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Level 3

Handbook for the examination of Structures Part 11B: Reporting and recording of examinations of Operational Property Structures and inspections of Buildings in OPAS

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1 Purpose

The purpose of this part of the handbook is to define particular requirements and give guidance and recommendations for the recording the findings of an examination Operational Property Structures and inspection of Building fabric in Operational Property Asset System (OPAS).

2 Scope

This part of the handbook applies to all Network Rail owned or managed and Operational Property Structures that have been assigned to Structure Category E in accordance with [NR/L1/CIV/032](#): *Managing existing Structures*.

This part of the handbook also applies to the following Structures within Operational Property:

- Retaining Walls assigned to Structure Category B;
- Footbridges, Subways and other Bridges assigned to Structure Category A;
- Ancillary Structures assigned to Structure Category G.

This part of the handbook applies to all Network Rail owned or managed, Shared and Outside Party Buildings within Operational Property that have been assigned to Structure Category E in accordance with [NR/L1/CIV/032](#): *Managing Existing Structures*.

This part of the handbook also applies to Network Rail owned or managed Structures including Major Structures, Outside Party Structures and Shared Structures within Operational Property that have been assigned to Structure Category A1, A2, A3, B, C, F and G in accordance with [NR/L1/CIV/032](#).

Each examination of a Structure includes the production of accurate and complete information relating to the condition of the Structure including quantified defects to enable the safety and fitness for purpose of the Structure to be evaluated, and any work or further investigation as considered necessary for the continuing safety and fitness for purpose of the Structure to be determined.

3 Records of examinations and inspections

3.1 General requirements

The findings of Detailed, Visual and Additional Examinations of Operational Property Structures shall be recorded in OPAS.

The records of inspections of Buildings shall be recorded in OPAS.

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3.2 Written reports

Written reports shall otherwise not normally be required, except when making recommendations for an extension to the survey uploaded into OPAS including but not limited to:

- further investigation or testing, intrusive or otherwise, and analysis;
- Additional Examinations or enhanced monitoring of structural elements;
- assessments of the condition, strength, etc of elements or equipment;
- replacement or renewals;
- adequacy and suitability of the maintenance that has been or is being undertaken;
- non - compliance with Statutory Regulations, Railway Group and Network Rail Standards, European and British Standards or station or depot lease maintenance obligations, or deviation from good practice guidance recommendations.

Hidden obscured or buried parts of Operational Property Structures or elements not inspected shall be identified clearly and listed within each report and the reasons for not inspecting recorded. Recommendations shall be made for any further investigation required. Supporting photographs shall be provided to illustrate the location and difficulty of those parts or elements not inspected. These requirements shall also apply in respect of inspections of Buildings

A list of any items for which further investigation or testing is recommended shall be included in the report. This list shall exclude any items that should routinely be carried out as part of the maintenance process (for example periodic electrical installation testing).

The report shall be cross-referenced to the Operational Property Structure as described in the OPAS system.

Recommendations shall be made where opportunities exist to reduce future maintenance costs by:

- replacing assets with those sized to match current demand (e.g. limiting the maintained length of Platforms or the length of Platform Canopies to suit station usage or the size of boiler plant to suit the current load);
- decommissioning redundant assets;
- using lower maintenance materials;

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- selecting materials to reduce the need for future maintenance works or sighting elements to reduce the need for track possessions or isolations.

3.3 Video and photographic records

Video and photographic records of drains shall be supplied digitally in colour, and shall include identification of the drain run, chainage from the start point and the time and date.

Surveys identifying drain runs with blockages preventing CCTV camera access shall be listed and reported to the Building Manager immediately.

4 Information to be recorded

4.1 General

Data in OPAS may be input using a handheld personal data assistant (PDA) or a standalone data entry laptop (SDE) by completing the digital template which contains details of the area to be surveyed, including the portfolio type, site name, address and reference number for the Site.

A list of Operational Property assets is also included from which relevant assets at the site may be identified with the location.

Information in OPAS shall be input in a logical sequence, which enables OPAS to be interrogated and used. To enable this facility the taxonomy data structure in OPAS is defined as in Figure 11B.1.

The taxonomy shows that the portfolio is split into individual sites, blocks, locations and finally assets. An asset is described by its element, feature and attribute.

