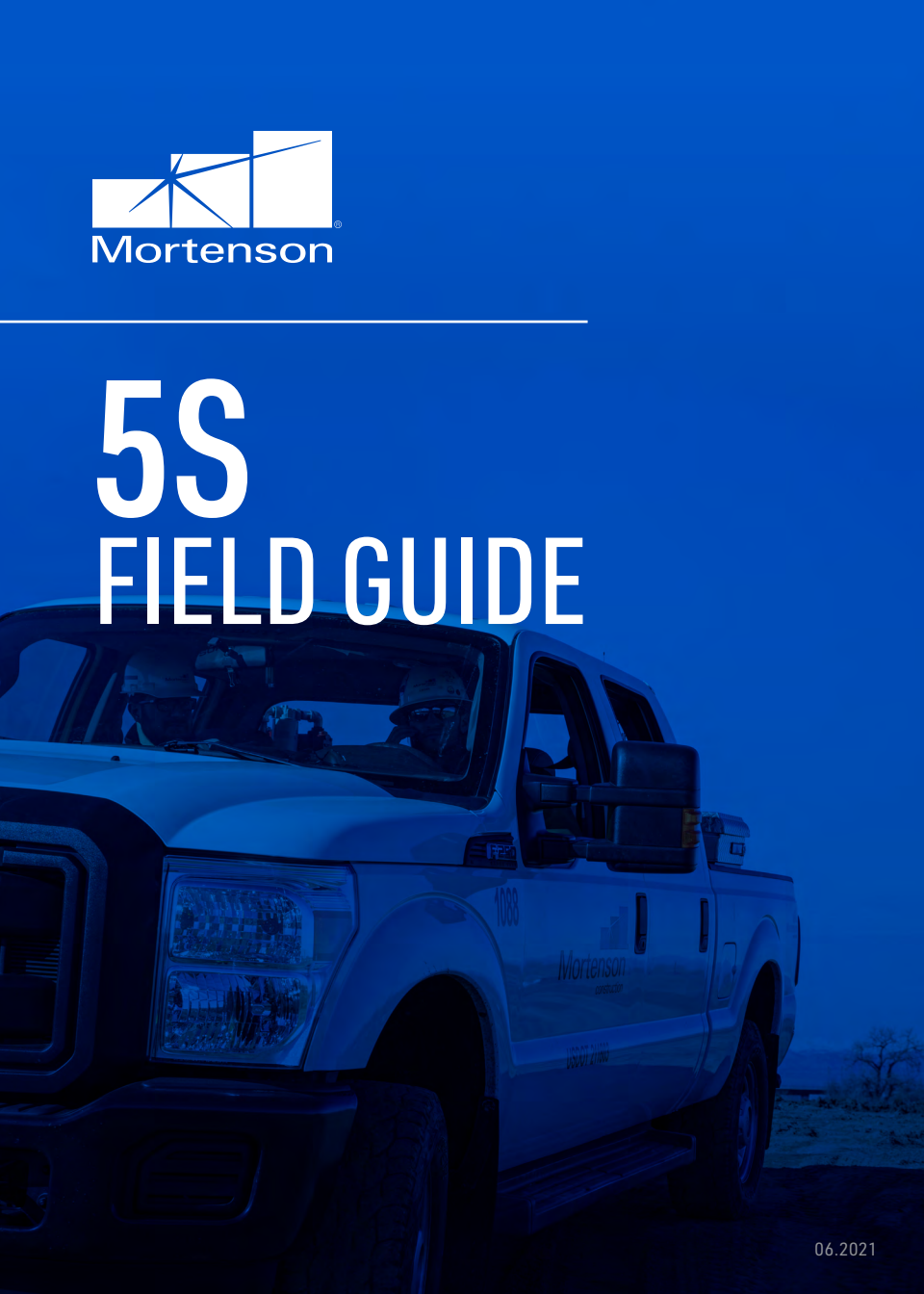
Mortenson

5S FIELD GUIDE



06.2021

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5S has contributed to flawless delivery and an exceptional customer experience on many Mortenson projects since 2015. Specifically, 5S:

- Creates a safer, more organized, efficient, and impressively clean project site.
- Makes work easier for everyone through better material flow – to have just what's needed, when needed, where needed.
- Creates a One Team environment in which everyone on site takes pride in delivering quality work and continuously improving how we build.

This Field Guide is a tool for project teams to plan and execute for success:

- **Section I: What Good Looks Like** helps create the vision for how 5S can benefit the project, and what the site standards should be.
- **Section II: Plan for Success** will help the Mortenson team and trade partners create a solid plan.
- **Section III: Make it Real** will help project teams to sustain 5S as the project progresses through major phases of work.

While certain elements of 5S will be common to all projects, each team should plan and execute 5S based on the project's unique conditions. In addition to this Field Guide, Project leaders should consult their Group "Absolutes" (minimum expectations) and are encouraged to consider how to apply 5S with every trade or task during each phase of construction.

Finally, the 5S Page on MortNet has additional resources such as What Good Looks Like pictures by scope and phase, and tools and templates to get you started.

LET'S REDEFINE POSSIBLE!™

Jim Yowan, Chief Operating Officer

TABLE OF CONTENTS

SECTION 1

WHAT GOOD LOOKS LIKE

IN THIS SECTION:

SORT

Have everything needed to do the job at hand – and nothing more.

NO TRASH HITS THE GROUND

THE BIG IDEA?

Reduce the amount of trash and scrap wherever possible, and contain the rest so that it doesn't hit or stay on the ground. This will reduce double-handling and ensure trash and scrap are never in our way.

Cut stations with dedicated gondola trash containers prevent scrap from hitting the ground.

GET ORGANIZED!

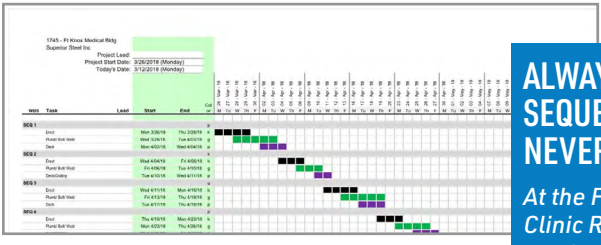
Project recycling program with color-coded dumpsters, SRP, Phoenix, 2016

IN THE FIELD

JUST-IN-TIME DELIVERIES

THE BIG IDEA?

