



Design Deliverables

September 2016

As part of the deliverables for formal UM review at each of the major phases of design listed below, the Design Professional shall submit this "Design Deliverables" document to the University's Design Coordinator. On the "Design Deliverables" document, the Design Professional shall indicate the status of each required item (a check mark is interpreted to mean that an item has been included in the deliverables). On or attached to the "Design Deliverables" document, the Design Professional shall identify all items NOT included in the review package.

Note that design deliverables for the Design Development phase are to include all items listed in the Design Development column of the "Design Deliverables" table AND, except as specifically stated to the contrary in the table, all items listed in the Schematic Design column of the table (which are to have been further developed during Design Development).

Note that design deliverables for the Construction Document phase are to include all items listed in the Construction Document column of the "Design Deliverables" table AND, except as specifically stated to the contrary in the table, all items listed in the Schematic Design column and all items listed in the Design Development column of the table (which are to have been further developed during the Construction Document phase).

Item	Schematic Phase	Design Development Phase	Construction Document Phase
General Description (continued)	1 Scope of work narrative	1 Description of construction phasing	1 Documentation on drawings as required by building codes (specifically to include indication of maximum allowable number of people in each room)
	2 Comparison of capacities (see "Building Interior" for area comparison) to program	2 Description of any proposed occupancy within construction area	2 List of all code variances (on drawings cover sheet)
	3 List of applicable building codes on drawing title sheet	3 Description of water and vapor characteristics of roof and exterior walls	3 When special inspection or testing is required by building code, a separately bound "Statement of Special Inspections" as stipulated by Michigan Building Code
	4 Building code review (describe means of compliance for major code issues and building systems)		4 If multiple bid packages, clear indication of scope of each release
	5 List of anticipated building code variance request.		5 Identification of construction phasing, including temporary requirements during each phase

General Description

6	Anticipated building and space occupancy schedules.			6	Provide electronic, clean 2D files per DG 2.4 in Microstation or AutoCAD format (with or without the Design Professional's title block) of CD Phase drawings for use by U-M or the Construction Manager as backgrounds for special construction bid packs (e.g. telephone/data and audio/visual wiring bid packs) or creation of UM master floor plans.
7	Life Safety (egress) plans with identification of security and access control points			7	For projects over \$10 million construction cost, visual display that depicts sustainability initiatives and achievement as described in DG 3.1 "Sustainable Design Requirements"
8	For project over \$5 million construction cost, UM's list of outstanding Facility Condition Assessment improvement recommendations with notation as to which will be addressed by the project.				
9	Owner's Project Requirements and Basis of Design document as described in DG 2.0 "Design Intent Documents"				
10	Demonstration of compliance with DG 3.2 "Energy and Water Conservation". See DG 3.2 for deliverables requirements.				
11	List of sustainability features incorporated into project design as described in-DG 3.1 "Sustainable Design and LEED Requirements"				
12	For new building and addition projects over \$10 million construction cost, information as required to apply for LEED Silver (or higher) certification, and a project-specific LEED Checklist, both as described in DG 3.1 "Sustainable Design and LEED Requirements"				

