



# ICD-705 Design and Construction Best Practices

May 2, 2023, 1:00 p.m.



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# ICD-705 Design and Construction Best Practices

Moderator: Lt. Cdr. Tim Dahms, P.E., OICC China Lake

## Speakers:

- Nathan Novark, SAF/RCC Requirements Program Manager, OICC China Lake / NAWCWD
- Jason Ridings, AIA, Director of Design, Harper Construction
- Marc Walker, DBIA, Project Manager, Hensel Phelps
- Chris Potten, Site Security Director, OICC China Lake / NAWCWD



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- ✓ **Questions will be addressed in the allotted time**
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## Moderator



Lt. Cdr. Tim Dahms, P.E.  
OIC China Lake

## Fun Facts

- WI Sports Fan
- Runner
- Publishing a book
  - *Detachment November*



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# Speaker



**Nathan Novark**  
OICC China Lake/NAWCWD

SAF/RCC Requirements Program  
Manager

## Fun Facts

- BBQ
- Served in the Army for over 9 years
- Enjoy building project cars
- Enjoy hiking/exploring



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# Speaker



# Jason Ridings

Harper Construction

Director of Design

## Fun Facts

- Favorite Team
  - St Louis Cardinals
- Recent Vacation Spots
  - Tiberias, Israel
  - Mammoth, California
- Did you Know...
  - I am a Twin
- Hobbies
  - Surfing
  - Restoring a '74 Triumph Spitfire



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# Speaker



## Marc Walker

Hensel Phelps

Project Manager

### Fun Facts

- Recently travelled to Barcelona, Rome, Paris, Amsterdam, and London
- Volunteer in Mexico building homes for migrant farm workers
- Love attending country music concerts
- Detroit Lions fan





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# Speaker



# Chris Potten

OICC China Lake/NAWCWD

Side Security Director

## Fun Facts

- Whiskey connoisseur
- Avid Traveler
- Soccer Coach



# China Lake Earthquake Recovery Program



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# Program Overview

- Two earthquakes occurred on 04 JUL 19\* and 05 JUL 19\*\* that caused damage across Naval Air Weapons Station (NAWS) China Lake
- To bring the Installation back to mission capable status, 18 MILCONS and numerous repairs have been approved and awarded
  - 14 MILCONS have been awarded for NAWCWD
  - 4 MILCONS have been awarded for NAWS China Lake
- Approved Budget - \$3.87 Billion
  - Dollars divided across MCON, OPN, RDTEN, and OMN
  - Have the FYDP to spend (MILCON appropriated in FY20 expires FY25)
- Highly integrated NAVFAC / NAWCWD team
  - Officer In Charge of Construction (OICC) China Lake
    - Over 150 full-time teammates across NAVFAC, NAWCWD, and KTRs supporting the OICC
  - Public Works Department support
    - Minor Construction projects under \$6M
    - Significant number of repair projects under execution

\*04 JUL 19 magnitude 6.4 at 10:33 A.M. PDT – local time (UTC – 4 July 17:33)

\*\*05 JUL 19 magnitude 7.1 at 8:19 P.M. PDT – local time (UTC – 6 July 03:19)

