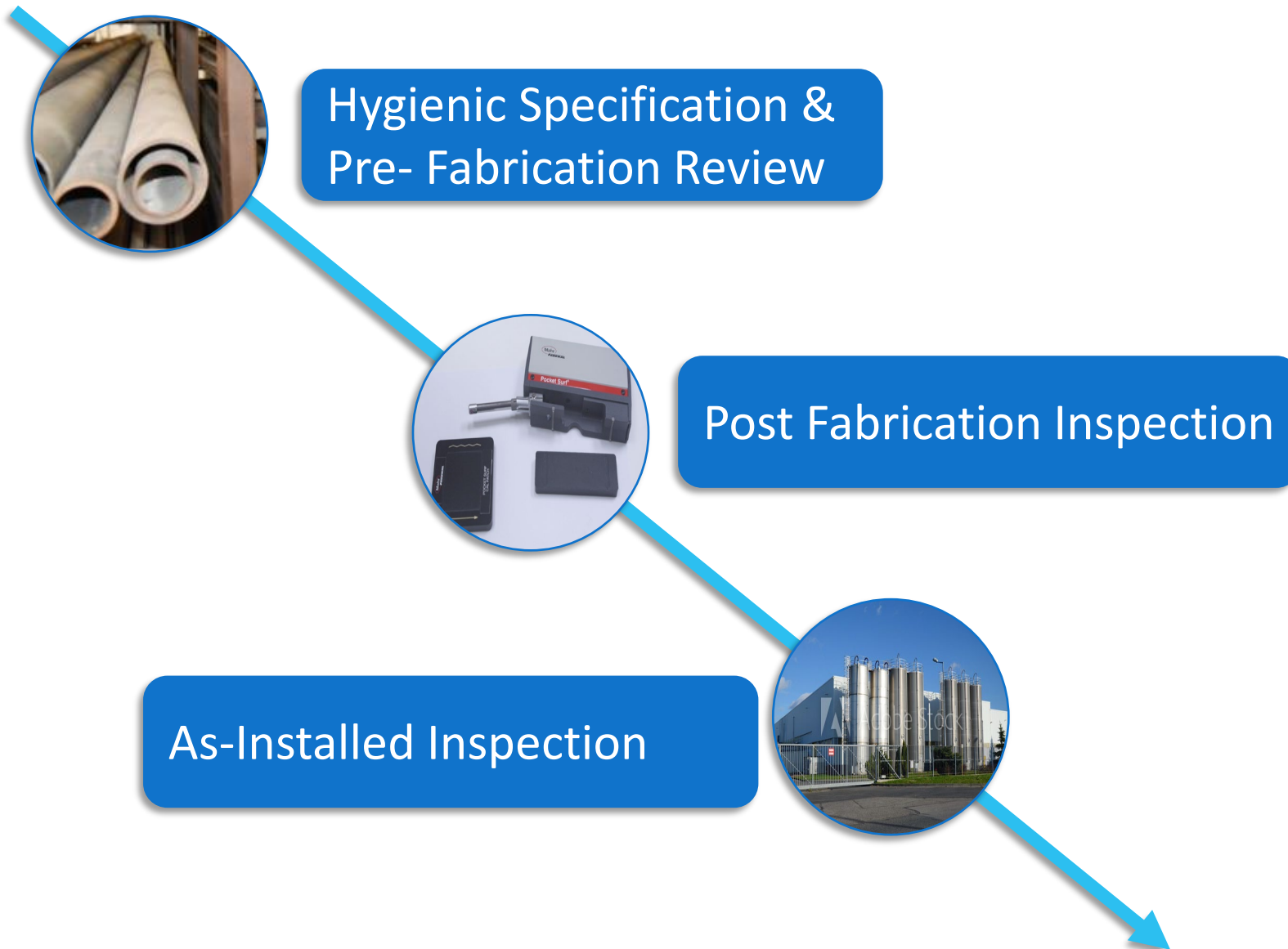




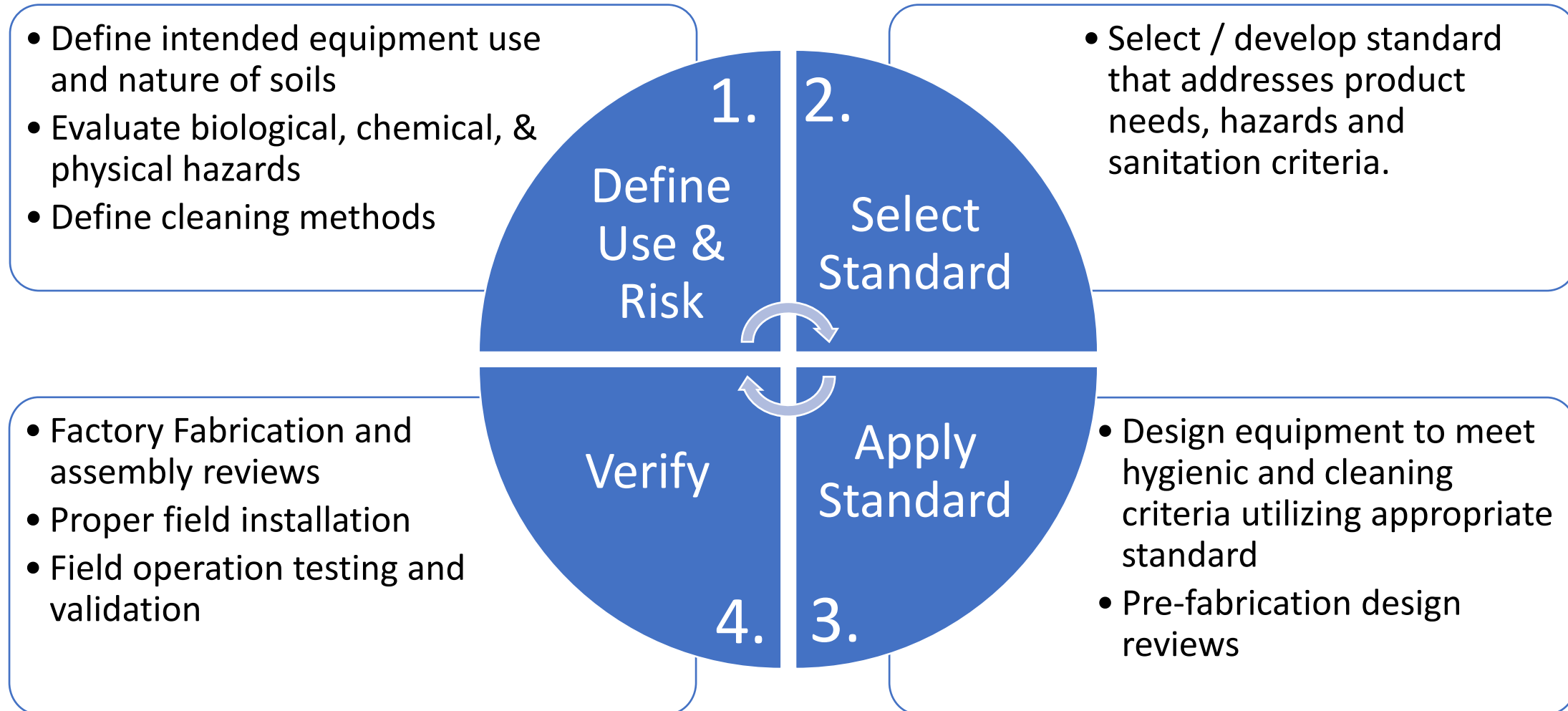
Hygienic Specification & Inspection Methods

Greg Marconnet
Mead & Hunt, Inc.

