

## PROJECT DELIVERABLES CHECKLIST

### GENERAL INFORMATION

- 1.1 This checklist is to be used as a minimum guideline for deliverables for projects.
- 1.2 Deliverables shall consist of drawings, narrative, reports, analysis, models and renderings, etc. that are deemed appropriate and necessary to properly convey the scope of the proposed work along with existing conditions. Appropriate level of design and documentation will allow for the expeditious review and acceptance of each phase, by all project stakeholders.

### DEFINITIONS

- 2.1 Owner – the CPM (Capital Project Management) and Facilities representatives assigned to the project.
- 2.2 Client – the end user or occupant(s) for whom the project is being done.

### DESIGN REQUIREMENTS

- 3.1 All drawing title blocks shall comply with CUF and the Department of Building guidelines and include the Columbia University Facilities Logo. Title blocks shall contain at a minimum the name of the project, name of the building, floor (construction and marketing), all addresses and aliases, date, scale, DOB BIN, consultants and sub-consultants.
- 3.2 Orient all plans with north to the top of the page.
- 3.3 Drawings shall be 24"x36" maximum as a standard document size. 11 x 17 and 8 ½ x 11 minimum size drawings shall be used if appropriate to the scale and scope of the work at the SD level.
- 3.4 Hardcopy submittals shall be provided at adequate size so that all notes are readable.
- 3.5 Scale of drawings shall be no less than 1/16" and preferably no less than 1/8" scale UON.
- 3.6 The following checklist is a comprehensive list for each phase of the work. Certain requirements may be waived as is appropriate to the size and scale of project. This shall be determined by the Project Manager at the kickoff meeting.

END OF SECTION

## DELIVERABLES CHECKLIST

FEASIBILITY GENERAL REQUIREMENTS	
	Review the Columbia University Facilities Design Requirements: <a href="http://facilities.columbia.edu/design-requirements">http://facilities.columbia.edu/design-requirements</a>
	Meet with Owner's stakeholders and project team to understand Program goals.
	Confirm existing conditions along with an assessment of architectural, infrastructure, and structural components that will need to be addressed during the subsequent design phases.
	Prepare a regulatory, zoning, and code compliance assessment of the Program, the proposed Project Site, and its facilities, noting areas or conditions that will need to be addressed as part of any subsequent design phases.
	Conduct a comprehensive survey of the proposed Project Site.
	Evaluate and prepare comments on the survey, zoning, and code compliance assessment, and existing conditions assessment.
	Prepare architectural concepts and initial planning.
	Create and conduct a presentation to Owner's stakeholders.
	Make recommendations on adjustments to the Program.

PRE-DESIGN (CONCEPT) GENERAL REQUIREMENTS	
	<b>Project Schedule</b>
	Develop a simple overall project schedule identifying durations of design phases, estimated construction duration, and any other major milestones. The schedule should be flexible enough to allow for revisions and updates as required by Owner. This schedule shall be reviewed with Owner at project meetings.
	<b>Program Requirements</b>
	Provide preliminary evaluation of Program and make recommendations to Owner for modifications to the Program
	Develop and finalize project design program
	Establish design objectives and criteria
	Confirm Program requirements including legal requirements
	Develop Zoning analysis
	<b>Conceptual Schemes</b>
	Prepare concept design documents, based on project design program requirements. Prepare multiple schemes, as needed, for Owner review.
	<b>Budget + Costs</b>
	Based on Owner accepted Concept Design Documents, assist in the preparation of Project Budget

