BEM webinar 2023 SERIES

ENGINEERING THE FUTURE

OSHCIM

Promotion of Best Practices of Regulations and Guidelines on Safety and Health

Presented by:

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UTM & UNBOX Resources

Date : 9th May 2023

Venue : BEM Webinar Series 2023 via ZOOM Platform

Outline of Presentation

- The Need
- OSHCIM Impact Assessment
- OSHCIM Benefits
- Engineer/ Designer Roles and Responsibilities

Occupational Injuries & Fatal Occupational Injuries Statistics (2012 – 2021)

Occupational Injuries

Fatal Occupational Injuries

Reference: Big Data Analytics: National Occupational Accident and Disease Statistics 2021, Department of statistics Malaysia 2021

SLOW IMPLEMENTATION OF SAFER INITIATIVE ON DESIGN & TECHNICAL

THE LEVEL OF RISK HAS INCREASED

RISK MANAGEMENT APPROACH

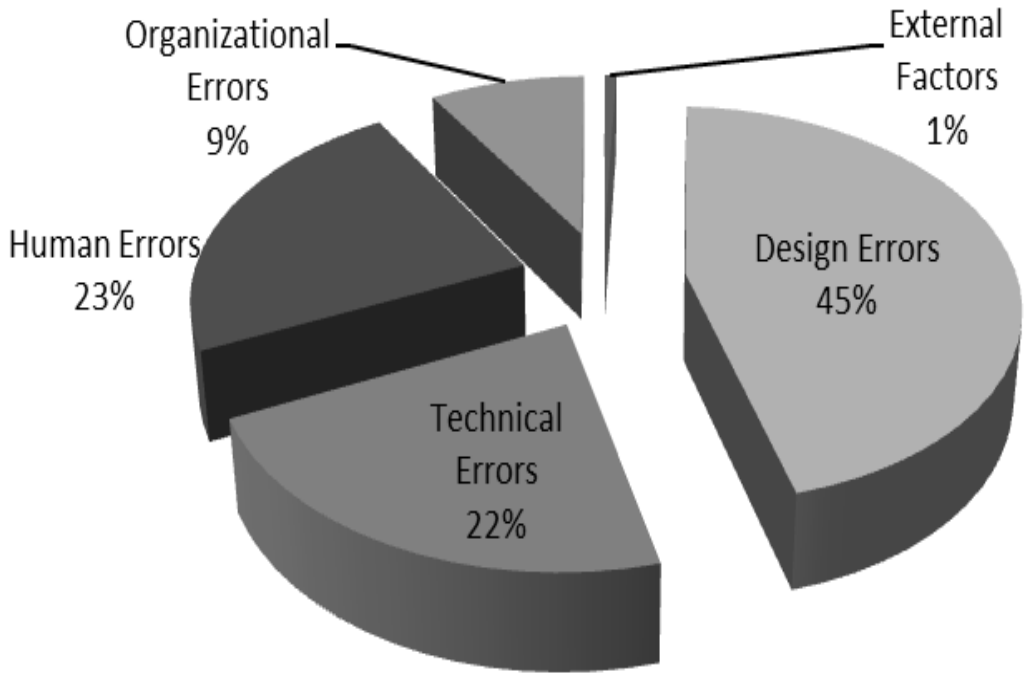
SAFETY KNOWLEDGE WITHIN ORGANIZATION

POOR DISSEMINATION OF ACCIDENT INFORMATION

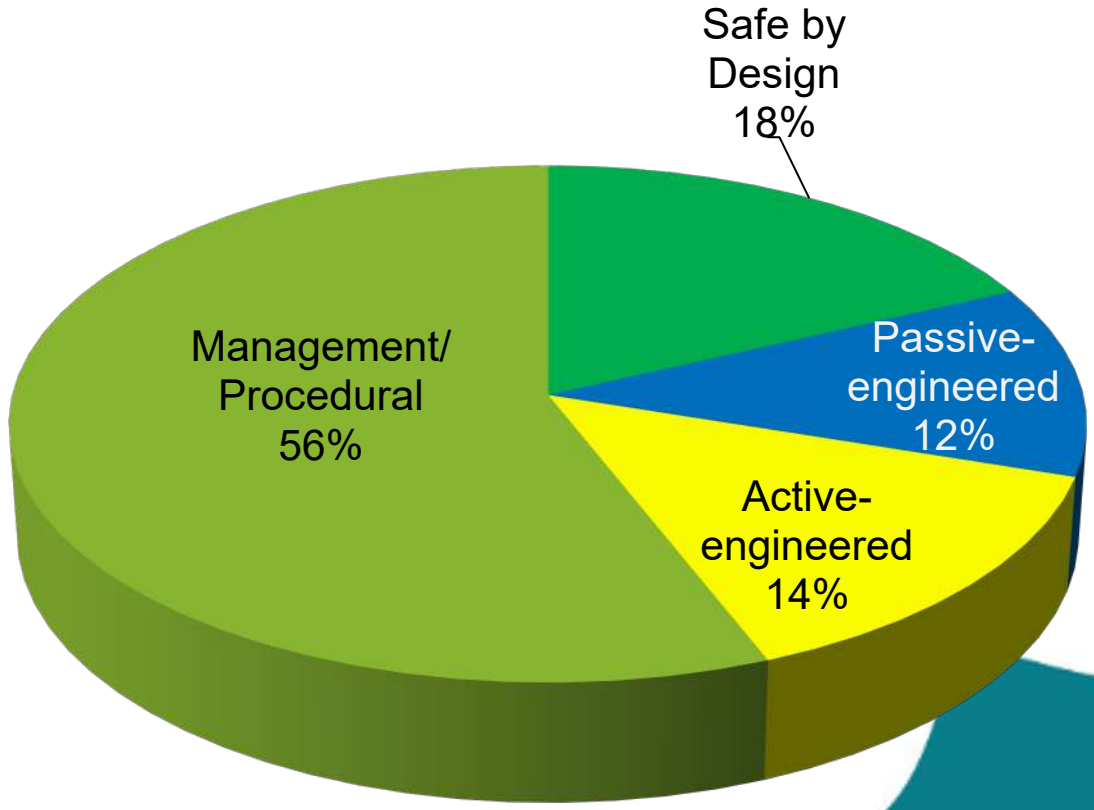
LACK OF LEARNING FROM ACCIDENTS

Unbalance Risk Management Approach

- **Accident Causes**



- **Accident Corrective Action**



Ref: Kidam et.al (2010) 13th Loss prevention, Rome

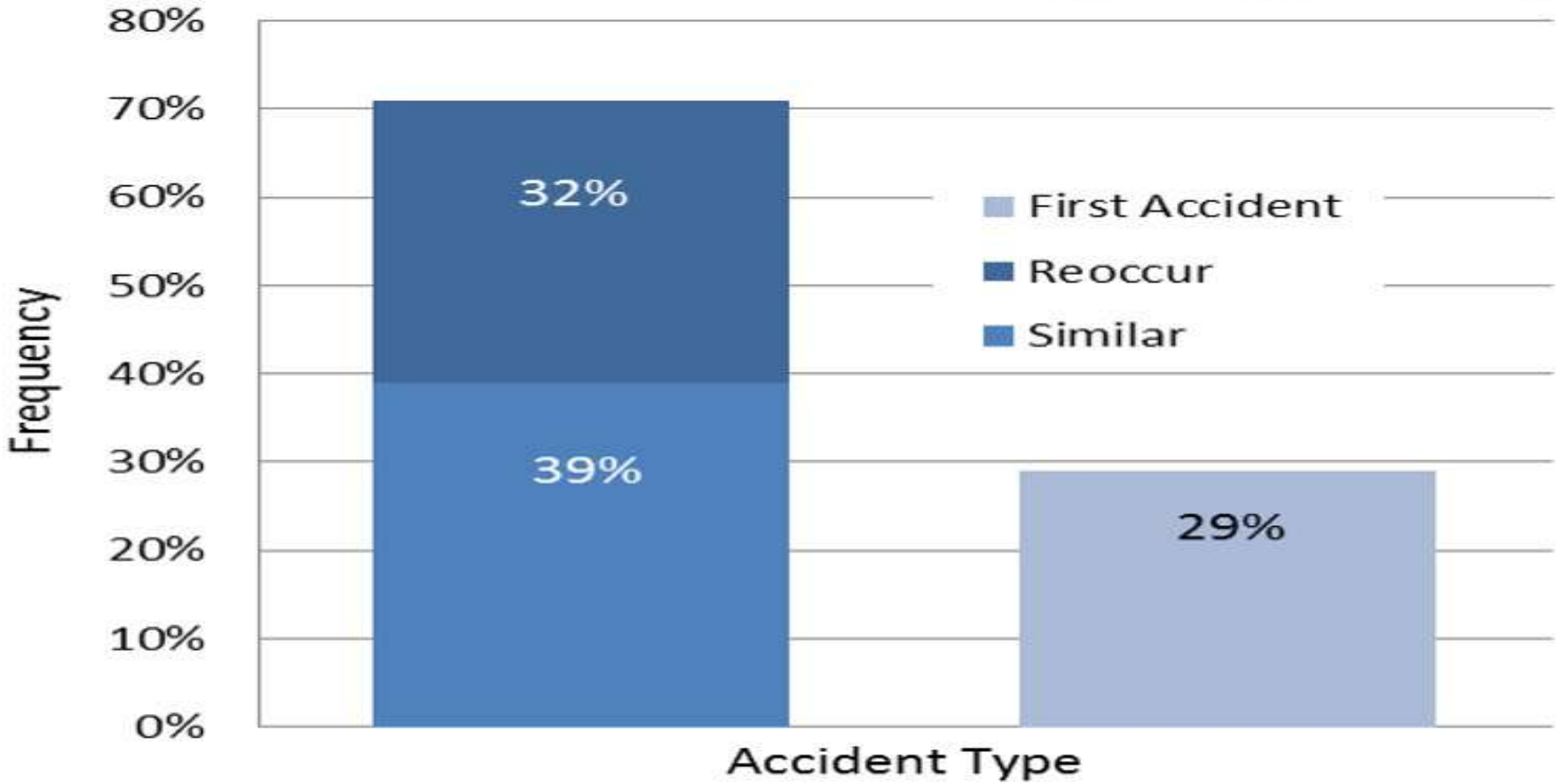
Suitability Analysis

Type of Errors	No. of Actions	Percentage of Process Safety Actions (%)			
		Most Suitable	Suitable	Less Suitable	Not Suitable
External	33	15	21	9	55
Design	3,233	11	12	11	67
Technical	1,131	14	15	17	54
Human	1,715	78	7	8	7
Organizational	967	85	5	6	4
Average	**1,416**	**41%**	**15%**	**10%**	**37%**
Suitable		**56%**			
Unsuitable				**47%**	

Jurnal Teknologi, Vol. 79 No. 3: March 2017

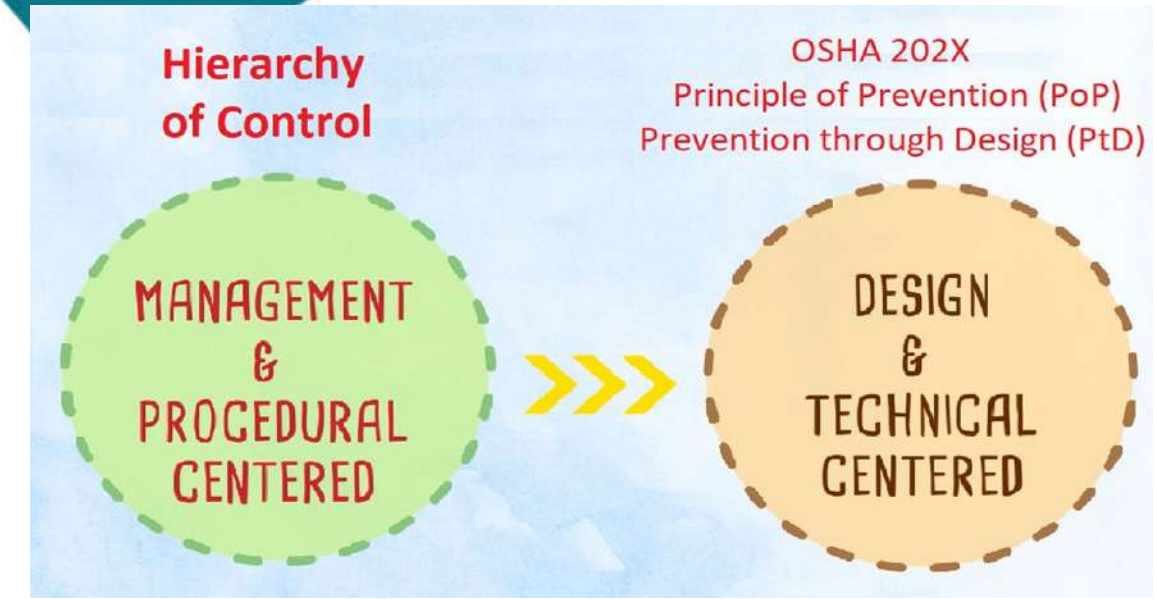
>70% of Accident Repeated Naturally....

* Normal Accident Theory (NAT)



Ref: Jihan et.al (2015) Jurnal Teknologi

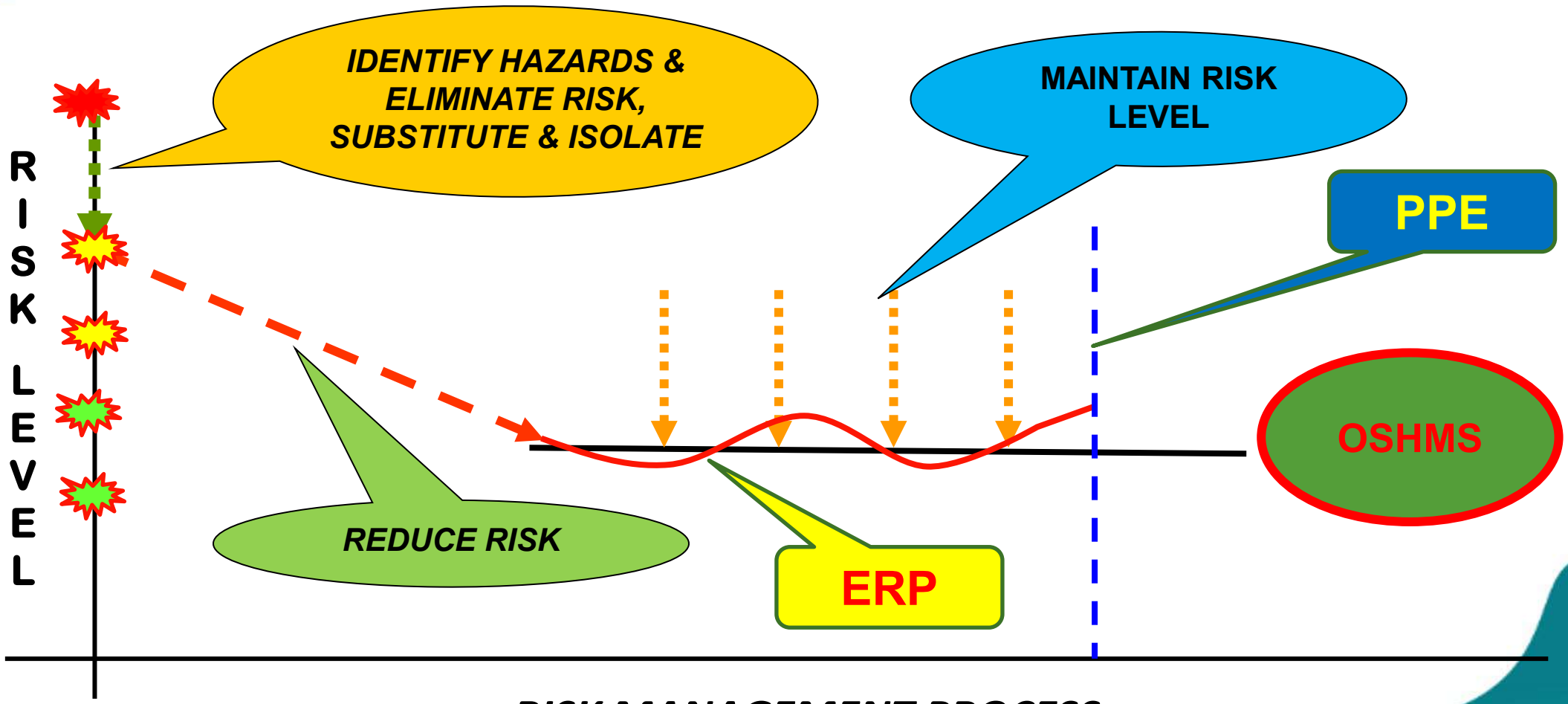
Prevention through Design



Safety measures			Degree of safety achieved
1	Inherent safety/**PtD/Df/OSHCIM**		100%
2	Safeguards		80%
3	Control method	Indications, warnings, etc.	20%
4		Manuals, approved systems, etc.	20%

