

## Building Element (DK)

General Note: If there are more than one structural typology in plan for one Building Block (i.e. plan additions with different structural types), the building should be split in to building "Pieces" and the surveyor will need to fill out a different Building Piece form for each with different IDs as follows: EMIS number-Block Ref-piece # (e.g. EMIS200120006 -A-01 and EMIS200120006 -A-02 etc.). A building with only one structural typology in plan would be labelled - EMIS number-Block Ref (e.g. EMIS200120006 -A-01).

Surveyor ID

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### 5) Piece Assessment

District:

- ☐ Bhaktapur
- ☐ Dhading
- ☐ Dolakha
- ☐ Gorkha
- ☐ Kathmandu
- ☐ Kavre
- ☐ Lalitpur
- ☐ Makwanpur
- ☐ Nuwakot
- ☐ Okhaldhunga
- ☐ Ramechap
- ☐ Rasuwa
- ☐ Sindhuli
- ☐ Sindhupalchok

VDC / Municipality

EMIS School/College Code

*Last 4 digit of school/college code*

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**Block Reference**

*A school campus is made up of a number of school buildings which are referred to as "Blocks". Each Block has a reference code (e.g. A or B etc.)*

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**5.1) Piece Reference**

*Each piece should be referenced;*

*Piece number e.g. 01 or 02 etc.*

*A building with only one structural typology in plan and therefore one building piece would be labelled - 01*

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District: VDC: EMIS: EMIS Piece Reference No: EMIS--

**Please verify the Piece Reference no**

☐ Yes

**Is the condition of the building equal to 'Site Clear' or 'Rubble'?**

☐ Yes

☐ No

**5.2) Upload plan image**

*Upload plan sketch on Building block (as in previous Building Block App)*

**5.3) No of Stories**

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7

☐ 8

☐ 9☐ 10**» Foundations****6.1) Foundation Type**

- ☐ Continuous Footings under walls - Stone
- ☐ Continuous Footing under walls - Brick
- ☐ Continuous Footing under walls - Concrete
- ☐ Continuous Footing under walls - Unknown
- ☐ Pad Footings
- ☐ Pad Footings with foundation tie beam
- ☐ Don't know

**Comment**

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**Take photo****6.2) Is there a continuous plinth beam?**

- ☐ Yes
- ☐ No
- ☐ Don't know

**6.3) Damage / Deterioration to Foundation due to**

- ☐ Settlement
- ☐ Slope failure
- ☐ Overall tilting of the building due to soil liquefaction
- ☐ No evidence of foundation damage
- ☐ Other

**Specify other.**

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**» Storey**

**\* 5.4. ) Storey - Structural Category**

- ☐ Load Bearing
- ☐ RC Frame
- ☐ Steel Frame
- ☐ Timber Frame
- ☐ Other

**Specify other.**

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**\* 5.4. ) Storey - Structural Category**

- ☐ Load Bearing
- ☐ RC Frame
- ☐ Steel Frame
- ☐ Timber Frame
- ☐ Same as storey below
- ☐ Other

**Specify other.**

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**\* 5.5) Area of the storey (estimate the area in square meters).**

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**» » 6) Building Elements (Storey )****» » » Floors****6.4) What is the floor structure?**

*This does not include the floor on grade*

- ☐ Reinforced concrete slab
- ☐ Reinforced brick concrete

- ☐ Timber with in-plane bracing
- ☐ Timber without in-plane bracing
- ☐ Other

**Specify other.**

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**6.5) How is the floor structure connected to the wall/frame?**

- ☐ Floor structure fully embedded in wall (full wall thickness bearing)
- ☐ Floor structure partially embedded in wall
- ☐ Floor structure anchored/bolted to wall or frame
- ☐ Floor structure sits on masonry corbel
- ☐ Don't know
- ☐ Other

**Specify other.**

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**Comment**

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**Take photo**

**6.6) Condition of Floor**

- ☐ For concrete slab floors - rebar exposed
- ☐ For concrete slab floors - evidence of corrosion of rebar
- ☐ For concrete slab floors - cracks in concrete
- ☐ Damage / deterioration to floor connection to wall or frame
- ☐ Damage / deterioration to floor structure
- ☐ Damage / deterioration to floor finish
- ☐ None
- ☐ Don't know

**Comment**

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**Take photo****» » 7) Load Bearing Wall****» » » Wall****\* 7.1) Masonry wall type confirmed***Select major wall type and add comment in case of multiple types*

- ☐ Dry stone (no mortar)
- ☐ Stone in cement mortar
- ☐ Brick in cement mortar
- ☐ Stone in mud mortar
- ☐ Brick in mud mortar
- ☐ Stone in mud mortar with cement mortar pointing
- ☐ Brick in mud mortar with cement mortar pointing
- ☐ Adobe in mud mortar
- ☐ Compressed Stabilised Soil Blocks in mud mortar

☐ Other

Specify other.

Comment

7.2) If stone what Type of stone

- ☐ Rubble Stone (mixed/random)
- ☐ Rounded Stone
- ☐ Rectangular Stone (undressed)
- ☐ Dressed Stone
- ☐ Semi-Dressed (interior and exterior cut stone with rubble infill)

Comment

Take photo

\* 7.3) Does the building have at least two lines of load bearing wall in each direction?