<b>SCHEMATIC DESIGN GENERAL REQUIREMENTS</b>	
<b>Project Schedule</b>	
	Develop a simple SD project schedule, which shall be reviewed with Owner at project meetings, identifying the following items:
	Project phase submittals
	Review times assumptions
	Plan Submittal
	Pre-bid operations
	Construction duration
<b>Program Requirements</b>	
	Review program requirements
	Confirm building program with Owner and Client
	Review with Owner and Construction Manager the proposed site use and planned improvements, selection of materials, building systems and equipment, construction methods and methods of project delivery
<b>Budget + Costs</b>	
	Assist Owner in defining the budget and preparing a statement of probable construction costs in cooperation with the Estimator for the project or the Construction Manager
	Bring any unusual cost item to the attention of Owner.
	Provide drawings, outline specification and other documents for use in preparing an estimate of construction cost.
	Assist with preparation of the construction cost estimate.
	Obtain approval from Owner before proposing or initiating any work which may require performance of extra services.
<b>Regulatory</b>	
	Engage in preliminary discussion with filing representative or code consultant regarding filing approach and likely applications and approvals.
	Assess impact of project scope on building and floor occupancy type, maximum occupancy and egress.
	Establish regulatory "Construction" and "Marketing" floor designations for use on all drawings and details.
<b>Institutional Citizenship</b>	
	Determine sustainability goals.
	Determine scope and approach to accessibility.
<b>Coordination</b>	
	Coordinate and interface with any governmental agencies involved with the Project.
	Attend design meetings as needed with Owner and Consultants.
	Attend weekly page turning meetings with Owner's engineering department and commissioning agent to discuss design intent, review progress, obtain direction, etc.
	Secure project planning information including information on U/G utilities and site constraints

	Request any additional data needed from Owner.
	Meet with other Consultants and obtain required information
	Coordinate work with other Consultants. Architect will be the primary design coordinator of the project with regard to spatial requirements and shall input all elements received from other consultants on drawings. Engineer shall notify the architect promptly of any conflicts.
	Review and annotate any progress sets received from other Consultants.
	Identify any proposed deviation from CU Standards and obtain approval from Owner.
	<b>Communication</b>
	Copy Owner on all communication with other Consultants.
	Use a file sharing website as directed by Owner for exchanging all project documents.
	Submit SD package for review by Owner and incorporate all comments prior to proceeding to Design Development (DD) phase.
<b>SCHEMATIC DESIGN MECHANICAL, ELECTRICAL AND PLUMBING (MEP) &amp; FIRE PROTECTION (FP) REQUIREMENTS</b>	
	<b>Infrastructure Assessment</b>
	Assess impacted building systems. Prepare narrative report outlining likely impact to existing MEP and FLS systems. Lead schematic level discussion with Owner on best design approach.
	<b>HVAC Requirements</b>
	Provide outline system description of recommended mechanical systems or alterations to existing systems, including, but not limited to estimates system capacities
	Provide written analysis of calculated loads for proposed HVAC systems and a description of the recommended system with the basis for the recommendation over other approaches
	Provide an analysis of the proposed systems, including energy conservation and load management systems
	Provide preliminary system flow and/or riser diagram(s) showing critical major systems, including, but not limited to, HVAC, chilled water distribution, heating, and condenser water systems.
	Provide sketches of main equipment room locations and major shaft/riser locations for incorporation into the architect's schematic drawings.
	Provide part plans indicating sizes and locations of major equipment items, including but not limited to, cooling towers, chillers, pumps, fans, air-handling units, compressors, and related items.
	Show air intake and exhausts requirements and coordinate louver requirements with the architect.
	<b>Electrical/Telecom/Fire Alarm Requirements</b>
	Provide outline system description of recommended electrical systems or alterations to existing systems, including service voltage, estimated number of service takeoffs, estimated size of emergency power system (if applicable). And estimated capacities.
	Provide outline system description of recommended telecom systems