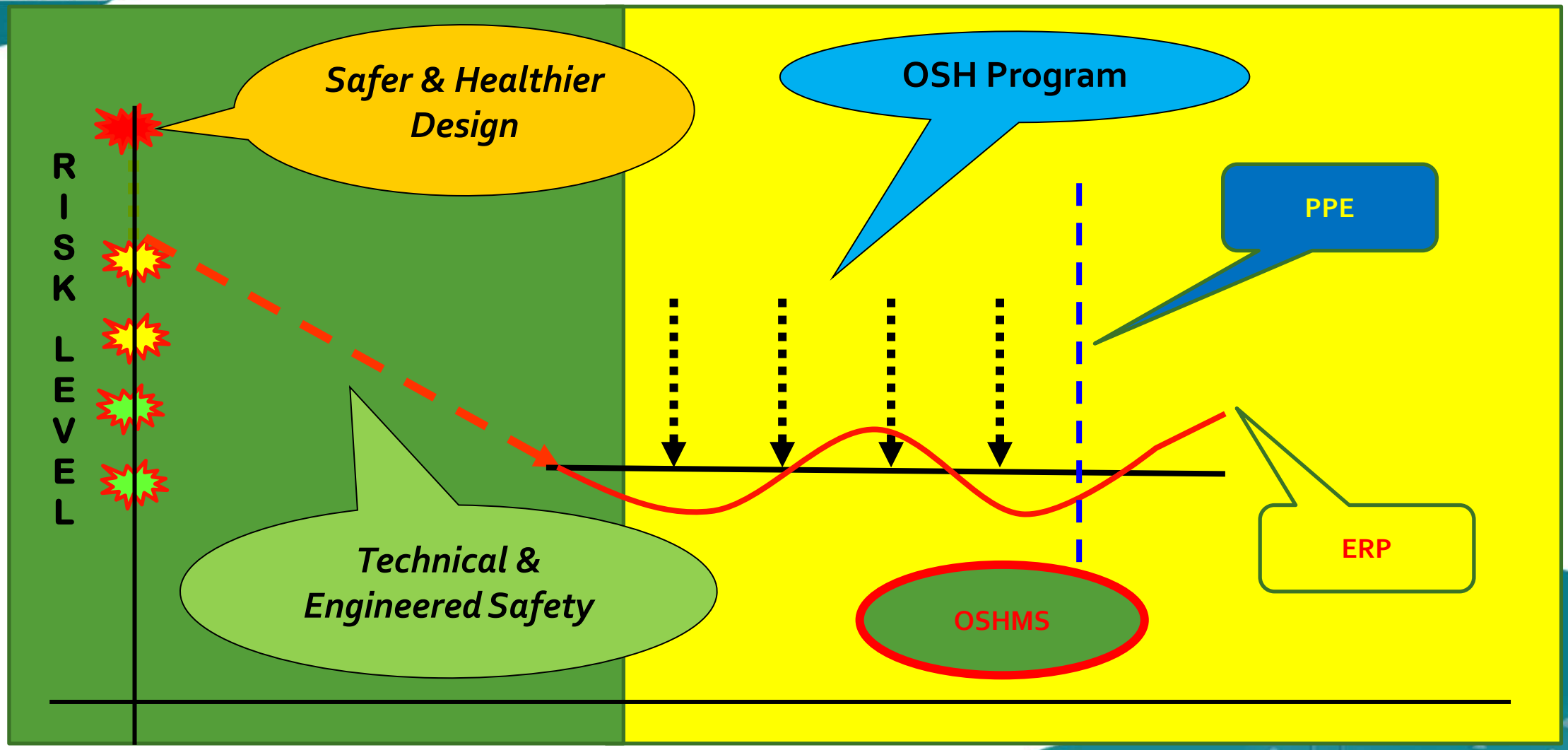
Source: Japan Industrial Safety and Health Association, "Shokuba no Risk Assessment no Jissai" (Realities of Workplace Risk Assessment), 1999, p.26

OVERALL RISK MANAGEMENT LIFECYCLE



RISK MANAGEMENT PROCESS

Overall Risk Management throughout Project Lifecycle



Development & Design

Procurement, contract, Spec-in

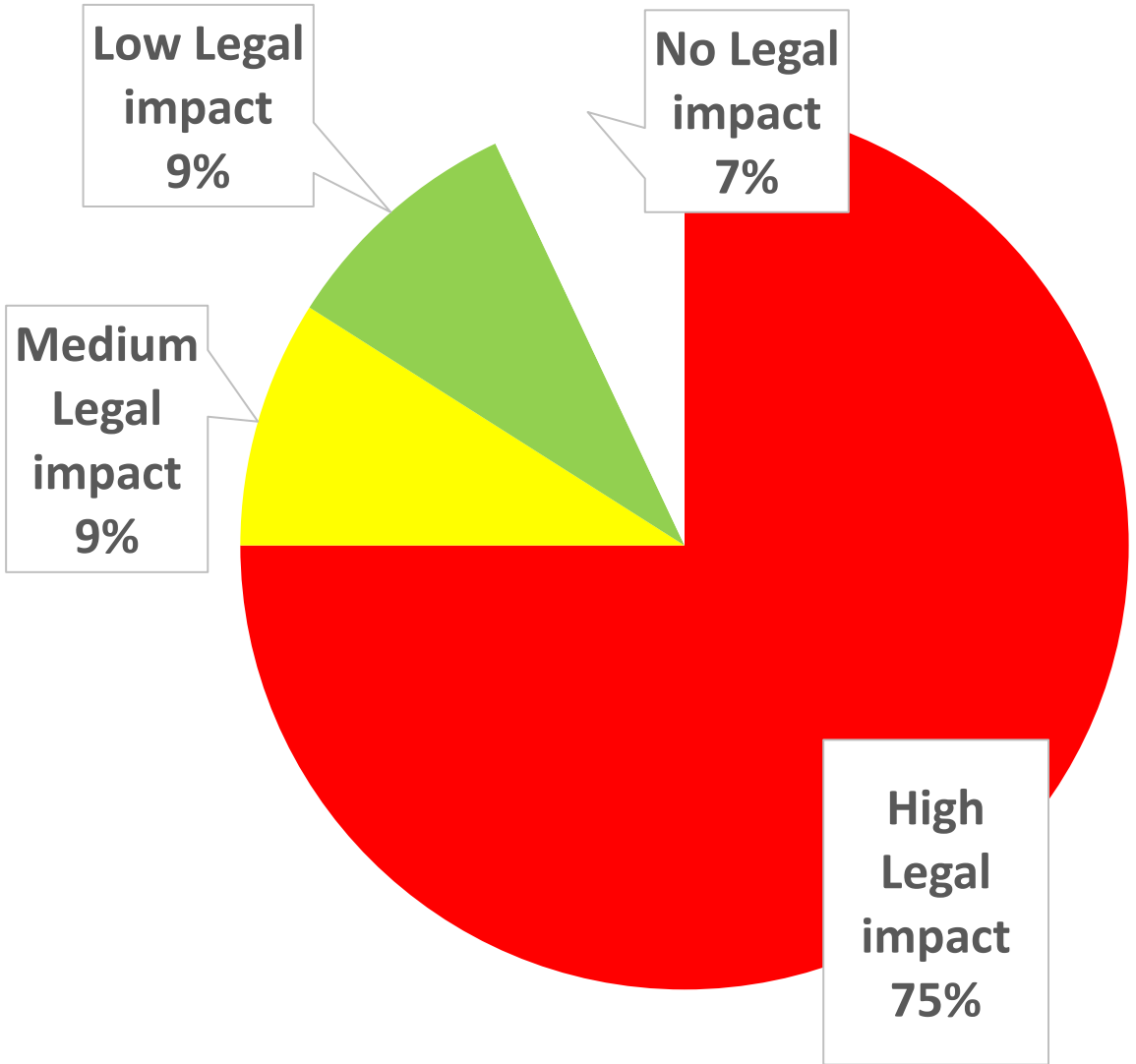
Operations

SSOW, MS, Procedural, Human, CI

OSHCIM Impact Assessment

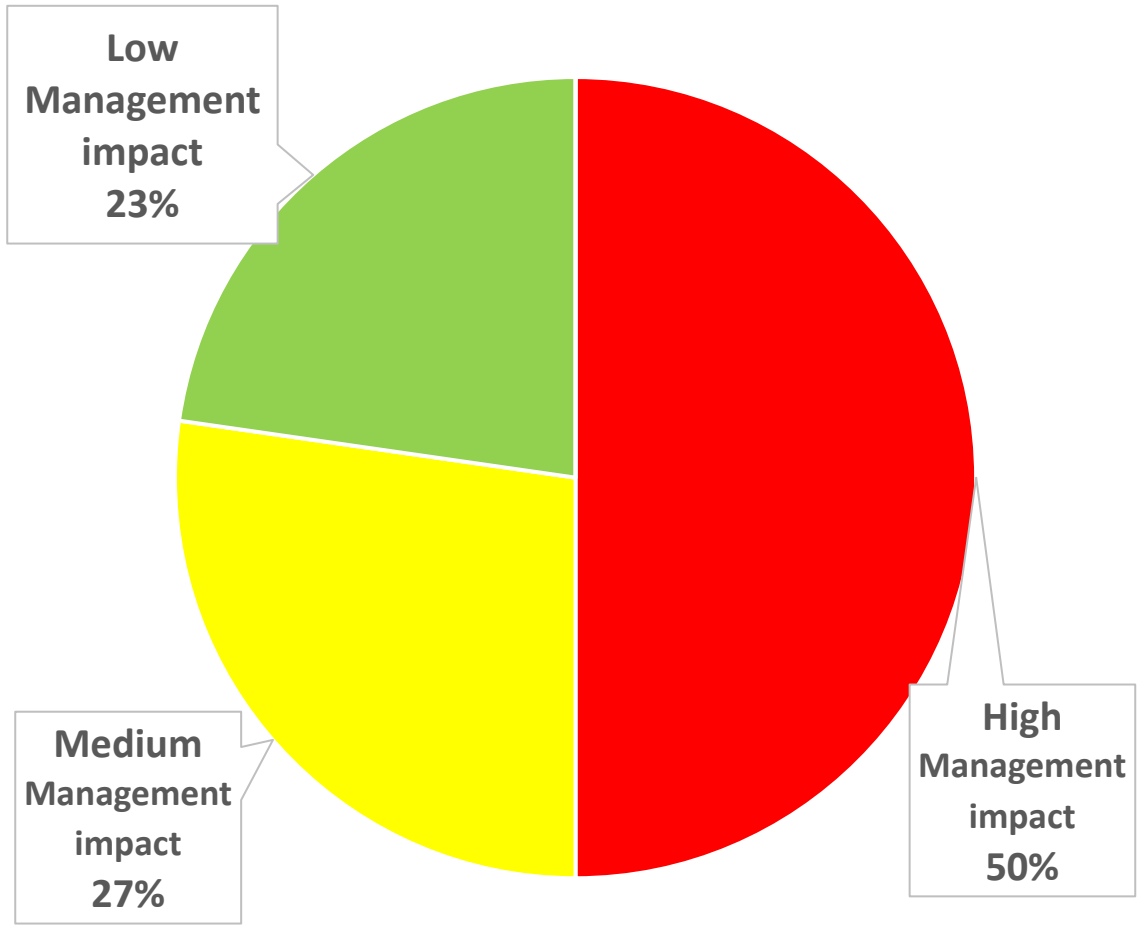
- ✓ Legal
- ✓ Management
- ✓ Documentation

OSHCIM IMPACT ASSESSMENT - LEGAL



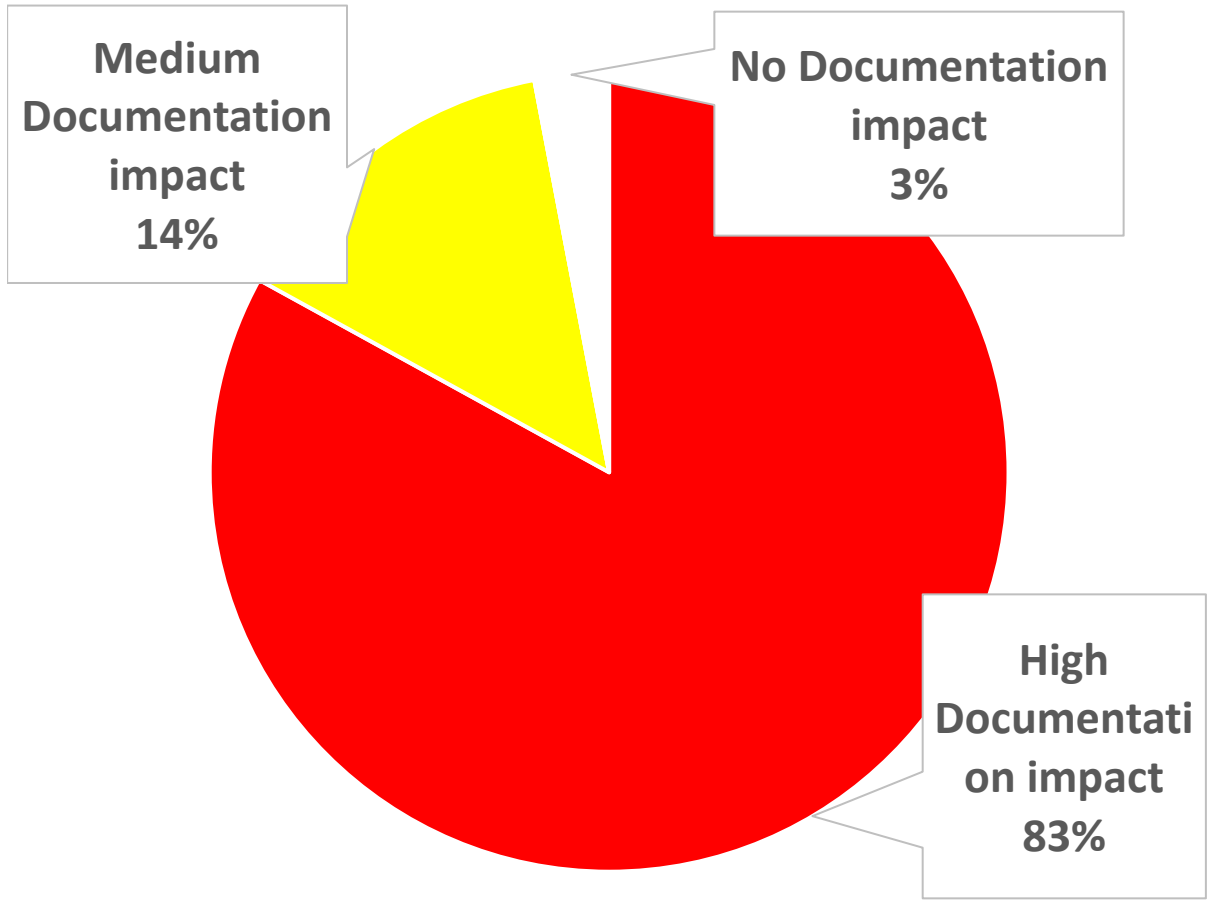
- The majority of the legal aspect gets a high impact score (75%) implying an urgent need to comply with OSHCIM requirements based on Section 18A and 18B to avoid penalty based on OSHA (Amendment) 2022.
- Impact of non-compliance is high, because the penalty in OSHA (Amendment) 2022 is RM500,000.

