नेपाल सरकार

शहरी विकास मन्त्रालय

योजना, भवन तथा आवास महाशाखा

पत्र संख्याः- यो.२०८२/०८३ -६३ (२४)

चलानी नं.:- २८२

श्री महानिर्देशक

दर्ता नं.:-४४२ मितिः२०८२/०६/०२

मितिः-२०८२।६।२

सिंहदरबार,
काठमाण्डौं, नेपाल ।

श्री शहरी विकास तथा भवन निर्माण विभाग,
बबरमहल, काठमाण्डौ ।

भवन महाशाखा
दर्ता नं: ९३६
मितिः२०८२।०६।०४

विषयः Post Fire Rapid Damage Assessment Checklist सम्बन्धमा ।

प्रस्तुत विषयमा २०८२ साल भाद्र २३ र २४ गते युवाहरूको आह्वानमा भएको आन्दोलनको क्रममा आगजनी तथा तोडफोडबाट क्षतिग्रस्त सरकारी, संस्थागत तथा अन्य भवनहरूको क्षति आंकलनका लागि शहरी विकास तथा भवन निर्माण विभागवाट विभिन्न सरोकारवाला संघ संस्था एंव विज्ञहरूसँग छलफल पश्चात तयार गरी विभागको मिति २०८२।०५।३१ को निर्णय बमोजिम पेश भएको " Post Fire Rapid Damage Assessment Checklist " यस मन्त्रालयको (सचिवस्तर) मिति २०८२/०५/३१ को निर्णयानुसार स्वीकृत भएकोले स्वीकृत टिप्पणी फाइल यसै पत्रसाथ संलग्न राखी आवश्यक कार्यार्थ पठाइएको व्यहोरा निर्देशानुसार अनुरोध छ ।

Nikash

(निकाश रेग्मी)
इन्जिनियर

इ. मचाकाजी महर्जन
महानिर्देशक

सुनिल कुमार ठाकुर
उप-महानिर्देशक
भवन महाशाखा

फोनः ०१-४२११८८३, ४२११६७३ फ्याक्स नं.: ९७७-१-४२११८७३, ९७७-१-४२००२४६
इमेलः info@moud.gov.np, वेवसाइटः www.moud.gov.np

हालको Gen Z आन्दोलनको क्रममा आगलागीबाट क्षति भएका भवनहरुको Post fire rapid damage assessment सम्बन्धि प्राविधिक मुल्याङ्कन कार्यलाई छिटो, छरितो र प्रभावकारी बनाउन यी निर्देशनहरु जारी गरिएको छन् ।

१ क्षति भएका संघीय स्तरका सरकारी भवनहरुको हकमा शहरी विकास मन्त्रालय र शहरी विकास तथा भवन निर्माण विभाग अन्तर्गतका बिल्डिङ्ग एण्ड आर्किटेक्ट उपसमूहका प्राविधिकहरुबाट खटिएको टोली अन्तर्गत assessment गर्ने ।

२. प्रदेश तथा स्थानीय तहहरुका सरकारी भवनहरुको हकमा सम्बन्धित प्रदेश तथा स्थानीय तहहरुले शहरी विकास मन्त्रालयले स्वीकृत गरेको Post fire rapid damage assessment को checklist ढाँचामा assessment गरी तोकेको ढाँचामा sticker टाँस गरी assessment गर्ने । शहरी विकास तथा भवन निर्माण विभाग अन्तर्गत भवन निर्माण तथा डिजाइन शाखामा Post fire damage assessment को checklist सहितको प्रतिवेदन पेश गर्नुपर्ने ।

३. अन्य निजी भवनहरुको हकमा सम्बन्धित प्रदेश तथा स्थानीय तहहरुसँग समन्वय गरी शहरी विकास तथा भवन निर्माण विभागबाट अनुमति लिई विभिन्न विषयगत विज्ञ वा संस्थाहरुले शहरी विकास मन्त्रालयले स्वीकृत गरेको Post fire rapid damage assessment को checklist ढाँचामा assessment गर्ने । तोकेको ढाँचामा sticker टाँस गरी Post fire damage assessment गरी शहरी विकास तथा भवन निर्माण विभाग अन्तर्गत भवन निर्माण तथा डिजाइन शाखामा assessment को checklist सहितको प्रतिवेदन पेश गर्नुपर्ने ।

