Pride in the Job Awards

Best practice guide

Section 10

Multi-storey and high-rise

NHBC

Best practice guide

Our series of Best Practice Guides take you through what the Pride in the Job judges look for at each stage of construction and when considering the site manager's overall organisation and management skills.

The Pride in the Job marking sheet used by our judges has 43 marking lines split across 10 sections. The judges will give a score for each line – where there is no work to mark, that line will be left blank and no mark given. A mark of four indicates compliance with NHBC Standards. A mark of five indicates extra attention to detail over and above compliance standards. A mark of six would indicate that much of what the judges have seen cannot be improved upon. A mark less than four would indicate varying issues relating to workmanship and non-compliance with NHBC's Standards – the greater the issue or number of the same issue, the lower the mark. The final score will be all the marks awarded expressed as a percentage.

These Guides set out what the judges are looking for with clear hints and tips on the sort of practice that will lead to higher marks.

Clearly it is impossible in these short guides to cover every single point of construction – we try here to cover the main issues that are taken into account when considering a mark for each score line.

When looking at the photographs, consider each one in the context of the score line heading – don't be distracted by something else that isn't as good – that will be marked accordingly elsewhere.

Section 10

Multi-storey and high-rise

This best practice guide has been produced specifically for sites with buildings of multi-occupancy and multi-storey (four to six stories) or high-rise (seven storeys and over) developments.

We have taken eight build areas within multi-storey/high-rise construction and provided photographs and commentary. These build stages differ considerably from low-rise residential housing and we hope this guide provides you with some tips to enhance your chances of winning a Pride in the Job award.

Foundations
Basements and podium decks
Mechanical and engineering
Structural framing
Firestopping (superstructure)
Flat roofs
Cladding
Balconies – fixing and weather proofing

Section 10

Foundations

Will be marked under Pride in the Job Section 1 Foundations.

The site manager should be able to demonstrate an awareness and understanding of the design, the potential for changes in circumstances encountered during the dig and the knowledge to take action to accommodate these changes which are likely to be either ground conditions, contamination, or poor pile installation. Although normally this work is carried out by specialist subcontractors it still needs to be managed well. A particular knowledge and interest exhibited by the site manager demonstrates the understanding and ability to control and check these complex works.

Pride – As the foundation will generally be expected to carry far greater loads than for traditional construction, the formation should be accurate. It should be free from debris or loose material and clear of excess water before the concrete is poured. The relative position of any piles to the foundation pad or ground beam must be checked and installation of pile reinforcement carried out correctly. Pile installation logs and test results should be checked, queried as necessary and be available on request. The pile heads should be trimmed to expose sound concrete with the correct penetration into the pad or beam. Pile reinforcement should protrude to provide adequate laps into ground beam/pad reinforcement. Formwork should be appropriate for the conditions (consider strength, size, materials, positioning of stop-ends etc). Quality and care taken with dig and support of trenches, accuracy and alignment of dig and pile placement, fixing of heave precautions to avoid gaps.

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4

Section 10

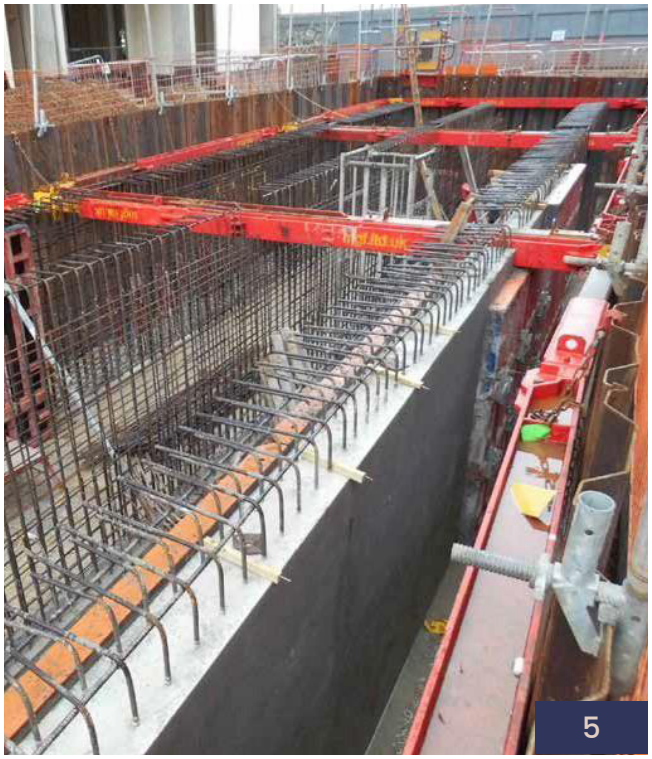
Basements and podium decks

For basement construction to be successful it is vital that works are carried out under strict supervision. Design and specification information should be available on site listing relevant specialist subcontractors and/or suppliers and include the following information: a full set of current drawings; details of joints, junctions and service penetrations; an installation method statement detailing the sequence of work; a ground condition report and third-party certificates.

Waterproofing systems should be designed by a waterproofing design specialist with a robust QA process and records in place.

