

Arab academy for Science, Technology and Maritime Transport  
College of Engineering and Technology  
Construction and Building Engineering Department



# الأكاديمية العربية للعلوم و التكنولوجيا و النقل البحري كلية الهندسة و التكنولوجيا

## قسم هندسة التشييد و البناء

### مشروعات التخرج ٢٠١٤ - ٢٠١٥



## List of Projects

	Project		Project
1	Geotechnical and Foundations	9	Airport
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5	Highway	13	Construction Management (1)
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7	Surveying	15	Construction Management (3)
8	Traffic		

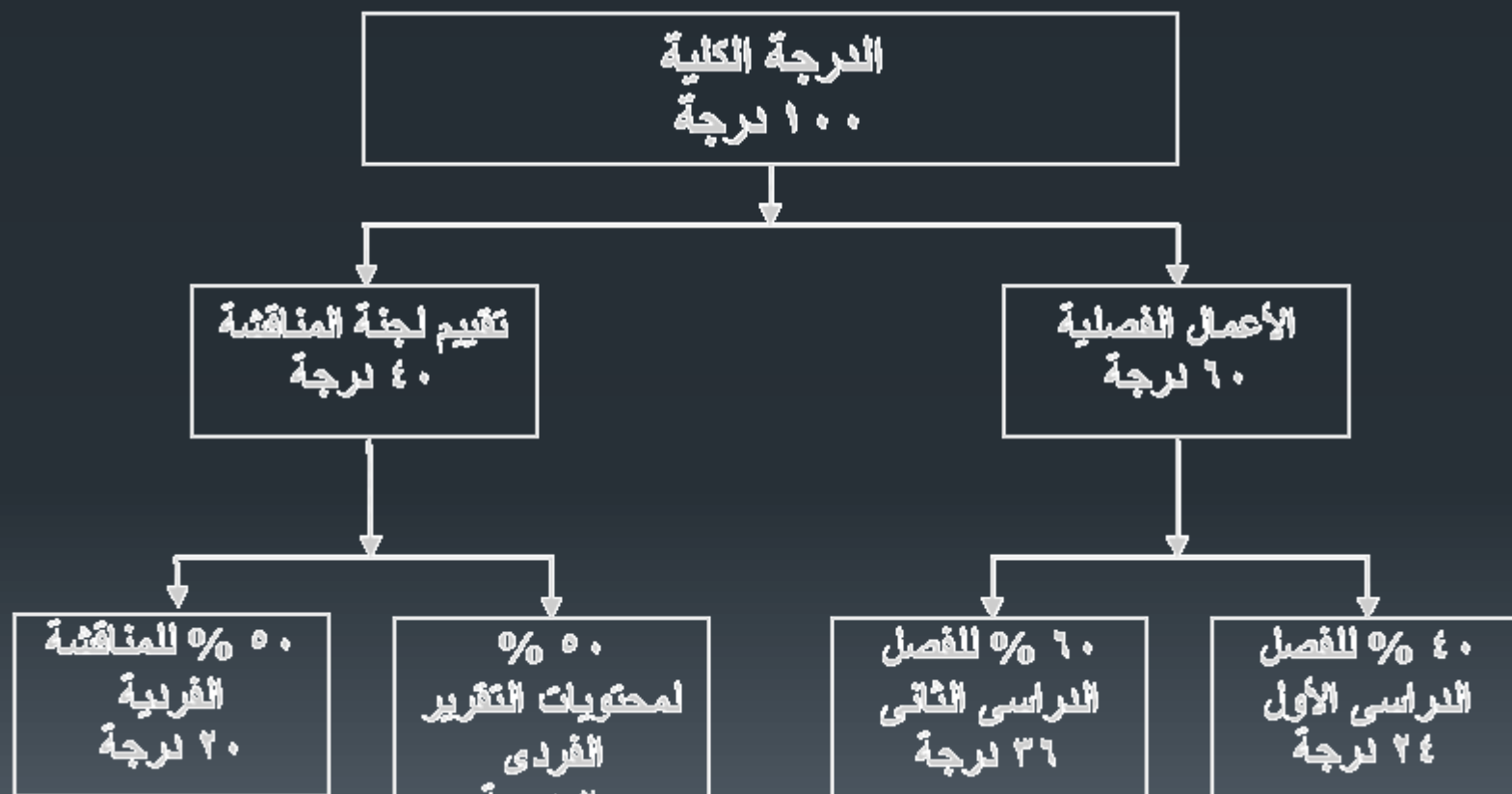


## Project Submission Requirements

- 1- Calculation sheet for all project elements.
- 2- Layout of the whole project.
- 3- Illustrative detailed drawings of the project.
- 4- The final report is expected to include; quantity survey for construction materials and labor requirements with realistic cost estimate and planning for the project; a draft for construction contract and detailed schedule for all construction phases.
- 5- Design poster for the project
- 6- PowerPoint Presentation



## Project Evaluation





## Basis of Project Evaluation

### ١- الاهتمام والتعاون:-

- أ-الحضور المنتظم للقاءات مع المشرف (٨٠% من عدد المرات على الأقل).
- ب-التعاون الايجابي مع المشرف والمجموعة.

