

**RAPID VISUAL SCREENING OF BUILDINGS FOR  
POTENTIAL SEISMIC VULNERABILITY AND  
CONDITION ASSESSMENT**

QUICK REFERENCE GUIDE

## Guidelines for RVS of Buildings

1. Print the data collection form for the required number of floors.
2. Carefully study the building plan and elevation details from architectural/structural drawings, if available.
3. Verify and update the building identification information and provide surveyor(s) details.
4. Walk around the building to identify its size, shape and sketch rough plan and elevation of the building.
5. Determining and document occupancy details relating to it.
6. Determine soil type, if not available furnish it inquiring with concerned authorities.
7. Identify potential non-structural falling hazards, if any, and indicate their existence on the data collection form.
8. Record the site morphology and estimate the value of slope in degrees.
9. Note any observable conditions of leaning, excessive loadings on any of the floors of the building.
10. Note any significant geotechnical observations such as subsidence, unequal settlements or lowered plinth level.
11. Visit each and every room to evaluate the condition of structural members and occupancy to determine the service load.
12. Try to inspect the portions which are covered with decorative elements, false ceiling, obstructed by some kind of storage or hidden from direct view for any other reason.
13. Note down the number and condition of various vertical and horizontal structural elements in sheets A1 and A2. Categorization guidelines for different members and materials are given in Table-1 and 2 below.
14. Measure the various dimensions of vertical and horizontal structural members and record the same for each floor and suspended slab and note them in sheets A3 and A4.

15. Estimate the loading on each vertical and horizontal structural member using floor dead loads, super-imposed dead loads and live loads as per IS code. For vertical members all loads from the upper stories need to be added.
16. Calculate the permissible load on member using member dimensions, material strength and appropriate charts given in Appendix C.
17. Check whether the member is safe or unsafe by comparing permissible and observed load.
18. Categorise the building based on the observed condition data collected at different stories as per Table-3 below.
19. Categorise the building based on detailed calculations at different stories as per Table-4 below.

## **Checklist for RVS of buildings**

1. Data collection form
2. Quick reference guide
3. Plan/detailed drawings of the building to be surveyed (if available)
4. Measuring tape
5. Clip board for holding the data collection forms
6. Pen, pencil, eraser and a 15 cm edge
7. Camera to capture important features in a building

# Components of Data Collection Form

Details of survey engineer

Building details

Rough sketch of plan and elevation of the building to be surveyed

Occupancy details, soil type and falling hazards

Details of the important photographs taken for capturing important structural and vulnerable features

Visually estimated slope of the ground on which the structure is constructed

Overall structural observation to see if the building is leaning on one side

Observed geotechnical parameters (subsidence, unequal settlements and lowered plinth level)

**RAPID VISUAL SCREENING OF BUILDINGS FOR POTENTIAL SEISMIC VULNERABILITY AND CONDITION ASSESSMENT**

Sheet A

**Survey Engineer Details:**  
 Name: \_\_\_\_\_  
 Contact Number: \_\_\_\_\_  
 Email: \_\_\_\_\_

**Building Details:**  
 Address: \_\_\_\_\_  
 Village/Town/City: \_\_\_\_\_ District: \_\_\_\_\_  
 State: \_\_\_\_\_ PIN: \_\_\_\_\_  
 Landmark: \_\_\_\_\_  
 GPS Coordinates: \_\_\_\_\_  
 Surveyor: \_\_\_\_\_ Year Built: \_\_\_\_\_  
 Total Floor Area (sq. m): \_\_\_\_\_ Date: \_\_\_\_\_  
 Building Name: \_\_\_\_\_  
 Use: \_\_\_\_\_  
 Construction Drawings Available:  Yes  No

OCCUPANCY TYPE		
Assembly	Govt.	Office
Commercial	Historic	Residential
Fire Service	Industrial	School

OCCUPANCY LOAD		
Max. Number of Persons		
0-10	11-100	100+

SOIL TYPE (IS 1893:2002)		
TYPE I	TYPE II	TYPE III
Hard Soil	Medium Soil	Soft Soil

FALLING HAZARDS			
<input type="checkbox"/> Chimneys	<input type="checkbox"/> Parasols	<input type="checkbox"/> Chaddings	<input type="checkbox"/> Others

**PHOTOGRAPH Nos.**

SITE MORPHOLOGY					
<input type="checkbox"/> Flat	<input type="checkbox"/> Crest	<input type="checkbox"/> Embankment	<input type="checkbox"/> Downward Slope	<input type="checkbox"/> Trough	<input type="checkbox"/> Adjacent to Hill Slopes
Slope of the Terrain (Degrees) _____					

**ASSESSMENT**  
 Investigate the building for the conditions given below and check the appropriate column

**I Broad Structural Observations:**  
 Any storey/building noticeably leaning  
 Estimated maximum floor loading (SID Le II)  Yes  No  Normal  Excessive

**II Geotechnical/Foundation Observations:**  
 Subsidence, unequal settlements  
 Plinth level lowered  Yes  No  Not Known  
 Yes  No  Not Known

**III Condition of Vertical Structural Elements**  
 (Fill separately for each floor using enclosed forms A.1)

**IV Condition of Vertical Structural Elements**  
 (Fill separately for each floor using enclosed forms A.2)

**V Capacity of Vertical Structural Elements**  
 (Fill separately for each floor using enclosed forms A.3)

**VI Capacity of Vertical Structural Elements**  
 (Fill separately for each floor using enclosed forms A.4)

A. 1 form has to be filled one for each floor and this is on the basis of observed structural damaged conditions of the structure

Visual conditions of load bearing walls, arches, partition walls and columns are based on table 1 and 2

III Condition of Vertical Structural Elements (One Form/Floor)		Floor No: _____	A1
<b>WALL:</b>			
<b>Load Bearing Wall:</b>			
If Yes, Total no. of beams:	<input type="checkbox"/> Yes <input type="checkbox"/> No	___ Nos. inspected ___ Nos. un-inspected	
Wall thickness (mm)	<input type="checkbox"/> 230 <input type="checkbox"/> 350 <input type="checkbox"/> 450 <input type="checkbox"/> 600 <input type="checkbox"/> Other: _____		
Type of mortar	<input type="checkbox"/> Mud <input type="checkbox"/> Lime <input type="checkbox"/> Cement <input type="checkbox"/> Gauged		
Is masonry reinforced?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
No. of walls having diagonal/cross cracks	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
No. of walls having vertical cracks (Except corners)	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
Bulging or out of plane failure	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
Separation of walls (vertical cracks at corner/T-junction)	<input type="checkbox"/> Yes <input type="checkbox"/> No		
If Yes, at corners (Number of walls)	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
at T-junctions (Number of walls)	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
Openings bridged by using:	<input type="checkbox"/> RC Lintels <input type="checkbox"/> Masonry Arches		
	<input type="checkbox"/> Flat Brick Lintels <input type="checkbox"/> Timber Lintels <input type="checkbox"/> None		
<b>Openings</b>			
Nos. with inclined/teething cracks originating from corners	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
Nos. with cross cracks in piers between openings	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
<b>Arches:</b>			
Cracks in arches	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Arches collapsed	<input type="checkbox"/> Yes <input type="checkbox"/> No		
<b>Partition Wall:</b>			
If Yes, Total no. of partition walls inspected	<input type="checkbox"/> Yes <input type="checkbox"/> No	___ Nos.	
Estimated no. of non-inspected partition walls:	___ Nos.		
Number of Partition walls that have:			
Diagonal/cross cracks	___ No. of Walls		
Vertical cracks	___ No. of Walls		
Separation from main wall / column	___ No. of Walls		
Bulging or out of plane failure	___ No. of Walls		
Horizontal cracks:			
at Sill Level	___ No. of Walls		
at Lintel Level	___ No. of Walls		
at Floor Level	___ No. of Walls		
<b>COLUMNS:</b>			
Total no. of Columns:	___ Nos. inspected	___ Nos. un-inspected	
<b>Timber (Wooden) Columns:</b>			
If Yes, total no. of columns (inspected):	<input type="checkbox"/> Yes <input type="checkbox"/> No	___ Nos.	
Diagonal cracks /cross cracks	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
Significant reduction in cross section	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
Crushing or decay of timber	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
<b>RCC Columns:</b>			
If Yes, total no. of columns (inspected):	<input type="checkbox"/> Yes <input type="checkbox"/> No	___ Nos.	
Cracks at beam-column junction	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
Diagonal cracks /cross cracks	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
Spalling of concrete	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
Crushing of concrete or/and buckling of bars	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
<b>Steel Columns:</b>			
If Yes, total no. of columns (inspected):	<input type="checkbox"/> Yes <input type="checkbox"/> No	___ Nos.	
Knee bracing provided?	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
Buckling or bowing of columns?	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
Tilting or inclination of columns?	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
Rusting of columns?	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		
Condition of welds/nuts/bolts at joints	S0-S1 ___ S2-S3 ___ S4 ___ S5 ___		

