

Quality Supervision of Building Works

The authorized person (AP), registered structural engineer (RSE), registered geotechnical engineer (RGE) appointed in respect of any building works (including street works) have the duties under the Buildings Ordinance (BO), inter alia, to supervise, whereas the registered contractor (RC) appointed has to provide continuous supervision to, the carrying out of the building works in accordance with the supervision plan. Quality supervision forms part of the supervision plan system to ensure that the building works are carried out in general accordance with the provisions of the BO and its regulations, the plans approved by the Building Authority (BA) and any approval and/or consent conditions imposed.

2. In accordance with the Code of Practice for Site Supervision (the Code), the AP, RSE, RGE and authorized signatory (AS) of the RC shall devise checklists by reference to the typical items, and to include any other particular items considered essential for the project, including those for quality supervision and any other conditions imposed by the BA at approval and/or consent stage, for compliance by their respective streams of technically competent persons (TCPs) of all grades. As regards quality supervision, the Code provides guidance on the items of works to be inspected at different stages of various foundation works, ground investigation field works and soil nailing works; identifies areas as critical stages of the works warranting more frequent supervision; and guides the AP, RSE, RGE and AS to determine certain sections of the works as critical activities.

Items of Works for Quality Supervision

3. For the purpose of refining the extant quality supervision control mechanism, this practice note provides further guidance on the common inspection items for superstructure, excavation and lateral support and site formation works in **Appendix A** for reference. The items contained therein are not exhaustive and AP/RSE/RGE/AS should include other items they consider essential for the building project. For example, under the category of superstructure, other inspection items such as those for the construction of curtain walls, glass walls, prestressed concrete or structural steelworks, etc. relevant to individual project should also be included.

Records of Quality Supervision

4. The AP, RSE, RGE and AS are responsible for the operation of the respective parts of the supervision plans prepared by them and should carry out the necessary site inspections (including personally) to satisfy themselves that the requirements of the supervision plans are fulfilled, and that their respective representatives and TCPs discharge their duties under the supervision plans.

5. In order to facilitate the BA's audit of the AP/RSE/RGE/AS's carrying out of their supervision duties and to provide an overview of the progress of the building works, all the checklists and inspection records should be kept on site and available for inspection by the officers of the Site Monitoring Section or other representatives of the BA. A sample of record of quality supervision and inspections carried out by the respective TCPs is given in **Appendix B** for reference. To suit the needs and practice of individual building projects, the AP/RSE/RGE/AS may devise their record of quality supervision carried out by TCPs under their respective streams.

6. A similar practice note has been issued to RCs.



(HUI Siu-wai)
Building Authority

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**Items of Works at
Various Stages of Superstructure/Excavation and Lateral Support/
Site Formation Works for Quality Supervision**

Items of works at various stages of building works required for quality supervision are given in the tables below for reference. The heads of the project management structure shall communicate with other functional streams to derive checklists of various works, determine appropriate inspection frequencies and critical stages of individual items of works to suit the needs of individual project.

Stages of Superstructure Works (Quality supervision of superstructure works should be provided by the AP/RSE and his TCPs as appropriate, as well as by the AS of the registered general building contractor (RGBC) and his TCPs)						
Item No.	Stage/Item	Description	Stream			
			AP	RSE	RGE	RC
(a) In-situ Reinforced Concrete Works						
QC1	Locations and sizes of essential elements	Check the location, layout and sizes of reinforced concrete elements.		✓		✓
QC2	Verifying quality of steel reinforcing bars	Check material delivery records & batch size; sampling and testing of steel reinforcing bars in accordance with the applicable version of CS2.		✓		✓
QC3	Fixing of steel reinforcing bars	Check the sizes, location and amount of steel reinforcing bars and their fixing details including concrete cover and starter bars details if so required for next stage of concreting work and the workmanship in accordance with PNAP ADV-15.		✓		✓
QC4	Verifying quality of concrete	Check material delivery records; sampling of concrete and compression testing and statistics of concrete test cubes in accordance with the applicable version of CS1. Check particular conditions imposed for high strength concrete including the coring tests.		✓		✓
QC5	Placing, compaction and curing of concrete	Check the quality and workmanship of concrete works.		✓		✓
QC6	Placing, compaction and curing of concrete for transfer structure	In addition to the quality and workmanship as mentioned in Item QC5 above, check that proper sequence of works, temporary work, concreting method and curing method are used.		✓		✓
QC7	Temporary formwork and falsework	Check the stability of the formwork and falsework before concreting and no early stripping of formwork and falsework.		✓★		✓★
QC8	Verifying concrete condition	Check the quality of concrete after stripping of formwork.		✓		✓

