Temporary Containment Practices

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What is Temporary Containment?
2 MILLION HAI\text{s PER YEAR > 110,000 DEATHS

Comparative Death Rates (2010)

- Vehicular Accidents – 33,000
- Homicides – 16,000
- Heart Disease and Cancer – 1.2 Million
## ICRA Class IV Requirements

<table>
<thead>
<tr>
<th>Patient Risk Group</th>
<th>TYPE A</th>
<th>TYPE B</th>
<th>TYPE C</th>
<th>TYPE D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Risk Group</td>
<td>I</td>
<td>II</td>
<td>II</td>
<td>III/IV</td>
</tr>
<tr>
<td>Medium Risk Group</td>
<td>I</td>
<td>II</td>
<td>III</td>
<td>IV</td>
</tr>
<tr>
<td>High Risk Group</td>
<td>I</td>
<td>II</td>
<td>III/IV</td>
<td>IV</td>
</tr>
<tr>
<td>Highest Risk Group</td>
<td>II</td>
<td>III/IV</td>
<td>III/IV</td>
<td>IV</td>
</tr>
</tbody>
</table>

**CLC Level 1: Basic Requirements**

1. Isolate HVAC system in area where work is being done to prevent contamination of duct system.
2. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins.
3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units.
4. Seal holes, pipes, conduits, and punctures.
5. Construct anteroom and require all personnel to pass through this room so they can be vaccinated using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave work site.
6. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area.

**CLC Level 2: Advanced Requirements**

1. Do not remove barriers from work area until completed project is inspected by the owner’s Safety Department and Infection Prevention & Control Department and thoroughly cleaned by the owner’s Environmental Services Dept.
2. Remove barrier material carefully to minimize spreading of dirt and debris associated with construction.
3. Contain construction waste before transport in tightly covered containers.
4. Cover transport receptacles or carts. Tape covering unless solid lid.
5. Vacuum work area with HEPA filtered vacuums.
6. Wet mop area with cleaner/disinfectant.
7. Upon completion, restore HVAC system where work was performed.
MICROBIAL MODES OF TRANSMISSION - AIR

- Outdoor Air
- HVAC Systems
- Indoor Air
- Respiration (People)
MICROBIAL MODES OF TRANSMISSION - HUMANS

- Hair & Skin
- Shoes
- Coughing
- Sneezing
- Clothes
  - Dirty Work Clothes
  - Reused Shoe Covers
  - Unwashed Reflective Vests
MICROBIAL MODES OF TRANSMISSION - SURFACES

- Soil
- Drywall
- Ceiling Tiles
- Counter Tops
- Door Knobs
- Light Switches
- Skin
MICROBIAL MODES OF TRANSMISSION - WATER

- Domestic Water Systems
- Heating / Cooling Water
- Sterilizers
- Roof and Sanitary Drains
- Hydrotherapy Areas
- Kitchens
- Water Features
- Cooling Towers
SOURCES OF WATER

- Water Intrusion
- Utility / Equipment Leaks
- Humidity > 60% at Room Temperature
- Condensation
# Construction Related Infections

<table>
<thead>
<tr>
<th>Mold Type</th>
<th>Medical Condition</th>
<th>Patients Infected</th>
<th>Patients Dead</th>
<th>Circumstances</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>A. fumigatus</em></td>
<td>Bone Marrow Transplant</td>
<td>6</td>
<td>6</td>
<td>Construction in adjacent BMT unit, improper airflow</td>
</tr>
<tr>
<td><em>A. fumigatus</em></td>
<td>Renal transplant</td>
<td>3</td>
<td>1</td>
<td>Renovation activity on floor above. Mold dispersed from drop ceiling.</td>
</tr>
<tr>
<td><em>Aspergillus</em> spp.</td>
<td>Burn unit, dialysis unit, and oncology</td>
<td>5</td>
<td>4</td>
<td>Air return vents not covered during Controlled Removal.</td>
</tr>
<tr>
<td><em>Aspergillus</em></td>
<td>Patients in hematology</td>
<td>11</td>
<td>5</td>
<td>Excavation during hospital expansion. Isolation rooms overlooked the building site, mold drawn in through leaky windows.</td>
</tr>
</tbody>
</table>
Dust and Particle Sizes

