BIM FORUM LOD Specification 2020 Part II

Milestones shown here are examples only ->

Breakdown Level	This project	UNIFORMAT	OMNICLASS	SYSTEM/COMPONENT	RELEVANT ATTRIBUTE TABLES	SD LOD	SD MEA	SD Notes	DD LOD	DD MEA	DD Notes	CD LOD	CD MEA	CD Notes	Estimating Est. 1 LOD	Estimating Est. 1 MEA	Estimating Est. 1 Notes	Estimating Bid Pkg. LOD	Estimating Bid Pkg. MEA	Estimating Bid Pkg. Notes	LEED Cert. Check LOD	LEED Cert. Check MEA	LEED Cert. Check Notes	LEED Cert Submittal LOD	LEED Cert Submittal MEA	LEED Cert Submittal Notes
				INFORMATION																						
1		N/A	36-51	**OFFICE RESOURCES**																						
2		N/A	36-51 73	**Office Model Templates**																						
3		N/A	36-51 73 11	**Model Content**																						
4		N/A	36-51 73 11 13	Model Annotation Content																						
5		N/A	36-51 73 11 13 11	Properties																						
6		N/A	36-51 73 11 13 11 19	Zones/Rooms/Spaces																						
5		N/A	36-51 73 11 13 17	Symbols																						
6		N/A	36-51 73 11 13 17 11	Horizontal Grids																						
6		N/A	36-51 73 11 13 17 13	Vertical Levels																						
				ELEMENTS																						
1		A	21-01 00 00	**SUBSTRUCTURE**																						
2		A10	21-01 10	**Foundations**	A, B Concrete; A, B Wood; A, B Masonry; A, B Precast Concrete																					
3		A1010	21-01 10 10	**Standard Foundations**	A, B Concrete; A, B Wood; A, B Masonry; A, B Precast Concrete																					
4		A1010.10	21-01 10 10 10	Wall Foundations	A, B Concrete; A, B Wood; A, B Masonry; A, B Precast Concrete																					
4		A1010.30	21-01 10 10 30	Column Foundations	A, B Concrete; A, B Wood; A, B Masonry; A, B Precast Concrete																					
4		A1010.90	21-01 10 10 90	Standard Foundation Supplementary Components																						
3		A1020	21-01 10 20	**Special Foundations**	A, B Concrete; A, B Wood; A, B Masonry; A, B Precast Concrete																					
4		A1020.10	21-01 10 20 10	Driven Piles																						
4		A1020.15	21-01 10 20 15	Bored Piles																						
4		A1020.20	21-01 10 20 20	Caissons																						
4		A1020.30	21-01 10 20 30	Special Foundation Walls																						
4		A1020.40	21-01 10 20 40	Foundation Anchors																						
4		A1020.50	21-01 10 20 50	Underpinning																						
4		A1020.60	21-01 10 20 60	Raft Foundations																						
4		A1020.70	21-01 10 20 70	Pile Caps																						
4		A1020.80	21-01 10 20 80	Grade Beams	A, B Concrete; A, B Wood; A, B Masonry; A, B Precast Concrete																					
2		A20	21-01 20	**Subgrade Enclosures**	A, B Concrete; A, B Wood; A, B Masonry; A, B Precast Concrete																					
3		A2010	21-01 20 10	**Walls for Subgrade Enclosures**	A, B Concrete; A, B Wood; A, B Masonry; A, B Precast Concrete																					
4		A2010.10	21-01 20 10 10	Subgrade Enclosure Wall Construction																						
4		A2010.20	21-01 20 10 20	Subgrade Enclosure Wall Interior Skin																						
4		A2010.90	21-01 20 10 90	Subgrade Enclosure Wall Supplementary Components																						
2		A40	21-01 40	**Slabs-on-Grade**	A, B - Str. Concrete																					
3		A4010	21-01 40 10	**Standard Slabs-on-Grade**	A, B Concrete																					
3		A4020	21-01 40 20	**Structural Slabs-on-Grade**	A, B Concrete																					
3		A4030	21-01 40 30	**Slab Trenches**																						
3		A4040	21-01 40 40	**Pits and Bases**																						
3		A4090	21-01 40 90	**SlabOn-Grade Supplementary Components**																						
4		A4090.10	21-01 40 90 10	Perimeter Insulation																						
4		A4090.20	21-01 40 90 20	Vapor Retarder																						
4		A4090.30	21-01 40 90 30	Waterproofing																						
4		A4090.50	21-01 40 90 50	Mud Slab																						
4		A4090.60	21-01 40 90 60	Subbase Layer																						
2		A60	21-01 60	**Water and Gas Mitigation**																						
3		A6010	21-01 60 10	**Building Subdrainage**																						
4		A6010.10	21-01 60 10 10	Foundation Drainage																						
4		A6010.20	21-01 60 10 20	Underslab Drainage																						
3		A6020	21-01 60 20	**Off-Gassing Mitigation**																						
4		A6020.10	21-01 60 20 10	Radon Mitigation																						
4		A6020.50	21-01 60 20 50	Maethane Mitigation																						
2		A90	21-01 90	**Substructure Related Activities**																						
3		A9010	21-01 90 10	**Substructure Excavation**																						

4							A9010.10	21-01 90 10 10	Backfill and Compaction																								
3							A9020	21-01 90 20	**Construction Dewatering**																								
3							A9030	21-01 90 30	**Excavation Support**																								
4							A9030.10	21-01 90 30 10	Anchor Tiebacks																								
4							A9030.20	21-01 90 30 20	Cofferdams																								
4							A9030.40	21-01 90 30 40	Cribbing and Walers																								
4							A9030.60	21-01 90 30 60	Ground Freezing																								
4							A9030.70	21-01 90 30 70	Slurry Walls																								
3							A9040	21-01 90 40	**Soil Treatment**																								
1							B	21-02 00 00	**SHELL**																								
2							B10	21-02 10	**Superstructure**																								
3							B1010	21-02 10 10	**Floor Construction**	A, B Cold Formed Metal Framing; A, B Masonry; A, B Metal Deck; A, B Precast Concrete; A,B Steel Joist; A, B Structural Steel; A, B Concrete; A, B Wood																								
4							B1010.10	21-02 10 10 10	Floor Structural Frame																								
5							B1010.10.10		Concrete	A, B Concrete																								
5							B1010.10.11		Precast Structural Inverted T Beam	A, B Precast Concrete																								
5							B1010.10.12		Precast Structural Column	A, B Precast Concrete																								
5							B1010.10.20		Masonry	A, B Masonry																								
5							B1010.10.30		Steel Framing Columns	A, B Structural Steel																								
5							B1010.10.40		Steel Framing Beams	A, B Structural Steel																								
5							B1010.10.50		Steel Framing Bracing Rods	A, B Structural Steel																								
5							B1010.10.60		Steel Joists	A,B Steel Joist																								
5							B1010.10.70		Cold-Formed Metal Framing	A, B Cold Formed Metal Framing																								
5							B1010.10.80		Wood Floor Trusses	A, B Wood																								
4							B1010.20	21-02 10 10 20	Floor Decks, Slabs, and Toppings																								
5							B1010.20.10		Wood Floor Deck	A, B Wood																								
5							B1010.20.20		Metal Floor Deck	A, B Metal Deck																								
5							B1010.20.30		Composite Floor Deck	A, B Structural Steel; A, B Concrete																								
5							B1010.20.40		Concrete	A, B Concrete																								
5							B1010.20.41		Precast Structural Double Tee	A, B Precast Concrete																								
4							B1010.30	21-02 10 10 30	Balcony Floor Construction																								
4							B1010.40	21-02 10 10 40	Mezzanine Floor Construction																								
4							B1010.50	21-02 10 10 50	Ramps																								
4							B1010.90	21-02 10 10 90	Floor Construction Supplementary Components																								
3							B1020	21-02 10 20	**Roof Construction**	A, B Cold Formed Metal Framing; A, B Masonry; A, B Metal Deck; A, B Precast Concrete; A,B Steel Joist; A, B Structural Steel; A, B Concrete; A, B Wood																								
4							B1020.10	21-02 10 20 10	Roof Structural Frame	A, B Structural Steel; A, B Concrete; A,B Steel Joist																								
4							B1020.20	21-02 10 20 20	Roof Decks, Slabs, and Sheathing	A,B Steel Joist; A, B Metal Deck																								
4							B1020.30	21-02 10 20 30	Canopy Construction																								
4							B1020.90	21-02 10 20 90	Roof Construction Supplementary Components																								
3							B1080	21-02 10 80	**Stairs**	A, B Cold Formed Metal Framing; A, B Masonry; A, B Metal Deck; A, B Precast Concrete; A, B Structural Steel; A, B Concrete; A, B Wood																								
4							B1080.10	21-02 10 80 10	Stair Construction	A, B Structural Steel; A, B Precast Concrete; A, B Concrete																								
4							B1080.30	21-02 10 80 30	Stair Soffits																								
4							B1080.50	21-02 10 80 50	Stair Railings	A, B Structural Steel; A, B Precast Concrete; A, B Concrete																								
4							B1080.60	21-02 10 80 60	Fire Escapes	A, B Structural Steel; A, B Precast Concrete; A, B Concrete																								
4							B1080.70	21-02 10 80 70	Metal Walkways	A, B Structural Steel; A, B Precast Concrete; A, B Concrete																								
4							B1080.80	21-02 10 80 80	Ladders	A, B Structural Steel																								
2							B20	21-02 20	**Exterior Vertical Enclosures**																								
3							B2010	21-02 20 10	**Exterior Walls**	B – Ext. Wall																								
4							B2010.10	21-02 20 10 10	Exterior Wall Veneer	A, B Masonry																								
4							B2010.20	21-02 20 10 20	Exterior Wall Construction	A, B Cold Formed Metal Framing; A, B Wood																								
5							B2010.20.10		Exterior Walls - Wood																								
5							B2010.20.20		Exterior Walls - Cold-Form Metal Framing																								
5							B2010.20.30		Exterior Walls - Masonry																								
5							B2010.20.40		Exterior Walls - Precast Concrete																								
4							B2010.30	21-02 20 10 30	Exterior Wall Interior Skin																								
4							B2010.40	21-02 20 10 40	Fabricated Exterior Wall Assemblies																								

4							B2010.50	21-02 20 10 50	Parapets																										
4							B2010.60	21-02 20 10 60	Equipment Screens																										
4							B2010.80	21-02 20 10 80	Exterior Wall Supplementary Components																										
4							B2010.90	21-02 20 10 90	Exterior Wall Opening Supplementary Components																										
3							B2020	21-02 20 20	**Exterior Windows**	B – Ext. Openings																										
4							B2020.10	21-02 20 20 10	Exterior Operating Windows																										
4							B2020.20	21-02 20 20 20	Exterior Fixed Windows																										
4							B2020.30	21-02 20 20 30	Exterior Window Wall																										
4							B2020.50	21-02 20 20 50	Exterior Special Function Windows																										
3							B2050	21-02 20 50	**Exterior Doors and Grilles**	B – Ext. Doors																										
4							B2050.10	21-02 20 50 10	Exterior Entrance Doors																										
4							B2050.20	21-02 20 50 20	Exterior Utility Doors																										
4							B2050.30	21-02 20 50 30	Exterior Oversize Doors																										
4							B2050.40	21-02 20 50 40	Exterior Special Function Doors																										
4							B2050.60	21-02 20 50 60	Exterior Grilles																										
4							B2050.70	21-02 20 50 70	Exterior Gates																										
4							B2050.90	21-02 20 50 90	Exterior Door Supplementary Components																										
3							B2070	21-02 20 70	**Exterior Louvers and Vents**	B - Ext. Louvers and Vents																										
4							B2070.10	21-02 20 70 10	Exterior Louvers																										
4							B2070.50	21-02 20 70 50	Exterior Vents																										
3							B2080	21-02 20 80	**Exterior Wall Appurtenances**																										
4							B2080.10	21-02 20 80 10	Exterior Fixed Grilles and Screens																										
4							B2080.30	21-02 20 80 30	Exterior Opening Protection Devices																										
4							B2080.50	21-02 20 80 50	Exterior Balcony Walls and Railings																										
4							B2080.70	21-02 20 80 70	Exterior Fabrications																										
4							B2080.80	21-02 20 80 80	Bird Control Devices																										
3							B2090	21-02 20 90	**Exterior Wall Specialties**																										
2							B30	21-02 30	**Exterior Horizontal Enclosures**																										
3							B3010	21-02 30 10	**Roofing**	B – Roof																										
4							B3010.10	21-02 30 10 10	Steep Slope Roofing																										
4							B3010.50	21-02 30 10 50	Low Slope Roofing																										
4							B3010.70	21-02 30 10 70	Canopy Roofing																										
4							B3010.90	21-02 30 10 90	Roofing Supplementary Components																										
3							B3020	21-02 30 20	**Roof Appurtenances**																										
4							B3020.10	21-02 30 20 10	Roof Accessories																										
4							B3020.30	21-02 30 20 30	Roof Specialties																										
4							B3020.70	21-02 30 20 70	Rainwater Management																										
3							B3040	21-02 30 40	**Traffic Bearing Horizontal Enclosures**	B – Roof																										
4							B3040.10	21-02 30 40 10	Traffic Bearing Coatings																										
4							B3040.30	21-02 30 40 30	Horizontal Waterproofing Membrane																										
4							B3040.50	21-02 30 40 50	Wear Surfaces																										
4							B3040.90	21-02 30 40 90	Horizontal Enclosure Supplementary Components																										
3							B3060	21-02 30 60	**Horizontal Openings**	B – Ext. Openings																										
4							B3060.10	21-02 30 60 10	Roof Windows and Skylights																										
4							B3060.50	21-02 30 60 50	Vents and Hatches																										
4							B3060.90	21-02 30 60 90	Horizontal Openings Supplementary Components																										
3							B3080	21-02 30 80	**Overhead Exterior Enclosures**	C - Susp. Clg.																										
4							B3080.10	21-02 30 80 10	Exterior Ceilings																										
4							B3080.20	21-02 30 80 20	Exterior Soffits																										
4							B3080.30	21-02 30 80 30	Exterior Bulkheads																										
1							C	21-03 00 00	**INTERIORS**																										
2							C10	21-03 10	**Interior Construction**																										
3							C1010	21-03 10 10	**Partitions**	C - Partitions																										
4							C1010.10	21-03 10 10 10	Interior Fixed Partitions																										
5							C1010.10.10		Masonry	A, B Masonry																										
5							C1010.10.20		Cold-Form Metal Framing	A, B Cold Formed Metal Framing																										
5							C1010.10.30		Wood	A, B Wood																										
4							C1010.20	21-03 10 10 20	Interior Glazed Partitions																										
4							C1010.40	21-03 10 10 40	Interior Demountable Partitions																										
4							C1010.50	21-03 10 10 50	Interior Operable Partitions																										
4							C1010.70	21-03 10 10 70	Interior Screens																										
4							C1010.90	21-03 10 10 90	Interior Partitions Supplementary Components																										

3							C1020	21-03 10 20	**Interior Windows**	C – Int. Windows																							
4							C1020.10	21-03 10 20 10	Interior Operating Windows																								
4							C1020.20	21-03 10 20 20	Interior Fixed Windows																								
4							C1020.50	21-03 10 20 50	Interior Special Function Windows																								
4							C1020.90	21-03 10 20 90	Interior Window Supplementary Components																								
3							C1030	21-03 10 30	**Interior Doors**	C – Int. Doors																							
4							C1030.10	21-03 10 30 10	Interior Swinging Doors																								
4							C1030.20	21-03 10 30 20	Interior Entrance Doors																								
4							C1030.25	21-03 10 30 25	Interior Sliding Doors																								
4							C1030.30	21-03 10 30 30	Interior Folding Doors																								
4							C1030.40	21-03 10 30 40	Interior Coiling Doors																								
4							C1030.50	21-03 10 30 50	Interior Panel Doors																								
4							C1030.70	21-03 10 30 70	Interior Special Function Doors																								
4							C1030.80	21-03 10 30 80	Interior Access Doors and Panels																								
4							C1030.90	21-03 10 30 90	Interior Door Supplementary Components																								
3							C1040	21-03 10 40	**Interior Grilles and Gates**	C - Int. Doors																							
4							C1040.10	21-03 10 40 10	Interior Grilles																								
4							C1040.50	21-03 10 40 50	Interior Gates																								
3							C1060	21-03 10 60	**Raised Floor Construction**	C - Raised Floor																							
4							C1060.10	21-03 10 60 10	Access Flooring																								
4							C1060.30	21-03 10 60 30	Platform/Stage Floors																								
3							C1070	21-03 10 70	**Suspended Ceiling Construction**	C - Susp. Clg.																							
4							C1070.10	21-03 10 70 10	Acoustical Suspended Ceilings																								
4							C1070.20	21-03 10 70 20	Suspended Plaster and Gypsum Board Ceilings																								
4							C1070.50	21-03 10 70 50	Specialty Suspended Ceilings																								
4							C1070.70	21-03 10 70 70	Special Function Suspended Ceilings																								
4							C1070.90	21-03 10 70 90	Ceiling Suspension Components																								
3							C1090	21-03 10 90	**Interior Specialties**																								
4							C1090.10	21-03 10 90 10	Interior Railings and Handrails	A, B Miscellaneous Steel																							
4							C1090.15	21-03 10 90 15	Interior Louvers	B,C Louvers and Vents																							
4							C1090.20	21-03 10 90 20	Information Specialties																								
4							C1090.25	21-03 10 90 25	Compartments and Cubicles																								
4							C1090.30	21-03 10 90 30	Service Walls																								
4							C1090.35	21-03 10 90 35	Wall and Door Protection																								
4							C1090.40	21-03 10 90 40	Toilet, Bath and Laundry Accessories																								
4							C1090.45	21-03 10 90 45	Interior Gas Lighting																								
4							C1090.50	21-03 10 90 50	Fireplaces and Stoves																								
4							C1090.60	21-03 10 90 60	Safety Specialties																								
4							C1090.70	21-03 10 90 70	Storage Specialties																								
4							C1090.90	21-03 10 90 90	Other Interior Specialties	A, B Miscellaneous Steel																							
2							C20	21-03 20	**Interior Finishes**																								
3							C2010	21-03 20 10	**Wall Finishes**																								
4							C2010.10	21-03 20 10 10	Tile Wall Finish																								
4							C2010.20	21-03 20 10 20	Wall Paneling																								
4							C2010.30	21-03 20 10 30	Wall Coverings																								
4							C2010.35	21-03 20 10 35	Wall Carpeting																								
4							C2010.50	21-03 20 10 50	Stone Facing																								
4							C2010.60	21-03 20 10 60	Special Wall Surfacing																								
4							C2010.70	21-03 20 10 70	Wall Painting and Coating																								
4							C2010.80	21-03 20 10 80	Acoustical Wall Treatment																								
4							C2010.90	21-03 20 10 90	Wall Finish Supplementary Components																								
3							C2020	21-03 20 20	**Interior Fabrications**																								
3							C2030	21-03 20 30	**Flooring**																								
4							C2030.10	21-03 20 30 10	Flooring Treatment																								
4							C2030.20	21-03 20 30 20	Tile Flooring																								
4							C2030.30	21-03 20 30 30	Specialty Flooring																								
4							C2030.40	21-03 20 30 40	Masonry Flooring																								
4							C2030.45	21-03 20 30 45	Wood Flooring																								
4							C2030.50	21-03 20 30 50	Resilient Flooring																								
4							C2030.60	21-03 20 30 60	Terrazzo Flooring																								
4							C2030.70	21-03 20 30 70	Fluid-Applied Flooring																								
4							C2030.75	21-03 20 30 75	Carpeting																								
4							C2030.80	21-03 20 30 80	Athletic Flooring																								
4							C2030.85	21-03 20 30 85	Entrance Flooring																								

4							C2030.90	21-03 20 30 90	Flooring Supplementary Components																								
3							C2040	21-03 20 40	**Stair Finishes**																								
4							C2040.20	21-03 20 40 20	Tile Stair Finish																								
4							C2040.40	21-03 20 40 40	Masonry Stair Finish																								
4							C2040.45	21-03 20 40 45	Wood Stair Finish																								
4							C2040.50	21-03 20 40 50	Resilient Stair Finish																								
4							C2040.60	21-03 20 40 60	Terrazzo Stair Finish																								
4							C2040.75	21-03 20 40 75	Carpeted Stair Finish																								
3							C2050	21-03 20 50	**Ceiling Finishes**																								
4							C2050.10	21-03 20 50 10	Plaster and Gypsum Board Finish																								
4							C2050.20	21-03 20 50 20	Ceiling Paneling																								
4							C2050.70	21-03 20 50 70	Ceiling Painting and Coating																								
4							C2050.80	21-03 20 50 80	Acoustic Ceiling Treatment																								
4							C2050.90	21-03 20 50 90	Ceiling Finish Supplementary Components																								
1							D	21-04 00 00	**SERVICES**																								
2							D10	21-04 10	**Conveying**																								
3							D1010	21-04 10 10	**Vertical Conveying Systems**																								
4							D1010.10	21-04 10 10 10	Elevators																								
4							D1010.20	21-04 10 10 20	Lifts																								
4							D1010.30	21-04 10 10 30	Escalators																								
4							D1010.50	21-04 10 10 50	Dumbwaiters																								
4							D1010.60	21-04 10 10 60	Moving Ramps																								
3							D1030	21-04 10 30	**Horizontal Conveying**																								
4							D1030.10	21-04 10 30 10	Moving Walks																								
4							D1030.30	21-04 10 30 30	Turntables																								
4							D1030.50	21-04 10 30 50	Passenger Loading Bridges																								
4							D1030.70	21-04 10 30 70	People Movers																								
3							D1050	21-04 10 50	**Material Handling**																								
4							D1050.10	21-04 10 50 10	Cranes																								
4							D1050.20	21-04 10 50 20	Hoists																								
4							D1050.30	21-04 10 50 30	Derrecks																								
4							D1050.40	21-04 10 50 40	Conveyors																								
4							D1050.50	21-04 10 50 50	Baggage Handling Equipment																								
4							D1050.60	21-04 10 50 60	Chutes																								
4							D1050.70	21-04 10 50 70	Pneumatic Tube Systems																								
3							D1080	21-04 10 80	**Operable Access Systems**																								
4							D1080.10	21-04 10 80 10	Suspended Scaffolding																								
4							D1080.20	21-04 10 80 20	Rope Climbers																								
4							D1080.30	21-04 10 80 30	Elevating Platforms																								
4							D1080.40	21-04 10 80 40	Powered Scaffolding																								
4							D1080.50	21-04 10 80 50	Building Envelope Access																								
2							D20	21-04 20	**Plumbing**	D20 - Plumbing, D- Fluid_Gas Distribution; D50 - Electrical																							
3							D2010	21-04 20 10	**Domestic Water Distribution**																								
4							D2010.10	21-04 20 10 10	Facility Potable-Water Storage Tanks																								
4							D2010.20	21-04 20 10 20	Domestic Water Equipment																								
4							D2010.40	21-04 20 10 40	Domestic Water Piping																								
4							D2010.60	21-04 20 10 60	Plumbing Fixtures																								
4							D2010.90	21-04 20 10 90	Domestic Water Distribution Supplementary Components																								
3							D2020	21-04 20 20	**Sanitary Drainage**																								
4							D2020.10	21-04 20 20 10	Sanitary Sewerage Equipment																								
4							D2020.30	21-04 20 20 30	Sanitary Sewerage Piping																								
4							D2020.90	21-04 20 20 90	Sanitary Drainage Supplementary Components																								
3							D2030	21-04 20 30	**Building Support Plumbing Systems**																								
4							D2030.10	21-04 20 30 10	Stormwater Drainage Equipment																								
4							D2030.20	21-04 20 30 20	Stormwater Drainage Piping																								
4							D2030.30	21-04 20 30 30	Facility Stormwater Drains																								
4							D2030.60	21-04 20 30 60	Gray Water Systems																								
4							D2030.90	21-04 20 30 90	Building Support Plumbing System Supplementary Components																								
3							D2050	21-04 20 50	**General Service Compressed-Air**																								
3							D2060	21-04 20 60	**Process Support Plumbing Systems**																								
4							D2060.10	21-04 20 60 10	Compressed-Air Systems																								
4							D2060.20	21-04 20 60 20	Vacuum Systems																								

4							D2060.30	21-04 20 60 30	Gas Systems																									
4							D2060.40	21-04 20 60 40	Chemical-Waste Systems																									
4							D2060.50	21-04 20 60 50	Processed Water Systems																									
4							D2060.90	21-04 20 60 90	Process Support Plumbing System Supplementary Components																									
2							D30	21-04 30	**HVAC**	D20 - Plumbing; D30 - HVAC; D- Air Distribution; D40 - Fire Protection; D- Fluid_Gas Distribution; D50 - Electrical; D- Electrical Distribution																									
3							D3010	21-04 30 10	**Facility Fuel Systems**																									
4							D3010.10	21-04 30 10 10	Fuel Piping																									
4							D3010.30	21-04 30 10 30	Fuel Pumps																									
4							D3010.50	21-04 30 10 50	Fuel Storage Tanks																									
3							D3020	21-04 30 20	**Heating Systems**																									
4							D3020.10	21-04 30 20 10	Heat Generation																									
4							D3020.30	21-04 30 20 30	Thermal Heat Storage																									
4							D3020.70	21-04 30 20 70	Decentralized Heating Equipment																									
4							D3020.90	21-04 30 20 90	Heating System Supplementary Components																									
3							D3030	21-04 30 30	**Cooling Systems**																									
4							D3030.10	21-04 30 30 10	Central Cooling																									
4							D3030.30	21-04 30 30 30	Evaporative Air-Cooling																									
4							D3030.50	21-04 30 30 50	Thermal Cooling Storage																									
4							D3030.70	21-04 30 30 70	Decentralized Cooling																									
4							D3030.90	21-04 30 30 90	Cooling System Supplementary Components																									
3							D3050	21-04 30 50	**Facility HVAC Distribution Systems**																									
4							D3050.10	21-04 30 50 10	Facility Hydronic Distribution																									
4							D3050.30	21-04 30 50 30	Facility Steam Distribution																									
4							D3050.50	21-04 30 50 50	HVAC Air Distribution																									
4							D3050.90	21-04 30 50 90	Facility Distribution Systems Supplementary Components																									
3							D3060	21-04 30 60	**Ventilation**																									
4							D3060.10	21-04 30 60 10	Supply Air																									
4							D3060.20	21-04 30 60 20	Return Air																									
4							D3060.30	21-04 30 60 30	Exhaust Air																									
4							D3060.40	21-04 30 60 40	Outside Air																									
4							D3060.60	21-04 30 60 60	Air-to-Air Energy Recovery																									
4							D3060.70	21-04 30 60 70	HVAC Air Cleaning																									
4							D3060.90	21-04 30 60 90	Ventilation Supplementary Components																									
3							D3070	21-04 30 70	**Special Purpose HVAC Systems**																									
4							D3070.10	21-04 30 70 10	Snow Melting																									
2							D40	21-04 40	**Fire Protection**	D40 - Fire Protection, D- Fluid_Gas Distribution; D50 - Electrical,																									
3							D4010	21-04 40 10	**Fire Suppression**																									
4							D4010.10	21-04 40 10 10	Water-Based Fire-Suppression																									
4							D4010.50	21-04 40 10 50	Fire-Extinguishing																									
4							D4010.90	21-04 40 10 90	Fire Suppression Supplementary Components																									
3							D4030	21-04 40 30	**Fire Protection Specialties**																									
4							D4030.10	21-04 40 30 10	Fire Protection Cabinets																									
4							D4030.30	21-04 40 30 30	Fire Extinguishers																									
4							D4030.50	21-04 40 30 50	Breathing Air Replenishment Systems																									
4							D4030.70	21-04 40 30 70	Fire Extinguisher Accessories																									
2							D50	21-04 50	**Electrical**	D50 - Electrical, D- Electrical Distribution																									
3							D5010	21-04 50 10	**Facility Power Generation**																									
4							D5010.10	21-04 50 10 10	Packaged Generator Assemblies																									
4							D5010.20	21-04 50 10 20	Battery Equipment																									
4							D5010.30	21-04 50 10 30	Photovoltaic Collectors																									
4							D5010.40	21-04 50 10 40	Fuel Cells																									
4							D5010.60	21-04 50 10 60	Power Filtering and Conditioning																									
4							D5010.70	21-04 50 10 70	Transfer Switches																									
4							D5010.90	21-04 50 10 90	Facility Power Generation Supplementary Components																									
3							D5020	21-04 50 20	**Electrical Service and Distribution**																									
4							D5020.10	21-04 50 20 10	Electrical Service																									
4							D5020.30	21-04 50 20 30	Power Distribution																									
4							D5020.70	21-04 50 20 70	Facility Grounding																									
4							D5020.90	21-04 50 20 90	Electrical Service and Distribution Supplementary Components																									
3							D5030	21-04 50 30	**General Purpose Electrical Power**																									

4							D5030.10	21-04 50 30 10	Branch Wiring System																								
4							D5030.50	21-04 50 30 50	Wiring Devices																								
4							D5030.90	21-04 50 30 90	General Purpose Electrical Power Supplementary Components																								
3							D5040	21-04 50 40	**Lighting**																								
4							D5040.10	21-04 50 40 10	Lighting Control																								
4							D5040.20	21-04 50 40 20	Branch Wiring for Lighting																								
4							D5040.50	21-04 50 40 50	Lighting Fixtures																								
4							D5040.90	21-04 50 40 90	Lighting Supplementary Components																								
3							D5080	21-04 50 80	**Miscellaneous Electrical Systems**																								
4							D5080.10	21-04 50 80 10	Lightning Protection																								
4							D5080.40	21-04 50 80 40	Cathodic Protection																								
4							D5080.70	21-04 50 80 70	Transient Voltage Suppression																								
4							D5080.90	21-04 50 80 90	Miscellaneous Electrical Systems Supplementary Components																								
2							D60	21-04 60	**Communications**	D50 - Electrical, D- Electrical Distribution																							
3							D6010	21-04 60 10	**Data Communications**																								
4							D6010.10	21-04 60 10 10	Data Communications Network and Equipment																								
4							D6010.20	21-04 60 10 20	Data Communications Hardware																								
4							D6010.30	21-04 60 10 30	Data Communications Peripheral Data Equipment																								
4							D6010.50	21-04 60 10 50	Data Communications Software																								
4							D6010.60	21-04 60 10 60	Data Communication Program and Integration Services																								
3							D6020	21-04 60 20	**Voice Communications**																								
4							D6020.10	21-04 60 20 10	Voice Communications Switching and Routing Equipment																								
4							D6020.20	21-04 60 20 20	Voice Communications Terminal Equipment																								
4							D6020.30	21-04 60 20 30	Voice Communications Messaging																								
4							D6020.40	21-04 60 20 40	Call Accounting																								
4							D6020.50	21-04 60 20 50	Call Management																								
3							D6030	21-04 60 30	**Audio-Video Communication**																								
4							D6030.10	21-04 60 30 10	Audio-Video Systems																								
4							D6030.50	21-04 60 30 50	Electronic Digital Systems																								
3							D6060	21-04 60 60	**Distributed Communications and Monitoring**																								
4							D6060.10	21-04 60 60 10	Distributed Audio-Video																								
4							D6060.30	21-04 60 60 30	Healthcare Communications and Monitoring																								
4							D6060.50	21-04 60 60 50	Distributed Systems																								
3							D6090	21-04 60 90	**Communications Supplementary Components**																								
2							D70	21-04 70	**Electronic Safety and Security**	D50 - Electrical, D- Electrical Distribution																					
3							D7010	21-04 70 10	**Access Control and Intrusion Detection**																								
4							D7010.10	21-04 70 10 10	Access Control																								
4							D7010.50	21-04 70 10 50	Intrusion Detection																								
3							D7030	21-04 70 30	**Electronic Surveillance**																								
4							D7030.10	21-04 70 30 10	Video Surveillance																								
4							D7030.50	21-04 70 30 50	Electronic Personal Protection																								
3							D7050	21-04 70 50	**Detection and Alarm**																								
4							D7050.10	21-04 70 50 10	Fire Detection and Alarm																								
4							D7050.20	21-04 70 50 20	Radiation Detection and Alarm																								
4							D7050.30	21-04 70 50 30	Fuel-Gas Detection and Alarm																								
4							D7050.40	21-04 70 50 40	Fuel-Oil Detection and Alarm																								
4							D7050.50	21-04 70 50 50	Refrigeration Detection and Alarm																								
4							D7050.60	21-04 70 50 60	Water Intrusion Detection and Alarm																								
3							D7070	21-04 70 70	**Electronic Monitoring and Control**																								
4							D7070.10	21-04 70 70 10	Electronic Detection Monitoring and Control																								
3							D7090	21-04 70 90	**Electronic Safety and Security Supplementary Components**																								
2							D80	21-04 80	**Integrated Automation**	D50 - Electrical, D- Electrical Distribution																					
3							D8010	21-04 80 10	**Integrated Automation Facility Controls**																								
4							D8010.10	21-04 80 10 10	Integrated Automation Control of Equipment																								
4							D8010.20	21-04 80 10 20	Integrated Automation Control of Conveying Equipment																								
4							D8010.30	21-04 80 10 30	Integrated Automation Control of Fire-Suppression Systems																								
4							D8010.40	21-04 80 10 40	Integrated Automation Control of HVAC Systems																								

4							D8010.50	21-04 80 10 50	Integrated Automation Control of Plumbing Systems																								
4							D8010.60	21-04 80 10 60	Integrated Automation Control of Electrical Systems																								
4							D8010.70	21-04 80 10 70	Integrated Automation Control of Communication Systems																								
4							D8010.80	21-04 80 10 80	Integrated Automation Control of Electronic Safety and Security Systems																								
4							D8010.90	21-04 80 10 90	Integrated Automation Supplementary Components																								
1							E	21-05 00 00	**EQUIPMENT & FURNISHINGS**																								
2							E10	21-05 10 00	**Equipment**																								
3							E1010	21-05 10 10	**Vehicle and Pedestrian Equipment**																								
4							E1010.10	21-05 10 10 10	Vehicle Servicing Equipment																								
4							E1010.30	21-05 10 10 30	Interior Parking Control Equipment																								
4							E1010.50	21-05 10 10 50	Loading Dock Equipment																								
4							E1010.70	21-05 10 10 70	Interior Pedestrian Control Equipment																								
3							E1030	21-05 10 30	**Commercial Equipment**																								
4							E1030.10	21-05 10 30 10	Mercantile and Service Equipment																								
4							E1030.20	21-05 10 30 20	Vault Equipment																								
4							E1030.25	21-05 10 30 25	Teller and Service Equipment																								
4							E1030.30	21-05 10 30 30	Refrigerated Display Equipment																								
4							E1030.35	21-05 10 30 35	Commercial Laundry and Dry Cleaning Equipment																								
4							E1030.40	21-05 10 30 40	Maintenance Equipment																								
4							E1030.50	21-05 10 30 50	Hospitality Equipment																								
4							E1030.55	21-05 10 30 55	Unit Kitchens																								
4							E1030.60	21-05 10 30 60	Photographic Processing Equipment																								
4							E1030.70	21-05 10 30 70	Postal, Packaging and Shipping Equipment																								
4							E1030.75	21-05 10 30 75	Office Equipment																								
4							E1030.80	21-05 10 30 80	Foodservice Equipment																								
3							E1040	21-05 10 40	**Institutional Equipment**																								
4							E1040.10	21-05 10 40 10	Educational and Scientific Equipment																								
4							E1040.20	21-05 10 40 20	Healthcare Equipment																								
4							E1040.40	21-05 10 40 40	Religious Equipment																								
4							E1040.60	21-05 10 40 60	Security Equipment																								
4							E1040.70	21-05 10 40 70	Detention Equipment																								
3							E1060	21-05 10 60	**Residential Equipment**																								
4							E1060.10	21-05 10 60 10	Residential Appliances																								
4							E1060.50	21-05 10 60 50	Residential Stairs																								
4							E1060.70	21-05 10 60 70	Residential Ceiling Fans																								
3							E1070	21-05 10 70	**Entertainment and Recreational Equipment**																								
4							E1070.10	21-05 10 70 10	Theater and Stage Equipment																								
4							E1070.20	21-05 10 70 20	Musical Equipment																								
4							E1070.50	21-05 10 70 50	Athletic Equipment																								
4							E1070.60	21-05 10 70 60	Recreational Equipment																								
3							E1090	21-05 10 90	**Other Equipment**																								
4							E1090.10	21-05 10 90 10	Solid Waste Handling Equipment																								
4							E1090.30	21-05 10 90 30	Agricultural Equipment																								
4							E1090.40	21-05 10 90 40	Horticultural Equipment																								
4							E1090.60	21-05 10 90 60	Decontamination Equipment																								
2							E20	21-05 20	**Furnishings**																								
3							E2010	21-05 20 10	**Fixed Furnishings**																								
4							E2010.10	21-05 20 10 10	Fixed Art																								
4							E2010.20	21-05 20 10 20	Window Treatments																								
4							E2010.30	21-05 20 10 30	Casework																								
4							E2010.70	21-05 20 10 70	Fixed Multiple Seating																								
4							E2010.90	21-05 20 10 90	Other Fixed Furnishings																								
3							E2050	21-05 20 50	**Movable Furnishings**																								
4							E2050.10	21-05 20 50 10	Movable Art																								
4							E2050.30	21-05 20 50 30	Furniture																								
4							E2050.40	21-05 20 50 40	Accessories																								
4							E2050.60	21-05 20 50 60	Movable Multiple Seating																								
4							E2050.90	21-05 20 50 90	Other Movable Furnishings																								
1							F	21-06 00 00	**SPECIAL CONSTRUCTION & DEMOLITION**																								
2							F10	21-06 10	**Special Construction**																								

3							F1010	21-06 10 10	**Integrated Construction**																								
4							F1010.10	21-06 10 10 10	Building Modules																								
4							F1010.50	21-06 10 10 50	Manufactured/Fabricated Rooms																								
4							F1010.70	21-06 10 10 70	Modular Mezzanines																								
3							F1020	21-06 10 20	**Special Structures**																								
4							F1020.10	21-06 10 20 10	Fabric Structures																								
4							F1020.20	21-06 10 20 20	Space Frames																								
4							F1020.30	21-06 10 20 30	Geodesic Structures																								
4							F1020.40	21-06 10 20 40	Manufacturer-Engineered Structures																								
4							F1020.60	21-06 10 20 60	Manufactured Canopies																								
4							F1020.65	21-06 10 20 65	Rammed Earth Construction																								
4							F1020.70	21-06 10 20 70	Towers																								
3							F1030	21-06 10 30	**Special Function Construction**																								
4							F1030.10	21-06 10 30 10	Sound and Vibration Control																								
4							F1030.30	21-06 10 30 30	Seismic Control																								
4							F1030.50	21-06 10 30 50	Radiation Protection																								
3							F1050	21-06 10 50	**Special Facility Components**																								
4							F1050.10	21-06 10 50 10	Pools																								
4							F1050.20	21-06 10 50 20	Interior Fountains																								
4							F1050.30	21-06 10 50 30	Interior Water Features																								
4							F1050.40	21-06 10 50 40	Aquariums																								
4							F1050.50	21-06 10 50 50	Amusement Park Structures and Equipment																								
4							F1050.60	21-06 10 50 60	Ice Rinks																								
4							F1050.70	21-06 10 50 70	Animal Containment																								
3							F1060	21-06 10 60	**Athletic and Recreational Special Construction**																								
4							F1060.10	21-06 10 60 10	Indoor Soccer Boards																								
4							F1060.20	21-06 10 60 20	Safety Netting																								
4							F1060.30	21-06 10 60 30	Arena Football Boards																								
4							F1060.40	21-06 10 60 40	Floor Sockets																								
4							F1060.50	21-06 10 60 50	Athletic and Recreational Court Walls																								
4							F1060.60	21-06 10 60 60	Demountable Athletic Surfaces																								
3							F1080	21-06 10 80	**Special Instrumentation**																								
4							F1080.10	21-06 10 80 10	Stress Instrumentation																								
4							F1080.20	21-06 10 80 20	Seismic Instrumentation																								
4							F1080.40	21-06 10 80 40	Meteorological Instrumentation																								
4							F1080.60	21-06 10 80 60	Earth Movement Monitoring																								
2							F20	21-06 20 00	**Facility Remediation**																								
3							F2010	21-06 20 10	**Hazardous Materials Remediation**																								
4							F2010.10	21-06 20 10 10	Transportation and Disposal of Hazardous Materials																								
4							F2010.20	21-06 20 10 20	Asbestos Remediation																								
4							F2010.30	21-06 20 10 30	Lead Remediation																								
4							F2010.40	21-06 20 10 40	Polychlorinate Biphenyl Remediation																								
4							F2010.50	21-06 20 10 50	Mold Remediation																								
2							F30	21-06 30 00	**Demolition**																								
3							F3010	21-06 30 10	**Structure Demolition**																								
4							F3010.10	21-06 30 10 10	Building Elements Demolition																								
4							F3010.30	21-06 30 10 30	Tower Demolition																								
4							F3010.50	21-06 30 10 50	Bridge Demolition																								
4							F3010.70	21-06 30 10 70	Dam Demolition																								
3							F3030	21-06 30 30	**Selective Demolition**																								
4							F3030.10	21-06 30 30 10	Selective Bldg Demo																								
4							F3030.30	21-06 30 30 30	Selective Interior Demolition																								
4							F3030.50	21-06 30 30 50	Selective Bridge Demolition																								
4							F3030.70	21-06 30 30 70	Selective Historic Demolition																								
3							F3050	21-06 30 50	**Structure Moving**																								
4							F3050.10	21-06 30 50 10	Structure Relocation																								
4							F3050.30	21-06 30 50 30	Structure Raising																								
1							G	21-07 00 00	**SITEWORK**																								
2							G10	21-07 10 00	**Site Preparation**																								
3							G1010	21-07 10 10	**Site Clearing**																								
4							G1010.10	21-07 10 10 10	Clearing and Grubbing																								
4							G1010.30	21-07 10 10 30	Tree and Shrub Removal and Trimming																								
4							G1010.50	21-07 10 10 50	Earth Stripping and Stockpiling																								
3							G1020	21-07 10 20	**Site Elements Demolition**																								

