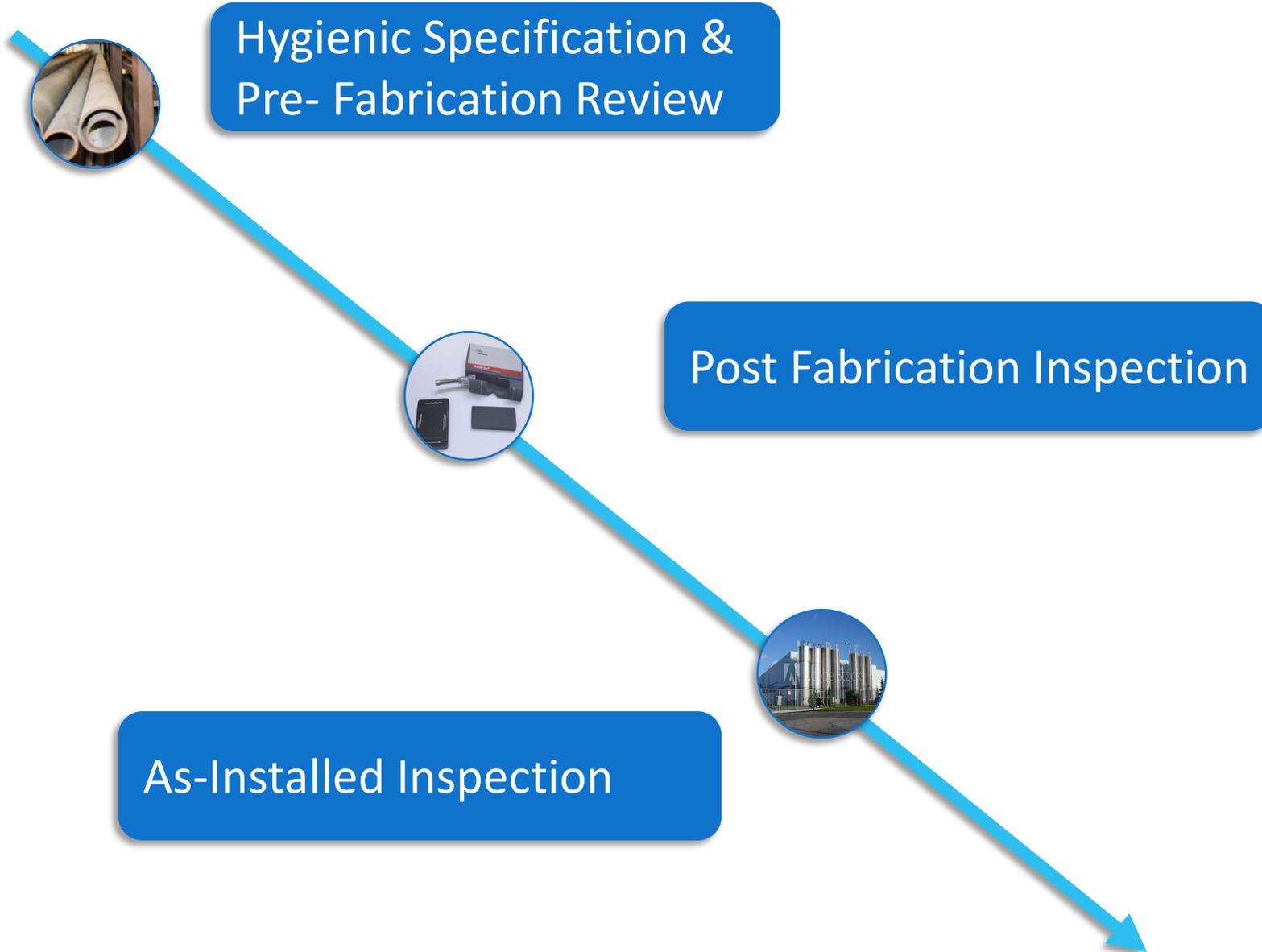




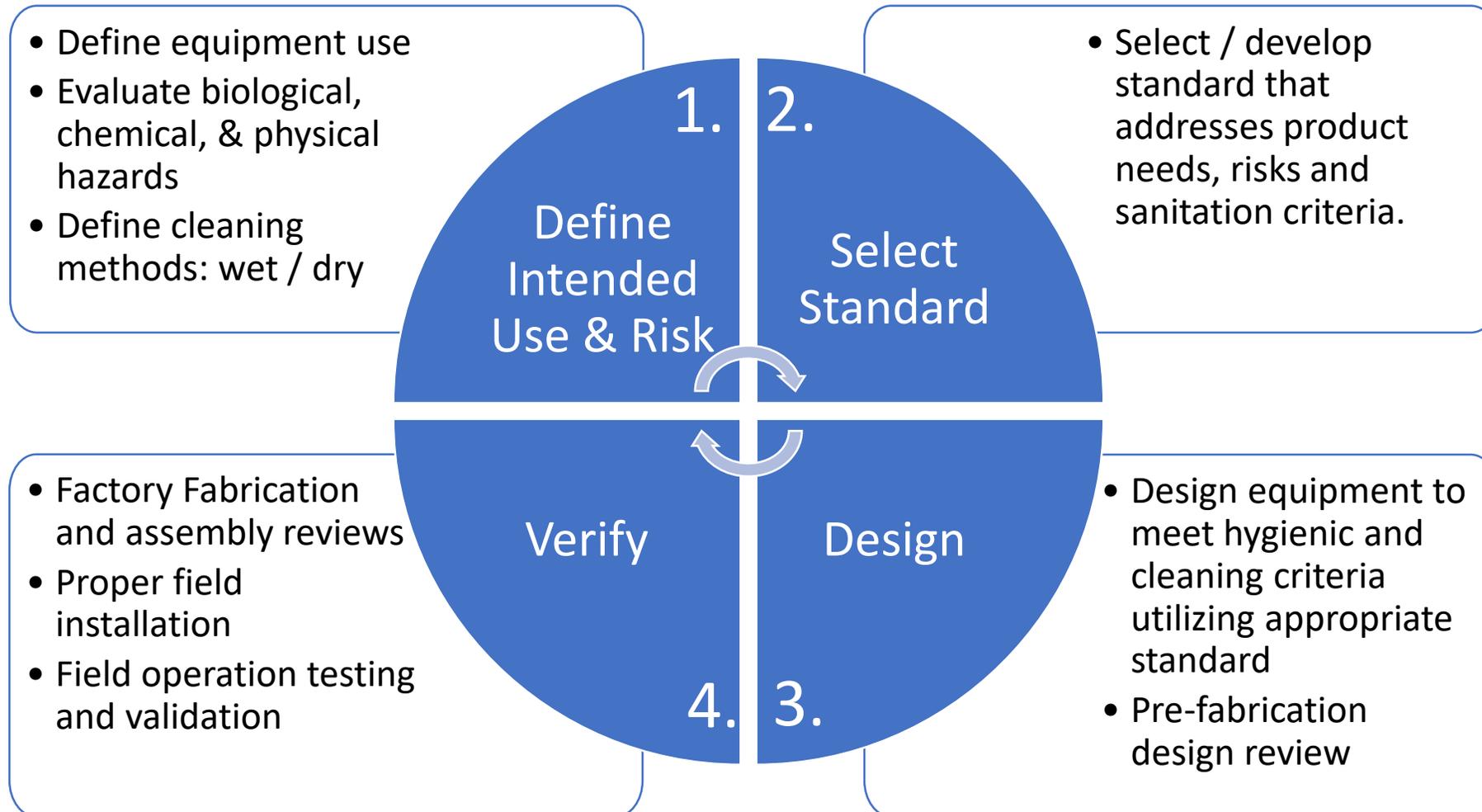
Hygienic Specification & Inspection Methods