OSHCIM IMPACT ASSESSMENT - MANAGEMENT



- The aspect for impact on Client Project management are focusing on existing management system, including overall project management, design risks procedure and contracts.
- Assessment shows a 50% high impact of the management aspects which indicates some improvements or additional aspect are needed, to fully implemented and comply with OSHCIM.

OSHCIM IMPACT ASSESSMENT - DOCUMENTATION



- The assessment shows that documentation aspects have a high impact (83%) on Client in implementing the OSHCIM.
- Current practice, the basic documentation: Client Brief, Pre-Construction Information (PCI), and Construction Phase Plan are already in place. However, most of the documents are lacking OSHCIM-related details as per OSHCIM guidelines. Hence, the existing documents need to be upgraded to fulfill the OSHCIM compliance.
- Other new documentation are to be prepared including design risk assessment, OSHCIM-inclusive TOR and LOA for appointment of designers, contractors and others as per assessment checklist.

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OSHCIM Impact Assessment

- ✓ Pros & Cons
- ✓ Benefits

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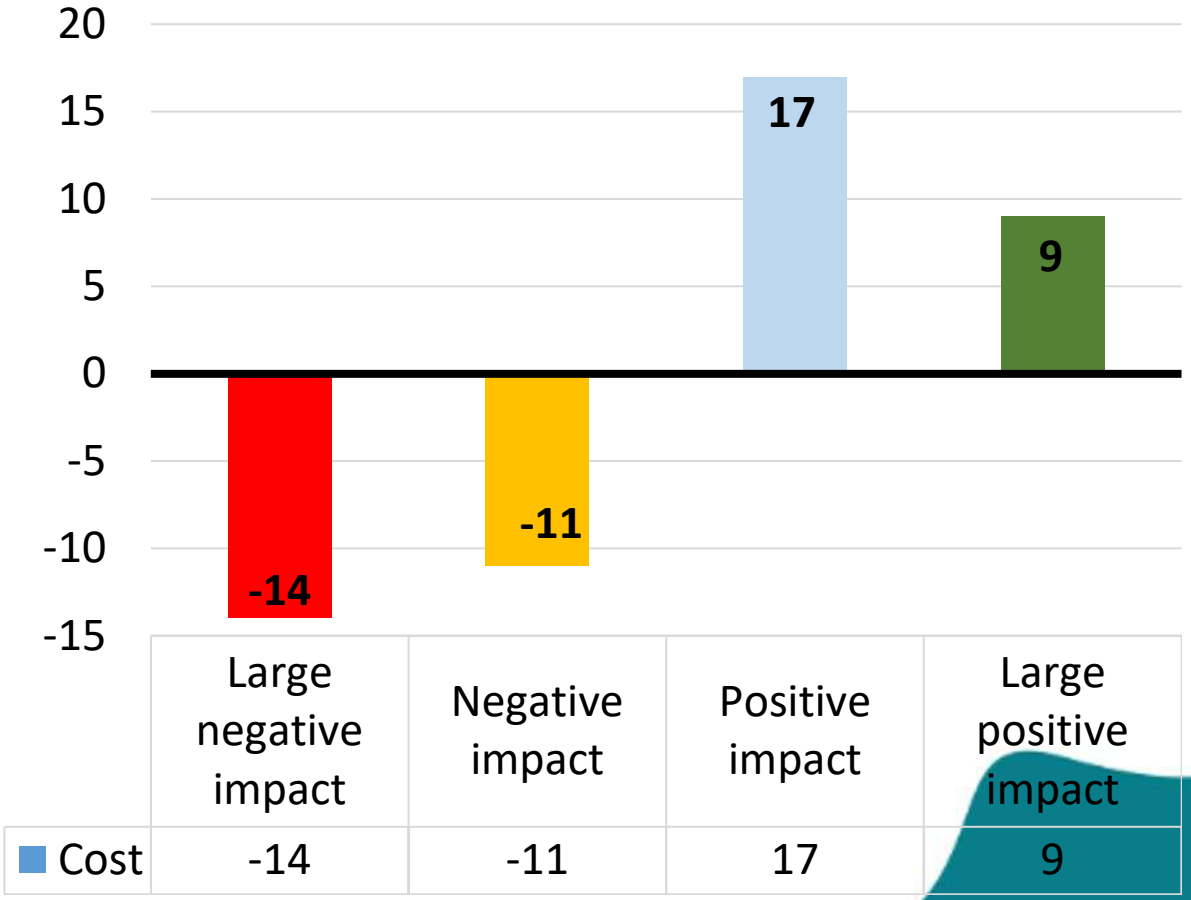
COST IMPACT

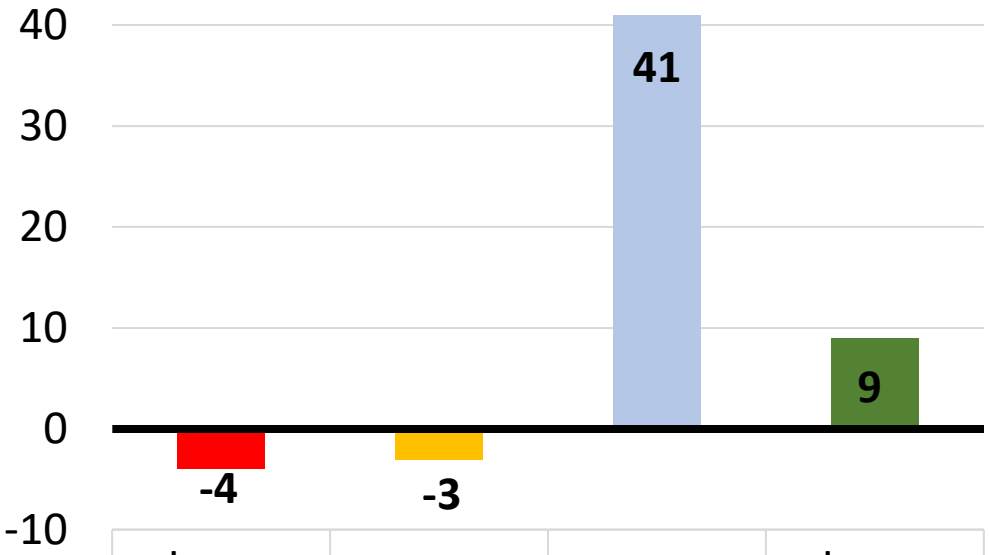
- The costs and benefits of OSH implementation are found to be in balance.
- Negative impacts have been identified are only the short term, i.e.: Appointment and professionals' fees, designers' risk assessments, and training.
- For positive impact, it is a long-term impact, i.e.: reduction of accidents at site, which reduce the cost due to accident, reduction in maintenance cost, improvement of management procedures for on-time project delivery, improved productivity and quality and avoidance of ad-hoc cost during construction.



	Large negative impact	Negative impact	Positive impact	Large positive impact
Cost	-14	-11	17	9

PROGRESS / DELIVERY IMPACT

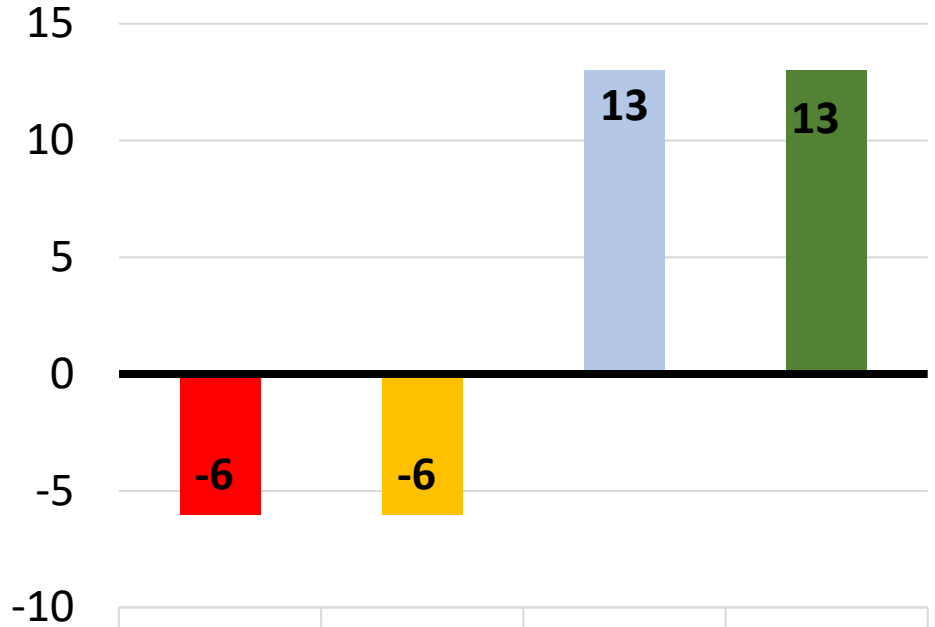
- In terms of project's progress, most of respondents decided that OSHCIM implementation have a positive impacts to Client.
- OSHCIM implementation will ensure poor design and poor work schedule are eliminated in the first place.
- Resulting in a well-planned and positive impact on the project's progress due to the improvement in management procedures for on-time project delivery, improving productivity and quality



	Large negative impact	Negative impact	Positive impact	Large positive impact
Progress/ Delivery	-4	-3	41	9

SAFETY & HEALTH IMPACT

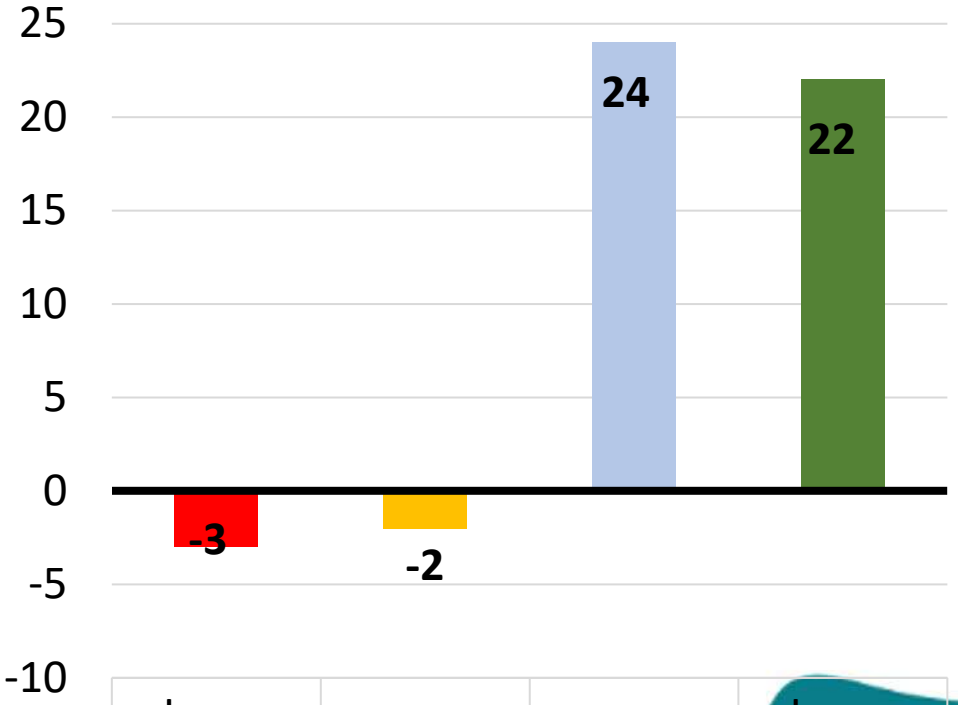
- Assessments indicate that the safety and health impact of OSHCIM implementation is mostly positive.
- OSHCIM promotes the concept of the general principle of prevention (GPP) from the early design stage, where the hazard has been identified and designed out, while the remaining risk is carefully mitigated with proper method.
- Thus, resulting in a safer, healthier and more robust design of construction, with fewer risk to the workers, building structure and operability and safety and health of the users.



	Large negative impact	Negative impact	Positive impact	Large positive impact
Safety & Health	-6	-6	13	13

ACCIDENT RATE IMPACT

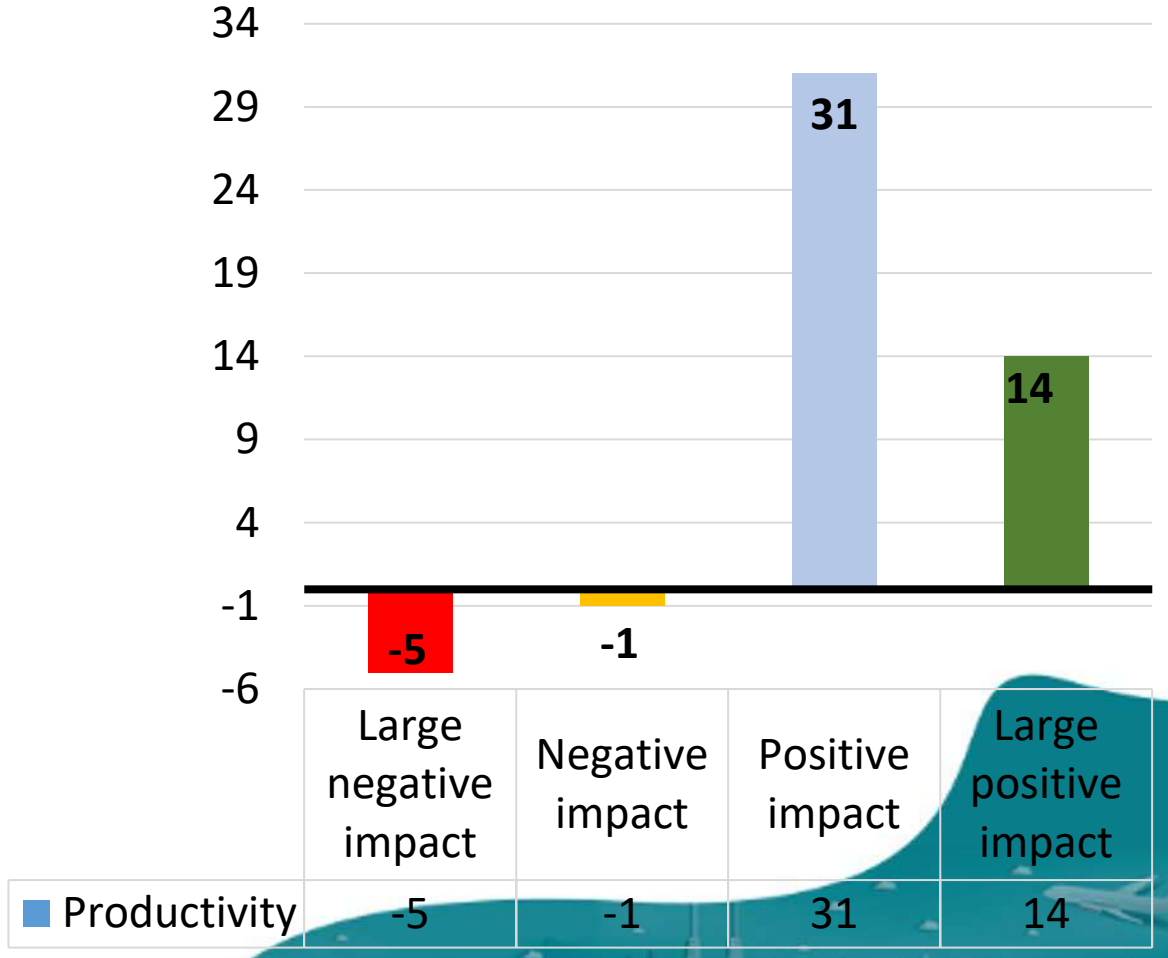
- For the accident rate, the assessment shows a positive impact in this aspect.
- This is due to the core of OSHCIM that is to prevent hazards rather than controlling hazards by performing the risk assessment and applying the general principle of prevention.
- Application of OSHCIM-based aspect such as CDM in UK , DfS in Singapore and WSH in Australia, has proven a significant reduction in accident cases at construction projects.
- Implementation of OSHCIM is expected to positively impact construction projects in the reduction of construction errors, failures and accidents.



