OSHCIM

CONSTURCTION PROJECT LIFECYCLE AND DESIGN REVIEW PROCEDURE

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Date: 18th April 2022
Venue: Zoom

Outline of Presentation

- **OSHCIM 2017**
- OSHCIM Project Lifecycle Requirements
- Design Review Procedure

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OSH ISSUES –IN CONSTRUCTION INDUSTRY

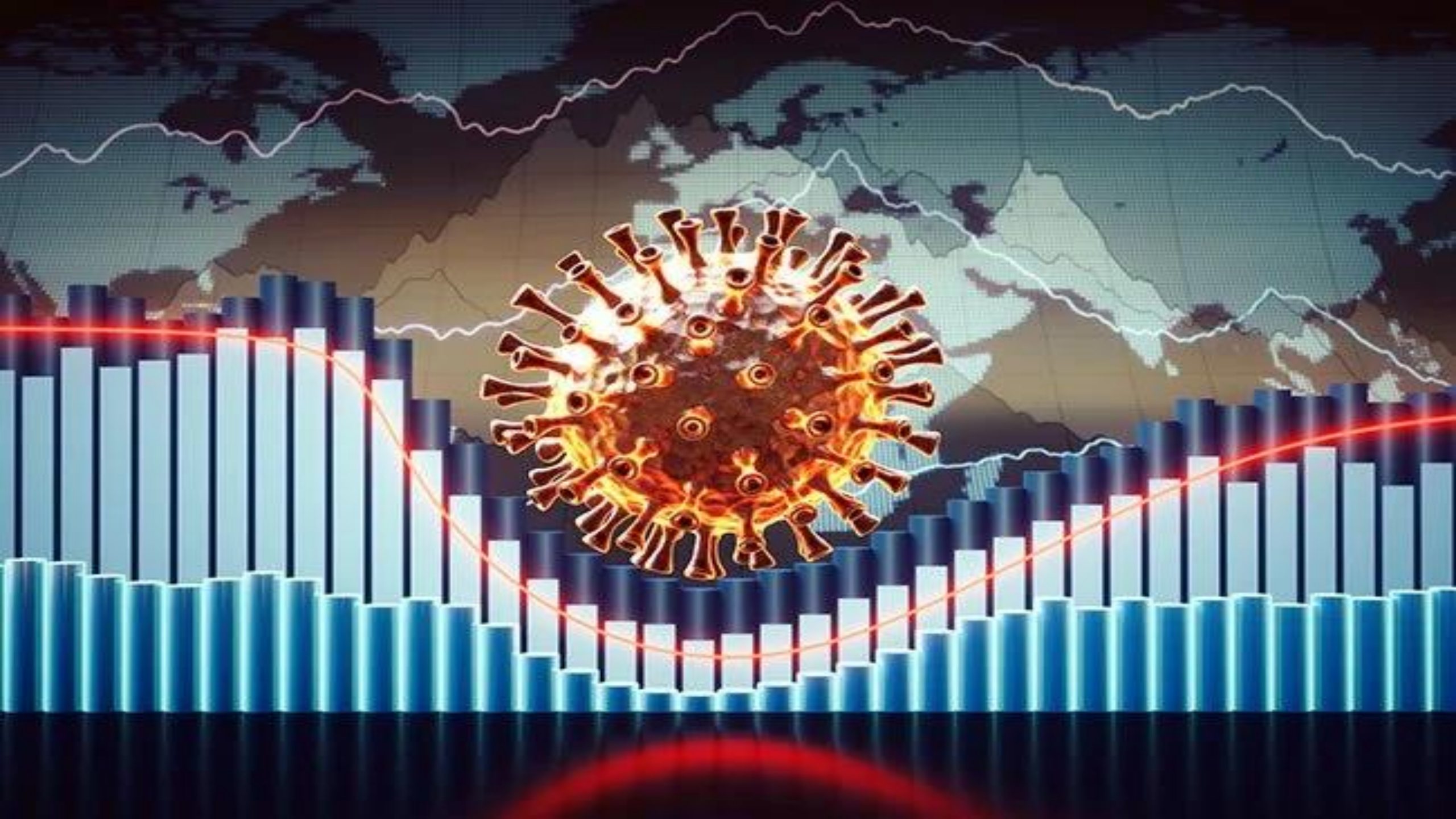
- More high rise projects
- Shorter Completion period
- Longer working hours per day
- Big scale projects
- Number of Construction Sites Increased
- More high risk machinery
- Congested area

Work at height	Public Safety	Lifting
Machinery	Temporary Structure	Working near water, high voltage, gas pipeline
Trenching	Cave-in	