### ٢- عرض المشروع على المشرف:-

- أ-المظهر الشخصي.
- ب-الاعداد الجيد للعرض.
- ج-التجاوب مع اسئلة المشرف.
- د-جودة العرض.
- هـ-تطبيق النظريات العلمية لحل المشكلة تحت الدراسة.
- و-عرض وفهم الابعاد المختلفة المؤثرة فى المشكلة تحت الدراسة.
- ز-الحلول الجيدة للمشكلة تحت الدراسة

### ٣- تقرير المشروع:-

- أ-التنسيق وجودة وتسلسل عرض الافكار.
- ب-العرض الجيد للحالات الشبيهة التى سبق نشرها وعلاقة ذلك بموضوع المشروع.
- ج-ارتباط الانشطة المختلفة لتنفيذ المشروع مع نوعيته.
- د-موائمة الخلاصة والتوصيات مع نوعية المشروع.
- هـ-توافر قائمة مراجع كافية ومناسبة لنوعية المشروع.

### ٤- المناقشة النهائية:-

- أ-المظهر العام والسلوك الشخصى.
- ب-طريقة عرض المشروع.
- ج-فهم وتقديم محتويات المشروع والمعلومات العامة المرتبطة به.
- د-الفهم الجيد للاسئلة والتفاعل معها.
- هـ-التفهم الجيد للموضوع العام (الذى تقوم به المجموعة ككل) مع الاحاطة بالعلم الجيد للموضوعات التفصيلية التى يدرسها زملاؤه فى المجموعة.



## 1- Geotechnical and Foundations

The design projects for geotechnical students are chosen to involve a significant current project in which geotechnical problems play a critical role in project delivery. Geotechnical students work closely with structural engineering students to develop an interdisciplinary approach and experience the atmosphere and professional interactions of a real design office.

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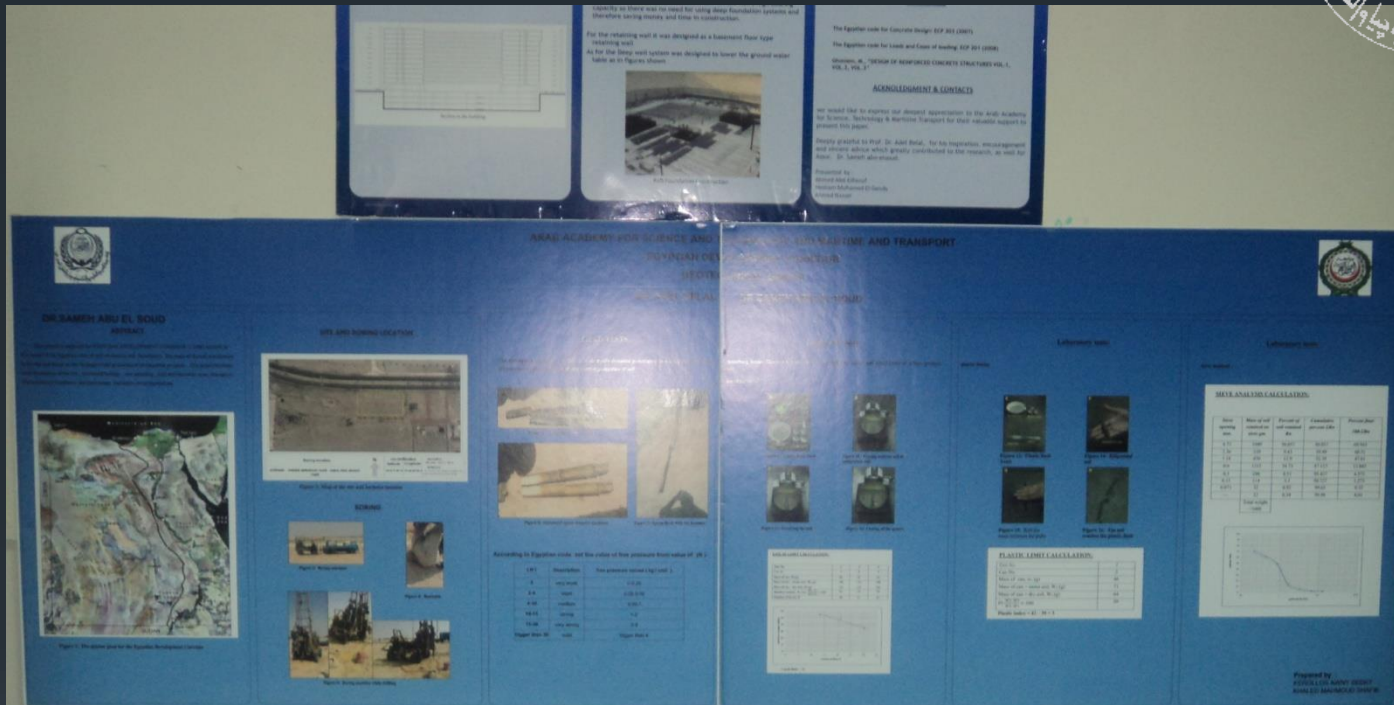




