1.4.2. Receiving application for Construction permit and examination of application documents

When Authorized Officer (AO) received an application for construction permit, he must examine whether all the necessary documents are attached using the following checklist below. If not, he shall ask the applicant to submit all the remaining documents,
After receiving the application from Authorized Officer (AO), Building Inspector (BI) visits the proposed site and make field visit report and check the application documents. BI and Chief Building Inspector (CBI) review the land related documents. If he finds all are ok, then he forwards it to Assistant Authorized Officer (AAO). Then AAO again checks these documents with the planning permit certificate and the consistency of these with all other Non Objection Certificates (NOCs). The Authorized Officer and Assistant Authorized Officer check the architectural drawing with respect to Dhaka Metropolitan building (construction, development, preservation and demolition) rules 2008, planning permit. The followings are the issues generally reviewed:

a. Size, Shape, adjacent roads, road's width and area of the proposed plot (there must be consistency in between draft survey map, BI's site visit map, approved layout plan for planned housing area and the submitted proposed layout plan).

b. FAR (Floor area ratio) value, MGC (Maximum ground coverage), GC (ground coverage), each floor area, overall FAR calculation.

c. Beside FAR calculation the following parameters are also checked (Layout plan, ground floor plan, floor plan, roof floor plan. The proposed basement floor in the view of BC rules 2008, planning permit and BNBC 2020).

d. Setback, entry size, driveway, ramp, car parking, number of parking, guard room, electromechanical room, driver's toilet at ground floor, stair width, lift lobby, lift size, landing, lobby size, smoke free wall and door, number of units, Room kitchen toilet size, door opening direction, window size, balcony, sun shade, fire protective special equipment (fire rated shutter, door, fire pump, hydrants etc.), scaling, car lift/ elevator are also checked.

For DCQR, confirm all the documents were submitted (e.g., using the table below)

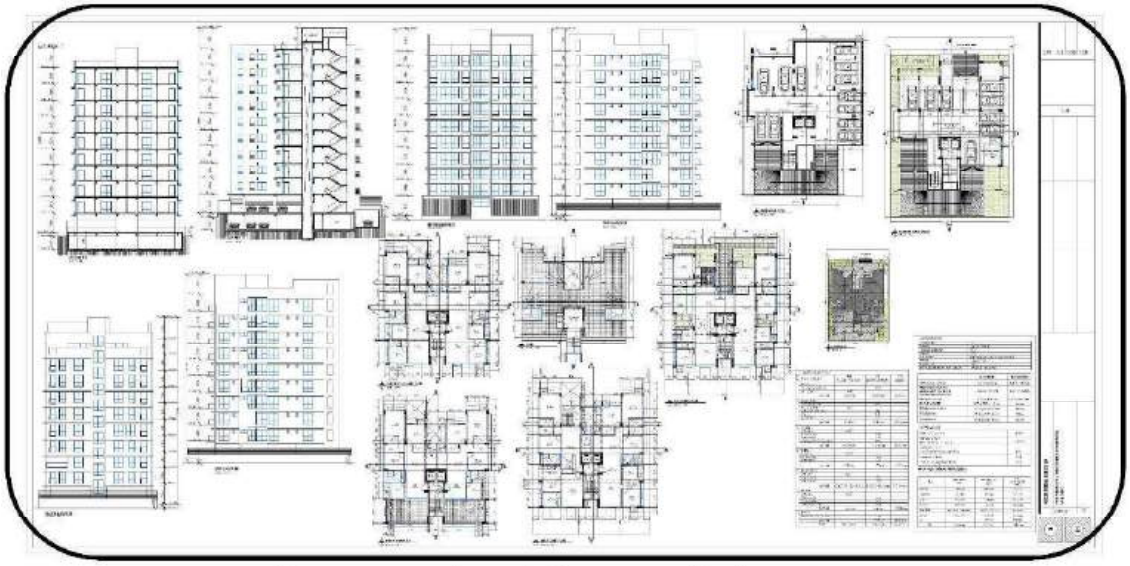
Check sheet for submitted documents (If documents are available, mark as ☑)

Type of Document	If available, mark as ☑	Details			
★Approval sheet	☐	Building specification	Floor Plan	Elevation Plan	Sectional plan
		☐	☐	☐	☐
●Design report	☐	Declaration of Responsibility and compliance	Structural Calculation sheet	Out put	-
		☐	☐	☐	-
●Soil report	☐	Site class	Ave. shear wave vel	Ave. SPT	Ave. undrained shear strength
		☐	☐	☐	☐
★ Architectural drawing	☐	Floor plan	Elevation	Cross-section of building	-
		☐	☐	☐	-
● Structural drawing	☐	specifications	Lay-out plan	Cross-section list of members [Column,beam, wall slab]	Detailed bar arrangement (beam column joint)
		☐	☐	☐	☐
▲ Mechanical drawing	☐	Fire			
		☐			
▲ Electrical drawing	☐	Fire			
		☐			
▲ Plumbing drawing	☐	Fire			
		☐			

★ : Documents required for both Structure and Fire safety

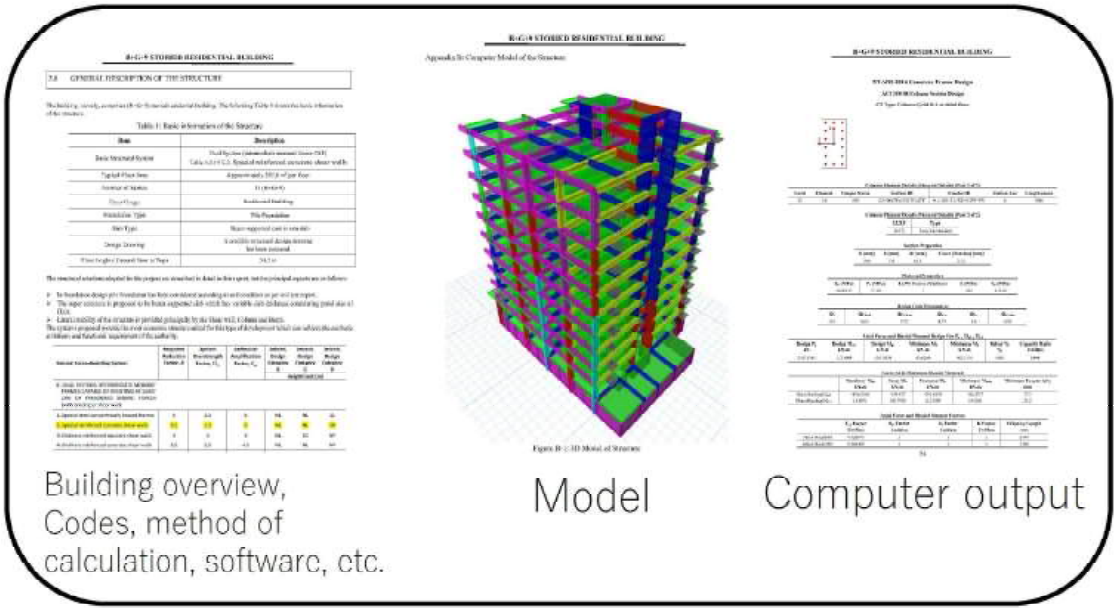
● : Documents required for Structure safety

▲ : Documents required for Fire safety



An example of Approval sheet

(Building specification, Floor plan, Elevation Plan, Sectional plan)



Building overview, Codes, method of calculation, softwarc, etc.

