Construction Clients' Group
Safety in Design & Procurement

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26 May, 2017

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CCG Position Statement – Key Elements for SiD

The key elements in the *Code of Practice for the Safe Design of Structures 2012* (CoP) are aligned to the HSWA and are consistent with international experience.

These provide robust and clear direction for achieving safe and healthy designs in the New Zealand context:

1. Use a risk management approach

2. Consider the lifecycle

3. Knowledge and capability

4. Consultation, cooperation and co-ordination

5. Information transfer

Applying these key elements during contract engagement and project management is fundamental to best practices for ensuring cost effective, efficient and a successful outcome for all stakeholders.

Knowledge & Capability:
i.e. Competency

Who Is Responsible For SID?

Under the new Health & Safety at Work Act, everyone, including designers, will have an obligation to mitigate risk, consult and collaborate to improve safety.

Under the Act, a designer is a PCBU when he or she designs (part of) plant, substances or structures that is to be used, or could reasonably be expected to be used, as, or at, a workplace.

Note: Anyone who alters or modifies a design without consulting the original or subsequent designer will assume the duties of a designer.

PCBU

A Person Conducting a Business or Undertaking

Responsibility rests with parties or individuals who control or manage design functions.

Responsibilities should be consistent with the degree of control that a person has.

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Degree of Control

A range of parties influence the design function at varying phases of the design process including but not limited to the following:

- Design professionals such as architects, engineers, industrial designers
- Suppliers (including manufacturers, importers, plant-hire), constructors, installers and trades/maintenance personnel
- Other groups who make design decisions, such as clients, developers, builders, owners, job managers, health and safety professionals and ergonomics practitioners
- Contractors who have a bearing on the safe working practices, particularly where innovative techniques are to be used
- Personnel who should work or be affected by the plant, building or structure
- Government regulators and inspectorates.

CAPABILITY OF DESIGNER

- Knowledge of work health and safety legislation, codes of practice and other regulatory requirements
- An understanding of the intended purpose of the structure
- Knowledge of risk management processes
- Knowledge of technical design standards
- An appreciation of construction methods and their impact on the design
- The ability to source and apply relevant data on human dimensions, capacities and behaviours

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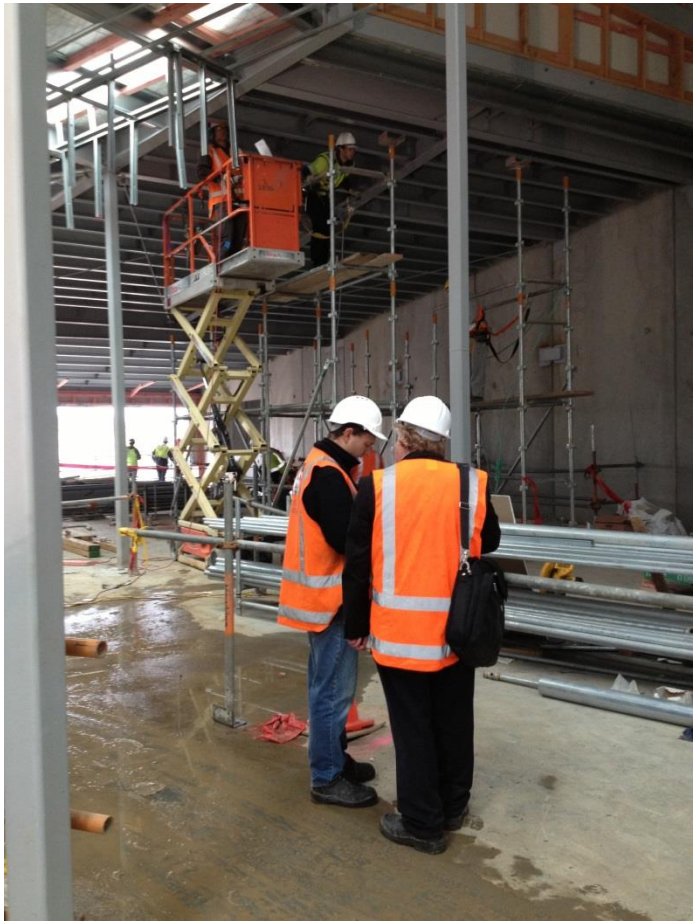