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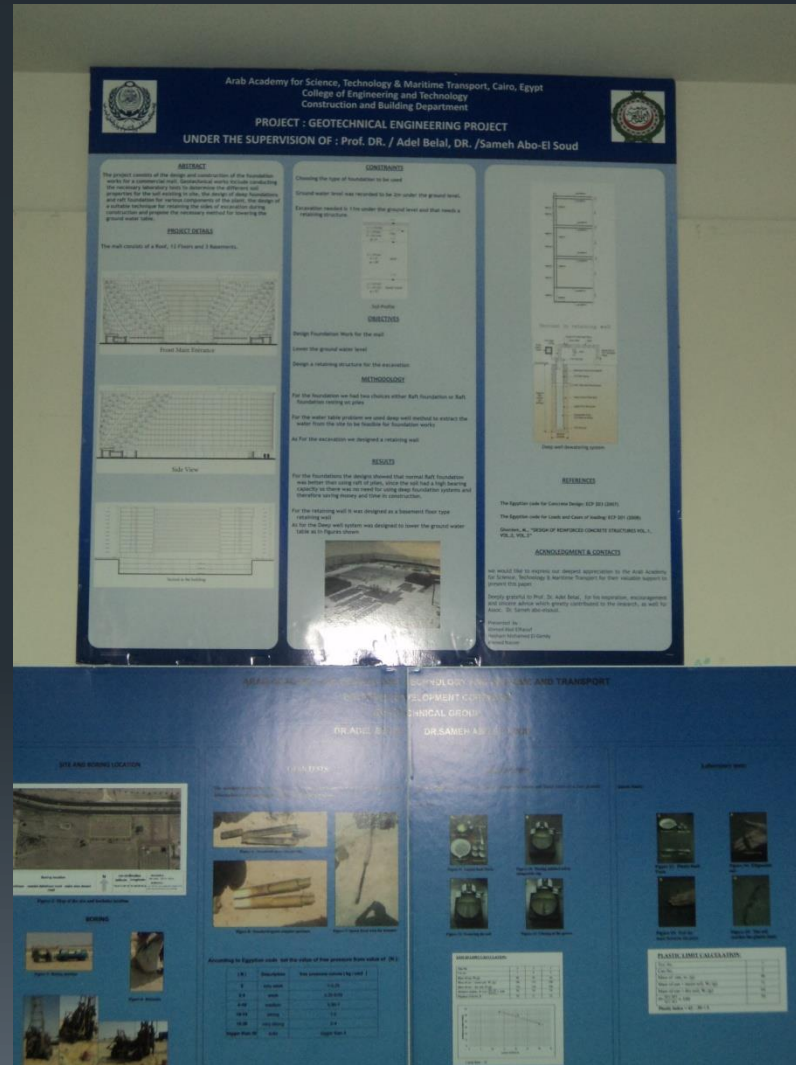




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## 2- Design of Metallic Structures

The project is intended to provide the student with a realistic experience on how to design and construct composite structures using the **Egyptian Code of Practice**. The student will apply the knowledge he accumulated over his undergraduate studies, to propose the following:

1. Select adequate structural systems fulfilling the architectural requirements and carry a complete structural analysis for the units.
2. Choose the most economical system and determine the internal forces.
3. Design composite elements according to the Egyptian Code of Practice 2001 based on two different way of construction of concrete slabs.
4. Quantity survey and cost estimate for each option with construction schedule.
5. Rank the full construction options for the project from the least to the most economical.

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### 3- Design of RC Structures

The project provides the students with professional experience on how to design different concrete buildings. Students should apply the knowledge they accumulated over their undergraduate studies. They shall be implementing their design such that it abides to the **Egyptian Code of Practice** in addition to other international references to assure a safe design. They are expected to apply some of the knowledge they attained concerning construction management and cost analyses. They are equally expected to provide detailed plans and shop drawings for construction.