Greg Marconnet

Learning Objectives



Hygienic Design Process for Equipment



Common US Equipment Standards and Uses

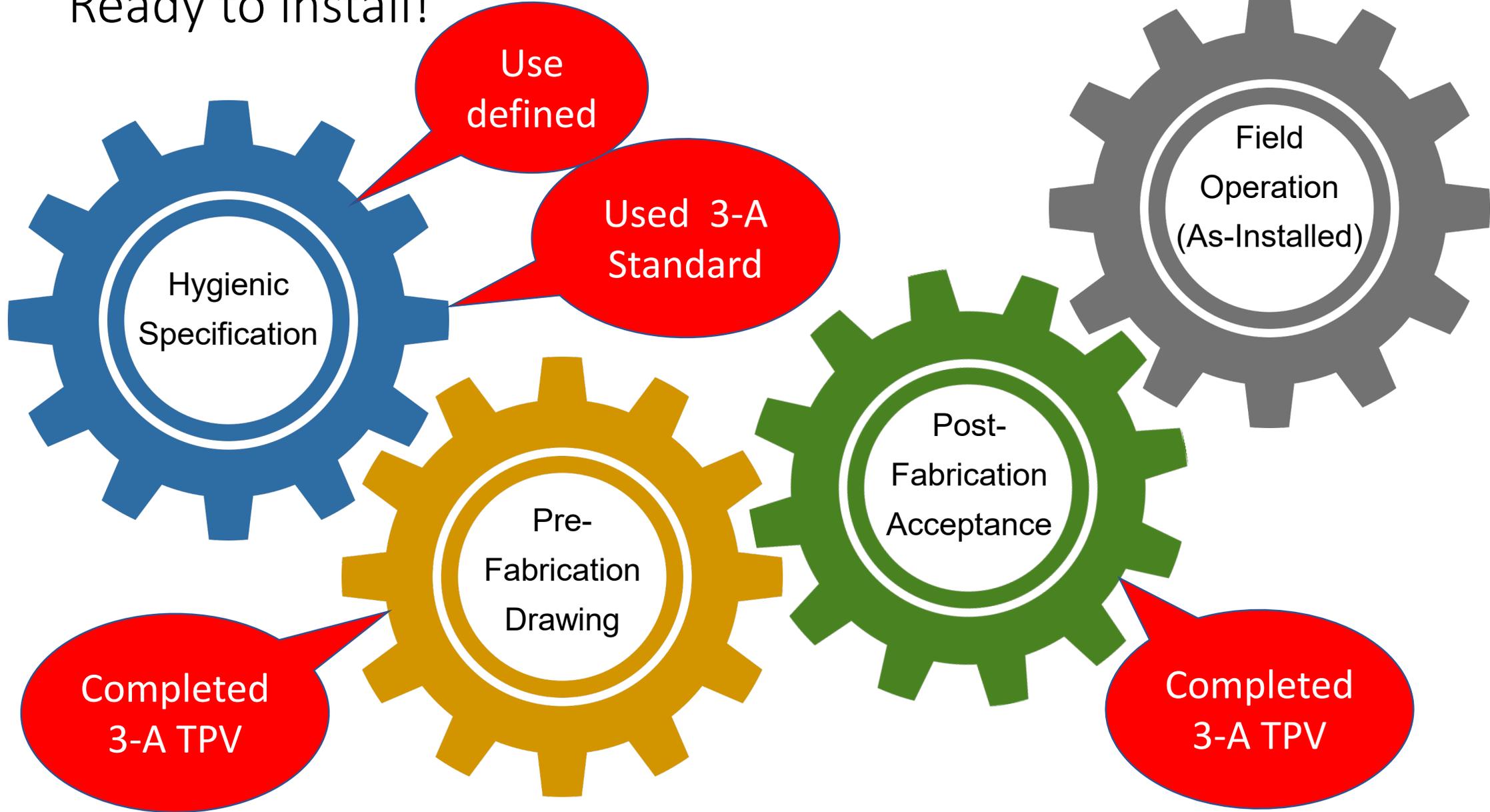


	3-A	NSF/3-A 14159	BISSC
Applications	Milk, dairy & other comestibles	Meat & Poultry	Bakery
Materials Types	Liquids, semi-liquids and dry powders	Solids and semi- solids	Solids and semi-solids
Milk & Dairy	◆		
Meat & Poultry		◆	
Bakery			◆
Brewery & Beverage	◇		
Confections	◇	◇	◇
Enhancers, Sauces	◇	◇	
Fruit, Nuts, Veg	◇	◇	◇

◆ - Primary standard use

◇ - Possible application

Hygienic Equipment with a 3-A Symbol Ready to install!

