

Seismic Assessment based on GEM Building Taxonomy v2.0

Project _____
 Inspection time _____
 Start (local time) _____ : _____ (hh/mm) Inspection duration _____ (min)
 Completed by _____
 Function Structural eng.
 Building official


Date _____ / _____ / _____ (dd/mm/yyyy)
 Areas inspected
 Exterior and interior
 Exterior only
 Architect
 Student

General building information

Building name _____ Street name and nb _____
 Neighborhood _____ City _____ Zip/Pcode _____
 State _____ Country _____
 Coordinates _____ Longitude X _____ Latitude Y _____

Building information

OCCUPANCY	Mixed use	DATE OF CONSTRUCTION OR RETROFIT
Unknown occupancy type	Mixed, unknown type	Year unknown
Residential	Mostly residential and commercial	Exact date of construction or retrofit
Residential, unknown type	Mostly commercial and residential	Upper and lower bound for the date of construction or retrofit: between _____ and _____
Single dwelling	Mostly commercial and industrial	Latest possible date of construction retrofit
Multi-unit, unknown type	Mostly residential and industrial	Approximate date of construction or retrofit
2 Units (duplex)	Mostly industrial and commercial	
3-4 Units	Mostly industrial and residential	
5-9 Units	Industrial	
10-19 Units	Industrial, unknown type	
20-49 Units	Heavy industrial	
50+ Units	Light industrial	
Temporary lodging	Assembly	
Institutional housing	Assembly, unknown type	
Mobile home	Religious gathering	
Informal housing	Arena	
Commercial and public	Cinema or concert hall	
Commercial and public, unknown type	Other gatherings	
Retail trade	Government	
Wholesale trade and storage (warehouse)	Government, unknown type	
Offices, professional/technical services	Government, general services	
Hospital/medical clinic	Government, emergency response	
Entertainment	Education	
Public building	Education, unknown type	
Covered parking garage	Pre-school facility	
Bus station	School	
Railway station	College/university, offices and/or classrooms	
Airport	College/university, research facilities and/or labs	
Recreation and leisure	Other occupancy type	

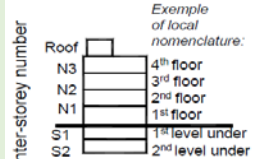
BUILDING POSITION IN A BLOCK	NUMBER OF STORY	
Unknown building position	Number of storeys unknown	
Detached building	Number of storeys above ground	
Adjoining building(s) on one side	Range of number of storeys above ground	
Adjoining building(s) on two sides	Exact number of storeys above ground	
Adjoining buildings on three sides	Approximate number of storeys above ground	
Corner building	Number of storeys below ground	
BUILDING HEIGHT	Number of storeys below ground unknown	
Height in meters _____ m	Range of number of storeys below ground	
Building tilt _____	Exact number of storeys below ground	

EXPOSURE AND CONSEQUENCES
Number of Day Occupants
Number of Night Occupants
Number of Transit Occupants
Number of Dwelling
Plan Area (m ²)
Replacement cost (per m ²)
Number of Fatalities
Number of Injured
Number Missing

inter-storey number

Roof		
N3	4 th floor	
N2	3 rd floor	
N1	2 nd floor	
N1	1 st floor	
S1	1 st level under	
S2	2 nd level under	

Example of local nomenclature:

