**Envelope checklist**

The checklist is intended for graduate engineers or those with little experience of envelopes

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| **Responsibilities and duties** | | |
| 1. | Who is designing the envelope and who is coordinating the information within the design team, client and the contractor? How is the cladding design being procured? Will the design and detailing be undertaken by the Contractor (Tier 1/2)? |  |
| 2. | Is the envelope design available for review and are all late changes incorporated? |  |
| 3. | Is the envelope specification available? Are client requirements clearly understood? |  |
| 4. | Who is the principal designer? |  |
| 5. | Who is the envelope contractor and their subcontractors? |  |
| 6. | Who is the envelope package manager? |  |
| 7. | Is the responsibility matrix clear and have any scope gaps/ package gaps in the design or construction identified? |  |
| 8. | What is the envelope contract? |  |
| 9. | What are client requirements in relation to design assurance – level of design assurance (Cat.1/2), design execution plan, etc? |  |
| 10. | What is the materiality of the envelope? Is any materials testing required? |  |
| 11. | Who is determining the loads/ conditions that the envelope is subjected too? |  |
| 12. | What is the strategy for accommodation of fabrication and installation tolerances (vertical and horizontal, construction sequence)? |  |
| 13. | What is the strategy for accommodation of structural movements (vertical and drift, consider duration of load and installation sequence)? |  |
| 14. | Is the detailed information about the magnitude and location of structural deformations available? |  |
| 15. | What is the structural system of the envelope, gravity and stability? |  |
| 16. | What is the structural capacity of all components in the load path (thermal breaks, setting blocks, support angles, screw fixing including back spans in pressure equalised systems, jointing within double glazed units)? |  |
| 17. | What is the structural capacity of individual components and what are possible failure mechanisms, weak links in the system? |  |
| 18. | Who is designing the support and jointing within the envelope systems? Is an Interface Control Document coordinated between the cladding/façade designer and the designer of the primary structure? |  |
| 19. | Are eccentricities in brackets/ elements considered at worst potential position? |  |
| 20. | What is the damage tolerance of the envelope components, impact loads, security loads, accidental loads? |  |
| 21. | Are the deflection criteria including the requirements of panels supported, (e.g. limitations on deflection of the edges of a brittle cladding panel or stricter visual requirements)? |  |
| 22. | What is the robustness and redundancy mechanism and disproportional collapse? Is a tethering system required? |  |
| 23. | What is the risk of the failure? |  |
| 24. | What are the non-structural performance requirements of the envelope (thermal, acoustic, weather performance, air infiltration, fire, security) and what interaction may they have on the structural behaviour of the envelope? |  |
| 25. | Who is detailing the interface detailing between envelope system and the primary structure available? |  |
| 26. | If applicable, please consider effects of thermal cycling loads. |  |
| 27. | Who is providing envelope connection locations and magnitude/ direction of reactions? |  |
| 28. | What is the strategy to connect the envelope brackets, (casting channels, post drilled anchors, site drilling/ welding of steel)? |  |
| 29. | Consideration to mitigate risk of bi metallic corrosion shall be given if dissimilar metals are in direct contact |  |
| 30. | Sustainability aspects shall be considered in materials selection and detailing of components. Initial embodied carbon calculated |  |
| 31. | Circular economy principles, component replacement and disassembly strategy together with end of the life plan shall be outlined |  |

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| **Technical aspects – Construction and maintenance** | | |
| 32. | Do you know the construction methodology and possible construction limitations? |  |
| 33. | What is the replacement strategy (glass, gaskets)? |  |
| 34. | What is the access and maintenance strategy? What provisions need to be provided to allow inspection of items which are difficult to access? |  |
| 35. | Has there been consideration of the sustainability, carbon footprint and end of life strategy? |  |
| 36. | Is full scale performance mock-up specified? |  |