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USING THE MODEL PROGRESSION SPECIFICATION

Topics

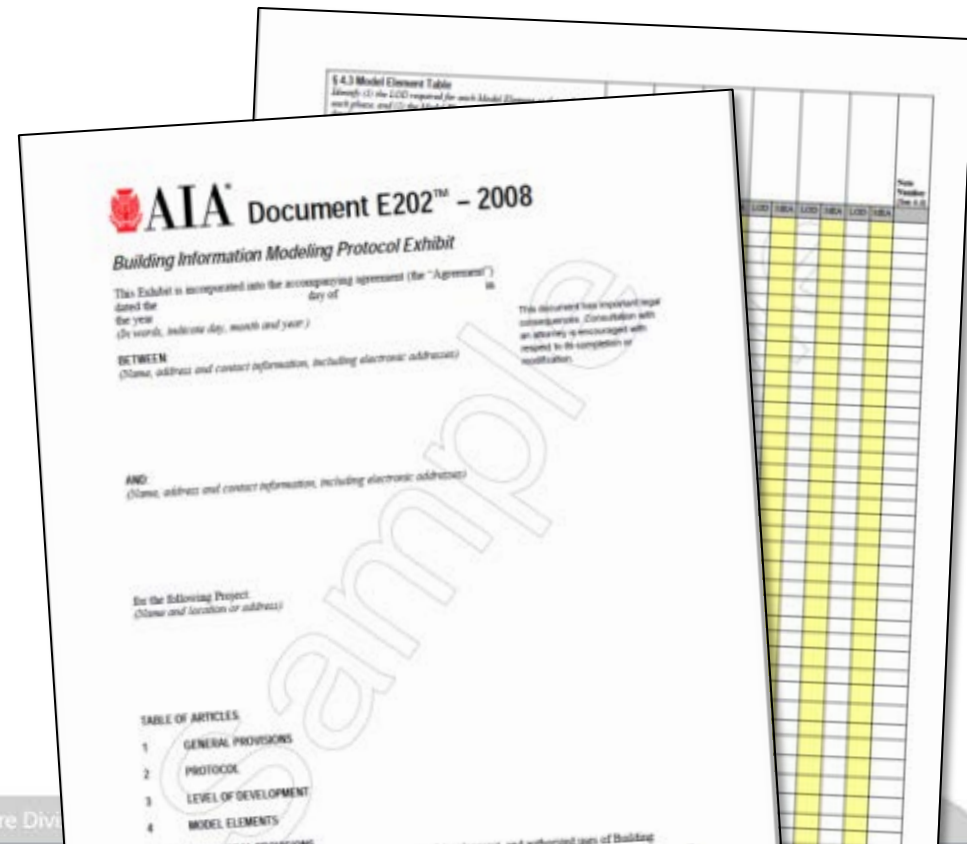
- MPS: A Brief History
- Problem Definition
- Goal
- Solution
 - Level of Detail (Level of Development)
 - Stages
 - Building Element Categories
 - Primitives
 - Aspects
- Example

MPS: A Brief History

- **Model Progression Specification**
- E202
- MPS 2.0, MPS 3.0

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Site Preparation	100	100	100	200	200
Sub Structure	100	200	200	300	400
Superstructure	100	100	200	200	300
Exterior Enclosure	100	100	200	200	200
Interior Build Out	100	100	150	100	200
MEP Systems	100	100	100	100	200
Site Improvements	100	100	100	100	200