<table>
<thead>
<tr>
<th>Size Range</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0001 Micron</td>
<td>Gas Molecules</td>
</tr>
<tr>
<td>0.001 Micron</td>
<td>Tobacco Smoke</td>
</tr>
<tr>
<td>0.01 Micron</td>
<td>Oil Smoke</td>
</tr>
<tr>
<td>0.1 Micron</td>
<td>Viruses</td>
</tr>
<tr>
<td>1 Micron</td>
<td>Bacteria</td>
</tr>
<tr>
<td>10 Micron</td>
<td>Mold</td>
</tr>
<tr>
<td>100 Micron</td>
<td>Pollen</td>
</tr>
<tr>
<td>1,000 Micron</td>
<td>Plant Spores</td>
</tr>
<tr>
<td>10,000 Micron</td>
<td>Fog</td>
</tr>
</tbody>
</table>

- Gas Molecules
- Tobacco Smoke
- Oil Smoke
- Viruses
- Bacteria
- Mold
- Pollen
- Plant Spores
- Fog
- Mists
- Rain
- Foundry Dust
- Human Hair
- Lung Damaging Dust
- Dusts
- Fumes
- Aspergillus
- TB
- Visible by Human Eye
NOISE AND VIBRATION

- Decibel (dB) - Unit used to Measure the Intensity of a Sound (Noise)
- Noise Standards - OSHA 1910 and 1926, Applies to Workers
- Patient Recovery
- Satisfaction Surveys
- Work Stoppage

<table>
<thead>
<tr>
<th>Duration In Hours</th>
<th>Sound Level In Decibels</th>
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</thead>
<tbody>
<tr>
<td>8</td>
<td>90</td>
</tr>
<tr>
<td>6</td>
<td>92</td>
</tr>
<tr>
<td>4</td>
<td>95</td>
</tr>
<tr>
<td>3</td>
<td>97</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>1.5</td>
<td>102</td>
</tr>
<tr>
<td>1</td>
<td>105</td>
</tr>
<tr>
<td>.5</td>
<td>110</td>
</tr>
<tr>
<td>.25 or less</td>
<td>115</td>
</tr>
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</table>
COMMON NOISE LEVELS

- Near Total Silence - 0 dB
- A Whisper - 15 dB
- Normal Conversation - 60 dB
- A Cordless Drill – 98 dB
- A Circular Saw – 110 dB
- Powder Actuated Tool - 140 dB
NICU ACCEPTABLE NOISE STANDARDS

- World Health Organization:
  - Average Of: 30 dBA
  - Peak Of: 40 dBA

  - Average Of: 45 dBA
  - Peak Of: 65 dBA

- American Academy of Pediatrics Committee on Environmental Health (1997):
  - Average Of: 45 dB
NICU – NEONATAL INTENSIVE CARE UNIT

Exposure to loud noises can cause the following conditions:

- Respiratory System Impacts
- Fluctuations In Heart Rate, Blood Pressure, And Oxygen Saturation
- Hearing Loss
- Abnormal Brain And Sensory Development
- Speech And Language Problems
Environment

• 85% of 2025 Health Care Facilities Already Built as of 2014\(^1\)

• $2.5B/Mos. HealthCare Renovation +6% - +8\(^%\)\(^2\)

• 5,400 Hospitals

• Reimbursement = Patient Satisfaction

• HAI’s = 98,000+ Deaths per Year

\(^1\) ASHE \(^2\) Dept of Commerce
Patient Satisfaction & Safety

**Healthcare Renovation Trends**

- **5400 Hospitals**
- **85%** of 2025 Healthcare facilities already built as of 2014\(^1\)
- **$2.5B/Month** Healthcare Renovation: +6% - +8%\(^2\)

**Patient Satisfaction & Safety: Critical Factors for Healthcare Executives**

- 45% of healthcare executives say *revamping the patient experience* is one of the of their organization's top three priorities over the next 5 years
- **98,000+** Deaths/Year Caused by HAIs
- Patient Satisfaction=Reimbursement

**Reimbursement = Patient Satisfaction**

- 86% of healthcare executives denoting *patient satisfaction* as “very important” when considering design changes to facilities and services. \(^3\)
- 50%+ of healthcare executives are implementing *noise-reduction construction material* to boost patient experience. \(^4\)

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1. ASHE.  
2. Department of Commerce.  
3. Becker’s Hospital Review.  
4. Becker’s Hospital Review
46 States and

3 Canadian Provinces

Across North America
What are the Temporary Containment Options?
Poly Sheets
Drywall
Environmentally Unfriendly.

