Concepts and Trends of Drafting

First, what is Drafting?

- communication through drawn images

Drafting – the first language?

- drawing is the first documented sign of people trying to communicate with one another

Drafting is Technical Drawing

- is the act and discipline of composing plans that visually communicate how something functions or is to be constructed.
- Technical drawing is essential for communicating ideas in industry, engineering, and architecture.

Types of Drafting

1

Sketching

2

Technical Drawings

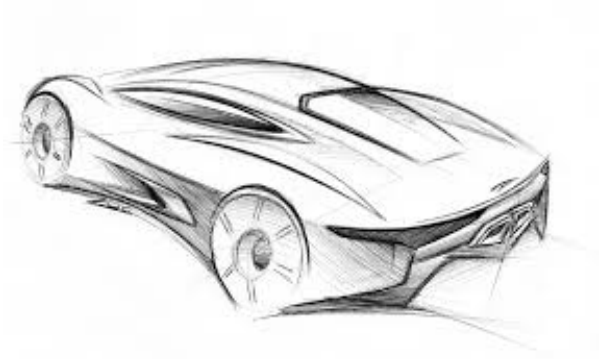
- Multiview Drawings

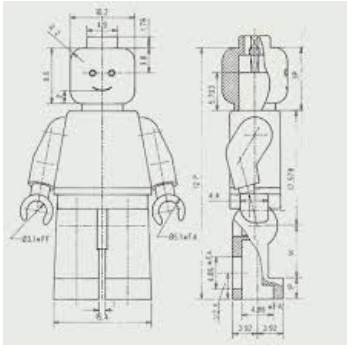
3

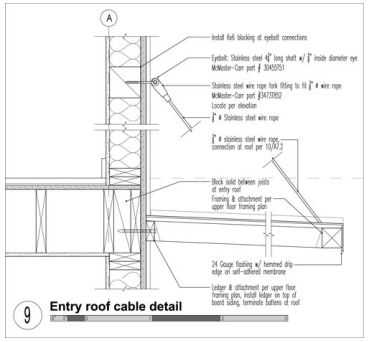
CAD

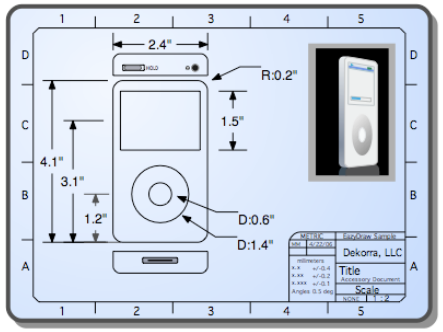
Sketching – First level of drafting

- A sketch is a way to quickly get an idea on paper.
- In sketching, all that is needed is a pencil and piece of paper.
- The most important part of a sketch is Clarity and Proportion.