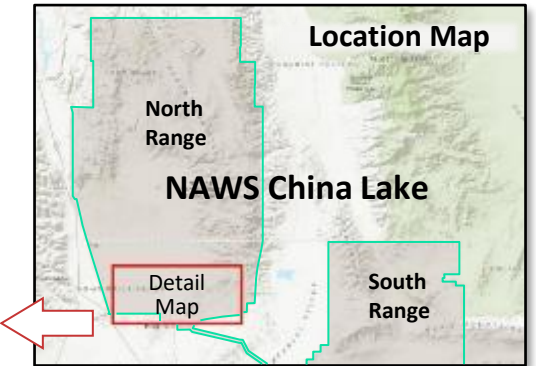


# MILCON & Major Repair Overview

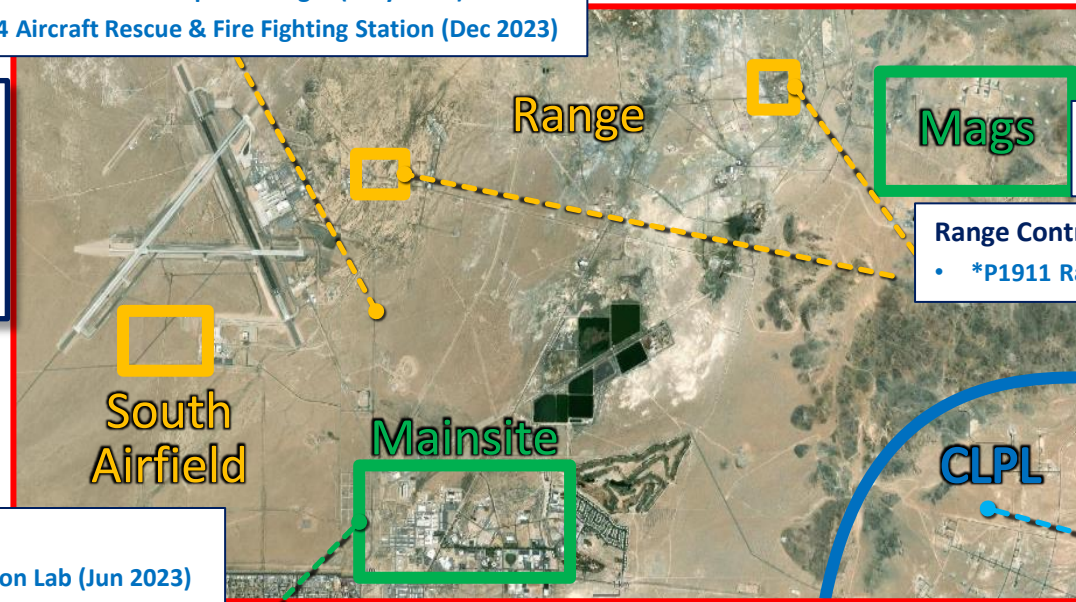
## South Airfield (SAF):

- \*P1900 Hangar 3 Replacement (May 2024)
- \*P1901 Integration Lab (May 2024)
- P1902 Air Ops and ATC Tower (Dec 2023)
- P1907 Aircraft Parking Apron for Hangar 2 (Dec 2023)
- \*P1908 Advanced Weapons Hangar (May 2024)
- P1914 Aircraft Rescue & Fire Fighting Station (Dec 2023)

Temporary Space: Total: 254,559 SF  
 27 Modulares, 15 Classified Modulares,  
 3 VX-31 Maintenance Shops, 6 TFS Hangars  
 Space for 1,100 personnel and programs



<b>Total = \$3.87B</b>	
MCON	\$2,282M
OMN (Repairs, Minor Equipment, Other)	\$846M
OPN (Equipment)	\$439M
RDT&E:	\$305M



**Main Magazine Area:**

- P1910 Magazines & Inert Storage Facility (Jun 2023)

**Range Control Complex (RCC):**

- \*P1911 Range Control Complex (Jun 2024)

**China Lake Propulsion Lab (CLPL) / Salt Wells:**

- P1918 Ordnance Test Supt & Tech Svcs Lab (Dec 2023)
- P1919 Radiographic Building (May 2024)
- P1922 Skytop Firing Bays (Jan 2024)
- P1917 Cast Propellant Mix Building (Feb 2025)
- P1920 Warhead Casing Operations (Sep 2023)
- P1921 Motor Assembly Compound (Feb 2025)
- RM19-1835: T-Range (Dec 2024)
- 800MR CT-6 Firing Range Support Facility LRP (Sep 2023)
- 810MR Inert Storage Warehouse LRP (Sep 2023)
- 440MR CLPL Prototype Laboratory LRP (Sep 2023)
- 450MR CLPL Admin Bldg. LRP (Sept 23)

**Legend:**  
 (Planned BOD)  
 \*ICD-705 Projects

**Mainsite:**

- \*P1903 Michelson Mission Systems Integration Lab (Jun 2023)
- P1916 Community Support Facilities (Mar 2023-Complete)
- \*RM19-1867 Michelson Lab Wings 2-5 (Oct 2023)
- P1924 Academic Training Building (Jun 2023)
- P1904 Michelson Lab Complex (Dec 2023)
- RM19-1867 Michelson Lab Wings 6-7 (Oct 2025)

**328,000SF of ICD-705 Space**



# ICD-705 Requirements



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# Requirements

- Gathering requirements:
  - End users: Customer operational requirements
  - Networks: Corporate and Program requirements
  - Security: Physical and Tempest
- Flexibility:
  - Networks
  - Access Control
  - Alarms