Redundancy

- ☐ Yes
- ☐ No

Comment

Take photo

**\* 7.4) Wall thickness (mm)**

**Comment**

**Take photo**

**\* 7.5) Wall panel length (m)**

*Length of unsupported wall between buttresses or perpendicular walls. Record longest wall panel length.*

**Comment**

**Take photo**

**\* 7.6) Wall height (m)**

**Comment**

**Take photo**



**\* 7.7) For Single Storey blocks - Combined width of the openings on a wall between two consecutive cross-walls less than 35% of total wall length**

- ☐ Yes (small openings)
- ☐ No (large openings)
- ☐ Don't know

**Comment**

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**Take photo**

**\* 7.8) For multi-storey - Combined width of the openings on a wall between two consecutive cross-walls less than 25% of total wall length**

- ☐ Yes (small openings)
- ☐ No (large openings)
- ☐ Don't know

**Comment**

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**Take photo**

**» » » Wall Damage / Deterioration to wall structure**

**\* 7.9) Collapsed wall**

*Have any of the walls completely collapsed*

- ☐ Most walls (50 -99%)
- ☐ Limited Number of walls (up to 49%)
- ☐ None (0%)

**Comment**

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**Take photo****\* 7.10) Separation of walls at corners and junctions**

*Note whether only limited number/portion of walls are separated or if all walls are separated*

- ☐ All corners/junctions (100%)
- ☐ Most corners/junctions (50-99%)
- ☐ Limited number of corners/junctions (up to 49%)
- ☐ None (0%)

**Comment**

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**Take photo****\* 7.11) Corner failure.**

*Note the number of corners of the block that have failed.*

- ☐ All corners (100%)
- ☐ Most corners (75-99%)
- ☐ Limited number of corners (30-74%)
- ☐ Few corners (1-29%)

**\* 7.12) Evidence of cracking around openings**

- ☐ Nearly all openings (75%+)
- ☐ Most openings (30 - 74%)
- ☐ Limited Number of Openings (up to 29%)
- ☐ None (0%)

**Comment**

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**Take photo**

**7.12.1) Extent of cracking typically around openings**

- ☐ Severe [crack widths  $\geq 1/4"$  (6mm)]
- ☐ Moderate [crack widths  $> 1/8"$  (3mm) but less than  $1/4"$  (6mm)]
- ☐ Hairline cracking

**Comment**

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**Take photo****\* 7.13) In-plane failure of masonry walls - Is there evidence of diagonal cracking of walls or cracking of bed-joints**

*In addition to tick box note if there is a stairstepped crack pattern and if more than 5% of courses have cracks in masonry units*

- ☐ Nearly all panels (75%+)
- ☐ Most panels (30 - 74%)
- ☐ Limited Number of panels (up to 29%)
- ☐ None (0%)

**Comment**

*Note if there is a stairstepped crack pattern and if more than 5% of courses have cracks in masonry units*

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**Take photo**

**7.13.1) Extent of typical in-plane wall damage**

*Consider the most common pattern observed.*

- ☐ Severe [crack widths  $\geq 1/4"$ (6mm)] or cracking through masonry units
- ☐ Moderate [crack widths  $> 1/8"$ (3mm) but less than  $1/4"$ (6mm)]
- ☐ Hairline cracking

**Comment**

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**Take photo**

**\* 7.14) Out of plane failure - partial collapse and out of plane offsets**

*Note if out-of-plane offsets are more than  $1/8"$ (3mm)*

- ☐ Most walls (50-100%)
- ☐ Limited Number of walls (up to 49%)
- ☐ None (0%)

**Comment**

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**Take photo**

**\* 7.15) Delamination of walls**

- ☐ All walls (100%)
- ☐ Most walls (50 - 99%)
- ☐ Limited Number of walls (up to 49%)
- ☐ None (0%)

**Comment**

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**Take photo****\* 7.16) Is the masonry deteriorated?**

*Specify whether the masonry can be easily scrapped away/crumbled, if it can be easily removed with hand tool or whether some material of the fabric or plaster is missing*

- ☐ Yes
- ☐ No
- ☐ Don't know

**Comment**

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**Take photo****» » » Earthquake Resistance****\* 7.17) Have seismic enhancements been included in the original construction?**

*Select one or more appropriate options.*

- ☐ Through stones included with maximum spacing of within 1.2m horizontally and 0.6m vertically.
- ☐ Reinforced concrete elements connecting two orthogonal walls at a vertical distance of at least 0.5m to 0.7m
- ☐ Wooden elements connecting two orthogonal walls at a vertical distance of at least 0.5m to 0.7m
- ☐ Reinforced concrete lintel beams/band beam at the top of wall
- ☐ Wooden lintel beams/band beam at the top of wall
- ☐ Gable band
- ☐ Wooden ties connecting parallel walls (note whether the ties are anchored to the walls or not)
- ☐ Metallic ties connecting parallel walls (note whether the ties are anchored to the walls or not)
- ☐ None
- ☐ Other