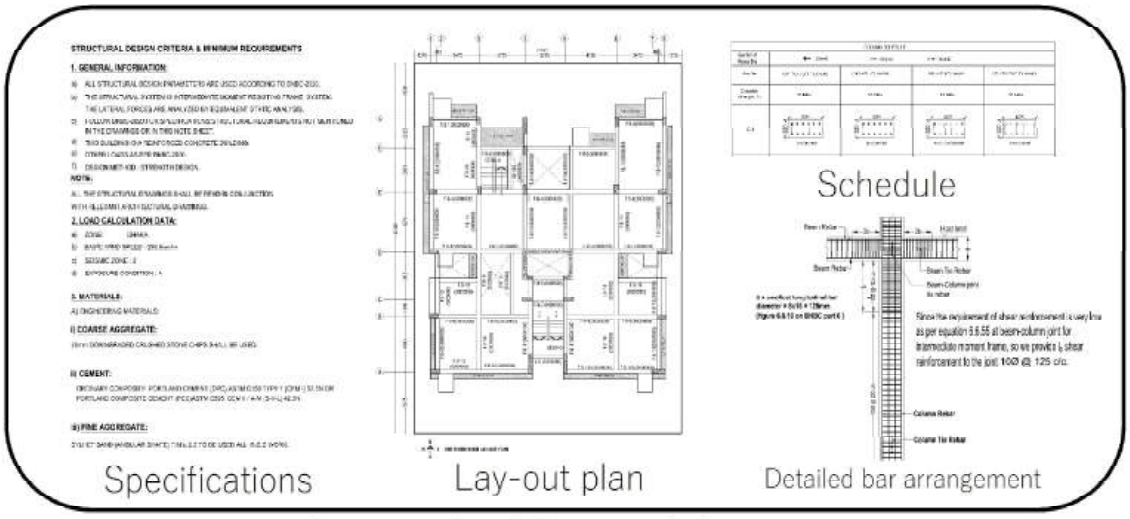
Model

Computer output

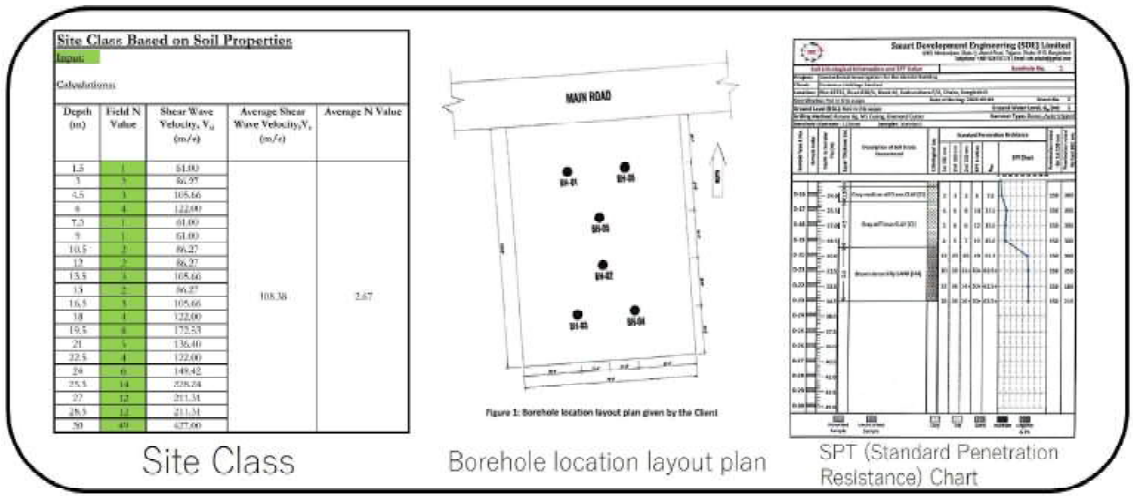
An example of Design report

(Declaration of responsibility and compliance, Structural Calculation sheet, etc.)

An example of Architectural drawing



An example of Structural drawing

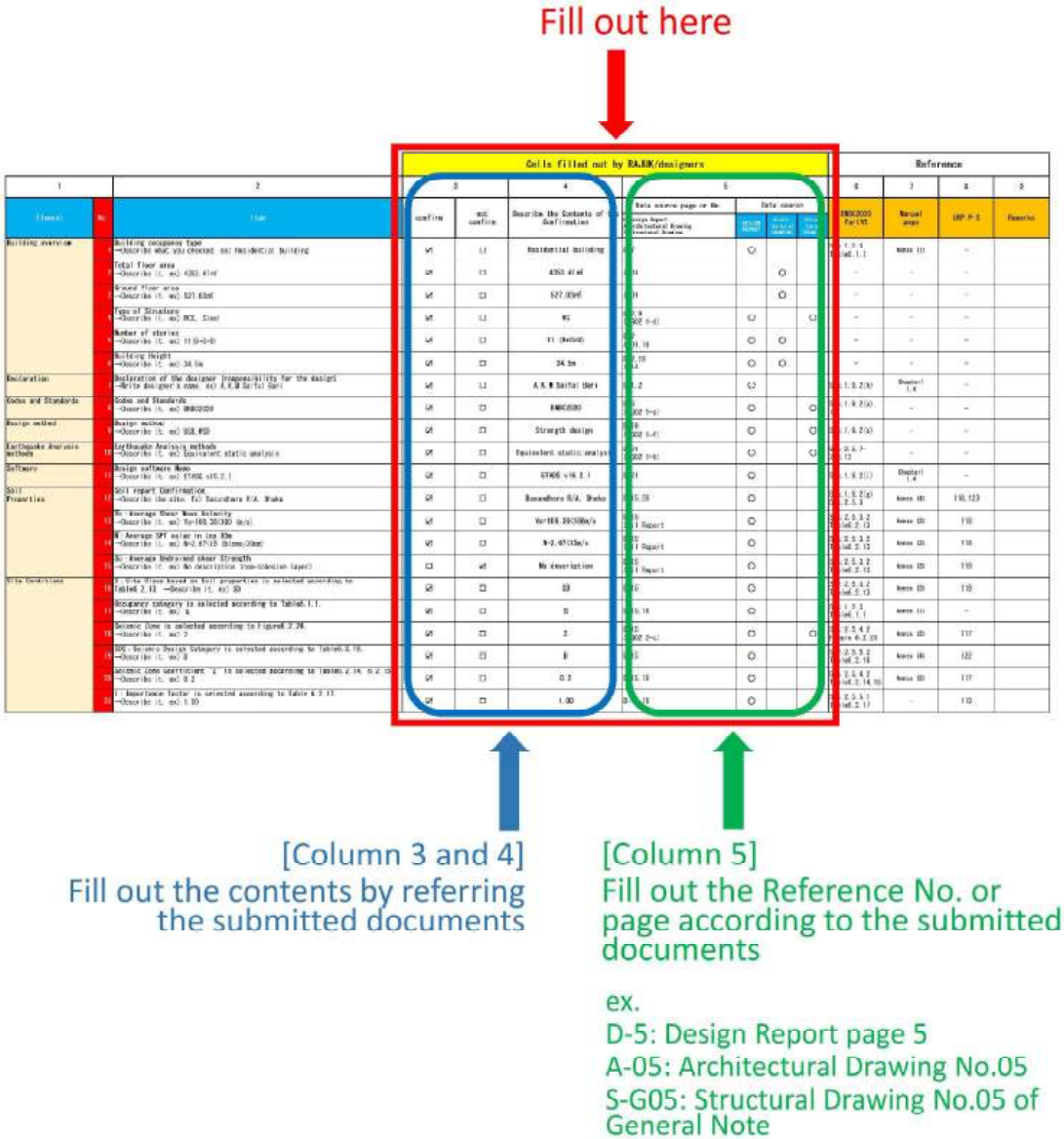


An example of Subsoil investigation report

(Site class, Average of shear wave velocity, etc.)

1.4.3. Preparation of Checklist for design review by filling necessary cells in the Checklist

Preferably , structural design reviewers examine all the design documents. However, due to the limited time available, only the main items of the design documents are subject to review. Therefore, structural design review is carried out only for the items indicated in the checklist. （The design engineers is responsible on all the design） The structural design checklist is/will be filled by RAJUK officers (=reviewers). However, in order to improve efficiency, it might be better if some of the items in checklist are filled in by the structural design engineers.