A. 2 form has to be filled one for each suspended slab and this is on the basis of observed structural damaged conditions of the structure

Visual conditions of beams and slabs are based on tables

IV Condition of Horizontal Structural Elements (One Form/Suspended Slab)		Suspended Slab No: _____		A.2	
Total no. of beams:	_____	No. inspected	_____	No. un-inspected	_____
<b>Timber (Wooden) Beams:</b>		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	
If Yes, no. of framing beams (inspected)	_____				
No. with loss of support/displacement of beam	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
No. with weathering/disintegration of beam near support	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
No. with noticeable deflection/sagging	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
Are chords present?		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	
If Yes, nos. of chords have been bent in lateral direction?	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
<b>Concrete Beam:</b>		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	
If Yes, no. of framing beams (inspected)	_____				
No. of beams with horizontal tension cracks at bottom	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
No. of beams with vertical cracks near supports	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
No. of beams with vertical cracks near mid-span	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
No. of beams with diagonal cracks near supports	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
No. with noticeable deflection/sagging	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
<b>Steel Beam:</b>		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	
If Yes, no. of framing beams (inspected)	_____				
If Yes, no. with noticeable deflection/sagging	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
Weathering/corrosion of beam	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
Condition of welds/nuts/bolts at joints	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
Loss of support / displacement of beams	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
Floor beams have been braced horizontally?		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	
If Yes, connection between bracings & beams damaged?	S0-S1 _____ S2-S3 _____				
Diagonals of bracing have buckled or yielded?	S0-S1 _____ S2-S3 _____				
Chords have been bent in lateral direction?	S0-S1 _____ S2-S3 _____				
<b>RCC Slab:</b>		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	
If Yes, spalling of concrete / exposed reinforcement	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
Excessive deflection of slab	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
Cast in place slabs are damaged?	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
Punching shear damage?	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
Are there cut-outs in slabs?		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	
If Yes, then indicate damage adjacent to cut-out	<input type="checkbox"/> None/Minor <input type="checkbox"/> Moderate <input type="checkbox"/> Severe				
Corner cracks next to cut-out	<input type="checkbox"/> None/Minor <input type="checkbox"/> Moderate <input type="checkbox"/> Severe				
<b>Floor Supported on Timber (Wooden) Joists:</b>		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	
If Yes, excessive deflection of slab	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
No. of joists	_____ Nos. failed _____ Nos. excessively bent _____ Nos. moved from supporting wall/binder				
<b>Floor Supported on Steel Joists:</b>		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	
If Yes, excessive deflection of slab	S0-S1 _____ S2-S3 _____ S4 _____ S5 _____				
Loss of section due to rusting of joists	_____				
Bending (Sagging) of joists	_____				
<b>Jack Arch Floor:</b>		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	
If Yes, joists supporting vault	<input type="checkbox"/> RCC <input type="checkbox"/> Steel				
Excessive deflection of joists	_____ No. of joists				
Failure in vaults	_____ Nos. cracked _____ Nos. cracked				
Ties provided	<input type="checkbox"/> Yes <input type="checkbox"/> No <b>If yes, No. failed ties: _____ Nos.</b>				
<b>Hollow Block Floor:</b>		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	
If Yes, spalling of concrete / exposed reinforcement	_____				
Vertical displacement due to support movement	_____				
Connections in slab damaged	_____				
<b>Caststone slab:</b>		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	
If Yes, spalling of concrete / exposed reinforcement	_____				
Vertical displacement due to support movement	_____				
Connections in slab damaged	_____				

**Table1: Damage Category Assessment Guidelines for Structural Elements**

Damage Category	Building Element			
	Steel Column	Steel Beam	Jack Arch Floor	Timber Post
<b>S5</b>	Excessive inter-storey deflection; Buckling of column; Failure of joints with beams; Failure of connection with foundation; Significant loss of cross-section due to corrosion	Loss of support; Failure of connection with columns; Buckling of web; Significant loss of cross-section due to corrosion	Loss of arch action; Dislodgement of keystone; Failure of tie-member; Partial or full collapse	Significant reduction in cross-section; Failure of connection with beams; Excessive inter-storey drift/tilting; Severe rotting of timber
<b>S4</b>	Moderate loss of cross-section due to corrosion; Twisting of column; Significant distress in bolts and shims; Cracks in welds	Moderate loss of cross-section due to corrosion; Torsional deformation; Differential settlement of supports; Significant distress in bolts and shims; Cracks in welds	Loosening of keystone; Wide cracks (> 2mm) near arch crown	Severe distress in connections and supports; Minor cracks in post; Moderate rotting
<b>S3</b>	Minor loss of cross-section due to corrosion; Minor distress in connections	Minor loss of cross-section due to corrosion; Minor distress in connections	Moderate cracks (1-2 mm) near arch crown; Minor reduction in tie-member cross section	Minor rotting; visibly looking safe
<b>S2</b>	--	--	Visible cracks near arch crown; Falling of plaster near arch crown	--
<b>S1</b>	--	--	Visible cracks away from crown; Falling of plaster away from crown	--
<b>S0</b>	No damage	No damage	No damage	No damage

**Table 2: Damage Category Assessment Guidelines for Structural Elements**

Damage Category	Building Element			
	Timber Beam	RCC Column and Shear Wall	RCC Beam	Load Bearing Wall
<b>S5</b>	Significant reduction in cross-section; Failure of connection with column; Crushing of member at any section; Differential support settlement; Severe rotting of timber	Crushing of core concrete at joints, relative movement with respect to slab and other columns	Crushing of concrete at supports, excessive deflection	Partial or total collapse of wall; Wide cracks (> 2mm) in crown of wall arch
<b>S4</b>	Apparent loss of support; Excessive deflection at mid-span; Moderate rotting	Diagonal / Torsional cracks in concrete core (>0.5 mm), opening of tie bars, buckling of longitudinal bars, non-uniform reinforcement size	Reinforcement and concrete bond is broken, cracks in the core concrete (>0.5 mm), shear tie bars have failed	Gaps in the wall, separation at openings (e.g. windows, doors); Moderate cracks (1-2 mm) in crown of wall arch
<b>S3</b>	Minor rotting; visibly looking safe	Major portion of outer layer of concrete is spalled but core is intact except for hairline cracks (<0.5 mm)	Major portion of outer layer of concrete is spalled but core is intact except for hairline cracks (<0.5 mm)	Wide and deep cracks (1 - 2 mm) in wall areas other than crown of wall arch, out of plane movement
<b>S2</b>	--	Visible cracks (up to 0.1-0.2 mm)	Visible shear cracks (near support) or tension cracks (at bottom) (up to 0.1-0.2 mm)	Visible cracks (up to 0.1-0.2 mm), some falling of plaster
<b>S1</b>	--	Very fine cracks (<0.1mm)	Very fine cracks (<0.1mm)	Very fine cracks (<0.1mm)
<b>S0</b>	No damage	No damage	No damage	No damage





Compiled results based on the calculations from the capacity curves given in Appendix C

