DESIGN STANDARD.

Architecture, Structure, MEP Systems, Façade.

LSG Solutions provides construction management, design and advisory services in various sectors such as real estate, hospitality, healthcare, industrial and infrastructure.



CONTENT

[2] - DESIGN DEVELOPMENT

[3] - CLIENT REQUIREMENTS

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- [6]-ARCHITECTURE
- Concept design
- Schematic design
- Detailed design

- [25] MEP SYSTEMS
- Concept design
- Schematic design
- Detailed design

- [36]-STRUCTURAL
- Concept design
- Schematic design
- Detailed design

- [43]-FACADE
- Concept design
- Schematic design
- Detailed design

DESIGN STANDARD

Architecture	CD*	SD*	DD*
	30%	70%	100%
MEP Systems	CD*	SD*	DD*
	30%	70%	100%
Structural	CD*	SD*	DD*
	30%	70%	100%
Facade	CD*	SD*	DD*
	30%	70%	100%

CLIENT REQUIREMENTS

DESIGN BRIEF

FUNCTIONAL ZONING

AREA DESCRIPTION AND OBJECTIVES BUILDING TYPE:

TERRITORY

BUILDING SPACES

- Residential
- Commercial Industrial
- Hotel
- Food & beverage
- Multifunctional
- Healthcare
- Wellness
- Entertainment
- Other

- Outdoor parking lot
- Fencing construction site
- Greenery
- Playground
- Small architectural objects
- Sport grounds
- Outdoor swimming pool
- Other

- Living
- Indoor parking lot
- Technical Commercial
- Office
- Conference room
- Spa
- Fitness
- Indoor swimming pool
- Food & beverage
- Other

CLIENT REQUIREMENTS

SPACE QUANTIFICATION SCHEDULE

PRELIMINARY MASSING OF THE BUILDING

CLIENT'S INSPIRATION (VISUAL/REFERENCES)

DESIGN SCOPE

- Urban
- Development plan
- Vertical planning
- Landscaping
- Architecture
- Structural Engineering

- Indoor/outdoor Engineering
- Networks Interior Design
- Lighting Design
- Kitchen Design
- Construction logistics plan
- Other

CLIENT REQUIREMENTS

PROJECT DEADLINES AND DELIVERY STAGES

COMMERCIAL PART AND PAYMENT TERMS

DESIGN STANDARDS

DRAWING REGISTER AND FORMAT

MATERIALS TO BE SUBMITTED BY THE CLIENT

PROJECT ORGANIZATION CHART

EXCEPTIONS

ARCHITECTURE



ARCHITECTURE



DESIGN DEADLINES AND DELIVERY STAGES

SUBMISSION OF PROJECT DOCUMENTATION IS CARRIED OUT IN THREE STAGES

- Stage #1 30%, **Concept Design**
- Stage #2 70%, **Schematic Design**
- Stage #3 100% **Detailed Design**

Concept design, the stage in which the general Architectural design of the building and location are determined. The Design concept has to be provided based on a topographic survey, geological/hydrogeological survey, and network surveys. During this stage preliminary consultations with 41 resolution experts, Emergency Management Agency, Structural engenders and MEP engineers should be initiated.

RESEARCH OF THE TERRITORY

TOPOGRAPHIC SURVEY

- Outlining the existing buildings in the area
- Outlining the existing above-ground and below-ground communications, networks
- Outlining the greeneries
- Graphic measurements of terrain (isohypses)

ARCHITECTURE concept design | geological survey

RESULT OF ENGINEERING-GEOLOGICAL INVESTIGATION

- Introduction
- Conclusions and recommendations
- Physical-geographical conditions of the investigated area
- Physical-mechanical properties of soils
- Used literature
- Geotechnical task
- Engineering-geological studies program
- Topographical plan of the territory
- Results of point test of bedrock with spherical indenters
- The results of statistical processing of the results of point test of rocky rocks with spherical indenters (in natural and water-saturated states)
- Layout scheme of mining works and engineering-geological trenches, scale 1:500
- Engineering geological trenches I-I, II m-bi 1:100
- Geotechnical columns of works M-bi 1:100

