

# Design Standard.

Architecture, Structural, Mep system, Facade.

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

# Content

## **[ 1 ] - Design Development**

## **[ 2 ] - Clients Requirements**

## **[ 5 ] - Architecture**

- preliminary design
- schematic design
- design development
- construction documentation

## **[ 36 ] - MEP Systems**

- schematic design
- design development
- construction documentation

## **[ 48 ] - Structural**

- schematic design
- design development
- construction documentation

## **[ 59 ] - Facade**

- schematic design
- design development
- construction documentation

# DESIGN STANDARD

ARCHITECTURE	PD* 10%	SD* 30%	DD* 70%	CD* 100%
MEP SYSTEMS		SD* 30%	DD* 70%	CD* 100%
STRUCTURAL		SD* 30%	DD* 70%	CD* 100%
FAÇADE		SD* 30%	DD* 70%	CD* 100%

## DESIGN BRIEF

- Area description And objectives
- Building type:
  - Residential
  - Commercial
  - Industrial
  - Hotel
  - Food & beverage
  - Multifunctional
  - Healthcare
  - Wellness
  - Entertainment
  - Other

## FUNCTIONAL ZONING

### Territory

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

### Building spaces

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

## 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

**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

**PD\***  
10%

**SD\***  
30%

**DD\***  
70%

**CD\***  
100%



# PRELIMINARY DESIGN

Preliminary design is the stage in which general Architectural project location and design concepts are determined.

## 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)

## 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 ON ADJACENT BUILDINGS (IF APPLICABLE)**

**DETERMINING THE STATUS OF THE EXISTING BUILDING**

## PRELIMINARY PREPARATION OF THE GENERAL PLAN

- Determination of orientation
- Zoning: determination of K1, K2, K3 coefficients
- Determination of front, back and side setbacks according to the neighbors' lot lines
- Determinations of setback line
- Traffic/transport schemes (taking into account the pedestrian carriageway)
- Sketch
- Location of the building into the existing environment
- Determination of shape/massing

## 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 or other 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

## SPECIFYING THE TIMELINES OF THE STAGES

- Schematic Design
- Design Development
- Construction Documentation

## AN ARCHITECT'S VISION

- **Functional, stylistic, theoretical**

## DETERMINING THE APPROXIMATE BUDGET

## PERMIT ISSUES

- Receive the architectural-planning task from the municipality
- During the stage process, the Architect receives a project assignment or GRG from the municipality
- The initiation of the next stage is carried out by the

# SCHEMATIC DESIGN

## BUILDING SHAPE GENERATION AND DETERMINATION

- Building footprint
- Distance to property line (red line) and regulation line (blue line)
- Setback line

## 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 SPACES

- Determination of rough 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
- 
- Current stage (SD) is limited to technical consultation.
  - The design of the Structural part and Engineering details starts on the next stage (DD).



## INCORPORATION OF RESOLUTION 41 EXPERT

- 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.

## REPORT OF COEFFICIENTS

- Development coefficient (k-1)
- Development intensity coefficient (k-2)
- Greening coefficient (K-3)

## TOTAL BUILD-UP AREA OF PROJECT

### TECHNICAL AND ECONOMIC PARAMETERS OF BUILDINGS

- GEA (Gross External Area) - outer perimeter
- NFA (Net Floor Area) - useful area

- It is possible to define additional specific areas upon request.

## STAGE DELIVERABLES

### GENERAL PLAN

- Location of existing buildings within cadastral boundaries
- Site access road
- Layout of outdoor parking lot
- Greenery Schematic Design
- Landscaping Schematic Design

## **FLOOR PLAN**

- Partition plan
- Space / Room areas
- External and internal openings - doors and windows
- Allocation of WCs with furniture
- Staircases/Elevators/Ramps
- Indoor car parking lots
- Circulation scheme
- Roof plan

## **SCHEMATIC FACEDE OF THE BUILDING**

## **SCHEMATIC SECTIONS OF THE BUILDING**

## **STAIRCASES/ELEVATORS/RAMPS**

## **DESIGN TIMELINE**

## **DRAWING REGISTER**

## INVOLVEMENT OF DISCIPLINES IN THE CURRENT PHASE

- Structural engineer
- MEP Group
- Resolution 41 Expert
- Transport scheme expert
- Other
  - **Only after the approval** of the current stage by the customer the initiation of the next stage is possible.

