Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Procedure for Control of Building Workmanship

Procedure No. 018

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INTRODUCTION

The purpose of this procedure is to ensure a good standard of workmanship on our projects.

Scope

This procedure can be used on all building and refurbishment works carried supervised by technical services department.

Responsibility

It is the responsibility of all in the technical services department to ensure that these guidelines are available to all staff in building supervision roles within technical services.

PROCEDURE

1.0 Demolition

When demolition work is being carried out, ensure that the method statement is fully implemented in terms of safe working methods, adjacent properties. Regularly check hoardings, gantries, screens and dust control. Ensure that all services are disconnected and temporary services are safe. Check temporary shoring is secure and complies with the method statement.

2.0 Excavation

Ensure strutting / shoring is in place before entering excavated areas. Provide a safe means of access / exit via appropriate ladders / walkways being well secured. Keep excavated material away from excavation by a distance of not less than the excavated depth. Check that adjacent buildings / ground is not adversely affected. Check that props are well secured. Use personal protective equipment.

3.0 Concrete

Check operation of concreting equipment and its safety before ordering concrete. Ensure work areas are ready to take the concrete such, cleanliness,

safe scaffold access, waterbars, dowels, expansion joints, box outs are in correct position.

3.1 Check concrete delivery note complies with that ordered. Check additives are correct.

3.2 Verify slump before placing concrete and check time from batching to placing and ensure the right grade of concrete is used in the right location. Check concrete curing / tank is in satisfactory condition.

3.3 Ensure full compaction / vibration of concrete when air-bubbles cease during vibration. Protect the finished concrete from damage by rain with polythene covers and apply curing compound. When placing concrete in stairs, parapets, sills ensure surface finish is smooth and level. Use tremmie pipes / chutes for high column / wall pours to avoid segregation.

3.4 Clean and clear away surplus concrete before it sets and remove latinance at construction / wall / column joints. Clean / wash off grout runs from walls and floors below. Clean skips, tools, equipment after concreting not the next day.

4.0 Formwork

4.1 Ensure formwork is erected in accordance with the method statement / design drawings. Store formwork materials off the ground and protect. Check access and scaffolding in terms of safety.

4.2 Where sole plates are used on the ground ensure they are adequate and are placed on solid compacted fill or binding.

4.3 Ensure support frames / props are undamaged, vertical, tied / braced, correct pins are used and head / base jacks are fully screwed down / up without gaps between frame / timber head / base support. This applied to table forms too.

4.4 Beam formwork to be fully braced and triangular struts used and fixed properly by timber base plates and top of beam plates not relying on nails alone. In deep beams through bolts and straps to be full screwed without gaps.

4.5 Ensure wall forms / columns are plumb, aligned, correct heights, through bolts in the correct positions and fully tightened with no gaps. Wailing timbers adequate and fixed with steel plates / bolts with no gaps between plates and timber. Plywood to be without delamination, with no gaps between panels and floors. Ensure column props are secure and fully engaged / extended / fixed to floor and column forms. Apply mould oil to all surfaces in contact with concrete before fixing reinforcement. Check level markings / nails for correct height of concrete pour. Check cast in services / conduits etc.

4.6 Formwork decks to be uniform and level. Check that cambers are correct and there is no warping or delamination. All gaps should be filled and mould oil applied before reinforcement fixing. Check position / size of all box outs, conduit boxes cast in services / sleeves, check height of decks, folding wedges under and support systems for gaps / spacing / bracing. Ensure stop ends are in the right position / level / secure. During concreting ensure at least one carpenter is below the deck to check for any movement, grout loss, wash off any grout observed and take any corrective action. Replace any deteriorated surfaces / timbers.

4.7 Clean all remaining waste after formwork erection, steel fixing and after concreting works.

4.8 Make good the construction joints on each floor.

4.9 Check installations of tendon straightening anchorage.

5.0 Reinforcement

5.1 Ensure no contamination by oil, mud, concrete, paint etc. Ensure safe access to scaffold for columns and wall elements.

5.2 Check that no reinforcing bar is touching the formwork. As a rule of thumb / generally the gap between bars and forms must be at least the bar diameter and laps / splices with other bars 40 times the diameter. Ensure adequate steel support chairs are in place, generally for small bar diameters spacing should be on a one meter grid staggered. Feet of chairs must be fully coated with plastic. Concrete spacers must be of the same strength as the concrete used or greater. Adequately fix bars with tie wire.