Learning Objectives



Hygienic Design Process for Equipment



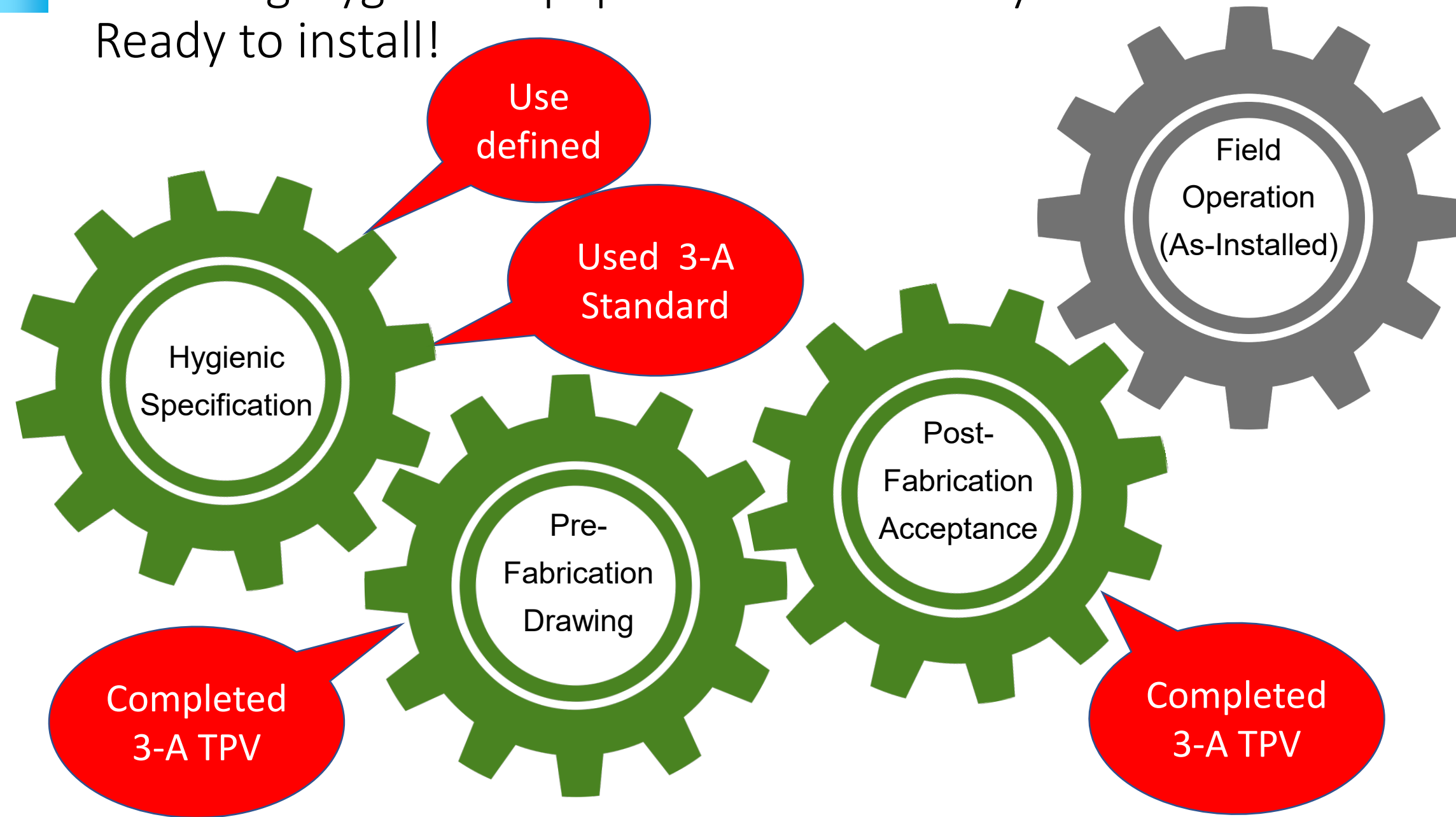
Common US Equipment Standards and Uses



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