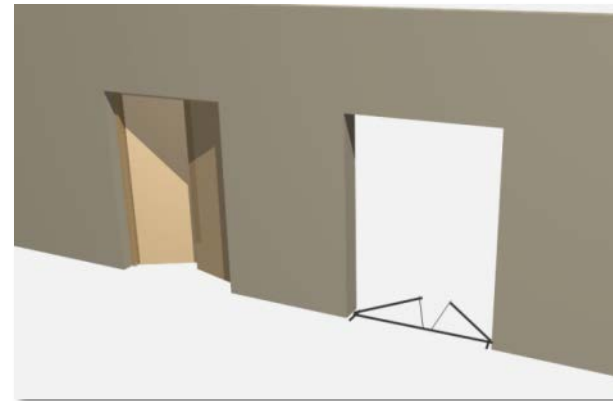
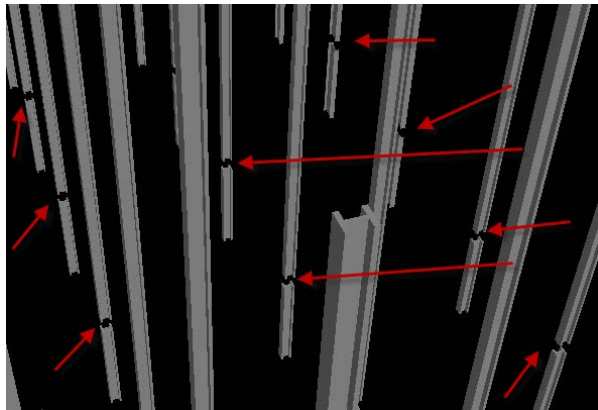
Architecture Div



Problem Definition

Part 1

Integration requires coordinated input from multiple disciplines involved in design and preconstruction phases.



Problem Definition

Part 2

BIM allows for **larger number of releases**, with increasing information richness, which has to be coordinated and planned based on **decision making requirements**.



Problem Definition

Part 3

Not all design parts of the project **progress** at the same **pace**.