# Requirements

- Who to involve to get the real requirements?
  - Integrated Team
  - End user requirements: Identify a requirements lead
  - Security requirements: GSSO, AO, PSO, CTTA, SSO
- Know your customer
  - Who is using the facility and what type of data do they need access to?
- What type of work is being performed?
  - Hardware / fabrication
  - Software development
- How to minimize change?
  - Early involvement in planning stages through final construction
  - Specific, but not too specific



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# ICD-705 Design



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# Design - General Strategy

- Determine the means to mitigate the effects of a tactic:
  - forced entry
  - covert entry
  - visual surveillance
  - acoustic eavesdropping
  - compromising emanations
- This impacts planning of construction, building support systems, equipment, manpower, and procedures
- Every facility must be planned, programmed, designed, and constructed on a project-by-project basis
- SCIF/SAPF must be accredited to meet the supported command's operational capabilities



# Design – Minimum vs. Enhanced Requirements

- ICS 705-1 & IC Tech Spec - minimum & enhanced requirements
- Physical security criteria - unauthorized physical access
  - Related to walls, windows, doors, ceiling, and floor
- Technical security criteria – prevent collection or observation
  - RF transmitters, ACS, IDS, PEDs restricted, unclassified telecom
- Best practices - “suggested details” are cost-effective assemblies
  - Not prescriptive, project-specific conditions, comply with life safety provisions and other technical requirements (applicable building codes, accessibility, AT/FP, security, sustainability, safety)
- To implement security enhancements above the minimum, the AO and CTTA will evaluate the threat, TEMPEST, SID and balance the security enhancements with cost at acceptable risk



# Design – Bid Solicitation

- Security requirements increase cost above conventional construction
- Prioritize countermeasures that address risks – Do not exceed the AO approved recommendations
- Government must determine minimum and enhanced security requirements of the IC Tech Spec (AO, SSM, planners)
- Bidders will rely on requirements identified in Design Build RFP, Construction Security Plan (CSP), design documents, and contracts
- After contract award, planning requirements must be validated with AO/CTTA as soon as possible



# Design – Design Approval

- AO must approve final design prior to start of construction - Multiple AO/SSM reviews required
- Confirm AO/SSM interpretation of IC Tech Spec
- Separate security-focused design package (“Security Report”)
- Security design documents including plans with consolidated locations and details of penetrations through secure perimeter
- Develop narratives, details, product data sheets, test reports
- Mockups help the AO/SSM approve certain design details





# ICD-705 Construction



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# Construction - Aligning the Trades

- Unique requirements that are not traditional
- A series of meetings and trainings held on-site for all trade partners
  - Introductory Meeting – Why ICD-705 is important to the project’s mission
  - Basic Training – Discuss the installation details, and the do’s and don’ts for SCIF construction
  - Mock-up Preparatory Meeting – Plan for the construction of the mock-up
- Goal is to stress the importance of the standards and installation procedures



# Construction - Selecting the Materials

## RF Shielding – Coverttech rFoil Ultra Radiant Barrier (Solid) 85dB



**rFOIL®**  
Reflective Insulation

**TECHNICAL DATA SHEET**

**ULTRA NT RADIANT BARRIER (SCIF's) SOLID**  
Designed for (SCIF's) Sensitive Compartmental Information Facilities

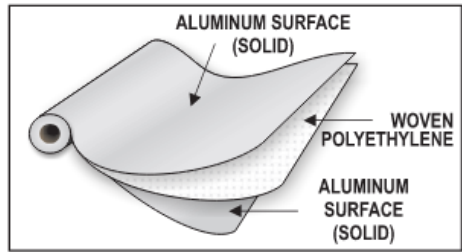
Page 1 of 2

**Product Description:**

rFOIL® Ultra NT Radiant Barrier is a heavy duty radiant barrier sheet made up of a single layer of woven polyethylene material bonded to and sandwiched between two highly reflective aluminum surfaces.

Ultra NT Radiant Barrier is designed to be used in Sensitive Compartmented Information Facilities (SCIF's). In addition to being a highly effective radiant barrier, Ultra NT solid is also an approved vapor barrier.

