Spray Booth Design - Do it Right!

SPRAY BOOTH ESSENTIALS
DESIGNING THE PERFECT SPRAY BOOTH

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Over 40 Years Designing & Engineering Spray Booths

“Spray Booth Essentials”
The Perfect Booth Must …

1. Protect your employees and facilities at all times
2. Obtain the quality of finish you desire
3. Realize cost optimization

Part I

- Your manufacturing fundamentals determine how to design an effective spray booth solution

Part II

- Understand Spray Booth Solution Options that best fit your finishing requirements

Part III

- Avoid costly mistakes before and after booth installation

Part I:

Understand your manufacturing fundamentals to determine how to design an effective spray booth solution

- Parts…
- Coatings…
- Production…
- Location…
- Safety and Code Requirements…

Top 5 Design Objectives for Your Perfect Booth Design …

1. The right size to be efficient
2. Effectively facilitates your production
3. Enhances your spray quality
4. Completely complies with all safety and code standards
5. Allows you to produce parts, cost-effectively

What type of part do you manufacture?

Not all parts can be treated the same way....

- Part sizes
- Anticipate future part sizes
- Configuration of the part in booth

What types of coatings are being sprayed?

Not all coatings are handled the same way…

- Powder vs. Liquid coatings
- Functional
- Aesthetic
- Multiple coatings
- Application method of coating

What are your production requirements?

Production requirements vary widely and require custom solutions ...

- Rate of Production
- Spraying Applications
- Powder Systems: Batch vs. Reclaim

Where will the booth be located?

Location, location, location…

- Inside the plant (Where?)
- Match booth design to location
- Outdoor Locations

Will your booth meet all safety standards…

Your requirements, and the requirements of all regulatory agencies?

- Spray Booths are highly regulated
- Employee safety is scrutinized
- Plant and property are protected
- Safer/cleaner environments increase productivity

Part II

Understand Spray Booth Solution Options that best fit your finishing requirements

- Choosing the right Air Flow Design
- Booth Insert Designs
- Water Wash vs. Dry Filter
- Recirculating Booths
- Powder Booths

Remember our Top 5 Design Objectives for a Perfect Booth Design...

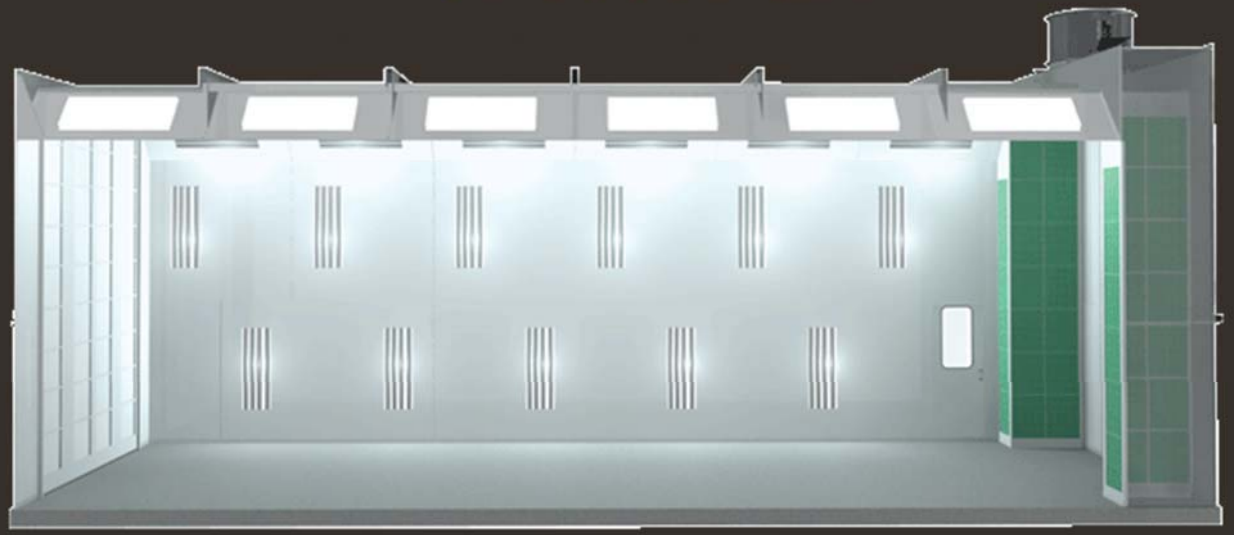
- The right size requirements to be efficient
- Effectively facilitates your production
- Enhances your spray quality
- Completely complies with all safety regulations and standards
- Allows you to finish parts cost-effectively

Primary Spray Booth Types... What are they and when best to consider them

Crossdraft

Spray Booth

Crossdraft



- Air passes thru front of booth thru supply filters
- Air flows over part in booth
- Enters exhaust filter chamber
- Exhausts through fan and duct to atmosphere

Primary Spray Booth Types... What are they and when best to consider them

Downdraft

Spray Booth

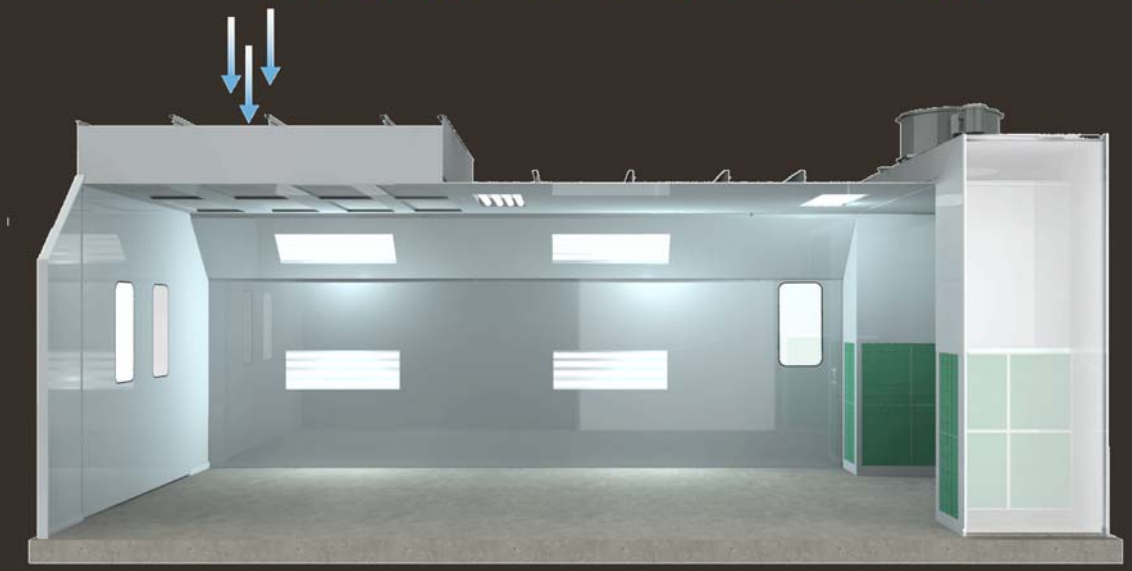
Downdraft Spray Booth

- Supply Air enters top supply plenum
- Air passes over part towards floor of booth
- Overspray is directed to grating and filters
- Air passes thru filters and then to atmosphere