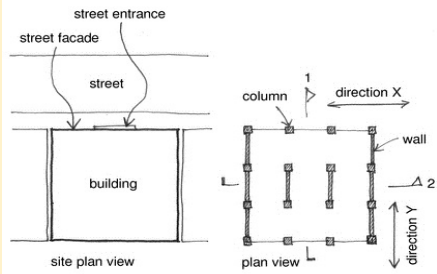


General building damage

Grade 1: Negligible to Slight Damage (<10%)	Damage to building of reinforced concrete	Damage to masonry buildings
Grade 2: Moderate Damage (10-30%)	Grade 1: Negligible to slight damage (no structural damage, slight non-structural damage)	Grade 1: Negligible to slight damage (no structural damage, slight non-structural damage)
Grade 3: Substantial to Heavy Damage (30-60%)	Fine cracks in plaster over frame members or in walls at the base.	Hair-line cracks in very few walls. Fall of small pieces of plaster only. Fall of loose stones from upper parts of buildings in very few cases.
Grade 4: Very Heavy Damage (60-90%)	Fine cracks in partitions and infills.	
Grade 5: Destruction (>90%)	Grade 2: Moderate damage (slight structural damage, moderate non-structural damage)	Grade 2: Moderate damage (slight structural damage, moderate non-structural damage)
Is there localised damage?	Cracks in columns and beams of frames and in structural walls.	Cracks in many walls. Fall of fairly large pieces of plaster.
No	Cracks in partition and infill walls; fall of brittle cladding and plaster.	Partial collapse of chimneys.
Yes (if yes please precise floor nb, location)	Falling mortar from the joints of wall panels.	
Floor number: _____	Grade 3: Substantial to heavy damage (moderate structural damage, heavy non-structural damage)	Grade 3: Substantial to heavy damage (moderate structural damage, heavy non-structural damage)
Location: _____	Cracks in columns and beam column joints of frames at the base and at joints of coupled walls. Spalling of concrete cover, buckling of reinforced rods. Large cracks in partition and infill walls, failure of individual infill panels.	Large and extensive cracks in most walls.
		Roof tiles detach. Chimneys fracture at the roof line; failure of individual non-structural elements (partitions, gable walls).
	Grade 4: Very heavy damage (heavy structural damage, very heavy non-structural damage)	Grade 4: Very heavy damage (heavy structural damage, very heavy non-structural damage)
	Large cracks in structural elements with compression failure of concrete and fracture of rebars; bond failure of beam reinforced bars; tilting of columns.	Serious failure of walls; partial structural failure of roofs and floors.
	Collapse of a few columns or of a single upper floor.	
	Grade 5: Destruction (very heavy structural damage)	Grade 5: Destruction (very heavy structural damage)
	Collapse of ground floor or parts (e.g. wings) of buildings.	Total or near total collapse.

Structural System

Direction		
Direction X (Longitudinal)		Unspecified direction
		Parallel to street
Direction Y (Transverse)		Unspecified direction
		Perpendicular to street



Material			
Concrete, unknown reinforcement	Unknown material	Unknown concrete technology	
	Concrete, unreinforced	Cast-in place concrete	
	Concrete, reinforced	Precast concrete	
	Concrete, composite with steel section	Cast-in-place prestressed concrete	
		Precast prestressed concrete	
Steel		Steel, unknown	
		Cold-formed steel members	
		Hot-rolled steel members	
Metal(except steel)		Steel, other	
	Masonry, unknown reinforcement	Masonry unit, unknown	
	Masonry, unreinforced	Adobe blocks	
	Masonry, confined	Stone, unknown technology	
	Masonry, reinforced		Dressed stone
			Fired clay unit, unknown type
			Fire clay bricks
			Concrete blocks, unknown type
			Concrete block, solid
	Wood		Concrete blocks, hollow
		Masonry unit, other	
Material other			

Lateral-load resisting system	
L	T
	LLRS Lateral-load resisting system
	Unknown lateral load-resisting system
	No lateral load-resisting system
	Moment frame
	Infilled frame
	Braced frame
	Post and Beam
	Wall
	Dual frame-wall system
	Flat slab/plate or waffle slab
	Infilled flat slab/plate or infilled waffle slab
	Hybrid lateral load-resisting system
	Other lateral load-resisting system

Structural Irregularity

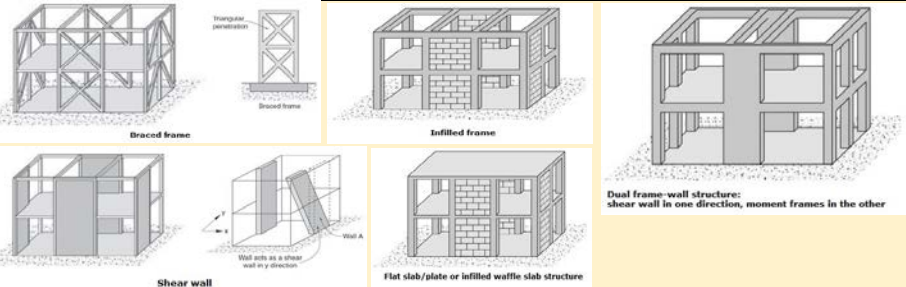
STR_IRREG	Regular or irregular
	Unknown structural irregularity
	Regular structure
	Irregular structure

The user can choose a maximum of two vertical and two plan irregularities for a building. However, if a building has two irregularities of the same type (plan/vertical), the user needs to prioritize them by identifying the primary irregularity first and the secondary irregularity next.