TECHNICAL



(SOLID product)

**Stock Sizes Available (Rolls):**

Size	<b>48" X 125'</b> (solid)
Part No.	1800-48-125S

**Features:**

- **Minimum Shielding Effectiveness (100MHz – 10GHz): 85 dB**
- Highly reflective radiant barrier surface
- Thermal performance unaffected by moisture
- Durable and flexible woven polyethylene base
- Reflects 97% of Radiant Heat
- Unrolls and cuts easily
- Increases sound attenuation for SCIF's

# Construction - Selecting the Materials

## Conductive Adhesive Tape – Coverttech rFoil and 3M 1170

- Expensive – 6” = \$536 per roll, 2” = \$135 per roll

rFOIL TAPE PRODUCT CODES		rFOIL SURFACE APPLICATIONS		rFOIL INSULATION PRODUCTS TO BE USED WITH	
15072 and 15073	Standard Metallized Foil	Used on rFOIL Products with a Metallized Surface		rFOIL (2200 and 4800) Series	
15113	Premium Metallized Foil	For use on rFOIL Duct Insulation Products		rFOIL (2260, 2280 and 2290) Series	
15512 and 15513	Aluminum Foil	Used on rFOIL Products with an Aluminum Surface		rFOIL (1800) Series	
15852 and 15853	White Poly	Used on rFOIL Products with a Poly Surface		rFOIL (1620, 2500, 2600, 4320 and 4700) Series	
11702	Aluminum Conductive Foil	Used on rFOIL Products with an Aluminum Surface		rFOIL (1800) Series (for SCIF Applications)	

PRODUCT SPECIFICATIONS						
Product Code Item Numbers and Sizes:	Item#	Size	Item#	Size	Item#	Size
	15072 - (2" x 180") 15073 - (3" x 180") <small>Length may vary between 150-180"</small>		15113 - (3" x 150")		15512 - (2" x 150") 15513 - (3" x 150")	
Physical Properties	STANDARD METALLIZED FOIL	PREMIUM METALLIZED FOIL	ALUMINUM FOIL	ALUMINUM CONDUCTIVE FOIL	WHITE POLY	
THICKNESS	3.0 MILS (0.003")	3.2 MILS (0.0032")	2.8 MILS (0.0028")	3.2 MILS (0.0032")	2.0 MILS (0.002")	
PEEL ADHESION	30 oz. / in.	60 oz. / in.	46 oz. / in. width	35 oz. / in.	22.0 oz. / in.	
BACKING	Polypropylene (BOPP)	Polypropylene (BOPP)	Aluminum Foil	Aluminum Foil <small>Shielding Effectiveness (85dB)</small>	White Polypropylene (BOPP)	
ELONGATION	130%	130%	4%	5%	—	
TENSILE STRENGTH	20 lbs. / in.	20 lbs. / in.	15 lbs. / in.	20 lbs. / in.	20 lbs. / in.	
TEMPERATURE RESISTANCE	-40°C to 85°C	-40°C to 85°C	-40°C to 121°C	-40°C to 130°C	-30°C to 120°C	
ADHESIVE	Acrylic	Acrylic	Acrylic	Acrylic Conductive	Acrylic	
FIRE CLASSIFICATION	UL723	—	UL723	UL510	—	

All tape specifications and sizes are subject to change without notice

### 3M

**3M™ EMI Aluminum Foil Shielding Tape 1170 with Electrically Conductive Acrylic Adhesive**

Data Sheet

June 2021

**Product Description**

3M™ EMI Aluminum Foil Shielding Tape 1170 is a 3-mil (0.076 mm) thick tape composed of a 2-mil (0.051 mm) flat aluminum foil backing coated on one side with a non-corrosive, electrically conductive acrylic pressure-sensitive adhesive supplied on removeable liner for easy handling.

- Commonly used for EMI/RFI shielding applications in the electronics industry and for static charge draining, seaming shielded rooms, cable wrapping and surface contact to non-solderable materials
- Can be die-cut and offers a multitude of uses in electrical design and test laboratories for prototyping, design and troubleshooting
- Adhesive requires no moisture, solvents, heat or other manner of preparation to affect application
- Flame Retardant per UL-510A Standard