VII BUILDING SAFETY LEVEL

Floor No.		
Structural Element	Safe (Nos.)	Unsafe (Nos.)
RCC column		
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)		
RCC slab (Two-Way)		
RCC Beam		
Wooden Beam		
Steel Beam		
Floor No.		
Structural Element	Safe (Nos.)	Unsafe (Nos.)
RCC column		
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)		
RCC slab (Two-Way)		
RCC Beam		
Wooden Beam		
Steel Beam		
Floor No.		
Structural Element	Safe (Nos.)	Unsafe (Nos.)
RCC column		
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)		
RCC slab (Two-Way)		
RCC Beam		
Wooden Beam		
Steel Beam		
Floor No.		
Structural Element	Safe (Nos.)	Unsafe (Nos.)
RCC column		
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)		
RCC slab (Two-Way)		
RCC Beam		
Wooden Beam		
Steel Beam		

Floor No.		
Structural Element	Safe (Nos.)	Unsafe (Nos.)
RCC column		
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)		
RCC slab (Two-Way)		
RCC Beam		
Wooden Beam		
Steel Beam		
Floor No.		
Structural Element	Safe (Nos.)	Unsafe (Nos.)
RCC column		
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)		
RCC slab (Two-Way)		
RCC Beam		
Wooden Beam		
Steel Beam		
Floor No.		
Structural Element	Safe (Nos.)	Unsafe (Nos.)
RCC column		
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)		
RCC slab (Two-Way)		
RCC Beam		
Wooden Beam		
Steel Beam		
Floor No.		
Structural Element	Safe (Nos.)	Unsafe (Nos.)
RCC column		
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)		
RCC slab (Two-Way)		
RCC Beam		
Wooden Beam		
Steel Beam		



**Table 3: Building Damage Safety Level Categorization Based on Structural Element Categories**

<b>Building Category</b>	<b>Description</b>
<b>S0-S2</b>	Highest category member is S0-S2 Highest category member is S3 and not satisfying condition for S3 building category.
<b>S3</b>	Highest category member is S3 and more then 50% of observed vertical supporting members and/or more then 75% of observed horizontal members <b>on any floor</b> are in S3 category.
<b>S4</b>	Highest category member is S5 and not satisfying condition for S5 building category. Highest category member is S4
<b>S5</b>	Some members are in S5 category and building experiences partial collapse, leaning, significant settlement or any other sign of loss of stability of any portion/floor of building.

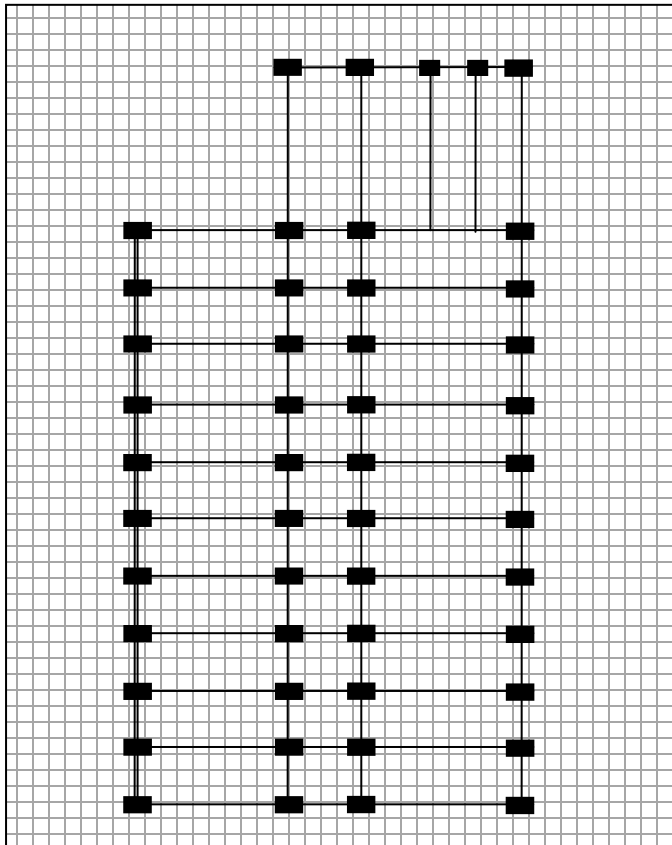
**Table 4: Building Damage Categorization Based on Structural Element Evaluation**

<b>Building Category</b>	<b>Description</b>
S0-S2	All inspected members are safe.
S3	If any of these conditions are satisfied: a) Beam and slab: up to 20% of inspected members are unsafe. b) Column and wall: up to 10% of inspected members are unsafe. c) Conditions for S4 or S5 are not satisfied.
S4	If any of these conditions are satisfied: a) Beam and slab: 20% to 40% of inspected members are unsafe. b) Column and wall: 10% to 20% of inspected members are unsafe. c) Conditions for S5 are not satisfied.
S5	If any of these conditions are satisfied: a) Beam and slab: more than 40% of inspected members are unsafe. b) Column and wall: more than 20% of inspected members are unsafe. c) Partial collapse of building. d) Leaning, significant settlement or any other sign of loss of stability of any portion/floor of building.

# Example Building

# RAPID VISUAL SCREENING OF BUILDINGS FOR POTENTIAL SEISMIC VULNERABILITY AND CONDITION ASSESSMENT

Sheet A



**Survey Engineer Details:**

Name: Ashish Sapre, Chaitanya Krishna  
 Contact Number: \_\_\_\_\_  
 e-mail: \_\_\_\_\_

**Building Details:**

Address: Department of Civil Engineering, IIT-Bombay,  
 Village/Town/City Powai District Mumbai  
 State Maharashtra PIN 400076  
 Landmark: \_\_\_\_\_  
 GPS Coordinates: E72.91° N19.13°  
 No. Stories: G+2 Year Built: 1960s  
 Surveyor: \_\_\_\_\_ Date: 15-10-2012  
 Total Floor Area (sq. m): 2500  
 Building Name: Department of Civil Engineering  
 Use: Educational institute  
 Construction Drawings Available:  Yes /  No

PHOTOGRAPH Nos.

OCCUPANCY TYPE		
Assembly	Govt.	Office <input checked="" type="checkbox"/>
Commercial	Historic	Residential
Emer. Service	Industrial	School <input checked="" type="checkbox"/>

OCCUPANCY LOAD	
Max. Number of Persons	
0-10	11-100
101-1000 <input checked="" type="checkbox"/>	1000+

SOIL TYPE (IS 1893:2002)		
TYPE I	TYPE II	TYPE III
Hard Soil <input checked="" type="checkbox"/>	Medium Soil	Soft Soil

FALLING HAZARDS			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Chimneys	Parapets	Cladding	Other:

SITE MORPHOLOGY					
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flat	Crest	Embankment	Downward Slope	Trough	Adjacent to Hill Slopes
Slope of the Terrain (Degrees)			<u>0</u>		

**ASSESSMENT**

Investigate the building for the conditions given below and check the appropriate column

**I Broad Structural Observations:**

Any storey/building noticeably leaning  Yes  No  
 Estimated maximum floor loading (SIDL+IL)  Normal  Excessive

**II Geotechnical/Foundation Observations:**

Subsidence, unequal settlements  Yes  No  Not Known  
 Plinth level lowered  Yes  No  Not Known

**III Condition of Vertical Structural Elements**

(Fill separately for each floors using enclosed forms A.1)

**IV Condition of Horizontal Structural Elements**

(Fill separately for each floors using enclosed forms A.2)

**V Capacity of Vertical Structural Elements**

(Fill separately for each floors using enclosed forms A.3)

**VI Capacity of Horizontal Structural Elements**

(Fill separately for each floors using enclosed forms A.4)



**III Condition of Vertical Structural Elements (One Form/Floor)**

Floor No: 1

**A.1**

**WALL:**

**Load Bearing Wall:**

**If Yes,** Total no. of beams:      Nos. inspected      Nos. un-inspected  Yes  No

Wall thickness(mm)  230  350  450  600  Other     

Type of mortar  Mud  Lime  Cement  Gauged

Is masonry reinforced?  Yes  No

No. of walls having diagonal/cross cracks S0-S1      S2-S3      S4      S5     

No. of walls having vertical cracks (Except corners) S0-S1      S2-S3      S4      S5     

Bulging or out of plane failure S0-S1      S2-S3      S4      S5     

Separation of walls (vertical cracks at corner/T-junction)  Yes  No

**If Yes,** at corners (Number of walls) S0-S1      S2-S3      S4      S5     

at T - Junctions (Number of walls) S0-S1      S2-S3      S4      S5     

Openings bridged by using:  RC Lintels  Masonry Arches

Flat Brick Lintels  Timber Lintels  None

Openings

Nos. with inclined/toothed cracks originating from corners S0-S1      S2-S3      S4      S5     

Nos. with cross cracks in piers between openings S0-S1      S2-S3      S4      S5     

**Arches:**

Cracks in arches:  Yes  No

Arches collapsed  Yes  No

**Partition Wall:**

**If Yes,** Total no. of partition walls inspected      Nos.  Yes  No

Estimated no. of non-inspected partition walls:      Nos.