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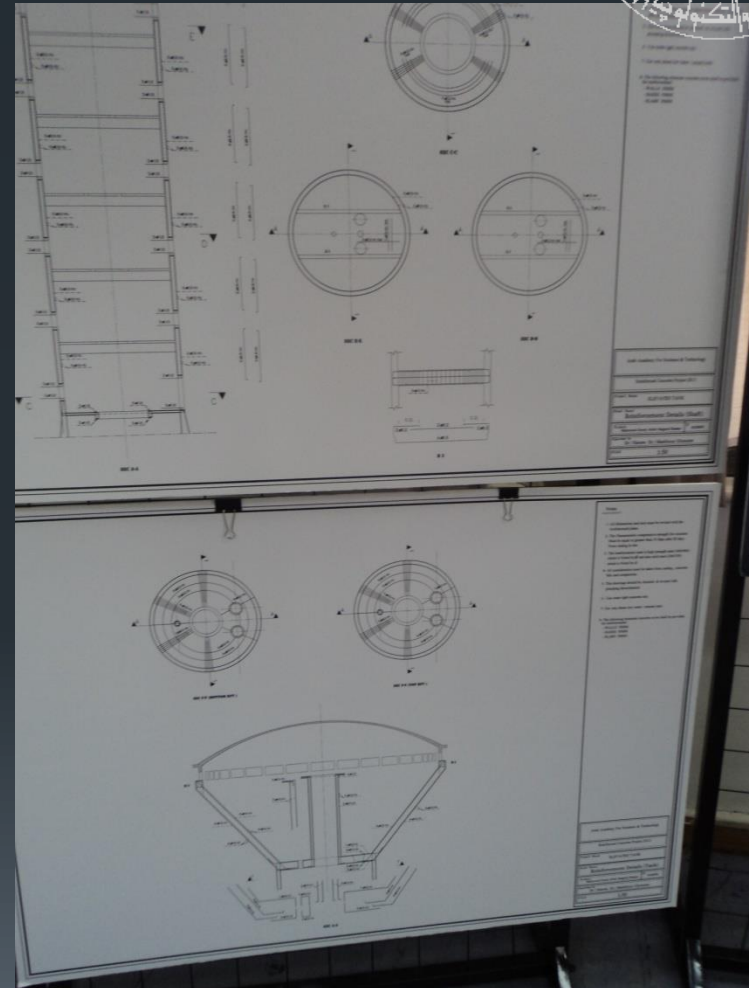
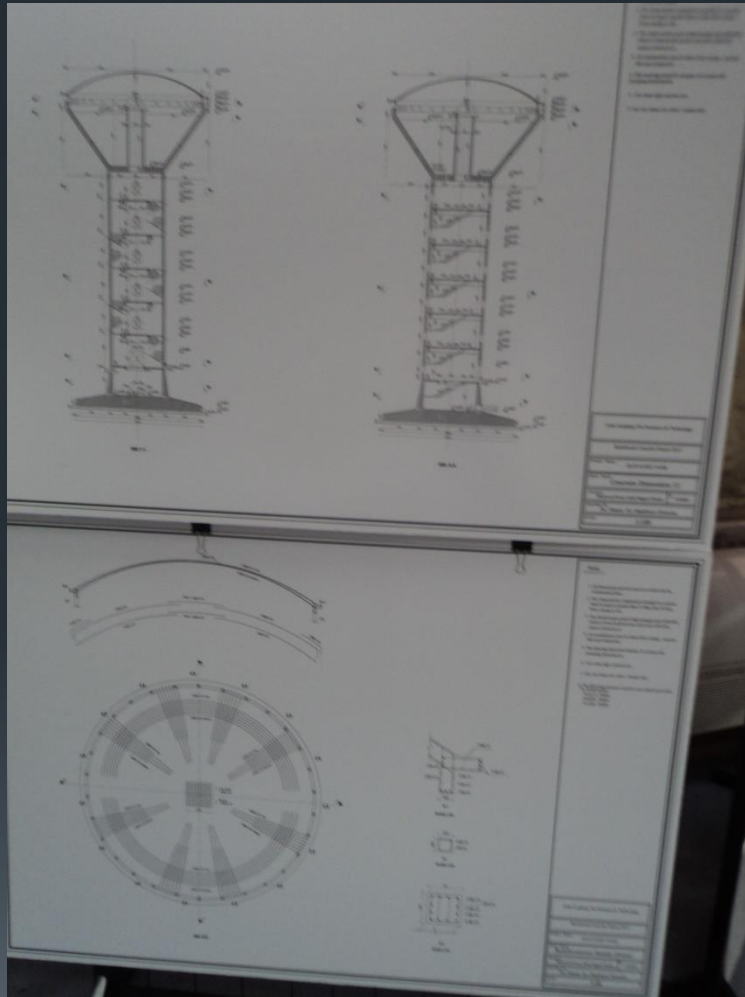




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## 4- Testing of Materials





## 5- Highway

The main aim of the project is to have enough training on actual examples extracted from running project to simulate the market requirements and latest technology. Project is either inner roads network or highway with grade separation intersections. During the solving of this real example, continuous learning of how to deal with different design aspects of highway topics of which horizontal alignments, vertical alignments, at grade intersections, interchanges, roundabouts, parking design, structure design, soil properties, and asphalt layers thickness design. Latest worldwide programs should be used such as Civil 3D, AutoCAD and Auto turn programs



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## 6- Railway

The main aim of the project is to have enough training on actual examples extracted from running project to simulate the market requirements and latest technology. Project is railway track alignment and design of track elements. During the solving of this real example, continuous learning of how to deal with different design aspects of railway topics of which horizontal alignments, vertical alignments, structure design, turnout design, and station design. In addition to above mentioned tasks, the railway construction and quality control are important goals for academy to learn student actual market experience and to execute a safe and economic design according to the Egyptian code of practice.

