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A HAND BOOK ON INDUSTRIAL TRANING MANUAL

- JV'n Mr.KANHAIYA KUMAR

JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR
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DEPARTMENT OF CIVIL ENGINEERING

VISION OF THE DEPARTMENT:

Department of civil engineering is committed to prepare graduates, post graduates and research scholars by providing them the best outcome based teaching, learning experience and scholarship enriched with professional ethics.

MISSION OF THE DEPARTMENT:

Our aim is to Prepare globally acceptable graduates, post graduates & research scholars for their future learning in Civil Engineering, Maintenance Engineering & Engineering Management.

Develop futuristic perspective in Research towards Civil Engineering , Maintenance Engineering & Engineering Management.

Establish collaborations with reputed construction company & Research organizations to form strategic and meaningful partnerships.

SPECIFIC OUTCOMES :

Apply modern skills & tools in these test to solve the real world problems.

Apply concepts and principles of management to manage these test task.

Apply fundamental knowledge & solve problem concerning environmental issues.

EDUCATIONAL OBJECTIVES

To apply construction geo-tech design system tools & necessary skills in the field of civil engineering in solving problems of the society.

To apply principles of all civil engineering & management concepts to enhance global idea and outcome growth.

To apply materials engineering concepts in solving problems concerning environmental pollution and fossil fuel depletion and work towards alternatives.

CHAPTER ONE

CHAPTER TWO

CHAPTER THREE

CHAPTER-ONE

INDUSTRIAL WORK EXPERIENCE SCHEME (S.I.W.E.S): THE CONCEPT AND ITS MEANING

The Student Industrial Work Experience Scheme (SIWES) was established by the Industrial Training Fund in 1973 to solve the problem of inadequate practical skills of graduates from Nigerian tertiary institutions. The aim was to raise indigenous manpower to man and manage the various sector of the Nigerian economy. The scheme was design to expose students to industrial based skills necessary for smooth transition from theory learnt in school to the real industrial work. It affords students of tertiary institutions the opportunity of being familiarize and exposed to the needed experience in managing people, handling tools and equipment to fit into the industrial work environment readily.

The Students Industrial Work Experience Scheme (SIWES) is a skill training programme designed to expose and prepare students of Technical, Engineering and Science based courses for the industrial work situation which they are likely to meet after graduation. This particular industrial attachment which is done in the universities is embarked upon by students at the end of their 400Level first semester year.

Students leave for the six months IT at the end of their first semester fourth year examinations with the following documents --- Student's Log Book, SPE1 Form & Form 8. Each student is expected to return the photocopy of the SPE1 Form; two weeks after securing his/her place of attachment to the SIWES Office of the university. In addition, the original copy of the SPE1 Form, which is duly signed by the employer, must be submitted to the ITF area office situated in the state where the IT is being done.

1.1 OBJECTIVES OF SIWES

The objectives of the scheme are as follows:

I. To provide the student with an opportunity to apply knowledge in real work situation thereby bridging the gap between university work and actual practice.

II. To access the student‘s interest in and suitability for the occupation they have chosen.

III. To expose the students to work not done in the institution and provide access to the production equipment not normally available in the institution environment.

IV. To enhance industry’s satisfaction with certificates from institutions of higher learning.

V. To enlist and strengthen employer’s involvement in institutional activities and in the entire educational process of preparing the students for employment in industries and commerce.

VI. To make the student gain more practical experience of the industry in their various field of study.

VII. To serve as a useful tool of interaction between the classroom and the industry.

VIII. It discloses the mode of operation of both private and government establishments to the students.

1.2 OBJECTIVES OF SIWES REPORT

The objectives of this SIWES report are as follows:

1. To offer useful suggestions and proffer recommendations as the case may be.

2. To put into writing the practical experience gained and industrial knowledge acquired during the SIWES program.

3. To enable the coordinator assess the students activities during the industrial attachment

4. Assess the organizations overall contribution to the students' knowledge and practice of the profession

5. To identify major areas where experience was gained during the period of attachment

1.3. BRIEF HISTORY OF ADVANCED ENGINEERING CONSULTANTS

Advanced Engineering Consultants (AEC) is a well-established multi-disciplinary engineering and management organization with extensive specialized engineering capacity, a staff complement in excess of 120 and a proud record of 25 years experience throughout Nigeria. It is an International firm that came out of ICEC Rome/Lagos, which was founded, in the early 70's, it has its headquarter in Rome and a sister firm in Lagos.