**Specify other.**

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**Comment**

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**Take photo**

**\* 7.18) Is there any evidence that the school/college has been retrofitted in the past?**

- ☐ Strengthening to floor / roof (addition of braces, members, supports, etc.)
- ☐ Wall jacketing
- ☐ RC jacketing of columns and other elements
- ☐ Steel jacketing of columns and other elements
- ☐ Addition of RC shear wall
- ☐ Addition of steel bracing
- ☐ Single vertical reinforcement in walls
- ☐ Strengthening to foundations
- ☐ Reinforcement with welded wire mesh
- ☐ Bamboo reinforcing
- ☐ Seismic belts
- ☐ Post tensioning
- ☐ External cane and rope mesh
- ☐ External wire mesh reinforcement
- ☐ External polymer reinforcement
- ☐ Used car tyre straps
- ☐ None
- ☐ Other

**Specify other.**

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**Comment**

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**Take photo****» » » Construction Quality**

**7.19) Specify any structural defect that the structure has, which has not been reported before :**

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**7.20) Describe the overall quality of the construction:**

*Tick one option and describe in more detail the overall quality of the construction in the Comment field.*

- ☐ Very good
- ☐ Good
- ☐ Regular
- ☐ Poor
- ☐ Very poor

**Comment**

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**» » » 8) RC Frame****» » » Redundancy**

**\* 8.1.1) Does the structure have two or more lines of concrete frame?**

- ☐ Yes
- ☐ No
- ☐ Don't know

**Comment**

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**\* 8.1.2) Does the structure have two or more bays of RC frame in the shorter direction?**

- ☐ Yes
- ☐ No
- ☐ Don't know

**Comment**

**» » » Walls****\* 8.2) Storey height (in meters, Floor to Floor)**  

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**\* 8.3) Wall panel length (m)**

*Length of unsupported wall between cross walls or frames.*

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**\* 8.4) Typical infill wall material**

- ☐ Brick with mud mortar
- ☐ Brick with cement mortar
- ☐ Stone with mud mortar
- ☐ Stone with cement mortar
- ☐ Concrete block with cement mortar
- ☐ Other

**Specify other.**

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**Comment**

*Note if there is mixed types of infill material or atypical type of infill*

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**Take photo****8.5) Typical Exterior infill walls thickness (mm)**

*If thickness varies in the same floor level, please note in the comment box*

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**Comment**

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**8.6) Typical Interior infill walls thickness (mm)**

*If thickness varies in the same floor level, please note in the comment box*

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**Comment**

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**\* 8.7) What was the sequence of construction for the concrete frame and infill walls?**

*To determine whether the structure is more like confined masonry construction (walls built first and then reinforced concrete tie beams and columns are cast later) or frame construction with infill walls built after the frame. This influences the degree to which the infill stiffens the frame.*

- ☐ Frame constructed (beams and columns) and then infill walls are constructed.
- ☐ Columns are constructed, then infill walls, then beams are cast onto top of infill walls.
- ☐ Walls are constructed first, then concrete columns and beams.
- ☐ Don't know

**Comment**

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**Take photo**

**\* 8.8) Is there any exterior masonry wall offset from frame?**

- ☐ Yes
- ☐ No

» » » **Masonry wall offset from frame**

**8.8.1) Thickness of masonry wall offset from frame (mm)**

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**8.8.2) Height of masonry wall offset from frame (in meters)**

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**Comment**

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**Take photo****» » » Frame****8.9) Column sizes**

- ☐ Less than 9" x 9" (230mm x 230mm)
- ☐ 9" x 9" (230mm x 230mm)
- ☐ 9" x 12" (230mm x 300mm)
- ☐ 12" x 12" (300mm x 300mm)
- ☐ Columns with dimensions > 12" (300mm)
- ☐ Don't know

**Comment**

*Note for instance if the size of the columns vary in the same floor, in different directions or if some columns are circular*

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**Take photo**

8.10) Typical Beam spans

Short direction (in meters)

Long direction (in meters)

Comment

Take photo

8.11) Typical RC Beam size (in mm)

Long direction (D x B)

D

B

Short direction (D x B)

D

B

**\* 8.12) Short Columns: Is the effective height of columns unrestrained by infill wall or parapets less than 5 times the dimension of the column or 50% of the nominal height of typical columns in that storey.**

- ☐ Yes
- ☐ No
- ☐ Don't know

**Comment**

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**Take photo**

**\* 8.12.1) Short-column damage**

*Note whether there is short-column damage and the level of damage. Provide details in the comment field.*

- ☐ Severe (inclined cracks with rebar exposed)
- ☐ Moderate (inclined cracks wider than 1mm)
- ☐ Minor (cracks smaller than 1mm)
- ☐ No short column damage observed

**Comment**

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**Take photo**

**\* 8.13) Beam-column joint damage**

*This can be caused by splicing at joints, soft or weak storey failure or shear cracking in joints from demands imposed by infill panels. Ignore hairline cracks. Note if cracking is greater than 1/8"(3mm)*

- ☐ Extensive damage (more than 75% of beams)
- ☐ Significant damage (30 - 75% of beams)
- ☐ Limited damage (up to 30% of beams)
- ☐ None (0%)

**Comment**

*Specify how many joints have cracks wider than 3mm in terms of most, limited or few?*

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**Take photo**

**\* 8.14) RC Column Damage**

*This can be caused by short column failure, soft or weak storey or shear cracking from demands imposed by infill panels. Ignore hairline cracks. Note if cracking is greater than 1/4"(6mm)*