DETERMINATION OF ZONE/COEFFICIENTS

TAXATION OF GREENERY

HISTORICAL AND ARCHITECTURAL RESEARCH (IF APPLICABLE)

ENVIRONMENTAL IMPACT ANALYSIS (IF APPLICABLE)

ANALYSIS OF THE IMPACT OF ADJACENT BUILDING (IF APPLICABLE)

DETERMINING THE STATUS OF THE EXISTING BUILDING

- Explanatory Note
- Drawing Register

GENERAL PLAN

- Determination of orientation
- Location of the building into the existing environment
- Transport and pedestrian connections, parking space
- Landscape

DEMOLITION: (in case of existing building)

- Demolition organization project
- Demolition organization project expertise
- Demolition Impact report on adjacent Buildings
- Measurement drawings of existing building
- Required demolition permit for construction permit

RECONSTRUCTION/RESTORATION (in case of existing building)

- In the case of a building with historical/cultural heritage, the relevant expert's report
- A drawing of the existing building, which includes: plans, sections and wall elevations describing and fixing all wall cracks of the damages (if any)
- Determination of foundation conditions and base characteristics
- Expert technical examination of the building (must be visual and, if necessary, instrumental) determining the causes of deformations

- Determination of building shape/ parameters and scales of the project /sketch of the building (buildings)
- Schematic plans/function zoning (scale 1:200)
- Preliminary Type of Structure
- Concept sections (scale 1:200)
- Concept exterior elevations (scale 1:200)
- Illustrations demonstrating design concepts
- Abstracts of building data
 - Preliminary determination of K1, K2, K3 coefficients GBA - Gross building area
- Preliminary bill of materials (BOM)
- BIM model _LOD_ 100

SPECIFYING THE TIMELINES OF THE STAGES

- Concept Design
- Schematic Design
- Detailed Design

DETERMINE THE APPROXIMATE BUDGET

PERMIT ISSUES

Receive the architectural-planning task from the municipality

*Note: After completing the stage, it is advisable to prepare a presentation for the customer. *During the stage process, the Architect receives a project assignment or GRG from the municipality

ARCHITECTURE schematic design

Schematic design, the stage in which the general Architectural design of the building and location are determined. The Design concept has to be provided based on a topographic survey, geological/ hydrogeological survey, and network surveys. During this stage preliminary consultations with 41 resolution experts, Emergency Management Agency, Structural engenders and MEP engineers should be initiated.

DETERMINATION OF STRUCTURE

- Type of Structure
- Structural grid
- Structural height of floor and building
- Openings of staircases and elevators
- Preliminary determination of seismic joints and structural walls

DETERMINATION OF TECHNICAL SPACE

- Determination of the area of technical spaces
- Location of Technical Space(Indoor/Outdoor)
- Load bearing requirements
- Assessment of the impact from the engineering/technical space(acoustics, vibration, temperature, ventilation, etc.
- Determination of the size and the location of horizontal/vertical engineering openings

ARCHITECTURE schematic design

INCORPORATION OF RESOLUTION 41 EXPERTS

- Coordination of already existing zoning (staircases, elevators, corridors, evacuation exits, adaptation for PWD (a person with disabilities))
- Determination of fire safety norms

EMERGENCY MANAGEMENT SERVICE

Consulting with the Emergency Management Agency of the Ministry of Internal Affairs.

ARCHITECTURE schematic design | stage deliverables

- Explanatory note
- Drawing register

GENERAL PLAN

- Site access road and circulation scheme
- Greenery design according to the Dendrology
- Outdoor parking lot and circulation scheme
- Landscape design

FLOOR PLAN

- General structural scheme including structural columns, reinforced walls and seismic joints General arrangement plan
- SSL /FFL and absolute level marks
- Function of spaces /room areas
- External and internal openings (doors and windows)
- Allocation of WCs with sanitary furniture
- Staircases /Elevators /Shafts
- Types of handrail system
- Marking of windows/door and curtain walls
- Indoor car parking lots and circulation
- Roof plan