Number of Partition walls that have:

Diagonal/cross cracks      No. of Walls

Vertical cracks      No. of Walls

Separation from main wall / column      No. of Walls

Bulging or out of plane failure      No. of Walls

Horizontal cracks:

at Sill Level      No. of Walls

at Lintel Level      No. of Walls

at Floor Level      No. of Walls

**COLUMNS:**

Total no. of Columns: 43 Nos. inspected 6 Nos. un-inspected

**Timber (Wooden) Columns:**

**If Yes,** total no. of columns (inspected):      Nos.  Yes  No

Diagonal cracks /cross cracks S0-S1      S2-S3      S4      S5     

Significant reduction in cross section S0-S1      S2-S3      S4      S5     

Crushing or decay of timber S0-S1      S2-S3      S4      S5     

**RCC Columns:**

**If Yes,** total no. of columns (inspected): 43 Nos.  Yes  No

Cracks at beam-column junction S0-S1 All S2-S3      S4      S5     

Diagonal cracks /cross cracks S0-S1 All S2-S3      S4      S5     

Spalling of concrete S0-S1 All S2-S3      S4      S5     

Crushing of concrete or/and buckling of bars S0-S1 All S2-S3      S4      S5     

**Steel Columns:**

**If Yes,** total no. of columns (inspected):      Nos.  Yes  No

Knee bracing provided? S0-S1      S2-S3      S4      S5     

Buckling or bowing of columns? S0-S1      S2-S3      S4      S5     

Tilting or inclination of columns? S0-S1      S2-S3      S4      S5     

Rusting of columns? S0-S1      S2-S3      S4      S5     

Condition of welds/rivets/bolts at joints S0-S1      S2-S3      S4      S5

**III Condition of Vertical Structural Elements (One Form/Floor)**

Floor No: Ground

**A.1**

**WALL:**

**Load Bearing Wall:**

Yes  No  
 If Yes, Total no. of beams: \_\_\_ Nos. inspected \_\_\_ Nos. un-inspected  
 Wall thickness(mm)  230  350  450  600  Other \_\_\_\_\_  
 Type of mortar  Mud  Lime  Cement  Gauged  
 Is masonry reinforced?  Yes  No  
 No. of walls having diagonal/cross cracks S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 No. of walls having vertical cracks (Except corners) S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Bulging or out of plane failure S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Separation of walls (vertical cracks at corner/T-junction)  Yes  No  
 If Yes, at corners (Number of walls) S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 at T - Junctions (Number of walls) S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Openings bridged by using:  RC Lintels  Masonry Arches  
 Flat Brick Lintels  Timber Lintels  None  
 Openings  
 Nos. with inclined/toothed cracks originating from corners S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Nos. with cross cracks in piers between openings S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_

**Arches:**

Cracks in arches:  Yes  No  
 Arches collapsed  Yes  No

**Partition Wall:**

Yes  No  
 If Yes, Total no. of partition walls inspected \_\_\_ Nos.  
 Estimated no. of non-inspected partition walls: \_\_\_ Nos.  
 Number of Partition walls that have:  
 Diagonal/cross cracks \_\_\_ No. of Walls  
 Vertical cracks \_\_\_ No. of Walls  
 Separation from main wall / column \_\_\_ No. of Walls  
 Bulging or out of plane failure \_\_\_ No. of Walls  
 Horizontal cracks:  
 at Sill Level \_\_\_ No. of Walls  
 at Lintel Level \_\_\_ No. of Walls  
 at Floor Level \_\_\_ No. of Walls

**COLUMNS:**

Total no. of Columns: 48 Nos. inspected 1 Nos. un-inspected

**Timber (Wooden) Columns:**

Yes  No  
 If Yes, total no. of columns (inspected): \_\_\_ Nos.  
 Diagonal cracks /cross cracks S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Significant reduction in cross section S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Crushing or decay of timber S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_

**RCC Columns:**

Yes  No  
 If Yes, total no. of columns (inspected): 48 Nos.  
 Cracks at beam-column junction S0-S1 All S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Diagonal cracks /cross cracks S0-S1 All S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Spalling of concrete S0-S1 All S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Crushing of concrete or/and buckling of bars S0-S1 All S2-S3\_\_\_ S4\_\_\_ S5\_\_\_

**Steel Columns:**

Yes  No  
 If Yes, total no. of columns (inspected): \_\_\_ Nos.  
 Knee bracing provided? S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Buckling or bowing of columns? S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Tilting or inclination of columns? S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Rusting of columns? S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Condition of welds/rivets/bolts at joints S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_

**IV Condition of Horizontal Structural Elements (One Form/Suspended Slab) Suspended Slab No: 3**

Total no. of beams: 74 Nos. inspected 8 Nos. un-inspected

**Timber (Wooden) Beam:**

Yes  No  Not Known  
 \_\_\_Nos.  
 Nos. with loss of support/displacement of beam S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Nos. with weathering/disintegration of beam near support S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Nos. with noticeable deflection/sagging S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Are chords present?  Yes  No  Not Known  
 If Yes, nos. of chords have been bent in lateral direction? S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_

**Concrete Beam:**

Yes  No  Not Known  
74 Nos.  
 Nos. of beams with horizontal tension cracks at bottom S0-S1most S2-S3 2 S4\_\_\_ S5\_\_\_  
 Nos. of beams with vertical cracks near supports S0-S1 All S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Nos. of beams with vertical cracks near mid-span S0-S1 All S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Nos. of beams with diagonal cracks near supports S0-S1 All S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Nos. with noticeable deflection/sagging S0-S1 All S2-S3\_\_\_ S4\_\_\_ S5\_\_\_

**Steel Beam:**

Yes  No  Not Known  
 \_\_\_Nos.  
 If Yes, no. of framing beams (inspected) \_\_\_Nos.  
 If Yes, no. with noticeable deflection/sagging S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Weathering/corrosion of beam S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Condition of welds/rivets/bolts at joints S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Loss of support / displacement of beams S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Floor beams have been braced horizontally?  Yes  No  Not Known  
 If Yes, connection between bracings & beams damaged? S0-S1\_\_\_ S2-S3\_\_\_  
 Diagonals of bracing have buckled or yielded? S0-S1\_\_\_ S2-S3\_\_\_  
 Chords have been bent in lateral direction? S0-S1\_\_\_ S2-S3\_\_\_

**RCC Slab:**

Yes  No  Not Known  
 If Yes, spalling of concrete/exposed reinforcement S0-S1 All S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Excessive deflection of slab S0-S1 All S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Cantilever slabs are damaged? S0-S1 All S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Punching shear damage? S0-S1 All S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Are there cut-outs in slabs?  Yes  No  Not Known  
 If Yes, then indicate damage adjacent to cut-out  None/Minor  Moderate  Severe  
 Corner cracks next to cut-out  None/Minor  Moderate  Severe

**Floor Supported on Timber (Wooden) Joists:**

Yes  No  Not Known  
 If Yes, excessive deflection of slab S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Nos. of Joists \_\_\_Nos. failed \_\_\_Nos. excessively bent  
 \_\_\_Nos. moved from supporting wall/binder

**Floor Supported on Steel Joists:**

Yes  No  Not Known  
 If Yes, excessive deflection of slab S0-S1\_\_\_ S2-S3\_\_\_ S4\_\_\_ S5\_\_\_  
 Loss of section due to rusting of joists \_\_\_\_\_  
 Bending (Sagging of Joists) \_\_\_\_\_

**Jack Arch Floor:**

Yes  No  Not Known  
 RCC  Steel  
 \_\_\_No. of Joists  
 \_\_\_Nos. cracked \_\_\_Nos. cracked  
 Ties provided  Yes  No If yes, No. failed ties: \_\_\_Nos.