	Large negative impact	Negative impact	Positive impact	Large positive impact
Accident Rate	-3	-2	24	22

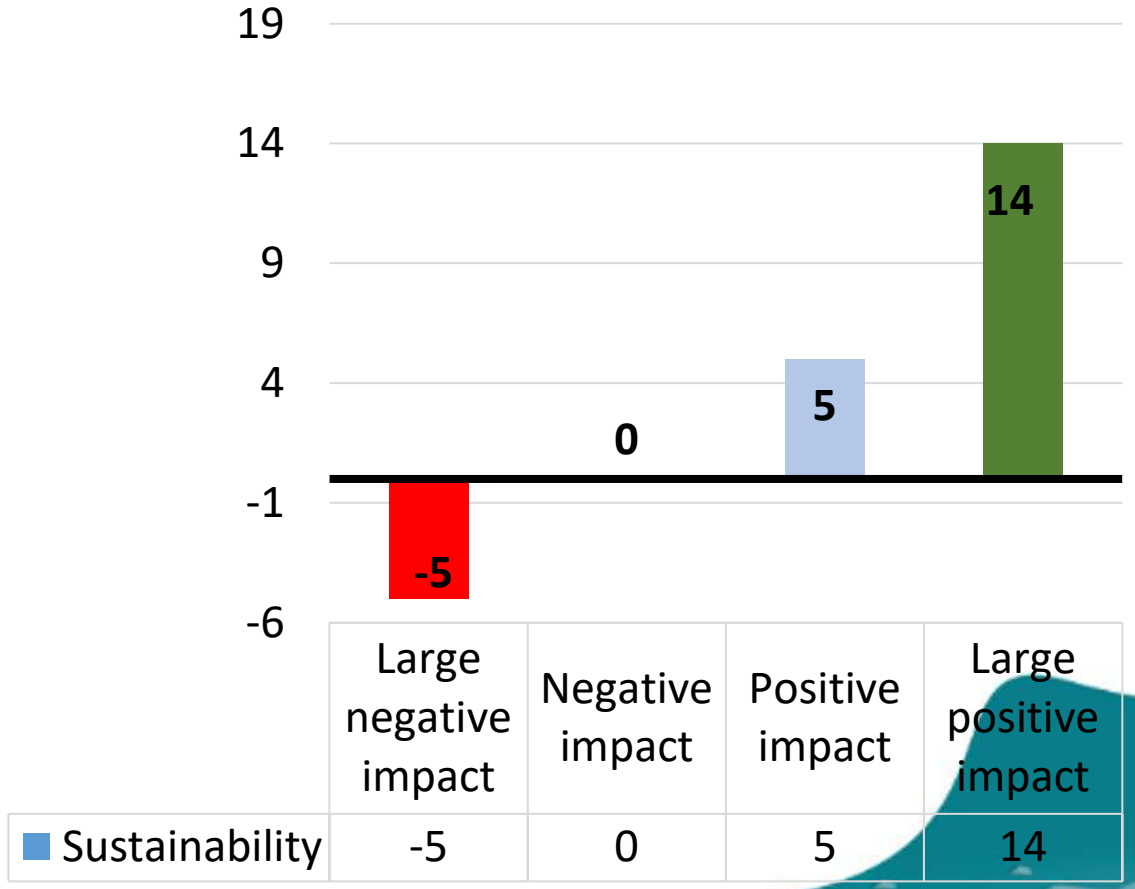
PRODUCTIVITY IMPACT

- In terms of productivity, OSHCIM is found to have a positive impact on productivity.
- A systematic and well-planned project construction for the whole project lifecycle will ensure effective productivity for day 1 of project planning.
- Identification of hazards and constraints helps to provide better work scheduling. Therefore, any barrier or obstacle is identified and corrected at an early stage.
- OSHCIM will also improve management procedures for productivity and quality
- i.e.: work method, physical constraint and traffic arrangements to be designed early and will boost productivity



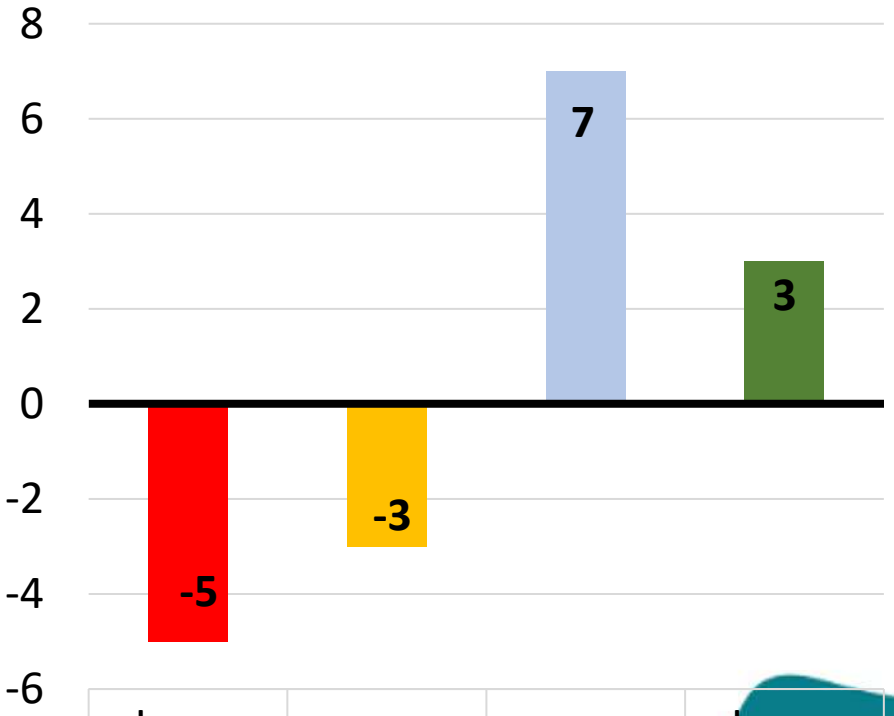
SUSTAINABILITY IMPACT

- OSHCIM approach is part of Sustainable Development Goals (SDG)
- The impact assessment show that OSHCIM considers the SDG requirement significantly and supports several goals such as
  - *Good health and well-being*
  - *Industry, innovation, and infrastructure*
  - *Decent work and economic growth*



MAINTAINABILITY IMPACT

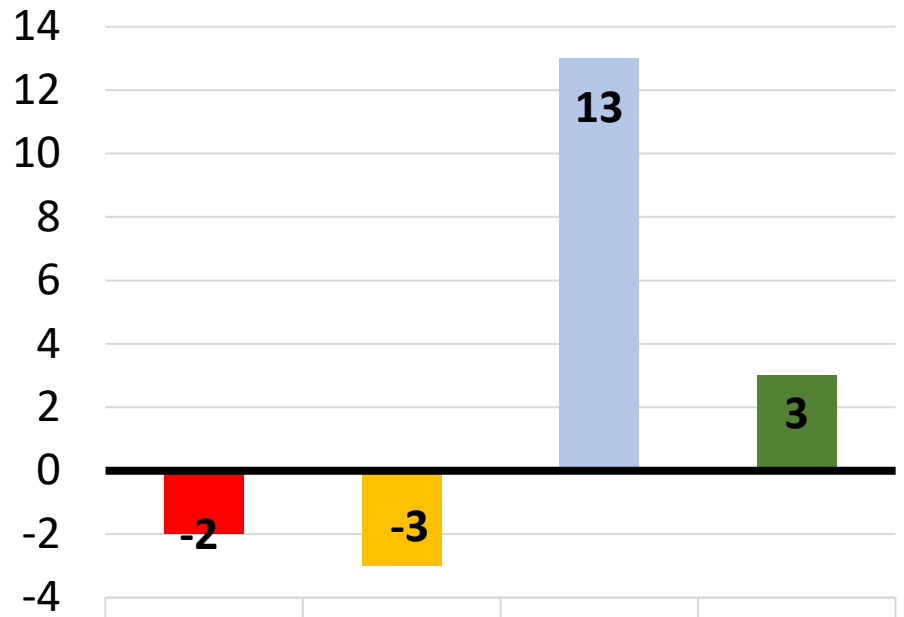
- OSHCIM promote maintainability throughout project lifecycle. Starting from project idea until demolishment of a project.
- It is significantly being emphasized during design risk assessment 2 (DRA2).
- For the long-term effect, it could positively reduce any ad-hoc maintenance costs in future.
- However, the negative impact may be due to additional cost during construction for accessibility or any special structure



	Large negative impact	Negative impact	Positive impact	Large positive impact
Maintainability	-5	-3	7	3

CONSTRUCTIBILITY IMPACT

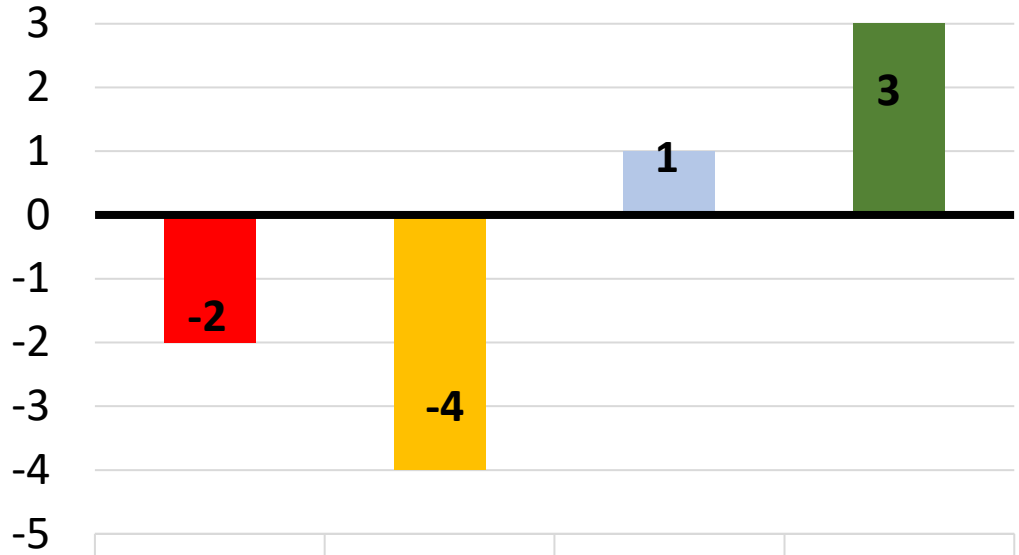
- In terms of constructability, OSHCIM has a positive impact on this aspect.
- As mentioned, OSHCIM promotes a systematic and well-planned project construction lifecycle in the early phase.
- Thus, improving the proper schedule, constructability technology, and constructability methods such as precast, IBS, remote sensing, and other methods that are safer and more reliable and effective.



	Large negative impact	Negative impact	Positive impact	Large positive impact
Buildability/ Constructability	-2	-3	13	3

MODIFICATION/RENOVATION IMPACT

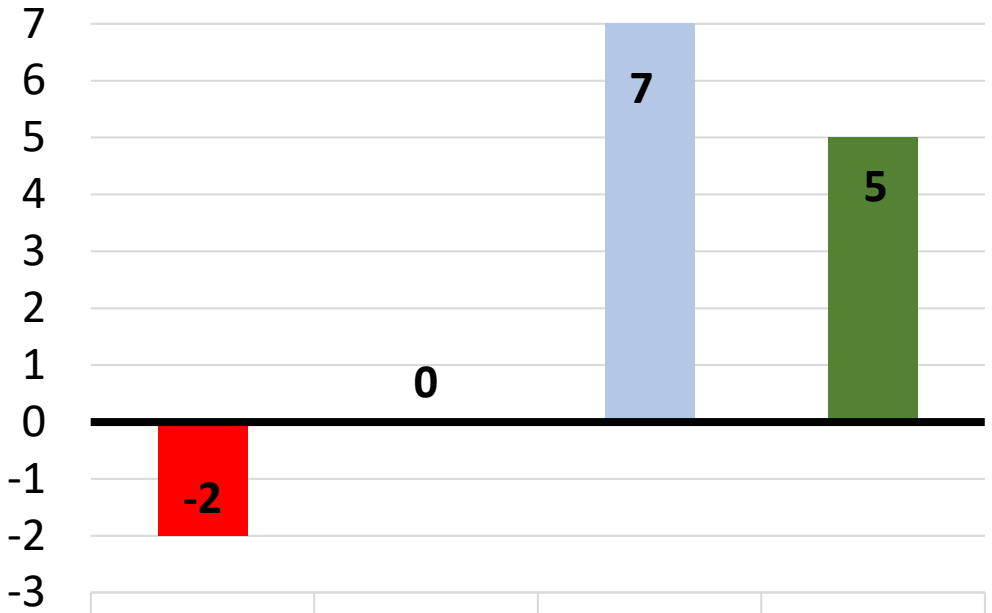
- The impact assessment shows a negative impact, where the aspect is considered a new design task and it seems like a load to the current designer on top of their existing tasks.
- Consideration on modification and renovation should be provided in the early stage as it able to ease in the long term, future, or next project



	Large negative impact	Negative impact	Positive impact	Large positive impact
Modification/ Extension/ Renovation	-2	-4	1	3

OPERABILITY/UTILISATION IMPACT

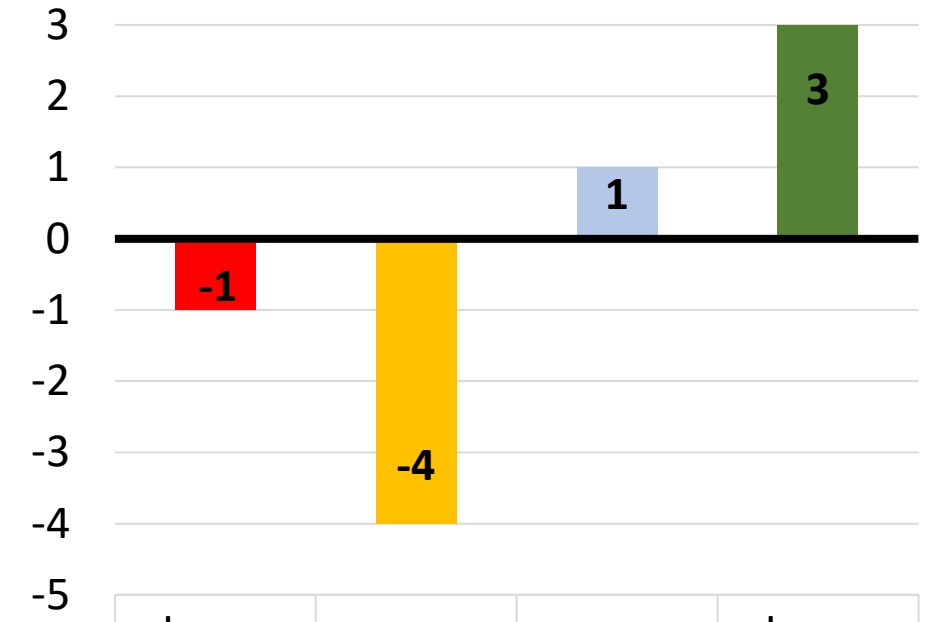
- OSHCIM promote systematic and well-planned project construction life-cycle, hence it will positively impact the operability and utilization of the buildings.
- Foreseeable functional use of the building were considered during the design phase to ensure the positive impact in terms of its full function.
- Majority of the positive impact shows that OSHCIM is able to keep the operation of the building safe and reliable.