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AECOM Competency Framework

	Certification Level	All staff	Project Managers / Design Managers	Safety in Design Practitioners*
Safety for Designers & Consultants	Awareness	X	X	X
Safety in Design Management	Competency		X	X
Safety in Design Facilitation	Competency			X

*Safety in Design Practitioners must participate in the above training as well as demonstrate relevant experience and formal training or qualifications, typically;

- Post graduate training in risk management and/or safety in design;
- Demonstrated experience in the selection, application and /or facilitation of risk management tools and techniques (i.e. CHAIR, HAZOP, HAZID etc.).

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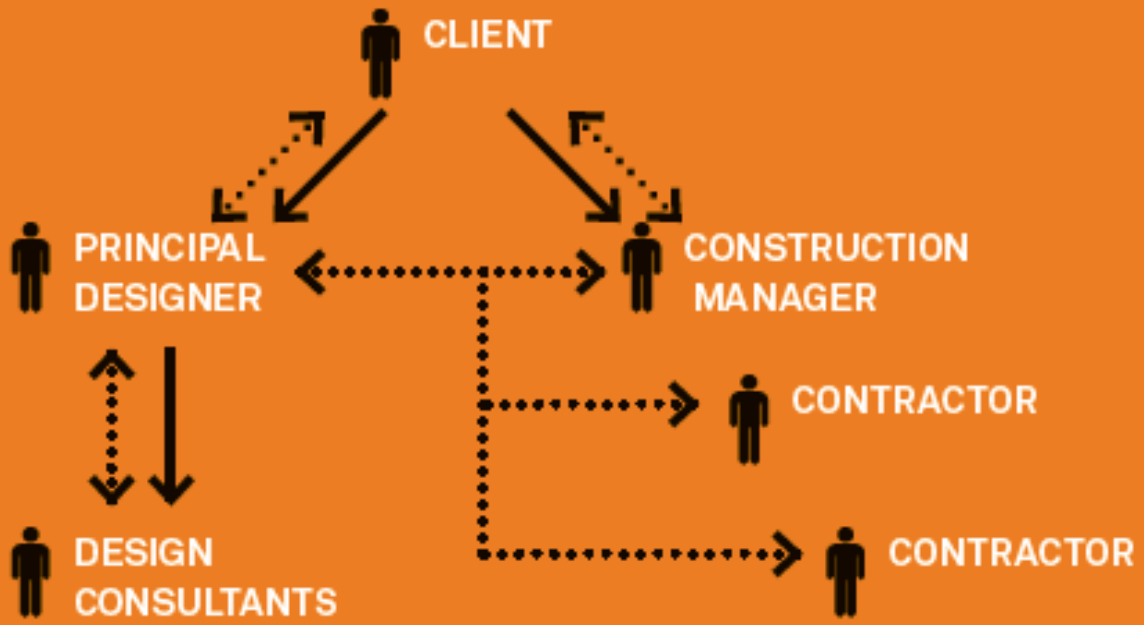
How to ensure that SiD Competency is covered effectively in Procurement?

- During the procurement process it is imperative that competency is proven
- This needs to be evidenced in a documented process
- As Clients – include the requirement to prove competency in EOI/RFP etc., think about SiD prequalification
- As Designers/Contractors – have a clear competency framework and demonstrated evidence of compliance
- Ensure that the evaluation process used to assess tenders puts a high score on SiD competency.

Consultation, Co-operation and Co-ordination to *facilitate* good Risk Management

Two parties may have no contractual obligation but if their actions may affect the health and safety of others, they must consult, cooperate and coordinate.