ARCHITECTURE schematic design

BUILDING SECTIONS

- Informational section of functionally important part of the building.
- SSL, FFL and Absolute level marks
- Implementations of vertical communication shafts and staircases
- Implementation of Elevators with Machinery space and pit
- Implementation of outdoor and Indoor Ramps with slopes
- Level marks of surrounding areas
- Indication of various architectural elements with codes
- Enlarged Detailed sections

BUILDING FACADES

- All elevations of the building with FFL and SSL level marks
- Indication of materials with codes
- Level marks of surrounding areas
- Indication of handrail system with codes

STAIRCASE/RAMPS:

- Plans of the staircase, the indication of handrail types
- Longitudinal and transverse sections of the staircase
- Detailed drawing of the railing arrangement

ELEVATORS

- Plan with dimensions of slab openings and cabin
- Section displaying headroom and pit

ARCHITECTURE schematic design

VISUALIZATION

DEVELOPMENT OF MATERIAL CONCEPT

BILL OF MATERIAL (BOM) ACCORDING TO THE STAGE

ABSTRACT OF BUILDING DATA

(Technical and Economic indicators of the Project)

- Determination of K1, K2, K3 coefficients
- GBA Gross building area

BIM MODEL LOD 200

*Note: After completing the stage, it is advisable to prepare a presentation for the customer.

The Design completion stage, with final design documentation. The document includes final and detailed design drawings coordinated with all disciplines involved in the project.

STAGE DELIVERABLES

EXPLANATORY NOTE

DRAWING REGISTER

GENERAL PLAN AND AREA LANDSCAPE/ACCOMPLISHMENT

- Vertical planning including the ground floor of the building
- Plan with engineering networks
- External floor types (showing the build-ups)
- Typical and non-typical details (with connection details)
- External Lighting Arrangement Plan
- Greenery according to the dendrology project
- Structural elements, (small architectural objects, support walls, structural solution barrier and curbs if necessary)
- Landscape furniture plan
- Roof plans of the building(s)
- Site access road and circulation scheme
- Outdoor parking lot and circulation scheme

ARCHITECTURE Detailed design | plans

FLOOR PLANS, REFLECTED:

- General structural scheme including structural columns, reinforced walls and seismic joints
- General arrangement plan:
- SSL, FFL and absolute level marks
- Functions of spaces and areas/m2
- Vertical communication shaft
- Marking of columns (If necessary)
- Marking of windows/doors and curtain walls
- Types of drainage systems
- Types of handrail systems
- Furniture arrangement

PARTITION PLAN:

 Internal and external door/window openings, wall types and dimensions

REFLECTED CEILING PLAN:

Electrical fixtures end FLS fixtures

ELECTRICAL PLANS:

Electrical fixtures end FLS fixtures

FINISH PLAN:

- Walls, ceiling and floor finish types
- Roof plan with slopes and MEP equipment
- Enlarged detailed plans

SECTIONS

- Informational sections of a functionally important part of the plans;
- SSL, FFL and Absolute level marks;
- Implementations of vertical communication shafts and staircases; Implementation of Elevators with Machinery
- space and pit; Implementation of outdoor and Indoor Ramps with slopes
- Level marks of surrounding areas
- Enlarged Detailed sections

FACADES

- All elevations of the building (With detailing) coordinated with the façade engineer
- All elevations of the building with doors, windows, curtain walls and other façade elements Indication of mate-
- rials with codes
- Levels marks of surrounding areas
- Indication of external handrail system with codes
- Indication of various architectural elements with codes

WALL TYPES

- Detailed sections with finishes and connection details to the existing floor and ceiling,
- Material specifications (fire resistance, thermal insulation, hydro insulation, sound insulation, vapor barrier, etc.);
- Wall seismic and expansion joints.

FLOOR TYPES

- Floor buildups, with structural slab and other layers indicating finish materials;
- Material specifications (fire resistance, thermal insulation, hydro insulation, sound insulation, vapour barrier, etc.);
- Floor seismic and expansion joints.

CEILING TYPES

- Ceiling details, with an indication of the structural slab, other layers and finish materials;
- Indication of MEP revision holes;
- Ceiling seismic and extension joints.

