

The developer or registered provider in charge of the project will then use its own internal governance process to sign off the submission and the full planning application is then submitted. Supporting reports and surveys are undertaken and submitted with the application and these are examined by the local authority during its validation process of the application.

The local planning authority then consults on the application with the local community and most notably the various statutory consultees. The statutory consultees include a range of agencies as well as other tiers of local government. Agencies include the Environment Agency, National Highways, Heritage England and Sports England. Small applications are sometimes decided on by planning officers by way of delegated powers, which means they do not need to be considered by the planning committee. For larger applications, planning officers usually make recommendations, but the planning committee, comprised of local councillors, makes the decision. Sometimes however, even larger applications can be determined by officers, if they are non-contentious, or the policy framework is extremely clear.

If permission granted this will usually be subject to various 'Reserved Matters' for which a later application will have to be submitted including details that were not yet known at the time of the initial application. Planning conditions will also be imposed. These can be 'pre-commencement,' meaning that they must be met before construction can commence or can be required to be met at a later stage, as specified by the local planning authority.

If a planning application is rejected it can be resubmitted with changes made to address the reasons for rejection. Alternatively, the applicant can choose to appeal the decision.



Be aware of what can go wrong

It is important to allow sufficient time in the overall programme for the planning period and the process can bring a high degree of complexity and risk. Planning approval, and the number of conditions set, influences the commencement of the construction phase. Changes to the programme can impact funding linked to the start date on site and if the scheme needs to go to planning committee this can severely delay the programme. For example, the offer of development finance from a bank might expire if the project is overly delayed in the planning phase. With current conditions in planning committees, consultants should be advising of increased planning determination timeframes.

Poor meeting and record management can lead to last minute changes in local authority requirements. It is important to keep a strong design audit trail which can help challenge decisions if the need arises. If excessive value engineering scheme redesign occurs post planning, then abortive costs can result. This can also require amendments to the consented scheme from the local planning authority. Onerous planning conditions and significant programme delays can occur if communications are not consistent with the local authority prior to submission and during the determination period. The ultimate failure is in not achieving planning approval.

What can be improved?

Good communication is key. Local authorities should be aware of larger applications that are likely to be submitted, in advance of receiving them. Communication should be maintained with the case officer during the planning determination timeframe to ensure any potential issues can be resolved early.

Local planning authorities should be adequately resourced, and their processes could be strengthened and reviewed to make decisions within agreed timescales. Templates for report briefs or scope could be shared between authorities for use by the technical advisors who are issuing supplementary reports on behalf of applicants to support the application (such as noise surveys or traffic surveys) so that all parties are clear as to what baseline information and methodology should be adopted in the production of those reports.

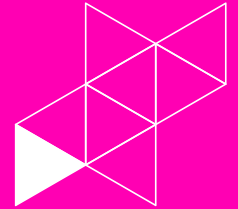
A well-considered planning and design pack should be submitted to be reviewed by the local planning authority at pre-application meetings, followed by regular and positive meetings with clear actions recorded and actioned in a timely manner.

Early engagement helps. Good projects engage early with local stakeholders/consultees and residents, with evidence that the design reflects views within the consultation statement. The team submitting the application should allow sufficient time for thorough engagement with all stakeholders to deal with concerns and objections.





Route Map for New Home Delivery



Chapter 5

Pre-construction

Pre-construction is the work carried out as the project moves from appointment of contractors to getting ready to begin on site. The end result is a fully coordinated and resolved technical design up to RIBA Stage 4, completed with the input of specialist contractors and engineers who were appointed by the contractor, following their own appointment.

Pre-construction is important in mitigating construction risk in the form of variations and programme delays. A detailed cost plan is produced to assist in client budget allocation which allows contract discussions to begin with and the right contractors to be appointed.

Pre-construction

Inputs

- Planning permission obtained and all conditions are communicated amongst the project team with a clear plan for action
- Building control approval, including the building control officer's or Approved Inspector's compliance report indicating items for consideration and development during pre-construction stage
- Design is finalised and or approved by the client to proceed to development
- Cost plan and cash flow forecast including mechanism for on-going cost review and management through future phases
- Project Programme to map out deliverables and critical dates for future phases.