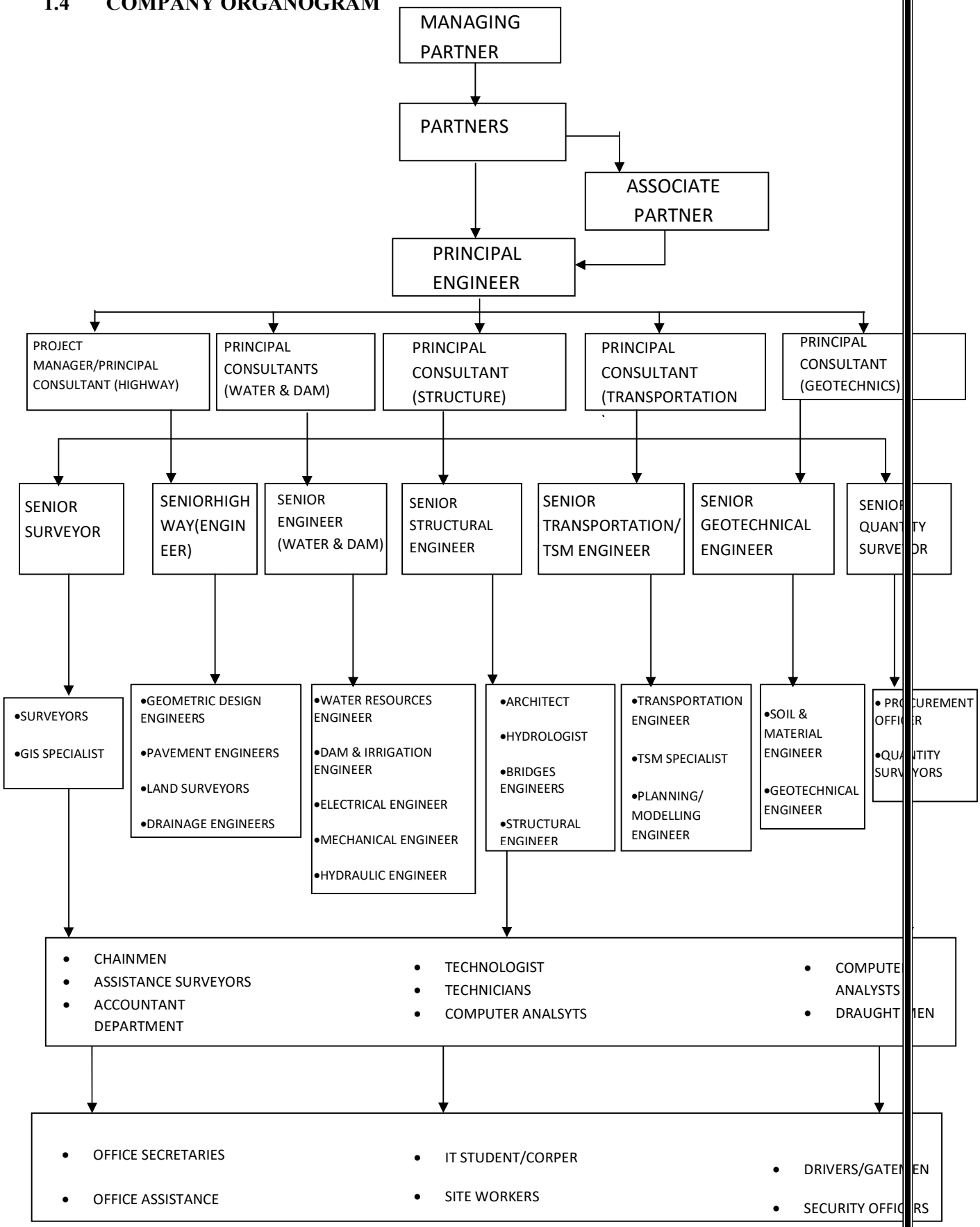
AEC Lagos was registered with Corporate Affair Commission in 1990. The firm has associations with companies in Sub-Saharan Africa region, Italy, Canada, South Africa, Ireland, United Kingdom and maintains networking arrangements with other multi-disciplinary companies in Europe and North America.The firm is a member of the Association of Consulting Engineers of Nigeria (ACEN) and also registered with the Councils for the Regulation of Engineering in Nigeria (COREN).

AEC provides complete consulting services from the initial investigation stages, through feasibility studies, inventory, condition survey, outline planning, production of detailed designs, preparation of contract documents, evaluation of tenders to construction supervision with successful completion of design and supervision for various types of project.