- ☐ Extensive damage (more than 75% of beams)
- ☐ Significant damage (30 - 75% of beams)
- ☐ Limited damage (up to 30% of beams)
- ☐ None (0%)

**Comment**

*Specify how many columns have cracks wider than 6mm*

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**Take photo**

**\* 8.15) RC Beam Damage**

*Ignore hairline cracks. Note if cracking is greater than 1/4"(6mm)*

- ☐ Extensive damage (more than 75% of beams)
- ☐ Significant damage (30 - 75% of beams)
- ☐ Limited damage (up to 30% of beams)
- ☐ None (0%)

**Comment**

*Specify how many beams have cracks wider than 6mm*

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**Take photo****» » » Infill wall Damage / Deterioration****\* 8.16) Collapsed infill panels**

*Have any of the infill walls completely or partially collapsed?*

- ☐ Extensive collapse of panels (75%+)
- ☐ Most panels (30-74%)
- ☐ Limited Number of panels (up to 30%)
- ☐ None (0%)

**Comment**

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**Take photo**

**\* 8.17) Evidence of cracking around openings**

- ☐ Nearly all openings (75%+)
- ☐ Most openings (30 - 74%)
- ☐ Limited Number of Openings (up to 29%)
- ☐ None (0%)

**Comment**

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**Take photo****8.17.1) Extent of cracking typically around openings**

- ☐ Severe [crack widths  $\geq 1/4"$  (6mm)]
- ☐ Moderate [crack widths  $> 1/8"$  (3mm) but less than  $1/4"$  (6mm)]
- ☐ Hairline cracking

**Comment**

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**Take photo****\* 8.18) In-plane failure of infill masonry walls - Is there evidence of diagonal cracking of infill walls or cracking of bed-joints?**

*In addition to tick box note if there is a stairstepped crack pattern and if more than 5% of courses have cracks in masonry units*

- ☐ Nearly all panels (75%+)
- ☐ Most panels (30 - 74%)
- ☐ Limited Number of panels (up to 29%)
- ☐ None (0%)

**Comment**

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**Take photo****8.18.1) Extent of in-plane wall damage**

- ☐ Severe [crack widths  $\geq 1/4"$ (6mm)] or cracking through masonry units
- ☐ Moderate [crack widths  $> 1/8"$ (3mm) but less than  $1/4"$ (6mm)]
- ☐ Hairline cracking

**Comment**

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**Take photo****\* 8.19) Cracking at perimeter of panel of Infill walls (may possibly include hairline diagonal cracks)**

*In addition to tick box note if any joint cracks (including diagonally oriented cracks) are more than  $1/4"$ (6mm)*

- ☐ Nearly all panels (75%+)
- ☐ Most panels (30 - 74%)
- ☐ Limited Number of panels (up to 29%)
- ☐ None (0%)

**Comment**

*Specify if the cracks are at wall/beam joints or wall/column joints or at both*

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**Take photo****» » » General Damage / Deterioration**



**\* 8.20) General condition of the frame and infill walls**

- ☐ Deteriorated masonry
- ☐ Deteriorated mortar
- ☐ Exposed rebar in columns
- ☐ Exposed rebar in beams
- ☐ Evidence of corrosion of rebar in beams
- ☐ Evidence of corrosion of rebar in the columns
- ☐ No damage/deterioration
- ☐ Other

**Specify other.**

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**Comment**

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**Take photo**

**» » » Earthquake Resistance****\* 8.21) Is there any evidence that the school/college has been retrofitted in the past?**

- ☐ Used car tyre straps
- ☐ Strengthening to foundations
- ☐ RC jacketing of columns and other elements
- ☐ Steel jacketing of columns and other elements
- ☐ Addition of RC shear wall
- ☐ Addition of steel bracing
- ☐ None
- ☐ Other

**Specify other.**

---

**Comment**

---

**Take photo**

**» » » Construction Quality**

**8.22) Specify any structural defect that the structure has, which has not been reported before :**

---

**\* 8.23) Describe the overall quality of the construction:**

*Tick one option and describe in more detail the overall quality of the construction in the Comment field.*

☐ Very good

☐ Good

☐ Regular

☐ Poor

☐ Very poor

**Comment**

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**» » » 9) Steel Frame**

**» » » Steel Structure**

### 9.1) Type of frame

#### 9.1.1) Cross-section of principal vertical steel members

- ☐ Hollow section (tubular)
- ☐ Hollow section (square or rectangular)
- ☐ I - section
- ☐ C - section
- ☐ Angle section
- ☐ T - section
- ☐ Double channel back to back
- ☐ Double channel front to front
- ☐ Double angle-box
- ☐ Other

#### Specify Other

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#### 9.1.2) Connections within frame

- ☐ Welded
- ☐ Bolted
- ☐ Other

#### Specify other.

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#### 9.1.3) Maximum size of the typical post

- ☐ <50mm
- ☐ 50-99mm
- ☐ 100-150mm
- ☐ >150mm

**9.1.4) Protection of the frame**

- ☐ GI frame
- ☐ GI post and other member enameled
- ☐ GI post and other member unprotected
- ☐ Enameled Iron frame
- ☐ Uncolored iron frame
- ☐ Other

**Specify other.**

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**» » » Infill Walls****\* 9.2) Is the infill wall made or partially made of masonry?**