**Hollow Block Floor:**

Yes  No  Not Known  
 If Yes, spalling of concrete / exposed reinforcement \_\_\_\_\_  
 Vertical displacement due to support movement \_\_\_\_\_  
 Connections in slab damaged \_\_\_\_\_

**Caststone slab:**

Yes  No  Not Known  
 If Yes, spalling of concrete / exposed reinforcement \_\_\_\_\_  
 Vertical displacement due to support movement \_\_\_\_\_  
 Connections in slab damaged \_\_\_\_\_

**IV Condition of Horizontal Structural Elements (One Form/Suspended Slab)**

**Suspended Slab No:** 2

Total no. of beams: 70 Nos. inspected 12 Nos. un-inspected

**Timber (Wooden) Beam:**

**If Yes**, no. of framing beams (inspected) \_\_\_\_\_ Nos.

Nos. with loss of support/displacement of beam S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Nos. with weathering/disintegration of beam near support S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Nos. with noticeable deflection/sagging S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Are chords present?  Yes  No  Not Known

**If Yes**, nos. of chords have been bent in lateral direction? S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

**Concrete Beam:**

**If Yes**, no. of framing beams (inspected) \_\_\_\_\_ Nos.

No. of beams with horizontal tension cracks at bottom S0-S1most S2-S3 4 S4\_\_\_\_ S5\_\_\_\_

No. of beams with vertical cracks near supports S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

No. of beams with vertical cracks near mid-span S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

No. of beams with diagonal cracks near supports S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Nos. with noticeable deflection/sagging S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

**Steel Beam:**

**If Yes**, no. of framing beams (inspected) \_\_\_\_\_ Nos.

**If Yes**, no. with noticeable deflection/sagging S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Weathering/corrosion of beam S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Condition of welds/rivets/bolts at joints S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Loss of support / displacement of beams S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Floor beams have been braced horizontally?  Yes  No  Not Known

**If Yes**, connection between bracings & beams damaged? S0-S1\_\_\_\_ S2-S3\_\_\_\_

Diagonals of bracing have buckled or yielded? S0-S1\_\_\_\_ S2-S3\_\_\_\_

Chords have been bent in lateral direction? S0-S1\_\_\_\_ S2-S3\_\_\_\_

**RCC Slab:**

**If Yes**, spalling of concrete/exposed reinforcement S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Excessive deflection of slab S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Cantilever slabs are damaged? S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Punching shear damage? S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Are there cut-outs in slabs?  Yes  No  Not Known

**If Yes**, then indicate damage adjacent to cut-out  None/Minor  Moderate  Severe

Corner cracks next to cut-out  None/Minor  Moderate  Severe

**Floor Supported on Timber (Wooden) Joists:**

**If Yes**, excessive deflection of slab S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Nos. of Joists \_\_\_\_\_ Nos. failed \_\_\_\_\_ Nos. excessively bent \_\_\_\_\_

\_\_\_\_\_ Nos. moved from supporting wall/binder

**Floor Supported on Steel Joists:**

**If Yes**, excessive deflection of slab S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Loss of section due to rusting of joists \_\_\_\_\_

Bending (Sagging of Joists) \_\_\_\_\_

**Jack Arch Floor:**

**If Yes**, joists supporting vault  Yes  No  Not Known

Excessive deflection of Joists  RCC  Steel

Failure in vaults \_\_\_\_\_ No. of Joists \_\_\_\_\_ Nos. cracked \_\_\_\_\_ Nos. cracked \_\_\_\_\_

Ties provided  Yes  No **If yes**, No. failed ties: \_\_\_\_\_ Nos.

**Hollow Block Floor:**

**If Yes**, spalling of concrete / exposed reinforcement  Yes  No  Not Known

Vertical displacement due to support movement \_\_\_\_\_

Connections in slab damaged \_\_\_\_\_

**Caststone slab:**

**If Yes**, spalling of concrete / exposed reinforcement  Yes  No  Not Known

Vertical displacement due to support movement \_\_\_\_\_

Connections in slab damaged \_\_\_\_\_

**IV Condition of Horizontal Structural Elements (One Form/Suspended Slab)**

**Suspended Slab No:** 1

Total no. of beams: 71 Nos. inspected 11 Nos. un-inspected

**Timber (Wooden) Beam:**

**If Yes**, no. of framing beams (inspected) \_\_\_\_\_ Nos.

Nos. with loss of support/displacement of beam S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Nos. with weathering/disintegration of beam near support S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Nos. with noticeable deflection/sagging S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Are chords present?  Yes  No  Not Known

**If Yes**, nos. of chords have been bent in lateral direction? S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

**Concrete Beam:**

**If Yes**, no. of framing beams (inspected) 71 Nos.

No. of beams with horizontal tension cracks at bottom S0-S1most S2-S3 4 S4\_\_\_\_ S5\_\_\_\_

No. of beams with vertical cracks near supports S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

No. of beams with vertical cracks near mid-span S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

No. of beams with diagonal cracks near supports S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Nos. with noticeable deflection/sagging S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

**Steel Beam:**

**If Yes**, no. of framing beams (inspected) \_\_\_\_\_ Nos.

**If Yes**, no. with noticeable deflection/sagging S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Weathering/corrosion of beam S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Condition of welds/rivets/bolts at joints S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Loss of support / displacement of beams S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Floor beams have been braced horizontally?  Yes  No  Not Known

**If Yes**, connection between bracings & beams damaged? S0-S1\_\_\_\_ S2-S3\_\_\_\_

Diagonals of bracing have buckled or yielded? S0-S1\_\_\_\_ S2-S3\_\_\_\_

Chords have been bent in lateral direction? S0-S1\_\_\_\_ S2-S3\_\_\_\_

**RCC Slab:**

**If Yes**, spalling of concrete/exposed reinforcement S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Excessive deflection of slab S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Cantilever slabs are damaged? S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Punching shear damage? S0-S1 All S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Are there cut-outs in slabs?  Yes  No  Not Known

**If Yes**, then indicate damage adjacent to cut-out  None/Minor  Moderate  Severe

Corner cracks next to cut-out  None/Minor  Moderate  Severe

**Floor Supported on Timber (Wooden) Joists:**

**If Yes**, excessive deflection of slab S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Nos. of Joists \_\_\_\_\_ Nos. failed \_\_\_\_\_ Nos. excessively bent \_\_\_\_\_ Nos. moved from supporting wall/binder \_\_\_\_\_

**Floor Supported on Steel Joists:**

**If Yes**, excessive deflection of slab S0-S1\_\_\_\_ S2-S3\_\_\_\_ S4\_\_\_\_ S5\_\_\_\_

Loss of section due to rusting of joists \_\_\_\_\_

Bending (Sagging of Joists) \_\_\_\_\_

**Jack Arch Floor:**

**If Yes**, joists supporting vault  Yes  No  Not Known

Excessive deflection of Joists  RCC  Steel

Failure in vaults \_\_\_\_\_ No. of Joists \_\_\_\_\_ Nos. cracked \_\_\_\_\_ Nos. cracked \_\_\_\_\_

Ties provided  Yes  No **If yes**, No. failed ties: \_\_\_\_\_ Nos.