Problem Definition

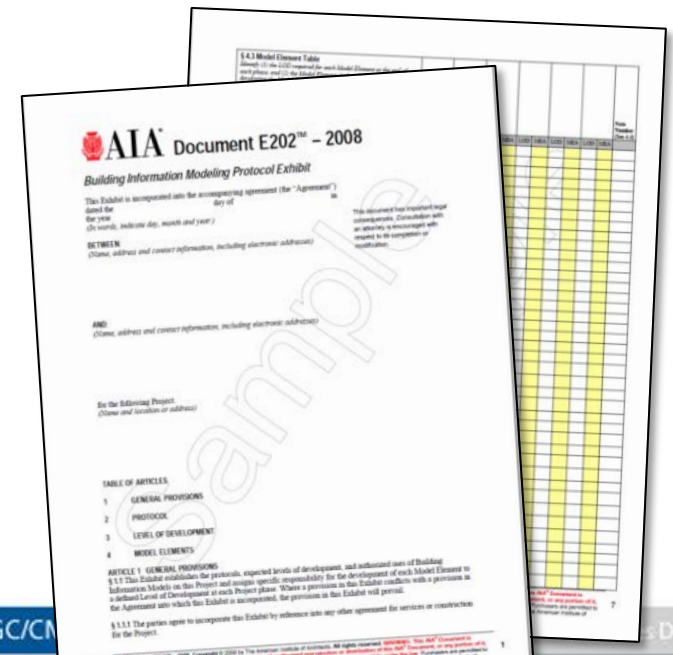
Part 4

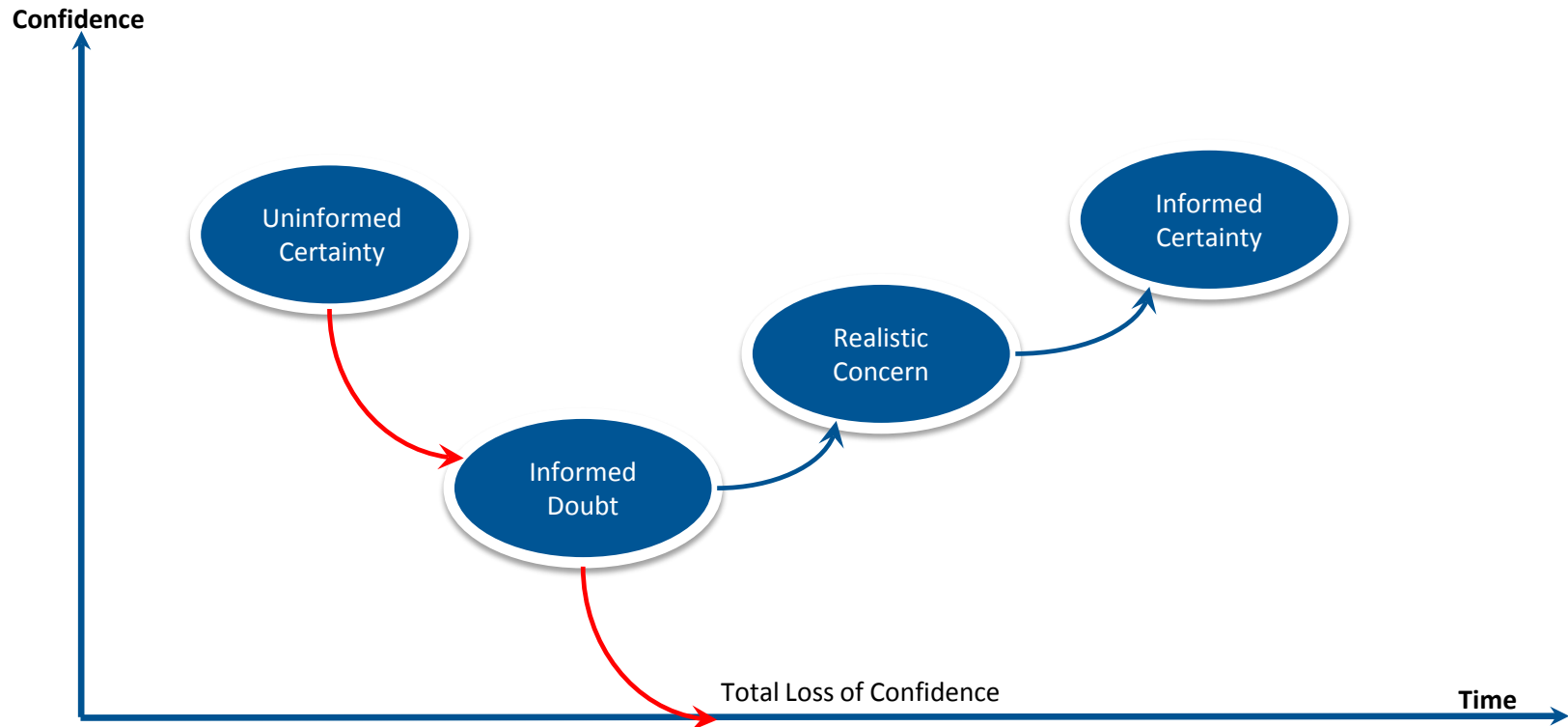
Project teams are working in **different locations.**