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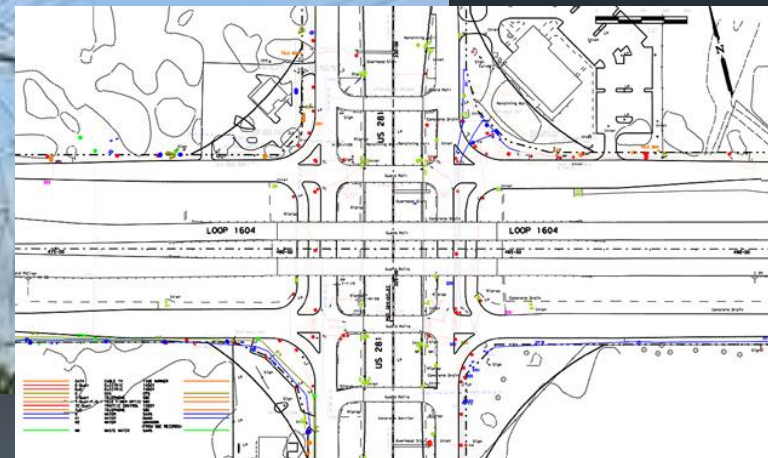


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## 7- Surveying





## **8- Traffic**





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PROJECT: AIRPORT AND HIGHWAY MAINTENANCE

UNDER THE SUPERVISION OF: Assoc. Prof. Dr Ahmed EL - Dosoki

## 9- Airport

### AIRPORT

#### INTRODUCTION + DEFINITIONS

##### INTRODUCTION

According to ICAO, an airport is the base of human or animal life in the air. It is a place where aircraft take off and land, and where they are stored, repaired, and serviced. It is a place where aircraft are stored, repaired, and serviced. It is a place where aircraft are stored, repaired, and serviced.

##### Definitions

Runway: A paved or unpaved surface on which aircraft take off and land. Taxiway: A paved or unpaved surface used for taxiing aircraft between the runway and the apron. Apron: A paved or unpaved surface used for parking, loading, and unloading aircraft.

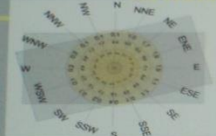


#### DESIGN AIRCRAFT

Aircraft Type: A 380  
Approach Speed: 333.33 km/hr  
Wing Span: 44.84m  
Reference Field Length: 2532m  
Maximum Gross Take-off Weight: 165500 kg  
Maximum Landing Weight: 140000 kg  
Maximum Turning Radius: 50m  
Load On 1 Main Gear Leg: 40000 kg



#### RUNWAY ORIENTATION



We tried to use 1 runway at 90°, but it covered only 94% of coming wind. After many trials we figured out that, it better to use 2 intersected runways (e.g. one of them at 90° and the other at 75°), since it covered 98% of coming wind as shown in the following equation:

$$4.2 + 5.6 + 19.7 + 40.4 + 9.1 = 99$$

#### Design of Runway And Taxiway

Runway: A paved or unpaved surface on which aircraft take off and land. Taxiway: A paved or unpaved surface used for taxiing aircraft between the runway and the apron.

Runway length: 2532m  
Runway width: 44.84m  
Taxiway width: 30m  
Apron width: 100m

##### Runway Width:

Code	A	B	C	D	E
1	15	15	15	15	15
2	15	15	15	15	15
3	15	15	15	15	15
4	15	15	15	15	15
5	15	15	15	15	15

##### Taxiway:

A paved or unpaved surface used for taxiing aircraft between the runway and the apron. It is a paved or unpaved surface used for taxiing aircraft between the runway and the apron.



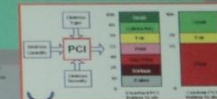
### HIGHWAY MAINTENANCE

#### INTRODUCTION

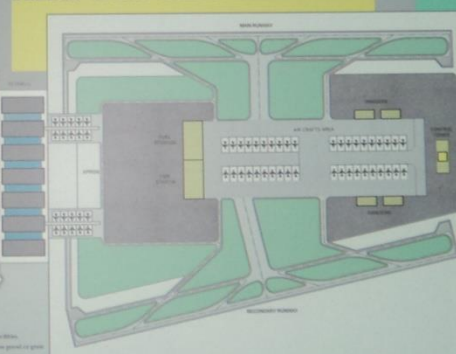
Highway maintenance is the process of keeping a highway in good condition. It involves a variety of activities, including cleaning, painting, and repairing the pavement. Highway maintenance is essential for ensuring the safety and efficiency of the transportation system.

##### Prevention Distresses

The prevention distress index (PDI) is a numerical indicator based on a scale of 0 to 100. It is determined by measuring pavement surface distresses that affect the surface condition of the pavement.