- ☐ Yes
- ☐ No
- ☐ Don't know

**Comment**

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**\* 9.3) Type of wall**

- ☐ Masonry, full height of the wall
- ☐ Masonry, up to sill level
- ☐ CGI, full height of the wall
- ☐ CGI, from sill level to roof
- ☐ Don't know
- ☐ Other

**Specify other.**

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**\* 9.4) Is the masonry wall built in line with the steel frame or offset from the frame**

- ☐ Inline and inbetween the metal frame
- ☐ Inline and surrounding the metal frame
- ☐ Offset from the metal frame
- ☐ Don't know

**Comment**

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**9.5) Masonry wall type confirmed**

- ☐ Dry stone (no mortar)
- ☐ Stone in cement mortar
- ☐ Brick in cement mortar
- ☐ Stone in mud mortar
- ☐ Brick in mud mortar
- ☐ Stone in mud mortar with cement mortar pointing
- ☐ Brick in mud mortar with cement mortar pointing
- ☐ Adobe in mud mortar
- ☐ Compressed Stabilised Soil Blocks in mud mortar
- ☐ Other

**Specify other.**

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**\* 9.6) If stone what type of stone**

- ☐ Rubble Stone (mixed/random)
- ☐ Rounded Stone
- ☐ Rectangular Stone (undressed)
- ☐ Dressed Stone
- ☐ Semi-Dressed (interior and exterior cut stone with rubble infill)

**Comment**

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**Take photo****\* 9.7) Typical wall thickness (mm)**

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**Comment**

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**Take photo****\* 9.8) Walls panel length (m)**

*Length of unsupported wall between buttresses or perpendicular walls. Record panel length of gable wall.*

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**Comment**

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**Take photo**

**\* 9.9) Wall height (m)***Excluding gable if any*

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**Comment**

---

**Take photo****9.10) Is combined width of the openings on a wall****between two consecutive cross-walls less than 35% of total wall length***Provide details*

- ☐ Yes (small openings)
- ☐ No (large openings)
- ☐ Don't know

**Comment**

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**Take photo****» » » Damage and condition of Steel Structure**

9.11) Damage and condition of Steel Structure

**\* 9.11.1) Damage**

- ☐ Most connections within the frame failed (more than 50% of the connections)
- ☐ Limited number of connections within the frame failed
- ☐ Connections of the frame to foundation failed
- ☐ Connections of the frame to roof/floor structure failed
- ☐ Steel frame buckled

☐ Steel frame buckled☐ No damage☐ Other

**Specify other.**

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**Comment**

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**Take photo**

**\* 9.11.2) Condition**

☐ Evidence of severe corrosion (loss of section)☐ Evidence of minor corrosion (some rusting)☐ No deterioration☐ Other

**Specify other.**

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**Comment**

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**Take photo**

**9.12) Is the frame re-usable?**

☐ Yes, completely re-usable☐ Yes, but only partially re-usable☐ No☐ Don't know

**Comment**

*Estimate the % that is re-usable if only a portion of the frame is re-usable.*



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**» » » Walls Damage / Deterioration to Wall Structure****\* 9.13) Collapsed wall - Have any of the walls completely collapsed?**

- ☐ Most walls (50 -99%)
- ☐ Limited Number of walls (up to 49%)
- ☐ None (0%)

**Comment****Take photo****\* 9.14) Evidence of cracking around openings?**

- ☐ Nearly all openings (75%+)
- ☐ Most openings (30 - 74%)
- ☐ Limited Number of Openings (up to 29%)
- ☐ None (0%)

**Comment****Take photo****9.14.1) Extent of cracking typically around openings**

- ☐ Severe [crack widths  $\geq 1/4"$  (6mm)]
- ☐ Moderate [crack widths  $> 1/8"$  (3mm) but less than  $1/4"$  (6mm)]
- ☐ Hairline cracking

**Comment****Take photo**

**\* 9.15) In-plane failure of masonry walls - Is there evidence of diagonal or bed joint cracking**

*Ignore hairline cracks. In addition to tick box note if there is a stairstepped crack pattern and if more than 5% of courses have cracks in masonry units.*

- ☐ Nearly all panels (75%+)
- ☐ Most panels (30 - 74%)
- ☐ Limited Number of panels (up to 29%)
- ☐ None (0%)

**Comment**

---

**Take photo****9.15.1) Extent of in-plane wall damage**

*Consider the most common pattern observed.*

- ☐ Severe [crack widths  $\geq 1/4"$ (6mm)] or cracking through masonry units
- ☐ Moderate [crack widths  $> 1/8"$ (3mm) but less than  $1/4"$ (6mm)]
- ☐ Hairline cracking

**Comment**

---

**Take photo**

**9.16 Separation of walls at corners and junctions**

*Note whether only limited number/portion of walls are separated or if all walls are separated*

- ☐ All corners/junctions (100%)
- ☐ Most corners/junctions (50-99%)
- ☐ Limited number of corners/junctions (up to 49%)
- ☐ None (0%)

**Comment**

---

**Take photo****\* 9.17) Out of plane failure - partial collapse and out of plane offsets**

*Note if out-of-plane offsets are more than 1/8"(3mm)*

- ☐ Most walls (50-100%)
- ☐ Limited Number of walls (up to 49%)
- ☐ None (0%)