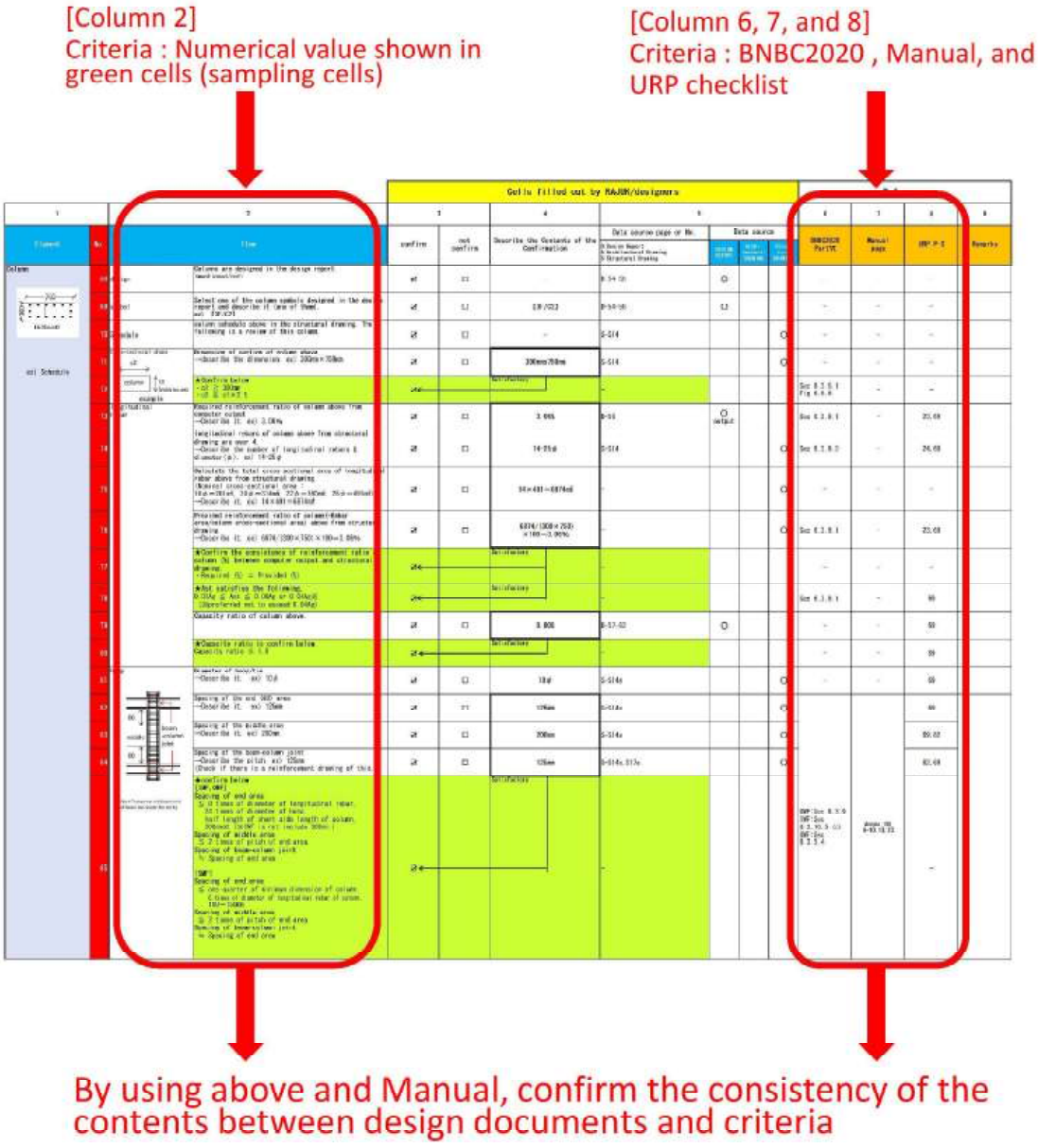
1.4.4. Design Review using the Checklist

The checklist includes the criteria, BNBC reference chapter, Manual page and URP list to help reviewers for expediting the review process.

All the items are categorized into two groups (Level 1 and Level 2) below by RAJUK for practical use of the Checklist.

Level 1: mandatory items (100 items) --- ex. checked by inspector

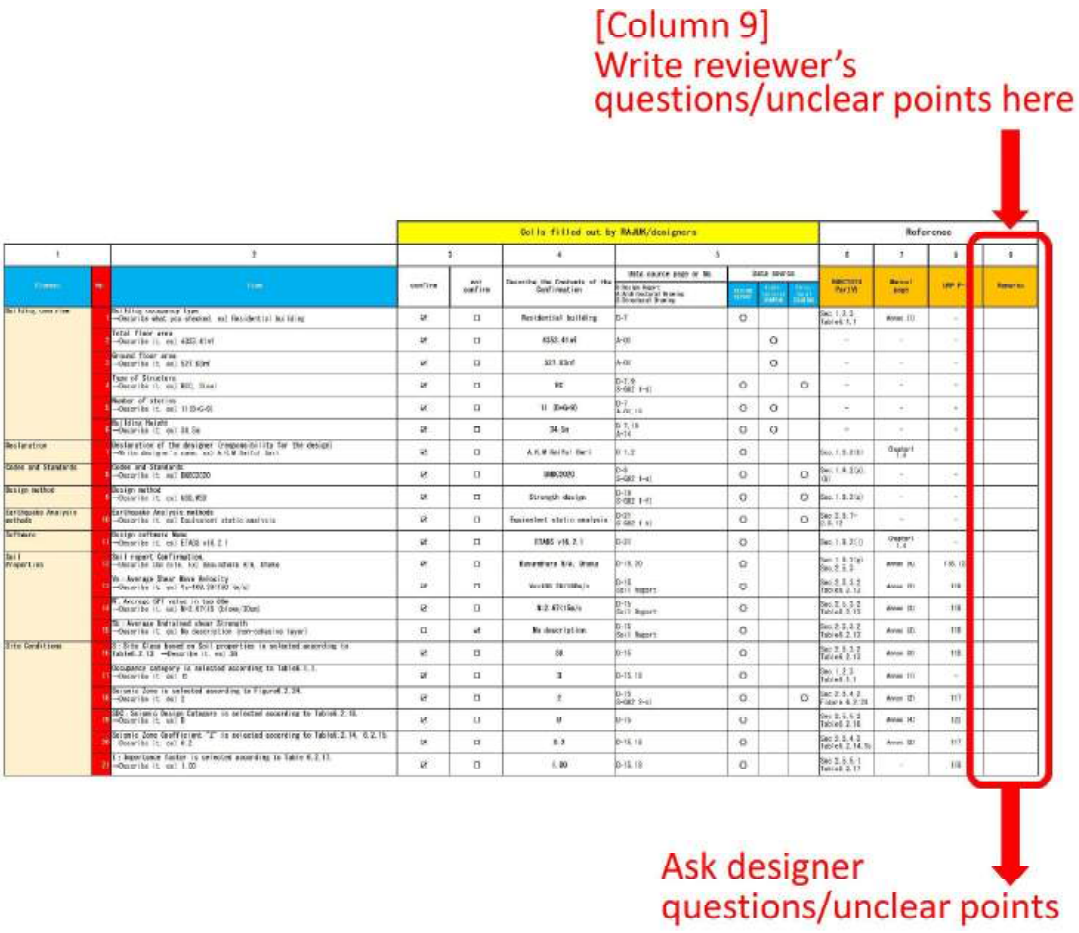
Level 2: sampling items (25 items) --- ex. checked by assistant authorized officer or authorized officer