Primary Spray Booth Types... What are they and when best to consider them

Semi-Downdraft Spray Booth

Semi-Downdraft



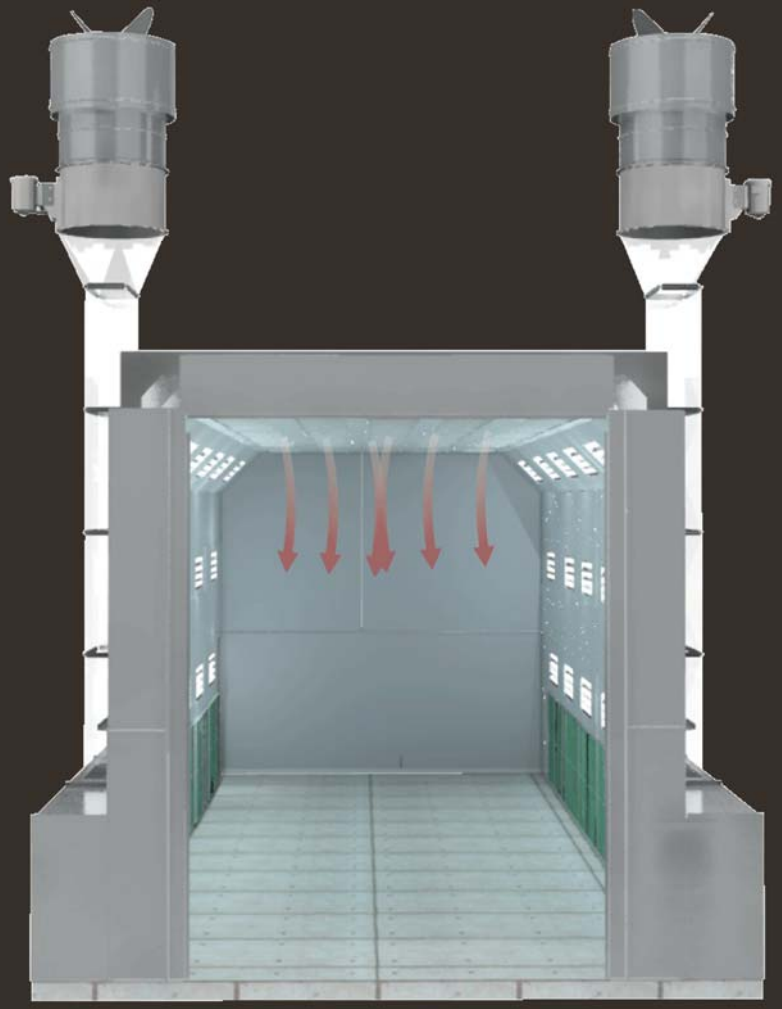
- Air enters the supply plenum at the front/top of booth
- Air moves down and back towards the rear exhaust
- Air has a “Semi-Downdraft” movement over the product
- Overspray passes thru filter and then to atmosphere

Primary Spray Booth Types... What are they and when best to consider them

Modified
Downdraft
Spray
Booth

Modified Downdraft

- Supply Air Enters top supply plenum
- Air passes over part towards the floor of the booth
- Overspray is directed to the lower exhaust plenums
- Air passes thru filters and then to atmosphere



Primary Spray Booth Types… What are they and when best to consider them

- Exhaust Chambers

EC-1412 Rear Style Cabinet Exhaust Chamber

Primary Spray Booth Types... What are they and when best to consider them

- Supply Chambers

SC-1610 Cabinet Type
Supply Chamber

Primary Spray Booth Types… What are they and when best to consider them

Water Wash Booth vs. Dry Filter Booth

Recirculating Spray Booths

Powder Booths

Powder Booths Should:

- Contain over sprayed powder
- Recover over sprayed powder
- Enhance application efficiency
- Provide for safe operating environments

Recovery Style

Cartridge Module Systems

- Module attached to the side of the booth with no separator

Cyclone System

- Cyclone used as a separator with a cartridge module secondary filter

Cartridge vs. Cyclone

Cartridge booths

- Single colors
- Multiple colors
  - Spray-to-waste
    - ✓ Fast color change 20-30 seconds
  - Recovery
    - Low color change frequency
    - Break even point 3-4 colors

Cyclone booths

- High frequency of color change
- Large number of colors to recover

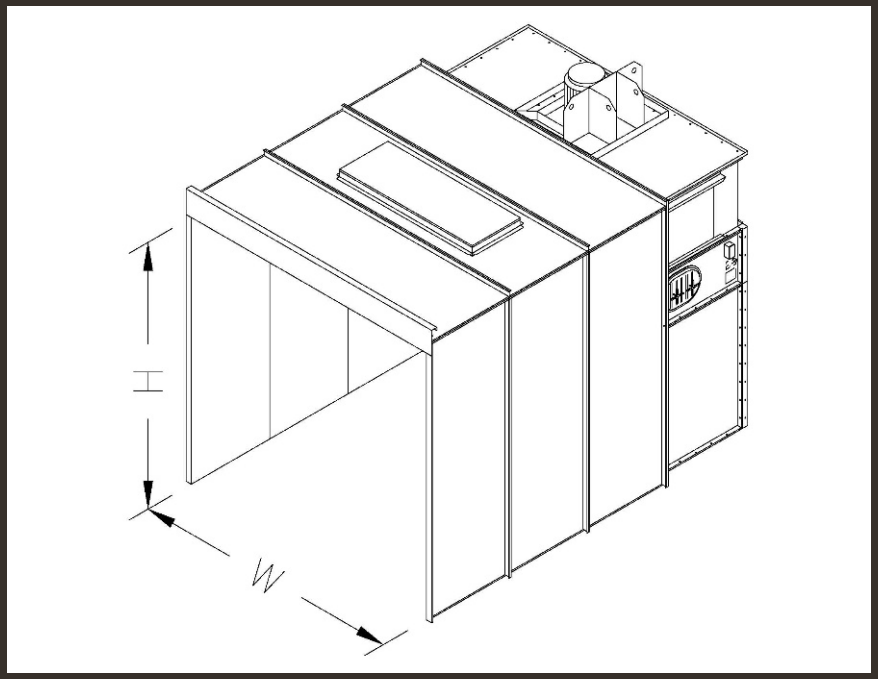
Normal range of containment air is 80 to 150 lineal feet per minute (LFPM)

Factors that affect design velocity

- Part & operator openings
- Volume of powder sprayed
- Part temperature
- Plant air conditions
- Environmental room conditions
- Recovery method

Automatic Conveyorized Recovery Type Powder Booth with Two Collectors

Total Air Flow Required to Contain Powder in Booth = Total Openings Area x Face Velocity Through Openings



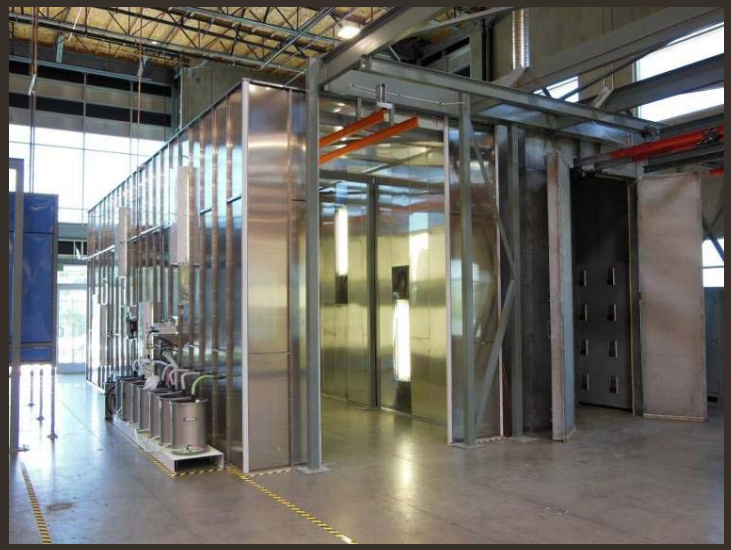
End Opening
8'H x 12'W = 96 sq. ft.