STAIRCASES

- Detailed plans of the staircase, indication of the ceiling, floor, wall and handrail types
- Detailed longitudinal and transverse sections of the staircase showing the FFL and SSL evels on the floor slab and middle floor slab
- Detailed drawing of the railing arraignment

ELEVATORS

- Detailed plan with dimensions of slab openings and cabin
- Detailed section Showing headroom and pit
- Details of the frame (If necessary)
- Considering the openings for a call button and a control panel

SPECIFICATIONS

- Exterior and Interior doors and window specifications
- Characteristics of glass
- Handrail specification
- Louvers and frills specifications
- Specification of insulating materials (Hydro, sound, steam, heat and others)
- Specification of finishing materials
- Detailed annotation of all materials that are considered in the design work

INTERIOR ELEVATIONS, FOR THE WALL WITH SPECIFIC DETAILS

VISUALIZATION

Rendering, closer to the real project. (With appropriate quality and resolution of materials)

SITE FOUNDATION MARKING/TRACING PLAN:

The whole floor plan with Columns, Concrete walls and edges of the slabs in the overall coordination system

BILL OF MATERIALS (BOM) (according to the stage)

ABSTRACTS OF BUILDING DATA (Technical and Economic indicators of the project)

BIM MODEL LOD300 (BOX)

*Note: After completing the stage, it is advisable to prepare a presentation for the customer.

MEP SYSTEMS



MEP SYSTEMS



DESIGN DEADLINES AND DELIVERY STAGES

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- Stage #2 70%, **Schematic Design**
- Stage #3 100% **Detailed Design**

MEP SYSTEMS concept design

- Determining design criteria and preparation of
- design brief. Coordination with architect, system selection.



MEP SYSTEMS concept design

EXPLANATORY NOTES WITH STANDARDS PROPOSED SYSTEM DESCRIPTION & ETC

- Evaluation of technical task (client requirement) with the following recommendations
- Explanation of design solutions with corresponding argumentation end proofing
- Development of recommendations on the thermal properties of the enclosing structure

DETERMINATION OF LOCATION AND CONFIGURATION OF TECHNICAL AREAS

- Determination of technical spaces
- Location of technical spaces (indoor/outdoor)
- Load bearing requirements
- Assessment of the impact from the engineering/technical space (acoustics, vibration, temperature, ventilation, etc.)
- Determination of location and size of horizontal/vertical engineering openings

MEP SYSTEMS CONCEPT DESIGN

- determination of approximate conFiguration of Vertical shafts and horizontal openings
- Determining the approximate configuration (weight and dimensions) of the central equipment
- Determining the approximate routing of the main trunk network of the systems
- Preliminary determination of required installation heights for engineering networks

MEP SYSTEMS Schematic design

Preliminary calculation report, identifying central

equipment arrangement and main route of installations.



MEP SYSTEMS Schematic design

EXPLANATORY NOTE WITH STANDARDS, SYSTEM DESCRIPTION & ETC;

PRELIMINARY ENGINEERING CALCULATION REPORTS

- Water consumption
- Heat loss
- Electrical load
- Fire ventilation

FLOOR LAYOUTS OF ENGINEERING NETWORKS

- Pipeline plan
- Air Duct planning
- Cable channel and network planning
- Indoor/Outdoor equipment layouts
- Mechanical and electrical fixtures layout
- External engineering network plan

MEP SYSTEMS schematic design

PRELIMINARY PLANNING OF CENTRAL MEP ROOMS

GENERAL SINGLE-LINE DIAGRAMS

PRELIMINARY DEFINITION OF EQUIPMENT CAPACITIES

EXTERNAL NETWORK PLANNING

- Final coordination with all discipline, checking engineering calculations, final drafting
- Preparation of specification and material take-off



EXPLANATORY NOTE WITH STANDARDS, SYSTEM DESCRIPTION & ETC

FINAL MEP CALCULATIONS, INCLUDING

- Hydraulic
- Heat loss
- Electrical load
- Lighting
- Fire ventilation

DETAILED FLOOR LAYOUTS SHOWING ALL COMPONENTS INCLUDING:

- Pipeline plan
- Air Duct planning;
- Cable channel and network planning;
- Indoor/Outdoor equipment layouts;
- Mechanical and electrical fixtures layout;
- External engineering network plan.