**Comment**

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**Take photo****9.18) Delamination of walls**

- ☐ All walls (100%)
- ☐ Most walls (50 - 99%)
- ☐ Limited Number of walls (up to 49%)
- ☐ None (0%)

**Comment**

---

**Take photo****\* 9.19) Is the masonry deteriorated?**

*Specify whether the masonry can be easily scrapped away/crumbled, if it can be easily removed with hand tool or whether some material of the fabric or plaster is missing*

- ☐ Yes
- ☐ No
- ☐ Don't know

**Comment**

---

**Take photo****» » » Earthquake Resistance****\* 9.20) Have seismic enhancements been included in the original construction?**

- ☐ Through stones included with maximum spacing of within 1.2m horizontally and 0.6m vertically.
- ☐ Reinforced concrete elements connecting two orthogonal walls at a vertical distance of at least 0.5m to 0.7m
- ☐ Wooden elements connecting two orthogonal walls at a vertical distance of at least 0.5m to 0.7m
- ☐ Reinforced concrete lintel beams / band beam at the top of the wall
- ☐ Steel lintel beams / band beam at the top of the wall
- ☐ Gable band
- ☐ Steel ties connecting parallel walls (note whether the ties are anchored to the walls)
- ☐ Other
- ☐ None

**Specify other.**

---

**Comment**

---

**Take photo****9.21) Has the education facility been retrofitted?**

\*

- ☐ Strengthening to floor / roof (addition of braces, members, supports, etc.)
- ☐ Wall jacketing
- ☐ RC jacketing of columns and other elements
- ☐ Steel jacketing of columns and other elements
- ☐ Addition of RC shear wall
- ☐ Addition of steel bracing
- ☐ Single vertical reinforcement in walls
- ☐ Strengthening to foundations
- ☐ Reinforcement with welded wire mesh
- ☐ Bamboo reinforcing
- ☐ Seismic belts
- ☐ Post tensioning
- ☐ External cane and rope mesh
- ☐ External wire mesh reinforcement
- ☐ External polymer reinforcement
- ☐ Used car tyre straps
- ☐ None
- ☐ Other

**Specify other.**

---

**Comment**

---

**Take photo**

**» » » Construction Quality**

**9.22) Specify any structural defect that the structure has, which has not been reported before :**

---

**\* 9.23) Describe the overall quality of the construction:**

*Tick one option and describe in more detail the overall quality of the construction in the Comment field.*

- ☐ Very good
- ☐ Good
- ☐ Regular
- ☐ Poor
- ☐ Very poor

**Comment**

---

**» » 10) Timber Frame****» » » Timber Structure**

**\* 10.1) Type of structure**

- ☐ Structural timber panels (includes panels with canes/bamboo as infill)
- ☐ Timber frame with masonry walls
- ☐ Traditional Newari construction
- ☐ Don't know
- ☐ Other

**Specify other.**

---

**Comment**

*describe briefly the structural system*

---

**Take photo**

## 10.2) Type of frame

### \* 10.2.1) Typical cross-section of principal members (posts and girders)

- ☐ Round / Oval
- ☐ Rectangular
- ☐ Trapezoid
- ☐ Don't know
- ☐ Other

**Specify other.**

---

**Comment**

---

**Take photo**

### 10.2.2) Connections within the frame and structural panels

- ☐ Carpentry joints
- ☐ Mechanical connections (with mechanical fasteners, for instance nails or screws)
- ☐ Other

**Specify other.**

---

**Comment**

*describe briefly the connections*

---

**Take photo**

**\* 10.3.1) Timber species of the principal structural elements (posts and girders)**

- ☐ Hardwood
- ☐ Softwood
- ☐ Mixed
- ☐ Don't know

**\* 10.3.1.1) Specify the timber species of the principal structural elements***Hardwood*

- ☐ Sal
- ☐ Teak
- ☐ Sisau
- ☐ Don't know
- ☐ Other

**Specify other.**

---

**Comment**

---

**\* 10.3.1.2) Specify the timber specie of the principal structural elements***Softwood*

- ☐ Salla
- ☐ Mango
- ☐ Don't know
- ☐ Other

**Specify other.**

---

**Comment**

---



**» » » Infill walls**

## 10.4) Type of infill

**\* 10.4.1) Is the infill wall made or partially made of masonry?***Includes structural timber panels with masonry infill*

- ☐ Yes
- ☐ No
- ☐ Don't know

**Comment**

---

**\* 10.4.2) Is the infill wall made or partially made of canes/bamboo with mortar?**

- ☐ Yes
- ☐ No
- ☐ Don't know

**Comment**

---

**\* 10.5) Is the masonry wall built in line with the timber frame or offset from the frame**

- ☐ Inline and inbetween the timber frame
- ☐ Inline and surrounding the timber frame
- ☐ Offset from the timber frame
- ☐ Don't know

**Comment**

---

**Take photo**

**10.6) Masonry wall type**

- ☐ Dry stone (no mortar)
- ☐ Stone in cement mortar
- ☐ Brick in cement mortar
- ☐ Stone in mud mortar
- ☐ Brick in mud mortar
- ☐ Stone in mud mortar with cement mortar pointing
- ☐ Brick in mud mortar with cement mortar pointing
- ☐ Adobe in mud mortar
- ☐ Compressed Stabilised Soil Blocks in mud mortar
- ☐ Other