4							G1020.10	21-07 10 20 10	Utility Demolition																									
4							G1020.30	21-07 10 20 30	Infrastructure Demolition																									
4							G1020.50	21-07 10 20 50	Selective Site Demolition																									
3							G1030	21-07 10 30	**Site Element Relocations**																									
4							G1030.10	21-07 10 30 10	Utility Relocation																									
3							G1050	21-07 10 50	**Site Remediation**																									
4							G1050.10	21-07 10 50 10	Physical Decontamination																									
4							G1050.15	21-07 10 50 15	Chemical Decontamination																									
4							G1050.20	21-07 10 50 20	Thermal Decontamination																									
4							G1050.25	21-07 10 50 25	Biological Decontamination																									
4							G1050.30	21-07 10 50 30	Remediation Soil Stabilization																									
4							G1050.40	21-07 10 50 40	Site Containment																									
4							G1050.45	21-07 10 50 45	Sinkhole Remediation																									
4							G1050.50	21-07 10 50 50	Hazardous Waste Drum Handling																									
4							G1050.60	21-07 10 50 60	Contaminated Site Material Removal																									
4							G1050.80	21-07 10 50 80	Water Remediation																									
3							G1070	21-07 10 70	**Site Earthwork**																									
4							G1070.10	21-07 10 70 10	Grading																									
4							G1070.20	21-07 10 70 20	Excavation and Fill																									
4							G1070.30	21-07 10 70 30	Embankments																									
4							G1070.35	21-07 10 70 35	Erosion and Sedimentation Controls																									
4							G1070.40	21-07 10 70 40	Soil Stabilization																									
4							G1070.45	21-07 10 70 45	Rock Stabilization																									
4							G1070.50	21-07 10 70 50	Soil Reinforcement																									
4							G1070.55	21-07 10 70 55	Slope Protection																									
4							G1070.60	21-07 10 70 60	Gabions																									
4							G1070.65	21-07 10 70 65	Riprap																									
4							G1070.70	21-07 10 70 70	Wetlands																									
4							G1070.80	21-07 10 70 80	Earth Dams																									
4							G1070.90	21-07 10 70 90	Site Soil Treatment																									
2							G20	21-07 20	**Site Improvements**																									
3							G2010	21-07 20 10	**Roadways**																									
4							G2010.10	21-07 20 10 10	Roadway Pavement																									
4							G2010.20	21-07 20 10 20	Roadway Curbs and Gutters																									
4							G2010.40	21-07 20 10 40	Roadway Appurtenances																									
4							G2010.70	21-07 20 10 70	Roadway Lighting																									
4							G2010.80	21-07 20 10 80	Vehicle Fare Collection																									
3							G2020	21-07 20 20	**Parking Lots**																									
4							G2020.10	21-07 20 20 10	Parking Lot Pavement																									
4							G2020.20	21-07 20 20 20	Parking Lot Curbs and Gutters																									
4							G2020.40	21-07 20 20 40	Parking Lot Appurtenances																									
4							G2020.70	21-07 20 20 70	Parking Lot Lighting																									
4							G2020.80	21-07 20 20 80	Exterior Parking Control Equipment																									
3							G2030	21-07 20 30	**Pedestrian Plazas and Walkways**																									
4							G2030.10	21-07 20 30 10	Pedestrian Pavement																									
4							G2030.20	21-07 20 30 20	Pedestrian Pavement Curbs and Gutters																									
4							G2030.30	21-07 20 30 30	Exterior Steps and Ramps																									
4							G2030.40	21-07 20 30 40	Pedestrian Pavement Appurtenances																									
4							G2030.70	21-07 20 30 70	Plaza and Walkway Lighting																									
4							G2030.80	21-07 20 30 80	Exterior Pedestrian Control Equipment																									
3							G2040	21-07 20 40	**Airfields**																									
4							G2040.10	21-07 20 40 10	Aviation Pavement																									
4							G2040.20	21-07 20 40 20	Aviation Pavement Curbs and Gutters																									
4							G2040.40	21-07 20 40 40	Aviation Pavement Appurtenances																									
4							G2040.70	21-07 20 40 70	Airfield Lighting																									
4							G2040.80	21-07 20 40 80	Airfield Signaling and Control Equipment																									
3							G2050	21-07 20 50	**Athletic, Recreational, and Playfield Areas**																									
4							G2050.10	21-07 20 50 10	Athletic Areas																									
4							G2050.30	21-07 20 50 30	Recreational Areas																									
4							G2050.50	21-07 20 50 50	Playfield Areas																									
3							G2060	21-07 20 60	**Site Development**																									
4							G2060.10	21-07 20 60 10	Exterior Fountains																									
4							G2060.20	21-07 20 60 20	Fences and Gates																									
4							G2060.25	21-07 20 60 25	Site Furnishings																									
4							G2060.30	21-07 20 60 30	Exterior Signage																									

4							G2060.35	21-07 20 60 35	Flagpoles																								
4							G2060.40	21-07 20 60 40	Covers and Shelters																								
4							G2060.45	21-07 20 60 45	Exterior Gas Lighting																								
4							G2060.50	21-07 20 60 50	Site Equipment																								
4							G2060.60	21-07 20 60 60	Retaining Walls																								
4							G2060.70	21-07 20 60 70	Site Bridges																								
4							G2060.80	21-07 20 60 80	Site Screening Devices																								
4							G2060.85	21-07 20 60 85	Site Specialties																								
3							G2080	21-07 20 80	**Landscaping**																								
4							G2080.10	21-07 20 80 10	Planting Irrigation																								
4							G2080.20	21-07 20 80 20	Turf and Grasses																								
4							G2080.30	21-07 20 80 30	Plants																								
4							G2080.50	21-07 20 80 50	Planting Accessories																								
4							G2080.70	21-07 20 80 70	Landscape Lighting																								
4							G2080.80	21-07 20 80 80	Landscaping Activities																								
2							G30	21-07 30	**Liquid and Gas Site Utilities**																								
3							G3010	21-07 30 10	**Water Utilities**																								
4							G3010.10	21-07 30 10 10	Site Domestic Water Distribution																								
4							G3010.30	21-07 30 10 30	Site Fire Protection Water Distribution																								
4							G3010.50	21-07 30 10 50	Site Irrigation Water Distribution																								
3							G3020	21-07 30 20	**Sanitary Sewerage Utilities**																								
4							G3020.10	21-07 30 20 10	Sanitary Sewerage Utility Connection																								
4							G3020.20	21-07 30 20 20	Sanitary Sewerage Piping																								
4							G3020.40	21-07 30 20 40	Utility Septic Tanks																								
4							G3020.50	21-07 30 20 50	Sanitary Sewerage Structures																								
4							G3020.60	21-07 30 20 60	Sanitary Sewerage Lagoons																								
3							G3030	21-07 30 30	**Storm Drainage Utilities**																								
4							G3030.10	21-07 30 30 10	Storm Drainage Utility Connection																								
4							G3030.20	21-07 30 30 20	Storm Drainage Piping																								
4							G3030.30	21-07 30 30 30	Culverts																								
4							G3030.40	21-07 30 30 40	Site Storm Water Drains																								
4							G3030.50	21-07 30 30 50	Storm Drainage Pumps																								
4							G3030.60	21-07 30 30 60	Site Subdrainage																								
4							G3030.70	21-07 30 30 70	Storm Drainage Ponds and Reservoirs																								
3							G3050	21-07 30 50	**Site Energy Distribution**																								
4							G3050.10	21-07 30 50 10	Site Hydronic Heating Distribution																								
4							G3050.20	21-07 30 50 20	Site Steam Energy Distribution																								
4							G3050.40	21-07 30 50 40	Site Hydronic Cooling Distribution																								
3							G3060	21-07 30 60	**Site Fuel Distribution**																								
4							G3060.10	21-07 30 60 10	Site Gas Distribution																								
4							G3060.20	21-07 30 60 20	Site Fuel-Oil Distribution																								
4							G3060.30	21-07 30 60 30	Site Gasoline Distribution																								
4							G3060.40	21-07 30 60 40	Site Diesel Fuel Distribution																								
4							G3060.60	21-07 30 60 60	Site Aviation Fuel Distribution																								
3							G3090	21-07 30 90	**Liquid and Gas Site Utilities Supplementary Components**																								
2							G40	21-07 40	**Electrical Site Improvements**																								
3							G4010	21-07 40 10	**Site Electric Distribution Systems**																								
4							G4010.10	21-07 40 10 10	Electrical Utility Services																								
4							G4010.20	21-07 40 10 20	Electric Transmission and Distribution																								
4							G4010.30	21-07 40 10 30	Electrical Substations																								
4							G4010.40	21-07 40 10 40	Electrical Transformers																								
4							G4010.50	21-07 40 10 50	Electrical Switchgear and Protection Devices																								
4							G4010.70	21-07 40 10 70	Site Grounding																								
4							G4010.90	21-07 40 10 90	Electrical Distribution System Instrumentation and Controls																								
3							G4050	21-07 40 50	**Site Lighting**																								
4							G4050.10	21-07 40 50 10	Area Lighting																								
4							G4050.20	21-07 40 50 20	Flood Lighting																								
4							G4050.50	21-07 40 50 50	Building Illumination																								
4							G4050.90	21-07 40 50 90	Exterior Lighting Supplementary Components																								
2							G50	21-07 50	**Site Communications**																								
3							G5010	21-07 50 10	**Site Communications Systems**																								
4							G5010.10	21-07 50 10 10	Site Communications Structures																								
4							G5010.30	21-07 50 10 30	Site Communications Distribution																								

4							G5010.50	21-07 50 10 50	Wireless Communications Distribution																								
2							G90	21-07 90	**Miscellaneous Site Construction**																								
3							G9010	21-07 90 10	**Tunnels**																								
4							G9010.10	21-07 90 10 10	Vehicular Tunnels																								
4							G9010.20	21-07 90 10 20	Pedestrian Tunnels																								
4							G9010.40	21-07 90 10 40	Service Tunnels																								
4							G9010.90	21-07 90 10 90	Tunnel Construction Related Activities																								
									Products																								
1							N/A	23-13	**Structural and Exterior Enclosure Products**																								
2							N/A	23-13 23	**Mechanical Fasteners, Adhesives, and Sealants**																								
3							N/A	23-13 23 11	**Mechanical Fasteners**																								
2							N/A	23-13 31	**Structural Concrete Products**																								
3							N/A	23-13 31 17	**Concrete Formwork**																								

	Uniformat ID	**Omniclass ID**	**Element ID**
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1	A	21-01 00 00	SUBSTRUCTURE
2	A10	21-01 10	FOUNDATIONS
3	A1010	21-01 10 10	Standard Foundations
4	A1010.10	21-01 10 10 10	Wall Foundations
4	A1010.30	21-01 10 10 30	Column Foundations
4	A1010.90	21-01 10 10 90	Standard Foundation Supplementary Components
3	A1020	21-01 10 20	Special Foundations
4	A1020.10	21-01 10 20 10	Driven Piles
4	A1020.15	21-01 10 20 15	Bored Piles
4	A1020.20	21-01 10 20 20	Caissons
4	A1020.30	21-01 10 20 30	Special Foundation Walls
4	A1020.40	21-01 10 20 40	Foundation Anchors
4	A1020.50	21-01 10 20 50	Underpinning
4	A1020.60	21-01 10 20 60	Raft Foundations
4	A1020.70	21-01 10 20 70	Pile Caps
4	A1020.80	21-01 10 20 80	Grade Beams
2	A20	21-01 20	SUBGRADE ENCLOSURES
3	A2010	21-01 20 10	Walls for Subgrade Enclosures
4	A2010.10	21-01 20 10 10	Subgrade Enclosure Wall Construction
4	A2010.20	21-01 20 10 20	Subgrade Enclosure Wall Interior Skin
4	A2010.90	21-01 20 10 90	Subgrade Enclosure Wall Supplementary Components
2	A40	21-01 40	SLABS ON GRADE
3	A4010	21-01 40 10	Standard Slabs-on-Grade
3	A4020	21-01 40 20	Structural Slabs-on-Grade
3	A4030	21-01 40 30	Slab Trenches
3	A4040	21-01 40 40	Pits and Bases
3	A4090	21-01 40 90	Slab-On-Grade Supplementary Components
4	A4090.10	21-01 40 90 10	Perimeter Insulation
4	A4090.20	21-01 40 90 20	Vapor Retarder
4	A4090.30	21-01 40 90 30	Waterproofing
4	A4090.50	21-01 40 90 50	Mud Slab
4	A4090.60	21-01 40 90 60	Subbase Layer
2	A60	21-01 60	WATER AND GAS MITIGATION
3	A6010	21-01 60 10	Building Subdrainage
4	A6010.10	21-01 60 10 10	Foundation Drainage
4	A6010.20	21-01 60 10 20	Underslab Drainage
3	A6020	21-01 60 20	Off-Gassing Mitigation
4	A6020.10	21-01 60 20 10	Radon Mitigation
4	A6020.50	21-01 60 20 50	Methane Mitigation
2	A90	21-01 90	SUBSTRUCTURE RELATED ACTIVITIES
3	A9010	21-01 90 10	Substructure Excavation

4	A9010.10	21-01 90 10 10	Backfill and Compaction
3	A9020	21-01 90 20	Construction Dewatering
3	A9030	21-01 90 30	Excavation Support
4	A9030.10	21-01 90 30 10	Anchor Tiebacks
4	A9030.20	21-01 90 30 20	Cofferdams
4	A9030.40	21-01 90 30 40	Cribbing and Walers
4	A9030.60	21-01 90 30 60	Ground Freezing
4	A9030.70	21-01 90 30 70	Slurry Walls
3	A9040	21-01 90 40	Soil Treatment
1	B	21-02 00 00	SHELL
2	B10	21-02 10	SUPERSTRUCTURE
3	B1010	21-02 10 10	Floor Construction
4	B1010.10	21-02 10 10 10	Floor Structural Frame
5			
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4	B1010.20	21-02 10 10 20	Floor decks, slabs and topping
5			
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4	B1010.30	21-02 10 10 30	Balcony Floor Construction
4	B1010.40	21-02 10 10 40	Mezzanine Floor Construction
4	B1010.50	21-02 10 10 50	Ramps
4	B1010.90	21-02 10 10 90	Floor Construction Supplementary Components
3	B1020	21-02 10 20	Roof Construction
4	B1020.10	21-02 10 20 10	Roof Structural Frame
4	B1020.20	21-02 10 20 20	Roof decks, slabs and sheathing
4	B1020.30	21-02 10 20 30	Canopy Construction
4	B1020.90	21-02 10 20 90	Roof Construction Supplementary Components
3	B1080	21-02 10 80	Stairs
4	B1080.10	21-02 10 80 10	Stair Construction
4	B1080.30	21-02 10 80 30	Stair Soffits
4	B1080.50	21-02 10 80 50	Stair Railings
4	B1080.60	21-02 10 80 60	Fire Escapes
4	B1080.70	21-02 10 80 70	Metal Walkways
4	B1080.80	21-02 10 80 80	Ladders
2	B20	21-02 20	EXTERIOR VERTICAL ENCLOSURES
3	B2010	21-02 20 10	Exterior Walls
4	B2010.10	21-02 20 10 10	Exterior Wall Veneer
4	B2010.20	21-02 20 10 20	Exterior Wall Construction
5			
5			
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5			
4	B2010.30	21-02 20 10 30	Exterior Wall Interior Skin
4	B2010.40	21-02 20 10 40	Fabricated Exterior Wall Assemblies

4	B2010.50	21-02 20 10 50	Parapets
4	B2010.60	21-02 20 10 60	Equipment Screens
4	B2010.80	21-02 20 10 80	Exterior Wall Supplementary Components
4	B2010.90	21-02 20 10 90	Exterior Wall Opening Supplementary Components
3	B2020	21-02 20 20	Exterior Windows
4	B2020.10	21-02 20 20 10	Exterior Operating Windows
4	B2020.20	21-02 20 20 20	Exterior Fixed Windows
4	B2020.30	21-02 20 20 30	Exterior Window Wall
4	B2020.50	21-02 20 20 50	Exterior Special Function Windows
3	B2050	21-02 20 50	Exterior Doors and Grilles
4	B2050.10	21-02 20 50 10	Exterior Entrance Doors
4	B2050.20	21-02 20 50 20	Exterior Utility Doors
4	B2050.30	21-02 20 50 30	Exterior Oversize Doors
4	B2050.40	21-02 20 50 40	Exterior Special Function Doors
4	B2050.60	21-02 20 50 60	Exterior Grilles
4	B2050.70	21-02 20 50 70	Exterior Gates
4	B2050.90	21-02 20 50 90	Exterior Door Supplementary Components
3	B2070	21-02 20 70	Exterior Louvers and Vents
4	B2070.10	21-02 20 70 10	Exterior Louvers
4	B2070.50	21-02 20 70 50	Exterior Vents
3	B2080	21-02 20 80	Exterior Wall Appurtenances
4	B2080.10	21-02 20 80 10	Exterior Fixed Grilles and Screens
4	B2080.30	21-02 20 80 30	Exterior Opening Protection Devices
4	B2080.50	21-02 20 80 50	Exterior Balcony Walls and Railings
4	B2080.70	21-02 20 80 70	Exterior Fabrications
4	B2080.80	21-02 20 80 80	Bird Control Devices
3	B2090	21-02 20 90	Exterior Wall Specialties
2	B30	21-02 30	EXTERIOR HORIZONTAL ENCLOSURES
3	B3010	21-02 30 10	Roofing
4	B3010.10	21-02 30 10 10	Steep Slope Roofing
4	B3010.50	21-02 30 10 50	Low-Slope Roofing
4	B3010.70	21-02 30 10 70	Canopy Roofing
4	B3010.90	21-02 30 10 90	Roofing Supplementary Components
3	B3020	21-02 30 20	Roof Appurtenances
4	B3020.10	21-02 30 20 10	Roof Accessories
4	B3020.30	21-02 30 20 30	Roof Specialties
4	B3020.70	21-02 30 20 70	Rainwater Management
3	B3040	21-02 30 40	Traffic Bearing Horizontal Enclosures
4	B3040.10	21-02 30 40 10	Traffic Bearing Coatings
4	B3040.30	21-02 30 40 30	Horizontal Waterproofing Membrane
4	B3040.50	21-02 30 40 50	Wear Surfaces
4	B3040.90	21-02 30 40 90	Horizontal Enclosure Supplementary Components
3	B3060	21-02 30 60	Horizontal Openings
4	B3060.10	21-02 30 60 10	Roof Windows and Skylights
4	B3060.50	21-02 30 60 50	Vents and Hatches
4	B3060.90	21-02 30 60 90	Horizontal Opening Supplementary Components
3	B3080	21-02 30 80	Overhead Exterior Enclosures
4	B3080.10	21-02 30 80 10	Exterior Ceilings
4	B3080.20	21-02 30 80 20	Exterior Soffits
4	B3080.30	21-02 30 80 30	Exterior Bulkheads
1	C	21-03 00 00	INTERIORS
2	C10	21-03 10	INTERIOR CONSTRUCTION
3	C1010	21-03 10 10	Interior Partitions
4	C1010.10	21-03 10 10 10	Interior Fixed Partitions
5			
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4	C1010.20	21-03 10 10 20	Interior Glazed Partitions
4	C1010.40	21-03 10 10 40	Interior Demountable Partitions
4	C1010.50	21-03 10 10 50	Interior Operable Partitions
4	C1010.70	21-03 10 10 70	Interior Screens
4	C1010.90	21-03 10 10 90	Interior Partition Supplementary Components

3	C1020	21-03 10 20	Interior Windows (a.k.a borrowed lites)
4	C1020.10	21-03 10 20 10	Interior Operating Windows
4	C1020.20	21-03 10 20 20	Interior Fixed Windows
4	C1020.50	21-03 10 20 50	Interior Special Function Windows
4	C1020.90	21-03 10 20 90	Interior Window Supplementary Components
3	C1030	21-03 10 30	Interior Doors
4	C1030.10	21-03 10 30 10	Interior Swinging Doors
4	C1030.20	21-03 10 30 20	Interior Entrance Doors
4	C1030.25	21-03 10 30 25	Interior Sliding Doors
4	C1030.30	21-03 10 30 30	Interior Folding Doors
4	C1030.40	21-03 10 30 40	Interior Coiling Doors
4	C1030.50	21-03 10 30 50	Interior Panel Doors
4	C1030.70	21-03 10 30 70	Interior Special Function Doors
4	C1030.80	21-03 10 30 80	Interior Access Doors and Panels
4	C1030.90	21-03 10 30 90	Interior Door Supplementary Components
3	C1040	21-03 10 40	Interior Grilles and Gates
4	C1040.10	21-03 10 40 10	Interior Grilles
4	C1040.50	21-03 10 40 50	Interior Gates
3	C1060	21-03 10 60	Raised Floor Construction
4	C1060.10	21-03 10 60 10	Access Flooring
4	C1060.30	21-03 10 60 30	Platform/Stage Floors
3	C1070	21-03 10 70	Suspended Ceiling Construction
4	C1070.10	21-03 10 70 10	Acoustical Suspended Ceilings
4	C1070.20	21-03 10 70 20	Suspended Plaster and Gypsum Board Ceilings
4	C1070.50	21-03 10 70 50	Specialty Suspended Ceilings
4	C1070.70	21-03 10 70 70	Special Function Suspended Ceilings
4	C1070.90	21-03 10 70 90	Ceiling Suspension Components
3	C1090	21-03 10 90	Interior Specialties
4	C1090.10	21-03 10 90 10	Interior Railings and Handrails
4	C1090.15	21-03 10 90 15	Interior Louvers
4	C1090.20	21-03 10 90 20	Information Specialties
4	C1090.25	21-03 10 90 25	Compartments and Cubicles
4	C1090.30	21-03 10 90 30	Service Walls
4	C1090.35	21-03 10 90 35	Wall and Door Protection
4	C1090.40	21-03 10 90 40	Toilet, Bath, and Laundry Accessories
4	C1090.45	21-03 10 90 45	Interior Gas Lighting
4	C1090.50	21-03 10 90 50	Fireplaces and stoves
4	C1090.60	21-03 10 90 60	Safety Specialties
4	C1090.70	21-03 10 90 70	Storage Specialties
4	C1090.90	21-03 10 90 90	Other Interior Specialties
2	C20	21-03 20	INTERIOR FINISHES
3	C2010	21-03 20 10	Wall Finishes
4	C2010.10	21-03 20 10 10	Tile Wall Finish
4	C2010.20	21-03 20 10 20	Wall Paneling
4	C2010.30	21-03 20 10 30	Wall Coverings
4	C2010.35	21-03 20 10 35	Wall Carpeting
4	C2010.50	21-03 20 10 50	Stone Facing
4	C2010.60	21-03 20 10 60	Special Wall Surfacing
4	C2010.70	21-03 20 10 70	Wall Painting and Coating
4	C2010.80	21-03 20 10 80	Acoustical Wall Treatment
4	C2010.90	21-03 20 10 90	Wall Finish Supplementary Components
3	C2020	21-03 20 20	Interior Fabrications
3	C2030	21-03 20 30	Flooring
4	C2030.10	21-03 20 30 10	Flooring Treatment
4	C2030.20	21-03 20 30 20	Tile Flooring
4	C2030.30	21-03 20 30 30	Specialty Flooring
4	C2030.40	21-03 20 30 40	Masonry Flooring
4	C2030.45	21-03 20 30 45	Wood Flooring
4	C2030.50	21-03 20 30 50	Resilient Flooring
4	C2030.60	21-03 20 30 60	Terrazzo Flooring
4	C2030.70	21-03 20 30 70	Fluid-Applied Flooring
4	C2030.75	21-03 20 30 75	Carpeting
4	C2030.80	21-03 20 30 80	Athletic Flooring
4	C2030.85	21-03 20 30 85	Entrance Flooring

4	C2030.90	21-03 20 30 90	Flooring Supplementary Components
3	C2040	21-03 20 40	Stair Finishes
4	C2040.20	21-03 20 40 20	Tile Stair Finish
4	C2040.40	21-03 20 40 40	Masonry Stair Finish
4	C2040.45	21-03 20 40 45	Wood Stair Finish
4	C2040.50	21-03 20 40 50	Resilient Stair Finish
4	C2040.60	21-03 20 40 60	Terrazzo Stair Finish
4	C2040.75	21-03 20 40 75	Carpeted Stair Finish
3	C2050	21-03 20 50	Ceiling Finishes
4	C2050.10	21-03 20 50 10	Plaster and Gypsum Board Finish
4	C2050.20	21-03 20 50 20	Ceiling Paneling
4	C2050.70	21-03 20 50 70	Ceiling Painting and Coating
4	C2050.80	21-03 20 50 80	Acoustical Ceiling Treatment
4	C2050.90	21-03 20 50 90	Ceiling Finish Supplementary Components
1	D	21-04 00 00	SERVICES
2	D10	21-04 10	CONVEYING
3	D1010	21-04 10 10	Vertical Conveying Systems
4	D1010.10	21-04 10 10 10	Elevators
4	D1010.20	21-04 10 10 20	Lifts
4	D1010.30	21-04 10 10 30	Escalators
4	D1010.50	21-04 10 10 50	Dumbwaiters
4	D1010.60	21-04 10 10 60	Moving Ramps
3	D1030	21-04 10 30	Horizontal Conveying Systems
4	D1030.10	21-04 10 30 10	Moving Walks
4	D1030.30	21-04 10 30 30	Turntables
4	D1030.50	21-04 10 30 50	Passenger Loading Bridges
4	D1030.70	21-04 10 30 70	People Movers
3	D1050	21-04 10 50	Material Handling
4	D1050.10	21-04 10 50 10	Cranes
4	D1050.20	21-04 10 50 20	Hoists
4	D1050.30	21-04 10 50 30	Derricks
4	D1050.40	21-04 10 50 40	Conveyors
4	D1050.50	21-04 10 50 50	Baggage Handling Equipment
4	D1050.60	21-04 10 50 60	Chutes
4	D1050.70	21-04 10 50 70	Pneumatic Tube Systems
3	D1080	21-04 10 80	Operable Access Systems
4	D1080.10	21-04 10 80 10	Suspended Scaffolding
4	D1080.20	21-04 10 80 20	Rope Climbers
4	D1080.30	21-04 10 80 30	Elevating Platforms
4	D1080.40	21-04 10 80 40	Powered Scaffolding
4	D1080.50	21-04 10 80 50	Building Envelope Access
2	D20	21-04 20	PLUMBING
3	D2010	21-04 20 10	Domestic Water Distribution
4	D2010.10	21-04 20 10 10	Facility Potable-Water Storage Tanks
4	D2010.20	21-04 20 10 20	Domestic Water Equipment
4	D2010.40	21-04 20 10 40	Domestic Water Piping
4	D2010.60	21-04 20 10 60	Plumbing Fixtures
4	D2010.90	21-04 20 10 90	Domestic Water Distribution Supplementary Components
3	D2020	21-04 20 20	Sanitary Drainage
4	D2020.10	21-04 20 20 10	Sanitary Sewerage Equipment
4	D2020.30	21-04 20 20 30	Sanitary Sewerage Piping
4	D2020.90	21-04 20 20 90	Sanitary Drainage Supplementary Components
3	D2030	21-04 20 30	Building Support Plumbing Systems
4	D2030.10	21-04 20 30 10	Stormwater Drainage Equipment
4	D2030.20	21-04 20 30 20	Stormwater Drainage Piping
4	D2030.30	21-04 20 30 30	Facility Stormwater Drains
4	D2030.60	21-04 20 30 60	Gray Water Systems
4	D2030.90	21-04 20 30 90	Building Support Plumbing System Supplementary Components
3	D2050	21-04 20 50	General Service Compressed-Air
3	D2060	21-04 20 60	Process Support Plumbing Systems
4	D2060.10	21-04 20 60 10	Compressed-Air Systems
4	D2060.20	21-04 20 60 20	Vacuum Systems

4	D2060.30	21-04 20 60 30	Gas Systems
4	D2060.40	21-04 20 60 40	Chemical-Waste Systems
4	D2060.50	21-04 20 60 50	Processed Water Systems
4	D2060.90	21-04 20 60 90	Process Support Plumbing System Supplementary Components
2	D30	21-04 30	HVAC
3	D3010	21-04 30 10	Facility Fuel Systems
4	D3010.10	21-04 30 10 10	Fuel Piping
4	D3010.30	21-04 30 10 30	Fuel Pumps
4	D3010.50	21-04 30 10 50	Fuel Storage Tanks
3	D3020	21-04 30 20	Heating Systems
4	D3020.10	21-04 30 20 10	Heat Generation
4	D3020.30	21-04 30 20 30	Thermal Heat Storage
4	D3020.70	21-04 30 20 70	Decentralized Heating Equipment
4	D3020.90	21-04 30 20 90	Heating System Supplementary Components
3	D3030	21-04 30 30	Cooling Systems
4	D3030.10	21-04 30 30 10	Central Cooling
4	D3030.30	21-04 30 30 30	Evaporative Air-Cooling
4	D3030.50	21-04 30 30 50	Thermal Cooling Storage
4	D3030.70	21-04 30 30 70	Decentralized Cooling
4	D3030.90	21-04 30 30 90	Cooling System Supplementary Components
3	D3050	21-04 30 50	Facility HVAC Distribution Systems
4	D3050.10	21-04 30 50 10	Facility Hydronic Distribution
4	D3050.30	21-04 30 50 30	Facility Steam Distribution
4	D3050.50	21-04 30 50 50	HVAC Air Distribution
4	D3050.90	21-04 30 50 90	Facility Distribution Systems Supplementary Components
3	D3060	21-04 30 60	Ventilation
4	D3060.10	21-04 30 60 10	Supply Air
4	D3060.20	21-04 30 60 20	Return Air
4	D3060.30	21-04 30 60 30	Exhaust Air
4	D3060.40	21-04 30 60 40	Outside Air
4	D3060.60	21-04 30 60 60	Air-to-Air Energy Recovery
4	D3060.70	21-04 30 60 70	HVAC Air Cleaning
4	D3060.90	21-04 30 60 90	Ventilation Supplementary Components
3	D3070	21-04 30 70	Special Purpose HVAC Systems
4	D3070.10	21-04 30 70 10	Snow Melting
2	D40	21-04 40	FIRE PROTECTION
3	D4010	21-04 40 10	Fire Suppression
4	D4010.10	21-04 40 10 10	Water-Based Fire-Suppression
4	D4010.50	21-04 40 10 50	Fire-Extinguishing
4	D4010.90	21-04 40 10 90	Fire Suppression Supplementary Components
3	D4030	21-04 40 30	Fire Protection Specialties
4	D4030.10	21-04 40 30 10	Fire Protection Cabinets
4	D4030.30	21-04 40 30 30	Fire Extinguishers
4	D4030.50	21-04 40 30 50	Breathing Air Replenishment Systems
4	D4030.70	21-04 40 30 70	Fire Extinguisher Accessories
2	D50	21-04 50	ELECTRICAL
3	D5010	21-04 50 10	Facility Power Generation
4	D5010.10	21-04 50 10 10	Packaged Generator Assemblies
4	D5010.20	21-04 50 10 20	Battery Equipment
4	D5010.30	21-04 50 10 30	Photovoltaic Collectors
4	D5010.40	21-04 50 10 40	Fuel Cells
4	D5010.60	21-04 50 10 60	Power Filtering and Conditioning
4	D5010.70	21-04 50 10 70	Transfer Switches
4	D5010.90	21-04 50 10 90	Facility Power Generation Supplementary Components
3	D5020	21-04 50 20	Electrical Service and Distribution
4	D5020.10	21-04 50 20 10	Electrical Service
4	D5020.30	21-04 50 20 30	Power Distribution
4	D5020.70	21-04 50 20 70	Facility Grounding
4	D5020.90	21-04 50 20 90	Electrical Service and Distribution Supplementary Components
3	D5030	21-04 50 30	General Purpose Electrical Power

4	D5030.10	21-04 50 30 10	Branch Wiring System
4	D5030.50	21-04 50 30 50	Wiring Devices
4	D5030.90	21-04 50 30 90	General Purpose Electrical Power Supplementary Components
3	D5040	21-04 50 40	Lighting
4	D5040.10	21-04 50 40 10	Lighting Control
4	D5040.20	21-04 50 40 20	Branch Wiring for Lighting
4	D5040.50	21-04 50 40 50	Lighting Fixtures
4	D5040.90	21-04 50 40 90	Lighting Supplementary Components
3	D5080	21-04 50 80	Miscellaneous Electrical Systems
4	D5080.10	21-04 50 80 10	Lightning Protection
4	D5080.40	21-04 50 80 40	Cathodic Protection
4	D5080.70	21-04 50 80 70	Transient Voltage Suppression
4	D5080.90	21-04 50 80 90	Miscellaneous Electrical Systems Supplementary Components
2	D60	21-04 60	COMMUNICATIONS
3	D6010	21-04 60 10	Data Communications
4	D6010.10	21-04 60 10 10	Data Communications Network and Equipment
4	D6010.20	21-04 60 10 20	Data Communications Hardware
4	D6010.30	21-04 60 10 30	Data Communications Peripheral Data Equipment
4	D6010.50	21-04 60 10 50	Data Communications Software
4	D6010.60	21-04 60 10 60	Data Communication Program and Integration Services
3	D6020	21-04 60 20	Voice Communications
4	D6020.10	21-04 60 20 10	Voice Communications Switching and Routing Equipment
4	D6020.20	21-04 60 20 20	Voice Communications Terminal Equipment
4	D6020.30	21-04 60 20 30	Voice Communications Messaging
4	D6020.40	21-04 60 20 40	Call Accounting
4	D6020.50	21-04 60 20 50	Call Management
3	D6030	21-04 60 30	Audio-Video Communication
4	D6030.10	21-04 60 30 10	Audio-Video Systems
4	D6030.50	21-04 60 30 50	Electronic Digital Systems
3	D6060	21-04 60 60	Distributed Communications and Monitoring
4	D6060.10	21-04 60 60 10	Distributed Audio-Video
4	D6060.30	21-04 60 60 30	Healthcare Communications and Monitoring
4	D6060.50	21-04 60 60 50	Distributed Systems
3	D6090	21-04 60 90	Communications Supplementary Components
2	D70	21-04 70	ELECTRONIC SAFETY AND SECURITY
3	D7010	21-04 70 10	Access Control and Intrusion Detection
4	D7010.10	21-04 70 10 10	Access Control
4	D7010.50	21-04 70 10 50	Intrusion Detection
3	D7030	21-04 70 30	Electronic Surveillance
4	D7030.10	21-04 70 30 10	Video Surveillance
4	D7030.50	21-04 70 30 50	Electronic Personal Protection
3	D7050	21-04 70 50	Detection and Alarm
4	D7050.10	21-04 70 50 10	Fire Detection and Alarm
4	D7050.20	21-04 70 50 20	Radiation Detection and Alarm
4	D7050.30	21-04 70 50 30	Fuel-Gas Detection and Alarm
4	D7050.40	21-04 70 50 40	Fuel-Oil Detection and Alarm
4	D7050.50	21-04 70 50 50	Refrigeration Detection and Alarm
4	D7050.60	21-04 70 50 60	Water Intrusion Detection and Alarm
3	D7070	21-04 70 70	Electronic Monitoring and Control
4	D7070.10	21-04 70 70 10	Electronic Detection Monitoring and Control
3	D7090	21-04 70 90	Electronic Safety and Security Supplementary Components
2	D80	21-04 80	INTEGRATED AUTOMATION
3	D8010	21-04 80 10	Integrated Automation Facility Controls
4	D8010.10	21-04 80 10 10	Integrated Automation Control of Equipment
4	D8010.20	21-04 80 10 20	Integrated Automation Control of Conveying Equipment
4	D8010.30	21-04 80 10 30	Integrated Automation Control of Fire-Suppression Systems
4	D8010.40	21-04 80 10 40	Integrated Automation Control of HVAC Systems

4	D8010.50	21-04 80 10 50	Integrated Automation Control of Plumbing Systems
4	D8010.60	21-04 80 10 60	Integrated Automation Control of Electrical Systems
4	D8010.70	21-04 80 10 70	Integrated Automation Control of Communication Systems
4	D8010.80	21-04 80 10 80	Integrated Automation Control of Electronic Safety and Security Systems
4	D8010.90	21-04 80 10 90	Integrated Automation Supplementary Components
1	E	21-05 00 00	EQUIPMENT & FURNISHINGS
2	E10	21-05 10 00	EQUIPMENT
3	E1010	21-05 10 10	Vehicle and Pedestrian Equipment
4	E1010.10	21-05 10 10 10	Vehicle Servicing Equipment
4	E1010.30	21-05 10 10 30	Interior Parking Control Equipment
4	E1010.50	21-05 10 10 50	Loading Dock Equipment
4	E1010.70	21-05 10 10 70	Interior Pedestrian Control Equipment
3	E1030	21-05 10 30	Commercial Equipment
4	E1030.10	21-05 10 30 10	Mercantile and Service Equipment
4	E1030.20	21-05 10 30 20	Vault Equipment
4	E1030.25	21-05 10 30 25	Teller and Service Equipment
4	E1030.30	21-05 10 30 30	Refrigerated Display Equipment
4	E1030.35	21-05 10 30 35	Commercial Laundry and Dry Cleaning Equipment
4	E1030.40	21-05 10 30 40	Maintenance Equipment
4	E1030.50	21-05 10 30 50	Hospitality Equipment
4	E1030.55	21-05 10 30 55	Unit Kitchens
4	E1030.60	21-05 10 30 60	Photographic Processing Equipment
4	E1030.70	21-05 10 30 70	Postal, Packaging, and Shipping Equipment
4	E1030.75	21-05 10 30 75	Office Equipment
4	E1030.80	21-05 10 30 80	Foodservice Equipment
3	E1040	21-05 10 40	Institutional Equipment
4	E1040.10	21-05 10 40 10	Educational and Scientific Equipment
4	E1040.20	21-05 10 40 20	Healthcare Equipment
4	E1040.40	21-05 10 40 40	Religious Equipment
4	E1040.60	21-05 10 40 60	Security Equipment
4	E1040.70	21-05 10 40 70	Detention Equipment
3	E1060	21-05 10 60	Residential Equipment
4	E1060.10	21-05 10 60 10	Residential Appliances
4	E1060.50	21-05 10 60 50	Retractable Stairs
4	E1060.70	21-05 10 60 70	Residential Ceiling Fans
3	E1070	21-05 10 70	Entertainment and Recreational Equipment
4	E1070.10	21-05 10 70 10	Theater and Stage Equipment
4	E1070.20	21-05 10 70 20	Musical Equipment
4	E1070.50	21-05 10 70 50	Athletic Equipment
4	E1070.60	21-05 10 70 60	Recreational Equipment
3	E1090	21-05 10 90	Other Equipment
4	E1090.10	21-05 10 90 10	Solid Waste Handling Equipment
4	E1090.30	21-05 10 90 30	Agricultural Equipment
4	E1090.40	21-05 10 90 40	Horticultural Equipment
4	E1090.60	21-05 10 90 60	Decontamination Equipment
2	E20	21-05 20	FURNISHINGS
3	E2010	21-05 20 10	Fixed Furnishings
4	E2010.10	21-05 20 10 10	Fixed Art
4	E2010.20	21-05 20 10 20	Window Treatments
4	E2010.30	21-05 20 10 30	Casework
4	E2010.70	21-05 20 10 70	Fixed Multiple Seating
4	E2010.90	21-05 20 10 90	Other Fixed Furnishings
3	E2050	21-05 20 50	Movable Furnishings
4	E2050.10	21-05 20 50 10	Movable Art
4	E2050.30	21-05 20 50 30	Furniture
4	E2050.40	21-05 20 50 40	Accessories
4	E2050.60	21-05 20 50 60	Movable Multiple Seating
4	E2050.90	21-05 20 50 90	Other Movable Furnishings
1	F	21-06 00 00	SPECIAL CONSTRUCTION AND DEMOLITION
2	F10	21-06 10	SPECIAL CONSTRUCTION

