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TRAINER'S MANUAL (MODULE 2)

DEPARTMENT OF
OCCUPATIONAL SAFETY & HEALTH
MINISTRY OF HUMAN RESOURCES

OCCUPATIONAL SAFETY & HEALTH

IN CONSTRUCTION INDUSTRY (MANAGEMENT)

OSHCIM TRAINER'S MANUAL

MODULE 2:

CONSTRUCTION INDUSTRY DUE DILIGENCE

THIS TRAINER'S MANUAL CONSISTS OF ENGLISH AND MALAY VERSION THAT COMPRISES OF:

MANUAL PENCERAMAH INI MENGANDUNGI VERSI BAHASA INGGERIS DAN BAHASA MELAYU YANG MERANGKUMI:

1. OSHCIM MIND MAP
   PETA MINDA OSHCIM
2. LESSON PLANS
   PELAN PEMBELAJARAN
3. TRAIN THE TRAINERS' (TTT) GUIDANCE NOTES
   NOTA BIMBINGAN BAGI PENCERAMAH (TTT)

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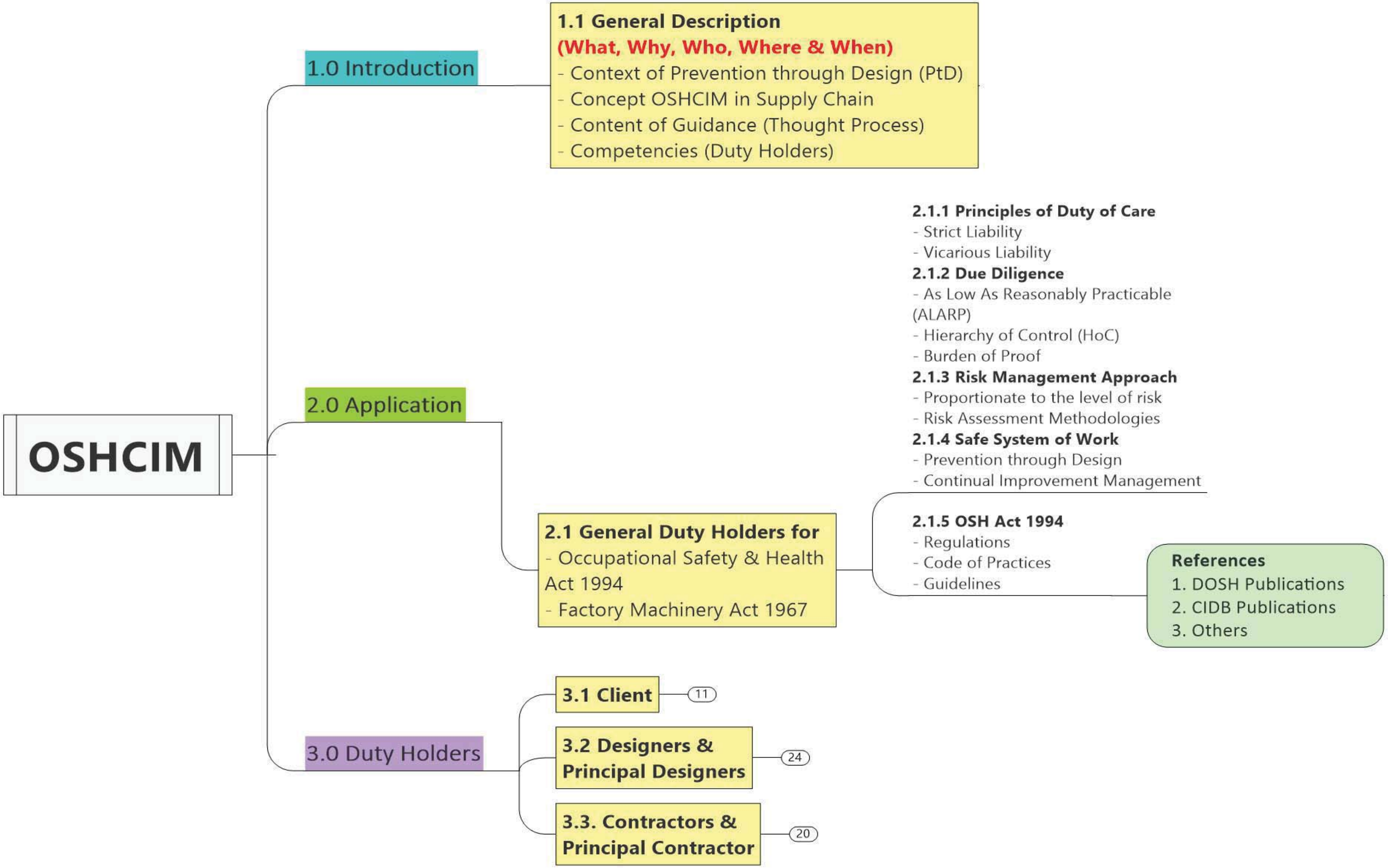
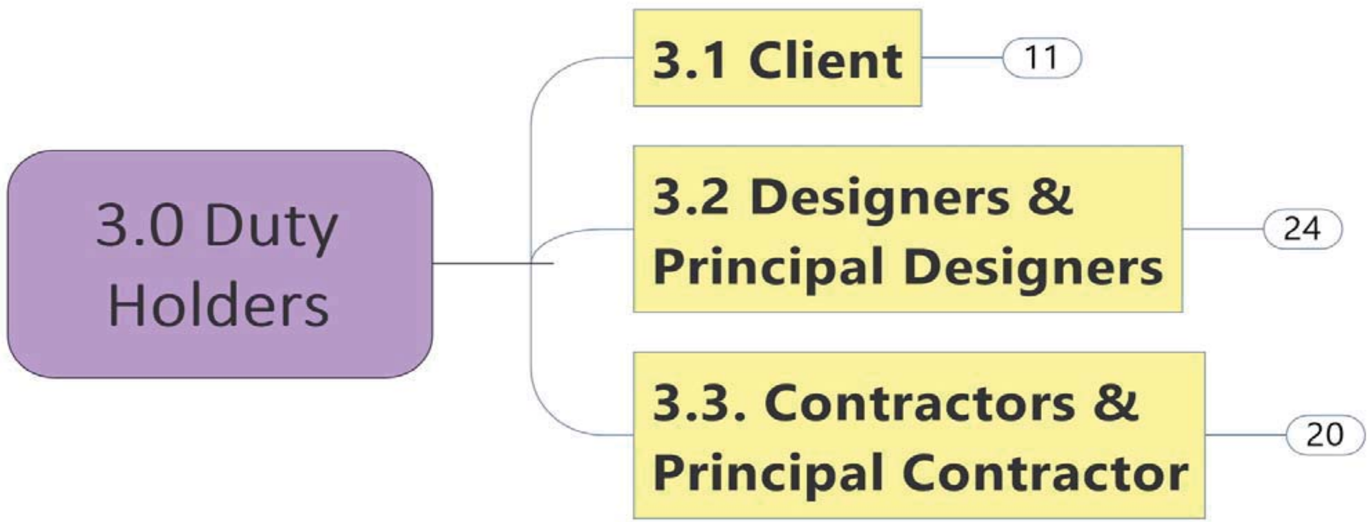
OSHCIM MIND MAP



OSHCIM
1.0 Introduction
1.1 General Description
(What, Why, Who, Where & When)
- Context of Prevention through Design (PtD)
- Concept OSHCIM in Supply Chain
- Content of Guidance (Thought Process)
- Competencies (Duty Holders)
2.0 Application
2.1 General Duty Holders for
- Occupational Safety & Health Act 1994
- Factory Machinery Act 1967
2.1.1 Principles of Duty of Care
- Strict Liability
- Vicarious Liability
2.1.2 Due Diligence
- As Low As Reasonably Practicable (ALARP)
- Hierarchy of Control (HoC)
- Burden of Proof
2.1.3 Risk Management Approach
- Proportionate to the level of risk
- Risk Assessment Methodologies
2.1.4 Safe System of Work
- Prevention through Design
- Continual Improvement Management
2.1.5 OSH Act 1994
- Regulations
- Code of Practices
- Guidelines
References
1. DOSH Publications
2. CIDB Publications
3. Others
3.0 Duty Holders
3.1 Client
11
3.2 Designers & Principal Designers
24
3.3. Contractors & Principal Contractor
20


3.0 Duty Holders
3.1 Client
11
3.2 Designers & Principal Designers
24
3.3. Contractors & Principal Contractor
20

3.1 Client

- **3.1.1 Introduction**
  - General Information
- **3.1.2 Who are Clients**
  - Client Roles
- **3.1.3 What should Client do?**
  - **A. Preparation: the client brief**
    - A1- What is a **client brief?**
    - A2- What should the client brief include?
    - A3- Appointment of Designers & Contractors
  - **B What do you have to do in the pre-construction phase?**
    - B1- Make suitable arrangements for managing the project
    - B2- Select the project team and formally appoint duty holders
    - B3- Provide information to help with design and construction planning **(Pre Construction Information-PCI)**
    - B4- **Notify the project to the enforcing authorities, where required**
    - B5- Ensure the management arrangements are working
    - B6- Pre-construction client checklist
  - **C. What do you have to do in the construction phase?**
    - C1- Ensure the **construction phase plan** is in place
    - C2- Ensure welfare facilities are in place
    - C3- Ensure the management arrangements are working
    - C4- Check completion and handover arrangements
    - C5- Co-operate with the principal contractor
  - **D. The health and safety file**
    - D1- What is the **safety and health file**?
    - D2- What should duty holders do?
    - D3- Check that the health and safety file has been prepared
    - D4- Maintain and make available the health and safety file
- **3.1.4 Client Work Process**
  - Process Map
  - Checklist
  - Documented Outputs
- **3.1.5 Attachments**
  - **A. Appendixes**
    - A1- Client Brief
    - A2- Pre Construction Information
    - A3- Construction Phase Plan
    - A4- Safety & Health File
    - **A5- DOSH OSHCI(M)GL 2017 Appendixes**
  - **B. References**
    - B1- DOSH Publications
    - B2- CIDB Publications
    - B3- Other Publications

3.2 Designers & Principal Designers

3.2.1 Introduction
- General Information

3.2.2 Who are Designers & Principal Designers & Roles
- What is the designer's role?
- Being appointed and appointing others.

10

3.2.3 Designers & Principal Designers Work Process

A. Design Risk Management Process
B. **Design Risk Mgmt Review**
C. Documented Outputs (Records)
D. Appendixes & References

11

3.2.2 Who are Designers & Principal Designers & Roles

- What is the designer's role?
- Being appointed and appointing others.

3.2.2.1 What should Designer do?

A. What do you have to do?

A1- Make clients aware of their duties
A2- Prepare and modify designs for safety and health
A3- Eliminate, reduce and control risks through design
A4- Co-operate and co-ordinate with others

B. What information do you need?

B1-Preparation
B2- Information from the client and principal designer
B3- Information from other designers
B4- Information from contractors
B5- Information from other interested parties

C. What information must you provide?

C1- Preparation
C2- Information for the client
C3- Information for the principal designer
C4- Information for other designers
C5- Information for principal contractors and contractors

D. What could it look like in practice?

D1- Provide a schedule on appointment
D2- Develop a good relationship with the client
D3- Ensure you understand the brief
D4- Clarify roles
D5- Hold regular meetings
D6- Undertake an early site visit
D7- Use building information modelling (BIM)
D8- Use Red-Amber-Green (RAG) lists

3.2.2 Who are Designers & Principal Designers & Roles

- What is the designer's role?
- Being appointed and appointing others.

3.2.2.2 What should Principal Designer do?

A. What do you have to do at project set up?

A1- Carry out your duties on appointment
A2- Help with the client brief
A3- Obtain information from the client

B. What do you have to do during the pre-construction phase?

B1- Liaise with the client
B2- Provide information to the designers
B3- Ensure co-ordination with and between the designers
B4- Oversee the design
B5- Develop the pre-construction information

C. What do you have to do during the construction phase?

C1- Liaise with the principal contractor
C2- Provide information to the principal contractor
C3- Receive information about design changes
C4- Prepare and develop the health and safety file

D. What could it look like in practice?

D1- Project set up
D2- Pre-construction phase
D3- Construction phase

3.2.3 Designers & Principal Designers Work Process

A. Design Risk Management Process
B. **Design Risk Mgmt Review**
C. Documented Outputs (Records)
D. Appendixes & References

A. Design Risk Management
- Integrating design and risk management
- Design considerations
- Integrating design and risk management

A1. Integrating design and risk management
- Pre-design phase
- Conceptual and schematic design phase - Design development phase
- Reviewing control measures

A2- Design considerations
- Design for safe construction
- Design to facilitate safe use
- Design for safe maintenance
- Modification
- Demolition and dismantling

A3- Integrating design and risk management
- Pre-design phase
- Conceptual and schematic design phase - Design development phase

B. Design Risk Mgmt Review
- Preliminary Hazard Analysis
- Systematic Risk Management.

WSHC SG WSH GL -Design for Safety 2016
GUIDE-1: Concept Design Review
GUIDE-2: Detailed Design Review
GUIDE-3: Pre-construction Review

NSW WC CHAIR (Construction Hazard Assessment Implication Review) Safety in Design Tool 2001
CHAIR-1 Study: Conceptual Design Review
CHAIR-2 Study: Detailed Design Construction or Demolition Review
CHAIR-3 Study: Detailed Design Maintenance & Repair Review

C. Documented Outputs
- Client Brief
- Pre Construction Information
- Construction Phase Plan
- Safety & Health File

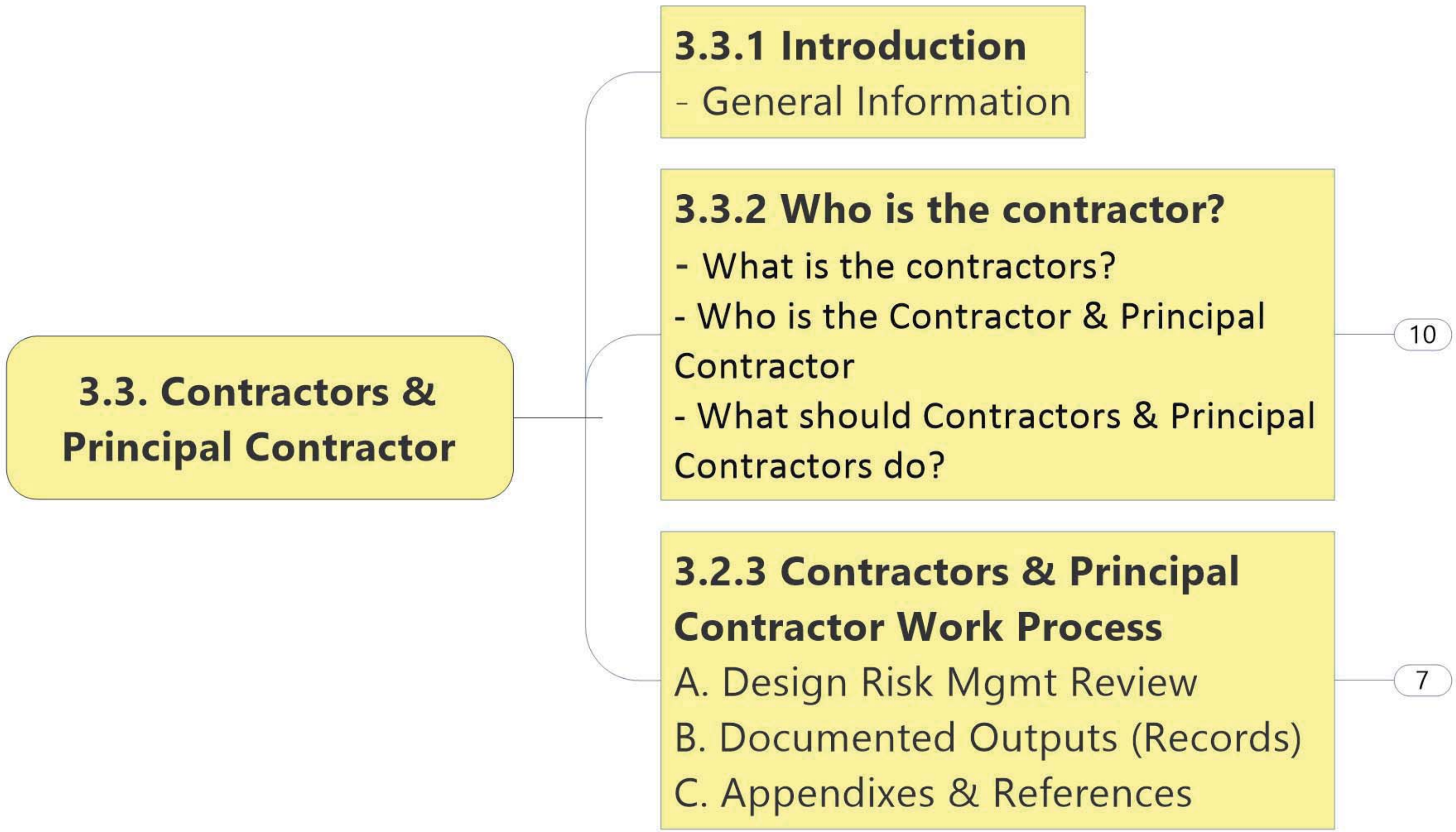
C1- SAMPLE
C2- CHECKLIST

D1- Appendixes
- DOSH OSHCI(M)GL 2017

D2-. References
- DOSH Publications
- CIDB Publications
- Other Publications

A5- DOSH OSHCI(M)GL 2017 Appendixes
- App 1. General principles of prevention
- App 2. Cooperation, communication and coordination between duty holders in various contractual arrangements.
- App 3. How different types of information relate to and influence each other in a construction project involving more than one contractor: A summary
- App 4. Work involving particular risks
- App 5. Minimum welfare facilities required for construction sites.

1. Sanitary conveniences
2. Washing facilities
3. Drinking water
4. Changing rooms and lockers
5. Facilities for rest


3.3. Contractors & Principal Contractor
3.3.1 Introduction
- General Information
3.3.2 Who is the contractor?
- What is the contractors?
- Who is the Contractor & Principal Contractor
- What should Contractors & Principal Contractors do?
10
3.2.3 Contractors & Principal Contractor Work Process
A. Design Risk Mgmt Review
B. Documented Outputs (Records)
C. Appendixes & References
7

3.3.2 Who is the contractor?

- What is the contractors?
- Who is the Contractor & Principal Contractor
- What should Contractors & Principal Contractors do?

3.3.2.1 What should Contractors do?

A. What do you have to do?
A1- Manage your work
A2- Co-operate with other duty holders
A3- Consult with employees
A4- Prepare the construction phase plan
A5- Ensure welfare facilities are provided
A6- Ensure a site induction is provided
A7- Ensure the site is secure
A8- Appoint contractors and workers
A9- Provide the right supervision

B. What information do you need?
B1-From Principal Contractor
B2-From the Workers

C. What information must you provide?
C1- To the Principal Contractor
C2- To the Workers

D. What could it look like in practice?
D1- Before you start on site
D2- While working on site

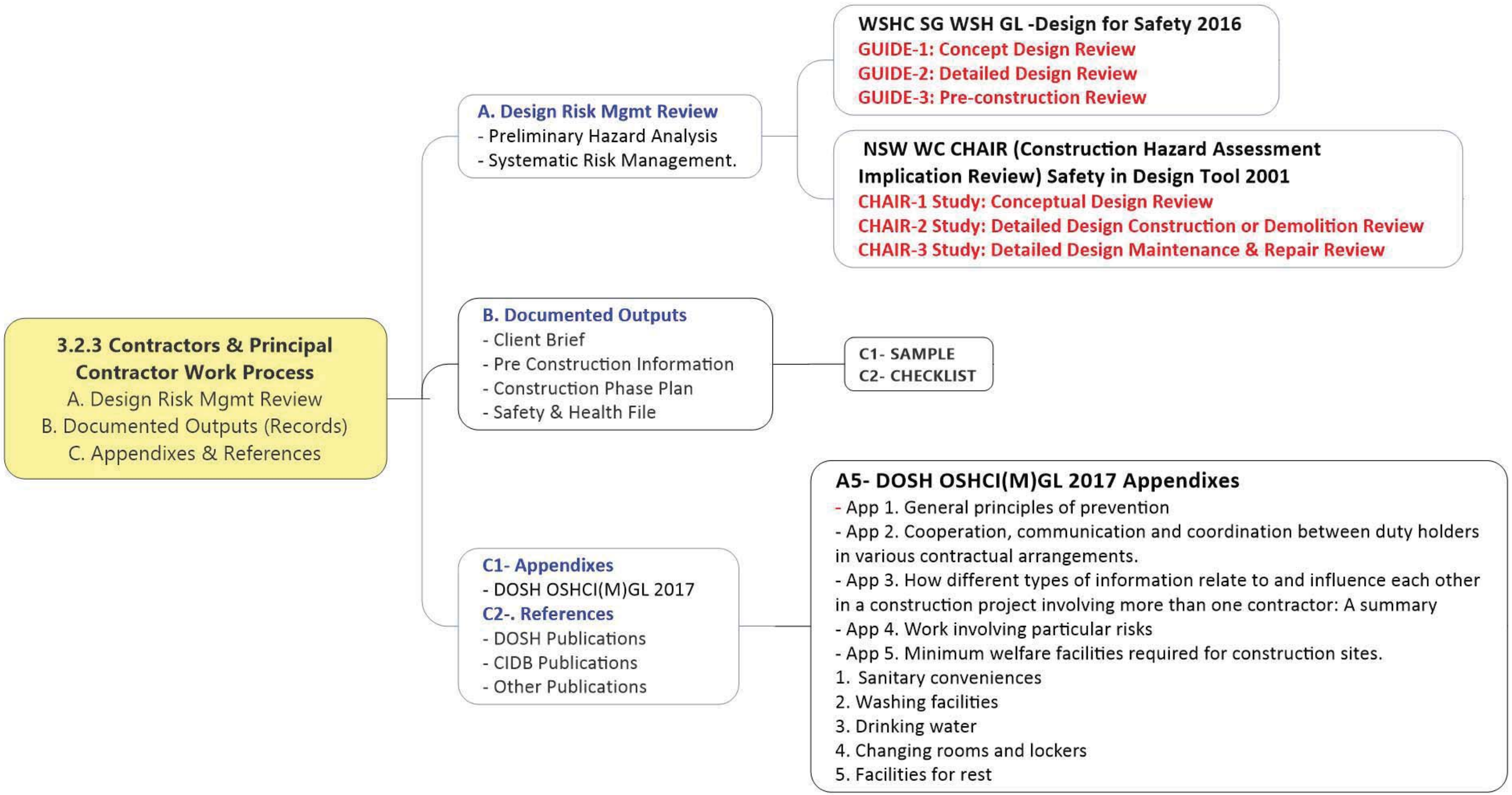
3.3.2.2 What should Principal Contractor do?

A. What do you have to do?
A1- Liaise with the other duty holders
A2- Manage the construction phase
A3- Prepare the construction phase plan
A4- Ensure welfare facilities are provided
A5- Provide a site induction
A6- Secure the site
A7- Appoint contractors and workers
A8- Provide the right management and supervision
A9- Engage contractors and workers
A10- Monitor the risks on site
A11- Contribute to the health and safety file

B. What information do you need?
B1- Receive from the Client
B2- Receive from the Principal Designers
B3- Receive form the Contractors

C. What information must you provide?
C1- To the Client Principal Contractor
C2- To the Principal Designers
C3- To the Designers
C4- To the Contractors
C5- To the Workers

D. What could it look like in practice?
D1- Before pricing the work
D2- Tender or pricing
D3- On site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B. Documented Outputs (Records)
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4. Changing rooms and lockers
5. Facilities for rest

ENGLISH

LESSON PLANS

OVERALL SUMMARY OF MODULE 2 – CONSTRUCTION INDUSTRY DUE DILIGENCE	
DAYS NEEDED TO CONDUCT THE MODULE	2 Days - Day 1 (8.00 am to 5.00 pm) - Day 2 (8.00 am to 5.00 pm)
OBJECTIVE	1. Duty holders will know their roles and responsibility under OSHCIM and how to properly implement OSHCIM 2. Duty holders will prioritize PtD in implementation process of construction project
OUTCOME	At the end of the module, duty holders are able to describe: 1. The Principles of Prevention through Design (PtD) and how it brings value to business by ensuring failure due to designs can be avoided 2. Their Duty of Care and extent of Due Diligence required to ensure their liabilities either corporate's or personal are manage 3. The prevailing Construction industry legal obligations 4. OSHCIM CDM Case Studies in application and implementation overseas 5. The OSHCIM Guideline 2017, Duty Holders and their general duties and specifically CLIENT role and the importance of Safety Design Risk Management processes
BENEFIT OF THIS MODULE TO PARTICIPANTS	• Participants will have knowledge on Principles of PtD, their duty of care, construction’s industry legal obligations, OSHCIM Guidelines 2017, duty holders’ duties and client roles
VALUE	• Care and compassion • Integrity • Responsibility • Respect • Honesty and Trustworthiness
APPROACH	1. Lecture 2. Video presentation 3. Learn from experience 4. Question and answer session
MATERIALS TO BE USED DURING LECTURE	• Speaker • LCD • Laptop • Microphone (fix/cordless/portable) • White board • Marker pen • Camera • Video • Audio recorder

TRAINING MATERIALS FOR PARTICIPANTS	• Power point handouts @ notes	• Pen • Pencil • Eraser	• Blank A4 papers
MATERIALS REQUIRED FOR TRAINER	• Soft copy of Power point slides	• Hardcopy of Power points handouts @ notes	

DAY 1				
TIME	**SLIDE**	**DETAIL**	**ESTIMATED DELIVERY TIME**	**REQUIREMENTS**
9.00 am – 9.23 am (Introduction)	1	• Ice breaking (Getting participant attention through jokes and stories on what happened yesterday or today morning before workshop) • Brief explanation on the topic, what the overall module is all about * Important for ice breaking to be successful, so that participant will feel engaged with the speaker	3 minutes	**Handouts to be used during the workshop
	2	• Trainer profile 1. Name 2. Education background 3. Experience in safety, health and environment sector 4. Experience in construction sector 5. Awards and recognition national and international level	2 minutes	
	3	• Brief explanation regarding DISCLAIMER	1 minute	
	4	• Tell participants the DO's and DON'T during you class. It can be anything. What you favour, pleasure and displeasure * Important to prevent inconvenience to the presenter and other participants involved	2 minutes	

	5	• Ask participant to install any QR Code Scanner or Reader in their smartphone. So that they can download any documents in the slide during the workshop. Give sometime for them to download. • Jokes along the way • Explain the use of QR code for downloading the publication at your own risk. Refer disclaimer	3 minutes	Smartphones
	6	• Tell all the topics that participants will learn for these 2 days list by list • Do not explain further as you will explain this in the next slide	1 minute	
	7	• Explain briefly what participants will learn for topic 1 to 3 in Day 1	2 minutes	
	8	• Explain briefly what participants will learn for topic 4 to 6 in Day 2	2 minutes	
	9	• Tell the objectives of this workshop	1 minute	
	10 11 12	• Describe the definition of all terms that participants will be hearing for 2 days • Make them familiarize the terms	6 minutes	

9.23 am – 10.26 am (63 minutes)	13	• List sub-topic that participants going to learn	1 minute	
	14	• Look at the history of OSHCIM development	3 minutes	
	15	• Describe UK construction statistics for 2013/2014	2 minutes	
	16	• Explain the reason behind the high numbers of construction fatalities	2 minutes	
	17	• Describe Malaysia occupational accidents statistics by sector until April 2018	2 minutes	
	18	• Compare national occupational accidents and fatality rate • Ask participant why the increasing trend happened in Malaysia	2 minutes	
	19	• Look at the trend of fatality rate	2 minutes	
	20	• Compare Malaysia and UK fatality rate and the reason behind it	2 minutes	
	21	• Discuss the figures • Ask participant what they think of the figure, what can be done, what can be prevented, what are their concern etc.	5 minutes	Video Camera Microphone Speaker
	22	• Discuss the figures • Ask participant what they think of the figure, what can be done, what can be prevented, what are their concern etc.	5 minutes	
	23	• Discuss the figures • Ask participant what they think of the figure, what can be done, what can be prevented, what are their concern etc.	5 minutes	

	24	• Discuss the figures • Ask participant what they think of the figure, what can be done, what can be prevented, what are their concern etc.	5 minutes	
	25	• Discuss the figures • Ask participant what they think of the figure, what can be done, what can be prevented, what are their concern etc.	5 minutes	
	26	• Explain the slide	2 minutes	
	27	• Explain figure with relevant examples	3 minutes	
	28	• Look into the section mention in the slide	1 minute	
	29	• Describe the figure in the slide	3 minutes	
	30	• Talk about importance of PTD for OSH in construction projects	4 minutes	
	31	• Explain with relevant examples		
	32	• Ask participants what is the purpose of life? • 'DO GOOD THINGS AND AVOID BAD THINGS'	1 minute	
	33	• Explain in detail PTD process • Ensure participants understanding	5 minutes	
	34	• Download the video and show it to the participants	3 minutes	
10.26 am – 11.00 am (34 minutes)	Coffee break for 34 minutes			