Specifications	1	System & material narrative description	1	Outline or preliminary specifications indicating project specific features of major equipment as well as component materials, E.G. "welded Schedule 40 steel pipe", "quarter sawn oak", etc. w. same section numbering as final specification	1	Complete specification including draft front end documents
					2	List of items which are sole-sourced or dual-sourced and justification for not specifying three acceptable products
					3	For items listed in UM's "Preferred Manufacturers List", a table of specified items that are NOT indicated in UM's PML, and the justification for specifying these items.
					4	For door hardware sets that require electricity, indicate the proposed sequence of operations for the hardware.
Site (continued)	1	Site Plans to include the following:	1	General dimensions & elevations	1	Extent of construction area, construction fencing and gates
		a. Existing conditions (see site survey requirements)	2	Permanent exterior signage, for building and site elements	2	Area traffic plan, if existing roads/ walks are impacted
		b. Demolition	3	Parking/ roadway plans & elevations	3	Site development phasing
		c. Building outline (s)	4	Vehicle & pedestrian traffic controls (if required), includes pavement markings and signage location ref. DG 4.4.5	4	Construction site access
		d. Future expansion (accommodated, but UPO to determine if shown)	5	Grading Plan - 1' contours and critical spot elevations, include critical spot elevations for ADA requirements, such as ramps, at 10 scale	5	Staging area
		e. Site entrance	6	Site lighting plans simulations, specifications, equipment cut sheets and photometrics (as defined in Design Guideline 16521)	6	Construction signage
		f. Roads & driveways	7	Concept details of site fixtures & equipment	7	Site details, including hardscape
		g. Parking locations	8	Utility and ROW plans for local governing agency approval (preliminary plan review)	8	Utility profiles, elevations, details (including submittal for governing agency civil plan review)...
		h. Bus stop/ shelter (if required)	9	Sanitary Sewer Flow Mitigation Calculations	9	Utility pipe sizing calculations, engineer stamped submittal
		i. Loading dock location	10	Underground utilities plan (all underground utilities shown, including electrical and data, and coordinated with site features)	10	Storm water management calculations and plan requirements

Site			11	Overall site plan, all visible site features shown and coordinated with utilities.	11	Copy of local government review comments on utilities and modifications in right(s)-of-way and approval to proceed with work.
	j. Waste/ recycling collection locations					
	k. Walkway locations		12	Plan to address existing hazardous/contaminated materials, if applicable	12	Fire apparatus route and required signage
	l. Stairway locations		13	Soil erosion and sedimentation control plan (for both construction and occupancy)	13	Pedestrian and vehicular pavement striping, directional signage, traffic signage, stop signs, no parking signs, restricted access signage etc. Ref. DG 4.4.5
	m. Emergency telephone locations		14	Soil erosion and sedimentation control "Design & Review Checklist" described in UM Design Guidelines Section 02215		
	n. Utility requirements		15	Dewatering plan		
	o. Site utilities and utility tunnels		16	Structural evaluation of existing tunnels for proposed construction logistics.		
	p. Preliminary grading plan		17	Fire apparatus route layout		
	q. Soil retention work, if needed		18	Storm water management deliverable - design elevation infiltration date/ permit required calculations and DD option deliverable.		
	r. Land encumbrances (deed restrictions, easements, etc.)					
	s. Fire/ Emergency Access Plan					
	2 Site plan for public use DG 2.4					
	3 Storm water management plan SD deliverable with potential options					
	4 Preliminary site lighting plan					
Landscaping	1 Existing conditions		1	Planting plan	1	Protection for existing trees and significant plantings during construction
	2 Landscaping concept		2	Irrigation plan	2	Soil preparation & planting specifications
	3 Existing irrigation			Irrigation electrical and water source, including building penetration details and interior piping to panels.	3	Guying diagrams
				Irrigation controls	4	Irrigation Piping diagrams
					5	Irrigation Pipe sizes
					6	Landscape and irrigation details and legends
Structural (continued)	1 Structural Scheme plans		1	Foundation plan	1	Definition of control joints
	2 Written description		2	Typical floor framing plan	2	Beam, column & slab schedules