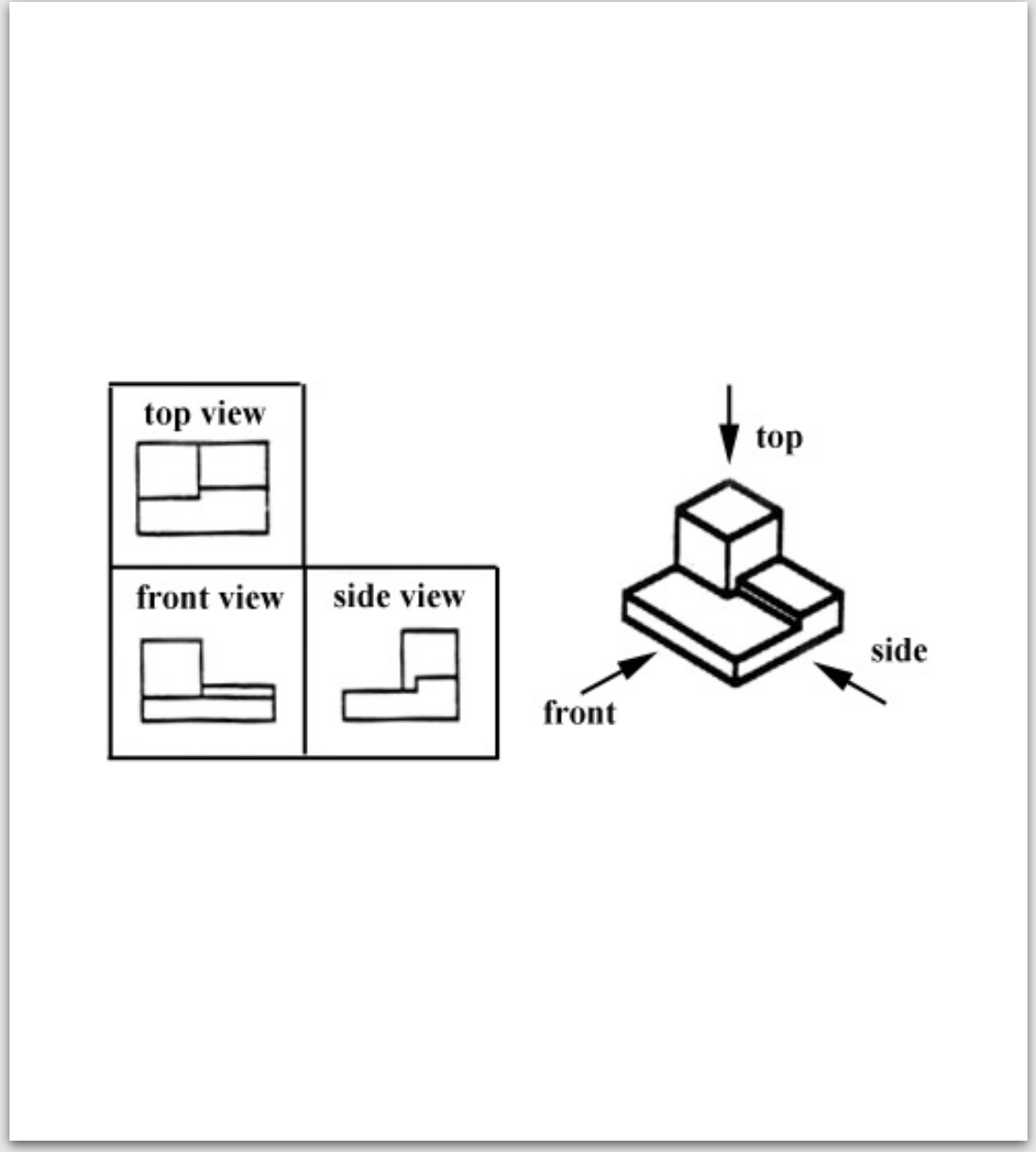


Technical Drawings

- Show true shape and size. (TO SCALE)
- Includes Dimensions
- Clear writing and descriptions