Contracted Responsibilities

Consultation, cooperation & coordination duties

Engaging early is the key to success

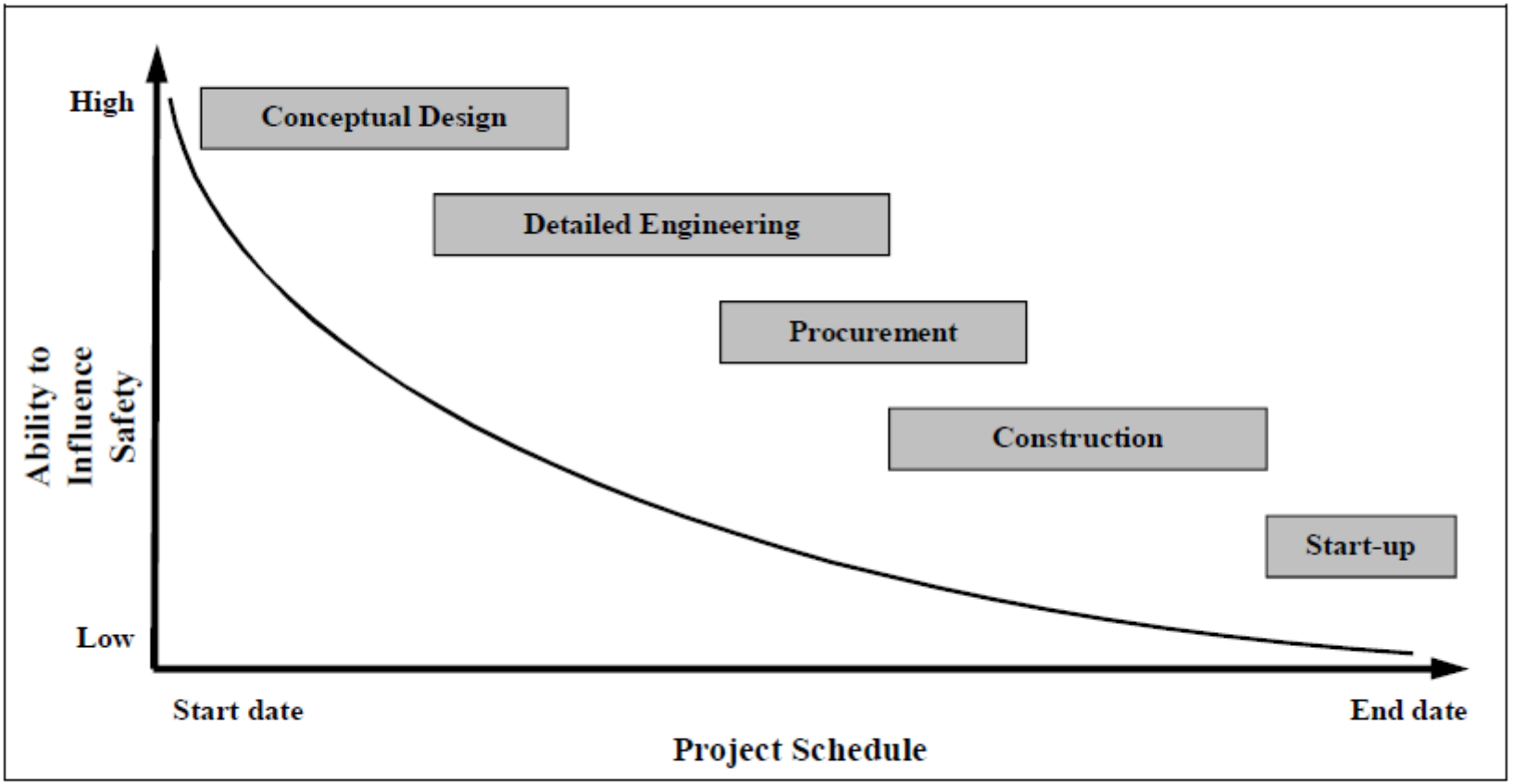


Figure 2 Ability to influence safety on a project (Szymberski, 1997))

