
DEFINITION OF SERVICES GUIDELINES

Building Construction

Supplement: Detailed Task Descriptions

TO BE COMPLETED



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Detailed Task Descriptions (Building Construction)

1A Structural Engineering

Phase 3: Schematic Design Phase (Building Construction)

Design Process	Deliverables
<p>Inputs</p> <ul style="list-style-type: none"> <input type="checkbox"/> Client brief, including budget & time schedule <input type="checkbox"/> Survey information, including legal & physical <input type="checkbox"/> Architectural sketch concept drawings, e.g., bulk & location <input type="checkbox"/> Preliminary fire engineering (where appropriate) <input type="checkbox"/> Preliminary wind studies (where appropriate) <input type="checkbox"/> Preliminary acoustic advice (where appropriate) <input type="checkbox"/> Preliminary geotechnical report, including preliminary design parameters <input type="checkbox"/> Design programme <input type="checkbox"/> Site constraints, including planning & fire issues <input type="checkbox"/> Conditions of consents <input type="checkbox"/> Existing building & site information/records <p>Design</p> <ul style="list-style-type: none"> <input type="checkbox"/> Structural type & form <input type="checkbox"/> Main gravity & lateral load resisting systems <input type="checkbox"/> Floor system <input type="checkbox"/> Ground retention systems <input type="checkbox"/> Foundation system <input type="checkbox"/> Façade support systems <input type="checkbox"/> Roof support systems <input type="checkbox"/> Identify structural scheme options <input type="checkbox"/> Special project features concepts, e.g., large canopies <input type="checkbox"/> Design co-ordination of key elements with other disciplines <input type="checkbox"/> Identify responsibility for control & set-out of dimensions <input type="checkbox"/> Identify responsibility for design co-ordination & management <input type="checkbox"/> Evaluate & select primary structural systems <input type="checkbox"/> Define grid layout (with the architect) <input type="checkbox"/> Preliminary analysis to establish critical member sizes for primary elements <input type="checkbox"/> Define key serviceability criteria <input type="checkbox"/> Design co-ordination of key elements with other disciplines <input type="checkbox"/> Define floor to floor heights <input type="checkbox"/> Preliminary assessment of floor vibration & building movement <input type="checkbox"/> Preliminary assessment of primary members of existing buildings <input type="checkbox"/> Address durability requirements <input type="checkbox"/> Preliminary input to the architect on 'architectural' elements <input type="checkbox"/> Identify high risk &/or cost elements in structure <input type="checkbox"/> Define key elements of ground retention system (if required) 	<p>Drawings</p> <ul style="list-style-type: none"> <input type="checkbox"/> Sketch drawings <input type="checkbox"/> Drawings outline primary members as mark ups of architectural drawings (1:200) <input type="checkbox"/> Proposed primary framing <input type="checkbox"/> Preliminary sizes of primary members only with reinforcing as kg/m³ & steel as kg/m <input type="checkbox"/> Preliminary foundation layout <input type="checkbox"/> Indicative structural connection types <input type="checkbox"/> Outline system for secondary elements <input type="checkbox"/> Outline durability/coating systems <input type="checkbox"/> Indicative surface finish for exposed concrete <input type="checkbox"/> Critical details that may have significant cost implication <input type="checkbox"/> Proposed primary elements of strengthening for existing buildings (where appropriate) <p>Specifications</p> <ul style="list-style-type: none"> <input type="checkbox"/> Outline specification of key structural elements <p>Reports</p> <ul style="list-style-type: none"> <input type="checkbox"/> Sketch drawings where necessary within report <input type="checkbox"/> Structural concept design brief, including floor loadings <input type="checkbox"/> Key risks & assumptions <input type="checkbox"/> Concept report outlines key issues & options considered <input type="checkbox"/> Design brief, including fire protection requirements for structural members <input type="checkbox"/> Design features (options) report, with recommended option to take to developed design <input type="checkbox"/> Outline of elements not covered in preliminary design drawings or design features report <input type="checkbox"/> Define assumed construction methodology governing design (where appropriate) <input type="checkbox"/> Highlight 'significant' buildability issues & significant/unusual health & safety issues arising from the structure