STR_HZIR_P	P	S
Plan irregularity-primary		No irregularity
STR_HZIR_S		Torsion eccentricity
		Re-entrant corner
		Other plan irregularity
STR_VEIR_P		No irregularity
Vertical structural irregularity - primary		Soft storey
STR_VEIR_S		Short column
		Cripple wall
		Pounding potential
		Setback

Structural system (Severity of Damage)

Negligible to Slight Damage (<10%)
Moderate Damage (10-30%)
Substantial to Heavy Damage (30-60%)
Very Heavy Damage (60-90%)
Destruction (>90%)



Exterior Attributes

Roof	
ROOF_SHAPE	Roof shape
	Unknown roof shape
	Flat
	Pitched
	Sawtooth
	Curved
	Complex regular
	Complex irregular
	Roof shape, other
Roof (Severity of Damage)	
	Negligible to Slight Damage (<10%)
	Moderate Damage (10-30%)
	Substantial to Heavy Damage (30-60%)
	Very Heavy Damage (60-90%)
	Destruction (>90%)

ROOF_COVMAT	
Roof covering	Roof covering
	Unknown roof covering
	Concrete roof without additional covering
	Heavy roof covering (slate, stone slab/clay or concrete tile)
	Light roof covering (metal tile, shingle, membrane)
	Vegetative/Earthen roof covering
	Solar panelled roofs
	Roof covering, other
ROOF_CONN	
	Roof connection
	Roof-wall diaphragm connection unknown
	Roof-wall diaphragm connection not provided
	Roof-wall diaphragm connection present
	Roof tie-down not provided
	Roof tie-down present

ROOFSYSTYP	
Roof system type	Roof system type
	Roof material, unknown
	Concrete roof, unknown
	Cast-in-place beamless reinforced concrete roof
	Cast-in-place beam-supported reinforced concrete roof
	Precast concrete roof with concrete topping
	Masonry roof, unknown
	Composite masonry and concrete roof system
	Metal roof, unknown
	Metal beams or trusses supporting light roofing
	Metal roof beams supporting precast concrete slabs
	Composite steel roof deck and concrete slab
	Wooden roof
	Fabric roof
	Roof material, other

Exterior walls/Façade	
Unknown material of exterior walls	Concrete exterior walls
	Concrete and masonry
	Masonry exterior walls
	Steel and masonry
	Glass exterior walls
	Metal exterior walls
	Vegetative exterior walls
	Wooden exterior walls
	Plastic/vinyl exterior walls, various
	Cerment-based boards for exterior walls
	Other
Exterior walls (Severity of Damage)	
	Negligible to Slight Damage (<10%)
	Moderate Damage (10-30%)
	Substantial to Heavy Damage (30-60%)
	Very Heavy Damage (60-90%)
	Destruction (>90%)

FLOOR_MAT	
Floor system material	No elevated or suspended floor material (single-storey building)
	Floor, material, unknown
	Concrete floor, unknown
	Cast-in-place beamless reinforced concrete floor
	Cast-in-place beam-supported reinforced concrete floor
	Precast concrete floor with reinforced concrete topping
	Precast concrete floor without reinforced concrete topping
	Masonry floor, unknown
	Metal floor, unknown
	Metal beams, trusses, or joists supporting light flooring
	Metal floor beams supporting precast concrete slabs
	Composite steel deck and concrete slab
	Composite cast-in-place RC and masonry floor system
	Wooden floor, unknown
	Floor material, other
FLOOR_CONN	
	Floor connections
	Floor-wall diaphragm connection unknown
	Floor-wall diaphragm connection not provided
	Floor-wall diaphragm connection present

Foundation system	
FOUNDN_SYS	Foundation system
	Unknown foundation system
	Shallow foundation, with lateral capacity
	Shallow foundation, no lateral capacity
	Deep foundation, with lateral capacity
	Deep foundation, no lateral capacity
	Foundation, other

Soil type	
	Very soft clay
	Silt or clay
	Granular loose
	Granular compact
	Rock
Zone Mexican codes	
	Firm soil (Zone I)
	Transition (Zone II)
	Soft-soil (Zone IIIa, b, c or d) (ple)

A map of Mexico is shown with different regions shaded to represent various soil zones as defined in the table above.