4.2 Portfolios

There are six portfolio types within OPAS. These are:

- Station (Franchised): leased to TOC's
- Station (Managed): Station managed by Network Rail
- MDU: Maintenance Deliver Units
- LMD: Light Maintenance Depots
- Critical lineside Building e.g. signal boxes
- Non-critical lineside Building e.g. REB

A full matrix of the data required for each portfolio type is given in **Appendix A**.

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A
S
S
E
T

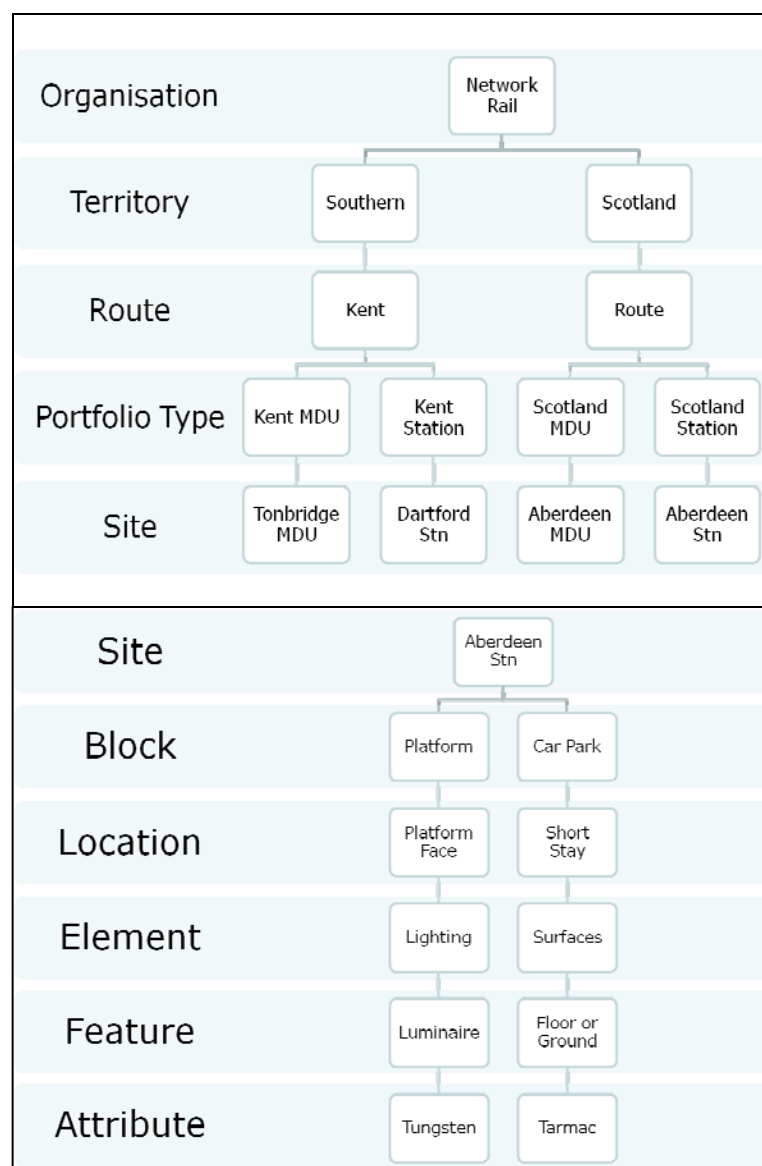


Figure 11B.1: OPAS Taxonomy

4.3 Sites

Each portfolio type shall be broken down into one of six site types.

A site as named on the OPAS system is an amalgamation of the name of the site and an abbreviated form of the applicable type of portfolio (Stn; LMD; MDU; and CLS).

For example, Dinting Stn may be identified as a site under the station portfolio type and Stockport No.2 Signal Box may be considered a site within the critical manned lineside Buildings portfolio. Other examples are:

- Station (Franchised): Folkestone West Station;
- Station (Managed): London Charing Cross Station;

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- MDU: Deal Street MDU;
- LMD: Strawberry Hill LMD;
- Critical Manned: Stockport No.2 signal box;
- Non-Critical: Shap Summit fog hut.

