Project Development Manual: Vol - 2

ENERGY CITY QATAR
Volume 2 : Revision 1
Requirement for Design Consultants
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1.0 Executive Summary

1.1 Purpose of Project Development Manual

The Energy City Qatar (ECQ) Project Development Manual is comprised of the following volumes:

- Vol 1: Requirements for Plot Owner’s
- Vol 2: Requirements for Design Consultants
- Vol 3: Requirements for Contractor’s

The main objective of the guidelines outlined in the Project Development Manual (PDM) is to assist and guide the Energy City Qatar (ECQ) and their Sub-Development Clients, including their Design Consultants and Contractors to create an exceptional high quality and sustainable “green building” commercial business hub characterized by exceptional environmental quality and world class, state-of-the-art design.

The Project Development Manual sets regulations and design criteria and standards for Sub-Development Client’s, their Design Consultants and Contractors for the overall design, appearance, environment and construction of the individual sub-development projects, while allowing for architectural creativity and expression. The Project Development Manuals must be read in conjunction with the ECQ Master Plan.

The Manual also emphasizes the requirement for Sustainable (Green Building) Design for every sub-development project within Energy City Qatar (ECQ), reflecting the design intent of the ECQ Development as the first fully integrated energy business cluster in the Gulf for the energy industry that achieves exclusive LEED certification.

The Project Development Manual outlines as part of the ground rules the strategic plans, procedures and methodologies that are to be implemented to achieve the vision and objective of the Energy City Qatar Master Plan and assist Sub-Development Client’s in achieving their vision and objectives for their individual projects.

1.2 Project Components

The Energy City Qatar (ECQ) development is comprised of the following key elements:

- Construction of the Infrastructure works
- District Cooling Network
• Construction of ECQ’s Shell & Core Office Building
• Design and Construction of ECQ’s Corporate Headquarters and Data Centre
• Design and Construction of Individual Sub-development Projects.
• Design and Construction of the ECQ Corporate Development Amenity facilities (Mosque and Business Hotel.)
• Coordination of these works to achieve the completion of the project in accordance with the designated time frame requires that strict project phasing be adhered to.

Design Consultants Execution Programs (Project Schedule) for design up to Issue for Tender (IFT) and Construction, will be closely monitored and managed to reflect current achievable milestone dates for their respective project(s).

The ECQ Master Schedule provides the relevant milestone dates and durations for the key components listed above.

Sub-development Design Consultants are required to compile and submit their proposed Execution Programs for Design and Construction of their respective projects. These Sub-Development Project Schedules will be integrated into the ECQ-Master Schedule to identify milestone dates and durations for Design and Construction and coordination with the project key components.

1.3 Role of Sub-Development Logistics Management Team (SDLM Team)

Energy City Qatar (ECQ) has created a Sub-Development Logistic Management Team comprised of Sr. Architects and Sr. Engineers to ensure sub-development projects comply with the guidelines described in the Project Development Manual and the Master Plan. The Sub-Development Logistics Management Team will be available to assist individual Sub-Development Plot Owners and their Design Consultants with the following activities:

• Assist individual Plot Owners in understanding the Master Plan and related design guidelines and ensure that the design development of their respective project complies with the Master Plan and the guidelines contained in the Project Development Manual.
• Provide technical, architectural and engineering resources for Sub-Development Clients where they can obtain information engage in discussions and understand development procedures and policies and other matters related to their Plot design, project development and construction.
• Coordinate and monitor the timely delivery of required deliverables throughout the design development process, including conducting Design Reviews throughout each design phase to ensure compliance with the Project Development Manual and Master Plan.
• Act as Energy City Qatar (ECQ)’s Logistics Manager on behalf of the design and construction of individual sub-development projects.
1.4 Design Reviews

In order to realize the desired quality of the overall Energy City Qatar (ECQ) Corporate Development, design reviews are undertaken by the Sub-Development Logistics Management Team on behalf of individual Sub-Development projects at defined stages of each project.

Section 6.0 and 7.0 of this Manual (Vol-2) sets forth the content and procedures of required design reviews for individual Sub-Development projects.

Design Reviews, in general, are mechanisms to provide a check and balance system, formally comment and assist Design Consultants with their development of solutions, and filter the comments for the Plot Owner’s and ECQ’s perusal and acceptance.

The purpose of the design review shall be to appraise the quality, compliance and completeness of the Design Consultant’s design proposals for the respective design stages. Review of the following criteria is included in the review and is appraised by the relevant disciplines and recorded in the design review report:-

1. Compliance with the design intent representative of high-quality, world class, iconic architecture
2. Creativity and innovation of design as applicable to the relevant discipline
3. Compliance with the design criteria outlined in the Master Plan
4. Compliance with the design criteria specified in individual Plot Regulation Sheets

5. Compliance with statutory and applicable design code requirements (i.e. IBC, QCDD, QCS, Kahramaa, etc) for the relevant discipline

The Design Review is intended to be an overview of the relevant disciplines only.

While the review is not intended to replace the Consultants’ QA/QC procedure for complying with required statutory requirements and design codes, it is an opportunity to provide feedback to the Consultant regarding areas which may need additional clarity or detail. It is also an opportunity to provide feedback and direction specific to ECQ requirements, local conditions, or other factors which the Consultant may have overlooked.
1.5 Information Management System

Each Sub-Development Plot Owner, their Design Consultant and Contractor will be given access to a web-based Information System for the retrieval of relevant design information on behalf of their design and to allow electronic submission of schematic and preliminary design drawings/sketches, draft reports and other design information applicable to their design for review, comments and assistance by the Sub-Development Logistics Team.

The web-based Information System is based on a File Transfer Platform (FTP) system and provides Consultants direct access to the Sub-Development Logistics Management Team for transferring design information or uploading documentation. Secured passwords will be issued to Key Project Staff to access the system.
2.0 Master Plan Requirements

2.1 Master Plan Principles

The Energy City Qatar (ECQ) Master Plan provides a flexible framework for the sustainable development of the ECQ site. It will be continuously and systematically updated as Sub-Development proposals for individual plots are detailed, and incorporated into the Master Plan. Functional efficiency and overall environmental quality of each project will be maintained throughout this process.

The Energy City Qatar (ECQ) Master Plan established the foundational framework for the physical design and development which specifies the physical layout of individual sub-development plots, open spaces, road networks and civil amenities. It organizes the plots in Sectors and discusses their interrelationships, taking into account the creation of vibrant commercial/ business nodes and streetscapes.

The Energy City Qatar (ECQ) Master Plan also defines the infrastructure networks of roads, water, power and sewer, district cooling, telecommunications/ IT-Security and related deliverables to support the layout of the development plots.

The Master Plan is to be read in conjunction with the Project Development Manual. Together they are the tools that will govern the implementation of the development, including Sub-Development projects. The intent is to advance a creative design resolution for the development of individual Plots.

2.2 Land Use Provisions

The Energy City Qatar (ECQ) Master Plan is designed to create a comprehensive overview for the ECQ Corporate Development, incorporating relevant components in order to clearly illustrate the intentions of the project. It provides a framework in which various components can be developed while still illustrating the project as a whole.

The Illustrative Master Plan is a non-technical, conceptual element meant to indicate the general appearance, esthetic environment and principal features of the project. Buildings shown are indicative illustrations of general mass and appearance, providing an image which depicts one possible condition for the finished development.

The Land Use Plan defines areas within the project for buildings, and how these areas relate to the project road system. The Land Use Plan also shows other land uses such as the landscaped perimeter buffer zone. It shows the primary and secondary entrances to the project, and how the internal road system of Energy City relates to the surrounding Lusail Development road network.
2.3 FAR, Program, Sub-development Plot Coordinates

The precise information regarding use, program and plot coordinates are stated in individual Plot Regulation Sheets for each Sub-Development Plot. This information will be handed over to Sub-Development Plot Owner’s in both hard copies and electronic copies. An example of the Sub-Development Design Data Sheet for Plot A-01 in Sector A is shown opposite as an example only:
2.4 Road Network/Streetscapes
Within every city there is a hierarchy of streets and circulation roads. This hierarchy is reflected in the design of the road network/streetscape with ECQ as described below:

- **Perimeter Roads** are roads for fast moving vehicular traffic, with little or no pedestrian traffic, and will be identified by distinctive landscaping to provide strong definition to perimeter roads, and protection from weather characteristics unique to Qatar such as windblown sand/dust and intense solar glare. The ground cover may be either grass or simply the natural existing surface. The treatment is very simple and clear.

- **Internal Streets** with slower moving vehicular traffic and some pedestrian movement will have a grass or planted parkway between the curb and sidewalk. This parkway will contain a row of shade trees spaced to provide a continuous canopy at maturity. In addition to providing shade and natural beauty, the parkway treatment creates a clear separation of pedestrian areas and vehicular streets. Wherever possible, an additional row of shade trees should be added to the inside of the sidewalk, forming a double row of trees. The walkway between double rows of shade trees is one of the strongest, most desirable elements in landscape architecture design.

- **Office Streets** are the spines of Energy City Qatar (ECQ) and are the most active pedestrian streets by far. These streets are simply and clearly landscaped with rows of trees along the curbs, which impart a high level of visibility to fronting offices and shops. Some under planting at the bases of the trees will provide a touch of natural texture and color. Links to the internal road network system and ground transport are distributed intermittently along the office streets. At each of these there is a structure, or vehicle stand which, in addition to providing shade and some urban furniture, identifies the entrances to the greenway links. Rich paving and abundant urban furniture also make these locations important gathering spaces.

2.5 Public spaces
At various places within the ECQ Corporate Development pedestrian ways coverage at public plazas and throughout the landscaped buffer zones. These are envisioned as architecturally defined places ideally suited to public gatherings, performances or exhibitions as reflected in the public atrium planned for the ECQ Corporate Head Quarters.

2.6 Landscape/ Site Landscape Buffer Zone
The landscape of Energy City Qatar emerges from the Master Plan Concept. The site arises from a central point, signifying the primary energy forces. This is the focal point generating energy and giving
life to the rest of the city. Major Landmarks included in the Master Plan Landscape Design symbolize this idea. It absorbs sun rays, and reflects this energy source throughout the city, acting as the city generator. In this way, it introduces natural forces to this city busy with corporate industrial activities. This landmark might therefore act as a time reference for Energy City Qatar, reflecting different times of the day.

The city’s radial growth tells the story of development in time from renewable energy sources at the origin of time (city) - moving on towards human development and uses of resources (shown in purple and pink color zones). Hence these two colors signify an atmosphere of industry, technology and non-renewable energy resources (coal, petroleum, oil...). However, the use of materials in hardscape, streetscape, urban furniture and buildings, should be of low impact, non-volatile substances, representing renewable energy and sustainable design, and typifying the unique energy hub that ECQ is intended to be.

The last green radial zone is that of sustainable ways of dealing with industry. Windmill landmarks and sculptures help in emphasizing this idea.

The Green Belt surrounding the city acts as a buffer zone, along with a natural protective belt providing visual and physical privacy to the whole of the ECQ site and specifically to those sites located at the perimeter of the city. The design intent is to represent a major natural element amidst a city of energy and industry.
In addition to the Green Belt surrounding the City, sculptures acting as landmarks, representing various forms of energy, identify the designated entrances to the city. A hierarchy has been assigned to the entrances to distinguish Principal and Secondary access to the site.

The Landscaped Buffer Zone is to be implemented by ECQ, which is a non-buildable area for plots bordering the buffer zone. This includes hardscape and soft landscaping, external lighting, irrigation and urban furniture.
2.7 Design Controls
The main design controls are incorporated in the Project Development Manual and the individual sub-development Plot Regulation Sheets. The Plot Regulation sheets indicate the type of building allowed, pedestrian, vehicle and service access points, building height and site setback, permitted uses, FAR (Floor Area Ratio) and the built up requirements for each sub-development plot. Section 6 of Vol-2 of this manual, further identifies and expands on the design controls that have been incorporated into the design development process.

2.8 Environmental Impact
Reducing Environmental Impact through sustainable design is a principal focus of ECQ, dealing with efficient use of energy, water treatment and waste management while utilizing the latest smart construction techniques as an essential ingredient. Architecture and planning are crucial for the success of a truly sustainable development. Construction as a whole uses more of the world's energy and material resources than any other activity. Perhaps nowhere is sustainability more problematic than in the Middle East, where an abundance of wealth and energy, with few of the restraints found in other regions of the world, has resulted in an urban environment that relies almost entirely on artificial support.

Thus the following principals are paramount for the Energy City Qatar development and are expected to be considered in all building design submissions:

1) Selection of sustainable resources.

2) Selection and efficient use of resources through design.

3) Environmental awareness & stewardship.

4) Promotion of environmental awareness via built functioning example.

5) Life Cycle Analysis (LCA) of materials, systems and processes.

6) Building designs to suit and utilize site characteristics and climate conditions

Refer to appendices for example: Sample Environmental Site Analysis

2.9 Structural Engineering
The structural engineering for individual building designs shall be governed by current applicable engineering standards and codes. The structural engineering will take into account the minimum civil and structural design requirements to be adopted on the design of the new buildings, structures and foundations.

Sub-development Plot Owner’s will ultimately be responsible for the integrity of the structural engineering and built structure of their respective sub-development projects.
2.10 LEED Certification/ Sustainable Design (Green Building System -GBS)

The benefits from the energy-efficient site orientation and design of buildings impact economic, social, and ecological factors. Plot Owner’s and their Design Consultants are required to take a proactive approach to meeting the Sustainable Design requirements set out by ECQ by including a Sustainability Consultant as part of their project team with at least one team member qualified as a LEED Accredited Professional. This should include collaboration with a specialist environmental consultant early in concept design to generate alternative concepts for building form, envelope, and materialization and landscaping, focusing on minimizing peak energy loads, demand and consumption. Typically, cooling load reductions from better glazing, insulation, efficient lighting, daylighting and other measures allows smaller and less expensive HVAC equipment and systems, resulting in little or no increase in construction cost compared to conventional designs.

Emulations can be used to refine designs and ensure that energy conservation and capital cost goals are met; and to demonstrate compliance with regulatory and certification requirements.

The layout of individual sub-development buildings and the spaces created between adjacent buildings should respond to the orientations of the plot to ensure an appropriate relationship to sun and wind, and if possible maximize passive energy systems. This would include the use of sun shading, awnings and covered arcades as important design elements.

The LEED green building rating system -- developed and administered by the U.S. Green Building Council, a Washington D.C.-based, nonprofit coalition of building industry leaders -- is designed to promote design and construction practices that increase profitability while reducing the negative environmental impacts of buildings and improving occupant health, well-being, and productivity.

LEED certification includes a rigorous third-party commissioning process that offers compelling proof that individual building projects have achieved required environmental goals and that the building is performing as designed. Energy City Qatar has engaged a specialist consultant to assist Plot Owner’s with third-party validation to verify that individual building projects have achieved required sustainable designs elements in their building designs, including validating LEED certification ratings.

The LEED rating system offers four certification levels for new construction: Certified, Silver, Gold and Platinum -- that correspond to the number of credits accrued in five green design categories: sustainable sites, water efficiency, energy and atmosphere, materials and resources and indoor environmental quality.

Every sub-development building project within ECQ is required to achieve LEED certification under US LEED NC v.2.2; with a minimum rating of LEED Silver Certification to comply with the sustainable design requirements set for the ECQ Corporate Development. Incorporating sustainability into the fundamental design and construction practices of the individual sub-development projects as early as the Concept Design phase is an important step in
Green Building design. This commitment should be exemplified in a Preliminary Sustainability Report included in initial Preliminary Concept Design submissions that demonstrates how the project will interact with the surrounding site, its water and energy usage, the types of materials that have been selected and the health and comfort of the occupants of the project and construction personnel involved. Once projects have advanced into the design development phase a Detailed Sustainability Report should demonstrate the sustainable achievement of the project and its compliance. To meet the ECQ mandated Silver Certification, sub-development projects need to achieve the 7 pre-requisites and a credit point total of 33-38 out of the total of 69 points of the LEED NC 2.2. Since ECQ requires the entire Corporate Development to be Green, all buildings should have substantial green building features in common. Moreover, emphasis should be placed within the context of building designs for water saving features rather than as optional considerations in the US LEED framework.

The Regulations for Green Building Design in Energy City Qatar (ECQ) is included in the Appendices.

ECQ have appointed an independent Specialist Environmental Consultant to conduct design reviews of design proposals at selected design stages to assess sustainable design features and their effectiveness in achieving ECQ’s requirements for Green Building design.
3.0 Plot Specific Requirements

3.1 Building Orientation, Massing & Articulation

Building context is defined by surrounding development patterns. Each new building on adjoining plots has an impact on its neighbors. Plot owners and their Design Consultants are to consider urban climate conditions arising from building density and orientation within each commercial business zone; this should be identified through an environmental site analysis. A sample of an Environmental Site Analysis is included in the Appendices. Building mass and details should create comfortable micro-climates for all seasons by minimizing heat gain and the effect of shade on adjacent land uses. Public comfort should be maximized through the provision of shaded outdoor circulation corridors and shaded building entrances.

Design Consultants will be encouraged to create Study Models of the proposed building designs to show accurate building mass and input to adjoining plots, including daylighting of buildings and potential natural ventilation systems implemented as a means of achieving higher LEED Certification ratings.

Design Consultants are to seek to create interesting massing and articulation in their building designs to create identity to their respective projects as distinctive elements of the urban landscape. Creative design solutions suggest imaginative use of windows, sun shades and balconies, or external landscape terraces, to utilize natural ventilation systems, including operable windows, are encouraged, however, operable window systems will be required to interface with Building Management Systems (BMS) for automatic closure in compliance with fire protection strategies.

Intensity of site use, or density, is expressed in terms of a Development Ratio. This number, otherwise known as a Floor Area Ratio (FAR), relates to the maximum allowable gross building floor area in square meters to the total site area in square meters. The Floor Area Ratio (FAR) for individual sub-development plots is specified on the respective Plot Regulation Sheets.

Maximum allowable building heights are 20m (Four storeys - ground floor + mezzanine floor + three floors). Roof height 20.0 meters from curb height, exclusive parapet or screens. An additional 4.0 meters is allowed from roof height for stair towers and elevator machine rooms. Parapet heights are not to exceed 3.0 meters. Boundary walls within individual plots are prohibited.

