

**INFRASTRUCTURE AUDIT CHECKLIST FOR BUILDINGS**  
(Zone 4: Seismic Zone Map of the Philippines)

**I. GENERAL INFORMATION**

**IDENTIFICATION**

Region / Province : NA / CMTE City/Municipality : Maragondon  
 Barangay : Robinson 1A Street Boundary : 7 / 1

**INSPECTION**

Inspector/s: Engr. Luisa Caparos Position: Researcher Office : \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Inspection Date / Time: \_\_\_\_\_ Weather Condition: ☒ Sunny ☐ Part Sunny ☐ Cloudy

**II. BUILDING INFORMATION**

Building Name : Municipal Hall of Maragondon, Cavite  
 Address : Robinson 1A Maragondon, Cavite  
 Contact Person : Engr. Adwin Amayon ☐ Building Owner ☐ Administrator ☐ Tenant Municipal Head Engineer  
 Address : Maragondon, Cavite  
 Contact No. : \_\_\_\_\_

No. of Storey : 2 Above ground \_\_\_\_\_ Below Ground \_\_\_\_\_  
 Coordinates (if available) Latitude \_\_\_\_\_ Longitude \_\_\_\_\_

**A. Type of Building:**

☐ Concrete Frame ☒ Timber Frame ☐ Reinforced Masonry  
☐ Steel Frame ☐ Composite Steel-Concrete ☐ Unreinforced Masonry  
☐ Reinforced Concrete Shear Wall ☐ Other types, pls. specify \_\_\_\_\_

**B. Type of Structure:**

☒ Build-up Section ☐ Pre-Cast ☐ Combination  
☐ Rolled Section ☐ Cast-In-Place ☐ Other types, pls. state \_\_\_\_\_

**C. Design Occupancy:**

☐ Public Assembly ☒ Offices ☐ School  
☐ Health Center ☐ Industrial ☐ Emergency/Evacuation Center  
☐ Commercial ☐ Historical (museum?) ☐ Or pls. specify \_\_\_\_\_

**HR** Current Occupancy, please specify \_\_\_\_\_ Date of Construction / Age of Structure \_\_\_\_\_

Year Edition of NSCP used : Phil Code  
 Original Construction (Y/N)? Y Add'l Storey: NA Add'l span/overhang: NA  
 Rehabilitated (Y/N)? N Pls. describe: \_\_\_\_\_

Available Records/Documents: ☐ Geotechnical investigation ☐ Construction Plan  
☐ As-built Plan ☐ Structural Design Computation  
☐ Other, pls. specify Field Plan

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### III. RAPID VISUAL SCREENING OF BUILDING FOR POTENTIAL SEISMIC HAZARDS (from FEMA-154 2015 Data Collection Form)

TYPE OF CONSTRUCTION	Wood Frame (W1A)	Steel Frame (S1)	Concrete Frame (C1)
Basic Score	1.90	1.50	1.00
Severe Vertical Irregularity	-0.90	-0.80	-0.70
Moderate Vertical Irregularity	-0.50	-0.40	-0.40
Plan Irregularity	-0.70	-0.50	-0.40
Pre-Code (1972)	-0.30	-0.30	-0.10
Post Benchmark (wood=1986, conc.=1992, steel=2001)	1.90	1.00	1.40
Soil Type A or B (hard rock or rock)	0.50	0.3	0.20
Soil Type E (soft soil, 1-3 stories)	-0.2	-0.3	-0.1
Soil Type E (soft soil, >3 stories)	-0.4	-0.3	-0.1
FINAL SCORE, S	1.4 (0.7 min)	(0.5 min)	(0.3 min)

This seismic vulnerability assessment is aimed mainly at determining earthquake resilience, as designed by FEMA 2015 and not the present condition of the structure. The scores above are derived in part from Level 1 Form for Very High Seismicity or Zone 4 of the Seismic Zone Map of the Philippines, wherein the minimum score to be derived should be as indicated. (Note use a different form provided for buildings located in Zone 2, particularly in Sub/Taxi Law and in Palawan.)

