

Требования к детализации модели – нужен ли в эксплуатации LOD500?

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по управлению жизненным циклом здания

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Американская история развития понятия LOD

- 2004г. частная компания Vico Software:
LOD – Level of Detail
- 2008г. институт архитектуры (AIA):
LOD – Level of Development (LOD100, LOD200, LOD300, LOD400 и LOD500)
- 2013г. общественная организация BIMForum:
LOD350, Level of Development Specification

Соотношение значения геометрии и информации в модели на разных этапах жизненного цикла

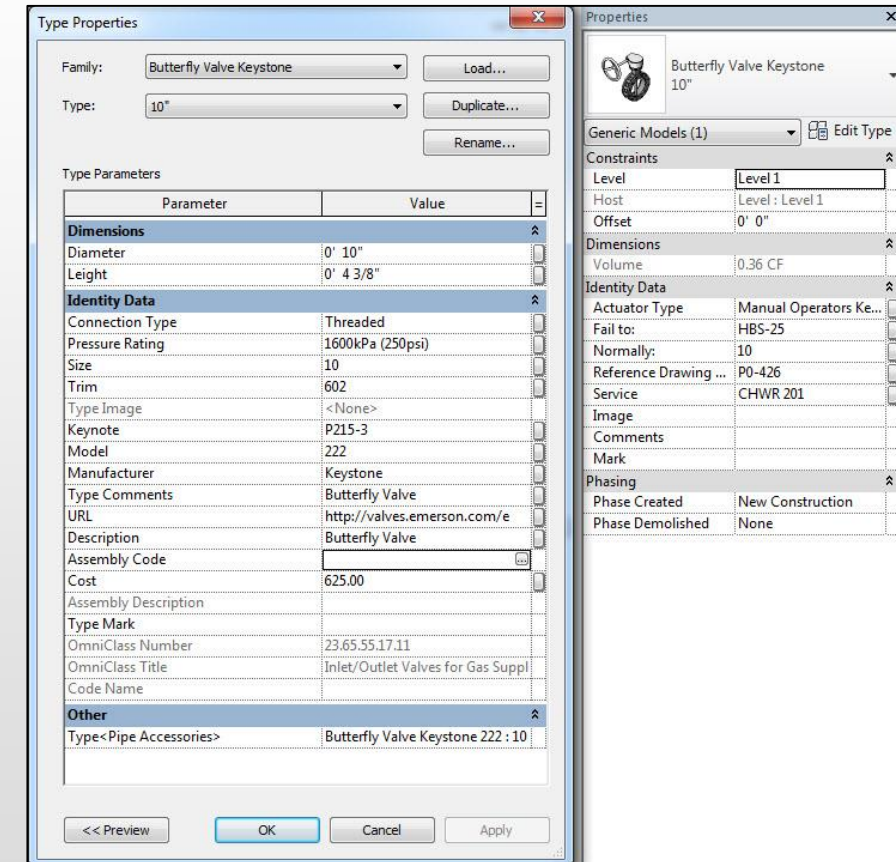


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■ Геометрия
■ Информация

LOD (Level of Model Definition) = LOD + LOI

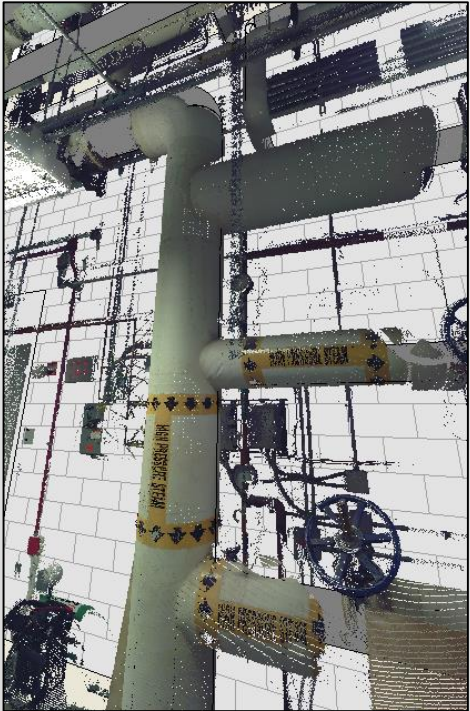
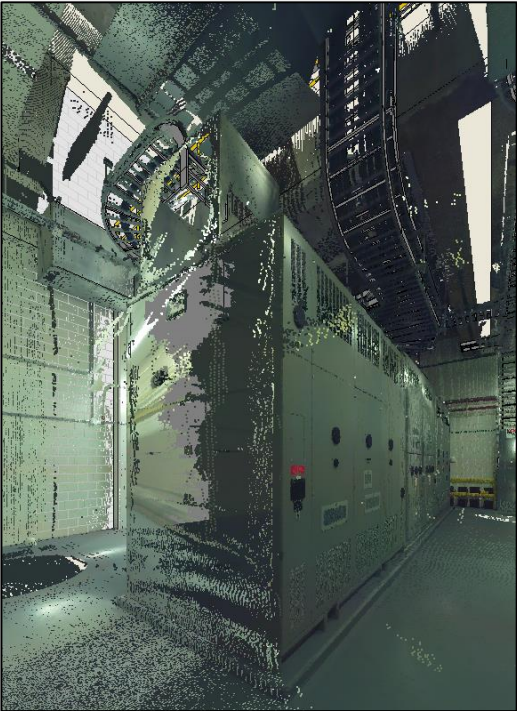
LOI – Level of Information – Уровень проработки информации



LOA – Level of Accuracy

уровень проработки точности

OmniClass Table 21 Elements (CSI UniFormat™ 2010)		Measured Accuracy							Represented Accuracy						
		-	2"	5/8"	1/4"	1/16"	Upper Range		2"	2"	5/8"	1/4"	1/16"	Upper Range	
		2"	5/8"	1/4"	1/16"	0"	Lower Range		LOA10	LOA20	LOA30	LOA40	LOA50	Lower Range	
		LOA10	LOA20	LOA30	LOA40	LOA50	Validation	Note	LOA10	LOA20	LOA30	LOA40	LOA50	Validation	Note
21-01 00 00	Substructure							Exposed surface							Exposed surface
21-01 10 00	Foundations							Exposed surface		•					Exposed surface
21-01 10 10	Standard Foundations							Exposed surface		•					Exposed surface
21-01 10 20	Special Foundations							Exposed surface		•					Exposed surface
21-01 20 00	Subgrade Enclosures							Interior or Exposed Surface			•				Interior or Exposed Surface
21-01 20 10	Walls for Subgrade Enclosures							Interior or Exposed Surface			•				Interior or Exposed Surface