◆ - Primary standard use, ◇ - Possible application

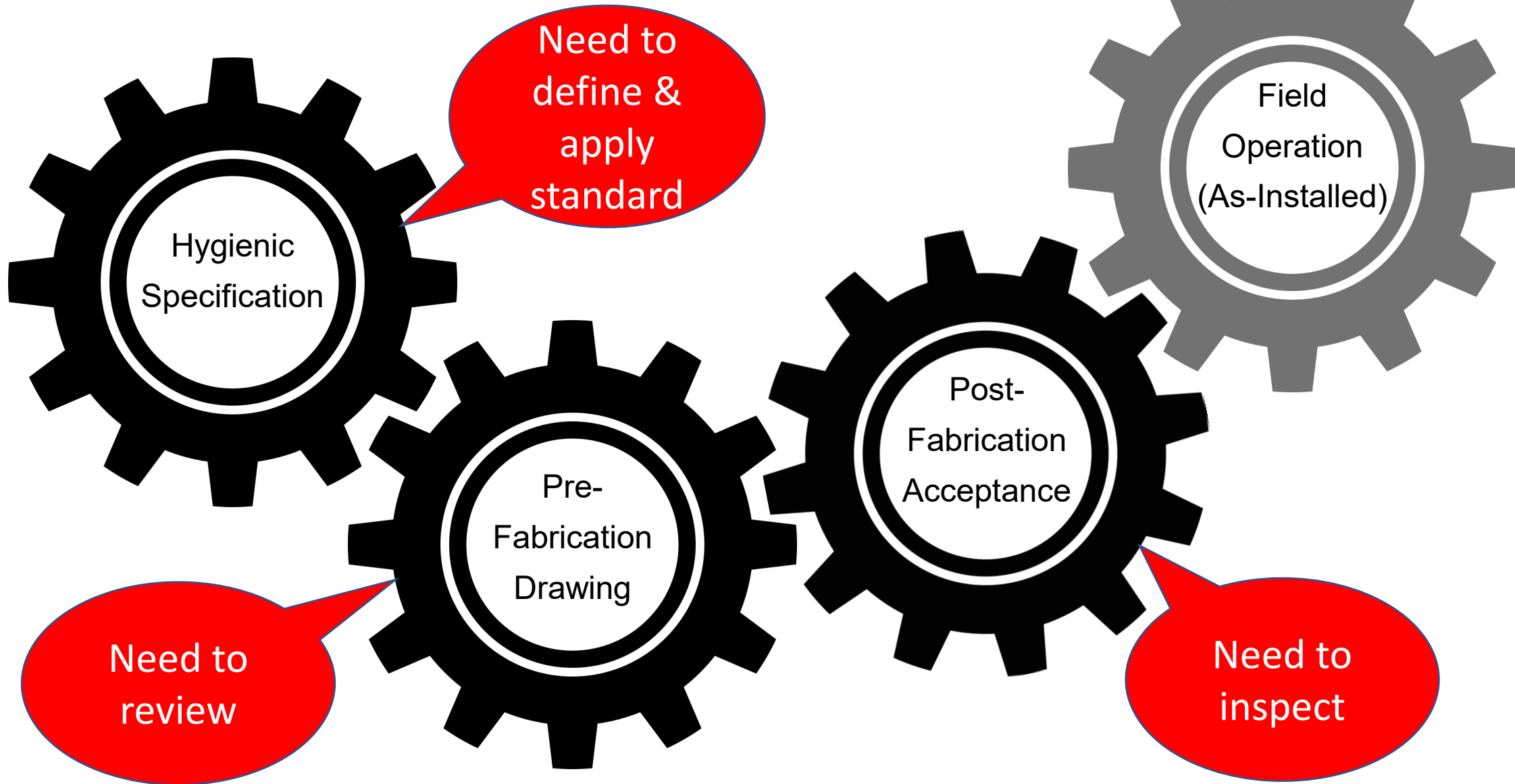
Selecting Hygienic Equipment with a 3-A Symbol Ready to install!