3.2 Streetscape

Streetscape elements and urban furniture follow the same basic principals. Urban furniture throughout the site will have common themes while special features at the intersections will define different zones for ease of identification. Sustainable design (Green Building Design) also contributes to streetscapes that are comfortable, safe and relaxing.
Multiple building projects designed for the consolidation of multiple sub-development plots on behalf of individual plot owners should adopt architectural features and incorporate design themes in the streetscape that further creates building connectivity and common themes that identifies sub-development clients corporate image where applicable.

3.3 Landscaping

Landscaping in individual sub-development plots should be complimentary to the broader landscape design theme for the whole of the ECQ site and harmoniously tie into the surrounding public space creating a larger continuum with no visual breaks. Landscaping should also be sensitive to the unique climatic conditions on site that are characteristic of Qatar, with mean average summer temperatures exceeding 45 degree’s Celsius. Landscape species should be selected on the basis of indigenous and durable planting schemes that tolerate and flourish in Qatar’s extreme climatic conditions. Species selection should be designed to minimize on-site irrigation requirements.

ECQ’s Landscape Development Guidelines and Typology Report is included in the Appendices. Design Consultants should reference this report in the design of their respective streetscape and external landscape design.

ECQ will coordinate and install soft landscaping, hardscape, external landscape lighting, irrigation and special features throughout the landscape buffer zone at the perimeter of the site and within the interface or connecting areas between perimeter Plot boundaries.

3.4 Special Uses

One Mosque will be designed and constructed within the ECQ site on Plot D-30. In addition, a Business Hotel with hotel facilities will be designed and constructed on Plot A05.

3.5 Car Parking

Parking shall be provided in relation to land use according to the following standards:

<table>
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<th>Land Use</th>
<th>Required Parking Spaces</th>
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<tbody>
<tr>
<td>Office</td>
<td>1/25m2 net leasable area</td>
</tr>
<tr>
<td>Retail</td>
<td>1/15m2 net retail area</td>
</tr>
</tbody>
</table>

No above grade parking or below grade parking structure is allowed within the buffer zone area which is designated as a 20.0 meter green space around the perimeter of the ECQ site. Apart from emergency service vehicles and selected disabled parking, no on-grade parking is allowed. Single lane vehicle circulation drive should be included at street-side elevations where applicable, including vehicle turn outs for pedestrian set down areas that eliminates potential vehicle circulation congestion.

Parking area design shall consider and incorporate the following:

(a) Each parking space must be a minimum of 2.75 meters wide and 5.80 meters long. Minimum aisle width serving right-angle parking spaces must be 6.7 meters. Parking areas must be linked to a pedestrian path system. This connection must be clearly
visible and easily usable. Parking areas must be arranged to accommodate connections to other parking areas where applicable.

Apart from emergency service vehicles and selected disabled parking (2% Max); on-grade parking is prohibited. All car parking must be located within basement car parking levels.

(b) One-half of all on-grade-level parking stalls must be fully shaded. Open canopies are encouraged since air movement under them prevents heat build-up. Please note: on-grade car parking not to exceed 2% for disabled/service vehicles.

(c) Trees are encouraged for use in lieu of canopies or other coverings to shaded parking spaces and to soften visual impact. Shades of canopies and roof areas are counted by vertical projection onto the surface. Trees must have quick growth habits, broad canopies and must not drop resinous substances.

(d) Parking areas must be screened from major roads by hedges, dense planting, and/or earth berms, subject to design approval.

(e) Parking areas shall be designed to include pedestrian circulation routes which minimize pedestrian encounters with vehicular circulation.

(f) Provision shall be made for barrier free access to public sites and buildings for handicapped persons. Minimal requirements, which should also conform to International Building Code (IBC) and Qatar Construction Standards (QCS) requirements, include:

i.) At least two parking spaces or 2% of the required parking not less than 3.75 meters wide and as close as possible to the building entrance reserved for individuals with physical disabilities.

(ii.) A continuous surface, not interrupted by steps or abrupt level changes from the handicapped parking into the building. Should ramps be necessary, such ramps should have non-slip surface, a slope no more than 8 percent, a handrail on at least one side, and have a flat platform at the top and at each turn of the ramp. The width of ramps shall be a minimum of 1.5 meter.

(iii.) Entrances and doors to all public buildings should be at least 1.0 meter wide with a flush threshold; they should provide access to elevators, if applicable.

(iv.) Provisions for visually handicapped and those with impaired hearing should also be taken into consideration.

(v.) Lighting scheme should be provided on all spaces. Lux levels for parking area to be 100 Lux for driveway and surface parking. Lux levels for basement parking to be 50 Lux.

(vi.) Vehicular and pedestrian circulations should be clear to orient people towards the main entrances of the Building Entrances.
3.6 Site Access

The Master Plan shows one vehicle access for each sub-development plot. Based on the net leasable area for individual buildings in determining the projected car parking density, Plot Owners who have purchased and consolidated multiple plots and whose design proposal includes multiple buildings on these consolidated plots will be required to comply with the car parking allocation of 1 car parking space for every 25 m² of net leasable area. The single vehicle access points to individual sub-development plots shown on the Master Plan may not accommodate the increase in vehicle car parking spaces.

Individual plots requiring multiple vehicle access points to accommodate projected vehicle circulation densities, will require special application and approval. Design Consultants will be required to apply for modifications to the infrastructure and road network to accommodate required multiple vehicle entrance and egress points.

Design Consultants will be required to prepare and submit for review and approval a site specific traffic analysis that provides documentation that supports any requests for modification to traffic access locations including number of vehicle entry egress points. Any approved variations and costs thereof, to the Master Plan in relationship to curb cuts and entry/egress locations will be the responsibility of sub-development Clients. ECQ’s Traffic Impact Study for the whole of the Corporate Development is included in the Appendices. Design Consultants should refer to this report in preparation of their respective site specific traffic analysis.
4.0 Building Specific Requirements (Design Consultant Requirements)

The regulated elements that govern the physical attributes of development for all Plot Owners’ lots include the following:

(a) Building Use
(b) Maximum Floor Area Ratio (FAR)
(c) Maximum Number of Buildings Per Plot
(d) Building Type
(e) Building Setbacks
(f) Underground Parking Setbacks
(g) Minimum Parking and Loading Requirements
(h) Building Entrance Orientation
(i) Landscaping and Fencing
(j) Ground Floor Transparency/ Fenestration
(k) Building Materials

Sub-development Plot Regulation Sheets outline the arrangement of vehicular access to individual sites.

Accessory buildings and structures (such as guard rooms) are prohibited subject to these provisions and all principal and accessory uses are to be entirely contained within the principal buildings with the exception of private outdoor open space.

4.1 Code Compliance

The regulatory standards as set forth in this Manual do not supersede or supplant any of the applicable statutory codes or bylaws of the State of Qatar, which take precedence in all cases. Qatar codes should be considered as the minimum requirement and consultants should be encouraged to exceed these standards.

Design submissions shall include reference to applicable design codes and standards and identify specific codes; example: IBC, NFPA, ASHRAE, Kahramaa, Q-Tel, QCDD, etc.

4.2 Sustainability Designs (LEED Certificates)

Sustainable architecture depends upon the successful integration of technical knowledge and imaginative problem solving to create buildings that are in harmony with their respective environments. The challenge for the Design Consultant is to achieve the highest attainable levels of sustainability, durability, longevity and quality of materials which serve to enhance sense of place. In its broadest sense, sustainable architecture seeks to minimize the adverse environmental impact of the built environment by enhancing efficiency and economy in the selections of materials, the use of energy and allocation of land resources.

4.2.1 LEED Silver Certification under US LEED Rating system

- The current requirement requires all projects within ECQ to be LEED Certified with silver level certification for a green building design. As ECQ will be the first “green” development in Qatar, all sub-development projects to be mandated to require minimum Silver Certification under US LEED NC v. 2.2
• **Sustainability Report by a Qualified Expert**
  All plot owners and their Consultants must take a pro-active approach to meeting the requirements set out by ECQ by including a Sustainability Consultant as part of the project team with at least one team member qualified as a LEED Accredited Professional.

The sustainability report should include the following to a minimum:

**Section 1 Principles Incorporated from ASHRAE Green Guide**
- Third Party Commissioning
- Indoor Environment Quality
- Renewable Energy
- Energy Distribution Systems
- Control Systems

**Section 2 Statement on US LEED NC v. 2.2 Rating Score**
To meet the ECQ mandated Silver Certification, projects need to achieve the 7 pre-requisites and a credit point total of 33-38 out of the total of 69 points of the LEED NC 2.2. It is recommended to increase the number of pre-requisites in the ECQ Regulation for all buildings to have substantial green building features in common. Emphasis is laid on mandatorily meeting water credits, as water is a scarce and highly valued natural resource in the region, and having a LEED accredited professional to guide the green design team. A LEED Checklist highlighting the ECQ mandatory credits required for all projects within the ECQ is included in the Appendices.

**Section 3 Statement on Computer Model of Energy Performance**
In order to predict and compare the energy performance of the project with respect to the LEED requirements, energy analysis is to be undertaken using a Whole Building Environment Simulation program approved by US Green Building Council.

**Section 4 Statement on Computer Model of Daylight Performance**
Lighting simulation software must be used to demonstrate the amount of daylight illumination level of all regularly occupied areas.

**Section 5 Design Statement on Building Envelop**
Thermal load through building fabric must be less than 35W/m² over the gross floor area. The energy performance of the projects Building Envelop has to be demonstrated using the computer model as described in Section 4.

**Section 6 Proposal for Water Sensitive Urban Design**
All projects within ECQ are required to establish their baseline water usage and demonstrate reductions in the design case as per the LEED water credits methodology.

**Section 7 Design Statement on Carbon Reductions**
All projects within ECQ are required to benchmark their carbon footprint and demonstrate reductions. This will help to gauge the ECQ development carbon footprint and its carbon reduction achievements.
which will eventually go a long way in becoming a precursor to carbon reduction initiatives by other developments and Qatar as a whole.

Section 8 Other Sustainability Requirements

The sustainability report should describe all other measures undertaken to adhere to the sustainable requirements and guidelines established for sub-development projects.

Each of the items of the sustainability report as stated above are described in detail in the subsequent sections of this report.

- **Sustainability Report approval by ECQs appointed Specialist Environmental Consultant**

  The Sustainability report shall be submitted to ECQ at two stages for its approval (in addition to the other submissions to Authorities as described in the “Development Governance Policies and Procedures”): Preliminary Design submission i.e. concept/schematic stage and Final Design stage.

4.2.2 Principles Incorporated with ASHRAE Green Guide

There are various ways that a project can be “more green”, including the following:

- **Commissioning**
  
  An important part of green design is verifying that the goals defined by the owner and integrated by the design and construction team are actually achieved as intended from the first day of the occupancy. “Commissioning is a systematic process of assuring that a building performs in accordance with the design intent and the owner’s operation needs.”
  Commissioning is a requirement to achieving LEED certification, under the Energy and Atmosphere Prerequisite.
  The project team must involve a commissioning agent, at an early stage of design to ensure the design allows for the full scope of commissioning as required by LEED and the commissioning agent. The commissioning agent will need to have experience on two projects of similar complexity and may not be a member of the project team.

- **Design Process**
  
  An integrated design process with sustainability as a primary goal is a recipe for a well designed project. Issues that may arise later in design or during construction are usually addressed early on and can more easily be dealt with resulting in minimal budget and time costs.
  
  - Create and Integrated cross disciplinary design team, committed to sustainability
  - Define environmental standards, goals and strategies early in pre-design
  - Establish benchmarks/performance targets as a reference point
  - Educate contractor and sub contractor in sustainable practices

- **Conceptual Engineering Design**

  Give adequate time and effort to the design concepts and assumptions for mechanical components of each project. While potentially requiring more time at the front end, benefits
like proper sizing, correctly functioning equipment and reduced changes will add significant benefits throughout design and construction.

- Set goals for energy performance, environment performance, comfort and operating cost
- Integrate the design of all systems-Envelope, HVAC, Lighting and Interiors
- Increase emphasis on HVAC performance
- “Form-follows-function” design
- Design HVAC loads for actual load and not “imaginary worst case” scenarios

- **Indoor Environment Quality**
  The benefits of indoor air quality are some of the most important to the overall success of a green building. Healthy and comfortable air will be a key area of satisfaction for the occupants of a green building.
  - Reduce the amount of indoor and outdoor air contaminants
  - Provision for measuring outside air
  - Provide air-air energy recovery device
  - Dedicated Outdoor air systems
  - Ventilation Demand control using Co2 sensor for occupancy intense area
  - Day lighting and view from interior spaces

- **Energy Distribution Systems**
  Ensure that efficient distribution is considered at every point of the system.
  - Minimizing pressure drop across coils
  - Utilization of 2-way valves, variable speed pumping
  - Size duct to minimize pressure drop
  - Adopt VAV concepts where possible

- **Renewable/Non Renewable Energy Sources**
  Renewable energy production is the most recognized aspects of sustainable design. On-site production of a renewable form of energy will reduce a project’s reliance on municipally provided electricity while raising a project’s profile in terms of sustainability and in regard to use of new and exciting technologies.
  - Solar energy for domestic water heating
  - Building-integrated or mounted Photovoltaic Solar Panels

- **Lighting Systems**
  Lighting is a significant contributor to the overall energy needs of a project. Lifecycle cost analysis is important for this approach because many situations occur when the slight initial cost increased yield significant benefits with relatively short term paybacks.
  - Efficient lamps and ballasts
  - Daylight harvesting
• Lighting controls

• **Control Systems**

Automation of systems is both energy efficient and demonstrates a project’s commitment to innovative and highly technological solutions. Many end users appreciate both of these benefits as do facilities managers and owners.

• Occupancy sensors
• Thermal sensors
• Air quality sensors
• Commissioning process

### 4.2.3 STATEMENT ON LEED RATING SYSTEM SCORE

The LEED NC 2.2 rating system allows designers and owners to pick and choose those credits which best suit their project vis-à-vis the cost and its environmental benefits. To meet the ECQ mandated Silver Certification, projects need to achieve the 7 pre-requisite- and a credits point total of 33-38 out of the total of 69 points of the LEED NC 2.2. It is recommended to increase the number of pre-requisites in the ECQ regulation.

Since ECQ required its entire Corporate Development to be Green, all buildings should have substantial green building features in common. Moreover, emphasis should be laid on water by making it mandatory in Sub-Development projects to have water saving features in the designs rather than as optional as considered in the US LEED framework.

The LEED check-list in the Appendices highlights the ECQ mandatory credits required for all projects within the ECQ.

The LEED Checklist is an important tool for the design team to establish in their design approach the desire for the project to reach a LEED certification level. This can then be used to implement the necessary design specifications and continually improve the design to meet the ultimate objective of a truly sustainable project that achieves a high level of LEED certification.

All plot owners and consultants should demonstrate their project’s likely ability to meet the credit requirements through their Sustainability Reports.

All projects are encouraged to target beyond Silver Certification to create a high performance building.

### 4.2.4 Statement on Computer Model for Energy Performance

In order to predict and compare the energy performance of the project with respect to the LEED requirements, energy analysis is to be undertaken using a Whole Building Environment Simulation program approved by US Green Building Council. The analysis and modeling methodology is to be in line with both the LEED credits requirements and the local regulations so that the same model can be used in the LEED certification process. The results of the analysis and likelihood of credit point’s achievement should be described in detail.

The basic idea of the Thermal modeling is to create a baseline model of the building referring to the ASHRAE standard 90.1, 2004 and compare it with the actual design and other prevalent standard design procedures in Qatar. It will help the designers to evaluate multiple design options within a single model early in the design process not only to view the
graphical representation of the building but also to access the resulting energy performance of each design alternative.

4.2.5 Statement about Daylight and View

The ability of a building to distribute daylight and allow views to its occupants is a very important element of Indoor Environmental Air Quality according to the USGBC. The benefits of adequate daylight and views are many, but the main benefit is increased comfort in working and living situations. Adequate daylight and views allow building occupants to feel a connection to the outdoors, reduces the reliance on artificial light, and creates an environment that is more soothing to the mind and body.

Because of the proven benefits of introducing daylight and views into occupied spaces, LEED credits EG8.1 and 8.2, are aimed at maximizing the exposure of occupants to daylight and views. To earn this credit EQ 8.1, it must be demonstrated that a certain portion of the regularly occupied areas within a project must be lit by daylight within a certain plane. Lighting simulation software must be used to demonstrate the amount of daylight illumination level of all regularly occupied areas. Illumination measurements must be taken under the model criteria of clear sky conditions, at noon, on the equinox, at 90cm above the floor.

4.2.6 Design Statement on Building Envelop

The building envelop design is a key factor that defines how well a building and its occupants perform. Construction materials and techniques of the building envelop dictate the useful service life of the building, Inside Air Quality (IAQ), HVAC sizing, structural design and maintenance costs, all of which have a significant impact on environment and total cost of ownership.

All projects should describe the building form and envelop features considered in the attempt to maximize energy efficiency and occupant performance. It has to exceed all local authority regulations in addition to meeting the requirement of ASHRAE 90.1, 2004. Thermal load through building fabric must be less than 35W/m² over the gross floor area. The energy performance of the projects Building Envelop has to be demonstrated using the computer model as described in Section 4.

The building-envelop factors that have major impact on energy and IAQ are as follows:

- Window/Wall Ratio
- Wall & Roof Insulation
- Glazing u-values and shading coefficient
- Shading elements
- Building geometry and orientation
- Daylight harvesting

4.2.7 Proposal for Water Sensitive Urban Design

Water is a scarce and highly valued natural resource in the region, with almost the entire supply through desalination. This method of producing potable water is quite expensive and with a very large environmental impact. It is therefore imperative to conserve water through reduced water consumption with improved water efficiency plumbing fittings and fixtures and ensuring controls to possible waste
due to high flow. Projects should adopt the following strategies wherever applicable:

- Flow restrictors and/or reduced flow aerators on toilet, sink and shower fixtures
- Dry fixtures such as composting toilets and waterless urinals
- Dual flush toilets and ultra low flush urinals
- Occupant sensors and metering controls
- Native and adaptive plant material for landscaping
- Efficient irrigation techniques
- Reuse of municipal water, storm-water and on-site generated grey-water for non-potable applications such as irrigation, toilet and urinal flushing, and custodial uses.

All projects within ECQ are required to establish their baseline water usage and demonstrate reductions in the design case as per the LEED water credits methodology.

