



The Project for Promotion of Nepal National Building Code Compliance for Safer Building Construction (NBCC)

Newsletter Volume-2, February 2023

[Project Introduction]

In Nepal, there are Building Codes and By-Laws. If you build a house in compliance with them, the house will be earthquake-resistant.

When you build a house, you have to submit drawings and other necessary documents to the municipality and get a building permit. The municipality carefully checks whether the drawings comply with the Building Codes and By-Laws or not. Therefore, if you build a house according to the approved drawings, your house meets the Building Codes and By-Laws and is earthquake-resistant house.

However, we can see houses are constructed without following the approved drawings while some building owners build their houses without getting a building permit from the municipality.

Buildings that are not constructed as per the approved design & drawings can get more damaged during an earthquake and may endanger the neighbors' houses.

To improve this situation, Ministry of Urban Development (MoUD) started the NBCC Project with the support of JICA (Organization of the Japanese government). The NBCC Project aims to increase the construction of earthquake-resistant houses by improving the procedure for applying for construction permits to municipalities

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1. Introduction of the Updated BCWP

The building construction practices in Nepal is improving drastically in recent decades. New construction materials, equipment, technologies are being introduced in the construction sector for carrying out the sophisticated construction works smoothly, properly and timely in the case of the bigger and large-scale building construction projects. However, for most of the residential buildings which are comparatively small scale in terms of cost and volume of works, the professional qualified technicians are rarely involved and quality works mostly depends on the unprofessional contractors and semi-skilled masons. Construction methods are not followed, and the new technologies and testing methodologies are rarely used to assure the quality construction.

There is lack of standard working procedures

and guidelines to carry out inspection works as per prevailing building By-Laws and building codes. DUDBC has taken an initiation to develop Building Construction Working Procedures (BCWP) to support municipalities to enforce building regulations. The main purpose of the BCWP is to make uniformity in the building permit process in the municipalities all over the country with introduction of interim inspections of building constructions by municipal engineers.



Use of crane in high rise building

As mentioned in the "Project Introduction" above, the NBCC Project improves the procedure for applying for construction permits to municipalities. This procedure is called Building Construction Working Procedure (BCWP). In BCWP, steps to build a building (from applying for a building permit to the municipality to receiving a certificate of completion) are explained. Municipalities follow the procedures prescribed in the BCWP.

Here we describe the procedures for RC buildings that are applicable in most cases in the city. In the case of masonry buildings, the required documents are slightly different, so please check with the municipality.

Once you decide to build a building, it's time to get started !

- (1) The building owner selects a designer among designers who registered to the municipality where new house is built, sign the contract, and ask the designer to prepare design and drawings. And then, the building owner submit necessary documents (including drawings) to the municipality to apply the building permit. If the design and drawings do not comply to the Building Codes or By-Laws, building permit will not be granted. So please discuss thoroughly with the designer and prepare design and drawings.
- (2) BCWP requires a quality supervision by a qualified "supervision consultant" to ensure that the building is built according to the drawings. In the application form, you should fill in the names of the contractor/mason and supervision consultant. Therefore, you should select a contractor/mason and a supervision consultant before submitting the application form to the municipality.
- (3) For buildings with floor areas larger than 10,000 sq. ft or more than 17 meters in height, the building owner should submit the Work Schedule, Quality Assurance Plan

and Construction Safety Plan together with the application form. For other type of buildings, the building owners should submit at least the test frequency of compressive strength test of concrete.

- (4) The municipality may request for the amendment or resubmission of the application, designs and drawings in case the submitted details do not comply with the building By-Laws or the building codes, or in the case of omission of some relevant details.
- (5) Field Verification and Public Inquiry (Sarjamin) is performed by the ward office. Once the municipality confirms these procedures, the building owner will be notified to pay the building permit fee and to attend the orientation class on NBC and By-Laws.
- (6) After the building owner pays the building permit fee and attends the Orientation Class, the **Temporary Building Permit** will be issued.



Municipal engineers checking the design drawings to make compliance with NBC and By-Laws.

Q: Why should I hire a Supervision Consultant?

A: Quality control is very important when building a house. Contractors/masons may “cut corners” for their profit, but the supervision consultant supervises the construction work from the viewpoint of a third party and performs quality control.

The supervision report to be submitted to the municipality must be prepared by a supervision consultant.

The cost of hiring a supervision consultant varies depend on the contract conditions (such as the frequency and duration of supervision), but at most it is about 1% of the construction cost + material cost.