Structural			3	Framing plans at unique features	3	Mechanical and electrical concrete housekeeping pads
			4	Main member sizing	4	Foundation details
			5	Structural sections	5	Structural details
					6	Structural notes
					7	Structural calculations
Building Exterior Envelope	1	Typical elevations	1	All building elevations w/ dimensional heights	1	Roof-mounted equipment
	2	Fenestration layout	2	Typical wall sections	2	Roof details
	3	Material designations	3	Parapet & coping details	3	Exterior details
	4	Overall building cross-sections	4	Roof & drainage plan	4	Flashing details
	5	Roof layout	5	Exterior door details	5	Control joint definition & details
			6	Typical window details		
			7	Details of unique features		
			8	Expansion joint locations		
			9	Large scale building cross- sections		
Building Interior	1	Typical floor plans (min. 1/16" scale) w/ legends	1	All floor plans (min. 1/16" scale)	1	Dimensioned floor plans
	2	Floor plans for room numbering & public use (see DG 2.4)	2	Submit floor plans for revised room numbers (see DG 2.4)	2	Enlarged plans
	3	Demolition Plans	3	Enlarged plans at elevation changes (such as stairs)	3	Partition details
			4	Enlarged plans at toilet rooms	4	Interior details
	4	Area use identification & area in square ft.	5	Reflected ceiling plans	5	Interior elevations
	5	Mechanical, electrical & other service closets & rooms	6	Wall types, fire ratings, smoke control zones	6	Finish schedules
	6	Circulating paths	7	Plan to address existing hazardous materials, if applicable	7	Door & hardware schedules
	7	Area tabulations compared to program requirements	8	Fixed seating	8	Room signage
	8	Show flexibility for expansion & alterations	9	Defined seating, serving, & kitchen facilities	9	Schedule of proposed movable equipment that is NOT indicated on documents (for reference)
	9	Preliminary layout of major spaces w/ fixed equipment	10	Equipment & furniture layouts	10	Schedule of lab fixtures (turrets, etc.), if applicable
			11	Important interior elevations		
			12	Details of unique features		
			13	Details of fixed equipment		
			14	Preliminary finish schedule		
			15	Preliminary door schedule		
			16	Informational signage		

Elevators	1	Elevator locations	1	Elevator shaft section	1	Dimensioned plans
	2	Equipment room locations	2	Equipment description	2	Sections & details of hydraulic cylinder, if applicable
					3	Description of shaft sump pits
					4	Elevator car & equipment support details
					5	Description of controls & Fixtures
					6	Door & frame details
					7	Interior details including lighting
HVAC (continued)	1	Identify all systems	1	Overall building air flow diagram indicating air handlers, exhaust fans, duct risers, and duct mains	1	Detailed piping and duct design with all sizes indicated
	2	One- line diagrams for each air, hydronic, steam, condensate and all other HVAC related systems, and other materials as required to describe the fundamental design concept for all mechanical systems	2	Duct layout for typical spaces	2	Floor plans w/ all components and required service access areas drawn to actual scale. On the plans, indicate duct sizes and air flow quantities relative to each room, including CFM in and out of all doors. Indicate location of control panels.
	3	Indication of the amount of redundancy for all major pieces of mechanical equipment, e.g. "two pumps 100% capacity each"	3	Equipment schedules (major equipment)	3	Lab air valves and volume control boxes (note that each is to be identified by a unique number assigned by the engineer). Provide a schedule that indicates the control sequence that applies to each room (room #, room descriptor, control sequence #)
	4	Major equipment locations.	4	Equipment locations (w/ enlarged mechanical plans)	4	Detailed floor plans of mechanical rooms w/ all components and required service access areas drawn to actual scale
	5	Air intake & discharge locations	5	Indication of typical locations of fire dampers, smoke dampers, and combination F/S dampers	5	Cross-sections through mechanical rooms and areas where there are installation/coordination issues (tight space, zoning of utilities). Indicate required service access areas
	6	Gross HVAC zoning, and typical individual space zoning (e.g. VAV boxes per office =?)	6	Control diagrams (concept form) for all mechanical and plumbing systems	6	In common mechanical space, indication of space zoning by system
	7	Mechanical legend	7	Outline of major control sequences of operation	7	Connection to fire alarm & campus control systems
	8	Special occupancy zones	8	M/E smoke control schemes	8	Equipment details, including structural support requirements