4.2.8 Design Statement of Carbon Reductions

Climate change has become one of the major challenges for mankind and the natural environment. Greenhouse gas (GHG) emissions released into the atmosphere in ever rapidly growing volumes are recognized to be responsible for this change. A Carbon Footprint is a measure of the impact human activities have on the environment in terms of the amount of greenhouse gases produced, measured in units of carbon dioxide. Carbon footprint quantification, analysis and reduction are key to preventing this, for example, by enhancing energy efficiency, mitigating carbon emissions by means of green energy and then compensating for remaining GHG emissions by investing in carbon offsets, with a final goal to becoming carbon neutral.

All projects within ECQ are encouraged to benchmark their carbon footprint and demonstrate reductions. This will help to gauge the ECQ development carbon footprint and its carbon reduction achievements which will eventually go a long way in becoming a precursor to carbon reduction initiatives by other developments and Qatar as a whole.

4.2.9 Other Sustainability Requirements of Project Development Manuals Vol 1 and Vol 2

Site Strategies:
Design Consultants are to analyze their sub-development plot(s) for microclimate, land use, density, expandability, green space and adapt to the best possible sustainable design factors in relationship to factors listed below:

- Use of passive, active and renewable energy systems; solar, wind etc.
- Guarantee sufficient aeration for site and surroundings
- Capitalize on regional appropriate building technology
- Indoor Environmental Quality
- Energy Distribution Systems
- Control Systems
Building Envelope:
The performance of the building envelope is a function of the relationship between the building and its external environment. Key factors are wind patterns, solar angles, excessive exposure, air quality, thermal massing, air tightness, thermal massing and noise. The building itself may be oriented in a particular direction to take advantage of naturally occurring attributes of wind and sun. In addition, low energy buildings typically have double or triple glazed window systems with gas filled “air” spaces and low emissive (low-E) coatings, providing much better insulation than conventional windows. Light colored roofing, radiant barriers, heat reflective paint systems should be considered to reduce solar heat gain. Preventing excessive solar gain in the summer months is a key to reducing demand for cooling energy. Design consultants should consider the effect of sand storms native to Qatar, and the possibility of sand and dirt adhesion to glass, other radiant barriers and sloped or faceted surfaces.

Energy:
Design Consultants must address energy efficiency over the entire life cycle of building development and use different techniques to reduce the energy needs of buildings and increase their ability to capture or generate their own energy. Dynamic thermal modeling and energy modeling techniques may be useful in order to achieve low energy designs. Design Consultants are encouraged to consider active and passive solar building design allowing buildings to harness the energy of the sun efficiently with the use of active solar mechanisms such as photovoltaic cells or solar hot water panels, and support cooling of building by passive cooling strategies.

Room Comfort:
The thermal comfort of offices and occupants is dependent on ambient air temperature, wall temperature, air velocity and relative humidity. These factors contribute significantly to determine the overall level of comfort attainable. Design Consultants are to address the following sustainable design factors:

- Design development of building to be supported with simulation studies on air flow and room temperature benchmarks
- Provide appropriate heat protection for the building envelope
- Use of glazing and façade elements with low-U-values
- Reduce total area of unprotected glazed surfaces
- Use automated exterior sunscreens
- Use sensors to detect and control solar gain
- Design responsive system for effective distribution of heating and cooling
- Provide zoned room conditioning
- Avoid exceedingly dry or humid indoor air quality
Air exchange to improve indoor air quality

**HVAC Systems:**
The most important and cost effective element of an efficient heating, ventilating and air conditioning (HVAC) system is a well insulated building envelop. Design Consultants and their Sub-Consultants are to design efficient cooling systems addressing the following sustainable design factors:

- The use of ECQ’s district cooling provider is mandatory
- Passive cooling strategies
- Cooling operation conditions
- Avoid passing below the dew point
- Optimize flow temperatures to avoid thermal losses
- Provide effective controls and monitors
- Managed cooling capacity in design stage

**Electrical Systems:**
Design Consultants are encouraged to consider active solar building design allowing buildings to harness the energy of the sun efficiently with the use of active solar mechanisms such as photovoltaic cells or solar hot water panels. Daylighting and artificial lighting controls must be optimized to achieve energy efficient solutions for the development and the following recommended strategies to address these factors are listed as follows:

- Sivacon electrical systems
- Automated lighting controls
- Light shelves, Light Scoops, deep reveals and other secondary light sources
- Clerestory Windows
- Skylights, Sky domes and Roof monitors
- Louvers, Blinds, Brie Soleil, Aero foils and other light diffusion and shading devices
- Timing devices
- Dimmer control
- Highest electrical safety procedures
- Lighting design controls
- EIB Based Systems
**Long Lasting Lamps:**
- Avoid multi-filament fixtures with low efficiency
- Use energy saving ballasts
- Use energy-efficient equipment and lighting to reduce internal heat load

**Water:**
Water conservation is considered a high priority factor in the design of individual sub-development buildings and Design Consultant’s shall consider water-efficient technologies and conservation methods, including:

- **Toilets:**
  - Low volume flush toilets
  - Dual flush toilets (3/6 liters)
  - Cistern displacement devices

- **Urinals:**
  - Urinal controls (infrared, radar, auto-flush)

- **Wash hand basins:**
  - Push taps
  - Flow control, self closing
  - Tap flow regulators

- **Showers:**
  - Shower mixers
  - Water saving showerheads
  - Self closing shower system

- **Outside landscape gardens:**
- Water control meters

- **Water Supply**
  - Auto shut off and pressure regulators
  - Water meters and consumption monitoring
  - Use of gray water from hotel and other buildings for irrigation purposes to be considered

**Solid Waste Management:**
Sufficient space is to be allowed within the buildings to accommodate refuse bins for the separate storage of solid waste. Plot Owner’s should allow for multiple containers for waste segregation. Solid Waste Management strategy should provide access for waste haulers to pick up waste containers in service dock areas in lieu of taking waste containers to curb edge for collection.

**Decommissioning and Deconstruction:**
The design shall include methods and guidance for decommissioning, demolition and recycling of all components of the building.
Building components, materials, assemblies and finishes should be designed and specified for ease of dismantling, removal, recycling and reuse. By using methods of fixing that allows ease of dismantling and removal, instead of damaging, permanent adhesive, and solvent fixing methods.
**Sustainable Environment:**
Sustainable design also means minimizing the environmental and health impacts of building materials. As such, specification of materials most compatible with the environment and human health are strongly recommended, such as materials with low natural carbon emissions. Sub-development Plot Owners are encouraged to benchmark their carbon footprint of their project to demonstrate reduction in carbon emissions.

**Energy Management Systems (EMS)**
The use of Energy Management Systems and internal processes to manage energy demands and control of building mechanical and electrical equipment performances is encouraged. Design Consultants are to address green practices in the following areas:

- Commissioning of building systems
- Building operation
- Maintenance practices and methodologies

**4.3 Basement Design**
The layout of the basement requires consideration of the car parking space requirements; the ramps to access the parking level the building core and supporting column spacing or grid. The structural column grid will vary depending on the building floor plate and basement design.

Parking and loading Design Standards will apply to all accessory parking provided on plots that is located below grade. Access to the parking ramps is to be designed individually for each building. The design and location of the ramps and site circulation is to be in substantial conformity to common design standards further described in the IBC (International Building Code) and/or QCS (Qatar Construction Standards). Handicap parking should be included at the first basement level with ramps close to lift/ elevator cores and appropriate signage.

**4.4 Main Entry Level Design, Materials and Colors**
Main entry features to individual buildings must be clearly identified to facilitate pedestrian circulation and access into the buildings. Safety and compliance with design requirements for accessibility of buildings and their associated sites and facilities for people with physical disabilities is imperative. This includes alternative means of egress and entrance to main entry levels via ramps and lifts, and interior and finishes schemes that provide adequate visibility in accordance with code requirements and the ADA. Appropriate colors, luminance, contrast, and tone variations to clearly and safely define circulation routes and interior spaces shall be included in the design by differentiating between key building elements such as floors, walls, doors, and delineate stairs, glass partitions, screens and doors.
Material and color ranges shall encourage a harmonious but varied visual fabric to the streetscape. In general, permanent and sustainable stone and glass finishes are required at the main entry levels as opposed to painted surfaces that require continual maintenance and repair. Stone, marble and tile surfaces must comply with slip resistance coefficients to ensure public safety.

Shop front and curtain wall system glazing should be, either clear or, where tinted or coated, maintain visual acuity to ensure safety for pedestrian circulation at main entry areas.

Building designs and features are to represent high quality and innovative design aesthetics without the use of flashy gimmicks or fantasy themes.

Mezzanine floors are to be included in the Total Built-Up Area (BUA). Design of Mezzanines shall comply with Section 505 of the IBC (International Building Code) with the following exceptions:

1. GFA of Mezzanine Level shall not exceed 75% of the Ground Floor GFA
2. GFA of Mezzanine Level shall be included in the total GFA calculations for the design of fire protection/suppression systems
3. GFA of Mezzanine Level shall be included in the total BUA
4. GFA of Mezzanine Level shall be included in the aggregate Net Rentable Area for calculating car parking requirements, unless the total GFA is less than or equal to 1/3 of the Ground Floor GFA, and a.) and b.) below apply:
   a) Total GFA is less than or equal to 1/3 total GFA of Ground Floor, and
   b) Mezzanine Level is not designated a rentable or lettable area.
5. Ground Floor to underside of First Floor slab shall not exceed 7.0 meters.

4.5 Building Façade & Fenestration

The façade of individual buildings shall respond to the regional climate and make use of exterior sun shading wherever possible to reduce heat gain. Fenestration designs should utilize and enhance daylighting whilst preventing direct sunlight, glare and solar gain. Reinforced concrete/masonry, and external cladding/glass curtain walls are encouraged with good detailing that address the following criteria:

- Structural integrity
- Moisture control
- Temperature control
- Air pressure control

The use of mirrored glass or material selections that have characteristics of high-reflectivity for external fenestrations is prohibited. All glazing is to be low-E glass with the highest possible transparency with subtle color tinting. The following design criteria must also be taken into consideration:

- Enclosures to balconies are not permitted
• Satellite dishes are not permitted on façade or balconies
• Visible wall or window air conditioning units are not permitted

No exterior components of plumbing, heating, cooling and ventilation systems are to be mounted or installed on building facades, unless they form discreetly integrated architectural design features.

Staircases shall be enclosed within the building envelope and expressed above parapet level on the building façade.

Balconies are outdoor spaces connected and accessed from within the individual buildings and interior spaces to contribute to the articulation of architectural form, scale of the buildings and to provide comfortable useable outdoor areas during suitable times of temperate climate. Principles to note on the introduction of balconies in individual buildings include the following factors:

• Extend internal office, public spaces
• Must be comfortable with adequate space provision to allow for safe use
• Must be adequately sized to accommodate furniture components that promote indoor/ outdoor interaction
• Offer opportunities for integrating external landscaping and irrigation

• Encourage the use of sun shading
• Provide opportunities for open, glazed and solid balustrades allowing for general views: minimum width of 2.5 meters
• Maximum projection from the finished face of the building of 2.5 meters provided that the projection is no more than 50% of the total depth of the balcony: when buildings are constructed to the minimum setback lines, balconies are allowed to project the same maximum of 1.5 meters beyond set back line, provided they do not impede service vehicle circulation at lower levels

FAR guidelines in relationship to balconies are to comply with the following criteria:

• Balcony area up to 5% of the total enclosed building area above grade will not be calculated in the FAR
• Balcony area above 5% of the total enclosed building area above grade will be calculated in the FAR

4.6 Roof Design

Roof mounted equipment shall be hidden from view using suitable aesthetically designed enclosures or screens depending on location.
Maximum dimensional height to roof slabs is 20.0 meters, with parapets extending additional 3.0 meters and lift/ elevators machine rooms to 4.0 meters.

4.7 Building Lighting
Overall building lighting to be tasteful up-lighting or feature lighting only to enhance architectural features. Flashing or gimmicky lighting is prohibited. No programmed lighting with changing and flashing colors is allowed. Sensitivity to the design of external and landscape lighting must consider impact to adjoining buildings.

4.8 Building Signage
All building signage will entail formal application, submission and approval by ECQ. Lighting of building identity and address signs (not including directional signage) in all sub-development Sectors shall use indirect lighting. Direct lighting and internal lighting of signs is prohibited. (Indirect lighting is a light source that is separate from the sign face and that is directed to shine onto the sign.)

ECQ will design and install all signage and way finding devises outside of sub-development projects.

Prohibited Signage throughout all Sectors is described as follows:
- Banner Signs
- Changing Image Signs
- Flashing Signs
- Marquees and Marquee Signs
- Off-premise signs (other than directional signs)
- Portable Signs
- Painted Wall Signs
- Projecting Signs (except as specified in public spaces)
- Roof Signs
- Signs identifying a product
- Video Display Signs

Buildings will have minimum information of address with a street name and number. The option to include building naming is not discouraged but Plot Owners are required to apply separately for approval from ECQ.

Building Directional Signs:
Signs communicating the address and/ or name of individual buildings shall be placed at the point of vehicle access to plot entrances from public streets. A single monument sign shall be placed at each such intersection at right angles to the public street and shall identify all buildings served by each access drive. All such monument signs throughout all Sectors of ECQ shall be of standard, uniform design, construction, illumination and placement as defined and illustrated in the Master Plan Landscape Design.
4.9 Commercial Signage

Sign sizes will be determined by the gross total face area of all wall mounted and window display signs for any use adjoining a building. Sign size is limited to 0.3 square meters per meter of street frontage.

Prohibited signs shall include awning signs, and no signs shall be affixed to any external surface of any building, except within pedestrian corridors. Signs may be affixed to the enclosing wall or window of any commercial space within any arcade/ corridor. For each use adjoining an arcade/ corridor, one additional sign suspended from the arcade/ corridor ceiling is permitted.

Suspended signs from arcade/ corridor ceilings shall have two faces, be of uniform dimensions within any arcade, attached at right angles to the direction of pedestrian movement, and arranged in consistent geometrical alignment.

Window signs with lettering of less than 600 mm in height shall not be counted, provided the sign is limited to information such as address, hours of operation, product information and logos.

Affixed signs to enclosing wall of any use shall not project more than 35 centimeters from a building façade.

4.10 HVAC Systems

The use of ECQ’s district cooling provider will be mandatory for all sub-development projects. Provision of district cooling water supply and return mains to and from the cooling plants will be available and have supply to and from isolating valves at boundary points for each sub-development Plot in the vicinity of other utility provisions.

ETS exchange rooms shall be incorporated into designs and must comply with the District Cooling providers design criteria.

Design Consultants will be required to provide as design stage deliverables, heat load calculations to be reviewed by Civil / Infrastructure Design Consultant for compliance with provisions in the Infrastructure works.

Electronic data containing infrastructure services information in AutoCAD format will be provided to all sub-development Design Consultants. Design Consultants must coordinate with ECQ’s Infrastructure Contractor to finalize tie-in connections points.

Rooftop mechanical equipment shall be visually screened and/ or enclosed in a roof form. Noise and vibration emanating from mechanical equipment shall be attenuated in conformance with International noise and vibration design standards (American
Mechanical ventilation discharge vents shall be visually screened, designed and located to minimize impact on pedestrian ways/circulation and adjacent buildings.

**4.11 Satellite Dish Antenna**

Communication antennas/receivers and transmitters are prohibited. An integrated rooftop communication dish system providing service for the entire building is permitted.

**4.12 Architectural Grid and Structural Configuration**

The Design Consultant has the freedom to vary the design/layout grids to suit the plot basement parking design. The positioning of the building core(s) will also vary depending upon overall height, the configuration of individual floor plates and Plot Owners requirements. A degree of flexibility is implied to facilitate the creation of varied layouts without undue restrictions on structural design. Structural transfer levels may be employed to facilitate offsets between basement and building column grids.
5.0 Infrastructure Provisions

5.1 Road Network

The design of the roads in the relevant zones, in terms of cross-section, horizontal geometry and junction layout, require an understanding of the future volumes and distributions of traffic that they will be expected to serve. Access, circulation and parking considerations are inextricably linked to traffic operations on the road network, and are therefore an integral part of the traffic network design.

ECQ’s Final Traffic Report for the ECQ Corporate Development is included in the Appendices.

A number of elements or aspects of the road network as a whole, as well as of parts of the network such as individual road links and junctions, need to function together and in a balanced and mutually complementary manner, to provide a safe, efficient and functional road network. These elements or aspects include, primarily:

- Access from the major road network into the overall area;
- Access conditions at individual junctions within the area;
- Access to individual developments and parking facilities;
- Junction type, such as signalized or stop-controlled junctions;
- Road cross section – number of lanes, etc.

The treatment of each of these elements, or the combination of the treatments of the various elements, must work together to provide for safe, convenient access, minimize travel distances and circulation required, and minimize traffic volumes on road links and at junctions.

The site comprises approximately 6,200 M of road network. The roads are sized as follows:

- District Distribution Roads 42.0 M wide
- Local Distribution Roads 28.0 M wide
- Major & Minor Access Roads 18.0 M wide

Sculptures acting as landmarks, representing various forms of energy, will be installed at the main entrances to the Energy City Qatar (ECQ). There is a hierarchy of entrances, important in distinguishing Principal and Secondary access to the site. These land marked entrances use planting and sculptural elements to define the various site entries.
Water features will also be used at some of the entrances and in the interior of the site. In keeping with the sustainable / green building theme, water features are limited in scale and water consumption.

Anticipating the phased development of sub-development projects in conjunction with the construction of the infrastructure it is an important consideration in minimizing the potential conflicts between the infrastructure contractor and individual sub-development Plot Owner’s contractors. This also has the advantage of minimizing damage to infrastructure resulting from construction vehicle traffic. It is therefore preferred to have the roadway infrastructure developed to at least a base course stage prior to the commencement of individual sub-development projects. Heavy pavement bridges will be required for construction access traffic to minimize damage to the roadway infrastructure. This will require continuous monitoring during the construction phase. Final paved surfaces and footpaths shall be completed progressively in accordance with the infrastructure contractors Execution Schedule to provide permanent access to sub-development plots prior to completion of individual sub-development projects.

Vol – 3 of the Project Development Manual entitled “Requirements for Contractors” expands on the requirements for sub-development contractors during construction.

5.2 Water Supply

Daily consumption of water is set at 80 liters / 1 staff per day during daytime working hours. Therefore, total domestic water demand = 1600 cubic meters / day.

5.3 Irrigation & Fire Fighting

A complete irrigation infrastructure system will be incorporated into the development with connection onto the Lusail Irrigation network, however, Lusail will not (for the time being) provide irrigation water and therefore the need for irrigation will have to be taken up using potable water through the water supply network. Individual building owners will have the responsibility to irrigate the adjacent public areas within their site boundaries until such time that Lusail provides irrigation water through its network after which public areas and buffer zones will be irrigated through the intended systems using grey water or TSE.