	Provide written analysis of fire alarm infrastructure capacity for supporting design to current codes. If infrastructure upgrade is required, provide written scope narrative.
	Prepare preliminary utility analysis based on a general project overview. Develop electrical load letter for submission to Con Edison
	Prepare preliminary emergency power system analysis based on code requirements as well as optional loads required by owner.
	Provide preliminary electrical single-line diagrams and/or riser diagrams showing: <ul style="list-style-type: none"> <li>• Main utility service</li> <li>• Major electrical distribution switchboards, transformers, and panels</li> <li>• Major bulk feeders/pipe &amp; wire distribution</li> <li>• Major components of emergency power system (if applicable)</li> </ul>
	Provide sketches of main electric service room/electric closet locations and major power riser locations along with space and height requirements for incorporation into the architect's schematic drawings.
	Provide part plans showing layouts of major equipment, including, but not limited to, equipment within the service switchgear room, typical electric closets, and major mechanical rooms.
	Provide sketches showing locations of main telecom point of entry room, main distribution frame and independent distribution frame closets, and major telecom riser locations along with space and height requirements for incorporation into the Architects schematic drawings
	<b>Plumbing / Fire Protection Requirements</b>
	Outline system description of recommended plumbing and fire life safety systems or alterations to existing systems, including an estimate of system capacities
	Provide written analysis of calculated load demands of proposed new plumbing systems, the design demand of the Project, and the capacity of the existing plumbing systems, if any, showing sanitary systems, natural gas, domestic water, storm retention and release, and fire protection subsystems.
	Provide analysis of male and female fixture count and location with a comparison to plumbing code minimum requirements.
	Provide plumbing plans with diagrammatic water service, storage, roof drainage, fire risers if applicable, and invert elevations at points of connection with site utilities.
	Provide written analysis of fire protection infrastructure capacity for supporting sprinklers, if not already existing. If infrastructure upgrade is required, provide written scope narrative.
	Determine estimated size of the New York City Department of Environmental Protection (DEP) required detention tanks and coordinate height/location with the Architect.
	Coordinate with Sustainability Consultant for integration of sustainability requirements into specification sections.

SD ARCHITECTURAL DOCUMENT REQUIREMENTS		
General SD Architectural Requirements		
	Prepare schematic design documents consisting of drawings and other documents illustrating the scale and relationship of project components. SD set to consist of:	
	design criteria;	
	a description of systems;	
	block layouts of major elements and systems; and	
	diagrammatic plans and sections.	
	At intervals appropriate to SD progress, provide design studies for Owner's and Contractor's review.	
	Provide alternate design approaches for review.	
	Provide renderings and other presentation material as required to illustrate the design intent.	
	Provide axonometric (or basic 3-D sketch) studies as required to analyze various building massing schemes.	
	Provide narrative description of the design concept and important features of the Project.	
	Prior to the completion of the Schematic Design phase, submit for Owner's review a detailed drawing list matrix outlining all the drawings anticipated for this Project, their scale, the project phases they will be part of. (SD, DD, ____% CD, ____%CD and/or ___% CD) ( <b>Note: fill in as outlined in the RFP</b> ), and their anticipated percentage <b>complete at each</b> of these phases.	
Code Compliance + Zoning Analysis		
	Design the facility in accordance with all applicable codes and standards.	
	Prepare and provide a narrative discussion and summary of building code issues, impacts and restrictions particular to this Project. The outline shall include a written report and diagrammatic plan drawings delineating design criteria (e.g. exit paths, travel distances, required exits, rated walls, rated corridors, building occupancy, construction type, and fire zones) (" <u>Code Study</u> "). The analysis shall be updated for each design phase.	
	Prepare preliminary required zoning analysis, which shall be in the format required by any applicable governmental, quasi-governmental and legal authorities having jurisdiction over the Project. The analysis shall be updated for each design phase.	
	Prepare an area summary chart noting all programmed space (gross, zoning, rentable, net, etc.).	
Building Envelope		
	Prepare a basis of design report for the building envelope.	