Their services include:

- Transportation & Highways
- Water & Wastewater
- Structures & Heavy Civils
- Mechanical & Electrical
- Architectural & Planning
- Environmental & Monitoring
- Solid Waste & Energy
- Industrial & Pharmaceutical
- Quantity Surveying & Cost Control
- Geotechnical & Laboratory testing
- Land Surveying & Setting Out
- Project Management & Supervision

1.4 COMPANY ORGANOGRAM



CHAPTER –TWO

BRIEF DESCRIPTION OF ACTIVITIES DONE DURING INDUSTRIAL TRAINING

2.1. AUTOCAD DESIGN

Autocad is an application used in multiplication and arranging of planning works. During my first week at the regulatory focus, I was given more information on some various features of autocad like plan, model, format, scale, plotting, printing, etc and besides I was given assorted planning drawings to repeat and print out.

2.2. SEE-THROUGH FENCE

Additional works, for instance, erection of straightforward fence was refined for the BRT way from Mile12-Ikorodu aberrant. The straightforward fence is included a cross area that is 3.3m long and a shaft that is 2.1m high. The foundation of the fence is dugged to about 1ft long, 1ft in broadness and to about 1.5ft high. Concrete of mix extent 1:2:4 was used for its foundation.

2.3. LASPARK GARDEN BEAUTIFICATION

In the nursery, I had the alternative to see different sorts of grasses that were used there and how clearing stones are laid on the walkway. Different kinds of grasses and blooms used in the beautification of the nursery fuse; Bahama grass, White grass, Red and entertainment mecca, Green and celebration.

2.4. PEDESTRIAN BRIDGE

A bystander associate in like manner called a footbridge is an augmentation proposed for walkers to move beginning with one way then onto the following if it isn't fitting to use the rule road because of traffic and speed at which different vehicles move. There are unmistakable cycle drawn in with the improvement of a walker interface going from the fundamental communication of setting out of centers for depleting of loads to the last period of fixing handrails or as it might be according to the arrangement. Parts that make up the LBE Pedestrian augmentation include: piles, store covers, dock, wharf covers, shaft, deck, etc

2.5. HIGHWAY CONSTRUCTION

The Lagos-Badagry is a 62.255km road of 10 ways with a light rail mass travel of 2 ways (i.e 4 ways for organization way, 4 ways for the expense way, 2 ways for the BRT and 2 ways for the LRMT. The supreme way for the endeavor is 12 ways. Distinctive improvement frameworks were clung to according to the arrangement and different features, for instance, road signs was presented.

2.6. LABORATORY WORKS

In the examination community, I was advantaged to see how different tests were done and I furthermore participated in some the practical gatherings. A segment of the tests fuse; Moisture content test, Laboratory game plan of Asphalt, Sieve size assessment, Loose thickness test, Absorption test, Flankness test and Elongation test.

2.7. CASTING OF JERSEY BARRIER LINKS

The sweatshirt limit joins projected was for the Light Rail Mass Transit(LRMT). Here, the blinding for the shirt check was casted which has a thickness of 200mm and a width of 1150mm after which precast sweatshirt deterrents of length 3000mm with removing support bars and formwork for the association base piece is set and it is casted using concrete of assessment C30.

2.8 .QUALITY CONTROL AND ASSURANCE

All through thoroughfare improvement, course of action of tests were coordinated to ensure that the road to be constructed will be as demonstrated by the arrangement and besides meet the essential highway advancement standards. Test, for instance, dynamic plate stacking test(EVD), insitu thickness by sand replacement method, insitu thickness by focus shaper methodology, sprinkle test, commonness check, bitumen extraction test, coring test, etc

Preface TO MATERIALS, TOOLS, AND EQUIPMENT USED ON SITE.

Equipment and machines used on the site in which I did my cutting edge association are recorded under;

CHAPTER- THREE

INTRODUCTION TO MATERIALS, TOOLS, AND EQUIPMENT USED ON SITE.

3.1.1. EQUIPMENTS

Stuff here insinuates all kind of absolutely controlled machines used being developed to extend creation, forgo weighty manual work and keep up raised assumption for creation. It can moreover be suggested as mechanical plants. Stuff's used compasses from the little hand-held power instruments to greater pieces of plant like excavators, grader, pay loaders and farm vehicles. The going with gear are used all through my readiness;

1) WATER PUMPING MACHINE

This is used for siphoning water out of a channel or channel. It was used close by to direct out unnecessary and excess water out of channels or from where it isn't needed.

2) EXCAVATOR

This is a heavy construction equipment consisting of a bucket and cab on a rotating platform. It could either have tracks or wheel depending on the purpose for which it is been used. On the site I worked on, it was used for excavating or digging the trenches, material handling, band demolition of structures on the right-of-way etc.