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Detailed Task Descriptions (Building Construction)

- Define design parameters for façade systems.
Incorporate additional structural implication of fire & acoustic requirements
- Assess implication of dynamic motion of building services equipment
- Consider build ability of primary structural system, including significant health & safety issues during construction
- For unusual structures or existing structures where stability may be affected by the sequence of construction, consider significant health & safety issues
- Assess maintenance requirements of structural components, including health & safety issues
- Coordinate relevant design information between disciplines

Comments

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| <ol style="list-style-type: none">1 The Schematic Phase is often split into concept & preliminary phases on larger projects.2 Costing on square metre rate basis or preliminary elemental basis.3 Agree roles & responsibilities for all participants in project procurement process.4 Discuss with client requirements & programme for client information & approvals.5 Establish project procedures for communication, document issue, approvals, etc. Note that larger projects may have a project procedure manual or web-based document control systems.6. Establish a design programme for key milestones & deliverables including design team coordination. | <ol style="list-style-type: none">7 Where appropriate carry out discussion with a 'preferred' contractor on construction methodology.8 Consultation with the TA is recommended on key aspects of the design that may be considered outside the 'Acceptable Solution' & unusual/contentious issues.9 Contribute to Value Management session, if required.10 Agree the scale of drawing deliverables for each phase according to project type.11 A specialist façade design consultant may need to be engaged, if the façade system is particularly complex or demanding. |
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Detailed Task Descriptions (Building Construction)

1B Structural Engineering

Phase 4: Developed Design Phase (Building Construction)

Design Process	Deliverables
<p>Inputs</p> <ul style="list-style-type: none"> <input type="checkbox"/> Client approval of preliminary design, including ratification of the cost estimate <input type="checkbox"/> Final Geotechnical report <input type="checkbox"/> Final wind report (if required) <input type="checkbox"/> Final fire report <p>Design</p> <ul style="list-style-type: none"> <input type="checkbox"/> Determine sizes of all primary & most secondary structural members; however, there may be some architectural & services secondary support members not defined at this stage <input type="checkbox"/> Generic connection details <input type="checkbox"/> Agree serviceability performance criteria with the client (e.g., floor vibration, interstorey drifts, etc.) <input type="checkbox"/> Structural input to architectural elements <input type="checkbox"/> Confirm building movements with the design team. <input type="checkbox"/> Incorporate likely erection/construction requirements (where appropriate), including consideration of significant/unusual health & safety issues arising from the structure <input type="checkbox"/> Key support details for façade elements <input type="checkbox"/> Structural support requirements for building maintenance systems (e.g., BMU & abseil anchor points) <input type="checkbox"/> Coordinate relevant information with other disciplines 	<p>Drawings</p> <ul style="list-style-type: none"> <input type="checkbox"/> Drawings (1:100 plans) defining all primary framing members, with reinforcing as kg/m³ <input type="checkbox"/> Layout & size of secondary framing members (e.g., lift, stairs, canopies and platforms) <input type="checkbox"/> Generic reinforcing details for typical primary elements <input type="checkbox"/> Typical connection details for primary elements <input type="checkbox"/> Define elements covered by proprietary design (e.g., precast floor and piling) <p>Specifications</p> <ul style="list-style-type: none"> <input type="checkbox"/> Preliminary technical specifications, including durability & serviceability issues <p>Reports</p> <ul style="list-style-type: none"> <input type="checkbox"/> Updated design brief, including fire protection requirements for structural members <input type="checkbox"/> Updated design features report, including serviceability and maintenance issues <input type="checkbox"/> Define key risks and assumptions, including erection/buildability & significant/unusual health and safety issues arising from the structure <input type="checkbox"/> List elements where the scope has not been fully defined elsewhere in the documents
<p>Contents</p> <ol style="list-style-type: none"> 1 Separate primary reinforcement from secondary stirrup or ties in quantity estimates. 2 Cost estimates at this stage can be produced by Quantity Surveyor on elemental basis, with secondary elements estimated on typical details. 3 Design and documentation may be sufficiently developed to lodge for Building Consent. 	<ol style="list-style-type: none"> 4 Developed Design generally provides the level of documentation to define the scope of all building elements. 5 Where appropriate carry out discussions with a 'preferred' contractor on construction methodology.