४ Post fire rapid damage assessment गर्न शहरी विकास तथा भवन निर्माण विभागबाट अनुमति लिनुपर्ने र सो लिंदा assessment गर्ने भवनको विवरण र assessment गर्ने टोलीको सम्पर्क नं. , assessment गर्ने कार्यतालिका सहितको विवरण खुलाउने पर्ने , उक्त टोलीमा structural engineer वा भवनको structural design/ supervision सम्बन्धि अनुभव भएका प्राविधिकको नेतृत्वमा टोली गठन गरी परिचालन हुनुपर्ने ।

५. भवनहरुको Post fire rapid damage assessment गर्दा प्राविधिक द्विविधा वा समस्या भएमा संघीय स्तरका सरकारी भवनहरुको हकमा शहरी विकास तथा भवन निर्माण विभागसँग समन्वय गर्ने र अन्य सरकारी तथा निजी भवनहरुको हकमा तपसिल बमोजिमको विज्ञ टोलीसँग समन्वय गर्न सकिने ।

विज्ञ टोली

१. SAENep प्रतिनिधि डा. सुदन त्रिपाठी ९८५१३०२०८७
२. NEA प्रतिनिधि, सजय कुमार शाह, ९८४१४०१३६०
३. IOE , प्रतिनिधि, डा. क्षितिज चरण श्रेष्ठ, ९८६१७७२७१७
४. SEEN प्रतिनिधि, ओम सागर बन्जारा, ९८४३३७४१४३
५. MB University प्रतिनिधि , किशोर तिमसिना ९८४९१४७७९२
६. NSET प्रतिनिधि , प्रयास मल्ल ९८४६७३९४३१
७. विज्ञ, द्वारिका श्रेष्ठ , ९८४१२७२२३६

माथिको विज्ञ टोलीले शहरी विकास तथा भवन निर्माण विभागसँग समन्वय गरी रायसुझाव उपलब्ध गराउनु पर्नेछ ।

६. आवश्यकता अनुसार शहरी विकास तथा भवन निर्माण विभागले थप निर्देशनहरु प्रदान गर्न सक्ने र Post fire rapid damage assessment सोही बमोजिम संचालन गर्नुपर्नेछ ।

अनुसूचि

१. Post fire damage assessment को checklist

२. Post fire damage assessment सम्बन्धि टाँस गर्ने Green, Yellow र Red Sticker

सुनिल कुमार ठाकुर
उप-महानिर्देशक
भवन महाशाखा

POST-FIRE RAPID DAMAGE ASSESSMENT OF REINFORCED CONCRETE BUILDINGS

POST-FIRE RAPID DAMAGE ASSESSMENT OF REINFORCED CONCRETE BUILDINGS			
1. Inspection			
Inspector ID:		Inspection Date:	BS / /
Inspector Name:		Inspection Time:	
Organization:		Areas Inspected:	☐ Exterior Only ☐Exterior & Interior
Date of Fire Incident:		Time of Fire Incident (approx..):	
Duration of Fire (approx..) in hours:		Fire-fighting method used:	☐ Water ☐ Foam ☐ Chemical ☐ Others (please describe): No
Location of Fire:	☐ Basement ☐ Ground Floor ☐ First Floor ☐ Second Floor ☐ ..... ☐	Fire started from which room:	(mention the room name and indicate it on floor plan)
Explosion, if any:	☐ Gas cylinder ☐ Explosives ☐ Others	Location of Explosion:	(mention the room name and indicate it on floor plan)
2. Building Description:			
Building Name/No:		Block Name:	

Address:		Phone no.:	
District:			
Municipality/ Rural Mun:		Ward No.:	
		Tole:	
Google Plus Code:	(to be obtained from google map)	Location Map:	☐ Attached
			☐ Not-attached
Building Age (in years):		Number of storeys of the building:	
3. Occupancy Type:			
	Residential:	☐ Individual House	☐ Apartment
		☐ Hostel	☐ Office Quarter
		☐ Others	
	Educational:	☐ School	☐ College
		☐ University	☐ Others
	Lifeline:	☐ Hospital	☐ Police Station
		☐ Fire Station	☐ Power Station
		☐ Water Plant	☐ Sewerage T Plant
		☐ Army Barrack	☐ Others
	Commercial:	☐ Hotel	☐ Shops
		☐ Mall	☐ Recreational
		☐ Dept. Stores	☐ Others
	Office:	☐ Federal Govt.	☐ Municipality
		☐ Provincial Govt.	☐ Rural Municipality
		☐ Private	☐ Semi-govt.
	Mixed Use:	☐ Residential-commercial	☐ Residential-industrial