**Specify other.**

---

**Comment**

---

**Take photo****10.6.1) If stone, What type of stone?**

- ☐ Rubble Stone (mixed/random)
- ☐ Rounded Stone
- ☐ Rectangular Stone (undressed)
- ☐ Dressed Stone
- ☐ Semi-Dressed (interior and exterior cut stone with rubble infill)

**Comment**

---

## » » » Walls

**\* 10.7) Typical wall thickness (in mm)**

---

**Comment**

---

**Take photo****\* 10.8) Walls panel length (in m)***Typical wall panel length (between posts or load-bearing perpendicular walls)*

---

**Comment**

---

**Take photo****\* 10.9) Wall height (in m)**

---

**Comment**

---

**\* 10.10) Is combined width of the openings on a wall between two consecutive cross-walls less than 35% of total wall length***Provide details*☐ Yes (small openings)☐ No (large openings)☐ Don't know**Comment**

---

**Take photo****» » » Damage and Condition of Timber Structure**

10.11) Damage and condition

**\* 10.11.1) Damage of the timber frame (includes wall panels if part of the main structure)**

- ☐ Most connections within the frame failed (more than 50% of the connections)
- ☐ Limited number of connections within the frame failed
- ☐ Connections of the frame to foundation failed
- ☐ Connections of the frame to the roof/floor structures failed
- ☐ Timber members have large permanent deformations
- ☐ Evidence of cracks (shear, tension) in timber members
- ☐ Evidence of crushing of timber members
- ☐ Evidence of cracks at the surface of the wall at location of timber members
- ☐ No damage
- ☐ Other

**Specify other.**

---

**Comment**

*describe briefly the damage observed*

---

**Take photo**

*Take additional photos to properly record the damage if needed.*

**\* 10.11.2) Condition of the timber frame (includes wall panels if part of the main structure)**

- ☐ Evidence of severe rotting of wood (loss of section)
- ☐ Evidence of minor rotting of wood (some rusting)
- ☐ Material decay (insect and fungi attack)

- ☐ Corrosion of metallic elements of the timber frame
- ☐ No deterioration
- ☐ Other

**Specify other.**

---

**Comment**

*describe briefly the deterioration observed*

---

**Take photo**

**\* 10.12) Is the timber frame re-usable?**

- ☐ Yes, completely re-usable
- ☐ Yes, but only partially re-usable
- ☐ No
- ☐ Don't know

**Comment**

*Estimate the % that is re-usable if only a portion of the frame is re-usable.*

---

**» » » Walls Damage / Deterioration to Wall Structure**

**\* 10.13) Collapsed walls - Have any of the walls completely collapsed?**

- ☐ Most walls (50 -99%)
- ☐ Limited Number of walls (up to 49%)
- ☐ None (0%)

**Comment**

---

**Take photo**

**\* 10.14) Evidence of cracking around openings?**

- ☐ Nearly all openings (75%+)
- ☐ Most openings (30 - 74%)
- ☐ Limited Number of Openings (up to 29%)
- ☐ None (0%)

**Comment**

---

**Take photo****10.14.1) Extent of cracking typically around openings**

- ☐ Severe [crack widths  $\geq 1/4"$  (6mm)]
- ☐ Moderate [crack widths  $> 1/8"$  (3mm) but less than  $1/4"$  (6mm)]
- ☐ Hairline cracking

**Comment**

---

**Take photo****\* 10.15) In-plane failure of masonry walls - Is there evidence of diagonal or bed joint cracking**

*Ignore hairline cracks. In addition to tick box note if there is a stairstepped crack pattern and if more than 5% of courses have cracks in masonry units.*

- ☐ Nearly all panels (75%+)
- ☐ Most panels (30 - 74%)
- ☐ Limited Number of panels (up to 29%)
- ☐ None (0%)

**Comment**

**Take photo****10.15.1) Extent of in-plane wall damage**

*Consider the most common pattern observed.*

- ☐ Severe [crack widths  $\geq 1/4"$  (6mm)] or cracking through masonry units
- ☐ Moderate [crack widths  $> 1/8"$  (3mm) but less than  $1/4"$  (6mm)]
- ☐ Hairline cracking

**Comment**

---

**Take photo****\* 10.16) Separation of walls at corners and junctions**

*Note whether only limited number/portion of walls are separated or if all walls are separated*

- ☐ All corners/junctions (100%)
- ☐ Most corners/junctions (50-99%)
- ☐ Limited number of corners/junctions (up to 49%)
- ☐ None (0%)

**Comment**

---

**Take photo****\* 10.17) Out-of-plane failure - partial collapse and out of plane offsets**

*Note if out-of-plane offsets are more than  $1/8"$  (3mm)*

- ☐ Most walls (50-100%)
- ☐ Limited Number of walls (up to 49%)
- ☐ None (0%)

**Comment**

---

**Take photo**

**\* 10.18) Delamination of walls**

- ☐ All walls (100%)
- ☐ Most walls (50 - 99%)
- ☐ Limited Number of walls (up to 49%)
- ☐ None (0%)