	Large negative impact	Negative impact	Positive impact	Large positive impact
Operability & utilisation	-2	0	7	5

VARIATION ORDER IMPACT

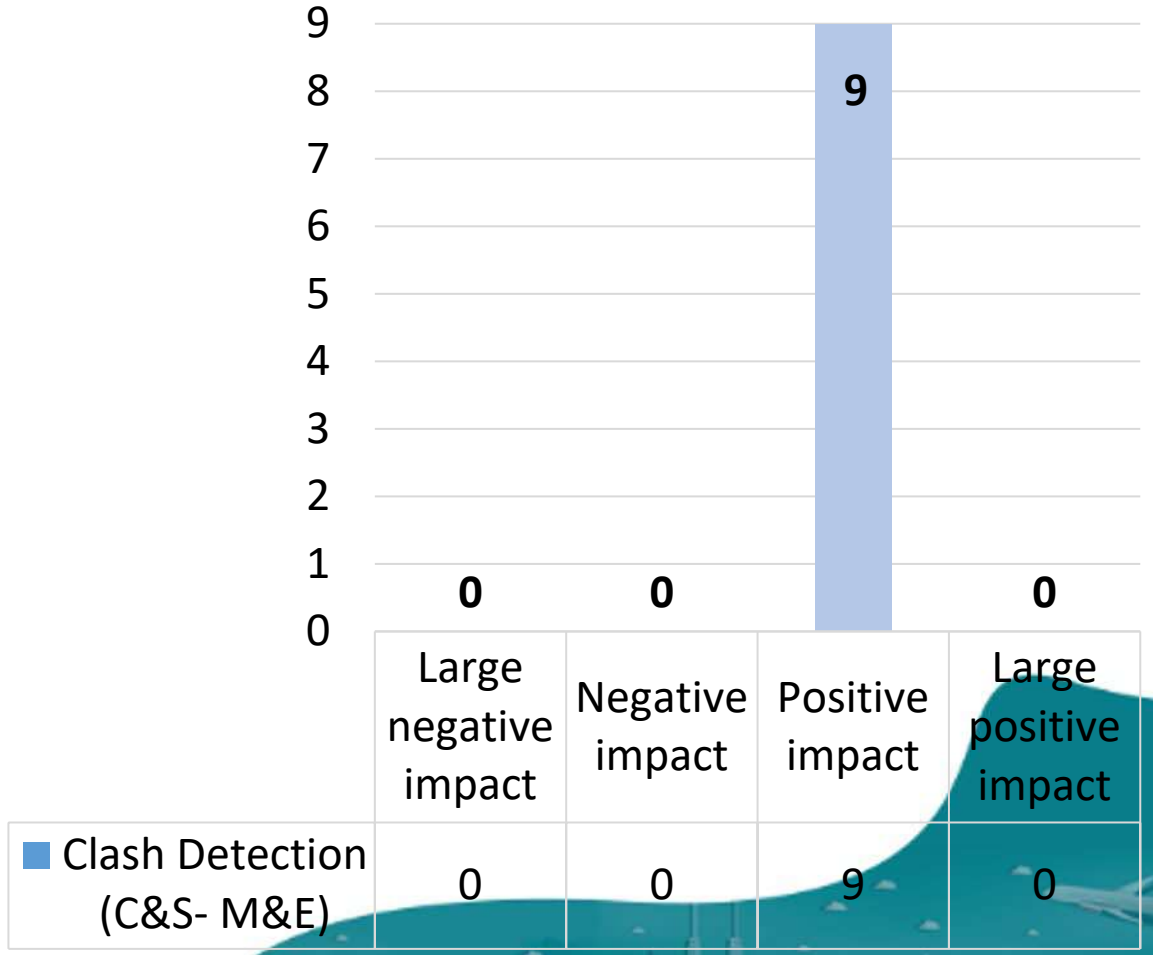
- Based on this aspect, the negative impact is based on the perspectives from the designer that they are overdoing their duty with OSHCIM.
- However, proper planning and communication between team project will help reducing unnecessary costs and disruption of the project progress
- As a result, it optimizes the client's benefits against the resource input and reduce miscommunication



	Large negative impact	Negative impact	Positive impact	Large positive impact
Variation Order (VO)	-1	-4	1	3

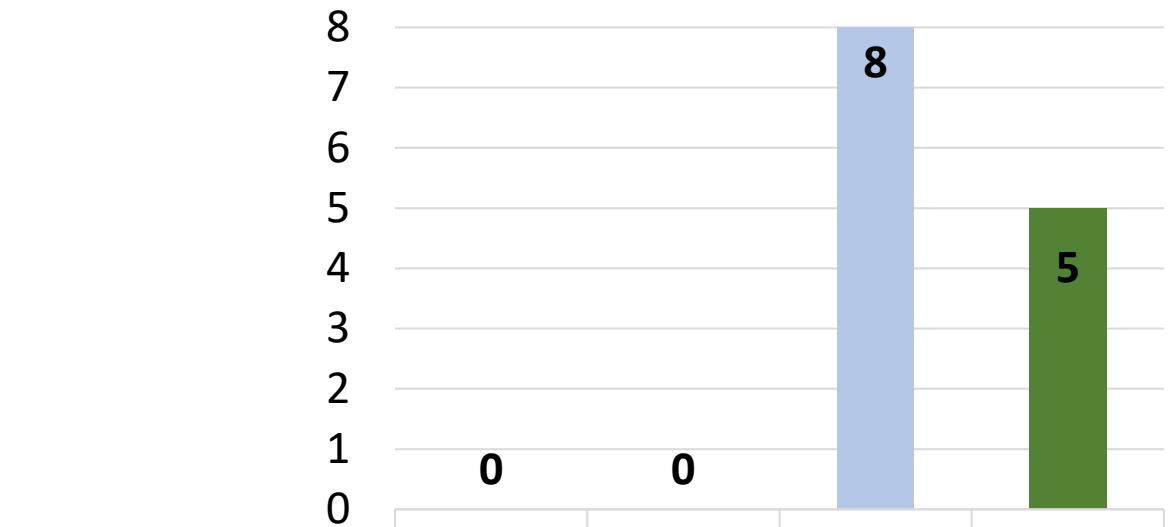
CLASH DETECTION IMPACT

- In terms of clash detection, a systematic and well-planned of project, it will reduce the clashes during design and construction.
- OSHCIM promotes the usage of Building Information Modeling (BIM) in the early-stage planning, which could help in detecting clashes.
- It effectively identify, inspect, and report interference in a construction project model.
- It will speed up projects progress and eliminate chances of multi-level design changes which can result in budget exceeding and delay in project completion time.



PROJECT COOPERATION AND COORDINATION IMPACT

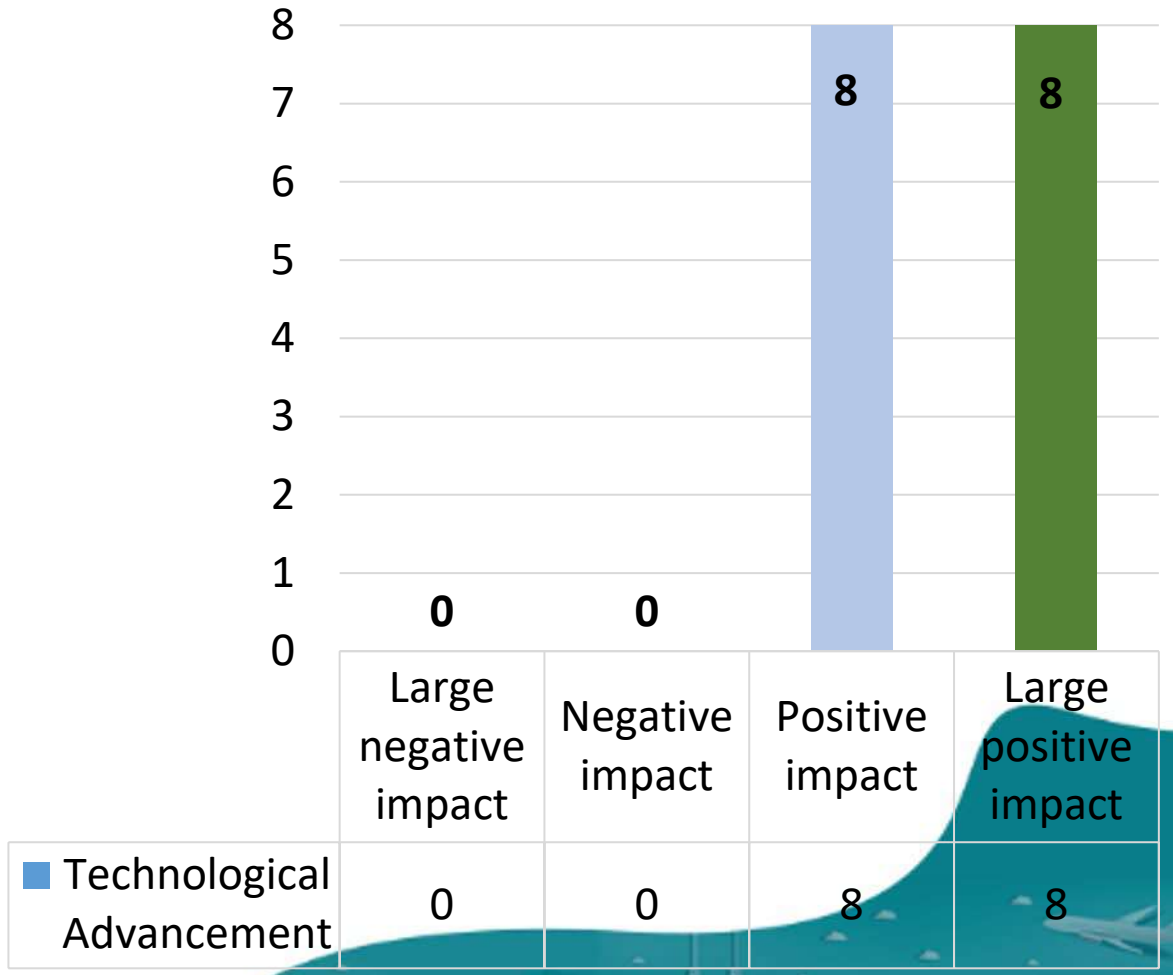
- Based on OSHCIM concept, the client should ensure that the design team cooperates, and coordinates work frequently.
- Any design constraint or problem on site, should be brainstormed and come up with proper design solutions involving multi-engineering discipline.
- Hence, OSHCIM will have a positive impact in ensuring the cooperation and coordination of a project.



	Large negative impact	Negative impact	Positive impact	Large positive impact
Project Cooperation and Coordination	0	0	8	5

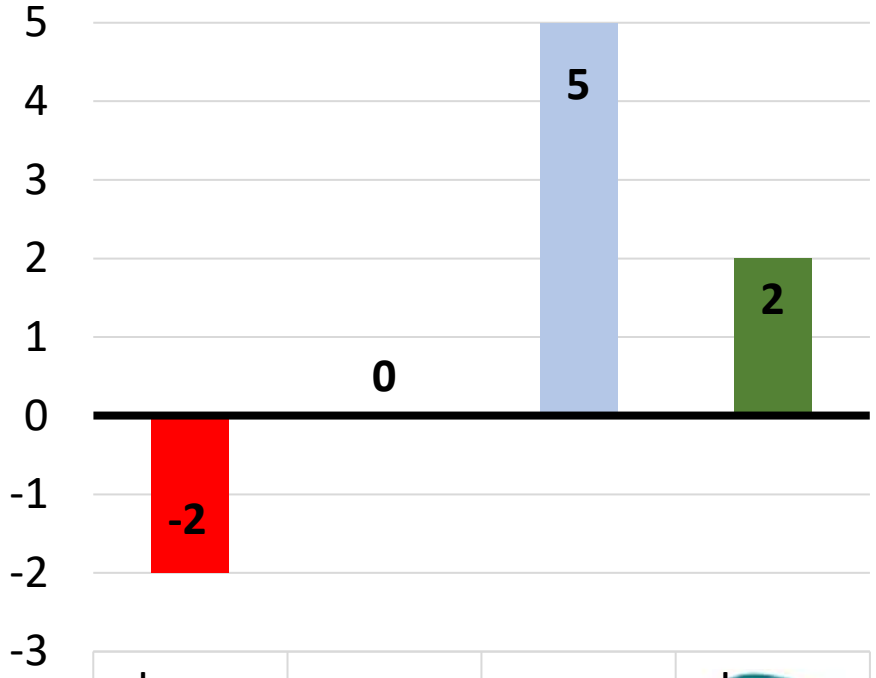
TECHNOLOGICAL ADVANCEMENT IMPACT

- OSHCIM involves efforts to anticipate and design out hazards by the usage of new technologies
- The basic principle of technology could be applied when doing the risk assessment to trigger the critical design and user-friendly technology selection
- Thus, it increases awareness of the work environment and all the potential dangers.



WASTE MANAGEMENT IMPACT

- OSHCIM promotes systematic and well-planned project construction lifecycle that start in early phase with the idea of robust design
- The systematic method could reduce the one-off usage of material or equipment and upgrade planning on work activities to make it usable multiple times and able to be recycled.
- Enhancement of efficient procurement with a correct bill of quantity that just enough for the current process, without excessive waste materials help in waste management as well.



	Large negative impact	Negative impact	Positive impact	Large positive impact
Waste Generation	-2	0	5	2

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ENGINEERING THE FUTURE

OSHCIM
The Roles of Engineer at Pre & Construction Phase

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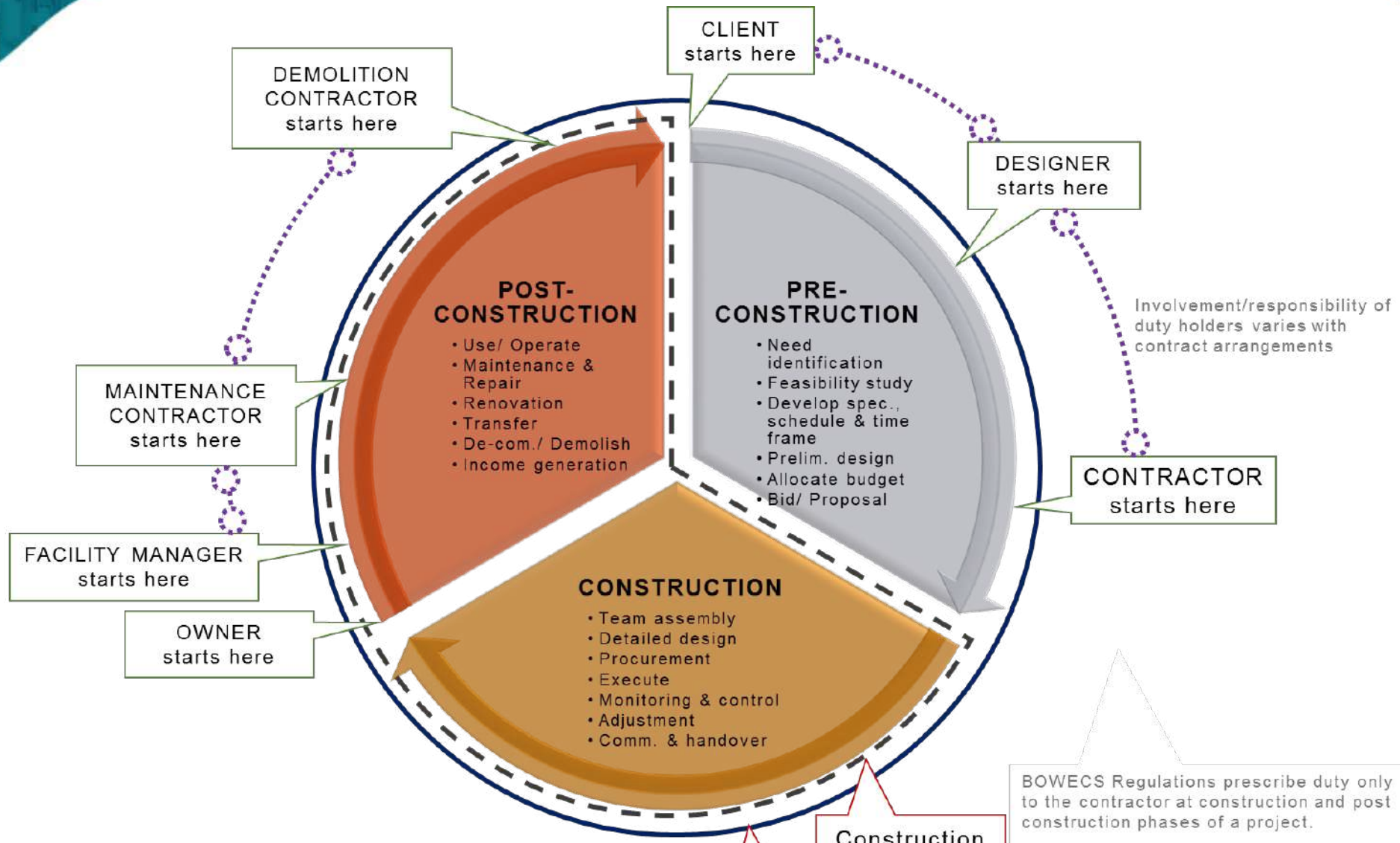
Construction OSH Management Guidelines - Overview



BOWECS Regulations prescribe duty only to the contractor at construction and post construction phases of a project.