QC9	Verifying quality of couplers	Check material delivery records & batch size; sampling and testing of couplers in accordance with conditions imposed & design criteria, site quality control such as tightening record.		✓		✓
QC10	Verifying cast-in embeds or anchors	Check the location, layout and types of the cast-in elements and the required sampling and testing in accordance with conditions imposed.		✓		✓
QC11	Verifying in-situ concrete strength	Check in-situ concrete strength (e.g. by concrete coring test or rebound hammer test).		✓		✓
QCn	Any other items considered essential for quality supervision of the superstructure works		as appropriate			
(b) General Building Works						
QB1	Setting out of basements and G/F	Check critical dimensions including lanes and streets within site, emergency vehicular access, building set back areas, dedicated areas, surrendered areas, storey height, firefighting and rescue staircases, required staircases, smoke vents, etc. Check conformity with general layout.	✓			✓
QB2	Setting out of upper floors and roofs	Check critical dimensions including internal dedicated areas, storey height, projections, balconies, utility platforms, protective barriers, required staircases, refuge floor and/or roof, etc. Check conformity with general layout.	✓			✓
QB3	Interior and fitting out works	Check critical dimensions for internal dedicated areas, exit routes [@] , fireman's lift lobbies, temporary refuge spaces, features subject to exemptions / modifications of gross floor area such as balconies, utility platforms, wider corridors / lobbies, plant rooms, pipe ducts, pipe wells, and residents' recreational facilities, etc. Check materials and construction of fire barriers and installation of proprietary fire resisting products such as FRR of fire doors and smoke seal, etc. Check suitable waterproofing for roofs. Check conformity with general layout.	✓			✓
QB4	Installation of windows	Check minimum areas of glazing and openable areas of prescribed windows and windows for rooms containing soil or waste fitments. Check according to guidelines on design, installation and water tightness test promulgated in PNAP APP-116. Check provisions required under modification / exemption Check conformity with general layout.	✓			✓
QB5	Provision of Barrier Free Access (if applicable)	Check critical dimensions of tactile guide paths, tactile warning strips, car parking spaces, dropped kerbs, service counters, accessible lifts, ramps, landings, bathrooms, corridors, lobbies,	✓			✓

		paths, dead-end manoeuvring spaces, handrail extensions, clear door width and unobstructed area adjacent to the door handle, accessible toilets and urinals, etc. Check conformity with the applicable version of the Design Manual: Barrier Free Access such as provision of tactile and braille map, automatic main entrance doors, braille and tactile information on handrail, signage, etc.				
QBn	Any other items considered essential for quality supervision of the general building works.		as appropriate			

Legend:

- ★ The division of responsibility between RSE and RC for formwork and falsework is detailed in clauses 4.7 to 4.9 of the Code of Practice for Site Supervision 2009
- @ Some examples of critical items to be checked are given for reference. These include : the continuous path of travel from any part of a building to the ultimate place of safety; clear dimensions of staircases including height and width together with dimensions of treads and risers and the general configuration of staircases (e.g. not more than 16 risers); and provision of adequate signage and lighting.