- Migrant workers
- New construction method and technologies


PACIFIC
HOTEL CITY INN


PNB
PNB 118
PNB

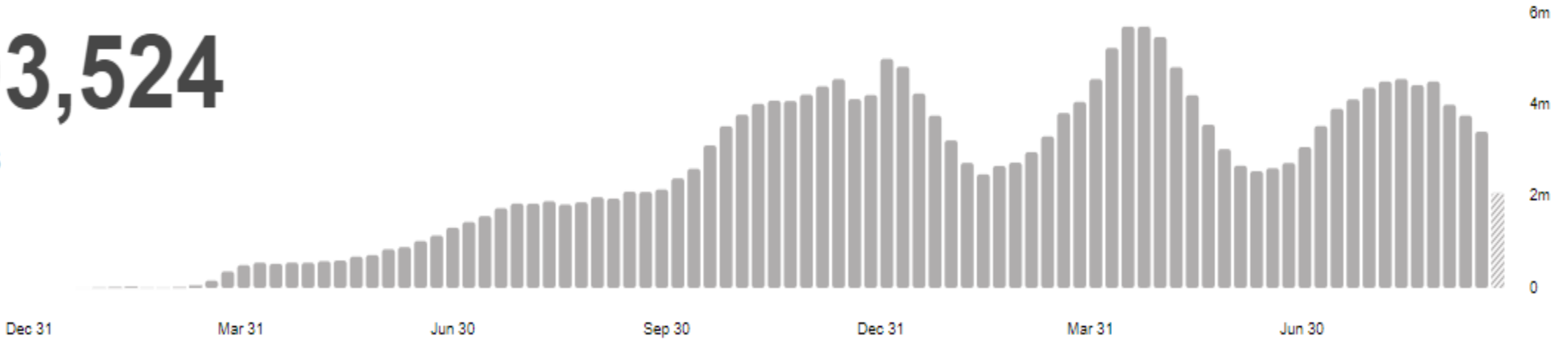


Global Situation

Daily Weekly

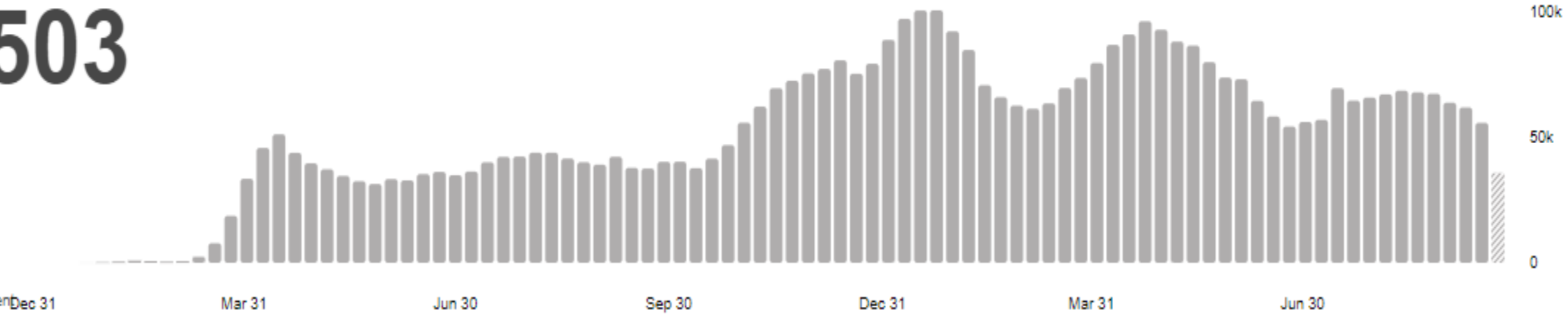
233,503,524

confirmed cases



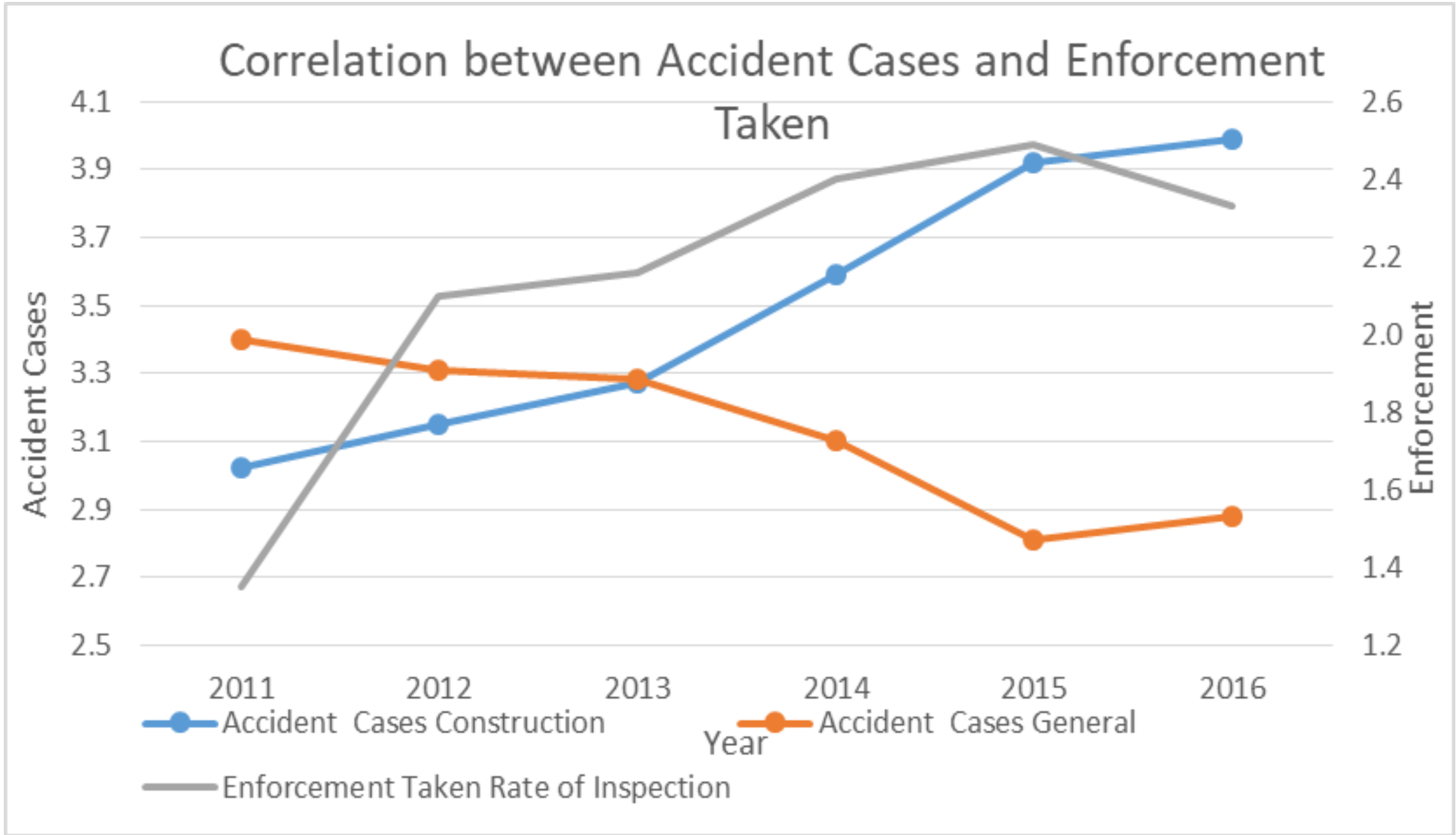
4,777,503

deaths



Source: World Health Organization

Data may be incomplete for the current day or week.


Correlation between Accident Cases and Enforcement Taken
Accident Cases
Enforcement
4.1
3.9
3.7
3.5
3.3
3.1
2.9
2.7
2.5
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
2011
2012
2013
2014
2015
2016
Year
Accident Cases Construction
Accident Cases General
Enforcement Taken Rate of Inspection

11,000 inspections carried out last year to ensure safety at construction sites, says DOSH

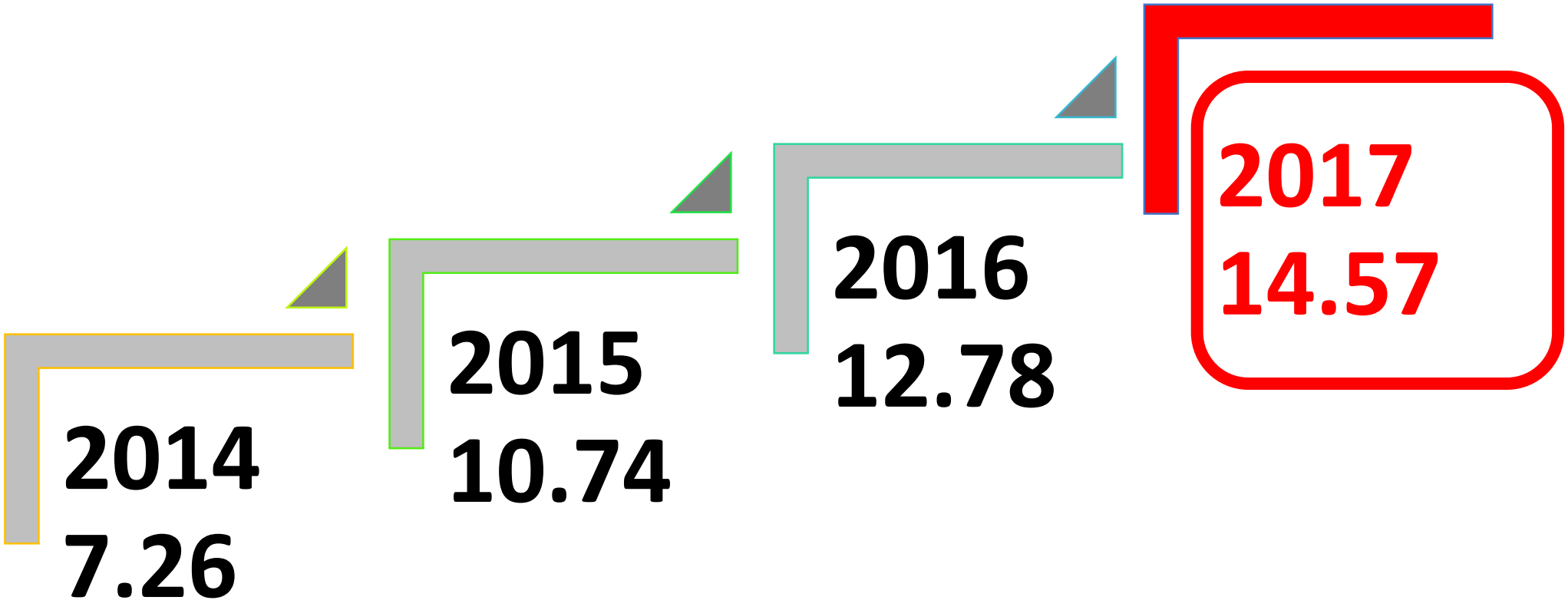
FMT Reporters - May 25, 2019 7:14 PM

617 Shares | 587 | 11 | 14

An Indonesian couple, working as construction workers, were killed when a building collapsed near the Gombak LRT station on May 23.

- DOSH DG Ir Omar Mat Piah said his department conducted 10,917 construction site inspections in 2018.
- Based on that:
  - 9,429 notices were issued,
  - 740 offences were compounded and
  - 113 cases were prosecuted in court

MY CONSTRUTION FATALITY RATE PER 100,000 WORKERS



The needs!


Hierarki Kawalan
PENGURUSAN
&
BERPUSATKAN
PROSEDUR
OSHA 2020
Pencegahan melalui reka bentuk (PtD)
Prinsip am pencegahan (GPP)
REKA BENTUK
&
BERPUSATKAN
TEKNIKAL

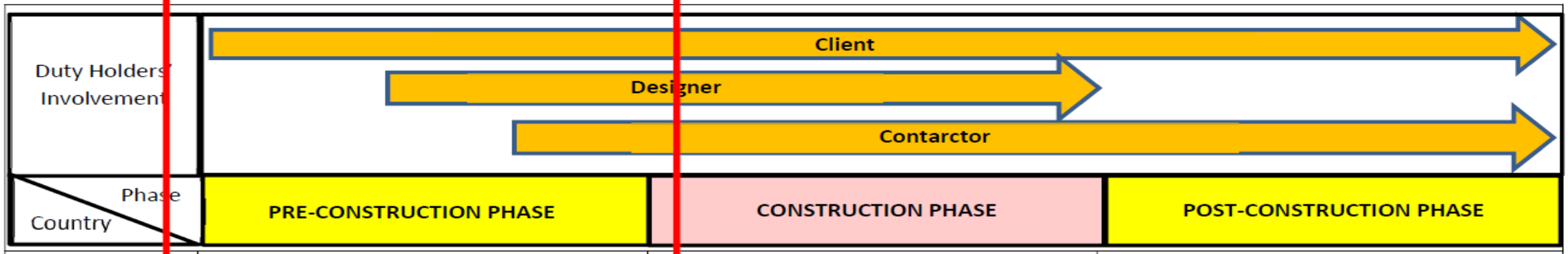
What is OSHCIM

- The Guideline was introduced with the aim to lower construction site accidents and fatalities.
- A study by the Ministry of Manpower Singapore found that 44% of site fatalities could have been prevented with Design For Safety.
- The OSHCIM Guidelines adopt the principles of Construction Design Management (CDM), modelled on the UK system that practices “prevention through design, PtD”.