Rather than taking extra tools and materials 'just in case', think "just in time". Just-in-time deliveries of exactly what's needed and nothing more keep the site clear of unwanted tools and materials, and encourage more detailed material planning, kitting and off-site prefabrication and assembly.



IN THE FIELD

ALWAYS SEQUENCED, NEVER STACKED.

At the Fort Knox Medical Clinic Replacement, each steel sequence took about one week to erect, the steel erection contractor coordinated weekly deliveries ...

... and unloaded the material in the exact location that the crane would pick it from ...

... which was designated in the laydown yard, resulting in no lost material for the duration of the project.

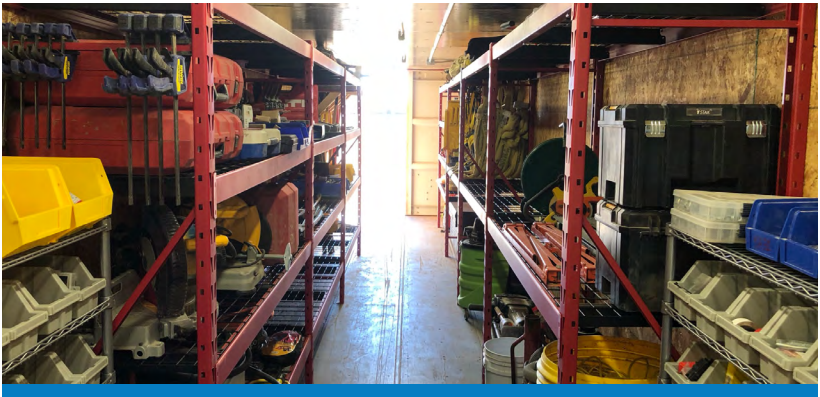
STAGING MATERIALS

By staging the exact materials needed before a task begins, we avoid stopping and starting work on the task to re-supply with materials – and ensure that no extra material is in our way.

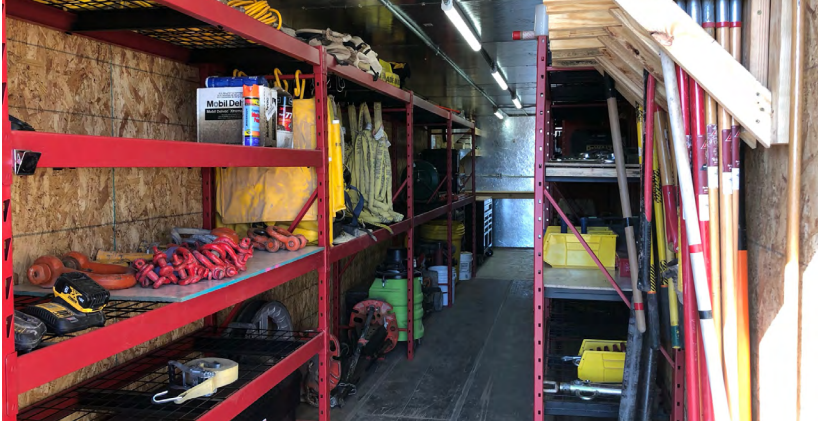
REMOVE UNNEEDED ITEMS

THE BIG IDEA?

Project teams and work crews should frequently assess their tool boxes, trucks, laydown yards, and connexes for extra materials, tools and equipment that are no longer needed, and remove them from the site.



Is everything here needed on site?



STRAIGHTEN

Straighten means arranging items so they are easy to find, use, and put away. It also applies to the overall organization of the job site, including cord management, walkways, access, and organized workspaces.

EVERYTHING ON WHEELS, PALLETS OR DUNNAGE

THE BIG IDEA?

Keep materials, tools and equipment contained, protected and easy to move.

IN THE FIELD

Material off the ground – UCHealth Highlands Ranch

LET'S GET ROLLING!

Carts protect materials and make them easy to move. Planning for carts also encourages material planning and delivering only when needed on the job.

By placing the metal studs on carts, they are easily moved to provide access to those working on the lift.

TOP NOTCH MATERIAL MANAGEMENT

THE BIG IDEA?

Have the right tools and materials for the job at hand. Use the Pre-Task Plan or a separate checklist. Kit and pre-assemble materials to make it easy to see that you have exactly what's needed in the field. Kitting and pre-assembly also makes final assembly in the field easier and more consistent.

IN THE FIELD

The Power Delivery Group set a standard of Top Notch Material Management, which includes prepping and kitting materials, making field install easier and more consistent.

Purpose-built trailers for hauling conduit

IN THE FIELD

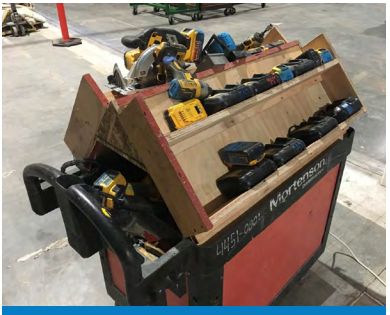
World-class laydown yard at Rush Creek!

CORD MANAGEMENT

THE BIG IDEA?

Make it easy for everyone to get the power they need while keeping cords out of the way and in good condition.

Everyone has the power they need, and no one is tripping over or damaging cords.



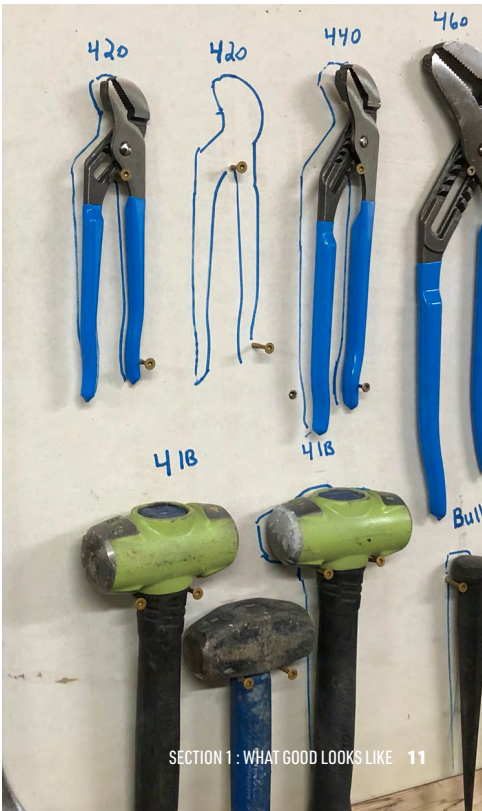
Maximize use of battery-powered tools and set up charging stations.

