

A3 No	Title	Revision #	Champion	Date Started	Collaborators	Effort/ Initiative	Mentor	Approved by:	Approved date:	Status	Type
	Safety in design through collaboration.	0	Craig Wilkins	04-29-07	Team Safety	Safety	Greg Howell			<input type="checkbox"/> Development <input type="checkbox"/> Collaborative review <input type="checkbox"/> XO(s) review	<input type="checkbox"/> Problem Solving <input type="checkbox"/> Proposal <input type="checkbox"/> Idea documentation

Section 1. Background

- Construction projects being completed via an Integrated Project Delivery (IPD) method, have the opportunity to incorporate safe practices into the design phase.
- Design professionals traditionally focus on the end user i.e.; building occupant, or facility operator and do not consider and not the construction worker.

Section 2. Current Condition (Problem Statement)

- Construction safety is not a prime consideration during the design phase.
- Typically, designed in safety occurs at the construction level on an as needed basis.
- OSHA's places the responsibility for safety on the construction firms.
- An emphasis for construction safety should be emphasized when designers are educated and trained.
- Lack of Safety in Design tools, guidelines, and procedures.
- Designer's limited role on the project team.
- Designer's traditional viewpoint on construction worker safety.
- Lack of understanding of the associated liability.

Section 3. Goals/Targets (Future State)

- Include construction safety into design process.
- Recognize potential hazards which may be encountered during construction & post construction.
- Design as both architect/engineer *and* as a constructor.
- Eliminate the use of specialty tools required for installation & maintenance.



Section 4. What is standing in the way?

- Traditionally, constructors are involved too late in the process to provide input into design.
- Constructability reviews should be performed early, with construction safety in mind.
- Operators are not given the opportunity for input at the design stage. (i.e.; constructors, maintenance personnel)
- Address the paradigm that Safety in Design costs money.
- Behaviors of the designers, constructors, and end users providing input.
- Motivate those managing the design and scope to include input at the right time.
- Designers lack knowledge of construction methods.
- Be sure not to overburden the design delivery so we can maintain the project schedule.

Section 5. Proposed Countermeasures

Examples of proposed safety-in-design:

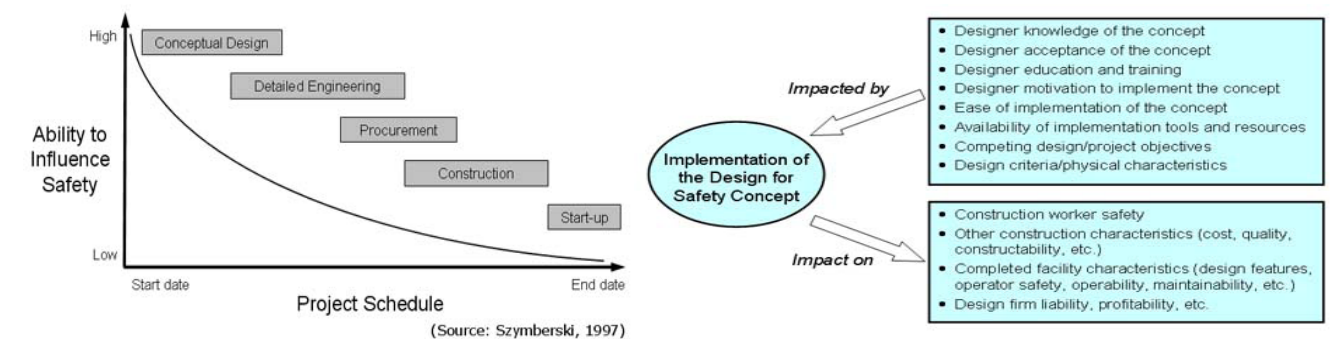
- Design work that can be constructed on the ground and lifted into place as a unit.
- Weld tie off attachment points prior to hoisting structural steel into place.
- Allow for offsite fabrication. Work that can be performed in a shop is typically safer than construction projects.
- Eliminate the tool or process which causes injuries.

Sources for safety in design: - *Safety in Design is a Culture of Collaboration for Shared Ownership and Outcome.*

- www.designforconstructionsafety.org
- www.safetyindesign.org
- www.elcosh.org

Section 6. Plan

- Designers can play a role in making construction sites safer.
- Keys to designing for safety:
 - Collaborate between *all* project team members
 - Allow time to meet with constructors and end users prior to completion of construction drawings.
 - Designers should gain the knowledgeable of:
 - Design for safety concept
 - Construction site safety
 - Construction practices



Benefits for Safety in Design:

- Reduce overall project costs through:
 - Reduced redesign and rework in the field, Earlier Planning for Efficiencies
- Streamline Project Delivery/Execution through:
 - More complete design packages, Fewer field clarifications/changes
 - Owner's representatives bought into the design
- Safer Project and Facility through:
 - Construction and Commissioning
 - Maintenance and Operations, & Retrofits

Section 7. Follow-up

- Continue to understand construction methods & how design can affect them.
- Document Lessons Learned for incorporation into future designs.