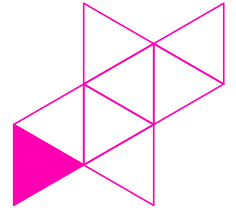
What happens and why is it important?

This stage is about ensuring that the organisation ultimately employed to build the housing has accurate, up to date information and the required approvals to progress to the construction stage.

All project team members attend a pre-start meeting to ensure everyone is aware of the project detail including the construction programme. Early involvement of the contractors can assist with price certainty and reducing risk. Regular pre-commencement project team meetings will ensure that all project team members and wider stakeholders are up to speed with all details of the project as it develops.

Outputs

- Fully developed RIBA Stage 4 design information including full coordination and agreement between all design team disciplines
- A RIBA Stage 4 cost plan taking into consideration all changes and design development since previous stage cost plan
- Building control approvals to the appropriate level
- Contracts signed after the client and contractor have negotiated and agreed the contractual terms and amendments.



Be aware of what can go wrong

Inadequate and uncoordinated design information can lead to ambiguity and impact on project delivery.

Time is needed: pre-construction can get squeezed because of front end operations such as planning and land negotiations. Changing the brief or a change in client priorities can add to costs or require changes to the programme, which may also add to the time required.

There can be a failure to engage with the right people at this stage: lack of supply chain engagement at an early stage may cause later programme delays. A lack of thought given to how the housing will be occupied, used and maintained leads to end-user difficulties in operation and maintenance of the buildings post completion.

What can be improved?

Clear lines of communication between the client, design team and contractor(s) are essential. All parties should meet regularly and cooperate to establish objectives of the agreements. Internal communications are needed to ensure that the latest amendments to the employer's requirements are clearly communicated to all. This includes the impact of any design reviews or value engineering considerations.

Clear strategy documents will assist the design team to meet the specified employer's requirements and deadlines.

Specialist input is needed to finalise design prior to construction, clear scopes, avoidance of scope gaps and clarity on design responsibilities.

Supply chain engagement and a contract value variation process is necessary once into one-to- negotiations.

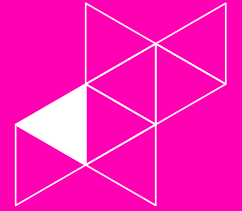
BIM can improve outcomes, adopting construction playbook principles.

Take stock and review. There should be a continuous review of progress against the original brief throughout the pre-construction phase to maintain oversight of project objectives and to adapt swiftly to any legislation changes such as new building safety regulations.





Route Map for New Home Delivery



Chapter 6 Manufacturing

The manufacturing stage involves the selection of components and vendors. Manufacturers are experts in their products and the knowledge that they possess can be the difference between a great efficient system or an average underperforming one.

It is therefore important to engage the supply chain and manufacturers as early as possible, sharing project vision and goals, design and delivery principles, key product specifications and project timetables.

Manufacturing

Inputs

- Designs such as technical drawings, technical calculations, schematics, product schedules and take-offs
- Specification that sets out the client's criteria that need to be followed by the contractors or manufacturers
- Copy of the employers requirements and contractor's proposals in line with the client's specification
- Estimates of the total cost of ownership which is the costs across the whole-life cycle, including both capital expenditure and ongoing operational costs, needed to help select the best products.

Outputs

- Products manufactured off site and sent to site to be assembled and installed as per the manufacturers recommendations
- Performance specifications, instructions and a handover process from the manufacturers to the construction team on site.

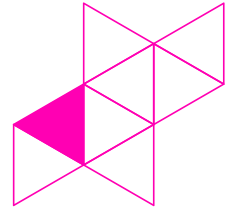
What happens and why is it important?

Usually, the procurement process will drive the interaction with subcontractors and merchants to generate the required estimates and bill of quantities. Less consideration is given to product availability as products are generally assumed to be available unless timescales are tight which then could cause major issues for all concerned.