WELL-MAINTAINED EQUIPMENT AND TOOLS

THE BIG IDEA?

Clean and check equipment on a regular basis. Tools and consumables should be stored properly to make them easier to find, use and replenish.

A place for everything and everything in its place.



CLEAR WALKWAYS AND ACCESS

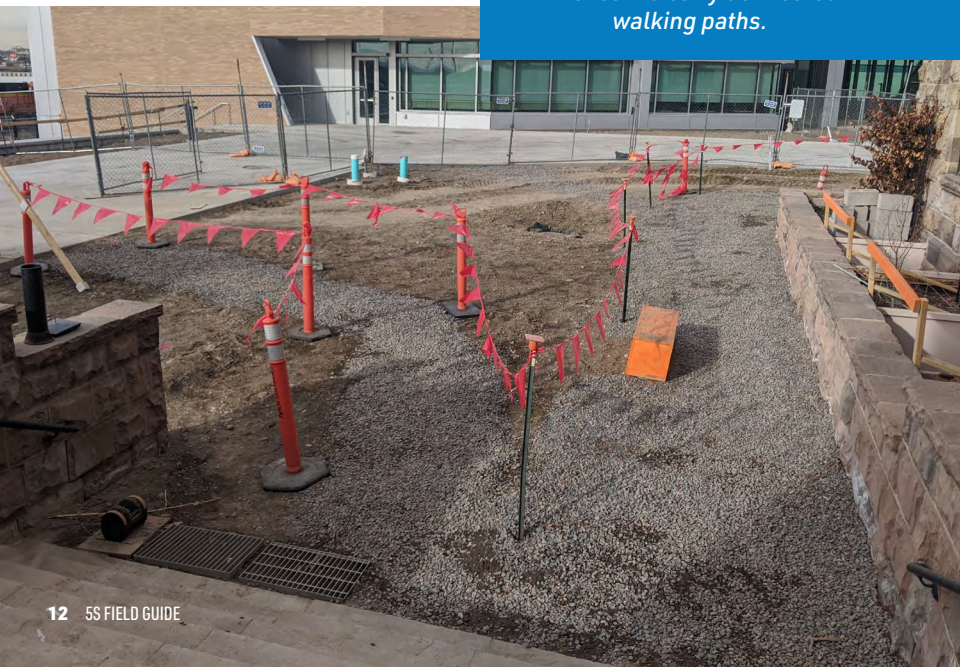
THE BIG IDEA?

Care for each other. Make it safe and easy to see and move on walkways while staying out of danger zones.

IN THE FIELD

At the Facebook Eagle Mountain Data Center, blue netting signals a walk path, while the orange netting means stay out.

This team clearly delineated walking paths.



ORGANIZED WORKSPACES

THE BIG IDEA?

In gang boxes, connexes, trucks and install areas, make a place for everything (that's needed) and keep everything in its place. Make it easy to see what you have and what you don't.

EVERYTHING YOU NEED, NOTHING YOU DON'T.

Easy to find, use and put away.

Nashville MLS Stadium, 2021.

Flatbed trailer organization on a Power Delivery project.

SHINE

Shine means preparing the work product and area for the next crew or inspection. "Clean to detect and correct".

WORK AREA READINESS

THE BIG IDEA?

We clean as we go and leave work areas organized, tidy and ready for the next crew's work. We expect to receive work areas in the same condition.

Believe it or not, mechanical, electrical and iron workers just finished working in this area.

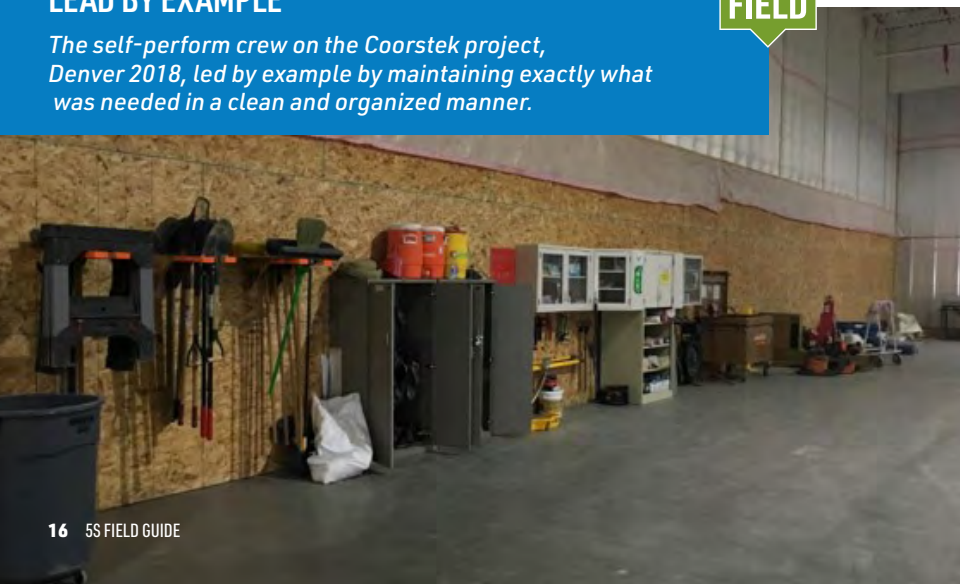
CLEAN AS WE GO

Upon completion of a task, the work area should have all trash and debris disposed of, and if indoors, broom swept.

IN THE FIELD

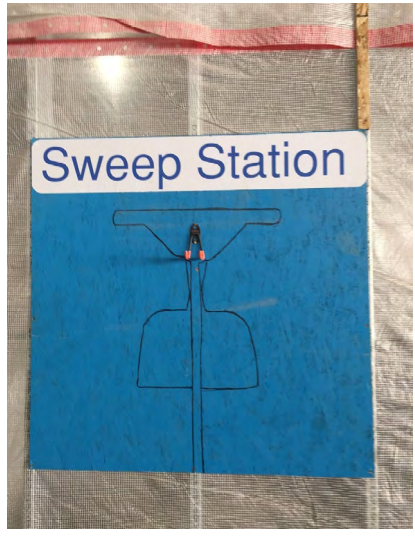
LEAD BY EXAMPLE

The self-perform crew on the Coorstek project, Denver 2018, led by example by maintaining exactly what was needed in a clean and organized manner.



MAKE CLEANING EASIER

Setting up sweep stations around the site makes cleaning up after each trade more convenient.