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Detailed Task Descriptions (Building Construction)

1C Structural Engineering

Phase 5: Construction Documentation Phase (Building Construction)

Design Process	Deliverables
<p>Inputs</p> <p><input type="checkbox"/> Client approval of completed developed design, including ratification of the cost estimate</p> <p>Design</p> <p><input type="checkbox"/> Complete the design & co ordination of all structural elements, including connection details, except for elements that can be adequately covered by non-specific design codes</p> <p><input type="checkbox"/> Address serviceability & maintenance criteria in the design</p> <p><input type="checkbox"/> Highlight significant/unusual health & safety risks arising from the structure that were identified through the design process (if any)</p>	<p>Drawings</p> <p><input type="checkbox"/> Drawings define all structural elements, including plans, elevations, sections & details, with cross-referencing</p> <p><input type="checkbox"/> Define all connections by either defining specific connection details or referencing to industry standard connection details (e.g., HERA connection details) or specifying forces for a propriety connection system</p> <p><input type="checkbox"/> Construction sequences & positions of control/construction joints</p> <p><input type="checkbox"/> Includes stairs, plant platforms & façade system support</p> <p><input type="checkbox"/> Reinforcing details defined (see comments below)</p> <p><input type="checkbox"/> Precamber/set established for members</p> <p><input type="checkbox"/> Include seismic & gravity support of ceiling/partition systems (optional)</p> <p>Specifications</p> <p><input type="checkbox"/> Detailed specifications for each structural trade</p> <p><input type="checkbox"/> Performance specifications where appropriate, including performance criteria for proprietary design</p> <p><input type="checkbox"/> Method statements for critical construction processes governing design</p> <p><input type="checkbox"/> Design loadings for design of proprietary non-structural elements e.g., glazing; seismic bracing of services</p> <p><input type="checkbox"/> Define deliverables from contractor, e.g., producer statements, shop drawings & testing requirements,</p> <p><input type="checkbox"/> Coating requirements for structural elements that are not addressed by the architect or other disciplines</p> <p><input type="checkbox"/> Define required tolerances if different from industry standards</p>
<p>Comments</p> <p>1 Detailed design generally provides a level of documentation to clearly define the design of all structural elements. Design details should be coordinated with other disciplines. However, the documents produced in this phase may not directly be able to be 'built' from.</p> <p>2 Reference the architectural plans or other disciplines for other dimensions (unless agreed otherwise).</p> <p>3 Reinforcing details defined means that all reinforcing required to construct the project is defined on the drawings, in quantum & size, such that shop drawings and/or bar bending schedule can be produced by others without further additional information.</p> <p>4 Design & documentation of secondary architectural elements are generally shown on the architect's drawings; the structural engineer will have input where requested by the architect.</p> <p>5 The contractor is responsible for managing health & safety risks during the construction phase.</p>	<p>6 Structural drawings should dimension the main building grids, critical structural elements & other elements that are the direct responsibility of the structural engineer.</p> <p>7 The level of design details shown on drawings in this phase, particularly for concrete & masonry elements, varies in the industry between regions, building type & procurement methodology. A major factor is the capability of the local building industry to efficiently provide the construction phase documentation. The level of details outlined in these guidelines is appropriate where the contractor has the skills & resources to efficiently provide construction phase documentation. For some projects, a greater level of detailing may need to be produced by the design consultant. The appropriate level of detailing required should be agreed with the client prior to the commencement of the project.</p> <p>8 Define in appropriate specification the significant/unusual health & safety risks arising from the structure identified in the design.</p>

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Detailed Task Descriptions (Building Construction)

1D Structural Engineering

Phase 8: Construction Phase (Building Construction)