It is advised that Design Consultants incorporate a dual waste water system separating solids (toilets) from wash basins and pantries. The wash basins and pantries, through a purification plant should drain into a holding tank within the building, the (purified) water can than be used (by coupling this to the irrigation system) for irrigating the plot and adjacent public areas, thus saving on the cost for the usage of potable water.

Irrigation of the perimeter landscaped buffer zone and public green spaces will be provided by ECQ. Connections will be provided at all lots from their irrigation system, and individual lot irrigation and upkeep will be the responsibility of the owner. Utility tie-in points for individual sub-development plots will be provided in electronic format to Sub-development Clients and their Design Consultants.

The fire fighting network is designed to deliver the peak domestic flow such that the minimum pressure is not less than 1.0 bar. During a fire, fire pumps shall be in operation to provide a minimum pressure of 1.35 bar (20 psi) at any fire hydrant and 4.0 bar (60 psi)
at any buildings provided with sprinklers or standpipes.

5.4 Storm Water
The drainage of storm water from the site will be by means of a positive system by which surface storm water is directed to the drainage system via carriageway catchments, gullies and swales. The storm water is then directed across the site to the north to the proposed park and water reservoir to be located there.

Individual sub-development plots are required to design plot storm water systems to integrate into the overall infrastructure design.

Sub-development Design Consultants are to take into consideration on behalf of their designs, the climatic conditions of Qatar and the significant sand and debris deposition that is characteristic of the environment. Consideration to filtration systems and maintenance systems that protect the operation of the Storm Water system need to be reviewed and incorporated into the designs by the Consultants.

5.5 Electrical Distribution Network
The Master Developer, Qatar Diar, in conjunction with ECQ is responsible for the electricity supply infrastructure through the Electrical Distribution Network. The distribution within each of the Commercial Zones shall be at 11kV, to be supplied either from suitably located 33/11kV or 132/11kV primary substations within the ECQ development. The Master Plan assumes that the maximum power demands will vary between sub-development projects based on calculated demand loads. A District Cooling System is also the responsibility of the Master Developer – QD in conjunction with ECQ.

Design Consultants will be required to prepare and submit Electrical Load Calculations as design stage deliverables to be reviewed and verified in conjunction with the provisions included in the Infrastructure design by the Infrastructure Design Consultant.

5.6 Telecommunications Network
The telecommunications infrastructure shall be built to provide and support the services expected of a world class, state-of-the-art development like Energy City Qatar (ECQ), with adequate capacity for future expansion.

The telecommunications infrastructure will be placed within the designed service corridors as part of the infrastructure works and a fiber optic network which will extend into every floor within each building as a backbone cabling only will connect at suitable locations to individual sub-development projects.

5.7 District Cooling
Chilled water at required design temperatures will be provided to individual sub-development projects. The design of the Plant facility is based on the specific requirements of the ECQ development.

5.8 Waste Management
The main objectives of the Waste Management system for all commercial zones of the ECQ development are as follows:
(a) To manage waste in a manner that will protect the environment and public health and conserve natural resources.
(b) To manage waste to minimize demand upon land fills.
(c) To manage waste in a cost-effective manner that maximizes environmental benefits and minimizes long-term financial liability.

It is proposed that the Facility Management provider will contract with private refuse haulers to provide refuse collection and transfer services throughout the whole of Lusail, including the ECQ development.

To maintain the integrity of the quality of the built areas Plot Owner’s are to allow for multiple waste containers for waste segregation and that building designs provide access to service docks for the waste hauler to pick up waste in the building dock area in lieu of moving waste containers to curb side for collection.

Containers are to be returned to their original storage locations immediately thereafter. In the interests of minimizing waste volume, developers are encouraged to consider the installation of waste compactors within their buildings waste rooms. These rooms may be required to be air conditioned for storage of waste prior to collection.

5.9 Site Security System

Energy City Qatar (ECQ) falls within the greater Lusail development which is designed to have a heightened security system, protocol and methodology. The security system provided by ECQ and incorporated in the ECQ infrastructure will be considered as a stand alone system and will offer state-of-the-art security for the site perimeter and vehicle access points. A “multi-hazard” approach to the security system will ensure full supervision of all access points and site perimeter by the implementation of the following requirements:

(a) Video and CCTV surveillance systems
(b) License plate recognition and recording systems
(c) Buried intrusion detection systems for the entire ECQ perimeter buffer zone. Individual plot protection of grounds and landscaping should be by landscape berms and planters, etc. Where a pedestrian path lies within individual sub-development sites, vehicle access and circulation is restricted through bollards and integrated landscaping. Building security system concepts shall be submitted to ECQ for review and approval. All security systems, fire alarm systems and emergency systems must provide compatible data connections with the ECQ Central Security Command Station as an integrated system.
6.0 Building Design Review – Process and Deliverables

6.1 Site Plan Requirements
All sub-development plots in each sector of ECQ are formalized in the individual Sub-development Plot Regulation Sheets issued to Plot Owners. This controlled document establishes the following:

- Key Site Plan
- Sector & Plot Number
- Plot Coordinates
- Plot Area and Dimensions
- Approved Use
- Building Type
- F.A.R. (Floor Area Ratio)
- Set-back Requirements
- Floor Plate Requirements
- Basement Set-out Requirements
- Height Requirements
- Car Parking Requirements

Plot Owners Design Consultants are to address and include the above information in their concept design submission duly endorsed by the Plot Owner for strict compliance.

6.2 Plot Boundary Requirements
Plot Owners Design Consultants are to engage registered surveyors to graphically identify and distinguish the plot boundary on all drawings accordingly. All reference and setting out shall be dimensioned from the plot boundary lines and coordinates, including sub-basement and building setbacks.

All design submissions and construction activities relating to the development of individual sub-development building projects are to remain within the plot boundary. Interfacing, coordinating and applying for external services connections are to be at the plot boundary line complying with each service provider code set-back requirements.

6.3 Plot Coordination/ Cooperation Requirements
Vehicular access to each Plot is made available through primary and secondary road network systems for each sector connecting the whole of the ECQ development. Individual Plots located in designated sectors are allocated vehicular access to their individual sites via secondary road networks. Design Consultants are required to coordinate with each other on behalf of adjoining sub-development projects.

ECQ will take an active role in the design and construction of the perimeter Landscape Buffer Zone and the landscaped interface between individual sub-development projects. ECQ will facilitate this through meeting’s and workshops. Design Consultants are to ensure that their access design is in compliance to all applicable traffic and road design standards and applicable codes.

Pedestrian access from one plot to another is to be encouraged and no physical barriers are allowed to hinder this urban theme further.
described in the Master Plan. Foot paths from one plot to another should be planned in cooperation with other neighboring plots and the overall landscape.

6.4 Plot Landscape Requirements

ECQ have appointed a Landscape Contractor who will construct the soft landscaping and hardscape throughout the perimeter Buffer Zone and the interface between sub-development projects.

The SDLM Team on behalf of ECQ will facilitate the implementation of the landscape design through meetings and workshops. The use of street/ urban furniture and sun shade devices is encouraged provided they blend and complement with the overall landscaping plan and safety issues.

The buildings external space between the ground and the basement roof slab is qualified as an environmental area for the integration of green space on the plot. Design Consultants are to ensure that the Master Plan landscaping design strategy can be accommodated and supported structurally in their proposal including waterproofing/ testing and proper backfill to the appropriate levels.

6.5 Plot Drainage Requirements

Design Consultants are to ensure that all surface water is collected from the Plot and channeled to road side storm drains. Discharging surface water into sewer systems is strictly prohibited. Design Consultants are to comply with the Master Plan design requirements for storm water systems on the following factors:

- Overall Drainage System Planning
- Rainfall & Runoff
- Design Flow and Criteria
- Ground Water Control
- Lifting Pump Station

6.6 Building Height Control Requirements

Building height controls are qualified in the Plot Regulation Sheets for each Plot. Building height is measured from the ground floor to the last roof slab and must not exceed 20.0 meters. Parapets are permitted to extend up to 3.0 meters above roof slab levels and lift/ elevator machine rooms 4.0 meters above roof slab level. Building ground floor slab is not to be above +500mm from the center finish level of adjacent secondary road where access to basement levels is stipulated in Plot Regulation Sheets for respective Plots.

6.7 Building Car Parking Requirements

The below grade, building basement enclosure systems and its functions are typically comprised of foundation, floor slabs and walls. The building basement must consider the following design criteria:

- Structural Support Functions of the below grade basement enclosure in consideration of the proposed buildings superstructure.

- Distribution Functions of utilities services such as power, communication, security, water, sewer, gas and cooled conditioned air to and within the basement enclosure.
- Building basement ramp is defined as a sloping vehicular way which is a means of moving from one floor level to another floor level without encountering any obstruction. Ramp slope is not to exceed 12.5% (1:8) for ground to first basement levels and for all lower levels. Building basement parking vehicular circulation and related turning radii are to be addressed and resolved in the building proposal for review. A design criterion for basement car parking, including design criteria for the design of circulation/vehicle ramps is included in the Appendices.

- Design Consultants are to propose natural and mechanical ventilation strategies to prevent build up of toxic fumes. Gas monitoring systems will be required. The extraction and exhaust are to be located outside the building and dispersed to open space where there is less public traffic.

- Design Consultants are to propose natural and electrical lighting to ensure that the basement parking is well lit and welcoming to motorist and public alike. Emphasis should be focused on directional signage leading to main entry lobbies and fire escape staircases which are required to be provided with e-lighting systems.

- The floor of basement parking and ramps shall be reasonably roughened and treated in such a way as to prevent slipping and comply with acceptable design standards for slip resistance coefficients. Corners of columns and walls adjacent to columns shall be covered with steel angle plates with protective rubber finishes, or equivalent. Ramps shall be provided with an adequately sized reflector mirror, where required, to improve visibility on curves, sharp turns and wherever poor visibility occurs.

- Design standards for calculating car parking requirements are based on 1:25 square meters of net lettable area (NLA).

- Design Consultants are encouraged to use a unit area allocation of 38m2 – 42m2 per car park, inclusive of circulation areas, for preliminary set out for car parking structures.

6.8 Building Public and Handicap Access Requirements
Design Consultants are to ensure that disabled (refer ADA guidelines) and pedestrian public access ramps shall have a minimum width of 1200mm and slope not greater that 8% (1:12). Handrails installed for wheelchair shall be at a height of 600mm. If the vertical height requires two ramps to achieve the properly graded slope, the ramps shall be no longer than 6000mm long, separated by a level landing platform at least 1500mm long with 90 or 180 degree turns. Disabled ramps should be clearly identified.

Landing platforms/ ramps at all building entrance doors shall be leveled sloped only as required to facilitate drainage. Landing platforms shall be at least 900mm wide if doors swing inwards and 1500mm wide if doors swing outwards. The ramp
surface should be hard and non-slip material finished and to be located close and accessible to an entrance. Security Aspects for the building are at the discretion of the Plot Owners; however, they must comply with statutory code requirements for safety and fire escape.

Special sight and hearing impaired disabilities should be considered in public circulation areas and vertical transport systems such as lifts/elevators.

6.9 Building Envelope Requirements
Building envelope is a separation between the interior and exterior environment. Design Consultants are to address and resolve transfer of heat energy, exchange of air, natural lighting, acoustic attenuation and moisture insulation, rain water penetration and precipitation through the building envelope system. Building envelope systems must be capable of withstanding all internal and external forces applied to them. The external forces are due to applied loads and the main internal forces are induced by temperature changes.

Design Consultants are to address and resolve the effects of both static and dynamic loading including, but not limited to dead loads, live loads, wind loads, seismic loads (where applicable), temperature induced loads and blast loads. The final detailed structural report to be submitted by the Design Consultant shall clearly indicate by means of sketches and calculations how these loads are safely transferred to the buildings primary structure. The Design Consultant is to ensure that consideration for the amount of daylight allowed into interior spaces and the individual control of thermal comfort in individual office areas and public spaces complies with best practice environmental and sustainable design to international standards.

Designs shall be prepared that ensure energy efficient, sustainable solutions that provide a healthy and comfortable environment for occupants. Careful design and detailing of the building envelope is required to safeguard against failures relating to the ingress or egress of unwanted air, moisture and heat.

In the concept and schematic design stages, the Design Consultant shall describe in the submissions, engineering aspects of the building envelope system, including acoustic attenuation of external noise, sustainability, energy efficiency, structural stability, load transfer and connections to the supporting structure. The building envelope criteria used in the submissions should include the following information:

- Structural Integrity and Strength
- Energy Conservation Properties
- Durability and Maintenance
- Fire Resistance
- Sustainability
- Constructability
- Acoustic Attenuation

The Master Plan and ECQ’s design intent and minimum sustainable design requirement, is to achieve LEED (US) Silver certification for all sub-development buildings. This is to include cost effective,
6.09 Building Form and Aesthetics Requirements

The architectural form of individual sub-development buildings is to be designed and proposed by the Design Consultants. The aesthetics of the buildings are to be considered taking into account the form and function and design innovation of each building. The building designs should reflect striking, iconic architecture, representing efficient programming spaces and addressing aspects of sustainable design commensurate with high-class commercial office buildings.

Extensive use of dynamic form and foreign theme ornamentations are to be discouraged. World class-iconic architecture with the integration of creative architectural features is to be encouraged. The guiding principle is to create buildings with unique identify and character, contributing to the urban theme made up of many design variations and at the same time complementing and contributing to the overall urban built environment.

The use of strong primary colors (fading color pigment due to UV exposure) as the base is to be discouraged. Colors are also to be used to give the buildings scale and emphasis in relationship to architectural features.

6.11 Building Window Requirements

Windows form the main architectural element on the building envelope and together with balconies is used to articulate the form and scale of the buildings. Windows provide views to the urban landscape, ventilation and light into the office and public internal spaces. Window openings and glazing allow daylight into buildings, while providing weather protection.

There are many configurations of operable and fixed glazing systems, including curtain wall systems available for commercial glazing and windows. Window specifications shall comply with the following criteria:

Design Consultants are to comply with all applicable design standards and relevant design codes when designing the building envelope. The Design Consultant will need to select materials and systems in accordance with the holistic needs of the design, budget and compliance with the masterplan.
• Operable windows should not impact the aesthetic integrity of the curtain wall and façade appearance.

• Timber framed windows may be allowed internally to accentuate architectural features associated with public and service facilities.

• Aluminum powder coated (as minimum specification) frames are encouraged with stainless steel bolting mechanisms to secure to structure supported with engineering design calculations. Operable window systems must interface with the Building Maintenance System (BMS) to comply with applicable fire codes and proposed fire protection strategies.

6.12 Building Door Requirements

Entrance exterior doors are to address weather-proofing and durability requirements generally to serve general public or as service entrances for building operations personnel. They typically serve double-duty as building entrance under normal operation conditions, and as emergency egress. These doors are to be of glass and aluminum framed material provided with automatic door closer systems.

No timber doors are to be used in building exterior context.

Timber doors used internally must comply with required fire rating and be tagged accordingly.

The International Building Code (IBC), American Disabilities Act (ADA) and local codes (QCS) govern many entrance/exit door requirements pertaining to life safety and accessibility. These requirements are to be met in the Design Consultants design proposals.

Building signage and building identification (address) are to be located near entrance exterior doors of the individual buildings.

6.13 Building Finishes Requirements

Design Consultants in their design proposals are to address and detail all finishing materials for the building to meet durability, safety and maintenance standards. They are to address and meet the following standards for building areas:

• Building external wall finishes are to be of a minimum use of plaster and paint.

• Building façades not to be finished in tiles.

• All other stone finishes to the external façades are to be designed and mechanically secured to the structure with supporting engineering calculations. Public safety and maintenance concern arising from objects falling from heights are to be taken into consideration by Design Consultants in the design and selection of façade finish materials.

• Building vehicle aprons and pedestrian walk-ways around the individual buildings are to be finished...
in heavy duty finish materials with spot patterns integrated into the design to break up long sections of walkways. The heavy duty finishes should be considered with public safety in mind (anti-slip) and ease of maintenance.

- Entrance areas to individual buildings are to be pronounced and welcoming with provisions for manned security and building management systems office(s). Floor finishes of lobby areas are to be of a minimum standard of homogenous mediums (tiles, stone, etc), to complement the intended interior design. Floor finishes should also extend out to meet external finishes (where applicable and suitable). Wall finishes should be of a minimum standard of homogenous medium, laid in patterns or configuration to complement the intended interior design.

- Floor lift lobby areas are to have a minimum floor and wall finishes standard of homogenous mediums to complement the interior design of the lobby areas. Use of carpets for these areas is prohibited. All finish materials must meet the relevant fire codes for smoke emission and flammability and relevant design codes/standards for selected materials.

- Lift/elevator interior design is to be complimentary in finishing material and standard of the lobby areas.

- Basement driveways and parking areas are to be cement screed finish with floor hardener or traffic coating. Basement walls are to be of a minimum standard of plaster and waterproof paint in light colors. The basement columns are to have painted markings as warning features and integrated into the design of the signage system for wayfinding and location. Entrance walls to lift lobbies and escape staircases are to be highlighted and easily identifiable.

- Staircase areas are to be finished with a minimum standard of homogenous medium from the ground floor to the first floor and thereafter all other floor to floor staircases are to be finished in cement screed with nosing treads. The walls of staircases are to be plaster and paint finished in light colors.

- Service rooms are to be generally finished in cement screed with epoxy coating applied for wet
areas. The walls of service areas are to be plaster and paint finished.

6.14 Building Civil Defense Requirements
Qatari Diar is Master Developer and assumes the responsibilities of the Municipality; however, the Civil Defense Department (Qatar) has issued the State of Qatar Fire Safety Handbook that applies to Design Consultants proposals.

The Fire Safety Handbook is produced by the Qatar Civil Defense Department in collaboration with the Ministry of Interior to explain the design/ plans preparation and submission procedures relating to fire safety works. It is intended to provide an easy reference for the Design Consultants to understand what is required in the preparation of their design and submission. Consultants are to verify and comply with applicable QCD fire safety codes, and must not assume that only international codes will apply. QCD may have unique or mandatory requirements.

A copy of the QCDD Fire Safety Handbook is included in the Appendices.

6.15 Building Sewer and Sanitation Requirements
For Wastewater design, the Design Consultant shall refer to the International Plumbing Code in conjunction with the International Building Code, British Standards where applicable and the Qatar Construction Standards. The above standards specify the design requirements and design capacity of the sewer networks, the approved hydraulic design equations for sewerage and design standards for flow rates.