1: Excavator

1) **ROAD ROLLER**

This is also a heavy equipment used in road construction to compact the soil on which the pavement is to be made so as to avoid settling later on by removing the air voids present in the soil.

2: Roller

2) **PAY LOADER**

This is another weighty gear utilized in development to clear out or stack materials into another sort of apparatus. It was utilized in the site chiefly for site arrangements, pulling of more modest hardware's and to stack sand, stone and concrete into the blender.

3: Pay loader

3) **CONCRETE MIXING TRUCKS**

These are trucks made to move concrete nearby to the spot where the solid is required. The sand, stone and concrete is included the correct extents and satisfactory water is added into its drum. It at that point moves the blend forthright on the site where the blend is required.

4: Concrete mixer used on site

4) **GRADER**

A grader, otherwise called a street grader, an edge, a maintainer or an engine grader. This is a development machine with a long edge used to make a level surface. Graders can create slanted surfaces, to give cannot (camber) to streets. In the development of cleared streets they are utilized to set up the base course to make a wide level surface for the black-top to be put on. Additionally, graders are utilized for evening out the surface during earthwork is banks and giving cover surface prior to spreading counterbalance and laying track.

5: Grader

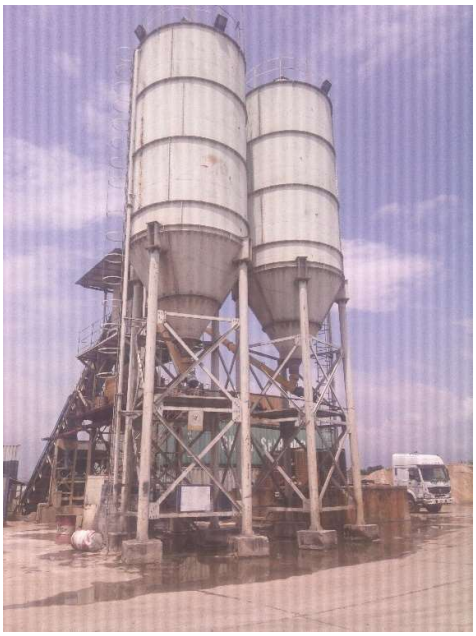
5) **CRANE**

A crane is a lifting machine, generally equipped with a winder (also called a wire rope drum), wire ropes or chains and sheaves that can be used both to lift and lower materials and to move them horizontally. It uses one or more simple machines to create mechanical advantage and thus move loads beyond the normal capability of a human. Cranes are commonly employed in the construction industry, lifting of heavy material, girders etc.

6: Crane

6) **CONCRETE BATCHING PLANT**

A cluster plant or bunching plant, is a gadget that consolidates different fixings to shape concrete. A portion of these information sources incorporate sand, water, total (rocks, rock, and so forth), fly debris, potash, and concrete. There are two kinds of solid plants: prepared blend plants and focal blend plants. A solid plant can have an assortment of parts and adornments, including yet not restricted to: blenders (either slant up or flat or sometimes both), concrete batchers, total batchers, transports, spiral stackers, total containers, concrete canisters, radiators, chillers, concrete storehouses, group plant controls, and residue gatherers (to limit ecological contamination)



7: Concrete batching plant

3.1.2 TOOLS USED ON SITE

Some other tools and implements are:

- Head Pan: It is used for measuring of aggregates (Batching) and transportation of concrete and cement mortar.
- Hammer and Mallet: It was used to drive nails into ground and concrete for markings.
- Jack Hammer, Chisel: The jack hammer is powered electrically for demolition work and for breaking concrete. It is used together with a chisel.
- Digger: It is used for excavation works.
- Measuring Tape: There are various types of measuring tapes but the ones we used are the steel and PVC tapes. It is used for measuring both vertical and horizontal distances. The sizes used are the 3.5m for measuring short distances and the 50m for measuring longer distances.
- Hacksaw: It is a hand held tool for cutting steel reinforcements and pipes for the man-hole on site.
- Shovel and Spade: These are used for batching and for mixing of concrete and cement mortar in small quantities. They are also useful in excavation works for proper leveling of the soil before blinding.

3.1.3 MATERIALS

Works on site are done primarily with reinforced concrete and mortar. Some of the materials used are;

1) CEMENT:

The cement is obtained by burning a mixture of calcarious (calcium) and argillaceous (clay) material at a very high temperature and then grinding the clinker so produced to a fine powder. It is the matrix or binder in a concrete mix. When cement is mixed with water, the cement hydrates, forming microscopic opaque crystal lattices encapsulating and locking the aggregates into a rigid structure.