6.0 Blockwork

Ensure that blockwork areas are completed / ready for the block laying and clear / clean.

6.1 Check lintels are available and relevant M&E services in the correct position.

6.2 Check blocks / bricks for damage upon delivery including substandard manufacturing process. Store cement off ground / slabs and prevent damage from water or rain and check regularly. Check lintel brackets are fixed. Are sills required?

6.3 Regularly check workmanship e.g. are blocks being laid according to setting out lines? Check plumbs of walls, is bonding correct? Are joints fully filled? Is reinforcement in the right position? Are built in items? Are services in the correct position?

6.4 Check the expansion joints are in the correct position and formed correctly. Any block wall over 6 meters long requires expansion joints.

6.5 Ensure cavity walls are tied correctly and cavities clean.

6.6 Check if damp-proof courses are required. Is raking out of joints necessary? Is wall reinforcement specified?

7.0 Granite / Marble / Stonework

7.1 Check that materials delivered comply with approved samples.

7.2 Co-ordinate delivery programme and allocate areas for storage so that they do not impede other trades and minimise out of sequence work. Carefully select storage areas to reduce damage by other trades. Store all materials off ground / slabs on timber packers.

7.3 Check correct mix / ratio of bedding material. Ensure no contamination. Read manufacturers instructions on fixing systems / adhesives.

7.4 Carry out spot checks of levels, plumbness, joint sizes. Ensure areas are ready to receive stonework by checking completion of metal work items, are frames in correct position, waterproofing done, penetrations sealed etc.

7.5 Ensure areas are cleaned on a daily basis and correct protection in place. Do not use hardwood / ply for protection due to staining. Protect with polythene and cover with softwood ply.

8.0 Structural Steelwork

8.1 Ensure all welding / cutting is carried out in a safe manner e.g. screens provided, hot work permits observed, fire extinguishers in place, protective personal equipment being used. With arc welding check that the equipment used is safe and certified, also are cables properly connected, out of water and undamaged.

8.2 Check member sizes comply with drawings and surface treatments are properly carried out e.g. has all rust been removed prior to priming? Is the correct primer being used? Are the correct number of coats being applied? Does the work comply with approved samples?

8.3 Check priming, surface coatings are undamaged.

8.4 Ensure grouting is homogenous, fully compacted. Check that the grout being used has been approved and mixed correctly.

8.5 Ask the surveyor to spot check level, plumb and that positioning of openings are correct.

9.0 Metal Work

9.1 Ensure all welding / cutting is carried out in a safe manner e.g. screens provided, hot work permits observed, fire extinguishers in place, protective personal equipment being used. With arc welding check that the equipment used is safe and certified, also are cables properly connected, out of water and undamaged. Check at end of the day that no fires can occur.

9.2 Check member sizes comply with drawings and surface treatments are properly carried out e.g. has all rust been removed prior to priming? Is the correct primer being used? Are the correct numbers of coats being applied? Does the work comply with approved samples?

9.3 Check the work being carried out complies with shop drawings. Are the fixings to structure adequate? Check the grade of steel used complies with that approved. Check dissimilar metals are isolated. Is protection adequate?
9.4 Check openings left out for metalwork items are in correct position and sizes verified before installation commences. Check setting out and levels are provided for all frames, gratings, curtain walling, suspended ceilings, partitions, ducts, grilles, louvers, roller shutters, guard rails. Check heights and spacing of balustrades, ladders, mat wells, windows, canopies, column guards, handrails, access floors, trunking etc.

10.0 Carpentry and Joinery

10.1 Check timber sub-frames, doors, skirtings etc for woodborers, shakes (splits) surface finish, priming, preservative on back and base of frames, bracing, sizes of members and frames etc.

10.2 Check workmanship such as mitres, chamfers, plumb line, and level position relative to surrounding finishes. For structural timbers inspect spacing, adequacy of bearing, trimmers, braces, strutting, nogging, herring bone strutting. Ensure adequacy of fixing especially packers, wedges etc.

10.3 Check type of insulation used complies with specification and manufacturers fixing instructions, protect fibre glass insulation from water / dust contamination.

10.4 Spot check moisture content if flooring / parquet, doors and joinery. Ensure flooring is colour matched, adequately fixed, cramped tight so no gaps exist. Inspect mitres, expansion joints, sanding / cleaning off dust before applying sealing and polishing. Protect after polishing.