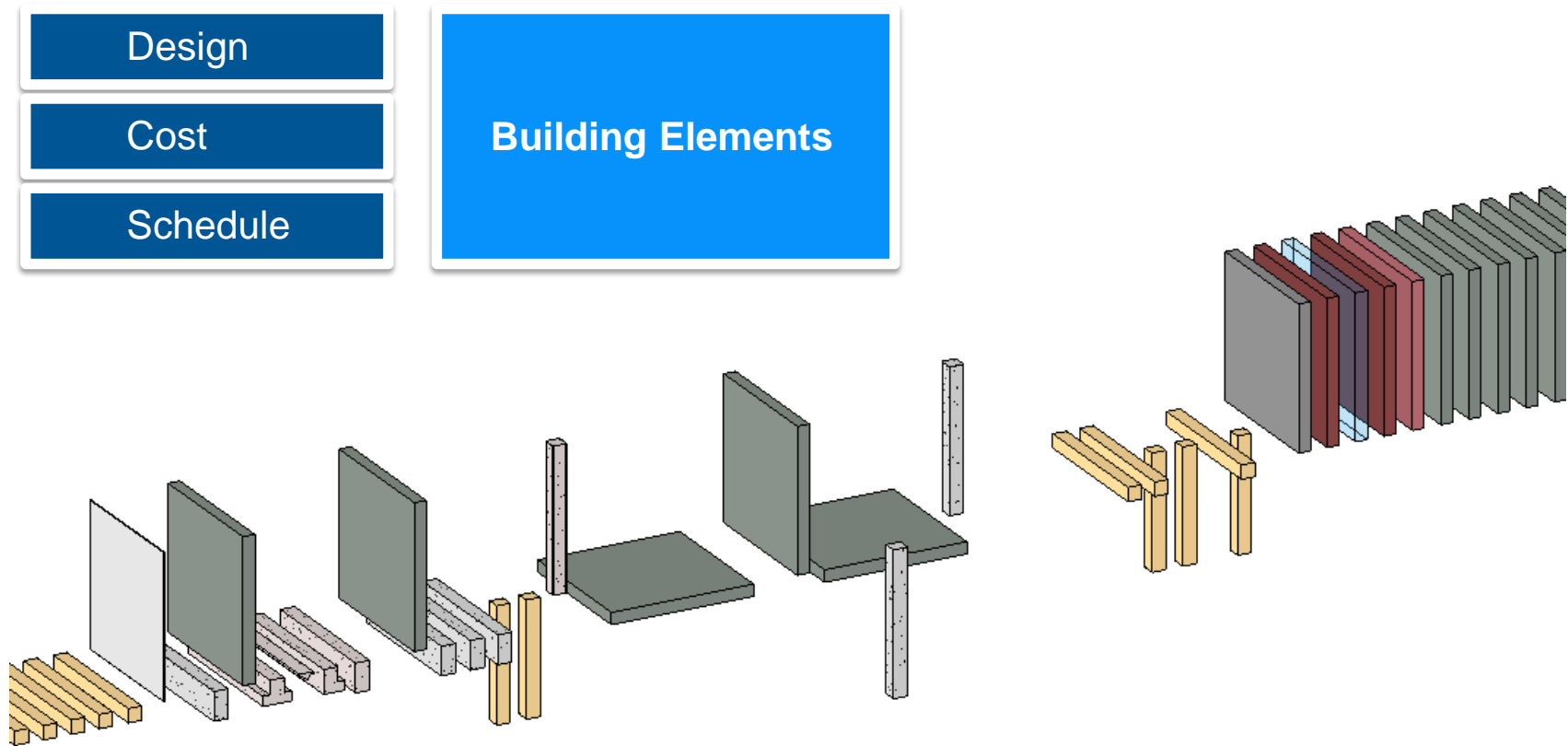
Problem Definition - Conclusion

Model Progression Planning is a **must** to ensure successful integrated use of BIM for design, cost estimating and schedule planning.





* Kim Caputo, "CMM Implementation Guide," Addison-Wesley (1998)