4.4 Asset referencing

An asset is described by a set of 4 numbers as follows:

09	02	00	02
Block Reference	Block Instance	Vertical Identifier	Horizontal Identifier

Each number descriptor has the following meanings:

- block reference: the number identifying the block type;
- block Instance: the occurrence of the block automatically applied by OPAS;
- vertical indicator: the vertical location of the instance;
- horizontal indicator: the horizontal location of the instance.

4.5 Blocks

There are 25 block types available within OPAS as shown in Table 11B.1.

01	Building	13	Fuelling
02	Platforms	14	Track
03	Car Parks	15	CET
04	Canopies	16	Carriage Wash
05	Train Shed (roof)	17	Lift and Escalators
06	Footbridge	18	Inspection and Maintenance Pits
07	Subway	19	Non Passenger Platforms
08	Apron/Hardstanding	20	Roadside and Bridges
09	Access Routes	21	Waiting Shelters
10	Viaduct	22	Undercroft
11	Curtilages	23	Retail Units
12	Depot Shed	24	Concourses
		25	Sidings

Table 11B.1: Block types and reference numbers

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A full definition of each block title not otherwise defined in **Part 1A** is given in **Appendix B**.

A generic question set (GQS) will appear at block level when the creating a record for the site. These questions ask for basic data such as measurements for the block, operational use and other relevant data.

4.6 Locations

Locations are a sub set of the block which accurately identifies and references the asset in relation to the site. Locations are identified within a list of specific locations ranging from Footbridge spans, toilets, and Platform faces etc in **Appendix C**.

For example, below is a picture of Folkestone West station. Annotated on the picture are the correct blocks and locations in view.

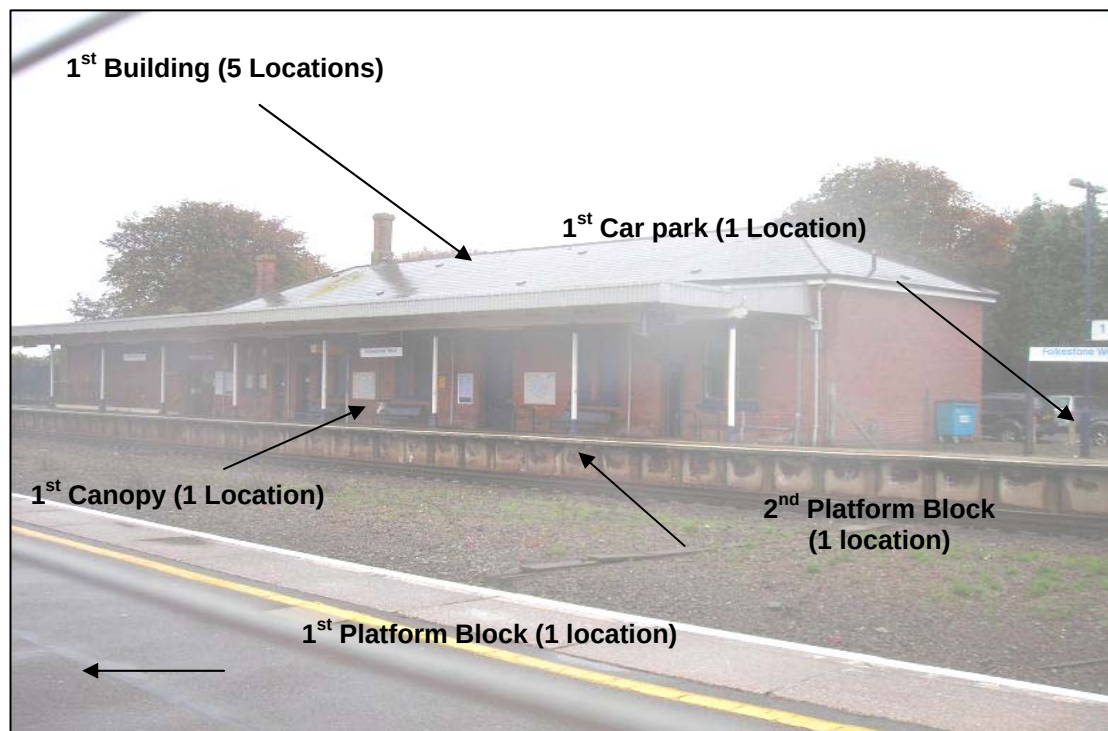


Figure 11B.2: Locations (Folkestone West)

In the example in Figure 11B.2, there are 5 blocks (Platform x 2, Building, Canopy and car park) with 9 locations attributed to the blocks. The references are shown in Table 11B.2.