# DESIGN DEVELOPMENT

An important design stage on which the final construction documentation depends. A process where a general revision with argumentative reasons is allowed.

The design development is **the phase during which the detailed design begins and the budget is determined. Various disciplines are involved in the process**

- Structural Engineer
- MEP Engineer
- FLS Consultant/Resolution 41 Expert
- Interior designer
- Lighting consultant
- Facade engineer
- Kitchen technologist
- Landscape Designer
- Vertical planning specialist
- Acoustics consultant
- BOQ consultant
- Different consultants according to specific purpose

## STAGE DELIVERABLES

### EXPLANATORY NOTE

### GENERAL PLAN

- Roof plans of the buildings
- Site access road and circulation scheme
- Outdoor parking lot and circulation scheme
- Greenery design according to the Dendrology
- Landscaping Design

## PLANS

- 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/m<sup>2</sup>
  - Marking of columns and vertical communication shaft
  - Marking of windows/doors and curtail walls
  - Types of drainage systems
  - Types of handrail systems
  - Furniture arrangement
- Partition plan with internal and external door/window openings, wall types and dimensions
- Reflected ceiling plan with ceiling types, heights and revision openings
- Electrical plans with electrical and FLS fixtures
- Finish plan with the wall, ceiling and floor finish types and schedules
- Roof plan with slopes and MEP equipment
- Enlarged detailed plans

## DETERMINING THE AREAS OF THE BUILDING

- GEA - Gross External Area
- GEA - NFA - Net Floor Area
- Technological and Economical indicators of the project

## SECTIONS

- Informational sections of a functionally important part of the plans. A number of the sections is to be determined as needed
- 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 FFL and SSL level marks and other heights doors, windows, curtain walls and other façade elements
- Indication of materials with codes
- Level marks of surrounding areas
- Indication of handrail system with codes
- Indication of various architectural elements with codes
- With rainwater system
- Enlarged Detailed Elevations

## WALL TYPES

Wall detailed sections with finishing and connection details to the existing floor and ceiling

## FLOOR TYPES

Floor build-ups, with structural slab and other layers including finishing materials

## CEILINGS TYPES

Ceiling details, with structural slab, other layers and finishing materials

## STAIRCASES

- Detailed plans of the staircase, Indication of the ceiling, floor, wall and handrail types, according to the local norms
- Detailed longitudinal and transverse sections of the staircases
- Detailed drawing of the railing arraignment

## ELEVATORS

- Detailed plan with dimensions of slab openings and cabin
- Detailed section displaying headroom and pit
- Details of the frame

## SPECIFICATIONS

- Exterior and Interior doors and windows specifications
- Curtain wall and window system specifications
- Handrail specifications
- Louver and grill specifications

## VISUALIZATION

- Visualization of façade
- Visualization of common interior spaces (if necessary)

## BOM (BILL OF MATERIALS)

## DRAWING REGISTER

## SECTIONS

- Coordinated sections of a functionally important part of the plans
- Coordinated sections with the structural project, considering FFL and SSL level marks
- Indicating vertical Communication shafts and staircases
- Showing the Reflecting ceilings
- Implementation of Elevators with Machinery space and pit that are already coordinated with Manufacturer
- Outdoor and Indoor ramps with slopes
- Levels marks of surrounding areas
- Enlarged Detailed sections

## FACADES

- All elevations of the building with FFL and SSL level marks and other heights
- Implementation of doors, windows, curtain walls and other façade elements including codes
- Indication of materials with codes
- Levels marks of surrounding areas
- Indicating hand railing system with codes
- With Indicating enlarged details
- With the rainwater system
- Façade lighting system with lighting fixtures