Design Process	Deliverables
<p>Inputs</p> <ul style="list-style-type: none"> <input type="checkbox"/> Construction programme & methodology, including craneage or access restrictions <input type="checkbox"/> Client approved ('For Construction') drawings & specifications <input type="checkbox"/> Design & performance requirements for propriety elements <p>Design</p> <ul style="list-style-type: none"> <input type="checkbox"/> Design of proprietary systems, e.g., flooring, glazing, plant support, etc. <input type="checkbox"/> Detailed co-ordination required with other disciplines, site conditions, proprietary elements, erection requirements & shop details <input type="checkbox"/> Prepare structural construction sequence, temporary erection <input type="checkbox"/> Structural input to architectural elements <input type="checkbox"/> Confirm building movements with the design team. <input type="checkbox"/> Determine the impact of temporary erection loads & construction sequence on structural members & connections <input type="checkbox"/> Check the design of structural members & connections for temporary construction conditions & loads, & redesign if required <input type="checkbox"/> Liaise with the design & construction teams to coordinate any revisions to the detailed design 	<p>General</p> <ul style="list-style-type: none"> <input type="checkbox"/> Drawings (including shop drawings & rebar schedules) on an elemental basis, including position, dimension, materials & finish of all details, including relevant material specifications (steel, timber, precast, etc) <input type="checkbox"/> Site management plans and/or method statements defining the construction sequencing & temporary erection requirements <input type="checkbox"/> Details of the temporary works <input type="checkbox"/> Revision of drawings, details & specifications arising from contract agreement, building consent & construction requirements <p>Concrete</p> <p>For non-standard conditions the following is to be provided where applicable:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Formwork <input type="checkbox"/> Propping & bracing <input type="checkbox"/> Scaffolding & access <input type="checkbox"/> Proprietary system layout drawings & connection details <input type="checkbox"/> Embedded items & penetrations defined & located <p>Steel</p> <ul style="list-style-type: none"> <input type="checkbox"/> Shop drawings generally as defined in Australian Detailer Handbook ASDH101 or the American Institute of Steel Retailers Guidelines <p>Review</p> <ul style="list-style-type: none"> <input type="checkbox"/> Review shop drawings, technical specification & construction method statement submissions for consistency with detailed design

Contents

- 1 Before the commencement of construction drawings the following needs to be in place: contract details confirmed & tender accepted; sub-contract agreements confirmed; & owner-supplied components available.
- 2 Deliverables contain sufficient details for elements to be manufactured/constructed without reference to other documents, i.e., "the details have co-ordinated the relevant design information across all disciplines & can be built from".
- 3 Final determination of some dimensions may be dependent on proprietary design of non-structural elements (e.g., mechanical services duct sizes). Such proprietary design may need to be advanced to enable structural dimensions to be completed.
- 4 The contractor is responsible for managing health & safety risks during the construction phase

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Detailed Task Descriptions (Building Construction)

2A Architects

Phase 1: Construction Documentation Phase (Building Construction)