STANDARDIZE

Standardize means setting specific expectations and routines and getting buy-in.

Mortenson project leaders should set clear expectations for site standards. Everyone has a responsibility to know and follow these standards.

THE BIG IDEA?

Get alignment on the project's expectations - first within the Mortenson team and then among everyone. We lead best when we lead by example.

5S STANDARDS

The following standards are foundational to the success of our projects. They are key to achieving world-class safety, productivity, and an exceptional experience for team members and customers.

Our Time To Shine
CLEAN & SAFE BY DESIGN

No trash hits the ground

- Adequate trash bins everywhere they are needed
- No trash or materials left behind

Topnotch material management

- Plan ahead for adequate and accessible space
- Be sure you have the right tools for the job

Well-maintained equipment and tools

- Equipment and tools stored properly when not in use
- Trucks, equipment, conexes, and trailers are kept neat and clean

Clear walksways, egress, and access

- Safe and unobstructed access to work areas
- Materials staged with access in mind

Organized work sites and spaces

- A place for everything and everything in its place (i.e. Conexes, office trailers, substations, turbine sites, trucks, etc. are kept clean)

Work area readiness

- Sites are left organized, clean, and ready for the next crew's work

Expectations and accountability

- Expectations are clear for all from the start
- All teams members are held accountable to the standards

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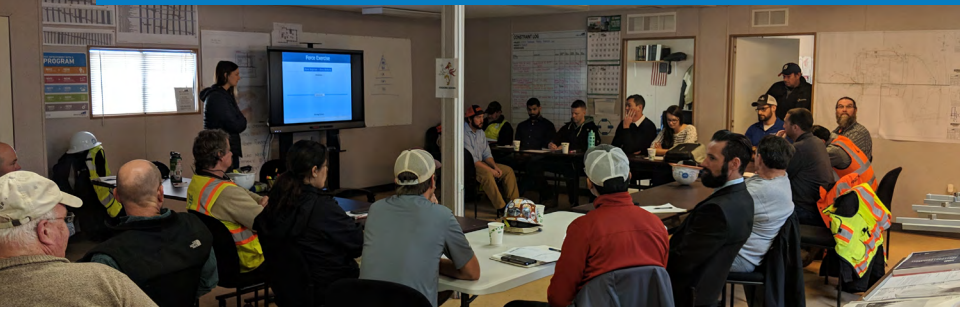
EARLY PLANNING AND ALIGNMENT

Early planning–first within the Mortenson project team, and then with trade partners–should align expectations and create detailed plans. Delivery schedules, laydown space,kitting and material management approaches all need to be discussed and agreed on before mobilization to the job site.



5S Orientation for craft, often held as the second orientation, can go a long way. "What Good Looks Like" pictures can Inspire What's Possible and get folks excited to be a part of a project that's better than anything they've experienced.

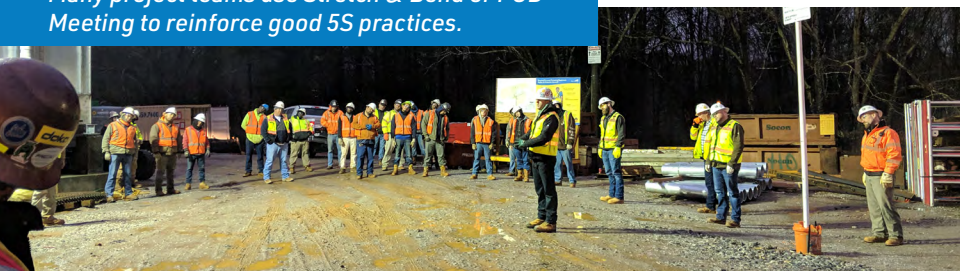
SUSTAIN

Sustain means reinforcing the site expectations constantly until everyone has adopted these new habits as standard practice.

THE BIG IDEA?

It takes time to unlearn old habits and to learn new ones. We are all leaders - and it's our role to Ignite Curiosity & Learning, by role modeling and encouraging a better way.

Many project teams use Stretch & Bend or POD Meeting to reinforce good 5S practices.

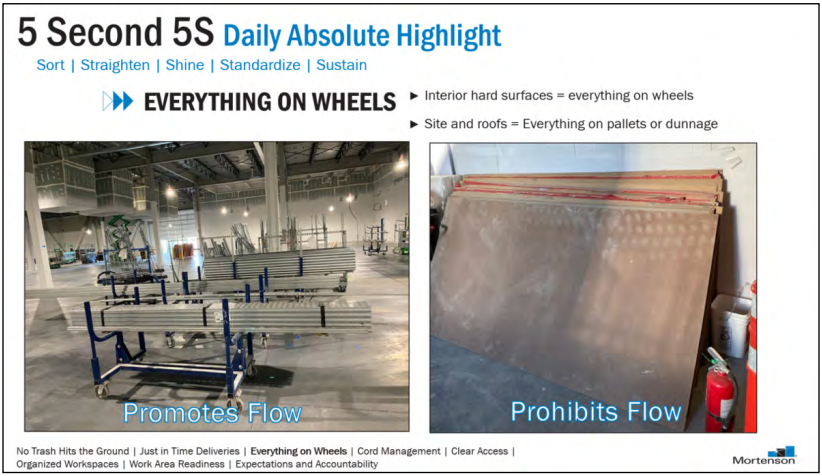


IN THE FIELD

The SRP team engaged their entire craft workforce and celebrated 5S accomplishments.

IN THE FIELD

The Eagle Mountain team shows one 5S slide per day at Bend & Stretch – to keep everyone engaged and understanding the site 5S standards. The slides focus NOT on cleanliness but on promoting flow.