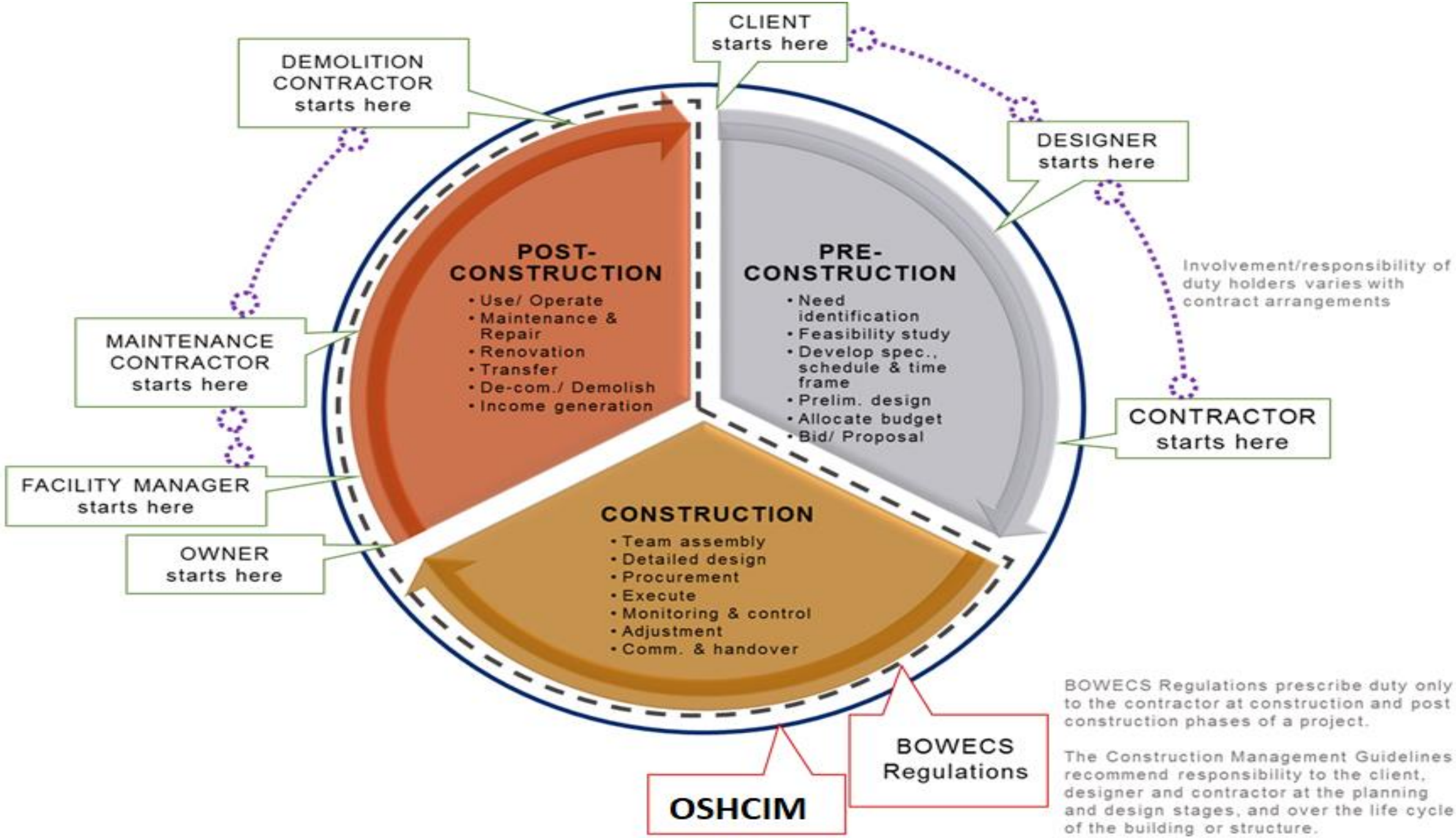
OSHCIM IN UK,HK,AU,NZ,SG,USA

		1994	2001	2002	2003	2005	2006	2007	2008	2010	2011	2012	2013	2014	2015	2016	2017	2018
UK	CDM	CDM Reg.1994						CDM Reg.2007							CDM Reg.2015			
								CDM Duty Holders Guidance 2015							CDM Duty Holders Guidance 2015			
HK	DfS CDM	1995: Considerate Contractors Site Award Scheme	2001:CIRC Construct for Excellence: 8.11 Designing for construction safety and integrated management		2003 - CDM Pilot Project (Adopted the principles)		2006; DEVB Guidance Notes: CDM 2006	2006-CDM Work Examples-OSHC.DEVB				2012-Hong Kong Construction Industry Vision 2020; 1.0 Strategic Area of Focus - 3.1 Safety, Health & Quality of Life ; To Mandate CDM	2013-CDM Work Examples-OSHC.ETWB,HKHA		2015 - HK Housing Autho Safety Auditing Scheme(HASAS) Prescribe CDM under Training Req.			
AU	SbD SDA		2001 NSW- Guide CHAIR Model.	2002 The National OHS Strategy 2002-2012; National Priorities (eliminate hazards at the design stage,)								2012 - Australian Work Health and Safety Strategy 2012–2022 : safe by design:						2018 Review of the model WHS laws
												2012 - Work Health and Safety Act 2010.						
												2012 - Work Health and Safety Regulations 2011						
												2012- SAFE DESIGN OF STRUCTURES COP						
NZ	SiD											2012 - CCG Construction Client Group Best Practices		2014 - NZCIC New Zealand Construction Industry Council (Design Documentation Guidelines)	2015 Health and Safety at Work Act 2015	2016 - DESIGNING SCHOOLS IN NEW ZEALAND Structural and Geotechnical Guidelines		
SG	DfS								2008 DfS Guidelines	Aug-2010 DfS Coordinators/ Professional Course Introduced	2011 DfS Guidelines Revised				2015 - WSH(DfS) Reg.2015 Incl Developer to Appoint DfS Professionals	2016 - DfS Guidelines		
US	PtD	1955: NSC Accident Prevention Manual				2005-OSHA Set up Design Const Safety Workgroup		2007 - NIOSH US PtD Initiatives			ANSI/ASSE Z590.3-2011 (Prevention through design; Guidelines)							

COMPARISON OF THE LEGISLATION / CODE OF PRACTICES/ STANDARDS



Malaysia	OSH Construction Industry (Management) GL	OSHA 1994, FMA 1975 (BOWEC Regulations)	Uniform Building By-Laws 1984 (UBBL)
UK	Construction (Design and Management) Regulations 2015	-HSW etc. Act 1974 -Construction (HSW) Regulations 1996	Construction (Design and Management) Regulations 2015
Australia	Safe Design of Structures Code of Practice, 2012	WHS Act 2011 WHS (Construction Work) Code of Practice 2015	Safe Design of Structures Code of Practice, 2012
New Zealand	Safety in Design (Under the Health and Safety at Work Act 2015)	-HSW 2015	Safety in Design (Under the Health and Safety at Work Act 2015)
Singapore	Workplace Safety and Health (Design for Safety) Regulations 2015	-WSH Act - WSH (Construction) Regulations 2007	Workplace Safety and Health (Design for Safety) Regulations 2015
US	ANSI/ASSE A10.1 – 2011 (ANSI)/ASSE Z590.3 – PtD GL	29 CFR 1910 - OSH Standards 29 CFR 1926 - Safety and Health Regulations for Construction	International Building Code (IBC) National Electric Code, NFPA 70


CLIENT
starts here
DEMOLITION
CONTRACTOR
starts here
DESIGNER
starts here
MAINTENANCE
CONTRACTOR
starts here
CONTRACTOR
starts here
FACILITY MANAGER
starts here
OWNER
starts here
POST-
CONSTRUCTION
• Use/ Operate
• Maintenance &
Repair
• Renovation
• Transfer
• De-com./ Demolish
• Income generation
PRE-
CONSTRUCTION
• Need
identification
• Feasibility study
• Develop spec.,
schedule & time
frame
• Prelim. design
• Allocate budget
• Bid/ Proposal
CONSTRUCTION
• Team assembly
• Detailed design
• Procurement
• Execute
• Monitoring & control
• Adjustment
• Comm. & handover
Involvement/responsibility of
duty holders varies with
contract arrangements
OSHCIM
BOWECS
Regulations
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.

Defining Prevention through Design (PtD)

- PtD encompasses all of the efforts to anticipate and design out hazards to workers in facilities, work methods and operations, processes, equipment, tools, products, new technologies, and the organization of work.
- The focus of PtD is on workers who execute the designs or have to work with the products of the design.
- The initiative has been developed to support designing out hazards, the most reliable and effective type of prevention.