**Comment**

---

**Take photo**

**\* 10.19) Is the masonry deteriorated**

*Specify whether the masonry can be easily scrapped away/crumbled, if it can be easily removed with hand tool or whether some material of the fabric or plaster is missing*

- ☐ Yes
- ☐ No
- ☐ Don't know

**Comment**

---

**Take photo**

**» » » Earthquake Resistance**



**\* 10.20) Have seismic enhancements been included in the original construction?**

- ☐ Through stones included with maximum spacing of within 1.2m horizontally and 0.6m vertically.
- ☐ Reinforced concrete elements connecting two orthogonal walls at a vertical distance of at least 0.5m to 0.7m
- ☐ Wooden elements connecting two orthogonal walls at a vertical distance of at least 0.5m to 0.7m
- ☐ Wooden lintel band beams at the top of the wall
- ☐ Gable band
- ☐ Wooden ties connecting parallel walls (note whether the tie-beams are anchored to the walls)
- ☐ Steel ties connecting parallel walls (note whether the tie-beams are anchored to the walls)
- ☐ None
- ☐ Other

**Specify other.**

---

**Comment**

---

**Take photo**

**\* 10.21) Has the education facility been retrofitted?**

- ☐ Strengthening to floor / roof (addition of braces, members, supports, etc.)
- ☐ Wall jacketing
- ☐ RC jacketing of columns and other elements
- ☐ Steel jacketing of columns and other elements
- ☐ Addition of RC shear wall
- ☐ Addition of steel bracing
- ☐ Single vertical reinforcement in walls
- ☐ Strengthening to foundations
- ☐ Reinforcement with welded wire mesh
- ☐ Bamboo reinforcing
- ☐ Seismic belts
- ☐ Post tensioning
- ☐ External cane and rope mesh
- ☐ External wire mesh reinforcement
- ☐ External polymer reinforcement
- ☐ Used car tyre straps
- ☐ None
- ☐ Other

**Specify other.**

---

**Comment**

---

**Take photo**

**» » » Construction Quality**

**10.22) Specify any structural defect that the structure has, which has not been reported before.**

---

**\* 10.23) Describe the overall quality of the construction**

*Tick one option and describe in more detail the overall quality of the construction in the Comment field.*

- ☐ Very good
- ☐ Good
- ☐ Regular
- ☐ Poor
- ☐ Very poor

**Comment**

---

**» Roof**

**6.7) What is the shape of the roof?**

- ☐ Flat
- ☐ Single pitch
- ☐ Double pitch
- ☐ Other

**Specify other.**

---

**Comment**

---

**Take photo**

**6.8) What is the roofing structure?**

- ☐ Metal Truss with inplane bracing
- ☐ Metal truss without inplane bracing
- ☐ Timber truss with inplane bracing
- ☐ Timber truss without inplane bracing
- ☐ Reinforced concrete slab
- ☐ Timber Joist
- ☐ Other

**Specify other.**

---

**Comment**

---

**Take photo****6.8.1) If not reinforced concrete slab what is the roofing material?**

- ☐ CGI
- ☐ Thatch
- ☐ Clay tiles
- ☐ Slate tiles
- ☐ Other

**Specify other.**

---

**Comment**

---

**Take photo****6.8.2) Is the roof covering adequately tied to the roof structure to resist wind uplift?**

- ☐ Yes
- ☐ No

**If yes:***Please specify how the roof covering is tied to the roof structure*

- ☐ J - hooks
- ☐ Nails
- ☐ Screws
- ☐ Other

**Specify other.**

---

**Comment**

---

**Take photo****6.8.3) How is the Roof structure connected to the wall / frame?**

- ☐ Roof structure sits (not connected) on wall or column
- ☐ Roof structure fully embedded in wall
- ☐ Roof structure partially embedded in wall
- ☐ Roof structure strapped
- ☐ Roof structure anchored to wall
- ☐ Roof structure bolted to frame
- ☐ Don't know
- ☐ Other

**Specify other.**

---

**Comment**

---

**Take photo**

**6.9) Condition of Roof**

- ☐ For concrete slab roofs - Rebar exposed
- ☐ For concrete slab roofs - evidence of corrosion of rebar
- ☐ For concrete slab roofs - Cracking in concrete
- ☐ Damage to the connection of the roof structure with the wall or frame
- ☐ Damage to the structure (trusses, joists, purlins, beams, etc.)
- ☐ Damage to roof covering
- ☐ None
- ☐ Don't know

**Comment**

---

**Take photo**

**6.10) Gable walls damage**

*Total or partial wall collapse*

- ☐ All walls (100%)
- ☐ Most walls (50 - 99%)
- ☐ Some walls (25 - 49%)
- ☐ None (0%)
- ☐ Not applicable

**Comment**

---

**Take photo**

**6.11) Are there any parapets?**☐ Yes☐ No**Comment**

---

**Take photo****6.11.1) What is the parapet height? (meters)**

---

**6.11.2) What is the parapet thickness? (mm)**

---

**6.11.3) Are the parapets damaged?**☐ Total collapse☐ Partial collapse☐ Minor damage☐ No damage**Take photo****6.12) Are there any pediments?**☐ Yes☐ No

**6.12.1) Are the pediments damaged?**

- ☐ Total collapse
- ☐ Partial collapse
- ☐ Minor damage
- ☐ No damage

**Take photo**