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 Specification Development



Define Intended Uses & Risks



Define Cleaning Methods



Define Product Surfaces



**Define Approved Materials
of Construction**



**Define Approved Construction
Methods**



Define acceptance criteria

Hygienic Equipment Design Specification Development



Define Intended Uses & Risks



Define Cleaning Methods



Define Product Surfaces



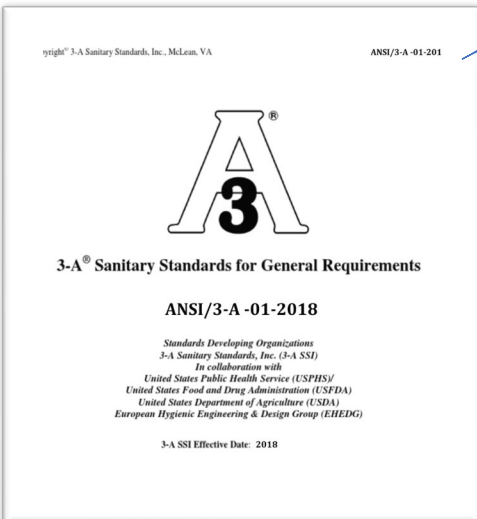
**Define Approved Materials
of Construction**



**Define Approved Construction
Methods**



Define acceptance criteria



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

Strong Statements
vs.
Vague Statements

Material Specification - Example



Avoid

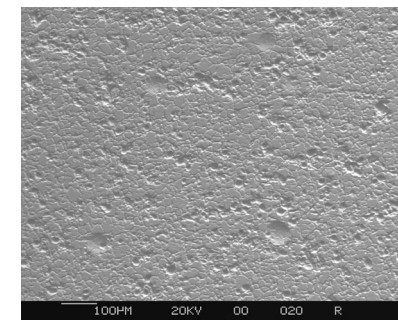
Vague Statements

- Made of stainless steel
- Food grade material

Strong Statements

- Define type or grade of stainless steel 304, 316, 316L or other acceptable material
- Specify plastics and elastomers need to provide with certificates of compliance to FDA and USDA requirements
- Easy Button-> Refer to 3-A 00, D

Surface Finish Specification - Example



Avoid

Vague Statements

- dairy grade finish
- No. 4 polish
- Bead blasted finish

Strong Statements

- Product contact surface roughness shall be less XX Ra micro inches.
- Non-product contact surfaces shall be less than XXX Ra micro inches.
- Easy Button-> Refer to 3-A 00, C36

Welded Joints



Avoid

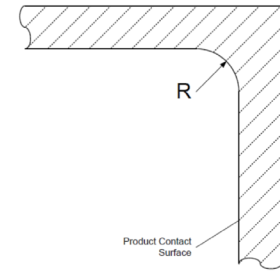
Vague Statements

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

Strong Statements

- Continuous welds only
- Free of pits, cracks, crevices
- Full penetration
- Grind and polish weld to XX Ra micro inches
- Easy Button-> Refer to 3-A 00 E1