Construction (Design & Management)

Prevention through Design

Engineering for Safety

Design for Safety

Safety in Design

Safe Design of building and structures

Life Cycle Safety

Safety Constructibility

Safety by Design

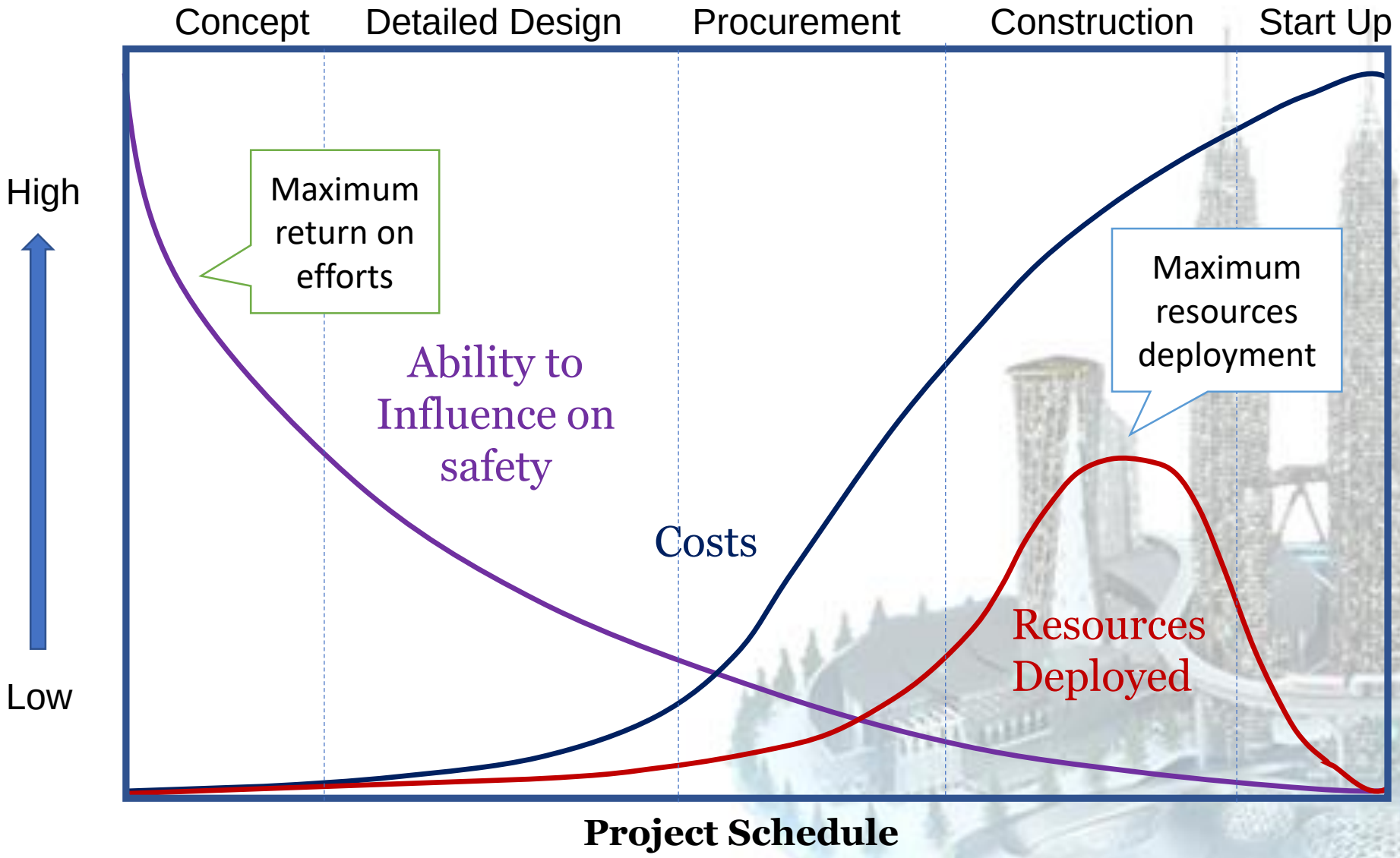
What is PtD

Anticipating and ***DESIGN OUT*** hazards in *tools, equipment, processes, materials, structures, products, new technologies, facilities, work methods, operations, and the organization of work* is the most effective way to prevent occupational **INJURIES, ILLNESS** and **FATALITIES**.

What is Safer Design

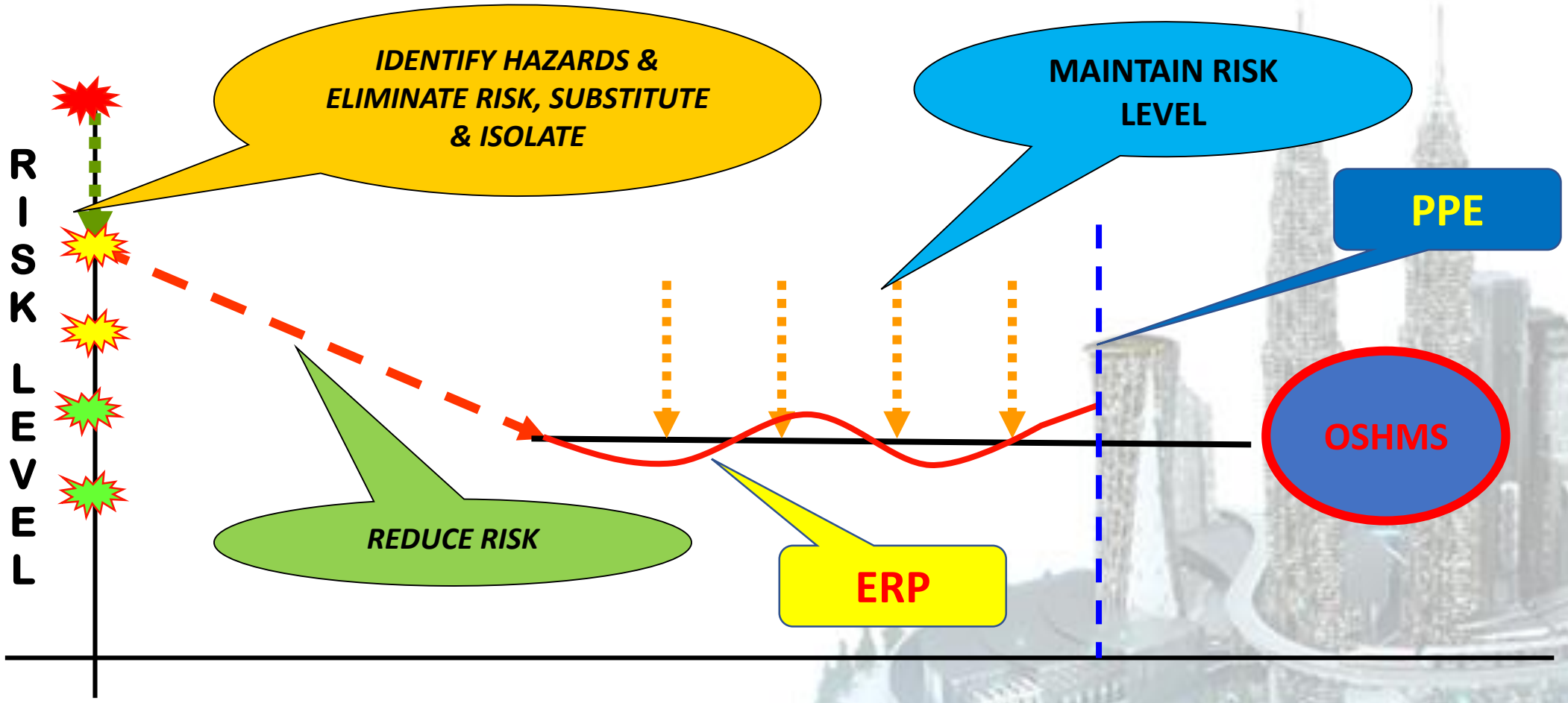
- Inherently Safer Design is a concept based on **ELIMINATING the causes** and/or *reducing the consequences* of potential hazards.
- ISD targets **HAZARD** rather than reducing **RISK.**
- **"BUILD-IN" not "ADDED-ON"**
- **"SAFER" not "SAFE"**

Ability to influence safety[1]



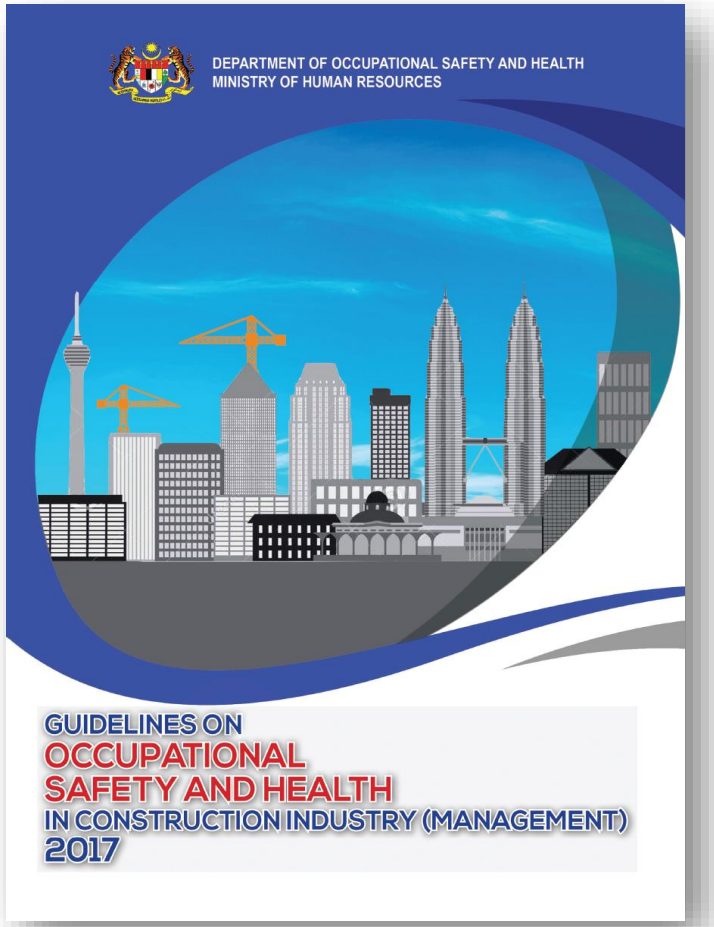
1 R. Szymberski, "Construction Project Safety Planning" TAPPI Journal, 1997

RISK MANAGEMENT



RISK MANAGEMENT PROCESS

OSHCIM Requirements….