21-01 40 00	Slabs-On-Grade							Exposed surface			•				Exposed surface
21-01 40 10	Standard Slabs-on-Grade							Exposed surface			•				Exposed surface
21-01 40 20	Structural Slabs-on-Grade							Exposed surface			•				Exposed surface
21-02 00 00	Shell							Exposed surface							Exposed surface
21-02 10 00	Superstructure							Exposed surface			•				Exposed surface
21-02 10 10	Floor Construction							Specify Vertical / Horizontal Surface			•				Specify Vertical / Horizontal Surface
21-02 10 20	Roof Construction							Specify Vertical / Horizontal Surface			•				Specify Vertical / Horizontal Surface
21-02 10 80	Stairs							Specify Vertical / Horizontal Surface			•				Specify Vertical / Horizontal Surface
21-02 20 00	Exterior Vertical Enclosures							Exposed Face		•					Exposed Face
21-02 20 10	Exterior Walls							Exposed Face		•					Exposed Face
21-02 20 20	Exterior Windows							Define Face required		•					Define Face required
21-02 20 50	Exterior Doors and Grilles							Define Face required		•					Define Face required
21-02 20 70	Exterior Louvers and Vents							Define Face required		•					Define Face required
21-02 20 80	Exterior Walls and Appurtenances							Exposed Face		•					Exposed Face
21-02 20 90	Exterior Walls Specialties							Exposed Face		•					Exposed Face
21-02 30 00	Exterior Horizontal Enclosures							Exposed surface		•					Exposed surface
21-02 30 10	Roofing							Exposed surface		•					Exposed surface
21-02 30 20	Roof Appurtenances							Exposed surface		•					Exposed surface
21-02 30 40	Traffic Bearing Horizontal Enclosures							Exposed surface		•					Exposed surface
21-02 30 60	Horizontal Openings							Define Face required		•					Define Face required
21-02 30 80	Overhead Exterior Enclosures							Exposed surface		•					Exposed surface
21-03 00 00	Interiors							Define Face required							Define Face required