Stages of Excavation and Lateral Support Works (Quality supervision of excavation and lateral support works should be provided by the AP/RSE and his TCPs as appropriate, as well as by the AS of the RGBC and his TCPs. Quality supervision by RGE stream should be provided only when the requirements of qualified supervision on the geotechnical aspects is imposed as a condition of approval.)						
Item No.	Stage	Description	Stream			
			AP	RSE	RGE	RC
QE1	Locations of the temporary retaining planking	Check the location and layout of the temporary retaining planking.	✓*	✓		✓
QE2	Installation of the temporary retaining planking	Check the material and sizes of the planking and the working procedures for installing the planking in position.		✓		✓
QE3	Installation of grout curtain	Check the grout mix, grout pressure and grout volume used on site and the grouting operation is in compliance with the method statement.			✓	✓
QE4	Pumping test or other ground treatment performance testing	Check the testing procedures.			✓	✓
QE5	Erection and removal of struts, lateral support works	Check the method statement and construction sequence for erection and removal of lateral supporting system, i.e. waling and strutting for excavation in stages.	✓*	✓		✓
QE6	Preloading of struts	Check the preloading procedures.		✓		✓
QE7	Excavation works	Check that the excavation is carried out stage by stage and there is no over-excavation, excessive temporary cutting slopes and stockpiling of materials adversely affecting the adjoining ground, structure or building.	✓*	✓	✓	✓
QE8	Backfilling works	Check that the backfilling works are carried out with proper compaction; the work sequence, plants & equipment, materials, final backfilling levels, test, etc. agree with approved plans or accepted proposal.	✓*	✓	✓	✓
QE9	Instrumentation and monitoring works throughout the excavation and lateral support works	Check locations of all monitoring points and see if they are in proper working conditions; readings are properly taken in a timely manner; and Check that there is no excessive ground/building movement, excessive groundwater drawdown and excessive water ingress into the site.	✓*	✓	✓	✓
QEn	Any other items considered essential for quality supervision of the excavation and lateral support works		as appropriate			

Legend :

- * AP and his TCPs are required to ensure that checking and supervision of the works are carried out by the appropriate building professionals (RSE and/or RGE) and RC; and to coordinate for follow up actions on non-conformity of works.

Stages of Site Formation Works							
(Quality supervision of site formation works should be provided by the AP/RSE/RGE and his TCPs, as well as by the AS of the RGBC/registered specialist contractor and his TCPs, as appropriate)							
Item No.	Stage	Description	Stream				
			AP	RSE	RGE	RC	
(a) General Works							
QSF1	Monitoring of ground or building movements or groundwater drawdown	Check locations of all monitoring check points and they are in proper working conditions; readings are correct and taken in a timely manner.	✓*		✓	✓	
QSF2	Site drainage	Check carrying out of the site drainage works.	✓#		✓	✓	
QSF3	Protection of earthworks against heavy rainstorm	Check carrying out of the protection measures.	✓#		✓	✓	
(b) Cut & Filling Works							
QSF4	Setting out of cut / fill profile	Check the location, extent and gradient of cut / fill.	✓#		✓	✓	
QSF5	Excavation works	Check that the excavation is carried out stage by stage and there is no over-excavation, excessive temporary cutting slopes and stockpiling of materials adversely affecting the adjoining ground, structure or building.	✓*		✓	✓	
QSF6	Backfilling works	Check that the backfilling works are carried out with proper compaction; the work sequence, plants & equipment, materials, final backfilling levels, test, etc. agree with approved plans or accepted proposal and in accordance with PNAP APP-15.	✓*		✓	✓	
QSF7	Records of backfilling works	Check that all backfilling works and testing results / records are properly prepared.			✓	✓	
QSFn	Any other items considered essential for quality supervision of the general, and cut & filling works		as appropriate				
(c) Rock Slope and Rock Slope Treatment Works							
QRS1	Setting out of rock slope	Check the location, extent and gradient of rock cut slope.	✓#		✓	✓	
QRS2	Excavation	Check the sequence/method of excavation and the standard of construction in accordance with PNAP APP-17.	✓*		✓	✓	