The Construction Management Guidelines recommend responsibility to the client, designer and contractor at the planning and design stages, and over the life cycle of the building or structure.

BOWECS Regulations

Construction Management Guidelines

Who is the designer & principal designer?

Designer

A designer is an organisation or individual , who in the course or furtherance of a business :

a) Prepares or modifies a design for a construction project; or
b) Arranges for, or instructs someone else under their control to do so, relating to structure, or to a procduct or mechanical or electrical system intended for a particular structure.

Who is the designer & principal designer?

Principal Designer

- A principal designer is the designer with control over the pre-construction phase of the project.
- The principal designer can be an organisation or an individual that has :

a)The technical knowledge of contruction industry relevant to the project;

b)The skills, knowledge and experience to understand, manage and coordinate pre- construction phase, including any design work carried out after construction begins.

What should designer do?

1. Preparing or modifying design

- Taking account of the general principles of prevention in design work
- Taking account of pre- construction information
- Eliminating, reducing or controlling foreseeable risks through design

2. Providing design information

Provide info to:

- Principal designer;
- Other designer;
- Principal contractor;
- Contractors.

3. Making client aware of their duties

4. Cooperating with other duty holders

What should principal designer do?

Planning, managing, monitoring and coordinating pre-construction phase

Liaising with the principal contractor

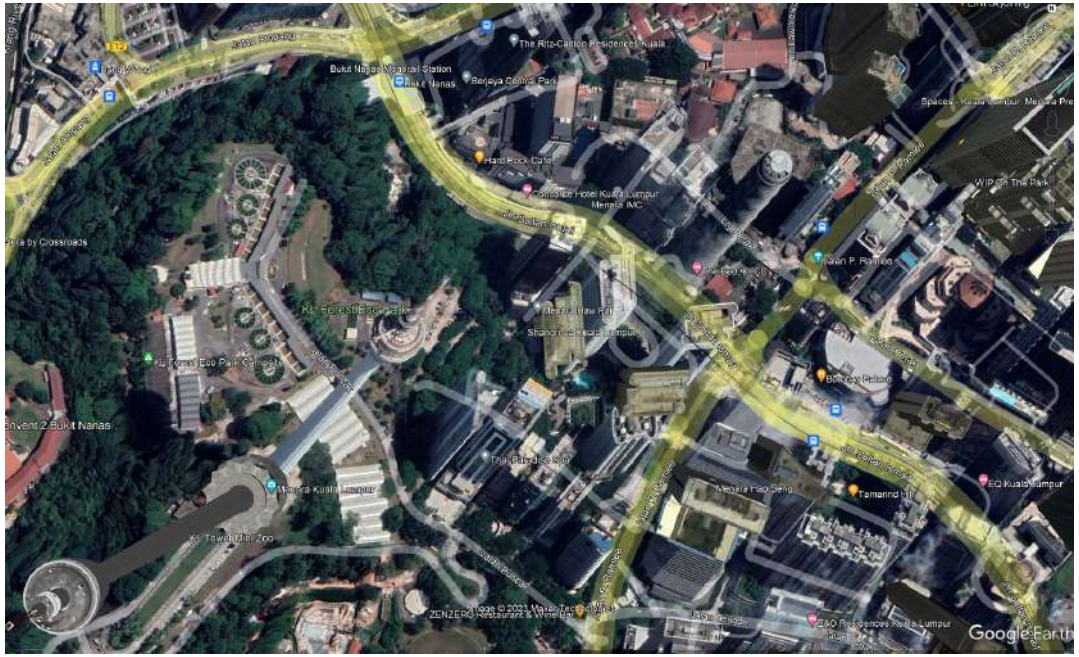
Identifying, eliminating or controlling foreseeable risks

Providing pre-construction information

Ensuring coordination and cooperation

ROLE OF PD & DESIGNER – PRE-CONSTRUCTION STAGE

1. Site Visit



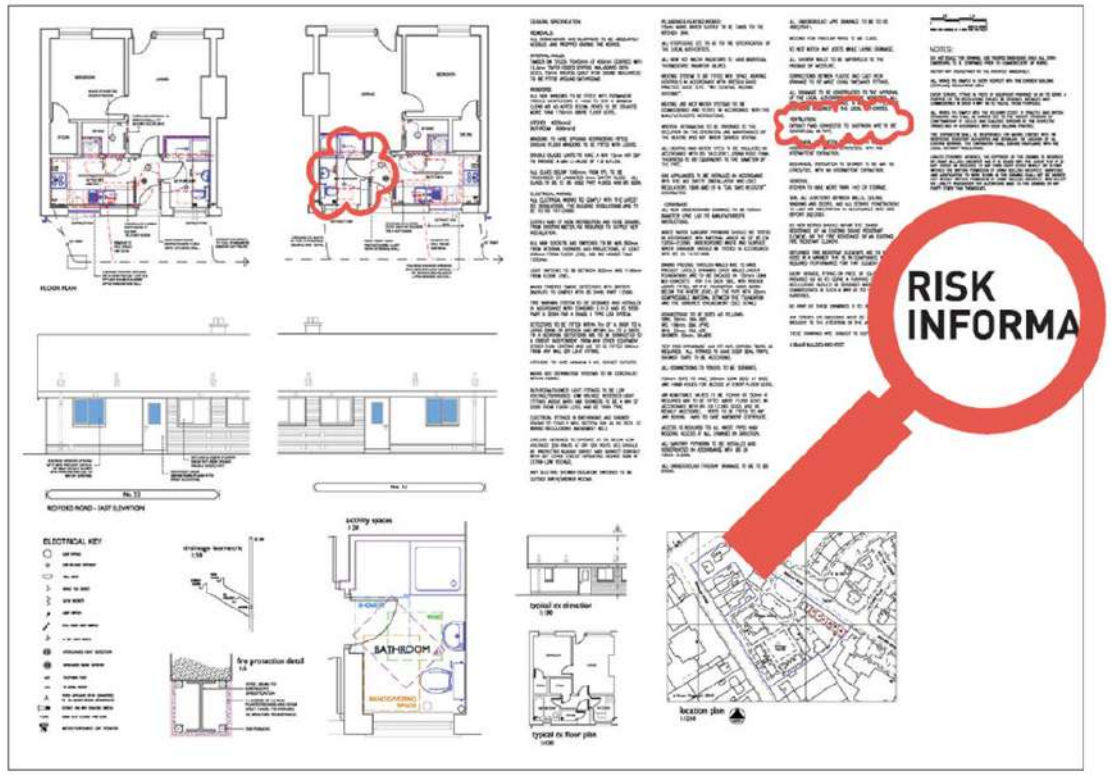
- The Principal Designer should visit the site to assess the health and safety issues affecting the project.
- If this is not possible, the use of Google Street View is useful but should always be supplemented by an actual site visit.

ROLE OF PRINCIPLE DESIGNER – PRE- CONSTRUCTION STAGE

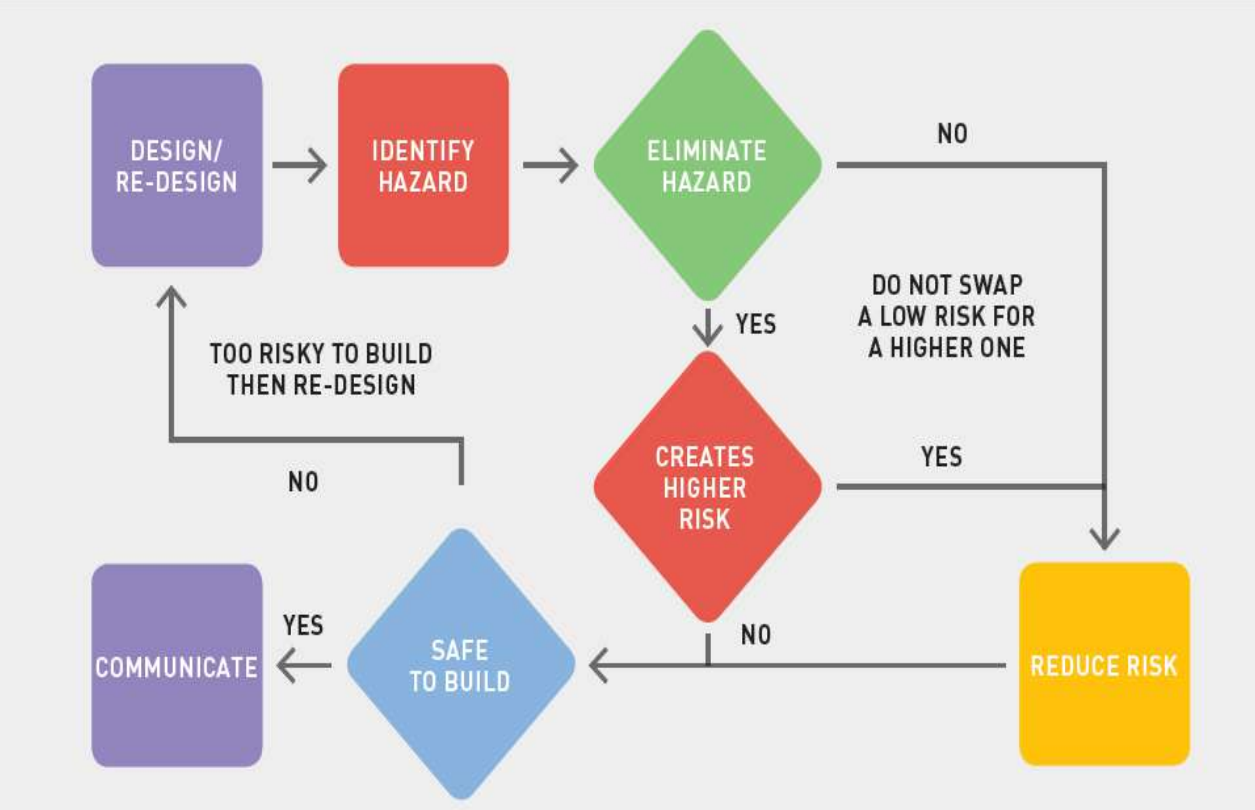
2. Pre-Construction Information development

- Supplementary Pre-Construction Information provided by Designers as the design of the project progresses should:

✓ Be relevant
✓ Have an appropriate level of detail
✓ Be proportionate to the risks involved.



3. Design Risk Management



- The Principal Designer should use a schedule to keep a record of the required information as it is received. This should cover:
  - Adequacy of information provided
  - Date of receipt and source of information.

Significant remaining risk information from Designers;

When receiving information on significant remaining risks from Designers, check the following:

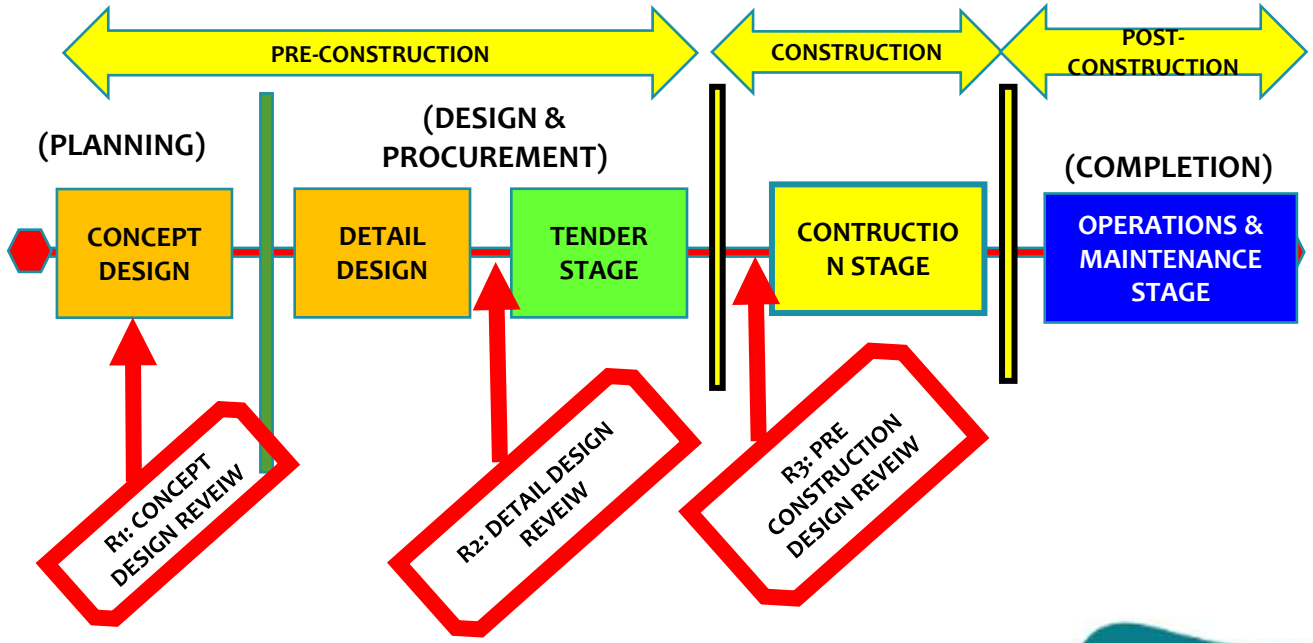
- Is the information clear, precise and in a form suitable for others?
- Could or should the information be on a drawing?
- The Principal Designer should log the responses from Designers; it is easy to lose track of returns. The Principal Designer should be proactive about seeking information

ROLE OF PRINCIPLE DESIGNER – PRE- CONSTRUCTION STAGE

Design Risk Management checklist

Design Risk Management should take place during:

- ✓ Feasibility – Preparation and Brief
- ✓ Outline design – Concept Design (DRA 1)
- ✓ Detailed design stages – Developed Design and Technical (DRA 2)
- ✓ Construction – (DRA 3)



FLOWCHART PROCEDURE FOR DESIGN RISK ASSESSMENT (DRA)

Steps	Design Review	Design Consideration /Cause of Accident	Document Required/	Output /Report
Step 1:	Review Past Accident Cases	1. Design calculation 2. Design specification 3. Lack of analysis	(Open Accident Data)	ACCIDENT DATABASE
Step 2:	Concept Design Review DRRULE1	1. Geotechnical 2. Existing infrastructure 3. Traffic Management 4. Site surroundings 5. Security 6. Hazardous material	(Table 6)	FORM A
Step 3:	Detailed Design Review DRRULE2	1. Prefabrication 2. Heavy Lifting 3. Confined space 4. Falling from height 5. Temporary works and sequencing 6. Layout 7. Access for maintenance 8. Health hazards 9. Weather 10. Emergency route 11. Others	(Table 7)	FORM B
Step 4:	Construction Phase Plan Review DRRULE3	1. Temporary works and sequencing 2. Specialist design 3. Weather 4. Others	(Table 8)	FORM C