SYNERGY

S Y S T E M S

$$\text{LOD} = \text{LOD} + \text{LOI} + \text{LOA}$$

OmniClass Table 21 Elements (CSI UniFormat™ 2010)	Level of Detail					Level of Information					Level of Accuracy						
	LOD100	LOD200	LOD300	LOD400	LOD500	LOI100	LOI200	LOI300	LOI400	LOI500	2'	2"	5/8"	1/4"	1/16"	Upper Range	Lower Range
											LOA10	LOA20	LOA30	LOA40	LOA50	Validation	Note
21-01 00 00 Substructure											Exposed surface						
21-01 10 00 Foundations			•					•				•				B	Exposed surface
21-01 10 10 Standard Foundations		•						•				•				B	Exposed surface
21-01 10 20 Special Foundations		•						•				•				B	Exposed surface
21-01 20 00 Subgrade Enclosures		•						•					•			B	Interior or Exposed Surface
21-01 20 10 Walls for Subgrade Enclosures			•					•					•			B	Interior or Exposed Surface
21-01 40 00 Slabs-On-Grade			•						•				•			B	Exposed surface
21-01 40 10 Standard Slabs-on-Grade			•						•				•			B	Exposed surface
21-01 40 20 Structural Slabs-on-Grade			•						•				•			B	Exposed surface
21-02 00 00 Shell											Exposed surface						
21-02 10 00 Superstructure			•						•				•			B	Exposed surface
21-02 10 10 Floor Construction			•						•				•			B	Specify Vertical / Horizontal Surface
21-02 10 20 Roof Construction			•						•				•			B	Specify Vertical / Horizontal Surface
21-02 10 80 Stairs			•						•				•			B	Specify Vertical / Horizontal Surface
21-02 20 00 Exterior Vertical Enclosures				•					•			•				B	Exposed Face
21-02 20 10 Exterior Walls				•					•			•				B	Exposed Face
21-02 20 20 Exterior Windows				•					•			•				B	Define Face required
21-02 20 50 Exterior Doors and Grilles				•					•			•				B	Define Face required
21-02 20 70 Exterior Louvers and Vents				•					•			•				B	Define Face required
21-02 20 80 Exterior Walls and Appurtenances				•					•			•				B	Exposed Face
21-02 20 90 Exterior Walls Specialties				•					•			•				B	Exposed Face
21-02 30 00 Exterior Horizontal Enclosures			•						•			•				B	Exposed surface
21-02 30 10 Roofing			•						•			•				B	Exposed surface
21-02 30 20 Roof Appurtenances			•						•			•				B	Exposed surface
21-02 30 40 Traffic Bearing Horizontal Enclosures			•						•			•				B	Exposed surface
21-02 30 60 Horizontal Openings			•						•			•				B	Define Face required
21-02 30 80 Overhead Exterior Enclosures			•						•			•				B	Exposed surface
21-03 00 00 Interiors											Define Face required						

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Определение требований к модели для эксплуатации

LOD 500		
Геометрия	Информация	Верификация
LOD 400	?	?

Универсальные интервалы		
Геометрия	Информация	Верификация
LOD 200 - 400	LOI 30 - 50	LOA 30 - 50

- Для модели по эксплуатации нужен баланс LOD, LOI, LOA
- Для разных задач по эксплуатации нужно свое соотношение параметров LOD, LOI, LOA

Модель для эксплуатации исследовательского центра ННМИ, США