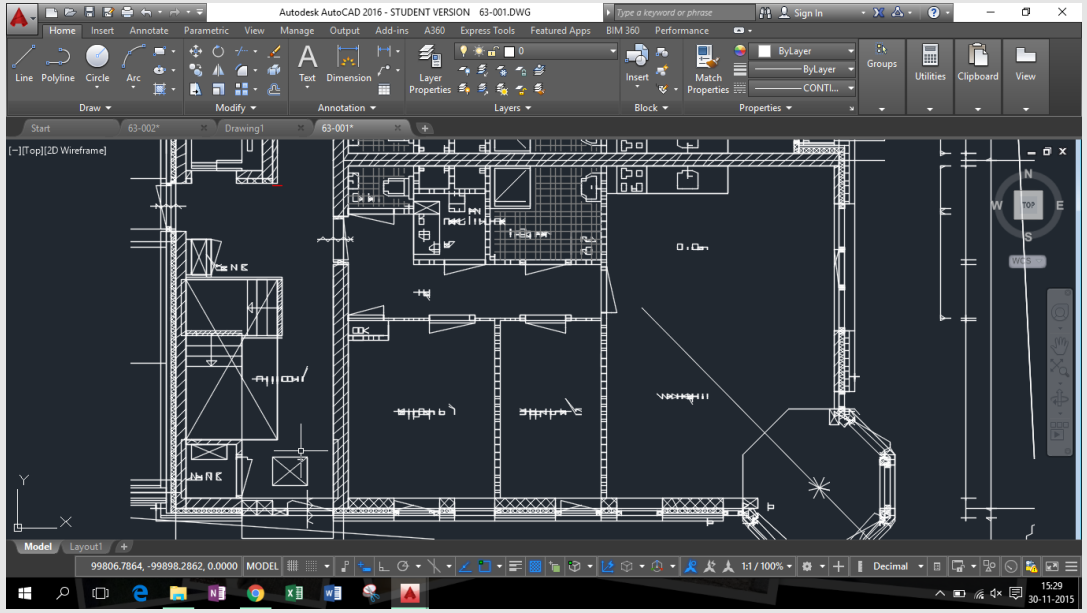
Multiview Drawings

- Front View - Most important view, Has most descriptive view. (shows height and width)
- Top View - view of object from Above. (shows width and depth)
- Right Side View - view of object from the side.(shows depth and height)



CAD

- Computed Aided Drafting
- Use of software such as AutoCAD or Inventor to create 2D & 3D models
- Can be sent straight to a manufacturer for production



Drafting Trends

BIM

- BIM- BUILDING INFORMATION MODELING
  - THE PROCESS OF MANAGING BUILDING DATA THAT COVERS NOT JUST GEOMETRY AND SPACIAL RELATIONSHIPS BUT ALSO GEOGRAPHIC INFORMATION AND PROPERTIES OF BUILDING COMPONENTS.

BIM (Continued)

HELPS TO CREATE MODELS OF THE BUILDINGS ACTUAL PARTS, AND INCLUDE DATA PERTAINING TO THAT PART, SUCH AS SIZE AND MODEL #.

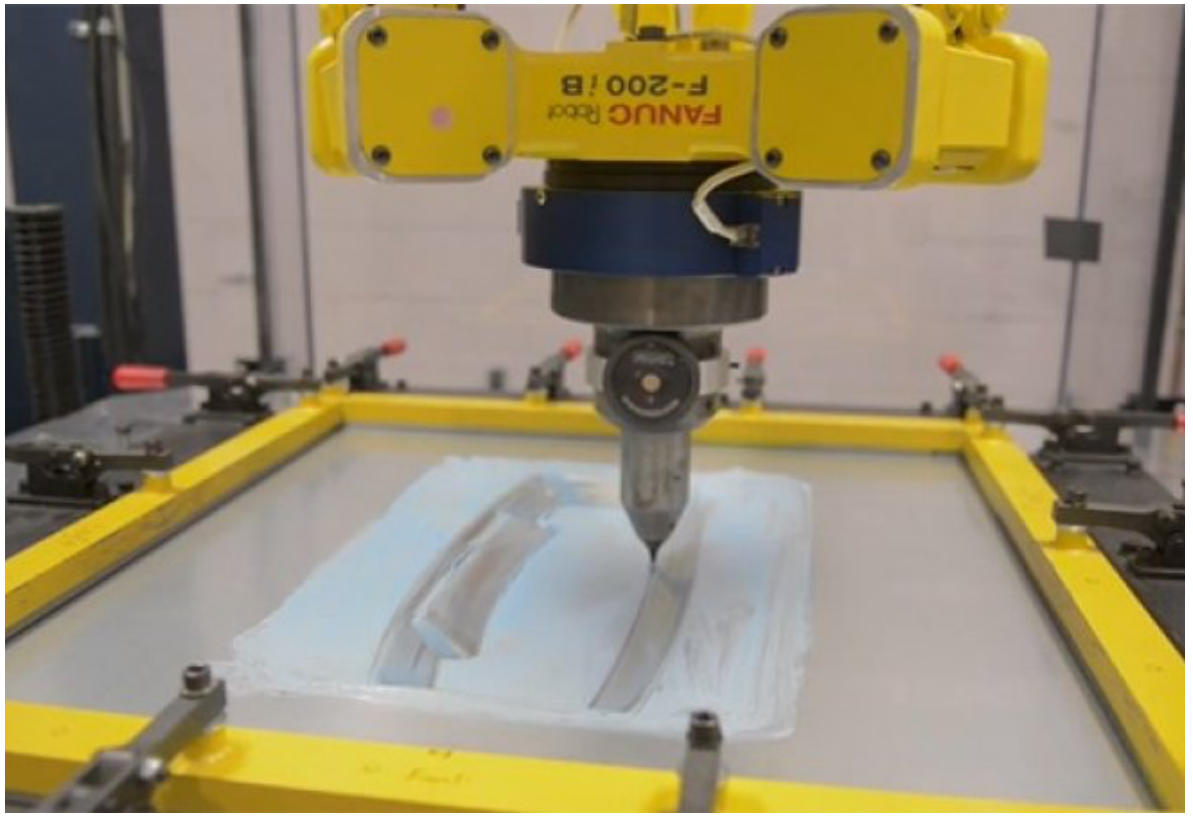
WHEN SHARED BETWEEN THE DESIGN TEAM, THE CONSTRUCTION COMPANY, AND THE OWNER/OPERATOR, THE DATA LOSS ASSOCIATED WITH THE BUILDING MODEL IS MINIMIZED AND ALLOWS FOR DATA TO BE CONTINUALLY ADDED TO THE MODEL.