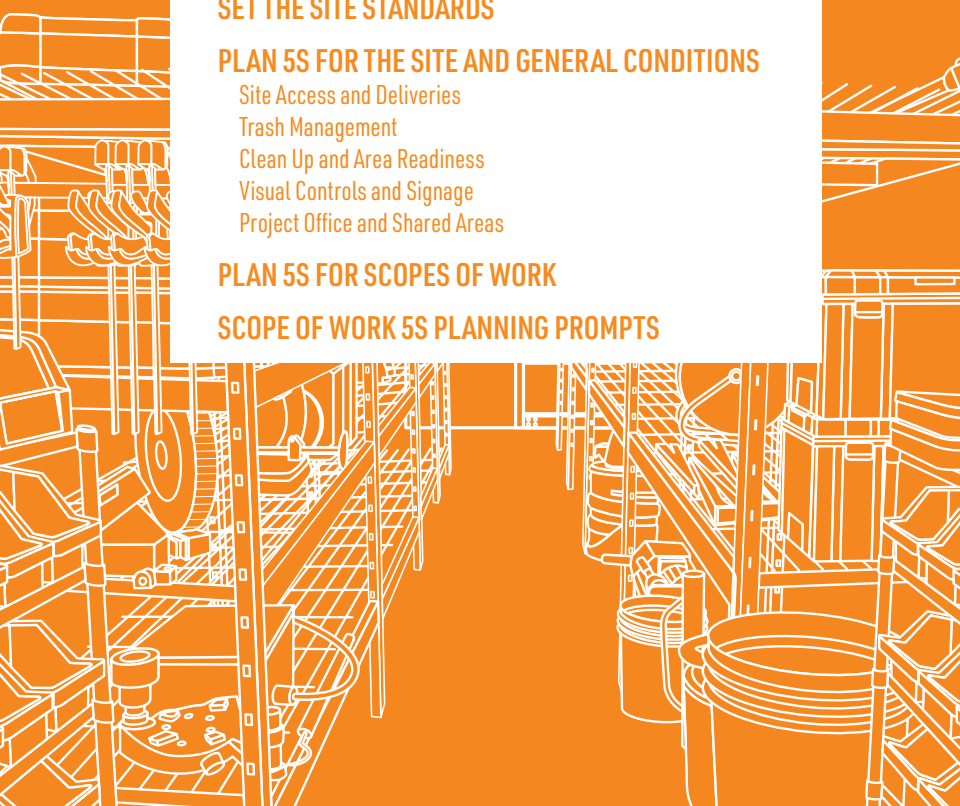
MAKE IT STANDARD!

It is important to set the example by applying 5S to Mortenson-managed scopes and project administration areas

SECTION 2

PLAN FOR SUCCESS

IN THIS SECTION:



The Mortenson team should set site 5S standards, and create a plan to support site offices, laydown yard, deliveries, break areas, walkways and access.

Mortenson self-perform and trade partner leaders should plan in detail how 5S will be applied on their scopes of work.

All of this should be complete prior to site mobilization!

Mortenson self-perform and trade partners should be held to the same standard.

IN THE FIELD

The SRP team in Phoenix planned ahead to achieve their recycling goal, in part by working with Equipment Solutions to provide color-coded and labeled tippy dumpsters.

SET THE SITE STANDARDS

- First, check with your Group leaders. Many Groups have set "Absolutes", or minimum expectations, for all projects.
- Then, meet with project leadership (or the entire Mortenson team) to develop specific, area-by-area, phase-by-phase and trade-by-trade expectations.
  - Flip back to Section I – What Good Looks Like – for specific ideas.
  - Use a phase-by-phase and trade-by-trade matrix to define specific expectations.
  - If you think this is overboard, think again! An ounce of extra planning is worth its weight in gold. Or something like that. Metaphors are hard. Planning for 5S isn't hard, you just need to do it, so the execution is that much easier.

Mortenson's Federal Contracting Group set expectations to encourage just-in-time material flow.

MATERIAL FLOW	STORE RELATIVELY STATIC	STAGE RELATIVELY DYNAMIC	PRODUCTION AREA CHANGES DAILY
AREA	ON-SITE (LAYDOWN)	IN-BUILDING (NEAR INSTALL AREA)	MATERIAL BEING INSTALLED
DESIGNATED	BY SUPT.	BY SUPT.	WEEKLY WORK PLAN
DURATION	2 WEEKS	2 DAYS	SHIFT

Mortenson

POWERED BY 5S

IMPRESSIVELY CLEAN ABSOLUTES

The following ABSOLUTES are foundational to the success of our journey in providing an exceptional experience for all workers and achieving world class safety performance on all Mortenson project sites

No Trash Hits the Ground
Trash cans available in work areas and emptied promptly

Just in Time Deliveries
Materials and equipment are not to be stored on-site for excessive periods of time

Everything on Wheels, Pallets or Dunnage
Hard surfaces = Everything on Wheels
No hard surface = Everything on dunnage or pallets

Cord Management
Cordless tool utilization
Cords are out of walkways and elevated off the ground

Clear Walkways & Access
All access/egress clearly identified
Safe and unobstructed access to work areas

Organized Workspaces
A place for everything, and everything in its place
E.g. - Work areas, gang boxes, office spaces, laydown yards, Mo

Work Area Readiness
Nothing left behind, broom swept
Work areas are clean for next trades

Expectations and Accountability
Expectations are clear for all trades from the start
All team members are held accountable for the absolutes lis

These 8 absolutes – developed by the Denver Group and adopted by several others – make clear the expected minimums for 5S application.

5S STANDARDS

The following standards are foundational to the success of our projects. They are key to achieving world-class safety, productivity, and an exceptional experience for team members and customers.

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Topnotch material management
- Plan ahead for adequate and accessible space
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Well-maintained equipment and tools
- Equipment and tools stored properly when not in use
- Trucks, equipment, conexes, and trailers are kept neat and clean

Clear walksways, egress, and access
- Safe and unobstructed access to work areas
- Materials staged with access in mind

Organized work sites and spaces
- A place for everything and everything in its place (i.e. Conexes, office trailers, substations, turbine sites, trucks, etc. are kept clean)

Work area readiness
- Sites are left organized, clean, and ready for the next crew's work

Expectations and accountability
- Expectations are clear for all from the start
- All teams members are held accountable to the standards

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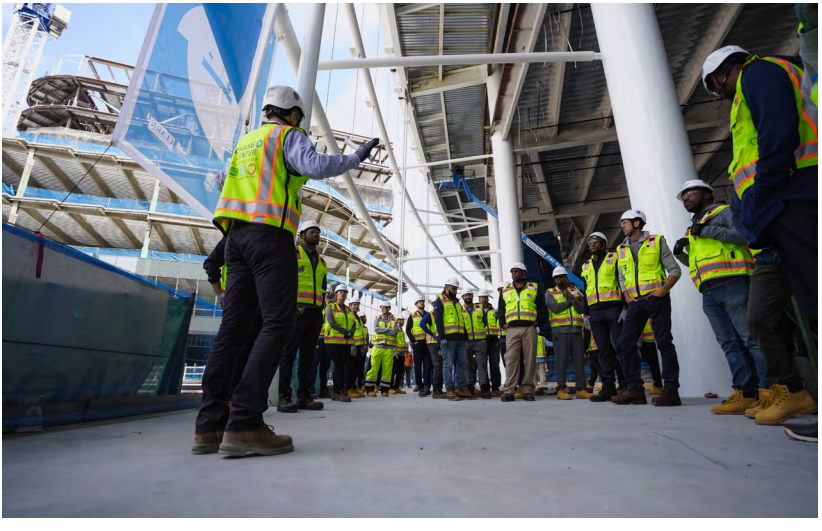
The Power Group established a slightly different version of these standards – more applicable to the type of work they do – within the Our Time to Shine program.