Products are manufactured in many ways, and to different models. For example, pipework can be bespoke and made to order and assembled off site to increase efficiency on site and reduce costs. A utility room may be built in place, or may be built off site where all the components are fitted in a factory environment and then shipped to site, making it easier to control health and safety, as well as quality. Modern methods of construction can include the following:

- The manufacturing of pods, in which entire units such as bathrooms are manufactured off site
- Pre-assembly of timber frame products
- Utility cupboards and risers
- Pre-cut components
- Wall and ceiling panels made off site
- Building segments manufactured offsite in 3D and fitted together on site.

It is important during this stage to understand any issues and use the specialist manufacturers to help resolve them in the most cost effective way. This may be a bespoke product built to order for a specific site.



Be aware of what can go wrong

Not including manufacturers at earlier stages of the project can lead to many issues arising such as incorrect designs being produced which then requires reworking, non-compliance on site with products that are unsuitable, not approved or do not meet the design specification. The result is that the finished building may not be in keeping with the original concept design in terms of the look, feel and performance, for example, by having higher energy usage than planned.

Supply chain management and availability can be impacted by lack of forecasting information being shared at earlier stages with the manufacturers. For example, if there is a component with a long lead time or out of stock, it is very costly to change at the last stage but could be easily amended at design stage with little impact on cost. Developers may also not be aware of recent product developments that could save time and money.

An unclear scope and specification at the outset can lead to inaccurate pricing and have implications for staying within the budget, or lead to delays as variations are tabled later in the project.

Not having the right people involved could result in dissatisfied residents, multiple callouts and additional costs.

What can be improved?

Earlier involvement from suppliers during the design stage will ensure that products are used in the most efficient way possible resulting in a better performing system overall. It will also mean that any risks to the budget and timetable will be clearer from the start.

Have the specialists involved from the start to help identify the best solutions. Manufacturers are constantly innovating with products and technology and can ensure decision makers are up to date with new ideas. This is especially important as we make the move towards net zero.

Share timelines with all stakeholders to ensure that design criteria and standards can be maintained. Product availability tends to be assumed, but having sight of the forecast and construction timescales along with updates of progress on site, helps manufacturers ensure availability.

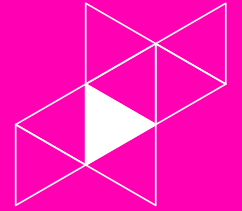
Improve stock and resource availability to help safeguard delivery on time.

Involve any operations teams that will take over the running of sites / services once the project has completed.





Route Map for New Home Delivery



Chapter 7

Construction and handover

This is when the housing is built. The previous work comes together, navigating the build programme through to a point where the new homes are ready for handover and occupation.

All constructed elements are subject to quality control, relevant documentation is created, and tools provided to support a smooth transfer to operating parties.

Construction and handover

Inputs

- All the design and technical information, including the mechanical and electrical designs, with accompanying drawings.
- A finalised brief capturing both the client's requirements and contractor's proposals
- Signed contracts between client and main contractor
- Contracts and agreed delivery schedules with manufacturers and suppliers of materials and utilities to meet the construction programme
- Registration for building control and warranty providers with both having approved the design.

Outputs

- Sign off by the building control inspector
- Responsibility and information on building safety, mechanical, electrical equipment and building management systems passed to the registered provider's:
 - Asset team
 - Home maintenance service teams
 - Sales team
 - Housing allocations team, and
 - Customer relation team
- All required documentation is provided for ongoing operation (warranties, certificates and user guides)
- Maintenance agreements in place for all aspects of the development.

What happens and why is it important?

The construction works will start on site led by the principal contractor, who will have a confirmed build programme which they follow throughout the build. The principal contractor will manage subcontractors and trades, ensuring there is enough resource throughout the build. Any specialist mechanical and electrical contractors should be engaged early in the process.