11.00 am – 12.30 pm (90 minutes)	35	• List sub-topic	1 minute	
	36	• State sub-topic	1 minute	
	37	• Define duty of care	2 minutes	
	38	• Explain the figure	3 minutes	
	39	• Correlate each component	3 minutes	
	40	• Explain briefly the extent of duty holder responsibility	3 minutes	
	41	• State and explain the slide (regarding OSH ACT 1994)	6 minutes	
	42			
	43	• Download QR Codes	3 minutes	
	44	• Explain each point in the figure	4 minutes	
	45	• Describe and relate each component in the figure	3 minutes	
	46	• Describe and relate each component in the figure	3 minutes	

	47	• Explain the flow	3 minutes	
	48	• Clarify the figure	5 minutes	
	49	• Correlate each component in the figure	3 minutes	
	50	• Define the guiding principles	2 minutes	
	51	• Explain employers duty of care	3 minutes	
	52	• State general duty of care	2 minutes	
	53	• Explain OSH policy	3 minutes	
	54	• Download QR Code	2 minutes	
	55	• Compare the figure	3 minutes	
	56	• Download QR Code	2 minutes	
	57	• Describe in detail each point	4 minutes	
	58	• Tell the Evolutionary process of OSHCIM	2 minutes	

	59	• Compare BOWEC and OSHCIM guidelines	4 minutes	
	60	• Download QR Codes and video regarding CITB	2 minutes	
	61	• Discuss all the points in the slide	3 minutes	
	62	• Explain all key elements	3 minutes	
	63	• Explain general principles of prevention and give relevant examples	3 minutes	
	64	• Animate and describe obligation of OSHCIM under OSH Act 1994	5 minutes	
	65	• Summarize the list of duty holders and their roles	3 minutes	
Rest for 1h 30 minutes (Lunch and Pray)				

(2.00 pm – 2.58 pm) (58 minutes)	66	• List subtopics for stakeholders roles and expectations	1 minutes	
	67	• Give overview for Part 3	3 minutes	
	68	• Describe the purpose and roles of each stakeholders	4 minutes	
	69	• Describe the animated flow of diagram. • Title description requires the change process to achieve the needs in sequence. - Business Needs - Concept & Design - Implementation - Post Implementation. • Describe the Change Process development of - Awareness - Desire - Knowledge - Ability - Reinforcement • Then only SUCESSFUL CHANGE can happen	10 minutes	
	70	• Explain the slide by giving appropriate situation example	5 minutes	

	71	• Explain the slide by giving appropriate situation example	5 minutes	
	72	• Explain the slide by giving appropriate situation example	5 minutes	
	73	• Explain the slide by giving appropriate situation example	5 minutes	
	74	• Explain the slide by giving appropriate situation example	5 minutes	
	75	• Explain the slide by giving appropriate situation example	5 minutes	
	76	• Explain the slide by giving appropriate situation example	5 minutes	
	77	• Explain the slide by giving appropriate situation example	5 minutes	

(3.00 pm – 4.37 pm) 1h 37m	78	• List down all the subtopic to be discussed for Part 4	1 minute	
	79	• Give overview on enforcement prosecution CDM 2015 2016/17.Give situation examples when appropriate	4 minutes	
	80	• Explain the slide and give relevant examples of cases and situation where appropriate	4 minutes	
	81	• Explain the slide and give relevant examples of cases and situation where appropriate	5 minutes	
	82	• Discuss the graph • Explain the slide and give relevant examples of cases and situation where appropriate	5 minutes	
	83	• Discuss the graph • Explain the slide and give relevant examples of cases and situation where appropriate	5 minutes	
	84	• Discuss the graph • Explain the slide and give relevant examples of cases and situation where appropriate	5 minutes	
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	86	• Discuss the graph • Explain the slide and give relevant examples of cases and situation where appropriate	5 minutes	
	87	• Explain the slide and give relevant examples of cases and situation where appropriate	5 minutes	
	88	• Explain the slide and give relevant examples of cases and situation where appropriate	5 minutes	
	89	• Explain the slide and give relevant examples of cases and situation where appropriate	5 minutes	
	90	• Download QR Code to the website	1 minute	
	91	• Explain PtD in the industry	3 minutes	
	92	• Sequencing and Design Considerations for Demolition explain with relevant examples	4 minutes	
	93	• Discuss PtD solution	4 minutes	
	94	• Describe all images	5 minutes	

	95	• Briefly explain the benefits of PtD in this case	4 minutes	
	96	• Façade Installation - Specialist Access Equipment Design – Heathrow T5- explain with relevant examples	5 minutes	
	97	• Show the picture and describe in brief	3 minutes	
	98	• Discuss PtD solution	4 minutes	
	99	• Briefly explain the benefits of PtD in this case	4 minutes	

DAY 2				
	100	• Roof Access - Permanent Fall Prevention Methods- Initial Design - explain with relevant examples	4 minutes	
	101	• Give ideas on the existing problem and the risks for this case	4 minutes	
	102	• Explain the picture with relevant examples	4 minutes	
9.00 am – 10.30 am (1 h 33 minutes)	103	• Describe the solution given	4 minutes	
	104	• Briefly explain the benefits of PtD in this case	3 minutes	
	105	• External Refurbishment of Unusual Structures - explain with relevant examples	4 minutes	
	106	• Describe the solution given	4 minutes	

	107	• Briefly explain the benefits of PtD in this case	4 minutes	
	108	• Download QR Codes	3 minutes	
	109	• Explain the tittle of the slide	1 minute	
	110	• Describe the CDM Process	12 minutes	
	111			
	112	• Download QR Codes	2 minutes	
	113	• Download QR Codes	1 minute	
	114	• List all the examples	2 minutes	

	115	• Give overview of the topic	1 minute	
	116	• Explain the topic with relevant examples	2 minutes	
	117	• Discuss the pictures given in the slide	3 minutes	
	118	• Discuss the pictures given in the slide with relevant cases etc	3 minutes	
	119	• Explain the topic with relevant examples	3 minutes	
	120	• Discuss the pictures given in the slide with relevant cases etc	3 minutes	
	121	• Discuss the pictures given in the slide with relevant cases etc	3 minutes	
	122	• Discuss the pictures given in the slide with relevant cases etc	3 minutes	

	123	• Discuss the pictures given in the slide with relevant cases etc	3 minutes	
	124	• Discuss the pictures given in the slide with relevant cases etc	3 minutes	
	125	• Discuss the pictures given in the slide with relevant cases etc	4 minutes	
Coffee Break 30 minutes (10.33 am – 11.00 am)				

11.00 am – 12.35 pm (1 h 35 m)	126	• Give overview of the topic	1 minute	
	127	• Download QR Codes and	4 minutes	
	128	• Discuss the pictures given in the slide with relevant cases etc	3 minutes	
	129	• Discuss the pictures given in the slide with relevant cases etc	3 minutes	

	130	• Discuss the pictures given in the slide with relevant cases etc	4 minutes	
	131	• Discuss the pictures given in the slide with relevant cases etc	4 minutes	
	132	• Download QR Codes	2 minutes	
	133	• Download QR Codes	2 minutes	
	134	• Explain the example for Singapore experience	4 minutes	
	135	• Discuss on how to clean the roof	4 minutes	
	136	• Discuss DFS example 2	3 minutes	
	137	• Discuss DFS example 3	4 minutes	

	138	• Discuss the picture in the slide	5 minutes	
	139	• Briefly explain the designers of sport hub	3 minutes	
	140	• Explain the point in the slide	4 minutes	
	141	• Discuss in detail	4 minutes	
	142	• Discuss the slide with participants	4 minutes	
	143	• Explain and discuss the slide with participants • Include relevant example	4 minutes	
	144	• Explain and discuss the slide with participants • Include relevant example	3 minutes	
	145 146	• List all the sub-topic and the objective of OSHCIM	1 minute	

	147 148	• Describe construction stage	4 minutes	
	149	• Define the terms	1 minute	
	150	• State key elements for OSHCIM guidelines	2 minutes	
	151	• Describe general principles of prevention	2 minutes	
	152 153	• Explain the meaning of client • Give examples	2 minutes	
	154	• Describe the flowchart	1 minute	
	155 156 157 158	• Discuss and explain relationship between client, principal designers and principal contractor	4 minutes	
	159 160	• Describe client' s roles and responsibility	2 minutes	

	161, 162	• Describe and explain the point in the pictures, the connection between each point	2 minutes	
	163	• Tell participants information needed to have and be distributed	2 minutes	
	164	• Explain all points in the table	3 minutes	
	165, 166, 167, 168	• Explain in detail duty holders documentation thought process • What clients need to ensure • What clients need to provide	5 minutes	
Lunch Break (12.30pm – 2.00 pm) – 1h 30m				

(2.00 pm – 5.00 pm) 3h	169	• Describe client brief contents	2 minutes	
	170	• Explain and discuss Pre-Construction Information Consideration • What to put inside the form	4 minutes	
	171			
	172	• Download QR Codes • Explain data needed to be put in the Pre-Construction Health, Safety and Environment Information	5 minutes	
	173			
	174			
	175	• Download QR Codes and explain briefly the content	2 minutes	
	176	• Download QR Codes and explain briefly the content	2 minutes	

	177			
	178	• Explain in detail components in the safety and health file • Give relevant examples	5 minutes	
	179			
	180	• Download QR Codes and explain briefly the content	2 minutes	
	181	• Download QR Codes and explain briefly the content	2 minutes	
	182	• Explain in detail safety and health file development and use	4 minutes	
	183	• State all the points in the slide	1 minute	
	184	• Download QR Codes and explain briefly the content	2 minutes	

	185	• Download QR Codes and explain briefly the content	2 minutes	
	186	• Download QR Codes and explain briefly the content	2 minutes	
	187	• Describe option A	2 minutes	
	188	• Describe option B	2 minutes	
	189	• Discuss the duty holder process map	3 minutes	
	190	• Explain the slide	2 minutes	
	191	• Explain the slide and give appropriate examples	2 minutes	
	192		2 minutes	

	193 194 195	• These 3 slides contain information on the same topic which is duties of designers checklist • Ensure to discuss and explain all the points in the slides	4 minutes	
	196 197 198	• These 3 slides contain information on the same topic which is 'Who is principal designer' • Ensure to discuss and explain all the points in the slides	4 minutes	
	199 200	• State principal designers duties • state risk management principles	2 minutes	
	201	• Look into the pictures and discuss hazards in construction site	4 minutes	
	202	• Show the form of preliminary hazard analysis • Explain and discuss the form	3 minutes	

	203 204 205	• These 3 slides contain information on the same topic which is ‘Design risk key factors’ • Ensure to discuss and explain all the points in the slides	5 minutes	
	206	• Describe ALARP – Hierarchy of control	3 minutes	
	207	• Download the code and describe briefly about the document	1 minute	
	208	• Show the form and explain it to the participants	3 minutes	
	209	• Download QR Code and discuss briefly the content of the document	1 minute	
	210 211	• Explain the slide regarding HIRARC 2008	6 minutes	

	212	• Explain ALARP	2 minutes	
	213 214	• Discuss in detail and give explanation with relevant examples for these slides	4 minutes	
	215	• Discuss the flowchart	3 minutes	
	216	• Explain with relevant examples of the points in the slide	3 minutes	
	217	• Explain the process	3 minutes	
	218	• State the RULES	1 minute	
	219 220 221	• Overview the topic • Explain the examples briefly	4 minutes	

	222	• These 3 slides contain information regarding Rule 1 • Explain the slides clearly yet simple	4 minutes	
	223			
	224			
	225	• These 4 slides contain information regarding Rule 2 • Explain the slides clearly yet simple	8 minutes	
	226			
	227			
	228			
	229	• Explain Rule 3	2 minutes	
	230	• Discuss Health Hazards	3 minutes	
	231	• These 4 slides contain information regarding Risk Control Principles and Residual Risk with example of plant layout • Explain the slides clearly yet simple	8 minutes	
	232			
	233			
	234			
	235	• Download QR Codes	1 minute	
	236	• RIBA – CDM Tips (explain the slide)	2 minutes	
	237	• Describe duty holder process map	2 minutes	

	238 239 240 241	• These 4 slides contain information regarding contractor • Define contractor • Explain their duties with relevant examples	5 minutes	
	242 243	• Download QR Codes • Explain briefly the content of the documents	4 minutes	
	244	• Define principle contractor	2 minutes	
	245 246 247 248	• Explain the duties of principle contactor checklist which is contained in these 4 slides	4 minutes	
	249	• Explain the slide	2 minutes	
	250	• Download QR codes regarding HSE UK references	2 minutes	
	251	• Download QR Codes and describe the documents	2 minutes	

	252	• Download QR Codes and describe the documents	2 minutes	
	253	• Explain the slide with relevant examples	2 minutes	
	254	• Overview the topic	2 minutes	
	255	• Describe the buy in process		
	256	• Explain the slide with relevant examples	2 minutes	
	257	• Explain the slide with relevant examples	2 minutes	
	258	• Explain the slide with relevant examples	2 minutes	
	259	• Remind participants back the benefits of OSHCIM	2 minutes	
	260	• Summarize client	3 minutes	
	261	• Summarize designers		
	262	• Summarize principal designers		
	263	• Summarize principal contractor		
	264	• Summarize contractor		
	265	• Summarize workers		
	266	• Explain the slide	2 minutes	

	267	• Summarize PtD	2 minutes	
	268	• Next step?	2 minutes	
	269	• Discuss proposed solutions		
	270	• Question answer session	2 minutes	

TRAIN THE TRAINERS (TTT) GUIDANCE NOTES

Dear Instructor,
This presentation file is intended to facilitate the Prevention through Design concept into constructions industry course. The file is organized to make it easy for you to use the slides that fit the number of hours of instruction that your course schedule allows.

INTRODUCTIONS

1. Construction is a high hazard industry that comprises a wide range of activities involving construction, alteration, and/or repair. Examples include residential construction, bridge erection, roadway paving, excavations, demolitions, and large scale painting jobs. Construction workers engage in many activities that may expose them to serious hazards, such as falling from rooftops, unguarded machinery, being struck by heavy construction equipment, electrocutions, silica dust, and asbestos.

2. Also the concept of Due diligence or 'technical due diligence' we are referring to the process of investigating a site to assess its suitability for a particular project and the risks involved before proceeding with that project. A due diligence checklist is presented below, providing a list of some of the aspects of a site and its context that it may be necessary to investigate.

3. Construction due diligence—overview

When a client is proposing to purchase a property or properties or purchase a company, whose assets include properties, due diligence will need to be carried out to ensure that the properties are sound and that 'good title' can be obtained. Where the property in question contains a building which was built less than 12 years before or where a substantial amount of construction work was carried out at the property within the past 12 years, it is advisable that a full due diligence of the construction documentation is carried out.

What are the main reasons for carrying out construction due diligence?

- **To establish what construction contracts were entered into in relation to the works carried out.**
- **To establish what obligations were imposed upon the contractor and the design consultants and to ensure that the documents have been drafted to an 'institutionally acceptable standard'.**
- **To establish if the purchaser will be able to acquire rights in the documents, to enable it to be able to commence actions against the defaulting parties if problems arise in the property due to faulty design and construction.**

Trainer Profile

2

DISCLAIMER

- *The information contained in program has been developed in good faith and is believed to present occupational safety & health safety principles. The training provider and all other participating organization make no representations or warranties as to the completeness or accuracy thereof. Persons using this information must make their own determination as to its suitability for the purposes in support of their own safety program. The training provider and all other participating organizations are in no way responsible for damages of any nature resulting from the use of this information;*
- *It should also be recognized that this training program is only part of a comprehensive training program on Occupational Safety & Health. For optimum results, this presentation should be augmented by various in-house group discussions and hands-on training to fully prepare yourself to implement these techniques in your working environment.*
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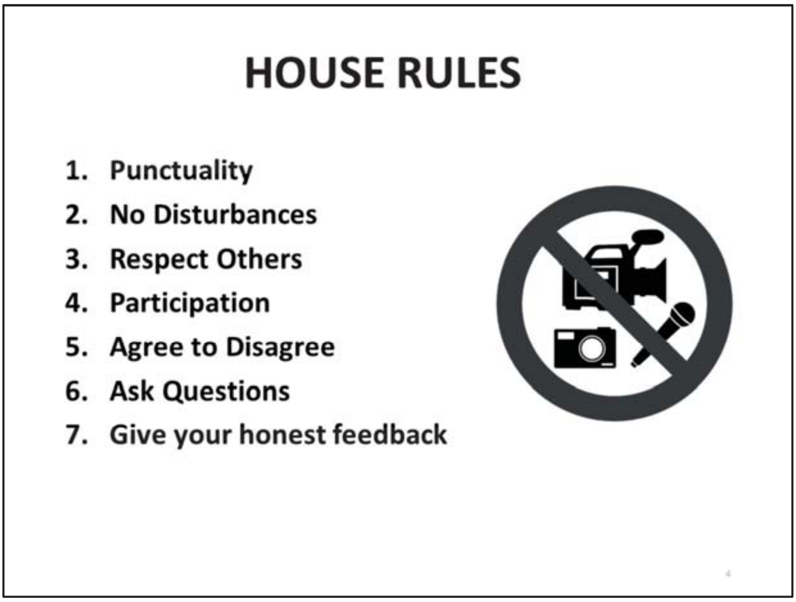
3

REMINDER TO ALL TRAINER AND TRAINEE REGARDS ON DISCLAIMER AND REGULATIONS SHOULD ALL FOLLOW



Dear Instructor,

All participate should be remind abut the seminar rule and regulations is follow.

4. House Rules

4.1 Punctuality – ***NO LATE*** **attend the seminar. If you know you will be absent in seminar the day, you should plan on doing the plan your time work and task before attend the seminar effectively.**

4.2 No Disturbance - You are expected to participate diligently and professionally in the seminar. If there are issues with your team member , please make sure you approach me as the instructor.

4.3 Respect Other - fundamental to self-respect. Once you begin to genuinely adopt and develop these, you'll be on your way to developing a healthy level of self-respect. However, as we talked about the true you in a previous article, certain ideals have the greatest impact on your level of self-respect and you'll have to determine how that quality will be deployed within your life such as being an honest

person and with others. One of the best ways to show respect for someone is to truly listen to another's point of view. Obviously, we'll not always agree with one another on every topic (and you should never adopt a point of view with which you do not agree), but we should allow each other to have and express our own views – regardless of whether we agree with them or not.

4.4 Participations – Discussion-based activities such as case-study analyses, role playing, and jigsaws encourage trainer to talk with one another and with the instructor. To be effective, however, they typically require clear instructions, including timelines. With one-on-one exchanges, you can adopt a deep questioning approach, probing trainer about the reasoning behind their responses, sometimes doing so repeatedly to achieve greater depth.

4.5 Agree and Disagree –Actually, it two way communications, agreeing to disagree simply means coming to an understanding with someone that you have a difference of opinion. When you agree to disagree, you acknowledge that neither person is going to convince the other person to change his or her mind, so you might as well stop arguing.

4.6 Ask Questions – The asking session will be any time as the seminar still running , the trainer can ask questions as just rise your hand and ask questions related to the seminar topic.

4.7 Give your honest feedback - Feedback is the process in which part of the output of a system is returned to its input in order to regulate its further output. It should be an essential part of education, training and personal development.

4.8 Laptop/Cell Phones/Electronic Gadgets –Remind the participate that if they use laptop to take notes or look up the Internet as it relates to in-class discussion. Please be respectful and use your laptops and other electronics judiciously. Please bear in mind that cold-calling is fair game at any point during seminar.

EXPLAIN THE USE OF QR CODE FOR DOWNLOADING THE PUBLICATION AT YOUR OWN RISK.
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(Note to Instructor: You will probably wish to modify this slide and the speaker notes below to reflect the topics that you will cover. For example, you could delete the topics that you will not cover or italicize the topics you do not cover and make the presentation file available to the students to let them review outside of class topics not covered in class.)

This is an overview of what the Prevention through Design topics that we will cover. Many of you are probably not familiar with the concept of Prevention through Design so we will spend a few minutes discussing what the concept is. Next we will summarize the Osh legalizations, the role of stakeholder and case study that we will discus time to time in this course. Similarly, we will summarize the OSHCI (M) guideline 2017 and challenge ahead facing by the constructions industry

Describe the main table of content that should include in this seminar and the outcome learning from these module every each topic.

1. **Prevention through design (PtD) – meaning by also called safety by design is the concept of applying methods to minimize occupational hazards early in the design process, with an emphasis on optimizing employee health and safety throughout the life cycle of materials and processes**

2. **Osh Legalizations - Occupational safety and health (OSH), also commonly referred to as occupational health and safety (OHS), occupational health, or workplace health and safety (WHS), is a multidisciplinary field concerned with the safety, health, and welfare of people at work. These terms also refer to the goals of this field, so their use in the sense of this article was originally an abbreviation of occupational safety and health program/department etc.**

3. **Stakeholder role - The fundamental question to be asked when considering these issues is any potential stakeholder wish to become involved in the promotion of health and well being in, and through, the workplace' Several answers are possible, and in reality stakeholder involvement may well be based on a mixture of some or all of them. They include:**

- ❖ **Altruism – we do it because we believe it is the right thing to do irrespective of cost • investment – we do it because we perceive that there will be a return.**
- ❖ **On our investment. This can be tangible e.g. an employer might expect that sickness absence costs will diminish, and / or intangible – the workforce will see that we are a caring employer and commitment and morale might rise as a consequence**
- ❖ **Compulsion – we do it because we have been told we have to. The significant risk with this approach is that we will do the absolute minimum**
- ❖ **lost opportunity – we do it because the potential benefits are so great that we cannot afford not to, or that our competitors are doing it, thus we must do the same to maintain our market position.**

4. Case study of PtD.

5. OSHCI (M) GUIDLINE 2017

6. Challenge Ahead.

CONTENTS

Prevention through Design (PtD) is an emerging risk management technique that is being applied successfully in many industries, including manufacturing, healthcare, telecommunications and construction. The concept is simply that the safety of workers throughout the life cycle is considered while the product and/or process is being designed. The life cycle includes the construction or manufacturing, operations, maintenance and eventual disposal of whatever is being designed, which could be a facility, a material or a piece of equipment.

1. Principles of Prevention through Design (PtD) -PtD Initiative is to prevent or reduce occupationally related injuries, illnesses, fatalities, and exposures by including prevention considerations in all designs that affect individuals in the occupational environment.

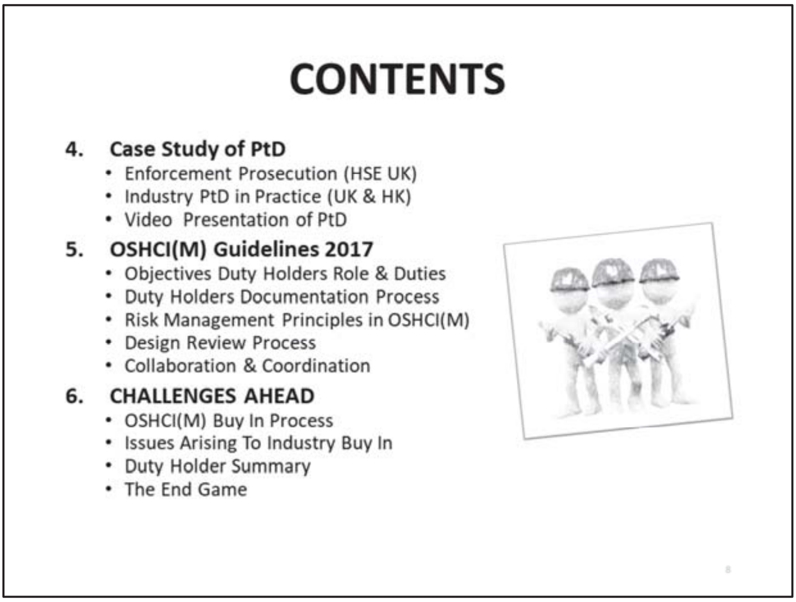
- ❖ **The Business Case of OSHCI(M)**
- ❖ **Global Construction Industry Accident Statistic**
- ❖ **Video Presentation of OSHCI(M) Promo**

2. OSH Legislation principles and application in the Construction Industry

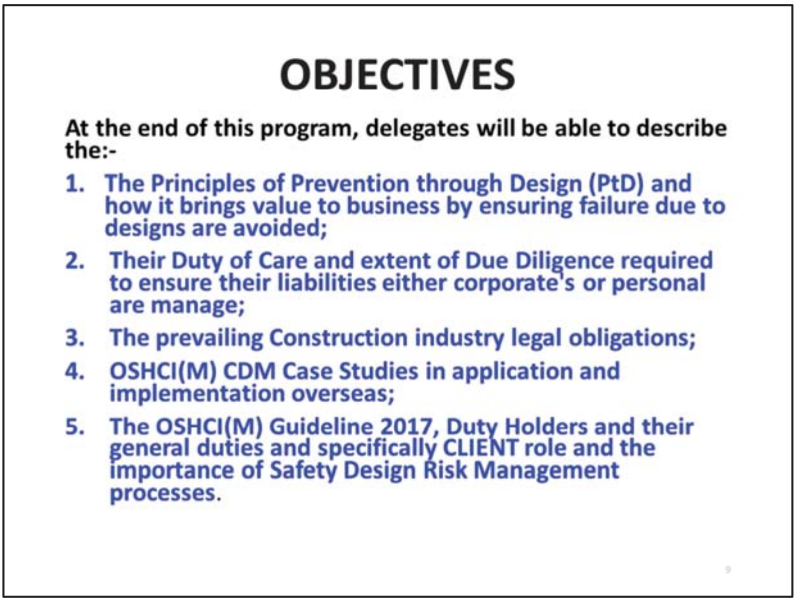
- ❖ **Principles of Duty of Care Due Diligence**
- ❖ **OSH Act 1994 & FMA 1967**
- ❖ **Construction Industry Duty Holders OSH Liabilities**

3. Stakeholders Roles & Expectations

- ❖ **Enforcement Authorities**
- ❖ **AEC Professional Bodies & NGO's**
- ❖ **Educational Institutions**


CONTENTS
4. Case Study of PtD
• Enforcement Prosecution (HSE UK)
• Industry PtD in Practice (UK & HK)
• Video Presentation of PtD
5. OSHCI(M) Guidelines 2017
• Objectives Duty Holders Role & Duties
• Duty Holders Documentation Process
• Risk Management Principles in OSHCI(M)
• Design Review Process
• Collaboration & Coordination
6. CHALLENGES AHEAD
• OSHCI(M) Buy In Process
• Issues Arising To Industry Buy In
• Duty Holder Summary
• The End Game

CONTENTS



DESCRIBE THE OBJECTIVES.

In construction, PtD represents a change from custom and practice whereby design professionals (that is, architects and/or engineers), and typically the project owner (that is, the client), become involved in reducing the risk of injuries or other health hazards throughout the life of a project, beginning at the earliest stages of a project's life cycle. PtD is thus the deliberate consideration of construction and maintenance worker safety in the design phase of a construction project. PtD processes in construction have been required in the UK for over a decade and are being implemented in other countries such as Australia and Singapore.

It is important to note that the PtD concept applies only to the design of the permanent facility, that is, to the aspects of the completed building that make a project inherently safer to build. PtD does not focus on how to make different methods of construction engineering safer. For example, it does not focus on how to use fall protection systems, but it does include consideration of design decisions that influence how often fall protection will be needed. Similarly, PtD does not address how to erect safe scaffolding, but it does relate to design decisions that influence the location and type of scaffolding needed to accomplish the work. Design professionals are in a position for decision-making and influencing to help improve construction safety in these and many other areas.

As the outcome from attending this program, delegates will be able to describe the:-

1. **The Principles of Prevention through Design (PtD) and how it brings value to business by ensuring failure due to designs are avoided;**

2. Their Duty of Care and extent of Due Diligence required to ensure their liabilities either corporate's or personal are manage;

3.The prevailing Construction industry legal obligations;

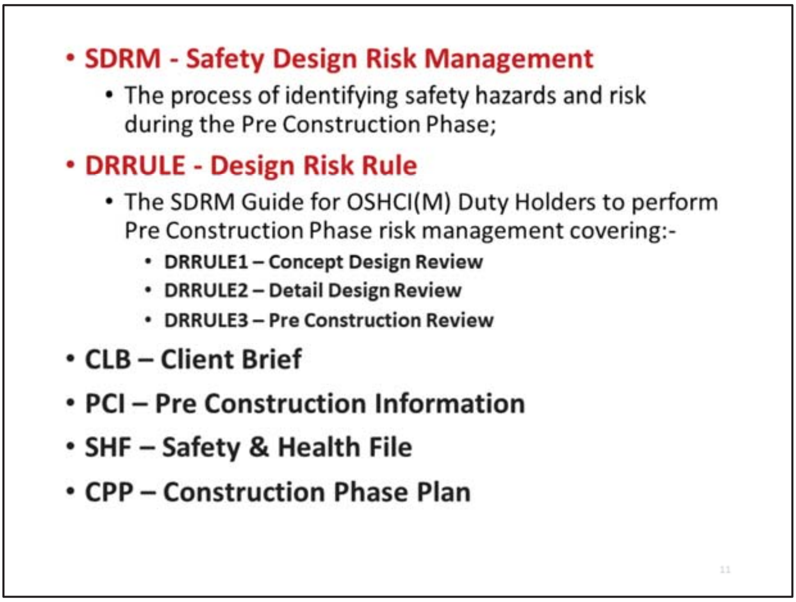
4.OSHCI(M) CDM Case Studies in application and implementation overseas;

5.The OSHCI(M) Guideline 2017, Duty Holders and their general duties and specifically CLIENT role and the importance of Safety Design Risk Management processes.