Site views when the First Interim Inspection should be taken

- (7) After getting the Temporary Building Permit, you can start the construction work!
- (8) During the construction, the supervision consultant is required to check and supervise that the building has been built according to the design drawings. Supervision Reports shall include test reports on compressive strength of concrete casted at site during the building construction. BCWP requires not only the “final inspection”, but also three times of “interim inspection”.
- (9) After the completion of the reinforcement arrangement in the foundation and columns, the building owner should apply for First Interim Inspection (check of foundation, column layouts and rebar arrangement) to the municipality **before casting concrete**. Such application shall include the Supervision Report prepared by the supervision consultant.

- (10) As a result of the inspection by the municipality, if there are any points to be corrected, the building owner should correct them and re-apply for the inspection. When the inspection is successful, the **First Inspection Certificate** will be issued.



Site views when the First Interim Inspection should be taken

Q: Why do I have to take the inspection before casting concrete?

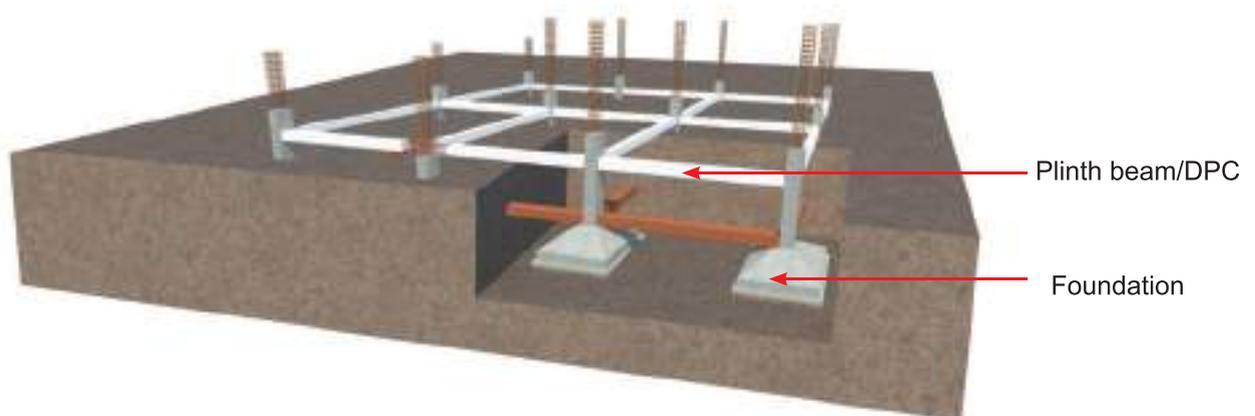
A: After the concrete is casted, the reinforcing bars are hidden by the concrete and cannot be checked. Concrete should not be casted until the rebar inspection is passed by the municipal engineers. If you cast concrete before passing the inspection, you have to demolish the concrete already casted.



- (11) When the First Inspection Certificate is issued, construction works can be continued.
- (12) When the concreting works of the foundations and columns up to the plinth beam/DPC are finished, and the reinforcement arrangement of the plinth beam is finished, the building owner applies for the Second Interim Inspection. Such application shall include the Supervision Report prepared by the supervision consultant.
- (13) As a result of the inspection by the municipality, if there are any points to be corrected, the building owner should correct them and re-apply for the inspection. When the inspection is successful, the **Second Inspection Certificate / Permanent Building Permit** will be issued.



