SOW for MEP Consultant

STAGE 1 - CONCEPT DESIGN

Data Collection: At the beginning of the concept design stage, the MEP team will review the design brief and identify all ambiguities. The team will also obtain all the client requirements, local standards and regulations, project's planning restriction and international standards. Key MEP personnel will be selected to conduct a meeting to gain further insight of the project and agree on all the above mentioned items.

- Review of planned MEP systems, plant allocation and preliminary layouts for compliance with the design intent
- Formulate all the expected MEP challenges that will be faced in the project and devise a plan of how these challenges will be addressed.
- Ensure that the MEP plan is in full compliance with the authorities. Discuss project challenges with the authorities and devise a plan on how will the authority requirements be met.
- Prepare the project's initial estimation of loads and utilities, including potential interface locations requirements
- Prepare MEP concept design report that includes a general description of the project's MEP system and equipment, the preliminary load estimation, initial space planning and conceptual layouts.

DELIVERABLES:

- ✓ Concept Design Report
- ✓ Projected drawing list
- ✓ Outlined options and alternatives as appropriate to meet the design brief
- ✓ Identification of notional space requirements and major plant selection as required

STAGE 2 - SCHEMATIC DESIGN

- Define and discuss criteria involved in the Schematic design process.
- Develop all MEP systems based on the Client requirements and Concept Design Report and documentation.
- Prepare Schematic Design Report that will include design criteria, preliminary design calculations and drawings. The report will include a description of systems and a detailed narrative to describe the works completed during this stage and works requiring additional investigation or further development during the subsequent stages.
- Develop schedules of electrical and mechanical load, capacity and plant requirements to assist in the identification and selection of major plant items

- Develop all concept design drawings and systems into schematic
- Develop the MEP schematic drawings and calculations
- Carry out check on multidiscipline coordination
- Attending workshops and meetings with the project's PM and Client
- Preparation of cut sheets for the various MEP systems as required
- Prepare Electrical and Mechanical calculation reports of major plants and systems.

DELIVERABLES:

- ✓ Schematic Design Report
- ✓ 1:100 single line MEP layouts
- ✓ MEP systems' schematics
- ✓ Schematic Design for the MEP services shall include but not be limited to the following: <u>a. Mechanical Services:</u>
 - Flow diagrams of all HVAC systems
 - Single line layouts of all HVAC systems showing equipment and zoning for each area
 - Single line diagrams of all exhaust and make up air systems
 - Single line piping diagrams of all chilled/ cooling water systems
 - Indicate capacities of all major equipment
 - Preliminary heat load calculations
 - Preliminary calculations for sizing of equipment and systems
 - Fire sprinkler systems layouts and riser diagrams
 - Fire hose, cabinets, fire extinguishers, Siamese connections, and fire hydrant systems layouts and riser diagrams
 - Any other information or computation required to permit verification of the design compliance with the design criteria, codes, standards and that is satisfactory for the intended purpose

b. Electrical Services:

- Site plan (1:250)
- Grounding, lightning protection plans (1:100)
- Lighting plans (1:100, 1:50)
- Power / communications Plans (1:100, 1:50)
- Electrical rooms, mechanical rooms, communications and fire rooms plans (1:100, 1:50)
- One-line diagrams
- Riser diagrams
- Preliminary Schedules for lighting and power panel boards, distribution panelboards

- Design studies listing electrical supply and distribution, electrical characteristics, total connected loads, kilowatt demand load, diversity factors, voltage drop, etc.
- Fire alarm and detection systems
- c. Plumbing Services:
- Single line layouts of all plumbing systems
- Riser diagrams for sanitary sewer, waste and vents; hot, cold and potable water; fire standpipe; storm drain; special piping systems
- Design studies listing criteria, codes, documents, and design conditions used
- Justification and brief description of types of plumbing fixtures, piping materials and equipment proposed for use
- Preliminary calculations and sizing of domestic hot and cold water, sanitary, roof drainage, compressed air, vacuum, water treatment, and special gas systems
- Preliminary hot water demand analysis
- Potable water consumption analysis
- Preliminary storm water and sewerage outflow analysis
- d. Any other information or computation required to permit verification of the design compliance with the design criteria, codes, standards and that is satisfactory for the intended purpose.

STAGE 3 - DETAILED DESIGN DEVELOPMENT

- Review the client comments on the schematic design and incorporate the changes into the detailed design
- Prepare the detailed project's electrical and mechanical drawings, sections and details
- Update the schematic calculation report for the mechanical and electrical systems and include all detailed MEP calculations.
- Update the project's MEP schedules and replace the estimated loads with actual calculated loads.
- Liaise and coordinate closely with the project's architect, MEP system specialists and all other disciplines to ensure delivery of an integrated design.
- Apply value management techniques to ensure the project cost does not exceed the client's established budget.
- Hold discussions with the Employer and receive final comments on this stage submission.

DELIVERABLES:

- ✓ 1:100 MEP Layouts
- ✓ 1:50 MEP Details Drawings
- ✓ MEP systems' detailed schematic drawings
- ✓ Mechanical and Electrical detailed calculation reports
- ✓ Detailed Design for the MEP services shall include but not be limited to the following:

- Final design calculations for all MEP systems.
- Final and fully coordinated detailed design drawings of all infrastructure networks, including power distribution, potable water, water feature, irrigation, street lighting, sewerage, etc.
- All risers, shafts, chases and equipment rooms sized and located on architectural plans.
- Plumbing drawings showing mains and branches, location of risers, and schematic system diagrams.
- Preliminary Gas installation systems and diagrams which should be detailed and finalized at later stage by Licensed Engineer.
- HVAC drawings (double line) showing all equipment, supply, return and exhaust ductwork, location of risers and schematic system diagrams.
- Power drawings showing panel locations, main distribution and schematic system diagrams.
- Lighting drawings coordinated with architectural and mechanical drawings and shown on reflected ceiling plans.
- ICT, telephone and PABX installation design.
- CCTV installation design including associated surveillance equipment and alarms.
- MATV installation design and documents.
- Background music installation design as required.
- Security and access control installation design.
- Building Management Systems design limited to typical equipment control diagrams and data point lists.
- Fire protection and control design documentation including external hydrants and portable firefighting equipment.
- Lightning protection.
- Television, video and audio-visual systems design.
- Equipment room plans and required pad identification.
- Louvers located, sized and coordinated with architectural drawings.

Pool Design

- Pool MEP layouts and sections (Lighting fixtures, motor powers, piping layouts etc.).
- Pool calculations (HEX selection, Pump selection, Electrical panel capacity, Water treatment selection etc.)

Fire System Design

- Fire safety report (Hazard classification, fire protection system selections, smoke & pressurization system selections, hydraulic and fire ventilation calculations, means of egress etc)
- Fire scenario / matrix

Kitchen and Laundry Design

- Kitchen and laundry layouts showing MEP connection points and capacities (Domestic water, waste water, gas, electricity, steam etc)
- Grease separator requirements and capacities
- Hood ventilation requirements and capacities

AV System

- AV Equipment list
- AV Equipment layout
- AV Equipment cable topology
- AV Equipment feed electrical power list

IT System

- IT Equipment layout
- Information of IT System type (IP TV, Pay TV, IP Phone, Wireless access point, etc.)

Security System

- Security system equipment brand list
- Security system equipment layout

*Delivery of each stage of the design should be checked and confirmed by PM Company, Hotel Operator and the Owner.