GLOSSORY

- **OSHCI(M)**
  - **Occupational Safety & Health Construction Industry (Management) Guidelines 2017;**
- **PtD – Prevention through Design Terminologies**
  - **DfS - Design for Safety**
  - **PtD – Safety by Design**
  - **CDM – Construction Design Management**

- **OSHCI(M) Duty Holders**
  - **CL – Client (Developers)**
  - **PD – Principal Designer (The lead designer and/or designer appointed by the Client, who has control of the project during the Pre Construction Phase)**
  - **PC – Principal Contractor (Is the Contractor appointed by the Client when there is more then one contractor, and shall be responsible for the OSH management of a construction site during construction phase)**



- **SDRM - Safety Design Risk Management**
- ❖ **The process of identifying safety hazards and risk during the Pre Construction Phase;**

- **DRRULE - Design Risk Rule**
- ❖ **The SDRM Guide for OSHCI(M) Duty Holders to perform Pre Construction Phase risk management covering:-**
- ❖ **DRRULE1 – Concept Design Review**
- ❖ **DRRULE2 – Detail Design Review**
- ❖ **DRRULE3 – Pre Construction Review**

- **CLB – Client Brief**
- **PCI – Pre Construction Information**
- **SHF – Safety & Health File**
- **CPP – Construction Phase Plan**

TTT

OYK – Orang yang kompeten (Competent Persons)
OYB – Orang yang bertanggungjawab (Designated Persons)
SHO – Safety & Health Officer
SSS – Site Safety Supervisor
PBT – Pihak Berkuasa Tempatan (Local Authority)
AEC - Architecture, engineering and construction
IPTA - Institut Pengajian Tinggi Awam i.e. Public Higher Education Institution.
IPTS - Institut Pengajian Tinggi Swasta (Private colleges and universities)

Module 1 : INTRODUCTION PREVENTION THROUGH DESIGN (PtD)

This module consist of three (3) main areas will be discuss especially in the preventions trough design PtD in the managing occupational safety and health risks at the planning and design stage is often more effective, easier to sustain and cheaper to achieve than making changes later when the hazards become real risks in the workplace. These guidelines provide practical guidance to the client, designer and contractor on the management of safety, health and welfare when carrying out construction including of :

❖ **The Business Case of OSHCI(M) Guidelines 2017**

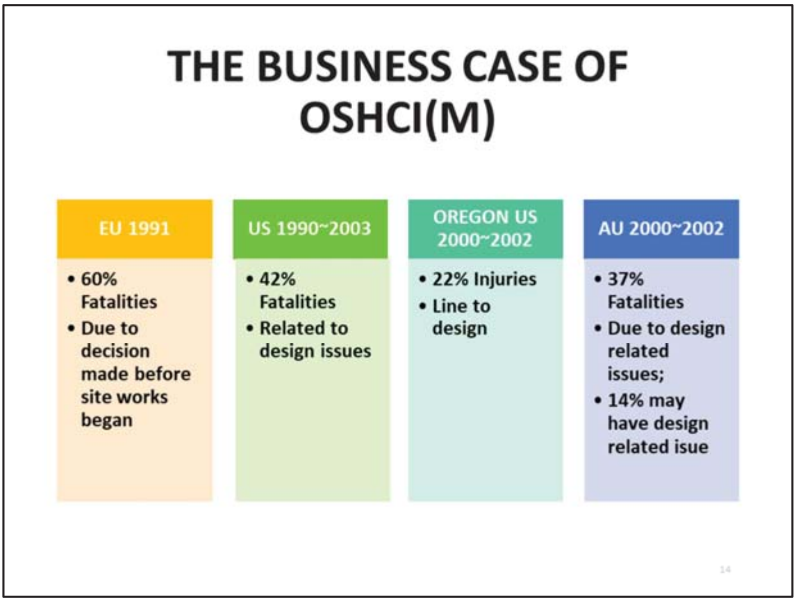
• Set the standard/ objective to achieve, but not how applies to design phase, construction, maintenance and demolition (full cycle).

• Focus on planning, design and management of construction project until the compete the constructions process at site.

• Main responsibility to the client/developer, principal designer and principal contractor that MUST comply with the law and recommends duties to them in order to manage their project constructions. Any actions taken should always be

proportionate to the risks in the construction project

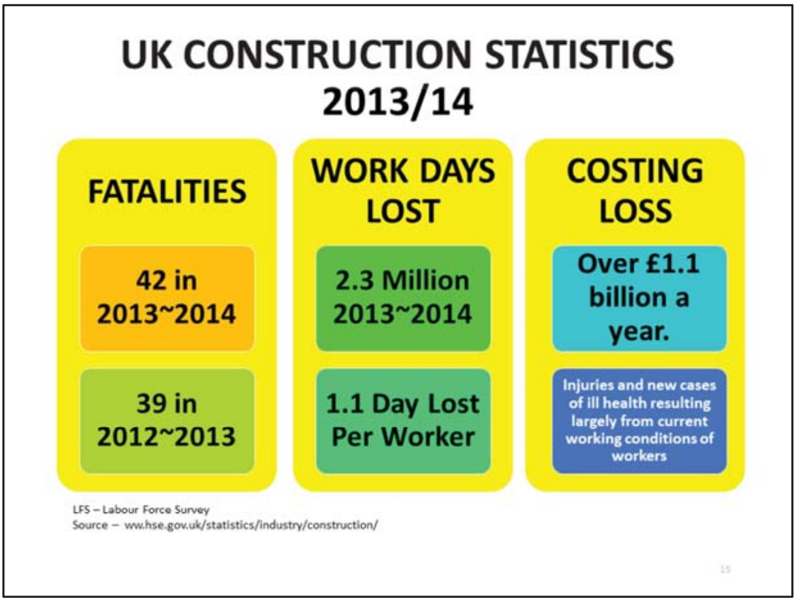
- ❖ **OSHCI(M) Lifecycle**
- ❖ **Video Presentation of OSHCI(M) Promo**



DESCRIBE EACH PHASE

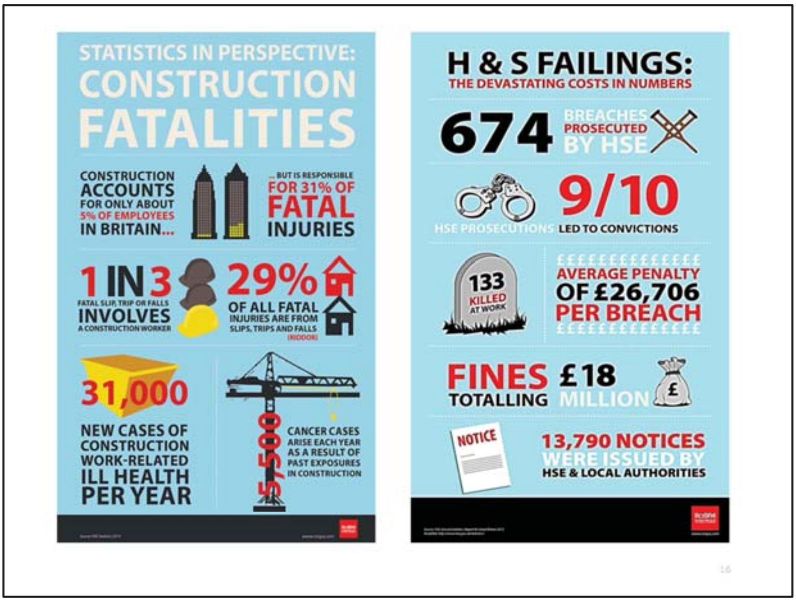
SIGNIFICANCE OF DESIGN PHASE

1. **A 1991 study done in Europe found that 60% of fatalities were the result of decisions made before the site work even began; (EU DIRECTIVE FOR CDM 1994)**
2. Across US, 42% of construction fatalities were related to design issues between the years **1990 and 2003;**
3. **During the years 2000-2002, 22% of injuries in Oregon, Washington and California were linked to design;**
4. **AUSTRALIAN STUDY, 2000–2002 Main finding: design contributes significantly to work-related serious injury 37% of workplace fatalities are due to design-related issues. In another 14% of fatalities, design-related issues may have played a role**



DESCRIBE EACH FACTS

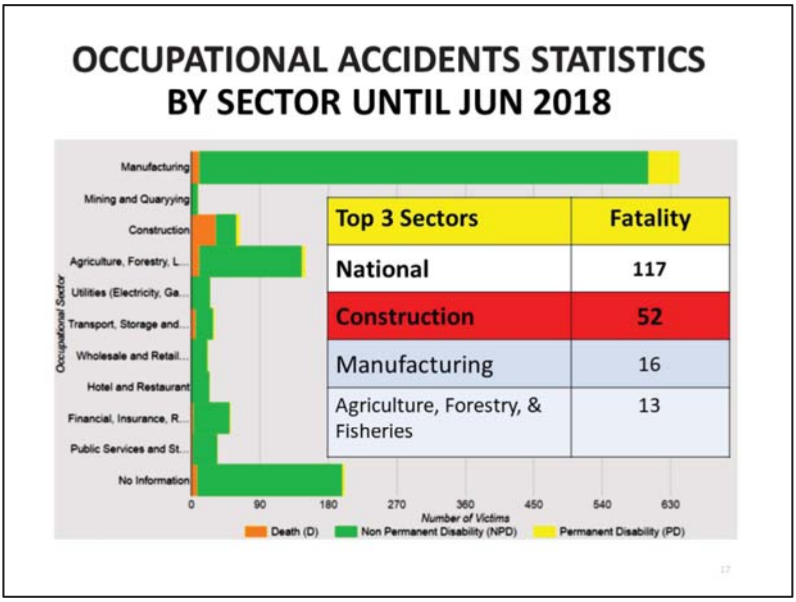
1. **42 construction workers were fatally injured in 2013/2014 compared to 39 in 2012/2013. This makes construction the worst industry in the UK for worker fatalities.**
2. **An estimated 2.3 million working days were lost in 2013/14, 1.7 million due to ill health and 592,000 due to workplace injury, making a total of 1.1 days lost per worker (LFS).**
3. **Injuries and new cases of ill health resulting largely from current working conditions of workers in construction cost society over £1.1 billion a year.**



This report provides headline numbers on workplace fatal injuries that were reported to enforcing authorities . It includes both fatal injuries to workers and to members of the public. The figures are is focus on the constructions fatality in certain years that fail to comply with health and safety in constructions site.

Base on the fact and figure most of the amount of penalty imposed per breach the regulations is $26,706 per breach and in the same years of 2015 the total number of fines is $18 millions.

Discuss this issues with the participate why ???

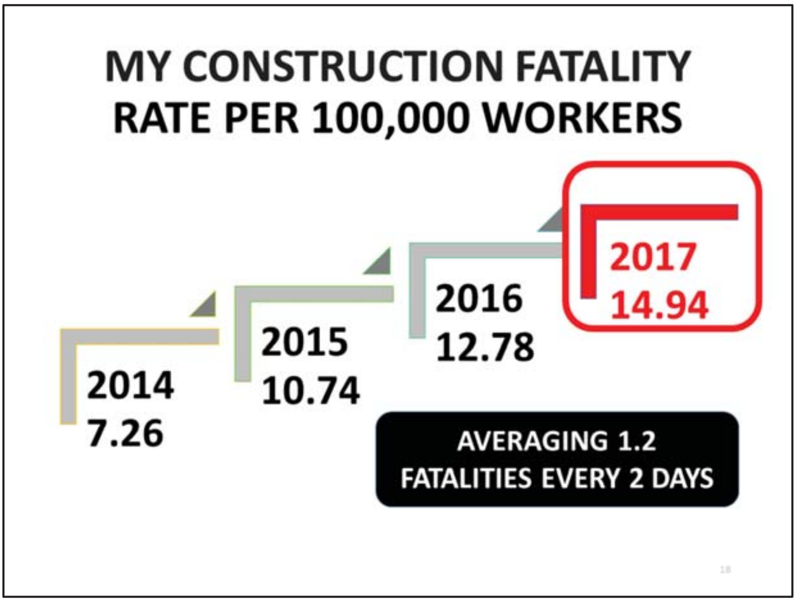


The instructor focus on describing the number of constructions fatality in Malaysia focus on accident statistic by sector until Jun 2018 (*CONSTRUCTION FATALITY NEARLY 50% OF NATIONAL TOTAL*)

The figure, respectively present the number of occupational accident by sectors and by types of accident in Malaysia on 2018. There was significant decline in the total number of industrial accidents reported for all sectors, a decrease of 55.30 percent from 125,506 in 1994 to 56,095 in 2018.

Among all sectors, the number of accidents reported for the manufacturing sector has been the highest throughout the period. This reflects workers in the manufacturing sector are exposed to higher accidental risk. But if we base on the number of fatality table show that the 1st rank cause of fatality in constructions sector in total of 52 fatality, 2nd rank report number of facility is manufacture in total of 16 fatality report and the 3rd rank report by Dosh is agricultures, forestry and fisheries in total fatality is 13 .

This data statistic prove that the most dangerous working place is constructions where the number of fatality among the highest in the industry. The booming factor can be consider as the main factor that contribute to the uncontrol situations especially in the incident contributions.



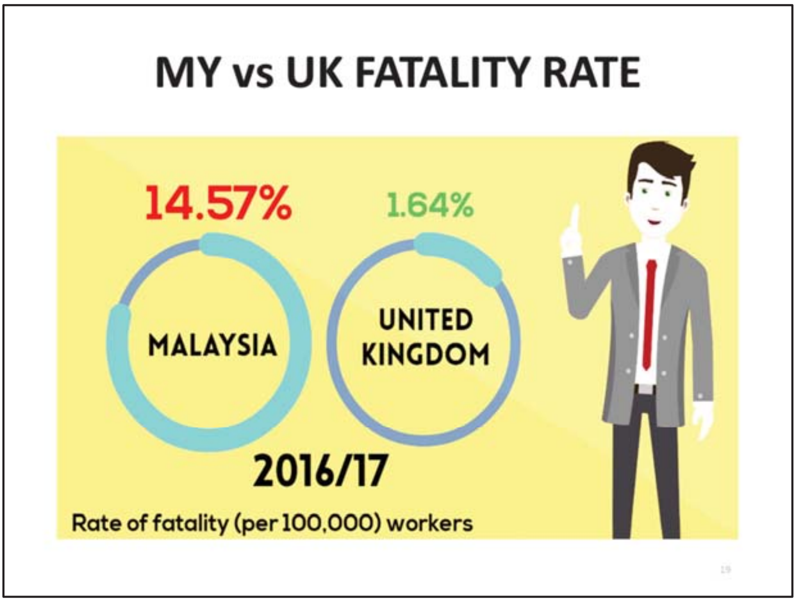
ANIMATE AND DESCRIBE

KOTA KINABALU: The construction industry in Malaysia is recording 1.2 fatalities every two days.

And the rate seems to be increasing instead of going down, said Master Builders Association Malaysia (MBAM) president Foo Chek Lee.

"According to statistics, the rate of fatalities in the construction industry per 100,000 workers has been increasing at an alarming rate. In 2014, the fatality rate was 7.26 per 100,000 workers. In 2015, it went up 10.74, in 2016 it went further up to 12.78 and in 2017 it shot up to 14.94 per 100,000 workers," he said.

He added that out of the 650 fatalities in all industries, a total of 187 were from the construction sector, signifying that within a year, and excluding Sunday as a day off, the construction industry records 1.2 fatalities every two days.



The figure of fatality rate show that:

There were 30 fatalities from workplace injuries in construction during 2016/17, according to the Health and Safety Executive's provisional data released this week – the lowest on record. The number of deaths in the sector has fluctuated over the past five years, with 47 fatalities in 2015/16 compared with 35 in 2014/15. The annual average for the past five years is 39. Of the 30 construction worker deaths counted in the latest year, 22 were employed and eight self-employed. The rate of fatal injury per 100,000 construction workers dropped from 2.12 in 2015/16 to 1.37 in 2016/17.

However, there are difference story happen in Malaysia constructions fatality where the all-industry average for the 2016/17 reported 14.57%.Twelve of the construction worker fatalities 2016/17 were due to falls from height. Four members of the public died from accidents related to the construction sector in 2016/17, up from two in the previous year.

TTT

TTT

The major thoroughfare serving the city's bustling Golden Triangle was cut off this morning after a burst water pipe caused a section of it to collapse.

The mid-morning incident happened along a 19-metre stretch at the busy Jalan Pudu-Jalan Imbi-Jalan Hang Tuah intersection, ending with a 10-metre deep sinkhole just 20 metres from the elevated KL Monorail track near the Imbi station.

READ ALOUD

In an immediate response to the incident, MRT Corporation Sdn Bhd (MRT Corp) stressed that the road collapse had nothing to do with the project as the alignment of the MRT Sungai Buloh-Kajang line does not pass the location.
"MRT Corp wishes to state unequivocally that the incident is not related in any way to the MRT project," the company said in a brief statement posted on its official Facebook page.

DISCUSS:

1.Do you agree with this statement?
2. Is there a possibility to foresee this incident? If yes HOW?

INCOMPETENT CRANE HANDLERS A FACTOR IN FREQUENT ACCIDENTS DEC 11, 2016, SUN

http://www.theborneopost.com/2016/12/11/incompetent-crane-handlers-a-factor-in-frequent-accidents/

File photo shows construction workers lifting the piling machine that crashed a car killing a couple on Nov 5 in Klang. — Bernama photo

KUALA LUMPUR: Incompetent crane handler is among factors seen as contributing to the frequent occurrence of accidents at construction sites.
A senior lecturer in Building Technology, School of Housing, Building and Planning, Universiti Sains Malaysia, Dr Mohd Zailan Sulieman said there are crane handlers who did not attend the safety and health Induction Course which is required for construction workers as stipulated by the authorities.

"This issue is often discussed at seminars and forums because many of the findings of the investigations pertaining to accidents at construction sites involving cranes showed they were due to negligence by incompetent handlers," he said when contacted by Bernama here.

DISCUSS
Q1. Can TRAINING ALONE prevent this incident from happening?
Q2. At what stage of construction this hazard could be foreseen

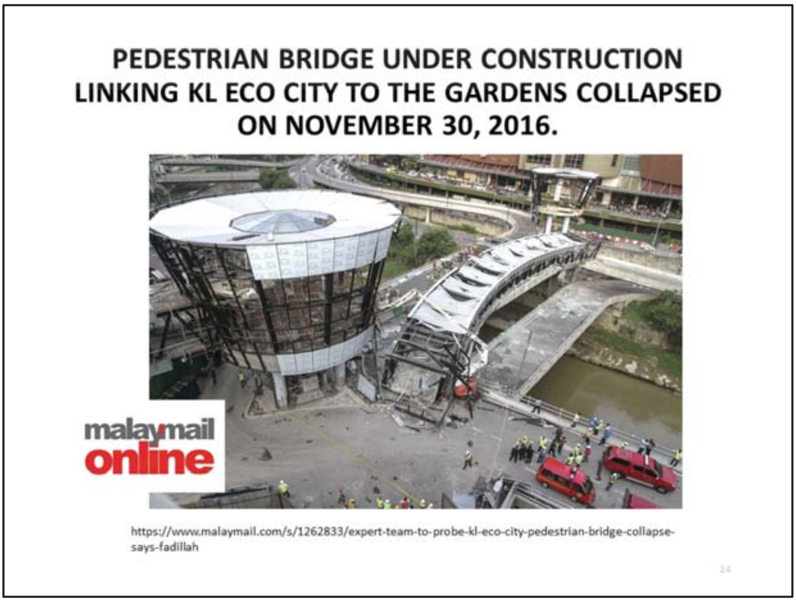
Landslide tragedy which happened at a construction site in Lengkok Lembah Permai, Tanjung Bungah, George Town, Penang **which resulted in the death of three workers and a total number of 11 workers buried alive.**

DISCUSS
Q1. Do you agree with the HEADLINE... SPECIAL TASK FORCE.
Q2. Who is responsible to foresee this hazard and risk?

A view of the construction site in Kajang where the scaffolding collapsed, injuring one worker. — Picture courtesy of Selangor Fire and Rescue Department

KUALA LUMPUR, Jan 10 — An Indonesian construction worker was injured while seven others escaped unscathed after a scaffolding collapsed at a construction site in Kajang yesterday. A dozen rescue personnel from the Kajang Fire and Rescue Department were dispatched to a sewerage construction site near the Grand Saga Highway after authorities were alerted at 5.28pm.
Selangor Fire and Rescue Department operations management chief Alimaddia Bukri said a 33-year-old labourer and seven others were working on the ground floor when the scaffolding toppled onto them from the second floor of the unfinished building. He said rescue personnel saved the injured worker who was not able to move away from the debris field in time.

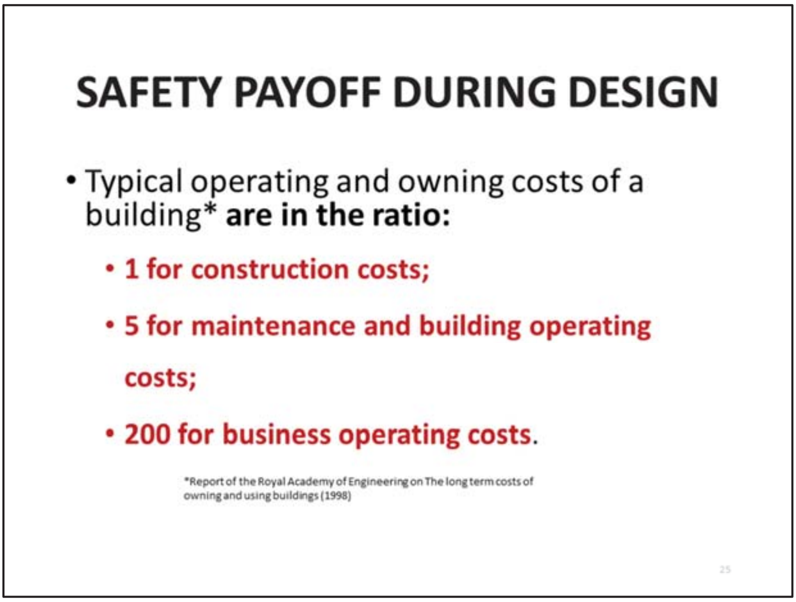
DISCUSS
Q1. Ask the delegates to list of CAUSAL FACTORS;
Q2. Can Design Risk on of the factors?
Q3. Can the Risk be Design Out before work is started?



An aerial view of the pedestrian bridge under construction linking KL Eco City to the Gardens shopping mall at Mid Valley mall, Kuala Lumpur that collapsed on November 30, 2016. — Picture by Yusof Mat Isa.

<u>30 Nov, 2016</u>
A 21-year-old Vietnamese contract worker was killed while five other workers were injured in the incident which occurred about 3.30pm yesterday.
The 70-metre pedestrian bridge under construction across the Klang River, connects KL Eco City to The Gardens shopping mall at Mid Valley City.
<u>13 April 2017</u>
KL Eco City bridge collapse investigation completed, DPP to decide if charges will be filed;
<u>22 May 2017</u>
CIDB prosecutes main contractor for KL Eco City bridge collapse; Tuck Sin Engineering & Construction Sdn Bhd was charged at the Kuala Lumpur Session Court earlier today under the Malaysian CIDB Act Section 34B(1)(C). If found guilty, Tuck Sin Engineering & Construction which is the main contractor of the project could be fined not more than RM500,000 or face a jail sentence of not more than two years, or both.

DISCUSS
Q1. What could be the causal factors?
Q2. How to prevent this from happening?



SAFETY PAYOFF DURING DESIGN

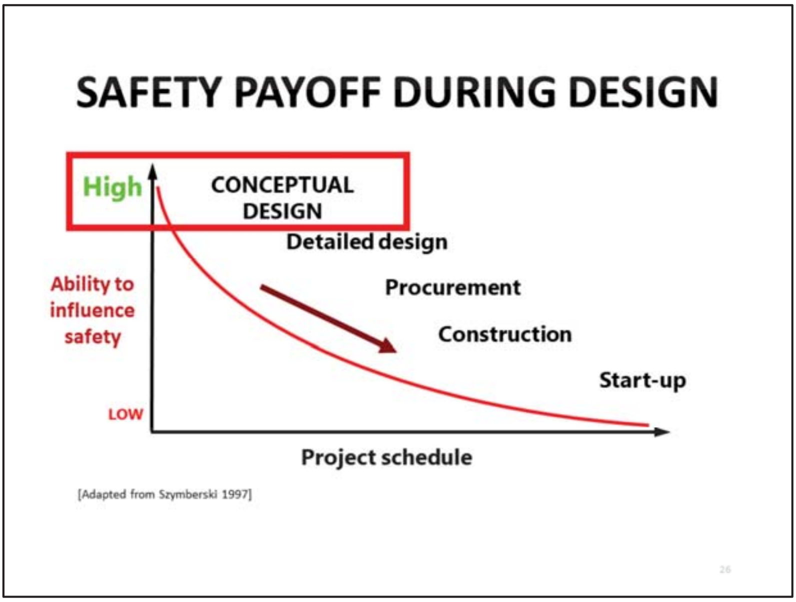
Designers can make decisions that significantly reduce the risks to safety and health during the construction stage and during subsequent use and maintenance. Therefore a key contributor to construction health and safety. In an attempt to focus to design stage the importance of considering the construction and maintenance costs of a commercial office building (both as a factor in staff productivity and as a fraction of lifetime staff costs) there is an often-quoted ratio of costs of 1:5:200.

As the example to make clear understanding:

-where for every one pound spent on construction cost, five are spent on maintenance and building operating costs and 200 on staffing and business operating costs.

-The accompanying belief that higher quality design and construction increases staff productivity, and simultaneously reduces maintenance costs, how ever laudable, appears unsupported by research, and carries all the hallmarks of an “urban myth”.

-In tracking down data about real buildings, a more realistic ratio appears to depend on a huge variety of variables, as well as the definition of the number of “lifetime” years. The ill-defined origins of the original ratio (1:5:200) describing these variables have made replication impossible.



DESCRIBE FLOW AND EMPHASIZE CONCEPTUAL STAGE

In studies conducted by Szymberski (1997), the time/safety influence curve was developed to demonstrate that designer influence could be an integral part of construction safety.

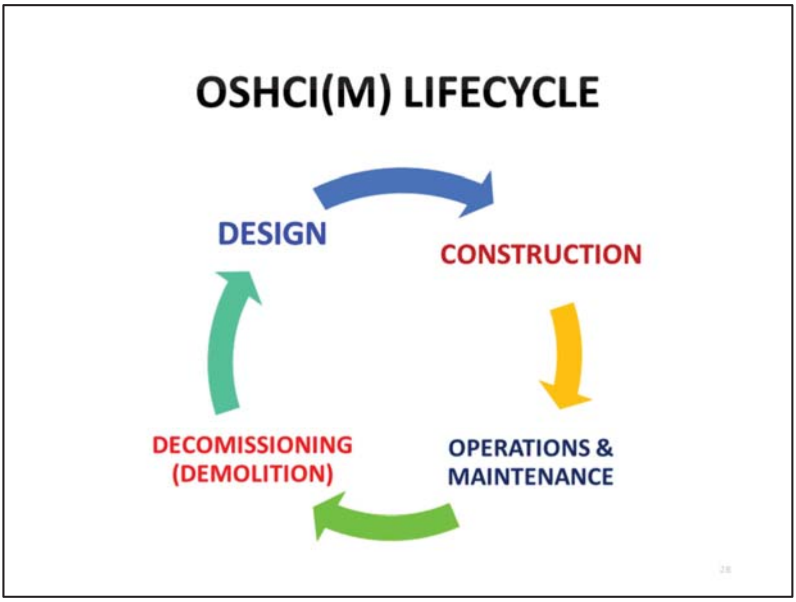
-As shown, safety can be best controlled during the early stages of the design development when the influence is high, even as the project is being conceptualized, and diminishes throughout the project life cycle.

-Regardless of the chosen contract form or project delivery utilized, design-bid-build (DBB), design-build (DB), or construction manager/general contractor (CM/GC) even greater influence can be achieved in the conceptual design phase through the incorporation of the experiences of construction management.

-The earlier that construction management is on board a greater influence can be placed on the effective influence on safety and vice versa. This concept holds true for all related professionals on the project, as the influence on safety decreases with project evolvement, as suggested by Szymberski. Fig. 1 represents the Time / Safety Influence Curve (Szymberski, 1997).

ANIMATE AND DESCRIBE

WHY METHOD STATMENT NOT REVIEWED AND EVALUATED?



The phases associated with OSHCI (M) lifecycle fall into four (4) categories including:

- Design
- Constructions
- Operations
- Decommission

Phase 1: Design
The initiation phase of the project management lifecycle involves the initial start up processes of a project. This phase is where the project's scope and purpose are defined, justified, and implemented.

A. Team members and managers are appointed

B. The feasibility of the project is studied

C. Documentation is collected

D. The project office is set up

The planning phase is the most crucial stage of the project management lifecycle. This

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phase is where the project documents are finalized and given to the project team members to be used to complete the project. The planning phase is started by creating a work breakdown structure, forming a cost loaded schedule, assigning the resources to the project, and establishing a baseline.

Phase 2: Construction

The project construction phase is where the work is started and completed. Once the project plans are set, construction begins on the project and the processes are compared against the baseline throughout the building of the project.