Site views when the Second Interim Inspection should be taken

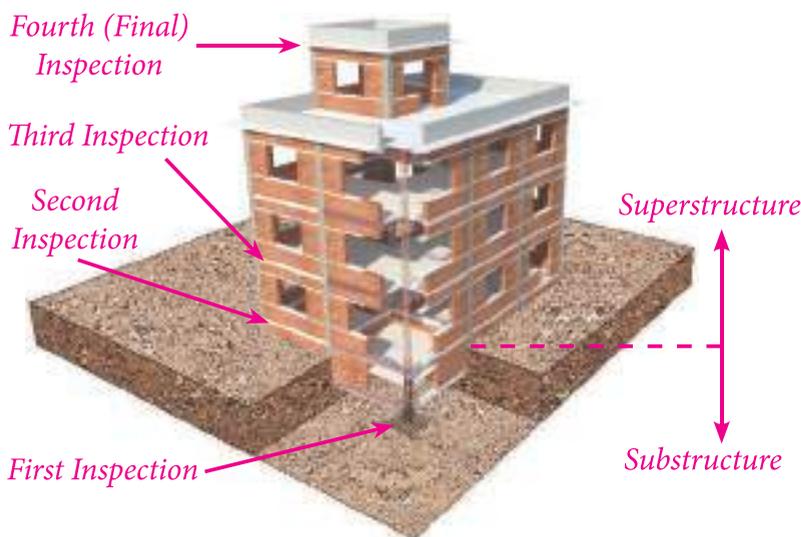


- (14) Now you can continue construction of superstructure (the parts above the ground).
- (15) Before casting concrete of the floor beams and floor slabs for the first floor, apply for a Third Interim Inspection. Such application shall include the Supervision Report prepared by the supervision consultant.
- (16) As a result of the inspection by the municipality, if there are any points to be corrected, the building owner should correct them and re-apply for the inspection. When the inspection is successful, the **Third Inspection Certificate** will be issued.
- (17) Once the Third Interim Inspection is successful, construction work can be continued up to the top floor. After the building construction has substantially completed (it means the building has been painted at least one coat on the inside and outside surface), you need to apply to the final inspection. Such application shall include the Supervision Report prepared by the supervision consultant. If the construction work affected public infrastructure (roads, sewerage, water supply, etc.), it must be repaired by the building owners before the application.
- (18) When constructing a building with more than one floor, the building owner will have

to construct the remaining parts as per approved design and drawings. According to Local Government Operation Act 2074, the municipality may inspect the building at any stage of construction to check that it is being constructed in full compliance with the approved design and drawings. As a result of the inspection by the municipality, if there are any points to be corrected, the building owner should correct them and apply. When the inspection is successful, the **Completion Certificate** will be issued.

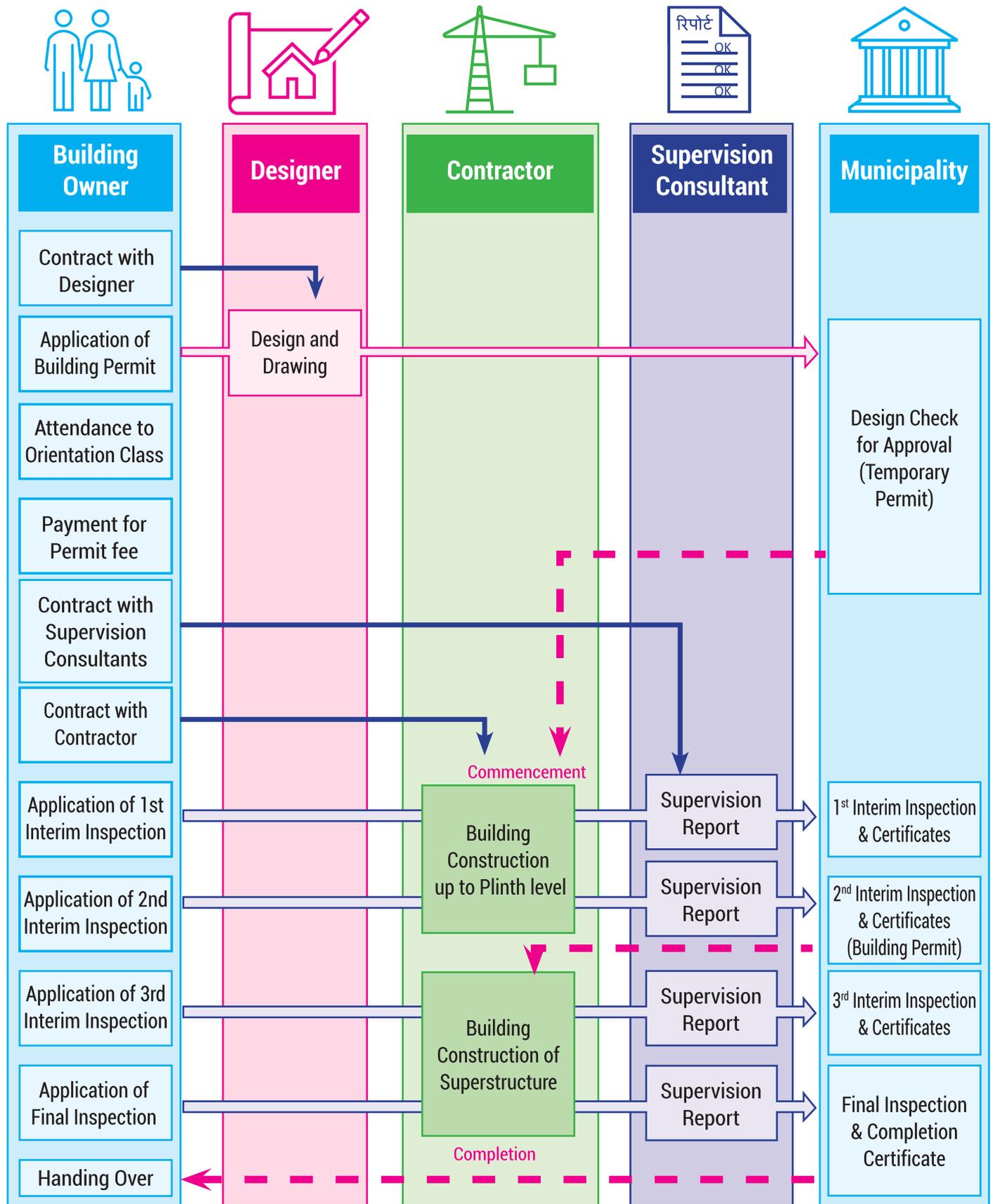


Site view when the Third Interim Inspection should be taken



Site view when the Final Inspection should be taken

Flowchart of Building Construction Working Procedure



Q: What is Concrete Compressive Strength Test? Why should we need to do it?