General Design Specifications -Examples



Avoid

Vague Statements

- Radii are smooth
- No dead-legs or dead-ends

Strong Statements

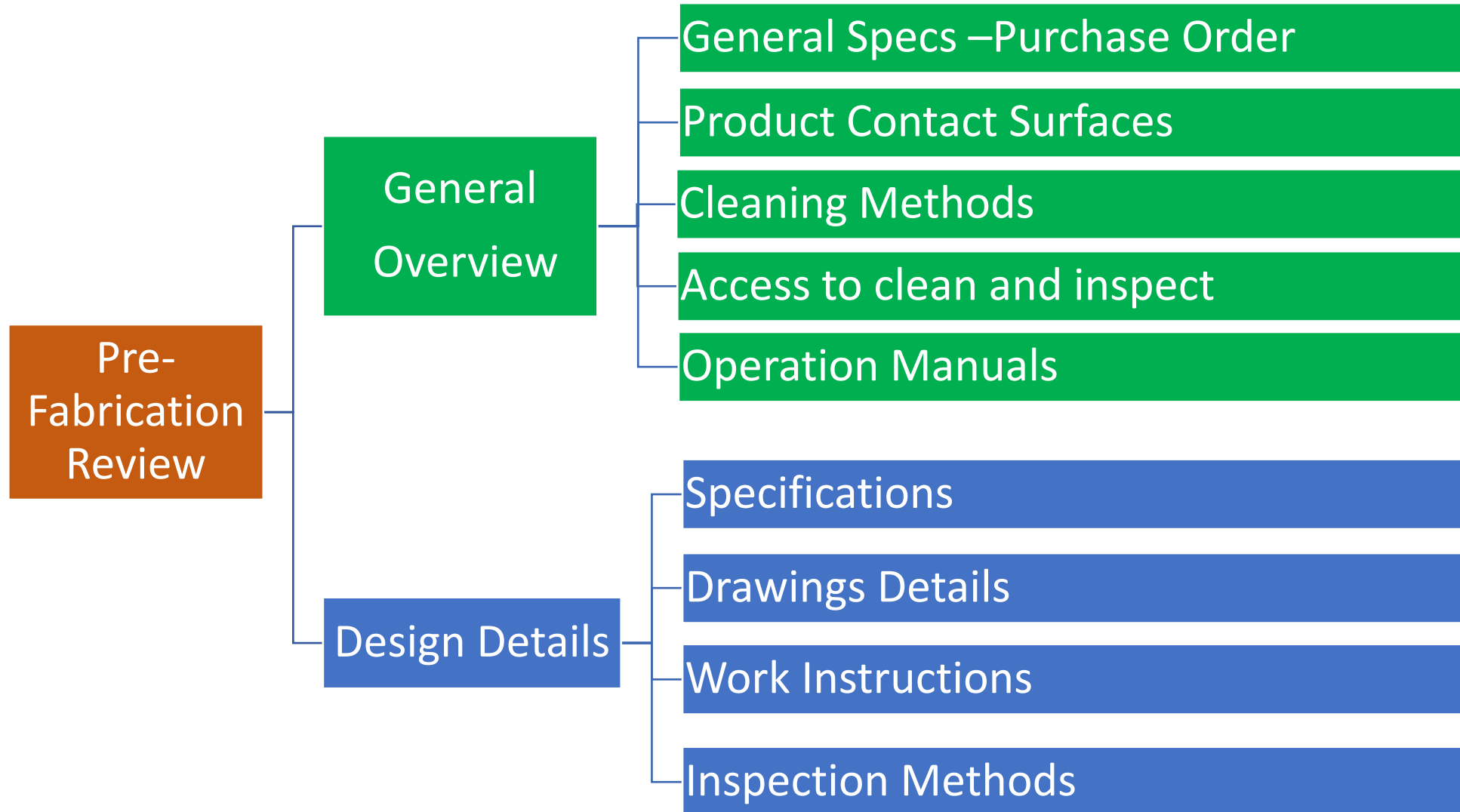
- All radii shall be greater than x.x inches for angle less than 135°
- Easy Button-> Refer to 3-A 00 E8
- No dead-ends greater than x times pipe diameter
- Easy Button-> Refer to 3-A 00 E6

Hygienic Specifications are the Foundation of a Design

All contract documents must follow the specification!