**Hollow Block Floor:**

**If Yes**, spalling of concrete / exposed reinforcement \_\_\_\_\_

Vertical displacement due to support movement \_\_\_\_\_

Connections in slab damaged \_\_\_\_\_

**Caststone slab:**

**If Yes**, spalling of concrete / exposed reinforcement  Yes  No  Not Known

Vertical displacement due to support movement \_\_\_\_\_

Connections in slab damaged \_\_\_\_\_

**V Capacity of Vertical Structural Elements (One Form/Floor) Floor No: 2**
**A.3**
**RCC Columns**
 Yes  No

Member No. or Designation	A1, A11, D1	A2 to A10, D2 to D10	B1, C1	B2 to B10, C2 to C10	B11	C11	D11	B12	C12
Member Damage Category	S0	S0	S0	S0	S0	S0	S1	S1	S0
Column Size b	610	610	610	610	610	610	610	610	610
Column Size d	360	360	360	360	360	360	360	360	360
Rebar percentage (0.8%, 1% or 1.2%)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Rebar grade (fy=250 or 415)	250	250	250	250	250	250	250	250	250
Concrete grade (M10, M15 or M20)	10	10	10	10	10	10	10	10	10
Estimated Load P (kN)	93.2	135.7	113.1	166.5	146.3	217.5	166.6	55.3	94.7
Estimated Moment M (kN-m)	0	0	0	0	0	0	0	0	0
Graph Number (used in calculations)	54	54	54	54	54	54	54	54	54
Are P&M in safe range as per PM curve	Y	Y	Y	Y	Y	Y	Y	Y	Y
Result (Safe/Unsafe)	S	S	S	S	S	S	S	S	S

**RCC Columns**
 Yes  No

Member No. or Designation	C1-12	C2-12	D12						
Member Damage Category	S0	S0	S0						
Column Size b	350	350	610						
Column Size d	250	250	360						
Rebar percentage (0.8%, 1% or 1.2%)	0.8	0.8	0.8						
Rebar grade (fy=250 or 415)	250	250	250						
Concrete grade (M10, M15 or M20)	10	10	10						
Estimated Load P (kN)	62.3	50.4	48.9						
Estimated Moment M (kN-m)	0	0	0						
Graph Number (used in calculations)	54	54	54						
Are P&M in safe range as per PM curve	Y	Y	Y						
Result (Safe/Unsafe)	S	S	S						

**Wooden Columns**
 Yes  No

**Steel Columns**
 Yes  No

**Masonry Wall**
 Yes  No

**V Capacity of Vertical Structural Elements (One Form/Floor) Floor No: 1**
**A.3**
**RCC Columns**
 Yes  No

Member No. or Designation	A1, A11, D1	A2 to A10, D2 to D10	B1, C1	B2 to B10, C2 to C10	B11	C11	D11	B12	C12
Member Damage Category	S0	S0	S0	S0	S0	S0	S1	S1	S0
Column Size b	610	610	610	610	610	610	610	610	610
Column Size d	360	360	360	360	360	360	360	360	360
Rebar percentage (0.8%, 1% or 1.2%)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Rebar grade (fy=250 or 415)	250	250	250	250	250	250	250	250	250
Concrete grade (M10, M15 or M20)	10	10	10	10	10	10	10	10	10
Estimated Load P (kN)	256.6	369.4	317.8	438.5	428.8	583.4	473.5	172.1	276.8
Estimated Moment M (kN-m)	0	0	0	0	0	0	0	0	0
Graph Number (used in calculations)	54	54	54	54	54	54	54	54	54
Are P&M in safe range as per PM curve	Y	Y	Y	Y	Y	Y	Y	Y	Y
Result (Safe/Unsafe)	S	S	S	S	S	S	S	S	S

**RCC Columns**
 Yes  No

Member No. or Designation	C1-12	C2-12	D12						
Member Damage Category	S0	S0	S0						
Column Size b	350	350	610						
Column Size d	250	250	360						
Rebar percentage (0.8%, 1% or 1.2%)	0.8	0.8	0.8						
Rebar grade (fy=250 or 415)	250	250	250						
Concrete grade (M10, M15 or M20)	10	10	10						
Estimated Load P (kN)	176.5	130.7	140.7						
Estimated Moment M (kN-m)	0	0	0						
Graph Number (used in calculations)	54	54	54						
Are P&M in safe range as per PM curve	Y	Y	Y						
Result (Safe/Unsafe)	S	S	S						

**Wooden Columns**
 Yes  No

**Steel Columns**
 Yes  No

**Masonry Wall**
 Yes  No

**V Capacity of Vertical Structural Elements (One Form/Floor) Floor No: Ground**
**A.3**
**RCC Columns**
 Yes  No

Member No. or Designation	A1, A11, D1	A2 to A10, D2 to D10	B1, C1	B2 to B10, C2 to C10	B11	C11	D11	B12	C12
Member Damage Category	S0	S0	S0	S0	S0	S0	S1	S1	S0
Column Size b	610	610	610	610	610	610	610	610	610
Column Size d	360	360	360	360	360	360	360	360	360
Rebar percentage (0.8%, 1% or 1.2%)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Rebar grade (fy=250 or 415)	250	250	250	250	250	250	250	250	250
Concrete grade (M10, M15 or M20)	10	10	10	10	10	10	10	10	10
Estimated Load P (kN)	441.2	624.1	543.6	731.6	713.2	952.2	782.2	290.7	460.8
Estimated Moment M (kN-m)	0	0	0	0	0	0	0	0	0
Graph Number (used in calculations)	54	54	54	54	54	54	54	54	54
Are P&M in safe range as per PM curve	Y	Y	Y	Y	Y	Y	Y	Y	Y
Result (Safe/Unsafe)	S	S	S	S	S	S	S	S	S

**RCC Columns**
 Yes  No

Member No. or Designation	C1-12	C2-12	D12						
Member Damage Category	S0	S0	S0						
Column Size b	350	350	610						
Column Size d	250	250	360						
Rebar percentage (0.8%, 1% or 1.2%)	0.8	0.8	0.8						
Rebar grade (fy=250 or 415)	250	250	250						
Concrete grade (M10, M15 or M20)	10	10	10						
Estimated Load P (kN)	292.6	226.2	247.7						
Estimated Moment M (kN-m)	0	0	0						
Graph Number (used in calculations)	54	54	54						
Are P&M in safe range as per PM curve	Y	Y	Y						
Result (Safe/Unsafe)	S	S	S						

**Wooden Columns**
 Yes  No

**Steel Columns**
 Yes  No

**Masonry Wall**
 Yes  No

**VI Capacity of Horizontal Structural Elements (One Form/Suspended Slab) Suspended Slab No: Roof**
**A.4**
**Jack Arch Floor Slab**
 Yes  No

**RCC Floor One Way Slab**
 Yes  No

Member No. or Designation	SL1	SL3	SL4						
Member Damage Category	S0	S0	S0						
Short Span (m)	3.1	2.65	3.2						
Depth (mm)	125	125	125						
Rebar percentage (0.12% or 0.2%)	0.12	0.12	0.12						
Rebar grade (fy=250 or 415)	250	250	250						
Estimated Floor Load (kN/m <sup>2</sup> )	2.5	2.5	2.5						
Graph Number (used in calculations)	28	28	28						
Undamaged Permissible Load	0.1	0.2	0.1						
Effective Permissible Load	0.1	0.2	0.1						
Result (Safe/Unsafe)	U	U	U						

**RCC Floor Two Way Slab**
 Yes  No

Member No. or Designation	SL2								
Member Damage Category	S0								
Short Span (m)	2.65								
Depth (mm)	125								
Rebar percentage (0.12% or 0.2%)	0.12								
Rebar grade (fy=250 or 415)	250								
Estimated Floor Load (kN/m <sup>2</sup> )	2.5								
Graph Number (used in calculations)	29								
Undamaged Permissible Load	3								
Effective Permissible Load	3								
Result (Safe/Unsafe)	S								