A: If the mixing ratio of cement, water, sand, and aggregate is not correct, the strength of the concrete will be weakened. If the strength of the concrete is low, the building will easily collapse even if it contains reinforcing bars. Therefore, test pieces should be collected on-site on the day of the concrete casting and stored according to standards. Set a test piece into the testing machine, apply force from above, and measure the compressive force until it breaks. If, as a result of the test, the strength does not meet the standards, it should be mandatorily checked for structural safety before any action is taken and if such buildings are found not to be safe structurally, then either retrofitting or partial/ full demolition of the building shall be done at the cost of the building owner. Therefore, you have to be very careful when mixing concrete.

Things you should to know

[Time period for the construction]

Once the building owner has received permanent building permit, he/she shall complete the construction of the building within a period of two years or as per submitted work plan from the date of issue of the permanent building permit.

According to section 39 of Local Government Operation Act 2074, The building owner can apply the extension of the building permit period by another two years with payment of 5 % of the original building permit fee.

Since the construction period cannot be extended for more than 4 years, the building owner shall apply for a fresh or new building permit.

[Design change]

In case the building owner wants to carry out some changes in the submitted designs, drawings and documents during the approval process, the building owner shall re-submit the revised ones for approval. And after getting approval for building permit, the building owner shall re-submit the revised ones with revision fee as per financial regulations of the municipality.

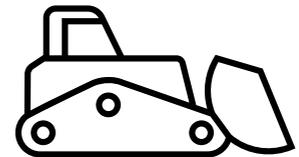
[Addition of storeys]

In the case the building owner wants to add storeys after getting the Completion Certificate or Partial Completion Certificate, the building owner is required to obtain a fresh building permit for the addition of storeys to the existing building.

This process is absolutely important as it is necessary to carefully check whether the building is strong enough even after the floor is added.

[Punishment]

Buildings built without following building codes and By-Laws can not only endanger the lives of your own family members, but also the lives of your neighbors in the event of an earthquake.



If the building is constructed without permissions from the municipality, or if the municipality verified that the building was not built in compliance with the approved drawings, the municipality shall first issue an order to stop construction, and then fine and an order to demolish.

If the building owner does not obey the demolition order, the municipality shall demolish the building on behalf of the building owner, but the building owner is responsible for the costs.

2. Recent Project Events

2-1. Training on Master Training of Trainers (MTOT) was held.

The NBCC project has plans to provide trainings to the engineers/architects about the BCWP to enhance the technical capacity & to develop the knowledge regarding provision of Nepal National Building Codes. The project has plan to provide Master TOT to 100 participants and then they will give trainings to other 2000-3000 participants. MTOT was started from 28th of November 2022. Three events of MTOT were conducted till date and 71 participants were trained and one more MTOT is planned to conduct very soon.



3. Introduction of the Project Member

3-1. Mr. Manoj Nakarmi (Section Chief, Building Code Section, DUDBC)

He is a Senior Divisional Engineer in the building code section of department of urban development and building construction and also working as a project manager in NBCC project.



Follow the Nepal National Building Code (NBC) and Built the safer building construction.



No earthquake, no study. Earthquakes have been creating strong buildings and strong people.

3-2. Ms. Yoko Shiraishi (Japanese Expert)

She is an engineer. She contributed to the drafting of guidelines and other documents associated with the BCWP.

3-3. Mr. Seiichi Horikoshi (Japanese Expert)

He is an engineer. He contributed to the drafting of guidelines and other documents associated with the BCWP.



Make the decisions that you know will lead to bigger and better things



BCWP is the key to safer building construction

3-4. Mr. Milan Karki (Project staff)

He is a structural engineer and responsible for building structure and design checking.

3-5. Mr. Suvash Chandra Gautam (Project staff)

He is a computer engineer and responsible for system development and implementation of e-BPS system.



The Objective of E-Bps is to implement Building Code & Byelaws

Please visit the DUDBC Website and Facebook

<http://dudbc.gov.np/nepal-building-code-compliance>
<https://www.facebook.com/dudbchub>



Website



Facebook



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