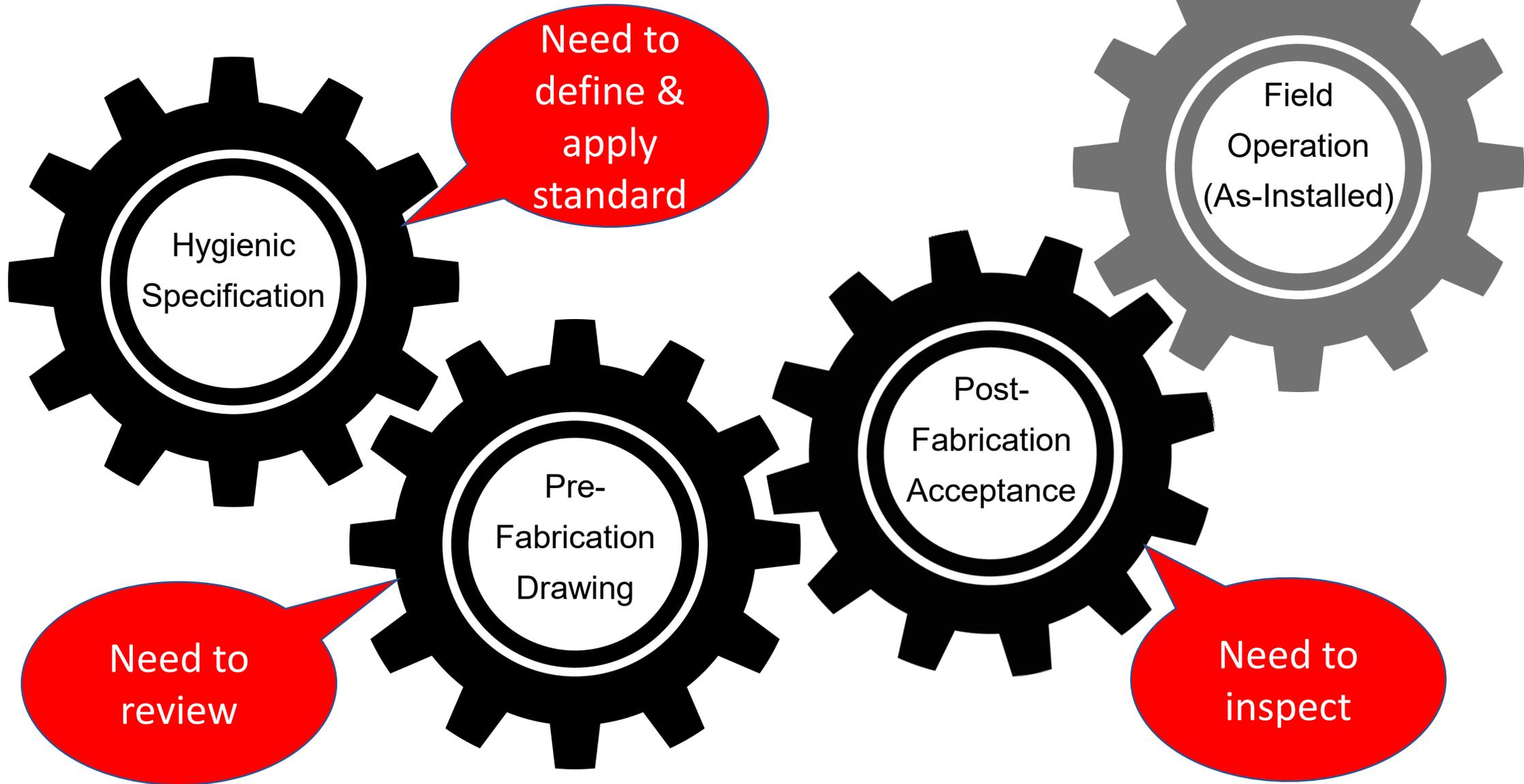




What if the hygienic equipment you are designing or buying has no 3-A standard or symbol?



Hygienic Equipment without a 3-A Symbol Needs careful evaluation





How to write a hygienic specification for equipment without a 3-A Standard?

Hygienic Equipment Design Standard Development



Define Intended Uses & Risks



Define Cleaning Methods



Define Product Surfaces



**Define Approved Materials
of Construction**



**Define Approved Construction
Methods**



Define acceptance criteria

When writing a hygienic design specification
to assure cleanability and inspectability.

Use Strong Statements

Avoid Vague Statements

Material Specification - Example



Strong Specification Statements

- Define type or grade of stainless steel 304, 316, 316 or other approval material
- Specify plastics and elastomer are provide with certificates of compliance to FDA and USDA requirements

Avoid Vague Statements

- Made of stainless steel
- Food grade material

Surface Finish Specification - Example



Strong Specification Statements

- Product contact surface roughness shall be less than XX Ra micro inches.
- Non-product contact surfaces shall be less than XX Ra micro inches.

Avoid Vague Statements

- Stainless steel is dairy grade finish
- No. 4 polish
- Bead blasted finish

Welded Joints



Strong Specification Statements

- Continuous welds only
- Free of pits, cracks, crevices
- Grind and polish weld to XX Ra micro inches