**RCC Beam**
 Yes  No

Member No. or Designation	On grid-A&D between Grid 1 to 11	On grid-B&C between Grid 1 to 11	Between grid-A&B on Grid 1&11	Between grid-C&D on Grid 1	Between grid-A&B on Grid 2 to 10	Between grid-C &D on Grid 2 to 10	Between grid-C&D on Grid 11	Between grid-B&C on Grid 1	Between grid-B&C on Grid 2 to 10
Member Damage Category	S0	S0	S0	S0	S0	S0	S1	S0	S0
Span of Beam(m)	3.1	3.1	9.1	9.1	9.1	9.1	9.1	2.65	2.65
Depth of Beam (mm)	250	250	760	760	760	760	760	250	250
Width of beam (230/300/350mm)	350	350	350	350	350	350	350	350	350
Rebar percentage (0.2%/0.3%/0.4%)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Rebar grade (fy=250 or 415)	250	250	250	250	250	250	250	250	250
Estimated Load on Beam	4.36	8.63	7.25	7.25	14.5	14.5	18.52	3.72	7.45
Graph Number (used in calculations)	48	48	48	48	48	48	48	48	48
Undamaged Permissible Load (kN/m)	1.5	1.5	0.1	0.1	0.1	0.1	0.1	2.5	2.5
Effective Permissible Load	1.5	1.5	0.1	0.1	0.1	0.1	0.1	2.5	2.5
Result (Safe/Unsafe)	U	U	U	U	U	U	U	U	U

**RCC Beam**
 Yes  No

Member No. or Designation	Between grid-B&C on Grid 11	Between grid-B&C on Grid 12	Between grid-C&C1 on Grid 12	Between grid-C1&C2 on Grid 12	Between grid-C2&D on Grid 12				
Member Damage Category	S0	S0	S0	S0	S0				
Span of Beam(m)	2.65	2.65	3.2	3	3				
Depth of Beam (mm)	250	250	890	660	590				
Width of beam (230/300/350mm)	350	350	350	350	350				
Rebar percentage (0.2%/0.3%/0.4%)	0.2	0.2	0.2	0.2	0.2				
Rebar grade (fy=250 or 415)	250	250	250	250	250				
Estimated Load on Beam (kN/m)	7.44	3.72	4.5	5.6	2.8				
Graph Number (used in calculations)	48	48	48	48	48				
Undamaged Permissible Load	2.5	2.5	20	15	12				
Effective Permissible Load (kN/m)	2.5	2.5	20	15	12				
Result (Safe/Unsafe)	U	U	S	S	S				

**Wooden Beam or Joist**
 Yes  No

**Steel Beam or Joist**
 Yes  No

**VI Capacity of Horizontal Structural Elements (One Form/Suspended Slab) Suspended Slab No: 2**
**Jack Arch Floor Slab**
 Yes  No

**RCC Floor One Way Slab**
 Yes  No

Member No. or Designation	SL1	SL3	SL4						
Member Damage Category	S0	S0	S0						
Short Span (m)	3.1	2.65	3.2						
Depth (mm)	125	125	125						
Rebar percentage (0.12% or 0.2%)	0.12	0.12	0.12						
Rebar grade (fy=250 or 415)	250	250	250						
Estimated Floor Load (kN/m <sup>2</sup> )	2.5	2.5	2.5						
Graph Number (used in calculations)	28	28	28						
Undamaged Permissible Load	0.1	0.2	0.1						
Effective Permissible Load	0.1	0.2	0.1						
Result (Safe/Unsafe)	U	U	U						

**RCC Floor Two Way Slab**
 Yes  No

Member No. or Designation	SL2								
Member Damage Category	S0								
Short Span (m)	2.65								
Depth (mm)	125								
Rebar percentage (0.12% or 0.2%)	0.12								
Rebar grade (fy=250 or 415)	250								
Estimated Floor Load (kN/m <sup>2</sup> )	2.5								
Graph Number (used in calculations)	29								
Undamaged Permissible Load	3								
Effective Permissible Load	3								
Result (Safe/Unsafe)	S								

**RCC Beam**
 Yes  No

Member No. or Designation	On grid-A&D between Grid 1 to 11	On grid-B&C between Grid 1 to 11	Between grid-A&B on Grid 1&11	Between grid-C&D on Grid 1	Between grid-A&B on Grid 2 to 10	Between grid-C &D on Grid 2 to 10	Between grid-C&D on Grid 11	Between grid-B&C on Grid 1	Between grid-B&C on Grid 2 to 10
Member Damage Category	S0	S0	S0	S0	S0	S0	S1	S0	S0
Span of Beam(m)	3.1	3.1	9.1	9.1	9.1	9.1	9.1	2.65	2.65
Depth of Beam (mm)	250	250	760	760	760	760	760	250	250
Width of beam (230/300/350mm)	350	350	350	350	350	350	350	350	350
Rebar percentage (0.2%/0.3%/0.4%)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Rebar grade (fy=250 or 415)	250	250	250	250	250	250	250	250	250
Estimated Load on Beam	4.36	8.63	7.25	7.25	14.5	14.5	18.52	3.72	7.45
Graph Number (used in calculations)	48	48	48	48	48	48	48	48	48
Undamaged Permissible Load (kN/m)	1.5	1.5	0.1	0.1	0.1	0.1	0.1	2.5	2.5
Effective Permissible Load	1.5	1.5	0.1	0.1	0.1	0.1	0.1	2.5	2.5
Result (Safe/Unsafe)	U	U	U	U	U	U	U	U	U

**RCC Beam**
 Yes  No

Member No. or Designation	Between grid-B&C on Grid 11	Between grid-B&C on Grid 12	Between grid-C&C1 on Grid 12	Between grid-C1&C2 on Grid 12	Between grid-C2&D on Grid 12				
Member Damage Category	S0	S0	S0	S0	S0				
Span of Beam(m)	2.65	2.65	3.2	3	3				
Depth of Beam (mm)	250	250	890	660	590				
Width of beam (230/300/350mm)	350	350	350	350	350				
Rebar percentage (0.2%/0.3%/0.4%)	0.2	0.2	0.2	0.2	0.2				
Rebar grade (fy=250 or 415)	250	250	250	250	250				
Estimated Load on Beam (kN/m)	7.44	3.72	4.5	5.6	2.8				
Graph Number (used in calculations)	48	48	48	48	48				
Undamaged Permissible Load	2.5	2.5	20	15	12				
Effective Permissible Load (kN/m)	2.5	2.5	20	15	12				
Result (Safe/Unsafe)	U	U	S	S	S				

**Wooden Beam or Joist**
 Yes  No

**Steel Beam or Joist**
 Yes  No

**VI Capacity of Horizontal Structural Elements (One Form/Suspended Slab) Suspended Slab No: 1**
**Jack Arch Floor Slab**
 Yes  No

**RCC Floor One Way Slab**
 Yes  No

Member No. or Designation	SL1	SL3	SL4						
Member Damage Category	S0	S0	S0						
Short Span (m)	3.1	2.65	3.2						
Depth (mm)	125	125	125						
Rebar percentage (0.12% or 0.2%)	0.12	0.12	0.12						
Rebar grade (fy=250 or 415)	250	250	250						
Estimated Floor Load (kN/m <sup>2</sup> )	2.5	2.5	2.5						
Graph Number (used in calculations)	28	28	28						
Undamaged Permissible Load	0.1	0.2	0.1						
Effective Permissible Load	0.1	0.2	0.1						
Result (Safe/Unsafe)	U	U	U						

**RCC Floor Two Way Slab**
 Yes  No

Member No. or Designation	SL2								
Member Damage Category	S0								
Short Span (m)	2.65								
Depth (mm)	125								
Rebar percentage (0.12% or 0.2%)	0.12								
Rebar grade (fy=250 or 415)	250								
Estimated Floor Load (kN/m <sup>2</sup> )	2.5								
Graph Number (used in calculations)	29								
Undamaged Permissible Load	3								
Effective Permissible Load	3								
Result (Safe/Unsafe)	S								