Guidance is provided on connections within the property boundary lines, and on the provision of future connections. The requirements for piping general arrangements, minimum diameter, gradient, minimum cover and pipe protection are some of the items outlined in the above standards.

Details for sand traps, grease separations and petrol/ fuel interceptors shall be submitted.

All bathroom and toilets are to have waterproofing systems. Floors shall be finished with non slip tiles or acceptable mediums. Walls shall be tiled or incorporate waterproof material finishes to ceiling levels. All bathrooms and toilets shall be equipped with mechanical ventilation ducts and systems. The air inlet and exhaust systems must comply with applicable design standards and relevant codes. Light switches, electrical outlets, thermostats and other environmental controls shall be in accessible locations.

6.16 Building Water Requirements
The Water Distribution systems is to be based on the International Plumbing Code in conjunction with the International Building Code, British Standards where applicable and the Qatar Construction Standards. The objectives of these guidelines is to provide the Design Consultants and Contractors with relevant and approved procedures for achieving compliant design and approved installations that comply with acceptable industry standards.

These guidelines are used to determine the water daily consumptions for individual buildings. Water tank capacities
(where applicable), locations and other design and construction elements are discussed in detail in the aforementioned standards.

Water storage is to be provided at each individual plot in accordance with relevant codes and design standards issued by PWA, Kahramaa and State of Qatar Ministry of Electricity and Water Standards (MEW).

Design Consultants are to fully comply with the requirements of the relevant guidelines and make necessary submissions accordingly.

6.17 Building Electrical Requirements

The Design Consultant is directed to refer to Kahramaa, QCS and other applicable codes and design requirements for the electrical works. These design standards are applicable for all electrical installations of buildings in general, including premises, shops, restaurants, coffee shops, retail facilities, office areas and general service areas. These standards regulate the following criteria:

- Requirements for Safety
- Access and Transformer Room Requirements
- General Arrangement, Control and Protection of Switches and Boards
- Sub-mains, Cables and Sub-main Distribution
- Conduits, Wiring and Distribution Boards
- Commercial Installations
- Earthing, Bonding and Testing
- Power Factor Corrections
- Electric Motors

6.18 Building Gas Requirements

The Design Consultant is to ensure that the design is suitable in all respects for the safe reticulation of either substitute natural gas or natural gas system that may be installed in the future.

6.19 Building Telecommunication Requirements

Refer to Appendices for ECQ guidelines on the requirements of the design and installations of telecom and other communication services, in accordance with QTel guidelines.

ECQ’s design standards provide a wide approach to suit future types of services within individual buildings. The Design Consultants should consider clear access path for telecom and T.V. ECQ’s future communication service supports extending the LAN/WAN networks, CATVF, ATM, ADSL and Wireless services. The ECQ guidelines provide further clarification regarding the following criteria:

- Civil Requirements
- Design of Main Telecom Rooms
- Distribution Boxes
- Cabling Requirements
- Structured and Horizontal Cable
- Conduits
- Protection from Electro-Magnetic Interface
- Telephony
6.20 Building District Cooling Requirements

The Design Consultant is to refer to the ECQ District Cooling provider and relevant regulations for the Distribution Design Guide. The ECQ District Cooling provider shall provide all regulations for all aspects of central cooling design, material and installation works.

Allowance should be made in the first basement for an Energy Transfer Room (ETS Room), dimension should be a minimum 10 x 12 x 4m (meters) in compliance with ECQ’s District Cooling consultant.

Noise from all equipment, including HVAC plant, shall be kept to a minimum in accordance with international best practice standards related to room function. Noise emanating from external equipment, including roof mounted plant shall be limited to 77dBA.

6.21 Building Refuse Disposal Requirements

All buildings shall be provided with a garbage/ rubbish collection point within the building limits by means of a garbage/ rubbish room on the ground floor level of the building for collection of waste. The garbage/ rubbish room specifications are recommended as follows:

- Shall be located close to the adjacent road or alleyway, if there is no service route to facilitate removing the containers and transporting them to the garbage collection vehicle points.

- Shall have a door with minimum clear width of 1800mm or an over head door system leading to the loading facilities and made of non-rusting metal (aluminum), with louvers at the bottom or any other method of mechanical ventilation. Doors shall open outward with lockable latch.

- The minimum height of the garbage room shall be 2400mm.

- Shall obtain water supply directly from the building supply system.

- Cut of scupper drains to ensure dirty water does not flow out into the external walkways or vehicle circulation drives and to be connected to the building’s sewer drainage network.

- Shall be provided with adequate lighting and mechanical ventilation systems.

- All windows to be air tight and protected by a metal mesh wire screen, or equivalent protective device, in order to prevent insects and rodents from entering the room.

- Floors and walls shall be tiled or equivalent impervious material, for ease of cleaning.
• Waste management strategies shall allow for multiple containers for waste segregation. Transport of waste containers out to roadside curb for pick-up is not typical practice in world-class, Class A environments. Waste management strategy shall provide access for the waste hauler to pick up containers in building dock areas.

6.22 Structural Design Requirements
The structural engineering for individual building designs shall be governed by current applicable engineering standards and codes.

Design Consultants must specify on the relevant structural drawings that all dimensions, layout plans, and sizes of architectural features detailed on the structural drawings should be governed by the corresponding dimension, plan sizes and shapes of architectural features indicated on the architectural drawings as approved by ECQ.

For structural analysis and detailed engineering documents, STAAD III Release 23W or similar approved software shall be used and the input file, on CD, shall be submitted for design review and approval.

6.23 Building Maintenance Requirements
Appropriate building maintenance equipment, including effective building maintenance methodologies shall be designed and provided to service the external and internal areas of the buildings, including site landscaping and services areas.

Supporting systems include power and water supply and shall be included in the Design Consultants proposal to ensure the building remains clean and aesthetically attractive within the ECQ site.

Doha and in particular the Lusail/ECQ sites experience significant deposition of sand, dirt and dust and inadequate building maintenance systems impact the appearance of individual buildings and have a negative impact on adjoining plots. Therefore, building design, including architectural and landscape designs feature such as water features, must take into consideration these environmental characteristics.

The Design Consultant is to compile a Building Maintenance Manual to be approved by ECQ that outlines recommended procedures, methodologies, equipment and standards to ensure the buildings remain properly maintained, promoting healthy and safe environments.

Particular care should be given to access points, equipment layout and maintenance requirements of equipment to ensure housekeeping and equipment maintenance can be performed without undue hazard, complication or effort.
7.0 Development Governance Policies & Procedures

7.1 Registration and File Initiation
Sub-development Plot Owners are entitled to nominate representatives to support them managing the interests of their development. Plot Owners are required to furnish ECQ with Letters of Authorization for nominated representatives, including Design Consultants and Specialist Consultants.

Plot Owners are requested to submit the following information as a basis of registration of their intended development:
- Name of Plot Owner
- Identification of Sector and Plot(s)
- Letter of Appointment
- Letter assigning single point of contact for communication with ECQ
- Company Profile

ECQ shall review Sub-development clients nominations for Design Consultant and Contractor based on the Consultant/Contractors Company Profile. ECQ will advise their formal approval or rejection of nominated Design Consultant/Contractor to sub-development clients for further action. Key critical information forming ECQ’s assessment includes, but not limited to the following:
- Commercial Registration
- Rating/grading for Design Consultants based on Qatar’s Engineering Committee’s evaluation (Grade A).
- Proposed Project Organizational Chart
- Key project personnel and experience /qualifications
- Previous project experience in Gulf/Qatar
- LEED registered Design Professionals
- Project experience on Sustainable Design Projects

7.2 Sub-development Plot Owner Cooperation
Plot Owners are encouraged to contact other Plot Owners within their respective Sector to coordinate joint procedures, Design Consultants, Specialist Consultants, Contractors and other matters.

Plot Owner’s Design Consultants will be required to collaborate with adjoining project Design Consultants on behalf of design site utilized, building massing, building orientation, streetscape, and external architecture.

7.3 Building Permit – Procedural Guidelines
Plot Owners, their appointed Design Consultants and Contractors are required to make submissions to ECQ to initiate the application for review and approval of Plot Owner’s proposed building development proposal.

As Master Developer, Qatari Diar assumes the responsibility as the Municipality and will provide initial approval for Preliminary Concept Design of Plot Owners proposals, as well as approvals for opening DC1 Files, DC2/Building Permits, Authorization to Commence Construction, Substantial Completion and Completion of Construction.

Municipal Approvals include:
- DC1
- Enabling Works (if applicable)
• DC2/Building Permit
• Substantial Completion and
• Construction Completion

Design Stage Approvals by ECQ include:
• Preliminary Concept Design
• Interim Concept Design/DC1
• Final Concept Design
• Final Schematic Design
• Final Design Development
• Final Working Drawings/DC2 – Building Permit
• Final IFT (Issue for Tender)

The submission and approval process is described as follows:

7.4 Architectural Design

The Design Consultant is required to prepare design proposal submissions for the SDLM Teams design review and approval at the following design stages:

• Preliminary Concept Design Stage
• Interim (DC1) and Final Concept Design Stage
• Final Schematic Design Stage
• Final Design Development Stage
• Final Working Drawing Stage
• Tender Document Stage
• Construction Documents

The Design Consultant shall provide a comprehensive list of Project Deliverables for the Project for all Stages of Services and for all items included in the Consultant’s Scope of Services. The Design Consultants list of project deliverables shall be based on the list of project deliverables detailed in Attachment 1 of the ECQ-Project Development Manual Vol -2 and shall be submitted to ECQ at the beginning of the project for review and approval. Where there are differences between the Design Consultant’s list of project deliverables and the list included in Attachment 1, the Design Consultant and ECQ shall agree on the final approval list of project deliverables.

The Design Consultant shall prepare and submit a complete design schedule including full details of key team members and their
individual roles and responsibilities. This shall include planned percentage progress objectives against the final approved list of deliverables.

The Design Consultant shall collect, assemble and review all information pertinent to the design of the project and shall independently verify all information and drawings provided by ECQ. Where there are deficiencies in the available information, the Design Consultant shall advise ECQ and prepare a plan for obtaining the required information.

7.4.1 Preliminary Concept Design Stage

The Design Consultant shall prepare a Preliminary Concept Design Report, including indicative drawings and perspective renderings that accurately describes their design proposal. The Design Consultant’s Preliminary Concept Design Report shall be submitted to ECQ for review, comments and approval. ECQ shall submit the approved Preliminary Concept Design Report to Qatari Diar, for the Master Developer’s review and approval of the Plot Owner’s Concept Design.

The recommended project deliverables to be included in the Design Consultants Preliminary Concept Design Report are included in the Appendices.

7.4.2 Interim Concept Design Stage – DC1

The Design Consultant shall prepare and submit their Interim Concept Design Report to ECQ for Qatari Diar’s review and approval of DC1. The recommended project deliverables to be included in the Design Consultants Interim Concept Design Report included in the Appendices.

7.4.3 Final Concept Design Stage

The Design Consultant shall refer to Attachment 1 – List of Project Deliverables and ensure full compliance therewith.

The Design Consultant is required to provide efficient space planning throughout the building(s) and shall strive to achieve the highest possible efficiency factor 70% - 80% of net building area out of total gross area) in comparison with similar building types and standards. The efficiency factor of the proposed design should be calculated by the Design Consultant and submitted with the Final Concept Design Report for ECQ’s review and comments.

The definition of net rentable/leasable area excludes circulation, core shafts, plant rooms, toilets and janitorial closets.

Acceptable industry standards for calculating building areas should be referenced in the initial Concept Design Stage. Acceptable standards include, but are not limited to the following:

- BOMA Standard – Building Owners and Managers Association- “Standard Method for Measuring Floor Area in Office Buildings,”

The Design Consultant shall submit their design stage report to ECQ’s Sub-development Logistics Management Team, inclusive of all requirements listed in Attachment 1 including space program, five (5) days prior to the scheduled Concept Design Presentation to allow the SDLM Team discipline architects and engineers to prepare for the Consultants presentation for each respective design stage. The Design Consultant shall comply strictly with this requirement in order that the Sub-development Logistics Management Team has sufficient time to review and study the Design Consultants submittal prior to the presentation in order to gain maximum benefit.

The Design Consultant shall note all matters arising from the formal presentation and if directed by ECQ, submit a revised Concept Design Report within 5 working days from the end of the presentation to ECQ for review and to demonstrate their intention to incorporate all matters identified during the presentation into the Final Concept Design.

ECQ shall conduct a Design Review of the Final Concept Design Report and issue the Final CD Design Review Report in soft copy/editable format to the Design Consultant. The Design Consultant shall provide appropriate responses to the design review comments and incorporate, where applicable, the comments into the subsequent interim design phase submission for further review and verification.

ECQ shall issue formal approval for completion of Concept Design Stage prior to the Design Consultant proceeding to the next stage. The Plot Owner and their Design Consultant shall be solely responsible for any abortive work done prior to formal approval of the Concept Design Stage.

7.4.4 Subsequent Final Design Stage Submissions
Subsequent Final Design Stage presentations, Design Report submissions, design reviews and approvals shall be conducted in generally the same manner as described in section 7.4.3 – Final Concept Design Stage above.

Design Consultants shall refer to Attachment 1 – List of Project Deliverables and ensure full compliance for respective design stages.

7.5 MEP Design
The Building Services elements for each sub-development project are to be designed by the Design Consultant and are summarized, but not limited to the requirements listed below. These requirements represent minimum requirements associated with the Building Services.

7.5.1 Air Conditioning and Ventilation
The Design Consultant shall include all the HVAC system design works within and surrounding the buildings, up to the infrastructure interface point.

Each individual building shall be air-conditioned utilizing ECQ’s District Cooling System. The Design Consultant shall allow for analyzing/ presenting alternative air conditioning systems types,
options for respective buildings to ensure that the final selected system meets the buildings needs, the District Cooling suppliers design criteria, including the requirements for sustainable design.

The Design Consultant shall survey/ check the existing buildings already designed so they can represent a standard/ style that is expected for the buildings they will be designing for both material quality and for system type.

It should be noted that a District Cooling system is being designed under a separate contract that will provide for each of the sub-development building projects. The Design Consultant shall survey/ check the existing/ proposed District Cooling network distribution system in order to confirm that the buildings service requirements, including estimated cooling load capacity in (TR) comply with the requirements of the District Cooling Provider.

Toilet/ Pantry/ Store areas shall be provided with extraction ventilation systems by either individual wall mounted extract fans or a central ducted system with twin fans, switch controlled at door entry, and indirectly cooled by cool air drawn from the surrounding air-conditioned areas via door/ wall transfer grilles, where the room size permits.

Areas to be provided with hood ventilation, e.g. kitchens, laboratories, etc, shall be provided with a ducted extract/ supply hood installation where possible in order to reduce the amount of makeup air required.

Areas such as toilets, pantries, stores, kitchens, laboratories, etc, shall be maintained under a negative pressure to ensure that odors are not carried to the surrounding areas, but the overall building shall maintain positive pressure. Fresh air to the buildings shall be provided to meet the occupancy requirements to comply with applicable design codes.

### 7.5.2 Electrical Power

The Design Consultant shall include for all the electrical systems design works within and surrounding the buildings, up to the infrastructure interface point.

It should be noted that a HV Electrical Distribution network that has already been designed under a separate contract shall be provided for each sub-development building project and is therefore to be utilized, but each building will require a dedicated HV sub-station to be incorporated in the works.

Design Consultants shall survey/ check the existing / proposed sub-station design and electrical distribution system in order to confirm that the service available is adequate.

The electrical distribution within individual sub-development building projects shall be via Sub Main Boards (SMB’s) located within the ground floor electrical room of the building, and via Distribution Boards (DB’s) located throughout the building. KWh meters shall be installed integral to the SMB’s for each outgoing circuit.

The Distribution Boards shall be located as required on each of the respective floors associated with the building, in dedicated rooms.
or in electrical cabinets flush with the wall with fully louvered doors.

The building shall be provided with essential and non-essential power according to the design/ user requirements.

Power outlets shall be provided to all equipment and accessories and a number of twin 13 Amp sockets shall be provided to each room type in order to suit the equipment/ furniture layout.

A minimum of two twin 13 Amp sockets shall be provided to each room type, unless use or codes stipulate otherwise.

Twin 13 Amp sockets shall be provided to the circulation areas to allow for cleaning, unless codes stipulate otherwise.

### 7.5.3.1 Lighting and Emergency Lighting

Illumination of the sub-development buildings shall be designed to provide uniform intensities according to current C.I.B.S.E. lighting code with emergency lighting by individual self-contained battery packs. Emergency lighting will be provided by ECQ.

The lighting to individual rooms and compartments shall be switch operated at room entry to each space.

The car parks, corresponding road system and the external façade of the buildings shall be provided with external lighting. All external lighting shall be provided with photocell/ timer control systems.

### 7.5.3.2 Telecommunications and Data

The Design Consultant shall include for all the pre-wired Telecommunications/ Data System/ IP-Telephony System design works within and surrounding the buildings, up to the infrastructure interface point.

It should be noted that a pre-wired Telecommunications/ Data System IP-Telephony System has been designed under a separate contract; interface points have been provided for each of the sub-development building projects and are therefore to be utilized.

A pre-wired Telecommunications/ Data System/ IP-Telephony System shall be designed with outlets to the appropriate rooms based on equipment/ furniture layouts.

Each room shall have minimum two-twin telephone outlet points, located near power supply outlets, where the approved building program does not indicate otherwise, pre-wired to a patch panel located as required throughout the building.

### 7.5.3.3 Plumbing

The Design Consultant shall include for all the plumbing design works within and surrounding the buildings, up to the infrastructure interface points.

It should be noted that a potable water network has already been designed under a separate contract and isolated supplies will be provided for each building and is therefore to be utilized.
A fire and irrigation water network has been designed under a separate contract to cater for irrigation requirements applicable to the buildings up to the interface connection points.

Plumbing hot/cold water shall be supplied to each of the individual appliances within the building. The Design Consultant shall survey/check the infrastructure in order to confirm that the service available is adequate.

7.5.3.4 Drainage
The Design Consultant shall include for all foul drainage and rainwater drainage design works within and surrounding the buildings up to the infrastructure interface point.

It should be noted that a foul drainage and rainwater drainage network has already been designed under a separate contract, and isolated supplies will be provided for each building and therefore should be utilized.

Condensate from the air conditioning units shall be routed to discharge to sanitary drainage. Soakaways shall be located to clear any road, parking and underground services.