96 sq./ft. x 80 fpm face velocity = 7,680 cfm
100 fpm face velocity = 9,600 cfm
120 fpm face velocity = 11,520 cfm

Typical Batch Powder Booths

Construction can be:

- Stainless Steel
- Powder coated
- Other materials



Typical Automatic Powder Booths

Cartridge Type

Cyclone Type

Part III

How you can avoid costly mistakes before and after booth installation

Top 5 Costly Mistakes

Top 5 Assumptions heard from our customers that are commonly relied on and underestimated that cause costly mistakes…

What I've heard from my customers....

5

"Any Air Flow Design will work for my booth and my part..."

What I've heard from my customers....

4

"I should have enough lighting for my painter to see..."

What I've heard from my customers....

3

"No worries, my building has enough air...
I won't need that air make-up system..."

What I've heard from my customers....

2

"I've got the building inspector all over me...

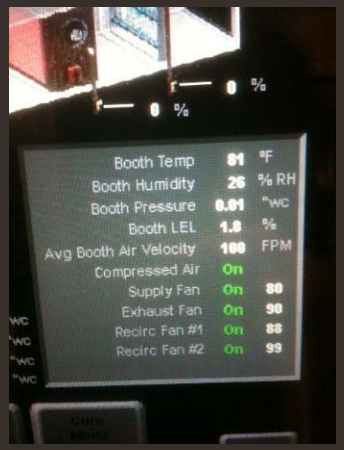
I'm sure my booth designer will meet all the required regulations..."

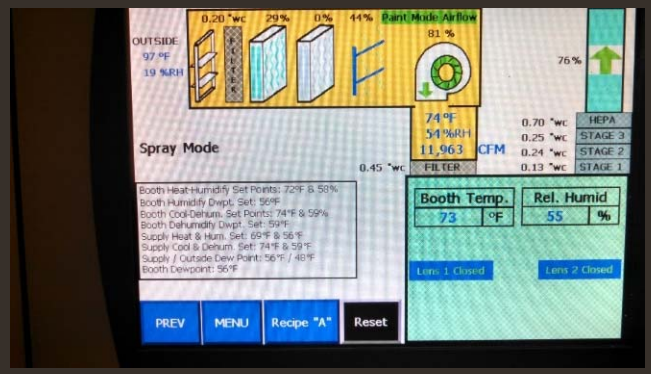
What I've heard from my customers....

1

"I think running the duct over here will work just fine…"

Booths are operating smarter these days...