Appendix D provides further examples to illustrate typical blocks and locations.

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Block Ref. No.	Block Reference	Block Instance	Location Reference	Vertical Identifier	Horizontal Identifier
02	Platform	01	Platform Face	00	01
02	Platform	02	Platform Face	00	01
04	Canopy	01	Canopy- Platform	01	01
03	Car Park	01	Long stay	00	01
01	Building	01	External roof	RO	01
01	Building	01	External Elevation N	EX	01
01	Building	01	External Elevation W	EX	02
01	Building	01	External Elevation S	EX	03
01	Building	01	External Elevation E	EX	04

Table 11B.2: Examples of block and location references

Table 11B.2 outlines four sets of digits required for a Location Reference Diagram (LRD). The first column states the block number of the block title in column 2 in accordance with Table 11B.1. The third column is the block instance, which is a sequential number based on the number of blocks of that type at that site. The fourth column is the name of the location. The fifth and sixth columns outline the vertical and horizontal references of that location.

The vertical number is sequential depending on the physical level of the location. This can either be a number or a set of letters.

The horizontal reference is sequential and set automatically once the first horizontal reference 01 has been identified. When the vertical level changes, a new vertical level (01 etc) must be entered and the horizontal reference reset to 01 for that level.

For example, should another external elevation be found on that particular Building, the horizontal reference would be 05. This would make the four numbers 01 01 EX 05.

If another Canopy was identified, the four sets of numbers would be 04 02 01 01. Notice that the second set of numbers increases from 01 to 02 but the remaining numbers do not increase. This is because the block instances have increased (now 2 canopies not 1) but the vertical level remains the same as does the horizontal reference because there is only one instance of a location on the new Canopy.

Figure 11B.3 shows Llangollen station with blocks and locations as listed in Table 11B.3. The block names are shown on the labels within Figure 11B.3.

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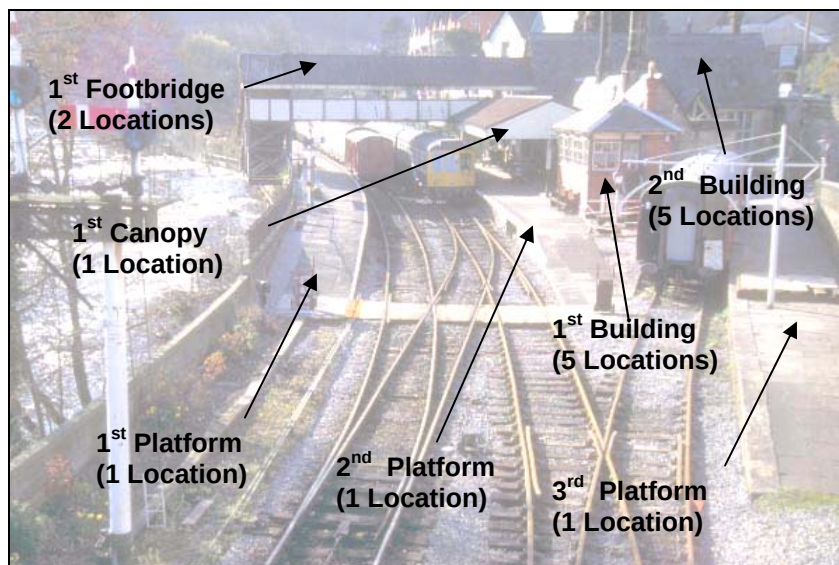


Figure 11B.3: Llangollen station locations and blocks

Block Ref. No.	Block Instance	Vertical Identifier	Horizontal Identifier	Location Name
06	01	01	01	Footbridge Span
06	01	00	01	Footbridge Stairs
06	01	00	02	Footbridge Stairs
04	01	01	01	Canopy - Platform
02	01	00	01	Platform Face
02	02	00	01	Platform Face
02	03	00	01	Platform Face
01	01	RO	01	External Roof
01	01	EX	01	Ex. Elev. N
01	01	EX	02	Ex. Elev. W
01	01	EX	03	Ex. Elev. S
01	01	EX	04	Ex. Elev. E
01	02	RO	01	External Roof
01	02	EX	01	Ex. Elev. N
01	02	EX	02	Ex. Elev. W
01	02	EX	03	Ex. Elev. S
01	02	EX	04	Ex. Elev. E

Table 11B.3: Block and locations at Llangollen station

The use of the special EX and RO prefixes are explained in detail in a later section.