IT IS TO PROVIDE INSIGHT FOR CREATING AND MANAGING BUILDING AND INFRASTRUCTURE PROJECTS FASTER, MORE ECONOMICALLY AND WITH LESS ENVIRONMENTAL IMPACT.

https://www.youtube.com/watch?v=5Qj9pI5us7o

Rapid Prototyping

- RAPID PROTOTYPING
  - TO QUICKLY PROVIDE A SCALE MODEL OF A PHYSICAL PART OR ASSEMBLY BY USING DATA FROM A THREE DIMENSIONAL (3D) **CAD** DESIGN TO FABRICATE THE PART.
  - THERE ARE A VARIETY OF METHODS TO FABRICATE THE PART, INCLUDING 3D PRINTING



Industrial Design

- INDUSTRIAL DESIGN (OR I.D.) IS:
  - THE DESIGN OF ALL OF THE **STUFF** THAT WE USE EVERYDAY.

UNDERSTANDING INDUSTRIAL DESIGN

- A DESIGNER'S ABILITY TO APPLY BOTH ART AND SCIENTIFIC TECHNIQUES TO HELP CREATE, AND SOLVE PROBLEMS RELATED TO A PRODUCTS FORM, USE, ERGONOMICS, DEVELOPMENT MARKETABILITY AND PROFITABILITY. (I.E. ROADS, BRIDGES, LARGE HOUSING PROJECTS.)

Industrial Designers

DESIGN things like cars, bikes, furniture, tools and equipment, computers, medical devices, house wares, toys –

all the stuff you see in stores, all the stuff people use at home and work every day, the things that most people think just appear somehow.

the term Product Design is another name for Industrial Design.

Sustainable Design

- ALSO KNOWN AS **ENVIRONMENTAL DESIGN**.
- THIS CONCEPT IS CLOSELY RELATED TO SUSTAINABILITY AND GREEN DESIGN AND LEED
- THE CREATION BUILDINGS/ OBJECTS THAT ARE RECYCLABLE OR ARE ABLE TO LEAVE MINOR IMPACT ON THE ENVIRONMENT.

Sustainable Design

- Sustainable design seeks to reduce negative impacts on the environment, and the health and comfort of building occupants, thereby improving building performance.