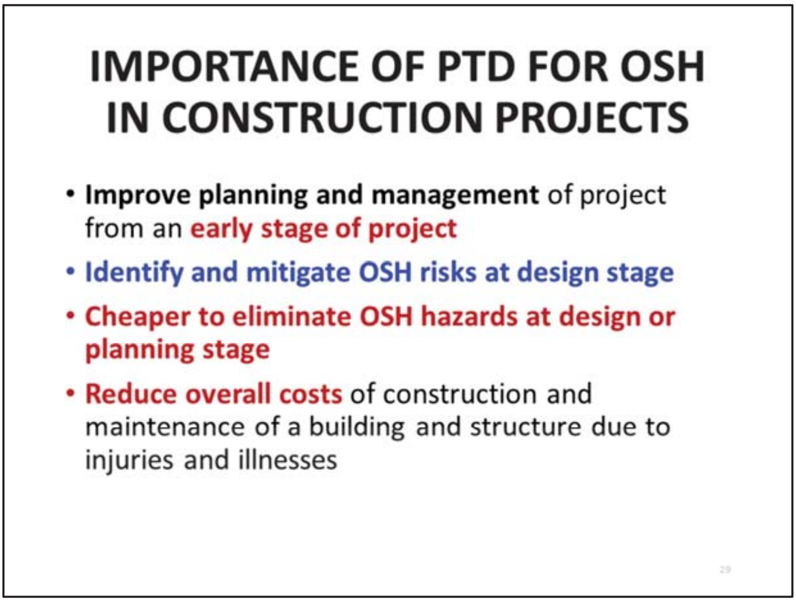
- ❖ report work in progress
- ❖ status the schedule
- ❖ compare projected start/ finish date against actual start/finish
- ❖ compare projected cost against actual cost
- ❖ compare projected resource usage against actual resource usage

Phase 3: Operations and Maintenance

Facilities operations and maintenance encompasses a broad spectrum of services, competencies, processes, and tools required to assure the built environment will perform the functions for which a facility was designed and constructed. Operations and maintenance typically includes the day-to-day activities necessary for the building/built structure, its systems and equipment, and occupants/users to perform their intended function. Operations and maintenance are combined into the common term O&M because a facility cannot operate at peak efficiency without being maintained

Phase 4: Decommission or demolitions

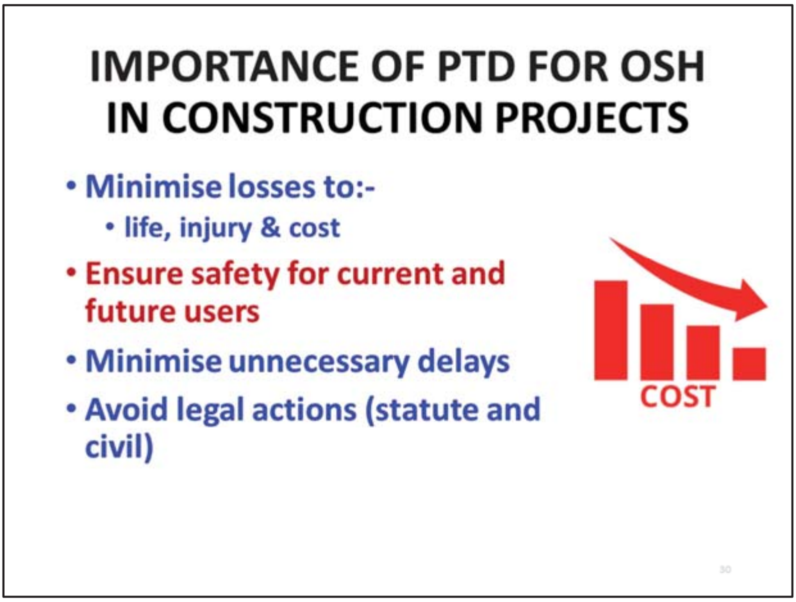
Decommissioning is the process of shutting down a building and/or removing it from operation or use. Decommissioning may be followed by re-commissioning, repurposing or demolition. Common types of buildings that may be decommissioned include; power stations, oil rigs, factories, warehouses, public buildings and so on. The purpose of decommissioning a building is to protect it and its systems, to reduce ongoing costs, and to reduce hazards and other risks until the future of the building has been determined. Decommissioning can be a complex process that requires careful planning and management to ensure it is carried out efficiently and safely:



IMPORTANCE OF PTD FOR OSH IN CONSTRUCTION PROJECTS

As a designer you can directly influence safety. Designers must take account of the General Principles of Prevention when preparing designs. The Principles of Prevention are a hierarchy or risk elimination and reduction.

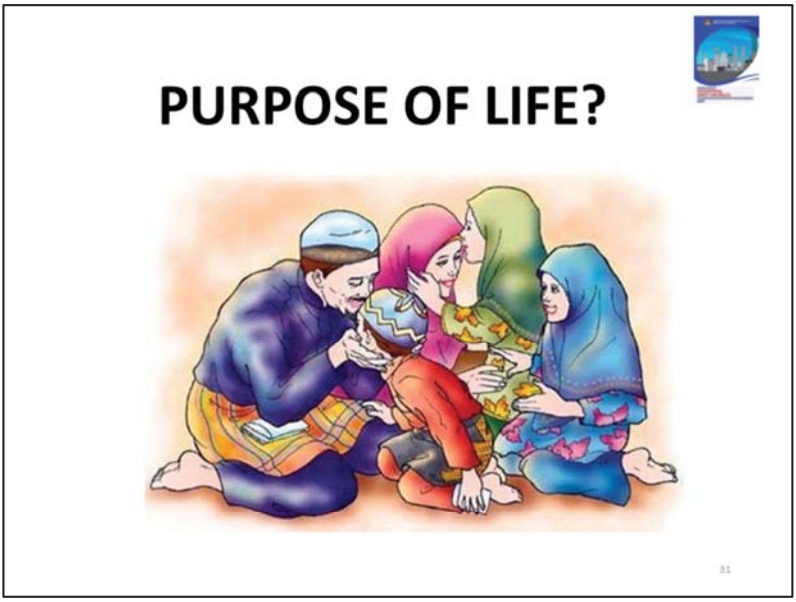
- ❖ **Improve planning and management of project from an early stage of project**
- ❖ **Identify and mitigate OSH risks at design stage**
- ❖ **Cheaper to eliminate OSH hazards at design or planning stage**
- ❖ **Reduce overall costs of construction and maintenance of a building and structure due to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



PtD is believed to result in a wide range of benefits, some obvious to industry professionals and some less obvious. For example, when a project has been designed with construction worker safety in mind, there will be fewer hazards on site to managed and few injuries and fatalities will result. Reduced injuries will result in reduced workers compensation insurance, which will accrue directly to the owner on projects with an owner controlled wrap up insurance program. Many professionals believe also PtD leads to improved productivity because workers face fewer hazards, which will reduce labor costs and therefore reduce total costs to the owner. Accidents always delay construction progress in some way, so safer designs lead to fewer project delays Minimized losses to:-

- ❖ **life, injury & cost.**
- ❖ **Ensure safety for current and future users**
- ❖ **Minimized unnecessary delays**
- ❖ **Avoid legal actions (statute and civil)**

.



1. PLAY THE VIDEO ON FAMILY IMAGE
2. ASK THE CLASS IS SAFETY IMPORTANT!!!!! . ASK THEM TO RAISE THEIR HANDS!!!!

3. TAKE PHOTOS HANDS RAISED
4. SAY EVIDENCE USE IN INVESTIGATION… LAUGH HA HA HA

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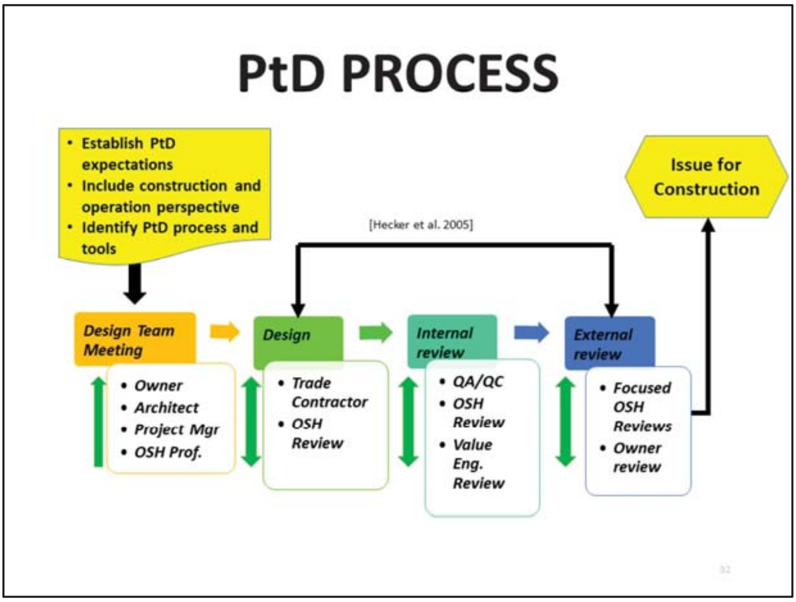

This graphic depicts the typical PtD process. The key component of this process is the incorporation of site safety knowledge into design decisions. Ideally, site safety would be considered throughout the design process. It is recognized, however, that a limited number of progress reviews for safety may be more practical. The required site safety knowledge can be provided by one or more possible sources of such safety constructability expertise, including trade contractors, an in-house employee, or an outside consultant. In the future, perhaps state and federal OSHA employees may provide such expertise.

This graphic points to a less obvious benefit of PtD: the communication between designers and constructors that is typically required to facilitate PtD. Such communication during design typically also leads to discussion of how to better value engineer the design or to reduce construction duration.

The National Safety Council has recommended basic guidelines for designers to ensure acceptable safety and health for products and processes. The guidelines given below are broad, and as many as possible should be considered during product design and use :

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• Eliminate hazards by changing the design, the materials used, or the maintenance procedures.
• Control hazards by capturing, enclosing, or guarding at the source of the hazard.
• Train personnel to be cognizant of hazards and to follow safe procedures to avoid them.
• Provide instructions and warnings in documentation and post them in appropriate locations.
• Anticipate credible abuse and misuse and take appropriate action to minimize the consequences.

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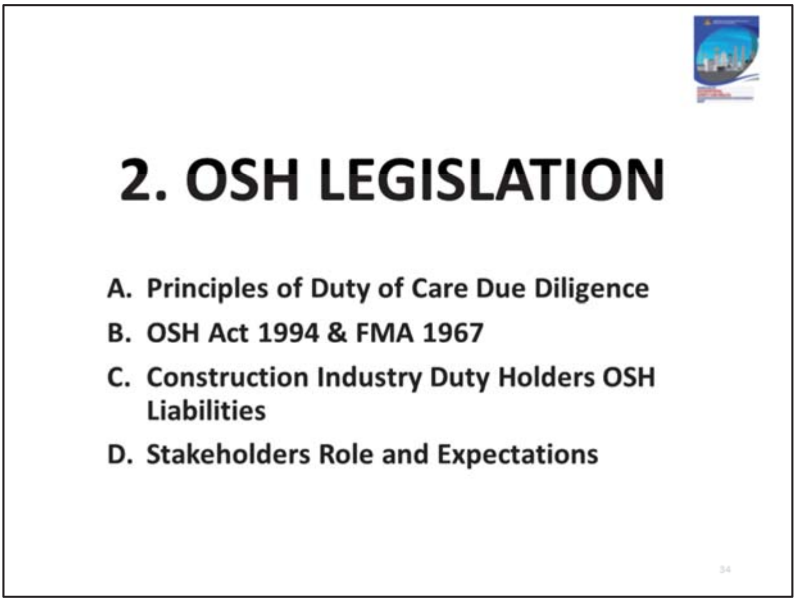
Videos
This is a selection of the videos from HSE's topics and industries websites.

More videos will appear soon - so keep checking this page - or sign up to our free bulletin to keep in touch with what's new.

Agriculture videos
Business video case studies
CO2: The rebreather incident
Construction videos
Manual handling task video 1 – Lifting from pallet to conveyor
Manual handling task video 2 – Lifting creels of wire onto spindles
Mesothelioma: This isn't just an old man's story
Real people on health and safety
Removing single-use gloves without contaminating your hands
What does it feel like to get dermatitis?
Woodworking videos
Workplace transport videos
Work smart video series



Module 2 : OSH LEGISLATION

The 2nd module compromised with the OSH Legislations Malaysia perspective All employers, include structural design firms, are required by law to provide their employees with a safe environment and training to recognize hazards that are present and equipment or other means to minimize or manage the hazards. Engineering employees historically have not received training on hazards or the federal OSHA standards because they were rarely exposed to jobsite hazards. With the increasing site roles that design engineers are playing—such as part of a design-build team—it is becoming increasingly important for design engineers receive construction safety training that includes federal or state construction safety standards.

In these module will discuss four (4) topic:

1. **Principles of Duty of Care Due Diligence**
2. **OSH Act 1994 & FMA 1967**
3. **Construction Industry Duty Holders OSH Liabilities**
4. **Stakeholders Role and Expectations**

PRINCIPLES OF DUTY OF CARE (DUE DILIGENCE)

In tort law, a duty of care is a legal obligation which is imposed on an individual requiring adherence to a standard of reasonable care while performing any acts that could foreseeably harm others. It is the first element that must be established to proceed with an action in negligence. The claimant must be able to show a duty of care imposed by law which the defendant has breached. In turn, breaching a duty may subject an individual to liability. The duty of care may be imposed by operation of law between individuals with no current direct relationship (familial or contractual or otherwise), but eventually become related in some manner, as defined by common law (meaning case law).

Duty of care may be considered a formalization of the social contract, the implicit responsibilities held by individuals towards others within society. It is not a requirement that a duty of care be defined by law, though it will often develop through the jurisprudence of common law.

DUTY OF CARE

Although the idea of a general duty of care is now widely accepted, there are significant differences among the common law jurisdictions concerning the specific circumstances under which that duty of care exists. Obviously, courts cannot impose unlimited liability and hold everyone liable for everyone else's problems; as Justice Cardozo put it, to rule otherwise would be to expose defendants "to a liability in an indeterminate amount for an indeterminate time to an indeterminate class."[1] There must be some reasonable limit to the duty of care; the problem is where to set that limit.

By the meaning - a duty of care is a legal obligation imposed on an individual requiring that they exercise a reasonable standard duty of care while performing any acts that could foreseeable harm others.

Example :
Business
See also: Business judgment rule
In business, "the duty of care addresses the attentiveness and prudence of managers in performing their decision-making and supervisory functions. "business judgment rule presumes that directors (and officers) carry out their functions in good faith, after

sufficient investigation, and for acceptable reasons. Unless this presumption is overcome, courts abstain from second-guessing well-meaning business decisions even when they are flops. This is a risk that shareholders take when they make a corporate investment."

The Duty of Care Risk Analysis Standard (DoCRA) provides principles and practices for evaluating risk. It considers all parties that could be affected by those risks. DoCRA evaluates safeguards if they are appropriate in protecting others from harm while presenting a reasonable burden.

STANDARD DUTY OF CARE

1. Safe Systems of Work

A large percentage of accidents occur due to lack of or failure in systems of work. Implementing safe systems of work is an important part of constructions activity . The law, requires employers to provide systems of work that are planned, organized, performed, maintained and revised as appropriate so as to be, so far as is reasonably practicable, safe and without risk to health. A system of work is a set of procedures according to which work must be carried out. Safe systems of work are required where hazards cannot be eliminated and some risk still exists. When developing your safe systems of work, consider how the work is carried out and the difficulties that might arise and expose you or your workers to risk. Then develop a set of procedures detailing how the work must be carried out to minimize or reduce the risk of accident or injury. Systems of work must be communicated and understood by the relevant employees. The detail of the system of work, for example, whether it is oral or written will depend on the level of risk and the complexity of the work involved. For example, high risk activities where there is a risk of serious injury or death, will need to have documented systems of work which are strictly supervised and enforced. Regularly review your systems of work to ensure that they still reduce or minimize risk and revise as necessary. Safe Systems of Work can reduce or eliminate exposure to hazards

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but they must be strictly followed Generally, the contractual obligation is a duty to perform services with reasonable skill and care, that is, to the standard of a reasonably competent professional. However, if an appointment is made on the basis of specialist capabilities, then the duty will be to perform services with the standard of care that would be expected from a reasonably competent specialist, rather than the standard of a general practitioner operating in that field.

2. Safe plant and Equipment

An effective maintenance programme will make plant and equipment more reliable. Fewer breakdowns will mean less dangerous contact with machinery is required, as well as having the cost benefits of better productivity and efficiency. Additional hazards can occur when machinery becomes unreliable and develops faults. Maintenance allows these faults to be diagnosed early to manage any risks. However, maintenance needs to be correctly planned and carried out. Unsafe maintenance has caused many fatalities and serious injuries either during the maintenance or to those using the badly maintained or wrongly maintained/repaired equipment.

3. Safe Premises

remises liability is an area of law whereby the landowner is responsible for certain accidents or incidents that occur on his or her property. In sum, an owner of a business, restaurant, retail store or any other location has a legal obligation to maintain their premises in a reasonably safe condition.

4. Safe Working Environment

Premises liability is an area of law whereby the landowner is responsible for certain accidents or incidents that occur on his or her property. In sum, an owner of a business, restaurant, retail store or any other location has a legal obligation to maintain their premises in a reasonably safe condition.

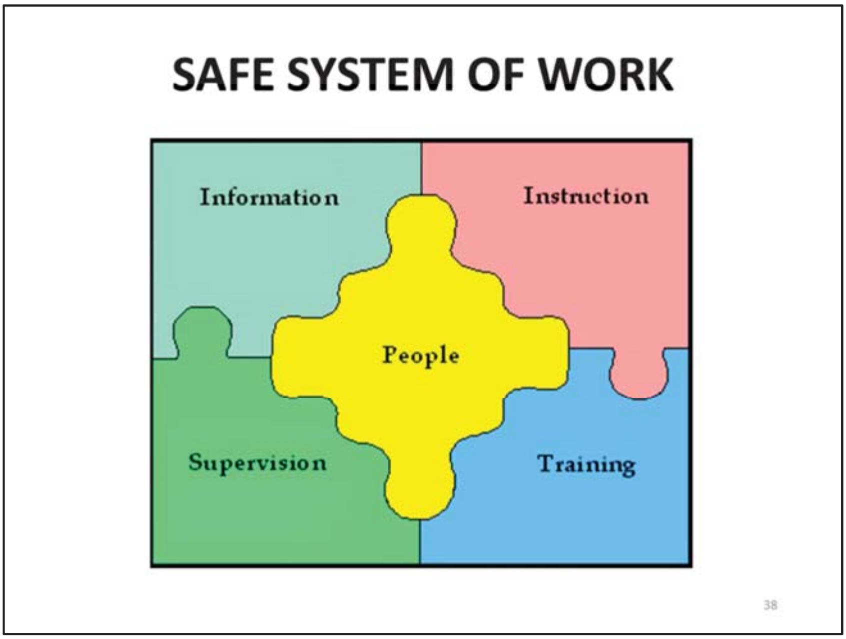
5. Safe Material and Substance

Under the Control of Substances Hazardous to Health Regulations (COSHH) you must ensure chemicals and dangerous substances are stored and handled in a way that minimizes the risks and limits people's exposure to them. You need to assess the risks of storing and handling dangerous substances. This includes the possibility of environmental damage caused by leaks and spills.

You should then take any precautions needed to control risks, including:

storing chemicals according to the manufacturer's instructions on the safety data sheet keeping the minimum quantity of hazardous substances necessary storing incompatible substances separately taking steps to prevent release or leakage of dangerous substances keeping a spill kit near to storage areas, and ensuring staff are trained in what to do in the event of a spill cleaning up any leaks or spills that occur using the

right precautions when handling substances - for example, wearing protective clothing or ensuring adequate ventilation ensuring employees who store and handle dangerous substances are properly trained checking containers used for short-term storage are properly labelled.



SAFE SYSTEM OF WORK

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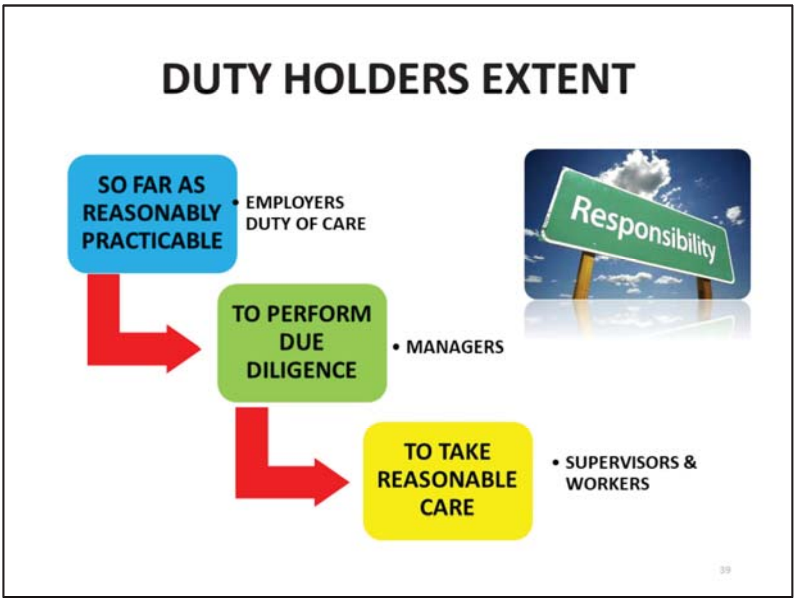
Systems of work must be communicated and understood by the relevant employees. The detail of the system of work, for example, whether it is oral or written will depend on the level of risk and the complexity of the work involved. For example, high risk activities where there is a risk of serious injury or death, will need to have documented systems of work which are strictly supervised and enforced. Regularly review your systems of work to ensure that they still reduce or minimize risk and revise as necessary. Safe Systems of Work can reduce or eliminate exposure to hazards but they must be strictly followed.



Describe each level duty holder extent of role:

1. To develop and establish Risk Management Requirements (HIRARC)
2. To manage Safe System of Work
3. To implement Safe Work Instructions
WHS Practitioner/Advisor – WHS duty holders
Principles applicable to duties under the WHS Act
Duties under the WHS Act are non-transferable. A person may have more than one duty and more than one person can have the same duty. However, in that case, each person must discharge the duty to the extent the person has the capacity to influence and control the matter (or would have that capacity but for an agreement or arrangement purporting to limit or remove that capacity).

Duties imposed on a person to ensure health or safety ('health and safety duties') require the person:

to eliminate risks to health and safety, so far as is reasonably practicable, and if it is not reasonably practicable to eliminate risks to health and safety, to minimize those risks so far as is reasonably practicable.
Worker
WHS practitioners are workers. The WHS Act adopts a broad definition of 'worker' to recognize the changing nature of work relationships and to ensure health and safety protection is extended to all types of workers.

A worker includes:

Employees
Independent contractors
Sub-contractors
Outworkers e.g. home based
Apprentices
Work experience students
Trainees
Volunteers who work in employment-like setting.
Volunteer means a person who is acting on a voluntary basis (irrespective of whether they receive out-of-pocket expenses):

The WHS Act specifically protects volunteers in their capacity as workers.
Ensures that volunteers are not discouraged from participating in community-based activities.
A 'volunteer association' (as defined) is not treated as a business or undertaking.
Workers must:

Take reasonable care for their own health and safety.
Take reasonable care that their acts or omissions do not adversely affect the health and safety of other persons.
Comply, so far as the worker is reasonably able, with any reasonable instruction given by a person conducting a business or undertaking to allow the person conducting the business or undertaking to comply with the WHS Act.
Cooperate with any reasonable policy or procedure of the person conducting the business or undertaking which relates to work health or safety and that has been notified to workers.

1.PCBU
The principal duty holder is a 'person conducting a business or undertaking' and has replaced the term 'employer'. PCBUs include the Commonwealth, Commonwealth Authorities, non-Commonwealth licensees, principal contractors, and will, in some cases, necessitate an analysis to understand who is a PCBU in a particular factual context under the WHS laws.

The duty of a person conducting a business or undertaking is probably the most significant conceptual change from the majority of previous OHS Acts. For the public sector, it means that every activity is captured, both policy and operational. The WHS Act coverage extends beyond the traditional employer/employee relationship to include new and evolving work arrangements and extends a PCBUs duty of care to any person who is performing work directly for, or on behalf of, the PCBU.

The WHS Act also places specific upstream duties on PCBUs who carry out specific activities:

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Persons with management or control of a workplace/fixtures, fittings and plant designers, manufacturers, importers, suppliers and PCBUs that install construct or commission plant or structures duties extend to any PCBU who is contributing to work has a duty of care. This can be more than one duty in relation to specific activities.
Note: 'Volunteer associations' (as defined in the WHS Act) are not treated as a business or undertaking.

2. Multiple PCBUs
A PCBU retains overall responsibility for workplace health and safety even if they contract out activities to others under their duty of care obligations. The WHS Act provides that a person can have more than one duty by virtue of being in more than one class of duty holder and that more than one person can concurrently owe the same duty

If more than one person has a duty of care for same matter, then each person:

retain responsibility for their duty in relation to the matter must discharge their duty to the extent the matter is within the person's capacity to influence or control must consult, cooperate and coordinate activities with all other persons who have a duty in relation to the same matter.

3. PCBU duty to consult
A PCBU, through its officers, has a duty under the WHS Act to consult with workers at all levels of the business. Senior leaders and managers should promote and foster open lines of communication and consultation with workers. This can be achieved by:

Creating and nurturing joint partnerships with:
workplace work groups HSRs and employee representative other involved PCBUs.
Ensuring effective consultation processes are built in to the business through its systems, policies and procedures.
Engage with workers by being visible and open to feedback and ideas.

4. Officer
An officer is, in most cases, a senior executive who makes, or participates in making, decisions that affect the whole, or a substantial part, of a business or undertaking. Officers have a duty to be proactive and continuously ensure that the business or undertaking complies with relevant duties and obligations.

The scope of an officers' duty is directly related to the influential nature of their position. A high standard requires persistent examination and care to ensure that the resources and systems of the business or undertaking are adequate to comply with the duty of care required under the WHS Act. This also requires officers to ensure that delegations are working effectively. Where the officer relies on the expertise of a manager or other person, that expertise must be verified and the reliance must be reasonable.

The intention of the officers' duty is to ensure engagement and leadership by officers in

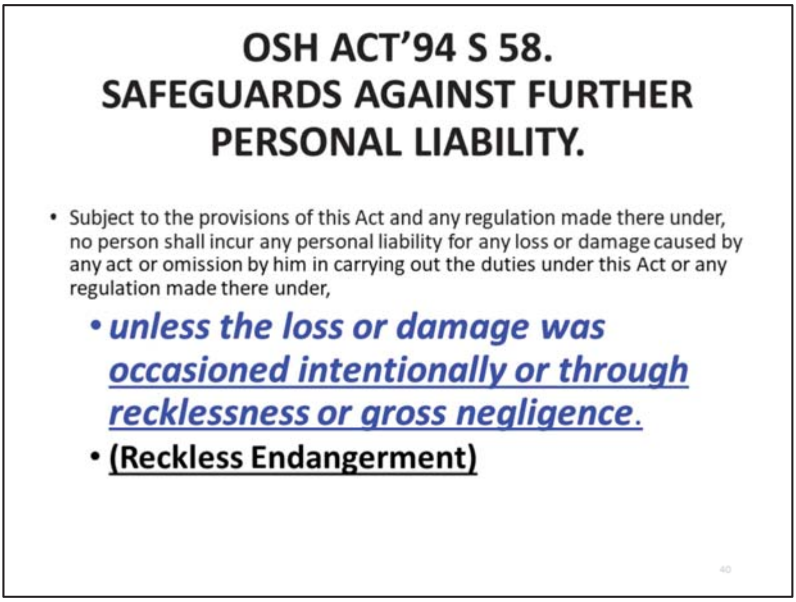
WHS management, better providing for sustainability and improvement in WHS performance.

Officers of PCBUs that have a duty or obligation under the WHS Act must exercise 'due diligence' to ensure that the person conducting a business or undertaking complies with that duty or obligation

5. Duties of others

All other persons at a workplace, such as visitors or customers, have health and safety duties. They include:

Taking reasonable care for their own health and safety at the workplace, and ensuring that their acts or omissions do not adversely affect the health and safety of others at the workplace. Complying, so far as they are reasonably able to, with any reasonable instruction that is given by the PCBU to allow the PCBU to comply with the WHS laws.

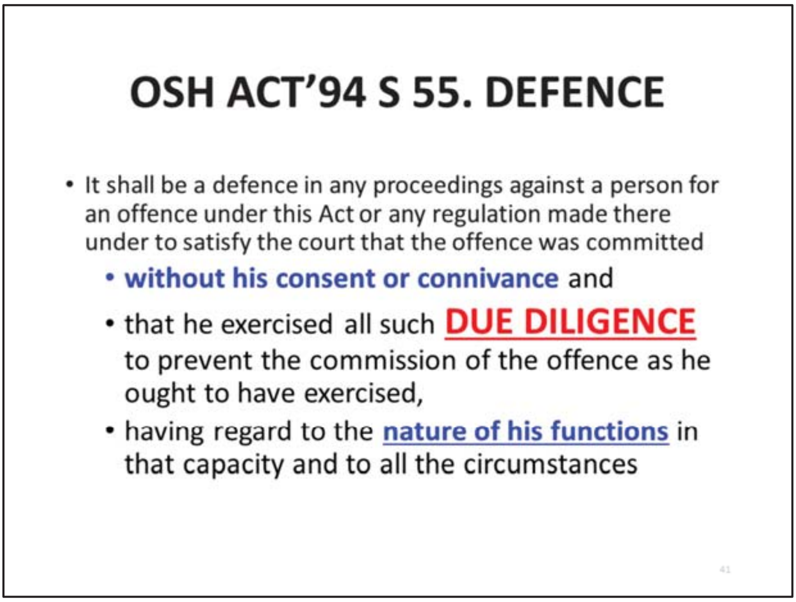


OSH ACT'94 S 58.