Each new block and location created increases the relevant location reference number sequentially.

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For example, should another Building block be identified at Llangollen Station, 01 **03** is automatically assigned as the first two sets of digits as this is the third Building at this site. Similarly a further Canopy block will be registered as 04 **02** as it is the second Canopy identified at the site.

For the horizontal and vertical identifiers, if another roof location is identified on the 2nd Building block would be automatically labelled as 01 02 RO **02** as it is the 2nd roof on the Building.

For the internal locations within a Building, the principles of vertical levels and horizontal levels are used to provide each room or location with a unique identifier. For example, a Building block with 5 floors should have five different vertical identifying numbers, but all 5 would be sequential (e.g. from 01 to 05). Each floor should have a set of horizontal identifiers for the rooms. With this scenario the 7th room on the third floor should have the following location reference:

01 (block no) **01** (block instance) **03** (vertical identifier) **07** (horizontal identifier)

At each new vertical level, the horizontal level starts from 01. Each new number is set automatically except that for the horizontal reference which must be reset to 01 for each new vertical level.

4.7 Vertical identifier

The third set of numbers may be referred to as a vertical identifier as well as the vertical reference. This is a set of numbers is primarily used for differentiating between vertical levels. Level 00 refers to the Platform level when adjacent to the Platform or ground level where the location is remote from the Platform. Figure 11B.4 illustrates the difference.

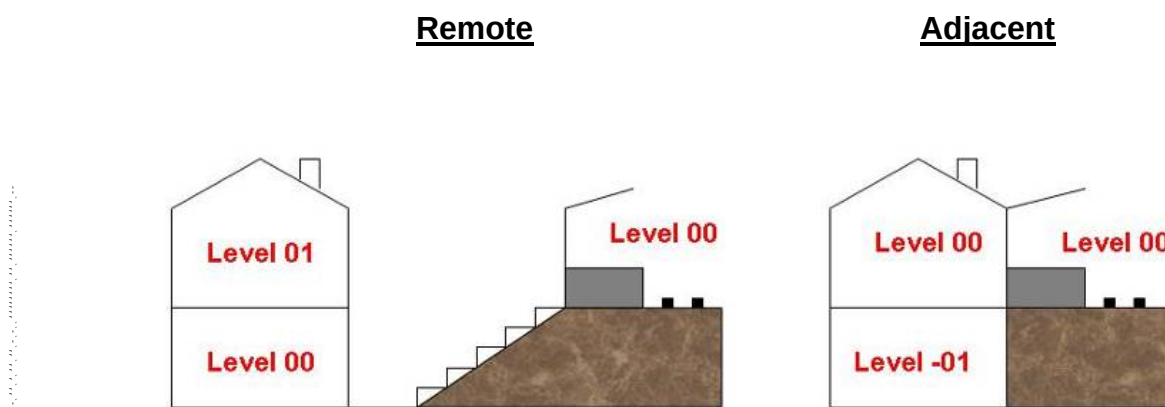


Figure 11B.4: Adjacent and remote locations

This principle is used for any location and the level is always relative to the Platform, unless there is a significant distance between the Platform and the location.

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Levels below the reference Platform level, or below the remote ground level, are denoted as a negative. In Figure 11B.4, the access route will be at level 00, because it leads directly to the Platform.

4.8 Horizontal identifier

The horizontal identifier relates the location to its position within the block. Often the horizontal identifier refers to the position of rooms within Buildings. The first location on a vertical level within a block has a horizontal identifier of 01 and subsequent locations on the same vertical level are numbered sequentially.

When changing the vertical identifier the next level, the horizontal identifier must be 01 for the first identified location. Subsequent horizontal identifier are numbered sequentially automatically. Figure 11B.5 illustrates this principle.

