ACE ATLANTA MENTOR PROGRAM

ARCHITECTURE · CONSTRUCTION · ENGINEERING

2019 STUDENT RESOURCE HANDBOOK

ACE MENTOR PROGRAM
ARCHITECTURE • CONSTRUCTION • ENGINEERING

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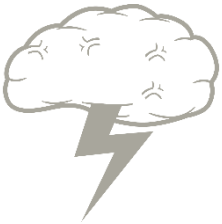

PART 2

PART 3

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Welcome & Challenge

Welcome to ACE Atlanta 2019!

We hope you are ready for an exciting year's program full of project-based learning opportunities and hands-on experiences to readily pursue careers in the A/E/C Industry.

You are the next generation of innovators/entrepreneurs, problem solvers, and stewards for the local community, and with the help of your mentor team, we will help put you on the path to finding your greatness. Are you ready?

Mission Statement:

To engage, excite and enlighten high school students to pursue careers in architecture, engineering, and construction through mentoring and to support their continued advancement in the industry.




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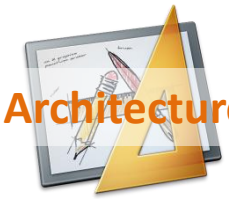
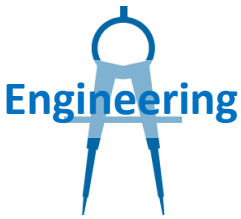
Program Skills Overview

Program Intent

The ACE curriculum is broken up into 3 distinct modules (Architecture, Engineering, Construction), but throughout the course of this weekly hands-on program, you will learn the fundamentals below and practice honing these crafts in our industry to ready you for your future career:



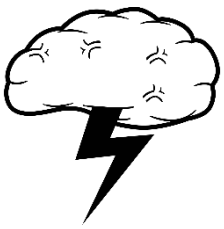


ACE ATL Mentor Program 2019

Student Project Skills Overview

Community Engagement

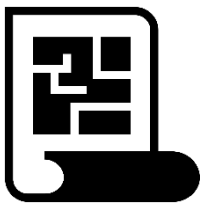
Project Brief



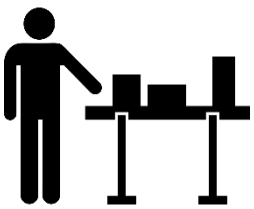
Discovery / Inspiration

Site Analysis / Material Re-Use

Sketch

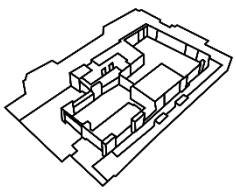


Design Programming



Scale Modeling

Technical Drawings

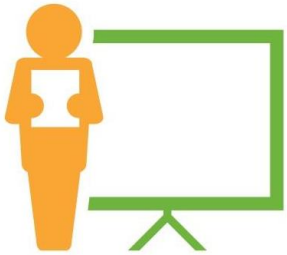


BIM / VDC Technology

Mock-Up / Build

Deliver

ACE Banquet | Student Scholarships



Annual ACE Awards Banquet

The annual ACE Awards Banquet is held at the conclusion of each program term in early May. The final location and date will be shared with everyone as soon as it is set. At this event we want to recognize all the ACE Atlanta location students and celebrate their efforts. Industry professionals are always invited for networking opportunities at the beginning of the night. You never know when it can lead to an internship, which we encourage. Each ACE location puts their work on display and takes a few minutes to tell the story of their project. A nice sit down dinner is served and a special key note speaker is on hand to inspire all.

ACE Student Scholarships

The other highlights are the Awards & Scholarships given out at the end of the night. ACE Atlanta is proud to have handed out more than $20,000+ dollars each of the last couple of years, and we look to up the ante each year that we can through various fundraisers. Please note the ACE Scholarships are open to all Juniors and Seniors looking to pursue a career in an A/E/C field- this includes traditional college degrees or through trade schools.

The scholarships are based on in-class and project participation. If mentors note great effort and attitude, they would like to reward that. There are no final “grades” given on the projects. The application process is based on answering a small set of short essay questions and submitting one mentor referral letter and one teacher referral letter. The Scholarship application deadline will be announced closer to the end of the program so stay posted for that. Scholarship types and amounts are usually not known until right before the banquet. Please talk to your lead mentor for more details and if you have any other questions.

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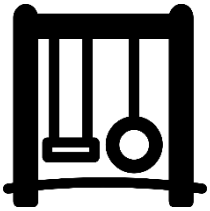
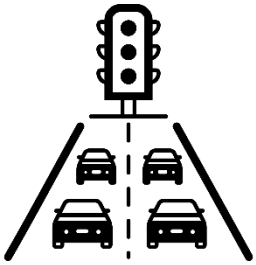
Project Challenge

COMMUNITY HEALTH CLINIC



PLAYGROUND or PLAYSCAPE



ALLEVIATE URBAN TRANSPORTATION CONGESTION

Wild Card

Student Project Challenge

This year the ACE Mentor program of Atlanta is offering 4 possible project challenges, based on this year's ACE National Design Competition guidelines:

- **COMMUNITY HEALTH CLINIC**
- **PLAYGROUND or PLAYSCAPE**
- **ALLEVIATE URBAN TRANSPORTATION CONGESTION**
- **WILD CARD**

Whichever project you choose, follow these 3 principles:

- ✓ Be creative and inventive and have fun.
- ✓ Show a before and after to tell the full story and transformation.
- ✓ Design and use Building Materials that emphasize Sustainability, energy efficiency, and recyclable eco-friendly products.

The ultimate goal of the project is to develop your ability to make a reasoned, coherent, well thought out, clear team presentation conveying design and construction approaches that can serve to better our friends' and neighbors' lives and communities, all within the design parameters laid out. Read on for more project details.

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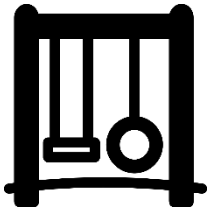
Project Briefs

COMMUNITY HEALTH CLINIC

Create a meeting point for individuals, families, and visitors, in need of medical treatment, checkups, and therapy that will present a whole-life feeling and reduce or eliminate the fear, anxiety, and boredom often associated with visiting medical clinics. The construction features of this facility must be the key to create a place where openness and diversity prevail -- where children, young people, and adults all feel at ease, whether they are the patient or just accompanying such a person. This challenge envisions an integrated clinic serving a local community, therefore should reflect "the style" of the area it will serve.

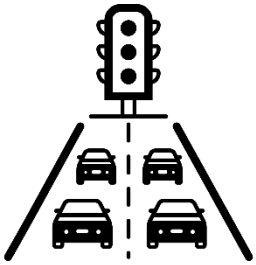
Site selection is critical as well as use/reuse of the available assets in the community (vs. new construction). Central to any solution should be the incorporation of elements that help facilitate the medical interaction (enhance flow, comfort, and recovery), as well as address the needs of accompanying individuals regarding waiting times, diversions, and entertainment. Think safety, too and equipping your final solution with the latest smart building and security technologies. The underlying goal of the design/construction proposal: find innovative ways to make something that is in general done with "dread" into something that enhances people's quality of life and health experiences.

PLAYGROUND or PLAYSCAPE



This challenge seeks to find exciting proposals to transform neglected parts of areas/cities into interactive landscapes, encouraging public engagement, community involvement, and sustainable adaptive reuse. It asks teams to provide a design/construction solution, which advocates creativity and promotes outside activity, increasing socialization, and interaction. Teams should site their proposals in an abandoned or forgotten site (site selection is critical), and develop a new era playground or playscape that creates opportunity for interaction and play for citizens of all ages.

ALLEVIATE URBAN TRANSPORTATION CONGESTION



This option asks teams to tackle the task of alleviating transportation congestion in urban settings. Moving large numbers of people in relatively small or restricted urban areas is an all too commonplace problem in modern societies. The challenge involves identifying the various assets or means of transportation, their relative importance, limitations, and potential to alleviate the congestion. Once identified, Teams propose a single element to be addressed with a cohesive design and CONSTRUCTION solution that has the greatest potential to alleviate the problems.

For example, replace a bridge or put a new one in to vastly improve flow of vehicle traffic, propose high-occupancy toll lanes, enhance or install a mass transit system, improve intermodal points to improve flow, etc. A great local example to look up is the Atlanta Beltline project.

WILD CARD

If one of these 3 projects don't best fit your community and community partner's needs, then you and your group can choose another that does. However, please consult and get approval from your lead mentor and mentor team first.

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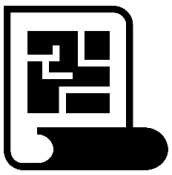
Project Parameters



PROJECT DESIGN PARAMETERS

Design & Build something light, small, and low-cost that makes a <u>Community Impact</u>. Due to project budget restraints, be as resourceful as possible by using recycled/upcycled materials and easily replicable or modular construction methods.

Structure Physical Limits: Maximum 8ft L x 8ft W x 10ft H
If you need a larger footprint, please consult with your lead mentor.

Key Site Considerations to Tie Into:
Site Context, Local Connectivity, Parking, Restrooms
Transportation, Circulation, Accessibility, Site Topography
This needs to be discussed early, during the Site Analysis phase before final site selection.

Key Considerations: City Zoning, Building Codes, Permits, Setbacks, Site Boundaries

Project Size: Scale your project appropriately to meet the needs of the location and end users. Please remember your *<u>limited time and budget</u>*.

Drawing Scale: During the Design Development phase and beyond, use a real drawing scale such as 1/8” = 1’-0” to create final construction ready documents.

Scaled Dimensions TIP: Find a real dimension to start from. If no dimensions are provided, find a common object you know a dimension of. Ex: A regular parking space is typically 9’ x 18’ and stair treads are roughly 1’ deep.

NOTE: Please consult your lead mentor if you have any other questions.

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Program Schedule

The 2019 ACE Mentor Schedule is subject to change based on inclement weather, etc., but below is the general outline that each group will follow on a weekly basis in order to complete the Student Project in time for the end of year ACE Awards Banquet presentations. Note this is based on the traditional AEC Curriculum (design/project management) track vs. the Skilled Trades track. New to ACE Atlanta this year we are adding a more "**Design + Build Studio**" integrated focus as reflected in the activities below. Please talk with your lead mentor if you have any specific questions. The Project Milestones page defines the process in more detail.

	Dates (Day of week varies per location)	**Week**	**Session Topic & Activities – "Design + Build Studio"**
Jan	1/7 – 1/11	ACE week 1	Icebreaker Community Planning Intro **Project Milestone:** Project Introduction & Selection *(start w/ groups of 3+)* Design Inspiration / Vision Boards *(start individually)*
	1/14 – 1/18	ACE week 2	***Field Trip #1 (Architecture)-*** Site Analysis OR Materials Day (OR College / ACE Alumni Day) **Project Milestone:** Find Materials / Select Final Site *(work in groups*)*
	1/21 – 1/25	ACE week 3	Preconstruction 1- Cost Estimate / Materials
	1/28 – 2/1	ACE week 4	Sketching
Feb	2/4 – 2/8	ACE week 5	Design Programming / Narrative Scaled Drawings / Drafting 2D Plans
	2/11 – 2/15	ACE week 6	Handmade Scale Models- Part 1
	2/18 – 2/22	***Winter Break***	***No session***
	2/25 – 3/1	ACE week 7	Handmade Scale Models- Part 2 Preconstruction 2- Scheduling / Planning / Logistics **Project Milestone:** Select strongest project to collectively work on after the Design & Engineering aspects have been tested and optimized. Define Team Roles & Responsibilities.
Mar	3/4 – 3/8	ACE week 8	***Field Trip #2 (Engineering)-*** Fab Shop Tour
	3/11 – 3/15	ACE week 9	BIM / VDC - 3D Models (Computer Lab)
	3/18 – 3/22	ACE week 10	Prototyping / Mock-Ups- Part 1 (Workshop / Site)
	3/25 – 3/29	ACE week 11	Prototyping / Mock-Ups- Part 2 (Workshop / Site)
Apr	4/1 – 4/5	***Spring Break***	***No session***
	4/8 – 4/12	ACE week 12	Construction- Framing / Rough-In (Workshop / Site)
	4/15 – 4/19	ACE week 13	***Field Trip #3 (Construction)-*** Active Jobsite Visit- Site TBD by each lead mentor
	4/22 – 4/26	ACE week 14	Construction- Finishes
May	4/29 – 5/3	ACE week 15	Final Project & Presentation Prep
	5/6 – 5/10	ACE Banquet	Group Presentations; Location To Be Finalized
	5/13 – 5/17		
	5/20 – 5/24	Last Week of School	
	5/27 – 5/31		