SAFEGUARDS AGAINST FURTHER PERSONAL LIABILITY

Section 58. Safeguards against further personal liability

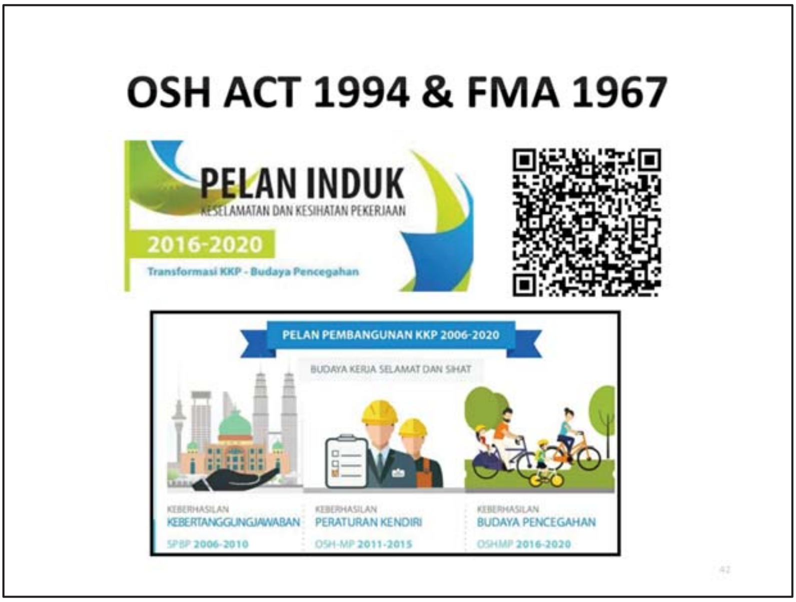
Subject to the provisions of this Act and any regulation made thereunder, no person shall incur any personal liability for any loss or damage caused by any act or omission by him in carrying out the duties under this Act or any regulation made thereunder, unless the loss or damage was occasioned intentionally or through recklessness or gross negligence.



Describe S.55 OSH Act 1994
Emphsize:
1. Without Consent meaning: To provide proof the provisison of Safe System of Work exisit, applicable and reliable;
2. Define Connivance: ill intent.

Explain due diligence in OSH;
Refer to DOSH OSH Act 1994 Guideline 2006 S.55 Defence Page 63

" Under this section the person charged needs to satisfy the court that the offence was committed without his consent. On his part the person charged must be able to show that he exercised all due diligence to prevent the offence being committed. **The essence of defence for due diligence is that**
- the defendant took such reasonable and practicable measures to avoid committing the offence and
- the court could conclude that the defendant was not negligent or otherwise at fault.
- It must be shown that the defendants mind was concentrated upon the likely risk; general precautions are "unlikely to be enough.



Explain the "Pelan Induk in RMK 11".

The RMKe 11 is designed by giving priority to the people in all efforts development. People based economy will be given priority. This approach strengthening the Government's commitment to improving living standards, dignity and potential people to capitalize on development and economic progress.

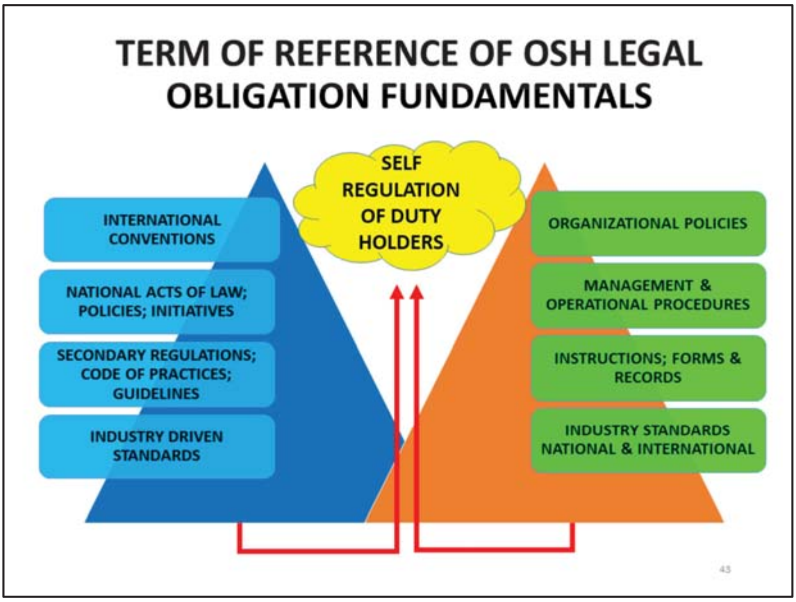
SPBP 2006-2010
- **Improve efficiency officers & practitioners of CTF**
- **Strategic alliances**
- **Increase activity enforcement**
- **Focus on critical sectors (SMEs, Site Buildings, Agriculture, Transportation & School)**
- **Run R & D**
- **Improve leadership government**
- **OSH Management System**

OSH-MP 2011-2015
- **CTF Basic Framework Nationality**
- **Improve cooperation with three party**
- **Promoting culture prevention**
- **New skills & competencies acquired & developed**

- **Strategic alliances at the level regional**
- **Increase activity enforcement**
- **Focus on issues, ergonomics, pressure & others**
- **R & D - structured & defined**
- **Improve leadership (employer / union)**
- **Business Focus - Improve SMEs**
- **OSH Management System in place**

SHMP 2016-2020

- **Raising awareness public on CTF**
- **Personal settings to practice**
- **Country Policy & framework regarding the CTF was established**
- **Promoting culture prevention & good practice**
- **Develop a group experts in various fields & skills**
- **Strategic alliances at the level international**
- **Increase activity enforcement**
- **Focus on new hazard**
- **R & D - the results of the research Driven**
- **Improve leadership**
- **OSH Management System as part of business.**



TERM OF REFERENCE OF OSH LEGAL OBLIGATION FUNDAMENTALS

Concept of Self-regulation

The provision of the Act 514 is based on the self-regulation approach to suit with the particular industry or organization and to establish effective safety and health organization and performance. Its primary responsibility is to:

1. ensure safety and health of work lies with those who create the risks, and

2. those who work with the risks.

This law also encourages cooperation, consultation and participation of employees and management in efforts to improve the standards of safety and health in the workplace.

Role of Authority

1. **Department of Occupational Safety and Health (DOSH), a government department under the Ministry of Human Resources Malaysia is responsible for, through enforcement and promotional works, those employers, self-employed persons, manufacturers, designers, importers, suppliers and employees to always practice safe and health work culture, and always comply with the existing legislation, guidelines and codes of practice in relation to Occupational Safety and Health.**

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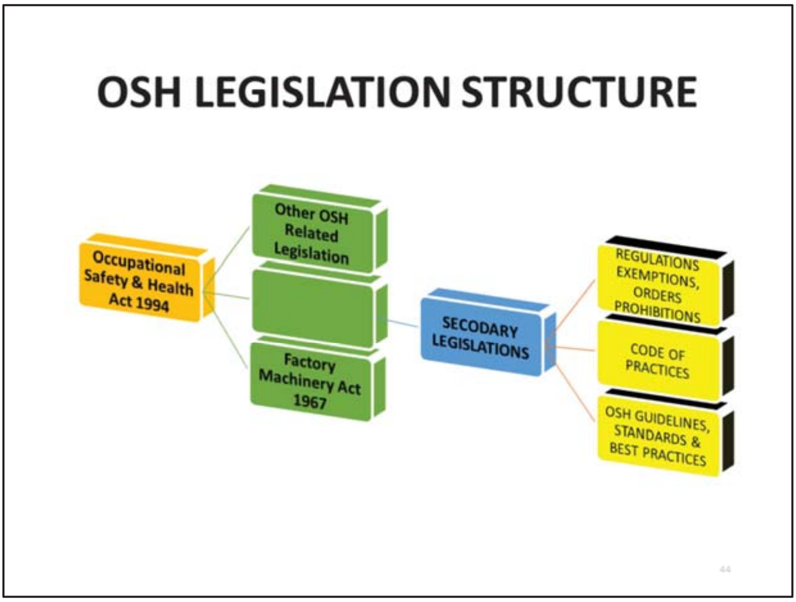
2. DOSH also evaluate and review the legislation, policies, guidelines and codes of practice from time to time pertaining to occupational safety, health and welfare as a basis in ensuring safety and health at work.

3. DOSH is also the secretariat to National Council for Occupational Safety and Health, a council established under section 8 of the Occupational Safety and Health Act 1994.

4. The National Council for Occupational Safety and Health shall have the power to do all things expedient or reasonably necessary for or incidental to the carrying out of the objects of this Act.



OSH LEGISLATION STRUCTURE

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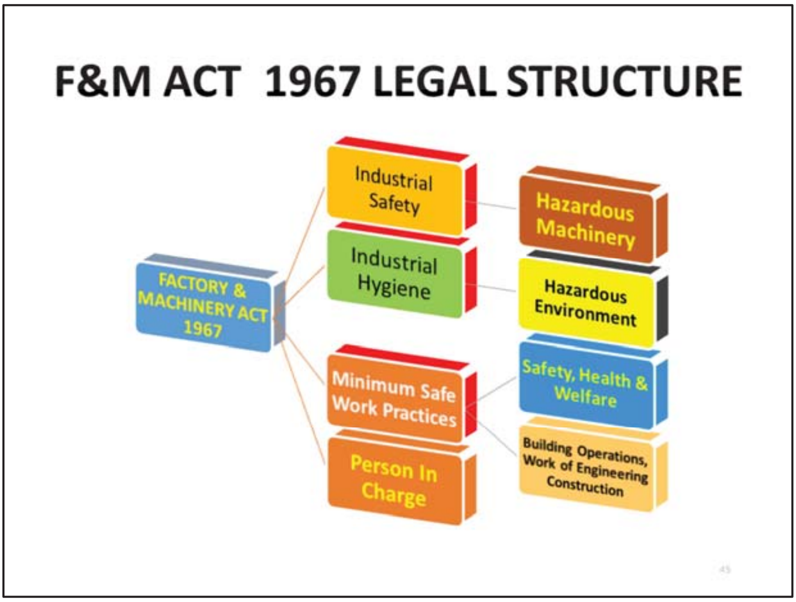

F&M ACT 1967 LEGAL STRUCTURE

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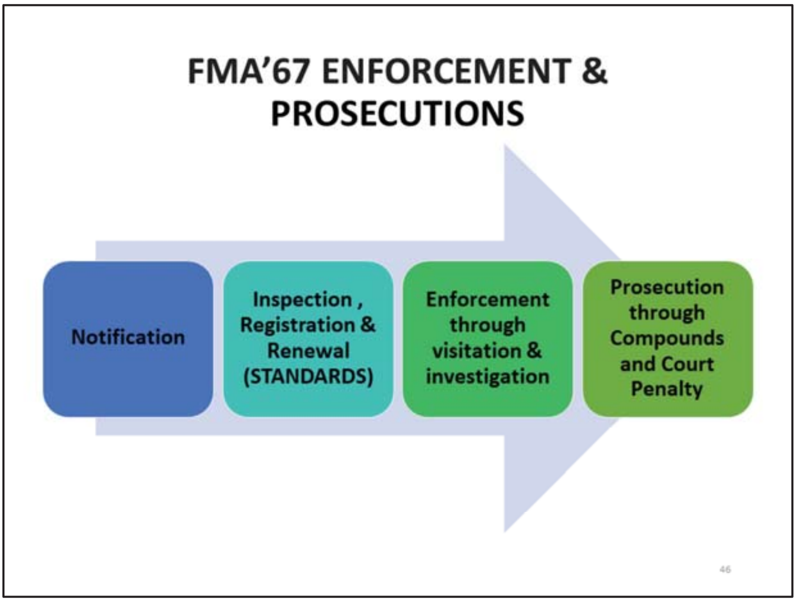

FMA'67 ENFORCEMENT & PROSECUTIONS

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IMPLEMENTATION OF OSHA 1994

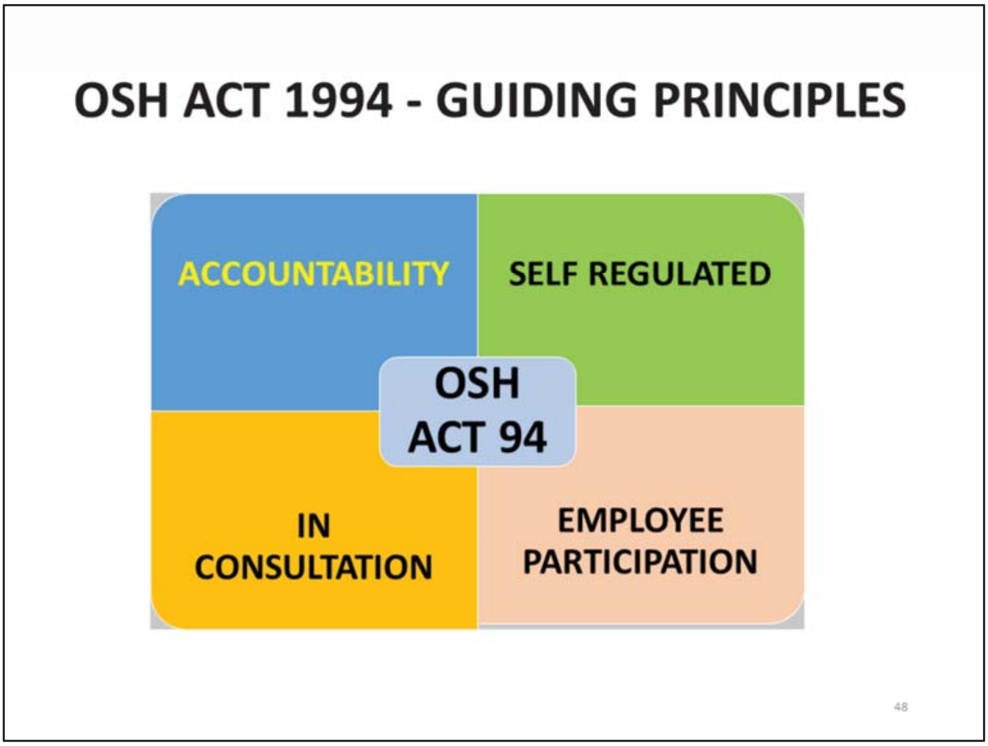
Code of Practice is intended to assist employers and employees to meet their responsibilities under the Occupational Safety and Health Act (OSHA) 1994 and to address the problem in the workplace. Under Section 15 of OSHA, employers are responsible for ensuring the safety, health and welfare of all employees.

Section 24 (1) OSHA also explains that employees are responsible for ensuring reasonable care for the safety and health of himself and others who may be affected by his actions in the workplace.

Occupational Health Division was responsible for carrying out the monitoring of compliance with Code of Practice on Prevention and Eradication of Drug Abuse, Alcohol and Substance in the Workplace at the state level. The monitored employees or workplace were guided on a few aspects, such as policy making, establishment of Committee on Prevention and Eradication of Drug Abuse, Alcohol and Substance in the Workplace, and training of employees and officers in charge.

Results of monitoring compliance with this Code of Practice on 11 employers across the country revealed that all the employers have implemented the Code of Practice. Awareness of employers in developing and implementing policies and programs on

drug abuse prevention, alcohol and substance is important to reduce accidents, absenteeism, high rates of resignation and involvement in crime among its employees due to their effect. It will also help employers improve the quality of products and services offered and thereby increasing overall productivity for their company.



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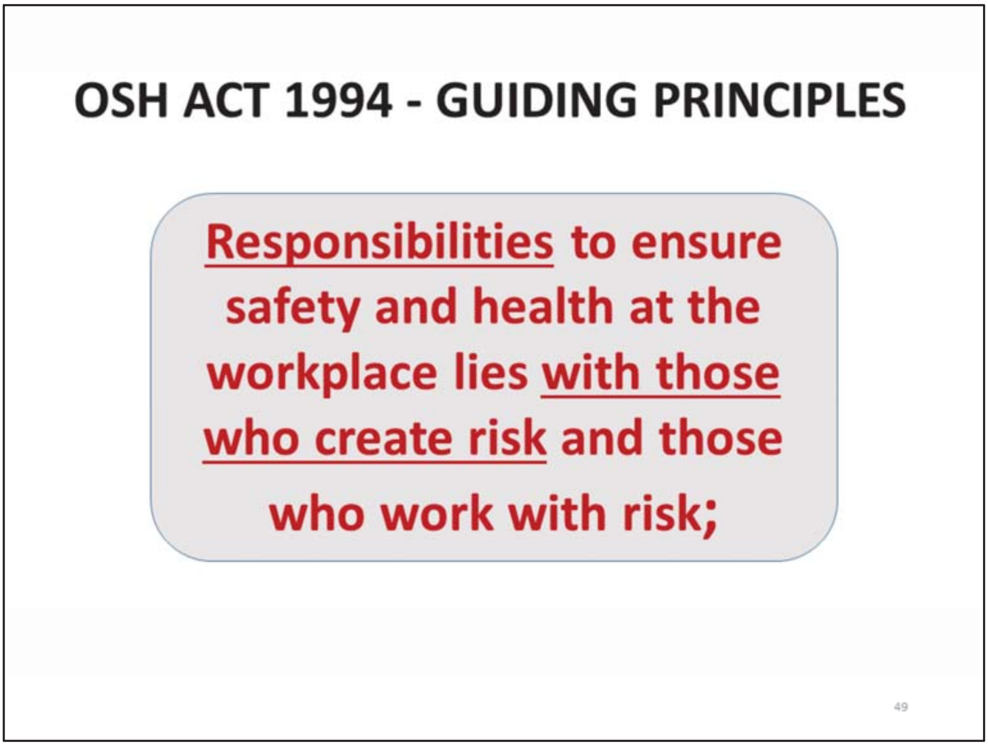
OSH ACT 1994 - GUIDING PRINCIPLES

The principle of the Act is "To make further provision for securing that safety, health and welfare of persons at work, for protecting others against risks to safety or health in connection with the activities of persons at work, to establish the National Council for Occupational Safety and Health and for matters connected therewith."

The Act applies throughout Malaysia to the industries specified in the First Schedule. Nothing in this act shall apply to work aboard ships governed by the Merchant Shipping Ordinance 1952 [Ord. No. 70 of 1952], the Merchant Shipping Ordinance 1960 of Sabah [Sabah Ord. No. 11 of 1960] or Sarawak [Sarawak Ord. No. 2 of 1960] or the armed forces.

FOCUS ON THE ACCOUTABILITY AS PER NEXT SLIDE



OSH ACT 1994 - GUIDING PRINCIPLES

Implementation
1. All employers with more than 5 employees are required by the legislation to arrange a written Safety and Health Policy. The objective is to demonstrate the commitment of the employer or company to ensure safety and health in the workplace.
2. Safety and Health Policy must be taken into account when making decisions or performing work activities of the organization.
3. This law also specifies the general duties of (a) Employers;
(b) Self-employed persons;
(c) Manufacturers, designers and suppliers;
(d) Employees,
(e) The establishment of the safety and health committee.
(f) The appointment of a safety and health officer and
(g) The enforcement, investigation and offenses.

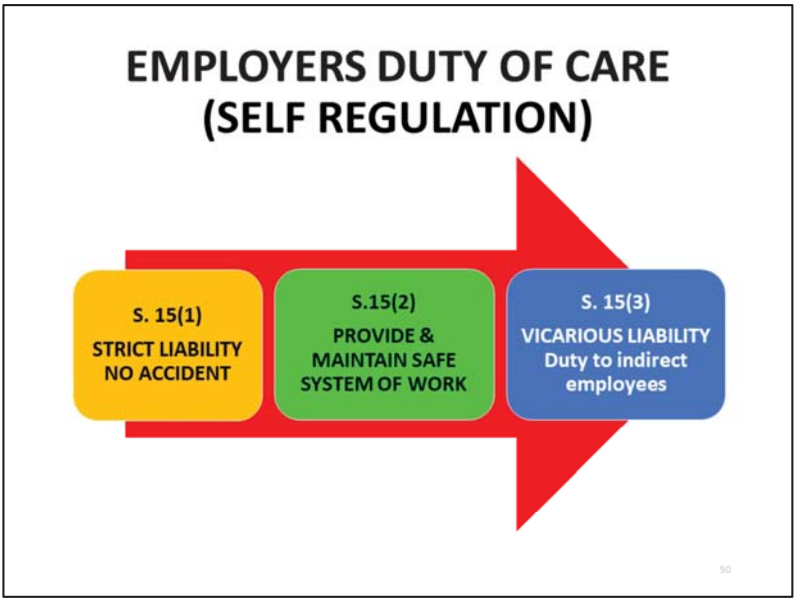
It shall be the duty of every employer to ensure, so far as is reasonably

practicable, the health, safety and welfare at work of all his employees." Most of us will be familiar with this phrase or variations of it, but what does 'reasonably practicable' actually mean?

Reasonably practicable means the employer is required to complete a thorough risk assessment and take all possible steps to ensure the health and safety of employees while taking into consideration the following;

- **The likelihood of the hazard or risk occurring**
- **The degree of harm that might result from the hazard or risk**
- **The availability and suitability of ways to eliminate or minimise the risk**
- **The cost associated with available ways of eliminating risk and whether this is proportionate to the risk**

It is important to note that from a regulator's perspective, cost will not be a key factor in determining what is reasonable for the employer to do to reduce risk. Safety is clearly favoured over cost unless it can be shown to be grossly disproportionate.



EMPLOYERS DUTY OF CARE(SELF REGULATION)

Employer's responsibilities
Under the law employers are responsible for health and safety management. The following provides a broad outline of how the law applies to employers. Don't forget, employees and the self employed have important responsibilities too.

It is an employer's duty to protect the health, safety and welfare of their employees and other people who might be affected by their business. Employers must do whatever is reasonably practicable to achieve this.

This means making sure that workers and others are protected from anything that may cause harm, effectively controlling any risks to injury or health that could arise in the workplace. S15(1)

Employers have duties under health and safety law to assess risks in the workplace. Risk assessments should be carried out that address all risks that might cause harm in your workplace.

Employers must give you information about the risks in your workplace and how you

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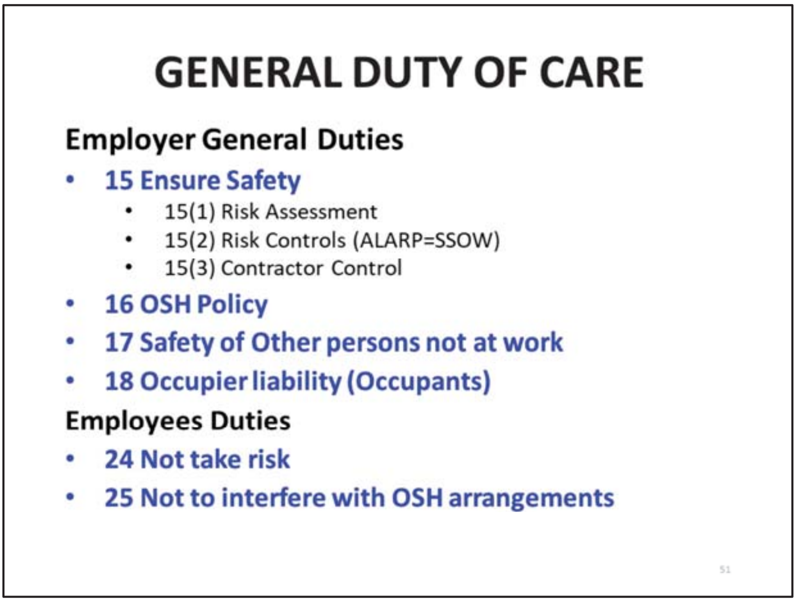
are protected, also instruct and train you on how to deal with the risks.15 (2)

Employers must consult employees on health and safety issues. Consultation must be either direct or through a safety representative that is either elected by the workforce or appointed by a trade union.S15(3)



GENERAL DUTY OF CARE

In English tort law, an individual may owe a duty of care to another, to ensure that they do not suffer any unreasonable harm or loss. If such a duty is found to be breached, a legal liability is imposed upon the tortfeasor to compensate the victim for any losses they incur. The idea of individuals owing strangers a duty of care – where beforehand such duties were only found from contractual arrangements – developed at common law, throughout the 20th century. The doctrine was significantly developed in the case of Donoghue v Stevenson,[1] where a woman succeeded in establishing a manufacturer of ginger beer owed her a duty of care, where it had been negligently produced. Following this, the duty concept has expanded into a coherent judicial test, which must be satisfied in order to claim in negligence.

Generally, a duty of care arises where one individual or group undertakes an activity which could reasonably harm another, either physically, mentally, or economically. This includes common activities such as driving (where physical injury may occur), as well as specialized activities such as dispensing reliant economic advice (where economic loss may occur). Where an individual has not created a situation which may cause harm, no duty of care exists to warn others of dangerous situations or prevent harm occurring to them; such acts are known as pure omissions, and liability may only arise where a prior special relationship exists to necessitate them

15. General duties of employers and self-employed persons to their employees.
(1) It shall be the duty of every employer and every self-employed person to ensure, so far as is practicable, the safety, health and welfare at work of all his employees.

(2) Without prejudice to the generality of subsection (1), the matters to which the duty extends include in particular-
(a) the provision and maintenance of plant and systems of work that are, so far as is practicable, safe and without risks to health;
(b) the making of arrangements for ensuring, so far as is practicable, safety and absence of risks to health in connection with the use or operation, handling, storage and transport of plant and substances;
(c) the provision of such information, instruction training and supervision as is necessary to ensure, so far as is practicable, the safety and health at work of his employees;
(d) so far as is practicable, as regards any place of work under the control of the employer or self-employed person, the maintenance of it in a condition that is safe and without risks to health and the provision and maintenance of the means of access to and egress from it that are safe and without such risks;
(e) the provision and maintenance of a working environment for his employees that is, so far as is practicable, safe, without risks to health, and adequate as regards facilities for their welfare at work.

(3) For the purposes of subsections (1) and (2)-
(a) "employee" includes an independent contractor engaged by an employer or a self-employed person and any employee of the independent contractor; and
(b) the duties of an employer or a self-employed person under subsections (1) and (2) extend to such an independent contractor and the independent contractor's employees in relation to matters over which the employer or self-employed person-
(i) has control; or
(ii) would have had control but for any agreement between the employer or self-employed person and the independent contractor to the contrary.
16. Duty to formulate safety and health policy.
Except in such cases as may be prescribed, it be the duty of every employer and every self-employed person to prepare and as often as may be appropriate revise a written statement of his general policy with respect to the safety and health at work of his employees and the organisation and arrangements for the time being in force for carrying out that policy, and to bring the statement and any revision of it to the notice of all of his employees.

17. General duties of employers and self-employed persons to persons other than their employees.
(1) It shall be the duty of every employer and every self-employed person to conduct his undertaking in such a manner as to ensure, so far as is practicable, that he and other persons, not being his employees, who may be affected thereby are not thereby exposed to risks to their safety or health.
(2) It shall be the duty of every employer and every self-employed person, in the

prescribed circumstances and in the prescribed manner, to give to persons, not being his employees, who may be affected by the manner in which he conducts his undertaking, the prescribed information on such aspects of the manner in which he conducts his undertaking as might affect their safety or health.

18. Duties of an occupier of a place of work to persons other than his employees.

(1) An occupier of non-domestic premises which has been made available to persons, not being his employees, as a place of work, or as a place where they may use a plant or substance provided for their use there, shall take such measures as are practicable to ensure that the premises, all means of access thereto and egress therefrom available for use by persons using the premises, and any plant or substance in the premises or provided for use there, is or are safe and without risks to health.

(2) A person who has, by virtue of a contract or lease or otherwise, an obligation of any extent in relation to -

(a) the maintenance or repair of a place of work or any means of access there to or egress there from; or

(b) the prevention of risks to safety and health that may arise from the use of any plant or substance in the place of work, shall for the purpose of subsection (1) be deemed to have control of the matters to which his obligation extends.

24. General duties of employees at work.

(1) It shall be the duty of every employee while at work-

(a) to take reasonable care for the safety and health of himself and of other persons who may be affected by his acts or omissions at work;

(b) to co-operate with his employer or any other person in the discharge of any duty or requirement imposed on the employer or that other person by this Act or any regulation made thereunder;

(c) to wear or use at all times any protective equipment or clothing provided by the employer for the purpose of preventing risks to his safety and health; and

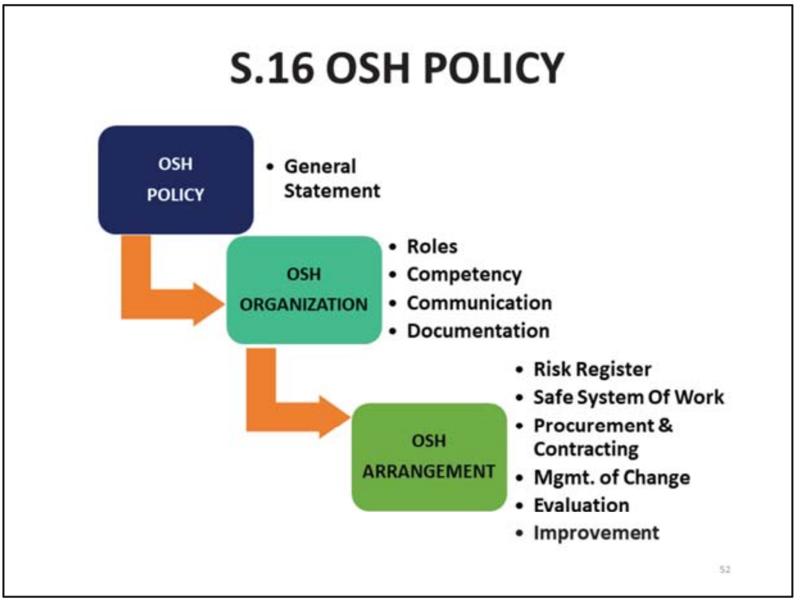
(d) to comply with any instruction or measure on occupational safety and health instituted by his employer or any other person by or under this Act or any regulation made thereunder.