There are various types of cement depending on its use, but during my industrial attachment, we made use of the ordinary Portland cement because there was no special condition prevailing on site.

2) AGGREGATES:

There are two types of aggregates that was used in the construction process, they are;

i. Coarse Aggregate: It refers to those materials like clinker, granite, gravel etc. They give mass to the concrete and prevent shrinkage of cement.

ii. Fine Aggregates: this refers to those materials like stone dust, sharp sand etc. It prevents shrinkage of cement and when surrounded by cement it gains mobility, enters the voids in coarse aggregates and binding of components takes place. It adds density to concrete, since it fills the voids.

3) WATER:

It is needed for both mortar, concrete production and other site needs. In concrete production, water is added to start the hydration process and to give the mix workability. The water used on site was ensured to be of adequate and good quality and free from impurities which are likely to affect the strength and/or quality of mortar or concrete.

4) PVC PIPES:

These are pipes that were used for the construction of the man-hole (service duct) for passage of telecommunication firm cables and other materials that needs to be taken underground.

8: Pvc pipe used on site

1) **REINFORCEMENT:**

Concrete is acceptable in opposing pressure yet exceptionally powerless in opposing strain. Thus support is given in the solid any place pliable pressure is normal. The best support is steel, since rigidity of steel is very high and the connection among steel and cement is acceptable.

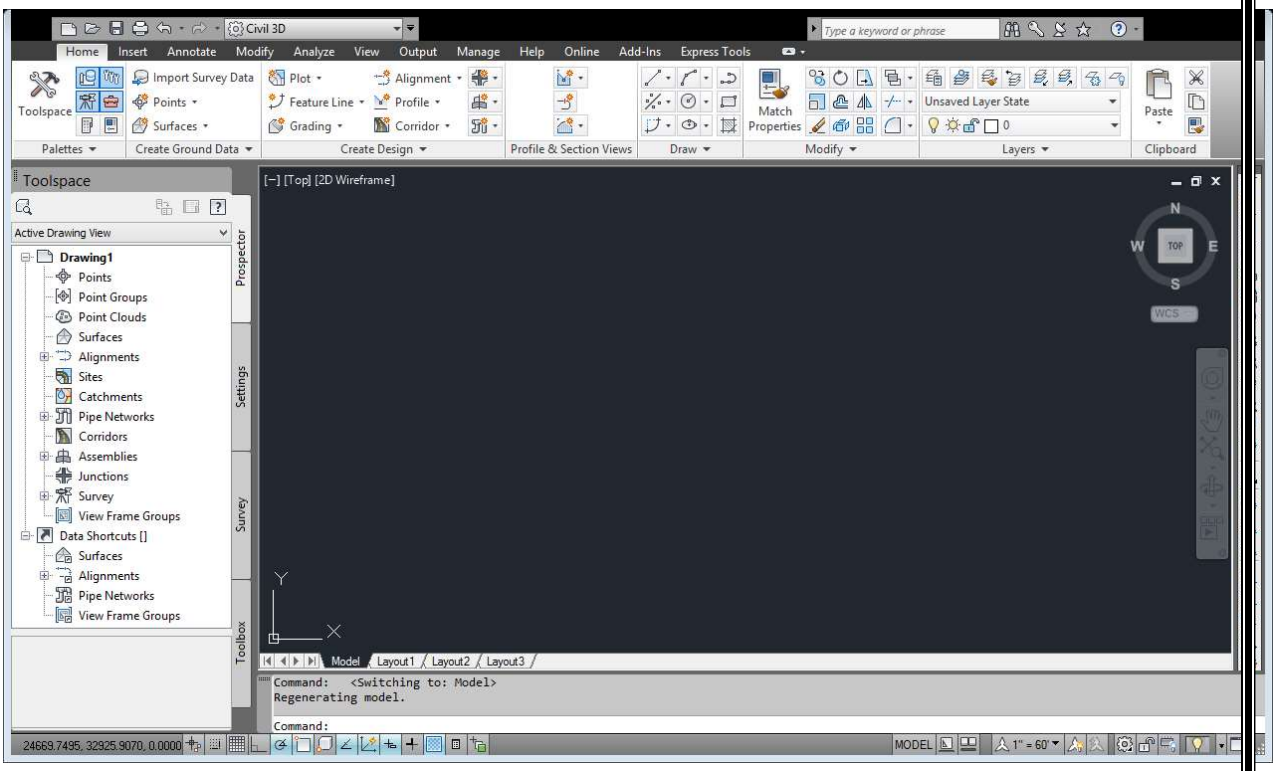
Fortifications are generally as gentle steel or high return steel bars of 6 mm to 32 mm width.