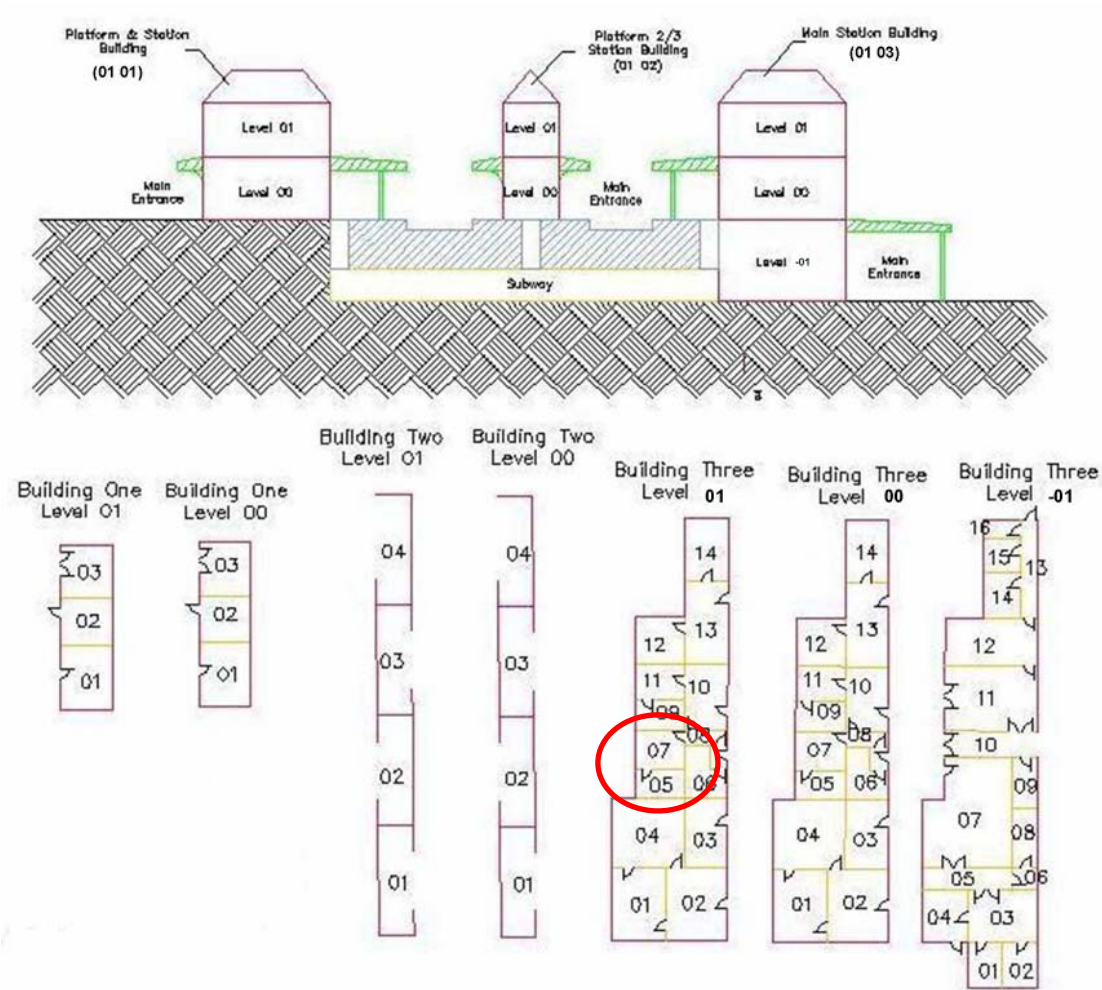


Figure 11B.5: Horizontal identifier within Buildings

Most block types used within OPAS, will require the first vertical and horizontal identifier to be 00 01. When there is a change in vertical level, the vertical identifier must remain sequential. For example a Building may have 3 vertical levels for which the vertical identifiers should be 00, 01 and 02.