1. Appointment of Design Team - 6/22
2. Organization & Arrangements – 53/A2
3. Notification – later in OSHCIM Regulation 202X
4. OSHCIM Duty-holders Contracts – 53/A2
5. OSHCIM Documentations – 37/C6
6. OSHCIM Risk Management – 15/63
7. Risk register & Record keeping – Form ABC

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

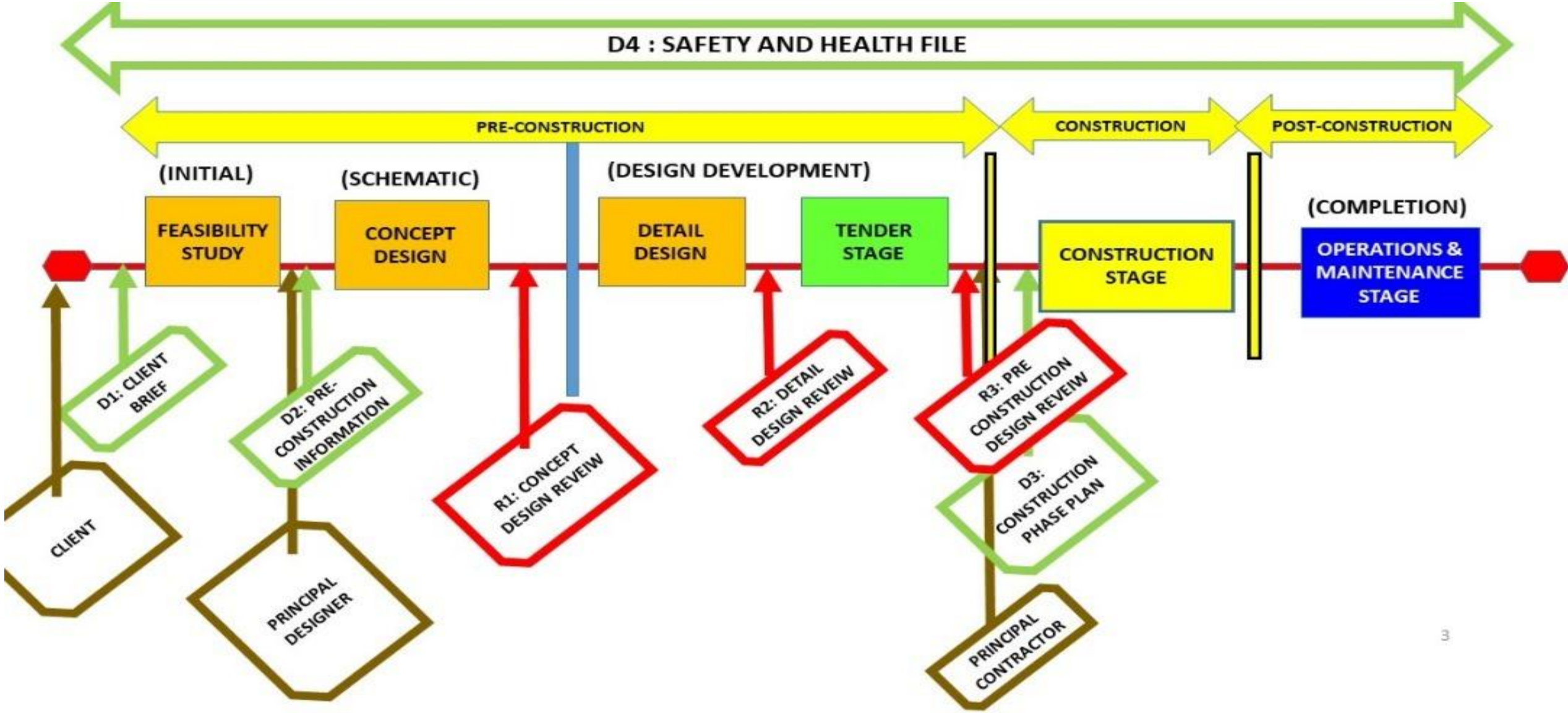
Provide info to:

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

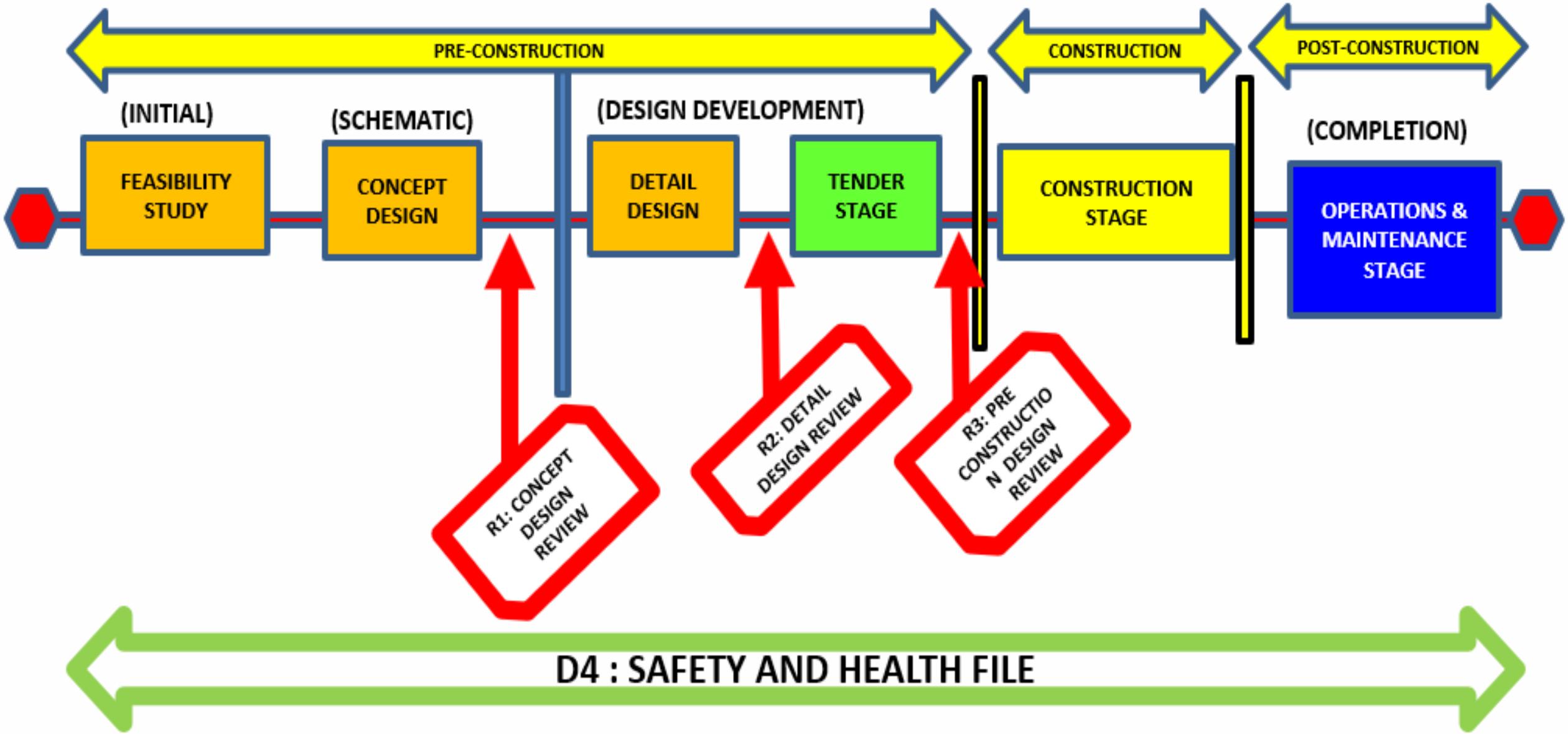
3. Making client aware of their duties

4. Cooperating with other duty holders

PROJECT PROCESS



DESIGN REVIEW TIMING



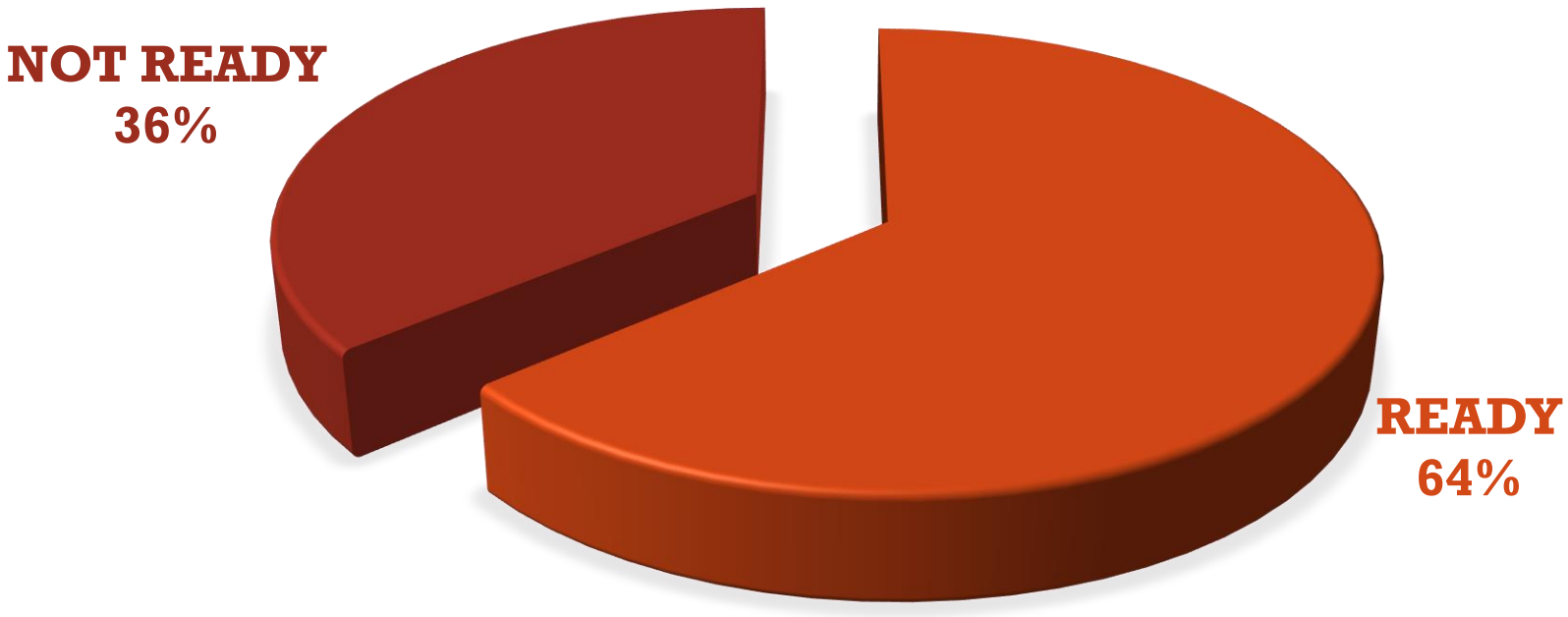
OSHCIM SURVEY (1,286 RESPONDENTS, IN 2018)

No.	OSHCIM Critical Factor	Client	Designers	Contractor	Enforcer	OYK	Worker	Average
1	Awareness	4	3	4	3	3	2	3.1
2	Commitment	3	2	5	5	4	4	3.8
3	Theoretical Knowledge	3	3	4	3	2	1	2.7
4	Design Knowledge	3	3	4	2	2	2	2.7
5	Skill	2	3	4	3	2	3	2.8
6	Exposure/Experience	2	3	4	2	4	3	3.0
7	Design Aid/Tool	2	5	5	3	2	1	2.7
8	Design Management	1	1	1	1	1	1	1
9	Design Failure Database	1	1	1	1	1	1	1
	OVERALL	2.3	2.7	3.6	2.6	2.3	2.0	2.58

***Ranking: Level 1: Nothing; Level 2: Weak; Level 3: Basic; Level 4: Moderate; Level 5: Ready**

OVERALL FINDINGS

CURRENT STATUS IN COMPLIANCE FOR OSHCIM IMPLIMENTATION



DESIGNER VS OSHCIM GUIDELINE 2017

What should a designer do?	
1	Making clients aware of their duties
2	Preparing or modifying designs
3	Providing design information
4	Cooperating with other duty holders
5	Planning, managing, monitoring and coordinating the pre-construction phase
6	Identifying, eliminating or controlling foreseeable risks
7	Ensuring coordination and cooperation
8	Providing pre-construction information
9	Liaising with the principal contractor

OSHCIM IMPLEMENTATION STATUS

The potential and weakness factor were identified through the engagement, introductory session and piloting

Readiness were about **64 %** which is **partly ready** and have the exposure regarding OSHCIM implementation

Majority of the companies were lack on the **risk assessment, RISK control and OSHCIM documentation**

RISK ASSESSMENT KIT FOR DESIGNERS

A

DESIGN REVIEW PROCEDURE

B

DESIGN REVIEW PROCEDURE OVERVIEW

- RULE 1: Concept Design Review
- RULE 2: Detailed Design, Maintenance and Repair Review
- RULE 3: Pre-Construction Review

C

FLOWCHART PROCEDURE FOR RISK ASSESSMENT

- Documents Required
- Documents to Produce

DESIGN REVIEW OBJECTIVES

RULE 1: Concept Design Review

Concept design review shall look into the project overall perspective including but not limited to **site location, public access traffic, and type of buildings in the surroundings, landscape and other general constraints.**

RULE 2: Detailed Design, Maintenance and Repair Review

Detailed design, operations, maintenance and repair review should look at a building's detailed architectural and structural design. The review should determine risks involved in the **construction methods, access and egress, and whether the design will create confined space or other hazards**. Risks related to **maintenance and repair** of a building, such as cleaning methods, should also be studied.

RULE 3: Pre-Construction Design Review

Pre-construction design review should examine **temporary works** design and design by **specialist** contractors not covered during the concept and detailed design phases

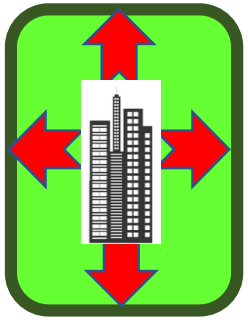
FLOWCHART PROCEDURE FOR RISK ASSESSMENT

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

DR-RULE-1:
PROJECT RISK IMPACT

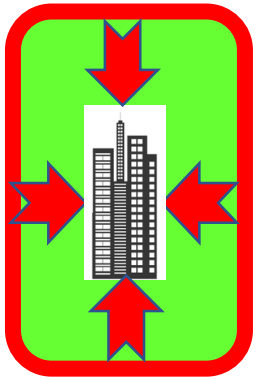
PROPOSED TYPE & SCALE OF BUILDING DEVELOPMENT

- To Surrounding Context



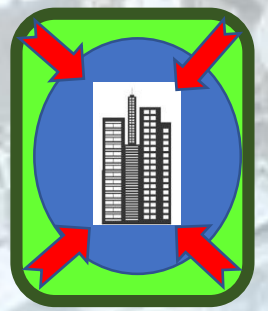
SURROUNDING CONTEXT

- On Proposed Type & Scale Of Building Development



EXISTING SITE CONDITIONS AND DIMENSIONS

- On The Proposed Type And Scale Of Building Development.



DR-RULE-2: DETAILED DESIGN, MAINTENANCE & REPAIR REVIEW

- DRRULE-2 review should include considerations such as:
  - Fabrication
  - IN-SITU
  - Heavy lifting
  - Falling from height
  - Temporary works and sequencing
  - Layout
  - Confined Space
  - Emergency Route
  - Health hazards
  - Weather
  - Others (early warning of hazards, fire risk source of energy stored etc)

DR-RULE-3
PRE-CONSTRUCTION PROJECT REVIEW

Nightmarish: Motorists along the Cheras-Kajang Highway inching their way into the East-West Link and Jalan Cheras that is drastically tightened to make way for MRT construction. -

- In evaluating the temporary works design, the design review team should ensure:
- Proper planning of work activities, diversion of road etc. to reduce the impact on traffic condition, and more importantly safety of workers, public and road users.

RISK ASSESSMENT

Risk:

- The likelihood that a specified undesired event will occur due to the realisation of a hazard by, or during work activities or by the products and services created by work activities.

- Subjective risk assessment

- Qualitative risk assessment involves making a formal judgement on the consequence and probability using:

- Risk = Severity x Likelihood

Assessment of Likelihood

Level	Likelihood	Description
1	Rare	Not expected to occur but still possible.
2	Remote	Not likely to occur under normal circumstances.
3	Occasional	Possible or known to occur.
4	Frequent	Common occurrence.
5	Almost Certain	Continual or repeating experience.