Hygienic Pre-Fabrication Drawing Review



Hygienic Pre-Fabrication Drawing Review



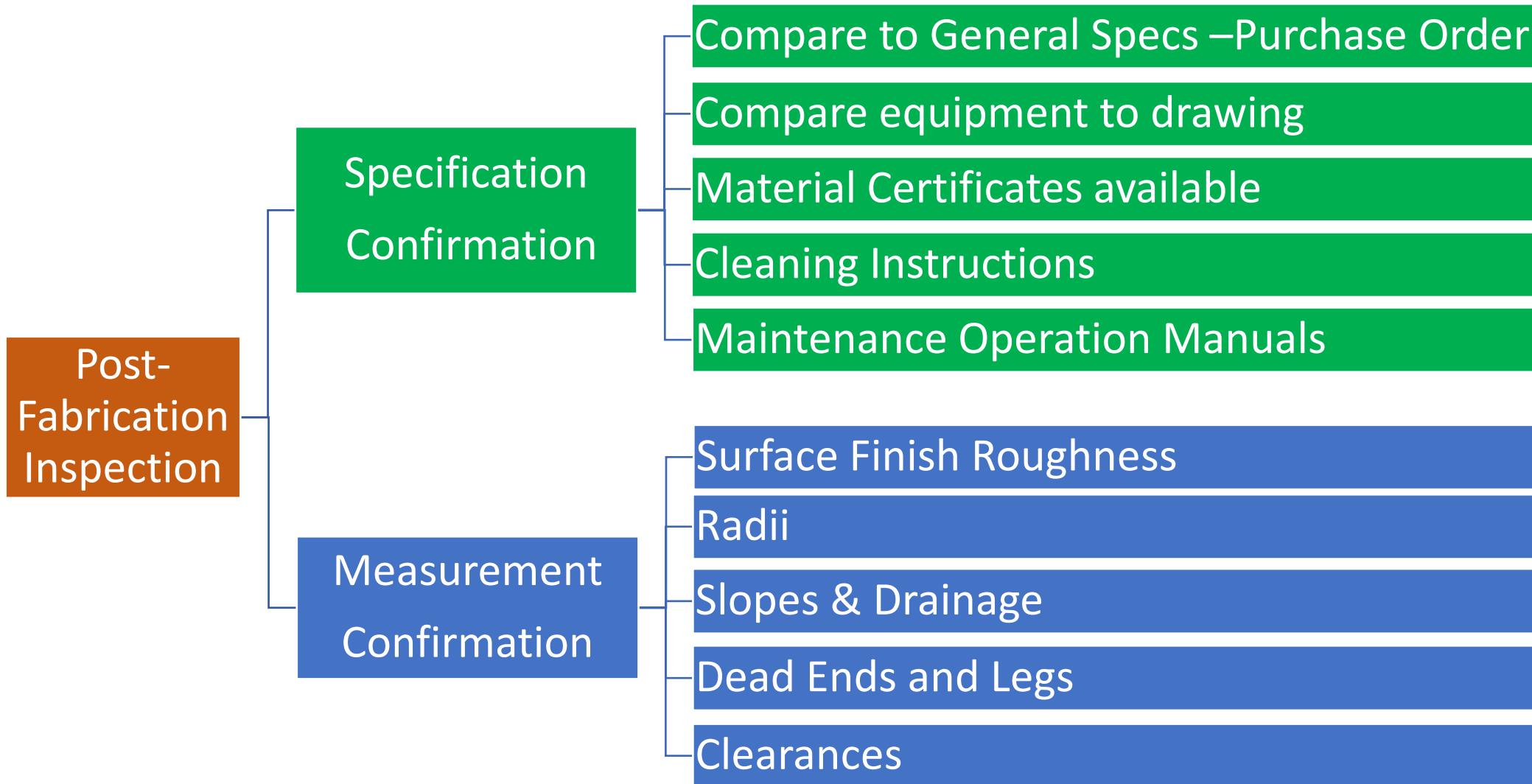
- **General Layout & Overview Review**
 - Compare **design specification** and purchase order with the General layout drawing.
 - Define **product contact surfaces** (PCS).
 - Define non-product contact surfaces (NPCS).
 - Define **cleaning methods**.
 - Are all surfaces **assessible** to inspect for 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 NPCS.
 - 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 utilities and 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 cleaning clearance to assure access to clean