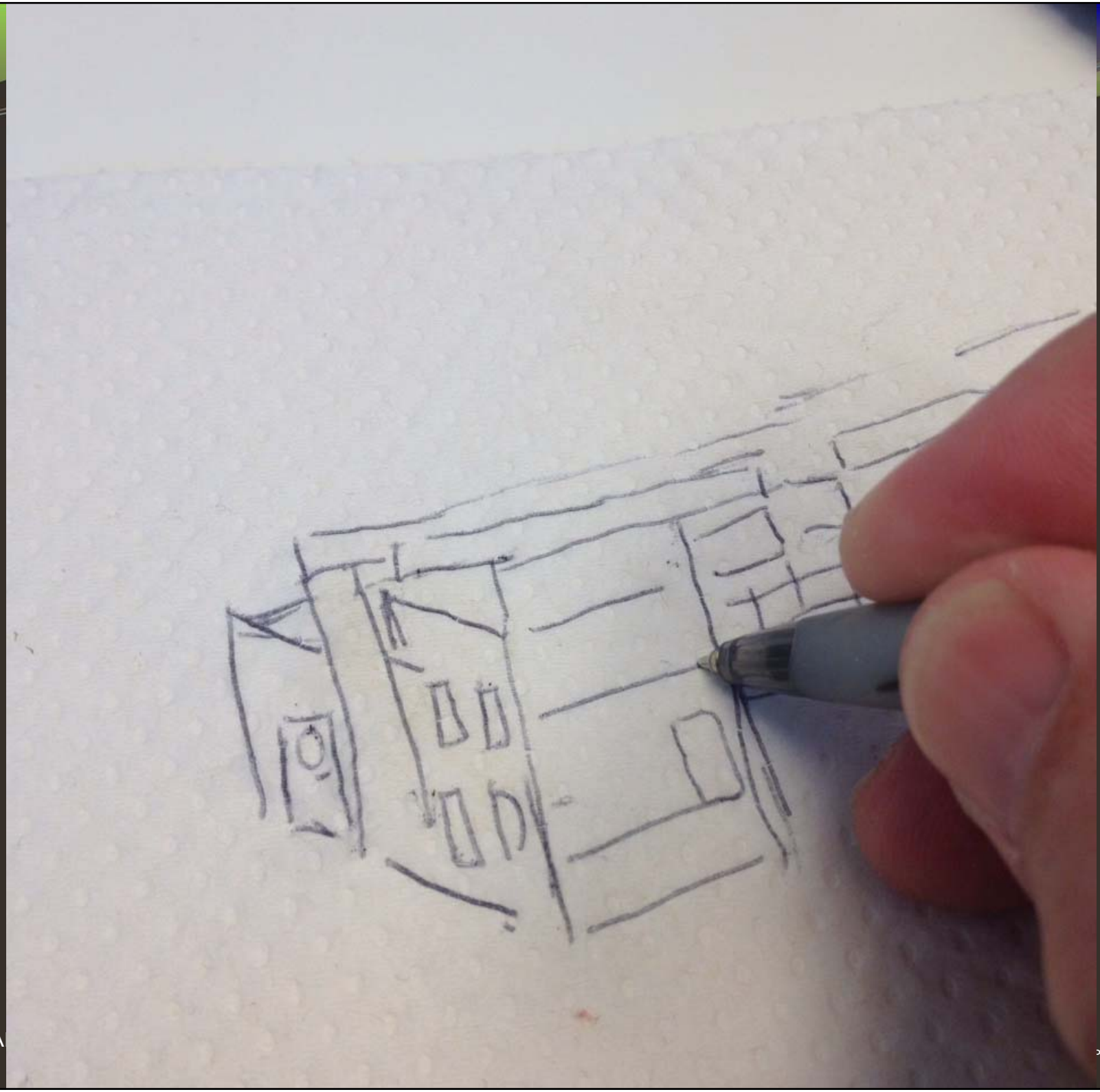


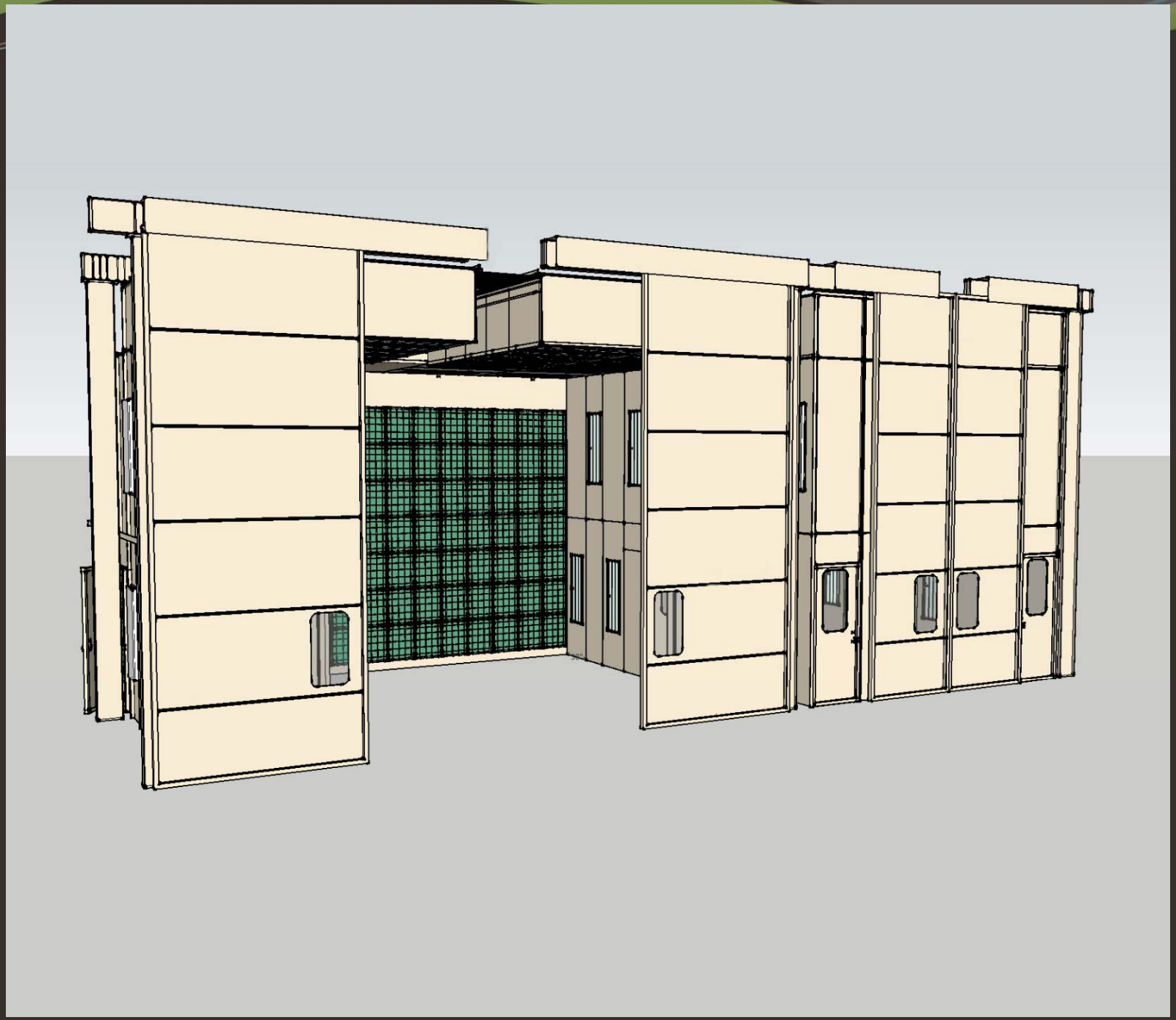
- Booth HMI Displays

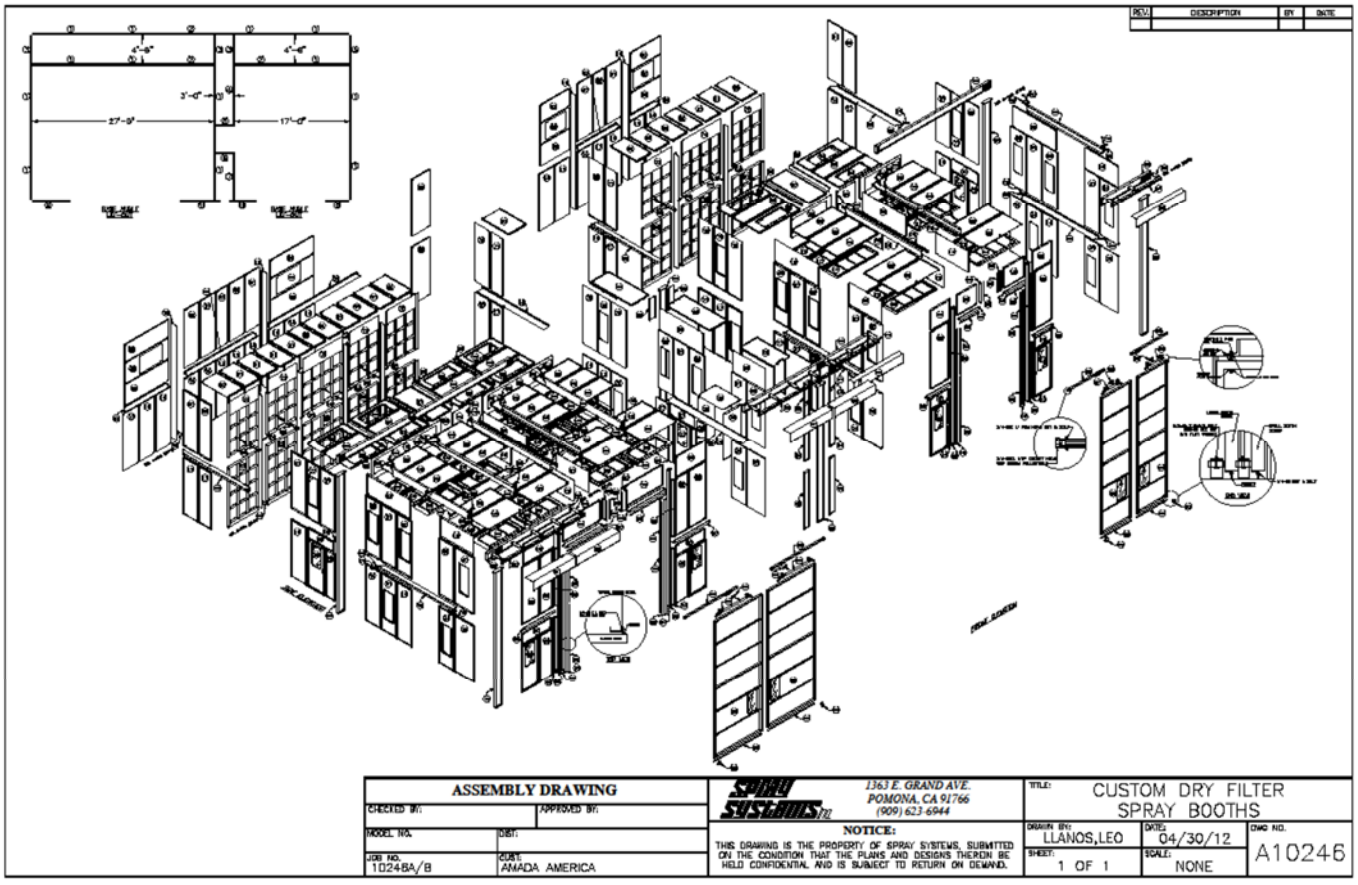