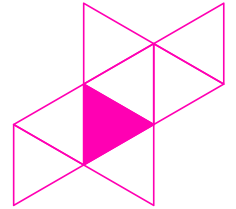
The client's clerk of the works (if they appoint one) will introduce themselves to the construction site team and explain their inspection regime and role throughout the build and handover phase. The inspection regime undertaken by the clerk of works consists of:

- An initial site walkover
- Weekly site visits, inspecting all elements being built
- The first available 'first fix' inspection
- Fire stopping inspections at first fix stage
- Pre- handover snagging/back snagging inspections
- Identification of any areas of concern.

The construction site team and clerk of works should have the design brief to hand throughout the build, so it is frequently referred to and adhered to.

Collaboration remains important. Monthly meetings will be held between the client's delivery team, the contractor's commercial team/site team and the employer's agent to discuss progress, quality and other matters.

The construction team should prepare all documentation specified in the contract ready for handover, with digital versions sent over to the client. The contract completion notice is then issued by the developer. The building control and warranty inspectors sign off the building works and the clerk of works identifies any snags and ensures they are rectified. The completed development is subject to final quality checks and asset data sheets are prepared to support a smooth handover to operational teams. The sales or allocations team will now be able to finalise conveyancing and place units on sale or begin letting them.



Be aware of what can go wrong

During construction, costs and timescales can quickly spiral out of control, especially in the current high inflationary climate. This requires regular review meetings to ensure expectations are clearly set and variations are approved via the correct channels.

Poor building practice results in homes that do not meet Building Regulations, have corners cut or result in problems post-handover. These can result in poor performance, risks to the safety and wellbeing of residents or energy consumption being higher than modelled.

If quality is not frequently checked and assessed during site works, aspects will need to be deconstructed, amended and result in programme delays. The season in which the build commences may have an influence on the build programme, which can cause a knock-on delay if timelines slip and cause problems for handover and the next stage.

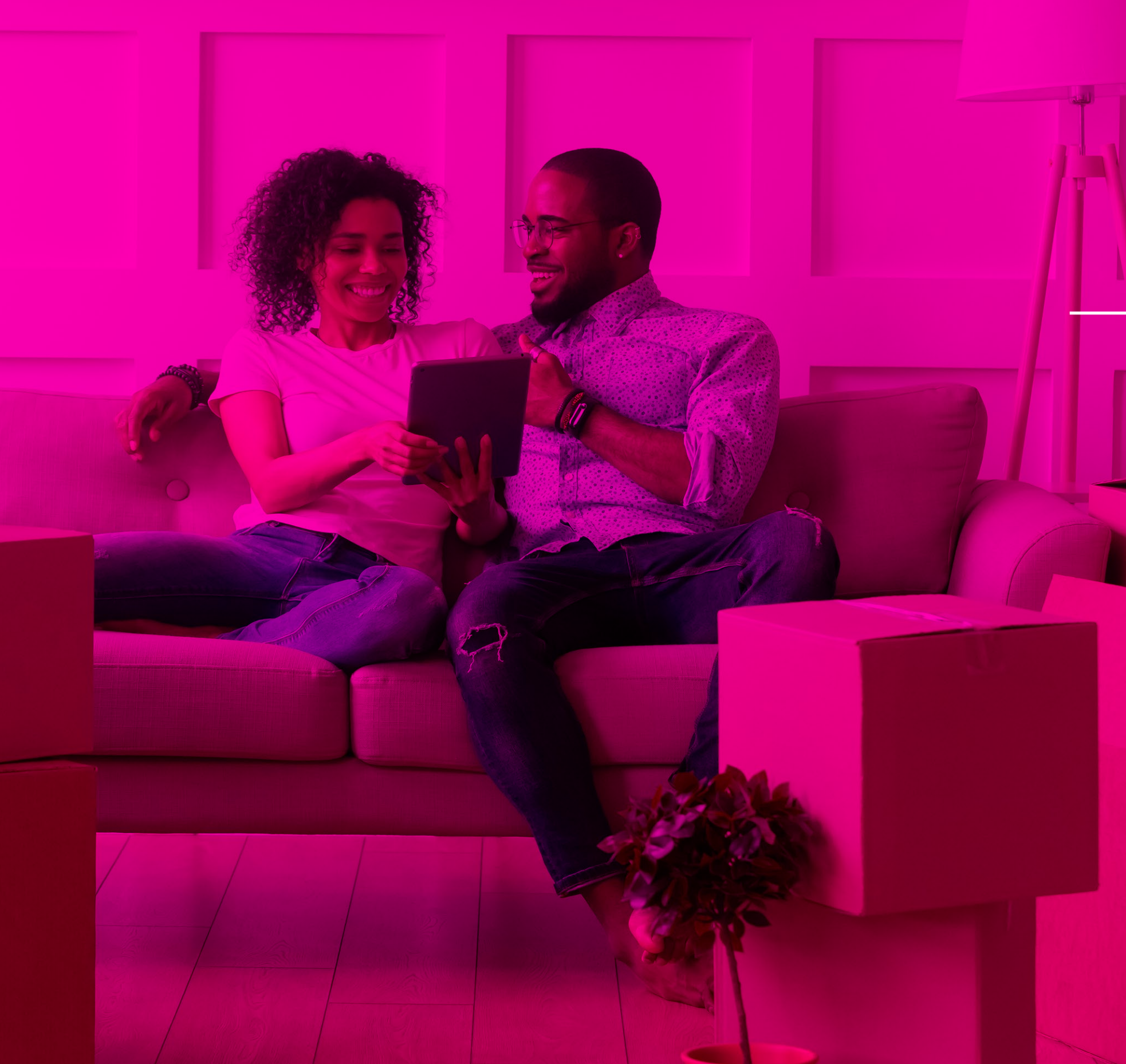
What can be improved?