## WALL TYPES

- Detailed wall sections with finishes and connection details to the existing floor and ceiling
- Material Specifications (fire resistance, thermal insulation, hydro insulation, sound insulation, vapour barrier, etc.)
- Seismic and expansion joints

## FLOOR TYPES

- Floor build-ups, with structural slab and other layers including finishing materials
- Material Specifications (fire resistance, thermal insulation, hydro insulation sound insulation, vapour barrier, etc.)
- Seismic and expansion joints

## CEILING TYPES

- Ceiling details, with structural slab, other layers and finishing materials
- Indication of access hatches
- Seismic and extension joints

## STAIR CELLS

- Detailed plan of the staircase, indication of the ceiling, floor, wall and handrail types according to the local norms
- Detailed longitudinal and transverse sections of the staircase showing the FFL and SSL levels on the floor slab and middle floor slab
- Detailed drawing of the railing arrangement

## ELEVATORS

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

## SPECIFICATIONS

- Exterior and Interior doors and windows specifications
- Characteristics of glass
- Handrail specifications
- Louvers and grills specifications
- Specification of insulating materials: (Hydro, sound, steam, heat and others)
- Specifications of finishing materials
- Detailed annotation of all materials that are considered in the design work (As needed)



## TRACING PLANS

Whole floor plan with Columns grids, shear walls and edges of the slabs in the overall coordination system.

## VISUALIZATION

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

## BOM (BILL OF MATERIALS)

Bill off Materials.

## BOQ (BILL OF QUANTITIES) WITH PRICES

## DETERMINING THE AREAS OF THE PROJECT BUILDING

- GEA - Gross External Area
- GEA - NFA - Net Floor Area

## DRAWING REGISTER

# CONSTRUCTION DOCUMENTATION

The Design completion stage, with final design documentation.

**Document includes final and detailed design drawings coordinated with all disciplines involved in the project.**

**STAGE DELIVERABLES**

**EXPLANATORY NOTE**

## AREA LANDSCAPING/ACCOMPLISHMENT PROJECT INCLUDES

- Situation Plan
- Existing Topographic Plan
- Master Plan with existing Level Marks
- Vertical planning including the ground floor of the building
- Cross-sectional longitudinal and transverse profiles of the area
- Plan with engineering networks
- Floor types (showing the build-ups)
- Non-typical details (with connection details)
- External Lighting Arrangement Plan
- Dendrology
- Structural elements, (small architectural objects, support walls, structural solution barrier and curbs if necessary)
- BOM Bill of Materials

## PLANS

- 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/m<sup>2</sup>
    - Marking of columns and vertical communication shaft
    - Marking of windows/doors and curtail walls
    - Types of drainage systems
    - Types of handrail systems
    - Furniture arrangement
- Partition plan with internal and external door/window openings, wall types and dimensions
- Reflected ceiling plan with ceiling types, heights and revision openings
- Electrical plans with electrical and FLS fixtures
- Finish plan with the wall, ceiling and floor finish types and schedules
- Roof plan with slopes and MEP equipment
- Enlarged detailed plans
- Specifications of windows, doors, curtain walls, drainages, handrails, furniture, electrical fixtures and other

## TECHNICAL TASK ON MEP SYSTEMS

- Project description
- Designed area (which buildings and places are included in the project assignment)
- Designed disciplines
- Below are given complete list of MEP systems what should be supported with full package of design documentation

### **Mechanical Systems:**

- Water supply and sewage
- Storm water disposal
- Fire fighting system
- Heating & Air conditioning
- Regular ventilation & smoke management system...