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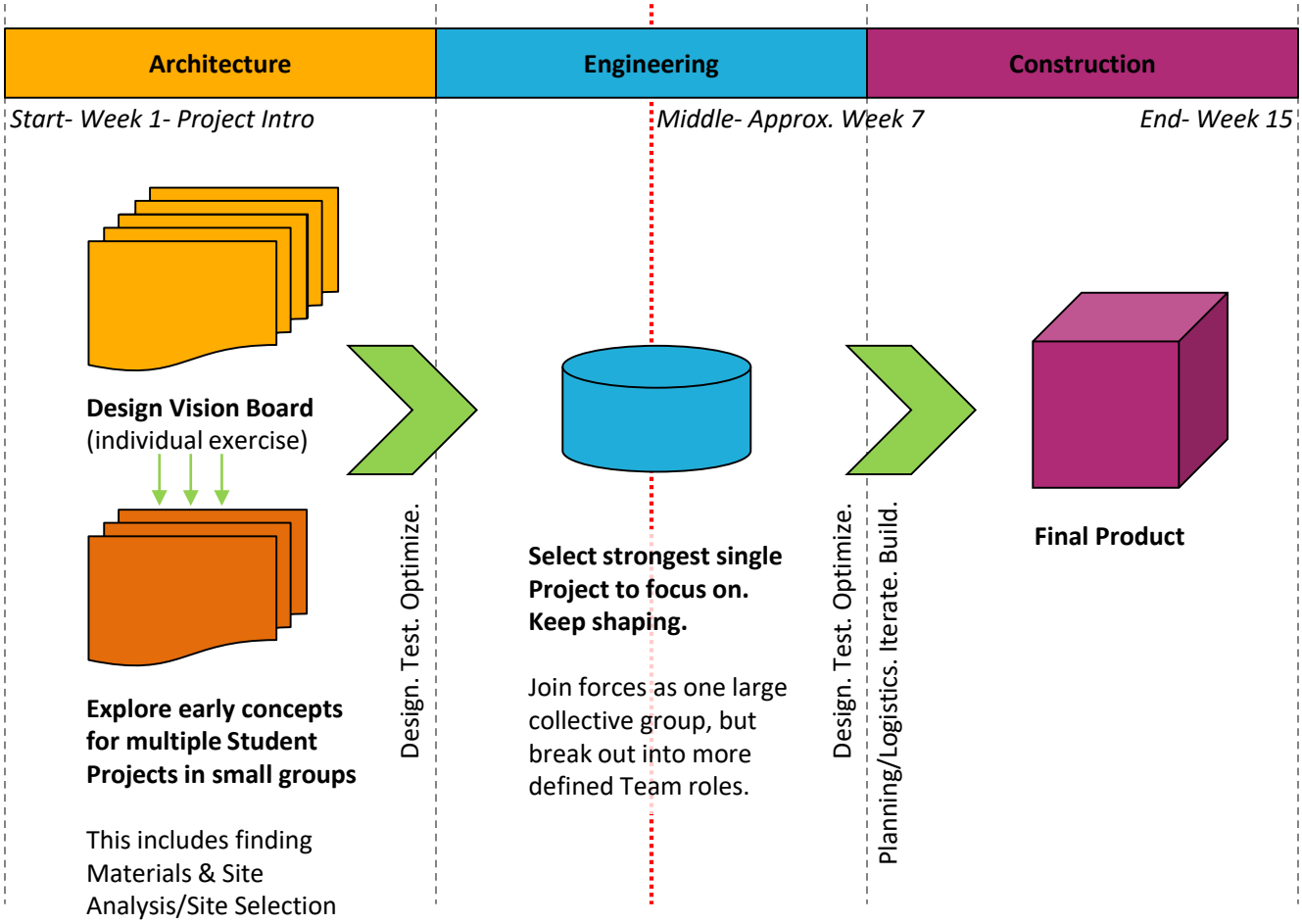
Project Milestones

Note that group sizes may need to vary depending on the number of students at each ACE location. As for **Project Milestones**, it is recommended to start out working in multiple, smaller groups at the beginning of the program, except for the Design Vision Boards exercise where individual work is encouraged. Those ideas can be combined with others', the idea being that the best ones gel to make up one cohesive major design move per project. It's recommended at around Week 7 (the halfway point and after Winter Break) to collectively decide on the strongest project to pursue for the remainder of the program term- that way adequate time, resources, and manpower can be committed to finishing. At this point it is key to define Team Roles to divide and conquer tasks and have stronger communication throughout the process.

Project Milestones Diagram



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Project Final Deliverables

ACE Final Project Deliverables

The following 11 items are the expected final deliverables to have completed and ready for the final project presentations. It is best to divide and conquer tasks between team members. Use the next page to identify Team Roles & Responsibilities. It is also best to complete these along the way, in other words, from week to week and make small tweaks at the end, rather than waiting until the very end to pull everything together.

- ❑ 1- Problem Statement / Design Narrative (include team bio) (1 pg.)
- ❑ 2- Design Vision Board
- ❑ 3- Process Sketches
- ❑ 4- Hand-made Physical Scale Model
- ❑ 5- 3D BIM Model- SketchUp is recommended, but any BIM based software is allowed
- ❑ 6- Final IFC Construction Document Plan Set for Contractor Use
- ❑ 7- Conceptual Estimate- Budget
- ❑ 8- Construction Schedule
- ❑ 9- Bill of Materials- Final Cost / Materials List
- ❑ 10- Final Presentation- Team, Handouts, Graphics, Process / Finish Photos
- ❑ 11- Final Built Structure- Signoff on-site / Handoff to end users

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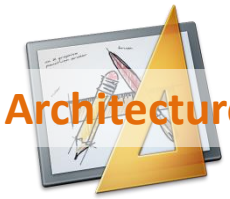
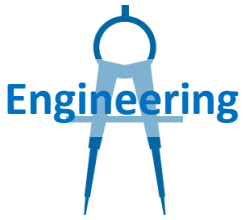
Project Team / Roles

NOTE: Combine roles or assign multiple roles as necessary for each location. Roles can shift depending on the project phase.



Design Manager/Job Captain = _____
Program Manager = _____
Drawing Production/Coordinator = _____
Construction Administration = _____



Structural Design Test Manager = _____
MEP Design Test Manager = _____
Sustainable Energy Manager = _____

Preconstruction- Cost/Scope Engineer = _____
Preconstruction- Master Scheduler = _____
BIM/VDC Specialist = _____
Operations- Project Manager = _____
Operations- Superintendent = _____
Operations- Field Coordinator/Safety = _____
Build Crews (4)- Layout / Framing / MEP (if applicable) / Finishes = _____

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Project Kickoff

PREREQUISITE DIALOGUE – 'ACE Collaborative'

ACE Mentors/Students, High School Construction Teachers, Local Community Partner

A successful partnership will hinge on forming a strong collaborative. Get buy-in from each group by focusing on communication and conversation. Here are a few fundamental questions to answer first:

- ACE Mentors- How can we *Facilitate*? _____
- ACE Students- What do you want to *Design* + *Build*? _____
- HS Teacher Sponsors- What *Resources* do you have to share? _____
- Local Community Partner- And for *Whom* will it *Serve*? What is the greatest *Need*?

_____

PART 1 – READY!

Each ACE Mentor location to identify and fill out:

1- *High School Sponsor(s)*-_____
2- *Community Partner (if applicable)*-_____
3- *Community Challenge / Need(s)*- _____
4- *Group to Serve*- _____

PART 2 – SET!

1- ***Project Selection-***
   - ***Choose Project-*** _____
   - ***Major Design Theme-*** _____
   - ***Project Name-*** _____

2- Define early Team Roles (see Project Team page for more team members details)-

_____

_____

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Project Startup Notes

PART 3- GO!!

Find Materials- Now that you have a specific student project in mind, make a group field trip to a local Recycling Center or salvage yard to find salvageable materials that resonate with your major design move. Make sure they are durable. Use your problem solving skills to think through cladding AND their connections. Have fun and be creative!

My List of Recycled / Upcycled / Salvaged Materials:

Write Other Project Startup Notes & Ideas below (feel free to use sketch paper, etc., too):

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Phase 1
ARCHITECTURE…Design It!

OBJECTIVES:

Provide Design/Architectural Services-

Community Engagement

Project Brief

Discovery / Inspiration

Site Analysis / Materials Re-use

Sketch

Program

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ARCHITECTURE...
DESIGN IT!

Phase 1: Architecture Activities Roadmap

101 GUIDE


Community Conversation

Predesign Services | Site & Community Planning

We will have a "community" conversation about the built environment and what the local community needs are to better their lives. We will also introduce the Student Project and begin filling out the Kickoff package.

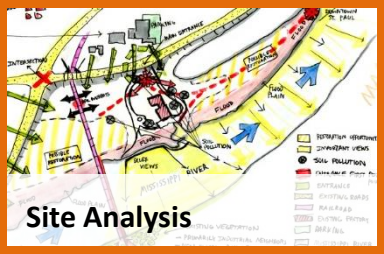
Career Paths | Education | Diversity (optional)

A fun, fast paced game will help guide the group's exploration of various careers, education paths, and diversity within the A/E/C industry. Group discussion with mentors and their shared experiences at the end can help connect the dots and show students that you too can find your own path.


Vision Board

Design Discovery & Inspiration | Site Analysis

You will create a design vision board of various mixed media to capture all your inspiring ideas and to develop your strongest design moves into one cohesive theme. What will best inform the vision boards are the key concepts of undertaking Site Analysis and exploring Materiality of resources at hand.


Site Analysis

Site Analysis | Recycling Center Field Trip (option)

We will wrap up Site Analysis studies and hopefully the group will have an opportunity at a local Recycling Center to find salvageable materials that resonate with your major design move. Make sure they are durable. Use your problem solving skills to think through cladding AND their connections. Have fun and be creative!


Sketch Charrette

Design Sketching Charrette

We will learn some principles of sketching and then you will apply those skills to your project through a sketching "charrette" exercise. Use this time to explore any and all design "moves".


Programming Puzzle

Space Planning & Design Programming

We will walkthrough the basics of design programming and apply that to your design in a fun and engaging activity. This forms the basis for final drawings.

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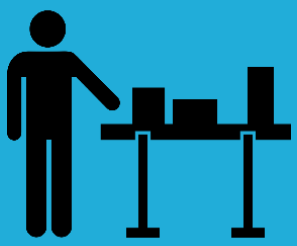
Phase 2
ENGINEERING...Problem Solve It!

OBJECTIVES:

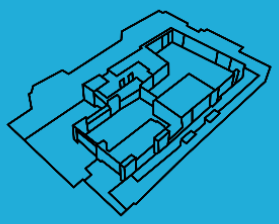
Provide Engineering Services- Test…Analyze…Optimize Your Design

Scale Model



Technical Drawings

BIM / VDC Technology



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ENGINEERING...
PROBLEM SOLVE IT!

Phase 2: Engineering Activities Roadmap

101 GUIDE

Hand-Built Scale Model

Design Testing- Physical Model Charrette

Before drawings can be issued for construction or even go into final production, a prototype or scaled mockup model of the design is made to test, refine, and optimize until it is the best possible design. Before 2D CAD (Computer Aided Design) drawings and 3D BIM (Building Information Modeling) technology emerged, designs were analyzed by creating physical scaled models by hand using common materials like cardboard or foam board. If your design is ready, feel free to build the full-size prototype at this stage as well so your team can go through several rounds of refinement- no design will ever be perfect after the first prototype.

Tower/Bridge Build

Structure- Tower/Bridge Build (option)

Structural systems are crucial to the safety, function, and durability of a project so we will learn the fundamentals in a fun tower/bridge build activity that investigates materials and forms along the way. We will test each structure at the end to see which one can withstand the heaviest load!

Fab Shop Field Trip

Engineering & Fabrication | Sustainability

You will get to visit a working fabrication shop where you get to learn how the project transforms from 2D paper drawings into real life working pipes, ducts, fittings, etc. that will get installed in the field. Also think about how Sustainability plays a greater and greater role in the engineering process and in our lives today and employ elements you learn into your project.