3.2. AUTOCAD DESIGN

During my first week at the administrative center, I was given more knowledge on some different highlights of autocad like design, model, layout, scale, plotting, printing and so forth and furthermore I was offered drawings to recreate and print out.

3.2 1. LAYOUT

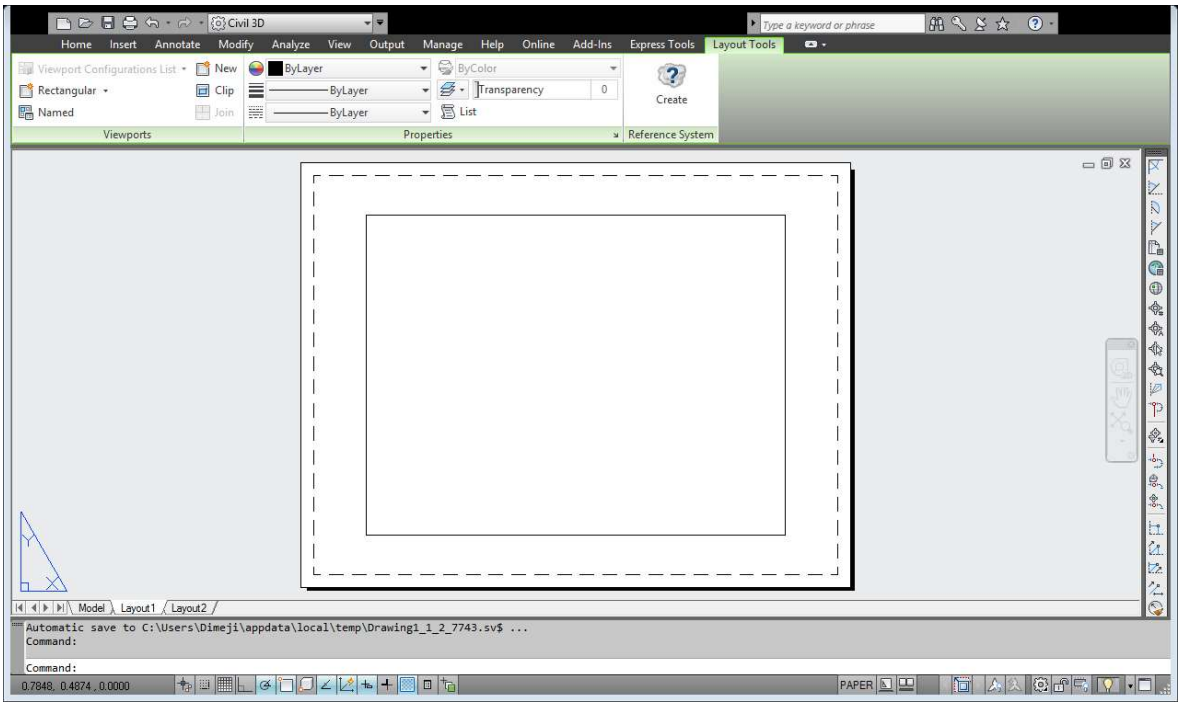
Drawing is done on the design for simpler utilization of scale. For another format, rightclick on the model symbol and snap on new design. Designs can likewise be duplicated, renamed or moved.