Booth interface to BMS

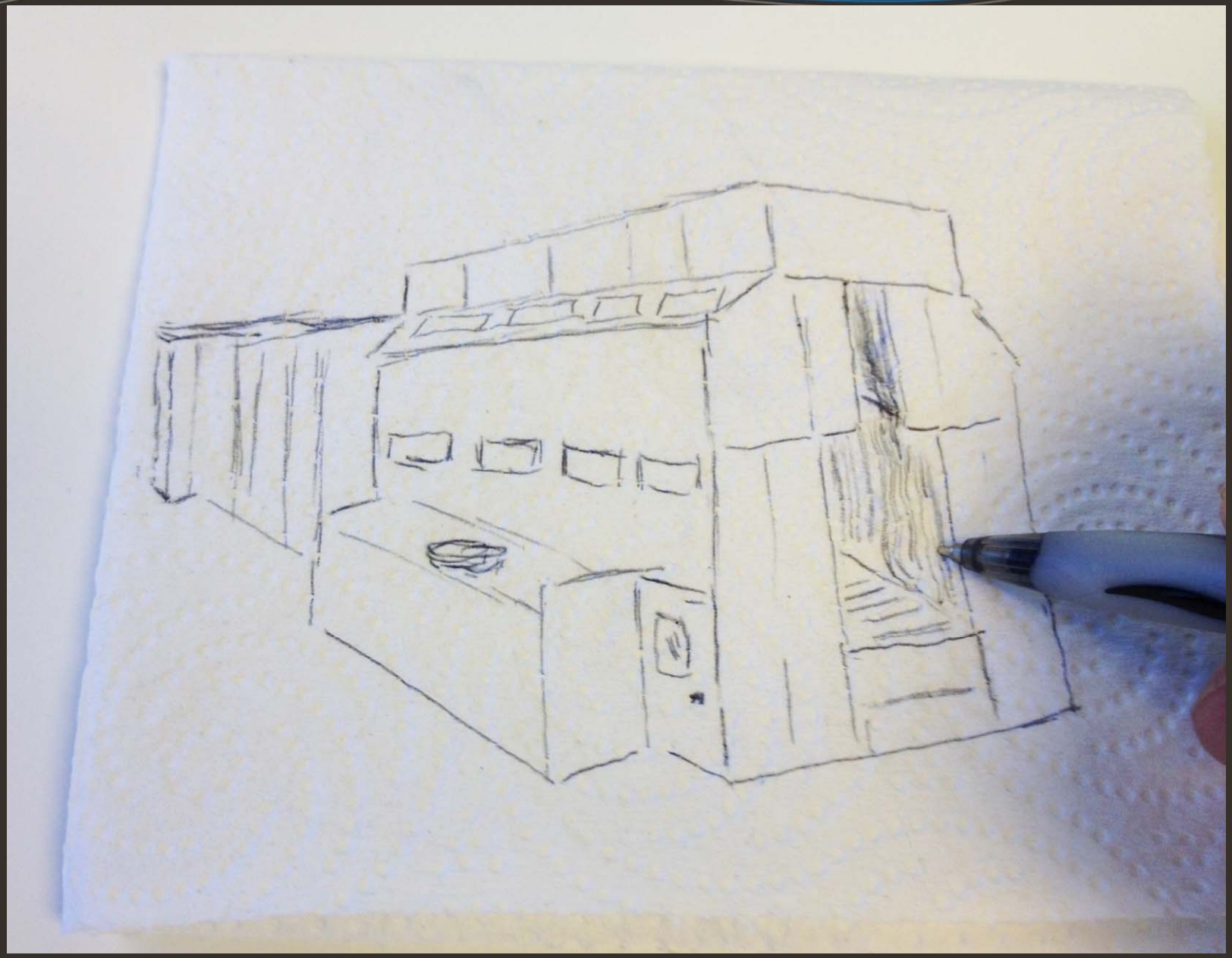
Celebrating Spray Booths Designs Done Right....