Avoid Vague Statements

- High quality welds
- Polished welds
- Weld finish to match base metal finish

General Design Specifications -Examples



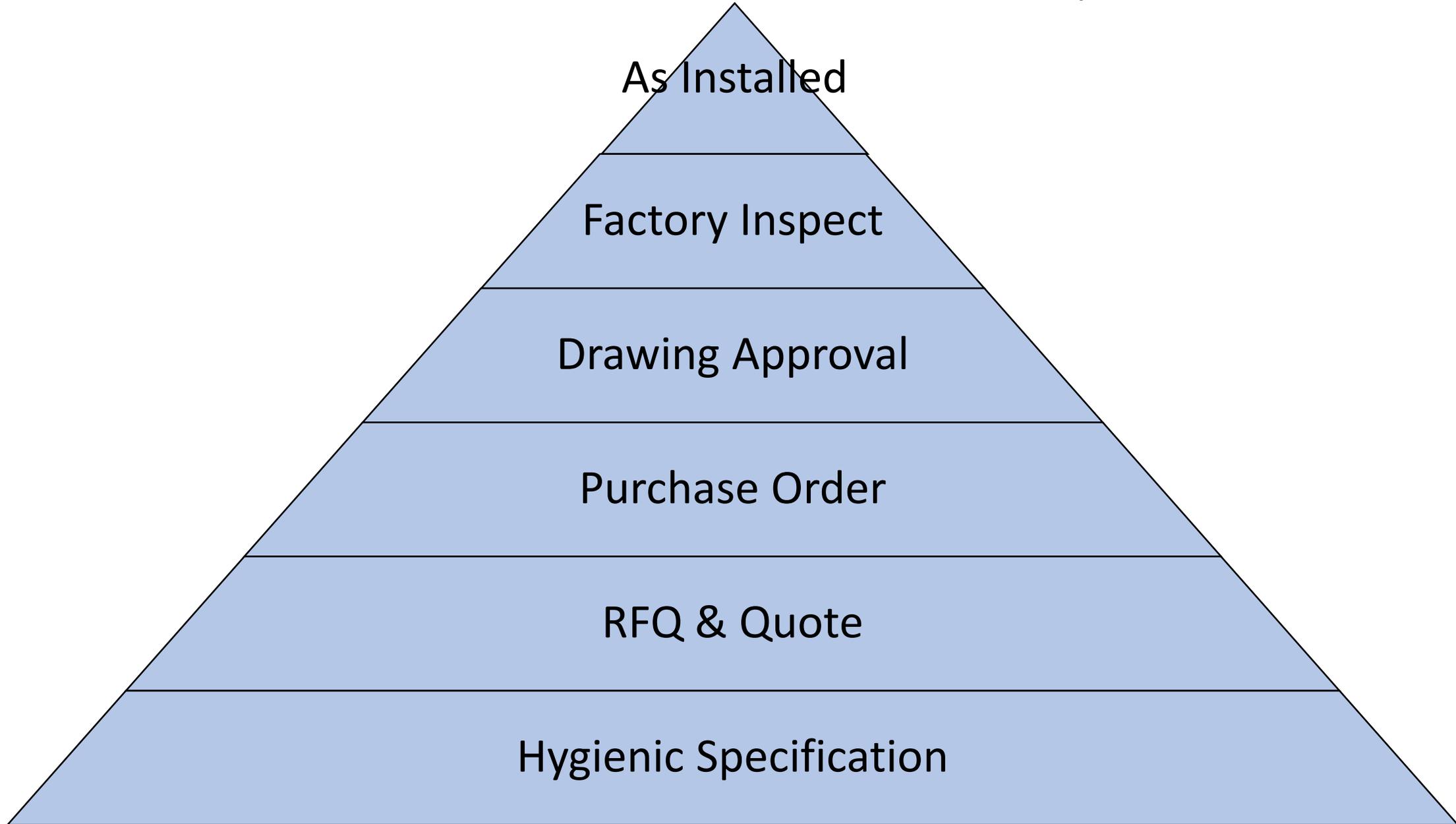
Strong Specification Statements

- All radii shall be greater than .x inches for angle less than 135°
- No dead-legs greater than x times this pipe diameter

