You don't need to describe every aspect of the project but do ensure that the parts that you choose to describe are done so in detail.

Please Note: Career Episodes must be written in the first person singular clearly indicating your own personal role in the work described. Remember, it is what I did, not what we did or what 'I was involved in' and describe how you did it.

Introduction (Write 100 words approx.)

1. Chronology-date and duration of career episode

2. Geographic location where the experience was gained

3. Name of organization

4. Title of the position occupied

Date and Duration of this career episode:

I started working on this particular project on June 11, 2009. It took me almost 11 months in accomplishing this task and it was May 2010 when I successfully submitted this project.

Background (write 200-500 words)

1. Nature of project (highlights)

2. Objectives

3. Nature of particular work area

4. A statement of duties (provide official statement, where available)

Objectives of the project:

The objective of this project was to electrify, do related electrical works, design of public address system, surveillance system, HVAC system, fire alarm system, telephone and networking system for a five floored office building with a basement and a sub-basement.

The further scope of work included the Preparation of methodology, Preparation of Technical Specifications, Technical Bid Drawings, Tender documents, Preparation of Bill of Quantities, Evaluation and selection of competent bidders (for supply of materials and testing, commissioning of electrical items/jobs) etc.

The nature of my particular work area:

My particular work included Assisting in preparation of Project methodology, Involvement with the design and drafting of building electrical systems including power distribution, lighting and life safety systems & building communications etc.

- Chart of organizational structure highlighting your position, in relation to the career episode

Chart of the organizational structure highlighting your position:

GM/Head /Chief Engineer Electrical

↓

Senior Engineer Electrical

↓

Junior Engineer Electrical

Personal Work Place Activity (Write 500-1000 words)

(Main body of the narrative and key assessable component) (Use "I", instead of "We" "us" or our" e.g. I designed, I tested or I installed. Add maximum engineering work)

- How you applied your engineering knowledge and skills.
- The tasks delegated to you and how you went about to accomplish them.
- Measurements/Calculations/Strategies devised by you including any original or creative design work.
- Designing details with tools/software used. (Do not attach screen shots, diagrams or tables etc).
- How you worked with other team members (team coordination) and management.
- Mention Safety Standards, safety parameters, safety instructions or safety codes that you followed during the project at work site.

- Were you involved in Documentation? Write in few lines. Also mention meetings attended and trainings conducted.
- How did you perform testing? Briefly explain testing phase and mention tools/software or techniques that used in this phase.
- Mention meetings, discussions/planning and suggestions given by you.
- Were you involved in the installation? Mention tools/software's or formulas that used.
- Briefly explain 2 technical issues. How you rectified these issues? What techniques/tools/software you applied? Mention results and conclusions.

I had to design, supervise and assist a senior engineer and GM/Head /Chief Engineer Electrical on project of designing and building NDC's own house Electrical, surveillance, public address and fire alarm system.

Then I studied the "International Building Code 2009", I first attended the meeting with architect, who gave the infrastructural drawings and information about the building architect.

After I understood the architectural drawings, I was asked to calculate interior lighting of building first. I knew how to calculate number of lights as I read in my engineering course book.

I started calculations using "Light Efficiency Method", to calculate any interior lighting first area or type of activity and dimensions/physical characteristics of room or area must be known.

I started with an office room; I got dimensions of room from drawings given by architect. With this data I had to determine necessary light flux, power of lamps, and number of lighting points and layout of the light fittings. I calculated total necessary light flux using formula below:

$$\phi t = \frac{E \times S}{ER \times EF \times Fm}$$

Where

ϕt = Total necessary light flux (Lumen)

E = Average illuminance (LUX) -

S = Surface to be lit (M)

ER = Efficiency of room

EF = Light fitting efficiency

FM = Maintenance factor of lighting unit

Average Illuminance (E): This is determined in accordance with activity normally envisaged. This factor is standardized in form of table bearing the factors which effect vision. (I took the values from table illustrated in my course book).

EF: The efficiency of the lighting fitting should be provided by the maker.

ER: The efficiency of the room depends on its dimensions, on the reflection factors of celling Rc, the walls Rw, floor Rf and on the room index factor K.

$$\text{Room index K} = \frac{L \times W}{h\,(L+W)}$$

Where:

L = length of room

W = width of room

h = Distance between work level and fitting.

I did these calculations on full load. Keeping in view of total load I used 630KVA transformer for building which was vetted by my chief and senior as right.

As it was four storied and two basement building so the cables I used for circuiting were quite lengthy and massive, so after I did meeting with architect and senior, came up the solution of cable duct on both side of building running from top to basement floor, I used cable tray for drawing cables from switch board and distribution board to duct and then to substation in the basement of building.

There were manly two types of transformers: Oil-immense transformer and Dry type transformer. I have had read the benefits and characteristics of both types in my course books. As the area was less and in basement therefore I used Dry type transformer because of its more reliability, safety, compactness and easy maintenance over oil type. I used dry type transformer meeting criteria.