# MEP SYSTEMS

# MEP SYSTEMS

**SD\***  
30%

**DD\***  
70%

**CD\***  
100%

- Design deadlines and delivery stages

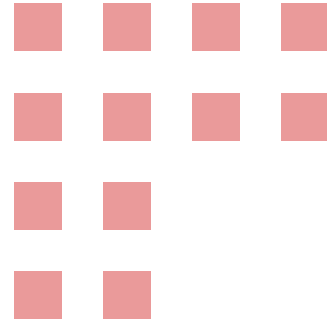
Submission of project documentation is carried out in three stages

- Stage #1 – 30%, **Schematic Design**
- Stage #2 – 70%, **Design Development**
- Stage #3 – 100% **Construction Documentation**

# SCHEMATIC DESIGN

## MEP SYSTEMS

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





## 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 and proofing
- Development of recommendations on the thermal properties of the enclosing structure

## DETERMINATION OF LOCATION AND CONFIGURATION OF TECHNICAL AREAS

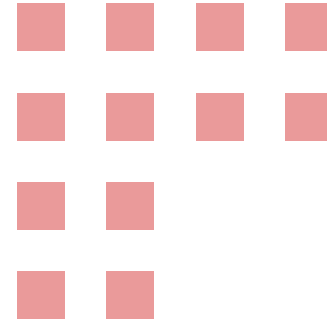
- Determination of technical spaces
- Location of technical spaces (indoor/outdoor)
- Load bearing requirements
- Assessment of the impact from the engineering/technical space (acoustics, vibration, temperature, ventilation, etc.)
- Determination of location and size of horizontal/vertical engineering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

- 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

# DESIGN DEVELOPMENT

## MEP SYSTEMS

Preparing calculation report, identifying central equipment arrangement and main route of installations.



## **EXPLANATORY NOTE WITH STANDARDS, SYSTEM DESCRIPTION & ETC;**

### **PRELIMINARY ENGINEERING CALCULATION REPORTS**

- Water consumption
- Hydraulic
- Heat loss
- Electrical load
- Lighting
- 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

**PLANNING OF CENTRAL MEP ROOMS**

**PIPING AND INSTRUMENTAL DIAGRAMS WITH INDICATION OF SPACES (PID)**

**GENERAL SINGLE-LINE DIAGRAM OF ELECTRIC NETWORK**

**PRELIMINARY DEFINITION OF EQUIPMENT CAPACITIES**

**SECTION DRAWINGS OF CRITICAL INTERSECTIONS**

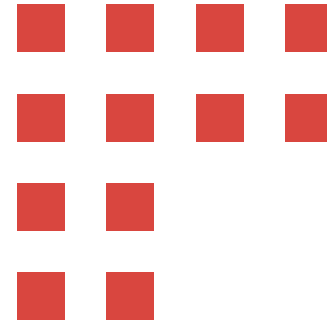
**EXTERNAL NETWORK PLANNING**

**PRELIMINARY BOQ**

# CONSTRUCTION DOCUMENTATION

## MEP SYSTEMS

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 electronically 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

**SD\***  
30%

**DD\***  
70%

**CD\***  
100%

- Design deadlines and delivery stages

Submission of project documentation is carried out in three stages

- Stage #1 – 30%, **Schematic Design**
- Stage #2 – 70%, **Design Development**
- Stage #3 – 100% **Construction Documentation**

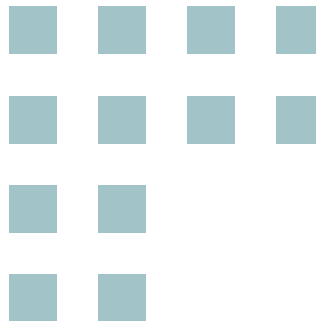
## STRUCTURAL PROJECT COMPOSITION

- Explanatory Note
- Foundation pit plans and sections;
- Foundation pit soil/ground strengthening plan;
- Temporary structural design/elements layout/plan;
- Foundation plan, reinforcement, sections;
- Waterproofing/hydro insulation work' plan;
- Concrete walls, ramps, plans, sections and other underground structural elements' drawings.

# SCHEMATIC DESIGN

## STRUCTURAL

Provides coordination with architectural layouts,  
recommend alternative solutions and underline hard details.