	Provide analysis of at least two alternate building envelope solutions as part of the initial 100% SD review. Provide large scale wall sections illustrating the proposed systems.	
	<b>Utility Analysis</b>	
	Review the utility analysis prepared by the mechanical, electrical, and plumbing engineer (“MEP”) engineer. The analysis will indicate anticipated energy use, costs, and other utility loads. It will be included as part of the MEP study and design documents.	
	<b>Site Plans (Scale: Minimum 1/16 inch = 1 foot)</b>	
	Prepare an overall site plan.	
	Depict the general layout of the Project.	
	Depict the coordination of layouts to incorporate zoning, traffic design, site entrances, grading, drainage, utilities, and other site requirements which are included in the civil engineer’s or other consultants’ work.	
	Depict the building footprint, setbacks, landscape areas, and other specific requirements of Owner that are identified in the Project requirements.	
	Depict transitional items including without limitation sidewalks and screening walls within the Project curb line and the relationship of these items to the grades of the Project and the Project Site.	
	Depict major new exterior elements and, for alterations and additions, existing exterior elements that will remain in place. Show streets, service drives, easements, loading docks, parking areas, paved areas, walks, stairs, ramps, pools, retaining walls, fences, fire hydrants, above & below ground storage (dry & wet), and equipment, as applicable.	
	Depict proposed finished elevations of building entrances and major exterior elements.	
	Depict existing and proposed contours at one-foot intervals. Indicate method of general site drainage. Provide a written narrative on design grading and retention systems proposed. Discuss possible alternate systems.	
	Provide sections through the site as needed to explain changes in levels within the proposed building as related to the Project Site.	
	Depict placement of ramps and other provisions for disabled access to the site and building.	
	Depict landscape areas.	
	Depict site demolition, if applicable.	
	<b>Floor Plans (Scale: Minimum 1/4 inch = 1 foot)</b>	
	Indicate locations, room names, sizes (in assignable square feet), and space numbers for all programmed spaces and required gross area spaces including entrances, lobbies, corridors, stairs, elevators, toilet rooms, janitor’s closets, and mechanical/electrical equipment rooms.	
	Indicate overall dimensions of major elements of the building.	

	Indicate building elements: walls, columns, doors, windows, openings, and major built-in equipment.	
	Indicate compliance with applicable accessibility codes.	
	Provide demolition plan if demolition required. Indicate existing work to be removed, and existing work to remain in place.	
<b>Elevations and Sections (Scale: Minimum 1/8 inch = 1 foot)</b>		
	Show all building elevations. Depict floor-to-floor dimensions, overall building height, and relationship to natural and graded ground contours.	
	Include sections as needed to explain the structure and its design features.	
<b>SD Outline Specifications</b>		
	At completion of SD, provide outline specifications which describe the following:	
	Essential systems;	
	Equipment;	
	Finishes; and	
	Materials.	
	Coordinate with sustainability consultant for integration of sustainability requirements into specification sections.	

<b>DESIGN DEVELOPMENT (DD) GENERAL REQUIREMENTS</b>		
<b>Project Schedule</b>		
	Refine project schedule with updated information and identify milestones for DD phase, including, but not limited to project phase submittals, review times assumptions and plan submittals. Schedule shall be updated and reviewed at project meetings as required.	
	Make initial recommendations for construction phase testing and special inspections, including, but not limited to, mechanical inspections, welding inspections, fire protection hydrostatic testing, and emergency/life safety inspections.	
<b>Program Requirements</b>		
	Refine MEP & FP design.	
	Resolve the design of all major components of building.	
<b>Budget + Costs</b>		
	Provide the Construction Manager with drawings, specifications and other documents approved by the Owner for use in preparing a further estimate of construction cost.	
	Bring any unusual item noted to the attention of the Owner.	
<b>Coordination</b>		
	Attend design meetings with Owner and Consultants.	
	Attend page turning meetings with Owner's Engineering department, Design and Compliance group, and Commissioning Agent to discuss design intent, review progress, obtain direction, etc.	
	Coordinate MEP components with the Architect as well as other disciplines.	