Collaboration and communication throughout the build phase is important to ensure both parties, the construction company and registered provider are aligned with how the project is going. Any variations can be reviewed, and decisions made to enable a dynamic programme to be maintained and prevent delays.

Quality control is a key aspect of the build process to ensure the construction phase reflects the inputs from previous stages. Having early engagement and a clear inspection regime from the first foundation being cast will help design out risks. Homes supplied without defects and meeting the Future Homes Standard will improve residents' experience and satisfaction with the home.

Transparency in handover information and timelines, with all certification obtained on time and in a comprehensive manner, for example via a single data-sharing platform.

Digital platforms can help to streamline work and support with document control and ensuring a comprehensive handover pack.





Route Map for New Home Delivery



Chapter 8

Use (post-occupancy and management)

Once built and handed over the homes are ready to be lived in. Completed homes transfer to the ownership of the registered provider or council. Those for market sale are then sold on to owner-occupiers or buy-to-let landlords.

Use (post-occupancy and management)

Inputs

- A certified build that is finished to an acceptable standard and is safe and fit for occupation
- Correct certification from housebuilders which will typically include a warranty, sign off cover note, building control certificate, Energy Performance Certificate, gas, electrical, specialist plant and fan test certificates.
- Clear and signed off arrangements for the management of different areas and shared facilities
- Information that lenders will require for those purchasing the homes with a mortgage, including a professional consultant's certificate and where applicable (when sales incentives are being offered to purchasers) a UK Finance disclosure form. Individual lenders may have their own specific requirements in addition to these.

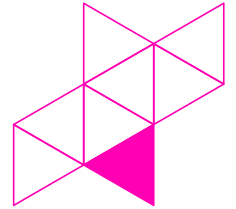
What happens and why is it important?

The homes are sold or let to tenants.

The responsibility for upkeep now rests with the new owners and so depends on the tenure of the properties. Homes for market sale are sold to owner-occupiers (or buy-to-let landlords), with the responsibility of the developer then shifting to defect rectification. In the case of leasehold sales, the freeholder holds responsibility for the building and charges a service charge to the leaseholders, and the leaseholders become responsible for the maintenance within their flats. Rented homes are maintained by the landlord, such a local authority or registered provider.

Customer surveys are sent out by the registered provider. The feedback is discussed internally to see where areas of improvement may be needed. A project debrief/ lesson learnt meeting is held between the client and contractor.

During the defects period and builder warranty the construction company is responsible for addressing reported defects and joint defect update meetings are held.