Cleaning Clearances



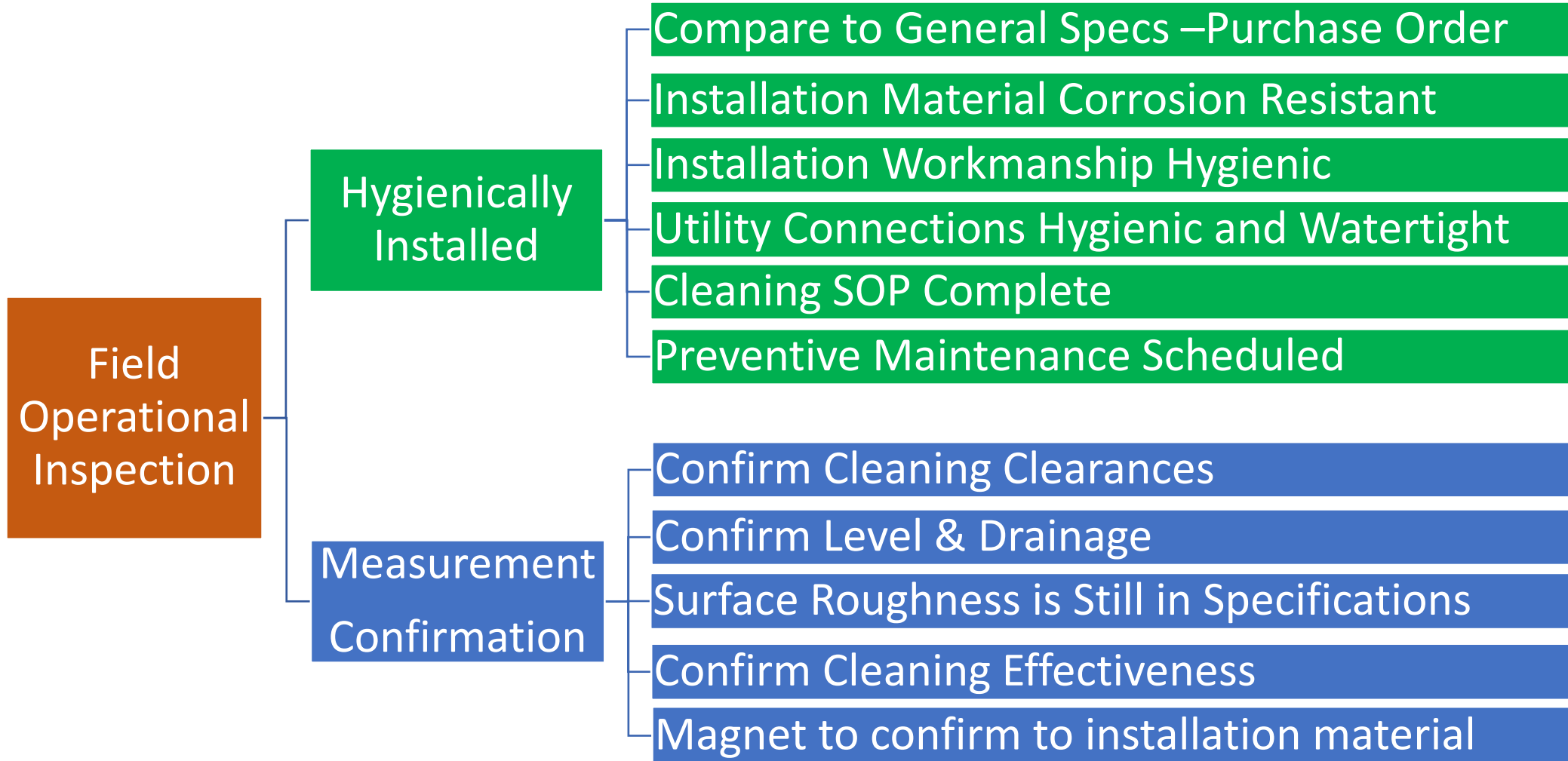
Post-Fabrication Fabrication Review Measurements



- Measure & record all key design requirements
- Compare with drawing
- Fix issues before shipping!



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.
 - ATP (adenosine triphosphate detection)
 - PCS < xx RLU
 - Plastics, Elastomers < xy RLU



Summary of Inspections for hygienic equipment



- 3-A standard and symbol
 - The standard is the basic specification
 - The TPV is the drawing review and factory inspection
- Not 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.