Working Sheet for DRA-1

Example of Working Sheet DRRULE 3

1. Hazard Identification				2. Risk Analysis				3. Risk Control									4. Risk Analysis		
								Prevention Through Design (PtD)					Control Measures						
Code	Element of design	POSSIBLE EVENT	Elaboration (optional)	POSSIBLE EFFECT	(A) Likelihood	(B) Severity	(AxB) Risk	Avoid risks	Combat risk at source	Substitute*	Adapt the work to the individual through design, equipment, method changes	Adapt to technical progress / engineering control	Develop a coherent overall prevention policy	Collective protective measures	Give appropriate instructions to employees	PPE	(A) Likelihood	(B) Severity	(AxB) Risk
D1-1-a (i)	Stability of soil, that is, is it subject to land slip	uneven settlement	sandy (SI Report)	property damage	3	4	12	na	concrete piling	na	na	na	na	na	na	na	1	4	4
D1-1-a (ii)			soft clay		4	4	16	na	concrete piling	na	na	na	na	na	na	na	1	4	4
D1-5-a	Trespass	illegal entrance	sabotaj	property damage	3	3	9	na	hoarding	na	CCTV	na	security	na	na	na	2	3	4
D1-6-c	Surrounding hazards, such as proximity to storage tanks associated with a petrol station	explosion, fire, contamination	Flammable chemical storage	loss of lide, property damage	4	5	20	na	na	na	outdoor storage & distant follows ms-871	na	containment pit, deflection wall	fire proof equipment			3	3	9

DRRULE FORM - Occupational Safety Health Construction Industry (Management)

FORM A

DR-RULE 1- Concept Design Review

PROJECT RISK REGISTER:	JOB No.:	PROJECT: TO DEVELOP TOWN HOUSE		SHEET NO.: 01 Of 01	REVISION:
PRELIMINARY WORK	101	PREPARED BY: Land Surveyor	APPROVED BY: Principal Designer	DATE: 10th Sept 2018	1

ELEMENTS OF DESIGN:		POSSIBLE EVENT	POSSIBLE EFFECT	Likelihood L	Consequence / Severity C/S	Risk R	RISK CONTROL	CLIENT/PD TO INCLUDE IN PCI (Yes or No)	PD/PC TO INCLUDE IN HEALTH & SAFETY FILE (Yes or No)	DATE RISK OR HAZARD REMOVE FROM LIST & BY WHOM
D11A	Soil condition	Slope / ground instability.	Worker and public				Geotechnical review of the generic design Undertaken.	Yes	Yes	20th Jan 2019 by Principal Contractor
D12B	Underground services on the site	Damage to underground services - Striking services resulting in disruption and injury.	Workers				Design to account for services known to exist at locations on the site and design out known 'clashes' where they are identified and verified. Contact stats companies for plans of services locations.	Yes	Yes	20th Jan 2019 by Principal Contractor

L1: Inconceivable L2: Remote L3: Conceivable L4: Possible L5: Most likely	C/S1: Negligible C/S2: Minor C/S3: Serious C/S4: Fatal C/S5: Catastrophic	R1-4: Low R5-12: Medium R15-25: High	PROJECT LEADER'S COMMENTS: *All these issues have been explained to all designers* DATE: 13th Sept 18	H & S MANAGER'S COMMENT'S: *All risky work needs to obtain permit to work* DATE: 14th Sept 18	√ ISSUED TO PRINCIPLE DESIGNER DATE: 15th Sept 2019 √ ISSUED TO ANOTHER DESIGNER & CLIENT DATE: 15th Sept 2019

Working Sheet for DRA-2

* based on the drawing (refer to Table 7A)
** refer to Appendix B (GL DOSH HIRARC 2008)

DESIGN ELEMENTS		DESIGNER TO CONSIDER THE FOLLOWING SIGNIFICANT RISK (Table 7)			Component / Condition / Circumstances *	Possible Design Issues*	Possible Hazards**	RISK			Possible Design Solutions	RESIDUAL RISK		
								L	S	R		L	S	R
1	Prefabrication	a	Can building components be prefabricated, assembled on ground and then lifted to position for installation?	Yes	Sewerage system	Confine space	chemical hazard/oxygen difficiancy	2	2	4	install cctv			0
					Wall	used Block work	ergonomic	2	1	2				0
					Roof truss	Working at height	manual handling/WH/heat stress			0				0
										0				0
				No; In-situ method						0				0
					Wall	Brick work	ergo/delay	4	3	12	block work	2	2	4
										0				0
										0				0
										0				0
		b	Can the cutting of steel members be done offsite, under controlled conditions to reduce the dust	Yes		Consider transportation method				0				0
										0				0
										0				0
										0				0
				No						0				0
										0				0

DRRULE FORM - Occupational Safety Health Construction Industry (Management)

FORM B

DR-RULE 2- Detail Design, Maintenance and Repair Review

PROJECT RISK REGISTER:	JOB No.:	PROJECT:		SHEET NO.	REVISION:
PRECAST WORK	105	TO DEVELOP TOWN HOUSE		01 Of 01	
	STAGE: CONSTRUCTION	PREPARED BY: ARCHITECT	APPROVED BY: PRINCIPLE DESIGNER	DATE: 30th March 2019	

ELEMENTS OF DESIGN		DWG. / SPEC	POSSIBLE EFFECT	WHO LIKELY TO BE HARMED	IS THE RISK ACCEPTABLE	RISK MANAGEMENT	ACTION REQUIRED	Risk Analysis L	S	R	PD TO INCLUDE IN PCI (Yes or No)	PD/PC TP INCLUDE IN HEALTH & SAFETY FILE (Yes or No)	DATE RISK OR HAZARD REMOVE FROM LIST & BY WHOM
D21E	Precast concrete wall installation - handling, transporting, and erecting precast concrete		Uncontrolled collapse of precast concrete elements and being crushed between a precast concrete element and another object.	Worker	Acceptable	Competent workers with permitted to work.	Contractor shall follow best practice approach to conduct the installation work				Yes	Yes	20th April 2019 by Principal Contractor
D22A	Heavy lifting plant		- crushing due to impact of moving objects loads falling from vehicles because they are not aligned properly	Worker	Acceptable	Competent handler with permitted to work.	Contractor shall design and carried out the process of work according to the best practice.				Yes	Yes	20th April 2019 by Principal Contractor
			-										

L1: Inconceivable L2: Remote L3: Conceivable L4; Possible L5: Most likely	S1: Negligible S2: Minor S3: Serious S4: Fatal S5: Catastrophic	R1-4: Low R5-12: Medium R15-25: High	PROJECT LEADER'S COMMENTS: DATE: 1st April 2019	H & S MANAGER'S COMMENT'S: *All risky work needs to obtain permit to work* DATE: 1st April 2019	√ ISSUED TO PRINCIPLE DESIGNER DATE: 2nd April 2019 √ ISSUED TO ANOTHER DESIGNER & CLIENT DATE: 2nd April 2019

DRRULE FORM - Occupational Safety Health Construction Industry (Management)

Department of Occupational Safety & Health

FORM C

DR-RULE 3- Pre-Construction Review

Ref	Activity	Hazard	Persons at risk	Design Measure taken, or being taken to eliminate or reduce the hazard	Risk Analysis			Information on the Residual Risk	Data Issues Raised	Action Required by:
					L	S	R			
D11A	Earthworks	Slope / ground instability.	Worker and public	Geotechnical review of the generic design undertaken.				Contractor to propose safe construction sequence and methods.	15th Sept 18	Principal Contractor
D21B	Underground services on the site	Damage to underground services - Striking services resulting in disruption and injury.	Workers	Design to account for services known to exist at locations on the site and design out known clashes' where they are identified and verified. Contact stats companies for plans of services locations.				Contractor to obtain accurate location of underground services / highway drainage before commencement of construction works and to verify / locate prior to commencement of any construction activity.	15th Sept 18	Principal Contractor
D21E	Precast concrete wall installation - handling, transporting, and erecting precast concrete	Uncontrolled collapse of precast concrete elements and being crushed between a precast concrete element and another object.	Worker	Design for precast concrete wall has been standardize				Competent workers with permitted to work.	20th May 2018	Principal Designer and Principal Contractor

DRRULE FORM - Occupational Safety Health Construction Industry (Management)

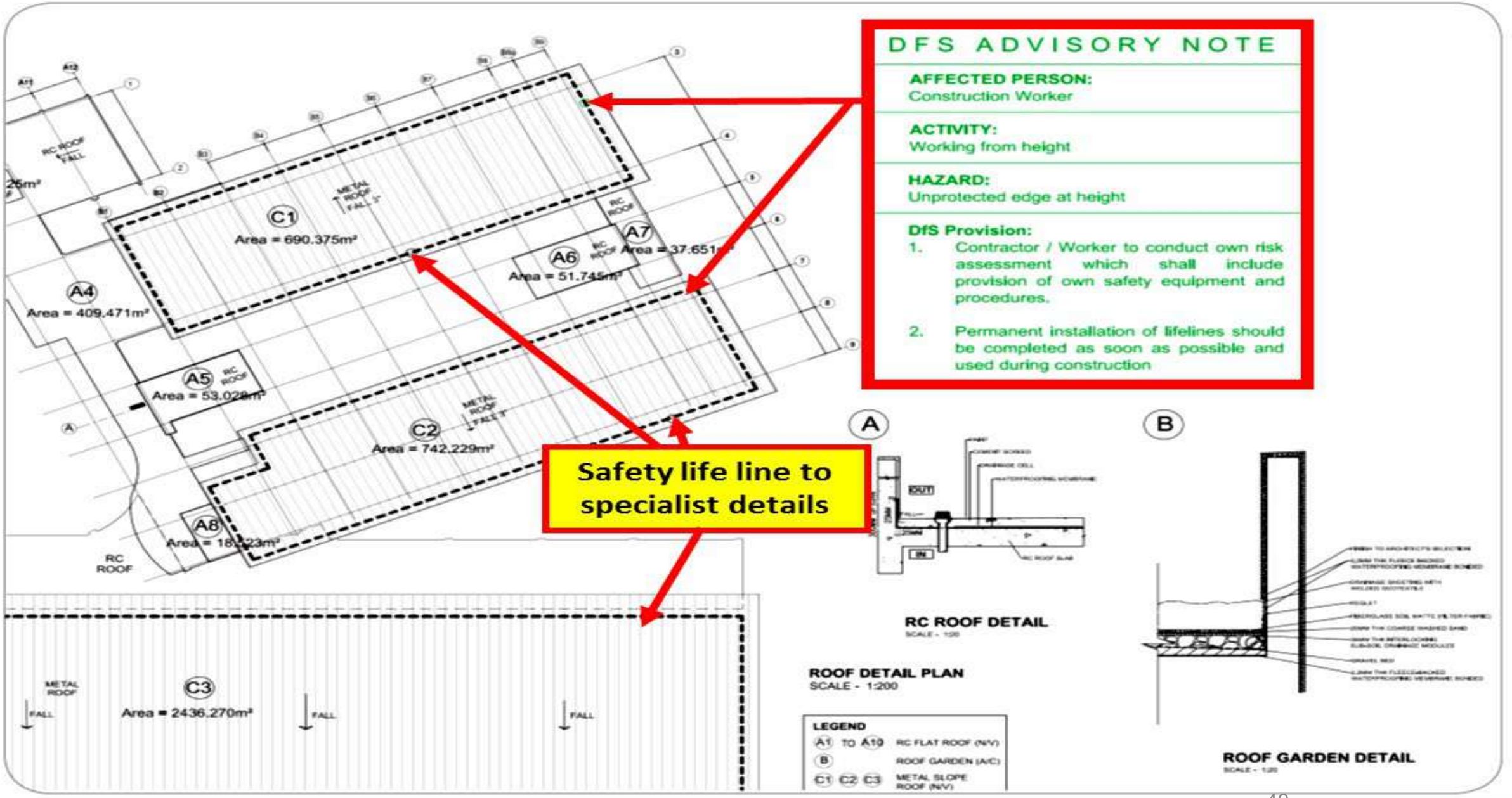
Department of Occupational Safety & Health

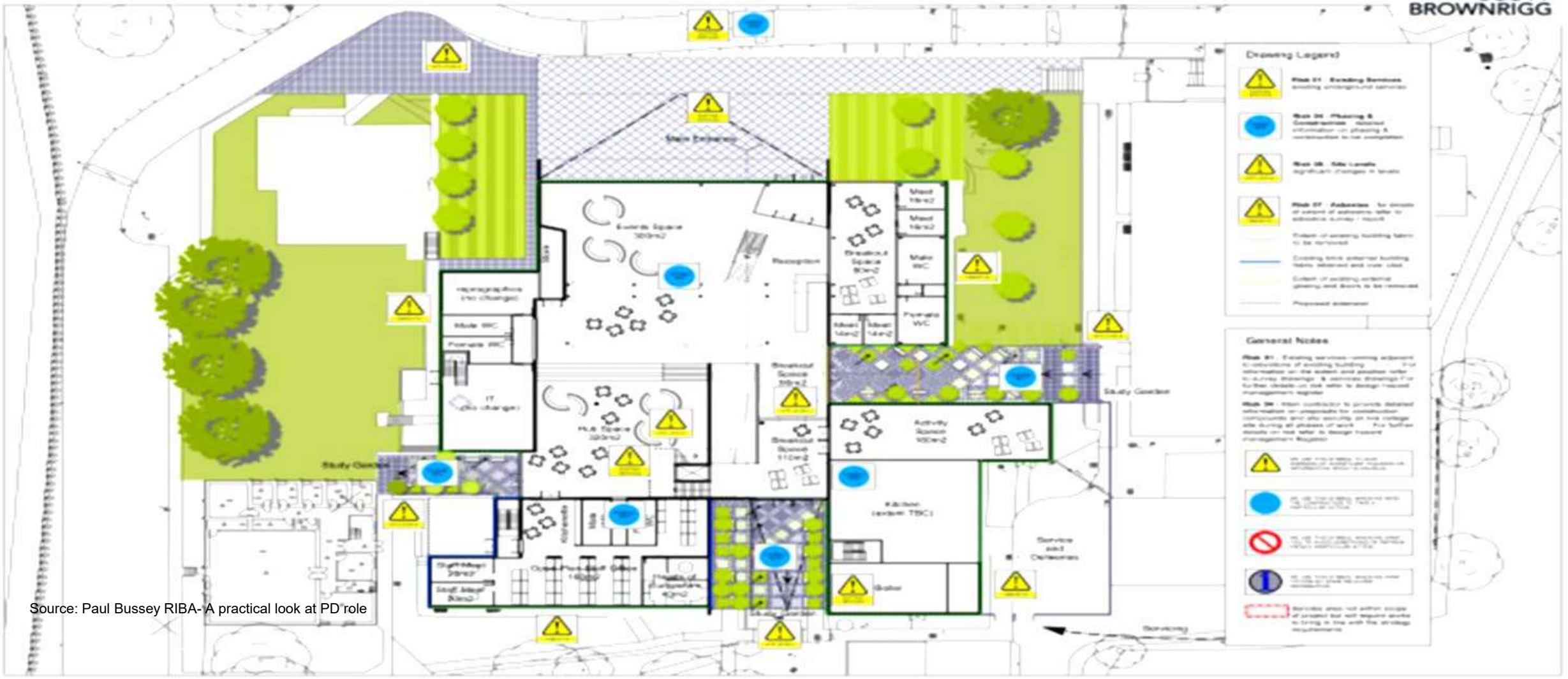
FORM D
RISKS REGISTER

ELEMENT	ACTIVITIES	WHO AT RISK	CONSEQUENCES	RISK BEFORE MITIGATION			AVAILABLE MITIGATION MEASURE			RISK AFTER MITIGATION		
				L	S	R	PRELIMINARY DESIGN	DETAILED DESIGN	CONSTRUCTION	L	S	R
D11A - Earthworks	Deep Excavations	Construction Staff	1. Risk of land slips 2. Slips/trips/falls	4	2	8	Alignment should be adjusted where possible to minimise the depth of .	Discussions held with the contractor	Contractor to determine safe method of earthwork	1	1	1