Non-structural elements

NON-STRUCTURAL WALL/ PARAPETS

Does the building have this component? No Yes (if yes, please fill the following information) Repair price

Material	Type of damage	Repair price
<input type="checkbox"/> Cast in place concrete	Parapet cracking	
<input type="checkbox"/> Hollow concrete block	Parapet crushing	
<input type="checkbox"/> Solid concrete block	Parapet locally falling out	
<input type="checkbox"/> Hollow fired clay block	Parapet collapsed	
<input type="checkbox"/> Solid brick	Non-structural wall cracking	
Sesimic performance features		
<input type="checkbox"/> No reinforcement	Non-structural wall crushing	
<input type="checkbox"/> Steel reinforcement	Non-structural wall locally falling out	
<input type="checkbox"/> Steel reinforcement	Non-structural wall collapsed	
Total cost to repair this component \$		

EXTERIOR WINDOWS/GLAZING

Does the building have this component? No Yes (if yes, please fill the following information) Repair price

Material	Type of damage	Repair price
<input type="checkbox"/> Wood frame	Cracking	
<input type="checkbox"/> Steel frame	Frame distortion	
<input type="checkbox"/> Aluminium frame	Fall out	
<input type="checkbox"/> Other:	Other:	
Total cost to repair this component \$		

STAIRS

Does the building have this component? No Yes (if yes, please fill the following information) Repair price

Material	Type of damage	Repair price
<input type="checkbox"/> Prefabricated steel	Non structural damage, local steel yielding	
<input type="checkbox"/> Precast concrete	Local concrete cracking, localized concrete spalling	
<input type="checkbox"/> Cast-in-place concrete	Localized steel yielding	
<input type="checkbox"/> Other:	Buckling of steel, weld cracking	
Sesimic performance features		
<input type="checkbox"/> Particular connection detailing	Extensive concrete cracking, concrete crushing	
	Extensive concrete cracking, concrete crushing, buckling of rebar	
	Loss of live load capacity. Connection and or weld fracture	
	Loss of live load capacity. Extensive concrete crushing, connection failure	
	Loss of live load capacity	
Total cost to repair this component \$		

WALL PARTITION

Does the building have this component? No Yes (if yes, please fill the following information) Repair price

Material	Type of damage	Repair price
<input type="checkbox"/> Gypsum with metal stud	Non structural damage, local steel yielding	
<input type="checkbox"/> Gypsum with wood studs	Local concrete cracking, localized concrete spalling	
<input type="checkbox"/> Gypsum + Wallpaper	Localized steel yielding	
<input type="checkbox"/> Gypsum + Ceramic Tile	Buckling of steel, weld cracking.	
Sesimic performance features		
<input type="checkbox"/> Fixed above	Extensive concrete cracking, concrete crushing	
<input type="checkbox"/> Lateral braced above	Extensive concrete cracking, concrete crushing, buckling of rebar	
<input type="checkbox"/> Fixed below	Loss of live load capacity. Connection and or weld fracture	
	Loss of live load capacity. Extensive concrete crushing, connection failure	
	Loss of live load capacity	
Total cost to repair this component \$		

DOORS

Does the building have this component? No Yes (if yes, please fill the following information) Repair price

Material	Type of damage	Repair price
<input type="checkbox"/> Wood	Cracking	
<input type="checkbox"/> Metal	Crushing	
	Frame distortion	
Total cost to repair this component \$		

SUSPENDE CEILINGS

Does the building have this component? No Yes (if yes, please fill the following information) Repair price

Type	Type of damage	Repair price
<input type="checkbox"/> Vertical support only	5 % of ceiling grid and tile damage	
<input type="checkbox"/> Vertical and Lateral support	30% of ceiling grid and tile damage	
Sesimic performance features		
<input type="checkbox"/> Braced	50% of ceiling grid and tile damage	
<input type="checkbox"/> Unbraced	Dropped acoustical tile	
	Perimeter damage	
	Separation of runners	
Total cost to repair this component \$		

NON-SUSPENDE CEILINGS

Does the building have this component? No Yes (if yes, please fill the following information) Repair price

Material	Type of damage	Repair price
<input type="checkbox"/> Plasterboard	Cracking	
<input type="checkbox"/> Drywall	Local spalling	
<input type="checkbox"/> Other:	Collapse	
	Other:	
Total cost to repair this component \$		

FLOOR FINISHES		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Material	Type of damage	
Stone	Falling from building	
Tile	Damaged panels and connctions	
Glass	Crush	
Other:		
		Total cost to repair this component \$

ELEVATORS		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Type	Type of damage	
Traction geared	Controller anchorage failed, and or machine anchorage failed, and or motor generator anchorage failed, and or governor anchorage failed, and or rope guard failures.	
	Rail distortion, and or intermediate bracket separate and spread, and or counterweight bracket break or bend, and or car bracket break or bend, and or car guide shoes damaged, and or counterweight guide shoes damaged, and or counterweight frame distortion, and or tail sheave dislodged and/or twisted	
	Cab stabilizers bent, or cab walls damaged, or cab doors damaged.	
	Cab ceiling damaged.	
Hydraulic	Damaged controls.	
	Damaged vane and hoist-way switches, and or bent cab stabilizers, and or damaged car guide shoes.	
	Damaged entrance and car door, and or flooring damage.	
	Oil leak in hydraulic line, and or hydraulic tank failure.	
		Total cost to repair this component \$