Roughly half of the construction industry’s waste stream comes from low-value drywall*
Class A Exceeds (ASTM E-84) fire and smoke rating
Exceeds Healthcare Renovation Requirements

Exceeds ICRA Class IV requirements when installed properly.

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Makes Renovations Disappear
Panel Widths to Fit Every Project

Panels extend from 6’ 10” to 10’ 3”
Panel Front

The panel front is built to be airtight, durable, and provide a real wall appearance.

Adjustable Height
Extends from 6' 10" to 10' 3"

Dual Slots & Flanged Stud
Lift and drop connection system allow 100' of wall to be installed in one hour

Bottom Gasket
Constructed from rubber that provides superior grip, an airtight seal and is easily cleaned and replaced

Top Gasket
Made of durable closed cell foam that provides an airtight seal and is easily cleaned and replaced

Urethane Foam Core
Eliminates up to 50% of renovation noise

Lightweight Aluminum Front
Bright white glossy surface is easily disinfected and looks like a real wall
Panel Back

The panel back is designed to provide superior adjustability.

- **Ceiling Grid Attachment Options**: Standard clips available for standard, flush, recessed and concealed grid tiles.
- **Vertical Spline Gaskets**: Reduces air leakage between adjacent panels.
- **Anodized Aluminum Frame**: Rugged and durable and has integrated airtight seal elements.
- **360° T-Slot Attachment System**: Adds stability and provides unlimited attachment options for brackets, anchors and bracing.
- **Concealed Height Locks**: Dual locks provide secure smooth adjustment and load bearing for the upper panel. Integrated lower limit safety stops.
- **Galvanized Steel Back**: Rugged surface that provides a secure safety barrier.
Negative Air Panel

Built to exceed ICRA Class IV requirements.

- **Adjustable Height**
  Extends from 6' 10" to 10' 3"

- **Multiple Widths**
  Panels available in 18", 24", 32", and 42"

- **Integrated Pressure Ports**
  One on each side of the panel

- **Anodized Aluminum Frame**
  Rugged and durable and has integrated airtight seal elements

- **Supports Optional Pressure Monitor**
  Comes ready to integrate a differential pressure monitor and accommodates all common data recorders

- **Lightweight Aluminum Front**
  Bright white glossy surface is easily disinfected and looks like a real wall

- **Standard Duct Collar**
  All panels come with a standard 12" duct collar with integrated adjustable shutter
Easy Set Up - 100' in One Hour
Our hinged door is engineered to be the most durable on the market.

**Multiple Widths**
Both sliding and hinged doors available in 42" and 54".

**Lightweight Aluminum Front**
Bright white glossy surface is easily disinfected and looks like a real wall.

**Anodized Aluminum Frame**
Both doors are rugged and durable and have integrated airtight seal elements.

**Superior Hinge System**
Allows for in/out or left/right adjustability, which is quickly and easily modified once installed.

**Modular “Over the Door” Kit**
Provides an airtight, flexible height panel that seals to ceiling heights up to 10’ 3”

**Handle Set**
Standard class 2 handle set available with an interchangeable core option.

**Threshold & Sweep**
Adjustable threshold and sweep gasketing allows for installation of doors on uneven surfaces.
Our rugged sliding door is the only self-closing door on the market.
Door Handle Locks Provide Security Level Options

- **Conventional Handle**
  - (hinged doors)

- **Mechanical Keypad**
  - (hinged doors)

- **Electronic Keypad**
  - (hinged doors)

- **Electronic Keypad**
  - (sliding doors)
Accessories To Create a Full Containment System
Options For Making an Airtight Seal

Wall Interface
Allows for creating an airtight seal of 2 1/2” to 4” against the wall