	Others:	☐ (Please state):	
4. Safety/Access			
Fire extinguished completely:	☐ Yes	Safe to approach:	☐ Yes
	☐ No		☐ No (Give Reason):
Entry to the building allowed by the authority:	☐ Yes ☐ No		
5. Structural System			
	☐ Moment Frame	☐ Moment Frame with braces	
	☐ Moment Frame with Shear Wall	☐ Others (Please State):	
6. Structural Components			
	Floor System:	☐ In-situ	☐ Pre-cast Planks with in-situ screed
		☐ Pre-cast	☐ Others (Please describe):
	Roof System:	☐ Flat	☐ Hipped
		☐ Pitched	☐ Others (Please describe):
	Roof System materials:	☐ In-situ	☐ Pre-cast Planks with in-situ screed
		☐ Pre-cast	☐ Others (Please describe):

7. Openings/ Curtain wall details			
Door Frames/Shutters :	☐ Timber	Window Frames/ Shutters:	☐ Timber
	☐ uPVC		☐ uPVC
	☐ Aluminium		☐ Aluminium
	☐ Steel		☐ Steel
Curtain Walls:	☐ Glass with aluminium frames		
	☐ Glass with steel frames		
	☐ Glass with uPVC frames		
	☐ Glass with Timber Frames		
Partition Wall Type (interior walls):	☐ Bricks		
	☐ Gypsum Board		
	☐ Others		
External Wall Type:	☐ Bricks		
	☐ Gypsum Board		
	☐ Others		
Material of False Ceiling:			
Approx. Plinth Area of the Building:	..... sq.m.		

8. External Condition of the Building (as observed from Visual Inspection)		
General appearances:		Remarks
	☐ No visible damage	
	☐ Smoke staining only	
	☐ Leaning/distortion of the structure	# (see note)
	☐ Partial Collapse	*
	☐ Roof Collapse only	Entry with Caution
	☐ Fully Collapsed	# (see note)
	☐ Hazards from adjacent structures/utilities	# (see note)
**Note: It is not necessary to proceed for further inspection if the building is leaning/tilted, fully collapsed or if there is hazard from adjacent structures/ utilities.*		

9. Internal Condition of Building (as observed from the visual inspection)

Damage Level of Structural Components (Refer to appendix-I & III for details)

- To be prepared for each floor/roof.
- Description of categories of damage level is given in appendix-I.
- Fill-in the percentage of each element damaged under light/insignificant, moderate and heavy damage level in appendix-III table for each floor separately.
- Prepare damage level mapping as shown in appendix-II for each floor.

Floor level: Basement (to be filled only if basement is there)

Major Floor Occupancy Type:

Elements	**Soot Deposition (DC)**	**Cracked (CR)**	**Concrete Spalling (SP)**	**Rebar Exposed (RE)**	**Sagging/ Buckling (SG)**	**Loss of Section (LS)**
Slabs						
Beams						
Columns						
Shear walls						
Beam-column joints						
Infill walls						
Staircase						

Use the table shown in the appendix-III for showing percentage of elements damaged under each category of damage level.

Damage Level of Non-Structural Components

Floor Level: Basement (to be filled only if basement is there)

Elements	**Soot Deposition (DC)**	**Burnt (BT)**	**Bended (BD)**	**Twisted (TW)**	**Melted (ML)**	**Damaged (DM)**
Doors/ windows						
Cladding/ Glazings						
False Ceilings						
Partition walls						
Plumbing systems						
Electrical & Allied System						
Floor Finishes						
Fire Fighting/Protection Systems						
Plaster						

Use the table shown in the appendix-III for showing percentage of elements damaged under each category of damage level.