Be aware of what can go wrong

A failure to capture and log the relevant information about the products used in the building and systems such as heating, ventilation or insulation, may result in incorrect usage, poor performance and increased maintenance costs.

If the defects period and builder warranties are not fully understood and managed, customer satisfaction will decline and complaints will increase.

What can be improved?

Post-occupancy evaluations are invaluable. Customer satisfaction surveys are a way to seek feedback, highlighting areas that require improvement. This can be used to help address any defects proactively as well as to inform future housing developments.

Maintaining strong communication is key. Dialogue between the construction company's customer care team and the registered provider helps ensure that everyone has a clear understanding of warranties and responsibilities and leads to a smoother defect period.

Digital storage and processing of (BIM) data is needed, alongside clear information strategies and accessibility to cloud based digital platforms. The golden thread of information which will include as-built final drawings, installation guides and full data, should be easily accessible to the registered provider.

Staff and residents should be familiar with the technology and installations in new homes. This includes call centre staff who may be the first point of contact for new residents.

Landlords need to understand tenants' needs and expectations in order to meet them, and landlords and freeholders also need to understand managing agents' challenges and give them the information and tools they need. Strong feedback loops with residents and managing agents will ensure everyone can learn lessons through continuous improvement.

Ongoing investment is needed to maintain housing in a good state of repair and should be factored in from the start as part of the building owners' future business planning.

The Route Map for New Home Delivery traces how the different teams come together, working across many different elements needed to build housing. But all of this is a relatively short period in comparison to what comes next.

Houses and apartments now become homes, housing families through the generations and helping deliver The Housing Forum's aim of 'A Quality Home for All'.

Route Map for New Home Delivery

Examples of excellence

The Futures Network have compiled a few examples of excellence to illustrate the collaborative approach to delivering new housing described where key stakeholders are engaged at the right stage.

An example of excellence: Project inception and commissioning

Waxwell Lane Harrow

Waxwell Lane in Harrow is a £8.1m mixed-tenure development of 24 low-rise homes in the London Borough of Harrow, commissioned by the local authority and located in an underutilised ex-parking lot.

The team behind the project undertook precise planning of the next stages during the inception and commissioning of the project.

The goals were clearly defined and strategies were set in place. Skilled teams were assembled, with each stakeholder contributed their expertise.

A meticulous and detailed execution was created for each stakeholder to have and champion, with attention to detail and adherence to timelines.

This resulted in successful delivery of the project and satisfied stakeholders, that ultimately became long-time partners for the borough.

For more information:
<https://www.innercircleconsulting.co.uk>

An example of excellence: Procurement

Teviot Estate regeneration Poplar, London

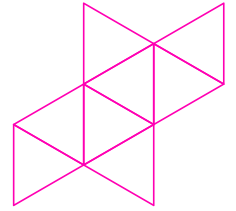
In the Teviot Estate regeneration, housing association Poplar HARCA procured a joint venture (JV) partner for the delivery of this project via a competitive tendering procedure with negotiation.

Poplar HARCA engaged early with key stakeholders (including residents through a resident steering group), and developed a clear vision and objectives.

A JV was identified as an appropriate delivery model, and this allowed a collaborative approach. Poplar HARCA used an alternative approach to price evaluation to avoid the 'race to the bottom' and set a clear message to the market that the preference was a for a high-quality proposal at the right price.

The JV partners established a Partners Charter setting out the expectations of each partner, and then ensured that commitments made were measured and audited throughout the project. The Charter is complimented by the Teviot Manual, which is used as an induction document for JV members and the supply chain.

For more information:
<https://www.poplarharca.co.uk/new-homes-regeneration/development-projects/project/teviot/>



An example of excellence: Design

Elephant Park Elephant and Castle, south London

At Plot H11a, the HTA-designed phase at Elephant Park for Lendlease, in Elephant and Castle, south London, a full complement of design team and advisory consultants were appointed before any work started.

A clear client brief, BIM requirements and defined design responsibility also ensured an efficient and well-informed design process, avoiding excessive iteration, and allowing the team to spend more time honing the design.