Filler Panel
Allows for creating an airtight seal around wall irregularity like a handrail
Flexible Corners Provide Unlimited Options

Corners can accommodate 15 to 90°.
T’ Connector

Allows for a rigid airtight connection when constructing a ‘T’ intersection to a wall.
Panel Carts Make Transport and Storage Easy

Panel Cart (empty)

Panel Cart (loaded)

Accessory Cart

Dust Cover
Typical Containment Layout
Additional Ceiling Attachments For Added Stability
Creating the Airtight Seal Above The Panel
Healthcare
St. Mary’s Health System
Healthcare

Maine Medical Center
Education
Northwestern
Airports
LaGuardia Airport
Selection Criteria

- Sound Attenuating
- Fast Installation
- Superior Durability
- Exceeds Class IV ICRA Requirements
- Class A Fire & Smoke Rated
- Cost Savings
- Real Wall Appearance
- Reusable & Waste Reducing
- Easily Disinfected
Temporary Containment Future

• Lighter
• Quieter
• Simpler
• Smart Panels
• Ceiling Systems
• One Hour Rated
• To Deck
• Power Panels
Thank You

844-596-1784 | www.starcsystems.com
That’s STARC with a “C”
# 91% Reorder Rate and 9.9 Overall Satisfaction

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interactions &amp; communications prior to purchase</td>
<td>9.5</td>
</tr>
<tr>
<td>Quoting &amp; buying experience</td>
<td>9.5</td>
</tr>
<tr>
<td>Order arrive by promise date</td>
<td>9.9</td>
</tr>
<tr>
<td>Panel conditions upon arrival</td>
<td>9.7</td>
</tr>
<tr>
<td>“Ease of use” &amp; simplicity in installation</td>
<td>9.8</td>
</tr>
<tr>
<td>Overall quality of components</td>
<td>9.6</td>
</tr>
<tr>
<td>Appearance &amp; aesthetics</td>
<td>9.9</td>
</tr>
<tr>
<td>Post-sales customer service</td>
<td>9.8</td>
</tr>
<tr>
<td>Would you order again</td>
<td>10.0</td>
</tr>
<tr>
<td><strong>Overall Level of Satisfaction</strong></td>
<td><strong>9.9</strong></td>
</tr>
</tbody>
</table>
A Partial Portfolio of Projects and Partners

**Healthcare**
- Beth Israel Deaconess Medical Center
- The Ohio State University Wexner Medical Center
- Brigham and Women's Hospital
- Cleveland Clinic
- Harvard Medical School
- Massachusetts General Hospital
- VA U.S. Department of Veterans Affairs

**Contractors**
- Bryan Construction
- Columbia Construction Company
- Skanska
- Hensel Phelps
- JE Dunn Construction
- W.E. Bowman Construction
- Mortenson Construction
- Turner Construction
- Lendlease
- Layton Construction
- Suffolk Construction
- Shawmut

**Other Verticals**
- LGA Laguardia Airport
- Pfizer
- VA U.S. Department of Veterans Affairs
- VCU Virginia Commonwealth University
- Salesforce
- Westinghouse
- J.P. Morgan
Cost Comparison Vs. Drywall

Traditional Method
$80-$120/lf

STARC
$350/lf

STARC Systems Pays For Itself After 3-5 Uses Creating An Ongoing Revenue Stream
<table>
<thead>
<tr>
<th>Feature</th>
<th>STARC Walls</th>
<th>Drywall</th>
<th>Plastic Sheeting</th>
<th>Polycarbonate Partitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Wall Appearance</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
<td></td>
</tr>
<tr>
<td>Improves Sound Attenuation</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Durability</td>
<td>✔</td>
<td>✗</td>
<td>✗</td>
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<tr>
<td>Stability</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
<td></td>
</tr>
<tr>
<td>Reduces Environmental Waste</td>
<td>✔</td>
<td>✗</td>
<td>✗</td>
<td>✔</td>
</tr>
<tr>
<td>Ongoing Savings</td>
<td>✔</td>
<td>✗</td>
<td>✗</td>
<td></td>
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</tbody>
</table>
Well-Positioned for Expansion