### IV. VULNERABILITY OF BUILDING LOCATION

#### A. Previous Hazard Experience

- ☐ Volcanic      ☐ Tsunami      ☒ Ground-shaking Earthquake  
☐ Landslide      ☐ Liquefaction      ☒ Typhoon  
☐ Flooding      ☐ Fire      ☐ Others, pls. specify \_\_\_\_\_

#### B. Soil Foundation

- ☐ Sandy      ☒ Loam      ☐ Rock  
☐ Silt      ☐ Peat      ☐ Shale  
☐ Clay      ☐ Limestone      ☐ Adobe  
☐ Other types, pls. specify \_\_\_\_\_

#### C. Vulnerability to Earthquake

##### C1. Approximate Distance from a known Active Fault

- ☐ 5 meters or less      ☐ between 5m to 1km      57.5 km, approx. distance if more than 1 km.

##### C2. Ground Condition (select all that applies)

- ☐ Existence of fissures      Remarks: \_\_\_\_\_  
☐ Bulged ground      Remarks: \_\_\_\_\_  
☐ Soil Creep      Remarks: \_\_\_\_\_  
☐ Scouring (loss of Foundation support)      Remarks: \_\_\_\_\_

#### D. Vulnerability of Landslide/Soil Erosion

- D1. Approximate Distance from Hillside \_\_\_\_\_ (in meters)  
 D2. Approximate Distance from Slopes, Cliffs, Ravines \_\_\_\_\_ (in meters)  
 D3. Within Low-lying Area      ☐ Y      ☒ N  
 D4. Presence of Landslide displacement or debris encroaching      ☐ Y      ☒ N  
 D5. Presence of Bulging of Slopes      ☐ Y      ☒ N  
 D6. Presence of Cracks in Rock Slopes      ☐ Y      ☒ N  
 D7. Presence of Fissures in Soil Slopes      ☐ Y      ☒ N

**E. Vulnerability to Liquefaction**

E1. Approximate Distance form Nearest Body of Water

1.15 km (in meters)

E2. Within Reclamation Area

☐ Y ☒ N

E3. Within Low-lying Area

☐ Y ☒ N**F. Vulnerability to Tsunami**

F1. Approximate Distance from Coast/Shore line

5.4 km (in meters)

F2. Presence of Water Barriers

☐ Y ☒ N**G. Vulnerability to Flooding**

G1. Within Floodplains

☐ Y ☒ N

G2. Within Flood-prone Area

☐ Y ☒ N**H. Vulnerability to Other Hazards**

H1. Typhoon-prone Area

☒ Y ☐ N

H2. Storm-surge Prone Area

☒ Y ☐ N

H3. Within 20kms Radius of Active Volcano

☒ Y ☐ N

H4. Distance from Garbage Dumping Area

N/A (in meters)

H5. Approximate Distance from Fire Hazard

N/A (in meters)

H6. Approximate Distance from Toxic Chemical Hazard

N/A (in meters)**V. DETAILED EVALUATION**Mark: 0 1 2 3

Legend: 0 - None

1 - Minor

2 - Moderate

3 - Severe

	CONCRETE	STEEL	WOOD	Remarks/Other Observations
<b>A. STRUCTURAL</b>				
<b>A1. Exterior Part of Building</b>				
<b>1. Building Site</b>				
a. Existence of Fissures	1			minor cracks
b. Bulged Ground	0			none
c. Soil Creep	0			none
d. Others, pls. specify				
<b>2. Foundation</b>				
a. Settlement (meter)	0			minor cracks
b. Tilting (degree)	0			good condition
c. Scouring	0			"
d. Others, pls. specify				"
<b>3. Columns</b>				
a. Cracks	1			hole on the right side
-diagonal/ vertical/horizontal cracks	2			are plywood
-Panel zone cracks	0			minor cracks
b. Drifting	0			
c. Spalling	0			none
-Exposure of reinforcing bars	0			none
d. Changes in the Vertical Alignment (i.e. Column out of plumb)	0			none
e. Broken, Buckled or Fractured	0			none
f. Joints Separation	0			
g. Detached Bracing/s	0			none
h. Corrosion of Steel Member	0			
i. Evidence of Termite Infestation	0			none
j. Others, pls. specify				
<b>4. Beams</b>				
a. Cracks	1			minor cracks
-diagonal/vertical / horizontal cracks				
b. Spalling	0			none
-Exposure of reinforcing bars				