QRS3	Scaling and trimming of rock slopes	Check that scaling and trimming of rock slopes are carried out in such a manner without affecting the stability and integrity of the slope.			✓	✓
QRS4	Verification of rock slope treatment design	Check that the design assumptions and conditions of joint sets agree with the design and the approved plans.			✓	✓
QRS5	Setting out of rock slope treatment works	Check the location, extent and layout of rock slope treatment works.			✓	✓
QRS6	Verifying quality of rock slope treatment works	Check the material, sampling and testing of rock slope treatment works.			✓	✓
QRSn	Any other items considered essential for quality supervision of the rock slope and rock slope treatment works		as appropriate			
(d) Retaining Wall Works						
QRW1	Location of retaining wall	Check the location, extent and layout of retaining wall.	✓#	✓	✓	✓
QRW2	Excavation	Check that the excavation is carried out stage by stage and there is no over-excavation, excessive temporary cutting slopes and stockpiling of materials adversely affecting the adjoining ground, structure or building.	✓*		✓	✓
QRW3	Inspection of bearing stratum	Check that the quality of ground bearing stratum is in compliance with approved plans, site investigation reports and design assumptions.			✓	✓
QRW4	Fixing of steel reinforcement	Check the sizes and amount of steel reinforcing bars and their fixing details including concrete cover and the workmanship in accordance with PNAP ADV-15.		✓		✓
QRW5	Verifying quality of concrete	Check material delivery records; sampling of concrete and compression testing of concrete test cubes in accordance with the applicable version of CS1. Check particular conditions imposed for high strength concrete including the coring tests.		✓		✓
QRW6	Placing, compaction and curing of concrete	Check the quality and workmanship of concrete works.		✓		✓
QRW7	Verifying quality of drainage and filter material	Check the drainage and filter material and they are in accordance with PNAP APP-54.			✓	✓

QRW8	Waterproofing and insulation works [^]	Check the materials and workmanship.	✓			✓
QRW9	Backfilling works	Check that the backfilling works are carried out with proper compaction; the work sequence, plants & equipment, materials, final backfilling levels, test, etc. agree with approved plans and in accordance with PNAP APP-15 & APP-54.	✓*		✓	✓
QRWn	Any other items considered essential for quality supervision of the retaining wall works		as appropriate			
(e) Reinforced Fill Structure						
QRF1	Setting out of reinforced fill structure	Check the location, extent and layout of reinforced fill structure.	✓#		✓	✓
QRF2	Verifying quality of drainage and filter material	Check the drainage and filter material and they are in accordance with PNAP APP-54.			✓	✓
QRF3	Backfilling works	Check that the backfilling works are carried out with proper compaction; the work sequence, plants & equipment, materials, final backfilling levels, test, etc. agree with approved plans or accepted proposal and in accordance with PNAP APP-15.	✓*		✓	✓
QRF4	Records of backfilling works	Check that all backfilling works and testing results / records are properly prepared.			✓	✓
QRFn	Any other items considered essential for quality supervision of the reinforced fill structure works.		as appropriate			

Legend:

- * AP and his TCPs are required to ensure that checking and supervision of the works are carried out by the appropriate building professionals (RSE and/or RGE) and RC; and to coordinate for follow up actions on non-conformity of works.
- # AP and his TCPs are required to check and satisfy that the works are carried out in compliance with the general layouts shown on the approved plans.
- [^] For retaining walls forming parts of a domestic building as required under regulation 48 of the Building (Planning) Regulations.

(11/2016)

**Record of Quality Supervision Carried Out by
TCP under AP / RSE / RGE/RC* Stream**

BD Ref. BD 3/1234/15

Project ABC Centre

Type of Works Superstructure Works

Name Mr X X Lee

Grade of TCP T3 **Frequency of Inspection** Weekly

Date Item No. ¹	7/1/2015 (Wed)			
	Locations of the works inspected (if applicable)	Inspection Findings		Photos (if any)
	Location / Details	Result ² (S/NS/NA)	Remedial / Remark	
QC1	Zone A of 3/F	S	-	
QC2	Batch no. 24, delivered on 02/01/2015	S	-	
QC3	Zone C of 6/F	NS	Inadequate no. of stirrup found at beam 6B23, 6B34 & 6B56	1-3
QC4	Zone A of 6/F	S		
QC5	Zone A of 6/F	S	-	
QC7	Zone B of 6/F	NS	Insufficient lateral bracings to vertical props	
QC8	-	NA	-	
QC9	Batch no. 7, delivered on 02/01/2015	S	3 nos. of couplers sampled for testing	
QC10	Glass Balustrade at Zone C of 6/F	S	Drill-in anchors selected for testing; tests witnessed	
Signature				

* delete if inappropriate

¹ according to the checklists attached

² "S", "NS" and "NA" denote "Satisfactory", "Not Satisfactory" and "Not Applicable" respectively.