**DRAWINGS OF VERTICAL STRUCTURAL ELEMENTS (COLUMNS, PYLONS, STIFFNESS DIAPHRAGMS, ELEVATOR SHAFTS, STIFFNESS CORES ...) BY FLOORS**

**PLANS OF STRUCTURAL BEAMS BY LEVELS**

**STRUCTURAL SLABS' PLANS BY FLOORS**

**STAIRCASE STRUCTURAL ELEMENTS' DRAWINGS BY FLOORS/LEVELS**

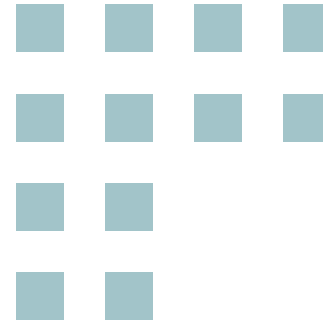
**ELEVATION PLAN OF THE STRUCTURAL (VERTICAL AND HORIZONTAL) ELEMENTS**

**SECTION DRAWINGS OF ALL THE ABOVE-MENTIONED STRUCTURAL ELEMENTS**

# DESIGN DEVELOPMENT

## STRUCTURAL

Assembly of building frame based on calculation report, preparing of drawings, including details.





## CONSTRUCTION PROJECT COMPOSITION

- Explanatory Note
- Structural calculation/modelling in LIRA (software)
- Foundation Excavation pit plans and sections
- Foundation pit soil/ground strengthening plan
- Temporary structural design/elements layout/plan
- Detailing of compacted soil arrangement under the foundation
- Foundation plan, reinforcement, sections, joints
- Waterproofing/hydro insulation work's plan
- Plans of reinforced walls, ramps and other underground structures, reinforcement, sections and joints
- Drawings of vertical structural elements (columns, pylons, stiffness diaphragms, elevator shafts, stiffness cores ...) by floors

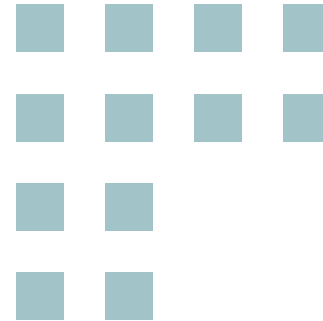
- Structural beams' plans by floors
- Structural Roof slab plans by floor
- Plans of staircases structures by floors
- Disassembly of the longitudinal and transverse frames and elevations of the frame
- Section drawings of all the above-mentioned structural elements with proper and detailed cuts, and connection details (tie knots)
- Detail drawings of seismic and anti-vibration joints
- Detailing of sealing elements and joints
- Detailing of protective measures (anti-corrosion, fire, etc.) of structural elements
- Openings arrangement detailed plan/layout
- Drawings of Engineering/Technological equipment anchorage/foundation details and structure

# CONSTRUCTION DOCUMENTATION

## STRUCTURAL

Final coordination with all discipline, checking engineering calculations, final drafting.

Preparation of specification and material take-off.



## CONSTRUCTION PROJECT COMPOSITION

- Explanatory Note
- Structural calculation/modelling in LIRA (software)
- Foundation Excavation pit plans and sections
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- Detailing of compacted soil arrangement under the foundation
- Foundation plan, reinforcement, sections, joints
- Waterproofing/hydro insulation work's plan
- Plans of reinforced walls, ramps and other underground structures, reinforcement, sections and joints
- Drawings of vertical structural elements (columns, pylons, stiffness diaphragms, elevator shafts, stiffness cores ...) by floors

- Structural beams' plans by floors
- Roof plans by floor
- Plans of staircases structures by floors
- Elevation plan of the structural (vertical and horizontal) elements
- Section drawings of all the above-mentioned structural elements with proper and detailed cuts, and connection details (tie knots)
- Detail drawings of seismic and anti-vibration joints
- Detailing of sealing elements and joints
- Detailing of protective measures (anti-corrosion, fire, etc.) of structural elements
- Openings arrangement detailed plan/layout
- Drawings of Engineering/Technological equipment anchorage/foundation details and structure
- Bill off Materials and Bill of quantities