10.5 Check access panel positions, sizes, surrounds, hinges, catches, compatibility with surrounding finishes. Check ease of operation of hatches and hardware.

11.0 Hardware and Ironmongery

11.1 Inspect hardware. Check cramps are fixed adequately to frames, walls, metal work. Ensure that metals are compatible or isolated to prevent electrolytic action. Ensure galvanised items are treated with galvanised paint where reworked or damaged.

11.2 Check galvanised windows are positioned correctly, fixed adequately, bonded / primed before fixing. Inspect quality of galvanising and operation of opening sashes. Is ironmongery provided as specified?

11.3 Inspect Ironmongery delivered complies with the schedules and brochures. Check whether the ironmongery is compatible with door thickness and handling of door. Is it fire rated? Check if hinges are as specified and fixing items (screws bolts etc) of correct quantity and compatible with items to be fixed.

11.4 Where master keying, key alike, construction keying or similar system for keying of locks are specified then check operation of same. Ensure all keys are properly identified / tagged and provide keyboards ready for handover.

12.0 Roofing and Roof Plumbing

12.1 Check that areas to be roofed are prepared and ready to receive roofing materials. E.g. Clear debris, prepare access / egress areas and hoisting facilities.

12.2 Check roofing materials delivered comply with approved / specified items. Check correct falls and outlets.

12.3 Check workmanship is acceptable in terms of laps, number of coats / layers, thickness, fixing of expanded metal skirtings, grooves are of correct depth and level, angle fillets of correct dimensions, flashings properly anchored and according to detail, check box gutters are the correct dimensions, overflows of correct numbers and positions. Ensure flashings are dressed and turned correctly into grooves.

12.4 Ensure skylight kerbs are in place and of specified height. Check adequacy of flashings / turn ups / turn overs / turn downs and that expansion joints are in the correct position and fixed adequately.

12.5 Check collars around pipes and dressing into outlets, sumps and kerbs at door openings. Check set out of paving, especially at expansion joints.

12.6 Check down pipes are connected to rain water outlets and ensure no debris enters same.

12.7 Inspect roofing at completion, water test, protect and request the submission of guarantees as specified.

13.0 Plumbing

13.1 Ensure areas are prepared and ready for plumbing especially vertical risers e.g. are walls completed and openings clear / correct size?

13.2 Check the sanitaryware delivered complies with approved samples, quantities and colours. Check that the accessories are correct. Store and protect from damage.

13.3 Ensure fixing of sanitaryware is adequate, fully bedded and correct fixings issued.

13.4 Check piping embedded into walls is isolated properly especially at bends and tested before closing up / concreting.

13.5 Ensure expansion fittings are used at expansion joints and that sleeves are provided and sealed when passing through floors and walls.

13.6 Check gratings are of specified materials, are of correct size and fixed adequately.

13.7 Check lagging is uniform / homogenous / continuous. On completion ensure pipe identification is in place with colour bands, tags, plates, badges or lettering / arrows as specified.

13.8 Check water tanks are completed in time, tested, tiled, access doors / manholes fixed and ladders in place.

13.9 Check fixing of baths, basins, sinks, laundry tubs, W.C. suites, urinals, flushing cisterns, shower bases, flush pipes, hot water units and appliances. Ensure correct flashings and sealants are properly applied.

14.0 Drainage

14.1 Compare the materials used comply with approved samples.

14.2 Ensure trenches are safe with planking / strutting / shoring in place and access / egress is satisfactory.

14.3 Provide barriers at top of excavation at least 1100 mm high to prevent persons falling into the trench.

14.4 Ensure drainage pipes are adequately supported and jointed; witness tests. Check invert levels, positions of manholes.

14.5 Check the encasement to pipes is to specification and that back filling is carried out in specified layers, compacted adequately and that back filling material is acceptable.

14.6 Ensure that gullies and grates are at the correct level and position.

15.0 Plastering

15.1 Check line / level of background materials and rectify prior to plastering / rendering. Ensure access panels, openings are in correct position, framed, aligned, plumb and that embedded items such as conduit boxes, windows, handrail brackets, lintels are in place and level, in line and bonding wires in place together with baths and shower bases.