For circuiting I used single core PVC Insulated Cables including PVC sheathing, I got the current ratings from table 12 of I.E.E Regulations (13 editions). For wiring of single light point or light plug I used 1.0/1.5mm^2 cable, for connection to distribution boards,

panels and 11kV (XLPE 3C 150mm^2) from meter to panel I used 6-10mm^2 or more rated cables in suitable PVC conduits of dia ranging from ¾" – 4".

Then I made drawings for building management system which included CCTV and Fire alarm system including public address system. I marked CCTV on each floor, mainly stair case area, entrance, parking, director offices and where felt the requirement.

For cabling of CCTV I used RG-II Coaxial cable 96-Mesh 75 Ohms that was to be drawn 1" dia heavy duty PVC conduit, for wiring used 3 Nos. 2-5mm^2 single core cables in PVC conduit installed on surfaces or recessed in walls from DB UPS included 3"x3"x3" Junction Box 15 A connectors and Pers Pex Cover Sheet.

For both indoor/outdoor surveillance I used 1/3" High Resolution Color CCD Day & Night Camera with characteristics of 1/3" supper HAD color CCD, SSNR digital noise reduction saves DVR storage space, Day and night capability for 24/7 operation, High resolution of 530 TV lines, Min. illumination of 0.3Lux@F1.2 (color),0.002 Lux@F1.2 (Color sense-up), Privacy masking with four programmable zones, Back light compensation, S/N ratio of 50 dB, Voltage : 42 V ac, 12 V dc.

For backup I used 16 - CH Digital Video Recorder which had specifications of H.264 High performance image compression, Real time high resolution recording, H.264/JPEG multi stream for high network performance, Easy installation with coaxial control (optional) with 1000 GB hard disk and LCD 32" for screen viewing, Outdoor Waterproof Housing for cameras.

For fire alarm system I made drawings on AutoCAD according NFC1999, IFC, and NFPA standards, which I read before those were provided in by my chief engineer. I used addressable automatic optical smoke detectors in office rooms, corridors, stores, stairs and parking keeping clearance from other detectors and electrical equipment. Also I used glass breakable manual fire alarms in area near staircases and corridors, above 3.5-4ft high from floor.

I used heat detector mainly in areas like kitchen, pantry. I divided the smoke alarm areas in zone of 22,500ft^2 maximum and length not exceeding 300ft according NFPA72. I marked the control panel for complete fire detection and alarm system in IT room in the basement floor, wiring of each detector was done in loop.

I marked emergency exit doors with emergency stairs in back and side of building after meeting with senior engineer and architect. Then I marked emergency exit signs. On each floor I proposed portable cylinders of CO_2 for fire extinguishing.

I proposed small circuit breakers for light circuits which had to be installed in distribution board. There was distribution board on each floor; cables from those were drawn to duct and from each floor duct to cable trench for substation in basement via busbar. Substation consisted of H.T (High Tension) panel /L.T (Low Tension) panel/Power Factor improvement panel/ Synchronous panel.

11kV cable from pole was drawn to substation. 630KVA Transformer and 400KVA diesel generator for standby power supply were also place in substation area with acceptable distances from each other.

After I received more detailed equipment layout plan from architect, I came to know they are proposing closed and opened cabins some of them were divided into two, three or four sub portions and to each cabin there must be both (2-pin) light and (3-pin) power plugs with telephone and internet ports too.

Previously I marked wall mounted plug as I did not received equipment placement plan yet. Then I got help from chief engineer regarding this matter and I came up with solution of metallic floor/wall mounted boxes to be provided in each cabin on each seat. For that cables were to be run under the floor slabs. For telephone I used RJ11 socket and RJ45 for Ethernet.

For safety of electrical equipment, components, building and humans, earthing is very important. I had studies earthing for building, therefore I made drawing of earthing mesh that had to be laid under building and marked earth connecting points for electrical system to be connects for earth.

Standard electric copper conductor tin coated with 70 microns $2x70mm^2$ to be installed in mesh. I marked 3/4" X 20' Ground Rods, tin coated standard copper conductor $70mm^2$,1-1/2" X 3/4" X 12" Copper Strips for lighting protection for devices.

Meanwhile I was preparing/designing all these drawings and related calculations, I made Specifications, Datasheets, Bill of quantities and tender documents in assistance of chief engineer.

Tender was floated and bidders were called for supply, installation, testing and commissioning of electrical works. I with help of my chief and senior engineer, evaluated the bidders and recommended the suitable (technical strong and financially low) bidder.

Lastly the bid winner got work, they were mobilized to site for installations and works. I along with senior engineer were then assigned task to supervise their work according to Specifications, Datasheets, Bill of quantities and tender documents.

Summary (write 100 words)

- Your view of the overall project and achievements.
- Learning's that you got form this project.
- How the project fared in meeting the goals and requirements
- How your personal role contributed to this project.

My input in the design, drawings, tendering of the electrification and electrical works was a very useful experience because I understood the basic electrical considerations of the building electrification, behavior and understanding of each phase in electrical system and its need, common mistakes made during the construction, how to make the project cost affective along with it being sufficiently durable for a long life.