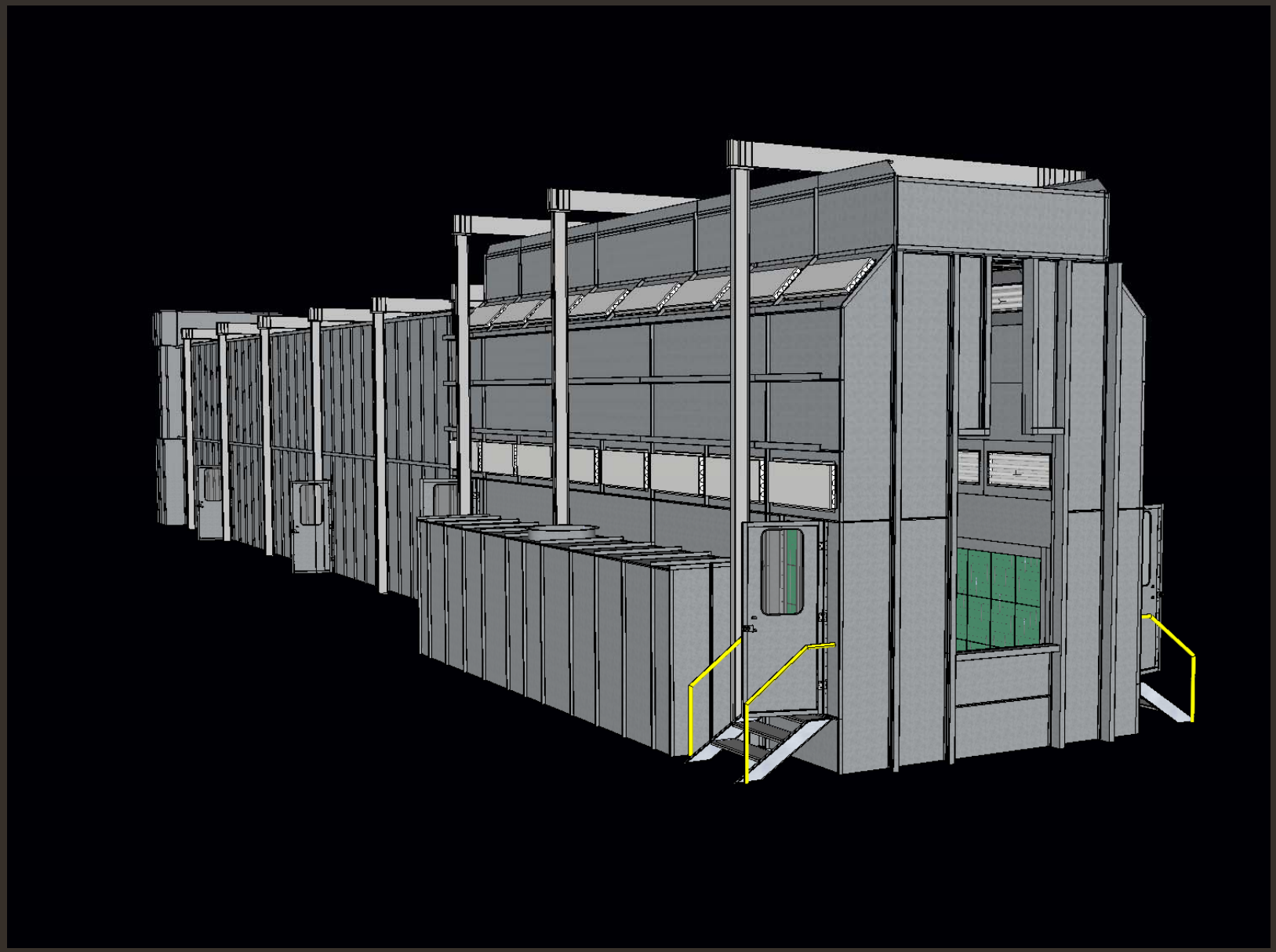

AMADA
CALIFORNIA
AMADA

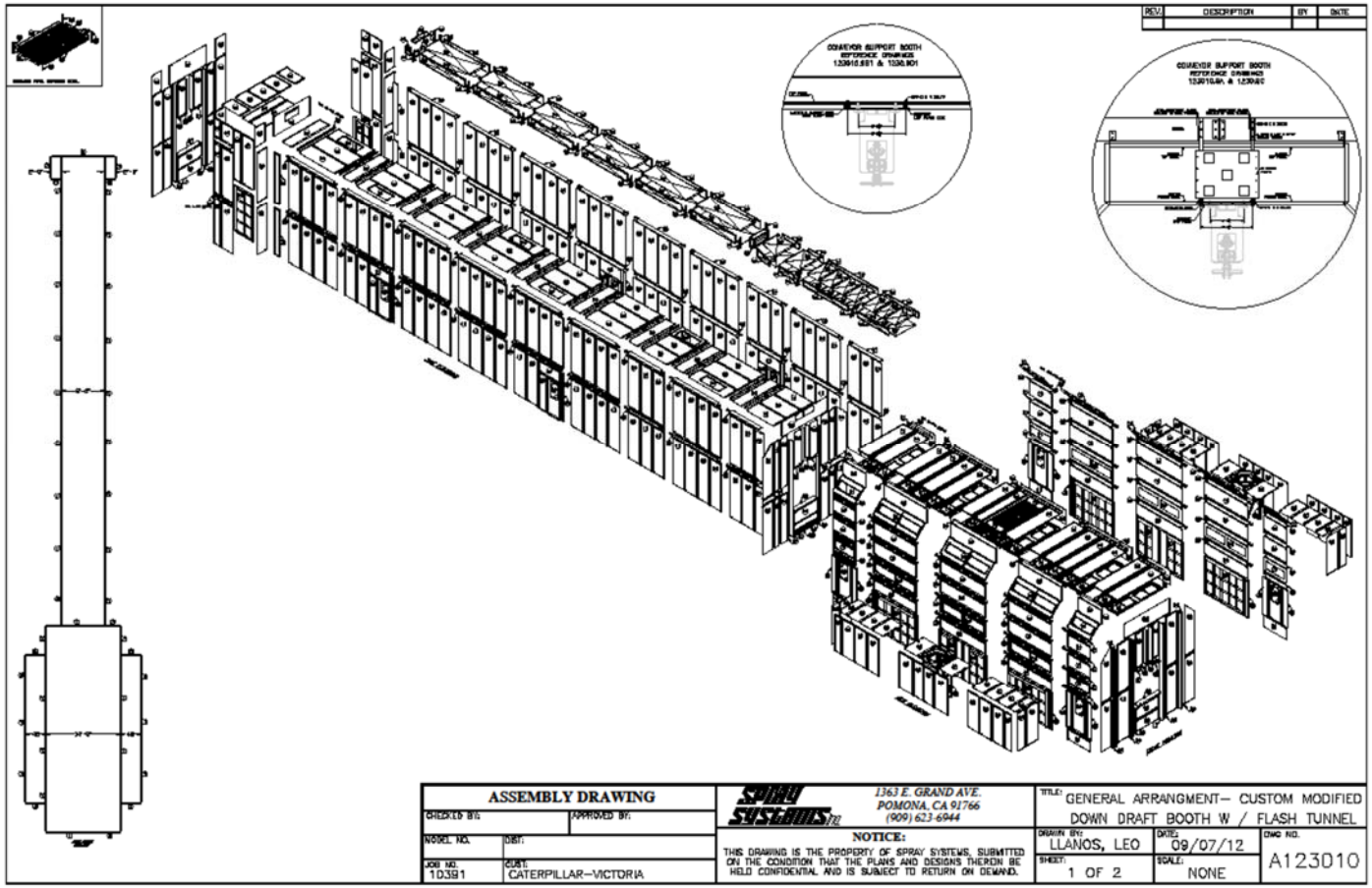