Emerging Tech / 3D Modeling

Emerging Technologies – BIM / VDC

Being exposed to emerging technologies is key to keeping up with the fast paced industry and ever complicated projects. We will demonstrate exciting technologies such as 3D Laser Scanning, Virtual Reality (VR), Drones, 360 Camera Pano Tours, Augmented Reality (AR), 3D Printing, and more and help you apply one of these to your project! We will also get you started on a piece of BIM modeling software so you can create a 3D model of your project!

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Phase 3
CONSTRUCTION…Build It!

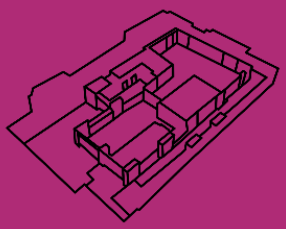
OBJECTIVES:

Provide Preconstruction Services- Scope, Estimating, Purchasing

Provide Construction Services- Logistics, Scheduling, Building

Cost / Schedule

BIM / VDC Technology



Mock-Up / Build

Deliver

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CONSTRUCTION… BUILD IT!

Phase 3: Construction Activities Roadmap

101 GUIDE

Cost Scavenger Hunt

Preconstruction- Cost Estimating Scavenger Hunt

Before construction or sitework ever starts or materials and equipment are delivered to the field, the construction drawings must be thoroughly examined to define the project’s ‘scope of work’ and avoid scope ‘gaps’. This scope is priced to establish the cost of work/construction estimate and see if it is in line with the project budget. For your project you will do a virtual or on-site scavenger hunt at a local hardware store to define final costs.

LEGO Build / Pull Scheduling

Preconstruction- Scheduling, Planning, Site Logistics

Construction sequencing and phasing is a critical part of the construction planning process. Once a team is solidified, the superintendent and other core members break down a potentially massive building into more manageable zones or areas. These areas become the foundation for the master schedule and drives other construction activities. With so many moving parts and team members, communication is key to keep everything and everybody on track. We will simulate a lean pull scheduling session for your project and/or take part in a LEGO build challenge that puts team communication to the test.

Active Jobsite Visit- TBA

Active Construction Site Field Trip- TBA

We will visit a real, active jobsite! We will walk the site in real construction safety gear and talk with multiple members of the team to understand their day-to-day roles, responsibilities, career paths, and backgrounds in project management and field supervision. Please note to talk with your lead mentor about the final meeting place and time.

Go Build!

Construction- Sequencing of Field Activities

In class we will tackle construction planning questions, logistics, and ‘means and methods’. Once major challenges are addressed, team members will form crews to help divide and conquer the build/prototype portion. Below is the recommended sequence of activities. Please note that some work may have to occur on a different site than your regular meeting location. It may also be on a different day. Please consult with your lead mentor for full details.

Part 1: Layout / Framing / Roof / Walls
Part 2: “Rough-In”- Doors / Windows / Insulation / MEP (if applicable)
Part 3: Finishes / Substantial Completion / Sign Off

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Communication FINAL PRESENTATIONS

101 GUIDE

OBJECTIVES:

Effectively communicate your project's key parts-

- Team- quickly define roles and responsibilities
- Process- briefly ***tell the story*** to capture attention
- Results / Deliverables

Communication **Tips**-

- Visual- tell your story, don't rely on text or too many visuals
- Verbal- be conversational with your audience
- Practice!- best way to feel prepared and comfortable

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Appendices A-E

OBJECTIVES:

Appendix A- Rules & Policies

Appendix B- ACE ATL Locations- Map

Appendix C- ACE Team Guide- Lead Contacts

Appendix D- ACE Dictionary- Understand basic industry terms

Appendix E.1- Architecture 101 Guide

E.2- Engineering 101 Guide

E.3- Construction 101 Guide

E.4- Communication / Presentations 101 Guide

ACE MENTOR PROGRAM
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Rules & Policies

Mission Statement:

To engage, excite and enlighten high school students to pursue careers in architecture, engineering, and construction through mentoring and to support their continued advancement in the industry.

1. **Attendance Policy:** Students must commit to the day and time of the team meetings and attend the meetings. When an absence from a meeting is necessary due to a valid school, family, or illness reason, students must communicate with their ACE Team Leader(s) **IN ADVANCE** of the ACE meeting which must be missed. **The MINIMUM attendance necessary for students to graduate from the program and be eligible for scholarships and awards is 10 sessions (equivalent to roughly 75% of meetings).**

2. **ACE Rules:** Students and mentors will **NOT**:

   a. Conduct one-on-one meetings behind closed doors
   b. Discuss personal matters.
   c. Exchange money or individual gifts.
   d. Share / request the mentor's personal information such as age, telephone numbers or address.
   e. Discriminate against one another on the basis of age, sex, ethnic or social-economic background, creed, or sexual orientation.
   f. Transport students in mentor vehicles in one-on-one situations or, even in groups, without specific signed consent of parent or guardian.
   g. Smoke or use any tobacco product near an ACE meeting or on meeting premises.
   h. Use or possess illegal drugs.
   i. Use, possess or be under the influence of alcohol.

3. **Questions or Concerns:** Students or parents should direct ANY questions or concerns to your ACE Team Leader(s) or an ACE Board Member.

   My ACE Team Leader(s) are:

   Name: _____ Name: _____

   Email: _____ Email: _____

   Phone: _____ Phone: _____

   ACE Atlanta Board of Directors Chair:

   Amy Tribo, Holder Construction Company

   atribo@holder.com

   770-988-3312

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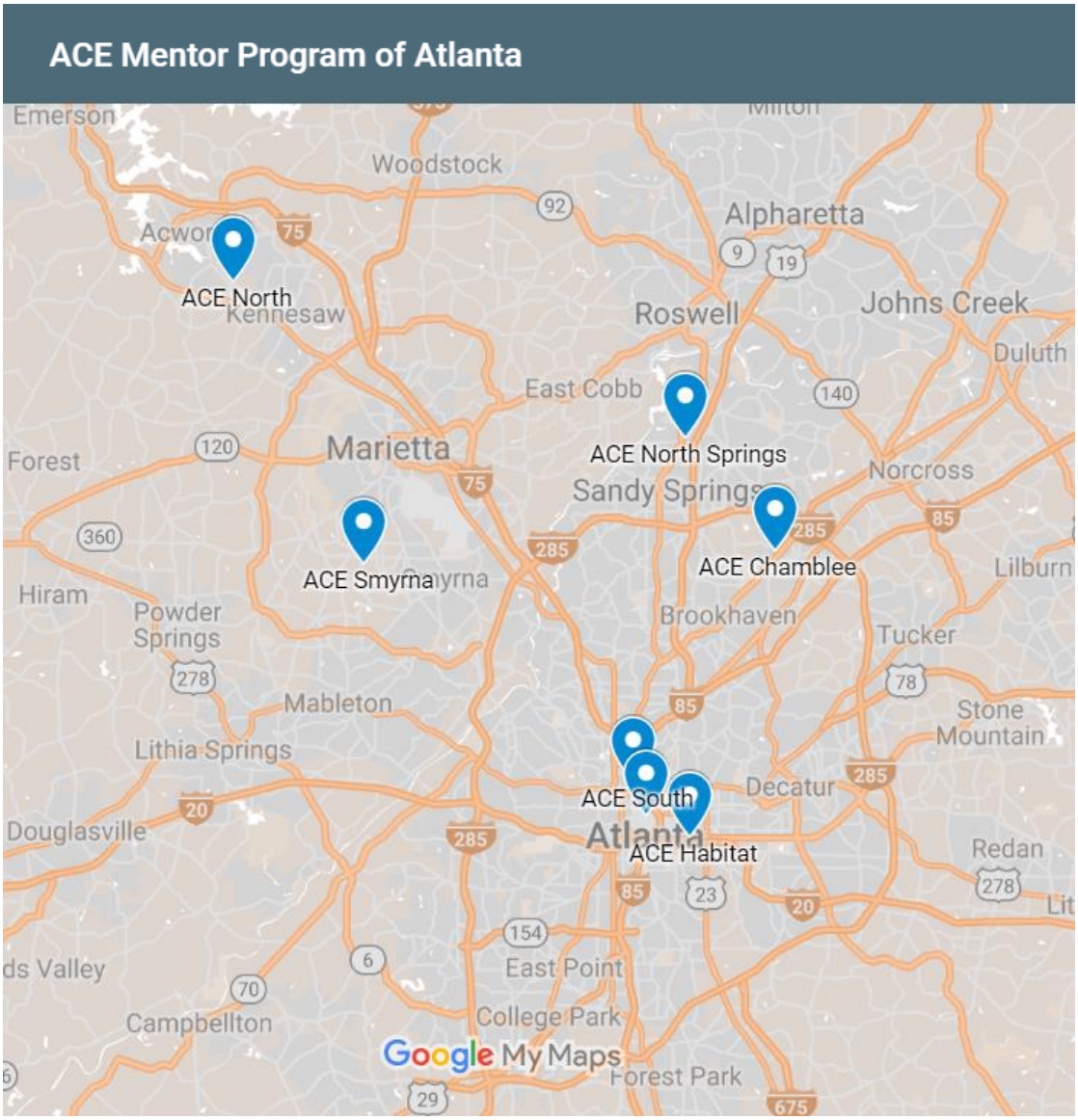
ACE ATL Locations



ACE Atlanta 2019 Locations

ID	Name	Site	**Team Leaders-** full contacts on next pg.
1	ACE South	Georgia Tech	Jeremy Wegener
2	ACE North	North Cobb High	Michael Hasamoh
3	ACE Chamblee	Chamblee High	David Elrod
4	ACE N. Springs	NS Charter High	Ross Durham
5	ACE Habitat	Habitat for Humanity HQ	Aaron Sibley
6	ACE HOK	HOK ATL Office	Scott Rose
7	ACE Smyrna	Osborne High	Kassinda Williams

ACE 2019 Team Guide

ACE North
Regular Meeting Day/Time: Tuesdays, 4:30 – 6:30 p.m.
North Cobb High School, Room 808
3400 Old 41 Hwy NW, Kennesaw, GA 30144
Lead Mentor Contact: Michael Hasamoh, 404.771.4202, MHasamoh@BrasfieldGorrie.com

ACE South
Regular Meeting Day/Time: Wednesdays, 5 - 7 p.m.
Georgia Tech, Clough Commons, Room 262
266 Fourth Street NW, Atlanta, GA 30332
Lead Mentor Contact: Jeremy Wegener, Jeremy.Wegener@fticonsulting.com

ACE Chamblee
Regular Meeting Day/Time: Thursdays, 4:30 – 6:30 p.m.
Chamblee High School, Room 3128
3688 Chamblee Dunwoody Rd, Chamblee, GA 30341
Lead Mentor Contact: David Elrod, 404.395.6897, delrod@gilbaneco.com

ACE Smyrna
Regular Meeting Day/Time: Wednesdays, 4:45 – 6:45 p.m.
DPR Construction Office, Room TBD
3301 Windy Ridge Parkway, Suite 500, GA 30309
Lead Mentor Contact: Kassinda Williams, 404.558.1120, KassindaW@dpr.com

ACE North Springs (Skilled Trades)
Regular Meeting Day/Time: Tuesdays, 4:00 – 6:00 p.m.
North Springs Charter High School, John Gresens Classroom
7447 Roswell Road, Sandy Springs, GA 30328
Lead Mentor Contact: Ross Durham, 301.503.1768, ross.durham@jci.com

ACE Habitat (Skilled Trades)
Regular Meeting Day/Time: Wednesdays, 4:30 – 6:30 p.m.
Atlanta Habitat for Humanity Headquarters
824 Memorial Drive SE, Atlanta, GA 30316
Lead Mentor Contact: Aaron Sibley, 352.284.9011, aaron.sibley@atlantahabitat.org

ACE HOK
Regular Meeting Day/Time: Wednesdays, 5:00 – 6:30 p.m.
HOK Architecture Office- 133 Peachtree St. NE, Suite 4800, Atlanta, GA 30303
Lead Mentor Contact: Scott Rose, 678.954.8899, scott.rose@hok.com

ACE MENTOR PROGRAM
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ACE Dictionary