### AIRPORT MASTER PLAN



#### Types of distresses

Distress Type	Severity	Frequency	Location	Notes
Cracking	1-5	1000	Runway	Cracking is a common distress type.
Potholes	1-5	1000	Runway	Potholes are a common distress type.
Surface Discoloration	1-5	1000	Runway	Surface discoloration is a common distress type.
Surface Erosion	1-5	1000	Runway	Surface erosion is a common distress type.
Surface Spalling	1-5	1000	Runway	Surface spalling is a common distress type.
Surface Scaling	1-5	1000	Runway	Surface scaling is a common distress type.
Surface Staining	1-5	1000	Runway	Surface staining is a common distress type.
Surface Stripping	1-5	1000	Runway	Surface stripping is a common distress type.
Surface Weathering	1-5	1000	Runway	Surface weathering is a common distress type.
Surface Abrasion	1-5	1000	Runway	Surface abrasion is a common distress type.

#### Steps to calculate pci

1. Determining street characteristics according to conditions and measurements and make sure they follow the regulations.
2. Determining types of distresses and the number of them in each section and putting them in the PCI sheet.
3. Calculations.
4. Assessing the distress index (DI) (Distress Condition).
5. Calculating the distress index of the section.
6. Calculating the PCI by getting to the table.
7. Rating the section if it is satisfactory or not.

### APPLIED STREET LAYOUT



### MARKING



### LIGHTING



#### TEAM WORK

ISHAK YOUSSEF MANSOUR  
HOSSAM MEGHAMED SOUICK  
AHMED EL-SAYED

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## 10- Design of Coastal Structures

The main aims of the project are:

- How to make planning of the HARBOUR with many varieties of design for the : Breakwater, , Quay walls, Berths , Navigation Channel, slipway, design several ways of dredging, water pipeline, electricity and drainage pipes.
- Cost estimation of all the items of this HARBOUR.
- Design all HAROUR elements according to the Egyptian Code of Practice.