Objectives of Sustainable Design

Reduce	Reduce Consumption of Non-Renewable Resources
Minimize	Minimize Waste • Raw Materials Used in Construction • Packaging: Pre-Use and Post-Use • Reduce – Reuse - Recycle
Create	Create Healthy, Productive Environments • Use Non-Toxic & Recycled Building Materials • Use of Natural Lighting & Ventilation

Sustainable Design Principles

Optimize	Optimize Site Potential
Minimize	Minimize Non-Renewable Energy Consumption
Use	Use Environmentally Preferable Products
Protect and Conserve	Protect and Conserve Water
Enhance	Enhance Indoor Environmental Quality
Optimize	Optimize Operational and Maintenance Practices

LEED

- LEADERSHIP in ENERGY & ENVIRONMENTAL DESIGN
- DEVELOPED BY THE U.S. GREEN BUILDING COUNCIL TO HELP WITH THE ENVIRONMENT RESPONSIBILITY.
- LEED HAS EVOLVED TO BE THE REPRESENTATIVE AND LEADER IN GREEN BUILDING TECHNOLOGIES.
- IF YOUR DESIGN IS LEED CERTIFIED YOU RECEIVE TAX CREDITS FROM THE GOV'T AND OTHER PERKS AS WELL.

What is LEED?

LEED is a green building tool that addresses the entire building lifecycle by recognizing best-in-class building strategies, thereby reducing its overall impact on the environment.

LEED is a program that provides third-party verification of green buildings.

Building projects satisfy prerequisites and earn points to achieve different levels of certification.

How does LEED work?

Projects earn points to satisfy green building requirements in specific categories.

Within each of the LEED credit categories, projects must satisfy prerequisites and earn points.

The number of points the project earns determines its level of LEED certification.

5 Main Credit Categories of LEED

- **Sustainable sites credits** encourage strategies that minimize the impact on ecosystems and water resources.
- **Water efficiency credits** promote smarter use of water, inside and out, to reduce potable water consumption.
- **Energy & atmosphere credits** promote better building energy performance through innovative strategies.
- **Materials & resources credits** encourage using sustainable building materials and reducing waste.
- **Indoor environmental quality credits** promote better indoor air quality and access to daylight and views.