Assessment of Severity

Level	Severity	Description
5	Catastrophic	Fatality, fatal diseases or multiple major injuries.
4	Major	Serious injuries or life-threatening occupational disease (includes amputations, major fractures, multiple injuries, occupational cancer, acute poisoning).
3	Moderate	Injury requiring medical treatment or ill-health leading to disability (includes lacerations, burns, sprains, minor fractures, dermatitis, deafness, work-related upper limb disorders).
2	Minor	Injury or ill-health requiring first-aid only (includes minor cuts and bruises, irritation, ill-health with temporary discomfort).
1	Negligible	Not likely to cause injury or ill-health

Risk Matrix

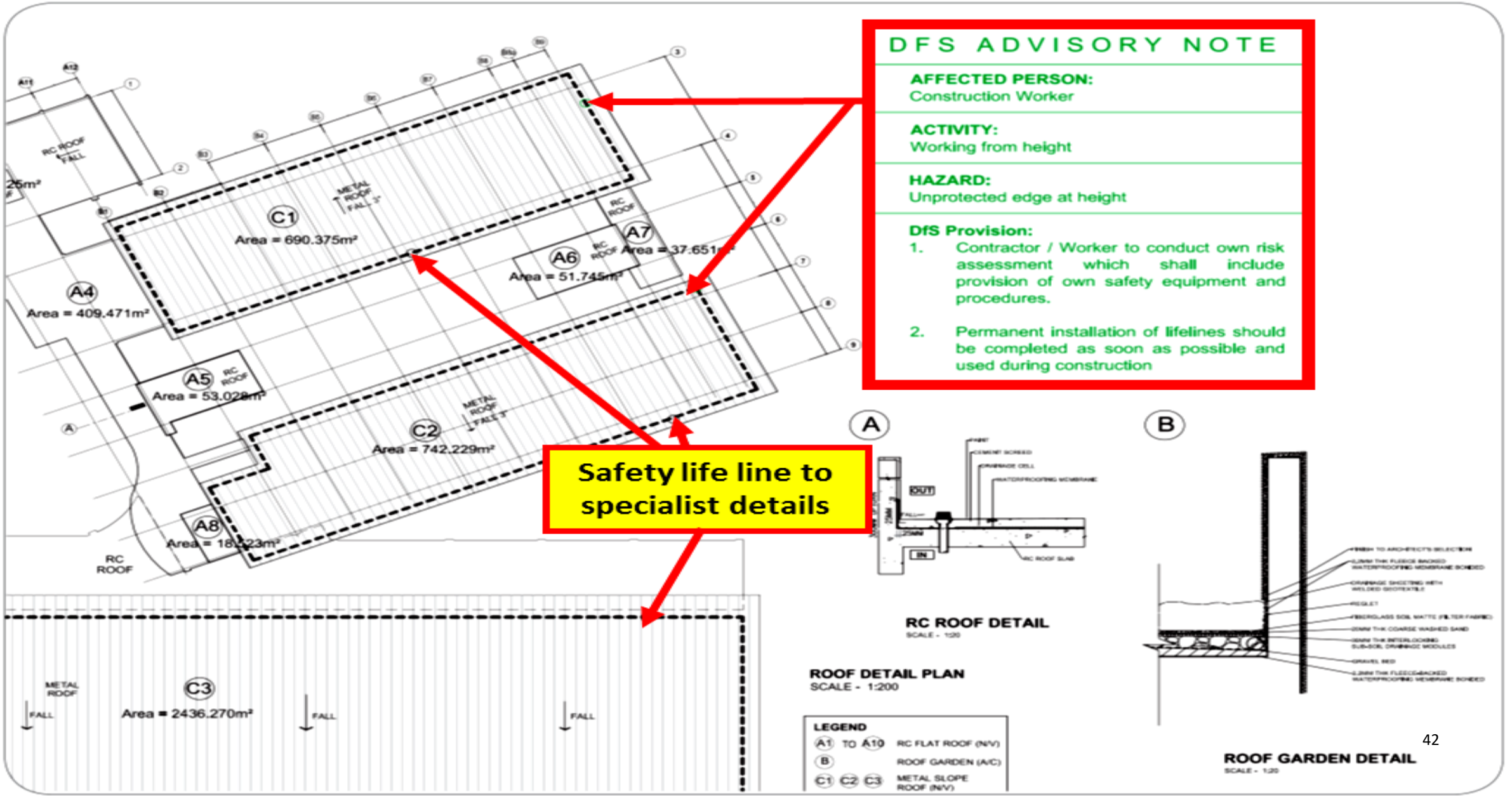
Likelihood / Severity	Rare (1)	Remote (2)	Occasional (3)	Frequent (4)	Almost Certain (5)
Catastrophic (5)	5	10	15	20	25
Major (4)	4	8	12	16	20
Moderate (3)	3	6	9	12	15
Minor (2)	2	4	6	8	10
Negligible (1)	1	2	3	4	5

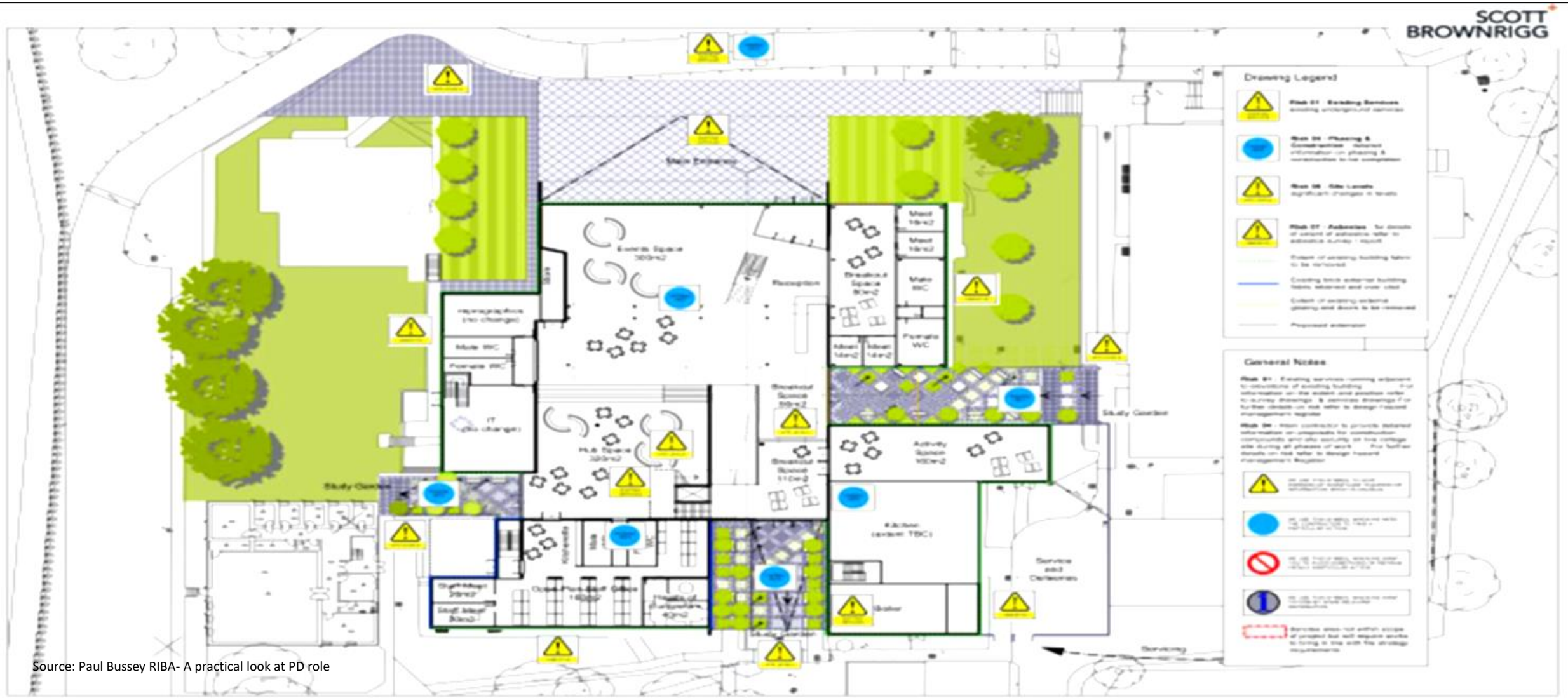
Action for Risk Levels

Risk level	Risk Acceptability	Recommended Actions
Low Risk	Acceptable	• No additional risk control measures may be needed. • Frequent review and monitoring of hazards are required to ensure that the risk level assigned is accurate and does not increase over time.
Medium Risk	Tolerable	• A careful evaluation of the hazards should be carried out to ensure that the risk level is reduced to as low as reasonably practicable (ALARP) within a defined time period. • Interim risk control measures, such as administrative controls or PPE, may be implemented while longer term measures are being established. • Management attention is required.
High Risk	Not acceptable	• High Risk level must be reduced to at least Medium Risk before work commences. • There should not be any interim risk control measures. Risk control measures should not be overly dependent on PPE or appliances. • If practicable, the hazard should be eliminated before work commences. • Management review is required before work commences.