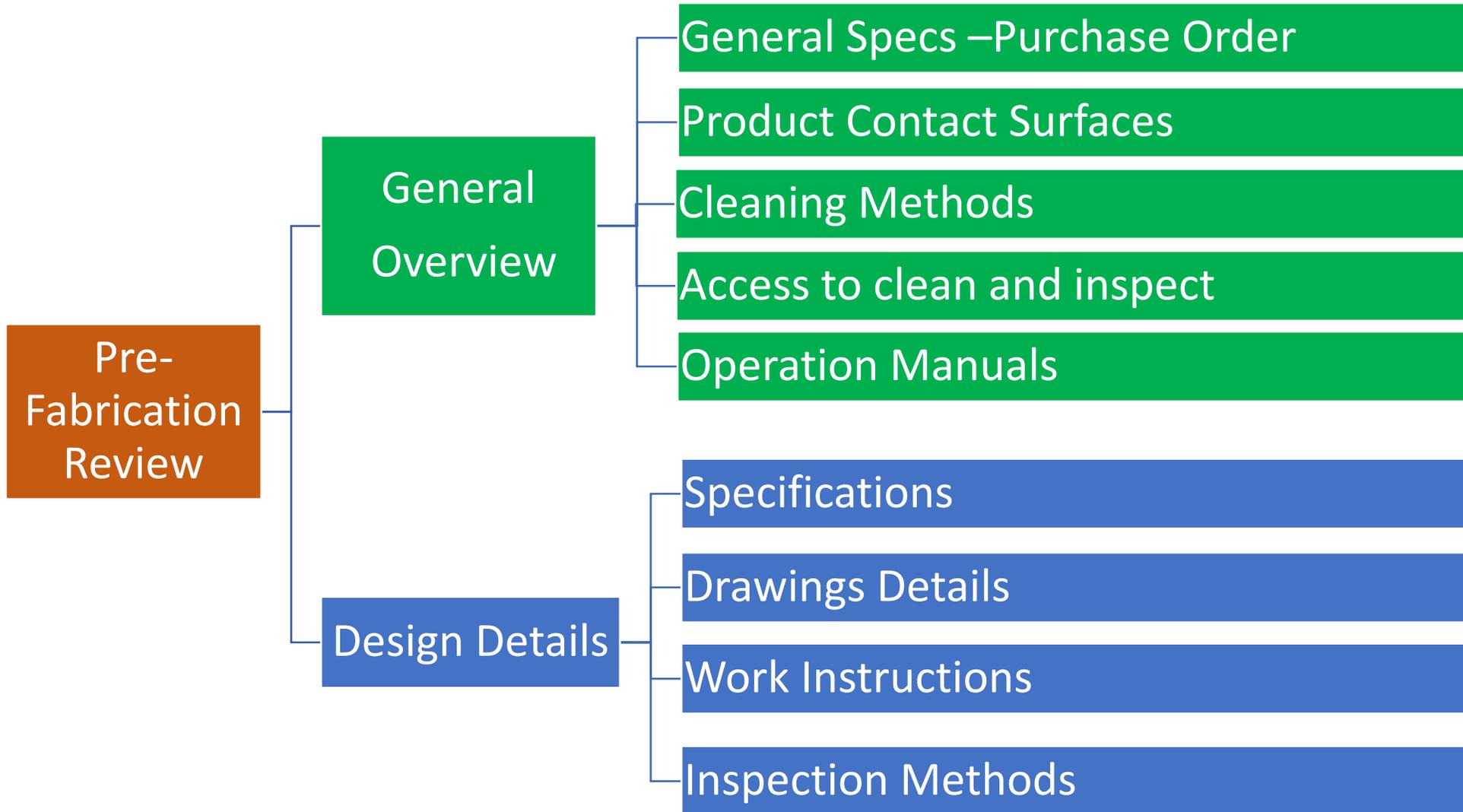
Avoid Vague Statements

- Radii are smooth
- No dead-legs

All contract document must follow the specification



Hygienic Pre-Fabrication Drawing Review



Hygienic Pre-Fabrication Drawing Review



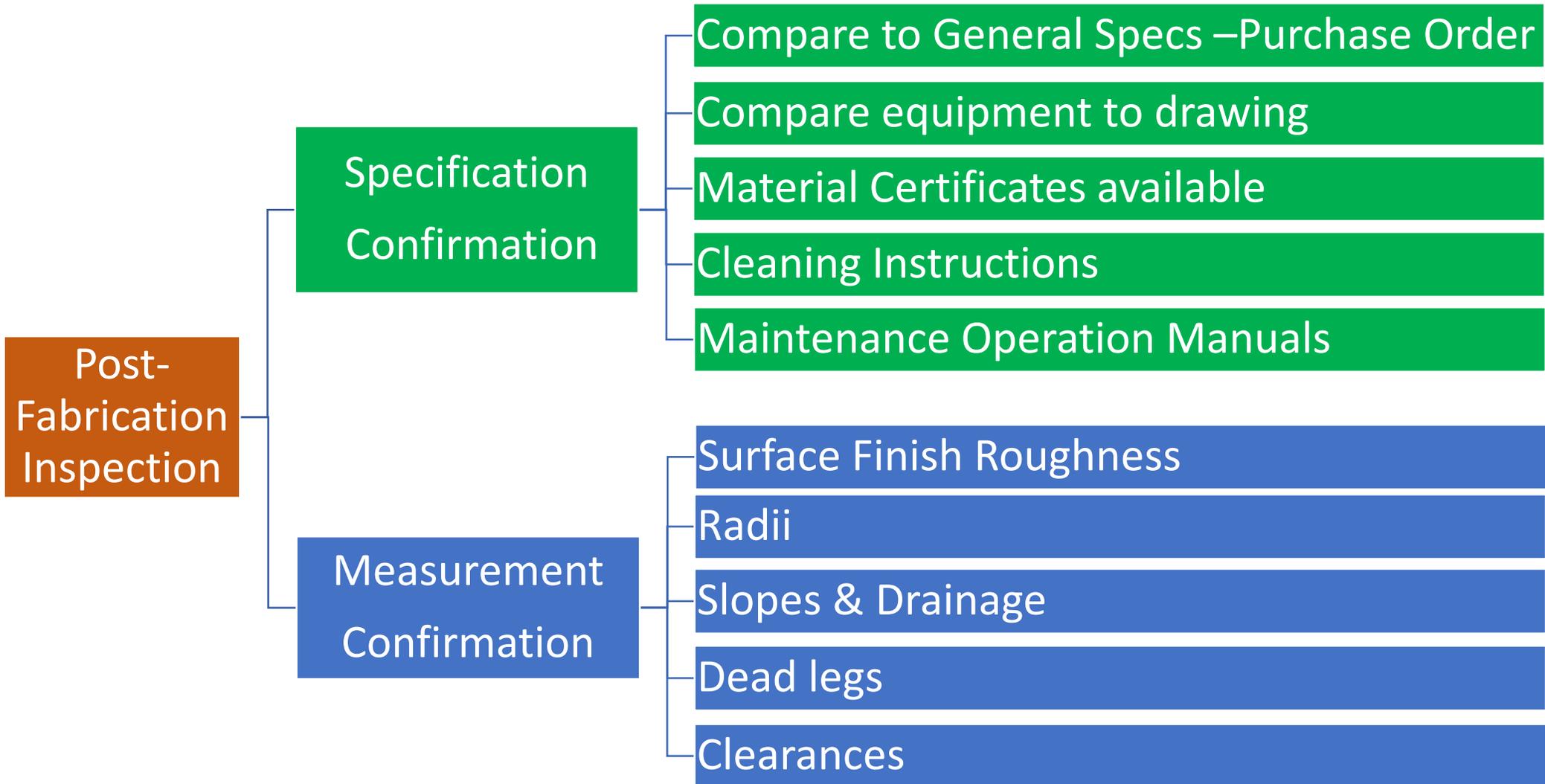
- General Layout & Overview Review
 - Compare **design specification** and purchase order drawing.
 - Define **product contact surfaces** (PCS).
 - Define non-product contact surfaces (NPCS).
 - Define **cleaning methods**.
 - Are all surfaces **assessible** to inspect for cleanliness?
 - Assess need for special **tools to clean**
 - Review operation manuals for cleaning methods (if completed)
 - Review maintenance manual for access points (if completed)

Hygienic Pre-Fabrication Drawing Review



- Detail Drawing review
 - Are **materials of construction** consistent with specification?
 - Check bill of materials
 - Are **surface finishes** defined on drawing correctly for all PCS.
 - Are finish symbols provide?
 - Are surface finishes defined on drawing correctly for all NPCCS.
 - Are all **welds** continuous? Finished?
 - Are **radii** defined and consistent with specification.
 - Are there any **dead-legs** or hollow designs?
 - Will all surfaces **drain**?
 - Are controls suitable for **washdown**?
 - Compare all sections of the specification and drawings for consistency.

Hygienic Post-Fabrication Inspection (As-Built or TPV)



Post-Fabrication Fabrication Review Measurements



- Measure & record all PCS surfaces roughness value with profilometer
- Measure & record all NPCS surfaces roughness value with profilometer
- Compare with drawing

Surface Finish



Post-Fabrication Fabrication Review Measurements



- Measure & record all radii with radii gauge
- Compare to drawing

Radii



Post-Fabrication Fabrication Review Measurements



- Measure and record equipment as level
- Measure & record all slopes specified on drawing

Slope



Post-Fabrication Fabrication Review Measurements

- Test for drainage and record any puddling of water.
- Use clean water to verify areas that may not drain