(2) A person who contravenes the provisions of this section shall be guilty of an offence and shall, on conviction, be liable to a fine not-exceeding one thousand ringgit or to imprisonment for a term not exceeding three rnonths or to both.

25. Duty not to interfere with or misuse things provided pursuant to certain provisions.

A person who intentionally, recklessly or negligently interferes with or misuses anything provided or done in the interests of safety, health and welfare in pursuance of this Act shall be guilty of an offence and shall, on conviction, be liable to a fine not exceeding twenty thousand ringgit or to imprisonment

for a terrn not exceeding two years or to both.



DEFINITION REFER TO DPSH OSH ACT 1994 GL 2006 & DOSH OSHMS GL 2011

16. Duty to formulate safety and health policy.

Except in such cases as may be prescribed, it be the duty of every employer and every self-employed person to prepare and as often as may be appropriate revise a written statement of his general policy with respect to the safety and health at work of his employees and the organization and arrangements for the time being in force for carrying out that policy, and to bring the statement and any revision of it to the notice of all of his employees

According to section 16 of the Occupational Safety and Health Act 1994 ("OSHA 1994"), it is a duty of the employer (or a self-employed person) to prepare a safety and health policy. Aside from preparing such a policy, they must also update it as often as necessary. This means that if your company has a safety and health policy from 1990, it might be time for them to look through it again.

Section 16 OSHA 1994:

"Except in such cases as may be prescribed, it shall be the duty of every employer and every self-employed person to prepare and as often as may be appropriate revise a

written statement of his general policy with respect to the safety and health at work of his employees and the organization and arrangements for the time being in force for carrying out that policy, and to bring the statement and any revision of it to the notice of all of his employees."

A point to note is that the OSHA 1994 only applies to the list of industries which are listed in the First Schedule of the Act. You can look at the full list on your own but the more common ones include manufacturing and construction to business services.

A failure to have a safety and health policy would result in very steep fines on your employer. This is provided for under section 19 which states that:

"A person who contravenes the provisions of section 15, 16, 17 or 18 shall be guilty of an offence and shall, on conviction, be liable to a fine not exceeding fifty thousand ringgit or to imprisonment for a term not exceeding two years or to both."

Landmark day" as ISO 45001 launched
12 March 2018

Today, Monday 12 March, is "a landmark day" in occupational safety and health (OSH) as ISO 45001 is launched. With 2.78 million people being killed worldwide each year by work-related injury or ill health, the new global standard can encourage "much-needed solutions", according to the Institution of Occupational Safety and Health (IOSH).

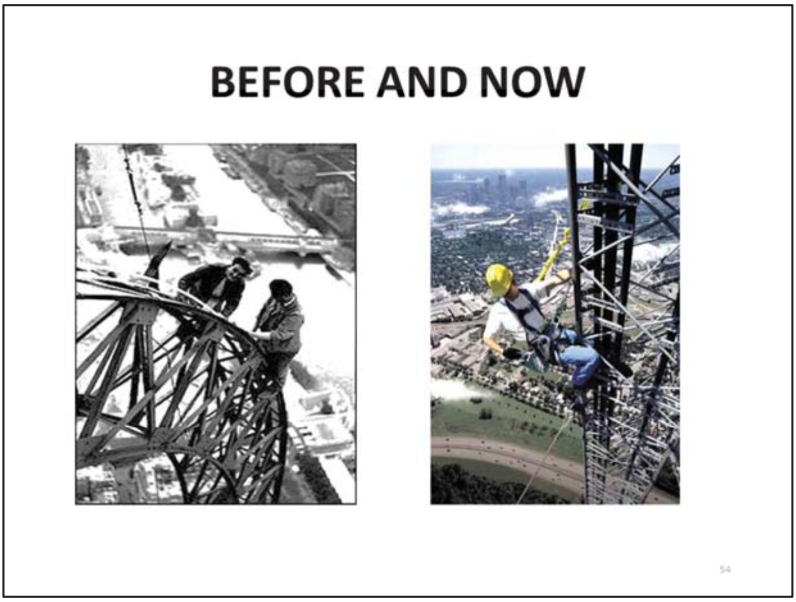
Organizations which adopt the standard – which has been four-and-a-half years in the making – will be required to have proportionate safety and health management systems which prevent injury and ill health among their workforce and throughout their supply chains.

Richard Jones, Head of Policy and Public Affairs at IOSH, said this means leaders will have to ensure it is integral to their strategies and operations.

He said: "This really is a landmark day for occupational safety and health. ISO 45001 can enhance the drive towards a safe and healthy world of work.

"Having an agreed international standard can help ensure consistency and encourage

much-needed solutions to the myriad of safety and health risks that exist in workplaces around the globe



Describe the difference between two(2) picture.

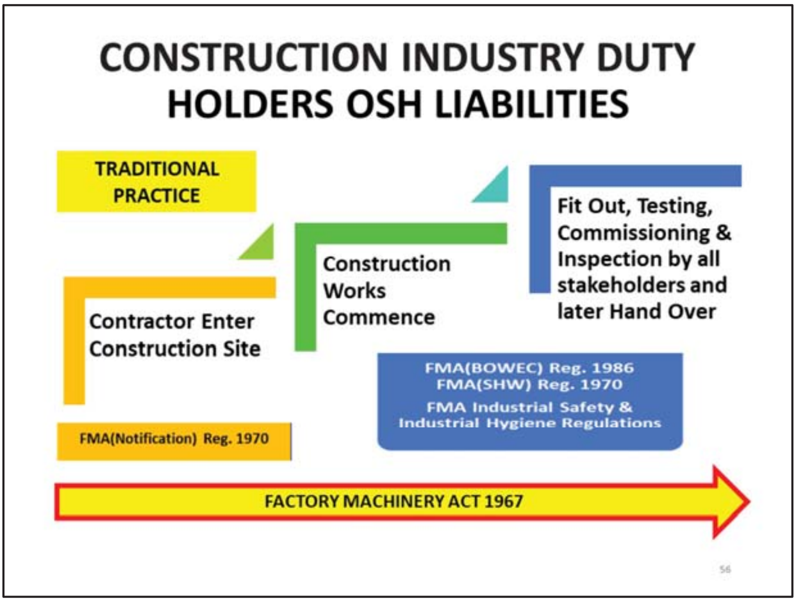
1. **WORK AT HEIGHT IN THE OLD DAYS; WHEN YOU FALL YOU DIE!!**
2. **NOWADAYS; YOU FALL YOU SURVIVE (FALL ARREST)**

Working at height remains one of the biggest causes of fatalities and major injuries. Common cases include falls from ladders and through fragile surfaces. ‘Work at height’ means work in any place where, if there were no precautions in place, a person could fall a distance liable to cause personal injury (for example a fall through a fragile roof).

This section shows how employers can take simple, practical measures to reduce the risk of any of their workers falling while working at height.

Lifting operations are inherent to many occupations in the construction industry. They can be performed manually or using lifting equipment. Both manual lifting and mechanical lifting operations can put construction workers at great risk of injury or health symptoms causing sick leave or disability. The costs of accidents and ill health related to lifting operations, are immense. This article describes the risks associated with lifting operations in the construction industry and measures to reduce these risks.

1. **WORK AT HEIGHT**
2. **PRE FAB (REDUCED FALL FROM HEIGHT HAZARDS)**
3. **PLAY VIDEO (CLICK QR CODE)**



DESCRIBE THE CONSTRUCTION INDUSTRY DUTY HOLDERS OSH LIABILITIES AS TRADITIONAL PRACTICE

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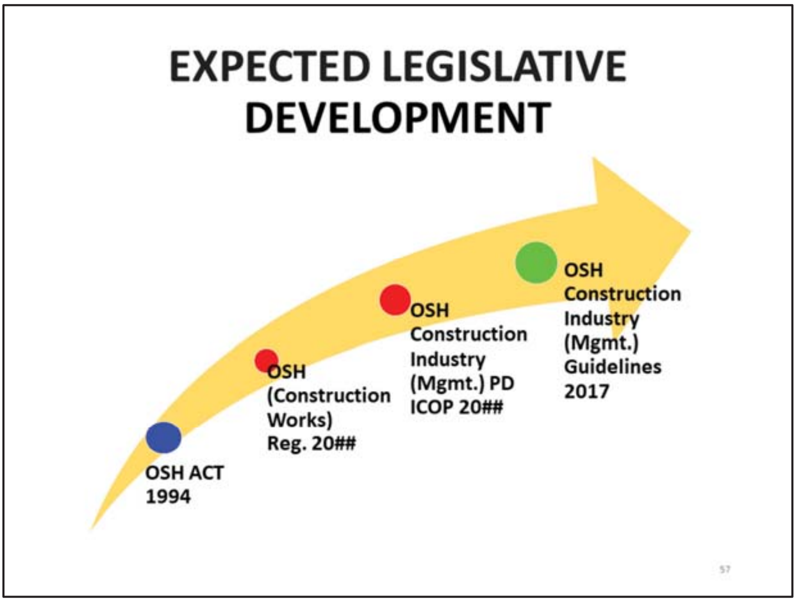


The purpose of this write up is to provide a brief overview of an employer's obligation of health and safety towards its employees under the laws of Malaysia. In Malaysia, the principal legislation that deals with employment health and safety is the Occupational Safety and Health Act 1994 (OSHA). Such obligations exist side by side with an employer's common law duty to provide a safe system of work at the workplace. Aside from the OSHA, other laws such as the Employees' Social Security Act 1969 (SOCSO) provides for employees compensation in the event of an employment injury. Occupational Health (OH) aims at protecting and promoting the health of the economically active sector of the population - the workforce. It is this economically active sector that pays the taxes and produces the goods contributing to a nation's GDP. How cognizant are policy makers, administrators, employers and employees of occupational health and how do we convince them that good health of the workforce is good for business.

Professor Malcolm Harrington raised these and other questions at the 26th International Conference on Occupational Health 2000 (ICOH 2000) held in August 2000 in Singapore. The question is whether occupational health is a saleable commodity, and if it is believed that occupational health has fiscal, moral and ethical worth, why is it failing to succeed. Reasons given for this included: low profile and hence low priority with politicians and the public; globalization of workplaces leading to inequity in health care, when low cost and high quality products become the goal and quality of working life is sacrificed and the real costs of occupational illness and

injury are not borne by employer but by the state and hence difficult to sell the benefits of Emerging OH problems and the need for new solutions provide an excellent opportunity for us to review current developments and to contemplate future directions for OH in Malaysia.

KEY CHANGES (OSH BEYOND THE CONSTRUCTION SITE)

BOWEC(S) 1986	OSHCIM Guidelines 2017
- Prescribed control measures (how to achieve the standard)	- Set the standard/ objective to achieve, but not how
- Applies to principal/main contractor in a construction site, maintenance and demolition	- Applies to design phase, construction, maintenance and demolition (full cycle)
- Focus on design and management of construction work	- Focus on planning, design and management of construction project
- Main responsibility to principal/ main contractor and singularly responsible for OSH	- Main responsibility to the client/developer, principal designer and principal contractor

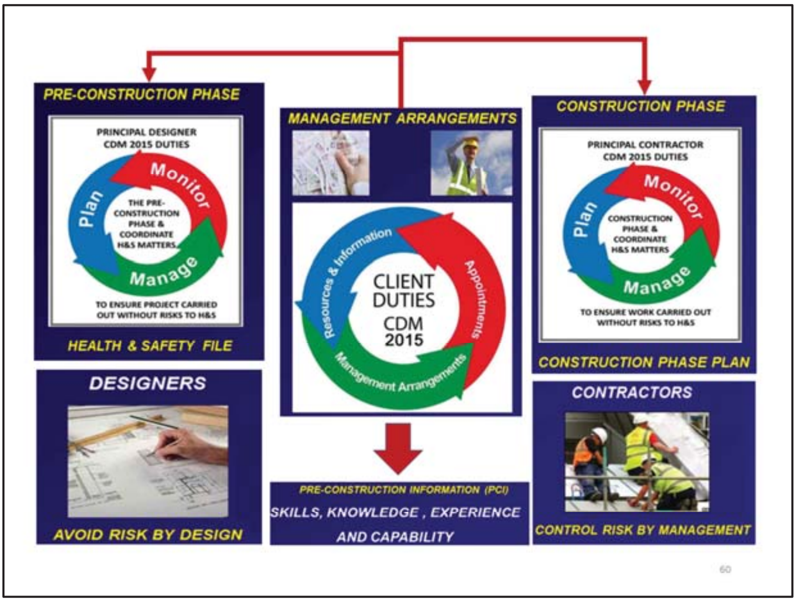
58

ANIMATE AND DESCRIBE

DESCRIBE EACH PROVISIONS (Line by line on the click of mouse)

Ask the participate to:

1. INFORM OF DOWNLOADABLE QR CODE
2. CLICK QR CODE TO PLAY VIDEO



Explain the diagram base on the :

1. CDM2015 HSE UK
2. CLIENT ROLE
3. PD & DESIGNERS ROLE
4. PC & CONTRCATOR ROLE

A sample of the project environment featuring the different kinds of stakeholders involved on a typical project. A study of this diagram confronts us with a couple of interesting facts.

Project Stakeholders
Top management may include the president of the company, vice-presidents, directors, division managers, the corporate operating committee, and others. These people direct the strategy and development of the organization.

On the plus side, you are likely to have top management support, which means it will be easier to recruit the best staff to carry out the project, and acquire needed material and resources; also visibility can enhance a project manager's professional standing in the company.

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On the minus side, failure can be quite dramatic and visible to all, and if the project is large and expensive (most are), the cost of failure will be more substantial than for a smaller, less visible project.

Some suggestions in dealing with top management are:

- Develop in-depth plans and major milestones that must be approved by top management during the planning and design phases of the project.
- Ask top management associated with your project for their information reporting needs and frequency.
- Develop a status reporting methodology to be distributed on a scheduled basis.
- Keep them informed of project risks and potential impacts at all times.

The Project Team

The project team is made up of those people dedicated to the project or borrowed on a part-time basis. As project manager, you need to provide leadership, direction, and above all, the support to team members as they go about accomplishing their tasks. Working closely with the team to solve problems can help you learn from the team and build rapport. Showing your support for the project team and for each member will help you get their support and cooperation.

Here are some difficulties you may encounter in dealing with project team members:

- Because project team members are borrowed and they don't report to you, their priorities may be elsewhere.
- They may be juggling many projects as well as their full-time job and have difficulty meeting deadlines.
- Personality conflicts may arise. These may be caused by differences in social style or values or they may be the result of some bad experience when people worked together in the past.
- You may find out about missed deadlines when it is too late to recover.
- Managing project team members requires interpersonal skills. Here are some suggestions that can help:

Involve team members in project planning.
Arrange to meet privately and informally with each team member at several points in the project, perhaps for lunch or coffee.
Be available to hear team members' concerns at any time.
Encourage team members to pitch in and help others when needed.
Complete a project performance review for team members.
Your Manager
Typically the boss decides what the assignment is and who can work with the project manager on projects. Keeping your manager informed will help ensure that you get the necessary resources to complete your project.

If things go wrong on a project, it is nice to have an understanding and supportive boss to go to bat for you if necessary. By supporting your manager, you will find your manager will support you more often.

Find out exactly how your performance will be measured.
When unclear about directions, ask for clarification.
Develop a reporting schedule that is acceptable to your boss.
Communicate frequently.

Peers

Peers are people who are at the same level in the organization as you and may or may not be on the project team. These people will also have a vested interest in the product. However, they will have neither the leadership responsibilities nor the accountability for the success or failure of the project that you have.

Your relationship with peers can be impeded by:

- Inadequate control over peers
- Political maneuvering or sabotage
- Personality conflicts or technical conflicts
- Envy because your peer may have wanted to lead the project
- Conflicting instructions from your manager and your peer's manager
- Peer support is essential. Because most of us serve our self-interest first, use some investigating, selling, influencing, and politicking skills here.

To ensure you have cooperation and support from your peers:

Get the support of your project sponsor or top management to empower you as the project manager with as much authority as possible. It's important that the sponsor makes it clear to the other team members that their cooperation on project activities is expected.
Confront your peer if you notice a behavior that seems dysfunctional, such as bad-mouthing the project.
Be explicit in asking for full support from your peers. Arrange for frequent review meetings.
Establish goals and standards of performance for all team members.

Resource Managers

Because project managers are in the position of borrowing resources, other managers control their resources. So their relationships with people are especially important. If their relationship is good, they may be able to consistently acquire the best staff and the best equipment for their projects. If relationships aren't good, they may find themselves not able to get good people or equipment needed on the project.

Internal Customers

Internal customers are individuals within the organization who are customers for projects that meet the needs of internal demands. The customer holds the power to accept or reject your work. Early in the relationship, the project manager will need to negotiate, clarify, and document project specifications and deliverables. After the project begins, the project manager must stay tuned in to the customer's concerns and issues and keep the customer informed.

Common stumbling blocks when dealing with internal customers include:

- A lack of clarity about precisely what the customer wants
- A lack of documentation for what is wanted
- A lack of knowledge of the customer's organization and operating characteristics
- Unrealistic deadlines, budgets, or specifications requested by the customer
- Hesitancy of the customer to sign off on the project or accept responsibility for decisions
- Changes in project scope
- To meet the needs of the customer, client, or owner, be sure to do the following:

Learn the client organization's buzzwords, culture, and business.
Clarify all project requirements and specifications in a written agreement.
Specify a change procedure.
Establish the project manager as the focal point of communications in the project organization.
External customer
External customers are the customers when projects could be marketed to outside customers. In the case of Ford Motor Company, for example, the external customers would be the buyers of the automobiles. Also if you are managing a project at your company for Ford Motor Company, they will be your external customer.

Government
Project managers working in certain heavily regulated environments (e.g., pharmaceutical, banking, or military industries) will have to deal with government regulators and departments. These can include all or some levels of government from municipal, provincial, federal, to international.

Contractors, subcontractors, and suppliers
There are times when organizations don't have the expertise or resources available in-house, and work is farmed out to contractors or subcontractors. This can be a construction management foreman, network consultant, electrician, carpenter, architect, or anyone who is not an employee. Managing contractors or suppliers requires many of the skills needed to manage full-time project team members.

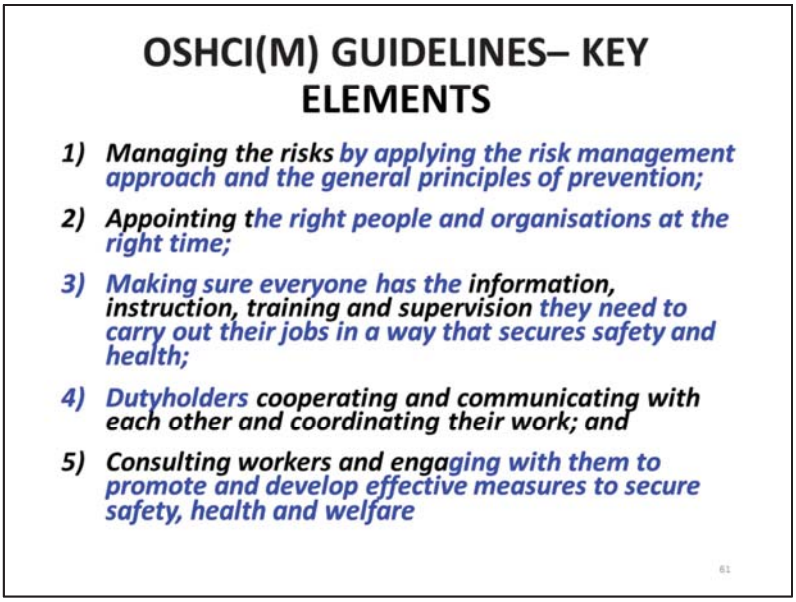
Any number of problems can arise with contractors or subcontractors:

Quality of the work
Cost overruns
Schedule slippage
Many projects depend on goods provided by outside suppliers. This is true for example of construction projects where lumber, nails, bricks, and mortar come from outside suppliers. If the supplied goods are delivered late or are in short supply or of poor quality or if the price is greater than originally quoted, the project may suffer.

Depending on the project, managing contractor and supplier relationships can consume more than half of the project manager's time. It is not purely intuitive; it involves a sophisticated skill set that includes managing conflicts, negotiating, and other interpersonal skills.

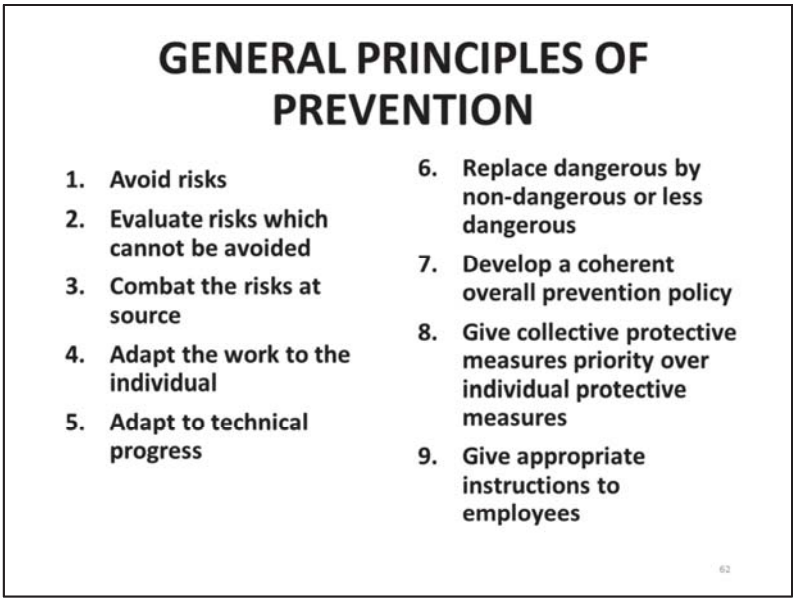
First, the number of stakeholders that project managers must deal with ensures that they will have a complex job guiding their project through the lifecycle. Problems with any of these members can derail the project.

Second, the diagram shows that project managers have to deal with people external to the organization as well as the internal environment, certainly more complex than what a manager in an internal environment faces. For example, suppliers who are late in delivering crucial parts may blow the project schedule. To compound the problem, project managers generally have little or no direct control over any of these individuals.



OSHCI(M) GUIDELINES– KEY ELEMENTS

- **Managing the risks by applying the risk management approach and the general principles of prevention;**
- **Appointing the right people and organizations at the right time;**
- **Making sure everyone has the information, instruction, training and supervision they need to carry out their jobs in a way that secures safety and health;**
- **Duty holders cooperating and communicating with each other and coordinating their work; and**
- **Consulting workers and engaging with them to promote and develop effective measures to secure safety, health and welfare**



GENERAL PRINCIPLES OF PREVENTION

Designers can make decisions that significantly reduce the risks to safety and health during the construction stage and during subsequent use and maintenance. They are therefore a key contributor to construction health and safety.

As designer you can directly influence safety. Designers must take account of the General Principles of Prevention when preparing designs. The Principles of Prevention are a hierarchy or risk elimination and reduction.

The General Principles of Prevention are set out in descending order of preference as follows:

- Avoid risks.
- Evaluate unavoidable risks.
- Combat risks at source.
- Adapt work to the individual, especially the design of places of work
- Adapt the place of work to technical progress.
- Replace dangerous articles, substances, or systems of work by non-dangerous or less dangerous articles, substances, or systems
- Use collective protective measures over individual measures

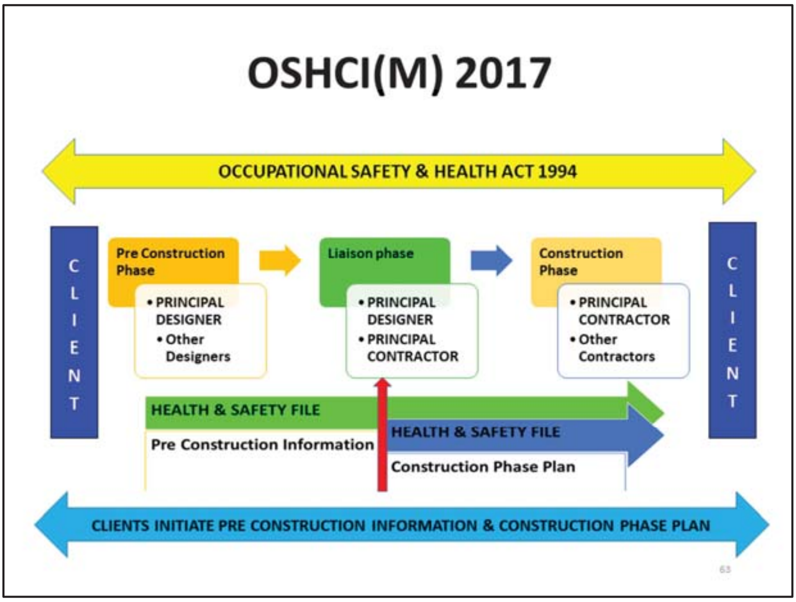
- Develop an adequate prevention policy
- Give appropriate training and instruction to employees.

As a designer you can directly influence safety. Some of the well-proven ways of reducing risk include: Choosing the position and design of structures to avoid or minimize risks from known site hazards, including:

buried services, including gas pipelines, overhead and underground power lines traffic movements to, from, around, and adjacent to the site contaminated ground (for example by using driven rather than bored piles)

Designing out or minimizing health hazards, for example:

- specify/permit the use of materials known to be less hazardous, e.g. low solvent adhesives and water-based paints
- avoid processes that create hazardous fumes, vapors, dust, noise or vibration, including disturbance of existing asbestos, cutting chases in brickwork and concrete, unnecessary breaking down cast in-situ piles to level or scrabbling concrete
- specify the use of easy to handle materials
- design block paved areas to enable mechanical handling and laying of units
- design access areas to accommodate work-at-height equipment.



ANIMATE AND DESCRIBE

1. OBLIGATION OF OSHCI(M) UNDER OSH ACT 1994

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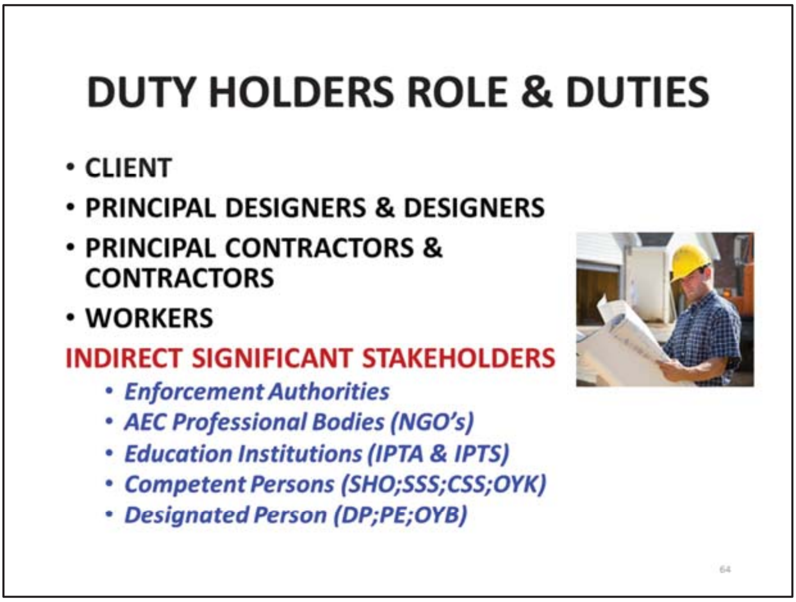


DUTY HOLDERS ROLE & DUTIES

Everyone has a role to play to ensure that health and safety is a priority in the workplace. The Work Health and Safety Act 2011 (WHS Act) and Work Health and Safety Regulations 2011 require persons who have a duty to ensure health and safety to 'manage risks' by eliminating health and safety risks so far as is reasonably practicable, and if it is not reasonably practicable to do so, to minimize those risks so far as is reasonably practicable.

he principal duty holder under the Work Health and Safety Act 2011 (WHS Act) is a 'person conducting a business or undertaking' (PCBU). PCBUs include the Commonwealth, Commonwealth Authorities, non-Commonwealth licensees, principal contractors. In some cases, there may be multiple PCBUs who share responsibilities under the WHS laws.

Broadening the responsibility from employer to PCBU means that WHS Act coverage extends beyond the traditional employer / employee relationship to include new and evolving work arrangements and risks.

The WHS Act also places specific upstream duties on PCBUs who carry out specific activities:

persons with management or control of a workplace/fixtures, fittings and plant designers, manufacturers, importers, suppliers and PCBUs that install construct or commission plant or structures.
Any PCBU who is contributing to work has a duty of care, and there can be more than one duty in relation to specific activities.