1.4.5. Inquiry on incompliant/unclear/skeptical issues to the applicants

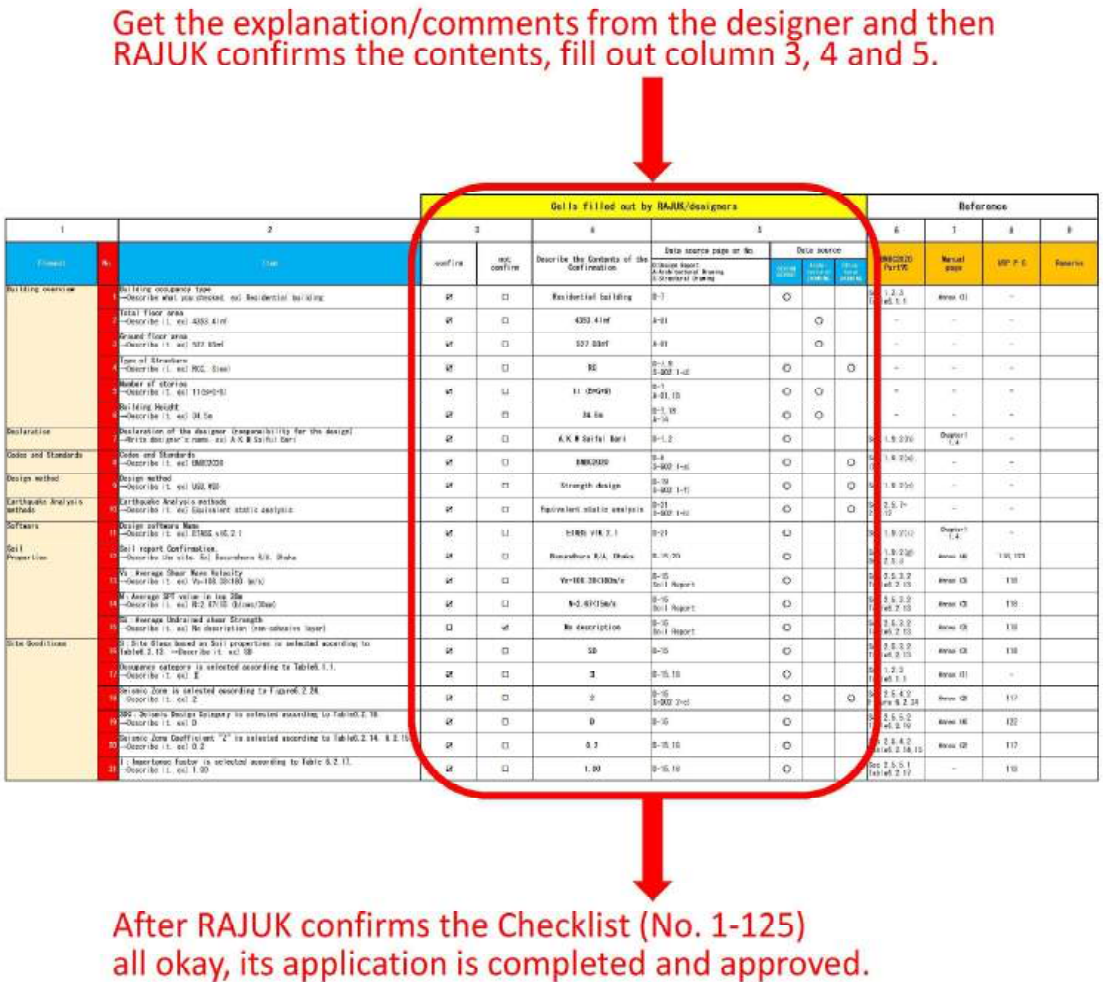
The reviewer, RAJUK, verifies the checklist whether there are any errors in the contents. If there is any discrepancy between the contents of the checklist and the design documents or related standards, the reviewer shall require the engineer to make correction or clarification to such discrepancies.

How to contact the designer (ECP2 system or email)? What kind of format should be used?



1.4.6. Reviewing answers on inquiry from the applicants

Once all the discrepancies are corrected or clarified to be appropriate by the designer and checklist and design documents are found to be consistent, the structural design review is considered to have passed. The reviewer must take full responsibility if he/she makes design review passed with deficiencies or errors on the items in the checklist.



[Summary of 1.4.3 to 1.4.6]

RAJUK reviews design documents based on the Checklist. If there are unclear points, RAJUK makes inquiries to the designer directly. After RAJUK confirms the items of Checklist (No.1-125) all OK, its application is completed and approved.

***RAJUK only takes responsibilities for No.1-125. The rest would be under the responsibility of designers.**

1.4.7. Approval by Building Construction Committee (BCC)

As per the provision laid out in section 3(2) of the Building Construction Act-1952 the government may constitute a committee by a notification to exercise the power of an Authorized Officer in such area as may be specified in the notification. As per this provision the building construction committee is formed to examine and scrutinize Construction Permit applications.

Formation of BC Committee in RAJUK

	No. Of Committee	**Committee members**	**Quorum No.**
BC Committee up to 07(seven) story buildings	24	1. Zonal Director (Committee Chairman) 2. Civil Engineer 3. Architect 4. Town Planner 5. Authorized Officer of concerned sub-zone (Committee Member-Secretary)	03
BC Committee 08(Eight) story and above buildings	02	1. Member (Planning/Development Control) (Committee Chairman) 2. Director (Development Control-1/Development Control-2) 3. Civil Engineer 4. Architect 5. Town Planner 6. Representative of Concerned City Corporation 7. Authorized Officer of concerned sub-zone(Committee Member-Secretary)	04

The General Terms of References and Work Procedure of BC Committee

1. Committee has to organize a meeting at least one per month.
2. The term of committee shall be a period of 03(three) years commencing on the day of notification.
3. The quorum for a 01(One) to 07(Seven) storied buildings BC committee meeting is 03(Three) and for 08(Eight) storied and above buildings BC committee meeting is 04(Four).
4. Committee has to submit a report about quality and transparency of its work to concerned meeting in ministry in every 06(six) months.
5. All committee decisions have to be anonymous.

Disposal of Application

Subject to the submission of correct and completed application for the construction permit and after preliminary assessment of the application by Building Inspector, Chief Building Inspector and Assistant Authorized Officer an application has been brought forward to a Building Construction Committee. The committee members check the file and put their comments and vote. An application may approve if all participatory members put positive vote, otherwise the application may reject or send back to applicant for correction.

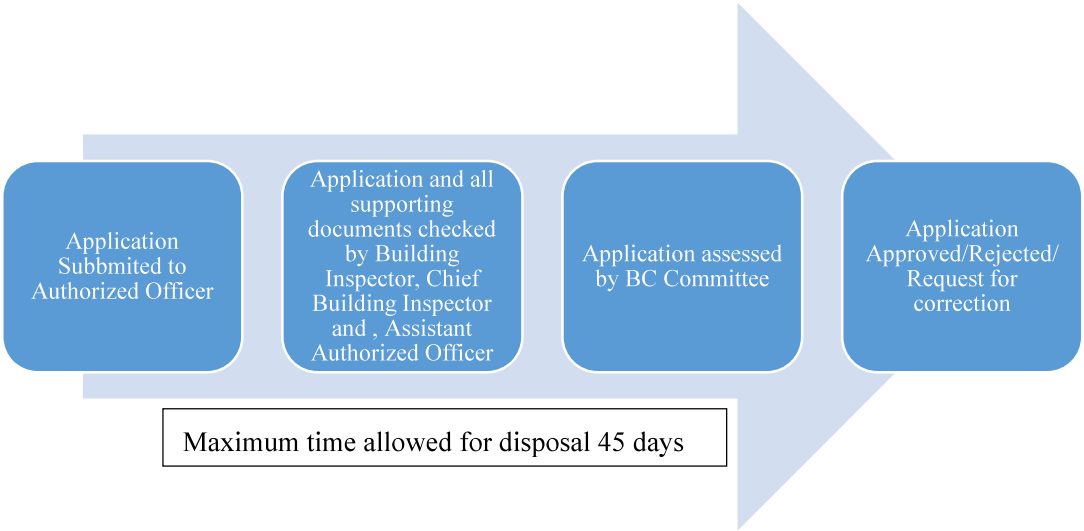


Figure: A simple process map of construction permit application disposal system in RAJUK

1.4.8. Issuance of Construction Permit

When a construction permit application is placed in Building construction committee and all the committee members find it ok then they vote yes for approval. After everyone's voting The Authorized Officer himself sign the architectural drawing electronically using dongle and send it to others for singing. Later when everyone's signature is completed then the Authorized Officer issues a construction permit approval letter in Electronic construction permit system (ECPS) and send it to applicant via ECPS. The applicant is notified with system generated sms/email that the construction permit application is approved. Then the applicant can download both the construction permit approval letter and approved architectural drawings from ECPS.

Chapter 2. Technical documents

2.1. Overview of the relevant laws, rules, and code

The lists of related law, rules and Code:

i. The building construction Act'1952

ii. The Town Improvement Act'1953

iii. Dhaka Metropolitan building (construction, development, preservation and demolition) rules 2008

iv. Bangladesh National Building Code'2020

<Reference>

Summary of Part 6 of BNBC 2020 (table of contents).