The Design Consultant shall survey/check the existing installation in order to confirm that the service offered is adequate.

7.5.3.5 Security/Access Control
ECQ shall provide for all the security/access control design works within and surrounding the buildings, up to the infrastructure interface point.

It should be noted that the security/access control network has been designed under a separate contract, and isolated supplies will be provided for each of the buildings and is therefore to be utilized.

The access control and security monitoring system shall be in compliance with existing or recommended ECQ Access Control and Management Systems (ACMS) and developed in line with ECQ’s Corporate Security System Philosophy. This information is available from ECQ.

7.5.3.6 Building Management System
The Building Management System (BMS) shall be suitable for monitoring and controlling the environment of the buildings and its operational areas to achieve maximum performance of the systems for optimum utilization of the resources and to achieve the sustainable design requirements. The BMS shall incorporate ACMS and fire alarm systems into its central monitoring station and be a fully integrated system provided by ECQ.

It should be noted that a Building Management System (BMS) network has already been designed under a separate contract, and isolated supplies will be provided for each building and are therefore to be utilized.

The Design Consultant shall survey/check the existing installation in order to confirm that the service offered is adequate.
7.6 Structural Design

This section describes the minimum civil and structural design requirements to be adopted for the design of the new buildings, structures and foundations.

7.6.1 Load Definition

**Dead Loads** – are vertical loads due to the weights of all permanent building components. Typical components are walls, floors, fixed equipment of all kinds, piping, electrical lighting, suspended ceilings, HVAC components and ductwork. These shall include suitable contingencies for material tolerances. The unit weights of materials and components shall be as defined in BS 648 “Schedule of Weights for Building Materials” or information from the product supplier giving installed weights of materials or components.

**Live Loads** – are all moveable superimposed loads such as furniture, moveable partitions, occupants and moveable equipment, but not including wind, earthquake or equipment dynamic loads. Live loads shall be as specified in BS 6399, Part 1. Loads shall be applied as a combined arrangement for the most severe effect.

The Design Consultant shall ensure that structural loading criteria for all buildings, rooms and compartments are fully established during schematic design and contained in design criteria reports.

In addition roofs with slopes less than 30 degrees shall be designed for the following live loads:

- Roof with parapet 1kN/m²
- Corrugated roof without parapet 0.4 kN/m²
- Other roofs None

**Wind Loads** – or wind pressures shall be calculated in accordance with BS CP3, Chapter V, Part 2, and 1972 “Basic data for Design of Buildings – Wind Loads.” Structures shall be designed for a basic wind speed of 45 m/sec.

The following wind factors shall be used:

- Topography factor, S1=1.0
- Ground roughness, S2, building size and height above ground factor from Table 3
- Statistical factor, S3=1.0

The prevailing wind direction is North-North-West, but for design purposes wind shall be assumed to come from any direction.

**Load Combinations** – Members/elements of buildings/structures as well as their supports and fixing points shall be designed for the following load combinations:
Table 1.0

<table>
<thead>
<tr>
<th>Load Combinations</th>
<th>Dead</th>
<th>Live</th>
<th>Wind</th>
</tr>
</thead>
<tbody>
<tr>
<td>D+L</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>D+L+W</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>D+W</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Where “D” is the dead load, “L” is the Live Load and “W” is the wind load.

Where appropriate, load(s) due to earth pressure and / or water pressure should be included in the load calculation(s).

7.6.2 Structural Design – Reinforced Concrete

**General** – Design and detailing of structural concrete shall be in accordance with BS 8110 and BS 8007.

Earth retaining structures shall be designed to resist the ranking active earth pressure based on the soil parameters given in the soil investigation report. For the passive soil pressure neglect the first 300mm from the finished grade level in the calculations.

All underground structures, such as car parks, shall be statically checked for flotation. In the case of pits, basins, manholes and other soil bearing structures the factor of safety against flotation shall be 1.1 for the empty/construction condition.

The thickness of the blinding layer shall be 75mm minimum. Sulphate resisting cement (SRC) complying with BS 4027:1980 shall be used for blinding concrete.

Types of loads and the load combinations shall be considered as per the table illustrated above. Load factors shall be applied as per BS 8110 or BS 8007.

In pedestals, vertical reinforcing shall be enclosed by complete circumferential ties meeting the size and spacing requirements of BS 8110 for tie reinforcement for compression members.

**Material Requirements:**

**Cement** – for structural reinforced concrete and paving shall be ordinary Portland Cement (OPC) to BS 12 or equivalent. Sulphate resisting cement (SRC) complying with BS 4027:1980 shall be used for blinding concrete.

**Concrete Grades** – Concrete works shall be designed using the following grades:

<table>
<thead>
<tr>
<th>Concrete</th>
<th>Grade N/mm²</th>
<th>Min. cement content (kg/m³)</th>
<th>Max. water cement ratio</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>C40/20</td>
<td>40</td>
<td>370</td>
<td>0.4</td>
<td>Structural concrete (Reinforced)</td>
</tr>
</tbody>
</table>
**Reinforcing Steel** – reinforcing steel bars shall be uncoated high yield deformed bars of characteristic strength of 420 N/mm² to BS 4449, or equal as supplied by Qatar Steel Company (QASCO), designated as grade ‘T’.

Un-coated mild steel plain bars with characteristic strength of 250 N/mm² to BS 4449, or equal may be used for links and binders, designated as grade ‘R’.

Steel wire fabric shall be of characteristic strength 485 N/mm² in accordance with BS 4483 or equal.

Adjacent sheets of mesh reinforcement shall be overlapped by at least 300mm or 31 times the diameter of the wires lying at right angles to the edges to be lapped, whichever is greater. Laps shall be tied together on both longitudinal and transverse wires.

All steel bars shall be bent in accordance with BS 4466:1989.

Mechanical bar couplers, where required, shall be specified as complying with the requirements of BS 8110.

Reinforcement shall be fixed, supported and maintained in position by the adequate use of chairs, spacers and tying wire.

**Concrete Cover** – is the concrete thickness to all steel reinforcement including links:

1.) For all concrete (with protection) in contact with soil, cover shall be 70mm.

2.) For all above grade concrete exposed to weathering, cover shall be 50mm.

3.) For above grade concrete protected from weathering, cover shall be:
   - Beams and columns 40mm
   - Slabs and walls 30mm

4.) Cover to bar couplers shall not be less than the minimum specified for reinforcing bars.
   
   Note: Blinding concrete is not to be considered as cover.

**Concrete Protection:** Appropriate concrete protection system shall be designed as per the soil/environmental condition to which the structural elements are exposed. Underground concrete protection systems shall be proposed based on the soil report. If the soil condition is
very hostile to the concrete structure then the Contractor shall propose a system of concrete protection including the use of appropriate concrete admixtures (micro silica, corrosion inhibitors, etc.) as required. However the following are the minimum requirements:

Concrete in contact with soil in foundations shall be protected using Bituthene 3000 HC membrane systems or equivalent.

For surfaces not exceeding 45 degrees to the horizontal, Bituthene is to be protected using Servipak bitumen impregnated hardboard or equivalent at least 4mm thick suitably bonded to the membrane.

At junctions and joints the membrane is to be overlapped by a minimum of 75mm, exposed edges of concrete are to be chamfered, with proprietary angel beads overlapped by the slab polythene damp proof membrane.

Prior to applying the membrane, the Contractor shall ensure that the concrete or block work surfaces are finished smooth and that any irregularity which might cause the membrane to be punctured has been removed and all edges shall be chamfered, with proprietary corner fillets installed. The Contractor shall adhere strictly to the manufacturer’s recommendation when applying the protection system.

7.6.3 Structural Design – Structural Steel

General – The following provisions shall be applicable to steel structures and building stairways and other miscellaneous steelwork. The design, details, fabrication and erection of structural steel shall be in accordance with BS 5950. All structural steel shall be Grade 43A to BS 4360: Part 2 or equivalent as a minimum.

Types of loads and the load combinations shall be in accordance with Table 1.0 above. Load factors shall be applied as per BS 5950 to obtain the most unfavorable conditions.

**Design Data:** Types of loads and load combinations shall be in accordance with Table 1.0 above. The Allowable deflections for some of the members are given below. For other members reference shall be made to BS 5950.

**Table 3.0**

<table>
<thead>
<tr>
<th>Category</th>
<th>Member Type</th>
<th>Vertical Deflection</th>
<th>Horizontal Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel members</td>
<td>Purlins</td>
<td>L/200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primary floor beams with equipment</td>
<td>L/500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Without equipment</td>
<td>L/300</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cantilever beams</td>
<td>L/400</td>
<td></td>
</tr>
<tr>
<td>Steel frames</td>
<td>Without equipment</td>
<td>H/200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>With</td>
<td>H/300</td>
<td></td>
</tr>
</tbody>
</table>
equipment; 
- without wind allowance 
- with wind allowance

H/200

HB is the height of frames, and L is the span of beams

**Connections:** Standard simple beam connections, unless otherwise noted, shall be designed and detailed by the fabricator as shown in Part 3 of “BCSA Structural Steelwork Handbook.”

Where bolts are permitted in structural connections (beam/column connections, moment connections, bracing connections, etc) they shall be black bolts grade 8.8 conforming to BS 3692 in normal tolerance holes with minimum of two M20 bolts. Whenever bolted connections are used, the reduced strength due to holes shall be computed.

Connections shall be designed taking into account of the effects of any eccentricity on the component parts of the connection, including welds and bolts.

The minimum leg length of any stressed weld shall be a minimum 6mm or in accordance with the following table:

**Table 4.0**

<table>
<thead>
<tr>
<th>Thickest part to be connected (mm)</th>
<th>Leg Size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to and including 20</td>
<td>6</td>
</tr>
<tr>
<td>20 to 35</td>
<td>8</td>
</tr>
</tbody>
</table>

Size of fillet welds shall refer to the leg length. The effective length of fillet welds shall be the length excluding the first and last 25mm of the weld.

**Minimum Material Thickness:** Minimum dimensions of load carrying members shall be as follows:

Structural members of the webs of rolled steel sections, steel used for external construction shall not be less than 8mm thick, and in construction not so exposed, not less than 6mm thick.

Gusset plates – no thinner than 10mm.

**Load on Crane Beams:** The design loads for structures handling moving loads shall include an impact allowance in accordance with BS 5950 as specified below:

**Table 5.0**

<table>
<thead>
<tr>
<th>Load Application</th>
<th>Electrical Operation</th>
<th>Hand Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical loads: increase static wheel loads by</td>
<td>25%</td>
<td>10%</td>
</tr>
<tr>
<td>Horizontal force acting transverse to the rails taken</td>
<td>10%</td>
<td>5%</td>
</tr>
</tbody>
</table>
as percentage of lifted load + weight of crab

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal force along the rails taken as percentage of lifted load + weight of crab</td>
<td>5% 5%</td>
</tr>
</tbody>
</table>

### 7.6.4 Soil Properties

Where specified, soil characteristics for all the foundations shall be established through the appropriate soil investigation carried out in accordance with BS 5930. The scope shall cover the soil bearing capacity considering the strength and settlement, durability and stability of the foundation soils with regard to water erosion, soil corrosion characteristics and problems with respect to excavation/construction.

### 7.6.5 Roads and Paved Areas

The design of roads within individual sub-development sites shall be carried out in accordance with QCS and Qatar Highway Design Manual (QHDM) published by the Ministry of Municipal Affairs and Agriculture (MMAA).

Precast concrete paving blocks, 80mm thick, shall be used for roads and car parking areas on-grade. Kerbs shall be provided at the boundaries of all concrete paved areas and at raised islands where these are shown on the drawings. Road signs and markings shall be in accordance with the Qatar Highway Design Manual, and Qatar Traffic Manual.

No Asphattic surfaces are allowed within the ECQ sub-development projects.

### 7.6.6 Underground Utilities

All reinforced concrete underground foundations, manholes and chambers shall be protected externally on horizontal and vertical surfaces.

All underground utilities, pipes, structures, culverts and covers shall be designed to accommodate imposed loading from service loading and construction traffic.

### 7.6.7 Foundations, Footings and Floor Slabs

Floor slabs shall be laid flat with no cross-falls. In addition to the requirements of QCS, the top level of slab shall not deviate more than +/-3mm in 2m when measured in any direction. All floor joints shall be sealed with an approved two-part polysulphide sealant.

Floor slabs shall be laid on one layer of 1200 gauge polythene sheet lapped minimum 300mm at each edge on top of 50mm concrete blinding on compacted free draining imported granular material.

In stability analysis calculations, the foundation shall be designed to have a minimum factor of safety of 2.0 against overturning and 1.5 against sliding. The weight of soil overburden may be taken into account when calculating factor of safety. The minimum factor of safety against floatation shall be 1.1. In determining the factor of safety against floatation allowance shall be made for removal of
soil overburden and possible loss of skin friction from the sides.

7.6.8 Concrete Blockwork

Blockwork shall be designed to BS 5628. External walls shall be cavity type comprising 100mm solid concrete externally, a 50mm insulated cavity and 150mm hollow concrete block internal skin.

Walls dividing storage areas from office areas, walls surrounding electrical rooms shall be minimum 200mm hollow concrete block. Other internal blockwork walls shall be minimum 150mm hollow concrete block.

Blockwork walls shall be tied to structural columns and beams using a proprietary stainless steel system that complies with the requirements of BS 5628. Cavity wall ties shall also be stainless steel.

Where joints are required, stainless steel plaster stops shall be used either side of each joint for all external wall joints. Internal wall joints in office areas shall be finished flush with plaster on stainless steel expanded metal. Wall joints formed using plaster stops shall be filled using an approved two-part polysulphide sealant.

All blockwork up to the ground level shall be of solid blocks and of sulphate resistant cement (SRC) and shall have a minimum compressive strength of 15N/mm2

7.6.9 Detailed Engineering Documents

Details of design and calculations shall be shown on sketches showing structural arrangements, loads, member sizes, etc. Computer printout of input data files shall be supplemented with analysis model plots, illustrating node/element numbers, support type (fixed, pinned, spring), member property/ size, member orientation, member length and member loading. Computer model plots shall not be altered by hand.

For structural analysis STADD III Release 23W or similar approved software shall be used and the input file, on CD, shall be submitted for design approval. Shrink command shall be used for presentation of model plots. This command enables each individual beam and/or finite element in the model to be clearly identified for checking/review purposes.

All calculations shall be in SI units.

Levels shall be related to QND (Qatar National Datum) and co-ordinates shall be related to QNG (Qatar National Grid).

7.7 No Objection Certificates

Plot Owner’s appointed Design Consultants and Contractors are required to obtain No Objection Certificates from relevant Utility Providers and Statutory Authorities.

Contractors may be required to obtain other NOC’s and or permits, such as temporary water, electricity, and other services, etc.
7.8 Roles and Responsibilities

Table 1.0

<table>
<thead>
<tr>
<th>Phase of Project Development</th>
<th>Plot Representative Responsibilities</th>
<th>QD/ ECQ/ Responsibilities</th>
<th>Constraints/ Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary Concept Design Submission</td>
<td>Design Consultants to prepare and submit preliminary concept design for QD review and approval</td>
<td>Review submittals and issue approval</td>
<td></td>
</tr>
<tr>
<td>Interim Concept Design</td>
<td>Design Consultants to prepare and submit interim concept design for QD review and approval in opening DC1.</td>
<td>Review submittals and issue approval</td>
<td></td>
</tr>
<tr>
<td>Concept Design Stage</td>
<td>Design Consultants to prepare Concept Design Report and submit to SDLM Team for approval</td>
<td>Review submittals and issue formal completion of CD</td>
<td></td>
</tr>
<tr>
<td>Schematic Design Stage</td>
<td>Design Consultants to prepare Schematic Design Report and submit to SDLM Team for approval</td>
<td>Review submittals and issue formal completion of SD</td>
<td></td>
</tr>
<tr>
<td>Design Development Stage</td>
<td>Design Consultants to prepare detailed design drawings and submit to SDLM Team for approval</td>
<td>Review submittals and issue formal completion of SD</td>
<td></td>
</tr>
<tr>
<td>Working Drawings Stage</td>
<td>Design Consultants to prepare working drawings and project specification and submit to SDLM Team for approval</td>
<td>Review submittals and issue formal completion of SD</td>
<td></td>
</tr>
<tr>
<td>Obtain Building Permit</td>
<td>Design Consultants to prepare and submit required documentation to ECQ/SDLM Team for Building Permit approval</td>
<td>ECQ to issue Final Building Permit</td>
<td></td>
</tr>
<tr>
<td>Tender Document Stage</td>
<td>Design Consultants prepares all tender documents and submits to SDLM Team along with a letter stating that Tender Documents comply with previously approved design. Design Consultant calls tenders, evaluates and assists Owner with negotiations, and finalizing Construction Contract</td>
<td>SDLM monitors process, evaluation and award.</td>
<td></td>
</tr>
<tr>
<td>Commence Construction</td>
<td>Plot Owner’s appointed Contractor commences construction.</td>
<td></td>
<td>Appointed Consultant to commence Construction Supervision</td>
</tr>
</tbody>
</table>
8.0 Project Controls

General :A-A

The following control documents have been created to monitor and control the elements of the design development and construction of sub-development projects:

- ECQ Master Schedule
- ECQ- Sub-development Project Status Register
- ECQ- Sub-development Project Status Drawing – PS001 (AutoCAD.dwg)
- ECQ _ Sub-development project Status Drawings – PS002 (AutoCAD.dwg)
- ECQ – Sub-development Weekly Status Register
- ECQ – Sub-development Risk Register

8.1.1 ECQ-Master Schedule

The ECQ-Master Schedule reflects a total implementation of the construction of the infrastructure, the G-05-Office Building, the Energy City Qatar (ECQ) Corporate Headquarters, all amenity facilities and all sub-development building projects within the ECQ Corporate Development. The ECQ-Master Schedule is developed with the assumptions that include both development phasing and overlapping construction of all sub-development projects, including the overlapping of the infrastructure construction with all of the building development projects.

8.1.2 Individual Project Schedules

Design Consultants are required to submit their proposed Execution Schedules at the commencement of the Concept Design Phase for individual sub-development projects. Execution Programs are to show task durations for all design development and construction phases to project completion, including but not limited to the following phases:

- Preliminary Concept Design
- Interim CD – DC1
- Concept Design Phase
- Enabling Works (if applicable)
- Schematic Design Phase
- Design Development Phase
- Working Drawing Phase
- Tendering Phase
- Award of Contract
- Construction Mobilization
- Construction Phase
- Substantial Completion
- Building Commissioning
- Project Completion and Close-Out

Execution Programs are to include milestone dates for design submissions, design reviews and approvals for both design and construction phases.