HVAC			9 Preliminary floor plans of mechanical rooms w/ all components and required service access areas drawn to scale	9 Penetration/ sleeve details
			10 Preliminary calculations	10 Installation details
			11 Meter locations and types	11 Duct construction schedule (on the drawings), indicating materials and pressure class for each duct system
				12 Detailed controls drawings, including clear differentiation of trade responsibility for control, fire, and control power wiring
				13 Detailed sequences of operation including the specific set points and time delays
				14 Design calculations
Plumbing & Piping	1	One-line (riser) diagrams for every plumbing system (e.g. domestic water, sanitary, storm, gas, RODI, etc.) and other materials as required to describe the fundamental design concept for all plumbing systems	1 Updated design criteria for each plumbing system (including set points, water quality levels, etc.)	1 Water riser diagram, including assumed fixture counts per floor connection
	2	Indication of the amount of redundancy for all major pieces of mechanical equipment, e.g. "two pumps 100% capacity each"	2 Preliminary piping plans (domestic & process) with indication of required service access areas	2 Waste and vent riser diagrams including assumed fixture counts per floor connection
	3	Main water supply, storm, and sanitary leads	3 Meter locations and system submittals	3 Foundation drains
	4	Major equipment locations	4 Back flow prevention locations	4 Detailed piping design with all pipe sizes indicated
	5	Restroom location(s)	5 Fixture schedules, to include lab fixtures	5 Typical plumbing details, including structural support requirements
	6	Plumbing legend	6 Equipment schedules (major equipment)	6 Water heating piping details
			7 Preliminary floor plans of mechanical rooms w/ all components and required service access areas drawn to scale	7 Penetration sleeve details
			8 Provide water metering service system submittals for DM submission to City of Ann Arbor reference DG 6.2 220010 Plumbing Specialties	8 Design calculations
Fire Protection (Mechanical) - contiued	1	One-line diagrams for each fire protection system, and other materials as required to describe the fundamental design concept for all fire protection systems	1 Location of test headers and fire department connections	1 Fire protect, service entrance details

Fire Protection (Mechanical)	2	Report documenting adequacy of utility	2	Preliminary piping plans (domestic & process) with indication of required service access areas	2	Fire protection plans (incl. header and riser layout) with indication of any required service access areas
	3	Connection to utility	3	Preliminary floor plans of mechanical rooms w/ all components and required service access areas drawn to scale	3	Detailed piping design with all major pipe sizes indicated
	4	Location of fire pump and controller, jockey pump and sprinkler valves	4	Fire pump sizing calculations	4	Location of all sprinkler zone valves, drains, and fire hose connections
	5	Sprinkler legend			5	Zoning extents, for areas where the contractor will size the piping
	6	Optional F.P. systems			6	Typical sprinkler installation details, including structural support details
					7	Penetration/ sleeve details
					8	Design calculations
Lighting	1	Electrical symbols legend	1	Typical interior lighting and control plans	1	Interior and outdoor lighting plans, including control systems and devices, lighting panels, switching and circuiting
	2	General drawing notes	2	Outdoor lighting and control plans	2	Lighting control system schematics and wiring diagrams
	3	General photometric levels	3	Fixture types and schedule	3	Lighting control system detailed sequences of operation
	4	Fixture, lamp, and controls descriptions	4	Control system and control device descriptions	4	Installation details, including structural support details
	5	Preliminary interior lighting plans	5	Typical photometric calculations	5	Normal lighting photometric calculations
	6	Preliminary outdoor lighting plans	6	Dimming, daylighting and low voltage control zones	6	Emergency lighting photo metric calculations on 2'x2' grid for State BFS approval
					7	General notes on conduit and wire sizes for 20 amp single phase lighting branch circuits
Electrical Power Distribution - contiued	1	Electrical demolition	1	Manhole, duct bank, and building entry plans and details	1	Details of power service to building
	2	One-line and riser diagrams with equipment ratings	2	Normal power riser diagram with circuit breaker, fuse, conduit and wire sizes	2	Detailed power plans, including primary cable raceways, feeder conduits, electrical loads, duplex and special receptacles, and circuiting
	3	Manhole, duct bank, and building entry locations	3	Emergency power riser diagram with circuit breaker, fuse, conduit and wire sizes	3	Emergency power system plans, controls, and details
	4	Exterior equipment locations	4	Grounding riser diagram	4	Connections to other building systems, including fire alarm and HVAC systems
	5	Substation, generator and ATS descriptions	5	Substation standard detail	5	Details of non-standard electrical installations