Draw the freehand sketch of the floor showing damage in structural elements and also label the occupancy type of each room):

Sketch:

Floor Level: Ground Floor						
Damage Level of Structural Components						
Major Floor Occupancy Type:						
Elements	**Soot Deposition (DC)**	**Cracked (CR)**	**Concrete Spalling (SP)**	**Rebar Exposed (RE)**	**Sagging/ Buckling (SG)**	**Loss of Section (LS)**
Slabs						
Beams						
Columns						
Shear walls						
Infill walls						
Beam-column joints						
Staircases						
Damage Level of Non-Structural Components						
Elements	**Soot Deposition (DC)**	**Burnt (BT)**	**Bended (BD)**	**Twisted (TW)**	**Melted (ML)**	**Damaged (DM)**
Doors/ windows						
Cladding/ Glazings						
Curtain Walls						
False Ceilings						
Partition walls						
Plumbing systems						
Electrical & Allied Systems						
Floor Finishes						
Fire Fighting/Protection Systems						

Use the table shown in the appendix-III for showing percentage of elements damaged under each category of damage level.

Use the table shown in the appendix-III for showing percentage of elements damaged under each category of damage level.

Draw the freehand sketch of the floor showing damage in structural elements and also label the occupancy type of each room):
Sketch:

Other Floors:	
(Add Pages to include details similar to those shown for the basement and & the Ground Floor)	

10. Other Hazards Present		
Falling Debris	☐ Yes	☐ No
Hot spots/ smoldering	☐ Yes	☐ No
Hazardous materials (chemicals/Fuels)	☐ Yes	☐ No
Gas Leaks	☐ Yes	☐ No
Exposed Electric Components	☐ Yes	☐ No
Blocked exits	☐ Yes	☐ No
11. Overall Safety Rating for Occupying the Building		

Rating	Assessment Decision	Safety Type
☐ **RED**	Unsafe, No Entry	Immediate Danger.
☐ **YELLOW**	Restricted Entry	Potential Danger.
☐ **GREEN**	Safe to Occupy	Minor Structural Damage, No hazard observed.

Justifications for the Rating given:(Please describe in detail)	

12. Recommended Immediate Actions		
	☐ Barricade the Whole Building restricting entry and occupancy	
	☐ Barricade Unsafe Areas/ Floors	
	☐ Post Warning Signage/ Placard	
	☐ Emergency Shoring to be provided	
	☐ Engage experts for Detailed Assessment	
	☐ Demolish the whole/unsafe parts	
	Others	
13. Documentation		
	☐ Photographs/videos of all possible building facades	
	☐ Photographs videos of melted/burnt/warped/damaged elements	
	☐ Photographs/ videos showing damages to the structural and non-structural elements	
	☐ Damage mapping on Floor Plans	
	☐ Building Drawings/Reports (if available)/ If not, freehand sketch	
	☐ Photographs/ videos showing nature of the burnt materials	
14. Further Comments, if any:		