PLAN 5S FOR THE SITE AND GENERAL CONDITIONS

MORTENSON PLANNING

Mortenson project leaders should use the checklists that follow to identify and plan for 5S success.

Also reference the Site Utilization Planning and the Material Management Planning pages within the Construction Phase Planning Playbook on MortNet.



SITE ACCESS AND DELIVERIES

Keeping in mind the just-in-time delivery principle – which typically results in smaller, more frequent deliveries:

- What site perimeter, traffic management, or road use constraints do we need to communicate?
- What flagger or traffic control requirements will we have around the site or at the site access gates?
- How many deliveries (and of what size/type) will enter the site during different phases of work?
- How will we communicate site access locations to ensure no deliveries ever go to the wrong place?
- What types of offload equipment will be needed on any given day?
- What time windows will we set for these deliveries?
- Will the project require off-hours or 2nd shift delivery or area access?
- Who/how will we ensure all parties are respecting the time windows?
- How might we guide deliveries directly to the point of install, rather than using a laydown yard?

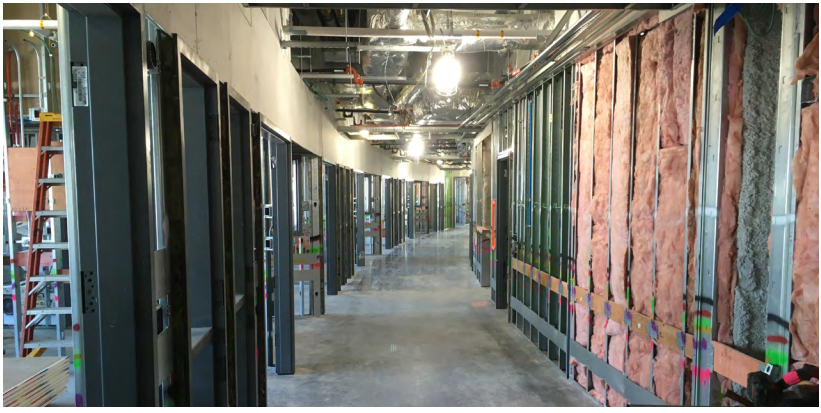
LAYDOWN YARD

Laydown space is most valuable for the project with proper planning and management.

- Were any laydown yard space, logistics or environmental constraints identified during design phase that we should plan for?
- How much space will we make available for laydown for each trade during each phase of work?
- How will we direct traffic to and through the laydown yard?
- What types of visual controls (signs, demarcations, movable mesh) will we use to encourage the right traffic flow and to ensure we lay down materials and equipment in the right spot?
- What types of physical controls (fences, jersey barriers) will we use to control traffic and access?
- How will we make it easy for people to lay down their materials and equipment in the right spot?
- How might we keep double handling (for example, movement within the laydown yard) to a minimum?
- Once laydown yard limits are set, what will we do (who will decide what to do?) if a trade partner or self-perform operation needs more space? What process should we follow?

AREA ACCESS AND WALKWAYS

- How will people, material and equipment safely access each area of the site as needed? Include plans for loading docks, lifts, cranes and other shared resources, and keep in mind the various types of carts to be used on site.
- How will we manage these loading docks, lifts, and other shared resources?
- How will we maintain, adjust, and make it easy to see walkways and roadways? Have we considered mesh or hard barriers instead of caution tape?
- How will we maintain access to toilets and break areas?
- How will we communicate these expectations to team members and trade partners?



TRASH MANAGEMENT

- What is the recycling goal for the project? What infrastructure is needed to achieve it? How will we encourage maximum recycling?
- What will be our expectation with respect to cut stations?
- How do we expect trade partners to manage scrap?
- Where will site dumpsters be located for different phases of work?
- What types of dumpsters are needed in different areas? How will we ensure ergonomic access to these dumpsters? (for example ramps and platforms, as needed)
- Will we make use of trash or recycling chutes?
- What dumpsters or trash bins will Mortenson provide, and what should trade partners provide?
- What expectations should we set with trade partners on the type of trash containers and the triggers for / frequency of emptying them?
- How frequently will each type of dumpster be emptied or hauled? By whom? What limits or triggers do we want to place for emptying (for example, when full or at the end of the day if at least half full)?
- How will we communicate these expectations to team members and trade partners?

CLEAN UP AND AREA READINESS

- What are the established housekeeping / trash container expectations?
- Will we provide sweep stations, or do we expect trades to provide their own?
- How will we avoid composite cleanup crews? What will be the trigger or threshold to enact them?
- How will the team verify the removal of excess materials, tools and equipment from an area before handoff to another trade, Mortenson or a third party for inspection?

VISUAL CONTROLS AND SIGNAGE

- What general directional signage will we provide?
- What signage related to the 5S program do we want to display?
- How will we indicate walk paths, entrances, exits and rallying points?
- How will we indicate controlled access zones?
- Will we assign each trade partner a color – to indicate their equipment, trash containers, materials (e.g. spray painted pallets)?

Masonry	Sun Valley	White
Site Utilities	Nickle	Green
Electrical	Wilson	Red
Plumbing	UMEC	Blue
Concrete	Mortenson	Yellow
ACM	Viking	Black
Rebar	Westwind	Orange
Steel	Fleming West	Purple
Site-Electrical Ductbank	Premier	Gray

IN THE FIELD

FLYING WITH COLORS

The Arizona State University Multi-Purpose Arena project team assigned each trade partner a color. Trade partners marked all their materials and equipment with this color. This made it easy to control.