GENERAL:

RFI- Request For Information- Formal request for clarification from the author (design)
RFP- Request for Proposal- formal request from the owner in search of the best design/engineering and construction teams available for their project. The proposal response should include the team's project approach, plan, and experience to date.
CAD- Computer Aided Design- traditionally 2D plans created on a computer
BIM- Building Information Modeling- Visual communication tools (Ex: 3D models) to solve problems virtually before they become field issues
VDC- Virtual Design & Construction- analogous to BIM

ARCHITECTURE / DESIGN:

SD- Schematic Design- Early design development once the main design concept is established.
DD- Design Development- Drawings that form the basis for design intent.
CD- Construction Documents- Detailed drawings used to build by
IFC- Issue for Construction- the final 100% CD set the contractor uses
Drawing Annotations-

- **Dimensions Ex:**- 1'-6" means 1 foot , 6 inches (or 1.5 ft)

ENGINEERING:

MEP- Mechanical / Electrical / Plumbing- Building systems or "Trades"
'Sick-Building' Syndrome- a condition typically marked by headaches and respiratory problems, attributed to unhealthy or stressful factors in the working environment such as poor ventilation.
Upcycling- creative reuse of discarded materials into something new and useful

CONSTRUCTION:

GC- abbreviation for the General Contractor, lead contractor specializing in construction management.
Scope of Work- commonly used in Construction. Simply refers to all the 'parts and pieces' that make up a building. These are identified in Preconstruction to eliminate any scope 'gaps' and ensure the building will function properly and the proper materials will be procured/purchased.
Prefabrication- a construction method that takes advantage of building in weather controlled conditions prior to final installation on-site
Modular Construction- a construction method that "unitizes" key building components, breaking it into smaller modules or a 'kit of parts'
Bill of Materials- final materials list (raw or assemblies) with quantities.
Means and Methods- describes the day-to-day activities a contractor employs to complete construction. Involves minor planning, logistics, and problem solving in the field to get things to work.
"Rough-in"- Term used mostly for basic MEP systems installation. Final connections are made later.
"Fit-out"- Term used typically to describe the final connections for the Interiors and/or MEP work.
"Top Out"- Term used to signify the main structure being completed or "topped out"

ACE MENTOR PROGRAM
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ARCHITECTURE 101

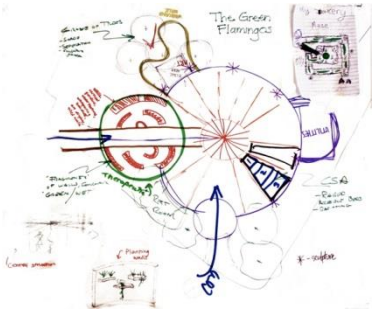
Planning, Programming, Drawings

Predesign Services | Community Planning | Site Analysis

We will explore human-focused connection, community-based design services to better understand and build empathy. We will learn the basics about the built environment, urban planning, and how zoning is used to preserve and protect the interests of the community. How do we balance the interests of individuals, businesses, and keep our living environment safe and clean?

Design Discovery & Inspiration

A vision board is used to help create and maintain focus at design project startup. Creating your own vision board will consist of gathering different photos, objects, or articles to display your inner creativity and form the main concept (one strong design move) of your design. There is no right or wrong way to complete the vision board, but this is best informed thorough Site Analysis study.

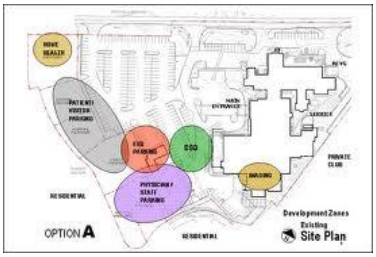


Design Sketching Charrette

Before a building is built or a floor plan is printed, the simple act of sketching allows you to ask yourself questions, explore limitless design 'moves', and develop those ideas into a first cohesive design. A Design Charrette is an intense period of designing, planning, and sketching in non-judgemental collaborative groups where one can get all of those ideas out of the head and onto paper.

Space Planning & Design Programming

Space planning and design programming is the next step in the Design Process of refining early and raw design sketches into a first fully formed plan. A mind map of defined building areas and their related spaces kicks off this phase. Once relative area sizes and spatial connections are established, it is ready for first Engineering steps to ensure the building will work.



Construction Documents

Once the building program and Engineering have been verified to be highly functional for the end user, final scaled floor plans, sections, and other details are produced by the design team so the building contractor will have an accurate contract set of documents to build by in the field.

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ARCHITECURE 101

What Is the Built Environment?

The term **built environment** is defined as "the human-made space in which people live, work, and recreate on a day-to-day basis". It encompasses places and spaces created or modified by people including buildings, parks, lakes, dams, and transportation systems.

While buildings and development provide countless benefits to society, they also have significant environmental and health impacts. This summary presents some basic facts about those impacts.

ISSUE	Impacting Activities Associated With Construction
Planning, Land-Use & Conservation	• Biodiversity • Re-use of existing buildings • Flooding
Energy Use, Global Warming & Climate Change	• Carbon dioxide emissions & greenhouse gases • Passive heating/cooling • Energy Use in production, transport, construction & operation
Pollution & Hazardous Substances	• Waste production • Pollution during manufacturing of materials & products • Recycling contaminated land
Resources, Waste & Recycling	• Mineral extraction • Waste Disposal • Water Use

QUESTION **What other impacts does built environment have on society and our standard of living?**

Sustainable construction , also know as **green building**, aims at reducing the environmental impact of a building over its entire lifetime, while optimizing its economic possibility and the comfort and safety of its occupants.

While standard building practices are guided by short term economic considerations, sustainable construction is based on best practices which emphasize long term affordability, quality and efficiency. At each stage of the life cycle of the building, it increases comfort and quality of life, while decreasing negative environmental impacts and increasing the economic sustainability of the project. A building designed and constructed in a sustainable way minimizes the use of water, raw materials, energy, and land over the whole life cycle of the building.

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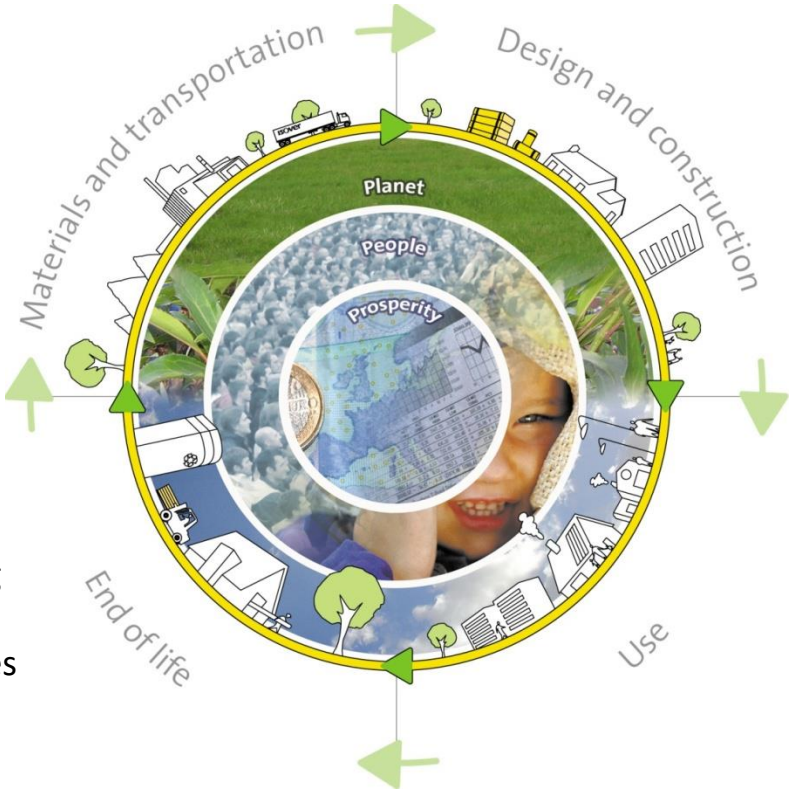
ARCHITECURE 101

What Is the Built Environment?

Leadership in Energy and Environmental Design (LEED) consists of rating systems for the design, construction and operation of high performance buildings, homes and neighborhoods.

LEED-certified buildings are designed to:

- Lower operating costs and increase asset value
- Reduce waste sent to landfills
- Conserve energy and water
- Be healthier and safer for occupants
- Reduce harmful greenhouse gas emissions
- Qualify for tax rebates, zoning allowances and other incentives in hundreds of cities



Developed by the **U.S. Green Building Council (USGBC)**, LEED is intended to provide building owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. Since its inception in 1998, the U.S. Green Building Council has grown to encompass more than 7,000 projects in the United States and 30 countries, covering over 1.5 billion square feet of development area. The hallmark of LEED is that it is an open and transparent process where the technical criteria proposed by USGBC members are publicly reviewed for approval by the almost 20,000 member organizations that currently constitute the USGBC.

The **Green Building Certification Institute (GBCI)** was established by USGBC to provide a series of exams to allow individuals to become accredited for their knowledge of the LEED rating system. This is recognized through either the LEED Accredited Professional (LEED AP) or LEED Green Associate designation. GBCI also provides third-party certification for projects pursuing LEED.

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ARCHITECURE 101

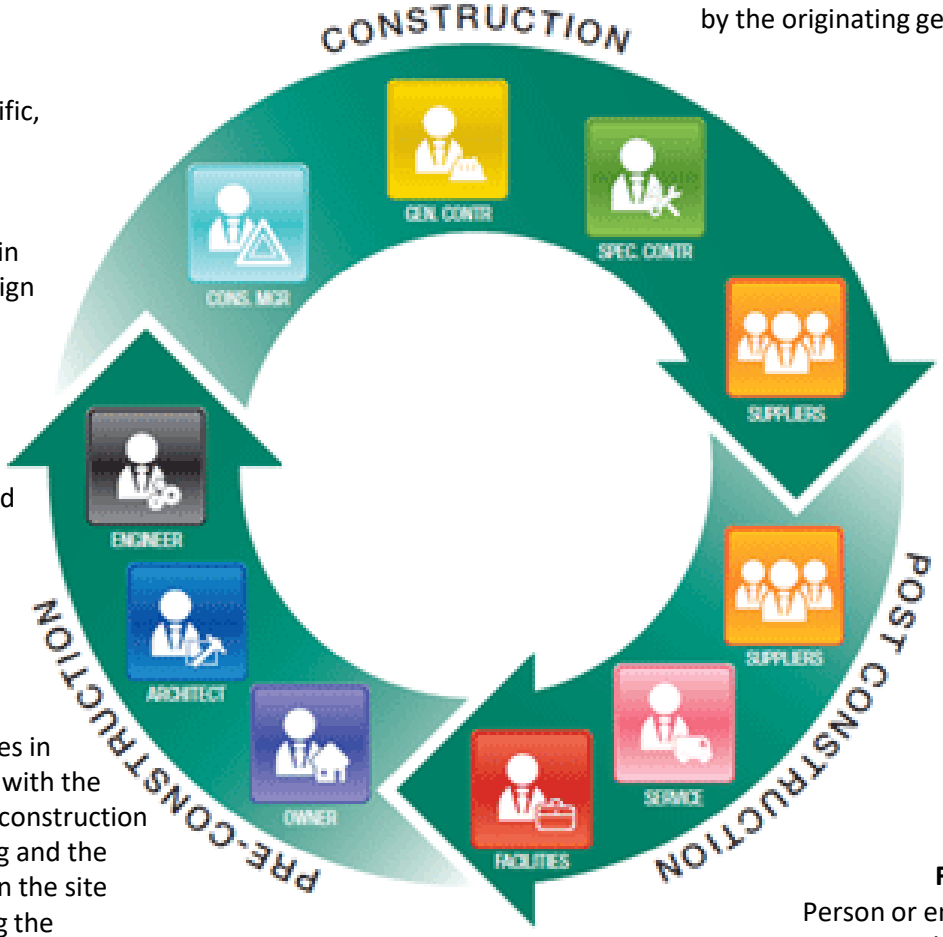
Key Roles / Careers in the Industry

Key Roles in the Design & Construction Process

Construction Managers and General Contractors
plan, coordinate, budget, and supervise construction projects from early development to completion.