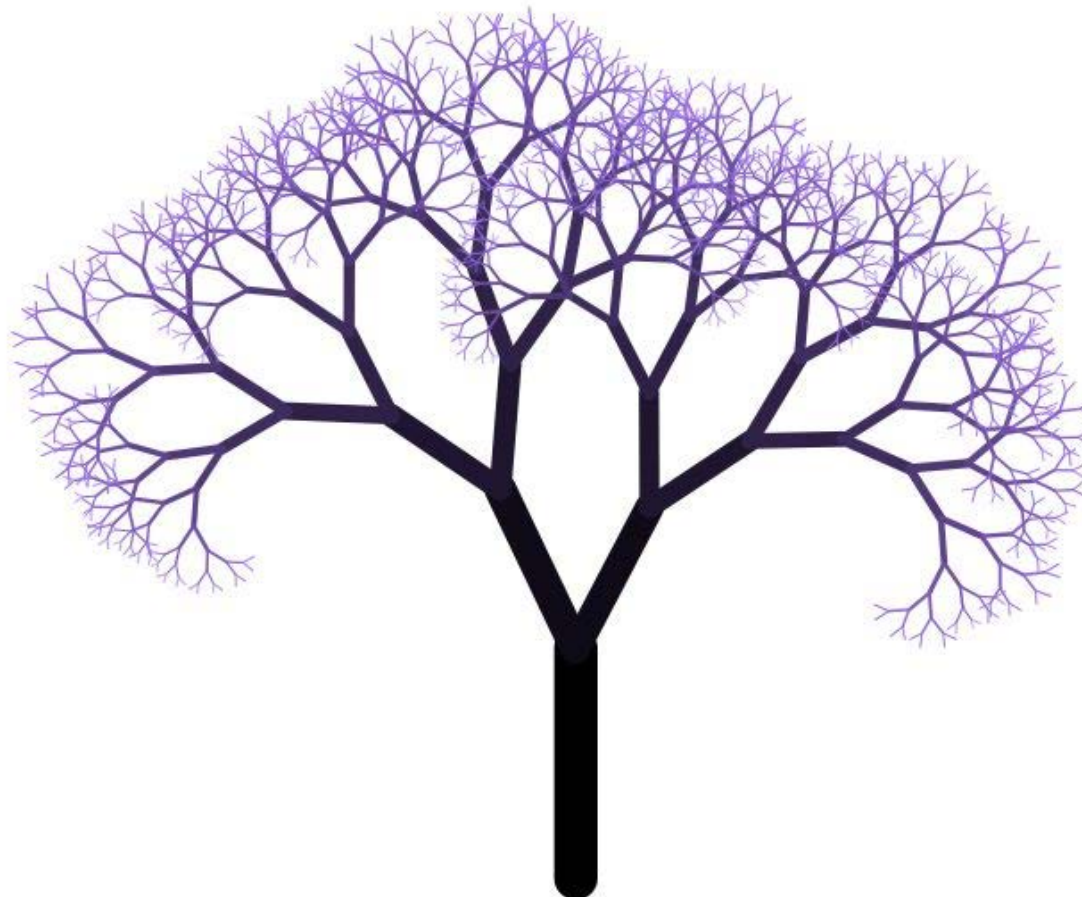


ASPECTS AND CLASSES

MPS MATRIX

ASPECTS	CLASSES	DESCRIPTION	TARGET LOD	ASPECTS		
MODEL 'M'	M0	No Model		M	C	S
	M1	Building/Spatial/Room Massing	000	M0	C1	S1
	M2	Building elements with approximate dimensions (SD)	050	M0	C2	S2
	M3	Building elements with design dimensions (DD)	100	M1	C2	S2
	M4	Construction Model (CD)	200	M2	C3	S3
	M5	Fabrication / Virtual Mockup	300	M3	C3	S3
	M6	As Built	400	M4	C4	S3
COST 'C'	C1	Division Level Ranges	450	M4	C5	S4
	C2	Massing Driven Ratios & Ranges	500	M5	C5	S4
	C3	Element Driven - Assumption Based - Resource Level & Ranges	550	M5	C5	S5
	C4	Element Driven - Specification Based	600	M6	C6	S6