Design Process	Deliverables
<p>Inputs</p> <ul style="list-style-type: none"> <input type="checkbox"/> Client brief, including budget and time schedule <input type="checkbox"/> Client advice in respect to structure of design proces. <input type="checkbox"/> Data Collection including: <ul style="list-style-type: none"> - Topographical survey - Existing structures and services - Certificate of Title - Other Legal Information - Geotechnical information - As-built measure of existing structures where additions or alterations are involved - Engineering reports on existing structures - District Plan Rules and Objectives including any existing Resource Consent, LIM and PIM - Other Design Constraints <input type="checkbox"/> Confirmed site topographical, geotech and legal surveys <input type="checkbox"/> Confirmed District Plan Analysis and Development Rules <input type="checkbox"/> Concept civil and structural engineering constraints <input type="checkbox"/> Concept services engineering and infrastructural constraints <input type="checkbox"/> Concept fire engineering <input type="checkbox"/> Concept environmental studies <input type="checkbox"/> Concept acoustic advice <input type="checkbox"/> Project time schedule <p>Tasks</p> <ul style="list-style-type: none"> <input type="checkbox"/> Attend regular design phase meetings with relevant parties <input type="checkbox"/> Inspect site and prepare site analysis <input type="checkbox"/> Prepare Schedule of Accommodation. Agree with Client <input type="checkbox"/> Distribute <input type="checkbox"/> Prepare Document Register <input type="checkbox"/> Inspect the site and prepare site analysis diagrams <input type="checkbox"/> Discuss and agree with Client the additional separate or sub consultants that are to be retained and by whom, i.e., Geotechnical Consultant, Surveyor, Planning Consultant, Civil, Structural, Fire, Services and Acoustic Engineers; Quantity Surveyors, Interior Designer, Landscape Architect, Specialised Project Management Services, Health and Safety Consultant, Others <input type="checkbox"/> Select and recommend to Client appointment of other consultants or sub-consultants: confirm fees <input type="checkbox"/> Identify responsibility for dimensional control <input type="checkbox"/> Identify responsibility for design coordination <input type="checkbox"/> Identify responsibility for design management 	<p>Drawings</p> <ul style="list-style-type: none"> <input type="checkbox"/> Agreed Design Brief and Schedule of Accommodation <input type="checkbox"/> Report on existing facilities and engineering systems if applicable <input type="checkbox"/> Options Studies Report <input type="checkbox"/> Conceptual drawings including: <ul style="list-style-type: none"> - Overall site plan - Floor plans - Elevations - Sketches - Sections (indicative sufficient to illustrate overall concept) <input type="checkbox"/> Model <input type="checkbox"/> Preliminary Cost Estimate (prepared by Quantity Surveyor) <input type="checkbox"/> Concept Schedule of Materials and Finishes <p>Drawings</p> <ul style="list-style-type: none"> <input type="checkbox"/> Overall site plan <input type="checkbox"/> Floor plans <input type="checkbox"/> Elevations <input type="checkbox"/> Sections <input type="checkbox"/> Sketches/perspectives exterior <input type="checkbox"/> Sketches/perspectives interior <input type="checkbox"/> Model(s). <input type="checkbox"/> Materials and Finishes Presentation <input type="checkbox"/> Other defined marketing material <p>Specifications</p> <ul style="list-style-type: none"> <input type="checkbox"/> Preliminary Schedule of internal and external Materials and Finishes <p>Reports</p> <ul style="list-style-type: none"> <input type="checkbox"/> Updated Design Brief, Schedule of Accommodation and Project time schedule <input type="checkbox"/> Schedule of Areas (Net and Gross as applicable) <input type="checkbox"/> Design features (options) report (with recommended option to take to Developed Design) <input type="checkbox"/> Outline of elements not covered in Preliminary Design <input type="checkbox"/> Define assumed construction methodology governing design <input type="checkbox"/> Highlight 'significant' or unusual buildability and Health and Safety issues <input type="checkbox"/> Highlight 'specia' project risks <input type="checkbox"/> Report on Façade options and Weathering issues

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Detailed Task Descriptions (Building Construction)

Design Process (continued)