Specialized or Trade Contractors
perform a specific task as part of the overall project and is normally paid for services provided to the project by the originating general contractor

Engineers
Apply scientific, economic, social, and practical knowledge, in order to design and build structures, machines, devices, systems, materials and processes



Suppliers and Vendors
provide specialized equipment, materials, and products used to complete constructions.

Architects
offer services in connection with the design and construction of a building and the space within the site surrounding the buildings, that have as their principal purpose human occupancy or use.

Facility Manager
Person or entity responsible overseeing the operation and maintenance of the building when construction is complete.

Owner/ Owner Representative
Person or entity responsible for making decisions and funding design and construction activities in the best interest of the end-user.

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ARCHITECURE 101

City Planning & Residential Development

Urban planning (urban, city, and town planning) is a technical and political process concerned with the control of the use of land and design of the urban environment, including transportation networks, to guide and ensure the orderly development of communities. It involves research and analysis, strategic thinking, architecture, urban design, public consultation, policy recommendations, implementation and management.

QUESTION **What types of issues do you think your community planners should address to make your area more efficient?**

City Planners and concerned with the following aspects:

- **Environmental Factors:** Environmental protection and conservation are of utmost importance to many planning systems across the world. Not only are the specific effects of development to be mitigated, but attempts are made to minimize the overall effect of development on the local and global environment.
- **Aesthetics:** All successful urban planning considers urban character, local identity, respects heritage, pedestrians, traffic, utilities and natural hazards.
- **Safety and Security:** Extreme weather, flood, or other emergencies can often be greatly mitigated with secure emergency evacuation routes and emergency operations centers. Many cities will also have planned, built safety features, such as levees, retaining walls, and shelters.
- **Reconstruction and Renewal:** Identifying and correcting **urban decay**, a process by which a city, or a part of a city, falls into a state of disrepair and neglect frequently due to depopulation, economic restructuring, property abandonment, high unemployment, fragmented families, political disenfranchisement, crime, and desolate urban landscapes.
- **Transportation:** The density of an urban environment increases traffic, which can harm businesses and increase pollution unless properly managed. Parking space for private vehicles requires the construction of large parking garages in high density areas. This space could often be more valuable for other development.
- **Economics:** Good communications and short travel distances increases the overall economic output of a city, and results in improved business and employment opportunities for its inhabitants.

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ARCHITECURE 101

City Planning & Residential Development

CIVIL ENGINEERING

Includes the design, construction, and maintenance of the physical and naturally built environment, including works like roads, bridges, canals, dams, and buildings.

ENVIRONMENTAL ENGINEERING

deals with the gathering of information on the environmental consequences of proposed actions and the assessment of effects of proposed actions for the purpose of assisting society and policy makers in the decision making process.

TRAFFIC ENGINEERING

involves specifying, designing, constructing, and maintaining transportation infrastructure which includes streets, canals, highways, rail systems, airports, ports, and mass transit.

LAND SURVEYING

- Survey existing conditions of the future work site, including topography, existing buildings and infrastructure, and underground infrastructure
- Stake out reference points and markers that will guide the construction of new structures such as roads or buildings for subsequent construction (otherwise "lay-out" or "setting-out")
- Verify the location of structures during construction
- Establish the boundaries of a parcel using its legal description
- Verify that the work authorized was completed to the specifications set on plans (As-Built surveying)

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ARCHITECURE 101

City Planning & Residential Development

RESIDENTIAL DEVELOPMENT PROCESS

Site Assessment

- Is the land identified by the city/county as residential space?
- Is the soil free of contaminants?
- Is the land feasible to be graded?

Parties Involved: City Planner, Engineers, Surveyors

↓

Purchase Land

Parties Involved: Real Estate Agent, Attorney

↓

Complete Site Plan

- Road Layout
- Public Utility Layout
- Separate Land into Lots

Parties Involved: Engineers, Surveyors, Utility Companies

↓

City/County Approval

Parties Involved: City Planning Commission

↓

Begin Construction

Parties Involved: Engineers, Grading Contractor, Paving Contractor, MEP Contractor

QUESTION How does residential construction differ from commercial construction?

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ARCHITECURE 101

Design Discovery & Inspiration

The Butterfly House
Auburn University Rural Studio
Hale Co., AL

What/where is the design inspiration in this home?

Design Inspiration

STEP 1

Find Inspiration/Passions
- Nature
- Music
- TV/Movies
- Art
- Comics, Books, Magazines
- Anything!

STEP 2:

Find a Representative Object
- Sketches
- Pictures
- Physical Objects
- Anything!

STEP 3:

Find Design Intent:
- 1 Strong Design Move
- Base it on the strongest quality of your representative object
- That's it!

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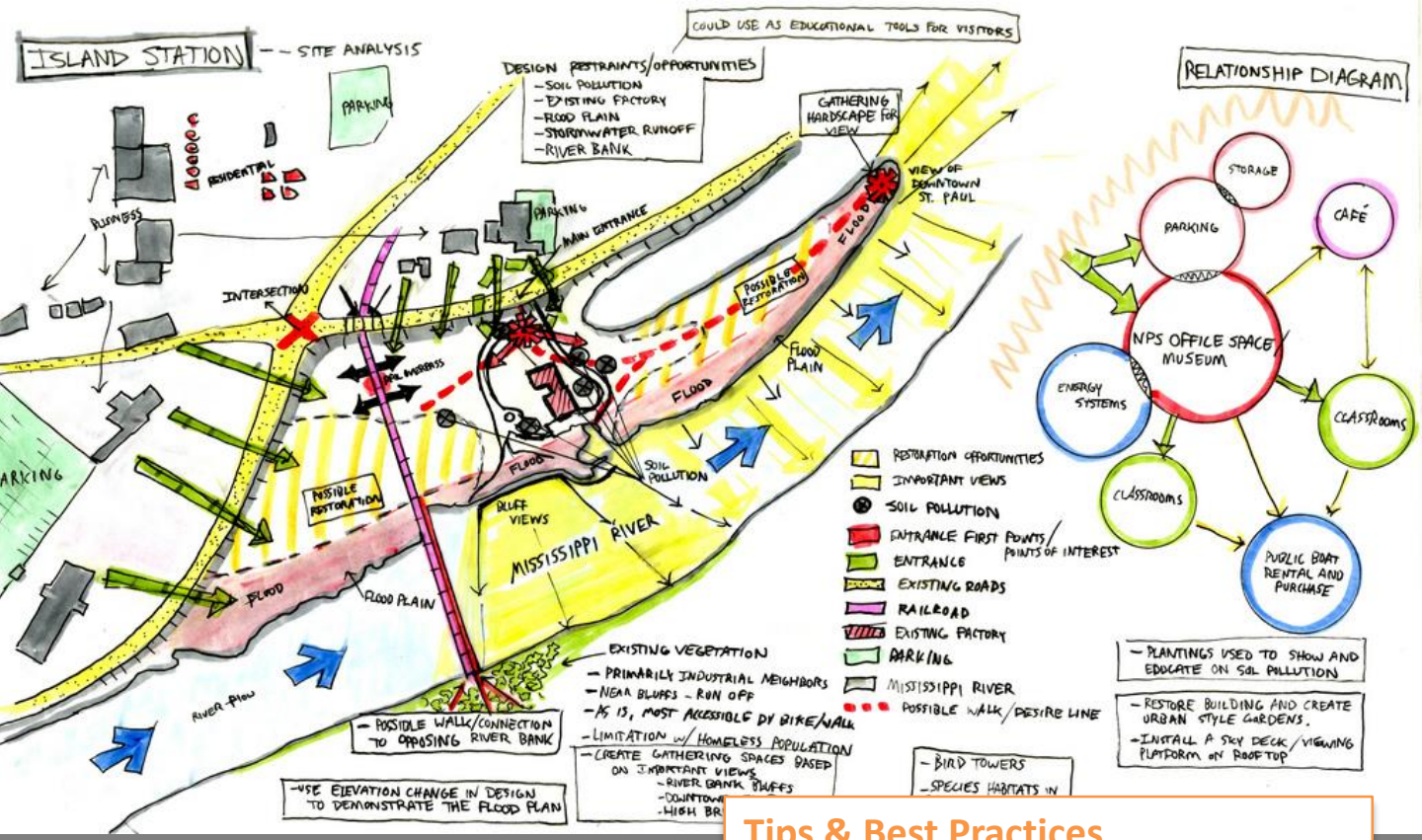
ARCHITECURE 101

Site Analysis



Site Analysis

The process of surveying or studying the existing environment and how it will influence the structure's design and layout on the site.

Tips & Best Practices

- Note the flow and conflicts- visually show
- Know your neighbors
- Embrace the site- minimize impact
- Leverage existing assets
- Marry the site and program

Site Factors

- Social, Economic, Cultural…
- Safety
- Sustainability
- Transportation / Circulation- ease to get to
- Ease of use
- Light / Dark / Shade
- History / Character
- Weather
- Native vegetation
- Water- features/drainage/cover/etc.
- Man-made materials
- Density / Scale / Complexity
- Views
- Noise
- Understand Current Usage
- People- Ergonomics, Active Uses/Passive Uses

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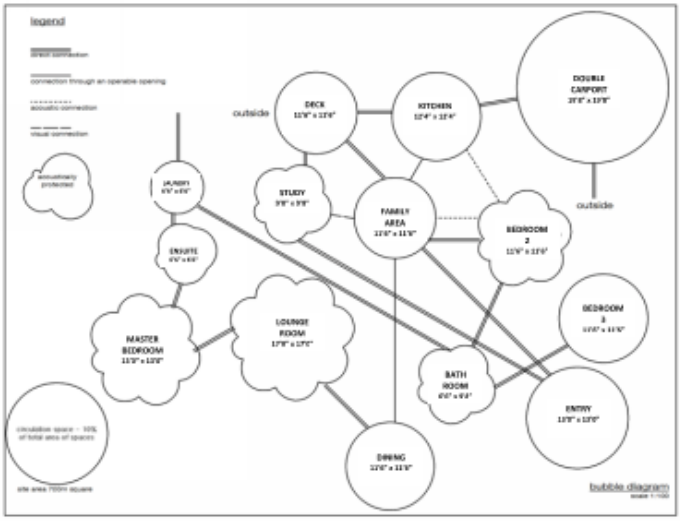
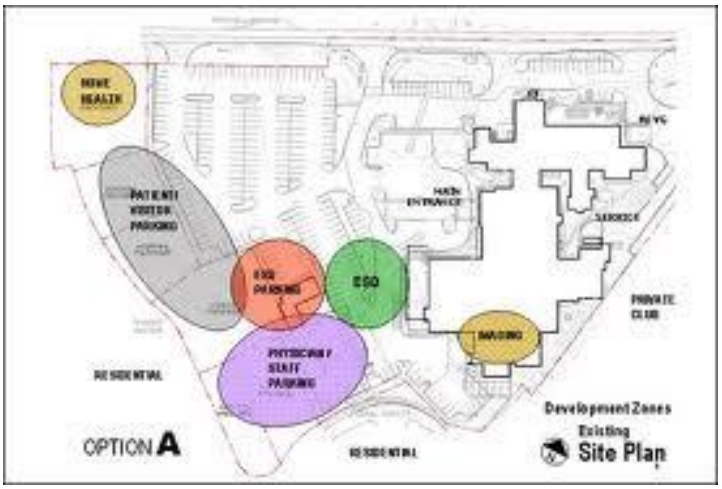
ARCHITECURE 101

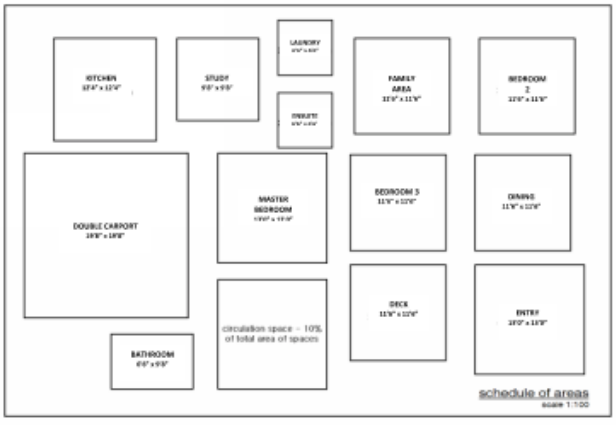
Space Planning & Design Programming

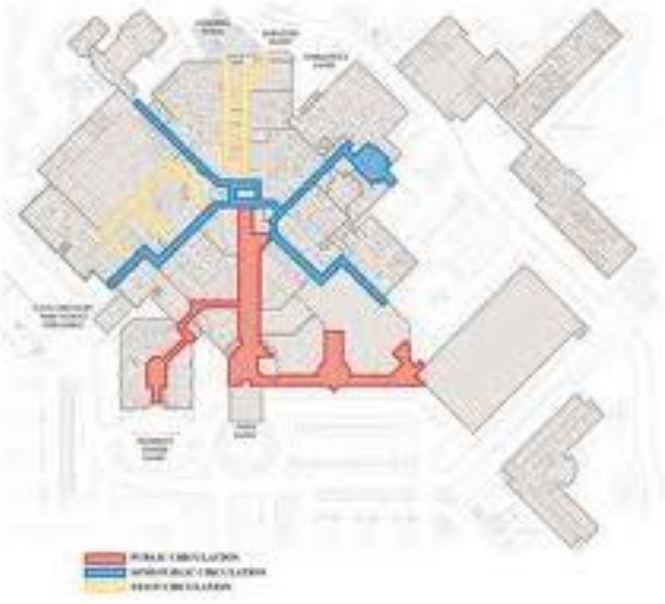
What is Space Programming?