PROJECT OFFICE AND SHARED AREAS

- What should our standards be for the Mortenson team project offices?
  - Main office entrance / lobby area
  - Conference rooms
  - Individual team member desks and workstations
  - Safety supplies
  - Material samples
  - Plan tables
- How might we make it easy to find and use safety and administrative resources?
  - *I Own Zero Injuries* supplies such as visitor PPE
  - Hot work permits, dig permits, pre-task planning cards
  - Radios
  - Buggies (never lose a key, not one!)
  - Shared General Conditions tools, equipment, materials and signs
- Craft break areas (eating, smoking)
  - Will smoking be allowed on site?
  - Where should break areas be located, and how much space will be required?
  - Will we make vending machines available?
  - What should the standards be for cleanliness and organization?
  - Will we provide designated spaces for personal items and food/drinks?
  - How/who will be responsible for maintaining these standards?

PLAN 5S FOR SCOPES OF WORK

The Mortenson team should align with trade partners and self-perform leaders on the site's standards and how we will work together to meet them. Three important waypoints for achieving team alignment are:

1. **Subcontract Agreement:** It is becoming more common to spell out 5S expectations in a subcontract Exhibit. See example Exhibit language on the 5S MortNet page. Consider sharing the digital version of this 5S Field Guide as part of the subcontract Exhibit.

2. **Preconstruction Meetings (Precon):** Gain alignment between Mortenson and trade partner leadership on the expectations for material deliveries, area readiness, cut stations, trash containers, etc. Discuss everything that will need to be planned and procured in advance: delivery schedules, carts, cut stations, trash containers, etc. Share copies of this 5S Field Guide.

3. **Activity Plans (IWPs, SWIs) and Preparatory Meetings:** Verify the trade partners' and self-perform field leaders' plan and commitment to meet the standards. Some Groups and projects ask trade partners to lay out their 5S plan in detail, including how they will achieve each of the Group's / project's "Absolutes". This discussion should include Mortenson's commitment relative to each absolute, to build a "One Team" approach from the very beginning. Trade partners and self-perform leaders can use the prompts in this section to create a solid plan.

SCOPE OF WORK 5S PLANNING PROMPTS

Deliveries

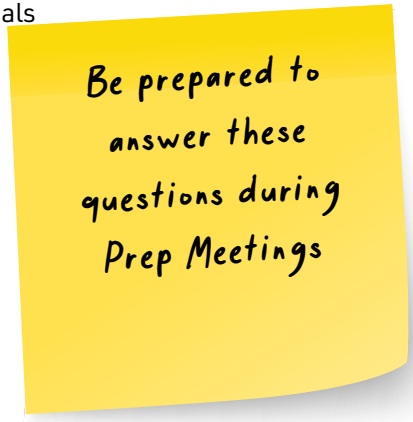
- (For each task / activity) How many deliveries do we plan? How will we meet the just-in-time material delivery expectation?
- Do our suppliers understand the delivery windows and just-in-time expectations? (As applicable, communicate that deliveries will be turned away if they were unplanned/unapproved or contain excessive materials).

Laydown Yard

- What material will go to the laydown yard and what will go straight to the install area?
- How much space is designated for us in the laydown yard, and where? Is it enough?

Everything on Wheels or Dunnage

- How will we ensure all materials will be on wheels (if inside a building), pallets or dunnage, or otherwise easily picked and moved? What types of carts, trucks, trailers or connexes will we have, and how many? Will this be enough for all our on-site material?



Visual Controls, Labels and Kitting

- What color has been assigned to us? How will we mark our materials, tools and equipment with this color?
- How will our materials be labeled and organized?

Prefabrication and Field Fabrication

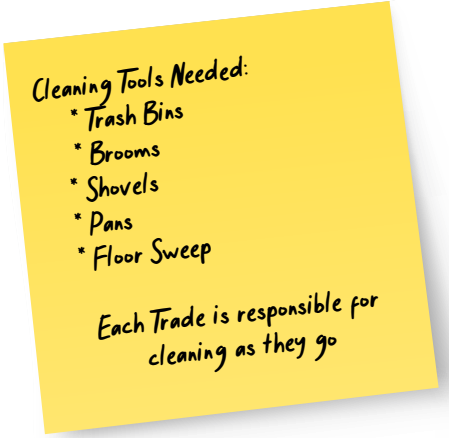
- To what extent will we be kitting and prefabricating materials for each task? (e.g. pre-cut, pre-bend, organize and contain together, pre-assembly)
- For fabrication in the field (cutting, bending), what are our plans for ergonomic workstations? (Cutting stations, worktables, jigs etc.) How many will we have? How will we keep scrap and debris off the floor?

Material Handling and Provisioning

- How will we handle material? (manual vs. mechanical means of handling; material handling equipment such as trucks, forklifts; operator / flagger requirements; access; hoist capacity and availability; schedule.)
- To make recycling and disposal of packaging easier, have we considered whether material packaging can be removed before entering the install area, without risking damage to the materials?
- We plan on a dedicated logistics/reprovisioning resource, or will crews reprovision themselves? What does this look like on a daily/weekly basis?

Work Area Readiness

- What cleaning supplies will we provide our crews? What is the expectation for cleaning as they work vs only upon task completion?



- How will we ensure all material, tools and equipment have been removed from an area before handoff, and the area is ready for the next trade (or an inspection)? Who on our team is responsible for ensuring this?
- How will we avoid needing to use composite clean-up crews? Are there some instances where we might have to use them?