The client's costing team monitored the viability of the design via mid-stage presentations and at the end of each RIBA stage, helping to avoid late-stage value engineering which can come at a cost to quality. The project was designed and coordinated entirely in BIM, which helped coordinate the design information needed for the large number of off-site manufactured components used.

The result is 222 high-quality homes of a mix of tenures, delivered to budget, true to the original design aspirations, creating a great place to live in the emerging Elephant Park neighbourhood.

For more information:

<https://www.hta.co.uk/project/elephant-park>

An example of excellence: Pre-construction

Irene House Balham, London

Baily Garner completed the conversion of Irene House - a 1960s commercial space - into 83 residential apartments including a single storey roof addition.

A multi-disciplinary client-side design team were appointed to develop the design to RIBA Stage 4. Having obtained both planning permission and Building Control approval at RIBA Stage 3, the design team and client met on a weekly basis to ensure that the design was fully developed between all design team disciplines. This helped ensure that decisions could be made quickly when needed and sustained momentum towards the agreed RIBA 4 deadline. Baily Garner's cost consultancy team were also engaged throughout the process to ensure accuracy of the cost data presented to the client.

Once complete, the design was reviewed and then agreed by all parties. The project management team then managed the contractor procurement, culminating in a signed contract for works on site.

For more information:

<https://www.bailygarner.co.uk/projects/irene-house/>

An example of excellence: Manufacturing

Park Edge near Doncaster

Park Edge, near Doncaster is a suburban development of 189 houses. It was developed by Barratt Homes, who worked with Lakeside Plumbers and Polypipe to deliver plumbing systems across the entire site.

The latest BioCote technology was used to reduce germs and improve the longevity of the systems.

By working closely with the developer and its assigned contractors, Polypipe was able to supply at volume a high specification system suitable for all stages of water management. This included everything from systems to manage rainfall on the roof, to the plumbing systems that remove waste water from a housing plot into the main sewer system.

For more information:

<https://www.polypipe.com/housing/blog/polypipe-one-stop-shop-barratt-homes>

Route Map for New Home Delivery

Acknowledgements

The Housing Forum Futures Network

The Housing Forum Futures Network is a development programme for housing sector professionals. Delegates of the Futures Network benefit from personal learning and development, mentoring, workstreams, and events participation.

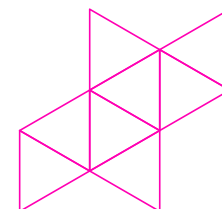
The programme was launched in July 2021 with the first cohort, and is now continuing with the second. For more information on the Futures Network please contact: simona.gavrila@housingforum.org.uk

2021-22 cohort

Ed Richards	Airey Miller
Will Gregory	Baily Garner
Thomas Bugler	Bugler Group
Eleni Stathi	HTA Design
Phena MacNamara	Pollard Thomas Edwards
Kotey Nikoi	Pollard Thomas Edwards
Daniel Love	Polypipe Building Products (part of the Genuit Group)
Stuart Brown	Trowers & Hamlins
Rory Kemp	Wates Development
Camilla Buds	Wates Development

2022 - 2023 cohort

Sonny Cook	Baily Garner
Laura Bradshaw	Baily Garner
Leonor Villa Pereira	Bugler Developments
Toby Blunsten-Fox	Durkan
Michael Luttners Tickner	FaithornFarrellTimms
Eve Murzyn	HTA Design LLP
Kwame Ohene-Adu	HTA Design LLP
Luis Obregon	Inner Circle Consulting
So Sum Lee	Inner Circle Consulting
Emily Lister	Insite Energy
Emma Bailey	Network Homes
Cameron Anterkyi	Network Homes
Katie Williamson	Platform Housing Group
Lyudmila Payne	Platform Housing Group
Hayley Hayes	Polypipe
Stuart Wood	Polypipe
Amie Ridgeway	Guinness
Ellie Park	South East Consortium
Nicola Conway	Trowers & Hamlins
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Oliver Parker	whg