Confirm Drainage



Post-Fabrication Fabrication Review Measurements



- Measure & record all dead-legs
- Compare with drawing



Post-Fabrication Fabrication Review Measurements

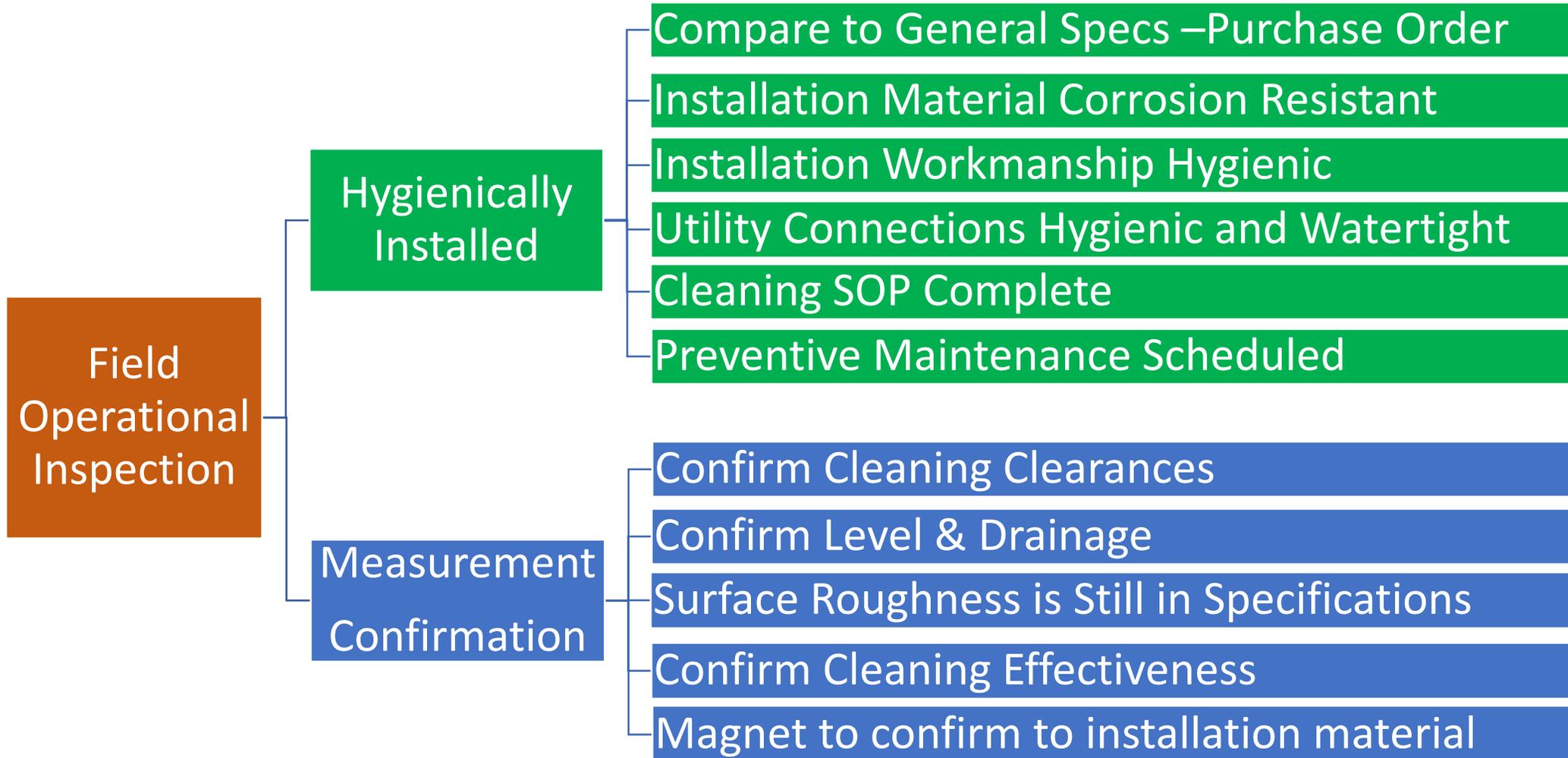


- Measure & record all cleaning clearance to assure access to clean

Cleaning Clearances



Hygienic Field Operational Inspection (As- Installed)



As-Installed cleaning

- Adequate cleaning needs to be confirmed with actual methods, utilities and soils after installation is complete.
- Inspect and swab to confirm.



Summary of Inspections for hygienic equipment



- If use a 3-A standard and symbol
 - The standard is the basic specification
 - The TPV is the drawing review and factory inspection
- If not using a 3-A standard
 - Need to create a specification
 - Conduct a drawing review to specification
 - Conduct a post-fabrication inspection of equipment
- Requirements for as-installed inspection are the same for both 3-A and non 3-A hygienic equipment.