Definition of Element Aspects



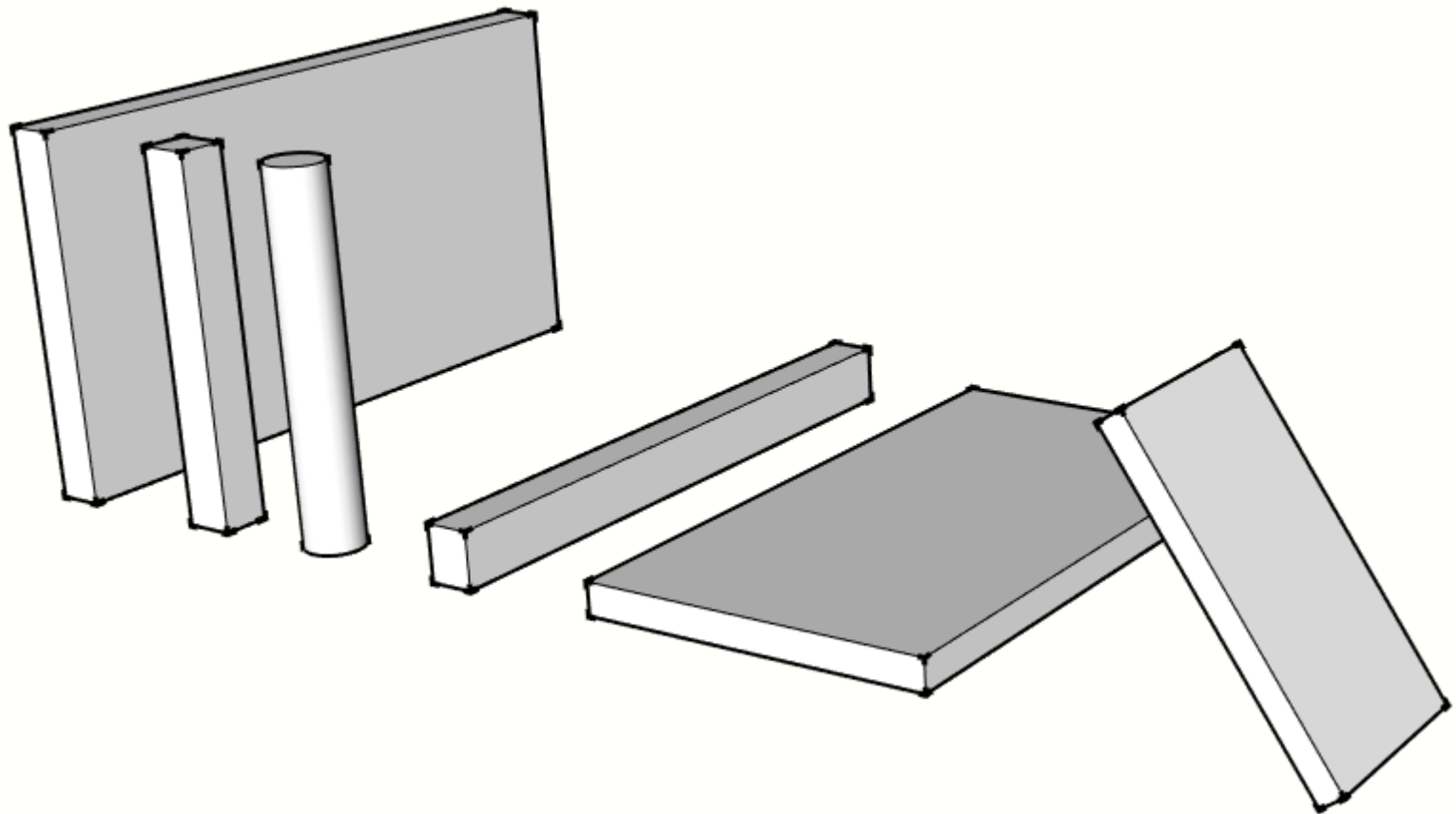
Primitives

- Modeling Behavior
- Quantity Data Extracted
- Cost Data Linked
- Schedule Data Linked

Defined per Aspect:

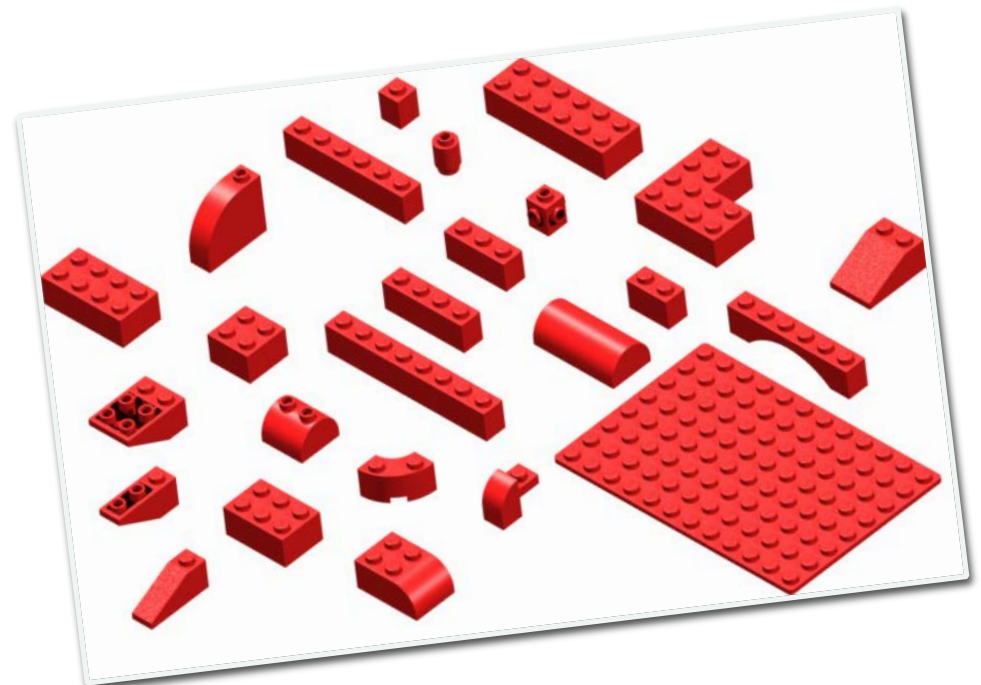
- Model
- Cost
- Schedule

Rectangular solid components
Solid wall
Solid rectangular / round column
Solid rectangular beam
Solid slab
Solid pitched roof
Profiled solid components
Profiled wall
Profiled column
Profiled beam
Multi-layered components
Composite wall
Composite slab
Flooring
Composite pitched roof
Multi-component systems
Curtain wall
Ceilings
Built-up column
Built-up beam/truss
Complex slab
Door/window
Stair
Fixture/device

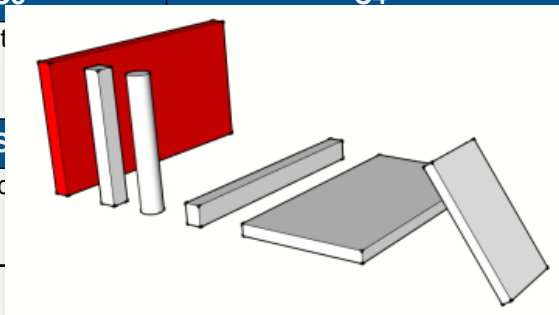


Primitives for Progression Plan

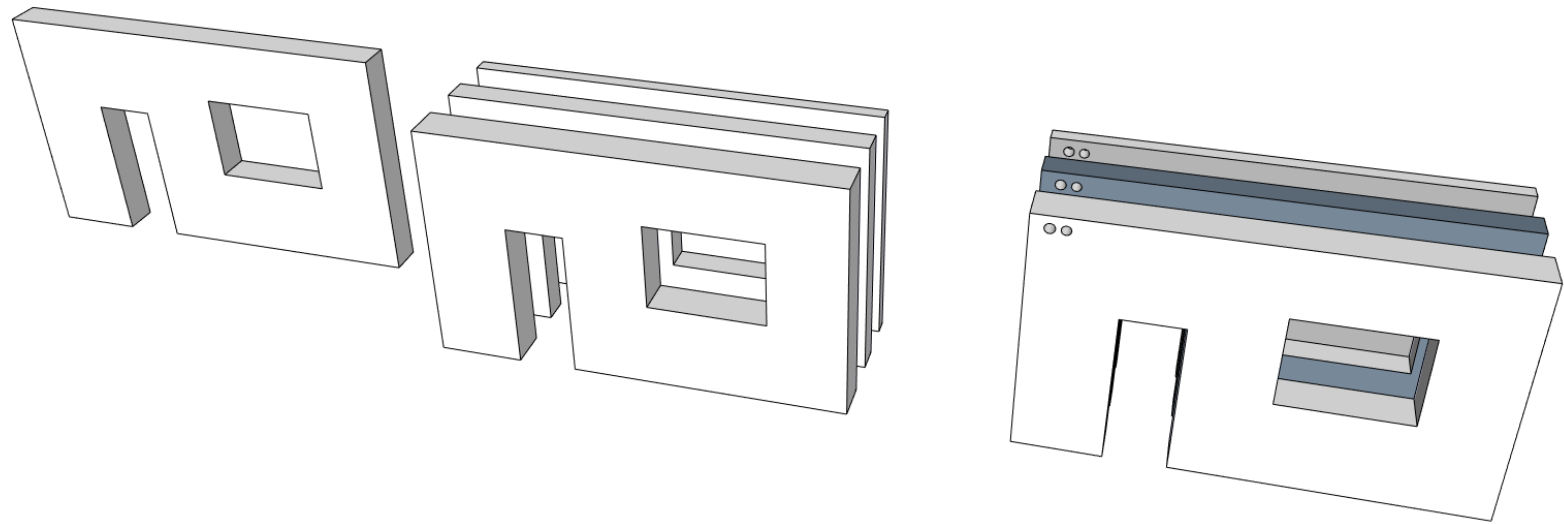
- Limited Collection of Basic Elements
- Specified Classes
- “Building Blocks”