PIPING		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Material	Type of damage	
Plastic	Minor leakage at flange connections	
Copper	Pipe Break	
Steel	Other:	
Aluminium		
Cast iron		
Other:		
Sesimic performance features		
Braced		
Unbraced		
		Total cost to repair this component \$

FIRE PROTECTION		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Type	Type of damage	
Wet pipe	Spraying & Dripping Leakage at joints	
Dry pipe	Joints Break - Major Leakage	
	Other:	
		Total cost to repair this component \$

HEATING SYSTEMS		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Material	Type of damage	
Unit heater	Sliding	
Boiler	Overturning. Broken/bent bolts	
Other:	Broken gas and exhaust lines	
Sesimic performance features	Loss of function	
Unanchored	Other:	
Anchored		
		Total cost to repair this component \$

COOLING SYSTEMS		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Material	Type of damage	
Packaged chiller	Sliding	
Rofftop air cond.	Overturning. Broken/bent bolts	
Other:	Leaking refrigerant	
Sesimic performance features	Loss of function	
Unanchored	Other:	
Anchored		
		Total cost to repair this component \$

DUCTS		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Material	Type of damage	
Plastic	Sliding	
Steel	Overturning	
Other:	Other:	
Sesimic performance features		
Unanchored		
Anchored		
		Total cost to repair this component \$

LIGHTING		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Type	Type of damage	
Incandescent	Disassembly of rod system at connections with horizontal light fixture, low cycle fatigue failure of the threaded rod, pullout of rods from ceiling assembly.	
Neon	Loss of function	
Other:	Other:	
Seismic performance features		
Non seismic		
Seismically rated		
		Total cost to repair this component \$

POWER GENERATORS		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Type	Type of damage	
Diesel generator	Damaged, inoperative. Pipes and nozzles damaged.	
Petrol generator	Anchorage failure.	
Other;	Damaged, inoperative but anchorage is OK. Pipes and nozzles damaged.	
Seismic performance features		
Unanchored		
Anchored		
		Total cost to repair this component \$

TANKS		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Material	Type of damage	
Plastic	Pipe break	
Metal	Tank or vessel rupture	
Other:	Other:	
Seismic performance features		
Unanchored		
Anchored		
		Total cost to repair this component \$

FIXED FURNISHINGS		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Type	Type of damage	
Fixed artwork	Only sliding, no damage	
Fixed casework	Cracks and crushing. Minor damage.	
Other:	Damaged, loss of function	
Seismic performance features		
Other:		
		Total cost to repair this component \$

BOOKCASE		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Material	Type of damage	
Wood	Bookcase slides. Some content fall over. No damage to the bookcase	
Metal	Book case falls over and contents are scattered. Likely damage to bookcase.	
Other:	Other:	
Seismic performance features		
Unanchored laterally		
Anchored laterally		
		Total cost to repair this component \$

FILING CABINET		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Type	Type of damage	
Wood	Sliding. Some content fall over. No damage to the bookcase	
Metal	Filing cabinet falls over and contents are scattered. Likely damage to file cabinet.	
Other:	Other:	
Seismic performance features		
Unanchored		
Anchored		
		Total cost to repair this component \$

DESK		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Type	Type of damage	
Wood	Sliding. Some content fall over. No damage to the bookcase	
Metal	Filing cabinet falls over and contents are scattered. Likely damage to file cabinet.	
Other:	Other:	
Seismic performance features		
Unanchored		
Anchored		
		Total cost to repair this component \$

DESKTOP COMPUTER UNITS		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Type	Type of damage	
Fixed artwork	Only sliding, no damage	
Fixed casework	Cracks and crushing. Minor damage.	
Other:	Damaged, loss of function	
Seismic performance features		Other:
		Total cost to repair this component \$

TV SETS		
Does the building have this component?		<input type="checkbox"/> No <input type="checkbox"/> Yes (if yes, please fill the following information)
		Repair price
Type	Type of damage	
Cathodic panel display	Only sliding, no damage	
Flat panel display	Cracks and crushing. Minor damage.	
Other:	Damaged, loss of function	
Seismic performance features		Other:
Unanchored		
Anchored		
		Total cost to repair this component \$

Building owner contact information:

Name of contractors/subcontractors involved in the repairs:

Building sketch

Pictures (please indicate the name of the first and last picture taken for this building)