FAÇADE.  
5

# FAÇADE.

**SD\***  
30%

**DD\***  
70%

**CD\***  
100%

- Design deadlines and delivery stages

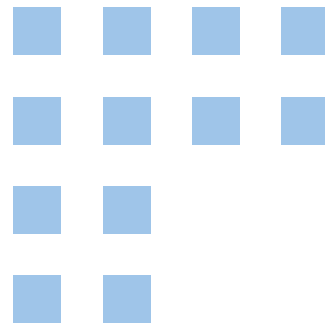
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# SCHEMATIC DESIGN

## FAÇADE SYSTEMS

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**

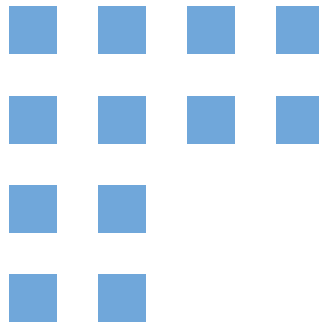
including heat transfer coefficient (U-Value); solar penetration factor (solar factor); glass types (glass-package, frosted, laminated, tinted); profile types and others;

**SECTION DRAWINGS OF CRITICAL INTERSECTIONS**

# DESIGN DEVELOPMENT

## FAÇADE SYSTEMS

Preparing calculation report, Selecting certain profiles  
and system solutions. Preparation of shop drawings



## DESIGN DEVELOPMENT

- **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 least includes 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)

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

**DETAILING OF FASTENING PROFILES TO THE MAIN SUPPORTING CONSTRUCTION**

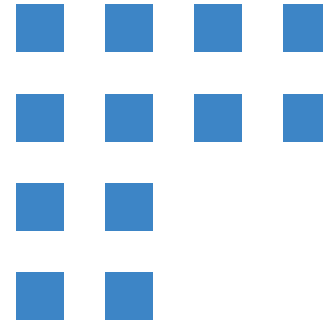
**DETAILING THE CLOSURE TO THE BUILDING, SHOWING ALL NON-TYPICAL NODES**

**TECHNICAL SPECIFICATION OF PLANNED ACCESSORIES**

# CONSTRUCTION DOCUMENTATION

## FAÇADE SYSTEMS

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



- **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

**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**

## CONSTRUCTION PROJECT COMPOSITION

- Explanatory Note
- Structural calculation/modelling in LIRA (software)
- Foundation Excavation pit plans and sections
- Foundation pit soil/ground strengthening plan
- Temporary structural design/elements layout/plan
- Detailing of compacted soil arrangement under the foundation
- Foundation plan, reinforcement, sections, joints
- Waterproofing/hydro insulation work's plan
- Plans of reinforced walls, ramps and other underground structures, reinforcement, sections and joints
- Drawings of vertical structural elements (columns, pylons, stiffness diaphragms, elevator shafts, stiffness cores ...) by floors



## PROJECT DOCUMENTATION NUMBERING AND FORMAT

**BTH - LSG - WR - REP - 001 - R00**

PROJECT CODE

ORIGINATOR CODE

DOC DISCIPLINE CODE

DOC. TYPE CODE

SEQUENCE NO.

REVISION

## DESIGN DRAWING NUMBERING AND FORMAT

**BTH - LSG - AR - A - L01 - 100 - R00**

**PROJECT CODE**

**ORIGINATOR CODE**

**DOC DISCIPLINE CODE**

**BUILDING CODE**

**LEVEL CODE**

**SHEET TYPE/SEQ. NUMBER**

**REVISION CODE**

- The design company must submit **documentation** both **electronically and** at least 3 copies in **hard format**
- A project submitted in **electronic format** must include both a **working format (DWG,RVT,PLA) and PDF files**
- The **updated design document** should consist of: an updated info, revision number and a revision cloud
- Project **title information**: Name, address and contact information of the company and disciplines involved

