2018 SAME Engineering and Construction Camp at USAFA

“Build then Design”

Teddy Brunger
June 26 – July 2
On my way...

- Nervous and Excited
- Reviewed Homework
- Layover in Denver
- Met at Colorado Springs baggage claim
- Arrival at USAFA
Day 1

- Orientation/Flight Assignments
  - Foxtrot

- What we learned
  - Colonel J. Christ

*Served 22yrs in USAF and Head of Dept of Civil Engineering USAFA*

- Real life application
  - Full group cooperation and collaboration
Day 2

• **Concrete Beam Construction**
  • What we learned
    – Concrete = compression
    – Rebar = tension
  • Real life application
    – The strongest beam is dependent on placement of the rebar and the W/L/H of the beam

• **Water Treatment**
  • What we learned
    – Sand = filter
    – Charcoal = pigment remover
  • Real life application
    – Water purification can be done using very limited materials.
Day 2 (continued)

• 3-Legged Chair

• What we learned
  – Strongest chair = strongest base

• Real life application
  – Integrity of a structure relies on its base
Day 3

• **USAFA Laboratories Tour**
  • What we learned
    — Mach 6 Ludwieg Tube
  • Real life application
    — Evaluate reaction of aircraft at high speeds

• **Catapult**
  • What we learned
    — 45 degree angle is optimal
    — Weight of pouch of balloon affects distance travelled
  • Real life application
    — Survival
Day 3 (continued)

• **Cardboard canoe**

• What we learned
  — Flat bottom more stable than v-shaped

• Real life application
  — V-shaped = speed
  — Flat = stability
  — Balance of both gave best results
Day 4

- **Engineering Firm Tours**
  - What we learned
    - Design then build
  - Real life application
    - Different 3-D models of same project help plan the optimal design

- **Engineer Reaction Course**
  - What we learned
    - Deadlines must be met
  - Real life application
    - Build fast but not in a hurry
      (fastest pace without risking integrity of the structure)
Day 5

- **Dog Kennel Construction**
  - *for CS Humane Society*
  - What we learned
    - Elevated structures can help protect against natural forces
  - Real life application
    - Only dog house that will not get wet inside during rain storm

- **Sprinkler System**
  - What we learned
    - More sprinkler heads = less pressure throughout system
  - Real life application
    - Quantity ≠ Best Quality
And even had time for more fun...
Day 6

- **USAFA Admissions Tour**
  - What we learned
    - What I have to do to apply to the USAFA
  - Real life application
    - I will continue to work hard to exceed the requirements

- **Water Balloon Launch**
  - What we learned
    - Did our catapult work optimally?
  - Real life application
    - Catapult angle and balloon pouch weight = travelled further than any other team
Day 7

- **0600 PT**
  - 100+ Push ups
  - 12x 50 meter sprints
  - 1 mi run
  - Core exercises
  - Formation practice

- **Concrete Beam Destruction**

- **What we learned**
  - Did we have a strong beam?

- **Real life application**
  - Rebar needs to be strategically placed diagonally through out the length of the beam for best outcome
Going home...

• Reflecting

  – “Civil Engineering” has new meaning to me

  – Motivated to pursue an education and career in engineering
THANK YOU

Space Coast SAME

for an UNFORGETTABLE experience!