Part 6: Structural Design

Chapter 1: Definitions and General Requirements
Chapter 2: Loads on Buildings and Structures
Chapter 3: Soils and Foundations
Chapter 4: Bamboo
Chapter 5: Concrete Material
Chapter 6: Strength Design of Reinforced Concrete Structures
Chapter 7: Masonry Structures
Chapter 8: Detailing of Reinforced Concrete Structures
Chapter 9: Prestressed Concrete Structures
Chapter 10: Steel Structures
Chapter 11: Timber
Chapter 12: Ferrocement Structures
Chapter 13: Steel-concrete Composite Structural Members

2.2. Critical aspects of buildings in Bangladesh

The older reinforced concrete buildings (hereinafter RC buildings) in Bangladesh have some problems like below. In the newly RC buildings, design and construction should be carried out in a way that eliminates these problems.

- the use of plain bars instead of deformed bars
- straight anchorage of beam longitudinal bars in the beam-column joints
- high axial load on the columns
- very low strength of concrete (ex. less than 10N/mm^2)
- insufficient lap-length of rebars
- poor hooking in ties and stirrups, etc.

Figure 2.2.1 shows the vulnerable spot of RC buildings in Bangladesh.

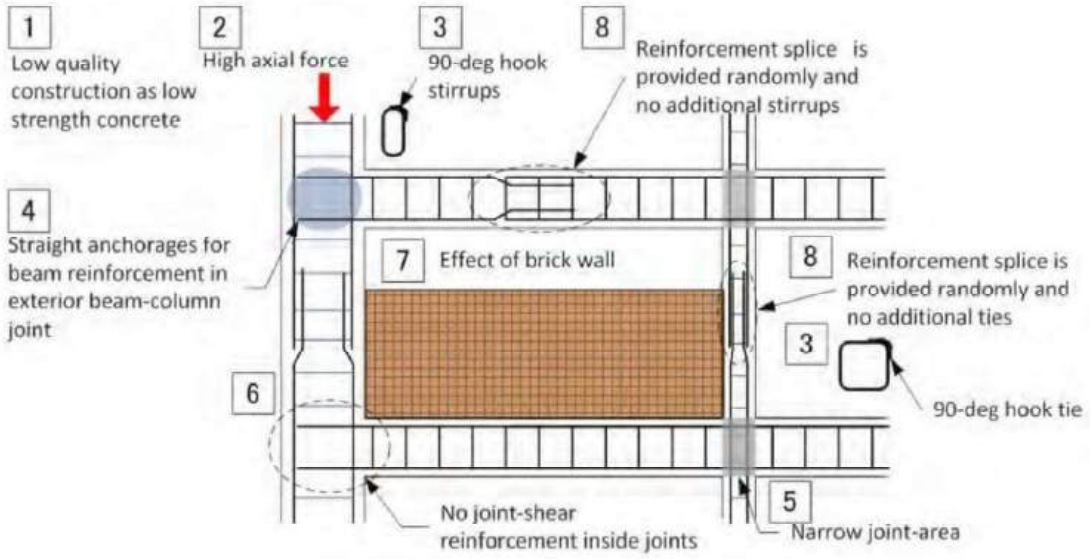


Figure 2.2.1 vulnerable spot of RC buildings in Bangladesh
(source: CNCRP report)

Rana Plaza Collapse in 2013

Source: JAEE NEWSLETTER, December 2019 Vol.8, Number3

■2023 Turkey-Syria Earthquake

Source: Journal of Architecture and Building Science, August 2023

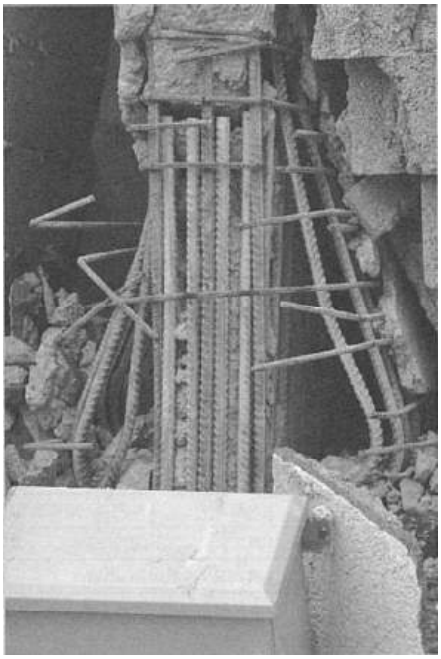


Photo 1

Lap joints on column leg (Example of overcrowded reinforcement that does not secure adhesion.)

Photo 2

Pancake collapse building

2.3. Overview of structural design procedures and design review procedures for earthquake resistant design

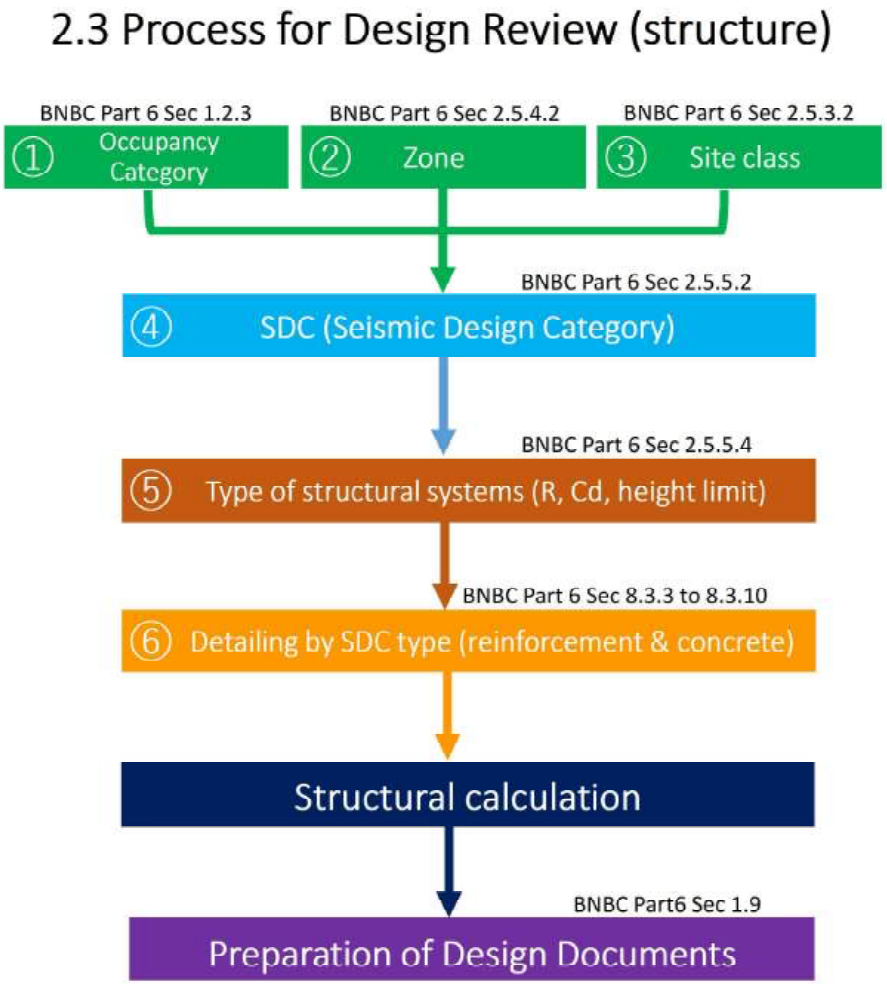
2.3.1 Overview of structural design procedures and design review procedures