15.2 Ensure internal / external angles, and the like are plumb in line and spot levels adequately spaced. Ensure surfaces to be plastered / screeded are free from contamination / waterproofed where necessary and that expanded metal / mesh / is correctly fixed / placed / lapped. Check adequacy of spatter dash.

15.3 Regularly check that the works being carried out comply with the approved samples and that the mixing proportions are correct. Where additives (i.e. laticrete) are used insist that the mixing is adequate and the mixing ratios comply with manufacturers instructions. Where bonding agents are used make sure mixing is correct and time limitations strictly observed. In hot weather apply bonding agents to smaller areas so that they can be covered by plastering / rendering before initial set occurs.

15.4 Where dubbing out is carried out do this in layers not exceeding 20mm, use wire / mesh reinforcement as specified and wait at least 24 hours between

coats depending on weather or as specified. Check on expansion joints details. Check surface finish specified e.g. steel trowel, wood float etc.

15.5 The screeding mix must not be too wet. Ensure mesh reinforcement is used in screeds less than 50 mm thick. Allow for expansion joints and adequate laps where specified. Cure screeds as necessary and protect. Check specified surface finish and if falls are required ensure correct falls.

15.6 Where ceilings are plastered, check on bonding characteristics of background materials. Smooth off form surfaces must be bonded with either spatterdash or preferably bonding agent. Do not exceed specified thickness. Ensure lime for lime plaster is fully slaked before use and adequately mixed.

15.7 Where plaster / render surfaces have been standing for a long period make sure the surfaces are cleaned / washed before fixing tiles / finishes / painting.

16.0 Tiling and Paving

16.1 Ensure surfaces to be tiled are free from contamination, dust etc and all openings / fixtures complete including expansion joints, equipotential bonding wires in place, make good around pipes sanitary fixings, railings, bracketry etc.

16.2 Check daily that the materials used and workmanship complies with the approved samples especially workmanship around openings / frames.

16.3 Ensure adequate supply of tiles, adhesive, sand, cement, grout etc. Requisition additional materials well in advance.

16.4 Check that mixing proportions / ratios of adhesives, bedding, grouting is in accordance with manufacturers instructions especially thickness of application and grout joint widths, do not butt tiles together without gaps. Adhesives must be applied with serrated float.

16.5 Work on staircases is especially important. Ensure risers, treads and strings are uniform. Check the correct height, thickness and line of skirtings. Check tile cuts and joints comply with details.

16.6 Check type of tiles / pavings being used against approved samples especially colour, size variation, defects and thickness.

16.7 Check substrata to be tiled / paved is sound, clean, correct level / plumb fall etc. Check "correct" division strips between differing finishes are securely fixed. Check expansion joints are in place and pipe openings are made good. Are kerbs / floor channels completed? Are fittings fixed? i.e. vents, towel rail brackets. Check size and type of mat wells, baths, showers, noising strips etc. Protect all fittings.

16.8 Check tiling before grouting for correct gaps etc. Clean grout off before setting occurs; do not use acid for cleaning. Adequately protect all finishes at completion.

17.0 Glazing

17.1 Check glass size, thickness, type, damage, distortion, colour varience (i.e. rainbow effect). Ensure double glazed units are the correct composition, thickness size and edge seals undamaged.

17.2 Ensure storage areas are undercover, well ventilated between sheets / panels, stored and spaced vertically and protected from contamination / damage.

17.3 Check frameless doors for damage and cutouts, positions, size of openings, thickness, and overall dimensions. Similarly for mirrors but check silvering, edges and colouring. Check protection.

17.4 Ensure domes, skylights are undamaged and in the correct size and height. Check kerbs, flashings and ensure all accessories have been supplied, protected and stored correctly.

17.5 Check silicone, polysulphide and other sealants comply with the specification / details. Ensure backing rods are in place, primed. Check the sealant joint width and alignment.

17.6 Sealant depth should be approximately half that of the width. Check that surface finish is smooth, even and does not encroach on the adjacent surfaces.

17.7 Ensure reflective finishes on solar glass are undamaged during installation and check that protection is provided.

17.8 Check that glass blocks comply with the approved samples for type, size and colour thickness. Check thickness of joints, type, width, spacing, reinforcing strips, securing, mix ratio and pointing finish.

18.0 Painting

18.1 Inspect painting materials for compliance with specification / approved samples.

18.2 Ensure hazardous substances are stored in enclosed well ventilated areas and identified with appropriate warning signs.