GENERAL PRINCIPLES OF PREVENTION

1. Avoid risks
2. Evaluate risks which cannot be avoided
3. Combat the risks at source
4. Adapt the work to the individual
5. Adapt to technical progress
6. Replace dangerous by non-dangerous or less dangerous
7. Develop a coherent overall prevention policy
8. Give collective protective measures priority over individual protective measures
9. Give appropriate instructions to employees


DFS ADVISORY NOTE
AFFECTED PERSON:
Construction Worker
ACTIVITY:
Working from height
HAZARD:
Unprotected edge at height
DfS Provision:
1. Contractor / Worker to conduct own risk assessment which shall include provision of own safety equipment and procedures.
2. Permanent installation of lifelines should be completed as soon as possible and used during construction
Safety life line to specialist details
C1
Area = 690.375m²
C2
Area = 742.229m²
C3
Area = 2436.270m²
A4
Area = 409.471m²
A5
Area = 53.028m²
A6
Area = 51.745m²
A7
A8
RC ROOF
METAL ROOF FALL
FALL
A
B
RC ROOF DETAIL
ROOF DETAIL PLAN
SCALE - 1:200
LEGEND
A1 TO A10 RC FLAT ROOF (N/V)
B ROOF GARDEN (A/C)
C1 C2 C3 METAL SLOPE ROOF (N/V)
ROOF GARDEN DETAIL



Source: Paul Bussey RIBA- A practical look at PD role

Capture the identified significant risks on CDM Visual Risk Analysis Drawings. Capture also other consultants significant risks

SITE LOCATION PLAN (EXISTING)

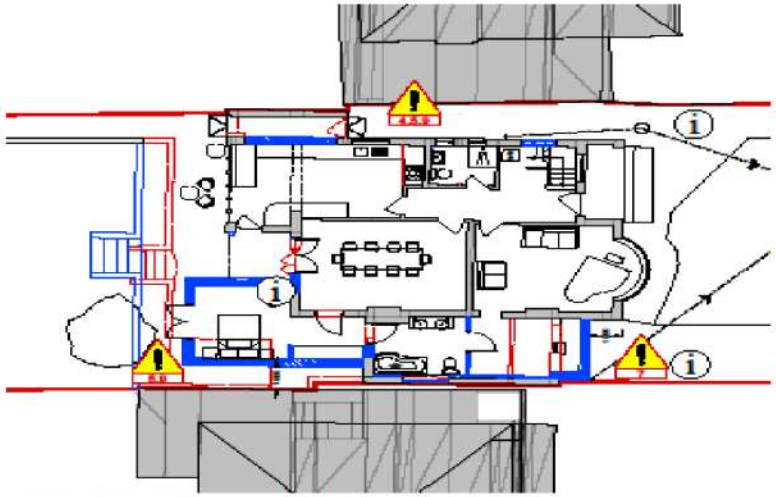
CLOSE BOUNDARY TO NEIGHBOURING PROPERTY
- RESTRICTED ACCESS
- PROXIMITY TO NEIGHBOURING STRUCTURES

OVERHEAD CABLE

NARROW DRIVEWAYS
- RESTRICTED ACCESS

- FOOTPATH & HEDGEROW RUNNING ALONGSIDE HIGHWAY
- TREES LINING VERGE

PROXIMITY TO HISTORIC LANDFILL SITE & POTENTIAL FOR GROUND CONTAMINATION



PROPOSED GROUND FLOOR PLAN

FRONT ELEVATION (NORTH EAST)

REAR ELEVATION (SOUTH WEST)

WORK STAGE 3 - PLANNING

Building Products and Construction Execution Hazards

The design team have highlighted unusual and significant risks only that may not be obvious to a competent contractor. They are to assist with risk reduction only and are not necessarily comprehensive. It is assumed that all works will be carried out by a competent contractor following good site management, site practice procedures, to an approved method statement (where appropriate) and in accordance with HSE guidance.

The proposed works are designed on a well established method of construction which can be carried out by a competent contractor. However, should the contractor find any area of concern he must inform the designer in order that appropriate action can be taken.

For significant hazards specific to this project see the following:

SITE SPECIFIC HAZARDS & SIGNIFICANT RISKS

1. Restricted site entrance - narrow driveway, overhanging trees along road verge, hedgerow restricting views of passing pedestrians and vehicles.
2. Overhead cables - risk of collision & electric shock
3. Proximity of site access to busy pedestrian and vehicle movement - college nearby
4. Narrow and limited access to rear garden - turning & manoeuvrability difficult on site.
5. Working close to boundaries/amenity areas used by neighbours.
6. Risk of ground contamination from nearby historic landfill site
7. Existing services present - risk of unrecorded services on site
8. Potentially materials containing asbestos
9. Maintaining support to adjacent structures
10. Stability of existing roof structure - danger of falling and collapse where existing roof structure may be weak or unstable.
11. Stability of all temporary and propping works during structural alterations to building.
12. Handling heavy items and equipment
13. Glazed areas - collision and cleaning.
14. Working at height over two storeys - risk of falling and items falling from height.

INFORMATION TO BE PROVIDED FOR NEXT STAGE

- Establish location of existing service routes and high voltage cables
- Further investigation required by competent specialist to ascertain ground conditions and potential risk of ground contamination before building work starts on site.
- Investigate footings of existing house and neighbouring structures.
- Asbestos Survey of existing building to ascertain absence or presence and location of any asbestos.

ACTIONS TO BE TAKEN IN NEXT STAGES.

- Identify asbestos materials and other contaminants in existing building and ensure adequate surveys & appropriate contractors used to identify dangerous materials on site and/or their removal.
- Structural inspection of existing structures by Structural Engineer for temporary & new loadings for materials, scaffolding or plant.
- Existing services to be located, clearly marked and recorded
- Consider ease of replacement of light bulbs and height of other controls or fittings which require regular maintenance, especially above stairs or at high level. Specify low-maintenance equipment/fittings where practicable.
- All unrecorded and new services to be clearly marked on drawings for inclusion in the Health and Safety File.

GENERAL NOTES:

- Principal Contractor to provide method statements for the safe working practice for: demolition, excavations, cutting of materials, support of adjacent structures, protecting personnel, neighbours & the public,working at height including crash bags & fall restraint systems.
- Principal Contractor to ensure Temporary Works Designer and Coordinator appointed for all propping works for structural alterations of existing building, including temporary guardrail and edge protection around voids and stairwells.
- This Designers Risk Assessment should be passed on to the Appointed Principal Designers and/or Principal Contractor carrying out the next phase of works on this site.

DESIGNERS RISK ASSESSMENT HEALTH AND SAFETY

THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2015

This drawing should be read in conjunction with the following documents:-

Current drawing packages from all Project Consultants
Other Project Consultants Designer Risk Assessments

LEGEND

- Site Boundary
- Existing structure
- To be demolished
- New Construction

- Significant Hazard & Significant Risk
- Other Relevant Information
- Actions for the next stage

REV.	DETAILS	BY	CKD	DATE
-		-	-	-

CLIENT
CLIENT NAME

PROJECT NAME

DRAWING TITLE
Designers Risk Assessment

DATE	DRAWN BY	CHECKED BY
11.01.17	RB	JT

SCALE	JOB NO.
NTS@A3	1516160

DRAWING NO.	REVISION
CDM01	-

PLANNING

4. Preparing the Health and Safety File

PD & D

- The Principal Designer must **prepare** the Health and Safety File, and **review, update** and **revise** it as the project progresses.
- The Principal Designer must also **hand over** the completed Health and Safety File to the Client to keep.

PC

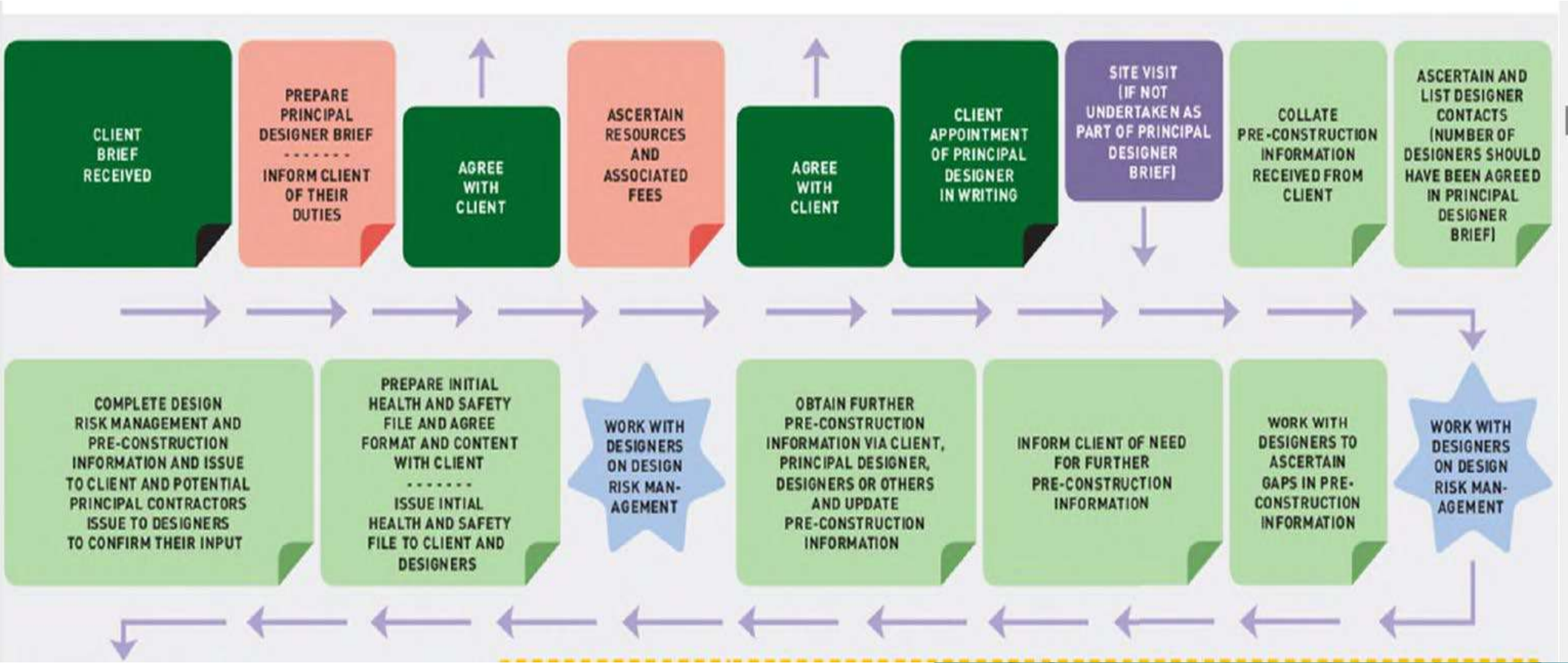
- The Principal Contractor must then take responsibility for **reviewing, updating** and **revising** it and **passing** it to the Client when the project finishes.

ROLE OF PRINCIPLE DESIGNER – CONSTRUCTION STAGE

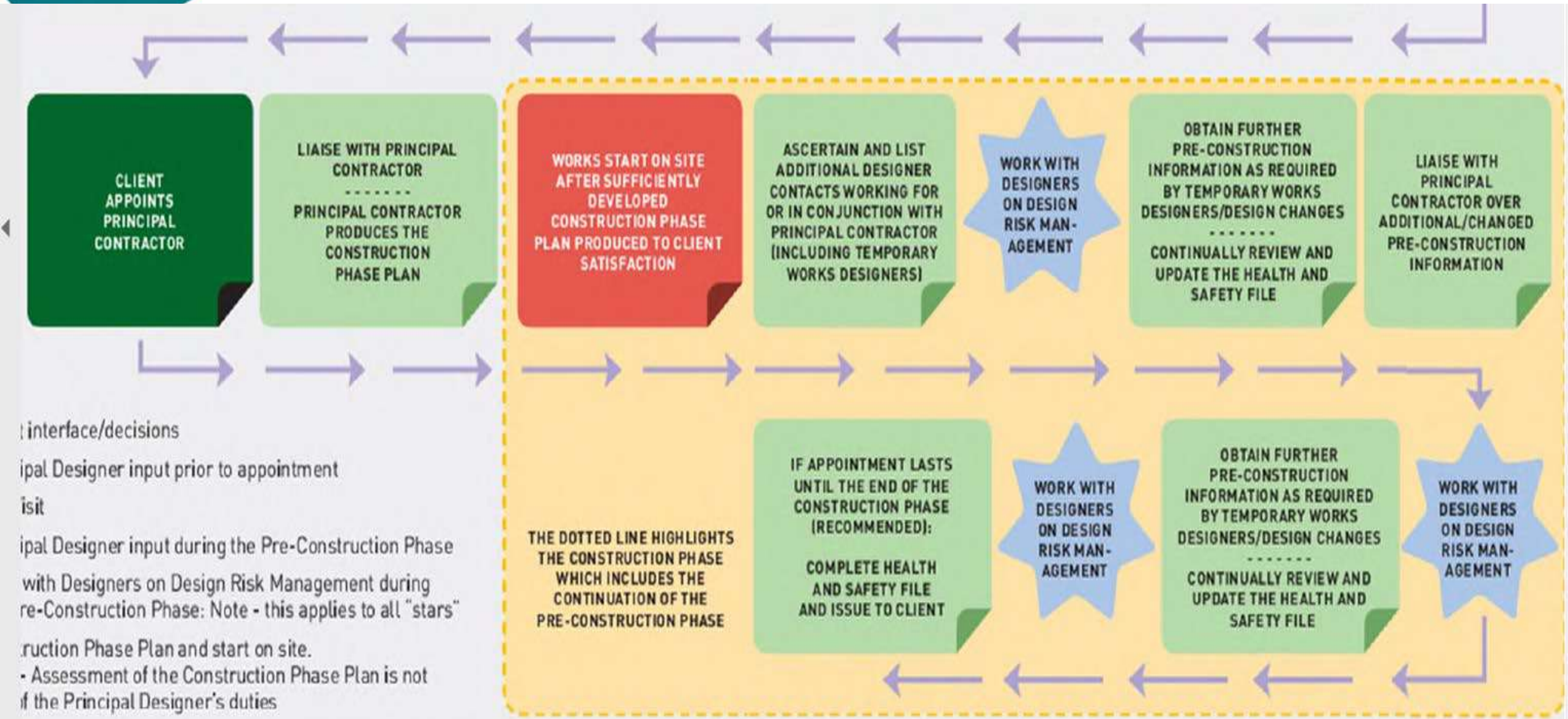
5. Continuing liaison during the Construction Phase

- Dealing with design changes by Designers and Contractors during the Construction Phase
- Consider the impact of these design changes on the Design Risk Management strategy for the project in consultation with the Principal Contractor.
- Assist Principal Contractor in identifying the risks associated with the work and determining the necessary controls that need to be put in place.
- Regular meetings will usually be the most effective management tool.

SUMMARY: The role of the Principal Designer & Designer



The role of the PD & Designer (cont'd)



interface/decisions

ipal Designer input prior to appointment

isit

ipal Designer input during the Pre-Construction Phase

with Designers on Design Risk Management during re-Construction Phase: Note - this applies to all "stars"

ruction Phase Plan and start on site.

- Assessment of the Construction Phase Plan is not f the Principal Designer's duties

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