3	F1010	21-06 10 10	Integrated Construction
4	F1010.10	21-06 10 10 10	Building Modules
4	F1010.50	21-06 10 10 50	Manufactured/Fabricated Rooms
4	F1010.70	21-06 10 10 70	Modular Mezzanines
3	F1020	21-06 10 20	Special Structures
4	F1020.10	21-06 10 20 10	Fabric Structures
4	F1020.20	21-06 10 20 20	Space Frames
4	F1020.30	21-06 10 20 30	Geodesic Structures
4	F1020.40	21-06 10 20 40	Manufacturer-Engineered Structures
4	F1020.60	21-06 10 20 60	Manufactured Canopies
4	F1020.65	21-06 10 20 65	Rammed Earth Construction
4	F1020.70	21-06 10 20 70	Towers
3	F1030	21-06 10 30	Special Function Construction
4	F1030.10	21-06 10 30 10	Sound and Vibration Control
4	F1030.30	21-06 10 30 30	Seismic Control
4	F1030.50	21-06 10 30 50	Radiation Protection
3	F1050	21-06 10 50	Special Facility Components
4	F1050.10	21-06 10 50 10	Pools
4	F1050.20	21-06 10 50 20	Interior Fountains
4	F1050.30	21-06 10 50 30	Interior Water Features
4	F1050.40	21-06 10 50 40	Aquariums
4	F1050.50	21-06 10 50 50	Amusement Park Structures and Equipment
4	F1050.60	21-06 10 50 60	Ice Rinks
4	F1050.70	21-06 10 50 70	Animal Containment
3	F1060	21-06 10 60	Athletic and Recreational Special Construction
4	F1060.10	21-06 10 60 10	Indoor Soccer Boards
4	F1060.20	21-06 10 60 20	Safety Netting
4	F1060.30	21-06 10 60 30	Arena Football Boards
4	F1060.40	21-06 10 60 40	Floor Sockets
4	F1060.50	21-06 10 60 50	Athletic and Recreational Court Walls
4	F1060.60	21-06 10 60 60	Demountable Athletic Surfaces
3	F1080	21-06 10 80	Special Instrumentation
4	F1080.10	21-06 10 80 10	Stress Instrumentation
4	F1080.20	21-06 10 80 20	Seismic Instrumentation
4	F1080.40	21-06 10 80 40	Meteorological Instrumentation
4	F1080.60	21-06 10 80 60	Earth Movement Monitoring
2	F20	21-06 20 00	FACILITY REMEDIATION
3	F2010	21-06 20 10	Hazardous Materials and Remediation
4	F2010.10	21-06 20 10 10	Transportation and Disposal of Hazardous Materials
4	F2010.20	21-06 20 10 20	Asbestos Remediation
4	F2010.30	21-06 20 10 30	Lead Remediation
4	F2010.40	21-06 20 10 40	Polychlorinate Biphenyl Remediation
4	F2010.50	21-06 20 10 50	Mold Remediation
2	F30	21-06 30 00	DEMOLITION
3	F3010	21-06 30 10	Structure Demolition
4	F3010.10	21-06 30 10 10	Building Elements Demolition
4	F3010.30	21-06 30 10 30	Tower Demolition
4	F3010.50	21-06 30 10 50	Bridge Demolition
4	F3010.70	21-06 30 10 70	Dam Demolition
3	F3030	21-06 30 30	Selective Demolition
4	F3030.10	21-06 30 30 10	Selective Bldg Demo
4	F3030.30	21-06 30 30 30	Selective Interior Demolition
4	F3030.50	21-06 30 30 50	Selective Bridge Demolition
4	F3030.70	21-06 30 30 70	Selective Historic Demolition
3	F3050	21-06 30 50	Structure Moving
4	F3050.10	21-06 30 50 10	Structure Relocation
4	F3050.30	21-06 30 50 30	Structure Raising
1	G	21-07 00 00	SITEWORK
2	G10	21-07 10 00	SITE PREPARATIONS
3	G1010	21-07 10 10	Site Clearing
4	G1010.10	21-07 10 10 10	Clearing and Grubbing
4	G1010.30	21-07 10 10 30	Tree and Shrub Removal and Trimming
4	G1010.50	21-07 10 10 50	Earth Stripping and Stockpiling
3	G1020	21-07 10 20	Site Elements Demolition

4	G1020.10	21-07 10 20 10	Utility Demolition
4	G1020.30	21-07 10 20 30	Infrastructure Demolition
4	G1020.50	21-07 10 20 50	Selective Site Demolition
3	G1030	21-07 10 30	Site Element Relocations
4	G1030.10	21-07 10 30 10	Utility Relocation
3	G1050	21-07 10 50	Site Remediation
4	G1050.10	21-07 10 50 10	Physical Decontamination
4	G1050.15	21-07 10 50 15	Chemical Decontamination
4	G1050.20	21-07 10 50 20	Thermal Decontamination
4	G1050.25	21-07 10 50 25	Biological Decontamination
4	G1050.30	21-07 10 50 30	Remediation Soil Stabilization
4	G1050.40	21-07 10 50 40	Site Containment
4	G1050.45	21-07 10 50 45	Sinkhole Remediation
4	G1050.50	21-07 10 50 50	Hazardous Waste Drum Handling
4	G1050.60	21-07 10 50 60	Contaminated Site Material Removal
4	G1050.80	21-07 10 50 80	Water Remediation
3	G1070	21-07 10 70	Site Earthwork
4	G1070.10	21-07 10 70 10	Grading
4	G1070.20	21-07 10 70 20	Excavation and Fill
4	G1070.30	21-07 10 70 30	Embankments
4	G1070.35	21-07 10 70 35	Erosion and Sedimentation Controls
4	G1070.40	21-07 10 70 40	Soil Stabilization
4	G1070.45	21-07 10 70 45	Rock Stabilization
4	G1070.50	21-07 10 70 50	Soil Reinforcement
4	G1070.55	21-07 10 70 55	Slope Protection
4	G1070.60	21-07 10 70 60	Gabions
4	G1070.65	21-07 10 70 65	Riprap
4	G1070.70	21-07 10 70 70	Wetlands
4	G1070.80	21-07 10 70 80	Earth Dams
4	G1070.90	21-07 10 70 90	Site Soil Treatment
2	G20	21-07 20	SITE IMPROVEMENTS
3	G2010	21-07 20 10	Roadways
4	G2010.10	21-07 20 10 10	Roadway Pavement
4	G2010.20	21-07 20 10 20	Roadway Curbs and Gutters
4	G2010.40	21-07 20 10 40	Roadway Appurtenances
4	G2010.70	21-07 20 10 70	Roadway Lighting
4	G2010.80	21-07 20 10 80	Vehicle Fare Collection
3	G2020	21-07 20 20	Parking Lots
4	G2020.10	21-07 20 20 10	Parking Lot Pavement
4	G2020.20	21-07 20 20 20	Parking Lot Curbs and Gutters
4	G2020.40	21-07 20 20 40	Parking Lot Appurtenances
4	G2020.70	21-07 20 20 70	Parking Lot Lighting
4	G2020.80	21-07 20 20 80	Exterior Parking Control Equipment
3	G2030	21-07 20 30	Pedestrian Plazas and Walkways
4	G2030.10	21-07 20 30 10	Pedestrian Pavement
4	G2030.20	21-07 20 30 20	Pedestrian Pavement Curbs and Gutters
4	G2030.30	21-07 20 30 30	Exterior Steps and Ramps
4	G2030.40	21-07 20 30 40	Pedestrian Pavement Appurtenances
4	G2030.70	21-07 20 30 70	Plaza and Walkway Lighting
4	G2030.80	21-07 20 30 80	Exterior Pedestrian Control Equipment
3	G2040	21-07 20 40	Airfields
4	G2040.10	21-07 20 40 10	Aviation Pavement
4	G2040.20	21-07 20 40 20	Aviation Pavement Curbs and Gutters
4	G2040.40	21-07 20 40 40	Aviation Pavement Appurtenances
4	G2040.70	21-07 20 40 70	Airfield Lighting
4	G2040.80	21-07 20 40 80	Airfield Signaling and Control Equipment
3	G2050	21-07 20 50	Athletic, Recreational, and Playfield Areas
4	G2050.10	21-07 20 50 10	Athletic Areas
4	G2050.30	21-07 20 50 30	Recreational Areas
4	G2050.50	21-07 20 50 50	Playfield Areas
3	G2060	21-07 20 60	Site Development
4	G2060.10	21-07 20 60 10	Exterior Fountains
4	G2060.20	21-07 20 60 20	Fences and Gates
4	G2060.25	21-07 20 60 25	Site Furnishings
4	G2060.30	21-07 20 60 30	Exterior Signage

4	G2060.35	21-07 20 60 35	Flagpoles
4	G2060.40	21-07 20 60 40	Covers and Shelters
4	G2060.45	21-07 20 60 45	Exterior Gas Lighting
4	G2060.50	21-07 20 60 50	Site Equipment
4	G2060.60	21-07 20 60 60	Retaining Walls
4	G2060.70	21-07 20 60 70	Site Bridges
4	G2060.80	21-07 20 60 80	Site Screening Devices
4	G2060.85	21-07 20 60 85	Site Specialties
3	G2080	21-07 20 80	Landscaping
4	G2080.10	21-07 20 80 10	Planting Irrigation
4	G2080.20	21-07 20 80 20	Turf and Grasses
4	G2080.30	21-07 20 80 30	Plants
4	G2080.50	21-07 20 80 50	Planting Accessories
4	G2080.70	21-07 20 80 70	Landscape Lighting
4	G2080.80	21-07 20 80 80	Landscaping Activities
2	G30	21-07 30	LIQUID AND GAS SITE UTILITIES
3	G3010	21-07 30 10	Water Utilities
4	G3010.10	21-07 30 10 10	Site Domestic Water Distribution
4	G3010.30	21-07 30 10 30	Site Fire Protection Water Distribution
4	G3010.50	21-07 30 10 50	Site Irrigation Water Distribution
3	G3020	21-07 30 20	Sanitary Sewerage Utilities
4	G3020.10	21-07 30 20 10	Sanitary Sewerage Utility Connection
4	G3020.20	21-07 30 20 20	Sanitary Sewerage Piping
4	G3020.40	21-07 30 20 40	Utility Septic Tanks
4	G3020.50	21-07 30 20 50	Sanitary Sewerage Structures
4	G3020.60	21-07 30 20 60	Sanitary Sewerage Lagoons
3	G3030	21-07 30 30	Storm Drainage Utilities
4	G3030.10	21-07 30 30 10	Storm Drainage Utility Connection
4	G3030.20	21-07 30 30 20	Storm Drainage Piping
4	G3030.30	21-07 30 30 30	Culverts
4	G3030.40	21-07 30 30 40	Site Storm Water Drains
4	G3030.50	21-07 30 30 50	Storm Drainage Pumps
4	G3030.60	21-07 30 30 60	Site Subdrainage
4	G3030.70	21-07 30 30 70	Storm Drainage Ponds and Reservoirs
3	G3050	21-07 30 50	Site Energy Distribution
4	G3050.10	21-07 30 50 10	Site Hydronic Heating Distribution
4	G3050.20	21-07 30 50 20	Site Steam Energy Distribution
4	G3050.40	21-07 30 50 40	Site Hydronic Cooling Distribution
3	G3060	21-07 30 60	Site Fuel Distribution
4	G3060.10	21-07 30 60 10	Site Gas Distribution
4	G3060.20	21-07 30 60 20	Site Fuel-Oil Distribution
4	G3060.30	21-07 30 60 30	Site Gasoline Distribution
4	G3060.40	21-07 30 60 40	Site Diesel Fuel Distribution
4	G3060.60	21-07 30 60 60	Site Aviation Fuel Distribution
3	G3090	21-07 30 90	Liquid and Gas Site Utilities Supplementary Components
2	G40	21-07 40	ELECTRICAL SITE IMPROVEMENTS
3	G4010	21-07 40 10	Site Electric Distribution Systems
4	G4010.10	21-07 40 10 10	Electrical Utility Services
4	G4010.20	21-07 40 10 20	Electric Transmission and Distribution
4	G4010.30	21-07 40 10 30	Electrical Substations
4	G4010.40	21-07 40 10 40	Electrical Transformers
4	G4010.50	21-07 40 10 50	Electrical Switchgear and Protection Devices
4	G4010.70	21-07 40 10 70	Site Grounding
4	G4010.90	21-07 40 10 90	Electrical Distribution System Instrumentation and Controls
3	G4050	21-07 40 50	Site Lighting
4	G4050.10	21-07 40 50 10	Area Lighting
4	G4050.20	21-07 40 50 20	Flood Lighting
4	G4050.50	21-07 40 50 50	Building Illumination
4	G4050.90	21-07 40 50 90	Exterior Lighting Supplementary Components
2	G50	21-07 50	SITE COMMUNICATIONS
3	G5010	21-07 50 10	Site Communications Systems
4	G5010.10	21-07 50 10 10	Site Communications Structures
4	G5010.30	21-07 50 10 30	Site Communications Distribution

4	G5010.50	21-07 50 10 50	Wireless Communications Distribution
2	G90	21-07 90	MISCELLANEOUS SITE CONSTRUCTION
3	G9010	21-07 90 10	Tunnels
4	G9010.10	21-07 90 10 10	Vehicular Tunnels
4	G9010.20	21-07 90 10 20	Pedestrian Tunnels
4	G9010.40	21-07 90 10 40	Service Tunnels
4	G9010.90	21-07 90 10 90	Tunnel Construction Related Activities
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2			
2			
2			
2			
2			

#	NOTE

BIMForum LOD Specification 2020 Part II

Spaces

Baseline / Additional	Part 1 - Attribute Description					Part 2 - Project-Specific Milestones (Examples)				
						Estimating	Estimating	LEED Cert.	LEED Cert	
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**	
Rooms					Attributes for Rooms					
RoomName	Text			Office, Corridor						
RoomNumber	Text			R-210, 315						
RoomType	Text			OmniClass Table 13						
FloorName	Text			2, East 3rd						
Description	Text			CEO Office, Main Corridor						
Areas					Attributes for Rooms					
AreaName	Text			East Wing, Offices						
Description	Text			2, East 3rd						
Floors					Attributes for Rooms					
FloorName										
FloorNumber	Text			2, East 3rd						
FloorType	Text			OmniClass Table 14						
Description	Text			R-210, 315						
Target LOD	Number			100, 200, 300, 350, 400						
Current LOD	Number			100, 200, 300, 350, 400						
Target Area	Number	ft^2	m^2	2010, 31500						

BIMForum LOD Specification 2020 Part II

A, B - Structural Steel

	Part 1 - Attribute Description					Part 2 - Project-Specific Milestones (Examples)				
						Estimating	Estimating	LEED Cert.	LEED Cert	
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**	
AISC Shape Type & Size	Text			options: [specific "HSS 6x6x1/4"]						
Fireproofed	Logical			T/F, 1/0						
Weight in pounds/foot	Decimal									
ASTM Material Grade	Text			options: [A992, etc]						
Coating	Text			options: [galvanized, painted for exterior exposure, etc]						
Architectural Exposed Structural Steel	Text			SSS, AESS-1, AESS-2, AESS-3, AESS-4, Custom	Note the five options are Standard Structural Steel, AESS-1, AESS-2, AESS-3, AESS-4, Custom. These options are from the AISC Code of Standard Practice 2016.					
Fabrication Sequence Number	Number				SequenceNumber					
Target LOD	Text			100, 200, 300, 350, 400						
Current LOD	Text			100, 200, 300, 350, 400						
Shop Submittal Parameters					{}					
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}					
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}					
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}					
Date - Detailing Submitted for EOR review \ Out For Approval (OFA	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}					
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}					
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}					
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}					
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}					
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}					
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}					
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}					
Material										
Deck Fasteners										
Typical Weld Specifications										
Camber										
Shear Studs										
Toppings										
Structural steel materials										
Finishes, i.e. painted, galvanized, etc										

BIMForum LOD Specification 2020 Part II

A, B Miscellaneous Steel

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	Part 2 - Project-Specific Milestones (Examples) Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
				Part 1 - Attribute Description					
AISC Shape & Size	Text								
Fireproofed	Logical			T/F, 1/0					
Weight in pounds/foot	Number	lb./ft.							
ASTM Material Grade	Text			options: [A992, etc]					
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Coating	Text			options: [galvanized, painted for exterior exposure, etc]					
Architectural Exposed Structural Steel	Logical			T/F, 1/0	Related NAAMM guidelines should be outlined in the projects BxP.				
Fabrication Sequence Number	Number				SequenceNumber				
Shop Submittal Parameters					{}				
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approva	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
Finishes, i.e. painted, galvanized, etc									

BIMForum LOD Specification 2020 Part II

A, B - Concrete

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	Part 1 - Attribute Description	Part 2 - Project-Specific Milestones (Examples) Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
Member Type	Text			(0) Foundation (1) Beam (2) Column (3) Slab (4) Wall						
Concrete Compression Strength	Number	PSI			Example: 3000 PSI					
Reinforcing Steel Flexture	Number	PSI			Example: 60,000 PSI					
Reinforcing Steel Shear	Number	PSI			Example: 60,000 PSI					
Target LOD	Text			100, 200, 300, 350, 400						
Current LOD	Text			100, 200, 300, 350, 400						
Material										
Exterior Exposure	Logical			T/F, 1/0						
Shop Submittal Parameters										
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}					
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}					
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}					
Date - Detailing Submitted for EOR review \ Out For Approva	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}					
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}					
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}					
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}					
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}					
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}					
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}					
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}					
Finish	Text			A,B,C per ACI 117	Specify by face of concrete					
Moisture Retarder										
Air Entrainment										
Aggregate Size										
Specific Deck Material										
Deck Fasteners										
Typical Weld Specifications										
Camber										
Shear Studs										
Toppings										
Embeds and Anchor Rods										
Aggregate, Clear cover										
Reinforcing Spacing										
Live Loads										
Shear Reinforcing and Stud Rails										
Reinforcing Post-Tension Profiles and Strand Locations										
Chamfers										
Post-tension profile										
Strands										

BIMForum LOD Specification 2020 Part II

A, B - Precast Concrete

	Part 1 - Attribute Description					Part 2 - Project-Specific Milestones (Examples)			
						Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	Est. 1	Bid Pkg.	Check	Submittal
Member Type	Text			(0) Foundation (1) Beam (2) Column (3) Slab (4) Wall					
Concrete Compression Strength		PSI			Example: 3000 PSI				
Reinforcing Steel Flexture		PSI			Example: 60,000 PSI				
Reinforcing Steel Shear		PSI			Example: 60,000 PSI				
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Member Casting Number									
Exterior Exposure	Logical			T/F, 1/0					
Shop Submittal Parameters									
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
Camber									
Finish	Text			A,B,C per ACI 117	Specify by face of concrete				
Material									
Post-tension profile									
Strands									

BIMForum LOD Specification 2020 Part II

A, B - Steel Open Web Joists

Baseline
Additional

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	Part 2 - Project-Specific Milestones (Examples) Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
Type	Text			K, LH, DLH, Joist Girder	{JoistType}				
SJI Joist Designation	Text			options: [specific "18K3"]	{JoistDesignation}				
Overall Length	Number	FT			{OAL}				
Joist Depth	Number	in			{JoistDepth}				
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Approx. Wt (lbs./ft.)	Number	#/ft			{JoistApproxWt}				
LRFD Load Total Safe	Number	Pounds / Lineal Foot			{Total_Load_LRFD_Safe} safe factored uniformly distributed load-carrying capacities				
LRFD Load Deflection 1/360	Number	Pounds / Lineal Foot			{Total_Load_LRFD_360} unfactored uniform load, which will produce an approximate joist deflection of 1/360 of the span				
Shop Submittal Parameters					{}				
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approval (OF	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
ASD Load Total Safe	Number	Pounds / Lineal Foot			{Total_Load_ASD_Safe}				
ASD Load Deflection 1/360	Number	Pounds / Lineal Foot			{Total_Load_ASD_360}				
Fireproofed	Logical			T/F, 1/0	{JoistFireproofed}				
Architectural Exposed Structural Steel	Logical			T/F, 1/0	{JoistAESS}				
Fabrication Sequence Number	Number				{JoistFabSequ} SequenceNumber				
Span, Base Length	Number	FT			{SpanBase}				
Design Span					{SpanDesign}				
Approximate Camber Based on Top Chord Length					{Camber}				
Extensions (Y/N)					{}				
Top Chord Extensions Left (Start End)	Logical			T/F, 1/0	{TCXL}				
Top Chord Extensions Right (Stop End)	Logical			T/F, 1/0	{TCXR}				
Bottom Chord Extension Left	Logical			T/F, 1/0	{BCXL}				
Bottom Chord Extension Right	Logical			T/F, 1/0	{BCXR}				
Lengths					{}				
Bottom Chord Extension Left Length	Number	in			{BCXLL}				
Bottom Chord Extension Right Length	Number	in			{BCXRL}				
Top Chord Extensions Left Length	Number	in			{TCXLL}				
Top Chord Extensions Right	Number	in			{TCXRL}				
Recycle Content	Number			%	{RecycleContent}				
Distance From Point of Fabrication to Site	Number			Miles	{FabDistToSite}				
Engineering Parameters					{}				
Joist Moment Of Inertia	Number	in^4			{Ij}				
Section Modulous	Number	in^3			{Sx}				
Slope "X" Low End ("X": 12")	Number	in			{SlopeXLow}				
Slope "X" High End ("X": 12")	Number	in			{SlopeXHigh}				
Bearing Depth Left	Number	in			{BearingDepthLeft}				
Bearing Depth Right	Number	in			{BearingDepthRight}				
Approximate Duct Opening Size Round	Number	in			{}				
Approximate Duct Opening Size Square	Number	in			{}				
Approximate Duct Opening Size Rectangular (Width x Height)	Number	in			{}				
Approximate Duct Opening Size Rectangular (Width x Height)					{}				
Chord Yield Strength	Number				{FyChord} Refer to SJI Specification.				
All Other Yield Strength	Number				{FyOther} Refer to current SJI Specification				

Number Of Rows Of Top Chord Bridging (Estimated per SJI Table)	Number				{TopChordBrdRowReqEst}						
Bearing Seat Attachment Left (start end)					{BearingTypeLeft} Bearing Seat Attachment Type: (1) Masonry or Concrete (2) Steel (3) Other						
Bearing Seat Attachment Right (stop end)					{BearingTypeRight} Bearing Seat Attachment Type: (1) Masonry or Concrete (2) Steel (3) Other						
Bearing Seat Uplift Left					{BrUpliftLeft} Is the joist seat in uplift						
Bearing Seat Uplift Right					{BrUpliftRight} Is the joist seat in uplift						
Laterally Unbraced Top Chords (Y/N)	Logical			T/F, 1/0	{LatUnbacedTopChord}						
Wood Nailers on Top Chored (Y/N)	Logical			T/F, 1/0	{WoodNailers}						
					{}						
LRFD Load Total Safe	Number	Pounds / Lineal Foot			{} safe factored uniformly distributed load-carrying capacities						
LRFD Load Deflection 1/360	Number	Pounds / Lineal Foot			{} unfactored uniform load, which will produce an approximate joist deflection of 1/360 of the span						
ASD Load Total Safe	Number	Pounds / Lineal Foot			{}						
ASD Load Deflection 1/360	Number	Pounds / Lineal Foot			{}						
					{}						
Top Chord Extension Type (None, S or R) Left	Number				{TCExTypeLeft} Top Chord Extension Type: (0) None (1) "S", top angles of top chord (2) top and bottom angle of top chord						
Top Chord Extension Type (None, S or R) Right	Number				{TCExTypeRight} Top Chord Extension Type: (0) None (1) "S", top angles of top chord (2) top and bottom angle of top chord						
Non-standard joist seat depths and/or sloping joist seat											
Member designation, load capacity and deflection criteria											
Design loads and location of concentrated loads											
Material requirements											

BIMForum LOD Specification 2020 Part II

A, B - Precast Concrete

Attribute	Part 1 - Attribute Description					Part 2 - Project-Specific Milestones (Examples)			
						Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary				
Member Type	Text			(0) Foundation (1) Beam (2) Column (3) Slab (4) Wall					
Concrete Compression Strength		PSI			Example: 3000 PSI				
Reinforcing Steel Flexture		PSI			Example: 60,000 PSI				
Reinforcing Steel Shear		PSI			Example: 60,000 PSI				
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Member Casting Number									
Exterior Exposure	Logical			T/F, 1/0					
Shop Submittal Parameters									
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approva	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
Camber									
Finish	Text			A,B,C per ACI 117	Specify by face of concrete				
Material									
Post-tension profile									
Strands									

BIMForum LOD Specification 2020 Part II

A, B - Metal Deck

Baseline
Additional

						Part 1 - Attribute Description	Part 2 - Project-Specific Milestones (Examples)			
							Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**		**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**
Deck Type	Number									
Yield Strength (Fy)		PSI								
Deck Thickness	Number	in			Example 1.5"					
Deck Flute Width	Number	in			Example 1.5"					
Diaphragm Load and Deflection criteria										
Deck Material										
Deck Fasteners										
Typical Weld Specifications										
Target LOD	Text			100, 200, 300, 350, 400						
Current LOD	Text			100, 200, 300, 350, 400						
Shop Submittal Parameters										
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}					
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}					
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}					
Date - Detailing Submitted for EOR review \ Out For Approva	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}					
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}					
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}					
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}					
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}					
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}					
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}					
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}					
Finishes, i.e. painted, galvanized, etc										
Diaphragm load and deflection criteria										
Deck material										
Deck fasteners										
Typical weld specifications										

BIMForum LOD Specification 2020 Part II

A, B Cold Formed Metal Framing

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	Part 2 - Project-Specific Milestones (Examples) Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
Part 1 - Attribute Description									
Member Type	Number			(0) Beam (1) Column (2)Wall					
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Shop Submittal Parameters									
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				

BIMForum LOD Specification 2020 Part II

A, B - Wood

Baseline
Additional

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	Part 2 - Project-Specific Milestones (Examples) Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
Member Type	Text			(0) Foundation (1) Beam (2) Column (3) Deck (4) Wall					
Flextural Strength (Fb)		PSI							
Shear Strength (Fv)		PSI							
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Wet Use	Logical			T/F, 1/0					
Repetitive Member Use	Logical			T/F, 1/0					
Shop Submittal Parameters									
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
Finish	Text								
Deck Orientation									
Deck Material Layer thickness									
Diaphragm Load and Deflection Criteria									
Deck Material									
Deck Fasteners									
Member designation									
Load capacity									
deflection criteria									
Design loads									

BIMForum LOD Specification 2020 Part II

A, B - Masonry

Baseline
Additional

	Part 1 - Attribute Description					Part 2 - Project-Specific Milestones (Examples)			
						Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**
Wall Type									
Wall Total Thickness				7 5/8"					
Wall Core Masonry Thickness				7 5/8"					
Wall Finish Face 1				3 5/8"					
Wall Finish Face 2									
Wall Is Load Bearing	Logical			T/F, 1/0	IsLoadBearning				
Block Type				CMUx8x8x16					
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Shop Submittal Parameters									
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
Reinforcing									
Mortar and grout defined									
Reinforcement and steel lintels required at openings									
Material									
Slope									
Spacing									
Design Loads									
Deflection criteria									

BIMForum LOD Specification 2020 Part II

A, B - Grating

Baseline
Additional

	Part 1 - Attribute Description					Part 2 - Project-Specific Milestones (Examples)			
						Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**
Grating Type									
Material				Steel, Alum, Fiberglass					
Finish				Painted, Galvanized, Anodized					
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Shop Submittal Parameters									
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
Reinforcement and steel lintels required at openings									
Slope									
Spacing									
Design Loads									
Deflection criteria									

BIMForum LOD Specification 2020 Part II

A, B - Helical Piers

Baseline
Additional

	Part 1 - Attribute Description					Part 2 - Project-Specific Milestones (Examples)			
						Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**
Grating Type									
Material				Steel, Alum, Fiberglass					
Finish				Painted, Galvanized, Anodized					
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Shop Submittal Parameters									
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
Reinforcement and steel lintels required at openings									
Slope									
Spacing									
Design Loads									
Deflection criteria									

BIMForum LOD Specification 2020 Part II

B – Ext. Wall

	Part 1 - Attribute Description					Part 2 - Project-Specific Milestones (Examples)			
						Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**
Construction	Text			framed, unit masonry, panelized, EIFS, etc.					
Material - Skin	Text			tiles, composite, sheet metal, etc.					
Material - Substrate	Text			corrugated metal, plywood, composite panels, etc.					
Material - Insulation	Text								
Wall Type	Text								
Thermal Resistance	Number	h·ft2·°F/Btu **(R)**	$m^{2o}C/W$ **(R)**						
Thermal Transmittance	Number	Btu/(h·ft2·°F/Btu **(U)**	W/($m^{2o}C$) **(U)**						
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Wind Load Capacity (drag)	Number	psf	Pa						
Wind Load Capacity (pressure)	Number	psf	Pa						
Fire Rating	Text			options: [UL label - A,B,C,D,E,S]					
Impact resistance	Text			options:[T/F, class]					
UV Resistance	Text			options:[T/F, class]					
Air Infiltration	Text			options:[T/F, class]					
Sound Transmission									
Acoustic Rating	Text								
Security Rating	Text								
Glazing Area	Number	ft^2	m^2		Fraction of the glazing area relative to the total area of the filling element.				
Combustible	Logical			T/F, 1/0	Indicates whether the object is made from combustible material.				
SurfaceSpreadofFlame	Text								
IsExternal	Logical			T/F, 1/0	Should be set to TRUE for all external walls.				
Shop Submittal Parameters:					{}				
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				

BIMForum LOD Specification 2020 Part II

B – Roof

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	IFC Property	Part 2 - Project-Specific Milestones (Examples) Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
				Part 1 - Attribute Description						
Material - Skin	Text			tiles, composite, sheet metal, etc.						
Material - Substrate	Text			corrugated metal, plywood, composite panels, etc.						
Material - Insulation	Text			Batt, rigid, etc.						
Thermal Resistance	Number			R-value						
Thermal Transmittance	Numeric			U-value		ThermalTransmittance				
Target LOD	Text			100, 200, 300, 350, 400						
Current LOD	Text			100, 200, 300, 350, 400						
Wind Load Capacity (drag)	Number	psf	Pa							
Wind Load Capacity (pressure)	Number	psf	Pa							
UV Resistance	Logical			T/F, 1/0						
Acoustic Rating	Text					AcousticRating				
Fire Rating	Text			options: [UL label - A,B,C,D,E,S]		FireRating				
Shop Submittal Parameters:					{}					
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}					
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}					
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}					
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}					
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}					
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}					
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}					
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}					
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}					
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}					
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}					

BIMForum LOD Specification 2020 Part II

B – Ext. Glazed Openings

	Part 1 - Attribute Description						Part 2 - Project-Specific Milestones (Examples)			
							Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**IFC Property**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**
Construction	Text			options:[Unitized (combined glass and frame), Stick Built, Structural Glass]						
Material	Text			options:[Aluminium Framed, Bronze Framed, Stainless Steel Framed, Channel Glass]						
Thermal Resistance	Number			R-value						
Thermal Transmittance	Number			U-value		ThermalTransmittance				
Target LOD	Text			100, 200, 300, 350, 400						
Current LOD	Text			100, 200, 300, 350, 400						
Manufacturer	Text									
Model Designation	Text									
Location	Text									
Operation	Text			fixed, casement, double/single hung, awning/project out, pivot, sliding		OperationType				
Glass - Material	Text			options:[Glass, Plastic]						
Glass - Configuration	Text			options:[Monolithic, Insulating]						
Glass - Condition	Text			options, multiple:[Annealed, Heat Strengthened, Tempered, Laminated, Bent]						
Glass - Coatings	Text			options, multiple:[Purolytic (hard coat), Sputter (soft coat), Low E, Metallic, Ceramic Frit, Opaci Coat, Digital Printed]						
Windbourne Debris Resistance	Number	psf	Pa							
Wind Load Capacity	Number	psf	Pa							
Air Infiltration	Text			options:[yes, no, class]		Infiltration				
Sound Transmission	Text			options:[yes, no, class]						
Acoustic Rating	Text					AcousticRating				
Security Rating	Text					SecurityRating				
Glazing Area	Number				Fraction of the glazing area relative to the total area of the filling ele	GlazingAreaFraction				
Handicap Accessible	Logical					HandicapAccessible				
Fire Exit	Logical					FireExit				
HasDrive	Logical				Indicates whether the door has an automatic drive to operate it.	HasDrive				
SelfClosing	Logical					SelfClosing				
SmokeStop	Logical				Indicates whether the door is designed to provide a smoke stop.	SmokeStop				
SillExternal	Logical					HasSillExternal				
SillInternal	Logical					HasSillInternal				
GLAZING ATTRIBUTES:										
GlassLayers	Number				Number of glass layers within the frame	GlassLayers				
GlassThickness1	Number	in	mm		Inner glass layer	GlassThickness1				
GlassThickness2	Number	in	mm		Intermediate or outer glass layer	GlassThickness2				
GlassThickness3	Number	in	mm		Outer glass layer	GlassThickness3				
FillGas	Text				Name of the gas in gap between glass layers	FillGas				
GlassColor	Text					GlassColor				
IsTempered	Logical					IsTempered				
IsLaminated	Logical					IsLaminated				
IsCoated	Logical					IsCoated				
IsWired	Logical					IsWired				
VisibleLightReflectance	Number					VisibleLightReflectance				
VisibleLightTransmittance	Number					VisibleLightTransmittance				
SolarAbsorption	Number				(Asol) The ratio of incident solar radiation that is absorbed by a glazing system	SolarAbsorption				
SolarReflectance	Number				(Rsol) The ratio of incident solar radiation that is reflected by a glazing system	SolarReflectance				
SolarTransmittance	Number				(Tsol) The ratio of incident solar radiation that directly passes through a glazing system	SolarTransmittance				

SolarHeatGainTransmittance	Number				(SHGC) The ratio of incident solar radiation that contributes to the heat gain of the interior	SolarHeatGainTransmittance					
ShadingCoefficient					SC is being phased out in favor of SHGC	ShadingCoefficient					
Shop Submittal Parameters:					{}						
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}						
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}						
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}						
Date - Detailing Submitted for EOR review \ Out For Approva	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}						
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}						
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}						
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}						
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}						
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}						
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}						
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}						

BIMForum LOD Specification 2020 Part II

B – Cladding

	Part 1 - Attribute Description					Part 2 - Project-Specific Milestones (Examples)			
						Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**
Construction	Text			options:[Unitized (combined glass and frame, Stick Built, Structural Glass]					
Material	Text			options:[Aluminium Framed, Bronze Framed, Stainless Steel Framed, Channel Glass]					
Coatings	Text			options, multiple:[Purolytic (hard coat), Sputter (soft coat), Low E, Metallic, Ceramic Frit, Opaci Coat, Digital Printed]					
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Wind Load Capacity (pressure)	Number	psf	Pa						
Wind Load Capacity (drag)	Number	psf	Pa						
Windbourne Debris Resistance				options:[yes, no, class]					
Thermal Resistance				R-value (h·ft2·°F/Btu)					
Shop Submittal Parameters					{}				
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approva	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
Condensation Resistance				options:[yes, no, class]					
Water Resistance				options:[yes, no, class]					
Air Infiltration				options:[yes, no, class]					
Sound Transmission				options:[yes, no, class]					
Bullet Resistance				options:[yes, no, class]					
Radiation Protection				options:[yes, no, class]					
Fire Rating				options: [UL label - A,B,C,D,E,S]					

BIMForum LOD Specification 2020 Part II

B – Ext. Doors

Baseline / Additional	Part 1 - Attribute Description						Part 2 - Project-Specific Milestones (Examples)			
							Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**IFC Property**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**
Type	Text			single, double, sliding, etc.		Reference				
Operation	Text			LH, LHR, RH, RHR		OperationType				
Material - Frame	Text			wood, metal, glass, etc.						
Material - Panel	Text			solid core / hollow core, wood/metal, etc.						
Material - Glazing	Text									
Hardware Set	Text			reference to schedule						
Fire Rating	Text			options: [UL label - A,B,C,D,E,S]		FireRating				
Target LOD	Text			100, 200, 300, 350, 400						
Current LOD	Text			100, 200, 300, 350, 400						
Manufacturer	Text									
Model Designation	Text									
Location	Text									
Finish - Frame	Text									
Finish - Panel	Text									
Wind Load Capacity	Number	psf	Pa							
Acoustic Rating	Text					AcousticRating				
Security Rating	Text					SecurityRating				
Glazing Area	Number				Fraction of the glazing area relative to the total area of the filling element.	GlazingAreaFraction				
Handicap Accessible	Logical					HandicapAccessible				
Fire Exit	Logical					FireExit				
HasDrive	Logical				Indicates whether the door has an automatic drive to operate it.	HasDrive				
SelfClosing	Logical					SelfClosing				
SmokeStop	Logical				Indicates whether the door is designed to provide a smoke stop.	SmokeStop				
GLAZING ATTRIBUTES:										
GlassLayers	Number				Number of glass layers within the frame	GlassLayers				
GlassThickness1	Length	in	mm		Inner glass layer	GlassThickness1				
GlassThickness2	Length	in	mm		Intermediate or outer glass layer	GlassThickness2				
GlassThickness3	Length	in	mm		Outer glass layer	GlassThickness3				
FillGas	Text				Name of the gas in gap between glass layers	FillGas				
GlassColor	Text					GlassColor				
IsTempered	Logical					IsTempered				
IsLaminated	Logical					IsLaminated				
IsCoated	Logical					IsCoated				
IsWired	Logical					IsWired				
VisibleLightReflectance	Number					VisibleLightReflectance				
VisibleLightTransmittance	Number					VisibleLightTransmittance				
SolarAbsorption	Number				(Asol) The ratio of incident solar radiation that is absorbed by a glazing system	SolarAbsorption				
SolarReflectance	Number				(Rsol) The ratio of incident solar radiation that is reflected by a glazing system	SolarReflectance				
SolarTransmittance	Number				(Tsol) The ratio of incident solar radiation that directly passes through a glazing system	SolarTransmittance				
SolarHeatGainTransmittance	Number				(SHGC) The ratio of incident solar radiation that contributes to the heat gain of the interior	SolarHeatGainTransmittance				
ShadingCoefficient					SC is being phased out in favor of SHGC	ShadingCoefficient				
Shop Submittal Parameters:					{}					
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}					
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}					
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}					
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}					
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}					
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}					
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}					
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}					

Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm	{DateFabReceived}						
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm	{DateErected}						
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm	{DateInspected}						