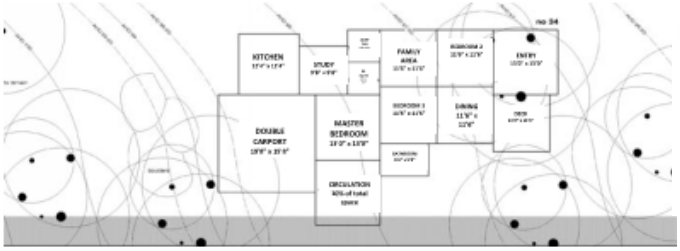
The research and **decision-making process** that identifies the **needs** of the building/facility and allows the design to take place. Programming typically **involves groups of end users** gathering to discuss **how they plan to use** the building and what they will need from the space to make it as **effective** as possible.











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ARCHITECURE 101

Planning, Roles, How to Read Plans

What are the different types of construction documents?

Plan – A view of the space looking straight down typically from approximately three feet above the floor. Plan drawings are 2D representations of a space in which all items are shown as flat and foreshortened.

- Floor Plan – view of the building , room, etc.
- Roof Plan – view of the roof from above looking straight down
- Reflected Ceiling Plan – view of the ceiling of a space from approximately 3 feet below the ceiling

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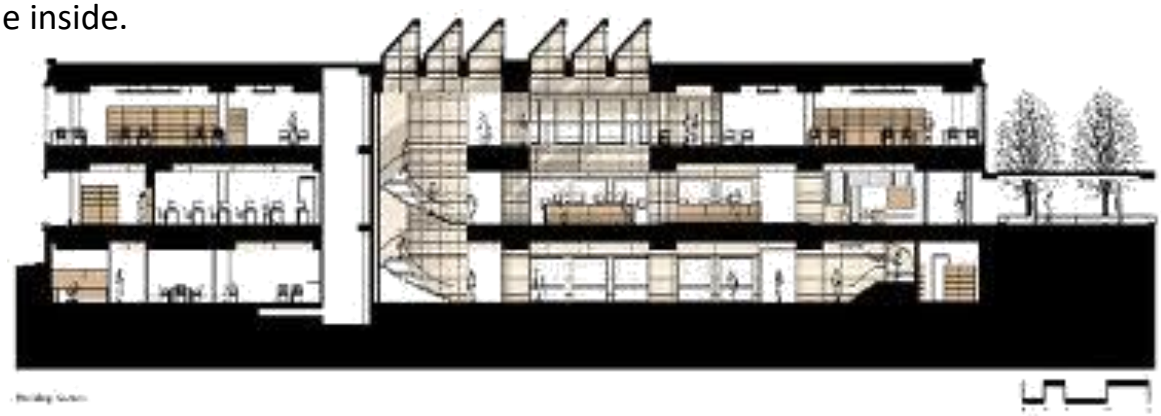
ARCHITECURE 101

Planning, Roles, How to Read Plans

What are the different types of construction documents?

Elevation – A view of the space looking at the walls of a space. Elevation drawings are 2D representations of a space in which all items are shown as flat and foreshortened.

Section – A hybrid of the plan and elevation, a section is a cut through the building like a plan but vertically like an elevation. Sections provide a view of the space on the inside.



Detail – A detail drawing is an enlarged view of a specific area within a section, generally. Details are used to show important connections within a design.

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ENGINEERING 101

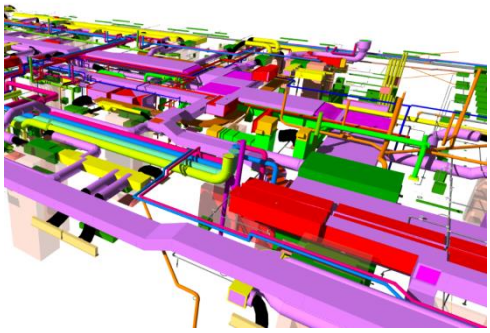
Structure, MEP Systems, Coordination

Structure

Structure is an extremely important aspect of design and construction. It affects how the building looks, functions and obviously its safety. There are numerous materials that can be used in making a structure, however, it is often the shape of these materials that affects how rigid and flexible they become.

Building Systems- MEP

Building Systems are an often overlooked but essential component of buildings as they must be heated and cooled to ensure the comfort of its building occupants and avoid creating unhealthy conditions like mold, mildew, and 'sick-building' syndrome. Systems can either be passive (natural) or active (ex: forced air), but both requires careful design layout, engineering, analysis, and quality controlled fabrication and installation.



Building Systems Coordination

An important part of the Engineering process is Systems Coordination. This occurs during the Construction phase but before fabrication in the shop and delivery of all pipes, ducts, and equipment to the jobsite. To avoid major re-work and schedule delays, effective communication amongst the trade team and the Construction Manager is critical. The groups meet weekly, often times leveraging BIM technology for the clash detection process, to make sure everything fits and find potential issues in the field, and ultimately ensure quality systems routing and installation.

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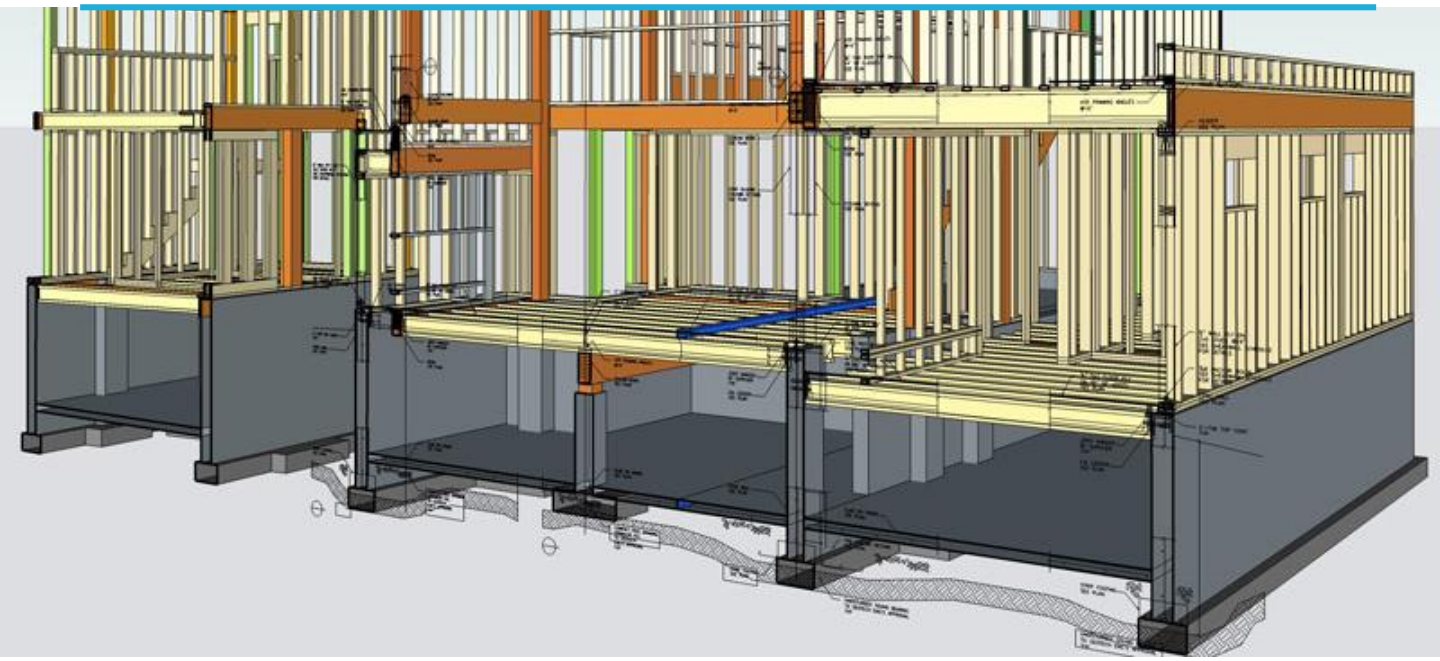
ENGINEERING 101

Structure Fundamentals- Part 1



Structure Fundamentals*:

Function

- Must Stand
- Support
- Reinforcement
- Strength
- Loads (Dead/Live)
- Forces
- Stresses
- Analysis
- Parallels in Nature

Process (Careers)

- Planning
- Design
- Drawings (Framing Plans)
- Building Codes
- Permit Approval
- Preconstruction Pricing
- Fabrication
- Transportation
- Construction
- Field Layout- Start Point
- Field Coordination
- Field Installation
- Inspections
- Maintenance

Materials

- Wood
- Metal
- Concrete
- CMU
- Steel
- Resteel/Rebar
- Masonry/Brick
- Composites

Architect Resources

- Frank Lloyd Wright
- Fay Jones
- Santiago Calatrava
- Renzo Piano
- Magazines
- Many others!

***NOTE:** These items are merely a “snapshot” and not a fully comprehensive list of all available resources.

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ENGINEERING 101

Structure Fundamentals- Part 2

Structure Fundamentals*:

Components

- Footings
- Retaining Walls
- Slabs
- Beams
- Columns
- Girders
- Joists
- Bracing
- Stud Framing (Wood, Metal)
- Trusses
- Connections/Fasteners

Foundations

- Deep
- Shallow
- Topography
- Soils/Excavation

Framing

- Light vs. Heavy
- Floors
- Walls
- Roofing

Assembly Types

Floors
- Slab on Grade
- Crawl Space
- Basement

Walls
- Load Bearing
- Non-Load Bearing
- Prefabricated

Roofs
- Flat
- Shed/Single Pitch
- Gable
- Hip
- Gambrel
- Mansard
- Vaulted
- Dome

***NOTE:** These items are merely a “snapshot” and not a fully comprehensive list of all available resources.

ACE MENTOR PROGRAM
ARCHITECTURE • CONSTRUCTION • ENGINEERING

ENGINEERING 101

MEP Systems Fundamentals

MEP Systems Fundamentals*:

Function

- Air Quality
- Water Quality
- Healthy
- Efficiency
- Thermal Comfort
- Accessibility
- Sustainability/Green

Process (Careers)

- Planning (Location)
- Design
- Drawings (1 Line Diagrams)
- Pricing
- Purchasing
- Fabrication
- “In-Wall” Coordination
- Finishes Coordination
- Installation
- ”Rough-In”
- Finish
- Commission/Calibrate
- Inspections
- Maintenance

Components

- Pipes
- Ducts
- Valves
- Air Units
- Air Terminals
- Filters
- Insulation
- Conduits
- Wiring
- Hangers/Support
- Surface Devices
- Controls

System Types

Mechanical
- HVAC- Hot/Cold
- Overhead- Forced Air
- Underfloor- Radiant
- Zones
- Attics/Basements

Electrical
- Power
- Lights

Plumbing
- Water
- Fixtures
- Kitchen/Bathroom

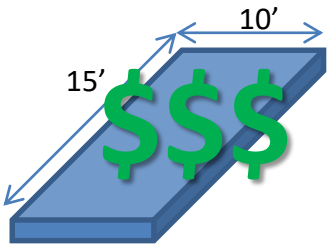
Special
- Fire Protection
- Safety
- Technology

***NOTE:** These items are merely a “snapshot” and not a fully comprehensive list of all available resources.

ACE MENTOR PROGRAM
ARCHITECTURE • CONSTRUCTION • ENGINEERING

Construction 101

Preconstruction & Construction Services



Preconstruction- Scope / Estimating / Purchasing

Before construction or sitework ever starts or materials and equipment are delivered to the field, the construction drawings must be thoroughly examined to define the project’s ‘scope of work’ and avoid scope ‘gaps’. This scope is priced to establish the cost of work/construction estimate and see if it is in line with the project budget.