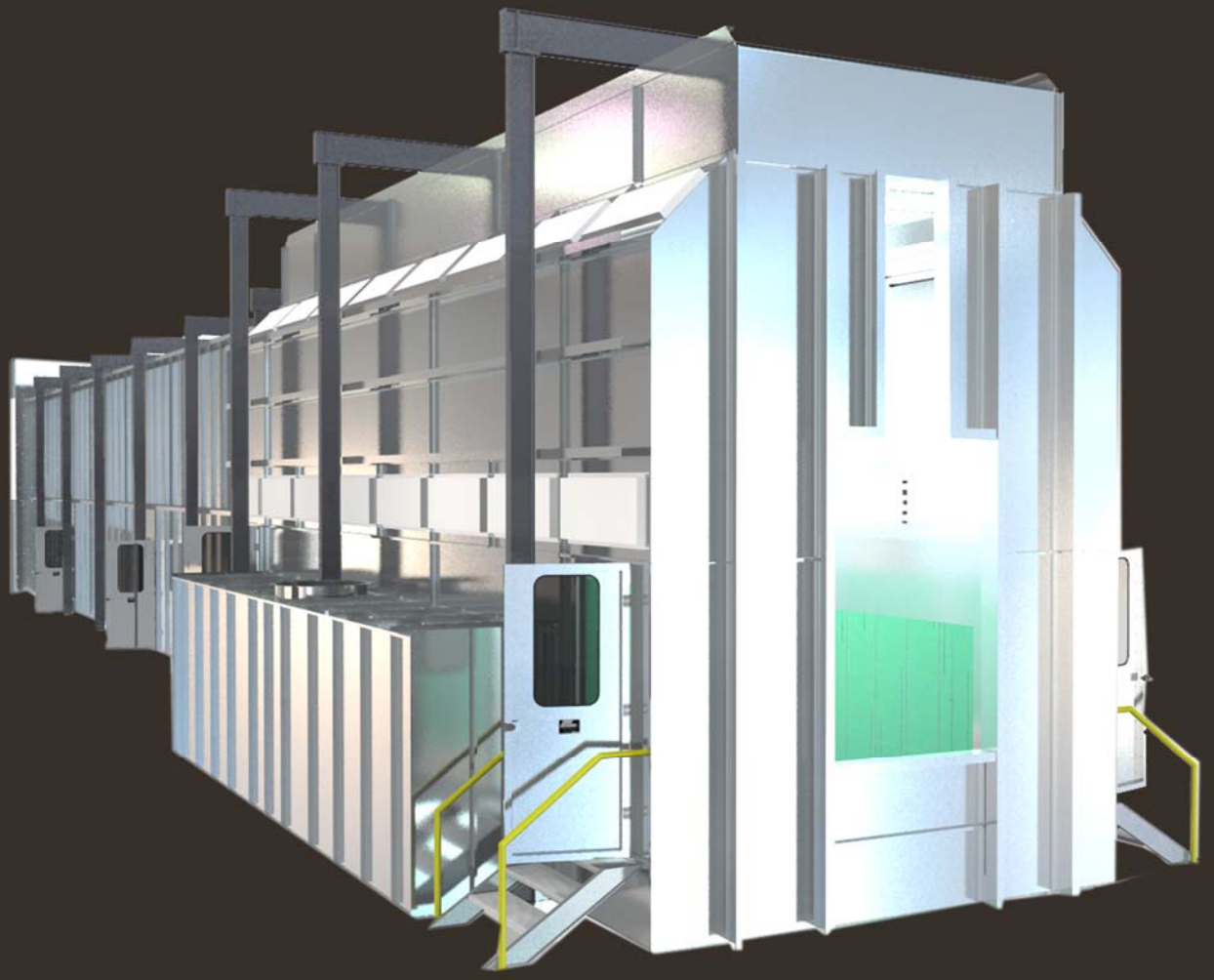












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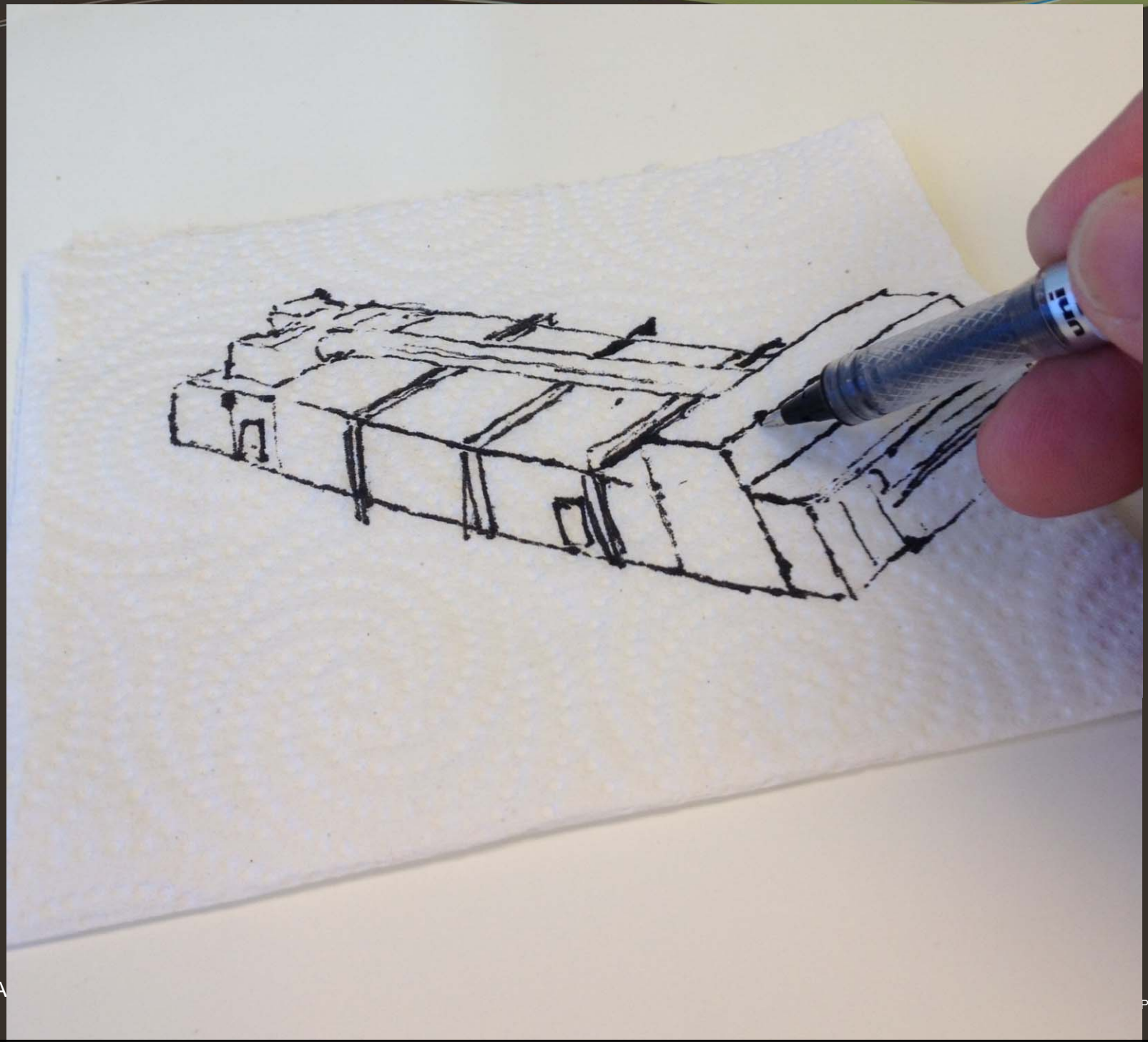