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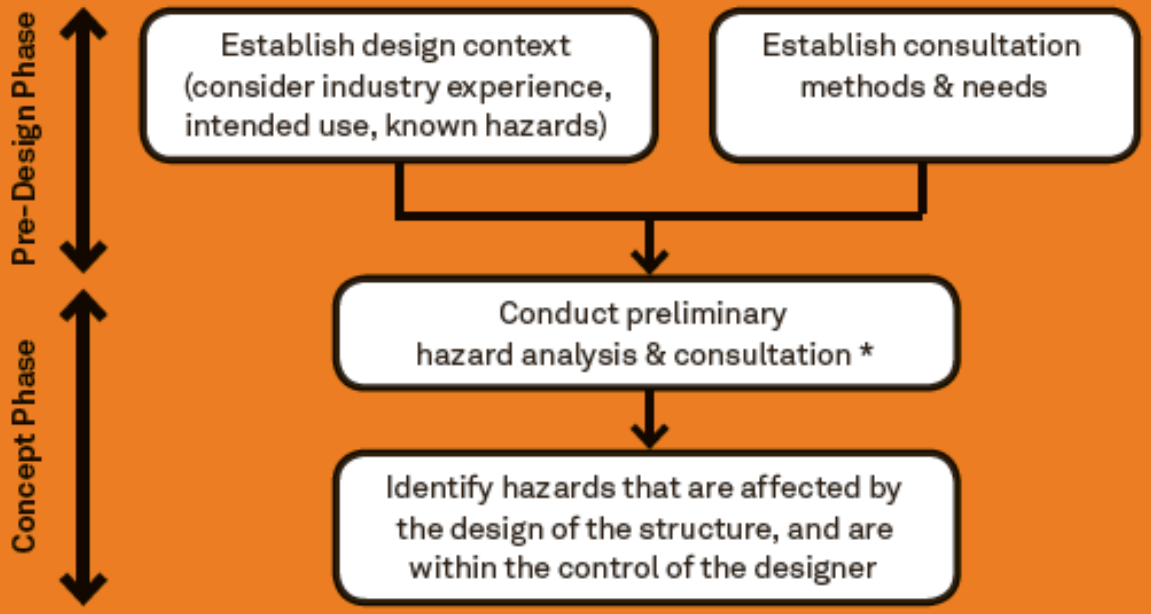
HAZARD IDENTIFICATION



***CONSIDER THE FOLLOWING:**

Siting – clearances, public access, existing structures, conditions, etc.
High Consequence Hazards – hazardous materials, heights, confined spaces, high energy systems, etc.
Systems of Work – staging, phases, access, materials, multi-use, etc.
Environmental Conditions – impact of catastrophic events, natural events, environmental changes, etc.
Incident Mitigation – access, egress, adequacy of structure for, assembly areas, etc.

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The PCBU that commissions the design must consult with the Designer SFAIRP.

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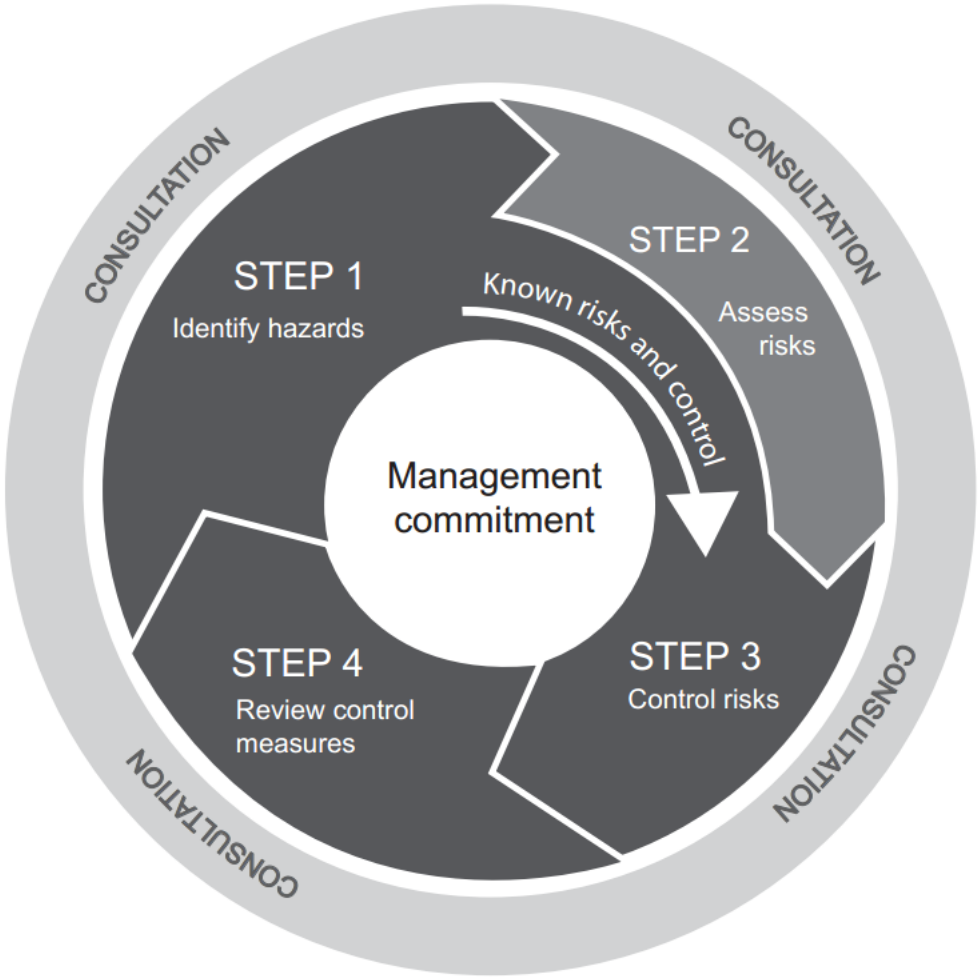
FIGURE 1: The risk management process