Preconstruction- Scheduling / Sequencing

Construction sequencing and phasing is a critical part of the construction planning process. Once a team is solidified, the superintendent and other core members break down a potentially massive building into more manageable zones or areas. These areas become the foundation for the master schedule and drives other construction activities. With so many moving parts and team members, communication is key to keep everything and everybody on track.

Construction-

Comprehensive construction planning and logistics must be performed by the project field team to anticipate and address challenges prior to material delivery on-site, throughout installation ‘means and methods’, and on through final inspections.

Major project milestones outlined in the overall project schedule include site layout/sitework, foundations, framing, roofing, exterior skin “dry-in”, MEP “rough-in” and “fit-out”, and interior finishes.

Typically these activities are performed by a team of subcontractors specializing in their own trades. Besides any self-perform work, the role of the general contractor (or GC) is to help steer the ship with consistent communication amongst the team from pre-install kickoffs through substantial completion and final sign off.

ACE MENTOR PROGRAM
ARCHITECTURE • CONSTRUCTION • ENGINEERING

CONSTRUCTION 101
Estimating 101

Unit Price Estimating

What is it?

Building a project in our mind and on paper.

Why do it?

To find cost

So everyone (especially the owner) knows how much they're spending

Level of Accuracy?

Guess

"Ballpark"

Component

Detailed

Components?

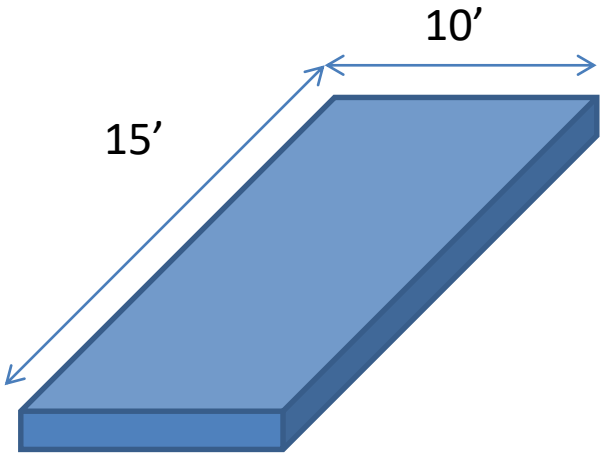
Quantity (Units)

Unit Prices

Materials

Labor (for information only)

Mark-Up (for information only)



Estimating Quantities?

LF (linear foot)

EA (each)

SF (square foot)

SY (square yard)

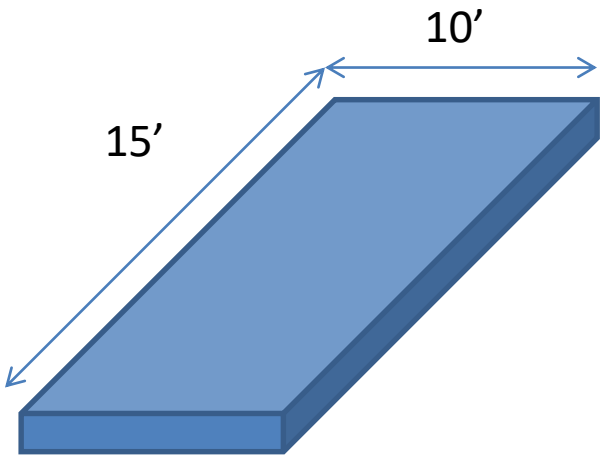
CY (cubic yards)

Unit Price Estimating

Estimating Quantities?

LF (linear foot)
EA (each)
SF (square foot)
SY (square yard)
CY (cubic yards)

Linear Foot



15’ + 10’ + 15’ + 10’ = 50’

50 LF

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ARCHITECTURE • CONSTRUCTION • ENGINEERING

CONSTRUCTION 101
Estimating 101

Unit Price Estimating

Estimating Quantities?

LF (linear foot)
EA (each)
SF (square foot)
SY (square yard)
CY (cubic yards)

Each (count)

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ARCHITECTURE • CONSTRUCTION • ENGINEERING

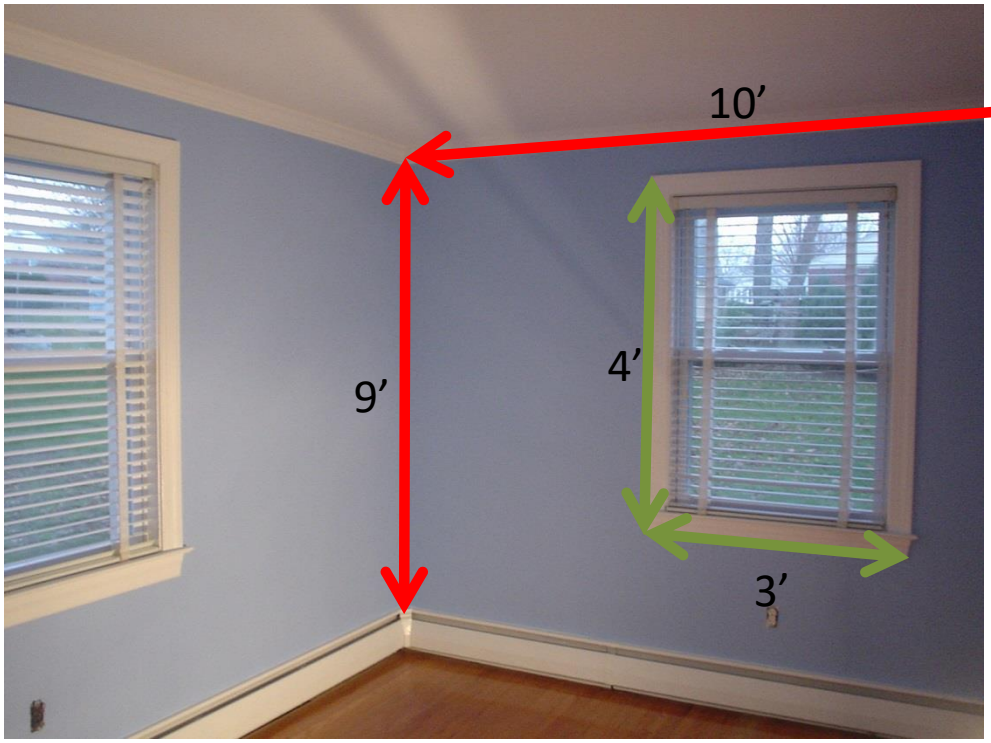
CONSTRUCTION 101
Estimating 101

Unit Price Estimating

Estimating Quantities?

LF (linear foot)
EA (each)
SF (square foot)
SY (square yard)
CY (cubic yards)

Square Foot



Wall
9’ x 10’ = 90 SF

Window
4’ x 3’ = 12 SF

Paintable Area
90 SF – 12 SF = 78 SF

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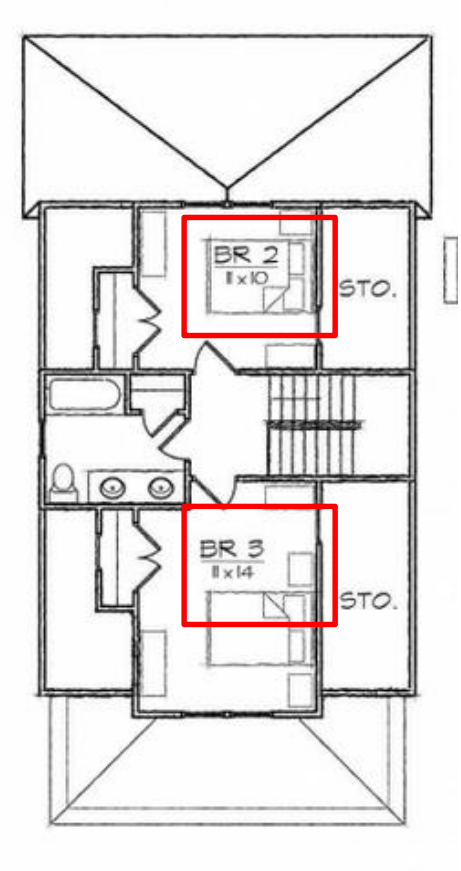
CONSTRUCTION 101
Estimating 101

Unit Price Estimating

Estimating Quantities?

LF (linear foot)
EA (each)
SF (square foot)
SY (square yard)
CY (cubic yards)

Square Yard



Bedroom 2
11’ x 10’ = 110 SF

Bedroom 3
11’ x 14’ = 154 SF

110 SF + 154 SF = 264 SF

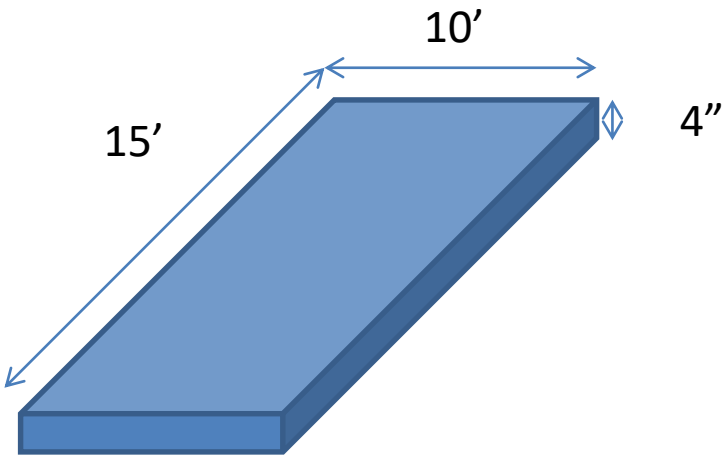
264 SF **/ 9** = 29.3 SY

Unit Price Estimating

Estimating Quantities?

LF (linear foot)
EA (each)
SF (square foot)
SY (square yard)
CY (cubic yards)

Cubic Yard



15’ x 10’ x .333’ = 49.99 CF

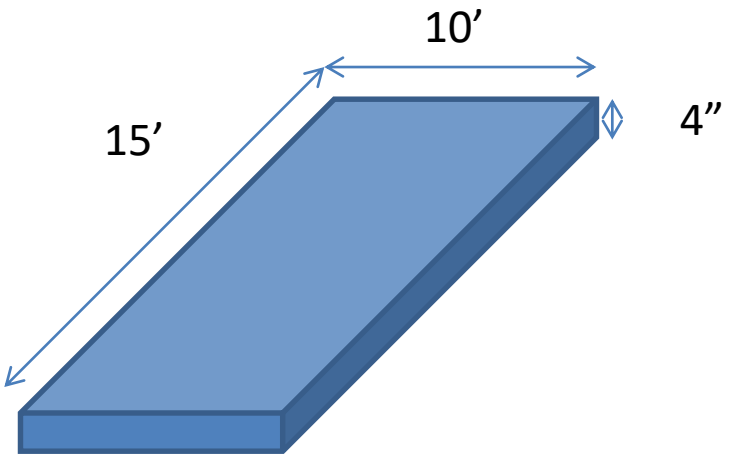
49.99 CF **/ 27** = 1.85 CY

Unit Price Estimating

Extending Cost

For Material

- Simply multiply quantity and unit price.



15’ x 10’ x .333’ = 49.99 CF

49.99 CF / 27 = 1.85 CY

1.85 CY x **$150.00/CY** = $277.50

ACE MENTOR PROGRAM
ARCHITECTURE • CONSTRUCTION • ENGINEERING

CONSTRUCTION 101
Exteriors Fundamentals

Exterior Materials / Fundamentals*:

Function

- Enclosure
- Protection
- Thermal Comfort
- Living/Breathing
- Veneer
- Curb Appeal
- Sustainability/Green

Architect Resources

- Frank Lloyd Wright
- Richard Meier
- Frank Gehry
- Mies van der Rohe
- Magazines
- Many others!