**RCC Beam**
 Yes  No

Member No. or Designation	On grid-A&D between Grid 1 to 11	On grid-B&C between Grid 1 to 11	Between grid-A&B on Grid 1&11	Between grid-C&D on Grid 1	Between grid-A&B on Grid 2 to 10	Between grid-C &D on Grid 2 to 10	Between grid-C&D on Grid 11	Between grid-B&C on Grid 1	Between grid-B&C on Grid 2 to 10
Member Damage Category	S0	S0	S0	S0	S0	S0	S1	S0	S0
Span of Beam(m)	3.1	3.1	9.1	9.1	9.1	9.1	9.1	2.65	2.65
Depth of Beam (mm)	250	250	760	760	760	760	760	250	250
Width of beam (230/300/350mm)	350	350	350	350	350	350	350	350	350
Rebar percentage (0.2%/0.3%/0.4%)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Rebar grade (fy=250 or 415)	250	250	250	250	250	250	250	250	250
Estimated Load on Beam	4.36	8.63	7.25	7.25	14.5	14.5	18.52	3.72	7.45
Graph Number (used in calculations)	48	48	48	48	48	48	48	48	48
Undamaged Permissible Load (kN/m)	1.5	1.5	0.1	0.1	0.1	0.1	0.1	2.5	2.5
Effective Permissible Load	1.5	1.5	0.1	0.1	0.1	0.1	0.1	2.5	2.5
Result (Safe/Unsafe)	U	U	U	U	U	U	U	U	U

**RCC Beam**
 Yes  No

Member No. or Designation	Between grid-B&C on Grid 11	Between grid-B&C on Grid 12	Between grid-C&C1 on Grid 12	Between grid-C1&C2 on Grid 12	Between grid-C2&D on Grid 12				
Member Damage Category	S0	S0	S0	S0	S0				
Span of Beam(m)	2.65	2.65	3.2	3	3				
Depth of Beam (mm)	250	250	890	660	590				
Width of beam (230/300/350mm)	350	350	350	350	350				
Rebar percentage (0.2%/0.3%/0.4%)	0.2	0.2	0.2	0.2	0.2				
Rebar grade (fy=250 or 415)	250	250	250	250	250				
Estimated Load on Beam (kN/m)	7.44	3.72	4.5	5.6	2.8				
Graph Number (used in calculations)	48	48	48	48	48				
Undamaged Permissible Load	2.5	2.5	20	15	12				
Effective Permissible Load (kN/m)	2.5	2.5	20	15	12				
Result (Safe/Unsafe)	U	U	S	S	S				

**Wooden Beam or Joist**
 Yes  No

**Steel Beam or Joist**
 Yes  No

**VII BUILDING SAFETY LEVEL**

<b>Floor No. 2</b>		
<b>Structural Element</b>	<b>Safe (Nos.)</b>	<b>Unsafe (Nos.)</b>
RCC column	49	0
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)	0	24
RCC slab (Two-Way)	10	0
RCC Beam	3	79
Wooden Beam		
Steel Beam		
<b>Floor No. 1</b>		
<b>Structural Element</b>	<b>Safe (Nos.)</b>	<b>Unsafe (Nos.)</b>
RCC column	49	0
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)	0	24
RCC slab (Two-Way)	10	0
RCC Beam	2	80
Wooden Beam		
Steel Beam		
<b>Floor No. Ground</b>		
<b>Structural Element</b>	<b>Safe (Nos.)</b>	<b>Unsafe (Nos.)</b>
RCC column	49	0
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)	0	24
RCC slab (Two-Way)	10	0
RCC Beam	2	80
Wooden Beam		
Steel Beam		
<b>Floor No.</b>		
<b>Structural Element</b>	<b>Safe (Nos.)</b>	<b>Unsafe (Nos.)</b>
RCC column		
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)		
RCC slab (Two-Way)		
RCC Beam		
Wooden Beam		
Steel Beam		

<b>Floor No.</b>		
<b>Structural Element</b>	<b>Safe (Nos.)</b>	<b>Unsafe (Nos.)</b>
RCC column		
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)		
RCC slab (Two-Way)		
RCC Beam		
Wooden Beam		
Steel Beam		
<b>Floor No.</b>		
<b>Structural Element</b>	<b>Safe (Nos.)</b>	<b>Unsafe (Nos.)</b>
RCC column		
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)		
RCC slab (Two-Way)		
RCC Beam		
Wooden Beam		
Steel Beam		
<b>Floor No.</b>		
<b>Structural Element</b>	<b>Safe (Nos.)</b>	<b>Unsafe (Nos.)</b>
RCC column		
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)		
RCC slab (Two-Way)		
RCC Beam		
Wooden Beam		
Steel Beam		
<b>Floor No.</b>		
<b>Structural Element</b>	<b>Safe (Nos.)</b>	<b>Unsafe (Nos.)</b>
RCC column		
Wooden Column		
Steel Column		
Masonry Wall		
Jack Arch Floor		
RCC slab (One-Way)		
RCC slab (Two-Way)		
RCC Beam		
Wooden Beam		
Steel Beam		

**RESULTS**

**I Building Damage Safety Level (On the basis of visual condition assessment)**

S0 - S2

S3

S4

S5

**II Detailed Assessment of the Building (On the basis of calculations)**

S0 - S2

S3

S4

S5

**III Further Evaluation Recommended**

Yes

No

**COMMENTS AND REMARKS**

---

---

---

---

---

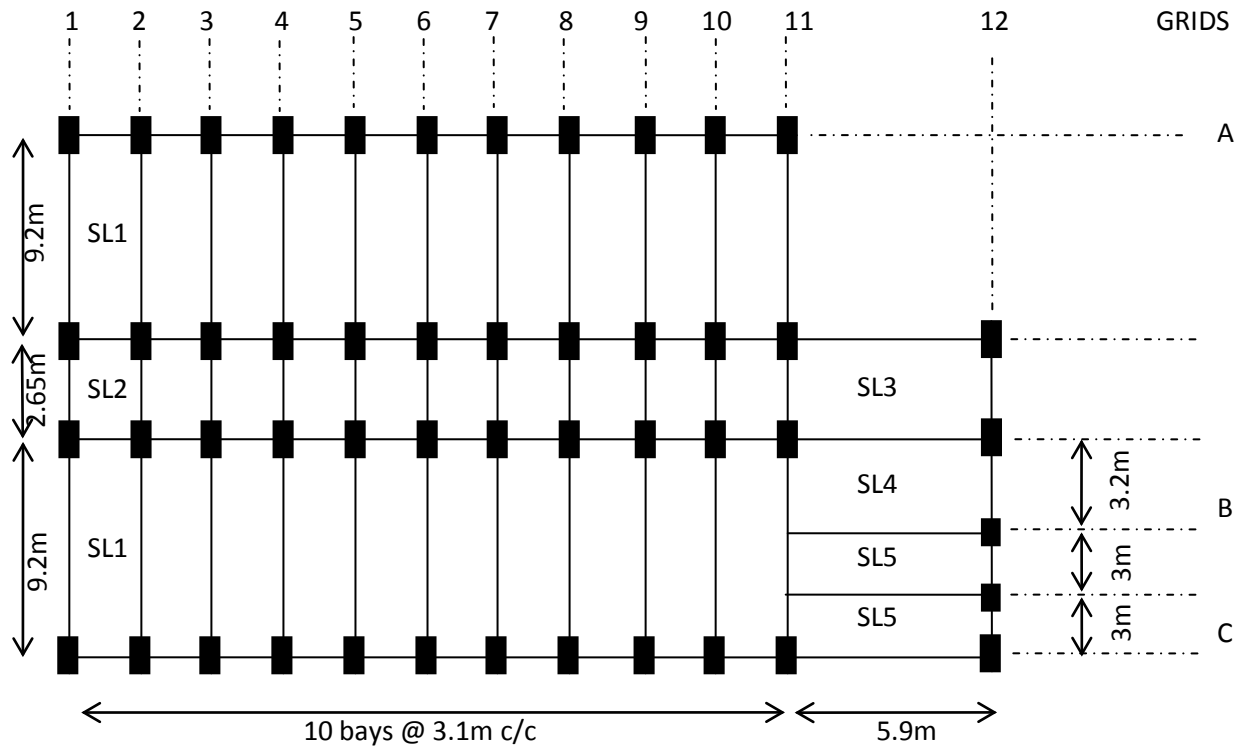
---

---

---

---

---



## Building Photographs



Roof view showing the column positions



**Outside view**



**Outside view**



**Expansion joint splitting the structure into two buildings**



**Beam-column joint**



**surface crack in concrete column**