Experts / Thanks

Sector experts

Tom Chance, Chief Executive	Community Land Trust Network
Stephen Teagle, Chief Executive	Countryside Partnerships
Phil Henry, Built Environment Director	Genuit
Mike De'Ath, Partner	HTA Design
William Cornall, Director of Regeneration & Place	Maidstone District Council
Jamie Ratcliff, Executive Director of People, Partnerships & Sustainability	Network Homes
Caroline Compton-James, Public Sector Director, Construction	Osborne
Joanne Payne, Service Manager, Housing Growth Delivery	Sheffield City Council
Kirsty Lambert, Business Development Director	Switch2
Katie Saunders, Partner	Trowers and Hamlins
Stephen Teagle, CEO Countryside Partnerships	Countryside Partnerships
Rebecca Bennett Casserly, Corporate Director of Development	whg
John East, Consultant	Winchester City Council
Charlie Sherer, Director	Helix

Member company questionnaire contributors

BPTW / Community Land Trust / Conisbee / Faithorn Farrell Timms / Hill / NHBC / Pollard Thomas Edwards / whg

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Graham Sibley, Director
Building Strategies

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Lester Clark, Creative Director
LesterClarkDesign

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INTERACT
INFORM
INFLUENCE

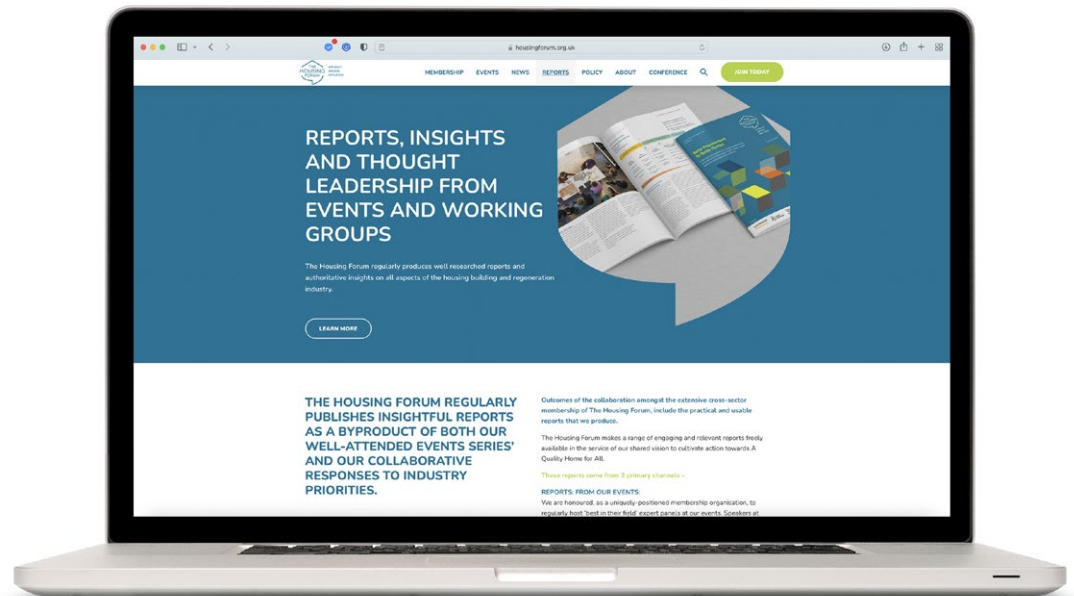
The Housing Forum

The Housing Forum is the only cross-sector, industry-wide organisation that represents the entire housing supply chain.

The Housing Forum's growing membership of 150+ organisations from both the public and private sectors represents £24bn turnover in the housing sector.

All members of The Housing Forum share our determination to drive quality in design, construction and maintenance of UK homes. They have a commitment to partnership working and share in our vision of 'A Quality Home for All'.

For more information email / visit:
info@housingforum.org.uk
www.housingforum.org.uk







The Housing Forum
6 Floor, 1 Minster Court, Mincing Lane, London EC3R 7AA
info@housingforum.org.uk