BIMForum LOD Specification 2020 Part II

B,C Louvers and Vents

Baseline / Additional	Part 1 - Attribute Description					IFC Property	Part 2 - Project-Specific Milestones (Examples)				
							Estimating	Estimating	LEED Cert.	LEED Cert	
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**		**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**	
Material	Text			options:[Aluminium Framed, Bronze Framed, Stainless Steel Framed, Channel Glass]							
Type	Text			Intake, Exhaust							
Target LOD	Text			100, 200, 300, 350, 400							
Current LOD	Text			100, 200, 300, 350, 400							
Manufacturer	Text										
Model Designation	Text										
Location	Text										
Net Free Area	Number	sf	sqm								
Windbourne Debris Resistance	Number	psf	Pa								
Wind Load Capacity	Number	psf	Pa								
Adjustable	Logical										
Air Flow	Text	cfm		options:[yes, no, class]							
Forced Entry Resistance	Text			options:[yes, no, class]							
Storm Proof	Logical										
Shop Submittal Parameters:					{}						
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}						
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}						
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}						
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}						
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}						
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}						
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}						
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}						
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}						
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}						
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}						

BIMForum LOD Specification 2020 Part II

C - Int. Windows

Baseline
Additional

	Part 1 - Attribute Description					Part 2 - Project-Specific Milestones (Examples)			
						Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**
Construction	Text			options:[Unitized (combined glass and frame), Stick Built, Structural Glass]					
Material	Text			options:[Aluminium Framed, Bronze Framed, Stainless Steel Framed, Channel Glass]					
Thermal Resistance	Number	R-Value							
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Function				fixed, casement, double/single hung, awning/project out, pivot, sliding					
Wind Load Capacity				psf					
Glazing Method				options:[Conventional, Two Sided, Three Sided, Four Sided, Pint Supported]					
Glass - Material				options:[Glass, Plastic]					
Glass - Configuration				options:[Monolithic, Insulating]					
Shop Submittal Parameters					{}				
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
Glass - Condition				options, multiple:[Annealed, Heat Strengthened, Tempered, Laminated, Bent]					
Glass - Coatings				options, multiple:[Purolytic (hard coat), Sputter (soft coat), Low E, Metallic, Ceramic Frit, Opaci Coat, Digital Printed]					

Glass - Use				options, multiple:[Glazing into conventional application, Glazing into structurally glazed application, Mirror, Decorative, Fire Resistant, Hurricane Resistant, Cable Suspended, Switchable Glass, Electronically Controlled switchable Glass, Pressure Resistant, Radiation Resistant, Security, Ballistics Resistant]						
Visible Light Transmission				options:[yes, no, class]						
Sound Transmission				options:[yes, no, class]						
Forced Entry Resistance				options:[yes, no, class]						
Bullet Resistance				options:[yes, no, class]						
Radio Frequency Interference Protection				options:[yes, no, class]						
Radiation Protection				options:[yes, no, class]						
Finishes										
Blast Resistance										
Manufacturer										
Model Designation										
Location										

BIMForum LOD Specification 2020 Part II

C - Int. Doors

Baseline
Additional

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	Part 2 - Project-Specific Milestones (Examples) Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
Type	Text			single, double, sliding, etc.					
Material - frame	Text			wood, metal, glass, etc.					
Material - panel	Text			solid core / hollow core, wood/metal, etc.					
Hardware set	Text			reference to schedule					
Fire Rating	Text			options: [UL label - A,B,C,D,E,S]					
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Level				options:[First Floor, Second Floor, etc.]					
Sill Height				options:[dimension: 0, 1'-0", etc.]					
Shop Submittal Parameters					{}				
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
Frame Setback				options:[dimension: 1", 2", etc]					
Frame Type				options:[reference to schedule]					
Glazing Type				options:[reference to schedule]					
Jamb Detail				options:[reference to schedule]					
Head Detail				options:[reference to schedule]					
Comments				options:[reference to schedule]					
Mark				options:[reference to schedule]					
Phase Created				options:[Existing, New Construction, Phase 1, Phase 2, etc.]					
Head Height				options:[dimension: 7'-0", etc.]					
Undercut				options:[yes, no]					
Function				options:[Interior, Exterior]					
Panel Thickness				options:[1 3/4", 2", etc.]					
Rought Width				options:[3'-4", 3'-10", etc.]					
Rought Height				options:[7'-2", etc.]					
Manufacturer									
Model Designation									
Location									

BIMForum LOD Specification 2020 Part II

C - Partitions

Baseline / Additional	Part 1 - Attribute Description					Part 2 - Project-Specific Milestones (Examples)			
						Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**
Framing	Text			3-5/8" Metal Studs @ 24"oc, etc					
Cladding	Text			2-layers Type x GWB					
Moisture Resistance	Logical			T/F, 1/0					
Fire Rating	Text			2-hr, etc.					
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Wall Type									
Base Constraint				options:[First Floor, Second Floor, etc.]					
Base Offset				options:[dimension: 6", 1'-4", etc.]					
Top Constraint				options:[First Floor, Second Floor, etc.]					
Shop Submittal Parameters					{}				
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
Top Offset				options:[dimension: 6", 1'-4", etc.]					
Structural				options:[yes, no]					
Length				options:[dimension: 12'-0", 23'-4", etc.]					
Area				options:[area: 110 sf, 1,300 sf, etc.]					
Volume				options:[volume: 1,760 cf, 7,650 cf, etc.]					
Mark				options:[reference to schedule]					
Phase Created				options:[Existing, New Construction, Phase 1, Phase 2, etc.]					
Structure Material				options:[Concrete, Masonry, Wood Stud, Metal Stud, etc.]					
Width				options:[dimension: 4 7/8", 7 1/4" 7 5/8", 1'-0" etc]					
Function				options:[Interior, Exterior, Foundation, Retaining, Soffit, Core-Shaft, etc.]					
Model				options:[manufacturer specific information]					
Manufacturer				options:[manufacturer specific information]					
URL				options:[manufacturer specific information]					
Assembly Code (Uniformat)				C1010					

BIMForum LOD Specification 2020 Part II

C - Raised Floor

Baseline
Additional

	Part 1 - Attribute Description					Part 2 - Project-Specific Milestones (Examples)			
						Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**
Model	Text			options:[manufacturer specific information]					
Manufacturer	Text			options:[manufacturer specific information]					
Grid	Text			12x12, etc.					
Height	Number								
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Material Thickness	Text			options:[dimension: 1", 1 1/4",etc.]					
Material Types	Text			options:[Concrete, Steel, Aluminum]					
Level				options:[First Floor, Second Floor, etc.]					
Shop Submittal Parameters					{}				
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
Height Offset from Level				options:[dimension: 8", 1'-0", etc]					
Room Bounding				options:[yes, no]					
Structural				options:[yes, no]					
Area				options:[dimension: 100 sf, 1,235 sf, etc.]					
Perimeter				options:[dimension: 42'-5", 125'-0", etc.]					
Comments				options:[reference to schedule]					
Mark				options:[reference to schedule]					
Phase Created				options:[Existing, New Construction, Phase 1, Phase 2, etc.]					
Keynote				options:[reference to schedule]					
URL				options:[manufacturer specific information]					
Assembly Code (Uniformat)				C1060					
Assembly Description (Uniformat)				Raised Floor Construction					
Cost				options:[cost = $/sf]					
Phase Demolished				options:[New Construction, Phase 1, Phase 2, etc.]					

BIMForum LOD Specification 2020 Part II

C - Susp. Clg.

Baseline / Additional	Part 1 - Attribute Description					Part 2 - Project-Specific Milestones (Examples)			
						Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**
Grid	Text			24x24, etc					
Material	Text								
Seismic Bracing	Logical								
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Phase Created				options:[Existing, New Construction, Phase 1, Phase 2, etc.]					
Material Thickness				options:[dimension: 3/4", 5/8", etc.]					
Model				options:[manufacturer specific information]					
Manufacturer				options:[manufacturer specific information]					
Shop Submittal Parameters					{}				
Date - Issued For Construction	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateIFC}				
Date - Permitted	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DatePermitted}				
Date - received for Shop Detailing	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approv	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFinalForFab}				
Date - Fabrication Start	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabStart}				
Date - Fabrication End	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabEnd}				
Date - Fabrication Shipped	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabShip}				
Date - Fabrication Received	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateFabReceived}				
Date - Erection	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateErected}				
Date - Inspected	Datetime	yyyy-mm-ddThh:mm	yyyy-mm-ddThh:mm		{DateInspected}				
Ceiling Attenuation Class (CAC)				options:[33, 35, 40, etc.]					
Surface Burning Characteristics (SBC)				options:[ASTM E84, etc.]					

D10 - Conveying

Baseline / Additional				Part 1 - Attribute Description		Part 2 - Example Project-Specific Milestones			
						Estimating	Estimating	LEED Cert.	LEED Cert
Attribute	**Data Type**	**Units - Imp.**	**Units - Metric**	**Option Examples**	**Commentary**	**Est. 1**	**Bid Pkg.**	**Check**	**Submittal**
Global Attributes									
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Item-Specific Attributes									
Electrical									
Riser Fuses for Separate Lighting	Number								
Riser Fuses	Number								
Nominal Line Current	Number								
Max. RMS acc. Line Current, Ia	Number								
Main Supply Voltage	Number	Volts							
Main Fuses	Number								
Lighting Fuses	Number								
Frequency	Number	Hz							
Mechanical									
Pit Floor Load	Number								
Lifting Hook Capacity	Number								
Force z Cwt	Number								
Force z Car	Number								
Force y Cwt	Number								
Force y Car	Number								
Force x Cwt	Number								
Force x Car	Number								
Dimensions									
Travel Distance	Number								
shaft depth	Number								
shaft width	Number								
Overhead height	Number								
Pit Depth	Number								
Clear Width	Number								
Clear Height	Number								
Clear Depth	Number								
Identity									
Manufacturer	Text								
Group ID	Text								
Equipment ID	Text								
Elevator									
Speed	text								
Capacity	text								
Machine Type	text								
Cwt Orientation	text								
Main Entrance Level	text								
Total Floors Served	Number								
Floors served front side	text								
Number of Accesses front side	Number								
Floors served back side	text								
Number of Accesses back side	Number								
Landing Door Clear Width front side	Number								
Landing Door Clear Height front side	Number								
Landing Door Clear Width back side	Number								
Landing Door Clear Height back side	Number								
Type of door front side	text			1-leaf 2-leaf telescopic 3-leaf telescopic 2-leaf central 4-leaf central 6-leaf central Other					

	Type of door back side	text			1-leaf 2-leaf telescopic 3-leaf telescopic 2-leaf central 4-leaf central 6-leaf central Other						
	Drive Principle	text			traction, hydraulic						
	Position of drive in shaft	text			left, right, other						
	Drive position	text			in top of elevator shaft, in pit of elevator shaft, on top of elevator shaft						
	Buffer Type	text									

BIMForum LOD Specification 2020 Part II

D20 - Plumbing

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	IFC Name	COBie Tag	Part 3 - Example Projec: Estimating Est. 1	Part 3 - Example Projec: Estimating Bid Pkg.
Part 1 - Attribute Description									
Global Attributes									
Component ID	Text				Part or Equipment Tag				
Condition Status	Text			New, Existing, Demolish, Temporary, User Defined	Status of the element, predominately used in renovation or retrofitting projects				
Room Number	Text				Room number where component to be/is installed				
Room Name	Text				Room name where component to be/is installed				
Story Number	Text				Floor or level room is located				
Manufacturer Name	Text				The organization that manufactured and/or assembled the item.				
Product Name	Text				The manufacturers model name of the product model (or product line)				
Model Designation	Text				The manufacturers model number or designator of the product model (or product line)				
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Component characteristics					**Properties of individual elements of manufactured products**				
Acquisition Date	Date Time	Date			The date that the manufactured item was purchased.				
Assembly Place	Text				Code defining where the assembly takes place				
Bar Code	Text				The identity of the bar code given to an occurrence of the product.				
Batch Reference	Text				The identity of the batch reference from which an occurrence of a product is taken.				
Production Year	Number	Year			The year of production of the manufactured item.				
Serial Number	Text				The serial number assigned to an occurrence of a product.				
Design Performance	Text								
Service Life					Captures the period of time that an artifact will last.				
Mean Time Between Failure	Number	Days			The average time duration between instances of failure of a product.				
Service Life Duration	Number	Year(s)			The length or duration of a service life.				
Service Life Factors	Text				Captures various factors that impact the expected service life of elements within the system or zone.				
Design Level	Text				Adjustment of the service life resulting from the effect of design level employed.				
Indoor Environment	Text				Adjustment of the service life resulting from the effect of the indoor environment (where appropriate).				
In Use Conditions	Text				Adjustment of the service life resulting from the effect of the conditions in which components are operating.				
Maintenance Level	Text				Adjustment of the service life resulting from the effect of the level or degree of maintenance applied to components.				
Outdoor Environment	Text				Adjustment of the service life resulting from the effect of the outdoor environment (where appropriate)				
Quality Of Components	Text				Adjustment of the service life resulting from the effect of the quality of components used.				
Work Execution Level	Text				Adjustment of the service life resulting from the effect of the quality of work executed.				
Warranty					A written guarantee, issued to the purchaser of an article by its manufacturer, promising to repair or replace it if necessary				
Exclusions	Text				Items, conditions or actions that may be excluded from the warranty or that may cause the warranty to become void.				
Is Extended Warranty	Logical			True or False	Indication of whether this is an extended warranty whose duration is greater than that normally assigned				
Point Of Contact	Text				The organization that should be contacted for action under the terms of the warranty.				
Warranty Content	Text				The content of the warranty.				
Warranty End Date	Date Time	Date			The date on which the warranty expires.				
Warranty Identifier	Text				The identifier assigned to a warranty.				
Warranty Period	Number	Year(s)			The time duration during which a manufacturer or supplier guarantees or warrants the performance of an artefact.				
Warranty Start Date	Date Time	Date			The date on which the warranty commences.				
Fixture-Specific Attributes									
Bath Tub					Sanitary appliance for immersion of the human body or parts of it.	IfcSanitaryTerminal			
Bath Type	Text			Domestic, Domestic Corner, Foot, Jacuzzi, Plunge, Sitz, Treatment, Whirlpool, User Defined	The property enumeration defines the types of bath that may be specified within the property set.				
Color	Text			White, Almond, User Defined	Principal color of the object.				
Drain Size	Number	Inch	mm		The size of the drain outlet connection from the object.				
Has Grab Handles	Logical				Indicates whether the bath is fitted with handles that provide assistance to a bather in entering or leaving the bath.				
Nominal Depth	Number	Inch	mm		Nominal or quoted depth of the object.				
Nominal Length	Number	Inch	mm		Nominal or quoted length of the object.				
Nominal Width	Number	Inch	mm		Nominal or quoted width of the object.				
Bidet					Waste water appliance for washing the excretory organs while sitting astride the bowl	IfcSanitaryTerminal			
Bidet Type	Text				The property enumeration defines the types of bidet that may be specified within the property set.				

	Color	Text			White, Almond, User Defined	Color selection for this object.				
	Drain Size	Number	Inch	mm		The size of the drain outlet connection from the object.				
	Mounting	Text			BackToWall, Pedestal, Wall Hung	The property defines sanitary terminals mounting type				
	Nominal Depth	Number	Inch	mm		Nominal or quoted depth of the object.				
	Nominal Length	Number	Inch	mm		Nominal or quoted length of the object.				
	Nominal Width	Number	Inch	mm		Nominal or quoted width of the object.				
	Spillover Level	Number	Inch	mm		The level at which water spills out of the object.				
Culvert						Covered channel or large pipe that forms a watercourse below ground level, usually under a road or railway.	IfcPipeSegment			
	Culvert Type	Text				The property enumeration defines the types of culvert that may be specified within the property set.				
	Clear Depth	Number	Inch	mm		The clear depth of the culvert.				
	Internal Width	Number	Inch	mm		The internal width of the culvert.				
Drinking Fountain						A sanitary terminal that provides a low pressure jet of water for a specific purpose.	IfcSanitaryTerminal			
	Fountain Type	Text			Drinking Water, Eyewash, User Defined	Selection of the type of fountain				
	Color	Text			White, Almond, Stainless, User Defined	Color selection for this object.				
	Drain Size	Number	Inch	mm		The size of the drain outlet connection from the object.				
	Mounting	Text			BackToWall, Pedestal, Countertop, WallHung, User Defined	Selection of the form of mounting of the fountain				
	Nominal Depth	Number	Inch	mm		Nominal or quoted depth of the object.				
	Nominal Length	Number	Inch	mm		Nominal or quoted length of the object.				
	Nominal Width	Number	Inch	mm		Nominal or quoted width of the object.				
Floor Drain						Pipe fitting, set into the floor, that collects waste water and discharges it to a separate trap.	IfcWasteTerminal			
	Drain Type	Text				Identifies the predefined types of drain from which the type required may be set.				
	Cover Length	Number	Inch	mm		The length measured along the x-axis in the local coordinate system or the radius (in the case of a circular shape in plan) of the cover				
	Cover Width	Number	Inch	mm		The length measured along the y-axis in the local coordinate system of the cover of the waste.				
	Nominal Body Depth	Number	Inch	mm		Nominal or quoted length measured along the z-axis in the local coordinate system of the waste.				
	Nominal Body Length	Number	Inch	mm		Nominal or quoted length measured along the x-axis in the local coordinate system or the radius (in the case of a circular shape in plan) of the waste.				
	Nominal Body Width	Number	Inch	mm		Nominal or quoted length measured along the y-axis in the local coordinate system of the waste.				
	Outlet Connection Size	Number	Inch	mm		Size of the outlet connection from the object.				
Floor Sink						Pipe fitting or assembly of fittings to receive surface water or waste water, fitted with a grating or sealed cover.	IfcWasteTerminal			
	Sink Type	Text				Identifies the predefined types of sink from which the type required may be set.				
	Back Inlet Pattern Type	Text			0,1,2,3 or 4: inlet connections and arrangement may vary. The outlet is either vertical or is placed at the bottom (south side) of the trap (when viewed in plan). Position 1 is to the left (west), position 2 is to the top (north), position 3 is to the right (east) and position 4 is to the bottom (south).	Identifies the pattern of inlet connections to a trap				
	Cover Length	Number	Inch	mm		The length measured along the x-axis in the local coordinate system or the radius (in the case of a circular shape in plan) of the cover of the trap.				
	Cover Width	Number	Inch	mm		The length measured along the y-axis in the local coordinate system of the cover of the trap.				
	Inlet Connection Size	Number	Inch	mm		Size of the inlet connection(s)				
	Nominal Sump Depth	Number	Inch	mm		Nominal or quoted length measured along the z-axis in the local coordinate system of the sump.				
	Nominal Sump Length	Number	Inch	mm		Nominal or quoted length measured along the x-axis in the local coordinate system or the radius (in the case of a circular shape in plan) of the sump.				
	Nominal Sump Width	Number	Inch	mm		Nominal or quoted length measured along the y-axis in the local coordinate system of the sump.				
	Outlet Connection Size	Number	Inch	mm		Size of the outlet connection from the object.				
Floor Trap						Pipe fitting or assembly of fittings to receive surface water or waste water, fitted with a grating or sealed cover and discharging through a trap	IfcWasteTerminal			
	Trap Type	Text				Identifies the predefined types of trap from which the type required may be set.				

Back Inlet Pattern Type	Number			0,1,2,3 or 4: inlet connections and arrangement may vary. The outlet is either vertical or is placed at the bottom (south side) of the trap (when viewed in plan). Position 1 is to the left (west), position 2 is to the top (north), position 3 is to the right (east) and position 4 is to the bottom (south).	Identifies the pattern of inlet connections to a trap				
Cover Length	Number	Inch	mm		The length measured along the x-axis in the local coordinate system or the radius (in the case of a circular shape in plan) of the cover				
Cover Width	Number	Inch	mm		The length measured along the y-axis in the local coordinate system of the cover of the trap.				
Sink Type	Text		mm		Identifies the predefined types of sink from which the type required may be set.				
Has Strainer	Logical		mm	True or False	Indicates whether the trap has a strainer				
Inlet Connection Size	Number	Inch	mm		Size of the inlet connection(s)				
Nominal Body Depth	Number	Inch	mm		Nominal or quoted length measured along the z-axis in the local coordinate system of the chamber of the trap.				
Nominal Body Length	Number	Inch	mm		Nominal or quoted length measured along the x-axis in the local coordinate system or the radius (in the case of a circular shape in plan) of the chamber of the trap.				
Nominal Body Width	Number	Inch	mm		Nominal or quoted length measured along the y-axis in the local coordinate system of the chamber of the trap.				
Outlet Connection Size	Number	Inch	mm		Size of the outlet connection from the object.				
Flow Meter					A flow meter is a device that is used to measure the flow rate in a system.	IfcFlowMeter			
Meter Type	Text			Energy, Gas, Oil, Water, User Defined	Identifies the predefined types of meter from which the type required may be set.				
Purpose	Text			Master, Submaster, Submeter, Other, Unknown	Enumeration defining the purpose of the flow meter occurrence.				
Read Out Type	Text			Dial, Digital, Other, Not Known, Unset	Indication of the form that readout from the meter takes. In the case of a dial read out, this may comprise multiple dials that give a cumulative reading and/or a mechanical odometer.				
Remote Reading	Logical			True or False	Indicates whether the meter has a connection for remote reading through connection of a communication device (set TRUE) or not (set FALSE).				
Energy Meter					**Device that measures, indicates and sometimes records, the energy usage in a system.**				
Maximum Current	Number	Amps			The maximum allowed current that a device is certified to handle.				
Multiple Tariff	Logical			True or False	Indicates whether meter has built-in support for multiple tariffs (variable energy cost rates).				
Nominal Current	Number	Amps			The nominal current that is designed to be measured.				
Gas Meter					**Device that measures, indicates and sometimes records, the volume of gas that passes through it without interrupting the flow.**				
Connection Size	Number	Inch	mm		Defines the size of inlet and outlet pipe connections to the meter.				
Gas Type	Text				Defines the types of gas that may be specified.				
Maximum Flow Rate	Number	Cubic Feet/Minute	Liter per Minute		Maximum rate of flow which the meter is expected to pass.				
Maximum Pressure Loss	Number	PSI			Pressure loss expected across the meter under conditions of maximum flow.				
Oil Meter					**Device that measures, indicates and sometimes records, the volume of oil that passes through it without interrupting the flow.**				
Connection Size	Number	Inch	mm		Defines the size of inlet and outlet pipe connections to the meter.				
Maximum Flow Rate	Number	Gallons/Minute	Liters per Minute		Maximum rate of flow which the meter is expected to pass.				
Water Meter					**Device that measures, indicates and sometimes records, the volume of water that passes through it without interrupting the flow.**				
Backflow Preventer Type	Text			Atmospheric Vacuum breaker, Anti Siphon valve, Double Check Backflow Preventer, Pressure Vacuum breaker Reduced Pressure Backflow Preventer Other Not known Unset	Identifies the type of backflow preventer installed				
Connection Size	Number	Inch	mm		Defines the size of inlet and outlet pipe connections to the meter.				

Maximum Flow Rate	Number	Gallons/Minute	Liters per Minute		Maximum rate of flow which the meter is expected to pass.				
Maximum Pressure Loss	Number	PSI			Pressure loss expected across the meter under conditions of maximum flow.				
Type	Text			Compound, Inferential, Piston, Other, Not Known, Unset	Defines the allowed values for selection of the flow meter operation type.				
Garbage Disposal					Electrically operated device that reduces kitchen or other waste into fragments small enough to be flushed into a drainage system.	IfcWasteTerminal			
Disposal Type	Text				Identifies the predefined types of disposal from which the type required may be set.				
Drain Connection Size	Number	Inch	mm		Size of the drain connection inlet to the waste disposal unit.				
Nominal Depth	Number	Inch	mm		Nominal or quoted depth of the object measured from the inlet drain connection to the base of the unit.				
Outlet Connection Size	Number	Inch	mm		Size of the outlet connection from the waste disposal unit.				
Gutter					Gutter segment type common attributes.	IfcPipeSegment			
Gutter Type	Text				Identifies the predefined types of gutter from which the type required may be set.				
Flow Rating	Number	Gallons/Minute	Liters per Minute		Actual flow capacity for the gutter. Value of 0.00 means this value has not been set.				
Slope	Number	Degrees			Angle of the gutter to allow for drainage.				
Heat Exchanger					A heat exchanger is a device used to provide heat transfer between non-mixing media such as plate and shell and tube heat exchangers.	IfcHeatExchanger			
Exchanger Type	Text				Identifies the predefined types of exchanger from which the type required may be set.				
Arrangement	Text			Counterflow, Crossflow, Parallelflow, Multipass, User Defined	Defines the basic flow arrangements for the heat exchanger				
Plate Exchanger					**Common attributes of plate heat exchanger**				
Number Of Plates	Number	None		1,2,3,...	Number of plates used by the plate heat exchanger.				
Interceptor					An interceptor is a device designed and installed in order to separate and retain deleterious, hazardous or undesirable matter while permitting normal sewage or liquids to discharge into a collection system by gravity.	IfcInterceptor			
Interceptor Type	Text				Identifies the predefined types of interceptor from which the type required may be set.				
Cover Length	Number	Inch	mm		The length measured along the x-axis in the local coordinate system or the radius (in the case of a circular shape in plan) of the cover				
Cover Width	Number	Inch	mm		The length measured along the y-axis in the local coordinate system of the cover				
Inlet Connection Size	Number	Inch	mm		Size of the inlet connection.				
Nominal Body Depth	Number	Inch	mm		Nominal or quoted =length, measured along the z-axis of the local coordinate system of the object, of the body of the object.				
Nominal Body Length	Number	Inch	mm		Nominal or quoted length, measured along the x-axis of the local coordinate system of the object, of the body of the object.				
Nominal Body Width	Number	Inch	mm		Nominal or quoted length, measured along the y-axis of the local coordinate system of the object, of the body of the object.				
Outlet Connection Size	Number	Inch	mm		Size of the outlet connection.				
Ventilating Pipe Size	Number	Inch	mm		Size of the ventilating pipe(s).				
Pump					A pump is a device which imparts mechanical work on fluids or slurries to move them through a channel or pipeline.	IfcPump			
Pump Type	Text				Identifies the predefined types of pump from which the type required may be set.				
Base Type	Text			Frame, Base, None, User Defined	Defines general types of pump bases				
Drive Connection Type	Text			Directdrive, Beltdrive,	The way the pump drive mechanism is connected to the pump				
Impeller Diameter	Number	Inch	mm		Diameter of pump impeller				
Flowrate	Number	Gallons/Minute	Liters per Minute		The actual operational fluid flowrate.				
Mechanical Efficiency	Number	Percent			The pumps operational mechanical efficiency.				
Overall Efficiency	Number	Percent			The pump and motor overall operational efficiency.				
Power	Number	Horsepower			The actual power consumption of the pump.				
Pressure Rise	Number	PSI			The developed pressure.				
Rotation Speed	Number	RPM			Pump rotational speed.				
Connection Size	Number	Inch	mm		The connection size of the to and from the pump.				
Flow Rate Range	Number	Gallons/Minute	Liters per Minute		Allowable range of volume of fluid being pumped against the resistance specified.				
Flow Resistance Range	Number	PSI			Allowable range of frictional resistance against which the fluid is being pumped.				
Net Positive Suction Head	Number	Feet or PSI			Minimum liquid pressure at the pump inlet to prevent cavitation.				
Nominal Rotation Speed	Number	RPM			Pump rotational speed under nominal conditions.				
Temperature Range	Number	Degrees F/C			Allowable operational range of the fluid temperature.				
Roof Drain					Pipe fitting, set into the roof, that collects rainwater for discharge into the rainwater system.	IfcWasteTerminal			
Drain Type	Text				Identifies the predefined types of drain from which the type required may be set.				
Cover Length	Number	Inch	mm		The length measured along the x-axis in the local coordinate system or the radius (in the case of a circular shape in plan) of				
Cover Width	Number	Inch	mm		The length measured along the y-axis in the local coordinate system of the cover of the drain.				
Nominal Body Depth	Number	Inch	mm		Nominal or quoted length measured along the z-axis in the local coordinate system of the drain.				

	Nominal Body Length	Number	Inch	mm		Nominal or quoted length measured along the x-axis in the local coordinate system or the radius (in the case of a circular				
	Nominal Body Width	Number	Inch	mm		Nominal or quoted length measured along the y-axis in the local coordinate system of the drain.				
	Outlet Connection Size	Number	Inch	mm		Size of the outlet connection from the object.				
Shower						Installation or waste water appliance that emits a spray of water to wash the human body.	IfcSanitaryTerminal			
	Shower Type	Text			Drench, Individual, Tunnel, User Defined	Identifies the predefined types of shower from which the type required may be set.				
	Color	Text			White, Almond, User Defined	Color selection for this object.				
	Drain Size	Number	Inch	mm		The size of the drain outlet connection from the object.				
	Has Tray	Logical			True or False	Indicates whether the shower has a separate receptacle that catches the water in a shower and directs it to a waste outlet.				
	Nominal Depth	Number	Inch	mm		Nominal or quoted depth of the object.				
	Nominal Length	Number	Inch	mm		Nominal or quoted length of the object.				
	Nominal Width	Number	Inch	mm		Nominal or quoted width of the object.				
	Shower Head Description	Text				A description of the shower head(s) that emit the spray of water.				
Sink or Lavatory						Waste water appliance for receiving, retaining or disposing of domestic, culinary, laboratory or industrial process liquids.	IfcSanitaryTerminal			
	Sink Type	Text			Belfast, Bucket, Cleaners, Combination_Left, Combination_Right, Combination_Double, Drip, Laboratory, Plaster, Pot, Rinsing, Preparation, Bar, User Defined	Identifies the predefined types of sink from which the type required may be set.				
	Color	Text			White, Almond, User Defined	Color selection for this object.				
	Drain Size	Number	Inch	mm		The size of the drain outlet connection from the object.				
	Mounting	Text			BackToWall, Pedestal, CounterTop, WallHung, User Defined	Selection of the form of mounting of the sink				
	Mounting Offset	Text				For counter top mounted sinks, the vertical offset between the top of the sink and the counter top.				
	Nominal Depth	Number	Inch	mm		Nominal or quoted depth of the object.				
	Nominal Length	Number	Inch	mm		Nominal or quoted length of the object.				
	Nominal Width	Number	Inch	mm		Nominal or quoted width of the object.				
Tank						A tank is a vessel or container in which a fluid or gas is stored for later use	IfcTank			
	Tank Type	Text			Fuel, Oil, Water, Rain Water,	Identifies the predefined types of tank from which the type required may be set.				
	Nominal Capacity	Number	Gallons	Liters		The total nominal or design volumetric capacity of the tank.				
	Access Type	Text			Manhole, User Defined	Defines the types of access (or cover) to a tank that may be specified				
	Effective Capacity	Number	Gallons	Liters		The total effective or actual volumetric capacity of the tank.				
	End Shape Type	Text			Semi-Elliptical, ASMEFlanged Dished,	Defines the types of end shapes that can be used for preformed tanks				
	First Curvature Radius	Number	Inch	mm		FirstCurvatureRadius should be defined as the base or left side radius of curvature value.				
	Has Ladder	Logical			True or False	Indication of whether the tank is provided with a ladder				
	Has Visual Indicator	Logical			True or False	Indication of whether the tank is provided with a visual indicator				
	Nominal Depth	Number	Feet			The nominal depth of the tank. Note: Not required for a horizontal cylindrical tank.				
	Nominal Length Or Diameter	Number	Feet			The nominal length or, in the case of a vertical cylindrical tank, the nominal diameter of the tank.				
	Nominal Width Or Diameter	Number	Feet			The nominal width or, in the case of a horizontal cylindrical tank, the nominal diameter of the tank. Note: Not required for a vertical cylindrical tank.				
	Number Of Sections	Number	None		1,2,3..	Number of sections used in the construction of the tank. Default is 1. Note: All sections assumed to be the same size.				
	Operating Weight	Number	Lbs/Kg			Operating weight of the tank including all of its contents.				
	Pattern Type	Text			Horizontal Cylinder,Vertical Cylinder, Rectangular, Other, Not Known	Defines the types of pattern (or shape of a tank that may be specified.				
	Second Curvature Radius	Number	Inch	mm		SecondCurvatureRadius should be defined as the top or right side radius of curvature value.				
	Tank Composition	Text			Complex, Element, Partial, User Defined	Defines the level of element composition where				
	Expansion Tank					**Common attributes of an expansion type tank.**				
	Charge Pressure	Number	PSI			Nominal or design operating pressure of the tank.				
	Pressure Regulator Setting	Number	PSI			Pressure that is automatically maintained in the tank.				
	Relief Valve Setting	Number	PSI			Pressure at which the relief valve activates.				
	Pressure Vessel					**Common attributes of a pressure vessel.**				
	Charge Pressure	Number	PSI			Nominal or design operating pressure of the tank.				

	Pressure Regulator Setting	Number	PSI			Pressure that is automatically maintained in the tank.					
	Relief Valve Setting	Number	PSI			Pressure at which the relief valve activates.					
Sectional Tank						Fixed vessel constructed from sectional parts with one or more compartments for storing a liquid.					
	Number Of Sections	Number	None		1,2,3..	Number of sections used in the construction of the tank					
	Section Length	Number	Inch	mm		The length of a section used in the construction of the tank.					
	Section Width	Number	Inch	mm		The width of a section used in the construction of the tank.					
Toilet Bowl						Soil appliance for the disposal of excrement.	IfcSanitaryTerminal				
	Toilet Type	Text			BedPanWasher, Chemical, CloseCoupled, LooseCoupled, SlopHopper, User Defined	Identifies the predefined types of toilet from which the type required may be set.					
	Color	Text			White, Almond, User Defined	Color selection for this object					
	Nominal Depth	Number	Inch	mm		Nominal or quoted depth of the object.					
	Nominal Length	Number	Inch	mm		Nominal or quoted length of the object.					
	Nominal Width	Number	Inch	mm		Nominal or quoted width of the object.					
	Pan Mounting	Text			BackToWall, Pedestal, WallHung, User Defined	The property defines the forms of mounting or fixing of the sanitary terminal					
	Spillover Level	Number	Inch	mm		The level at which water spills out of the terminal.					
	Toilet Pan Type	Text			Siphonic, Squat, WashDown, WashOut, User Defined	The property defines the types of toilet pan					
Toilet Tank						A water storage unit attached to a sanitary terminal that is fitted with a device, operated automatically or by the user, that discharges water to cleanse a water closet (toilet) pan, urinal or slop hopper.	IfcSanitaryTerminal				
	Tank Capacity	Number	Gallons	Liters		Volumetric capacity of the tank					
	Tank Color	Text			White, Almond, User Defined	Color of the object.					
	Tank Height	Number	Inch	mm	Number Value or None	Enumeration that identifies the height of the tank or no tank					
	Flush Rate	Number	Gallons/Minute	Liters per Minute		The minimum and maximum volume of water used at each flush.					
	Flush Type	Text			Lever, Pull, Push, Sensor, User Defined	The types of flushing mechanism that may be specified for tanks and sanitary terminals					
	Is Automatic Flush	Logical			True or False	Value that determines if the tank is flushed automatically either after each use or periodically					
	Is Single Flush	Logical			True or False	Indicates whether the tank is single flush					
Urinal						Soil appliance that receives urine and directs it to a waste outlet.	IfcSanitaryTerminal				
	Urinal Type	Text			Bowl, Slab, Stall, Trough, Wall Mounted, User Defined	Identifies the predefined types of urinal from which the type required may be set.					
	Color	Text			White, Almond, User Defined	Color of the urinal.					
	Mounting	Text			BackToWall, Pedestal, WallHung, User Defined	Selection of the form of mounting					
	Nominal Depth	Number	Inch	mm		Nominal or quoted depth of the object.					
	Nominal Length	Number	Inch	mm		Nominal or quoted length of the object.					
	Nominal Width	Number	Inch	mm		Nominal or quoted width of the object.					
	Spillover Level	Number	Inch	mm		The level at which water spills out of the object.					
Valve						A valve is used in a building services piping distribution system to control or modulate the flow of the fluid.	IfcValve				
	Valve Type	Text				Identifies the predefined types of valve from which the type required may be set.					
	Valve Pattern	Text			Singleport, Angled_2 Port, Straight_2_Port, Straight_3 _Port, Crossover_4_Port	The configuration of the ports of a valve according to either the linear route taken by a fluid flowing through the valve or by the number of ports					
	Body Material	Text				Material from which the body of the valve is constructed.					
	Close Off Rating	Number	PSI			Close off rating.					
	Flow Coefficient	Number	Kv or Cv			Flow coefficient					
	Measured Flow Rate	Number	GPM			The rate of flow of a fluid measured across the valve.					
	Measured Pressure Drop	Number	PSI			The actual pressure drop in the fluid measured across the valve.					
	Percentage Open	Number	%			The ratio between the amount that the valve is open to the full open position of the valve.					
	Size	Number	Inch	mm		The size of the connection to the valve (or to each connection for faucets, mixing valves, etc.).					
	Test Pressure	Number	PSI			The maximum pressure to which the valve has been subjected under test.					
	Valve Mechanism	Text			Ball, Butterfly, Gate, Globe,	The mechanism by which the valve function is achieved					
	Valve Operation	Text			Dropweight, Float, Hydraulic,	The method of valve operation					
	Working Pressure	Number	PSI			The normally expected maximum working pressure of the valve.					
	Air Vent					Valve used to release air from a pipe or fitting.					
	Is Automatic	Logical			True or False	Indication of whether the valve is automatically operated					

Faucet						A small diameter valve, with a free outlet, from which water is drawn.					
	Faucet Function	Text				Defines the operating temperature of a faucet that may be specified.					
	Faucet Operation	Text			CeramicDisc, LeverHandle, NonConcussiveSelfClosing,	Defines the range of ways in which a faucet can be operated that may be specified					
	Faucet Top Description	Text				Description of the operating mechanism/top of the faucet.					
	Faucet Type	Text			Bib, Globe, Diverter, Divided Flow Combination, Pillar,	Defines the range of faucet types that may be specified					
	Finish	Text			Chrome, Bronze, User Defined	Description of the finish applied to the faucet.					
Flush Valve						Valve that flushes a predetermined quantity of water to cleanse a WC, urinal or slop hopper. Note that a flushing valve is constrained to have a 2 port pattern.					
	Flushing Rate	Number	Gallons/Minute	Liters per Minute		The predetermined quantity of water to be flushed.					
	Has Integral Shut Off Device	Logical			True or False	Indication of whether the flushing valve has an integral shut off device fitted					
	Is High Pressure	Logical			True or False	Indication of whether the flushing valve is suitable for use on a high pressure water main					
Gas Tap Valve						A small diameter valve, used to discharge gas from a system.					
	Has Hose Union	Logical			True or False	Indicates whether the gas tap is fitted with a hose union connection					
Hose Bib						A small diameter valve, used to drain water from a tank or water filled system.					
	Has Hose Union	Logical			True or False	Indicates whether the drawoff cock is fitted with a hose union connection					
Isolation Valve						Valve that is used to isolate system components.					
	Is Normally Open	Logical			True or False	If TRUE, the valve is normally open. If FALSE is normally closed.					
	Isolating Purpose	Text				Defines the purpose for which the isolating valve is used since the way in which the valve is identified as an isolating valve may be in the context of its use.					
Mixing Valve						A valve where typically the temperature of the outlet is determined by mixing hot and cold water inlet flows.					
	Mixer Control	Text				Defines the form of control of the mixing valve.					
	Outlet Connection Size	Number	Inch	mm		The size of the pipework connection from the mixing valve.					
Pressure Reducing Valve		Text				Valve that reduces the pressure of a fluid immediately downstream of its position in a pipeline to a preselected value or by					
	Downstream Pressure	Number	psi			The operating pressure of the fluid downstream of the pressure reducing valve.					
	Upstream Pressure	Number	psi			The operating pressure of the fluid upstream of the pressure reducing valve.					
Pressure Relief Valve		Text				Spring or weight loaded valve that automatically discharges to a safe place fluid that has built up to excessive pressure in pipes or fittings.					
	Relief Pressure	Number	psi			The pressure at which the spring or weight in the valve is set to discharge fluid.					
Vibration Isolator						A vibration isolator is a device used to minimize the effects of vibration transmissibility in a building	IfcVibrationIsolator				
Height		Number	Inch	mm		Height of the vibration isolator before the application of load.					
Isolator Compressibility		Text				The compressibility of the vibration isolator.					
Isolator Static Deflection		Number	Inch	mm		Static deflection of the vibration isolator.					
Maximum Supported Weight		Number	Lbs/Kgs			The maximum weight that can be carried by the vibration isolator.					
Vibration Transmissibility		Number	%			The vibration transmissibility percentage.					
Wash Basin or Lavatory						Waste water appliance for washing the upper parts of the body.	IfcSanitaryTerminal				
Wash Hand Basin Type		Text			DentalCuspidor, HandRinse, Hospital, Tipup, Vanity, Washfountain, WashingTrough, User Defined	Identifies the predefined types of wash basin or lavatory from which the type required may be set.					
Color		Text			White, Almond, User Defined	Color of the object.					
Drain Size		Number	Inch	mm		The size of the drain outlet connection from the object.					
Mounting		Text			BackToWall, Pedestal, CounterTop, WallHung, User Defined	Selection of the form of mounting					
Mounting Offset		Number	Inch	mm		For counter top mounted basins the vertical offset between the top of the sink and the counter top.					
Nominal Depth		Number	Inch	mm		Nominal or quoted depth of the object.					
Nominal Length		Number	Inch	mm		Nominal or quoted length of the object.					
Nominal Width		Number	Inch	mm		Nominal or quoted width of the object.					
Waste Floor Trap						Pipe fitting, set into the floor, that retains liquid to prevent the passage of foul air.	IfcWasteTerminal				
Trap Type		Text				Identifies the predefined types of waste trap used in combination with the floor trap from which the type required may be set.					
Cover Length		Number	Inch	mm		The length measured along the x-axis in the local coordinate system or the radius (in the case of a circular shape in plan) of the cover					
Cover Width		Number	Inch	mm		The length measured along the y-axis in the local coordinate system of the cover of the trap.					
Cover Material		Text			SS, Aluminum, User Defined	Material from which the cover or grating is constructed.					
Has Strainer		Logical			True or False	Indicates whether the trap has a strainer					
Inlet Connection Size		Number	Inch	mm		Size of the inlet connection(s)					
Inlet Pattern Type		Text			0,1,2,3 or 4: inlet connections and arrangement may vary.	Identifies the pattern of inlet connections to a trap					

