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Change Request #:	215
Assigned OGC Document #:	12-044
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Document Name/Version:	*City Geography Markup Language (CityGML) Encoding Standard / 2.0
OGC Project Document:	*08-007r2

If this is a revision of a previous submission and you have a Change Request Number, then check here: ☐

Enter the CR number here:

Enter the Revision Number that you are revising here:

Title: ⓘ	* CityGML: Storeys and LODs for BIM interiors
Source: ⓘ	*Clifford Behrens; CityGML SWG
Work item code: ⓘ	
Category: ⓘ	* B (Addition of feature)

Reason for change: ⓘ	* 1) The concept of \"storeys\" or \"floors\" needs to be supported to enable emergency responses, e.g., E911, and other applications, e.g., indoor routing. Note, that the delineation of floors can happen in at least two ways. One notion derives from the topology of a CityModel, e.g., the number of rows of windows in a BIM. A second notion is realized as a name assigned to a feature collection, e.g., \"Floor 2.\" Note that this distinction is important since the name of a floor may not accurately reflect its topological position. As an example, in the US many buildings have 13 or more physical storeys; yet, the 13th floor is not a named option in an elevator, due to long-standing superstitions. The name is particularly important for providing natural language routing to mobile clients.
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	2) Related to the above, more levels of detail are required for modeling building interiors. At the moment only one CityGML level of detail (LOD4) pertains to building interiors, and its high-resolution captures all features including floors, walls, ceilings, furniture, etc., while five LODs exist for modeling building exteriors. This amount of detail in a BIM seems overkill for many indoor applications. A low-resolution interior LOD analogous to a building's footprint in LOD0, might be a tile of a floor's perimeter. The next higher-resolution LOD of a building's interior might be a 2D floorplan, or "milk carton" model. At the next higher level of resolution, the model of an interior LOD might resemble the block model of a cityscape in LOD1, and so on. These lower interior LODs are important to those applications, e.g., indoor navigation and routing, that only require floorplans or a "mazeway" view. Moreover, since CityGML models of building interiors will most likely be produced by CAD tools, it is important that a simpler, less-costly entry level be provided to CAD data producers. Otherwise, the availability of CityGML models of building interiors is likely to be delayed.
Summary of change: ⓘ	* The proposed enhancements above will require either an elaboration of LOD4 in the CityGML specification, or consideration of more than the current five LODs. I suspect that the former approach makes more sense because interior modeling of buildings may often require higher resolution than modeling of their exteriors and surrounding landscape. Floors or storeys might be modeled as city object groups, but it seems that support for both topological and attributed definitions (READ names) are needed.
Consequences if not approved: ⓘ	
Clauses affected: ⓘ	* Open for consideration.
Additional Documents affected: ⓘ	
Supporting Documentation: ⓘ	To start the discussion about this requirement, I would propose a careful review of the four-LOD indoor model described by Hagedorn, B.; Trapp, M.; Glander, T.; Dollner, J.; , "Towards an Indoor Level-of-Detail Model for Route Visualization," Mobile Data Management: Systems, Services and Middleware, 2009. MDM '09. Tenth International Conference on , vol., no., pp.692-697, 18-20 May 2009.
Comments: ⓘ	In previous TCs I (and others) had proposed the need of support for floors/storeys and lower-resolution LODs for modeling building interiors in CityGML. In response to an opportunity to suggest enhancements and new work in the next version of CityGML, I offered

	these two enhancements. These ideas were well-received and much discussion followed. Carsten encouraged me to formally submit these requirements in a CR to initiate the drafting of enhancements to the next version of CityGML.
Status: 	Assigned
Assigned To: 	CityGML SWG
Disposition: 	Referred and Posted