9: Autocad design model

3.2.2 Model to layout

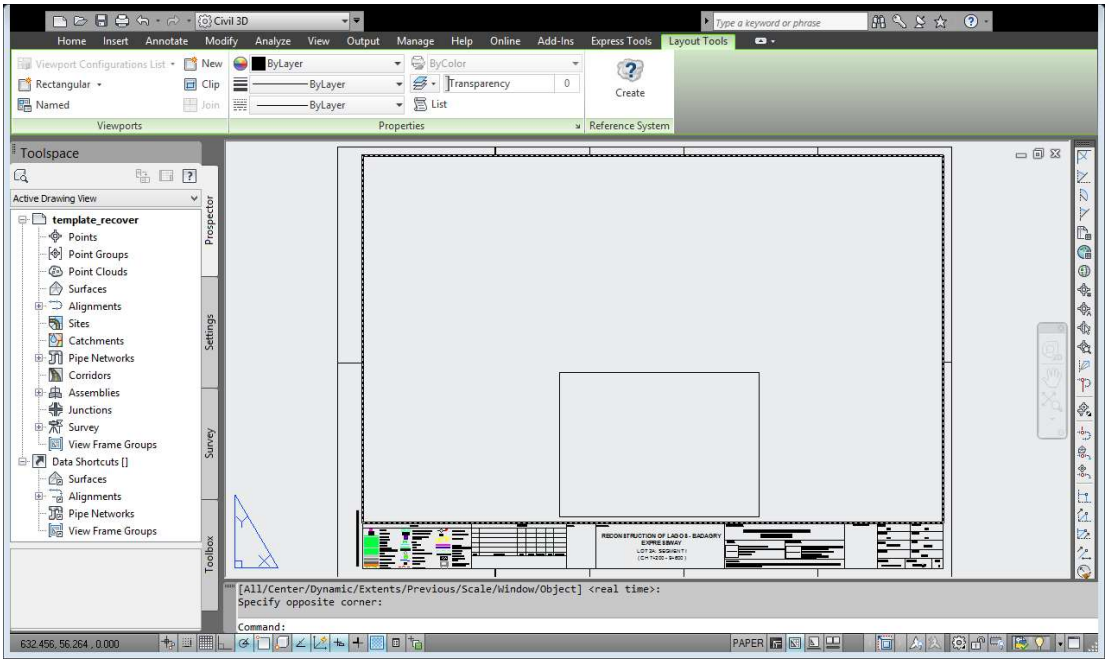
Drawings can be moved from the model to the format. To move the drawing, click on model, click on layout1 or some other layer and you will see the drawing you created in the design. To erase any drawing inside the viewport, double tap on the viewport and select what you need to erase and erase. On the off chance that you need to return, double tap outside the viewport or type "PS".



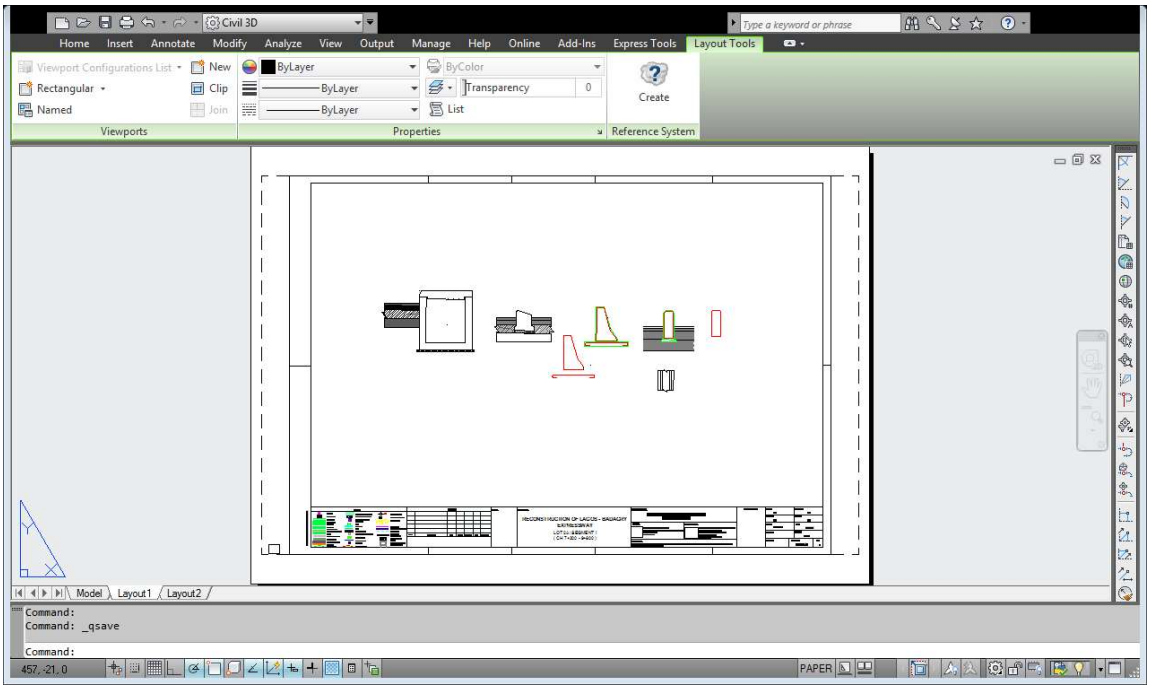
10: Autocad design layout

3.2.3 TEMPLATE

The format is reordered into the design you need to utilize. In the event that the drawing doesn't show in it, it is a direct result of the distinction in scale. Type zoom and press enter, type e and press participate in then the drawing it will bring it out.