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 3°
FALL
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)
A
B
RC ROOF DETAIL
SCALE - 1:20
ROOF GARDEN DETAIL
SCALE - 1:20

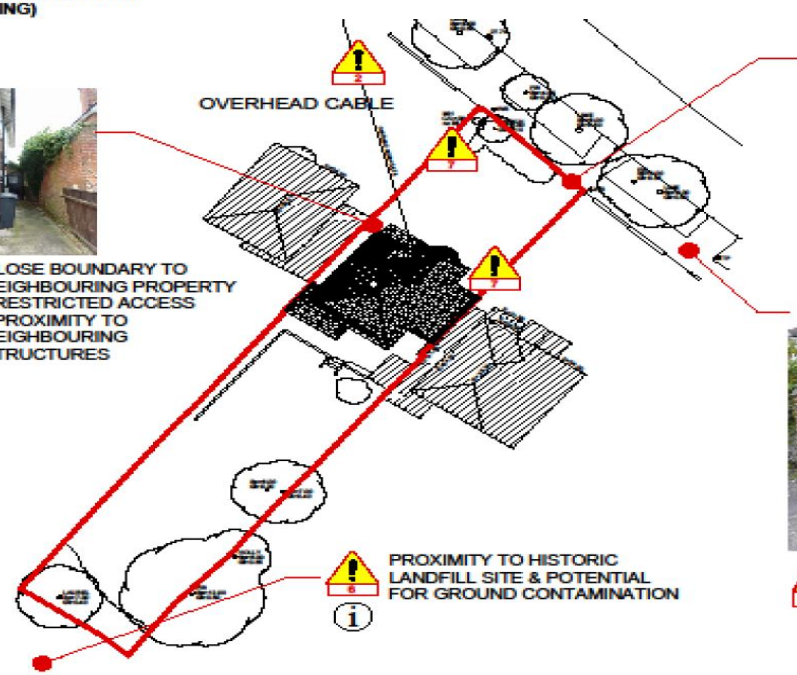


Source: Paul Bussey RIBA- A practical look at PD role

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

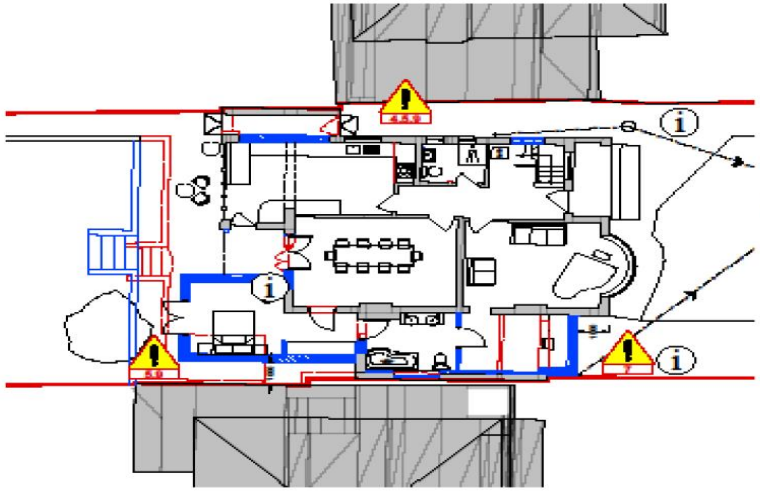
SITE LOCATION PLAN (EXISTING)

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



NARROW DRIVEWAYS
- RESTRICTED ACCESS

- FOOTPATH & HEDGEROW RUNNING ALONGSIDE HIGHWAY
- TREES LINING VERGE



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

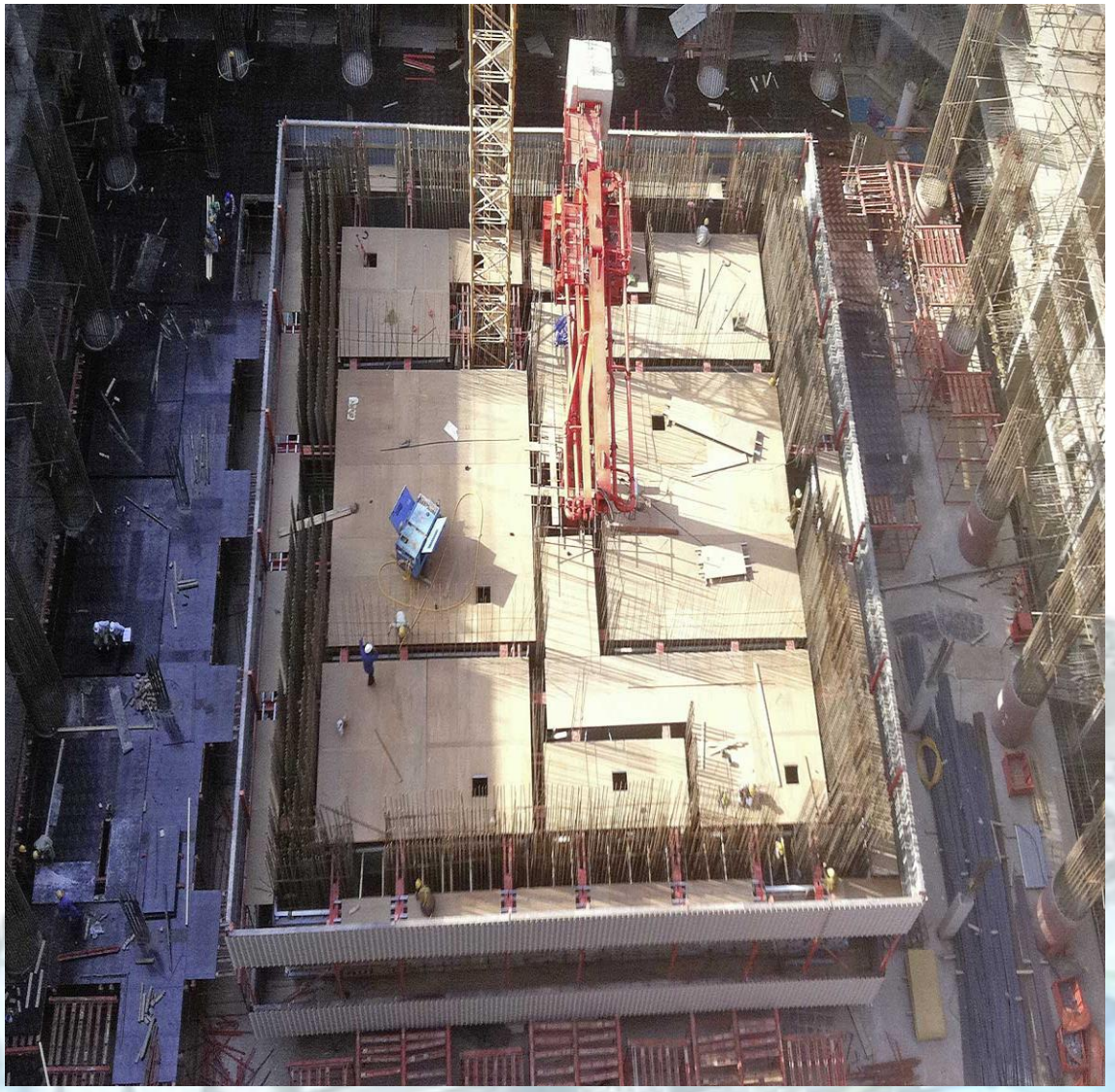
DATE	DRAWN BY	CHECKED BY
11.01.17	RB	JT

SCALE	JOB NO.
NTS@A3	1516160

DRAWING NO.	REVISION
CDM01	-

PLANNING

In-situ Vs IBS



Working Sheet for DRRULE-1

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

Department of Occupational Safety & Health

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 DRRULE-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 L	RISK S	RISK R	Possible Design Solutions	RESIDUAL RISK L	RESIDUAL RISK S	RESIDUAL RISK 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

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			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
								L	S	R			
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

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

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

IMPORTANCE OF PTD FOR OSH IN CONSTRUCTION PROJECTS

- Improve planning and management of project from an early stage of project
- Identify and mitigate OSH risks at design stage
- Cheaper to eliminate OSH hazards at design or planning stage
- Reduce overall costs of construction and maintenance of a building and structure due to injuries and illnesses

IMPORTANCE OF PTD FOR OSH IN CONSTRUCTION PROJECTS

- **Minimise losses to:-**
  - **life, injury & cost**
- **Ensure safety for current and future users**
- **Minimise unnecessary delays**
- **Avoid legal actions (statute and civil)**

WHAT IS “GOOD”

- **There is a clear commitment to safety and health**
- **Workers are involved in safety and health decisions**
- **Safety and health is treated as a priority**
- **Everyone contributes to safety and health**
- **Safety and health is measured**
- **Both safety and health risks are managed**
- **Everyone learns from experience**

OSHCIM Benefits

REDUCED COST

IMPROVED COORDINATION

IMPROVE DESIGN

PREVENT DELAYS

SUMMARY

- ***OSHCIM* will eventually be *legislated in the near future***
- ***Client duties* in ensuring Construction Management safety & health begins *EARLY FROM DAY 1*.**
- **DESIGN Decisions made in the planning and design stages can have safety and health implications in the later stages of construction**
- Design professionals can have a significant impact on construction injuries and fatalities by considering hazards in their designs – **Hazard prevention through design (PtD)**
- **Everyone has a role to prevent accident!!!**

THANK YOU

"Committed To Engineering Excellence"

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