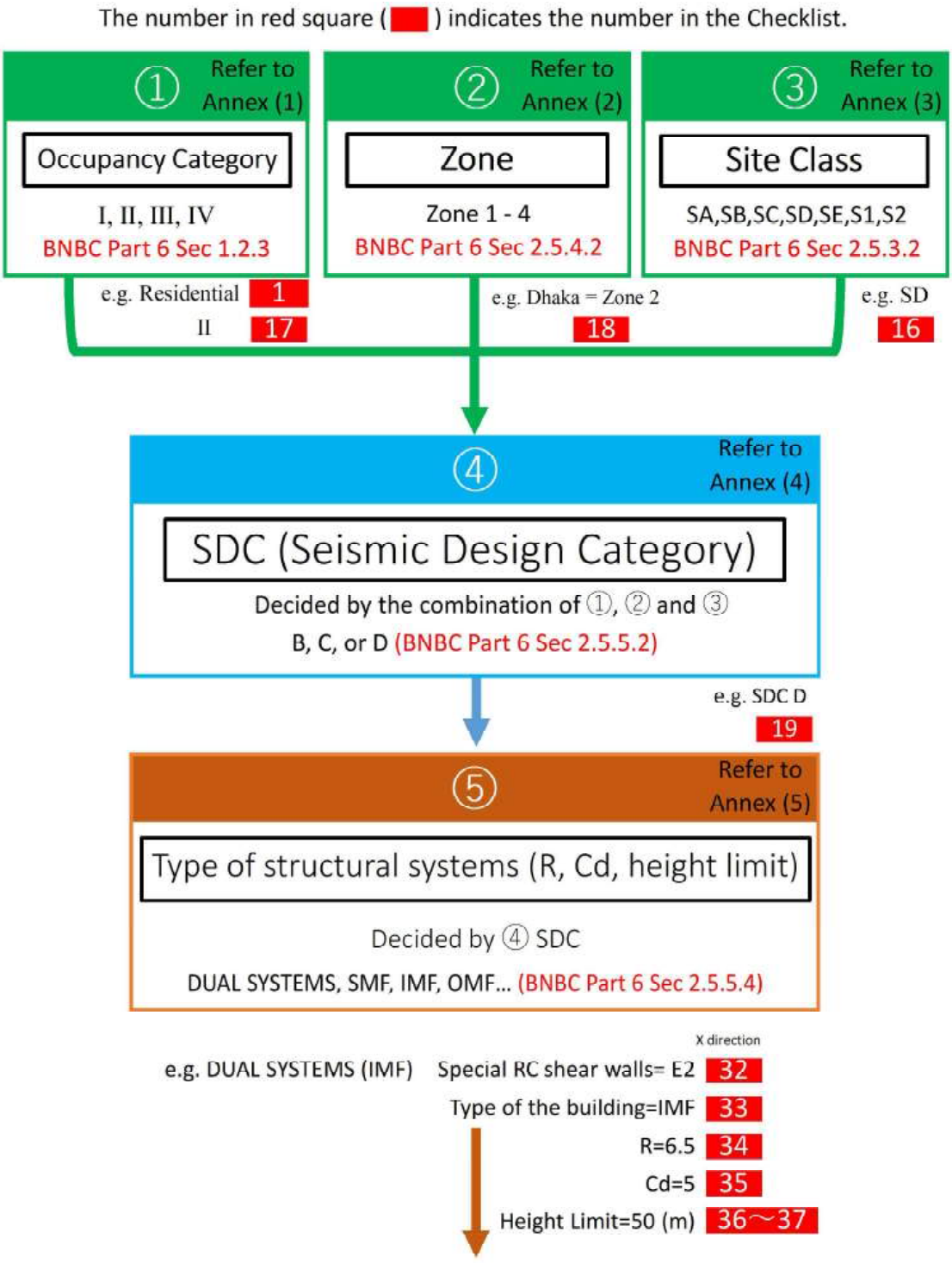
Following is a flow chart for structural design review. More details are shown on the next page together with the Checklist Items No. [1-125] related to each item.

To start the structural design, buildings are first classified in **(1) Occupancy Category**, **(2) Zone**, and **(3) Site Class**. Next, they are assigned to appropriate **(4) Seismic Design Category (SDC B, C or D)** and **(5) Structural type (with height limit)**. Finally, **(6) Detailing (reinforcement and concrete) by SDC** shall be considered as follows:

SDC D → follow SMF provisions in addition to OMF and IMF provisions	*higher SDC	the most stringent seismic design detailing
SDC C → follow IMF provisions in addition to OMF provisions	-	-
SDC B → follow OMF provisions	*lower SDC	the least stringent seismic design detailing

*Structures in lower SDCs are permitted to design with detailing provisions of higher SDCs (Part6 Sec 8.3.2 (e))




The number in red square ( ) indicates the number in the Checklist.
① Refer to Annex (1)
Occupancy Category
I, II, III, IV
BNBC Part 6 Sec 1.2.3
② Refer to Annex (2)
Zone
Zone 1 - 4
BNBC Part 6 Sec 2.5.4.2
③ Refer to Annex (3)
Site Class
SA,SB,SC,SD,SE,S1,S2
BNBC Part 6 Sec 2.5.3.2
e.g. Residential 1
II 17
e.g. Dhaka = Zone 2
18
e.g. SD
16
④ Refer to Annex (4)
SDC (Seismic Design Category)
Decided by the combination of ①, ② and ③
B, C, or D (BNBC Part 6 Sec 2.5.5.2)
e.g. SDC D
19
⑤ Refer to Annex (5)
Type of structural systems (R, Cd, height limit)
Decided by ④ SDC
DUAL SYSTEMS, SMF, IMF, OMF... (BNBC Part 6 Sec 2.5.5.4)
X direction
e.g. DUAL SYSTEMS (IMF)
Special RC shear walls= E2 32
Type of the building=IMF 33
R=6.5 34
Cd=5 35
Height Limit=50 (m) 36～37

The number in red square ( ) indicates the number in the Checklist.

⑥ Refer to Annex (6)

Detailing (reinforcement and concrete) by SDC

SDC D : BNBC Part 6 Sec 8.3.3 to 8.3.8 (special seismic detailing) SMF

SDC C : BNBC Part 6 Sec 8.3.10 (intermediate seismic detailing) IMF

SDC B : BNBC Part 6 Sec 8.3.9 (ordinary seismic detailing) OMF

e.g. Strength of concrete	52～61
Strength of steel	62～65
Lap splice for column	66
Lap splice for beam	67
Reinforcement of column (hoop/tie spacing of the end area, middle area, and beam-column joint)	81～85
Reinforcement of beam (development length and extension of longitudinal rebar. Stirrup spacing of the end area and middle area)	95～102

The number in red square ( ) indicates the number in the Checklist.

Structural Calculation

Design policy and calculation method

Design: determined by structural type, codes & standards, modeling, etc.

Calculation method: ASD/WSD, USD

Software: ETABS, etc.

e.g. Floor area [Total floor area, ground floor]	2～3
Structure [RC]	4
Number of stories	5
Height	6
Declaration of the designer	7
Codes and Standards [BNBC2020]	8
Applied calculation method [Strength Design]	9
Analysis method [Equivalent static analysis]	10
Design software [ETABS]	11

The number in red square ( ) indicates the number in the Checklist.

Structural Calculation

Load calculation and designing detailing/reinforcement

Software input: setting loads, designing shape and cross-sectional member & reinforcement by following BNBC 2020 and specification.

e.g. Zone factor [Z=0.2]	20
Importance factor [Ie=1]	21
Dead load	22
Live load	23
Seismic load	24
Wind load	29～31
Building period [T]	25
Normalized acceleration response spectrum [Cs]	26
Design spectral acceleration [Sa]	27
Seismic design base shear force [V]	28
Building irregurarities	
-Vertical	38
-Horizontal	39～43

The number in red square (■) indicates the number in the Checklist.

Preparation of Design Documents

Preparation of RAJUK Sheet and Design Documents

Designers shall prepare RAJUK sheet, design report, specifications (including concrete pouring), a set of drawings (architecture, structure and EMP) as well as calculation sheet.

After obtaining LUC (Land Use Clearance), owners submit all the above documents to RAJUK for application.

BNBC Part 6 Sec 1.9

e.g. Soil report	12
$\overline{Vs}$	13
$\overline{N}$	14
$\overline{Su}$	15
Concrete pouring	44～47
Curing	48～49
Cover	50
Concrete classification	51
Column	68～80
Beam	86～94
Shear Wall	103～114
Slab	115～119
Foundation	120～125

2.3.2 Structural design checklist

■Design Check List (No.1～125) No.32 20240829

100 items are mandatory (white cells).
25 items are sampling (green cells ★ marked).