18.3 Ensure access scaffold / ladders etc are safe with handrails, toe boards, ladders secured / tied. Ensure personal protective equipment is being used.

18.4 Check preparation of areas to be painted, remove dust, oil contamination, filling, knotting, rubbing down before priming and between coats, check the number of coats. Ensure protection / masking of adjacent finishes has been correctly carried out.

18.5 Ensure ceilings and walls are ready for painting. Check on cleanliness, surface finish, evenness, making good around openings, services, joints between walls, floors, doors, windows etc. Are filled / completed and access scaffold provided?

18.6 Ensure doors are not warped and are fully prepared for paintings e.g. mask all intumescent strips, lippings and hinges. Clean and rub down door edges / lippings. Check that gaps all round doors to frames are uniform, parallel and approximately 3mm wide. The gap between the bottom of the door and floor finish is no more than 10mm. Check number of coats and rub down in between coats. Loosen ironmongery / hardware for ease of painting around same.

18.7 On metalwork items check that rust is cleaned off, primed and ensure that zinc rich primer is used on galvanised surfaces as specified. This applies to windows, grilles, louvers, frames, vents, balustrades, railings, ductwork, pipes, gutters etc. On roller shutters ensure painting is dry before rolling up and interior of guide rails is not contaminated by paint.

18.8 Ensure skirtings, architraves are level, plumb, aligned, mitres tight, joint filled, no gaps between wall / floor / frames, parquet floors cramped tight and all sanded before application of first coat and sand between coats. Protect floors after completion.

19.0 Routine Safety Supervision

19.1 General and minor safety aspects. Check that there are arrangements for access and egress of vehicles which are satisfactory and do not endanger the public or other road users. Check that scaffolding is adequately secured to the building to prevent collapse. Check that the erection of hoarding and / or covered walkways has been erected to secure safety of the public in accordance with the hoarding plan agreed by the Building Authority. Check that there is adequate installation of catch fans, catch platforms and protection screens as necessary to secure safety against falling objects. Install and check safety barrier / rails / ropes on a daily basis.

19.2 Formwork for concrete. Check that formwork for concrete is inspected by a competent person before pouring of concrete.

19.3 Structural erection. Check that suitable anchorage points are provided for the attachment of safety harnesses and lifelines or a safety net is installed where the distance off all exceeds two meters. Check that safety lines are used to prevent any dangerous swing of steel works being raised or lowered by crane.

19.4 Structural support for plant and machinery. Check that fixing and supports for plant and machinery are secure.

19.5 Cranes and hoists. Check that crane fixing and supports are secure.

19.6 Passenger hoists, goods hoists and gondolas. Check that towers, pulleys and supporting frames are securely attached to the building. Check that there is free or uninterrupted passage provided for gondolas before they are moved. Check that floor mounted machinery and pulleys are adequately founded and secured by proper fixings.

19.7 Excavation plant & piling rigs. Check that if operated on ground, state of the ground is fit for use by the plant. Check that if operated on an elevated working platform, the working platform is adequate to support the plant. Check that rigs, masts, excavator jibs and buckets do not risk striking members of the public, road users and overhead power lines.

19.8 Stationary Plant e.g. compressors and concrete batching plants. Check that fixed plant is securely founded and fixed.

19.9 Excavation and lateral support. Check that the approved / agreed method statement is followed. Check that survey points and other geotechnical instrumentation have been installed and are regularly monitored and the results kept on site. Check that positions of sheet piling or other supports does not conflict with services or adjoining foundations. Check that sheet piles or other vertical members are adequately supported prior to and during driving. Check that sufficient layers of horizontal support are provided. Check that pre-loading is in place, where specified. Check that king posts to lateral support systems are provided, if required. Check that raking props are

adequately supported and have sufficient and reliable reaction. Check that there is no over-excavation. Check that as excavation proceeds, depth of sheet piles or similar vertical members are in place to sufficient depth to provide adequate cut off and lateral support below current depth of excavation by reference to original design, installation records and characteristics of subsoil being excavated. Check that there is no instability of temporary cuttings during intermediate stages.

19.10 Falsework for elevated structures. Check that the size and arrangement of falsework is in accordance with the drawings, if any. Check that base plates are adequate. Check that falsework is free of risk of impact by vehicles or site plant.