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In Figure 11B.5, room 07 location (circled in red) in the highest level of Building three would be represented by the following combination

01	03	01	07
----	----	----	----

01 = the Building block reference number within Table 11B.1

03 = Building three (block instance number)

01 = First floor level (vertical indicator)

07 = Room 7 (horizontal indicator)

This is the correct use of the referencing system in relation to the internal layout of a Building. In this way, any room in a Building can be successfully identified. For example, the reference of room 2 location on the Platform level of Building two would be referenced as:

01	02	00	02
----	----	----	----

For the internal layout of a Building, the horizontal identifier is used to uniquely identify the number of locations within that particular block. For example, an access route block with two separate pedestrian paths may be recorded with the first as 01 and the second as 02. These become the horizontal indicators. If however the access routes are at two different levels (potentially between a Platform at high level and a station entrance at low level) the vertical identifier should change to reflect the change in level. In this case, the access routes may be recorded as 00 01 and 01 01 when the routes are the first instance of an access route at levels 00 and 01.

To summarise, the pedestrian access path location in the particular example has the following four sets of numbers to identify it, where 09 represents the block reference number for access route in accordance with Table 11B.1.

09	02	00	02
----	----	----	----

4.9 Buildings and non-conforming prefixes

The system in accordance with Clause 5.8 changes, when locations extend beyond one vertical level. There are four examples where this occurs.

As stated previously Buildings have at least 5 external locations, four walls and one roof. Each wall is counted as an exterior elevation location and because a wall may extend to more than one level, walls are given the unique prefix of EX. In the four sets of numbers this replaces the vertical level. For example, in Figure 11B.6 the third location on this first Building is an exterior elevation facing south and as such the reference will be:

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01	01	Ex	03
----	----	----	----

This prefix can then be adapted for any solution. Figure 11B.6 is an example of a T-shaped Building with the vertical and horizontal levels indicated.

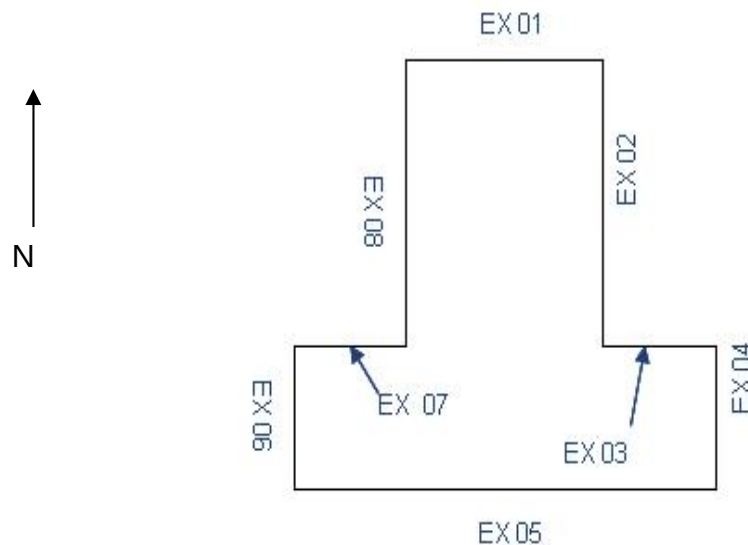


Figure 11B.6: T-shaped first Building (01 01)

Note that any external elevation, regardless of which direction it is facing can have any horizontal indicator, as long as it is in a logical sequence. For ease of reference, this document uses EX 01 as external elevation north location, but EX 01 could also be chosen to be the external elevation south. Regardless of facing direction, the horizontal identifier however still increases in sequential order. In Figure 11B.6, there are 8 external elevations all facing in different directions, in which the last location horizontal reference is 08 giving a full reference of:

01	01	Ex	08
----	----	----	----

The second set of non-conforming prefixes relates to internal structures which may traverse more than one level. A typical example is a column within a Building which stretches over more than one floor. In Figure 11B.7, the internal column forms a location on four levels.