	LOD 200	LOD 300	LOD 400	LOD 500
Model Class	M2	M3	M4	M5
Model: Diversification	Basic diversification by material and construction method One typical size used to model all instances of similar types	Thickness and type per schedules	Thickness, type per schedules and additional properties (related to estimating/scheduling)	Thickness, type per schedules and additional properties (related to estimating/scheduling)
Model: Geometry	Modeled with rectangular cross sectional geometry Slanted elements modeled with ± 5 degree tolerance	Modeled with exact rectangular cross sectional geometry Modeled with exact inclination	Modeled with exact rectangular cross sectional geometry Modeled with exact inclination	Modeled with exact rectangular cross sectional geometry Modeled with exact inclination
Model: Penetrations	Windows and doors only	Windows and doors only	Windows, doors and main MEP runs	Windows, doors and all modeled MEP runs
Model: Connections	Not Modeled	Not Modeled	Modeled	Modeled with Components
Estimating Class	C3	C4	C5	C5
Estimating: Requirements	Average cost		Cost per unique element, resources level	Cost per unique element, resources level
Scheduling Class	S3	S4	S4	S5
Scheduling: Requirements	Average production rate per element		Production rate from resource hours	Production rate from resource hours



Primitives for Progression Plan



Progression Specification

	A	B	C	D	E	F	G	H	I	J	K
1											
2	Code	Code	Code	Description	Units	Primitive	Stage 1	Author	Stage 2	Author	Stage 3
3	A			SUBSTRUCTURE							
4		A10		FOUNDATIONS							
5			A1010	STANDARD FOUNDATIONS		SOLID SLAB	100	Architect	300	Engineer	
6			A1020	SPECIAL FOUNDATIONS		SOLID SLAB	150	Architect	200	Engineer	
7		A20		SUBGRADE ENCLOSURES							
9		A40		SLABS-ON-GRADE							
15		A60		WATER & GAS MITIGATION							
18		A90		SUBSTRUCTURE RELATED ACTIVITIES							
23	B			SHELL							
24		B10		SUPERSTRUCTURE							
29		B20		EXTERIOR VERTICAL ENCLOSURES							
36		B30		EXTERIOR HORIZONTAL ENCLOSURES							
42	C			INTERIORS							
43		C10		INTERIOR CONSTRUCTION							
44			C1000	INTERIOR CONSTRUCTION MEANS & METHODS			100	Architect	100	Architect	
45			C1010	INTERIOR PARTITIONS		SOLID WALL	100	Architect	200	Architect	
46			C1020	INTERIOR WINDOWS		DOOR/WINDOW	100	Architect	200	Architect	
47			C1030	INTERIOR DOORS		DOOR/WINDOW	100	Architect	100	Architect	
48			C1040	INTERIOR GRILLES & GATES		INSTRUMENTATION & CONTROLS	100	Architect	100	Architect	
49			C1060	RAISED FLOOR CONSTRUCTION			100	Architect	100	Architect	
50			C1070	SUSPENDED CEILING CONSTRUCTION			100	Architect	100	Architect	
51			C1090	INTERIOR SPECIALTIES			100	Architect	100	Architect	
52		C20		INTERIOR FINISHES							
59	D			SERVICES							
60		D10		CONVEYING							
64		D20		PLUMBING							
71		D30		HEATING, VENTILATION & AIR CONDITIONING (HVAC)							
79		D40		FIRE PROTECTION							
82		D50		ELECTRICAL							
89		D60		COMMUNICATIONS INFRASTRUCTURE							

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