- Detailed drawings of central plant rooms, incl. layout and sections
- **Coordinated openings** and vertical shaft plans
- Block diagrams of all systems with spaces indicated
- General **single-line diagram** (scheme) of electric network
- Cable sheet, specifying customer, length, cross-section, etc.
- Single-line diagrams of all electric distribution boards
- Sections of critical intersections of systems
- Section drawings of the external engineering network with level markings
- Drawings and abbreviations of typical installation details, which include instructions related to installation matters, including detailing of equipment connections, installation heights, material gradation, etc.
- Detailed specifications (Schedule) of electrical/mechanical equipment
- General specification of materials (Overall Specification) the document should provide complete information about the project in terms of volume, indicating the standards
- List of recommended manufacturers (at least 3 choices)
- **Recommended list** of spare parts for aggregates
- Bill of Quantities (BoQ) must be well detailed and fully reflect information on a specific component (diameter, material, pressure, etc.)

- Ventilation layouts & diagram drawings should include airflow information
- Heating & cooling layouts & diagram drawings should include Waterflow information Engineering reports, including heat loss, hydraulic, etc., must be completed in a specialized program and elec - tronically attached to the Design package
- All MEP equipment & elements on drawings, including fixtures, must be to scale
- MEP fixture layouts should be coordinated with interior / architectural shop-drawings
- The planning of engineering equipment should take into account the possibility of their further service, the drawings should include inspection hatches, access, etc
- Planning of cable channels and network should be prepared to scale and taken into
- Account the specifics of the installation; The dimensions of the channels should be justified
- By taking into account the number and weight of the cables planned for it; Cable
- Cross-sections and the number of lines, as well as tracing to consumers, should be read on
- The drawings

STRUCTURAL



STRUCTURAL



DESIGN DEADLINES AND DELIVERY STAGES

SUBMISSION OF PROJECT DOCUMENTATION IS CARRIED OUT IN THREE STAGES

- Stage #1 30%, **Concept Design**
- Stage #2 70%, **Schematic Design**
- Stage #3 100% **Detailed Design**

STRUCTURAL concept design

- Explanatory sheet
- Drawing Register
- Preliminary structural calculation report
- Excavation plan and sections
- Excavation strengthening measures, if required
- Temporary structural elements drawings
- Foundation plan, reinforcement & sections
- Waterproofing measures
- Underground elements plan, reinforcement details, and sections

STRUCTURAL concept design

- Vertical elements, plan, reinforcement & section, such as columns, diaphragms, elevator shafts & etc.
- Structural beams plan, reinforcement & sections
- Floor slab plans, reinforcement & sections by floor
- Staircase plans, reinforcement & Sections
- Section drawings of spatial frame
- Seismic & vibration joints detailing
- Detailing of sealing elements
- Preliminary massing Model

STRUCTURAL Schematic design

- Explanatory sheet
- Drawing Register
- Specified structural calculation report
- Excavation plan and sections
- Excavation strengthening measures, if required
- Temporary structural elements drawings
- Foundation plan, reinforcement & sections
- Waterproofing measures
- Underground elements plan, reinforcement details, and sections
- Vertical elements, plan, reinforcement & section, such as columns, diaphragms, elevator shafts & etc.

STRUCTURAL schematic design | deliverables:

- Structural beams plan, reinforcement & sections
- Floor slab plans, reinforcement & sections by floor
- Staircase plans, reinforcement & Sections
- Section drawings of spatial frame
- Seismic & vibration joints detailing
- Structural openings arrangement
- Detailing of sealing elements
- Specified Massing Model
- Preliminary Bill of Quantities (BoQ)

STRUCTURAL detailed design

- Explanatory sheet
- Drawing Register
- Final structural calculation report
- Excavation plan and sections, work volumes
- Excavation strengthening measures, if required
- Temporary structural elements drawings
- Detailing for the artificial layer under the foundation
- Foundation plan, reinforcement & sections
- Waterproofing measures
- Underground elements plan, reinforcement details, and sections
- Vertical elements, plan, reinforcement & section, such as columns, diaphragms, elevator shafts & etc.