Process (Careers)

- Planning
- Design
- Drawings (Elevations)
- Building Codes
- Permit Approval
- Preconstruction Pricing
- Fabrication
- Transportation
- Construction
- Field Coordination
- Field Installation
- "Dry-In"
- Inspections
- Maintenance

Finish Materials

- Wood
- Metals
- Concrete
- Masonry/Brick
- Siding (Vinyl)
- Stucco
- EIFS
- Composites
- Plastics
- Paints/Coatings
- Windows/Glazing
- Mullions
- Doors
- Shading Devices
- Hardscape
- Landscape

Assembly Materials

Walls
- Substrate
- Sheathing
- Blocking
- Waterproofing
- Vapor Barrier
- Ventilation
- Insulation
- Prefab Panels
- Caulking/Sealing

Roofs
- Decking
- Drainage
- Shingles
- Flashing

***NOTE:** These items are merely a "snapshot" and not a fully comprehensive list of all available resources.

ACE MENTOR PROGRAM
ARCHITECTURE • CONSTRUCTION • ENGINEERING

CONSTRUCTION 101
Interiors Fundamentals

Interior Materials / Fundamentals*:

Function

- Enclosure/Protection
- Thermal Comfort
- Acoustics
- Sustainability/Green
- Craftsmanship
- Home Accents
- 'Sense of Home'

Architect Resources

- Bing Thom
- Vern Yip
- HGTV (Multiple)
- Southface ATL Campus
- Magazines
- Many others!

Process (Careers)

- Planning
- Design
- Drawings (Enlarged Details)
- Samples, Material Boards
- Pricing
- Purchasing
- Fabrication
- Field Coordination
- Field Installation
- Surface Prep/"Rough-In"
- Finishes
- Final Clean
- Maintenance
- Remodeling (Custom)

Finish Materials

- Wood
- Metals
- Concrete
- Brick/Masonry
- Stone
- Plastics
- Tile/Ceramics
- Composites
- Carpets
- Paints/Coatings
- Furniture
- Light Fixtures
- Countertops
- Fireplace
- Stairs/Railings
- Doors
- Windows/Glazing
- Natural Daylighting

Assembly Materials

Walls
- Framing/Blocking
- Drywall (Substrate)
- Air Barrier
- Moisture Protection
- Sealant, Joints
- Insulation
- Prefab Panels

Floors
- Subfloor
- Underlayment

Ceilings
- Soft
- Hard

Millwork
- Cabinets
- Baseboards
- Trim/Molding

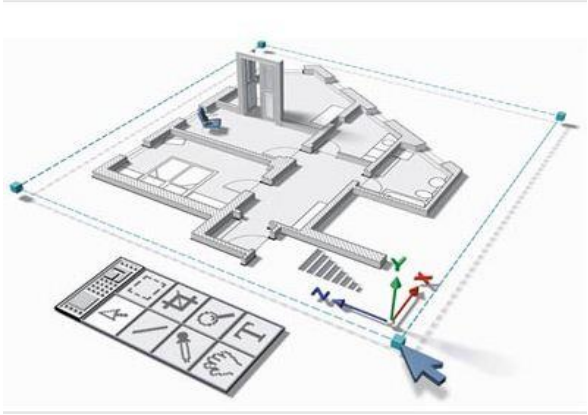
***NOTE:** These items are merely a "snapshot" and not a fully comprehensive list of all available resources.

ACE MENTOR PROGRAM
ARCHITECTURE • CONSTRUCTION • ENGINEERING

CONSTRUCTION 101

Scheduling / Activities Sequencing 101

Building construction requires a lot of planning, support, and resources. The following listed below are the fundamental steps for building, in this example, a residential house. Commercial construction will have a similar sequence of activities, but the types and durations of those activities may vary drastically depending on the building type and use.



STEP ONE – FLOOR PLANS

The first step to every house starts off with a floor plan. A solid plan like this digital rendering helps the building process run smoothly and helps you determine what quantity and types of materials will be used during construction.

STEP TWO - FOUNDATION

The foundation most essential component of the house because it supports and outlines the entire house and forms the base for everything else you build. Although the foundation is important, it is typically not seen because it underneath the ground. The foundation, typically concrete is poured in the ground after outline of the house has been excavated.

STEP THREE - FRAMING

Once the foundation has been laid, the rest of the house can begin to take shape. Wood floor joist are attached to the foundation. A sub-floor is attached to the floor joist and wood studs are installed on top of the sub-flooring. Openings for windows and doors are framed in each wall based on the floor plan. After walls are complete, framing for the roof are attached on top of the walls.

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CONSTRUCTION 101

Scheduling / Activities Sequencing 101

STEP FOUR – SHEATHING (WALLS & ROOF)

After the wall and roof framing is completed, it is important to completely enclose the entire house to protect it from outside weather conditions so that you can begin interior finishes as soon as possible. Wood sheathing (typically 4 x 8 sheets of plywood or OSB) is connected to the wall and roof framing to enclose the house.

STEP FIVE - ROOFING

After sheathing is completed at the roof, roofing paper is next, and then the shingles are tacked on. This provides a watertight enclosure at the top of the house. The next step is to provide a watertight enclosure at the exterior walls so that interior finishes can begin.

STEP SIX – FINISHES & FACADE

After sheathing is complete at all the exterior wall, house wrap tacked on and windows and doors to seal the interior of the house from the elements. Interior finishes can now begin and the exterior finish/ façade can now be attached to the exterior of the house such as brick, stone, siding, etc. Once the exterior finish is installed final touch ups are made and the exterior is complete. Now the construction process moves to the inside of the house.

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CONSTRUCTION 101

Scheduling / Activities Sequencing 101

STEP SEVEN – MECHANICAL & ELECTRICAL

After the exterior is finished, you can install electrical wiring through the wood framing for outlets and fixtures. Water and sanitary/vent piping for plumbing and air supply ducts for HVAC systems are installed through wood wall framing as well. Once all the wiring and piping inside the walls are complete.

STEP EIGHT - INSULATION

Insulation is key to keep your house comfortable and energy-efficient in all seasons. Insulation is installed between wood stud framing after all the wiring and piping has been inspected. Expandable spray insulation is applied in between joints around window and door openings to prevent outside air infiltration and inside air escaping. Good insulation and sealing makes heating and cooling your home less expensive in the long run.

STEP NINE – INTERIOR WALLS

Wiring, piping, and insulation are done, you can complete drywall and trim work including interior doors on the interior. Once this is complete, interior finishes can finally begin and the house is nearly complete.

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CONSTRUCTION 101

Scheduling / Activities Sequencing 101

STEP TEN – INTERIOR FINISHES

Drywall is complete, now paint, carpet, tile, wood flooring, base/wall cabinets, countertops, light fixtures, plumbing fixtures, and appliances can be installed. Completing the interior can be exciting, but don't neglect the finishing touches outside your house

STEP ELEVEN -INSPECTIONS

Throughout the construction process and especially towards the end, the house will need to be inspected. There are standard building codes and rules that the new constructed house must adhere to in order to pass inspection. Anything that is not in compliance to the rules must be repaired or even replaced in some cases.

STEP TWELVE - LANSCAPING

The house is nearly complete and landscaping will be the final touch. Adding trees, shrubs, flower, planting beds, mulch, pavers, sod, etc. around the house will add the design of the house and provide an environment that compliments the look and feel of the house.

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ARCHITECTURE • CONSTRUCTION • ENGINEERING

COMMUNICATION 101

Presentation Tips & Preparation 101

Completion and Readiness Checklist

The Deliverables

Use this simple checklist to make sure that you have all the required paperwork (deliverables) for your presentation. Assign a different person on your team responsible for each item to make sure that things get done.

Complete	Deliverable	Responsible
	Problem Statement / Design Narrative	
	Design Vision Board	
	Process Sketches	
	Hand-made Physical Scale Model	
	3D BIM Model (SketchUp preferred)	
	Final IFC Construction Document Plan Set	
	Conceptual Estimate	
	Construction Schedule	
	Bill of Materials	
	Presentation Visuals- Handouts, Graphics, etc.	
	Final Built Structure Signoff	

Define the Presenter ROLES.

On the day of your presentation, each person will play a specific role. Summarize here who is assigned to each role.

_____
_____
_____
_____
_____
_____
_____

ACE MENTOR PROGRAM
ARCHITECTURE • CONSTRUCTION • ENGINEERING

COMMUNICATION 101

Presentation Tips & Preparation 101

Practicing For Your Presentation

- **Use Visual Aids! But…**
- **Don't abuse your visuals aids** –Whatever your visuals may be, keep them simple and don't put too many words on them. The audience isn't there to read your slides, they are there to listen to you present.
- **Look at the audience** – If you ever wondered where you should be looking when presenting, the answer is right in front of you. Try to make eye contact with numerous people throughout the room.
- **Show your personality** – It doesn't matter if you are presenting to a corporate crowd or to senior citizens, you need to show some character when presenting.

- **Make them laugh** – Although you want to educate your audience, you need to make them laugh as well. In essence, it keeps the audience alert and they'll learn more from you than someone who just educates.
- **Talk to your audience, not at them** – People hate it when they get talked at, so don't do it. You need to interact with your audience and create a conversation. An easy way to do this is to ask them questions as well as letting them ask you questions.
- **Be honest** – A lot of people present to the audience what they want to hear, instead of what they need to hear. Make sure you tell the truth even if they don't want to hear it because they will respect you for that and it will make you more human.

ACE MENTOR PROGRAM
ARCHITECTURE • CONSTRUCTION • ENGINEERING

COMMUNICATION 101

Presentation Tips & Preparation 101

Practicing For Your Presentation

CONTINUED

- **Don't over prepare** –You need to be prepared enough to know what you are going to talk about but make sure your presentation flows naturally instead of sounding memorized.

- **Show some movement** –Make sure you show some gestures or pace around a bit (not too much) on the stage when speaking. Remember, no one likes watching a stiff. People are more engaged with an animated speaker.

- **Watch what you say** – You usually don't notice when you say "umm", "ah", "like", or any other useless word frequently, but the audience does. Some members of the audience will probably count how many times you say these useless words.

- **Differentiate yourself** – If you don't do something unique compared to all the other presenters the audience has heard, they won't remember you.

ACE MENTOR PROGRAM
ARCHITECTURE • CONSTRUCTION • ENGINEERING

COMMUNICATION 101

Presentation Tips & Preparation 101

Making a Better Presentation

Chances are you've already done one major presentation in your life so far. And chances are that you have some things about that presentation that you'd like to "do over". Use your next presentation as a second chance to get it right. Take some time to look through these new tips that should aid the visual side of your presentations.

Presentation Design

- Don't overload your slides with too much text or data.
- FOCUS. In general, using a few powerful slides is the aim.
- Let the picture or graphic tell the story. Avoid text.
- Type key words in the PowerPoint Notes area listing what to say when displaying the slide. The notes are printable.
- Number your slides and give them a title.
- Use the "summary slide" feature in slide sorter view to prepare an Agenda or Table of Contents slide.
- Prepare a company logo slide for your presentation.
- You can add a logo and other graphics to every slide using the slide master feature.
- Proof read everything, including visuals and numbers.
- Keep "like" topics together
- Strive for similar line lengths for text.

Visual Elements

- A font size of 28 to 34 with a bold font is recommended for subtitles. The title default size is 44. Use a san serif font for titles.
- Use clear, simple visuals. Don't confuse the audience.
- Use contrast: light on dark or dark on light.
- Graphics should make a key concept clearer.
- Place your graphics in a similar location within each screen.
- To temporarily clear the screen press W or B during the presentation. Press Enter to resume the presentation.

Making a Better Presentation

CONTINUED

Text

- Font size must be large enough to be easily read. Size 28 to 34 with a bold font is recommended.
- It is distracting if you use too wide a variety of fonts.
- Overuse of text is a common mistake.
    - Too much text makes the slide unreadable. You may just as well show a blank slide. Stick to a few key words.
    - If your audience is reading the slides they are not paying attention to you. If possible, make your point with graphics instead of text.
    - You can use Word Art, or a clip art image of a sign, to convey text in a more interesting way.