Expectations and Accountability

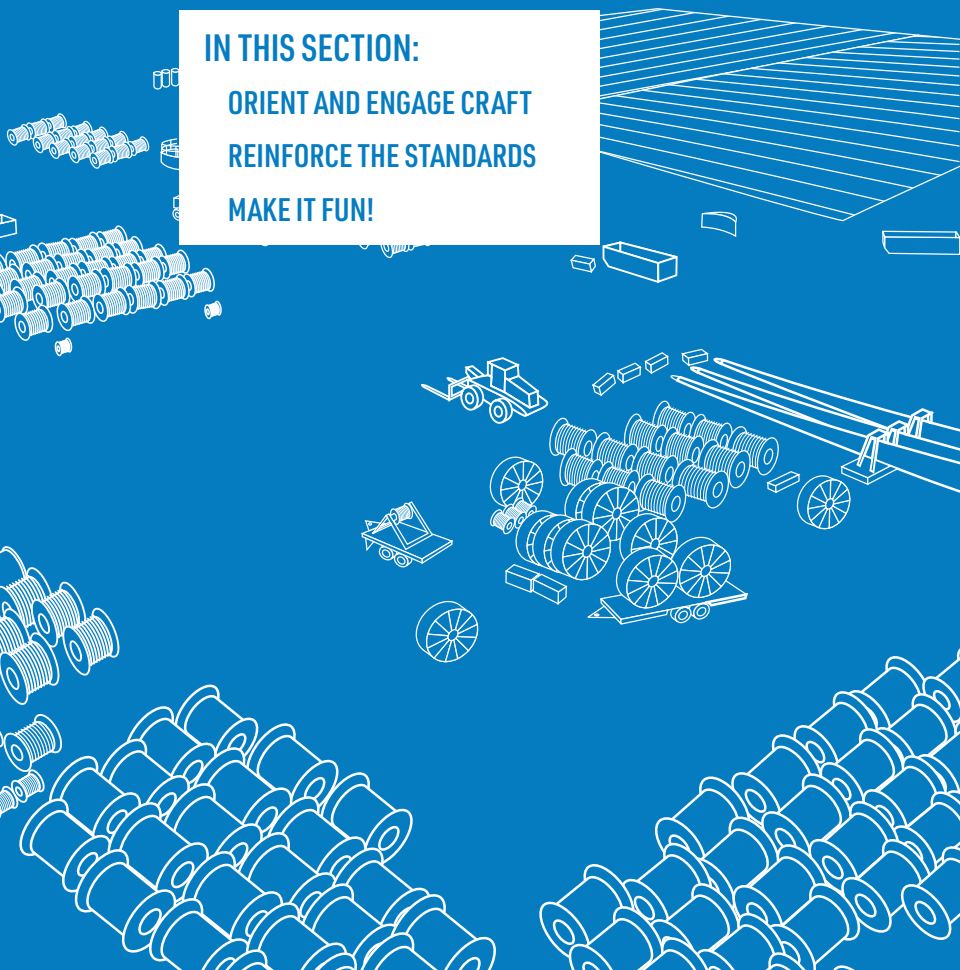
- How and when will we communicate 5S expectations to our craft workforce?
- How will we incorporate 5S into Pre-Task Planning? Who will be accountable? Who will be responsible for making it happen day-in and day-out?

SECTION 3

MAKE IT REAL

IN THIS SECTION:

- ORIENT AND ENGAGE CRAFT
- REINFORCE THE STANDARDS
- MAKE IT FUN!



All that planning will pay off in spades once the team has mobilized. Proper planning and aligned leadership will be a big help as you 'Make It Real'!

1 Orient and engage craft

2 Reinforce the standards among everyone on site

3 Make it Fun!

1 ORIENT AND ENGAGE CRAFT

There is no one 'right' answer on how to orient and engage craft. Things that have worked include:

- Insert a slide in First Day First Hour orientation.
- Hold a second orientation dedicated to 5S, by trade partner, within say two weeks of arriving on site. See sample orientation slides on the 5S MortNet page.

These sessions have proven powerful at many projects. After a short presentation, ask participants what they need to be successful. Give our craft workers a voice and they will become champions for change!

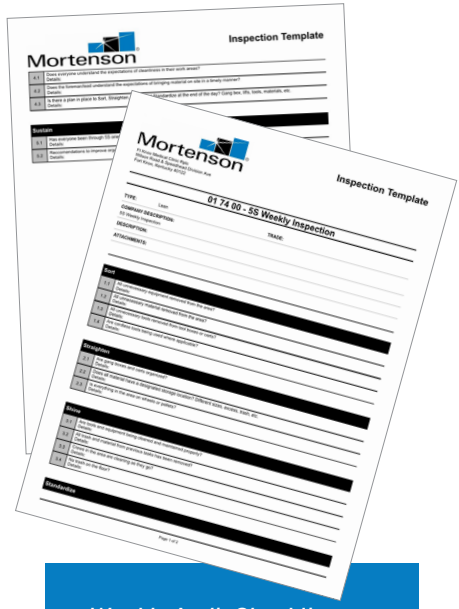
A "2nd Orientation" dedicated to 5S at Allegiant Stadium.

IN THE FIELD

2 REINFORCE THE STANDARDS

The most important is for field leaders to hold everyone accountable. Stop work and direct that corrective action be taken if the 5S absolutes are not being followed. Other approaches include:

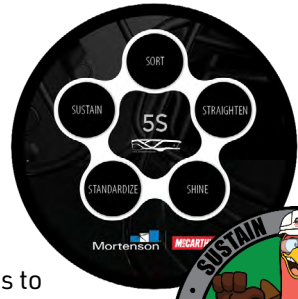
- Do weekly 5S Audits, using the 5S Checklist in Procore or on the 5S MortNet page. Discuss findings at POD/POND or Bend 'N Stretch
- Do daily or weekly leader walks to all areas of the job, pointing out good work and areas for improvement. Get commitments for action and make sure those improvements get implemented.
- Do regular Team 5S Assessments to see and act on weak spots in your program. (See the 5S Checklist, which contains both the Weekly Audits and the periodic Team 5S Assessments, on the 5S MortNet page.
- If a trade is falling behind on 5S, hold a 'reset' meeting with self-perform / trade partner leadership (like a Prep meeting all over again) and create a better plan for 5S.



Weekly Audit Checklist

3 MAKE IT FUN!

This is the best part of all.
There are so many ways to make things fun, but here are a few ways to get team members excited about 5S.



Seek authentic customer and senior leader / group leader recognition of specific trades and individual craft team members during site visits.

As simple as it is, creating a fun, project-specific 5S hard hat sticker can get people excited about being a change leader. Make a big deal of it!

Create an Ideas Board focused on ways to improve 5S and Safety on the site. Recognize and reward team members who submit and implement ideas.

Hold a competition. Coorstek held a "Best Gangbox" competition and asked their customer to be the judge and award gift cards to the winners.

REINFORCE THE GOOD PRACTICES

The Seattle Group initiated a quarterly "Impressively Clean" award and banner to recognize the entire site team

Climate Pledge Arena

Seattle Hotel

To be successful with anything new requires leadership from all of us. Which of the LeadBLU practices will you employ to make 5S successful on your project?

LeadBLU

Do The Right Thing

Demonstrate character
Communicate with clarity
Lean into challenges

We Before Me

Coach & empower others
Create meaningful connections
Care for each other

Inspire What's Possible

Ignite curiosity & learning
Activate ideas & insights
Cultivate diverse thinking

Trust | Teamwork | Responsibility | Safety | Service | Stewardship

Mortenson


Mortenson