The internal road networks, footpaths and infrastructure services will be constructed concurrently and linked to the peripheral existing roads and services installed by the Master Developer. The successful development of the sub-development projects forming
the various commercial business sectors throughout Energy City Qatar (ECQ) will be based on this phasing strategy that will allow for development and occupancy while taking into consideration the least construction impact nuisance to early occupant’s of Energy City Qatar.

The sub-development projects comprising the various commercial business sectors of Energy City Qatar (ECQ) will be phased in such a manner as to allow the completed projects to function independently of each other with minimum disruption to those projects occupied and operational.

8.1.3 Milestone Schedules for Individual Sub-development Projects

The ECQ-Master Schedule identifies milestone dates for individual sub-development projects within the ECQ Corporate Development. This includes design development through construction stages.

Typical milestone dates for construction to be included in Individual Project Schedules would be:

- **Early Start Milestone** – Work shall not begin early then this date.
- **Finish Milestone** – All work must be completed by this date.
- **Utilities Available Milestone** – Date when all required utilities must be operational or available for connection to the site Infrastructure Services.

8.1.4 Scheduling Software Tools

Design Consultants and Contractors hired by individual plot Owners shall generate and submit design and construction schedules utilizing the current version of Primavera (v.6.0) which will be reviewed and monitored by ECQ’s Sub-development Logistics Management Team. Individual project schedules will be integrated into the overall ECQ-Master Schedule to allow for overall coordination and logistics planning on behalf of the sub-development projects.

8.2 Informational Web Site

An informational web site will be developed and managed by the Sub-development & Logistics Management Team that will allow Plot Owners, their Design Consultants and Contractor’s, password restricted access to project development information, including updated scheduling data for the ECQ site and individual sub-development projects.

Refer to Section 2.5 – Information Management System.

The informational web site will function as an FTP site, and will provide an efficient and expeditious means of transferring and sharing draft and preliminary information such as draft reports, preliminary drawings and sketches for collaboration and comment, Minutes of Meetings, etc.
Formal submissions for approval shall not be submitted via the Information Management System.

8.3 ECQ – Sub-development Project Status Register

The ECQ – Sub-development Project Status Register is a logistics planning control document that supports the ECQ – Sub-development Project Status Drawing – PS001. The Energy City Qatar (ECQ) Corporate Development is comprised of 92 individual sub-development projects. The ECQ – Sub-development Project Status Register reconfigures the individual plots into individual sub-development projects and monitors and controls the required approval submissions and design stages for all sub-development projects.

The following eight (8) quality gates have been assigned for each sub-development project:

- Submission and Approval of Preliminary Concept Design (PCD)
- Submission and Approval for DC1 (DC1)
- Submission and Approval of Final Concept Design (CD)
- Submission and Approval of Final Schematic Design (SD)
- Submission and Approval of Final Design Development (DD)
- Submission and Approval of Final Working Drawings (WD)
- Submission and Approval of DC2 – Building Permit (DC2)
- Submission and Approval of Tender Phase (IFT)

The Sub-development Project Status Register allows the SDLM Team to monitor the status of all sub-development projects in compliance to their respective Execution Programme/Project Schedules.

8.4 ECQ Sub-development Project Status Drawing – PS001

The control document PS001 is an interactive AutoCAD drawing that identifies each of the sub-development projects with the following naming convention: (ex) ECQ-D01/05 – representing the selected sub-development plots – D-01, D-02, D-03, D-04, and D-05, consolidated into one single sub-development project.

Drawing PS001 shows the current approved site plans for each sub-development project at the active design development stage. The PS001 drawing is supported by the ECQ – Sub-development Project Status Register. As individual sub-development projects proceed into subsequent design phases, the approved site plan for the current design phase is inserted into the PS001 drawing for the respective project.

Individual sub-development projects are also shown in a coordinated color legend to the respective plot within the ECQ Corporate Development.

8.5 ECQ Sub-development Project Status Drawing – PS002

The control document PS002 is an interactive AutoCAD drawing that identifies those sub-development projects that have been highlighted to commence Construction Enabling Works following approval of
DC1. Sub-development Owner’s are still required to submit formal application with required deliverables to the SDLM Team for review and collaboration with ECQ, QBC, the Civil/Infrastructure Contractor and the Lusail Municipality, prior to approval.

8.6 ECQ Sub-development Weekly Status Register
The Weekly Status Register is a control document that the SDLM Team manages to report to ECQ the current project status of sub-development projects. The Weekly Status Register provides a weekly perspective of respective sub-development projects that have actively progressed from one design development stage to the next, including showing projects changes in design development status; (i.e. Preliminary Concept Design -> Preparation for DC1 – Submission, etc).

8.7 ECQ Sub-Development Project Risk Register
The Sub-development Project Risk Register is a control document for minimizing or eliminating project issues impacting project costs, schedule and/or designs. The Sub-development Project Status Register identifies potential issues relative for the whole of the ECQ Corporate Development and individual sub-development projects.

The Project Risk Register identifies and addresses the following key risk management issues:

- Risk Identification: The process of systematically identifying all possible Risk Events which may have an impact on a project.
- Risk Response: Pre-determined plan of action to reduce or eliminate Risk Events.
- Risk Mitigation: The art of reducing or eliminating Risk Events through Risk Response.
- Risk Assessment: Establishment of the degree to which the Risk Event is likely to occur.
9.0 GLOSSARY

General Rules of Interpretation of the guidelines, regulations, rules and qualifications contained in the Energy City Qatar (ECQ) Project Development Manual shall be applied unless the context clearly dictates otherwise:

- Words used in the present tense shall include the future; and words used in the singular to include the plural number and the plural, the singular.
- The words “shall”, “must”, or “will” are mandatory, not discretionary.
- The word “may” is permissive and discretionary.
- The word “sector” refers to the development Sectors A through I of the development in its entirety.
- The word “buffer zone” refers to the landscaped buffer area located at the site perimeter of the development.
- Standards for “floor area ratio”, number of “buildings”, “floor plates” and “height” are interpreted as limits or maxima, not to be exceeded.
- Standards for “setbacks”, “parking”, and “loading” are interpreted as minimum requirements.

Conflicting Provisions in the ECQ-Project Development Manual, where one or more provisions of these regulations are in conflict, the more restrictive rule, higher standard or regulation shall apply.

Accessory Building or Structure: A building or structure that is subordinate in area, extent and purpose to the principal use and building on the sub-development plot and that is customarily used or occupied in conjunction with a permitted accessory use.

Accessory Parking: Parking provided to comply with minimum off street parking requirements and non-required parking that is provided exclusively to serve occupants of and visitors to a particular use, rather than the public at large. See “non-accessory parking.”

Accessory Use: A use that is subordinate in area, extent and purpose to the principal use on the sub-development plot zoning and development requirements and that is customarily found in conjunction with a permitted principal use.

ACMS: Access Control & Management Systems

ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers

Awning: A roof-like structure of fabric, non-rigid, or rigid material such as glass/ acrylic panels attached to a rigid frame that is supported completely or partially by an exterior building wall in conjunction with a structural supporting system.

Awning Sign: A sign incorporated into or attached to an awning.

Banner: A sign made of fabric or other similar non-rigid material with no enclosing framework or electrical components that is supported or anchored on two or more edges or at all four corners. Banners also include non-rigid signs anchored along one edge, or
two corners, with weights installed that reduce the reaction of the sign to the wind. See also flag.

**Basement:** The portion of any structure whose height measured from the floor to the underside of ceiling slab is located more than 50% below grade. Basement floor area does not count towards floor area ratio so long as it is dedicated to accessory parking and other building support or accessory uses.

**BMS:** Building Management System

**Building:** Any structure that is permanently affixed to the land and built for the support, shelter, or enclosure of persons, chattels, or moveable property of any kind.

**Building Height:** Is considered to be the dimension from grade level to the highest point of underside of the flat roof joists or concrete roof slab, and or peak of the roof and eaves at their intersection with an exterior wall for a pitched roof. Limits for building height are stated in number of stories for individual commercial office buildings. They are expressed as maximum allowed and are further described in individual sub-development plot data sheets for each plot.

**Bulk:** The general term used to refer to the size of a building or the building features allowed on a plot. It includes the following: Plot area, setbacks, open space, floor area, floor area ratio, building coverage and building height.

**Canopy:** A roof like structure of a permanent nature that projects from the wall of a building and overhangs the public way, circulation corridor or main entry area.

**Changing Image Sign:** Any sign that, through the use of moving structural elements, sequential lights, lighting elements, or other automated method, results in the movement, the appearance of movement or change of sign image or message. Changing-image signs do not include otherwise static signs where illumination is turned off and back on not more than once every 24 hours.

**Commercial Establishment:** A business in which the ownership, management and physical location are separate and distinct from those of any other place of business located on the same plot, as partly evidenced by maintaining separate and distinct doors and access points.

**Commercial Message:** Any sign, wording, logo or other representation that directly or indirectly names, advertises or calls attention to a business, product, service or other commercial activity.

**Common Basement:** The basement area contained within and located below multiple buildings on the same sub-development plot.

**CSI:** Construction Specification Index

**DB:** Distribution Board

**Density:** The general terms used to refer to the number of buildings allowed per individual sub-development plot per unit of land area. It is controlled in these regulations by the maximum number of buildings in relationship to the FAR and total built-up area allowed on a plot.
Drive-Thru Facility: Any service window, automated device or other facility that provides goods or services to individuals in motor vehicles.

Electric Sign: Any sign containing electrical wiring, lighting or other electrical components, but not including signs illuminated by a detached exterior light source.

Façade: The exterior plane or “face” of a building.


Flag: A sign made of fabric or other similar non-rigid material supported or anchored along only one edge or supported or anchored at only two corners. If any dimension of a flag is more than 3-times as long as any other dimension, it is classified and regulated as a banner regardless of how it is anchored or supported. See also “banner.”

Flashing Sign: Any sign or portion of a sign that contains an intermittent or flashing light source or that changes light intensity in sudden transitory bursts. Example of flashing signs include signs that contain or use strobe lights, or rotating lights; signs with blinking or flashing features that are designed merely to attract attention rather than convey a message; and changing-image signs that do not comply with applicable standards.

Floor Area Ratio (F.A.R.): The ratio of the gross floor area of all principal buildings to the total area of the plot upon which such buildings are located. Floor area ratio is calculated by dividing the gross floor area by the gross plot area. Standards for floor area ratios in these regulations are stated as maximum permitted.

Front Property Line: That property line that abuts or is along an existing or dedicated public street, or when no public street exists, is along a public way. On plots with multiple street frontages, the urban design guidelines in the Master Plan clarifies which property line is the front property line grade. The curb level adjacent to the front property line or the mean elevation of the finished plot, as measured along exterior building walls of the principal building, whichever is higher.

Gross Floor Area: Gross floor area, for the purpose of calculating floor area ratio, is defined as the gross horizontal areas of several floors of the building measured from the exterior walls. Gross floor area shall include elevator shafts and stairwells at each floor, floor space used for mechanical equipment/ plant, except equipment open or enclosed, located on the roof; penthouses; attic space having headroom of 2.5m or more; interior balconies or mezzanines; enclosed porches; and floor area devoted to accessory uses. Below grade accessory parking and exterior balconies and/ or porches are excluded from gross floor area.

Gross Plot Area: The entire land area within the boundaries of a property control lot designated as a sub-development plot and further classified throughout the ECQ site into Sectors.

HVAC: Heating Ventilation & Air Conditioning

IBC: International Building Code

Incidental Sign: A sign that contains no commercial message and that is exclusively used to convey directions or other information for the convenience of the public. Included are signs designating rest rooms, address numbers, room numbers, hours of operations,
entrances to buildings, public telephone, etc. Also included are signs on private property designed to guide or direct pedestrians or vehicular traffic, such as “entrance” and “exit” signs.

**Individual Letter Signs:** A wall sign or building sign consisting of raised individual letters, script or symbols. The background of an individual letter sign is either the exterior building wall surface or another opaque, non-illuminated surface.

**IAQ:** Internal Air Quality

**Landsculated:** Substantially covered with grass, ground cover, shrubs, trees or other living plant material.

**LEED:** Leadership in Energy and Environmental Design

**Lot:** Same as a sub-development plot.

**Lot Area:** The total horizontal land area contained within the property control lines of sub-development plots.

**Lot Coverage:** The area of a lot/plot covered by principal buildings, as measured along the exterior building wall at ground level, and including all building projections other than those expressly allowed encroaching into required setback areas.

**Marquee:** A roof-like structure of a permanent nature that projects from the wall of a building and overhangs the public way.

**Marquee Sign:** A sign incorporated into or attached to a marquee or permanent canopy.

**Motor Vehicle:** Any passenger vehicle, truck, truck-trailer, trailer or semi-trailer propelled or drawn by mechanical power.

**Non-Accessory Parking:** Parking spaces (and the drive aisles and circulation area associated with such parking spaces) that are provided to serve the general public rather than being reserved exclusively for occupants of and visitors to a particular use (e.g., public parking garages).

**Off Premise Sign:** A sign that directs attention to a business or profession conducted or to a commodity, service, or entertainment sold or offered upon the premises where the sign is located.

**Ornamental Fencing:** A decorative fence, including wrought iron or fencing that gives the appearance of wrought iron fencing, but expressly excluding chain-link, barbed wire and similar non-decorative fences.

**Ownership Line:** The boundaries of the portion of a property control lot or plot, defined as the ownership plot or parcel, transferred into private ownership.

**Ownership Parcel:** The portion of a property control lot, defined by the ownership line, transferred to private ownership. Refer to Plot Owner’s individual Plot Data Sheets.

**Painted Wall Sign:** A sign applied to a building wall with paint or a thin layer of vinyl, paper or similar material adhered directly to the building surface and that has no sign structure.

**Permanent Sign:** Any sign not classified as a temporary sign.

**Permitted Use:** A use permitted by the Master Plan in accordance with the applicable use regulation of this document.
**Podium:** The portion of a building encompassing the ground floor or the ground and second floor or mezzanine serving as a base for a tower structure above.

**Portaable Sign:** Any sign not permanently attached to the ground or other permanent structure or a sign designed to be transported, including, but not limited to, signs designed to be transported by means of wheels and signs made as A-frames or T-frames.

**Principal Building:** A building or combination of buildings of chief importance or function on a plot. In general, the principal use is carried out in a principal building. The difference between a principal building and an accessory building or structure is determined by comparing the size, placement, similarity of design, use of common building materials, and the orientation of the structures on the plot.

**Principal Use:** An activity or combination of activities of chief importance on the plot. One of the main purposes for which the land, buildings or structures are intended, designed or ordinarily used.

**Product Display Window:** An illuminated window display area in which products and goods are displayed to pedestrians but that do not generally allow visibility into the interior of the building.

**Projecting Sign:** A sign attached to and projecting out from a building face or wall, generally at right angles to the building. Projecting signs include signs that are totally in the right-of-way, partially in the right-of-way, or fully on private property.

**Property Control Line:** The boundary of a property control lot or plot, as shown on a plan of subdivision.

**Property Control Plot:** The area defined by property control lines which comprises the area for development and construction of individual basements. A portion of the property control plot is defined as the ownership parcel and is transferred into individual ownership.

**Public Open Space:** Any public open area owned by ECQ, including, but not limited to parks, parkways and streets.

**Public Parkway:** That portion of the public way between a street and the nearest parallel property line, including sidewalk areas.

**Public Way:** Any sidewalk, pedestrian path or trail, street, alley, highway, or other public thoroughfare.

**QCS:** Qatar Construction Standards

**Roof Line:** The peak of a roof or top edge of a parapet, whichever is higher.

**Roof Sign:** A sign or any portion of a sign that is erected upon or projects more than 600mm above the roof line of any building whether the principal support for the sign is on the roof, wall or any other structural element of the building.

**Satellite Dish Antenna:** A device designed or used for the reception or the transmission of television or other electric communication signal broadcast or relayed from a satellite. It may be a solid, pen mesh, or bar configured structure, in the shape of a shallow dish or parabola.
**SDLM:** Sub-development Logistics Management Team

**Setback:** An open, unobstructed area that is required by these regulations to be provided from the furthermost projection of a structure to the property control line of the plot on which the building is located.

**Sign:** Materials placed or constructed, or light projected, that: (1) conveys a message or image and (2) is used to inform or attract the attention of the public. Some examples of “signs” are materials or lights meeting the definition of the preceding sentence and that are commonly referred to as signs, placards, A-boards, posters, billboards, murals, diagrams, banners, flags, or projected slides, or images or holograms. When not qualified with the terms “on-premise” or “off-premise” the term “sign” refers to all signs, whether on or off-premise in principle.

**SMB:** Sub Main Board

**Special Use:** A use allowed in the subject use zone only if reviewed and approved in accordance with the special use standard by the Sub-development & Logistics Planning Manager.

**Story:** That portion of a building included between the surface of any floor and the surface of the floor above, or if there is no floor above, the space between the floor and the ceiling above. A basement or below-grade floor will be counted as a story when more than one-half of the floor-to-ceiling height is above grade.

**Street:** A public right-of-way that affords a primary means of access to abutting property.

**Street Frontage:** Any portion of a plot that abuts a street.

**Temporary Sign:** A sign that is designed to be used only temporarily and not permanently mounted to a structure or permanently installed in the ground. These include “For Sale”, “Leasing” and “Grand Opening Signs.”

**USGBC:** United States Green Building Council

**Variation:** Modification of an otherwise applicable standard, approved in accordance with appropriate standards.

**Vehicular Use Area:** Any area of the plot not located within any enclosed or partially enclosed structure and that is devoted to a use by or for motor vehicles including parking (accessory or non-accessory); storage of automobiles, trucks or other vehicles; fuel storage; loading areas; service areas and drives; and access drives and driveways.