	CONCRETE	STEEL	WOOD	Remarks/Other Observations
c. Excessive Deflection	0			
d. Broken, Buckled or Fractured	0			
e. Joints Separation	0			
f. Detached Bracing	0			
g. Corrosion of Steel Member	0			none
h. Evidence of Termite Infestation	0			
i. Others, pls. specify				
<b>5. Walls</b>				
a. Cracks				
- diagonal/ vertical horizontal cracks	1			minor
b. Separation from Joints or Connections, I.e. Beam/Column	0			none
c. Spalling				
- Exposure of reinforcing bars	0			none
d. Racking	0			none
e. Solid Shear Walls				there are no shear walls
- diagonal/vertical/horizontal cracks	1			right bldg.
f. Evidence of Termite Infestation	1			minor
g. Others, pls. specify				
<b>A2. Interior Part of Building</b>				
<b>1. Foundation</b>				
a. Bowing of underground walls	-		1?	none
b. Others, pls. specify				
<b>2. Columns</b>				
a. Cracks			1	(RZ x 0.35m)
- diagonal/ vertical/ horizontal cracks			1	
b. Broken, Buckled or Fractured			1	1 column broken
c. Joints Separation			0	none
d. Spalling			0	none
- Exposure of reinforcing bars			0	none
e. Changes in the Vertical Alignment			1	1st floor
f. Detached Bracing/s			0	
g. Corrosion of Steel Member			0	
h. Evidence of Termite Infestation			0	
i. Others, pls. specify				
<b>3. Beams</b>				
a. Cracks			-	0.35 x 0.35m
- diagonal/ vertical/ horizontal cracks			0	none
b. Excessive Deflection			0	none
c. Spalling			0	none
- Exposure of reinforcing bars			0	none
d. Separation from vertical support			0	
e. Beam-column joint failure			0	
f. Corrosion of Steel Member			0	
g. Evidence of Termite Infestation			0	none
h. Others, pls. specify				
<b>4. Slab/ Flooring</b>				
a. Cracks				
- Along vertical plane of beam edge	0			
- Punching Shear	0			
b. Sagging	0			
c. Leaks	0			
d. Separation from vertical support (failure at columns)	0			
e. Spalling	0			
- Exposure of reinforcing bars	0			
f. Evidence of Termite Infestation	0			
g. Others, pls. Specify				
<b>5. Wall</b>				
a. Cracks				
- diagonal/vertical/ horizontal cracks	1			minor (D/H/V)

(may appear)