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| <ul style="list-style-type: none"> <input type="checkbox"/> Investigate District Plan requirements, analyse, review with Client <input type="checkbox"/> Prepare formal / functional diagrams, develop viable options, review with Client <input type="checkbox"/> Analyse Brief against design constraints <input type="checkbox"/> Prepare Concept Design <input type="checkbox"/> Study siting options and climatic influences; develop massing models; evaluate relationships to site context. <input type="checkbox"/> Test massing options against preferred functional arrangement and brief; review with Client. Select model. <input type="checkbox"/> Evaluate provisional concepts for accommodation of systems with Structural Engineer and Building Services Engineer <input type="checkbox"/> Evaluate provisional concepts for accommodation of parking and traffic requirements <input type="checkbox"/> Prepare architecture concept drawings <input type="checkbox"/> Prepare Feasibility Report <input type="checkbox"/> Prepare concept schedule of internal and external materials and finishes, confirm with Client, distribute to Quantity Surveyor <input type="checkbox"/> Check disabled access requirements <input type="checkbox"/> Check concept against planning and survey requirements <input type="checkbox"/> Review concepts for significant health and safety risks relevant to the design <input type="checkbox"/> Review scheme with Territorial Authority planners <input type="checkbox"/> Liaise with QS to prepare Concept Design cost estimate. <input type="checkbox"/> Check Concept Design for conformity with fire and egress requirements <input type="checkbox"/> Establish provisional beam depths, duct crossovers and floor-to-floor heights <input type="checkbox"/> Establish energy conservation design criteria <input type="checkbox"/> Prepare Energy Study <input type="checkbox"/> Determine if environmental studies are required if so, prepare and submit | <ul style="list-style-type: none"> <input type="checkbox"/> Coordinate all design information between disciplines <input type="checkbox"/> Attend regular design phase meetings with relevant parties <input type="checkbox"/> Revise Preliminary Design brief from Concept Design including all up to date information; confirm with Client <input type="checkbox"/> Update Document Register <input type="checkbox"/> Develop list of questions affecting Preliminary Design pertinent to each external discipline, circulate <input type="checkbox"/> Review Preliminary Design for significant or unusual Health and Safety Risks the design may present during construction and maintenance <input type="checkbox"/> Prepare Preliminary Design work time schedule <input type="checkbox"/> Review Town Planning Analysis and implications <input type="checkbox"/> Establish primary reference grids and dimensions <input type="checkbox"/> Evaluate provisional concepts for accommodation of structural systems with Senior Engineer <input type="checkbox"/> Evaluate provisional concepts for accommodation of services systems with BSEng <input type="checkbox"/> Revise Schedule of internal & external materials and finishes; evaluate lifecycle durability and maintenance implications; confirm with Client & submit to QS <input type="checkbox"/> Confirm compliance with fire and egress requirements <input type="checkbox"/> Confirm compliance with disabled access requirements <input type="checkbox"/> Confirm compliance with Sanitary Facilities Code <input type="checkbox"/> Confirm compliance with Development Rules <input type="checkbox"/> Confirm revisions; request updated Cost Plan from QS <input type="checkbox"/> Establish provisional lift shaft sizes, air duct sizes, raised floor requirements, plant room sizes / mechanical requirements, egress requirements <input type="checkbox"/> Prepare architectural Preliminary Design drawings <input type="checkbox"/> Determine if specific town planning studies are required, prepare and submit <input type="checkbox"/> Review with Town Planner and TA personnel for advice/comment <input type="checkbox"/> Review Design with Client's marketing/real estate advisors, including plan for presentation materials <input type="checkbox"/> Coordinate all design information |
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Comments

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| <ol style="list-style-type: none"> 1 Confirm Conditions of Engagement at outset of commission. 2 Note that the preparation of Brief is not part of Architect's Standard Service. 3 Agree roles and responsibilities for all participants in building procurement process particularly responsibility for obtaining Resource Consents. 4 Agree with Client the requirements and programme for Client information and approvals. 5 Costing may be only on square metre rate basis – QS should provide Concept Cost Plan to accompany deliverables. 6 Concept and Preliminary Design phases may be combined. 7 The approved design may be submitted for a PIM at this stage to identify Resource Consent issues and to obtain existing conditions/services information. | <ol style="list-style-type: none"> 8 Agree the scale of drawing deliverables for each phase according to project type. 9 Dimensioning and coordination is often the responsibility of the architect but this will vary with commission. 10 Advise Client on the advantages in maintaining consultant advice at every stage, and the risks incurred where this is not commissioned. 11 If a Partial Service is commissioned, confirm whether the Deliverables for the commissioned phase are affected. 12 Confirm with the Client whether Design Management Services are included in the Design commission, or whether another party will manage the design process. 13 It may be necessary to obtain from the Services Engineer a schedule of notional requirements. |
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- 14 Refer to separate Coordination Checklist documents.
 - 15 Consultation with TA is recommended on key aspects of the design that may be considered outside the 'Acceptable Solution' regime, and unusual/contentious issues.
 - 16 Cost estimates at this stage generally cannot be on a full elemental basis, as secondary elements are not well defined, but ensure independent professional cost advice is provided to the Client.
 - 17 Contribution to Value Management sessions may be required.
 - 18 Preliminary Design may provide a level of documentation appropriate for a Resource Consent application for less complex projects.
 - 19 It may be relevant to review SEng's preliminary report and effect on external façade systems, including deflections, seismic impact and weathering implications.
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