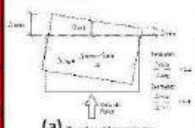
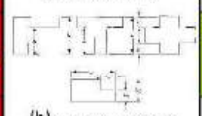
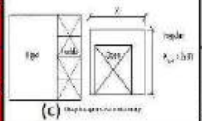
Building Name	
Site Location	
Engineer	Na
RAJUK	Na
	Na
	Na
	Na

1		2	3		
Element	No.	Item	confirm	not confirm	Des
Building overview	1	Building occupancy type →Describe what you checked. ex) Residential building	☑	☐	
	2	Total floor area →Describe it. ex) 4353.41㎡	☑	☐	
	3	Ground floor area →Describe it. ex) 527.03㎡	☑	☐	
	4	Type of Structure →Describe it. ex) RCC. Steel	☑	☐	
	5	Number of stories →Describe it. ex) 10 stories and 1 base	☑	☐	
	6	Building Height →Describe it. ex) 34.5m	☑	☐	
Declaration	7	Declaration of the designer (responsibility for the design) →Write designer's name. ex) A.K.M Saiful Bari	☑	☐	
Codes and Standards	8	Codes and Standards →Describe it. ex) BNBC2020	☑	☐	
Design method	9	Design method ·Describe it. ex) USD,WSD	☑	☐	
Earthquake Analysis methods	10	Earthquake Analysis methods →Describe it. ex) Equivalent static analysis	☑	☐	Ec
Software	11	Design software Name →Describe it. ex) ETABS v16.2.1	☑	☐	
Soil Properties	12	Soil report Confirmation. →Describe the site. Ex) Basundhara R/A, Dhaka	☑	☐	
	13	Vs : Average Shear Wave Velocity →Describe it. ex) Vs=108.38<180 (m/s)	☑	☐	
	14	N : Average SPT value in top 30m →Describe it. ex) N=2.67<15 (blows/30cm)	☑	☐	
	15	Su : Average Undrained shear Strength →Describe it. ex) No description (non-cohesive layer)	☐	☑	
Site Conditions	16	S : Site Class based on Soil properties is selected according to Table6.2.13. →Describe it. ex) SD	☑	☐	
	17	Occupancy category is selected according to Table6.1.1. →Describe it. ex) II	☑	☐	
	18	Seismic Zone is selected according to Figure6.2.24. →Describe it. ex) 2	☑	☐	
	19	SDC : Seismic Design Category is selected according to Table6.2.18. →Describe it. ex) D	☑	☐	
	20	Seismic Zone Coefficient "Z" is selected according to Table6.2.14, 6.2.15. →Describe it. ex) 0.2	☑	☐	
	21	I : Importance factor is selected according to Table 6.2.17. →Describe it. ex) 1.00	☑	☐	

Name	Date
Name	Date
Name	Date
Name	Date
Name	Date

Cells filled out by RAJUK/designers					Reference			
4	5				6	7	8	9
Describe the Contents of the Confirmation	Data source page or No. D:Design Report A:Architectural Drawing S:Structural Drawing	Data source			BNBC2020 PartVI	Manual page	URP P-S	Remarks
		DESIGN REPORT	Architectural DRAWING	Structural DRAWING				
Residential building	D-7	○			Sec 1.2.3 Table6.1.1	Annex (1)	-	
4353.41㎡	A-01		○		-	-	-	
527.03㎡	A-01		○		-	-	-	
RC	D-7,9 S-G02 1-d)	○		○	-	-	-	
10 stories and 1 base	D-7 A-01,18	○	○		-	-	-	
34.5m	D-7,18 A-14	○	○		-	-	-	
A.K.M Saiful Bari	D-1,2	○			Sec.1.9.2(h)	Chapter1 1.4	-	
BNBC2020	D-8 S-G02 1-a)	○		○	Sec.1.9.2(a), (b)	-	-	
Strength design	D-19 S-G02 1-f)	○		○	Sec.1.9.2(c)	-	-	
Equivalent static analysis	D-21 S-G02 1-b)	○		○	Sec 2.5.7-2.5.12	-	-	
ETABS v16.2.1	D-21	○			Sec.1.9.2(i)	Chapter1 1.4	-	
Basundhara R/A, Dhaka	D-15,20	○			Sec.1.9.2(g) Sec.2.5.3	Annex (4)	118,123	
Vs=108.38<180m/s	D-15 Soil Report	○			Sec.2.5.3.2 Table6.2.13	Annex (3)	118	
N=2.67<15m/s	D-15 Soil Report	○			Sec.2.5.3.2 Table6.2.13	Annex (3)	118	
No description	D-15 Soil Report	○			Sec.2.5.3.2 Table6.2.13	Annex (3)	118	
SD	D-15	○			Sec 2.5.3.2 Table6.2.13	Annex (3)	118	
II	D-15,18	○			Sec 1.2.3 Table6.1.1	Annex (1)	-	
2	D-15 S-G02 2-c)	○		○	Sec 2.5.4.2 Figure 6.2.24	Annex (2)	117	
D	D-15	○			Sec 2.5.5.2 Table6.2.18	Annex (4)	122	
0.2	D-15,18	○			Sec 2.5.4.2 Table6.2.14,15	Annex (2)	117	
1.00	D-15,18	○			Sec 2.5.5.1 Table6.2.17	-	119	

The entry in the red box above is an example.

Element	No.	Item		confirm	not confirm	De
Loads etc.	22	Total Dead Load →Describe it. ex) 53041.2kN		☑	☐	
	23	Total Live Load →Describe it. ex) 9484.0kN		☑	☐	
	24	W : Seismic weight W=Dead Load+Live Load × (25%, 50%, 100%, or higher) →Describe it. ex) W=55412.25kN		☑	☐	
	25	T(s) : Building period →Describe it. ex) T=0.694678957		☑	☐	
	26	Cs : Normalized acceleration response spectrum →Describe it. ex) Cs=3.375		☑	☐	
	27	Sa : Design spectral acceleration. Sa=2/3×ZI/R×Cs →Describe it. ex) Sa=0.069		☑	☐	
	28	V : Design base shear. V=Sa·W →Describe it. ex) V=3823.5kN		☑	☐	
	29	Wind Loads	Basic Wind Speed →Describe it. ex) 65.7m/s(=236.5km/h=146.9mph)	☑	☐	
	30		Importance Factor (Table 6.2.9) →Describe it. ex) 1	☑	☐	
	31		Gust Effect Factor →Describe it. ex) 0.85 If building period greater than 1.0 second, the Gust Effect Factor shall be calculated.	☑	☐	
Structural System	32	Seismic Force-Resisting System is selected according to Table 6.2.19. →Describe it. ex) DUAL SYSTEMS (IMF) E2 Special reinforced concrete shear walls		☑	☐	
	33	The type of Moment Resisting Frame(SMF, IMF, or OMF) →Describe it. ex) IMF		☑	☐	
	34	R : Response Reduction Factor is selected according to Table 6.2.19. →Describe it. ex) R=6.5		☑	☐	
	35	Cd : Diflection Amplification Factor is selected according to Table 6.2.19. →Describe it. ex) Cd=5		☑	☐	
	36	Height limit is selected according to Table 6.2.19. →Describe it. ex) 50m		☑	☐	
	37	★Building height is lower than the height limit above.		☑←		Sat
Building Irregularities	38	Vertical	Stiffness Irregularity check (mentioned/not) Soft story occurs when lateral stifness is less than 70% of that in the the story above.	☑	☐	
	39	Horizontal  (a) Torsional Irregularity	(a)Tortional Irregularity check (mentioned/not) Irreguler : Δmax/Δave > 1.2 Extreme : Δmax/Δave > 1.4	☑	☐	
	40		Drift check Storey drift →As a representative, describe the maximum value of the X-direction (positive force). ex) 0.003139 (6F)	☑	☐	
	41	 (b) Reentrant corners (A/L>0.15)	★The maximum storey drift above is lower than the value of Table 6.2.21 (ex. lower than 0.020hsx). hsx is the story height below level x.	☑←		Sat
	42		(b)Reentrant Corner check (A/L > 0.15) (mentioned/not)	☑	☐	
	43	 (c) Diaphragm discontinuity	(c)Diaphragm discontinuity check (mentioned/not) Irregular : Aaxn (= cutout or open areas) > 1/2XY (= 50 percent of the gross enclosed area of the diaphragm)	☑	☐	
Concreting Procedure	44	Concrete	Maximum permissible free fall height of concrete depositing/pouring →Describe it. ex) 1.5m	☑	☐	
	45		★The maximum free fall height above is lower than 1.5m (lower is better).	☑←		Sat
	46		A compaction method such as using mechanical vibrators	☑	☐	
	47		Precautions for form work such as follow PWD schedule	☑	☐	