	CONCRETE	STEEL	WOOD	Remarks/Other Observations
b. Separation of Joints/Connection (i.e. Floor -wall separation Beam/Column/Slabs separation)			0	none
c. Spalling - Exposure of reinforcing bars			0	none
d. Evidence of Termite Infestation			0	P
e. Others, pls. Specify				
6. Shear Walls				
a. Spalling and exposure of vertical reinforcement at boundary elements			0	none
b. Horizontal cracks 3mm (1/8") or larger extending through boundary elements.			0	none (1mm)
c. Shear failure at piers			0	none
d. Failed spandrel beams			0	none
e. Others, pls. Specify			0	none
7. Roof Framing				
a. Separation from Wall		0	0	about 2mm
b. Cracks/Fractured at welded connections		1	1	none
c. Buckling of members (including wood)	1	1	1	minor
d. Corrosion of Steel Members		1	1	minor
e. Sagging		0	1	some of steel members
f. Evidence of Termite Infestation			1	some wood
g. Others, pls. Specify				black no wood
B. NON-STRUCTURAL				
1. Ceiling				
a. Evidence of Termite Infestation			2	some ceiling
b. Materials are not securely fastened			2	yes
c. Warping			1	sa 2nd floor
d. Others, pls. Specify				
2. Interior Walls/Partition	1 (1F)		1 (2ndF)	
a. Masonry				
a1. Separation from column to beam	0			none
a2. Cracks	0			minor cracks about (1mm)
a3. Spalling	0			none
b. Wood				
b1. Separation from column to beam			2	none (doors (2F))
b2. Cracks			1	minor
b3. Evidence of Termite Infestation			1	some
c. Glass				
c1. Separation from columns/ beams	0			none
c2. Cracks	0			none
3. Doors and Entrances				
a. Not securely fastened and cannot be closed or opened	1			(some are steel matting) none
b. Evidence of Termite Infestation			1	some
c. Glass Crack	0			none
d. Others, pls. specify				
4. Windows and Shutters				
a. Not securely fastened and cannot be closed or opened	0			(steel matting) none
b. Evidence of Termite Infestation	0			
c. Glass Crack	0			
d. Others, pls. specify				
5. Stairs				
a. Cracks on step and rise			1	rise: 0.17, run (32)
b. Sagging			0	yes (0.5")
c. Displacement of steps/ railings			0	half inch displacement
d. Separation from joints			0	none
e. Corrosion			0	none
f. Spalling			0	none
g. Evidence of Termite Infestation			0	none

	CONCRETE	STEEL	WOOD	Remarks/Other Observations
h Others, pls. Specify				
6. Cladding				
a. Materials are not securely fastened	0			none
b Others, pls. Specify				
7. Parapet				
a. Cracks	0			none (wala labag)
b Spalling	0			
c Others, pls. Specify				
8. Floor Coverings (Tiles)				
a. Cracks	2			about 0.5 - 1mm
b Displacement	0			none
c Others, pls. Specify				
9. Roof Sheets				
a. Materials are not securely fastened		1		not secured
b Corrosion		1		not all / so
c Others, pls. Specify				
10. Ramps for Differently Abled				
a. Cracks on ramps	0			none
b Displacement of railings		0		none
c Corrosion		0		none
d Spalling	0			none
e Others pls. Specify				
		Yes	No	Remarks/Other Observations
11. Presence of open space (easement)				
a. Front		1		
b. Back			1	
c. Sides			1	
12. Parking capacity not exceeding NBC requirements.				
13. Building provisions allowing people to pass within the building premises in due consideration of security, thus providing more options for pedestrian movement.		1		
14. Covered walkway connecting the building to transport waiting areas.			1	
<b>C. ANCILLARY/AUXILIARY EQUIPMENT AND FACILITIES (Optional)</b>				
1. Electrical System				
a. Convenience Outlets				many
Breakage			1	
Corrosion			1	
Loose Contact				
Others, pls. Specify				
b. Wirings				
Exposed conductor		1		
Loose connections			1	
Others, pls. Specify				
c. Fixtures				
Breakage		1		
Corrosion		1		
Others, pls. Specify				
d Generator Sets				
Not securely fastened to base support			1	
Corrosion			1	
Others, pls. Specify				
2. Water Supply System				
a. Tank				
Leakages			1	
Corrosion			1	
Spalling			1	
Leaning			1	
Others, pls. Specify				
b Pipes				
Corrosion				
Clogging				