		Is For Grey Water	Logical			True or False	Indicates if the purpose of the floor trap is to receive grey water				
		Nominal Body Depth	Number	Inch	mm		Nominal or quoted length measured along the z-axis in the local coordinate system of the chamber of the trap.				
		Nominal Body Length	Number	Inch	mm		Nominal or quoted length measured along the x-axis in the local coordinate system or the radius (in the case of a circular shape in plan) of the chamber of the trap.				
		Nominal Body Width	Number	Inch	mm		Nominal or quoted length measured along the y-axis in the local coordinate system of the chamber of the trap.				
		Outlet Connection Size	Number	Inch	mm		Size of the outlet connection from the object.				
		Spillover Level	Number	Inch	mm		The level at which water spills out of the terminal.				
	Waste Trap						Pipe fitting, set adjacent to a sanitary terminal, that retains liquid to prevent the passage of sewer gases	IfcWasteTerminal			
		Waste Trap Type	Text				Identifies the predefined types of waste trap from which the type required may be set.				
		Inlet Connection Size	Number	Inch	mm		Size of the inlet connection(s)				
		Outlet Connection Size	Number	Inch	mm		Size of the outlet connection from the object.				
	Water Filter						A filter is an apparatus used to remove particulate or gaseous matter from fluids and gases	IfcFilter			
		Water Filter Type	Text			Filtration, Purification, Softening, User Defined	Identifies the predefined types of water filter from which the type required may be set.				

t-Specific Milestones							
LEED Cert.	LEED Cert						
Check	Submittal						

BIMForum LOD Specification 2020 Part II

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Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	IFC Name	COBie Tag	Part 3 - Example Proje: Estimating Est. 1	Estimating Bid Pkg.
Part 1 - Attribute Description									
Global Attributes									
Component ID	Text				Project assigned number for components (e.g. tag number)				
Condition Status	Text			New, Existing, Demolish, Temporary, User Defined	Status of the element, predominately used in renovation or retrofitting projects				
Room Number	Text				Room number where component **to be**/is installed				
Room Name	Text				Room name where component **to be**/is installed				
Story Number	Text				Floor or level room is located				
Manufacturer Name	Text				The organization that manufactured and/or assembled the item.				
Product Name	Text				The descriptive model name of the product model (or product line) as assigned by the manufacturer of the manufactured				
Model Designation	Text				The model number or designator of the product model (or product line) as assigned by the manufacturer of the				
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Component characteristics					**Defines properties of individual instances of manufactured products that may be given by the manufacturer.**				
Acquisition Date	Date Time	Date			The date that the manufactured item was purchased.				
Assembly Place	Text			Onsite, factory, other offsite	Enumeration defining where the assembly is intended to take place, either in a factory, other offsite location or on the				
Bar Code	Text				The identity of the bar code given to an occurrence of the product.				
Batch Reference	Text				The identity of the batch reference from which an occurrence of a product is taken.				
Production Year	Number	Year			The year of production of the manufactured item.				
Serial Number	Text				The serial number assigned to an occurrence of a product.				
Design Performance									
Service Life					**Captures the period of time that an artifact will last.**				
Mean Time Between Failure	Number	Days			The average time duration between instances of failure of a product.				
Service Life Duration	Number	Year(s)			The length or duration of a service life.				
Service Life Factors	Text				**Captures various factors that impact the expected service life of elements within the system or zone.**				
Design Level	Text				Adjustment of the service life resulting from the effect of design level employed.				
Indoor Environment	Text				Adjustment of the service life resulting from the effect of the indoor environment (where appropriate).				
In Use Conditions	Text				Adjustment of the service life resulting from the effect of the conditions in which components are operating.				
Maintenance Level	Text				Adjustment of the service life resulting from the effect of the level or degree of maintenance applied to components.				
Outdoor Environment	Text				Adjustment of the service life resulting from the effect of the outdoor environment (where appropriate)				
Quality Of Components	Text				Adjustment of the service life resulting from the effect of the quality of components used.				
Work Execution Level	Text				Adjustment of the service life resulting from the effect of the quality of work executed.				
Warranty					**An assurance given by the seller or provider of an artefact that the artefact is without defects and will operate as**				
Exclusions	Text				Items, conditions or actions that may be excluded from the warranty or that may cause the warranty to become void.				
Is Extended Warranty	Logical			True or False	Indication of whether this is an extended warranty whose duration is greater than that normally assigned to an artefact				
Point Of Contact	Text				The organization that should be contacted for action under the terms of the warranty.				
Warranty Content	Text				The content of the warranty.				
Warranty End Date	Date Time	Date			The date on which the warranty expires.				
Warranty Identifier	Text				The identifier assigned to a warranty.				
Warranty Period	Number	Year(s)			The time duration during which a manufacturer or supplier guarantees or warrants the performance of an artefact.				
Warranty Start Date	Date Time	Date			The date on which the warranty commences.				
Item-Specific Attributes									
Air Conditioning Unit					**A unitary packaged air-conditioning unit typically used in residential or light commercial applications.**	**IfcUnitaryEquipment**			
AC Unit Type	Text				The property enumeration defines the types of air conditioning unit that may be specified within the property set.				
Air Handler Construction	Text			Manufactured item, constructed on site,	Enumeration defining how the air handler might be fabricated.				
Air Handler Fan Coil Arrangement	Text			Blow Through, Draw Through, unknown	Enumeration defining the arrangement of the supply air fan and the cooling coil.				
Condenser Entering Temperature	Number	Degrees F	Degrees C		Temperature of fluid entering condenser.				
Condenser Flowrate	Number	Gallons/Min	Liters/Min		Flow rate of fluid through the condenser.				
Condenser Leaving Temperature	Number	Degrees F	Degrees C		Temperature of fluid leaving condenser.				
Cooling Efficiency	Number	None			Coefficient of Performance: Ratio of cooling energy output to energy input under full load operating conditions.				
Dual Deck	Logical			True or False	Does the Air Handler have a dual deck? TRUE = Yes, FALSE = No.				
Heating Capacity	Number	BTU/Hr			Heating capacity.				
Heating Efficiency	Number	None			Heating efficiency under full load heating conditions.				

	Latent Cooling Capacity	Number	Tonnage			Latent cooling capacity.					
	Outside Air Flowrate	Number	Cubic Feet/Minute	Liter/Minute		Flow rate of outside air entering the unit.					
	Sensible Cooling Capacity	Number	BTU/Hr			Sensible cooling capacity.					
Air Terminal Box						**an air terminal box typically participates in an HVAC duct distribution system and is used to control or modulate the amount of air delivered to its downstream ductwork**	**IfcAirTerminalBox**				
	Terminal Type	Text			VAV, CAV, User Defined	The property enumeration defines the types of air terminal box that may be specified within the property set.					
	Arrangement Type	Text			Single Duct, Dual Duct	Terminal box arrangement. Single Duct: Terminal box receives warm or cold air from a single air supply duct. Dual Duct: Terminal box receives warm and cold air from separate air supply ducts.					
	Airflow Rate Range	Number	Cubic Feet/Minute	Liter/Minute		Range of airflow that can be delivered.					
	Air Pressure Range	Number	Cubic Feet/Minute	Liter/Minute		Allowable air static pressure range at the entrance of the air terminal box.					
	Has Fan	Text			True or False	Terminal box has a fan inside (fan powered box).					
	Has Return Air	Logical			True or False	Terminal box has return air mixed with supply air from duct work.					
	Has Sound Attenuator	Logical			True or False	Terminal box has a sound attenuator.					
	Housing Thickness	Logical	Inch	mm		Air terminal box housing material thickness.					
	Nominal Air Flow Rate	Number	Cubic Feet/Minute	Liter/Minute		Nominal airflow rate.					
	Nominal Damper Diameter	Number	Inch	mm		Nominal damper diameter.					
	Nominal Inlet Air Pressure	Number	PSI	Pa		Nominal airflow inlet static pressure.					
	Operation Temperature Range	Number	Degrees F	Degrees C		Allowable operational range of the ambient air temperature.					
	Reheat Type	Text				Terminal box reheat type.					
	Return Air Fraction Range	Number	None			Allowable return air fraction range as a fraction of discharge airflow.					
	Airflow Curve	Number	Cubic Feet/Minute	Liter/Minute		Air flowrate versus damper position relationship; airflow = f (valve position).					
	Atmospheric Pressure	Number	PSI	Pa		Ambient atmospheric pressure.					
	Damper Position	Number	None		1,2,3…	Control damper position, ranging from 0 to 1.					
	Sound Rating	Number	dB			Sound performance.					
Air Terminal						**An air terminal is a terminating or origination point for the transfer of air between distribution system(s) and one or more spaces. It can also be used for the transfer of air between adjacent spaces.**	**IfcAirTerminal**				
	Air Terminal Type	Text				The property enumeration defines the types of air terminal that may be specified within the property set.					
	Air Diffusion Performance Index	Number	None			The Air Diffusion Performance Index (ADPI) is used for cooling mode conditions. If several measurements of air velocity and air temperature are made throughout the occupied zone of a space, the ADPI is the percentage of locations where measurements were taken that meet the specifications for effective draft temperature and air velocity.					
	Airflow Rate Range	Number	Cubic Feet/Minute	Liter/Minute		Air flowrate range within which the air terminal is designed to operate.					
	Air Flowrate Versus Flow Control Element	Number	Cubic Feet/Minute	Liter/Minute		Air flowrate versus flow control element position at nominal pressure drop.					
	Core Set Horizontal	Number	Degrees F	Degrees C		Degree of horizontal (in the X-axis of the Local Placement) blade set from the centerline.					
	Core Set Vertical	Number	Degrees F	Degrees C		Degree of vertical (in the Y-axis of the Local Placement) blade set from the centerline.					
	Core Type	Text				Identifies the way the core of the Air Terminal is constructed.					
	Discharge Direction	Text			Parallel, Perpendicular, Adjustable	Discharge direction of the air terminal. Parallel: discharges parallel to mounting surface designed so that flow attaches to the surface. Perpendicular: discharges away from mounting surface. Adjustable: both parallel and perpendicular discharge.					
	Effective Area	Number	Square Ft	Square Cm		Effective discharge area of the air terminal.					
	Face Type	Text				Identifies how the terminal face of an Air Terminal is constructed.					
	Finish Color	Text				The finish color for the air terminal.					
	Finish Type	Text				The type of finish for the air terminal.					
	Flow Control Type	Text				Type of flow control element that may be included as a part of the construction of the air terminal.					
	Flow Pattern	Text				Flow pattern.					
	Has Integral Control	Logical			True or False	If TRUE, a self powered temperature control is included in the Air Terminal.					
	Has Sound Attenuator	Logical			True or False	If TRUE, the air terminal has sound attenuation.					
	Has Thermal Insulation	Logical			True or False	If TRUE, the air terminal has thermal insulation.					
	Mounting Type	Text			Surface, Flat flush, Lay-in	The way the air terminal is mounted to the ceiling, wall, etc.					
	Neck Area	Number	Square Inch	Square mm		Neck area of the air terminal.					
	Number Of Slots	Number	None		1,2,3…	Number of slots.					
	Shape	Text				Shape of the air terminal. Slot is typically a long narrow supply device with an aspect ratio generally greater than 10 to 1.					
	Slot Length	Number	Inch	mm		Slot length.					
	Slot Width	Number	Inch	mm		Slot width.					
	Temperature Range	Number	Degrees F	Degrees C		Temperature range within which the air terminal is designed to operate.					

	Throw Length	Number	Inch	mm		The horizontal or vertical axial distance an airstream travels after leaving an Air Terminal before the maximum stream velocity is reduced to a specified terminal velocity under isothermal conditions at the upper value of the Air Flow rate Range.				
	Air Flow Rate	Number	Cubic Feet/Minute	Liter/Minute		Volumetric flow rate.				
	Centerline Air Velocity	Number	Feet/Minute	Cm/Minute		Centerline air velocity versus distance from the diffuser and temperature differential				
	Induction Ratio	Number	None			Induction ratio versus distance from the diffuser and its discharge direction; induction ratio (or entrainment ratio) is the				
	Neck Air Velocity	Number	Feet/Minute	Cm/Minute		Air velocity at the neck.				
	Pressure Drop	Number	Inches of Water	mm of Water		Drop in total pressure between inlet and outlet at nominal air-flow rate.				
	Supply Air Temperature Cooling	Number	Degrees F	Degrees C		Supply air temperature in cooling mode.				
	Supply Air Temperature Heating	Number	Degrees F	Degrees C		Supply air temperature in heating mode.				
	Air Flow Rate	Number	Cubic Feet/Minute	Liter/Minute		The actual airflow rate as designed.				
	Airflow Type	Text				Enumeration defining the functional type of air flow through the terminal.				
	Location	Text				Location (a single type of diffuser can be used for multiple locations); high means close to ceiling.				
Air to Air Heat Exchanger						**An air-to-air heat recovery device employs a counter-flow heat exchanger between inbound and outbound air flow.**	**IfcHeatExchanger**			
	Heat Exchanger Type	Text				The property enumeration defines the types of heat exchanger that may be specified within the property set.				
	Has Defrost	Logical			True or False	The heat exchanger has defrost function or not.				
	Heat Transfer Type	Text				Type of heat transfer between the two air streams.				
	Operational Temperature Range	Number	Degrees F	Degrees C		Allowable operation ambient air temperature range.				
	Primary Airflow Rate Range	Number	Cubic Feet/Minute	Liter/Minute		possible range of primary airflow that can be delivered..				
	Secondary Airflow Rate Range	Number	Cubic Feet/Minute	Liter/Minute		possible range of secondary airflow that can be delivered.				
	Air Pressure Drop Curves	Number	PSI	Pa		Air pressure drop as function of air flow rate.				
	Defrost Temperature Effectiveness	Number	Degrees F	Degrees C		Temperature heat transfer effectiveness when defrosting is active.				
	Humidity Effectiveness	Number	None			Humidity heat transfer effectiveness: The ratio of primary airflow absolute humidity changes to maximum possible absolute humidity changes.				
	Latent Heat Transfer Rate	Number	BTU/Ft2-°F			Latent heat transfer rate.				
	Sensible Effectiveness	Number	None			Sensible heat transfer effectiveness, where effectiveness is defined as the ratio of heat transfer to maximum possible heat transfer.				
	Sensible Effectiveness Table	Number	None			Sensible heat transfer effectiveness curve as a function of the primary and secondary air flow rate.				
	Sensible Heat Transfer Rate	Number	BTU/Ft2-°F			Sensible heat transfer rate.				
	Temperature Effectiveness	Number	None			Temperature heat transfer effectiveness: The ratio of primary airflow temperature changes to maximum possible temperature changes.				
	Total Effectiveness	Number	None			Total heat transfer effectiveness: The ratio of heat transfer to the maximum possible heat transfer.				
	Total Effectiveness Table	Number	None			Total heat transfer effectiveness curve as a function of the primary and secondary air flow rate.				
	Total Heat Transfer Rate	Number	BTU/Ft2-°F			Total heat transfer rate.				
Boiler						**A boiler is a closed, pressure-rated vessel in which water or other fluid is heated using an energy source such as natural gas, heating oil, or electricity. The fluid in the vessel is then circulated out of the boiler for use in various processes or heating applications.**	**IfcBoiler**			
	Boiler Type	Text				The property enumeration defines the types of boiler that may be specified within the property set.				
	Energy Source	Text				Enumeration defining the energy source or fuel combusted to generate heat.				
	Heat Transfer Surface Area	Number	Square Ft	Square Cm		Total heat transfer area of the vessel.				
	Is Water Storage Heater	Logical			True or False	This is used to identify if the boiler has storage capacity (TRUE). If FALSE, then there is no storage capacity built into the boiler, such as an instantaneous hot water heater.				
	Nominal Energy Consumption	Number	BTU			Nominal fuel consumption rate required to produce the total boiler heat output.				
	Nominal Part Load Ratio	Number	None			Allowable part load ratio range.				
	Operating Mode	Text				Identifies the operating mode of the boiler.				
	Outlet Temperature Range	Number	Degrees F	Degrees C		Allowable outlet temperature of either the water or the steam.				
	Partial Load Efficiency Curves	Number	Percent			Boiler efficiency as a function of the partial load factor; E = f (partial Load factor).				
	Pressure Rating	Number	PSI	Pa		Nominal pressure rating of the boiler as rated by the agency having jurisdiction.				
	Water Inlet Temperature Range	Number	Degrees F	Degrees C		Allowable water inlet temperature range.				
	Water Storage Capacity	Number	Gallons/Liters			Water storage capacity.				
	Auxiliary Energy Consumption	Text				Boiler secondary energy source consumption pumps).				
	Combustion Efficiency	Number	Percent			Combustion efficiency under nominal condition.				
	Combustion Temperature	Number	Degrees F	Degrees C		Average combustion chamber temperature.				
	Energy Source Consumption	Number	BTU/Hr			Energy consumption.				
	Load Real	Number	BTU			Boiler real load.				
	Operational Efficiency	Number	Percent			Operational efficiency: boiler output divided by total energy input (electrical and fuel).				
	Part Load Ratio	Number	None			Ratio of the real to the nominal capacity.				
	Primary Energy Consumption	Number	BTU/Hr			Boiler primary energy source consumption (i.e., the fuel consumed for changing the thermodynamic state of the fluid).				
	Working Pressure	Number	PSI	Pa		Boiler working pressure.				
	Steam Boiler	Text				Steam boiler type Specific Baseline Attributes.				

		Heat Output	Number	BTU/Hr			Total nominal heat output as listed by the Boiler manufacturer. For steam boilers, it is a function of inlet temperature versus steam pressure.				
		Maximum Outlet Pressure	Number	PSI	Pa		Maximum steam outlet pressure.				
		Nominal Efficiency	Number	Percent			The nominal efficiency of the boiler as defined by the manufacturer. For steam boilers, a function of inlet temperature versus steam pressure.				
	Water Boiler		Text				Water boiler type Specific Baseline Attributes.				
		Heat Output	Number	BTU/Hr			Total nominal heat output as listed by the Boiler manufacturer. For water boilers, it is a function of inlet versus outlet temperature. For steam boilers, it is a function of inlet temperature versus steam pressure				
		Nominal Efficiency	Number	Percent			The nominal efficiency of the boiler as defined by the manufacturer. For water boilers, a function of inlet versus outlet temperature.				
Chiller							**A chiller is a device used to remove heat from a liquid via a vapor-compression or absorption refrigeration cycle to cool a fluid, typically water or a mixture of water and glycol. The chilled fluid is then used to cool and dehumidify air in a building.**	**IfcChiller**			
	Chiller Type		Text				The property enumeration defines the types of chiller that may be specified within the property set.				
	Capacity Curve		Number	None			Chiller cooling capacity is a function of condensing temperature and evaporating temperature.				
	Coefficient Of Performance Curve		Number	None			Chiller coefficient of performance (COP) is function of condensing temperature and evaporating temperature.				
	Full Load Ratio Curve		Number	None			Ratio of actual power to full load power as a quadratic function of part load				
	Nominal Capacity		Number	Ton			Nominal cooling capacity of chiller at standardized conditions as defined by the agency having jurisdiction.				
	Nominal Condensing Temperature		Number	Degrees F	Degrees C		Chiller condensing temperature.				
	Nominal Efficiency		Number	Percent			Nominal chiller efficiency under nominal conditions.				
	Nominal Evaporating Temperature		Number	Degrees F	Degrees C		Chiller evaporating temperature.				
	Nominal Heat Rejection Rate		Number	BTU/Hr			Sum of the refrigeration effect and the heat equivalent of the power input to the compressor.				
	Nominal Power Consumption		Number	Horsepower			Nominal total power consumption.				
	Capacity		Number	Ton			The product of the ideal capacity and the overall volumetric efficiency of the compressor.				
	Coefficient Of Performance		Number	None			The Coefficient of performance (COP) is the ratio of heat removed to energy input.				
	Energy Efficiency Ratio		Number	BTU/Hr/Watt			The Energy efficiency ratio (EER) is the ratio of net cooling capacity to the total input rate of electric power applied				
Coil							**A coil is a device used to provide heat transfer between non-mixing media.**	**IfcCoil**			
	Coil Type		Text				The property enumeration defines the types of coil that may be specified within the property set.				
	Airflow Rate Range		Number	Cubic Feet/Minute	Liter/Minute	For cases where there is no airflow across the coil (e.g.	Possible range of airflow that can be delivered.				
	Nominal Latent Capacity		Number	BTU			Nominal latent capacity.				
	Nominal Sensible Capacity		Number	BTU			Nominal sensible capacity.				
	Nominal U A		Number	None			Nominal UA value.				
	Operational Temperature Range		Number	Degrees F	Degrees C		Allowable operational air temperature range.				
	Placement Type		Text			Floor, Ceiling, Unit	Indicates the placement of the coil				
	Air Pressure Drop Curve		Number	PSI	Pa		Air pressure drop curve, pressure drop – flow rate curve				
	Atmospheric Pressure		Number	PSI	Pa		Ambient atmospheric pressure.				
	Face Velocity		Number	Feet/Minute			Air velocity through the coil.				
	Sound Curve		Number	Decibel			Regenerated sound versus air-flow rate.				
	Sound Attenuation		Logical			True or False	TRUE if the coil has sound attenuation, FALSE if it does not.				
	Water Coil		Text				Hydronic coil type attributes.				
	Bypass Factor		Number	None		between 0-1	Fraction of air that is bypassed by the coil .				
	Coil Connection Direction		Text				Coil connection direction (facing into the air stream).				
	Coil Coolant		Text				The fluid used for heating or cooling used by the hydronic coil.				
	Coil Face Area		Number	Inch	mm		Coil face area in the direction against air the flow.				
	Coil Fluid Arrangement		Text			Cross Counter Flow, Crossflow, Cross Parallel Flow	Fluid flow arrangement of the coil				
	Fluid		Text				The properties of the hydronic fluid used for heat transfer within the coil tubes.				
	Fluid Pressure Range		Number	PSI	Pa		Allowable water working pressure range inside the tube.				
	Heat Exchange Surface Area		Number	Square Ft	Square Cm		Heat exchange surface area associated with U-value.				
	Primary Surface Area		Number	Square Ft	Square Cm		Primary heat transfer surface area of the tubes and headers.				
	Secondary Surface Area		Number	Square Ft	Square Cm		Secondary heat transfer surface area created by fins.				
	Sensible Heat Ratio		Number	None			Air-side sensible heat ratio, or fraction of sensible heat transfer to the total heat transfer.				
	Total U A Curves		Number	None			Total UA curves, UA - air and water velocities				
	Water Pressure Drop Curve		Number	PSI	Pa		Water pressure drop curve, pressure drop – flow rate curve				
	Wet Coil Fraction		Number	None		between 0-1	Fraction of coil surface area that is wet (0-1).				
Compressor							**A compressor is a device that compresses a fluid typically used in a refrigeration circuit.**	**IfcCompressor**			
	Compressor Type		Text				The property enumeration defines the types of compressor that may be specified within the property set.				
	Compressor Speed		Number	RPM			Compressor speed.				
	Has Hot Gas Bypass		Logical			True or False	Whether or not hot gas bypass is provided for the compressor				
	Ideal Capacity		Number	Tonnage			Compressor capacity under ideal conditions.				
	Ideal Shaft Power		Number	Horsepower			Compressor shaft power under ideal conditions.				
	Impeller Diameter		Number	Inch	mm		Diameter of compressor impeller - used to scale performance of geometrically similar compressors.				

	Maximum Part Load Ratio	Number	None			Maximum part load ratio as a fraction of nominal capacity.					
	Minimum Part Load Ratio	Number	None			Minimum part load ratio as a fraction of nominal capacity.					
	Nominal Capacity	Number	Tonnage			Compressor nameplate capacity.					
	Power Source	Text				Type of power driving the compressor.					
	Refrigerant Class	Text			CFC, HCFC, HFC	Refrigerant class used by the compressor.					
	Refrigerant Type	Text				Refrigerant material.					
	Coefficient Of Performance	Number	None			Coefficient of performance (COP).					
	Compression Efficiency	Number	Percent			Ratio of the work required for isentropic compression of the gas to the work delivered to the gas within the compression volume					
	Compressor Capacity	Number	Tonnage			The product of the ideal capacity and the overall volumetric efficiency of the compressor.					
	Compressor Total Efficiency	Number	Percent			Ratio of the thermal cooling capacity to electrical input.					
	Compressor Total Heat Gain	Number	BTU/Hr			Compressor total heat gain.					
	Energy Efficiency Ratio	Number	None			Energy efficiency ratio (EER).					
	Friction Heat Gain	Number	BTU/Hr			Friction heat gain.					
	Full Load Ratio	Number	None			Ratio of actual power to full load power as a quadratic function of part load, at certain condensing and evaporating temperature					
	Input Power	Number	HP			Input power to the compressor motor.					
	Isentropic Efficiency	Number	Percent			Ratio of the work required for isentropic compression of the gas to work input to the compressor shaft.					
	Lubricant Pump Heat Gain	Number	BTU/Hr			Lubricant pump heat gain.					
	Mechanical Efficiency	Number	Percent			Ratio of the work (as measured) delivered to the gas to the work input to the compressor shaft.					
	Shaft Power	Number	HP			The actual shaft power input to the compressor.					
	Volumetric Efficiency	Number	Percent			Ratio of the actual volume of gas entering the compressor to the theoretical displacement of the compressor.					
Condenser						**A condenser is a device that is used to dissipate heat, typically by condensing a substance such as a refrigerant from its gaseous to its liquid state.**	**IfcCondenser**				
	Condenser Type	Text				The property enumeration defines the types of condenser that may be specified within the property set.					
	External Surface Area	Number	Square Ft	Square Cm		External surface area (both primary and secondary area).					
	Internal Refrigerant Volume	Number	Square Ft	Square Cm		Internal volume of condenser (refrigerant side).					
	Internal Surface Area	Number	Square Ft	Square Cm		Internal surface area.					
	Internal Water Volume	Number	Gallons/Liters			Internal volume of condenser (water side).					
	Nominal Heat Transfer Area	Number	Square Ft	Square Cm		Nominal heat transfer surface area associated with nominal overall heat transfer coefficient.					
	Nominal Heat Transfer Coefficient	Number	None			Nominal overall heat transfer coefficient associated with nominal heat transfer area.					
	Refrigerant Class	Text			CFC, HCFC, HFC	Refrigerant class used by the condenser.					
	Refrigerant Material	Text				The refrigerant material used for heat transfer purposes.					
	Compressor Condenser Heat Gain	Number	BTU			Heat gain between condenser inlet to compressor outlet.					
	Compressor Condenser Pressure Drop	Number	PSI	Pa		Pressure drop between condenser inlet and compressor outlet.					
	Condenser Mean Void Fraction	Number	None			Mean void fraction in condenser.					
	Condensing Temperature	Number	Degrees F	Degrees C		Refrigerant condensing temperature.					
	Exterior Heat Transfer Coefficient	Number	None			Exterior heat transfer coefficient associated with exterior surface area.					
	Heat Rejection Rate	Number	BTU/Hr			Sum of the refrigeration effect and the heat equivalent of the power input to the compressor.					
	Interior Heat Transfer Coefficient	Number	None			Interior heat transfer coefficient associated with interior surface area.					
	Logarithmic Mean Temperature Difference	Number	Degrees F	Degrees C		Logarithmic mean temperature difference between refrigerant and water or air.					
	Refrigerant Fouling Resistance	Number	None			Fouling resistance on the refrigerant side.					
	U A curves	Number	None			UV = f (VExterior, VInterior), UV as a function of interior and exterior fluid flow velocity at the entrance.					
	Water Fouling Resistance	Number	Hr x Ft2 °F/BTU			Fouling resistance on water/air side.					
Chilled Beam						**A cooled beam (or chilled beam) is a device typically used to cool air by circulating a fluid such as chilled water through exposed finned tubes above a space**	**IfcCooledBeam**				
	Chilled Beam Type	Text			Active, Passive, User Defined	The property enumeration defines the types of chilled beam that may be specified within the property set.					
	Coil Length	Number	Inch	mm		Length of coil.					
	Coil Width	Number	Inch	mm		Width of coil.					
	Finish Color	Text				Finish color for cooled beam.					
	Integrated Lighting Type	Text				Integrated lighting in cooled beam.					
	Is Free Hanging	Logical			True or False	Is it free hanging type (not mounted in a false ceiling)?					
	Nominal Cooling Capacity	Number	Feet/Minute	Cm/Minute		Nominal cooling capacity.					
	Nominal Heating Capacity	Number	BTU per Lineal Feet/Cm			Nominal heating capacity.					
	Nominal Return Water Temperature Cooling	Number	Degrees F	Degrees C		Nominal return water temperature (refers to nominal cooling capacity).					
	Nominal Return Water Temperature Heating	Number	Degrees F	Degrees C		Nominal return water temperature (refers to nominal heating capacity).					
	Nominal Supply Water Temperature Cooling	Number	Degrees F	Degrees C		Nominal supply water temperature (refers to nominal cooling capacity).					
	Nominal Supply Water Temperature Heating	Number	Degrees F	Degrees C		Nominal supply water temperature (refers to nominal heating capacity).					
	Nominal Surrounding Humidity Cooling	Number	Percent			Nominal surrounding humidity (refers to nominal cooling capacity).					
	Nominal Surrounding Temperature Cooling	Number	Degrees F	Degrees C		Nominal surrounding temperature (refers to nominal cooling capacity).					
	Nominal Surrounding Temperature Heating	Number	Degrees F	Degrees C		Nominal surrounding temperature (refers to nominal heating capacity).					
	Nominal Water Flow Cooling	Number	Gallons/Min	Liters/Min		Nominal water flow (refers to nominal cooling capacity).					

	Nominal Water Flow Heating	Number	Gallons/Min	Liters/Min		Nominal water flow (refers to nominal heating capacity).				
	Pipe Connection	Text				The manner in which the pipe connection is made to the cooled beam.				
	Water Flow Control System Type	Text				Factory fitted water flow control system.				
	Active Chilled Beam Configuration	Text				Active (ventilated) cooled beam				
	Air Flow Configuration	Text				Air flow configuration type of cooled beam.				
	Air Flow Rate	Number	CFM/Lineal Feet			Air flow rate.				
	Air Pressure Drop Curves	Number	Inch/mm of Water			Air pressure drop as function of air flow rate.				
	Airflow Rate Range	Number	CFM/Lineal Feet			Possible range of airflow that can be delivered.				
	Beam Cooling Capacity	Number	BTU/Lineal Feet			Cooling capacity of beam. This excludes cooling capacity of supply air.				
	Beam Heating Capacity	Number	BTU/Lineal Feet			Heating capacity of beam. This excludes heating capacity of supply air.				
	Connection Size	Number	Inch	mm		Duct connection diameter.				
	Cooling Water Flow Rate	Number	Gallons/Min	Liters/Min		Water flow rate for cooling.				
	Correction Factor For Cooling	Number	None			Correction factor k as a function of water flow rate (used to calculate cooling capacity).				
	Correction Factor For Heating	Number	None			Correction factor k as a function of water flow rate (used to calculate heating capacity).				
	Heating Water Flow Rate	Number	Gallons/Min	Liters/Min		Water flow rate for heating.				
	Return Water Temperature Cooling	Number	Degrees F	Degrees C		Return water temperature in cooling mode.				
	Return Water Temperature Heating	Number	Degrees F	Degrees C		Return water temperature in heating mode.				
	Supply Air Connection Type	Text				The manner in which the pipe connection is made to the cooled beam.				
	Supply Water Temperature Cooling	Number	Degrees F	Degrees C		Supply water temperature in cooling mode.				
	Supply Water Temperature Heating	Number	Degrees F	Degrees C		Supply water temperature in heating mode.				
	Throw	Number	Inch	mm		Distance cooled beam throws the air.				
	Total Cooling Capacity	Number	BTU/Lineal Feet			Total cooling capacity. This includes cooling capacity of beam and cooling capacity of supply air.				
	Total Heating Capacity	Number	BTU/Lineal Feet			Total heating capacity. This includes heating capacity of beam and heating capacity of supply air.				
	Water Pressure Drop Curves	Number	Inches of Water	mm of Water		Water pressure drop as function of water flow rate.				
Cooling Tower						**A cooling tower is a device which rejects heat to ambient air by circulating a fluid such as water through it to reduce its temperature by partial evaporation.**	**IfcCoolingTower**			
	Circuit Type	Text			Open Circuit, Close Circuit, Wet, Dry, Dry Wet, User Defined	Open Circuit: Exposes water directly to the cooling atmosphere. Close Circuit: The fluid is separated from the atmosphere by a heat exchanger. Wet: The air stream or the heat exchange surface is evaporatively cooled. Dry: No evaporation into the air stream. Dry Wet: A combination of a dry tower and a wet tower.				
	Ambient Design Dry Bulb Temperature	Number	Degrees F	Degrees C		Ambient design dry bulb temperature used for selecting the cooling tower.				
	Ambient Design Wet Bulb Temperature	Number	Degrees F	Degrees C		Ambient design wet bulb temperature used for selecting the cooling tower.				
	Basin Reserve Volume	Number	Gallons/Liters			Volume between operating and overflow levels in cooling tower basin.				
	Capacity Control	Text			Fan Cycling, Two Speed Fan, Variable Speed Fan, Dampers Control, Bypass Valve Control, Multiple Series Pumps, Two Speed Pump, Variable Speed Pump, User Defined	Fan Cycling: Fan is cycled on and off to control duty. Two Speed Fan: Fan is switched between low and high speed to control duty. Variable Speed Fan: Fan speed is varied to control duty. Dampers Control: Dampers modulate the air flow to control duty. Bypass Valve Control: Bypass valve modulates the water flow to control duty. Multiple Series Pumps: Turn on/off multiple series pump to control duty. Two Speed Pump: Switch between high/low pump speed to control duty. Variable Speed Pump: vary pump speed to control duty.				
	Control Strategy	Text			Fixed Exiting Water Temp, Wet Bulb Temp Reset	Fixed Exiting Water Temp: The capacity is controlled to maintain a fixed exiting water temperature. Wet Bulb Temp Reset: The set-point is reset based on the wet-bulb temperature.				
	Flow Arrangement	Text			Counter Flow, Crossflow, Pparallel Flow, User Defined	Counter Flow: Air and water flow enter in different directions. Crossflow: Air and water flow are perpendicular. Parallel Flow: air and water flow enter in same directions.				
	Lift Elevation Difference	Number	Inch	mm		Elevation difference between cooling tower sump and the top of the tower.				
	Nominal Capacity	Number	Tonnage			Nominal cooling tower capacity in terms of heat transfer rate of the cooling tower between air stream and water stream at nominal conditions.				
	Number Of Cells	Number	None			Number of cells in one cooling tower unit.				
	Operation Temperature Range	Number	Degrees F	Degrees C		Allowable operation ambient air temperature range.				
	Spray Type	Text			Spray Filled, Splash Type Fill, Film Type Fill, User Defined	Water Spray Fill Type				
	Water Requirement	Number	Gallons/Min	Liters/Min		Make-up water requirements.				
	Capacity	Number	Tonnage			Cooling tower capacity in terms of heat transfer rate of the cooling tower between air stream and water stream.				
	Heat Transfer Coefficient	Number	None			Heat transfer coefficient-area product.				
	Sump Heater Power	Number	Watts			Electrical heat power of sump heater.				
	U A Curve	Number	None			UA value as a function of fan speed at certain water flow rate, UA = f (fan speed).				
	Water Delta	Number	Degrees F	Degrees C		Water temperature change as a function of wet-bulb temperature, water entering temperature, water flow rate, air flow				
Damper						**A damper typically participates in an HVAC duct distribution system and is used to control or modulate the flow of air.**	**IfcDamper**			

Damper Type	Text			Manual, Control, Fire, Fire Smoke, Smoke, User Defined	The property enumeration defines the types of damper that may be specified within the property set.				
Blade Action	Text				Blade action.				
Blade Edge	Text				Blade edge.				
Blade Material	Text				The material from which the damper blades are constructed.				
Blade Shape	Text				Blade shape. Flat means triple V-groove.				
Blade Thickness	Number	Inch	mm		The thickness of the damper blade.				
Close Off Rating	Text				Close off rating.				
Face Area	Number	Inch	mm		Face area open to the airstream.				
Frame Depth	Number	Inch/mm			The length (or depth) of the damper frame.				
Frame Material	Text				The material from which the damper frame is constructed.				
Frame Thickness	Number	Inch/mm			The thickness of the damper frame material.				
Frame Type	Text			Standard, Single Flange, Single Reversed Flange, Double Flange, User Defined	The type of frame used by the damper				
Leakage Curve	Number	None			Leakage versus pressure drop; Leakage = f (pressure).				
Leakage Fully Closed	Number	CFM per Ft2/L			Leakage when fully closed.				
Loss Coefficient Curve	Number	None			Loss coefficient – blade position angle curve; ratio of pressure drop to velocity pressure versus blade angle; C = f (blade angle position).				
Maximum Air Flow Rate	Number	Cubic Feet/Minute	Liter/Minute		Maximum allowable air flow rate.				
Maximum Working Pressure	Number	PSI	Pa		Maximum working pressure.				
Nominal Air Flow Rate	Number	Cubic Feet/Minute	Liter/Minute		Nominal air flow rate.				
Number of Blades	Number	None		1,2,3…	Number of blades.				
Open Pressure Drop	Number	Inches of Water	mm of Water		Total pressure drop across damper.				
Operation	Text				The operational mechanism for the damper operation.				
Orientation	Text				The intended orientation for the damper as specified by the manufacturer.				
Regenerated Sound Curve	Number	Dba			Regenerated sound versus air flow rate.				
Seal Material	Text				The material from which the damper seals are constructed.				
Temperature Range	Number	Degrees F	Degrees C		Temperature range.				
Sizing Method	Text				Identifies whether the damper is sized nominally or with exact measurements: NOMINAL: Nominal sizing method. EXACT: Exact sizing method.				
Air Flow Rate	Number	Cubic Feet/Minute	Liter/Minute		Air flow rate.				
Blade Position Angle	Number	Degrees		0-90	Blade position angle; angle between the blade and flow direction (0 - 90).				
Damper Position	Number	None		0-1	Damper position (0-1); damper position (0=closed=90deg position angle, 1=open=0deg position angle.				
Leakage	Number	CFM per Ft2/L			Air leakage rate.				
Pressure Drop	Number	Inches of Water	mm of Water		Pressure drop.				
Pressure Loss Coefficient	Number	None			Pressure loss coefficient.				
Control Damper					Control damper type attributes.				
Control Damper Operation	Text				The inherent characteristic of the control damper operation.				
Torque Range	Number	Inch-Lbs/Nm			Torque range: minimum operational torque to maximum allowable torque.				
Fire Damper					Fire damper type attributes.				
Actuation Type	Text				Enumeration that identifies the different types of dampers.				
Enclosure Rating	Text				Enumeration that identifies the closure rating for the damper.				
Fire Resistance Rating	Text				Measure of the fire resistance rating in hours (e.g., 1.5 hours, 2 hours, etc.).				
Fusible Link Temperature	Text				The temperature that the fusible link melts.				
Fire Smoke Damper					Combination Fire and Smoke damper type attributes.				
Actuation Type	Text				Enumeration that identifies the different types of dampers.				
Enclosure Rating	Text				Enumeration that identifies the closure rating for the damper.				
Control Type	Text				The type of control used to operate the damper (e.g., Open/Closed Indicator, Resettable Temperature Sensor, Temperature Override, etc.).				
Fire Resistance Rating	Text				Measure of the fire resistance rating in hours (e.g., 1.5 hours, 2 hours, etc.).				
Fusible Link Temperature	Number	Degrees F	Degrees C		The temperature that the fusible link melts.				
Smoke Damper					Smoke damper type attributes.				
Control Type	Text				The type of control used to operate the damper (e.g., Open/Closed Indicator, Resettable Temperature Sensor, Temperature Override, etc.) .				
Duct Silencer					**A duct silencer is a device that is typically installed inside a duct distribution system for the purpose of reducing the noise levels from air movement, fan noise, etc. in the adjacent space or downstream of the duct silencer device.**	**IfcDuctSilencer**			
Silencer Type	Text				The property enumeration defines the types of silencer that may be specified within the property set.				
Airflow Rate Range	Number	Feet/Minute			Possible range of airflow that can be delivered.				