AECOM Requirements for Consultation

ATTACHMENT 1 – Typical SiD Application for Project Types

The following table provides guidance to selection of appropriate Safety in Design processes based on typical project types.

TYPICAL PROJECT TYPES	TYPICAL SiD PROCESSES
• Common (i.e. familiar) simple projects • Single discipline projects	Either (or both) of: • Team Review • Peer Review (independent)
• Uncommon or unfamiliar projects for the project team • Complex single discipline	Either (or both) of: • Peer Review (independent) • "What if" or other self-guided study
• Multi discipline common basis of design	Either (or both) of: • Team or peer review for each discipline • "Workshop or formal study – level 1
• Multi discipline uncommon (unfamiliar) basis of design • High industry safety risks • Very large projects • High level of stakeholder interactions	All of: • Team or peer review for each discipline • Workshops and formal studies – Level 2 • May require several studies e.g. Different sections of the design and/or different stages of the design

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AECOM Requirements for Risk Management

ATTACHMENT 2 – Typical Application of SiD at Design Stages

The following table provides guidance on how Safety in Design can be applied at the various stages of design.

Design Stage	SiD Requirements	Examples of Safe Design Considerations (*Note: This list is not exhaustive*)	Suggested Techniques & Tools
Concept	Identification of large scale issues and critical health and safety related risks that may affect the viability of the project.	• Site geology e.g. soft soils • Contaminated land • Emissions from development • Proposed use zoning • Relocating power lines or placing them underground before construction • Site layout for emergency response, security and separation of hazardous activities • Spatial relationships and congestion /pedestrian or vehicle separation • Demolition of existing assets • Staging / coordination issues • Materials options / construction techniques	• Preliminary Hazard Analysis • Peer review
Schematic/ Preliminary	Identification of reasonably foreseeable safety risks considering construction, installation/commissioning, use, maintenance/repair, demolition/disposal.	Specification of materials with high durability and low maintenance requirements Dangerous and hazardous goods requirements Redundancy – Introduction of duplicates to allow safe continued operation in the event of failure Providing safe access to roofs, plant rooms and windows for maintenance Considering human behaviour / potential for misuse. Physical characteristics of users Consideration of ergonomic principles e.g. avoid designing construction activities that require work in restricted spaces or designs that require repetitive or prolonged movements to complete task.	• Preliminary Hazard Analysis • Human Reliability Analysis (HRA) • HAZOP or CHAIR study • Peer review
Detailed Design	Focus on ways in which a design can be fine-tuned to further improve safety aspects.	Eliminating the need for installing temporary barriers, by integrated guardrail system along roof edges Inclusion of construction access into building fabric e.g. removable panels Instrumentation and its layout Positioning anchorage and hoisting points Details such as trip/slip and material handling hazards	• HAZOP or Chair study • PEER reviews

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How to ensure that this is covered effectively in Procurement?