	Yes	No	Remarks/Other Observations
Disconnected			
Leakage			
Breakage			
Others, pls. Specify			
<b>C. Faucet</b>			
Corrosion			
Broken			
Securely fastened/connected to support system			
Others, pls. Specify			
<b>3. Sanitary Piping System</b>			
<b>a. Pipes</b>			
Leakage		/	
Corrosion		/	
Breakage	/		
Clogging	/		
Securely fastened to support system	/		male urinal (b)
Others, pls. Specify			
<b>(b) Bracing</b>			
Corrosion			
Securely fastened to support system			
Others, pls. Specify			
<b>4. Air Conditioning Systems</b>			
<b>a. Bracing and Support</b>			
Securely Fastened	/		
Corrosion	/		
Others, pls. Specify			
<b>5. Emergency Exit</b>			
<b>a. Presence of at least 2 emergency exits remote</b>	/		
<b>b. Luminous directional exit signs are located</b>		/	
<b>c. Illuminated "EXIT" signs have distinctive color</b>		/	
<b>d. Illumination system of the exit is AC/DC</b>		/	
<b>e. Fire exit doors are fire resistant, swing-out type.</b>		/	no door for fire exit (open bry)
<b>f. Others, pls. Specify</b>			
<b>6. Fire Safety Device System</b>			
<b>a. Functional Smoke Detector</b>	/		
<b>b. Functional Alarm</b>	/		
<b>c. Functional Sprinkler</b>	/		
<b>d. Functional Hose</b>	/		
<b>e. Functional Fire Extinguisher</b>	/	/	
<b>f. Others, pls. Specify</b>	/		
<b>7. Communication Facilities</b>			
<b>a. Functional Telephone Line</b>	/		
<b>b. Functional Internet Access</b>	/		
<b>c. Functional Two Way Radio</b>	/		
<b>d. Others, pls. Specify</b>	/		
<b>D. ECOLOGICAL CONSIDERATION (Optional)</b>			
<b>1. Presence of natural shading using trees and</b>	/		
<b>2. Presence of open-grid pavement system.</b>	/	/	5m away from main entrance
<b>3. Presence of vegetated roofing.</b>		/	
<b>4. Presence of wastewater treatment facility.</b>		/	
<b>5. Presence of water recycling technologies and water</b>		/	
<b>6. Presence of rain water harvesting</b>		/	
<b>7. Using Natural Ventilation Techniques</b>	/		
<b>8. Using natural lighting and access to day lighting.</b>	/		
<b>9. Using renewable energy technologies, pls. specify.</b>	/	/	
<b>10. Using Efficient Lighting.</b>	/	/	
<b>11. No Smoking Policy inside the building;</b>	/	/	
<b>smoking areas are designated.</b>	/	/	
<b>12. Presence of Materials Recovery Facility</b>	/	/	
<b>13. Implementing Solid Waste Management.</b>	/	/	
<b>14. Others pls. Specify</b>	/	/	

**VI. SUMMARY REPORT****A. Rapid Visual Screening of Building for Potential Seismic Hazard**Final Score, S = 1.4 (tick box below if less than 2.0)☒ Structure may be vulnerable to Seismic Hazards**B. Vulnerability of Building Site / Location**☐ No observed locational vulnerability☐ Highly / moderately vulnerable to \_\_\_\_\_  
(list down determined vulnerabilities on IV. Vulnerability of Building Location)**C. Physical Over-All Conditions****1. Structural Defects**☐ No adverse defects☐ Presence of minor structural defects☒ Presence of some severe defect found (see photos)☐ Presence of multiple severe defects requiring investigation**2. Non-Structural Defects**☐ No adverse defects☒ Presence of minor non-structural defects☐ Presence of localized defect found (see photos)☐ Presence of interrelated defects for further investigation**3. Ancillary/Auxiliary Equipment and Facilities Defects**☐ No adverse defects☒ Presence of minor defects☐ Presence of localized defect found (see photos)☐ Presence of interrelated defects for further investigation**4. Ecological Consideration**☒ No adverse defects☐ Presence of minor ecological concerns☐ Presence of localized concern found (see photos)☐ Presence of concerns affecting community  
(for further investigation)**D. Findings and Recommendation****1. Minor Findings and Recommendation**☐ No further action required☐ Recommend to communicate with owner for Level 2 investigationRemarks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_**2. Major Findings and Recommendation**☐ Recommend to communicate with owner for Level 2 investigation☐ Recommend to communicate with owner for Level 2 investigation by structural engineerRemarks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_\_\_\_\_\_  
Inspector / Screener\_\_\_\_\_  
Supervisor / Team Lead\_\_\_\_\_  
Office of the Building Official