Note that a 'Volunteer association' (as defined in section 5(8) of the WHS Act) is not treated as a business or undertaking.

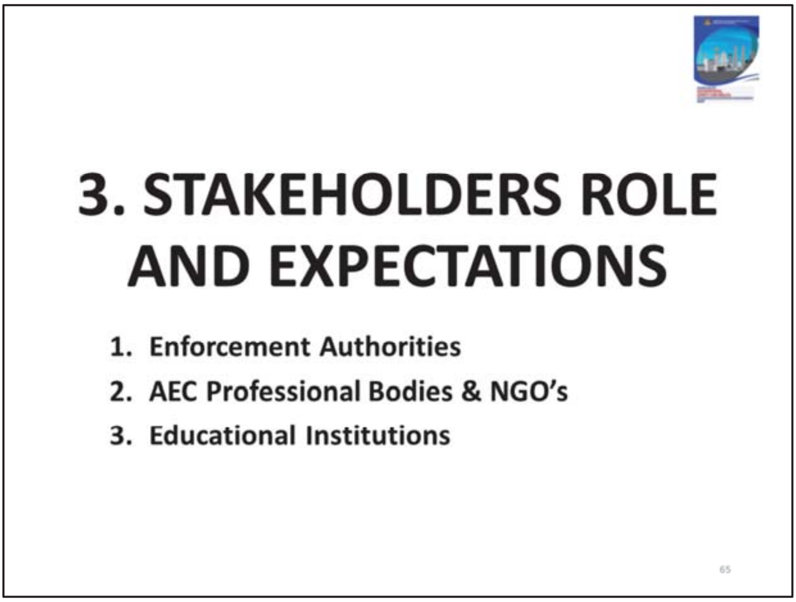
An officer is a senior executive who makes, or participates in making, decisions that affect the whole, or a substantial part, of a business or undertaking. Officers have a duty to be proactive and continuously ensure that the business or undertaking complies with relevant duties and obligations.

The scope of an officers' duty is directly related to the influential nature of their position. Continuous examination and care is required to ensure that the resources and systems of the business or undertaking are adequate to comply with the duty of care required under the WHS Act. This also requires officers to ensure that delegations are working effectively. Where the officer relies on the expertise of a manager or other person, that expertise must be verified and the reliance must be reasonable.

The intention of the officers' duty is to ensure engagement and leadership by officers in WHS management. This supports sustainability and improvement in WHS performance.

Workers include employees, contractors and volunteers working for a Commonwealth or non-Commonwealth licensee business or undertaking. Under the WHS Act, workers must take reasonable care for their own health and safety and take reasonable care that their actions or omissions do not adversely affect the health and safety of others.

Other persons at the workplace have a duty to take reasonable care for their own health and safety. They also have a duty to take reasonable care that their acts or omissions do not adversely affect the health and safety of other persons. They must also comply, so far as they reasonably can, with any reasonable instruction given by the person conducting the business or undertaking to allow the person to comply with the WHS Act.



Module 3 : STAKEHOLDERS ROLE AND EXPECTATIONS

A project is successful when it achieves its objectives and meets or exceeds the expectations of the stakeholders. But who are the stakeholders? Stakeholders are individuals who either care about or have a vested interest in your project. They are the people who are actively involved with the work of the project or have something to either gain or lose as a result of the project. When you manage a project to add lanes to a highway, motorists are stakeholders who are positively affected. However, you negatively affect residents who live near the highway during your project (with construction noise) and after your project with far-reaching implications (increased traffic noise and pollution)

he project sponsor, generally an executive in the organization with the authority to assign resources and enforce decisions regarding the project, is a stakeholder. The customer, subcontractors, suppliers, and sometimes even the government are stakeholders. The project manager, project team members, and the managers from other departments in the organization are stakeholders as well. It's important to identify all the stakeholders in your project upfront. Leaving out important stakeholders or their department's function and not discovering the error until well into the project could be a project killer.

Stakeholder Management is about relationships between an organization and their groups interested or stakeholders. These relationships impact on the individuals and their organizations, that could be positive, or have a negative influence on any successful project. Therefore the stakeholders from any project should be managed by the organizations with the outlook to minimize the negative impacts and make sure that there are no obstacles in the way of a successful project.

At the moment the stakeholder management is considered, at least in theory by the building construction sector, as important for their business as other areas, for example subcontracting, security or the environment.

Who are the Project Stakeholders?
The most formal sources, like Project Management Institute (2001) defines the stakeholders as: "individuals and organizations who are actively involved in the project, or whose interests may be positively or negatively affected as a result of project execution or successful project completion."

A more concise definition of the stakeholders would be: "those groups or individuals with whom the organization interacts or has interdependencies…any individual or group who can affect or is affected by the actions, decisions, policies, practices or goals of the organization". (Carroll, 1993).

The stakeholder in a project can be divided into (Calvert 1995; Winch and Bonked 2002):

Internal Stakeholders to the organization, who are the team members of the project or those who provide for the financing of it.
External Stakeholders like the people affected by the project in some significant way.
In the majority of projects from the construction sector there will be a lot of stakeholders and the diversity of its nature and demands will produce a conflict of interests.

The checklist of stakeholders in a construction project is often big and includes the owners and facility users, project management, team members, facilities managers, designers, shareholders, public administration, workers, subcontractors, services suppliers competitors, banks insurance companies, media, community representative, neighbors, general public, clients, regional development agencies. Each one of these could influence in the course of the project at some time. Even though some could influence in the project more than often, the majority of whom will do so at a set time.

If we are able to identify as many stakeholders in a construction project, the construction industry should be able to manage their expectations in a proactive way from the first moment of the project.

First time round, the companies worry more about registering the stakeholder who they think are a risk to the project, with a negative influence; while the stakeholders who make the project easy, are not even registered. In this sense it´s normal that these

organizations worry more about these agents who have a great influence and power over the success of the project, taking into account that it could not go through without their consent. The organizations often depend on the external stakeholders for financing, licenses, services, resources etc.

A consensus and simple way to register the stakeholders in a project is a Power–Interest Matrix, which puts them in groups depending on their level of power and interests with respect to the result of the project.

In addition to this Power-Interest dimension, Newcombe (2003) considers a Power-Predictability Matrix. A risk perspective overshadows the predictability of stakeholders. How predictable the stakeholders are, which affect the degree of uncertainty of a specific risk. In this sense, an organization should be able to identify those stakeholders who can create an uncertain risk or a power over the project.

As projects can create unexpected situations from the stakeholders it´s necessary to monitor the progress of the agents, the evolution of their power of influence, and the triggers that can originate these reactions. Therefore the urgency of which each stakeholder should be treated is changeable throughout the development of the project. This urgency associated with stakes and interests is often not static but dynamic. Therefore it should be controlled regularly to detect important changes.

An updated and dynamic matrix helps an organization to (Vogwell, 2002):

Bring order to a very complex situation.
Transmit and understand the different agents, even though they have been registered through different members of the organization or team.
Suggest updated strategies for the management and communication between the different groups interested.
Manage the resources and time in the management of the stakeholders in the best way possible.

Construction Stakeholder Management

The special nature of the construction projects makes the stakeholder management in this sector take into account these special factors, such as types of contracts or the nature of the project object. The organizations in the construction sector operate nowadays in a globalized market, with large project teams and jointed projects with international companies in which they manifest cultural differences, professional ethics and different ideas about how to conduct business.

The relationships between different process agents in the building construction sector can be regulated or limited by contracts, for example between the client and the builder. The contractual deposits or the laws about contacts with the administration limit the strategic use of stakeholder management. For example the obligation to finish a job within a limited time, with budgetary targets attached, makes the stakeholders management work effective within a pressured environment

This activity goes beyond the sentence of a construction project. The users of the facilities, clients, etc, can enjoy their interests after the building construction fase, so that the stakeholders management extends throughout the construction lifecycle.

ConstructionManagement2In order to achieve a more successful project result , the project director should be skillful in the management of the different stakeholders during the whole process of the project, from the beginning until after the building of it. The regular communication with the different stakeholders makes this inform their management of diverse stakes .

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Impact of Stakeholders on Projects and Organizations

As we have seen, the probability of project success is greatly reduced if stakeholders are ineffectively management.

Specially .the aspects that are considered with the projects objectives, the ones who are affected by lack of participation from the stakeholders. In this case, the project manager has problems to clearly define the objectives of the project. without clear and precise objectives neither the project manager nor the rest of the stakeholders will know when the project will have accomplished its objectives.

Furthermore even though the project will be successful from the managers point of view or the company, except if the project doesn´t fit the demands of the objectives of both parties, the stakeholders won`t be satisfied with the project results. (Jergeas).

Other potential problems associated with a ineffectively management are: a poor scope because of the lack of definition in, work problems coming from assigned sources to the project, regulatory changes that affect the project, or a negative reaction from the community against the project. All these problems put together with the lack of participation of the stakeholders in the project which affects the budget and schedules.

The stakeholder management is intimately related to Corporate Social Responsibility. CSR which could also be understood as a voluntary social and environmental concern in the business transaction and the interactions with the stakeholders (Enquist, 2006). The organizations assume that they have a social obligation that goes much further than their responsibilities with the shareholders. (Doh y Guay, 2006).

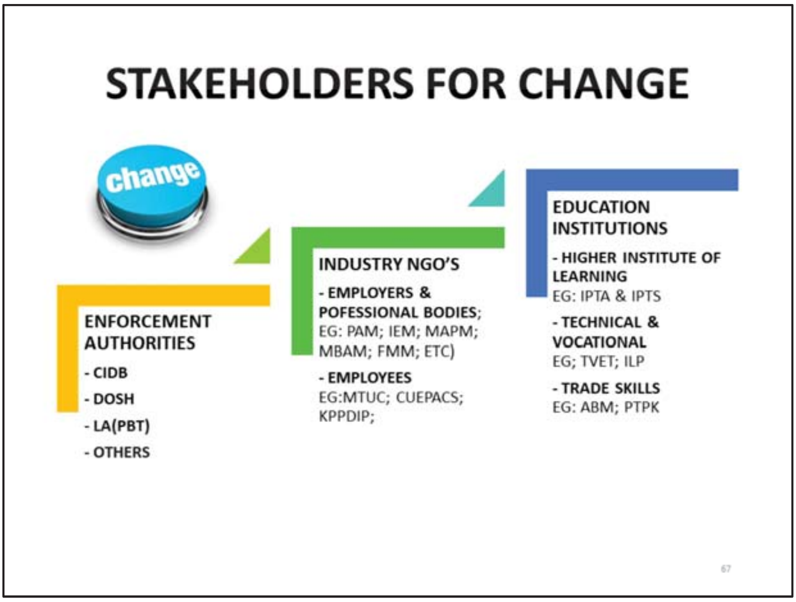
From the CSR perspective the organizations understand that they have a moral obligation with the stakeholders based on ethic, social and economic respect. The companies which are socially responsible try to use the ethic behavior in an agreement with the stakeholders. However the natural of this moral responsibility and how it can be interpreted into actions and corporate behavior is not defined. In other business

areas , the social corporate responsibility is interpreted in precise actions demanded from society as for example cheap labor, fair trade, etc. However in the construction sector morality and ethical responsibility are less defined.

These moral obligations usually hit head on against the business imperatives. The company has the requirements from the shareholders to build a project as soon as possible, within a budget; while they have to attend the demand of other stakeholders. If the management stakeholders are getting more and more important in the companies it`s because they are feared as a risk for the consequences of the commercial imperatives in the case of a business case.

OVERVIEW

-OSH is a legislative issue, construction OSH is impacted upon by a number of stakeholders;
-Safe and healthy work places is a tripartite responsibility (The State, Employers & Employees)
-Stakeholders have taken ownership construction OSH by promoting OSH through training, awareness, national awards and national construction events participation.
-Construction OSH has received wide publication in the media, thus attracting PUBIC CONCERNS of the number of fatalities and injuries occurring in the construction industry.

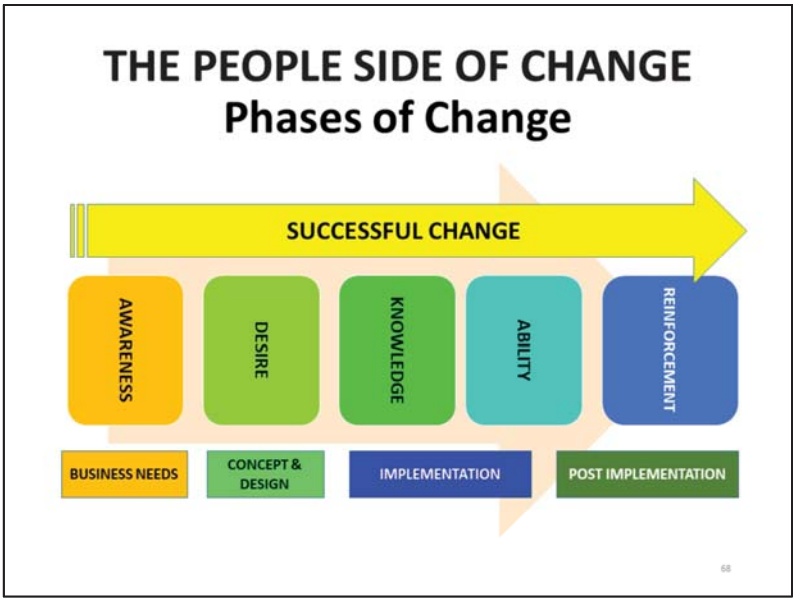


ANIMATE AND DESCRIBE

Enforcement Authority
CIDB – CONSTRUCTION INDUSTRY DEVELOPMENT BOARD
DOSH - DEPARTMENT OF OCCUPATIONAL SAFETY & HEALTH
LA – LOCAL AUTHORITY (PBT - PIHAK BERKUASA TEMPATAN)

Industry NGO
PAM – PERSATUTAN AKITEK MALAYSIA
IEM – INSTITUTE OF ENGINEERS
MAPM – MALASIA ASSOCATION OF PROJECT ENGINEERS
MBAM – MASTER BUILDERS ASSOCIATION OF MALAYSIA
FMM – FEDERATION OF MALAYSIA MANUFACTURERS;
MTUC – MALAYSIA TRADE UNION CONGRESS
CUEPACS- CONGRESS OF UNIONS OF EMPLOYEES IN THE PUBLIC AND CIVIL SERVICES
KPPDIP - KESATUAN PEKERJA-PEKERJA DALAM INDUSTRI PEMBINAAN

Educations Institutions
IPTA – INSTITUT PENGAJIAN TINGGI AWAM
IPTS – INSTITUT PENGAJIAN TINGGI SWASTA
TVET –TECHNICAL VOCATIONAL TRAINING
ILP – INSTITUT LATIHAN PERINDUSTRIAN
ABM – AKDEMI BINAAN MALAYSIA
PTPK - PERBADANAN TABUNG PEMBANGUNAN KEMAHIRAN (SKILLS DEVELOPMENT FUND CORPORATION)



Describe the animated flow of diagram.

1. Title description requires the change process to achieve the needs in sequence.
- Business Needs
- Concept & Design
- Implementation
- Post Implementation.

2. Describe the Change Process development of
- **Awareness**
- **Desire**
- **Knowledge**
- **Ability**
- **Reinforcement**

3. Then only SUCESSFUL CHANGE can happen

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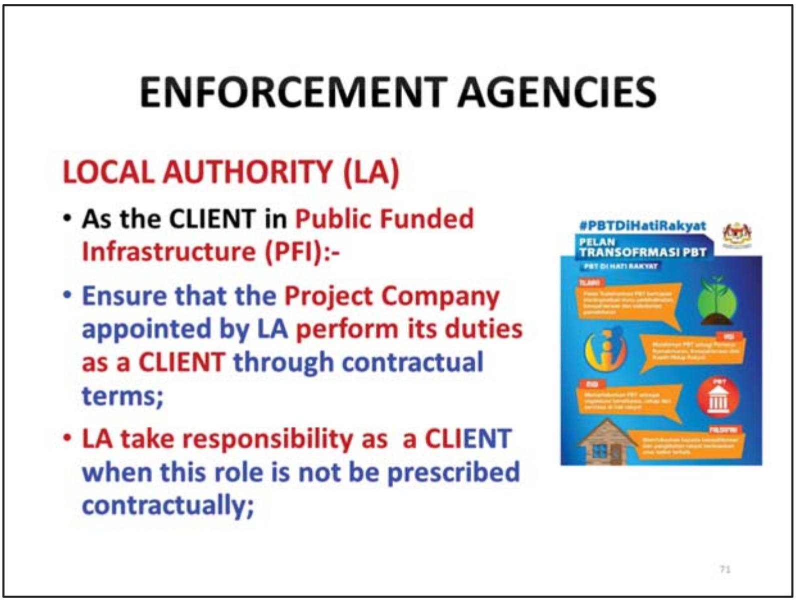
INTRODUCE CHANGE

DOSH SAW NEED TO CHANGE

- **Engage duty & stake holders**
- **Establish legislative enablers**
- **Justify the NEEDS;**
- **Initiate duty holders custodial mechanism;**
- **Roll out delivery plan and implementation tools;**
- **Lead and guide towards compliance**
- **Monitor and measure performance**
- **Enforces and finally prosecute;**
- **Review and improve for SUSTAINABILITY**

CIDB ACKNOWLEDGE CHANGE IS INEVITABLE

- **Engage Construction Industry Stakeholders**
- **Introduce CITP**
- **Supports DOSH Legislative Changes**
- **Promote the Context and Concept of Change**
- **Establish Changes into industry publications**
- **Ensure industry competencies and capabilities**
- **Introduce compliance strategies**
- **Review and improve for SUSTAINABILITY**



ENFORCEMENT AGENCIES

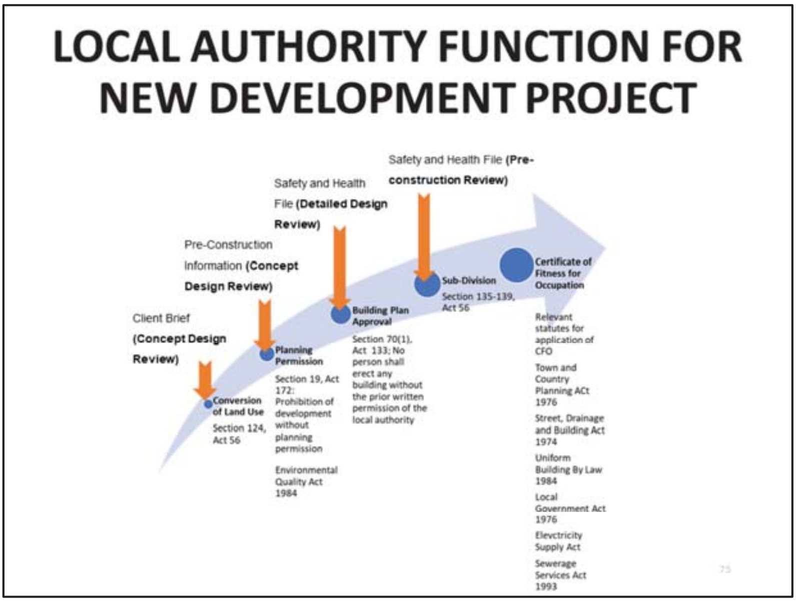
LOCAL AUTHORITY (LA)

- **As the CLIENT in Public Funded Infrastructure (PFI):-**
- **Ensure that the Project Company appointed by LA perform its duties as a CLIENT through contractual terms;**
- **LA take responsibility as a CLIENT when this role is not be prescribed contractually;**

Local authority (LA) when acting as the enforcement agency for approving of "development order", is recommended to ensure Clients do comply with the OSHCIM requirements.

This can be done by:

1. Legislating the requirements of OSHCIM as part of DO application;
2. Understand LA roles based on the LA Guidance Notes & OSHCIM Guidelines;
3. Encouraged and prioritized Clients with Voluntary declarations of OSHCIM practices



For a new development project, LA are encouraged to request the CLIENTS to submit OSHCIM documentations (the Concept Design Review) for the first two stage of new development project submission.

1. **For Conversion of Land Use/ land development applications – Client Brief**
2. **For Planning Permission – Pre-Construction Information (PCI)**

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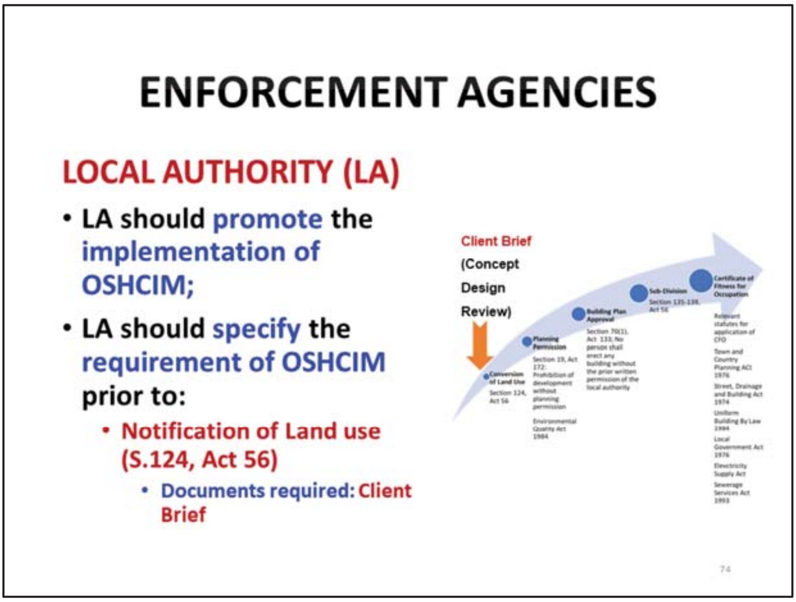

As an enforcement agencies, LA can promote the OSHCIM implementation by specifying the requirement of OSHCIM for any new development order application.
For instance, for Notification of Land Use, the Planning Department of LA should acquire a Client Brief from the CLIENT which contains the main purpose of land development.

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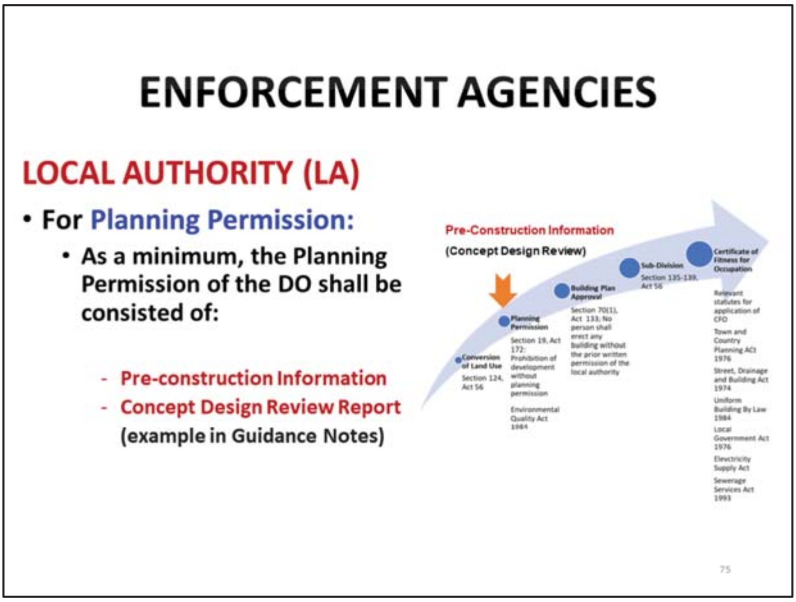

For planning permission, the contents of pre-construction information (PCI) and report of the concept design review (CDR) will be useful to all technical departments and agencies involves that includes the state town and country planning departments, Department of Drainage and Irrigation, Department of Sewerage Services and others.

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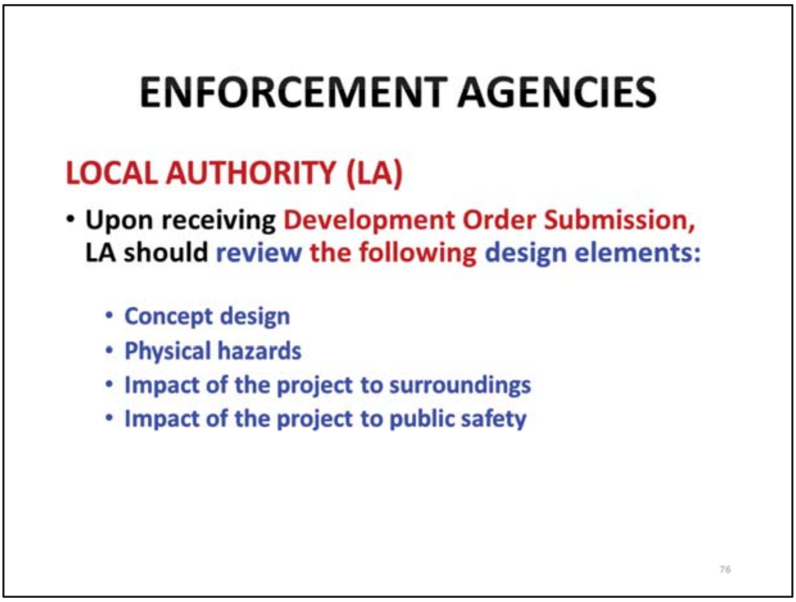
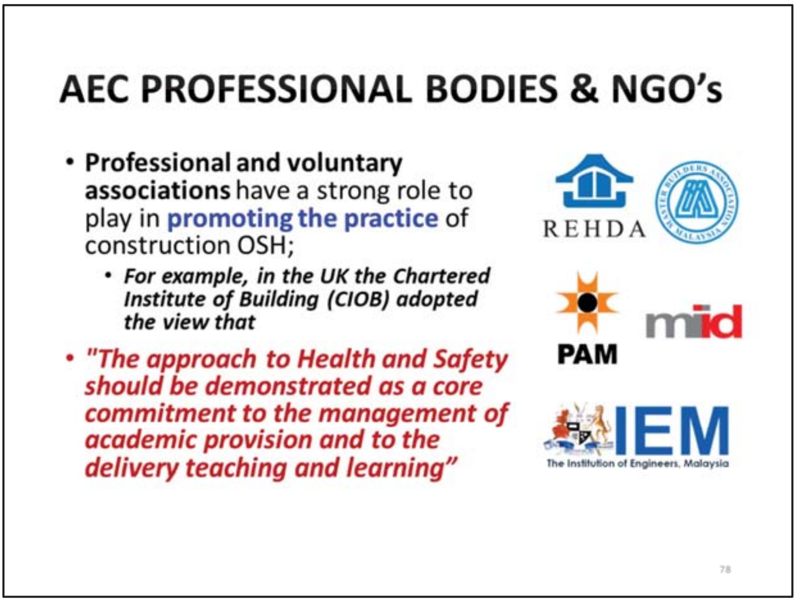


The design elements to be reviewed are:

1. **Conceptual design – which involved reviewing the conceptual design of the submitted project (the structure, the suitability of soil condition)**
2. **Physical hazards – Identify the physical hazards such as past accidents/ incidents that had previously occurred in that area with the similar project.**
3. **Review and identify impact of the project to the surroundings**
4. **Review and identify impact of the project to the public safety (accessibility, the road condition, etc.)**

All application that has been submitted shall be distributed to the relevant technical departments for view and comment that includes: DOSH, DOE, etc. For online application, each LA has their own One Stop Centre (OSC Online) that can be accessed for application submission. This OSC online, will provide the information to al relevant department and agencies.



Professional and voluntary associations have a strong role to play in promoting the practice of construction OSH;
For example, in the UK the Chartered Institute of Building (CIOB) adopted the view that "The approach to Health and Safety should be demonstrated as a core commitment to the management of academic provision and to the delivery teaching and learning

What more could be done?

- **Increase their statutory or influential role in accreditation of TERTIARY EDUCATION COURSES;**
- **Broaden the awards of CONTINUING PROFESSIONAL DEVELOPMENT (CPD) programmes addressing OSH;**
- **Provide OSH related PRACTICES NOTES AND GUIDELINES;**
- **Become the CUSTODIAN to specific OSHCI(M) role;**
- **Participate in promoting Safety Design Risk Management by setting up CASE STUDY LESSON LEARN DATABASE**

AEC PROFESSIONALS:

WHAT ARE THEIR ROLES IN OSHCIM?