- The key is to get the RIGHT PEOPLE, involved at the RIGHT TIME
- Sometimes concerns about Procurement/Probity stop this
- Procurement mechanisms to ensure success:
  - Early Contractor Involvement
  - Professional Services contracts to involve other parties e.g. Contractor, Operation, Maintenance etc. during design if traditional Design Bid Build e.g. 3910
  - Design and Construction Contract e.g. 3916
- Ensure that the contractually agreed scope of work clearly documents SiD process
- The process then must be documented through the lifecycle:
  - Who was involved
  - What the hazards are
  - Record the mitigations
  - Identify the mitigation owners and prepare action plans

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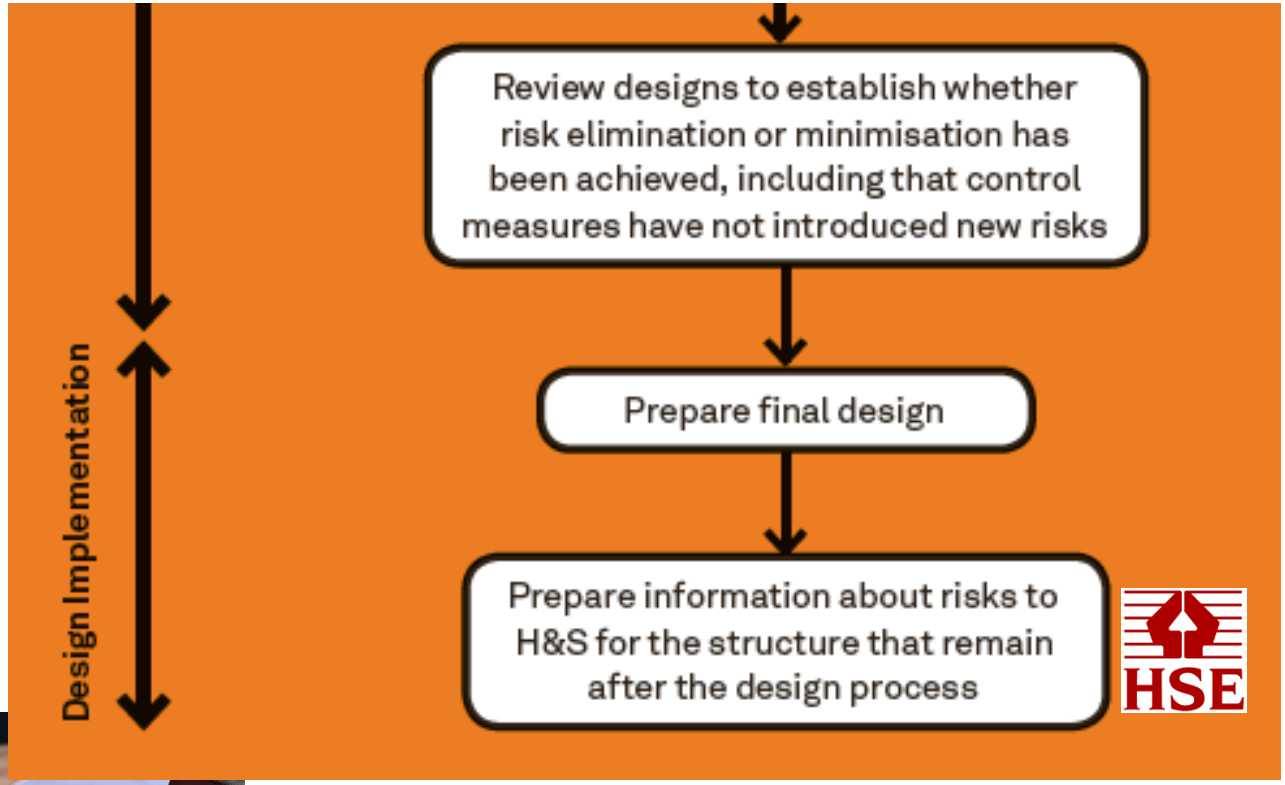
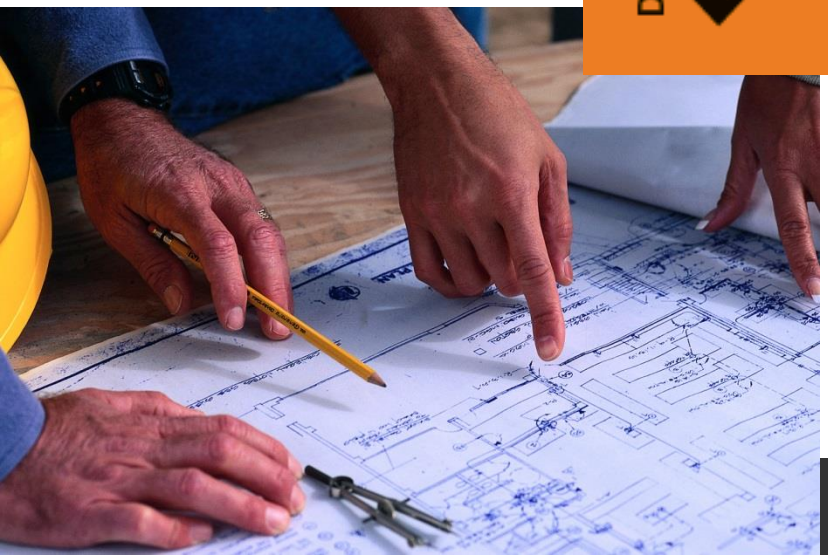
Information Transfer