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# 11- Water Projects

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## Water Projects

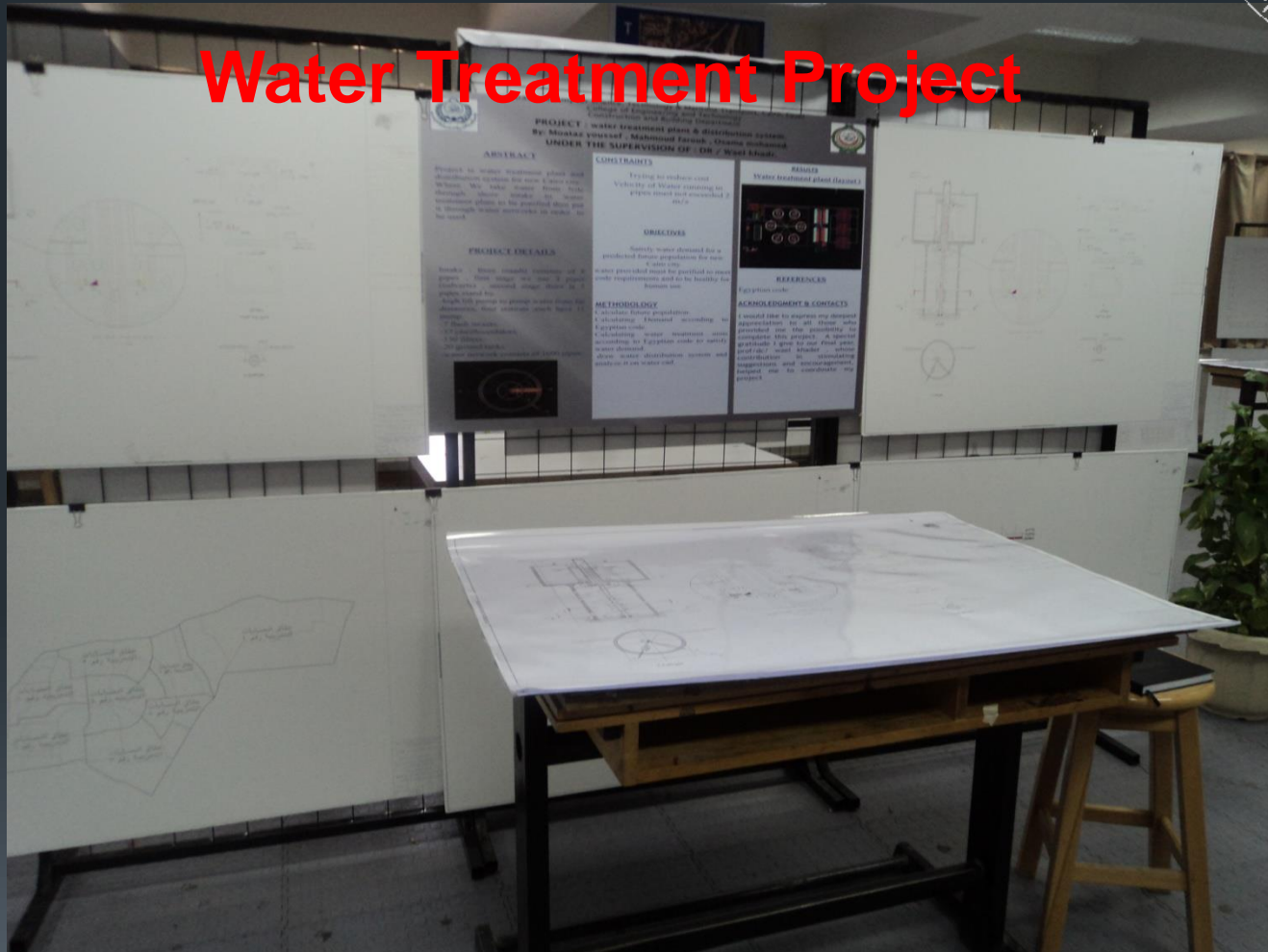




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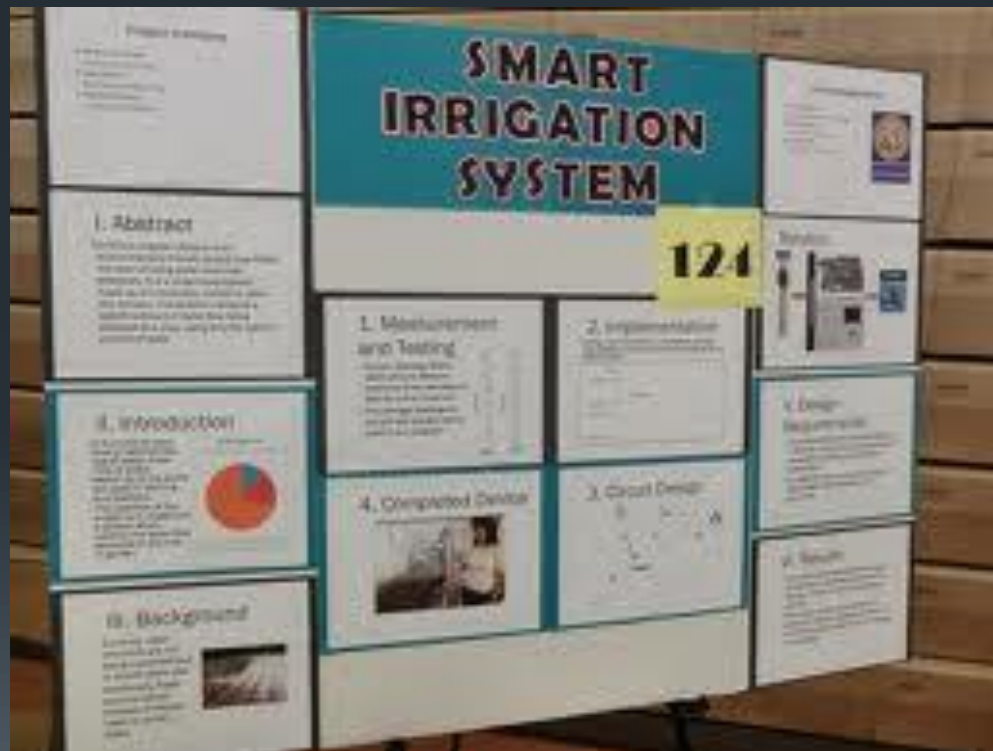


# Water Treatment Project





## Irrigation



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# **12- Environmental Projects**





## **Solid Waste Management**

Solid waste management is an integral component of heavy and large manufacturing industries dealing with safe disposal and reuse of wastes. The project aims to cover:

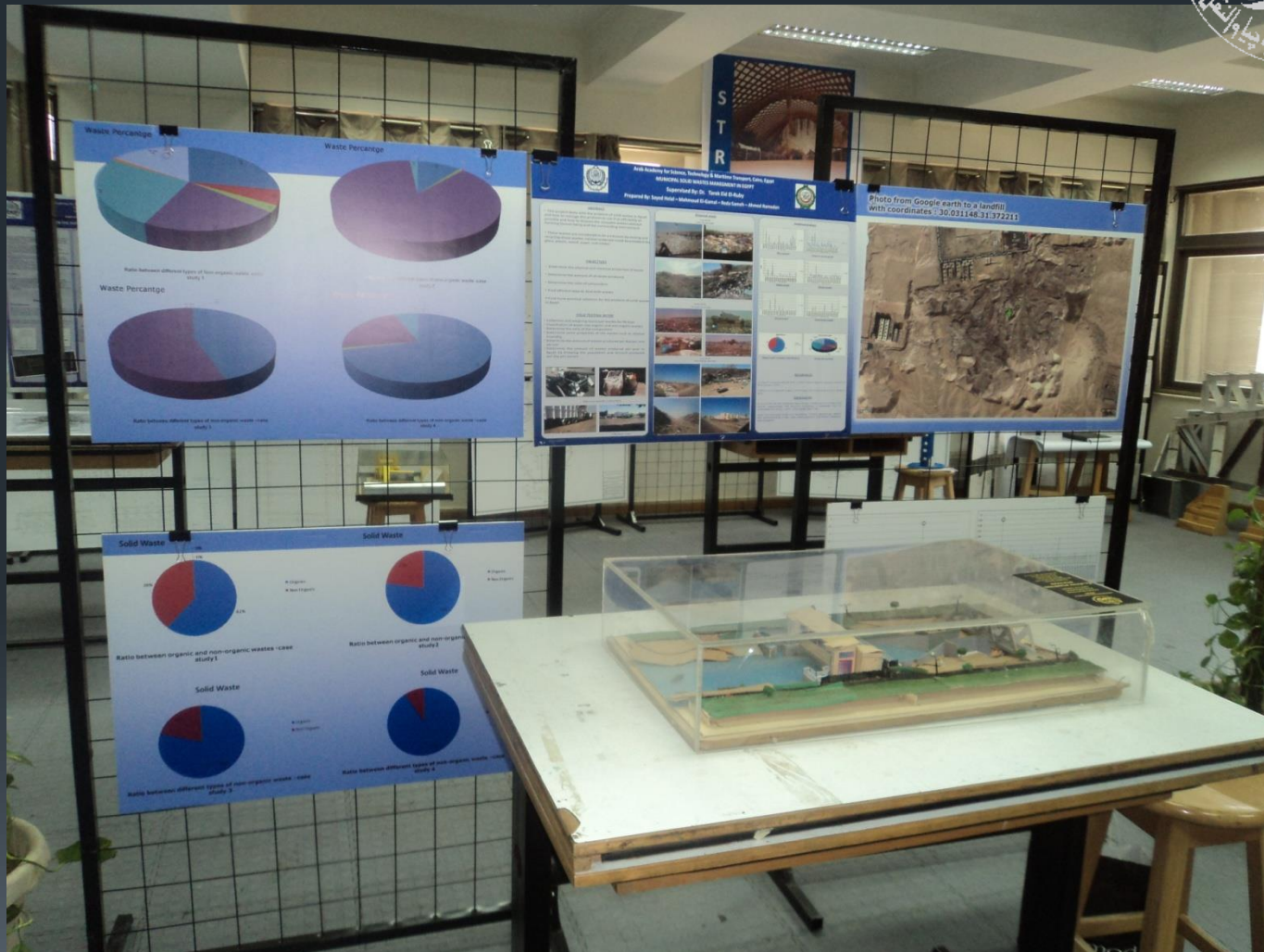
- |  |  |
|--|--|
| <b>1- Public Education and Involvement</b>     | <b>2- Facility Siting and Permitting</b> |
| <b>3- Develop and Waste Management Program</b> | <b>4- Collection and Transfer</b>        |
| <b>5- Source Reduction</b>                     | <b>6- Recycling</b>                      |
| <b>7- Composting</b>                           | <b>8- Combustion</b>                     |
| <b>9- Land Disposal</b>                        |  |

The project emphasizes that the industry plays a major role each of which focuses on some portion of this process.

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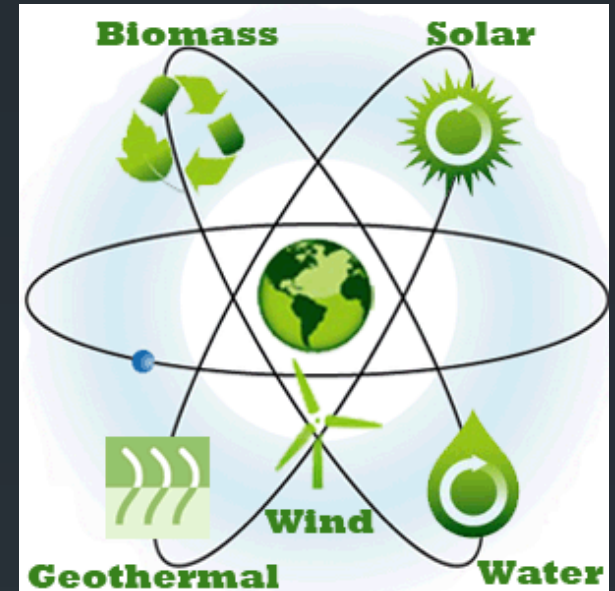
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## Renewable Energy





## 13- Construction Management

The project provides the students with professional experience on how to plan for executing a construction project based on real data from a project under construction. Students should apply the knowledge they accumulated over their undergraduate studies in the field of management, financial, environmental, in order to analyze contracts, estimate quantities and cost, and prepare a plan for the schedule with the project activities and their logical relationships. Students are expected in their final submission to provide detailed plan for executing with the cash flow analysis and risk assessment for the project.



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