4 LEED Certification Levels

1

CERTIFIED: 40 – 49 Points

2

SILVER: 50 – 59 Points

3

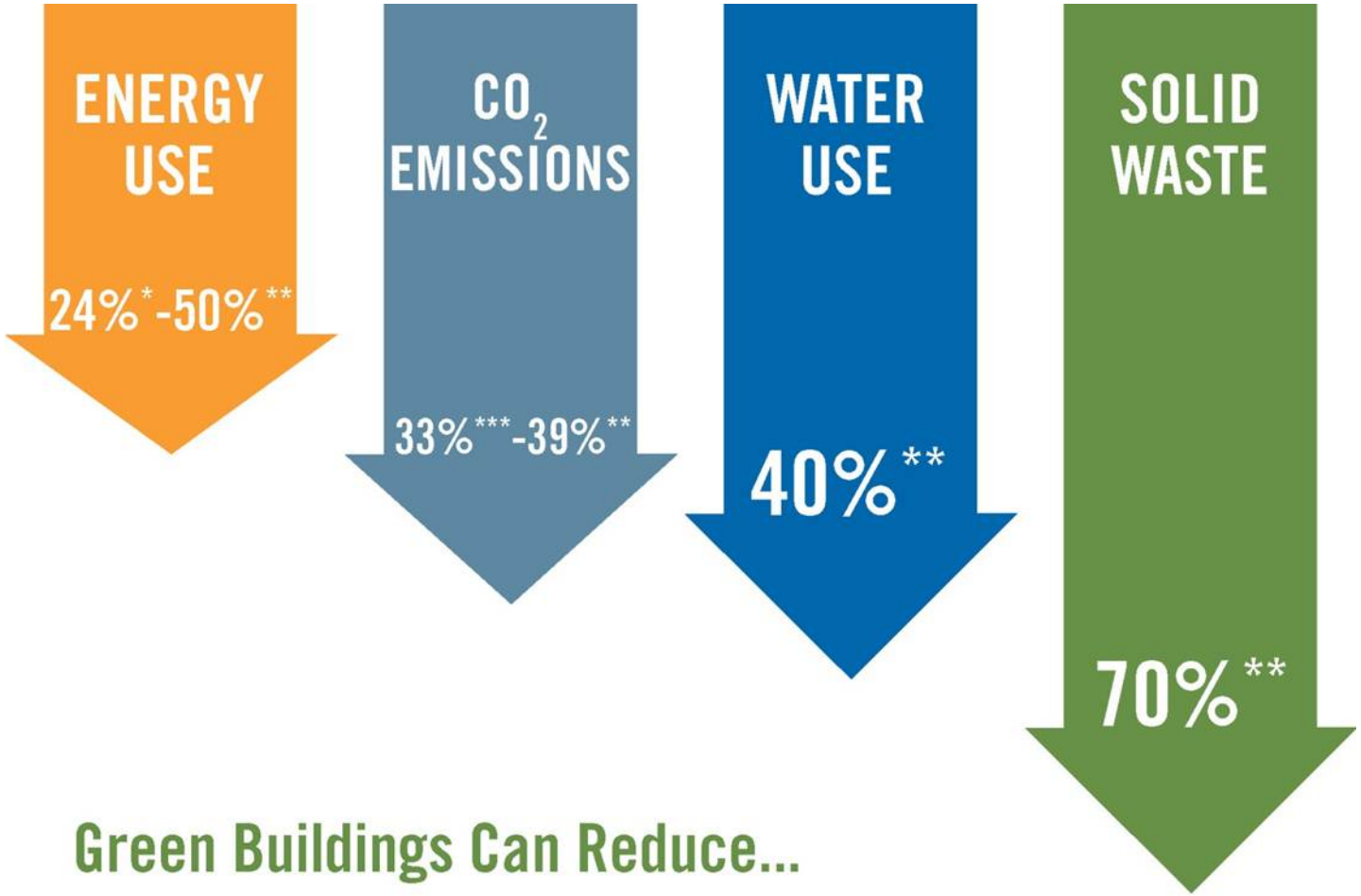
GOLD: 60 – 79 Points

4

PLATINUM: 80 Points and above

Why should you design an LEED Building?

- To Lower Operating Costs and Increase its Resale Value.
- To Conserve Energy, Water and other Natural Resources.
- To Create a Healthier and Safer Building for its Occupants.
- To Qualify for Money-Saving Incentives, like Tax Rebates and Zoning Allowances.



* Turner, C. & Frankel, M. (2008). Energy performance of LEED for New Construction buildings: Final report.
** Kats, G. (2003). The Costs and Financial Benefits of Green Building: A Report to California's Sustainable Building Task Force.
*** GSA Public Buildings Service (2008). Assessing green building performance: A post occupancy evaluation of 12 GSA buildings.

Review

- What is Industrial Design?
  - Industrial Design (or I.D.) is the design of all of the objects that we use every day.
- What is Sustainable Design?
  - Sustainable design seeks to reduce negative impacts on the environment, and the health and comfort of building occupants, thereby improving building performance.
- What is LEED?
  - LEED (Leadership in Energy & Environmental Design) is a green building tool that addresses the entire building lifecycle by recognizing best-in-class building strategies, thereby reducing its overall impact on the environment. It is a tool for achieving Sustainable Design.

Review

- What does BIM mean? What is it for?
  - Building Information Modeling. It is a resource that stores all necessary information regarding a building project, such as physical make-up, data, location, and other characteristics. Basically, it is what it sounds like.
- What is Rapid Prototyping?
  - A quickly produced, full size object or assembly used to test functionality

LEED Activity

Using Google – Find 3 LEED CERTIFIED BUILDINGS IN RALEIGH, NC.)

INCLUDE THE FOLLOWING:

- Name of the building and a BREIF DESCRIPTION of the building and its design.
- WHERE IS IT LOCATED?
- WHAT LEED RATING DOES IT HAVE?
- HAT DID YOU FIND INTERESTING OR COOL ABOUT THIS DESIGN?