	Has Exterior Insulation	Logical			True or False	TRUE if the silencer has exterior insulation. FALSE if it does not.					
	Hydraulic Diameter	Number	Inch	mm		Hydraulic diameter.					
	Length	Number	Inch	mm		The finished length of the silencer.					
	Temperature Range	Number	Degrees F	Degrees C		Allowable minimum and maximum temperature.					
	Weight	Number	Lbs/Kg			The weight of the silencer.					
	Working Pressure Range	Number	PSI	Pa		Allowable minimum and maximum working pressure (relative to ambient pressure).					
	Air Flow Rate	Number	Cubic Feet/Minute	Liter/Minute		Volumetric air flow rate.					
	Air Pressure Drop Curve	Number	Inch/mm of Water			Air pressure drop as a function of air flow rate.					
Engine						**An engine is a device that converts fuel into mechanical energy through combustion.**	**IfcEngine**				
	Engine Type	Text				The property enumeration defines the types of engine that may be specified within the property set.					
	Energy Source	Text				The source of energy.					
Evaporative Cooler						**An evaporative cooler is a device that cools air by saturating it with water vapor.**	**IfcEvaporativeCooler**				
	Cooler Type	Text				The property enumeration defines the types of evaporative cooler that may be specified within the property set.					
	Air Pressure Drop Curve	Number	Inch/mm of Water/CFM			Air pressure drop as function of air flow rate.					
	Effectiveness Table	Number	None			Total heat transfer effectiveness curve as a function of the primary air flow rate.					
	Flow Arrangement	Text				Counter Flow: Air and water flow enter in different directions. Crossflow: Air and water flow are perpendicular. Parallel Flow: Air and water flow enter in same directions.					
	Heat Exchange Area	Number	Square Ft	Square Cm		Heat exchange area.					
	Operation Temperature Range	Number	Degrees F	Degrees C		Allowable operation ambient air temperature range.					
	Water Press Drop Curve	Number	PSI	Pa		Water pressure drop as function of water flow rate.					
	Water Requirement	Number	Gallons/Liters			Make-up water requirement.					
	Effectiveness	Number	None			Ratio of the change in dry bulb temperature of the (primary) air stream to the difference between the entering dry bulb temperature of the (primary) air and the wet-bulb temperature of the (secondary) air.					
	Latent Heat Transfer Rate	Number	BTU/Hr			Latent heat transfer rate to primary air flow.					
	Sensible Heat Transfer Rate	Number	BTU/Hr			Sensible heat transfer rate to primary air flow.					
	Total Heat Transfer Rate	Number	BTU/Hr			Total heat transfer rate to primary air flow.					
	Water Sump Temperature	Number	Degrees F	Degrees C		Water sump temperature.					
Evaporator						**An evaporator is a device in which a liquid refrigerant is vaporized and absorbs heat from the surrounding fluid.**	**IfcEvaporator**				
	Evaporator Type	Text				The property enumeration defines the types of evaporator that may be specified within the property set.					
	Evaporator Coolant	Text				The fluid used for the coolant in the evaporator.					
	Evaporator Medium Type	Text				Cold Liquid: Evaporator is using liquid type of fluid to exchange heat with refrigerant. Cold Air: Evaporator is using air to exchange heat with refrigerant.					
	External Surface Area	Number	Square Ft	Square Cm		External surface area (both primary and secondary area).					
	Internal Refrigerant Volume	Number	Ft3 per Lb/m3 per Kg			Internal volume of evaporator (refrigerant side).					
	Internal Surface Area	Number	Square Ft	Square Cm		Internal surface area.					
	Internal Water Volume	Number	Gallons/Liters			Internal volume of evaporator (water side).					
	Nominal Heat Transfer Area	Number	Square Ft	Square Cm		Nominal heat transfer surface area associated with nominal overall heat transfer coefficient.					
	Nominal Heat Transfer Coefficient	Number	BTU/(H·Ft2.oF)			Nominal overall heat transfer coefficient associated with nominal heat transfer area.					
	Refrigerant Class	Text				Refrigerant class used by the compressor.					
	Refrigerant Type	Text				Refrigerant material.					
	Compressor Evaporator Heat Gain	Number	BTU			Heat gain between the evaporator outlet and the compressor inlet.					
	Compressor Evaporator Pressure Drop	Number	PSI	Pa		Pressure drop between the evaporator outlet and the compressor inlet.					
	Evaporating Temperature	Number	Degrees F	Degrees C		Refrigerant evaporating temperature.					
	Evaporator Mean Void Fraction	Number	None			Mean void fraction in evaporator.					
	Exterior Heat Transfer Coefficient	Number	None			Exterior heat transfer coefficient associated with exterior surface area.					
	Heat Rejection Rate	Number	BTU/Hr			Sum of the refrigeration effect and the heat equivalent of the power input to the compressor.					
	Interior Heat Transfer Coefficient	Number	None			Interior heat transfer coefficient associated with interior surface area.					
	Logarithmic Mean Temperature Difference	Number	Degrees F	Degrees C		Logarithmic mean temperature difference between refrigerant and water or air.					
	Refrigerant Fouling Resistance	Number	Hr·Ft2°F/BTU			Fouling resistance on the refrigerant side.					
	U A curves	Text				UV = f (VExterior, VInterior), UV as a function of interior and exterior fluid flow velocity at the entrance.					
	Water Fouling Resistance	Number	Hr·Ft2°F/BTU		0.00025	Fouling resistance on water/air side.					
Fan						**A fan is a device which imparts mechanical work on a gas. A typical usage of a fan is to induce airflow in a building services air distribution system**	**IfcFan**				
	Fan Type	Text				The property enumeration defines the types of fan that may be specified within the property set.					
	Application Of Fan	Text			Supply Air:, Return Air,	The functional application of the fan.					

	Capacity Control Type	Text				Inlet Vane: Control by adjusting inlet vane. Variable Speed Drive: Control by variable speed drive. Blade Pitch Angle: Control by adjusting blade pitch angle. Two Speed: Control by switch between high and low speed. Discharge Damper: Control by modulating discharge damper.				
	Coil Position	Text				Defines the relationship between a fan and a coil.				
	Discharge Pressure Loss	Number	Inches of Water	mm of Water		Fan discharge pressure loss associated with the discharge arrangement.				
	Discharge Type	Text				Defines the type of connection at the fan discharge. Duct: Discharge into ductwork. Screen: Discharge into screen outlet. Louver: Discharge into a louver. Damper: Discharge into a damper.				
	Discharge Velocity	Number	Feet/Minute			The speed at which air discharges from the fan through the fan housing discharge opening.				
	Drive Power Loss	Number	Horsepower			Fan drive power losses associated with the type of connection between the motor and the fan wheel.				
	Efficiency Curve	Number	Percent/CFM or LM			Fan efficiency =f (flow rate).				
	Fan Efficiency	Number	Percent			Fan mechanical efficiency.				
	Fan Mounting Type	Text				Defines the method of mounting the fan in the building.				
	Fan Power Rate	Number	Horsepower			Fan power consumption.				
	Fan Rotation Speed	Number	RPM			Fan rotation speed.				
	Fraction Of Motor Heat To Air Stream	Number	BTU/Hr			Fraction of the motor heat released into the fluid flow.				
	Impeller Diameter	Number	Inch	mm		Diameter of fan wheel - used to scale performance of geometrically similar fans.				
	Motor Drive Type	Text				Motor drive type: DIRECT DRIVE: Direct drive. BELT DRIVE: Belt drive. COUPLING: Coupling. OTHER: Other type of motor drive. UNKNOWN: Unknown motor drive type.				
	Motor Position	Text				Defines the location of the motor relative to the air stream. In Airstream: Fan motor is in the air stream. Out Of Air Stream: Fan motor is out of the air stream.				
	Nominal Air Flow Rate	Number	Cubic Feet/Minute	Liter/Minute		Nominal air flow rate.				
	Nominal Power Rate	Number	Horsepower			Nominal fan power rate.				
	Nominal Rotation Speed	Number	RPM			Nominal fan wheel speed.				
	Nominal Static Pressure	Number	Inches of Water	mm of Water		The static pressure within the air stream				
	Nominal Total Pressure	Number	Inches of Water	mm of Water		Nominal total pressure rise across the fan.				
	Operation Temperature Range	Number	Degrees F	Degrees C		Allowable operation ambient air temperature range.				
	Operational Criteria	Number	Hours			Time of operation at maximum operational ambient air temperature.				
	Overall Efficiency	Number	Percent			Total efficiency of motor and fan.				
	Pressure Curve	Number	Inch/mm/CFM			Pressure rise = f (flow rate).				
	Shaft Power Rate	Number	Horsepower			Fan shaft power.				
	Wheel Tip Speed	Number	Feet/Minute			Fan blade tip speed, typically defined as the linear speed of the tip of the fan blade furthest from the shaft.				
	Centrifugal Fan					Centrifugal fan occurrence attributes attached to an instance of a fan.				
	Arrangement	Text				Defines the fan and motor drive arrangement as defined by AMCA.				
	Direction Of Rotation	Text			Clockwise, Counter Clockwise	The direction of the centrifugal fan wheel rotation when viewed from the drive side of the fan.				
	Discharge Position	Text			Top Horizontal, Top Angular	Centrifugal fan discharge position.				
Filter						**A filter is an apparatus used to remove particulate or gaseous matter from fluids and gases.**	**IfcFilter**			
	Filter Type	Text				The property enumeration defines the types of filter that may be specified within the property set.				
	Final Resistance	Number	Inches of Water	mm of Water		Filter fluid resistance when replacement is required				
	Flow Rate Range	Number	Cubic Feet/Minute	Liter/Minute		Possible range of fluid flowrate that can be delivered.				
	Initial Resistance	Number	Inches of Water	mm of Water		Initial new filter fluid resistance (i.e., pressure drop at the maximum air flowrate across the filter when the filter is new per ASHRAE Standard 52.1).				
	Nominal Filter Face Velocity	Number	Feet/Minute			Filter face velocity.				
	Nominal Flowrate	Number	Cubic Feet/Minute	Liter/Minute		Nominal fluid flow rate through the filter.				
	Nominal Media Surface Velocity	Number	Feet/Minute			Average fluid velocity at the media surface.				
	Nominal Particle Geometric Mean Diameter	Number	Microns			Particle geometric mean diameter associated with nominal efficiency.				
	Nominal Particle Geometric Standard Deviation	Number	Microns			Particle geometric standard deviation associated with nominal efficiency.				
	Nominal Pressure Drop	Number	Inches of Water	mm of Water		Total pressure drop across the filter.				
	Operation Temperature Range	Number	Degrees F	Degrees C		Allowable operation ambient fluid temperature range.				
	Weight	Number	Lbs/Kgs			Weight of filter.				
	Counted Efficiency	Number	Percent			Filter efficiency				
	Particle Mass Holding	Number	Grams			Mass of particle holding in the filter.				
	Weighted Efficiency	Number	Percent			Filter efficiency				

Air Filter						Air particle filter type attributes.					
Air Particle Filter Type	Text			Coarse Filter, Coarse Metal		A panel dry type extended surface filter is a dry-type air filter					
Counted Efficiency Curve	Number	Percent/Gram				Counted efficiency curve as a function of dust holding weight					
Dust Holding Capacity	Number	Grams				Maximum filter dust holding capacity.					
Face Surface Area	Number	Square Inch	Square mm			Face area of filter frame.					
Frame Material	Text					Filter frame material.					
Media Extended Area	Number	Square Inch	Square mm			Total extended media area.					
Nominal Counted Efficiency	Number	Percent				Nominal filter efficiency based the particle count concentration before and after the filter against particles with a certain size distribution.					
Nominal Weighted Efficiency	Number	Percent				Nominal filter efficiency based the particle weight concentration before and after the filter against particles with a certain size distribution.					
Pressure Drop Curve	Number	PSI	Pa			Under certain dust holding weight, DelPressure = f (fluid flowrate)					
Separation Type	Text					Air particulate filter media separation type.					
Weighted Efficiency Curve	Number	Percent				Weighted efficiency curve as a function of dust holding weight, efficiency = f (dust holding weight).					
Compressed Air Filter						Compressed air filter type attributes.					
Automatic Condensate Discharge	Text					Whether or not the condensing water or oil is discharged automatically from the filter.					
Clogging Indicator	Logical			True or False		Whether the filter has an indicator to display the degree of clogging of the filter.					
Compressed Air Filter Type	Text					ACTIVATED CARBON: absorbs oil vapor and odor; PARTICLE FILTER: used to absorb solid particles of medium size; COALESCENSE FILTER: used to absorb fine solid, oil, and water particles, also called micro filter					
Operation Pressure Max	Number	PSI	Pa			Maximum pressure under normal operating conditions.					
Particle Absorption Curve	Number	Percent				Ratio of particles that are removed by the filter					
Water Filter						Water filter type attributes.					
Water Filter Type	Text			Filtration; purification;		Further qualifies the type of water filter					
Flow Meter						**A flow meter is a device that is used to measure the flow rate in a system.**	**IfcFlowMeter**				
Meter Type	Text			Energy, Gas, Oil, Water, User Defined		The property enumeration defines the types of meter that may be specified within the property set.					
Purpose	Text			Master, Submaster,		Enumeration defining the purpose of the flow meter occurrence.					
Read Out Type	Text			Dial, Digital, Other, Not Known, Unset		Indication of the form that readout from the meter takes. In the case of a dial read out, this may comprise multiple dials that give a cumulative reading and/or a mechanical odometer.					
Remote Reading	Logical			True or False		Indicates whether the meter has a connection for remote reading through connection of a communication device (set TRUE) or not (set FALSE).					
Energy Meter						Device that measures, indicates and sometimes records, the energy usage in a system.					
Maximum Current	Number	Amps				The maximum allowed current that a device is certified to handle.					
Multiple Tariff	Text					Indicates whether meter has built-in support for multiple tariffs (variable energy cost rates).					
Nominal Current	Number	Amps				The nominal current that is designed to be measured.					
Gas Meter						Device that measures, indicates and sometimes records, the volume of gas that passes through it without interrupting the flow.					
Connection Size	Number	Inch	mm			Defines the size of inlet and outlet pipe connections to the meter.					
Gas Type	Text					Defines the types of gas that may be specified.					
Maximum Flow Rate	Number	Cubic Feet/Minute	Liter/Minute			Maximum rate of flow which the meter is expected to pass.					
Maximum Pressure Loss	Number	PSI	Pa			Pressure loss expected across the meter under conditions of maximum flow.					
Oil Meter						Device that measures, indicates and sometimes records, the volume of oil that passes through it without interrupting the					
Connection Size	Number	Inch	mm			Defines the size of inlet and outlet pipe connections to the meter.					
Maximum Flow Rate	Number	Gallons/Min	Liters/Min			Maximum rate of flow which the meter is expected to pass.					
Water Meter						Device that measures, indicates and sometimes records, the volume of water that passes through it without interrupting					
Backflow Preventer Type	Text			Atmospheric Vacuum breaker, Anti Siphon valve, Double Check Backflow Preventer, Pressure Vacuum breaker, Reduced Pressure Backflow Preventer, Other, Not known, Unset		Identifies the type of backflow preventer installed					
Connection Size	Number	Inch	mm			Defines the size of inlet and outlet pipe connections to the meter.					
Maximum Flow Rate	Number	Gallons/Min	Liters/Min			Maximum rate of flow which the meter is expected to pass.					
Maximum Pressure Loss	Number	PSI	Pa			Pressure loss expected across the meter under conditions of maximum flow.					
Type	Text			Compound, Inferential, Piston, Other, Not Known, Unset		Defines the allowed values for selection of the flow meter operation type.					
Heat Exchanger						**A heat exchanger is a device used to provide heat transfer between non-mixing media such as plate and shell and tube heat exchangers.**	**IfcHeatExchanger**				
Exchanger Type	Text					The property enumeration defines the types of heat exchanger that may be specified within the property set.					
Arrangement	Text			Counter flow, Crossflow,		Defines the basic flow arrangements for the heat exchanger:					
Plate Exchanger						Plate heat exchanger type					

Number Of Plates	Number	None		1,2,3…	Number of plates used by the plate heat exchanger.				
Humidifier					**A humidifier is a device that adds moisture into the air.**	**IfcHumidifier**			
Humidifier Type	Text				The property enumeration defines the types of humidifier that may be specified within the property set.				
Air Pressure Drop Curve	Number	PSI	Pa		Air pressure drop versus air-flow rate.				
Application	Text			Fixed; Portable	Humidifier application.				
Internal Control	Text				Internal modulation control.				
Nominal Air Flow Rate	Number	Cubic Feet/Minute	Liter/Minute		Nominal rate of air flow into which water vapor is added.				
Nominal Moisture Gain	Number	Gallons/Day			Nominal rate of water vapor added into the airstream.				
Saturation Efficiency Curve	Number	Percent			Saturation efficiency as a function of the air flow rate.				
Water Requirement	Number	Gallons/Min	Liters/Min		Make-up water requirement.				
Weight	Number	Lbs/Kgs			The weight of the humidifier.				
Atmospheric Pressure	Number	PSI	Pa		Ambient atmospheric pressure.				
Saturation Efficiency	Number	Percent			Saturation efficiency				
Pump					**A pump is a device which imparts mechanical work on fluids or slurries to move them through a channel or pipeline.**	**IfcPump**			
Pump Type	Text				The property enumeration defines the types of pump that may be specified within the property set.				
Base Type	Text			Frame.	Defines general types of pump bases.				
Connection Size	Number	Inch	mm		The connection size of the to and from the pump.				
Drive Connection Type	Text			Direct drive.	The way the pump drive mechanism is connected to the pump.				
Flow Rate Range	Number	Gallons/Min	Liters/Min		Allowable range of volume of fluid being pumped against the resistance specified.				
Flow Resistance Range	Number	PSI	Pa		Allowable range of frictional resistance against which the fluid is being pumped.				
Flowrate	Number	Gallons/Min	Liters/Min		The actual operational fluid flowrate.				
Impeller Diameter	Number	Inch	mm		Diameter of pump impeller - used to scale performance of geometrically similar pumps.				
Mechanical Efficiency	Number	Percent			The pumps operational mechanical efficiency.				
Net Positive Suction Head	Number	Inch	mm		Minimum liquid pressure at the pump inlet to prevent cavitation.				
Nominal Rotation Speed	Number	RPM			Pump rotational speed under nominal conditions.				
Overall Efficiency	Number	Percent			The pump and motor overall operational efficiency.				
Power	Number	Horsepower			The actual power consumption of the pump.				
Pressure Rise	Number	PSI	Pa		The developed pressure.				
Rotation Speed	Number	RPM			Pump rotational speed.				
Temperature Range	Number	Degrees F	Degrees C		Allowable operational range of the fluid temperature.				
Space Heater					**Space heaters utilize a combination of radiation and/or natural convection using a heating source such as electricity, steam or hot water to heat a limited space or area.**	**IfcSpaceHeater**			
Space Heater Type	Text				The property enumeration defines the types of space heater that may be specified within the property set.				
Air Resistance Curve	Number	Inch/mm of Water/CFM			Air resistance curve (w/ fan only); Pressure = f (flow rate).				
Auxiliary Energy Source Consumption	Number	Watts			Auxiliary energy source consumption.				
Effectiveness	Number	None			Ratio of the real heat transfer rate to the maximum possible heat transfer rate.				
Energy Source	Text			Electric, Natural Gas, Propane, Hot Water, Steam, etc.	Enumeration defining the energy source or fuel combusted to generate heat if applicable				
Exponent	Number	None			Characteristic exponent, slope of log(heat output) vs log (surface temperature minus environmental temperature).				
Fraction Convective Heat Transfer	Number	None			Fraction of the total heat transfer rate as the convective heat transfer.				
Fraction Radiant Heat Transfer	Number	None			Fraction of the total heat transfer rate as the radiant heat transfer.				
Heat Output Rate	Number	BTU/Hr			Overall heat transfer rate.				
Heat Transfer Dimension	Text				Indicates how heat is transmitted according to the shape of the space heater.				
Heat Transfer Medium	Text				Enumeration defining the heat transfer medium if applicable.				
Number Of Panels	Number	None		1,2,3…	Number of panels.				
Number Of Sections	Number	None		1,2,3…	Number of vertical sections, measured in the direction of flow.				
Output Capacity	Number	Watts			Total nominal heat output as listed by the manufacturer.				
Output Capacity Curve	Number	Watts per Degree F/C			Partial output capacity curve (as a function of water temperature); Q = f (Twater).				
Placement Type	Text				Indicates how the space heater is designed to be placed.				
Size	Number	Inch	mm		Overall body mass of the heater.				
Space Air Temperature	Number	Degrees F	Degrees C		Dry bulb temperature in the space.				
Space Mean Radiant Temperature	Number	Degrees F	Degrees C		Mean radiant temperature in the space.				
Surface Temperature	Number	Degrees F	Degrees C		Average surface temperature of the component.				
Temperature Classification	Text				Enumeration defining the temperature classification of the space heater surface temperature.				
Thermal Efficiency	Number	Percent			Overall Thermal Efficiency is defined as gross energy output of the heat transfer device divided by the energy input.				
Thermal Mass Heat Capacity	Number				Product of component mass and specific heat.				
UV Curve	Number	None			UV = f (VExterior, VInterior), UV as a function of interior and exterior fluid flow velocity at the entrance.				
Convector Characteristic					**Space heater type convector attributes.**				
Convector Type	Text			Forced Air; Natural	Indicates the type of convector				

		Radiator Characteristic					**Space heater type radiator attributes.**					
			Radiator Type	Text				Indicates the type of radiator.				
			Tubing Length	Number	Inch	mm		Water tube length inside the component.				
			Water Content	Number	Lbs/Kgs			Weight of water content within the heater.				
			Cooling Air Flow Rate	Number	Cubic Feet/Minute	Liter/Minute		Cooling air flow rate in the space.				
			Exhaust Air Flow Rate	Number	Cubic Feet/Minute	Liter/Minute		Exhaust air flow rate in the space.				
			Heating Air Flow Rate	Number	Cubic Feet/Minute	Liter/Minute		Heating air flow rate in the space.				
			Space Relative Humidity	Number	Percent			The relative humidity of the space.				
			Space Temperature	Number	Degrees F	Degrees C		Temperature of the space.				
			Ventilation Air Flow Rate	Number	Cubic Feet/Minute	Liter/Minute		Ventilation air flow rate in the space.				
	Tank							**A tank is a vessel or container in which a fluid or gas is stored for later use**	**IfcTank**			
		Tank Type		Text				The property enumeration defines the types of tank that may be specified within the property set.				
		Storage Type		Text			Fuel, Oil, Water, Rain Water, Waste Water, Potable Water, Other, Not Known	Defines the general material category intended to be stored.				
		Nominal Capacity		Number	Gallons/Liters			The total nominal or design volumetric capacity of the tank.				
		Access Type		Text			Manhole, User Defined	Defines the types of access (or cover) to a tank that may be specified.				
		Effective Capacity		Number	Gallons/Liters			The total effective or actual volumetric capacity of the tank.				
		End Shape Type		Text			Semi-Elliptical, ASME Flanged Dished, ASME High Crown, Conical Dished, Standard Flanged Dished, Flanged Only, Dished Only, User Defined	Defines the types of end shapes that can be used for preformed tanks. The convention for reading these enumerated values is that for a vertical cylinder, the first value is the base and the second is the top; for a horizontal cylinder, the order of reading should be left to right. For a spherical tank, the value UNSET should be used.				
		First Curvature Radius		Number	Inch	mm		First Curvature Radius should be defined as the base or left side radius of curvature value.				
		Has Ladder		Logical			True or False	Indication of whether the tank is provided with a ladder (set TRUE) for access to the top. If no ladder is provided then value is set FALSE. Note: No indication is given of the type of ladder (gooseneck etc.)				
		Has Visual Indicator		Logical			True or False	Indication of whether the tank is provided with a visual indicator (set TRUE) that shows the water level in the tank. If no visual indicator is provided then value is set FALSE.				
		Nominal Depth		Number	Inch	mm		The nominal depth of the tank. Note: Not required for a horizontal cylindrical tank.				
		Nominal Length Or Diameter		Number	Inch	mm		The nominal length or, in the case of a vertical cylindrical tank, the nominal diameter of the tank.				
		Nominal Width Or Diameter		Number	Inch	mm		The nominal width or, in the case of a horizontal cylindrical tank, the nominal diameter of the tank. Note: Not required for a vertical cylindrical tank.				
		Number Of Sections		Number	None		1,2,3…	Number of sections used in the construction of the tank. Default is 1. Note: All sections assumed to be the same size.				
		Operating Weight		Number	Lbs/Kgs			Operating weight of the tank including all of its contents.				
		Pattern Type		Text			Horizontal Cylinder,Vertical Cylinder, Rectangular, Other, Not Known	Defines the types of pattern (or shape of a tank that may be specified.				
		Second Curvature Radius		Number	Inch	mm		Second Curvature Radius should be defined as the top or right side radius of curvature value.				
		Storage Type		Text			Fuel, Oil, Water, Rain Water, Waste Water, Potable Water, Other, Not Known	Defines the general material category intended to be stored.				
		Tank Composition		Text			Complex, Element, Partial, User Defined	Defines the level of element composition where. COMPLEX: A set of elementary units aggregated together to fulfill the overall required purpose. ELEMENT: A single elementary unit that may exist of itself or as an aggregation of partial units.. PARTIAL: A partial elementary unit.				
		Expansion Tank						Specific Baseline Attributes of an expansion type tank.				
			Charge Pressure	Number	PSI	Pa		Nominal or design operating pressure of the tank.				
			Pressure Regulator Setting	Number	PSI	Pa		Pressure that is automatically maintained in the tank.				
			Relief Valve Setting	Number	PSI	Pa		Pressure at which the relief valve activates.				
		Pressure Vessel						Specific Baseline Attributes of a pressure vessel.				
			Charge Pressure	Number	PSI	Pa		Nominal or design operating pressure of the tank.				
			Pressure Regulator Setting	Number	PSI	Pa		Pressure that is automatically maintained in the tank.				
			Relief Valve Setting	Number	PSI	Pa		Pressure at which the relief valve activates.				
		Sectional Tank						Fixed vessel constructed from sectional parts with one or more compartments for storing a liquid.				
			Number Of Sections	Number	None		1,2,3…	Number of sections used in the construction of the tank				
			Section Length	Number	Inch	mm		The length of a section used in the construction of the tank.				

Section Width	Number	Inch	mm		The width of a section used in the construction of the tank.				
Tube Heat Exchanger					**A device that transfer heat using shell and tube configuration**	**IfcTubeBundle**			
Exchanger Type	Text				The property enumeration defines the types of tube heat exchanger that may be specified within the property set.				
Fouling Factor	Number	Ft2-°F-Hr/BTU			Fouling factor of the tubes in the tube bundle.				
Has Turbulator	Logical			True or False	TRUE if the tube has a turbulator, FALSE if it does not.				
Horizontal Spacing	Number	None		1,2,3…	Horizontal spacing between tubes in the tube bundle.				
In Line Row Spacing	Number	None		1,2,3…	In-line tube row spacing.				
Inside Diameter	Number	Inch	mm		Actual inner diameter of the tube in the tube bundle.				
Length	Number	Inch	mm		Length of the tubes in the tube bundle.				
Nominal Diameter	Number	Inch	mm		Nominal diameter or width of the tubes in the tube bundle.				
Number Of Circuits	Number	None		1,2,3…	Number of parallel fluid tube circuits.				
Number Of Rows	Number	None		1,2,3…	Number of tube rows in the tube bundle assembly.				
Outside Diameter	Number	Inch	mm		Actual outside diameter of the tube in the tube bundle.				
Staggered Row Spacing	Number	None		1,2,3…	Staggered tube row spacing.				
Thermal Conductivity	Number	BTU/(Hr·Ft·F)			The thermal conductivity of the tube.				
Vertical Spacing	Number	Inch	mm	1,2,3…	Vertical spacing between tubes in the tube bundle.				
Volume	Number	Gallons/Liters			Total volume of fluid in the tubes and their headers.				
Finned Bundle					Finned tube bundle type attributes.				
Diameter	Number	Inch	mm		Actual diameter of a fin for circular fins only.				
Fin Corrugated Type	Text				Description of a fin corrugated type.				
Has Coating	Logical			True or False	TRUE if the fin has a coating, FALSE if it does not.				
Height	Number	Inch	mm		Length of the fin as measured perpendicular to the direction of airflow.				
Length	Number	Inch	mm		Length of the fin as measured parallel to the direction of airflow.				
Spacing	Number	Inch	mm		Distance between fins on a tube in the tube bundle.				
Thermal Conductivity	Number	BTU/(Hr·Ft·F)			The thermal conductivity of the fin.				
Thickness	Number	Inch	mm		Thickness of the fin.				
Valve					**A valve is used in a building services piping distribution system to control or modulate the flow of the fluid.**	**IfcValve**			
Valve Type	Text				The property enumeration defines the types of valve that may be specified within the property set.				
Valve Pattern	Text			Single port, Angled_2 Port, Straight_2_Port, Straight_3_Port, Crossover_4_Port	The configuration of the ports of a valve according to either the linear route taken by a fluid flowing through the valve or by the number of ports.				
Body Material	Text				Material from which the body of the valve is constructed.				
Close Off Rating	Number	PSI	Pa		Close off rating.				
Flow Coefficient	Number	Kv or Cv			Flow coefficient (the quantity of fluid that passes through a fully open valve at unit pressure drop), typically expressed as the Kv or Cv value for the valve.				
Measured Flow Rate	Number	Gallons/Min	Liters/Min		The rate of flow of a fluid measured across the valve.				
Measured Pressure Drop	Number	PSI	Pa		The actual pressure drop in the fluid measured across the valve.				
Percentage Open	Number	Percent			The ratio between the amount that the valve is open to the full open position of the valve.				
Size	Number	Inch	mm		The size of the connection to the valve (or to each connection for faucets, mixing valves, etc.).				
Test Pressure	Number	PSI	Pa		The maximum pressure to which the valve has been subjected under test.				
Valve Mechanism	Text			Ball, Butterfly, Gate, Globe, Plug, Gland, Needle	The mechanism by which the valve function is achieved.				
Valve Operation	Text			Drop weight, Float, Hydraulic, Lever, Lock shield, Motorized, Pneumatic, Solenoid, Thermostatic, Wheel , User Defined	The method of valve operation.				
Working Pressure	Number	PSI	Pa		The normally expected maximum working pressure of the valve.				
Air Vent					**Valve used to release air from a pipe or fitting.**				
Is Automatic	Logical			True or False	Indication of whether the valve is automatically operated (TRUE) or manually operated (FALSE).				
Isolation Valve					**A valve that is used to isolate system components.**				
Is Normally Open	Logical			True or False	If TRUE, the valve is normally open. If FALSE is normally closed.				
Isolating Purpose	Text				Defines the purpose for which the isolating valve is used				
Pressure Reducing Valve					**Valve that reduces the pressure of a fluid immediately downstream of its position in a pipeline to a preselected value or**				
Downstream Pressure	Number	PSI	Pa		The operating pressure of the fluid downstream of the pressure reducing valve.				
Upstream Pressure	Number	PSI	Pa		The operating pressure of the fluid upstream of the pressure reducing valve.				
Pressure Relief Valve				Spring Loaded	**A valve that automatically discharges to a safe place fluid that has built up to excessive pressure in pipes or fittings. Note**				
Relief Pressure	Number	PSI	Pa		The pressure at which the spring or weight in the valve is set to discharge fluid.				
Vibration Isolator					**A vibration isolator is a device used to minimize the effects of vibration transmissibility in a building**	**IfcVibrationIsolator**			
Height	Number	Inch	mm		Height of the vibration isolator before the application of load.				

		Isolator Compressibility	Number	Lbs/Kgs			The compressibility of the vibration isolator.				
		Isolator Static Deflection	Number	Inch	mm		Static deflection of the vibration isolator.				
		Maximum Supported Weight	Number	Lbs/Kgs			The maximum weight that can be carried by the vibration isolator.				
		Vibration Transmissibility	Number	Percent			The vibration transmissibility percentage.				

ct-Specific Milestones										
LEED Cert. Check	LEED Cert Submittal									

BIMForum LOD Specification 2020 Part II

D- Air Distribution

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	IFC Name	COBie Tag	Part 3 - Example Proje: Estimating Est. 1	Part 3 - Example Proje: Estimating Bid Pkg.
Part 1 - Attribute Description									
Global Attributes									
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Item-Specific Attributes									
Duct						IfcDuctFitting			
Atmospheric Pressure	Number	PSI/Pa			Ambient atmospheric pressure.				
Color	Text				The color of the duct segment. Note: This is typically used for any duct segments with a painted surface which is not otherwise specified as a covering.				
Condition Status	Text			New, Existing, Demolish, Temporary, User Defined	Status of the element, predominately used in renovation or retrofitting projects. The status can be assigned to as "New" - element designed as new addition, "Existing" - element exists and remains, "Demolish" - element existed but is to be demolished, "Temporary" - element will exists only temporary (like a temporary support structure).				
Fluid Flow Leakage	Number	CFM/LM per 100SF			Volumetric leakage flow rate.				
Has Liner	Logical			True/False	TRUE if the fitting has interior duct insulating lining, FALSE if it does not.				
Interior Roughness Coefficient	Number				The interior roughness of the duct fitting material.				
Leakage Curve	Number	CFM/LM per 100SF			Leakage per unit length curve versus working pressure. If a scalar is expressed then it represents Leakage Class which is flowrate per unit area at a specified pressure rating (e.g., ASHRAE Fundamentals 2001 34.16.).				
Longitudinal Seam	Text			Lock seam, button punch snap lock	The type of seam to be used along the longitudinal axis of the duct segment.				
Loss Coefficient	Number	None			Dimensionless loss coefficient used for calculating fluid resistance representing the ratio of total pressure loss to velocity pressure at a referenced cross-section.				
Nominal Diameter Or Width	Number	Inch	mm		The nominal diameter or width of the duct segment.				
Nominal Height	Number	Inch	mm		The nominal height of the duct segment.				
Pressure Range	Number	Inch/mm wg			Allowable maximum and minimum working pressure (relative to ambient pressure).				
Reinforcement	Text			angle, hat section, zee, or channel iron	The type of reinforcement, if any, used for the duct segment.				
Reinforcement Spacing	Number	Inch	mm		The spacing between reinforcing elements.				
Shape	Text			Rectangular, Square, Round	Cross sectional shape. Note that this shape is uniform throughout the length of the segment. For non uniform shapes, a transition fitting should be used instead.				
Temperature Range	Number	Degrees F	Degrees C		Allowable maximum and minimum temperature.				
Working Pressure	Number	Inch/mm Wg		SMACNA	Pressure classification as defined by the authority having jurisdiction (e.g., SMACNA, etc.).				

ct-Specific Milestones										
LEED Cert. Check	LEED Cert Submittal									

BIMForum LOD Specification 2020 Part II

D40 - Fire Protection

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	IFC Name	COBie Tag	Part 3 - Example Proje: Estimating Est. 1	Estimating Bid Pkg.
Part 1 - Attribute Description									
Global Attributes									
Component ID	Text				Part or Equipment Tag				
Condition Status	Text			New, Existing, Demolish, Temporary, User Defined	Status of the element, predominately used in renovation or retrofitting projects				
Room Number	Text				Room number where component to be/is installed				
Room Name	Text				Room name where component to be/is installed				
Story Number	Text				Floor or level room is located				
Manufacturer Name	Text				The organization that manufactured and/or assembled the item.				
Product Name	Text				The manufacturers model name of the product model (or product line)				
Model Designation	Text				The manufacturers model number or designator of the product model (or product line)				
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Component characteristics					**Properties of individual elements of manufactured products**				
Acquisition Date	Date Time	Date			The date that the manufactured item was purchased.				
Assembly Place	Text				Code defining where the assembly takes place				
Bar Code	Text				The identity of the bar code given to an occurrence of the product.				
Batch Reference	Text				The identity of the batch reference from which an occurrence of a product is taken.				
Production Year	Number	Year			The year of production of the manufactured item.				
Serial Number	Text				The serial number assigned to an occurrence of a product.				
Design Performance									
Service Life					**Captures the period of time that an artifact will last.**				
Mean Time Between Failure	Number	Days			The average time duration between instances of failure of a product.				
Service Life Duration	Number	Year(s)			The length or duration of a service life.				
Service Life Factors					**Captures various factors that impact the expected service life of elements within the system or zone.**				
Design Level	Text				Adjustment of the service life resulting from the effect of design level employed.				
Indoor Environment	Text				Adjustment of the service life resulting from the effect of the indoor environment (where appropriate).				
In Use Conditions	Text				Adjustment of the service life resulting from the effect of the conditions in which components are operating.				
Maintenance Level	Text				Adjustment of the service life resulting from the effect of the level or degree of maintenance applied to components.				
Outdoor Environment	Text				Adjustment of the service life resulting from the effect of the outdoor environment (where appropriate)				
Quality Of Components	Text				Adjustment of the service life resulting from the effect of the quality of components used.				
Work Execution Level	Text				Adjustment of the service life resulting from the effect of the quality of work executed.				
Warranty					**A written guarantee, issued to the purchaser of an article by its manufacturer, promising to repair or replace it if necessary within a specified period of time**				
Exclusions	Text				Items, conditions or actions that may be excluded from the warranty or that may cause the warranty to become void.				
Is Extended Warranty	Logic			True or False	Indication of whether this is an extended warranty whose duration is greater than that normally assigned				
Point Of Contact	Text				The organization that should be contacted for action under the terms of the warranty.				
Warranty Content	Text				The content of the warranty.				
Warranty End Date	Date Time	Date			The date on which the warranty expires.				
Warranty Identifier	Text				The identifier assigned to a warranty.				
Warranty Period	Number	Year(s)			The time duration during which a manufacturer or supplier guarantees or warrants the performance of an artefact.				
Warranty Start Date	Date Time	Date			The date on which the warranty commences.				
Item-Specific Attributes									
Breeching Inlet					**Symmetrical pipe fitting that unites two or more inlets into a single pipe**	**IfcFireSuppressionTerminal**			
Breeching Inlet Type	Text				Defines the type of breeching inlet.				
Coupling Type	Text				Defines the type coupling on the inlet of the breeching inlet.				
Has Caps	Logic			True or False	Does the inlet connection have protective caps.				
Inlet Diameter	Number	Inch	mm		The inlet diameter of the breeching inlet.				
Flow Meter					**A flow meter is a device that is used to measure the flow rate in a system.**	**IfcFlowMeter**			
Meter Type	Text			Energy, Gas, Oil, Water, User Defined	Identifies the predefined types of meter from which the type required may be set.				
Purpose	Text			Master, Submaster, Submeter, Other, Unknown	Enumeration defining the purpose of the flow meter occurrence.				