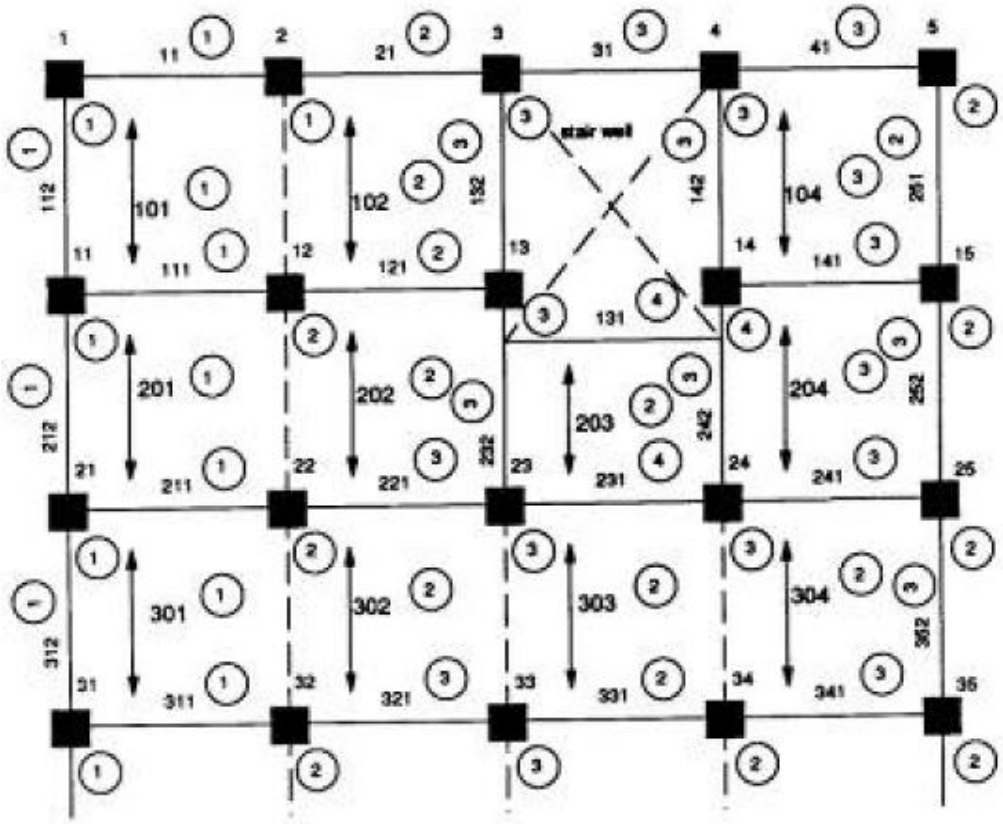
Appendix- I

GUIDELINES FOR IDENTIFYING DAMAGE LEVELS

Damage Grade	Damage Level	Description	Visual Indicators	Recommended Actions	Source
1	**Light/ Insignificant**	No damage/ soot clearance only	Soot/deposits; no cracks/spalling; normal color	Safe, only cleanup required	**MassDOT**
2	**Light/ Insignificant**	Damaged with small pop-outs, crack widths <0.012" (0.3mm)	Minor pop-outs (<5mm deep); fine cracks; slight discoloration	Monitoring with no immediate closure required	**MassDOT**
3	**Moderate**	Spalling (no rebar exposed); cracks < 0.025" (0.6mm)	Shallow spalling (<10mm); moderate cracks; pink/grey color	Potential repair needed	**MassDOT, Eurocode EN 1992-1-2**
4	**Heavy**	Exposed rebar; cracks > 0.025" (0.6mm)	Deep spalling (>10mm, rebar visible); whitish-grey/ buff color; possible deflection	Engineering review required with closure	**MassDOT, fib Bulletin 46**

Appendix- II

EXAMPLE OF DAMAGE LEVEL MAPPING OF BEAMS, COLUMNS & SLABS



Location: First Floor			
Element	**Damage Class**	**Damage Level**	**Member Reference Number**
Columns	1	Light/Insignificant	1,2,11,21,31
	2	Light/Insignificant	5,12,15,22,25,32.34,35
	3	Moderate	3,4,13,23,24,33
	4	Heavy	14
Beams	1	Light/Insignificant	11,111,211,311,112,212,312
	2	Light/Insignificant	21,121,331,152
	3	Moderate	31,41,141,221,241,341,321.132,142, 232,242,252,352
	4	Heavy	131,231
Slabs	1	Light/Insignificant	101,201,301
	2	Light/Insignificant	102,202,203,302,303,304
	3	Moderate	104,204
	4	Heavy	

Appendix-III

MATRIX FOR SHOWING DAMAGE LEVELS OF STRUCTURAL & NON-STR. ELEMENTS

(Please indicate damage levels in each element as a percentage of total elements at each floor level. For example, for slabs: damage levels of cracks of extreme category: 20%, moderate category: 10%, light/insignificant category: 70%)

Floor Level: ……..

S.N.	Structural Elements	Soot Deposition (SD)	Cracks (CR)			Concrete Spalled (SP)			Rebar exposed (RE)			Sagging/buckling (SG)			Loss of Section (LS)		
			Extreme	Moderate	Light/ Insignif.	Extreme	Moderate	Light/ Insignif.	Extreme	Moderate	Light/ Insignif.	Extreme	Moderate	Light/ Insignif.	Extreme	Moderate	Light/ Insignif.
1	Slabs																
2	Beams																
3	Columns																
4	Shear Walls																
5	Beam-column joints																
6	Infill walls																
7	Staircases																
8	Others																

S.N.	Non-Structural Elements	Soot Deposition (SD)	Burnt (BUR)			Bended (BEN)			Twisted (TW)			Melted (MEL)			Damaged (DG)		
			Extreme	Moderate	Light/ Insignif.	Extreme	Moderate	Light/ Insignif.	Extreme	Moderate	Light/ Insignif.	Extreme	Moderate	Light/ Insignif.	Extreme	Moderate	Light/ Insignif.
1	Doors/ Windows																
2	Claddings/ Glazings																
3	Curtain Walls																
4	False Ceilings																
5	Partition Walls																
6	Plumbing/HVAC																
7	Electrical & Allied System																
8	Floor Finishes																
9	Fire Fighting/Protection System																