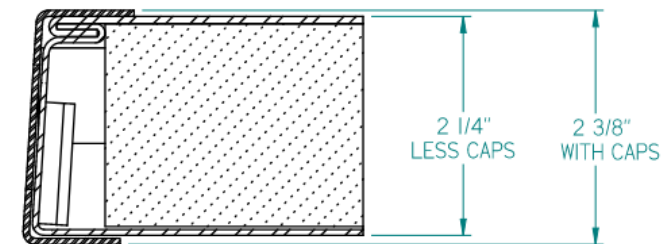
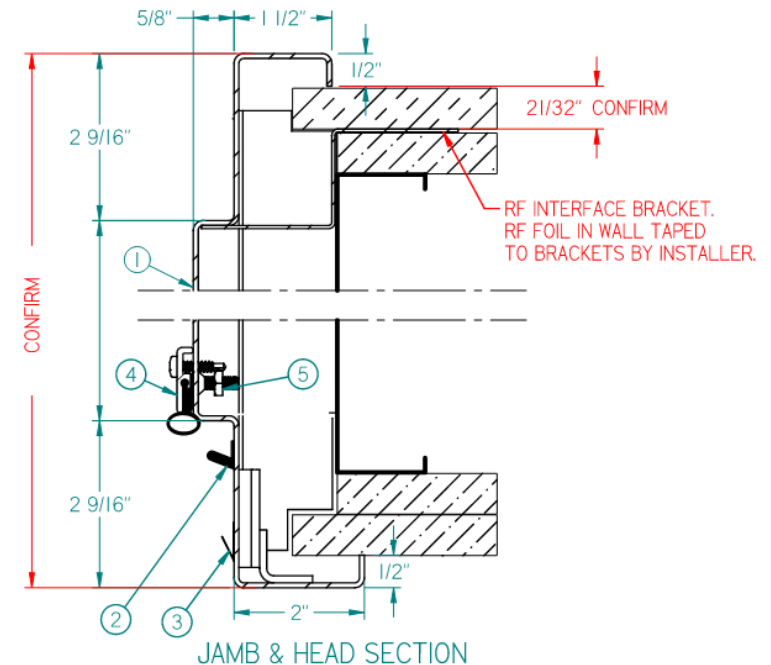