Describe the Contents of the Confirmation	Data source page or No. D:Design Report A:Architectural Drawing S:Structural Drawing	Data source			BNBC2020 PartVI	Manual page	URP P-S	Remarks
		DESIGN REPORT	Architectural DRAWING	Structural DRAWING				
53041.2kN	D-15	○			Sec 2.2	-	96	
9484.0kN	D-15	○			Sec 2.3	-	99-105	
W=55412.25kN	D-15	○			Sec 2.5.7.3	-	-	
T=0.694678957	D-18	○			Sec 2.5.7.2	-	128	
Cs=3.375	D-15	○			Sec 2.5.4.3	-	121	
Sa=0.069	D-15	○			Sec 2.5.4.3	-	121	
V=3823.5kN	D-15	○			Sec 2.5.7.1	-	-	
65.7m/s	D-13 S-G02 2-b)	○		○	Sec 2.4.4 Table6.2.8	-	138	
1	D-13	○			Sec 2.4.5 Table6.2.9	-	139	
0.85	D-13	○			Sec 2.4.8	-	158	
E2:Special reinforced concrete shear walls	D-7,18 S-G02 1-b)	○		○	Sec 2.5.5.4 Table 6.2.19	Annex (5)	120, 124	
IMF	D-7 S-G02 1-b)	○		○	SMF:Sec.8.3.3-8 IMF:Sec.8.3.10 OMF:Sec.8.3.9	Annex (6)	-	
R=6.5	D-18	○			Sec 2.5.5.4 Table 6.2.19	Annex (5)	120, 124	
Cd=5	D-18	○			Sec 2.5.5.4 Table 6.2.19	Annex (5)	120, 124	
50m	D-7	○			Sec 2.5.5.4 Table 6.2.19	Annex (5)	120, 124	
Satisfactory	-							
-	D-49	○			Sec 2.5.5.3.2 (i)	-	126	
-	D-44	○			Sec 2.5.5.3.1 (i)	-	126	
0.003139 (6F)	D-47	○			Sec 2.5.14.1 Table.6.2.21	-	136	
Satisfactory	-							
-	D-51	○			Sec 2.5.5.3.1 (ii)	-	126	
-	D-51	○			Sec 2.5.5.3.1 (iii)	-	126	
1.5m	S-G06			○	Sec 5.10 or Indian Standard IS-456:2000	-	-	
Satisfactory	-							
-	S-G06			○	Sec 5.10 or Indian Standard IS-456:2000	-	-	
-	S-G06			○	Sec 5.16	-	-	

The entry in the red box above is an example.

Element	No.	Item		confirm	not confirm	De
Curing (days)	48	Column/Beam/ Shear wall/Slab	The curing period →Describe it. ex) 21 days	☑	☐	
	49		★The curing period is subject to the following. ・General : More than 7 days at 10℃ or higher. ・High early strength : More than 3 days at 10℃ or higher. ・others : follow Sec 5.11.3.	☑←		Sat
Cover	50	Column/Beam/ Shear wall/Slab	The cover thickness (mentioned/not)	☑	☐	
Concrete	51	classification	Normal weight concrete is used. In the case of lightweight concrete, follow the regulations of lightweight concrete. Below is a regulation for normal weight concrete.	☑	☐	
Concrete Compressive Strength f'c	52	Column	Concrete compressive strength (f'c) of column from design report →Describe it. ex) 31N/㎟	☑	☐	
	53		Concrete compressive strength (f'c) of column from structural drawing. →Describe it. ex) 31N/㎟	☑	☐	
	54		★Confirm the consistency between design report and structural drawing. ・fc' of design report = fc' of structural drawing	☑←		Sat
	55	Beam	Concrete compressive strength (f'c) of beam. Confirm the consistency between design report and structural drawing. →Describe it. ex) 24.13N/㎟	☑	☐	
	56	Shear Wall	Concrete compressive strength (f'c) of shear wall. Confirm the consistency between design report and structural drawing. →Describe it. ex) 31N/㎟	☑	☐	
	57	Slab	Concrete compressive strength (f'c) of slab. Confirm the consistency between design report and structural drawing. →Describe it. ex) 24.13N/㎟	☑	☐	
	58		★fc' is subject to the following. ・IMF,OMF : 20 N/㎟ or more (17 N/㎟ or more for 4th floors and below) ・SMF : 21 N/㎟ or more ・For the corrosive environment or other severe exposure conditions : 25 N/㎟ or more	☑←		Sat
	59	Foundation	Concrete compressive strength (f'c) of foundation. Confirm the consistency between design report and structural drawing. →Describe it. ex) Pile=21N/㎟, Pile cap=31N/㎟	☑	☐	
	60		The type of foundation →Describe it. ex) cast in situ pile	☑	☐	
	61		★fc' is subject to the following. ・Footing:≧20N/㎟ ・Cast-in-situ pile:≧18N/㎟ ・Driven pile:≧25N/㎟	☑←		Sat
Steel yield Strength	62	fy (longitudinal rebar)	Steel yield strength (fy) of longitudinal rebar. Confirm the consistency between design report and structural drawing. →Describe it. ex) 414N/㎟	☑	☐	
	63		★fy is subject to the following. ・IMF,OMF : 550N/㎟ or less ・SMF : 420N/㎟ or less	☑←		Sat
	64	fyt (transverse rebar)	Steel yield strength (fyt) of transverse rebar. Confirm the consistency between design report and structural drawing. →Describe it. ex) 414N/㎟ If fyt is not described, the value of fy is adopted.	☑	☐	
	65		★fyt is subject to the following. ・IMF,OMF : 550N/㎟ or less ・SMF : 700N/㎟ or less	☑←		Sat
Lap splices	66	Column	The position of the lap splices (ℓd) of column. (mentioned/not)	☑	☐	
	67	Beam	The position of the lap splices (ℓd) of beam. (mentioned/not)	☑	☐	

Describe the Contents of the Confirmation	Data source page or No. D:Design Report A:Architectural Drawing S:Structural Drawing	Data source DESIGN REPORT	Architectural DRAWING	Structural DRAWING	BNBC2020 Part VI	Manual page	URP P-S	Remarks
21 days	S-G06			○				
Satisfactory	-				Sec 5.11	-	-	
-	D-9 S G05	○		○	Sec. 8.1.7	-	8, 12 17, 63	
-	S-G02			○	Sec. 5.1.1	-	-	
31N/㎟	D-9	○						
31N/㎟	S-G02			○				
Satisfactory	-							
24.13N/㎟	D-9 S-G02	○		○				
31N/㎟	D-9 S-G02, S-S16	○		○	Sec 5.5.4 Sec 8.1.7.8 Sec 8.3.3.3	Annex (6) A-8, 11, 17	64, 67 73, 84	
24.13N/㎟	D-9 S-G02	○		○				
Satisfactory	-							
pile=21N/㎟ pile cap=31N/㎟	pile:D-9, S-S04 pile cap:S-G02	○		○				
cast in situ pile	S-S04			○	Sec 3.6.1 Table 6.3.5	-	67	
Satisfactory	-							
fy=414N/㎟	D-9 S-G02	○		○	Sec 6.2.4 Sec 8.3.3.4(b)	Annex (6) A-11, 17	68, 74, 85	
Satisfactory	-							
fyt=414N/㎟	D-9 S-G02	○		○	Sec 6.2.4 Sec 8.3.3.4(c)	Annex (6) A-11, 17	68, 74, 85	
Satisfactory	-							
-	S-G04, S-G06			○	Sec 8.2.3 Sec 8.2.12.2 Sec 8.3.4.2 Sec 8.3.5.3 Sec 8.3.5.4 Sec 8.3.10.5	Annex (6) A-7, 8, 13 20, 22, 23	65, 66 69, 75 76, 81 82	
-	S-G04, S-G06			○				

The entry in the red box above is an example.