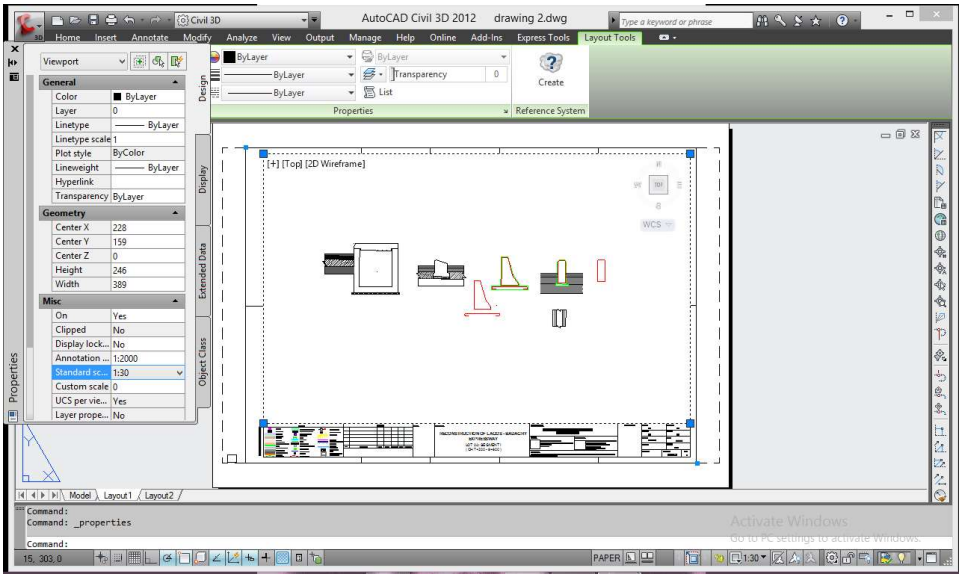
11: Template



12: Insertion of drawings into template

3.2.4 SCALE

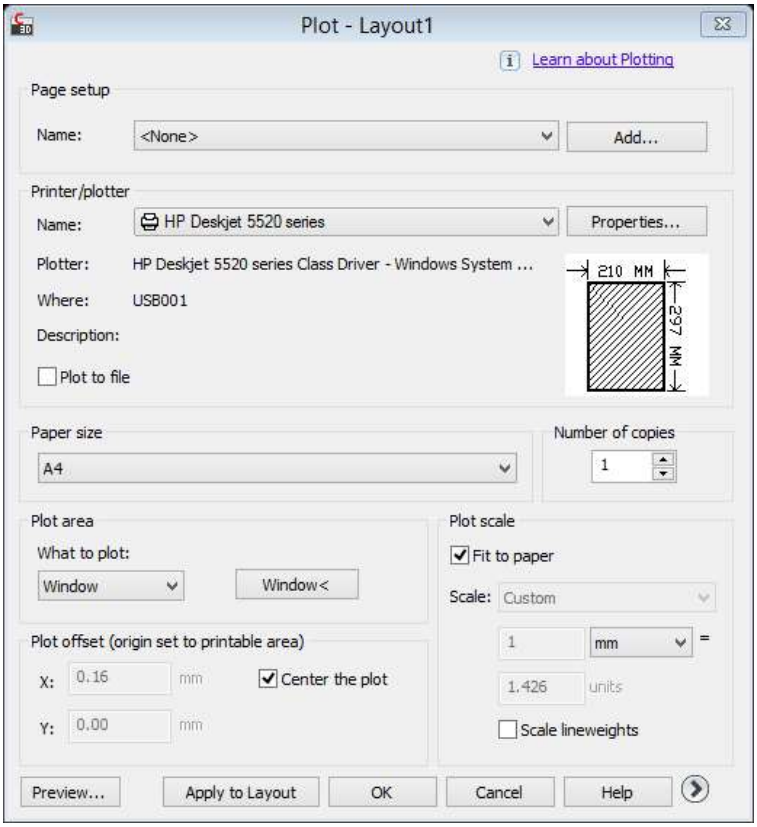
To change the scale, right click on the viewport and click on properties. Go to scale and click on standard scale to choose the desired scale.



13: Changing to a desired standard scale

3.2.5. PRINTING

To print, click on the autocad icon, then click on print. Choose the printer, paper size, click on plot scale(choose fit to paper), click on what to plot(choose window), preview and print.



14: Plotting for printing

Contact Us:

University Campus Address:

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Vadaant Gyan Valley, Village-Jharna, Mahala Jobner Link Road,

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