**Video Display Sign:** A sign capable of displaying full motion imagery of television quality or higher.

**Wall Sign:** A single-faced sign attached flush to a building or other structure or a sign consisting of light projected onto a building or other structure. Wall signs do not include signs that are attached to sign structures.
ATTACHMENT-1
PROJECT DELIVERABLES

The Design Deliverables for Sub-Development Projects in the Energy City Qatar Corporate Development are outlined below and establish a basis for general content of design stage submittals and the responsibility for delivering that content. The listing is to cover anticipated content, but not limited to solely what is listed. Design Consultants are responsible for providing fully comprehensive and coordinated submittals covering all aspects of the respective projects needs as indicated below:

PCD = Preliminary Concept Design (Lusail Municipality [QD] Approval)
CD = Concept Design
SD = Schematic Design
DD = Design Development
WD = Working Drawings
TD = Tender Documents
C = Construction
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<th>CD</th>
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<td>Mock-Up Reviews (Site)</td>
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</tbody>
</table>

- Copy Owner’s Registration Certificate
- Client Contact Details
- Agent/Consultant Registration Certificate
- Application Form signed by Owner
- Legal Description of Property/Land Ownership Document
- Application Fee
- Site Plan (dimensions, setbacks, parking, compliance with Plot development requirements – refer to Plot Data Sheet)
- Project Description (use, build-up areas, FAR, etc.)
- Refer to PDM – Vol-2: Project Deliverables, for submission requirements.

Lusail Office of Building Approval

Comments?

Yes

No

DC-1 File Opened

Agent/Consultant

Departmental & Utility Reviews

Roads Dept. - Drawings - Reports
Drainage Dept. - Drawings - Reports
Civil Defense Dept. - Drawings - Reports
Environmental Dept. - Drawings - Reports
Kahramaa - Drawings - Reports
Q-Tel - Drawings - Reports

Comments?

Yes

No

Agent/Consultant

Architectural & Structural Reviews

- Drawings, Calculations
- Client Signoff
- Agent/Consultant Stamp & Signoff
- Letter of Authority as Contractor

Comments?

Yes

No

Agent/Consultant

Municipality Approval

Building Permit Fees Paid by Owner

DC2 Building Permit

Construction on all projects/works can begin
Lusail Development
Data Collection & Sketch Design Stage

REQUIREMENTS

All the submittals to be submitted in A2 size format with 2 set of Hard copies & 1 CD soft copy

- **3D Perspective**

- **Site Development Plan**
  This should indicate the Orientation of the building and its location on the site. Access points and parking areas (if any), detailed landscape plans & areas. Drawing shall indicate all the dimensions with respect to setbacks and other criteria. All dimensions shall be clearly marked and indicated in the plan.

- **Location Plan or Key Plan**

- **Area Tabulations showing the following:**
  i. FAR (Floor Area Ratio) and area breakdown
  ii. Number of parking spaces provided
  iii. Covered Area and percentage
  iv. Tower Area and Percentage
  v. Commercial/Rented Areas
  vi. Residential Areas
  vii. Floor Areas for towers showing area usage

- **Floor Plans**, starting at the lowest floor level, showing the location of rooms, corridors and other functions.

- **Elevations with dimensions and/or levels**

- **Sections**

For amalgamated plots with the same owner or joint ventures, general site development plan (masterplan) highlighting the proposal within the context of the local district and the immediate environment shall be submitted if the development is limited to the individual plots but sharing common areas.

Individual Site Development Plan shall be submitted per property indicating where the shared areas are located.
Building Permit Application Procedures

EFADA:

TO OBTAIN THE FINAL PLOT PLAN AND INFRASTRUCTURE PLAN

The Owner or his representative must submit the following:

1. Authorized letter from the client to be addressed to the LAC Director (Lusail Administration Complex). This letter is authorizing the consultant office to proceed with the building permit procedures.
2. Copy of the valid commercial license for the consultant office.
3. Copy of the consultant office classification.
5. Copy of client ID card and the client address. (For private projects).

Concept Design Submittals:

TO OBTAIN THE NO OBJECTION LETTER TO PROCEED WITH DC I SUBMITTAL

Drawing Submittal Requirements:

All drawings need to be submitted in A2 size and banded. 
(Soft copy + 2sets hard copies) of the following:

1. Colored Perspective Cover Sheet with the following information
   - Owner
   - Consultants name
   - Project Title
   - District Location
2. Site Development plan:
   - Site plan 1:200
   - Key map 1:1000
   - Location plan 1:1000
3. Floor plans 1:100
4. Elevations 1:100
5. Sections 1:100
6. Area Tabulations
   - Showing Building Area Usage
     1. Type
     2. Areas
     3. No. of Units
4. FAR ratio,
5. Covered Area Ratio
6. Number of Parking Spaces
7. Height of the building

**Design control stage 1 (DC1):**

**Drawing Submittal Requirements:**

All drawings are to be submitted in A1 or A0 size and bounded. Paper size shall be on the discretion of the Consultant. All text, dimensions and levels must be readable and with proper line values. The minimum scale to be used shall be 1:200M for the Site Development Plan. All other drawings shall be 1:100, If required to clarify certain portions of the drawing, spot details (Scale 1:50 M or 1:20M) must be submitted.

A Soft copy + 2 set hard copies of the following:

1. Colored Perspective Cover Sheet with the following information
   - Owner
   - Consultants name
   - Project Title
   - District Location
2. Site Development plan :
   Site plan
   Key map
   Location plan
3. Floor plans
4. Elevations
5. Sections
6. Area Tabulations
   - Showing Building Area Usage
     1. Type
     2. Areas
     3. No. of Units
     4. FAR ratio,
     5. Covered Area Ratio
     6. Number of Parking Spaces
7. Landscape Design Concept

Upon getting the DC 1 approval the consultant is required to submit Nine (9) Site Development Plan to be stamped.
Qatari Diar Real Estate and Investment Company thru the LUSAIL ADMINISTRATION COMPLEX reserves the right to issue TEMPORARY BUILDING PERMIT. This permit can be used to commence the EARTH & FOUNDATION WORKS.

**Design control stage 2 (DC II):**

**Drawing Submittal Requirements:**

All drawings are to be submitted in A1 or A0 size and bounded. Paper size shall be on the discretion of the Consultant. All text, dimensions and levels must be readable and with proper line values.

A Soft copy + 3 sets hard copies of the following:

**Architectural:**

1. Site Development plan : A0,A1
   - Site plan 1:200 (including detailed area statement).
   - Key map 1:1000
   - Location plan 1:1000
2. Floor plans (detailed) 1:100 A1
3. All reflected ceiling plans 1:100 A1
4. Elevations 1:100 A1
5. Partial building elevations 1:50 A1
6. Sections 1:100 A1
7. Partial building sections 1:50 A1
   - Building section through stairway
   - Building section through elevator hoist ways
   - Sections through parking ramps
8. Sheet of partitions types 1:20 & 1:5 A1
9. Landscaping plan 1:100 A1
10. Site section showing landscaping features 1:50, 1:20 A1
11. Paving build-up details 1:20, 1:10, 1:5 A1
12. Finishes specifications report
13. Final perspective (colored) A1

**Roads:**

(Soft copy +3 sets hard copies) of the following:

1. Area statement vicinity map location plan site development plan. A1
Structural submittals:

2. Undertaking letter from consultant office.

3. Soft copy + 3 sets hard copies of the structural drawings.

4. Structural design calculations (Soft copy + 3 sets hard copies)

5. Other structural information as requested by the permitting authority

Electrical submittals:

Site development plan (Approved Architectural Site Development Plan.)
1. Site development & location plan plumbing layout
2. All floors lighting layout plans 1:100
3. All floor power & tel. layout plans 1:100
4. Substation Details.
5. DBs & Schedules.
6. Electrical schematic Diagrams

Plumbing submittals:
(Soft copy + 3 sets hard copies) of the following:

2. Site development & location plan plumbing layout
3. All floors plumbing layout plans 1:100
4. Schematic plumbing riser diagram

Telephone submittals:
(Soft copy + 3 sets hard copies) of the following:

1. Site plan electrical & telephone cable route layout
2. All floors power & telephone layout plans.
3. Schematic diagram of telephone layout.

Drainage submittals:
(Soft copy + 3 sets hard copies) of the following:

1. Site development, location, vicinity plan drainage layout
2. All floors drainage layout plans.
4. Schematic drainage riser diagram.
5. A1

Civil Defense:
(Soft copy + 3 sets hard copies) of the following:
1. All floors Fire alarm layout plans. 1:100 A1
2. Fire Alarm schematic diagram. A1
3. All floors fire fighting layout plans. 1:100 A1
4. Schematic diagram & standard details of fire fighting. A1
5. All floors voice alarm layout plans. A1
6. Voice alarm schematic diagram. A1
7. Fire priority telephone schematic diagram. A1
8. Required floors lighting protection system. A1
9. Required floors emergency lighting system. A1
10. Required floors emergency lighting layout. A1
11. Central battery system. A1
12. HAVC layout. A1

**Vertical transportation:**
Soft copy +3 sets hard copies) of the following:

- General information. 
- Hoist way pit, machine room plans 1:50 A1
- Hoist way sections 1:50 A1

**Obtaining building permit**

In order to apply for building permit, the Owner or his duly authorized representative must have completed the following procedures:

1. Submitted and obtained approval of all the drawing requirements.
2. QD Application form for building permit.
3. Contractor undertaking letter.
5. Building permit fee.

**Standard Forms to be issued by QD:**

1. No objection letter format
2. Project information requirements
3. Temporary Building Permit.
4. Early access to the plot request form
5. Standard application form for building permit.
CRITERIA FOR MEZZANINE FLOORS

1. Design of Mezzanines shall comply with Section 505 of the IBC (International Building Code) with the following exceptions:

   i.) GFA of Mezzanine Level shall not exceed 75% of the Ground Floor GFA
   ii.) GFA of Mezzanine Level shall be included in the total GFA calculations for the design of fire protection/ suppression systems
   iii.) GFA of Mezzanine Level shall be included in the total BUA
   iv.) GFA of Mezzanine Level shall be included in the aggregate Net Rentable Area for calculating car parking requirements, unless the total GFA is less than or equal to 1/3 of the Ground Floor GFA, and a.) and b.) below apply:
       a.) Total GFA is less than or equal to 1/3 total GFA of Ground Floor, and
       b.) Mezzanine Level is not designated a rentable, or lettable area.
   v.) Ground Floor to underside of First Floor slab cannot exceed 7.0meters.
CRITERIA FOR BASEMENT CAR PARKS

When producing designs please provide plans that include the following:-

i.) Car parking configuration that complies with plot data sheet design criteria.
ii.) Dimension aisle widths, parking spaces, including handicap spaces.
iii.) Show vehicular circulation direction and ramp configuration, access and egress, including widths.
iv.) Service facilities compliant with statutory codes and design criteria from QCD, Kahramaa, etc, including service vehicle access.
v.) Pedestrian circulation lanes and protection.
vi.) Bays that comply with 5.8x2.75m minimum
vii.) Aisles that comply with 6.7m minimum
viii.) Disabled bays AND access routes that comply with ADA requirements

NOTE:
The 6.7m aisle minimum width requirement also applies to circulation routes ‘on-grade’.

CRITERIA FOR CAR PARK RAMPS

Car park ramps are to comply with the following:-

Minimum Ramp Gradients:
a) 1:12 ratio transition ramps for first and last three meter sections of ramps, and,
b) Max 1:8 climb of main ramp section.

Minimum lane widths, division and wall protection:
Set-out all 2-Way ramps following the following minimum criterion:

1. 300mm outer upstand curb
2. 3.6m outer vehicle lane
3. 600mm dividing median upstand and curb
4. 3.6m inner vehicle lane
5. 600mm inner upstand curb

The above criterion is for a 2-way ramp, a 1 way ramp would be based on criterion 1, 2 and 5 above.
Request for Site Access & Gate Pass  
REF: ECQ/SDLM-SA001

Please fax this request to the address below for approval. Please allow one (1) week from the date of request for site coordination & preparation. We shall return by fax this form with our approval or comments.

Attention: ECQ Technical Department  
Fax: + (974) 441-1577  
Phone: + (974) 441-1522

Plot No. ______________

<table>
<thead>
<tr>
<th>Date of Visit – Start</th>
<th>Date of Visit – End</th>
<th>Time of Visit (if 1 day only)</th>
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<th>Name of Plot Owner</th>
<th>Contact No.</th>
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<th>Client Authorized Technical Representative – (1 only)</th>
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<tr>
<td>Name:</td>
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<td>Phone:</td>
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<tr>
<td>Email:</td>
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<td>Fax:</td>
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Purpose of Request  
(Mark only 1-Item per request)

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<tr>
<th>General/ Viewing</th>
<th>Temporary Fencing</th>
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<tr>
<td>Photographic Documentation</td>
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<td>Physical Land Handover</td>
<td>Temporary Construction Access</td>
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<td>Geotechnical Engineering Investigation</td>
<td>Enabling Works</td>
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<tr>
<td>Topographic Survey</td>
<td>Material Storage</td>
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<td>Mobilization</td>
<td>Construction Commencement</td>
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Names of Site Attendees

1. 
2. 
3. 
4.

Vehicle Type and Vehicle ID

Signature of Requestor  
Date

Reviewed by ECQ - Head of Planning & Design  
Date

Approved by ECQ - Head of Construction  
Date

Approved / Declined / Comments:
## APPENDIX A

### REGULATIONS FOR GREEN BUILDING DESIGN IN ENERGY CITY QATAR

#### Sustainable Sites 14 Possible Points

<table>
<thead>
<tr>
<th>Prereq 1</th>
<th>Credit 1</th>
<th>Credit 2</th>
<th>Credit 3</th>
<th>Credit 4.1</th>
<th>Credit 4.2</th>
<th>Credit 4.3</th>
<th>Credit 4.4</th>
<th>Credit 5.1</th>
<th>Credit 5.2</th>
<th>Credit 6.1</th>
<th>Credit 6.2</th>
<th>Credit 7.1</th>
<th>Credit 7.2</th>
<th>Credit 8</th>
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#### Water Efficiency 5 Possible Points

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<th>Credit 2</th>
<th>Credit 3.1</th>
<th>Credit 3.2</th>
<th>LEFD No 22</th>
<th>ECO-REGULATIONS</th>
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<tbody>
<tr>
<td>Water Efficient Landscaping, Reduce by 50%</td>
<td>Water Efficient Landscaping, No Potable Use or No Irrigation</td>
<td>Innovative Wastewater Technologies</td>
<td>Water Use Reduction, 20% Reduction</td>
<td>Water Use Reduction, 30% Reduction</td>
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#### Energy & Atmosphere 17 Possible Points

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<th>Prereq 1</th>
<th>Prereq 2</th>
<th>Prereq 3</th>
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<tr>
<td>Credit 1</td>
<td>Optimize Energy Performance</td>
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<td>Min 4 Points (21%)</td>
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<tr>
<td>Credit 2</td>
<td>On-Site Renewable Energy</td>
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<td>Min 1 Point (2.5%)</td>
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<td>Credit 3</td>
<td>Enhanced Commissioning</td>
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<td>Enhanced Refrigerant Management</td>
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<td>Measurement &amp; Verification</td>
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<td>Credit 6</td>
<td>Green Power</td>
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**Materials & Resources 13 Possible Points**

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<th>Prereq 1</th>
<th>Storage &amp; Collection of Recyclables</th>
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<tbody>
<tr>
<td>Credit 1.1</td>
<td>Building Reuse, Maintain 75% of Existing Walls, Floors &amp; Roof</td>
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<tr>
<td>Credit 1.2</td>
<td>Building Reuse, Maintain 95% of Existing Walls, Floors &amp; Roof</td>
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<td>Credit 1.3</td>
<td>Building Reuse, Maintain 50% of Interior Non-Structural Elements</td>
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<tr>
<td>Credit 2.1</td>
<td>Construction Waste Management, Divert 50% from Disposal</td>
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<td>ECO-MANDATORY</td>
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<tr>
<td>Credit 2.2</td>
<td>Construction Waste Management, Divert 75% from Disposal</td>
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<tr>
<td>Credit 3.1</td>
<td>Materials Reuse, 5%</td>
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<td>Credit 3.2</td>
<td>Materials Reuse, 10%</td>
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<tr>
<td>Credit 4.1</td>
<td>Recycled Content, 10% (post-consumer + 1/2 pre-consumer)</td>
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<tr>
<td>Credit 4.2</td>
<td>Recycled Content, 20% (post-consumer + 1/2 pre-consumer)</td>
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<tr>
<td>Credit 5.1</td>
<td>Regional Materials, 10% Extracted, Processed &amp; Manufactured Regionally</td>
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<tr>
<td>Credit 5.2</td>
<td>Regional Materials, 20% Extracted, Processed &amp; Manufactured Regionally</td>
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<tr>
<td>Credit 6</td>
<td>Rapidly Renewable Materials</td>
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<td>Credit 7</td>
<td>Certified Wood</td>
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**Indoor Environmental Quality 15 Possible Points**

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<tr>
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<tr>
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<td>Environmental Tobacco Smoke (ETS) Control</td>
<td>Pre-Requisite</td>
<td>ECO-MANDATORY</td>
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<tr>
<td>Credit 1</td>
<td>Outdoor Air Delivery Monitoring</td>
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<td>ECO-MANDATORY</td>
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<tr>
<td>Credit 2</td>
<td>Increased Ventilation</td>
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<tr>
<td>Credit 3.1</td>
<td>Construction IAQ Management Plan, During Construction</td>
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<tr>
<td>Credit 3.2</td>
<td>Construction IAQ Management Plan, Before Occupancy</td>
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<td>Credit 4.1</td>
<td>Low-Emitting Materials, Adhesives &amp; Sealants</td>
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<td>Low-Emitting Materials, Paints &amp; Coatings</td>
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<tr>
<td>Credit 4.3</td>
<td>Low-Emitting Materials, Carpet Systems</td>
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<td>Low-Emitting Materials, Composite Wood &amp; Agnitite Products</td>
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<td>Controllability of Systems, Lighting</td>
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<td>Controllability of Systems, Thermal Comfort</td>
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<td>Thermal Comfort, Design</td>
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<td>Credit 7.2</td>
<td>Thermal Comfort, Verification</td>
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<td>Credit 8.1</td>
<td>Daylight &amp; Views, Daylight 75% of Spaces</td>
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<tr>
<td>Credit 8.2</td>
<td>Daylight &amp; Views, Views for 90% of Spaces</td>
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**Innovation & Design Process 5 Possible Points**

| Credit 1.1 | Innovation in Design | 1 | EC2-MANDATORY |
| Credit 1.2 | Innovation in Design | 1 | 1 |
| Credit 1.3 | Innovation in Design | 1 | 1 |
| Credit 1.4 | Innovation in Design | 1 | 1 |
| Credit 2 | LEED Accredited Professional | 1 | EC2-MANDATORY |

LEED Note (V2.2) - Project Totals 69 Possible Points (as per LEED):

Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points

**Total Mandatory EC2 Points = 26**

Mandatory LEED Certification = SILVER