	Prepare spreadsheet of assets (equipment) to be removed and proposed new assets. Obtain Maximo Asset ID's from Maximo administrator for incorporation into CD's.
	Furnish in conjunction with the Architect and structural engineer an analysis and options with plans prepared to illustrate the principal features of the mechanical, plumbing, fire protection, heating, ventilating, air-conditioning, thermal insulation, electrical and other utility systems.
	Prepare filing documents and coordinate their submission, with other Consultants, the Expediter and Owner.
	Begin Consultant meetings no later than the end of the DD phase.
<b>Presentation Documents</b>	
	Prepare presentation documentation (such as drawings, computer renderings) as required to clarify proposed design intent.
	Prepare and package the final Design Development Documents.
<b>DD MEP &amp; FP DOCUMENT REQUIREMENTS</b>	
	<b>Note: At the completion of this phase, 100% scope should be included in the contract documents. The documents do not necessarily need to be fully coordinated nor include construction details; however, major coordination that dictates scope must be delineated.</b>
<b>HVAC Requirements</b>	
	<b>Floor Plans (Scale: minimum 1/8 inch = 1 foot)</b>
	Provide a single line mechanical plan showing primary duct layout and indicating all mains for each duct system.
	Provide a single line plan indicating typical supply and return air zones for each type of occupancy, including the terminal unit with associated branch ducts and air outlets and inlets.
	Provide equipment schedules
	Indicate sizes and location of each piece of equipment including air-handling units, chillers, cooling towers, pumps converters, expansion tanks, boilers, fans, fan coil units, and other equipment
	Indicate the typical exhaust air duct for each type of application (Including hoods, toilet rooms, janitors closets, transformers, mechanical/electrical equipment rooms, and other rooms as required for a satisfactory indoor environment) and identify size and bottom of duct elevations of primary service ducts. A typical duct shall include an air inlet and a source destination for exhaust air.
	<b>Enlarged Mechanical Plans (Scale: minimum 1/4 inch = 1 foot)</b>
	Provide a layout of all major equipment rooms to ensure that the proposed equipment will fit in the allotted space.
<b>Electrical/Telecom/Fire Alarm Requirements</b>	
	Provide a set of drawings for Power, Telecom, Fire Alarm, and Lighting using standard symbol conventions.
	<b>Floor Plans (Scale: Minimum 1/8 inch = 1 foot)</b>
	Provide a site electrical plan, indicating method of service for electrical power, telecommunications, and fire alarm systems.

	Provide lighting plan and schedule for each type and location of lighting fixture in typical offices, laboratories, corridors, examination rooms, and similar spaces.
	Provide a single-line electrical distribution diagram showing primary service to substations and secondary service to distribution switchboards, motor control centers, and panel boards for power and lighting. Show the permanent and temporary points of connection to external utilities such as high voltage, telephone, and all signal systems.
	Provide a Fire Alarm Drawing indicating type and number of devices, system expansion panels and point of connection to existing system. Confirm that project capacity needs have been reserved with the Fire Shop.
	Indicate each load center unit substation, motor control center, distribution switchboard, telecommunications equipment room and closet.
	Indicate major components of telecommunications system, including MDF/POE and IDF.
	Coordinate information with site utilities plan.
	Provide a narrative on proposed system design, media type conduit routing, and access.
	<b>Enlarged Equipment Room Plans (Scale: Minimum 1/4 inch = 1 foot)</b>
	Provide a layout of all equipment rooms to ensure that proposed equipment will fit in the allotted space.
	<b>Plumbing/Fire Protection Requirements</b>
	<b>Site utilities plan (Scale: minimum 1 inch = 40 feet)</b>
	Indicate routing of proposed new external utilities from utility point of connection to the building. Including fire service, sanitary systems, natural gas, domestic water, and storm detention and/or retention.
	<b>Floor plans (Scale: Minimum 1/8 inch = 1 foot)</b>
	Indicate all piping on the floor level plan in which it will be installed, including water service, storage, roof drainage, fire risers (if applicable) and invert elevations at points of connection with site utilities, including sizes based on calculations.
	Indicate locations of all vertical risers and vents as well as all service mains, including those for domestic water, fire, sanitary, storm, and natural gas.
	Indicate all pieces of equipment, including but not limited to, pumps, tanks, generators, pressure-reducing valves, gas boosters, showing their locations and required piping connections.
	<b>Outline Specifications</b>
	Provide outline specifications, including the following:
	- An index showing divisions and sections intended to be used in CSI format.
	- A general description of the plumbing and HVAC systems to be used in CSI format.
	- A general description of electrical services including the voltage and number of feeders. The specifications shall provide a specific description of items to be served by emergency power and design considerations for special areas. Such descriptions shall include applicable code references.
	- A general description of fire safety mechanical and electrical systems and devices required by the governmental authorities for the intended occupancy of the building.