# Construction - Selecting the Materials

## RF Rated Doors – Ambico

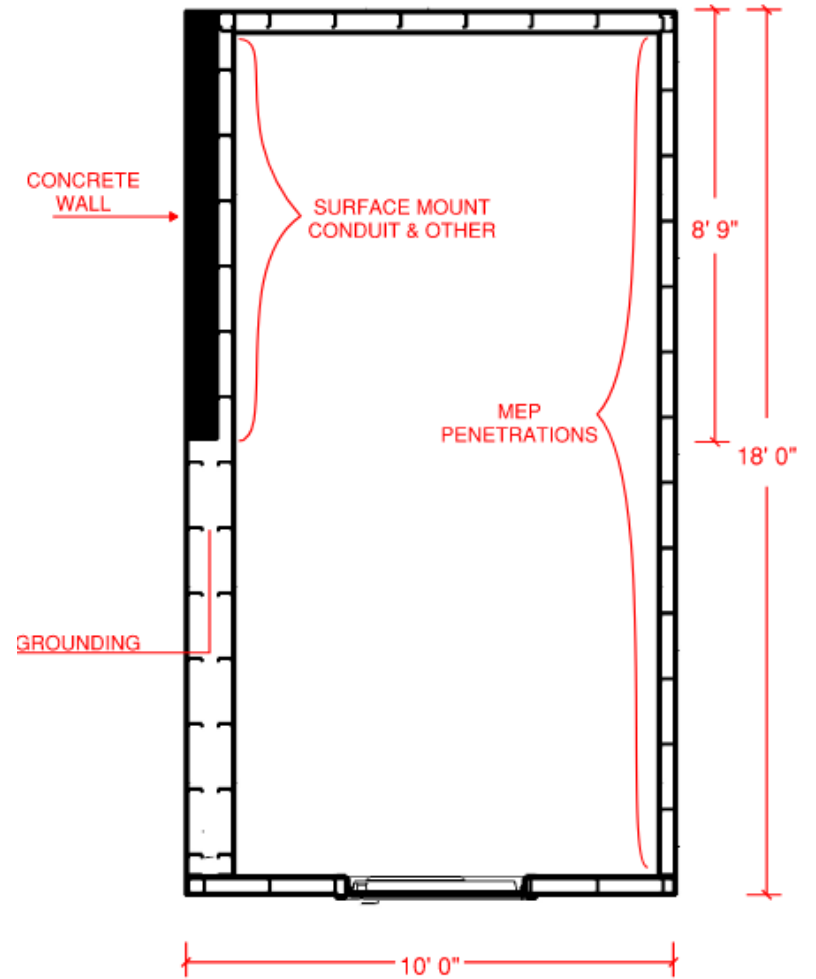
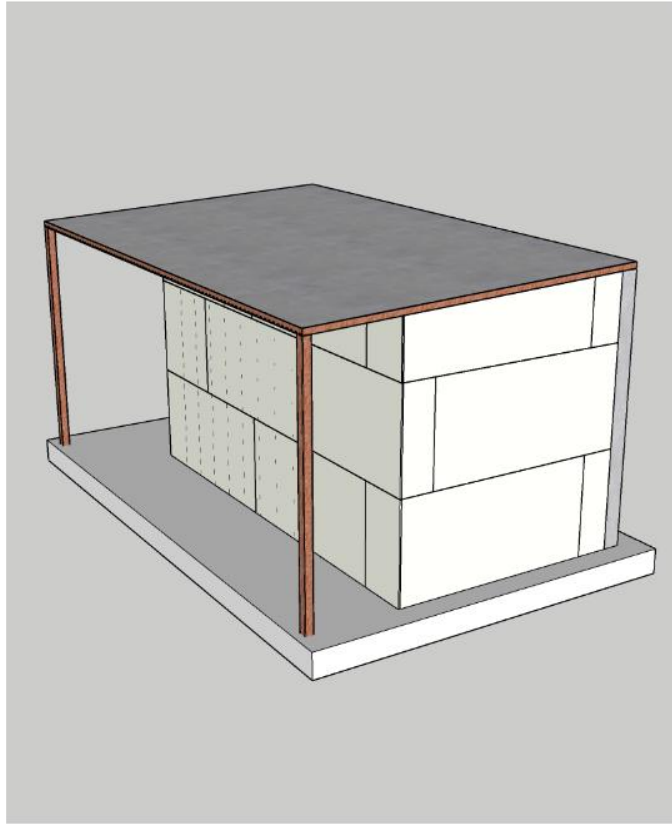
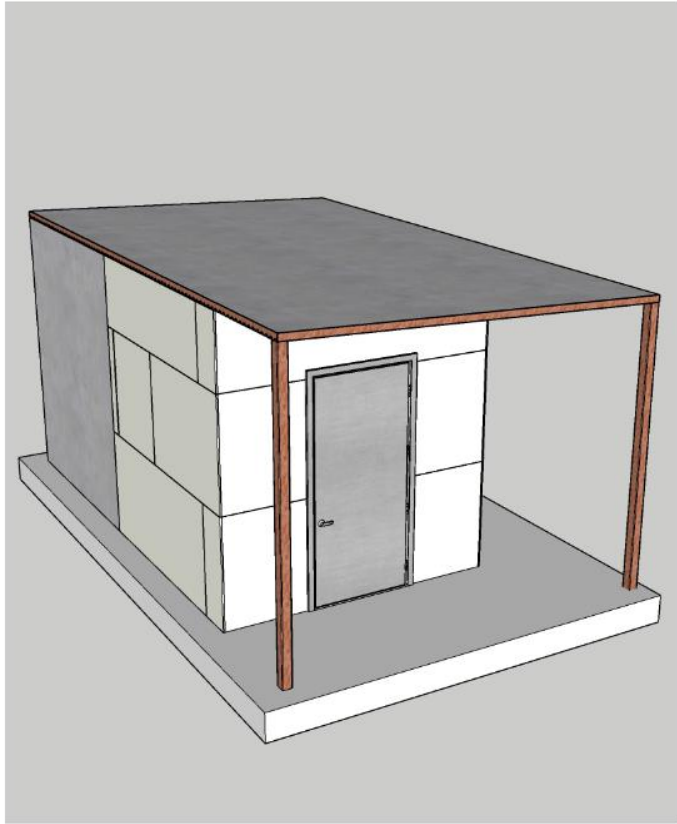
- Integral flange for foil termination
- Stainless Steel frame fully welded
- Stainless Steel edge caps on door
- RF gasket
- Manufacturer provided grounding



# Construction - Build a Mock-up

- Mimic the actual conditions as best as possible and create a “6-sided RF shielded box”
  - Include various penetrations and different methods of install
- Perform thorough inspections and photo documentation of steps with Site Security Team
- Perform an RF Test at the mock-up to determine if it performs as needed





# VIDEO

ICD-705 Mock-up

<https://youtu.be/u9oZVA2gg7g>

# UNCLASSIFIED



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# Construction - Issue Resolution