Information Transfer





The Designer must produce a report for any residual risks not normally associated with that type of design. The PCBU commissioning this must provide info & must request the report.

AECOM Requirements for Information Transfer

9.2 Designers shall, issue the client with SiD documentation specifying any hazards, design basis and relevant control measures that relate to the design that are not typically associated with other designs of the same nature or are not resolved as part of the design i.e. residual risks. Such information may include;

- The use or basis of design and any limiting criteria
- Installation issues
- Adjustments and set up requirements
- Maintenance, repair and cleaning
- Dismantling
- Any other information relevant to Safety in Design
- Any other specific residual risks

SiD - Report Template I4AN-221-TP4

SiD – Designer Hazard Identification I4AN-221-TP5

SiD – Hazard Assessment Management Template I4AN-221-TP6

Hazard Checklist Q3AN-330-FM1

"What if" Hazard Analysis Q3AN-330-FM2

9.3 Documentation shall be commensurate with the effort required to complete any Safety in Design review, and may consist of one or more of the following;

- Details of the SiD process applied
- Completed checklists/forms/risk register
- Notes on drawings and specifications.
- Report(s) and tracking of completed issues. (This could be a standalone SiD report or part of other project reports).

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How to ensure that this is covered effectively in Procurement?

- Information transfer is effectively “passing the baton”. Make sure that the contractual scope of work includes this and the deliverables are clearly defined
- Effective documentation is critical as this information may not be needed for many years e.g. demolition

1. List of **residual hazards**
2. Description of the **structural principles**
3. List of **hazards associated with materials**
4. Information regarding the **removal or dismantling**
5. Information about any **cleaning/maintenance** equipment
6. Nature, location, and markings of **significant services**, including fire-fighting services
7. **Information and as-built drawings** of the structures, plant and equipment, such as safe access to service voids and fire exits

Summary

Key steps for successful SiD procurement

- Make sure that your procurement approach has the RIGHT PEOPLE involved at the RIGHT TIME
- Plan for SiD to ensure success – it must be considered right from the beginning
- It needs to be in the contracts and part of the evaluation process
- Do not see it as an extra cost – good SiD results in reduced lifecycle costs
- Hand the “baton” at the appropriate life cycle phases
- Effective documentation is critical as some of the information may not be needed for many years

Thank You

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26 May, 2017

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