	- A description of special systems including control systems, energy metering/management systems, and special exhaust systems.
	Provide recommendation for vendor equipment and contractor installation warranty requirements.
<b>Coordination with Architect and other Consultants</b>	
	Coordinate with sustainability consultant to assess materials for compatibility with Owner's sustainability criteria. Share product data for vetting proposed products.
	Collaborate with energy consultant in developing energy model for building envelope.
	Provide plan to the architect, showing section and elevations all MEP services that penetrate the building envelope, including but not limited to, Siamese connections, vents, outside air intakes, hose bibs, flues, and fuel fill ports, vents and alarms.
	Show in plan, section and elevations all lighting protection terminals that engage building parapets and roof projections.
<b>Elevations and Sections (Scale: Minimum 1/8 inch = 1 foot)</b>	
	Depict all building exterior MEP elements including louvers, vents, plumbing outside air intakes, exhaust stacks, cooling towers, generators, air handling units, and similar units.
	Including sections as needed (scale: minimum 1/4 inch = 1 foot) to verify that MEP equipment, piping, valves, strainers, ductwork, dampers, etc. Fit within a given space, can be properly accessed, maintained and operated. Indicate all MEP elements, floor elevations, structural elements, ceiling heights, etc.
<b>CONTRACT DOCUMENTS GENERAL REQUIREMENTS</b>	
<b>Project Schedule</b>	
	Prepare a milestone schedule for the CD phase.
	Attend design meetings with Owner and consultants, in addition to the coordination meetings.
	Include a list of requirements for special testing and inspections to be conducted during the construction phase, as specified in Divisions 1 through 16 of the contract documents.
<b>Budget + Costs</b>	
	Assist the Owner and the Construction Manager in the preparation of the necessary bidding information.
	Package construction documents, including those of other consultants into bid sets.
	Provide coordinated specifications with sufficient time for Owner review and any edits and resolution well in advance of bid package issuance.
	Assist the construction manager in obtaining bids or negotiated proposals, if needed.
	Attend pre-bid conferences and bid openings and provide a reasonable level of assistance to owner, bidders, and contractors
	Compare the final 100% cost estimate with the Project Budget. Any significant differences between the revised estimates and the Project Budget shall be brought to the immediate attention of the Owner.
	Provide a written narrative explaining in detail any deviation from the approved estimated construction cost.
<b>Coordination</b>	