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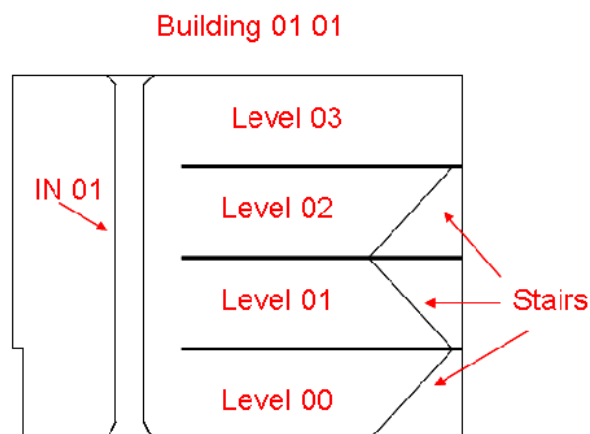


Figure 11B.7: Use of the IN prefix

The location of the column is given a reference of 'IN' and in the same format as 'EX', such columns must also be in sequence from 01. The full reference number for this column, will be:

01	01	IN	01
----	----	----	----

For subsequent columns in the same Building, the last two digits increase by one. For another Building with an internal structural element, the reference for the last two digits would return to 01 as one of the preceding set of numbers would have changed (i.e. the column in the second Building would be 01 02 IN 01).

The third set of non-conforming prefixes apply to mezzanine levels, primarily inside Buildings. Figure 11B.8 shows a mezzanine level.

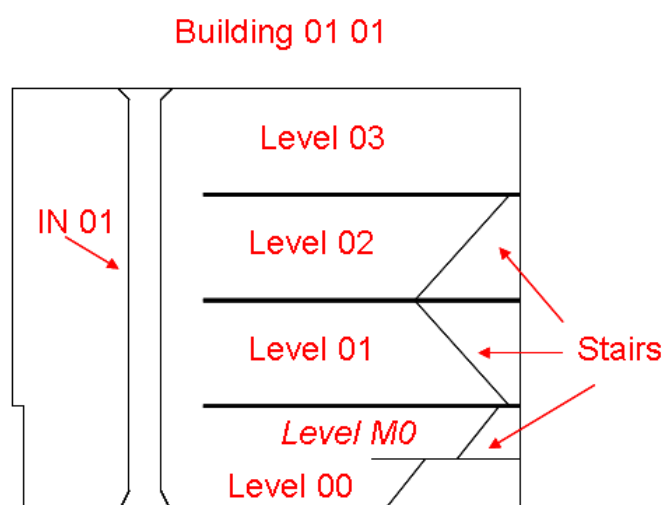


Figure 11B.8: Use of the M prefix

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When recording a mezzanine level the prefix 'M' should be used as the first character of the third set of numbers. The second character is the floor immediately below the mezzanine. In this example the full reference for the first room on the mezzanine level will be:

01	01	M0	01
----	----	----	----

The final non-conforming pre-fix applies to roofs which have a prefix of RO.

A separate roof location is required whenever the roof alters significantly in material or level. Figure 11B.9 is an example of a set of roofs on Building 01.

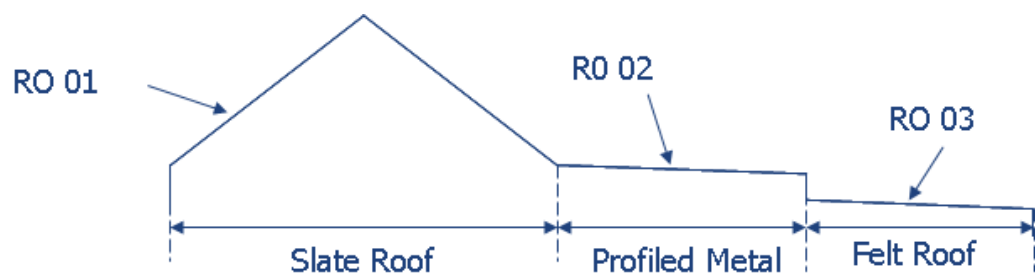


Figure 11B.9: A roof location layout

in this example, the roof has three locations, because the level or the material varies distinctly. Duo pitch gable and hipped end roofs should be recorded as one roof location and not as separate locations. The correct reference for the profiled metal roof would be:

01	01	R0	02
----	----	----	----

4.10 Platform referencing

The Platform numbering convention requires the same approach described in Clause 5.9, but requires a slightly different application and above all accuracy. The key differences are:

- a Platform block identifies a separated Platform structure, not just a Platform number;
- a new location is required when the operational status changes (e.g. operational and non-operational status;;
- locations relate to Platform 'faces' but include all the assets and features of the Platform structure and surfaces;