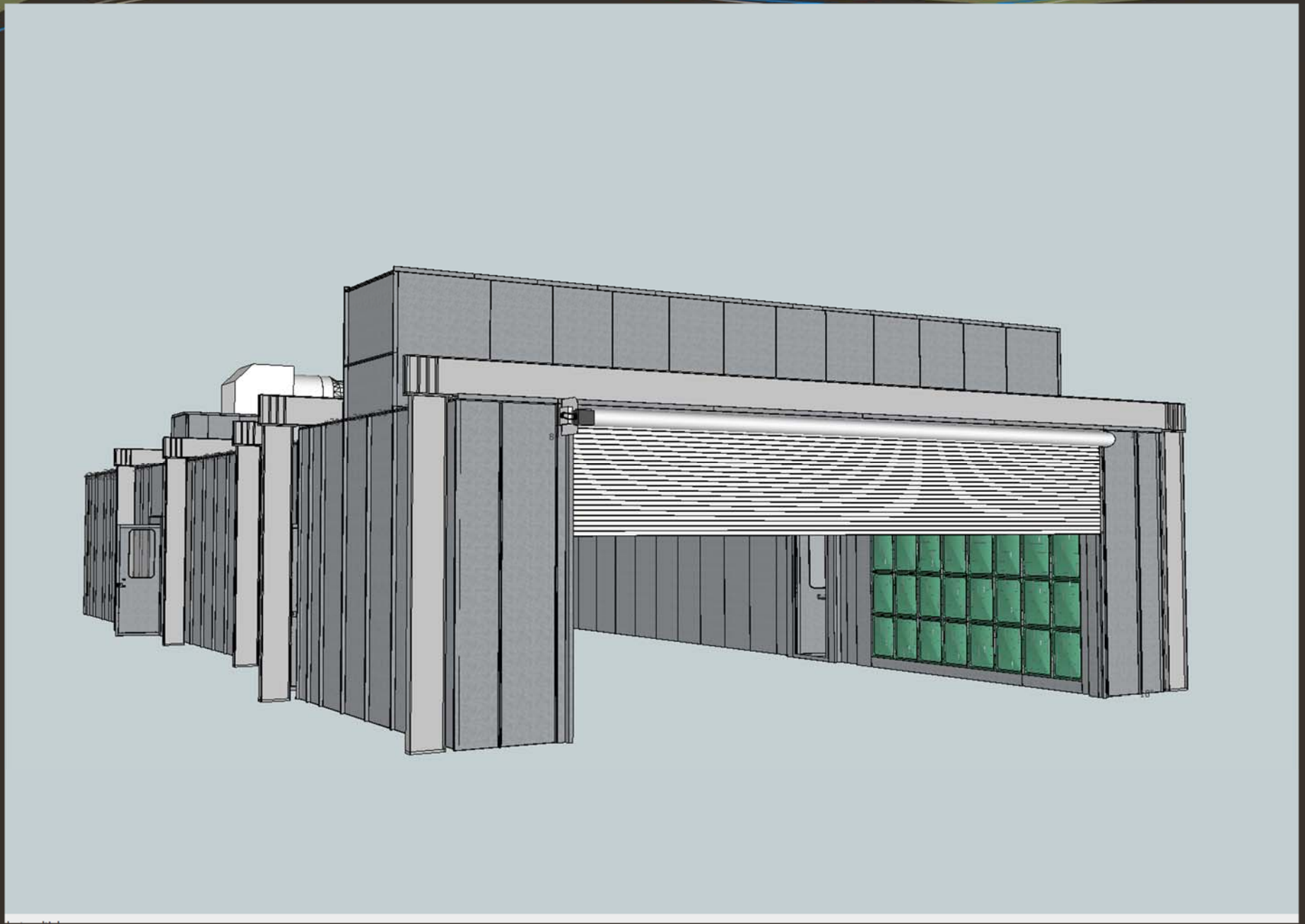

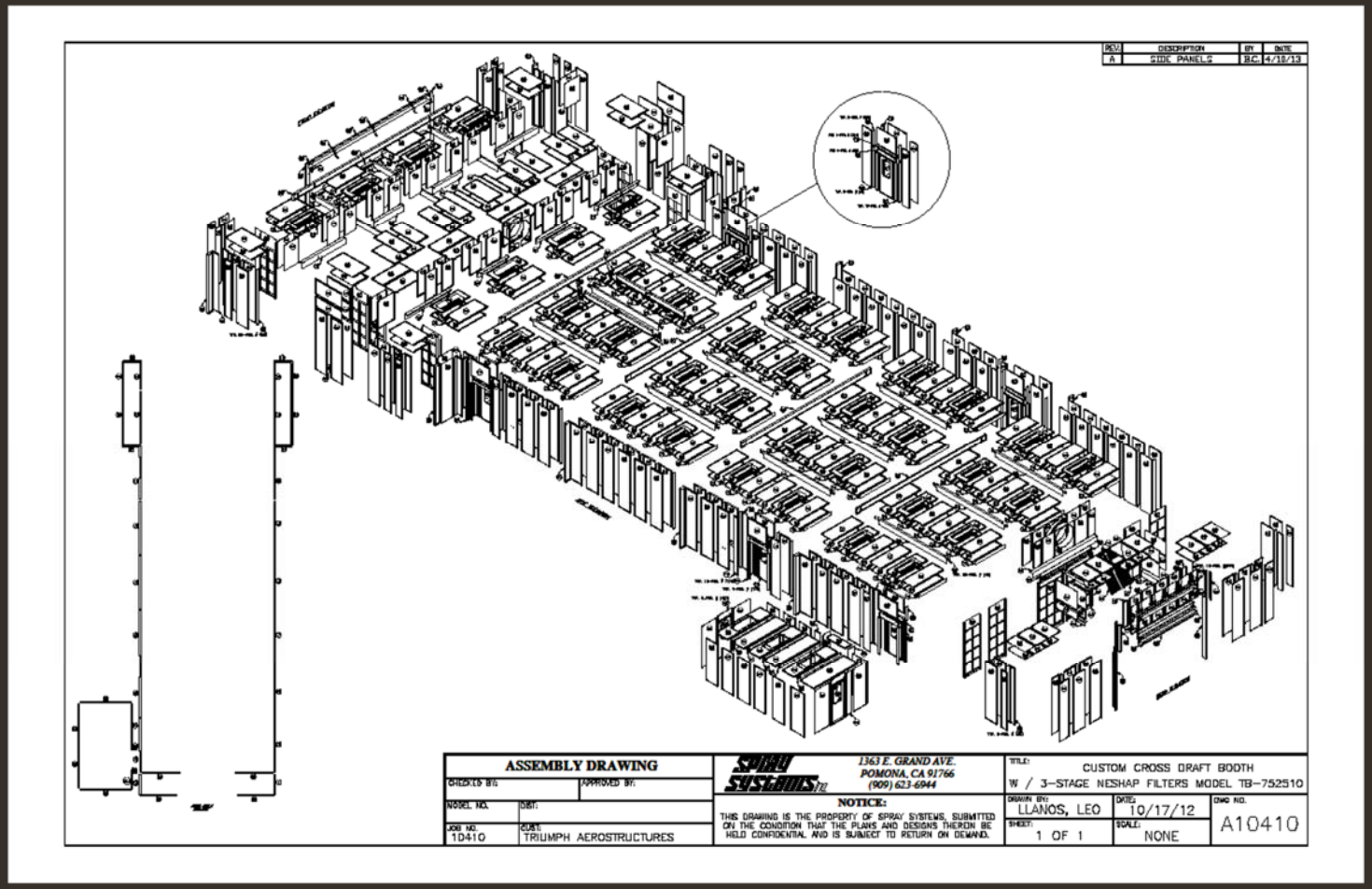

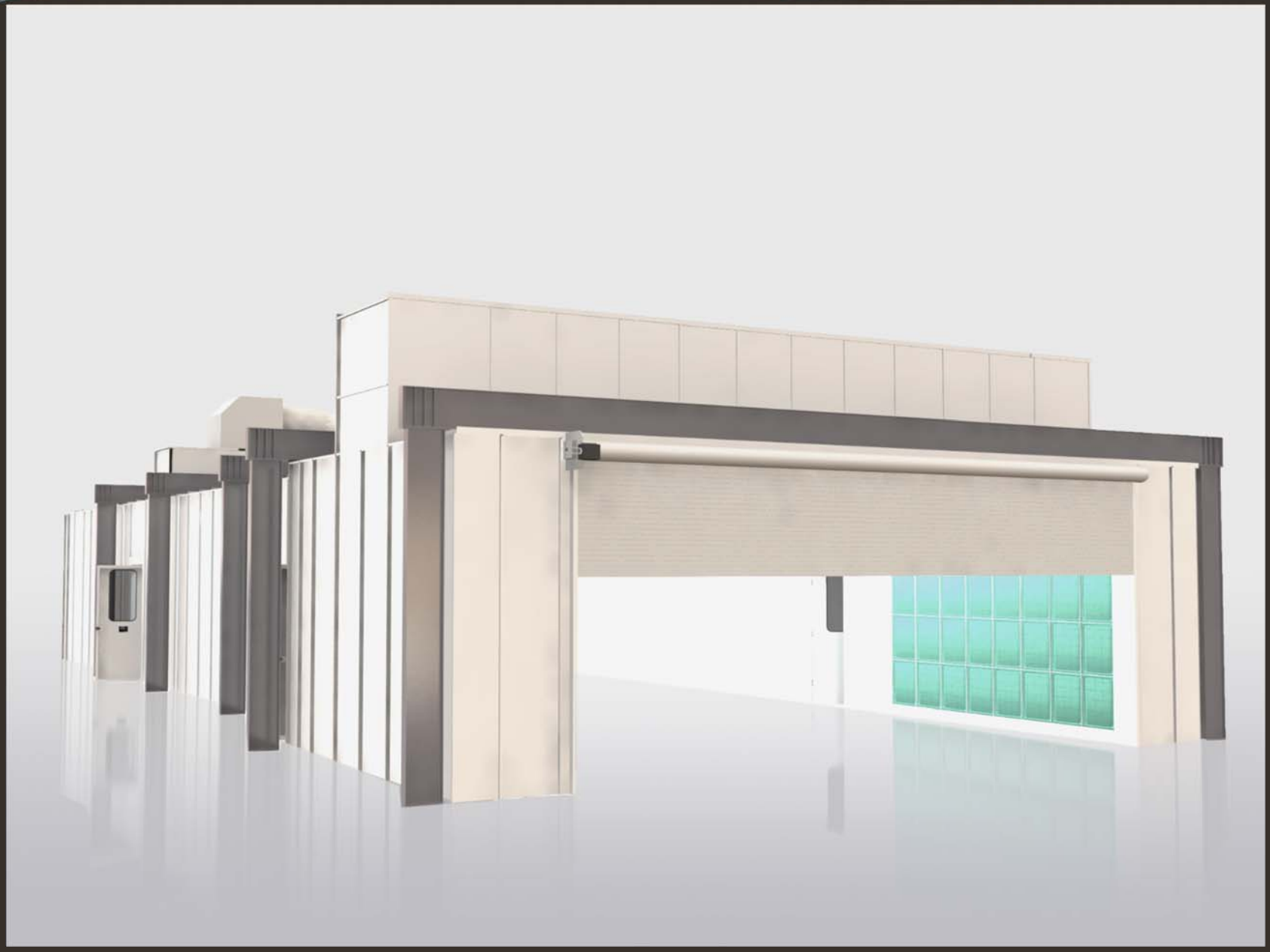

What have we learned today…
The importance of paying-off our Top 5 Design Objectives:

- Booth that's the right size to be efficient
- Booth that effectively facilitates your production
- Booth that enhances your spray quality
- Booth that completely complies with spray safety standards
- Booth that allows you to produce parts, cost-effectively

Thank You

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