Read Out Type	Text			Dial, Digital, Other, Not Known, Unset	Indication of the form that readout from the meter takes. In the case of a dial read out, this may comprise multiple dials that give a cumulative reading and/or a mechanical odometer.				
Remote Reading	Logic			True or False	Indicates whether the meter has a connection for remote reading through connection of a communication device (set TRUE) or not (set FALSE).				
Energy Meter					Device that measures, indicates and sometimes records, the energy usage in a system.				
Maximum Current	Number	Amps			The maximum allowed current that a device is certified to handle.				
Multiple Tariff	Text				Indicates whether meter has built-in support for multiple tariffs (variable energy cost rates).				
Nominal Current	Number	Amps			The nominal current that is designed to be measured.				
Gas Meter					Device that measures, indicates and sometimes records, the volume of gas that passes through it without interrupting the flow.				
Connection Size	Number	Inch	mm		Defines the size of inlet and outlet pipe connections to the meter.				
Gas Type	Text				Defines the types of gas that may be specified.				
Maximum Flow Rate	Number	Cubic Ft / Min	Liters/Min		Maximum rate of flow which the meter is expected to pass.				
Maximum Pressure Loss	Number	PSI	Pa		Pressure loss expected across the meter under conditions of maximum flow.				
Oil Meter					Device that measures, indicates and sometimes records, the volume of oil that passes through it without interrupting the				
Connection Size	Number	Inch	mm		Defines the size of inlet and outlet pipe connections to the meter.				
Maximum Flow Rate	Number	Cubic Ft / Min	Liters/Min		Maximum rate of flow which the meter is expected to pass.				
Water Meter					Device that measures, indicates and sometimes records, the volume of water that passes through it without interrupting				
Backflow Preventer Type	Text			Atmospheric Vacuum breaker, Anti Siphon valve, Double Check Backflow Preventer, Pressure Vacuum breaker Reduced Pressure Backflow Preventer Other Not known Unset	Identifies the type of backflow preventer installed				
Connection Size	Number	Inch	mm		Defines the size of inlet and outlet pipe connections to the meter.				
Maximum Flow Rate	Number	Cubic Ft / Min	Liters/Min		Maximum rate of flow which the meter is expected to pass.				
Maximum Pressure Loss	Number	PSI	Pa		Pressure loss expected across the meter under conditions of maximum flow.				
Type	Text			Compound, Inferential, Piston, Other, Not Known, Unset	Defines the allowed values for selection of the flow meter operation type.				
Hose Reel					**A supporting framework on which a hose may be wound (BS6100 155 8201).** **Note that the service provided by the hose (water/foam) is determined by the context of the system onto which the hose reel is connected.**	**IfcFireSuppressionTerminal**			
Hose Reel Mounting Type	Text				Identifies the predefined types of hose reel mounting				
Hose Nozzle Type	Text				Identifies the predefined types of nozzle spray pattern				
Classification Authority	Text			NFPA, FEMA	The name of the authority that applies the classification of service to the hose reel				
Class Of Service	Text				A classification of usage of the hose reel that may be applied.				
Hose Diameter	Number	Inch	mm		Notional diameter (bore) of the hose.				
Hose Length	Number	Inch	mm		Nominal length of the hose fitted to the hose reel when fully extended.				
Hose Reel Type	Text				Identifies the predefined types of hose arrangement				
Inlet Connection Size	Number	Inch	mm		Size of the inlet connection to the hose reel.				
Hydrant					**Device, fitted to a pipe, through which a temporary supply of water may be provided (BS6100 330 6107)**	**IfcFireSuppressionTerminal**			
Fire Hydrant Type	Text			DryBarrel, WetBarrel, User defined	Defines the range of hydrant types from which the required type can be selected where.				
Body Color	Text			Consult local fire regulations for statutory colors	Color of the body of the hydrant.				
Cap Color	Text			Consult local fire regulations for statutory colors	Color of the caps of the hydrant.				
Discharge Flow Rate	Number	Gallons/Min	Liters/Min		The volumetric rate of fluid discharge.				
Flow Class	Text			AA, A, B, C	AlphaNumber indication of the flow class of a hydrant				
Hose Connection Size	Number	Inch	mm		The size of connections to which a hose may be connected (other than that to be linked to a pumping unit).				
Number Of Hose Connections	Number	None			The number of hose connections on the hydrant (excluding the pumper connection).				
Pressure Rating	Number	PSI	Pa		Maximum pressure that the hydrant is manufactured to withstand.				
Pumper Connection Size	Number	Inch	mm		The size of a connection to which a fire hose may be connected that is then linked to a pumping unit.				
Water Is Potable	Logic			True or False	Indication of whether the water flow from the hydrant is potable (set TRUE) or non potable (set FALSE).				
Pump					**A pump is a device which imparts mechanical work on fluids or slurries to move them through a channel or pipeline. A typical use of a pump is to circulate chilled water or heating hot water in a building services distribution system**	**IfcPump**			

Pump Type	Text				The property enumeration defines the types of pump that may be specified within the property set.				
Base Type	Text			Frame, Base, None, Other	Defines general types of pump bases.				
Connection Size	Number	Inch	mm		The connection size of the to and from the pump.				
Drive Connection Type	Text			Direct drive, Belt drive, Coupling, Other	The way the pump drive mechanism is connected to the pump				
Flow Rate Range	Number	Gallons/Min	Liters/Min		Allowable range of volume of fluid being pumped against the resistance specified.				
Flow Resistance Range	Number	Kv or Cv			Allowable range of frictional resistance against which the fluid is being pumped.				
Flowrate	Number	Gallons/Min	Liters/Min		The actual operational fluid flowrate.				
Impeller Diameter	Number	Inch	mm		Diameter of pump impeller				
Mechanical Efficiency	Number	Percentage			The pumps operational mechanical efficiency.				
Net Positive Suction Head	Number	NPSH			Minimum liquid pressure at the pump inlet to prevent cavitation.				
Nominal Rotation Speed	Number	RPM			Pump rotational speed under nominal conditions.				
Overall Efficiency	Number	Percentage			The pump and motor overall operational efficiency.				
Power	Number	Voltage			The actual power consumption of the pump.				
Pressure Rise	Number	PSI	Pa		The developed pressure.				
Rotation Speed	Number	RPM			Pump rotational speed.				
Temperature Range	Number	Degrees F	Degrees C		Allowable operational range of the fluid temperature.				
Sprinkler Head					**Device for sprinkling water from a pipe under pressure over an area (BS6100 100 3432)**	**IfcFireSuppressionTerminal**			
Sprinkler Type	Text				Identifies the predefined types of sprinkler from which the type required may be set.				
Activation	Text				Identifies the predefined methods of sprinkler activation				
Activation Temperature	Number	Degrees F	Degrees C		The temperature at which the object is designed to activate.				
Bulb Liquid Color	Text				The color of the liquid in the bulb for a bulb activated sprinkler				
Connection Size	Number	Inch	mm		Size of the inlet connection to the sprinkler.				
Coverage Area	Number	SF			The area that the sprinkler is designed to protect.				
Discharge Coefficient	Number	Kv or Cv			The coefficient of flow at the sprinkler.				
Discharge Flow Rate	Number	GPM			The volumetric rate of fluid discharge.				
Has Deflector	Logic			True or False	Indication of whether the sprinkler has a deflector (baffle) fitted to diffuse the discharge on activation (= TRUE) or not (= FALSE).				
Maximum Working Pressure	Number	PSI	Pa		Maximum pressure that the object is manufactured to withstand.				
Residual Flowing Pressure	Number	PSI	Pa		The residual flowing pressure in the pipeline at which the discharge flow rate is determined.				
Response	Text				Identifies the predefined methods of sprinkler response				
Tank					**A tank is a vessel or container in which a fluid or gas is stored for later use.**	**IfcTank**			
Tank Type	Text			Fuel, Oil, Water, Rain Water,	Identifies the predefined types of tank from which the type required may be set.				
Nominal Capacity	Number	Gallons	Liters		The total nominal or design volumetric capacity of the tank.				
Access Type	Text				Defines the types of access (or cover) to a tank				
Effective Capacity	Number	Gallons	Liters		The total effective or actual volumetric capacity of the tank.				
End Shape Type	Text				Defines the types of end shapes that can be used for preformed tanks				
First Curvature Radius	Number	Inch	mm		First Curvature Radius should be defined as the base or left side radius of curvature value.				
Has Ladder	Logic			True or False	Indication of whether the tank is provided with a ladder(TRUE) or no ladder(FALSE)				
Has Visual Indicator	Logic			True or False	Indication of whether the tank is provided with a visual indicator(TRUE) or no visual indicator(FALSE)				
Nominal Depth	Number	Inch	mm		The nominal depth of the tank				
Nominal Length Or Diameter	Number	Inch	mm		The nominal length or, in the case of a vertical cylindrical tank, the nominal diameter of the tank.				
Nominal Width Or Diameter	Number	Inch	mm		The nominal width or, in the case of a horizontal cylindrical tank, the nominal diameter of the tank. Note: Not required for				
Number Of Sections	Number	None			Number of sections used in the construction of the tank				
Operating Weight	Number	Lbs	Kgs		Operating weight of the tank including all of its contents.				
Pattern Type	Text				Defines the types of pattern (or shape of a tank) that may be specified.				
Second Curvature Radius	Number	Inch	mm		Second Curvature Radius should be defined as the top or right side radius of curvature value.				
Storage Type	Text				Defines the general material category intended to be stored.				
Tank Composition	Text			Complex, Element, Partial	Defines the level of element composition				
Expansion Tank					Specific Baseline Attributes of an expansion type tank.				
Charge Pressure	Number	PSI	Pa		Nominal or design operating pressure of the tank.				
Pressure Regulator Setting	Number	PSI	Pa		Pressure that is automatically maintained in the tank.				
Relief Valve Setting	Number	PSI	Pa		Pressure at which the relief valve activates.				
Pressure Vessel					Specific Baseline Attributes of a pressure vessel.				
Charge Pressure	Number	PSI	Pa		Nominal or design operating pressure of the tank.				
Pressure Regulator Setting	Number	PSI	Pa		Pressure that is automatically maintained in the tank.				
Relief Valve Setting	Number	PSI	Pa		Pressure at which the relief valve activates.				
Sectional Tank					Fixed vessel constructed from sectional parts with one or more compartments for storing a liquid.				
Number Of Sections	Number	None		1,2,3…	Number of sections used in the construction of the tank Note: All sections assumed to be the same size.				
Section Length	Number	Inch	mm		The length of a section used in the construction of the tank.				
Section Width	Number	Inch	mm		The width of a section used in the construction of the tank.				
Valve					**A valve is used in a building services piping distribution system to control or modulate the flow of the fluid.**	**IfcValve**			

	Valve Type	Text				Identifies the predefined types of valve from which the type required may be set.					
	Valve Operation	Text			Dropwight, Float, Hydraulic, lever, Lockshield, Motorized, Pneumatic, Solenoid, Spring, Thermostatic, Chainwheel	The method of valve operation					
	Body Material	Text				Material from which the body of the valve is constructed.					
	Close Off Rating	Number	PSI	Pa		Close off rating.					
	Flow Coefficient	Number	Kv or Cv			Flow coefficient (the quantity of fluid that passes through a fully open valve at unit pressure drop), typically expressed as					
	Measured Flow Rate	Number	GPM			The rate of flow of a fluid measured across the valve.					
	Measured Pressure Drop	Number	Kv or Cv			The actual pressure drop in the fluid measured across the valve.					
	Percentage Open	Number	None			The ratio between the amount that the valve is open to the full open position of the valve.					
	Size	Number	Inch	mm		The size of the connection to the valve (or to each connection for faucets, mixing valves, etc.).					
	Test Pressure	Number	PSI	Pa		The maximum pressure to which the valve has been subjected under test.					
	Valve Mechanism	Text			Ball, Butterfly, Gate, Globe, Gland, Plug, Needle	The mechanism by which the valve function					
	Valve Pattern	Text			2Way, 3 Way, 4 Way	The configuration of the ports of a valve					
	Working Pressure	Number	PSI	Pa		The normally expected maximum working pressure of the valve.					
	Air Vent					**Valve used to release air from a pipe or fitting. Note that an air release valve is constrained to have a single port pattern**					
	Is Automatic	Logic			True or False	Indication of whether the valve is automatically operated (TRUE) or manually operated (FALSE).					
	Faucet					**A small diameter valve, with a free outlet, from which water is drawn.**					
	Faucet Function	Number	Degrees F	Degrees C		Defines the operating temperature of a faucet that may be specified.					
	Faucet Operation	Text			CeramicDisc, LeverHandle,	Defines the range of ways in which a faucet can be operated					
	Faucet Top Description	Text				Description of the operating mechanism/top of the faucet.					
	Faucet Type	Text			Bib, Globe, Diverter,	Defines the range of faucet types					
	Finish	Text				Description of the finish applied to the faucet.					
	Flush Valve					**Valve that flushes a predetermined quantity of water to cleanse a WC, urinal or slop hopper. Note that a flushing valve is constrained to have a 2 port pattern.**					
	Flushing Rate	Number	GPF/LPH			The predetermined quantity of water to be flushed.					
	Has Integral Shut Off Device	Logic			True or False	Indication of whether the flushing valve has an integral shut off device fitted (set TRUE) or not (set FALSE).					
	Is High Pressure	Logic			True or False	Indication of whether the flushing valve is suitable for use on a high pressure water main (set TRUE) or not (set FALSE).					
	Gas Tap Valve					**A small diameter valve, used to discharge gas from a system.**					
	Has Hose Union	Logic			True or False	Indicates whether the gas tap is fitted with a hose union connection (= TRUE) or not (= FALSE).					
	Hose Bib					**A small diameter valve, used to drain water from a tank or water filled system.**					
	Has Hose Union	Logic			True or False	Indicates whether the drawoff cock is fitted with a hose union connection (= TRUE) or not (= FALSE).					
	Isolation Valve					**Valve that is used to isolate system components.**					
	Is Normally Open	Logic			True or False	If TRUE, the valve is normally open. If FALSE is normally closed.					
	Isolating Purpose	Text				Defines the purpose for which the isolating valve					
	Mixing Valve					**A valve where typically the temperature of the outlet is determined by mixing hot and cold water inlet flows.**					
	Mixer Control	Text				Defines the form of control of the mixing valve.					
	Outlet Connection Size	Number	Inch	mm		The size of the pipework connection from the mixing valve.					
	Pressure Reducing Valve					**Valve that reduces the pressure of a fluid immediately downstream of its position in a pipeline to a preselected value or by a predetermined ratio. Note that a pressure reducing valve is constrained to have a 2 port pattern.**					
	Downstream Pressure	Number	PSI	Pa		The operating pressure of the fluid downstream of the pressure reducing valve.					
	Upstream Pressure	Number	PSI	Pa		The operating pressure of the fluid upstream of the pressure reducing valve.					
	Pressure Relief Valve					**Spring or weight loaded valve that automatically discharges to a safe place fluid that has built up to excessive pressure in pipes or fittings. Note that a pressure relief valve is constrained to have a single port pattern.**					
	Relief Pressure	Number	PSI	Pa		The pressure at which the spring or weight in the valve is set to discharge fluid.					
Vibration Isolator						**A vibration isolator is a device used to minimize the effects of vibration transmissibility in a building**	**IfcVibrationIsolator**				
	Height	Number	Inch	mm		Height of the vibration isolator before the application of load.					
	Isolator Compressibility	Number	Inch	mm		The compressibility of the vibration isolator.					
	Isolator Static Deflection	Number	Inch	mm		Static deflection of the vibration isolator.					
	Maximum Supported Weight	Number	Lbs	Kgs		The maximum weight that can be carried by the vibration isolator.					
	Vibration Transmissibility	Number	Percentage			The vibration transmissibility percentage.					

ct-Specific Milestones										
LEED Cert. Check	LEED Cert Submittal									

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D- Fluid_Gas Distribution

Additional

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	IFC Name	COBie Tag	Part 3 - Example Project-Specific Milestones: Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
Part 1 - Attribute Description											
Global Attributes											
Target LOD	Text			100, 200, 300, 350, 400							
Current LOD	Text			100, 200, 300, 350, 400							
Item-Specific Attributes											
Pipe Flange						**IfcPipeSegment**					
Condition Status	Text			New, Existing, Demolish, Temporary, User Defined	Status of the element, predominately used in renovation or retrofitting projects						
Bolthole Pitch	Number	Inch	mm		Diameter of the circle along which the boltholes are placed.						
Bolt Size	Number	Inch	mm		Size of the bolts securing the flange.						
Bore Size	Number	Inch	mm		The nominal bore of the pipe flange.						
Flange Diameter	Number	Inch	mm		Overall diameter of the flange.						
Flange Standard					Designation of the standard describing the flange table.						
Flange Table					Designation of the standard table to which the flange conforms.						
Flange Thickness	Number	Inch	mm		Thickness of the material from which the pipe bend is constructed.						
Number Of Bolt holes	Number				Number of boltholes in the flange.						
Pipe Fitting						**IfcPipeFitting**					
Condition Status	Text			New, Existing, Demolish, Temporary, User Defined	Status of the element, predominately used in renovation or retrofitting projects						
Color					The color of the pipe segment						
Flowrate Leakage					Leakage flowrate versus pressure difference.						
Interior Roughness Coefficient					The interior roughness coefficient of the pipe segment.						
Loss Coefficient					Dimensionless loss coefficient used for calculating fluid resistance						
Temperature Range					Allowable maximum and minimum temperature.						
Bend Attributes					**Pipe fitting type attributes for bend shapes.**						
Bend Angle	Number	Degrees			The change of direction of flow.						
Bend Radius	Number	Inch	mm		The radius of bending if circular arc or zero if sharp bend.						
Fitting Loss Factor					A factor that determines the pressure loss due to friction through the fitting.						
Pressure Class	Text				The test or rated pressure classification of the fitting.						
Pressure Range	Text				Allowable maximum and minimum working pressure						
Tee/Cross Attributes					**Pipe fitting type attributes for junction shapes.**						
Junction Left Angle	Number	Degrees			The change of direction of flow for the left junction.						
Junction Left Radius	Number	Inch	mm		The radius of bending for the left junction.						
Junction Right Angle	Number	Degrees			The change of direction of flow for the right junction where 0 indicates straight segment.						
Junction Right Radius	Number	Inch	mm		The radius of bending for the right junction where 0 indicates sharp bend.						
Junction Type	Text			Tee, Cross	The type of junction						
Pipe						**IfcPipeSegment**					
Condition Status	Text			New, Existing, Demolish, Temporary, User Defined	Status of the element, predominately used in renovation or retrofitting projects						
Color					The color of the pipe segment.						
Fluid Flow Leakage					Volumetric leakage flow rate.						
Gradient	Number	None			The gradient of the pipe segment.						
Inner Diameter	Number	Inch	mm		The actual inner diameter of the pipe.						
Interior Roughness Coefficient	Number	Kv or Cv			The interior roughness coefficient of the pipe segment.						
Invert Elevation	Number	Inch	mm		The invert elevation relative to the datum established for the project.						
Leakage Curve	Number	Kv or Cv			Leakage per unit length curve versus working pressure.						
Nominal Diameter	Number	Inch	mm		The nominal diameter of the pipe segment.						
Outer Diameter	Number	Inch	mm		The actual outer diameter of the pipe.						
Pressure Range	Number	PSI/Pa	Pa		Allowable maximum and minimum working pressure (relative to ambient pressure).						
Temperature Range	Number	Degrees F/C			Allowable maximum and minimum temperature.						
Working Pressure	Number	PSI/Pa	Pa		Working pressure.						

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D50 - Electrical

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	IFC Name	COBie Tag	Part 3 - Example Proje: Estimating Est. 1	Estimating Bid Pkg.
Part 1 - Attribute Description									
Global Attributes									
Component ID	Text				Part or Equipment Tag				
Condition Status	Text			New, Existing, Demolish, Temporary, User Defined	Status of the element, predominately used in renovation or retrofitting projects				
Room Number	Text				Room number where component **to be**/is installed				
Room Name	Text				Room name where component **to be**/is installed				
Story Number	Text				Floor or level room is located				
Manufacturer Name	Text				The organization that manufactured and/or assembled the item.				
Product Name	Text				The manufacturers model name of the product model (or product line)				
Model Designation	Text				The manufacturers model number or designator of the product model (or product line)				
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Component characteristics					**Properties of individual elements of manufactured products**				
Acquisition Date	Date Time	Date			The date that the manufactured item was purchased.				
Assembly Place	Text				Code defining where the assembly takes place				
Bar Code	Text				The identity of the bar code given to an occurrence of the product.				
Batch Reference	Text				The identity of the batch reference from which an occurrence of a product is taken.				
Production Year	Number	Year			The year of production of the manufactured item.				
Serial Number	Text				The serial number assigned to an occurrence of a product.				
Design Performance									
Service Life					**Captures the period of time that an artifact will last.**				
Mean Time Between Failure	Number	Days			The average time duration between instances of failure of a product.				
Service Life Duration	Number	Year(s)			The length or duration of a service life.				
Service Life Factors	Text				Captures various factors that impact the expected service life of elements within the system or zone.				
Design Level	Text				Adjustment of the service life resulting from the effect of design level employed.				
Indoor Environment	Text				Adjustment of the service life resulting from the effect of the indoor environment (where appropriate).				
In Use Conditions	Text				Adjustment of the service life resulting from the effect of the conditions in which components are operating.				
Maintenance Level	Text				Adjustment of the service life resulting from the effect of the level or degree of maintenance applied to components.				
Outdoor Environment	Text				Adjustment of the service life resulting from the effect of the outdoor environment (where appropriate)				
Quality Of Components	Text				Adjustment of the service life resulting from the effect of the quality of components used.				
Work Execution Level	Text				Adjustment of the service life resulting from the effect of the quality of work executed.				
Warranty					**A written guarantee, issued to the purchaser of an article by its manufacturer, promising to repair or replace it if necessary within a specified period of time**				
Exclusions	Text				Items, conditions or actions that may be excluded from the warranty or that may cause the warranty to become void.				
Is Extended Warranty	Logical			True or False	Indication of whether this is an extended warranty whose duration is greater than that normally assigned				
Point Of Contact	Text				The organization that should be contacted for action under the terms of the warranty.				
Warranty Content	Text				The content of the warranty.				
Warranty End Date	Date Time	Date			The date on which the warranty expires.				
Warranty Identifier	Text				The identifier assigned to a warranty.				
Warranty Period	Number	Year(s)			The time duration during which a manufacturer or supplier guarantees or warrants the performance of an artefact.				
Warranty Start Date	Date Time	Date			The date on which the warranty commences.				
Electrical Properties					**Common electrical properties for a device**				
Current	Number	Amps			The current that a device is designed to handle.				
Grounded	Logical			True or False	Indicates whether the electrical device has a protective earth connection				
Insulation Class	Text				Insulation standard classes provides basic protection information against electric shock.				
Enclosure Classification	Text				IEC 60529 Classification of degrees of protection provided by enclosures (IP Code).				
Frequency	Number	Hertz			The upper and lower limits of frequency for which the operation of the device is certified.				
Line Conductor	Text			By color: Red, Blue, Yellow or by number 1, 2, 3, etc.	Function of a line conductor to which a device is intended to be connected where L1, L2 and L3 represent the phase lines according to IEC 60446 notation				
Phase	Number			Single or Three	The number of live lines that is intended to be handled by the device.				
Power Factor	Number	None			The ratio between the rated electrical power and the product of the device's rated current and rated voltage				
Amp					The current that a device is designed to handle.				
Voltage					The voltage that a device is designed to handle.				

Item-Specific Attributes										
Battery					**A device for storing energy in chemical form so that it can be released as electrical energy.**	**IfcBattery**				
Battery Type	Text				The property enumeration defines the types of battery that may be specified within the property set.					
Connected Conductor Function	Text				Function of the conductors to which the load is connected.					
Earth Fault1 Pole Maximum State	Number	Amps			Maximum 1 pole earth fault current provided at the point of supply i.e. the fault between 1 phase and PE/PEN.					
Earth Fault1 Pole Minimum State	Number	Amps			Minimum 1 pole earth fault current provided at the point of supply i.e. the fault between 1 phase and PE/PEN.					
Earth Fault1 Pole Power Factor Maximum State	Number	Amps			Power factor of the maximum 1 pole earth fault current provided at the point of supply i.e. the fault between 1 phase and PE/PEN.					
Earth Fault1 Pole Power Factor Minimum State	Number	Amps			Power factor of the minimum 1 pole earth fault current provided at the point of supply i.e. the fault between 1 phase and PE/PEN.					
Nominal Frequency	Number	Hertz			The nominal frequency of the supply.					
Nominal Supply Voltage	Number	Volts			The nominal voltage of the supply.					
Nominal Supply Voltage Offset	Number	Volts			The maximum and minimum allowed voltage of the supply e.g. boundaries of 380V/440V may be applied for a nominal voltage of 400V.					
Short Circuit1 Pole Maximum State	Number	Amps			Maximum 1 pole short circuit current provided at the point of supply i.e. the fault between 1 phase and N.					
Short Circuit1 Pole Minimum State	Number	Amps			Minimum 1 pole short circuit current provided at the point of supply i.e. the fault between 1 phase and N.					
Short Circuit1 Pole Power Factor Maximum State	Number	PF			Power factor of the maximum 1 pole short circuit current provided at the point of supply i.e. the fault between 1 phase and N.					
Short Circuit1 Pole Power Factor Minimum State	Number	PF			Power factor of the minimum 1 pole short circuit current provided at the point of supply i.e. the fault between 1 phase and N.					
Short Circuit2 Pole Minimum State	Number	Amps			Minimum 2 pole short circuit current provided at the point of supply.					
Short Circuit2 Pole Power Factor Minimum State	Number	PF			Power factor of the minimum 2 pole short circuit current provided at the point of supply.					
Short Circuit3 Pole Maximum State	Number	Amps			Maximum 3 pole short circuit current provided at the point of supply.					
Short Circuit3 Pole Power Factor Maximum State	Number	PF			Power factor of the maximum 3 pole short circuit current provided at the point of supply.					
Breaker					**A protective device tripping unit breaks an electrical circuit at a separate breaking unit when a stated electric current that passes through the unit is exceeded**	**IfcProtectiveDevice**				
Breaker Type	Text				The property enumeration defines the types of breaker that may be specified within the property set.					
Atex Verified	Logical			True or False	An indication whether the tripping_unit is verified to be applied in EX-environment or not.					
Limiting Terminal Size	Text	Circular Mils (KCM)			The maximum terminal size capacity of the device.					
Old Device	Logical			True or False	Indication whether the protection_ unit is out-dated or not. If not out-dated, the device is still for sale.					
Standard	Text				The designation of the standard applicable for the definition of the characteristics of the tripping_unit.					
Use In Discrimination	Logical			True or False	An indication whether the time/current tripping information can be applied in a discrimination analysis or not.					
Curve					A coherent set of attributes representing a curve for let-through energy of a protective device.					
Breaker Unit Curve	Number, 2-16 digits, Cartesian Coord Set	Amps			A curve that establishes the let through energy of a breaker unit when a particular prospective current is applied.					
Nominal Current	Number	Amps			A set of nominal currents in [A] for which the data of this instance is valid.					
Voltage Level	Number	Volts			The voltage levels of the protective device for which the data of the instance is valid.					
Fuse Curve					A coherent set of attributes representing curves for melting- and breaking-energy of a fuse.					
Breaker Unit Fuse Breaking Curve	Number, 2-8 digits, Cartesian Coord Set	Amps			The let through breaking energy of a breaker unit when a particular prospective breaking current is applied.					
Breaker Unit Fuse Melting Curve	Number, 2-8 digits, Cartesian Coord Set	Amps			A curve that establishes the energy required to melt the fuse of a breaker unit when a particular prospective melting current is applied.					
Voltage Level	Number	Volts			The voltage levels of the fuse for which the data of the instance is valid. More than one value may be selected in the enumeration.					
IPI Curve					A coherent set of attributes representing curves for let-through currents of a protective device.					
Breaker Unit I P I Curve	Number, 2-16 digits, Cartesian Coord Set	Amps			The let through peak current of a breaker unit when a particular prospective current is applied.					
Nominal Current	Number	Amps			A set of nominal currents in [A] for which the data of this instance is valid. At least one value shall be provided.					
Voltage Level	Number	Volts			The voltage level of the protective device for which the data of the instance is valid. More than one value may be selected in the enumeration.					
Breaker Capacity					A coherent set of attributes representing the breaking capacities of an MCB.					
I C N60898	Number	Amps			The nominal breaking capacity in [A] for an MCB tested in accordance with the IEC 60898 series.					
I C S60898	Number	Amps			The service breaking capacity in [A] for an MCB tested in accordance with the IEC 60898 series.					

	I C S60947	Number	Amps			The service breaking capacity in [A] for an MCB tested in accordance with the IEC 60947 series.					
	I C U60947	Number	Amps			The ultimate breaking capacity in [A] for an MCB tested in accordance with the IEC 60947 series.					
	Nominal Currents	Number	Amps			A set of nominal currents in [A] for which the data of this instance is valid. At least one value shall be provided.					
	Power Loss	Number	Watts			The power loss in [W] per pole of the MCB when the nominal current is flowing through the MCB.					
	Voltage Level	Number	Volts			The voltage levels for which the data of the instance is valid. More than one value may be selected in the enumeration.					
Motor Protection						A coherent set of attributes representing different capacities of a a motor protection device, defined in accordance with IEC 60947.					
	I C M60947	Number	Amps			The making capacity in [A] for a circuit breaker or motor protection device tested in accordance with the IEC 60947 series.					
	I C S60947	Number	Amps			The service breaking capacity in [A] for a circuit breaker or motor protection device tested in accordance with the IEC 60947 series.					
	I C U60947	Number	Amps			The ultimate breaking capacity in [A] for a circuit breaker or motor protection device tested in accordance with the IEC 60947 series.					
	I C W60947	Number	Amps			The thermal withstand current in [A] for a circuit breaker or motor protection device tested in accordance with the IEC 60947 series. The value shall be related to 1 s.					
	Performance Classes	Text			B, C, N, S, H, L, V	A set of designations of performance classes for the breaker unit for which the data of this instance is valid.					
	Voltage Level	Number	Volts			The voltage levels for which the data of the instance is valid. More than one value may be selected in the enumeration.					
Characteristics						Properties that are applied to an occurrence of a protective device.					
	Ground Fault Current Set Value	Number	Amps			Ground fault current set value. The set value of the ground tripping current if adjustable.					
	Ground Fault Function	Logical			True or False	A flag indicating that the ground fault function of the device is used.					
	Ground Faulti2t Function	Logical			True or False	A flag indicating that the I2t ground fault function of the device is used.					
	Ground Fault Tripping Time	Number	Seconds			Ground fault tripping time. The set value of the ground fault tripping current if adjustable.					
	Instantaneous Current Set Value	Number	Amps			Instantaneous current set value. The set value of the instantaneous tripping current if adjustable.					
	Instantaneous Tripping Time	Number	Seconds			Instantaneous tripping time. The set value of the instantaneous tripping time if adjustable.					
	Long Time Current Set Value	Number	Amps			Long time current set value. The set value of the long time tripping current if adjustable.					
	Long Time Delay	Number	Seconds			Long time delay. The set value of the long time time-delay if adjustable.					
	Long Time Function	Logical			True or False	A flag indicating that the long time function (i.e. the thermal tripping) of the device is used.					
	Pole Usage	Number			1,3	Pole usage.					
	Short Time Current Set Value	Number	Amps			Short time current set value. The set value of the long time tripping current if adjustable.					
	Short Time Function	Logical			True or False	A flag indicating that the short time function of the device is used.					
	Short Timei2t Function	Logical			True or False	A flag indicating that the I2t short time function of the device is used.					
	Short Time Tripping Time	Number	Seconds			Short time tripping time. The set value of the short time tripping time if adjustable.					
Trip Curve						Tripping curves are applied to thermal, thermal magnetic or MCB_RCD tripping units (i.e. tripping units having type property sets for thermal, thermal magnetic or MCB_RCD tripping defined). They are not applied to electronic tripping units.					
	Tripping Curve	Number, 2-16 digits, Cartesian Coord Set	Amps			A curve that establishes the release time of a tripping unit when a particular prospective current is applied.					
	Tripping Curve Type	Text				The type of tripping curve that is represented by the property set.					
G Curve						Tripping functions are applied to electronic tripping units (i.e. tripping units having type property sets for electronic tripping defined). They are not applied to thermal, thermal magnetic or RCD tripping units.					
	Current Tolerance1	Number	Percentage			The tolerance for the current of time/current-curve in [%].					
	Current Tolerance2	Number	Percentage			The tolerance for the current of time/current-curve in [%] valid for times above CurrentTolereanceLimit1.					
	Current Tolerance Limit1	Number	Seconds			The time limit in [s] limiting the application of CurrentTolerance1, if any. If the value is set to 0, the value of the CurrentTolerance1 is valid for the whole time/current-curve.					
	External Adjusted	Logical			True or False	An indication if the ground fault protection may be adjusted according to an external current coil or not.					
	Is Current Tolerance Positive Only	Logical			True or False	Indication whether the value of CurrentTolerance1 is provided as a positive tolerance only or not. If not, the value is proved as a plus/minus tolerance.					
	Is Selectable	Logical			True or False	Indication whether the S-function can be switched off or not.					
	Is Time Tolerance Positive Only	Logical			True or False	Indication whether the value of TimeTolerance1 is provided as a positive tolerance only or not. If not, the value is proved as a plus/minus tolerance.					
	Nominal Current Adjusted	Logical			True or False	An indication if the tripping currents of the short time protection is related to the nominal current multiplied with the actual setting of the current adjustment, if any, of the long time protection part of the protective device, or not.					
	Release Current	Number	Amps			The release current in [x In] for the initial tripping of the S-function.					
	Release Current I2t End	Number	Amps			The release current in [x In] for the end point of the I2t tripping curve of the G-function, if any. The value of ReleaseCurrentI2tEnd shall be larger than ReleaseCurrentI2tStart.					
	Release Current I2t Start	Number	Amps			The release current in [x In] for the start point of the I2t tripping curve of the G-function, if any.					
	Release Time	Number	Seconds			The release time in [s] for the initial tripping of the relevant part. This time indicates that for current lower than the indicated release current, the tripping time will be longer than the indicated release time. The value is given as a mean value.					
	Release Time I2t End	Number	Seconds			The release time in [s] for the end point of the I2 tripping curve of the G-function, if any. The value of ReleaseTimeI2tEnd shall be lower than ReleaseTimeI2tStart.					

	Release Time I2t Start	Number	Seconds			The release time in [s] for the start point of the I2t tripping curve of the G-function, if any.					
	Time Tolerance1	Number	Percentage			The tolerance for the time of time/current-curve in [%].					
	Time Tolerance2	Number	Percentage			The tolerance for the time of the time/current-curve in [%] valid for currents above TimeToleranceLimit1.					
	Time Tolerance Limit1	Number	Amps			The current limit in [x In] limiting the application of TimeTolerance1, if any. If the value is set to 0, the value of the TimeTolerance1 is valid for the whole time/current-curve.					
I Curve						Tripping functions are applied to electronic tripping units (i.e. tripping units having type property sets for electronic tripping defined). They are not applied to thermal, thermal magnetic or RCD tripping units. This property set represent the instantaneous time protection (I-curve) of an electronic protection device.					
	Current Tolerance1	Number	Percentage			The tolerance for the current of time/current-curve in [%].					
	Current Tolerance2	Number	Percentage			The tolerance for the current of time/current-curve in [%] valid for times above CurrentTolereanceLimit1.					
	Current Tolerance Limit1	Number	Seconds			The time limit in [s] limiting the application of CurrentTolerance1, if any. If the value is set to 0, the value of the CurrentTolerance1 is valid for the whole time/current-curve.					
	Is Current Tolerance Positive Only	Logical			True or False	Indication whether the value of CurrentTolerance1 is provided as a positive tolerance only or not. If not, the value is proved as a plus/minus tolerance.					
	Is Off When S Function On	Logical			True or False	Indication whether the I-function is automatically switched off when the S-function is switched on.					
	Is Selectable	Logical			True or False	Indication whether the S-function can be switched off or not.					
	Is Time Tolerance Positive Only	Logical			True or False	Indication whether the value of TimeTolerance1 is provided as a positive tolerance only or not. If not, the value is proved as a plus/minus tolerance.					
	Max Adjustment X_ I C S	Number	Amps			Provides the maximum setting value for the available current adjustment in relation to the Ics breaking capacity of the protection device of which the actual tripping unit is a part of.					
	Nominal Current Adjusted	Logical			True or False	An indication if the tripping currents of the short time protection is related to the nominal current multiplied with the actual setting of the current adjustment, if any, of the long time protection part of the protective device, or not.					
	Release Current	Number	Amps			The release current in [x In] for the initial tripping of the S-function.					
	Release Time	Number	Seconds			The release time in [s] for the initial tripping of the relevant part.					
	Time Tolerance1	Number	Percentage			The tolerance for the time of time/current-curve in [%].					
	Time Tolerance2	Number	Percentage			The tolerance for the time of the time/current-curve in [%] valid for currents above TimeToleranceLimit1.					
	Time Tolerance Limit1	Number	Amps			The current limit in [x In] limiting the application of TimeTolerance1, if any. If the value is set to 0, the value of the TimeTolerance1 is valid for the whole time/current-curve.					
L Curve						Tripping functions are applied to electronic tripping units (i.e. tripping units having type property sets for electronic tripping defined). They are not applied to thermal, thermal magnetic or RCD tripping units. This property set represent the long time protection (L-curve) of an electronic protection device					
	Is Selectable	Logical			True or False	Indication whether the L-function can be switched off or not.					
	Lower Current1	Number	Amps			The current in [x In], indicating that for currents smaller than LowerCurrent1 the I2t part of the L-function will not trip the current,					
	Lower Current2	Number	Amps			The current in [x In], indicating the upper current limit of the lower time/current curve of the I2t part of the L-function.					
	Lower Time1	Number	Seconds			The time in [s], indicating that tripping times of the lower time/current curve lower than LowerTime1 is determined by the I2t part of the L-function.					
	Lower Time2	Number	Seconds			The time in [s], indicating the tripping times of the upper time/current curve at the LowerCurrent2.					
	Upper Current1	Number	Amps			The current in [x In], indicating that for currents larger than UpperCurrent1 the I2t part of the L-function will trip the current.					
	Upper Current2	Number	Amps			The current in [x In], indicating the upper current limit of the upper time/current curve of the I2t part of the L-function.					
	Upper Time1	Number	Seconds			The time in [s], indicating that tripping times of the upper time/current curve lower than UpperTime1 is determined by the I2t part of the L-function.					
	Upper Time2	Number	Seconds			The time in [s], indicating the tripping times of the upper time/current curve at the UpperCurrent2.					
S Curve						Tripping functions are applied to electronic tripping units (i.e. tripping units having type property sets for electronic tripping defined). They are not applied to thermal, thermal magnetic or RCD tripping units. This property set represent the short time protection (S-curve) of an electronic protection device.					
	Current Tolerance1	Number	Percentage			The tolerance for the current of time/current-curve in [%].					
	Current Tolerance2	Number	Percentage			The tolerance for the current of time/current-curve in [%] valid for times above CurrentTolereanceLimit1.					
	Current Tolerance Limit1	Number	Seconds			The time limit in [s] limiting the application of CurrentTolerance1, if any. If the value is set to 0, the value of the CurrentTolerance1 is valid for the whole time/current-curve.					
	Is Current Tolerance Positive Only	Logical			True or False	Indication whether the value of CurrentTolerance1 is provided as a positive tolerance only or not. If not, the value is proved as a plus/minus tolerance.					
	Is Off When Lfunction On	Logical			True or False	Indication whether the S-function is automatically switched off when the I-function is switched on.					
	Is Selectable	Logical			True or False	Indication whether the S-function can be switched off or not.					
	Is Time Tolerance Positive Only	Logical			True or False	Indication whether the value of TimeTolerance1 is provided as a positive tolerance only or not. If not, the value is proved as a plus/minus tolerance.					
	Nominal Current Adjusted	Logical			True or False	An indication if the tripping currents of the short time protection is related to the nominal current multiplied with the actual setting of the current adjustment, if any, of the long time protection part of the protective device, or not.					
	Release Current	Number	Amps			The release current in [x In] for the initial tripping of the S-function.					
	Release Current I2t End	Number	Amps			The release current in [x In] for the end point of the I2t tripping curve of the S-function, if any. The value of ReleaseCurrentI2tEnd shall be larger than ReleaseCurrentI2tStart.					
	Release Current I2t Start	Number	Amps			The release current in [x In] for the start point of the I2t tripping curve of the S-function, if any.					