Pride – Smoothness of concrete finish, especially if it is to remain unclad will gain extra marks. Absence of staining to walls indicating leakages. The method of providing service entries through the walls should be considered. In steel columns, correct use of holding down bolts and packing pieces is essential.

DPCs must be correctly located when rafts are used. Tanking must be applied in accordance with the manufacturer's instructions with particular attention given to laps, corners and fillets. Tanking should always lap with other DPCs, trays and other membranes to form a continuous envelope. Penetrations through the water proofing should be avoided where possible. Where penetrations cannot be avoided, the design should detail the method of water proofing to ensure that it is water tight and durable. Cleanliness and preparation of construction joints, water bars and the application of tanking to basement walls and the interface with superstructure are particularly important.



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Section 10

Mechanical and engineering

Designs and specifications should be issued to site supervisors, specialist subcontractors and suppliers, including the following information: location of all ductworks runs; the fan unit and controls; type, size and position of ducts and terminals; insulation of ducting where required to prevent condensation; type and spacing of clips and fixings.

The forming of holes for SVPs through the structural floors must be properly sealed to enable the sound and fire resistance to be fully maintained. Most services will be routed in vertical risers and then horizontally in either the floor void or fixed to the underside of the soffit.

Service supports to cabling or pipework including clips should be considered under this heading.

Mechanical ventilation and heat recovery systems ducting should be installed as per design in line with manufacturer's installation guidance.

Pride – Attention to detail, setting out and planning of drops, careful planning of fire stopping for service penetrations through compartment walls are critical. Thoughtful setting out of sockets and switches at first fix stage will help to enhance the overall internal appearance for second fix. Judges will also look for careful installation of timber and metal frame studwork and at party wall installations. Including sufficiency of clipping including non-combustible clips, support, pattresses and the provision of robust coverings to protect end users.

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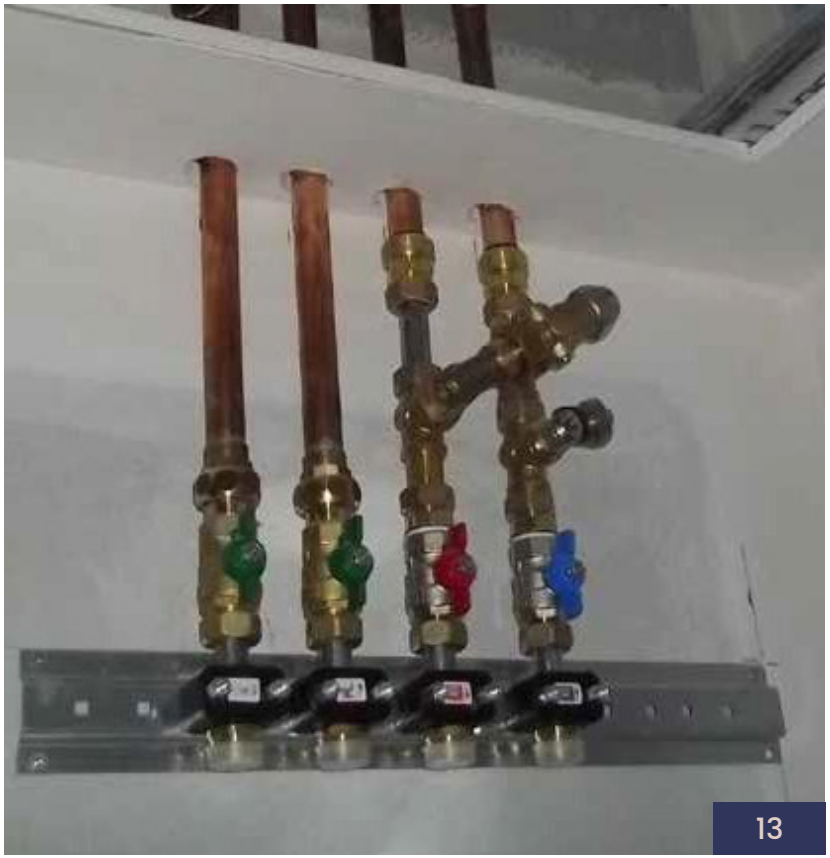

13

Section 10

Structural framing

Implementation of QA checks by both the frame contractor and site engineer are essential in the delivery of a successful frame being constructed. The frame should be in strict accordance with the structural design, with regular checks also being undertaken by the onsite engineer. Site managers should have a contingency plan for works carried out in inclement or cold weather.

Connections in both steel and concrete frames are vital, all base plates should be fully grouted up after the holding down bolts are fully tightened. All packs or shims must be of similar grade steel. ie, all bolts should be of the correct grade and tightened to the correct torque. In addition, bolts should be of the correct length to ensure the thread is visible beyond the head of the nut. Site cutting is normally avoided but, if necessary, should be to the frame designer's specification.

Pride – Consideration to a consistent smooth finish across the frame, attention to cover of reinforcement and quality of temporary formwork.

Accurate setting out, line, level and plumb of shear walls and floors edges.