	Conduct coordination meetings with other consultants. Work with the architect to prepare agenda prior to each meeting.
	Continue to attend design team meetings with owner and consultants.
	Attend page turning meetings with Owners engineering department and commissioning agent to discuss design intent, review progress, obtain direction, etc.
	Ensure that drawings clearly define the scope of work, with special attention to interfaces between trades.
	Review drawings of other consultants and promptly return mark ups for coordination purposes.
<b>CONTRACT DOCUMENTS MEP &amp; FP DOCUMENT REQUIREMENTS</b>	
<b>General MEP &amp; FP Requirements</b>	
	Prepare construction documents consisting of drawings and specifications setting forth in detail the complete MEP design requirements for the construction of the Project.
	Construction documents shall contain sufficient information, including details and dimensions, and shall be of suitable scale so that bidders and contractors will be able to construct the project.
	Note: At the 100% completion phase, plans shall be submitted as 100% complete. Consultant drawings shall be coordinated with architectural drawings and reconciled with a quality assurance review. Notes must coordinate with, and conform to, the written contract documents. Products and materials specified on the drawings must be identical to the products and materials required in the written contract documents and specifications. The 90% completion designation is solely to acknowledge that the plans have not been reviewed by Owner.
<b>Filing Requirements</b>	
	Prepare agency filing documents (including mechanical, plumbing, fire protection, and fire alarm drawings, in consultation with owner's code consultant/project expeditor) for submission to relevant agencies.
<b>50% CD HVAC Drawings</b>	
	Provide schedules and legends.
	Floor plans with sections indicating air and piping systems, including all branch distribution.
	Provide sections, details and enlarged floor plans depicting layout of mechanical equipment rooms
	Indicate air balance schedule for outside, supply, return, and exhaust air for each air system, as well as sections demonstrating sufficient clearances and volumes for air flows and access of equipment, where applicable.
	Indicate fire smoke dampers as required by code. Provide a matrix to describe dampers controlled by BMS vs. required control by fire alarm system for smoke control or post fire event purge.
	Flow diagrams for chilled water, condenser water, and boilers, where applicable
	Air/water riser diagram for each type of system.
	Plans and detail sections depicting the complete HVAC systems and branches with duct and pipe sizes for heating, steam, refrigeration, exhaust and ventilation, where applicable

	Indicate auxiliary HVAC required for 24/7 operating equipment service systems, where applicable.
<b>50% CD Electrical/Telecom/Fire Alarm Drawings</b>	
	Electrical service to the building from public utility, with size of feeders.
	Utility transformer/network protector vault locations and service connections/take-offs.
	Service switchboards, distribution switchboards, power panels, lighting panels, receptacle panels, and associated equipment.
	Feeders and conduit sizes
	Site and building light fixtures, receptacles, switches, and power outlets
	Telecommunications system design including point and nature of connection to existing service, MDF's, IDF's, conduit routing, outlets, cabling/wiring, terminal cabinets, and backboards. Show coordination with supporting mechanical services and with site utilities plans.
	Complete fire alarm system, including but not limited to, location of main fire control panel, data gathering panels, addressable initiating devices, audible/visual devices, fan shutdown/damper control relays.
	Emergency electrical power system, including generator, automatic transfer switches, fuel oil transfer system, and all auxiliaries.
	Audio visual conduit, cabling, and equipment.
	Lighting protection system, if applicable.
	Building sub-metering system complete with connections to water, steam, btu, chilled water timer meters, etc.
<b>50% CD Plumbing/Fire Protection Drawings</b>	
	Site utility sewer lines sized with invert elevations at point of connection
	Building waste line layouts, sized with vent stacks and connections to drains, fixtures, and equipment.
	Size and locations of DEP required storm detention and/or retention tanks. Indicate retention filtration/Ozone/UV transfer system, where applicable.
	Building incoming domestic water service with DEP required meters, backflow preventers, double check valve, etc.
	Building hot and cold water supply layouts, sized with circulation mains, tanks, branches, risers, and connections to fixtures and equipment.
	Riser diagrams for domestic hot/cold water and storm/sanitary systems.
	Fire protection equipment, sprinkler risers, standpipes, branch piping, and sprinkler head layouts.
	Plumbing fixtures, tanks, and pumps with drainage and supply connections.
	Locations and sizes of natural gas incoming service, direct meters, risers, booster equipment, pressure regulators and vents.
	Vacuum and pneumatic systems, where applicable
	Detail sections demonstrating coordination of structural, HVAC, and piping systems.
<b>100% CD MEP Drawings</b>	
	100% plans shall incorporate all review comments.