- Issues and unforeseen conditions can be expected to come up in the field
  - Security walks, new threats, AO suggestions/concerns
- When issues or concerns arise, construction team, end-users, and security team collaborate to find a solution
  - Walk the site and observe examples of the issue
  - Meet to discuss and review proposed details
  - Agree to a path moving forward
  - Document solution via RFI





# Site Security Management



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# ICD-705 – New Construction vs Renovations

- **Despite differences, approach is the same**
- **LL can still be applied to all projects in real time**
  - Identify issue → Fix issue → Implement LL across program and all projects
- **Renovations significantly harder than new construction**
  - Construction methods for renovations are different due to existing conditions
  - However, RF shielding, penetrations/basements, structural elements are already defined
- **Realism in constructability of secure features**
  - Threat Analysis (site dependent; Washington, D.C. not same as NAWS CL)
  - Maintenance (doors, penetrations, dielectric brakes, adhesives, waveguides); secure features increase costs of maintenance
  - Installation of shielding materials and finished construction
- **Multi-level, Multi-program secure spaces require new ways of working to create functional spaces**



# ICD-705 – SSM Team Best Practices

- **SSM Team Experience**
  - Previous ICD-705 construction experience including RFP development, design/construction, and accreditation package delivery
- **On Site Daily**
  - Entire Project Delivery Team and SSM working in unison
  - Supported by requirements leads and SGEs
- **Documentation**
  - Any security features of work in construction (written and photographed)
  - Use of electronic devices on project sites
  - Wiki repository for photos
- **Partnering**
  - Work with KTR to ensure means and methods align with design





# ICD-705 – SSM Team Lessons Learned

- **REQUIRE:**
  - Early SSM involvement
  - SSM to have ICD-705 experience from RFP development through design and construction
  - SSM to work with AO and CTTA for definable requirements for facilities
- **RECOMMEND:**
  - Early SSM involvement with Government Special Access Program (SAP) Security Officer (GSSO) for program move in, program space requirements, accreditation, and turnover
  - At minimum, two or three SSM's per facility for continuous site presence and access
  - AutoCAD and PlanGrid software for organization of site documentation (photographs, TEMPEST Checklist, Federal Communications Commission (FCC) Checklist, etc.) for accreditation package
  - Lead SSM to oversee SSM activities and report issues to Program Managers, SGEs, and CMs to resolve



# ICD-705 – AO Lessons Learned

- **RECOMMEND:**
  - AO and CTTA/Certified TEMPEST Professional (CTP) assigned to project and onsite for oversight throughout the entirety of project
- **REQUIRE:**
  - Multiple AO's for large scale programs (multiple sites on installation)
  - AO should be assigned for ICD-705 construction as primary duty/task and/or be easily accessible and on installation
  - AO early involvement in Construction Security Plan (CSP)
  - AO for RFP and design sign off
  - AO to designate if Construction Surveillance Team (CST) is needed
    - Define threat level to site security team at the beginning of project
  - CST should be based off threat level at local project site
  - AO to provide requirements, in writing, prior to design phase
    - Need AO guidance/opinions consistency between Navy Region Programs Security Office (NRPSO) and Defense Intelligence Agency (DIA).



# ICD-705 – CTTA Lessons Learned

- **REQUIRE:**

- Early CTTA involvement throughout the entire project
- CTTA or CTP assigned to any project with TEMPEST requirements
- CTTA/CTP for RFP and design sign off
- **Update Best Practice Guide with CTTA feedback**
  - Update guidance and instruction on TEMPEST mitigation
  - Provide testing requirements / performance specifications on RF attenuation
- **CTTA to provide requirements in writing, prior to design**
- **CTTA to provide in-depth guidance based on manufacturer recommendation**

- **RECOMMEND:**

- CTTA accept performance based RF shielding specifications
- CTTA to provide all responses in writing
- Include Information System Security Officer (ISSO), if applicable, to help with telecommunication TEMPEST concerns
- RFP must include Third Party shielding effectiveness testing with specific testing method



# Main Takeaways

- Integrated Team
- Security Design Package
- Build a Mockup
- Early SSM Involvement
  - Construction Security Plan in RFP
- Early AO involvement
  - Accreditation is primary goal!



# Q&A

- Nathan Novark  
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- Jason Ridings, AIA  
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- Marc Walker, DBIA  
mwalker2@henselphelps.com
- Chris Potten  
Christopher.j.potten.civ@us.navy.mil





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