Where shear links are required these should be correctly positioned and adequately tied to the reinforcing top/ bottom mats. Reinforcement laps and general placement must be in strict accordance with the design.

In post-tension slabs it is essential that safe zones are marked out to avoid damage to reinforcement.

Load–bearing walls must be in the correct locations for adequate bearing of floors and walls above. Care should be taken to protect work in progress to avoid potential damage, particularly to columns and soffits.

14

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Section 10

Firestopping

(superstructure)

It is vital that these life-saving elements to the frame are correctly installed and checked under strict supervision. A carefully designed checking and signing-off system implemented on site to ensure accurate installation has followed design drawings. A catalogued photographic record of fire stopping installation and fixing prior to covering up is critical.

Materials used for cavity barriers and fire stops shall be capable of producing adequate resistance to fire and smoke. Systems incorporating proprietary intumescent materials should follow the guidance provided by the Intumescent Fire Seals Association (IFSA) or the Association for Specialist Fire Protection (ASFP).

Pride – A high standard of detailing, accuracy, alignment and checking of fire stopping installation increases confidence in the safety and quality of the building.

Evidence of care taken to ensure that products are installed accurately and precisely to meet their performance capabilities, including cutting to size, abutments, correct compression and mechanical fixings if specified.

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24

Section 10

Flat roofs

A thorough understanding by the site manager of any specialist weatherproofing system being used is essential to achieve a successful delivery of the flat roof system being constructed. With particular focus on attention to interfaces with cavity trays at abutments, upstands and splash zones.

The installation of thermal insulation, vapour control and ventilation shall ensure satisfactory performance and prevent the formation of condensation which could adversely affect the construction. The structure and receiving surface should be checked and approved by the waterproofing contractor and weather conditions should be suitable for installing waterproofing. Flat roof coverings are likely to be proprietary systems, however the fixing of any coverings is a highly important item. The manufacturer's details and guidance must be strictly adhered to, to prevent leaks or wind damage. If a green or brown roof is being installed it should be clearly defined by the supplier as a completely independent third-party certified system. A green roof should be installed by a contractor trained and approved by the system supplier. Drainage arrangements should be effective to prevent ponding or standing water and have a suitable overflow. The building should not flood where an outlet or downpipe is blocked.

Pride – In addition to maintaining the weather-proofing system at upstands and junctions, flashing has a major impact on the visual appearance. Cleanliness and dressing are important considerations. It is essential that the waterproofing layer is protected from storage of heavy or hazardous materials and tested upon completion. Attention to details at laps, service penetrations and around drainage outlets are key focus areas.

25

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31

Section 10

Cladding

All types of cladding systems will be considered under this heading - facing brickwork, curtain walling, rainscreen cladding, insulated render and brick slip cladding. The site manager should have a thorough understanding of the cladding system being installed and be able to refer to a full set of drawings, fixing schedules, specific details of all interfaces including backing walls, EPDMs, all installed in strict accordance with manufacturer's specifications. It is imperative that insulation is correctly specified, securely fixed and neatly installed.

Curtain walling and cladding systems shall be adequately tested, certified and designed in accordance with appropriate standards. Where applicable, certification should be in accordance with the CWCT Standard for systemised building envelopes.

Correctly positioned and formed movement joints including sealant should also be marked under this heading. External lintels and shelf angles, including their protection and fixings should be considered as part of the external fabric. Pre-formed feature panels within curtain walling and in particular their fixings should also be considered under this heading. The installation of curtain walling should precisely follow manufacturer's instructions and requirements of the BBA, BRE or other UKAS accredited certification body.

Pride – The visual impact of the construction would also enhance the score. Quality execution of setting out and jointing, particularly at interfaces between different systems, lintels, windows and floor structures.

Particular attention should be paid to the supporting systems, bracketry and mechanical fixings. Early anticipation of architectural problems and robust quality control indicates a heightened level of skill, even if most of the work is being carried out by specialists.

32

33

34

35

Section 10

Balconies – fixing and weatherproofing

Balconies must be accurately aligned, installed, and correctly fixed back to the main frame. Early consideration to ensure robust fixing, thermal breaks and fire resistance at the interface with the main frame and weatherproofing at the threshold and across the entire balcony footprint.

Pride –Areas to focus on include installation of trays at abutments and linking of cavity trays with the waterproofing membrane above splash zones. Careful consideration of the maintenance of balcony drainage and overflow systems, including the balcony guarding. When the judges look at and score finished decking, they are looking at how it has been set out, neatness of cuts and fixings.

Waterproof layers and membranes should be protected throughout the build process to prevent damage from following trades. Protection of prefabricated/completed balconies through to handover is essential. Care taken to make these distinctive structures look aesthetically pleasing.

36

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Pride in the Job Awards

Good luck!

We hope you have found this best practice guide useful in gaining a better understanding of what the judges are looking for at each stage of construction.

Remember, the six characteristics the judges are looking for in a site manager are:

- consistency
- attention to detail
- technical expertise
- leadership
- interpretation
- health and safety.

We wish you all the very best in the Pride in the Job competition as you strive for your very first win or to repeat or even improve on your performance in previous years.

NHBC