	Certify, by a signed statement on the drawings and by provision of required calculations, that the CD's comply with the energy performance requirements.
	Stamp all drawings as required by law for professional engineers.
	All plumbing drawings shall indicate the complete plumbing system, fully coordinated with architectural and structural drawings, with specific details including methods for fastening equipment/piping to structure.
	All HVAC drawings shall indicate the complete heating, ventilating, and air-conditioning systems. Fully coordinated with architectural and structural drawings, with specific details including methods for fastening equipment/piping to structure.
	Electricals drawings shall indicate all components of the electrical and telecom system in place and connected to the sources of services. Drawings shall be fully coordinated with architectural and structural drawings. Provide sufficient level of detail to illustrate connections, routings, and other items in complex areas. All wiring shall be final-sized. Indicate detailed methods for fastening equipment/conduit to the structure. Indicate the following:
	- Feeder and conduit sizes
	- Schedule of feeder breakers or switches
	- Locations of light fixtures, receptacles, switches, power outlets
	- All branch circuiting
	- Complete telecommunication system design to accommodate active electronic equipment, to be provided by system integrator and/or service providers. Show point and nature of connection to existing service. Show BDFs, IDFs, terminal racks/cabinets and/or backboards. Show conduit routing, cabling/wiring and outlets
	- Complete audio visual system design
<b>Facilities Operations Data Collection</b>	
	Prepare and submit Asset, Utility and Custodial data sheets
<b>Specifications</b>	
	Specifications shall contain sufficient information so that bidders and contractors will be able to construct the project
	Specification must contain necessary language to achieve sustainability goals for the project.
	100% specifications shall incorporate all review comments.
<b>CONTRACT ADMINISTRATION GENERAL REQUIREMENTS</b>	
<b>Site Review</b>	
	Visit the site on, at least, a weekly basis. Issue a site visit report after each visit.
	Attend weekly construction meetings.
<b>Budget + Costs</b>	
	If required by the Owner, the engineer shall review the trade contractors' applications for payment and make recommendations to the owner for payment.
	Make a recommendation to the Owner concerning issuance of a final certificate for payment.

<b>Inspections + Testing</b>	
	Recommend any and all legally required or recommended special inspection or testing.
	Attend testing, including waterproofing testing, curtain wall testing and mock up sessions and make the final materials selection and/or approval.
	Conduct inspections to determine the dates of substantial completion and final completion.
	Review all submitted inspection and test reports, including reports on controlled inspections provided by others.
<b>Regulatory</b>	
	Assist construction manager in obtaining permits required in connection with project.
<b>Coordination + Review</b>	
	Review all trade contractor submittals received from the Construction Manager, including shop drawings, product data and samples, for general conformance with the contract documents. Coordinate comments with commissioning agent and the owner.
	Participate in trade coordination meetings, if necessary.
	Respond to requests for information (RFIs) from contractors and issue supplemental sketches and information as required.
	Review and evaluate all material substitutions proposed by the construction manager or contractors.
	Review change orders prepared by the construction manager for the owner.
	Recommend rejection of work which does not conform to the contract documents.
	Prepare a punch list for owner of incomplete and/or defective work.
<b>CONTRACT ADMINISTRATION (CA) MEP DOCUMENT REQUIREMENTS</b>	
<b>General CA MEP Requirements</b>	
	Issue ASI's and Bulletins as required to document design changes
<b>COMPLETION REQUIREMENTS</b>	
	Determine Substantial and Final Completion dates
	Establish Warranty Effective Dates
	Provide record drawings to owner in electronic format, both ".dwg's" and "pdf's".
	Collect, review and forward to the Owner, all warranties, Owner's Manuals and training / operating videos
	Perform 11 <sup>th</sup> Month Inspection to review facility operations and performance
<b>MEP &amp; FP COMPLETION REQUIREMENTS</b>	
	Attend Commissioning procedures
	Establish Warranty Effective Dates
	Review TAB Reports
	Cooperate with Expeditor in all regulatory application sign-offs