STRUCTURAL Detailed design

- Structural beams plan, reinforcement & sections
- Floor slab plans, reinforcement & sections by floor
- Staircase plans, reinforcement & Sections
- Section drawings of spatial frame
- Seismic & vibration joints detailing
- Detailing of sealing elements
- Openings arrangement drawings
- Structural connection elements drawing
- Materials detailed specification
- Summarized list of materials
- Finalized and precise massing model
- Bill of Quantities (BoQ)

FAÇADE.



FAÇADE.



DESIGN DEADLINES AND DELIVERY STAGES

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- Stage #2 70%, **Schematic Design**
- Stage #3 100% **Detailed Design**

FAÇADE concept design

Provides coordination with architectural layouts,

Recommend alternative solutions and underline hard details





DETERMINATION OF DESIGN STANDARDS

ESTABLISHING DESIGN LOADS

including - wind, snow, seismic, temperature impact and others

AN OVERVIEW REPORT OF ARCHITECTURALLY PRESCRIBED FACADE SYSTEMS with relevant conclusions and recommendations

DETERMINATION OF BASIC TECHNICAL PARAMETERS OF GLASS AND SUPPORTING PROFILES including heat transfer coefficient (U-Value); solar penetration factor (solar factor); glass types (glass-package, frosted, laminated, tinted); profile types and others;

SECTION DRAWINGS OF CRITICAL INTERSECTIONS

FAÇADE Schematic design

Preparing calculation report, Selecting certain profiles

and system solutions. Preparation of shop drawings



FAÇADE SCHEMATIC DESIGN

- Explanatory Note with an overview of the technical solutions required for the realization of the system established by the architecture, indicating the used software, conveying the basic parameters established and agreed upon by the schematic design, etc.
- Spatial report of the facade system with authorized software, which at leastincludes and is not limited to - wind load report, seismic report, structure spatial report on structural loads, etc.
- Information on the acoustic and fire resistance parameters of the system
- **Façade elevation,** adding vertical and horizontal profiles
- Sections of the facade system, by applying the glazing and profile scales determined by the selected system to the scale
- Detailing of moving (removable) elements planned in the façade (glazing)

FAÇADE Schematic design

DETAILING OF MOVING (REMOVABLE) ELEMENTS PLANNED IN THE FAÇADE (GLAZING)

DETAILING OF FASTENING PROFILES TO THE MAIN SUPPORTING CONSTRUCTION

DETAILING THE CLOSURE TO THE BUILDING, SHOWING ALL NON-TYPICAL NODES

TECHNICAL SPECIFICATION OF PLANNED ACCESSORIES

FAÇADE DETAILED DESIGN | FAÇADE SYSTEMS

Final coordination with all discipline, checking engineering

calculations, final drafting. Preparation of specification and

material take-off.

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FAÇADE

Explanatory Note - tage with basic parameters established and agreed upon by the

project and overview of technical chang

- Refined spatial reports of the facade system
- Façade **elevations**, adding vertical and horizontal profiles
- Sections of the facade system, by applying the glazing and profile scales determined by the selected system to the scale
- Detailing of fastening profiles to the main supporting construction

FAÇADE

DETAILING OF FASTENING PROFILES TO THE MAIN SUPPORTING CONSTRUCTION

DETAILING THE CLOSURE TO THE BUILDING, SHOWING ALL NON-TYPICAL NODES

ESTABLISHING REQUIREMENTS FOR WARRANTY CONDITIONS OF USED MATERIALS

FORMING A REQUEST FOR A SAMPLE OF THE SELECTED SYSTEM

SECTION DRAWINGS OF ALL THE ABOVE-MENTIONED STRUCTURAL ELEMENTS

BILL OF QUANTITIES (BOQ), BY DETERMINING THE AREAS OF INDIVIDUAL DISSIMILAR SURFACES, AS WELL AS BY ADDING PROFILES, GLASS AND OTHER INTEGRATED ELEMENTS

THANK YOU!

LSG SOLUTIONS, 2025