		Release Time	Number	Seconds			The release time in [s] for the initial tripping of the relevant part. This time indicates that for current lower than the indicated release current, the tripping time will be longer than the indicated release time. The value is given as a mean value.				
		Release Time I2t End	Number	Seconds			The release time in [s] for the end point of the I2 tripping curve of the S-function, if any. The value of ReleaseTimeI2tEnd shall be lower than ReleaseTimeI2tStart.				
		Release Time I2t Start	Number	Seconds			The release time in [s] for the start point of the I2t tripping curve of the S-function, if any				
		Time Tolerance1	Number	Percentage			The tolerance for the time of time/current-curve in [%].				
		Time Tolerance2	Number	Percentage			The tolerance for the time of the time/current-curve in [%] valid for currents above TimeToleranceLimit1.				
		Time Tolerance Limit1	Number	Amps			The current limit in [x In] limiting the application of TimeTolerance1, if any. If the value is set to 0, the value of the TimeTolerance1 is valid for the whole time/current-curve.				
	Current Adjustment Values						A set of current adjustment values that may be applied to an electronic or thermal tripping unit type.				
		Adjustment Designation	Text				The designation on the device for the adjustment.				
		Adjustment Range	Number	Amps			Upper and lower current adjustment limits for an AdjustmentValueType = RANGE. Note that this property should not have a value for an AdjustmentValueType = LIST.				
		Adjustment Range Step Value	Number	Amps			Step value of current adjustment for an AdjustmentValueType = RANGE. Note that this property should not have a value for an AdjustmentValueType = LIST.				
		Adjustment Values	Number	Amps			A list of current adjustment values that may be applied to a tripping unit for an AdjustmentValueType = LIST.				
		Adjustment Value Type	Text				The type of adjustment value that is applied through the property set. This determines the properties that should be asserted.				
	Time Adjustment Values						A set of time adjustment values that may be applied to an electronic or thermal tripping unit type.				
		Adjustment Designation	Text				The designation on the device for the adjustment.				
		Adjustment Range	Number	Seconds			Upper and lower time adjustment limits for an AdjustmentValueType = RANGE				
		Adjustment Range Step Value	Number	Seconds			Step value of time adjustment for an AdjustmentValueType = RANGE				
		Adjustment Values	Number	Seconds			A list of time adjustment values that may be applied to a tripping unit for an AdjustmentValueType = LIST.				
		Adjustment Value Type	Text				The type of adjustment value that is applied through the property set				
		Current For Time Delay	Number	Amps			The tripping current in [x In] at which the time delay is specified				
		I2 T Applicability	Logical			True or False	The applicability of the time adjustment related to the tripping function.				
	Electro Magnetic Type						Information on tripping units that are electrically or magnetically tripped.				
		Curve Designation	Text				The designation of the trippingcurve given by the manufacturer				
		Defined Temperature	Number	Degrees F/C			The ambient temperature at which the thermal current/time-curve associated with this protection device is defined.				
		Electro Magnetic Tripping Unit Type	Text			Overload, none special, short circuit, motor protection and bi-metal tripping	A list of the available types of electric magnetic tripping unit from which that required may be selected.				
		I1	Number	Amps			The (thermal) lower testing current limit in [x In], indicating that for currents lower than I1, the tripping time shall be longer than the associated tripping time, T2.				
		I2	Number	Amps			The (thermal) upper testing current limit in [x In], indicating that for currents larger than I2, the tripping time shall be shorter than the associated tripping time, T2.				
		I4	Number	Amps			The lower electromagnetic testing current limit in [x In], indicating that for currents lower than I4, the tripping time shall be longer than the associated tripping time, T5, i.e. the device shall not trip instantaneous.				
		I5	Number	Amps			The upper electromagnetic testing current limit in [x In], indicating that for currents larger than I5, the tripping time shall be shorter than or equal to the associated tripping time, T5, i.e. the device shall trip instantaneous.				
		T2	Number	Seconds			The (thermal) testing time in [s] associated with the testing currents I1 and I2.				
		T5	Number	Seconds			The electromagnetic testing time in [s] associated with the testing currents I4 and I5, i.e. electromagnetic tripping time				
		Temperature Factor	Text				The correction factor (typically measured as %/deg K) for adjusting the thermal current/time to an ambient temperature different from the value given by the defined temperature.				
	Electronic Type						Information on tripping units that are electronically tripped.				
		Electronic Tripping Unit Type	Text				A list of the available types of electronic tripping unit from which that required may be selected.				
		N_ Protection	Logical			True or False	An indication whether the electronic tripping unit has separate protection for the N conductor, or not.				
		N_ Protection_100	Logical			True or False	An indication whether the electronic tripping unit is tripping if the current in the N conductor is more than 100% of that of the phase conductors.				
		N_ Protection_50	Logical			True or False	An indication whether the electronic tripping unit is tripping if the current in the N conductor is more than 50% of that of the phase conductors.				
		N_ Protection_ Select	Logical			True or False	An indication whether the use of the N_Protection can be selected by the user or not.				
		Nominal Currents	Number				A set of values providing information on available modules (chips) for setting the nominal current of the protective device.				
	Residual Current						Information on tripping units that are activated by residual current.				
		Tripping Unit Release Current	Number	mA			The value of tripping or residual current for which the device has the possibility to be equipped. The values are given in mA.				
	Thermal Type						Information on tripping units that are thermally tripped.				
		Curve Designation	Text				The designation of the trippingcurve given by the manufacturer. For a MCB the designation should be in accordance with the designations given in IEC 60898.				
		Defined Temperature	Number	Degrees C			The ambient temperature at which the thermal current/time-curve associated with this protection device is defined.				

I1	Number	Amps			The (thermal) lower testing current limit in [x In], indicating that for currents lower than I1, the tripping time shall be longer than the associated tripping time, T2.				
I2	Number	Amps			The (thermal) upper testing current limit in [x In], indicating that for currents larger than I2, the tripping time shall be shorter than the associated tripping time, T2.				
T2	Number	Seconds			The (thermal) testing time in [s] associated with the testing currents I1 and I2.				
Temperature Factor	Text				The correction factor (typically measured as %/deg K) for adjusting the thermal current/time to an ambient temperature different from the value given by the defined temperature.				
Thermal Tripping Unit Type	Text				A list of the available types of thermal tripping unit from which that required may be selected.				
Circuit Breaker Type					A coherent set of attributes representing different capacities of a circuit breaker or of a motor protection device, defined in accordance with IEC 60947.				
I C M60947	Number	Amps			The making capacity in [A] for a circuit breaker or motor protection device tested in accordance with the IEC 60947 series.				
I C S60947	Number	Amps			The service breaking capacity in [A] for a circuit breaker or motor protection device tested in accordance with the IEC 60947 series.				
I C U60947	Number	Amps			The ultimate breaking capacity in [A] for a circuit breaker or motor protection device tested in accordance with the IEC 60947 series.				
I C W60947	Number	Amps			The thermal withstand current in [A] for a circuit breaker or motor protection device tested in accordance with the IEC 60947 series. The value shall be related to 1 s.				
Performance Classes	Text			B, C, N, S, H, L, V	A set of designations of performance classes for the breaker unit for which the data of this instance is valid.				
Voltage Level	Number	Volts			The voltage levels for which the data of the instance is valid. More than one value may be selected in the enumeration.				
Ground Fault Type					An earth failure device acts to protect people and equipment from the effects of current leakage.				
Earth Failure Device Type	Text				A list of the available types of circuit breaker from which that required may be selected				
Sensitivity	Number	Amps (RMS)			The rated rms value of the vector sum of the instantaneous currents flowing in the main circuits of the device which causes the device to operate under specified conditions.				
Fuse Disconnect Type					A coherent set of attributes representing the breaking capacity of a fuse, defined in accordance with IEC 60269.				
Fuse Disconnector Type	Text			EngineProtectionDevice, FuseSwitchDisconnector, HRC, OverloadProtectionDevice, SemiconductorFuse, SwitchDisconnectorFuse	A list of the available types of fuse disconnector from which that required may be selected				
I C60269	Number	Amps			The breaking capacity in [A] for fuses in accordance with the IEC 60269 series.				
Power Loss	Number	Watts			The power loss in [W] of the fuse when the nominal current is flowing through the fuse.				
Voltage Level	Number	Volts			The voltage levels for which the data of the instance is valid. More than one value may be selected in the enumeration.				
Current Circuit Breaker					A residual current circuit breaker opens, closes or isolates a circuit and has short circuit and overload protection.				
Sensitivity	Number	Amps			Current leakage to an unwanted leading path during normal operation (IEC 151-14-49).				
Current Switch					A residual current switch opens, closes or isolates a circuit and has no short circuit or overload protection.				
Sensitivity	Number	Amps			Current leakage to an unwanted leading path during normal operation (IEC 151-14-49).				
Variable Resistor					A high voltage surge protection device.				
Varistor Type	Text				A list of the available types of varistor from which that required may be selected.				
Distribution Board					**A distribution board is a flow controller in which instances of electrical devices are brought together at a single place for a particular purpose.**	**IfcElectricDistributionBoard**			
Main or Sub Main	Logical			True or False	Identifies if the current instance is a main distribution point or topmost level in an electrical distribution hierarchy				
Requires Qualifies Operator	Logical			True or False	Identifies if the current instance requires a skilled person or instructed person to perform operations on the distribution board				
Electrical Appliance					**Common properties for electric appliances**	**IfcElectricAppliance**			
Power Status	Logical			True or False	Indicates the power state of the device where True is on and False is off.				
Electric Motor					**Defines a particular type of machine for converting mechanical energy into electrical energy.**	**IfcElectricMotor**			
Motor Type	Text				The property enumeration defines the types of motor that may be specified within the property set.				
Electric Motor Efficiency	Number	Ratio			The ratio of output capacity to intake capacity.				
Frame Size	Text			B, C, D	Designation of the frame size according to the named range of frame sizes				
Has Part Winding	Logical			True or False	Indication of whether the motor is single speed, i.e. has a single winding				
Is Guarded	Logical			True or False	Indication of whether the motor enclosure is guarded				
Locked Rotor Current	Number	Amps			Input current when a motor armature is energized but not rotating.				
Maximum Power Output	Number	KW			The maximum output power rating of the engine.				
Motor Enclosure Type	Text			ODP, TEFC, TENV	A list of the available types of motor enclosure from which that required may be selected.				
Start Current Factor	Number				StartCurrentFactor is multiplied to NominalCurrent and to give the start current.				
Starting Time	Number	Seconds			The time (in s) needed for the motor to reach its rated speed with its driven equipment attached, starting from standstill and at the nominal voltage applied at its terminals.				
Te Time	Number	Seconds			The maximum time (in s) at which the motor could run with locked rotor when the motor is used in an EX-environment.				
Generator					**Defines a particular type of machine for converting mechanical energy into electrical energy.**	**IfcElectricGenerator**			

	Generator Type	Text				The property enumeration defines the types of generator that may be specified within the property set.					
	Electric Generator Efficiency	Number	Ratio			The ratio of output capacity to intake capacity.					
	Maximum Power Output	Number	KW			The maximum output power rating of the engine.					
	Start Current Factor	Number				StartCurrentFactor is multiplied to NominalCurrent and we get the start current.					
Junction Box						**Contains cables, outlets, and/or switches for electrical power.**	**IfcJunctionBox**				
	Junction Box Type	Text				The property enumeration defines the types of junction box that may be specified within the property set.					
	Clear Depth	Number	Inch/mm			Clear unobstructed depth available for cable inclusion within the junction box.					
	I P_ Code	Text				IEC 60529 (1989) Classification of degrees of protection provided by enclosures (IP Code).					
	Is External	Logical			True or False	Indication of whether the junction box type is allowed for exposure to outdoor elements					
	Mounting Type	Text			Surface, Flush	Method of mounting to be adopted for the type of junction box.					
	Number Of Gangs	Number			1,2,3,4	Number of slots available for switches/outlets (most commonly 1, 2, 3, or 4).					
	Placing Type	Text				Location at which the type of junction box can be located.					
	Shape Type	Text			Square, Round	Shape of the junction box.					
Lamp						**A lamp is an artificial light source such as a light bulb or tube.**	**IfcLamp**				
	Lamp Box Type	Text				The property enumeration defines the types of lamp that may be specified within the property set.					
	Color Appearance	Number				In both the DIN and CIE standards, artificial light sources are classified in terms of their color appearance.					
	Color Rendering Index	Number	CRI		1-100	The CRI indicates how well a light source renders eight standard colors compared to perfect reference lamp with the same color temperature.					
	Color Temperature	Number	Kelvin		3000-4100	The color temperatures of the commonest artificial light sources range from less than 3000K (warm white) to 4000K (intermediate) and over 5000K (daylight).					
	Contributed Luminous Flux	Number	Lumens			Luminous flux is a photometric measure of radiant flux, i.e. the volume of light emitted from a light source.					
	Lamp Ballast Type	Text			EC-A, EC-B	The type of ballast used to stabilize gas discharge by limiting the current during operation and to deliver the necessary striking voltage for starting.					
	Lamp Compensation Type	Text				Identifies the form of compensation used for power factor correction and radio suppression.					
	Lamp Maintenance Factor	Number				Non recoverable losses of luminous flux of a lamp due to lamp depreciation; i.e. the decreasing of light output of a luminaire due to aging and dirt.					
	Light Emitter Nominal Power	Number	Watts			Light emitter nominal power.					
	Spectrum	Number	nm		380-780nm	The spectrum of radiation describes its composition with regard to wavelength.					
Light Fixture						**A light fixture that is considered to have a length or surface area from which it emits light in a direction**	**IfcLightFixture**				
	Light Fixture Mounting Type	Text			Surface, Recessed, Wall, Pendant	A list of the available types of mounting for light fixtures from which that required may be selected.					
	Light Fixture Placing Type	Text				A list of the available types of placing specification for light fixtures from which that required may be selected.					
	Maintenance Factor	Number				The arithmetical allowance made for depreciation of lamps and reflective equipment from their initial values due to dirt, fumes, or age.					
	Maximum Plenum Sensible Load	Number	Watts			Maximum or Peak sensible thermal load contributed to return air plenum by the light fixture.					
	Maximum Space Sensible Load	Number	Watts			Maximum or Peak sensible thermal load contributed to the conditioned space by the light fixture.					
	Number Of Sources	Number				Number of sources .					
	Sensible Load To Radiant	Number	Percentage			Percent of sensible thermal load to radiant heat.					
	Total Wattage	Number	Watts			Wattage on whole lightfitting device with all sources intact.					
Outlet						**An outlet is a device installed at a point to receive one or more inserted plugs for electrical power or communications.**	**IfcOutlet**				
	Outlet Type	Text				The property enumeration defines the types of outlet that may be specified within the property set.					
	Is Pluggable Outlet	Logical			True or False	Indication of whether the outlet accepts a loose plug connection					
	Number Of Sockets	Number				The number of sockets that may be connected. In case of inconsistency, sockets defined on ports take precedence.					
	Reference	Text				Reference ID for this specified type in this project (e.g. type 'A-1')					
Security Light						**A light fixture having specific purpose of directing occupants in an emergency, such as an illuminated exit sign or emergency flood light.**	**IfcLightFixture**				
	Security Light Type	Text				The property enumeration defines the types of security light that may be specified within the property set.					
	Addressability	Text				The type of addressability.					
	Backup Supply System	Text				The type of backup supply system.					
	Fixture Height	Numeric	Inch	mm		The height of the fixture, such as the text height of an exit sign.					
	Pictogram Escape Direction	Text				The direction of escape pictogram.					
	Security Lighting Type	Text				The type of security lighting.					
	Self Test Function	Text				The type of self test function.					
Switch						**A switch is used in a cable distribution system (electrical circuit) to control or modulate the flow of electricity**	**IfcSwitchingDevice**				
	Switch Type	Text				The property enumeration defines the types of switch that may be specified within the property set.					
	Has Lock	Logical			True or False	Indication of whether a switching device has a key operated lock					
	Is Illuminated	Logical			True or False	An indication of whether there is an illuminated indicator to show that the switch is on					
	Legend	Text				A text inscribed or applied to the switch as a legend to indicate purpose or function.					
	Number Of Gangs	Number			1,2,3,4	Number of gangs/buttons on this switch.					
	Set Point	Logical			0,1	Indicates the setpoint and label. For toggle switches, there are two positions, 0 for off and 1 for on.					
	Switch Function	Text				Indicates types of switches which differs in functionality.					
	Contact					An electrical device used to control the flow of power in a circuit on or off.					

	Contactor Type	Text			CapacitorSwitching, LowCurrent, MagneticLatching, MechanicalLatching, Modular, Reversing, Standard	A list of the available types of contactor from which that required may be selected					
Dimmer						A dimmer switch is a switch that adjusts electrical power through a variable position level action.					
	Dimmer Type	Text				A list of the available types of dimmer switch from which that required may be selected.					
Emergency Stop						An emergency stop device acts to remove as quickly as possible any danger that may have arisen unexpectedly.					
	Switch Operation	Logical			True or False	Indicates operation of emergency stop switch.					
Keypad						A keypad is a switch supporting multiple functions.					
	Keypad Type	Text				A list of the available types of keypad switch from which that required may be selected.					
Momentary						A momentary switch is a switch that does not hold state.					
	Momentary Type	Text				A list of the available types of momentary switch from which that required may be selected.					
	Set Point	Logical			0,1	Indicates the switch position over time					
Selector						A selector switch is a switch that adjusts electrical power through a multi-position action.					
	Selector Type	Text				A list of the available types of selector switch from which that required may be selected.					
	Switch Activation	Text				A list of the available activations for selector switches from which that required may be selected.					
	Switch Usage	Text				A list of the available usages for selector switches from which that required may be selected.					
Starter						A starter is a switch which in the closed position controls the application of power to an electrical device.					
	Starter Type	Text			AutoTransformer, Manual, DirectOnLine, Frequency, nStep, Rheostatic, StarDelta	A list of the available types of starter from which that required may be selected					
Disconnect						A switch disconnector is a switch which in the open position satisfies the isolating requirements specified for a disconnector.					
	Load Disconnection Type	Text				A list of the available types of load disconnection from which that required may be selected.					
	Switch Disconnector Type	Text			CenterBreak, DividedSupport, DoubleBreak, EarthingSwitch, Isolator	A list of the available types of switch disconnector from which that required may be selected					
Toggle						A toggle switch is a switch that enables or isolates electrical power through a two position on/off action.					
	Switch Activation	Text				A list of the available activations for toggle switches from which that required may be selected.					
	Switch Usage	Text				A list of the available usages for toggle switches from which that required may be selected.					
	Toggle Switch Type	Text				A list of the available types of toggle switch from which that required may be selected.					
Transformer						**A transformer is an inductive stationary device that transfers electrical energy from one circuit to another.**	**IfcTransformer**				
	Transformer Type	Text				The property enumeration defines the types of transformer that may be specified within the property set.					
	Imaginary Impedance Ratio	Number	Ratio			The ratio between the imaginary part of the zero sequence impedance and the imaginary part of the positive impedance (i.e. imaginary part of the short-circuit voltage) of the transformer. Used for three-phase transformer which includes a N-conductor.					
	Is Neutral Primary Terminal Available	Logical			True or False	An indication of whether the neutral point of the primary winding is available as a terminal					
	Is Neutral Secondary Terminal Available	Logical			True or False	An indication of whether the neutral point of the secondary winding is available as a terminal					
	Maximum Apparent Power	Number	VA			Maximum apparent power/capacity in VA					
	Primary Apparent Power	Number	VA			The power in VA that has been transformed and that runs into the transformer on the primary side.					
	Primary Current	Number	Amps			The current that is going to be transformed and that runs into the transformer on the primary side.					
	Primary Frequency	Number	Hertz			The frequency that is going to be transformed and that runs into the transformer on the primary side.					
	Primary Voltage	Number	Volts			The voltage that is going to be transformed and that runs into the transformer on the primary side.					
	Real Impedance Ratio	Number	Ratio			The ratio between the real part of the zero sequence impedance and the real part of the positive impedance (i.e. real part of the short-circuit voltage) of the transformer. Used for three-phase transformer which includes a N-conductor.					
	Secondary Apparent Power	Number	VA			The power in VA (volt ampere) that has been transformed and is running out of the transformer on the secondary side.					
	Secondary Current	Number	Amps			The current that has been transformed and is running out of the transformer on the secondary side.					
	Secondary Current Type	Text				A list of the secondary current types that can result from transformer output.					
	Secondary Frequency	Number	Hertz			The frequency that has been transformed and is running out of the transformer on the secondary side.					
	Secondary Voltage	Number	Volts			The voltage that has been transformed and is running out of the transformer on the secondary side.					
	Short Circuit Voltage	Number	Percentage			A complex number that specifies the real and imaginary parts of the short-circuit voltage at rated current of a transformer given in %.					
	Transformer Vector Group	Text			D, Y, Z	List of the possible vector groups for the transformer from which that required may be set. D: means that the windings are delta-connected. Y: means that the windings are star-connected. Z: means that the windings are zig-zag connected (a special start-connected providing low reactance of the transformer)					

ct-Specific Milestones										
LEED Cert. Check	LEED Cert Submittal									

BIMForum LOD Specification 2020 Part II

D - Electrical Distribution

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	IFC Name	COBie Tag	Part 3 - Example Proje: Estimating Est. 1	Estimating Bid Pkg.
Part 1 - Attribute Description									
Global Attributes									
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Item-Specific Attributes									
Cable Management						**IfcCableCarrierSegment**			
Condition Status	Text			New, Existing, Demolish, Temporary, User Defined	Status of the element, predominately used in renovation or retrofitting projects				
ID Tag	Text				Reference ID for this specified type in this project (e.g. type 'A-1'), provided, if there is no classification reference to a recognized classification system used.				
Cable Ladder					**An open carrier segment on which cables are carried on a ladder structure.**				
Ladder Configuration	Text				Description of the configuration of the ladder structure used.				
Nominal Height	Number	Inch	mm		The nominal height of the segment.				
Nominal Width	Number	Inch	mm		The nominal width of the segment.				
Cable Tray					**An (typically) open carrier segment onto which cables are laid.**				
Has Cover	Logic			True or False	Indication of whether the cable tray has a cover (=TRUE) or not (= FALSE). By default, this value should be set to FALSE..				
Nominal Height	Number	Inch	mm		The nominal height of the segment.				
Nominal Width	Number	Inch	mm		The nominal width of the segment.				
Cable Trunk					**An enclosed carrier segment with one or more compartments into which cables are placed.**				
Nominal Height	Number	Inch	mm		The nominal height of the segment.				
Nominal Width	Number	Inch	mm		The nominal width of the segment.				
Number Of Compartments	Number				The number of separate internal compartments within the trunking.				
Conduit					**An enclosed tubular carrier segment through which cables are pulled.**				
Conduit Shape Type	Text				The shape of the conduit segment.				
Is Rigid	Logic			True or False	Indication of whether the conduit is rigid				
Nominal Height	Number	Inch	mm		The nominal height of the segment.				
Nominal Width	Number	Inch	mm		The nominal width of the segment.				
Electrical Cable						**IfcCableSegment**			
Carrier Stack Number	Number				Number of carrier segments (tray, ladder etc.) that are vertically stacked (vertical is measured as the z-axis of the local coordinate system of the carrier segment).				
Current Carrying Capacity	Number	Amps			Maximum value of electric current which can be carried continuously by a conductor, a device or an apparatus				
Design Ambient Temperature	Number	Degrees F/C			The highest and lowest local ambient temperature likely to be encountered.				
Distance Between Parallel Circuits	Number	Inch	mm		Distance measured between parallel circuits.				
ID Tag	Text				Reference ID for this specified type in this project (e.g. type 'A-1'), provided, if there is no classification reference to a recognized classification system used.				
Installation Method	Text				Method of installation of cable/conductor.				
Installation Method Flag Enum	Text				Special installation conditions relating to particular types of installation based on IEC60364-5-52:2001 reference installation methods C and D.				
Is Horizontal Cable	Logic			True or False	Indication of whether the cable occurrences are mounted horizontally				
Is Mounted Flat Cable	Logic			True or False	Indication of whether the cable occurrences are mounted flat				
Maximum Cable Length	Number	Inch	mm		Maximum cable length based on voltagedrop.				
Mounting Method	Text				The method of mounting cable segment on a cable carrier from which the method required can be selected.				
Number Of Parallel Circuits	Number				Number of parallel circuits.				
Power Loss	Number	Watts			Total loss of power across this cable.				
Soil Conductivity	Number	[SI] units of degK.m /W			Thermal conductivity of soil. Generally, within standards such as IEC 60364-5-52, table 52A-16				
User Correction Factor	Number	Percentage			An arbitrary correction factor that may be applied by the user.				
Bus Bar					Properties specific to busbar cable segments.				
Busbar Routing	Logic			True or False	Indication of whether the busbar occurrences are routed horizontally				
Electrical Cable					Electrical cable with a specific purpose to lead electric current within a circuit or any other electric construction.				
Function Reliable	Logic			True or False	Cable/bus maintain given properties/functions over a given (tested) time and conditions. According to IEC standard.				
Halogen Proof	Logic			True or False	Produces small amount of smoke and irritating Deaerator/Gas.				
Has Protective Earth	Logic			True or False	One core has protective earth marked insulation, Yellow/Green.				
Maximum Operating Temperature	Number	Degrees F	Degrees C		The maximum temperature at which a cable or bus is certified to operate.				
Maximum Short Circuit Temperature	Number	Degrees F	Degrees C		The maximum short circuit temperature at which a cable or bus is certified to operate.				
Number Of Cores	Number				The number of cores in Cable/Bus.				

	Overall Diameter	Number	Inch	mm		The overall diameter of a Cable/Bus.				
	Rated Temperature	Number	Degrees F	Degrees C		The range of allowed temperature that a device is certified to handle. The upper bound of this value is the maximum.				
	Rated Voltage	Number	Volts			The range of allowed voltage that a device is certified to handle. The upper bound of this value is the maximum.				
	Screen Diameter	Number	Inch	mm		The diameter of the screen around a cable or bus segment (if present).				
	Self Extinguishing60332_1	Logic			True or False	Self Extinguishing cable/core according to IEC 60332.1.				
	Self Extinguishing60332_3	Logic			True or False	Self Extinguishing cable/core according to IEC 60332.3.				
	Special Construction	Text				Special construction capabilities like self-supporting, flat dividable cable or bus flat non dividable cable or bus supporting elements inside				
	Standard	Text				The designation of the standard applicable for the definition of the Cable/Bus used.				
	Weight	Number	Lbs	Kgs		Weight of cable kg/km.				
	Electrical Conductor					An electrical conductor is a single linear element with the specific purpose to lead electric current.				
	Construction	Text			Solid, Stranded	Purpose of informing on how the conductor is constructed (intertwined or solid). I.e. Solid (IEV 461-01-06), stranded (IEV 461-01-07), solid-/finestranded(IEV 461-01-11) (not flexible/flexible).				
	Cross Sectional Area	Number	Circular Mils (kcmil)			Cross section area of the phase(s) lead(s).				
	Function	Text				Type of function for which the conductor is intended.				
	Material	Text				Type of material from which the conductor is constructed.				
	Shape	Text				Indication of the shape of the conductor.				
	Insulated Conductor					An assembly comprising a conductor with its own insulation (and screens if any)				
	Core Identifier	Text				The core identification used Identifiers may be used such as by color (Black, Brown, Grey) or by number (1, 2, 3) or by IEC phase reference (L1, L2, L3) etc.				
	Function Reliable	Logic			True or False	Core maintain given properties/functions over a given (tested) time and conditions. According to (IEC) standard.				
	Halogen Proof	Logic			True or False	Produces small amount of smoke and irritating deaerator/gas.				
	Overall Diameter	Number	Inch	mm		The overall diameter of a core (maximum space used).				
	Rated Temperature	Number	Degrees F	Degrees C		The range of allowed temperature that a device is certified to handle. The upper bound of this value is the maximum.				
	Rated Voltage	Number	Volts			The range of allowed voltage that a device is certified to handle. The upper bound of this value is the maximum.				
	Screen Diameter	Number	Inch	mm		The diameter of the screen around a core segment (if present).				
	Self Extinguishing60332_1	Logic			True or False	Self Extinguishing cable/core according to IEC 60332.1.				
	Self Extinguishing60332_3	Logic			True or False	Self Extinguishing cable/core according to IEC 60332.3.				
	Sheath Colors	Text				Colour of the core (derived from IEC 60757).				
	Standard	Text				The designation of the standard applicable for the definition of the core used.				
	Weight	Number	Lbs	Kgs		Weight of core kg/km.				
	Power State	Logic			0,1	Indicates the power state of the device where True is on and False is off.				
	Electrical Properties									
	Conductor Function	Text				Function of a line conductor to which a device is intended to be connected where L1, L2 and L3 represent the phase lines according to IEC 60446 notation				
	Has Protective Earth	Logic			True or False	Indicates whether the electrical device has a protective earth connection				
	Insulation Standard Class	Text				Insulation standard classes provides basic protection information against electric shock. Defines levels of insulation required in terms of constructional requirements				
	I P_ Code	Text				IEC 60529 Classification of degrees of protection provided by enclosures (IP Code).				
	Nominal Frequency Range	Number	Hertz			The upper and lower limits of frequency for which the operation of the device is certified.				
	Number Of Poles	Number				The number of live lines that is intended to be handled by the device.				
	Power Factor	Number	Ratio			The ratio between the rated electrical power and the product of the rated current and rated voltage				
	Rated Current	Number	Amps			The current that a device is designed to handle.				
	Rated Voltage	Number	Volts			The voltage that a device is designed to handle.				

ct-Specific Milestones										
LEED Cert. Check	LEED Cert Submittal									

BIMForum LOD Specification 2020 Part II

F - Metal Buildings

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	Part 2 - Example Project-Specific Milestones: Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
				Part 1 - Attribute Description					
Building Width	Number	ft							
Building Length	Number	ft							
Eave Height	Number	ft							
Roof Type	Text			options: [monoslope, gable, other]					
Roof Slope	Number	#/12			Inches per 12 inches (n/12)				
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Primary Framing and Bracing									
Structural steel materials	Text				ASTM Specification, Grade				
Frame base fixed	Logical			T/F, 1/0					
Support Reactions					Table of values				
Mark ID					Mark identification that correlates with bill of material (i.e., piece mark)				
Member finish	Text			options: [none, primer, galvanized, other]					
Fastener materials	Text				ASTM Specification, Grade				
Fasterner finish	Text			options: [black, zinc electroplated, hot-dipped galvanized, other]					
Secondary Framing									
Structural steel materials	Text				ASTM Specification, Grade				
Finish	Text			options: [none, primer, galvanized, other]					
Mark ID					Mark identification that correlates with bill of material (i.e., piece mark)				
Fastener materials	Text				ASTM Specification, Grade				
Fasterner finish	Text			options: [black, zinc electroplated, hot-dipped galvanized, other]					
Cladding and Exterior Trim									
Roof Panel System	Text			options: [through-fastened, standing seam roof]					
Wall Panel System	Text			options: [concealed fastener, through-fastened]					
Roof Panel Materials	Text				ASTM Specification, Grade, thickness, finish, and color				
Wall Panel Materials	Text				ASTM Specification, Grade, thickness, finish, and color				
Installation details	Text				Panel laps, crimping, etc. Fastener spacing and edge distance, etc.				
Mark ID					Mark identification that correlates with bill of material (i.e., piece mark)				
Fastener materials	Text				ASTM Specification, Grade				
Fasterner finish	Text			options: [black, zinc electroplated, hot-dipped galvanized, other]					
Caulk/mastic installation details	Text				field-installed weather-tightness materials and installation instructions				
AISC Shape Type & Size	Text			options: [specific “HSS 6x6x1/4”]					
Fireproofed	Logical			T/F, 1/0					
Weight in pounds/foot	Number								
ASTM Material Grade	Text	Text		options: [A992, etc]					
Coating	Text	Text		options: [galvanized, painted for exterior exposure, etc]					
Architectural Exposed Structural Steel	Logical			T/F, 1/0					
Fabrication Sequence Number	Number				SequenceNumber				
Shop Submittal Parameters					{}				
Date - Issued For Construction	Date Time				{DateIFC}				

Date - Permitted	Date Time				{DatePermitted}						
Date - received for Shop Detailing	Date Time				{DateReceivedForShopDet}						
Date - Detailing Submitted for EOR review \ Out For Approva	Date Time				{DateOutForApproval}						
Date - Final Erection Drawings Approved for Fab	Date Time				{DateFinalForFab}						
Date - Fabrication Start	Date Time				{DateFabStart}						
Date - Fabrication End	Date Time				{DateFabEnd}						
Date - Fabrication Shipped	Date Time				{DateFabShip}						
Date - Fabrication Received	Date Time				{DateFabReceived}						
Date - Erection	Date Time				{DateErected}						
Date - Inspected	Date Time				{DateInspected}						

BIMForum LOD Specification 2020 Part II

Highway Bridge Steel

Baseline
Additional

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	Part 2 - Example Project-Specific Milestones: Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
				Part 1 - Attribute Description					
AISC Shape Type & Size	Text			options: [specific "HSS 6x6x1/4"]					
Fireproofed	Logical			T/F, 1/0					
Weight in pounds/foot	Number								
ASTM Material Grade	Text			options: [A992, etc]					
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Coating	Text			options: [galvanized, painted for exterior exposure, etc]					
Architectural Exposed Structural Steel	Logical			T/F, 1/0					
Fabrication Sequence Number	Number				SequenceNumber				
Shop Submittal Parameters					{}				
Date - Issued For Construction	Date Time				{DateIFC}				
Date - Permitted	Date Time				{DatePermitted}				
Date - received for Shop Detailing	Date Time				{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approval (OFA	Date Time				{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Date Time				{DateFinalForFab}				
Date - Fabrication Start	Date Time				{DateFabStart}				
Date - Fabrication End	Date Time				{DateFabEnd}				
Date - Fabrication Shipped	Date Time				{DateFabShip}				
Date - Fabrication Received	Date Time				{DateFabReceived}				
Date - Erection	Date Time				{DateErected}				
Date - Inspected	Date Time				{DateInspected}				

BIMForum LOD Specification 2020 Part II

Railroad Bridge Steel

Baseline
Additional

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	Part 2 - Example Project-Specific Milestones: Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
				Part 1 - Attribute Description					
AISC Shape Type & Size	Text			options: [specific "HSS 6x6x1/4"]					
Fireproofed	Logical			T/F, 1/0					
Weight in pounds/foot	Number								
ASTM Material Grade	Text			options: [A992, etc]					
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Coating	Text			options: [galvanized, painted for exterior exposure, etc]					
Architectural Exposed Structural Steel	Logical			T/F, 1/0					
Fabrication Sequence Number	Number				SequenceNumber				
Shop Submittal Parameters					{}				
Date - Issued For Construction	Date Time				{DateIFC}				
Date - Permitted	Date Time				{DatePermitted}				
Date - received for Shop Detailing	Date Time				{DateReceivedForShopDet}				
Date - Detailing Submitted for EOR review \ Out For Approval (OFA	Date Time				{DateOutForApproval}				
Date - Final Erection Drawings Approved for Fab	Date Time				{DateFinalForFab}				
Date - Fabrication Start	Date Time				{DateFabStart}				
Date - Fabrication End	Date Time				{DateFabEnd}				
Date - Fabrication Shipped	Date Time				{DateFabShip}				
Date - Fabrication Received	Date Time				{DateFabReceived}				
Date - Erection	Date Time				{DateErected}				
Date - Inspected	Date Time				{DateInspected}				

BIMForum LOD Specification 2020 Part II

Bridge Concrete

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	Part 1 - Attribute Description	Part 2 - Example Project-Specific Milestones: Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
Member Type	Text			(0) Foundation (1) Beam (2) Column (3) Slab (4) Wall						
Concrete Compression Strength		PSI			Example: 3000 PSI					
Reinforcing Steel Flexture		PSI			Example: 60,000 PSI					
Reinforcing Steel Shear		PSI			Example: 60,000 PSI					
Target LOD	Text			100, 200, 300, 350, 400						
Current LOD	Text			100, 200, 300, 350, 400						
Member Casting Number										
Exterior Exposure	Logical			T/F, 1/0						
Shop Submittal Parameters										
Date - Issued For Construction	Date Time				DateIFC					
Date - Permitted	Date Time				DatePermitted					
Date - received for Shop Detailing	Date Time				DateReceivedForShopDet					
Date - Detailing Submitted for EOR review \ Out For Approv	Date Time				DateOutForApproval					
Date - Final Erection Drawings Approved for Fab	Date Time				DateFinalForFab					
Date - Fabrication Start	Date Time				DateFabStart					
Date - Fabrication End	Date Time				DateFabEnd					
Date - Fabrication Shipped	Date Time				DateFabShip					
Date - Fabrication Received	Date Time				DateFabReceived					
Date - Erection	Date Time				DateErected					
Date - Inspected	Date Time				DateInspected					
Finish	Character			A,B,C per ACI 117	Specify by face of concrete					

BIMForum LOD Specification 2020 Part II

Highway Bridge Precast

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	Part 2 - Example Project-Specific Milestones: Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
					Part 1 - Attribute Description				
Member Type	Text			(0) Foundation (1) Beam (2) Column (3) Slab (4) Wall					
Concrete Compression Strength		PSI			Example: 3000 PSI				
Reinforcing Steel Flexture		PSI			Example: 60,000 PSI				
Reinforcing Steel Shear		PSI			Example: 60,000 PSI				
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Member Casting Number									
Exterior Exposure	Logical			T/F, 1/0					
Shop Submittal Parameters									
Date - Issued For Construction	Date Time				DateIFC				
Date - Permitted	Date Time				DatePermitted				
Date - received for Shop Detailing	Date Time				DateReceivedForShopDet				
Date - Detailing Submitted for EOR review \ Out For Approv	Date Time				DateOutForApproval				
Date - Final Erection Drawings Approved for Fab	Date Time				DateFinalForFab				
Date - Fabrication Start	Date Time				DateFabStart				
Date - Fabrication End	Date Time				DateFabEnd				
Date - Fabrication Shipped	Date Time				DateFabShip				
Date - Fabrication Received	Date Time				DateFabReceived				
Date - Erection	Date Time				DateErected				
Date - Inspected	Date Time				DateInspected				
Finish	Character			A,B,C per ACI 117	Specify by face of concrete				

BIMForum LOD Specification 2020 Part II

Railroad Bridge Precast

Attribute	Data Type	Units - Imp.	Units - Metric	Option Examples	Commentary	Part 2 - Example Project-Specific Milestones: Estimating Est. 1	Estimating Bid Pkg.	LEED Cert. Check	LEED Cert Submittal
Member Type	Number			(0) Foundation (1) Beam (2) Column (3) Slab (4) Wall					
Concrete Compression Strength	Number	PSI			Example: 3000 PSI				
Reinforcing Steel Flexture	Number	PSI			Example: 60,000 PSI				
Reinforcing Steel Shear	Number	PSI			Example: 60,000 PSI				
Target LOD	Text			100, 200, 300, 350, 400					
Current LOD	Text			100, 200, 300, 350, 400					
Member Casting Number									
Exterior Exposure	Logical			T/F, 1/0					
Shop Submittal Parameters									
Date - Issued For Construction	Date Time				DateIFC				
Date - Permitted	Date Time				DatePermitted				
Date - received for Shop Detailing	Date Time				DateReceivedForShopDet				
Date - Detailing Submitted for EOR review \ Out For Approv	Date Time				DateOutForApproval				
Date - Final Erection Drawings Approved for Fab	Date Time				DateFinalForFab				
Date - Fabrication Start	Date Time				DateFabStart				
Date - Fabrication End	Date Time				DateFabEnd				
Date - Fabrication Shipped	Date Time				DateFabShip				
Date - Fabrication Received	Date Time				DateFabReceived				
Date - Erection	Date Time				DateErected				
Date - Inspected	Date Time				DateInspected				
Finish	Text			A,B,C per ACI 117	Specify by face of concrete				