



Table 9-1 The location of case study projects.

No.	Project	Location
1	General Motors Production Plant	Flint, Michigan, US
2	Coast Guard Facility Planning	Multiple locations
3	Camino Group Medical Building	Mountain View, California, US
4	National Aquatics Center	Beijing, China
5	Federal Office Building	San Francisco, California, US
6	100 11 th Avenue Apartments	New York City, NY, US
7	One Island East Office Tower	Hong Kong, China
8	Penn National Parking Structure	Grantville, PA, US
9	Hillwood Commercial Project	Dallas, TX, US
10	Federal Courthouse	Jackson Mississippi, US

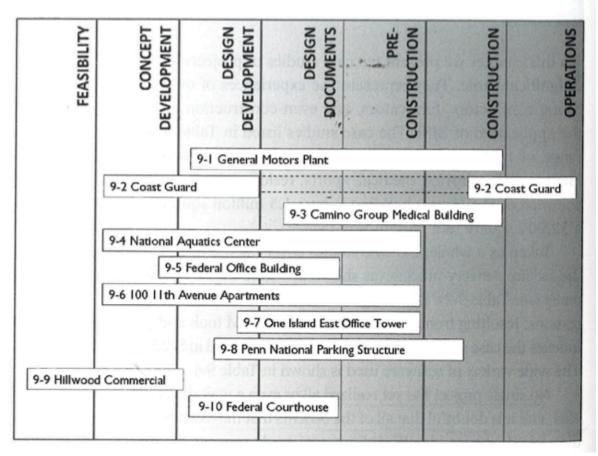


Figure 9-1 Case study guide showing various project phases.



Table 9-2 Participant index for the case studies.

	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	9.10
Participants	General Motors Production Plant	Coast Guard Facility Planning	Camino Group Medical Building	Beijing National Aquatics Center	San Francisco Federal Building	100 11th Avenue NYC	One Island East Office Tower	Penn National Parking Structure	Hillwood Commercial Project	Jackson Federal Courthouse
Owner/developer	•		•						•	
Architect	•			•	•	•	•			•
Engineer	•									
Contractor			•	•	•		•		•	
Subcontractor/ Fabricator										
Facility Operations/End users										

Table 9-3 Benefit checklist for the case studies. The benefits correspond to the list in Section 1.5, Chapter 1.

		9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	9.10
Project Phase	Benefits	General Motors Production Plant	Coast Guide Facility	Camino Group Medical Building	Beijing National Aquatics Center	SF Federal Office Building	100 11th Avenue NYC	One Island East Office Tower	Penn National Parking Structure	Hillwood Commercial Project	Jackson Federal
Feasibility study (Chapter 4)	Support for project scoping, cost estimation		•							•	
Concept design (Chapters 4 and 5)	Scenario planning Early and accurate visualizations Optimize energy efficiency and		•		•	•	•	rumuci Market	•	•	
	efficiency and sustainability										



		9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	9.10
Project Phase	Benefits	General Motors Production Plant	Coast Guide Facility	Camino Group Medical Building	Beijing National Aquatics Center	SF Federal Office Building	100 11th Avenue NYC	One Island East Office Tower	Penn National Parking Structure	Hillwood Commercial Project	Jackson Federal
Integrated Design/ construction (Chapter 5)	Automatic maintenance of consistency in design				100	9. ac	•		rka to 1	· Viney)	at-eN
	Enhanced building performance and quality				٠	•		•		•	
	Checks against design intent					•			•		•
	Accurate and con- sistent drawing sets	•		•	•	٠	•	•			•
Construction execution/ coordination (Chapters 6 and 7)	Earlier collaboration of multiple design disciplines	() () 1872 .		e al			in the				•
	Synchronize design and construction planning	•		•				•	•		
	Discover errors before construction (clash detection)			*				Physics 5			
	Drive fabrication and greater use of prefabricated components	•		•	•		•		•		
	Support lean con- struction techniques		\	٠							
	Coordinate/ synchronize procurement	•		•	•		•			•	
Facility operation (Chapter 4)	Lifecycle benefits regarding operating costs					•					
	Lifecycle benefits regarding maintenance/		•								



Table 9-4 Software checklist for the case studies.

		9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	9.10
Application Area	Software Tool	General Motors Production Plant	Coast Guard Facility Planning	Camino Group Medical Building	Beijing National Aquatics Center	SF Federal Office Building	100 11th Avenue NYC	One Island East Office Tower	Penn National Parking Structure	Hillwood Com- mercial Project	Jackson Federal Courthouse
Model Genera	ation Tools										
Architecture	ArchiCAD		•								
	Bentley Architecture*	٠				٠					
	Digital Project							•			
	ONUMA Plan- ning System		tar an								
	Revit Building		,								•
Structural	Bentley Structural*				infa o						
	Revit Structures			•	*						
	SDS/2										
	Tekla Structures								•		
MEP	CADDuct										
	Design Series										
	IntelliCAD										
	Piping Designer 3D			•							
	Revit Systems										
BIM Related	Tools										
2D	AutoCAD	•		•		•	•	•	•		•
	SprinkCAD			•							
3D	Architectural Desktop			•							
	3D Studio Max				OJO 7						
	FormZ					•					
	Rhino				Me.			101			
Manu- facturing	CATIA						•				
	Solidworks										
Database	MySQL										



Table 9-4 C	Continued										
		9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	9.10
Application Area	Software Tool	General Motors Production Plant	Coast Guard Facility Planning	Camino Group Medical Building	Beijing National Aquatics Center	SF Federal Office Building	100 11th Avenue NYC	One Island East Office Tower	Penn National Parking Structure	Hillwood Com- mercial Project	Jackson Federal
Analysis Tools											
Structural	RAM	•			4						
	Robot										
	STAAD Pro										
	Strand										
Estimating	Dprofiler									•	
	US Cost										•
Clash detection	Navisworks	•		•		,					•
Energy	EnergyPlus										

 $^{^{\}star}$ Bentley Architecture and Bentley Structures are based on the Microstation Triforma platform