Electrical Power Distribution	6	Substation, generator, and electric room locations	6	Substation front elevation	6	Final short circuit, coordination and arc flash hazard study
	7	Preliminary substation and generator room plans	7	List of equipment on emergency power	7	Conduit and wire sizes for services, feeders, and special branch circuits (other than 20 amp single phase)
	8	Electrical load calculations based on watts/sf	8	Electrical load calculations	8	General notes on conduit and wire sizes for 20 amp single phase branch circuits
			9	Panel schedules	9	Notes identifying locations of separate and shared neutrals
			10	Preliminary short circuit and protective device coordination study	10	MCC elevations
			11	Electrical equipment location plans	11	Grounding details
			12	Typical electrical outlet location plans	12	Roof, wall and floor penetration details
			13	Plan for temporary power doing construction.		
Fire Alarm and Emergency Communications	1	System descriptions	1	Riser diagrams	1	Detailed FA and EC panel, device and appliance location plans including duct detectors, fire/ smoke dampers, sprinkler flow and tamper switches, monitor and control modules, door hold -opens, door lock releases, etc.
	2	FA and EC panel locations	2	Auxiliary panel, remote panel, device and appliance location plans including pull stations, smoke detectors, horns, speakers, strobes, etc.	2	Strobe light candela ratings
	3	MOSCAD panel location	3	MOSCAD standard detail	3	Risk analyses required by NFPA-72
	4	Preliminary FA and EC device and appliance location plans			4	General notes on conduit and wire sizes
					5	Details of connections to HVAC, fire pump, fire suppression, door hold-open, door lock, and MOSCAD systems
					6	MOSCAD antenna location plans and installation details
					7	Detailed sequences of operation and/or alarm matrix
Communications (Including voice, data & video systems) - continued	1	Manhole, duct bank, and building entry locations	1	BE and TR locations, sizes, and door swings	1	Detailed voice, data and video outlet locations
	2	Building Entrance (BE) and local Telephone Room (TR) locations	2	Backboard locations in BE and TR's	2	Details of telecommunications service to the building
	3	Riser diagram	3	Raceway and grounding riser diagrams	3	Floor box schedule
	4	Preliminary cable tray plans	4	Conduit and cable tray plans with conduit and cable tray sizes	4	Conduit, outlet box and floor box installation details

Communications (Including voice, data & video systems)			5	Material cut-sheets		5	Power outlet locations in the BE and TR's
			6	List of equipment to share telecom rooms		6	Locations of non-telecom equipment in the BE and TR's
			7	BE and TR heat loads			
			8	Typical voice, data and video outlet location plans			
			9	Emergency phone locations and types (wall or pedestal)			
			10	Courtesy phone locations			
Security (including CCTV and Card Access Control Systems)	1	System descriptions	1	Riser Diagrams		1	Detailed equipment location plans
	2	Panel locations	2	Equipment descriptions		2	Equipment schedules
	3	Preliminary device location plans	3	A/V equipment location plans		3	Wiring diagrams
			4	Clock and other equipment location plans		4	Installation details (including cabinets, hangers, and connection boxes)
						5	Detailed sequences of operation
Other Graphics	1	Renderings, models, or other graphics as necessary to clearly present concept	1	Updated renderings, models and graphics required only as appropriate for design development		1	Updated renderings, models and graphics required only as appropriate for construction document preparation
Cost	1	Preliminary cost estimate. For projects with cost greater than \$500,000, use format described in UM Design Guidelines 2.5 "Project Estimates"					
	2	Cost Benchmarking. For projects with const. cost \$5million or greater ref. DG 2.5 Project Estimates for Project Benchmarking Requirements					
Notes	1	All movable furnishings and artwork are considered to be independent of the architectural design project.					
	2	Submittals of deliverables for DD and CD phases are to be preceded by a complete response to UM review comments on the previous phase of design work.					
	3	No individual volume of drawings is to exceed 25 lbs. in weight. No individual specification book volume is to exceed three inches in thickness.					