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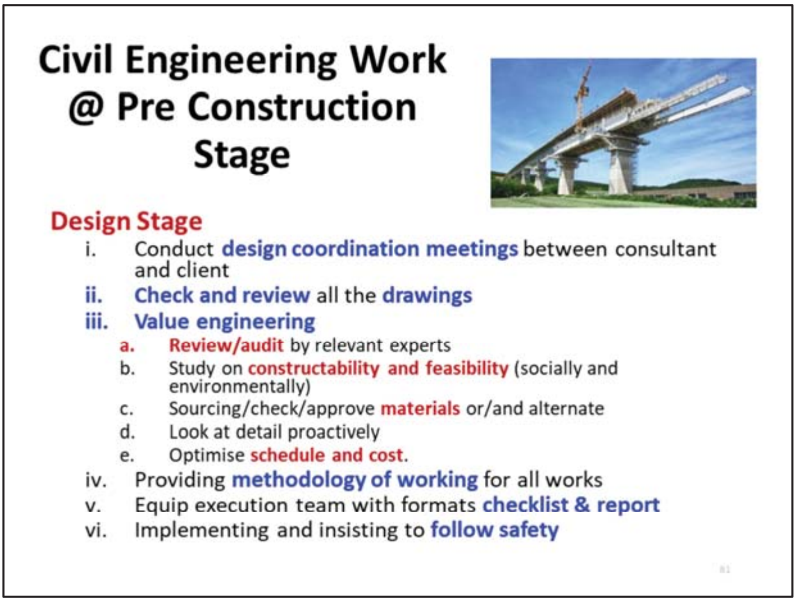
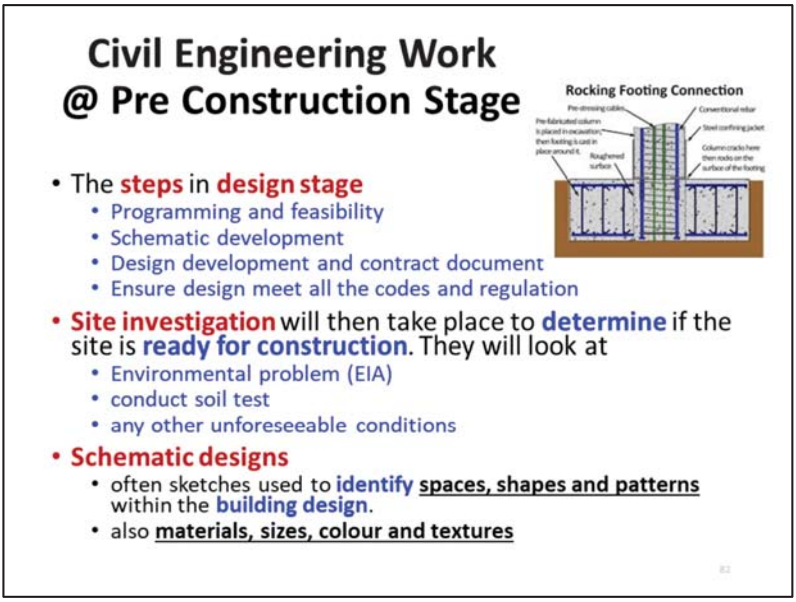


1. **Competent civil engineers should have the knowledge to participate actively in project discussions in the pre-construction phase.**
2. **This is very important in ensuring that the designers get the initial information and try to eliminate as much hazard as possible from the project**
3. **This can be done with**
    a) Assess design documents and project specifications
    b) Provide insights regarding designs and suggestions for improvement
    c) Using past experiences and accident events to avoid repeating events
    d) Suggested safe working methods for each construction activity
    e) Provides a way or mechanism to reduce risks to employees
    f) Prioritize occupational safety and health
    g) Adhere to the general rules and specific OSH on site

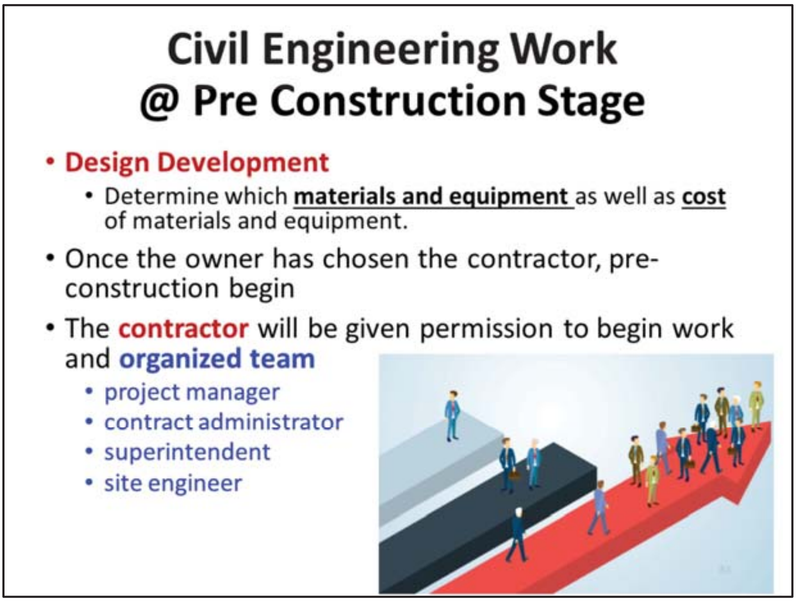


1. In terms of design work rules, civil engineers need to:

a) Make a schedule of work so that the work can be done properly and the initial requirements can be identified
b) Project schematic planning as a reference in the future
c) Ensure that OSH requirements are met in terms of design and clearly stated in project contracts and third party appointments
d) Ensure the design meets the minimum requirements of FMA 1967, OSHA 1994 and best practice code

2. Public engineers need to be involved during site visits to ensure all initial requirements and reports such as environmental problems, land survey and other uncertainties.

3. He also needs to give insights on the design drawings and design patterns so that construction hazards can be mitigated through design.



1. Civil engineers also need to evaluate the design of the selection of raw and semi-finished materials.

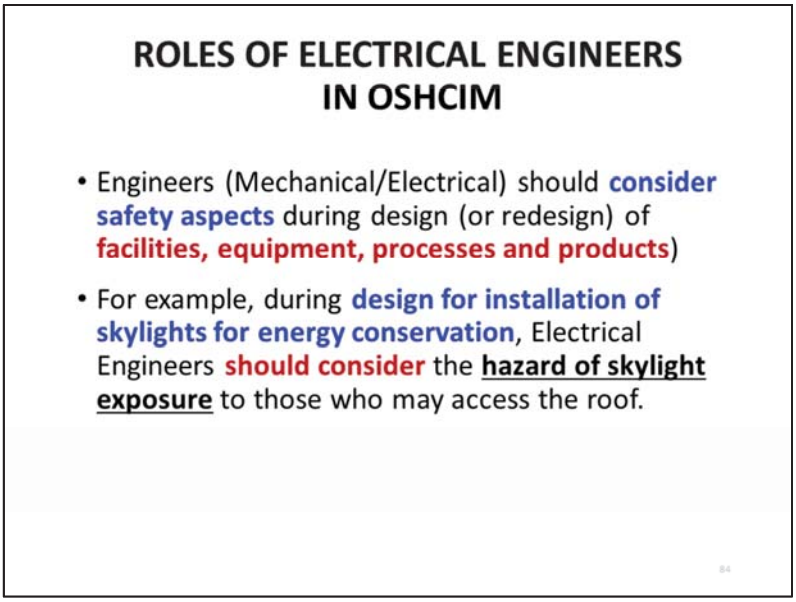
2. Research on overall construction costs.

3. This includes planning, requirements, preparations before the work is carried out.

4. Everything involved cost. This can reduce the burden of contingent spending Engineers may also participate in developing contractor selection conditions.

5. Make sure the OSH requirements are clearly stated and past achievements such as accidents and death rates are considered

6. It is also necessary to make sure the contractor has a competent member and the skills appropriate to the project



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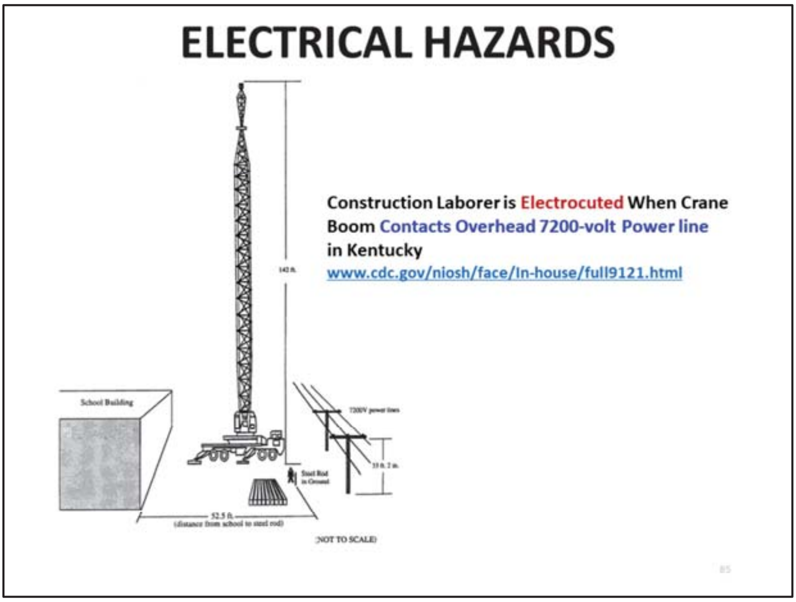
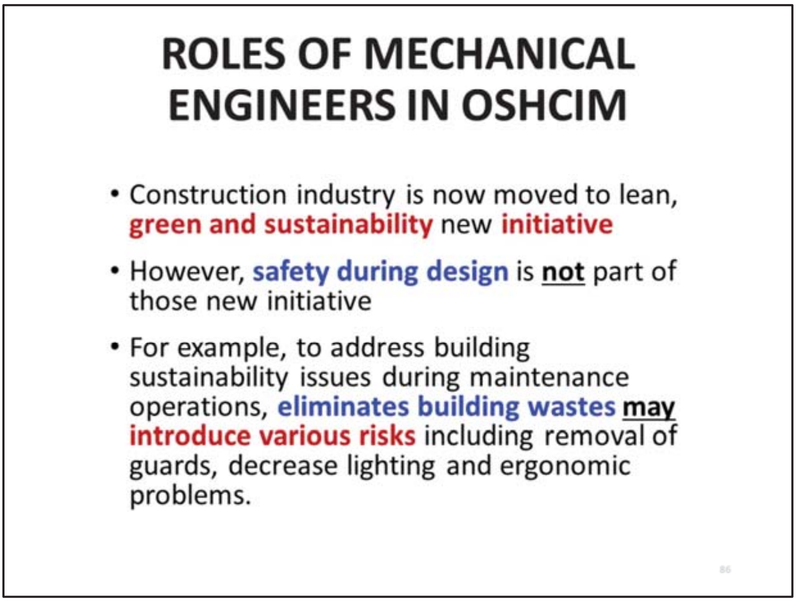
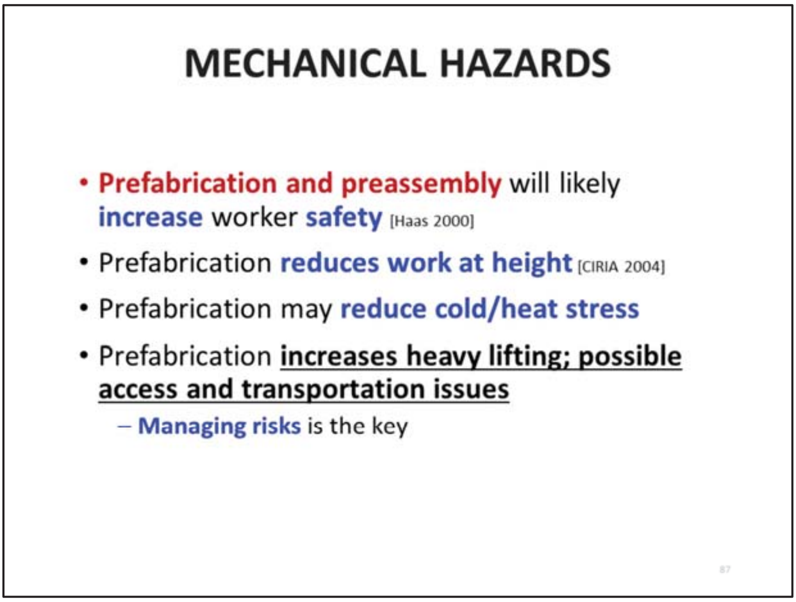
1. **Electrical engineers can play a major role during the pre-construction phase for accident prevention**
2. **The OSH aspect can be improved through design when making decisions about suitability, ROBUST and durable design - such as heat-resistant / fire-resistant cable selection**
3. **Convenient equipment for dislocation, installation and outbound space and site control aspects**
4. **Layouts that reduce the risk during construction, cleaning,**
5. **Example of placement of substation location and electrical box**
6. **Suitability in aspects of chemical explosive classes and so on**



Tell the basic causes of accident that can be corrected by an electrical engineer to prevent reoccurring in the future



1. **Mechanical engineers are also able to give suggestions on improving the OSH at the site.**
2. **In the pre-construction phase, mechanical engineers can advise on the design for**
3. **Design a user-friendly building from its physical and functional aspects**
4. **Recommends a simple design for lifting, installation, modification, etc. in terms of size and weight**
5. **Provides the necessary tool or space specifications and strong and durable site requirements**



Hazard control on site construction can be effectively controlled through the selection of working methods such as pre-fabrication and pre-installation

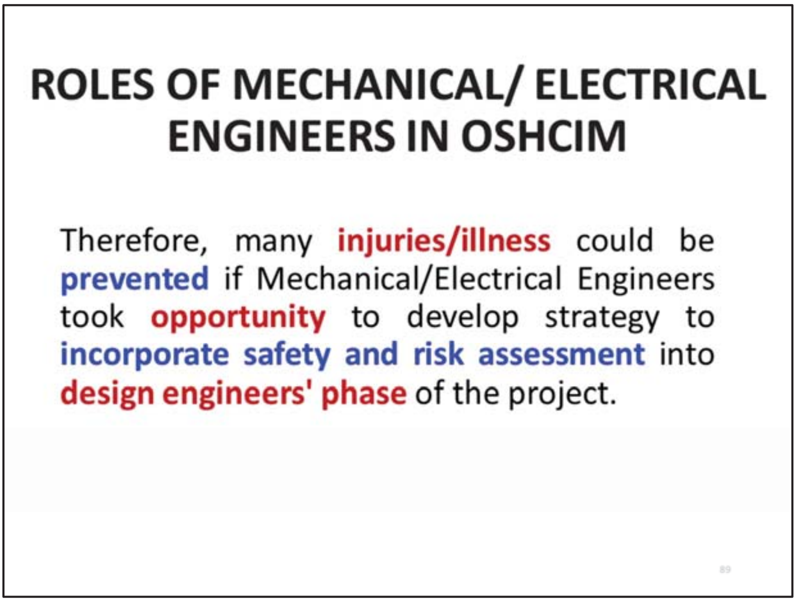
Provide practical and appropriate examples and benefits / weaknesses in every way

ERGONOMICS HAZARDS

Heavy blocks are a significant **musculoskeletal hazard**, causing many injuries, but are an easy design issue to resolve.

88

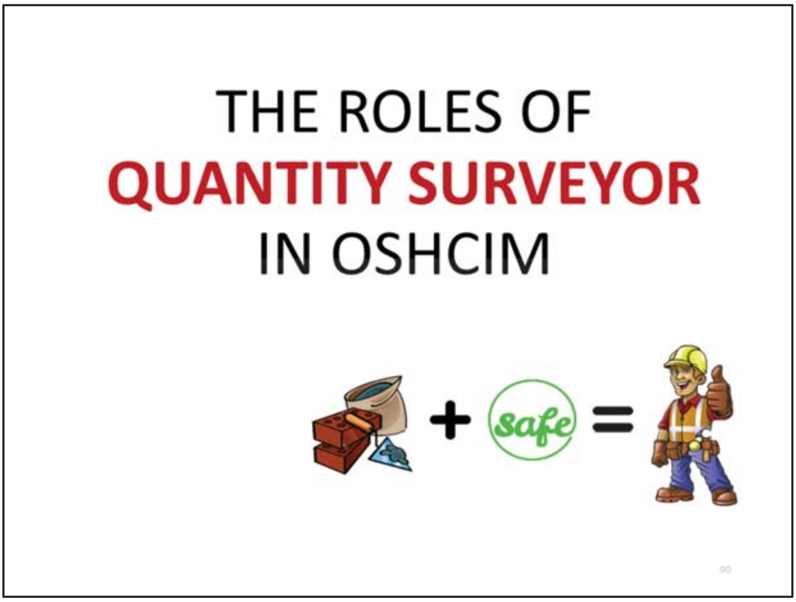
1. In DRRULE 2 for hazard analysis during construction and operation phases, occupational health hazards such as ergonomics and manual handling can be avoided
2. The use of lifting tools such as forklifts, goods cranes, tower cranes greatly reduces the need for manual lifting.
3. The use of lighter and harder bricks can greatly increase productivity and reduce the chance of an ergonomic injury



1. Every engineer involved in a construction project should use the opportunity to avoid harm by using their skills and experience

2. The electrical and mechanical fields are also capable of providing a safer, cleaner, environmentally friendly, healthier, simple, rugged, user-friendly and sustainable design in the use cycle of the build.

3. It can be done early in the pre-construction phase and it is permanent.



1. Ask participants what are the duties and responsibilities of the quantity surveyor in the implementation of OSHCIM?
2. Give 2 @ 3 minutes for them to discuss and give feedback

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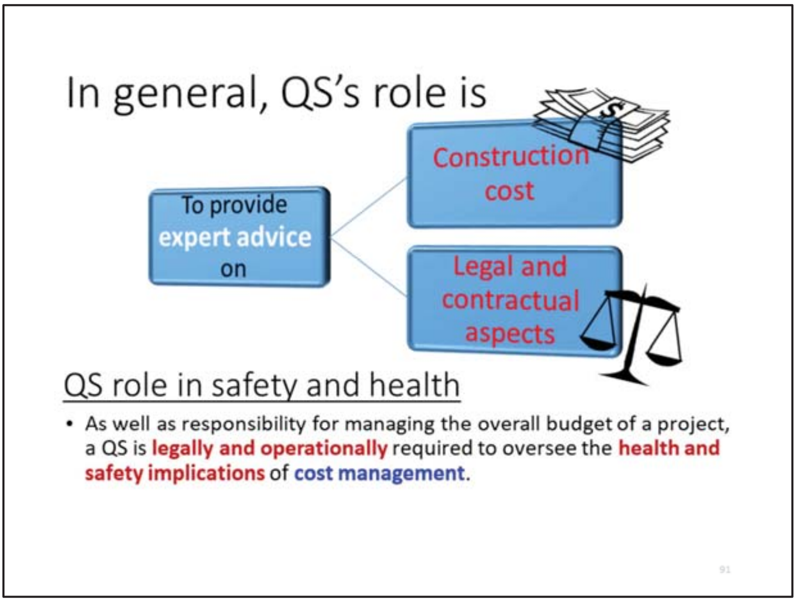

1. Share the participants' answers with this answer.
2. Try to elaborate on the answers given in terms of giving guidance on the overall cost of construction
3. Also guiding clients and third parties regarding previously agreed terms and conditions of project contracts
4. In the aspect of OSH, QS must ensure that appropriate budgets can be made available for OSH's needs and preparation during the construction project.
5. If the budget for OSH is less, discuss with participants what are the impact on the achievement of the OSH at the site.
6. What is its effect on employee morals?

QS has a professional obligation to ensure that the building materials recommended have been properly tested and are rated in accordance with the law. It would be unprofessional to recommend untested or unsafe materials.

Buildability is a pre-construction exercise that assesses designs from the perspective of those that will manufacture, install components and carry out the construction works. It should not be confused with value engineering (which is used to solve problems and identify and eliminate unwanted costs) though some processes are common to both activities. (https://www.designingbuildings.co.uk/wiki/Buildability_in_construction)

Maintainability refers to how the maintenance engineer/ technician will be able to maintain the project once it is built. Maintainability is considered, inherent to the building system design, ensuring the ease, accuracy, safety, and economy of maintenance tasks within that system. The purpose of maintainability is to improve effectiveness and efficiency of maintenance. One of the major products desired of such an activity is the optimization of building life—cycle costs. Design for Maintainability (DfM) is the first step of an effective maintenance program, linking maintenance goals to the design process. (https://www.wbdg.org/resources/design-for-maintainability). For example, to provide a cantilevered floor for easy maintenance of an external wall could be an extra cost to the construction project. Considered it helps the safety of people who are going to do the maintenance for the wall, QS should emphasize the need for it in term of safety over cost.

Hence, In determining the buildability and maintainability of the project, safety and health should be the greater factor than cost.

Safety and health must always take precedence over cost

In some cases, client might not have sufficient fund to provide safety, hence, as a quantity surveyor health and safety may be the reason to recommend that the project cannot go ahead with its current funding. The QS professional responsibilities is to the health and safety of the people who will work on the construction site, and to the end users of the building. If the health and safety of either group could be compromised between project budget and project aims, it is the QS's duty to raise the issues. QS may be able to find feasible alternatives, which can be constructed safely within budget. And as a QS, safety and health considerations include risk assessments for all stakeholders. (http://www.constructionsupport.co.uk/guide/what-you-need-to-know-about-quantity-surveyor-health-and-safety/)

Note: Stakeholder here is any person whose health and safety is affected by the project. Stakeholders range from the people who will use the building once it is finished, to the labourers and skilled tradespeople who put it together and also the site visitors and passing pedestrians or road users.

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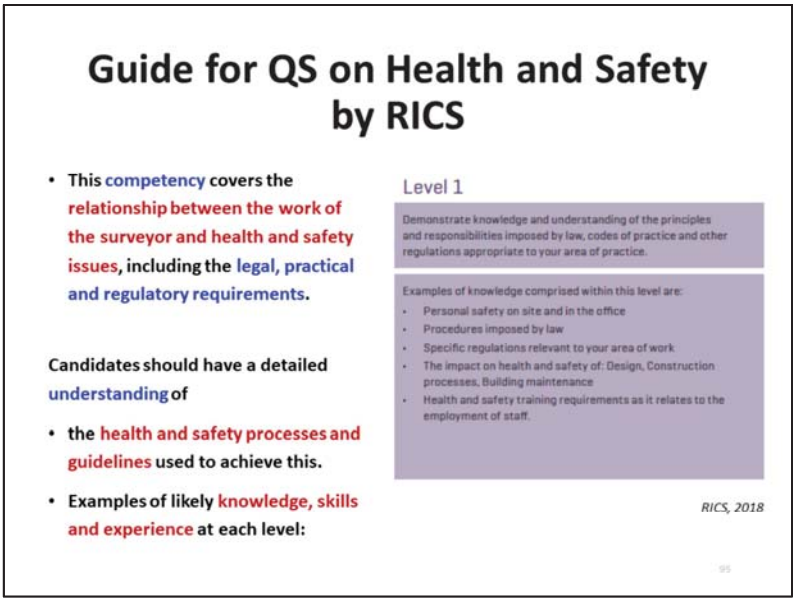
Being one of the expert to advice on legal and contractual aspect of a project, one of the key roles of the quantity surveyors is keeping up-to-date with the latest building regulation. Safety and health is regulated by relevant laws. A QS must understand them all and made aware of any changes made to the legislation. A QS should know when a project is endangering its stakeholders when he/she understand the law that protects them.



In the latest Pathway Guide for Quantity Surveying and Construction by Royal Institution of Chartered Surveyors, UK published in August 2018 laid out the Health and Safety competencies for QS at 3 levels i.e.

Level 1 – knowledge and understanding

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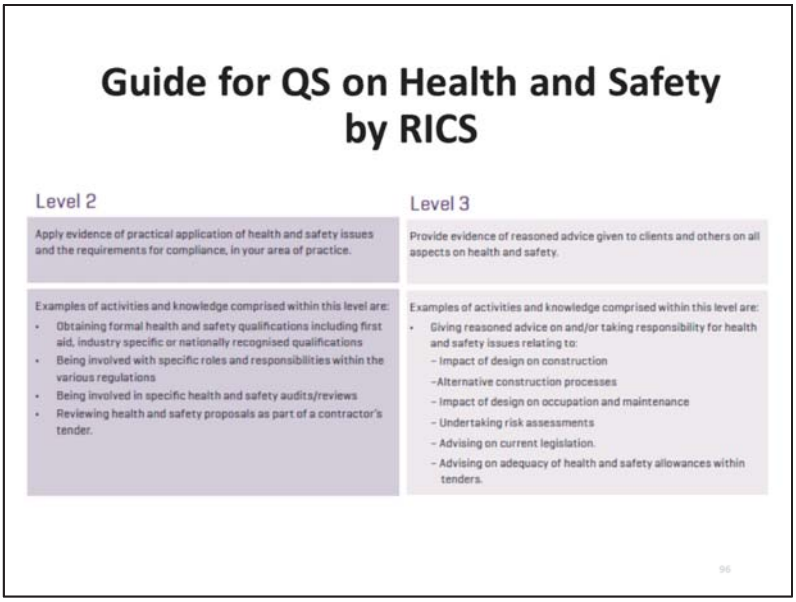

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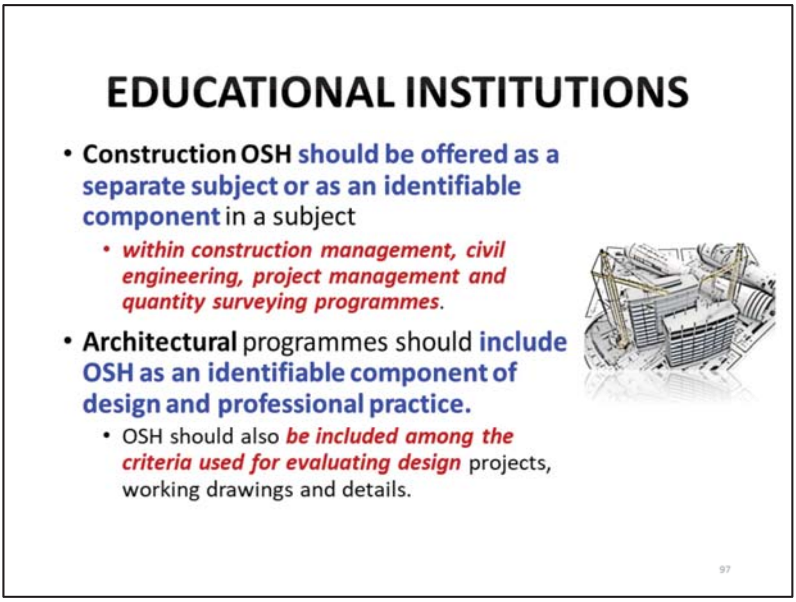
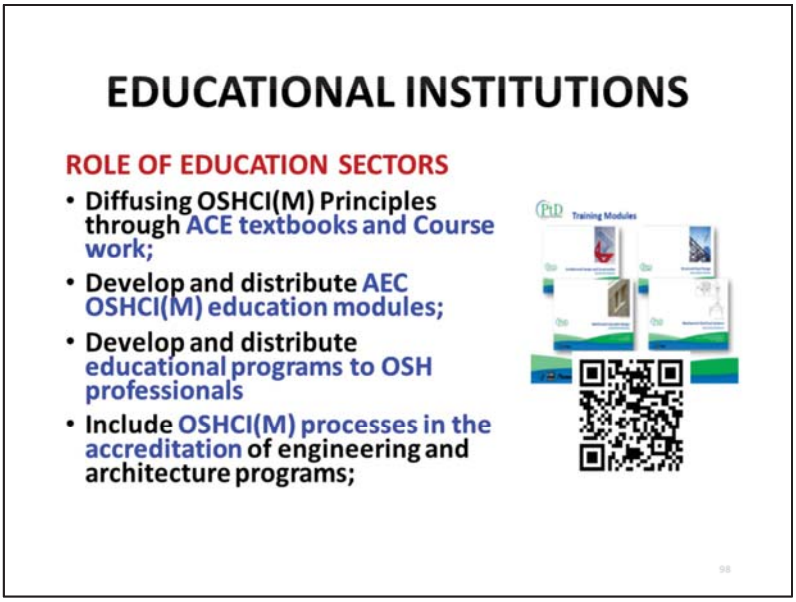
Level 2 – application of knowledge
Level 3 – reasoned advice, depth and synthesis of technical knowledge and its implementation.

Note:
The RICS competency framework ensures those applying for the RICS qualification are competent to practice and meet the highest standards of professionalism required by RICS. There is a wide range of pathways available to qualify as an RICS professional covering many different areas of practice.



- **Construction OSH should be offered as a separate subject or as an identifiable component in a subject within construction management, civil engineering, project management and quantity surveying programmed. Architectural programmed should include OSH as an identifiable component of design and professional practice.**
- **OSH should also be included among the criteria used for evaluating design projects, working drawings and details.**



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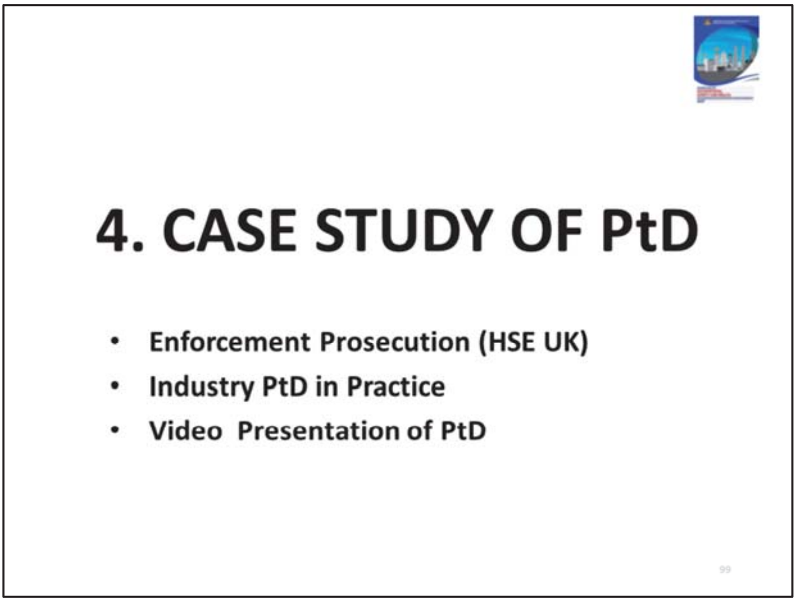
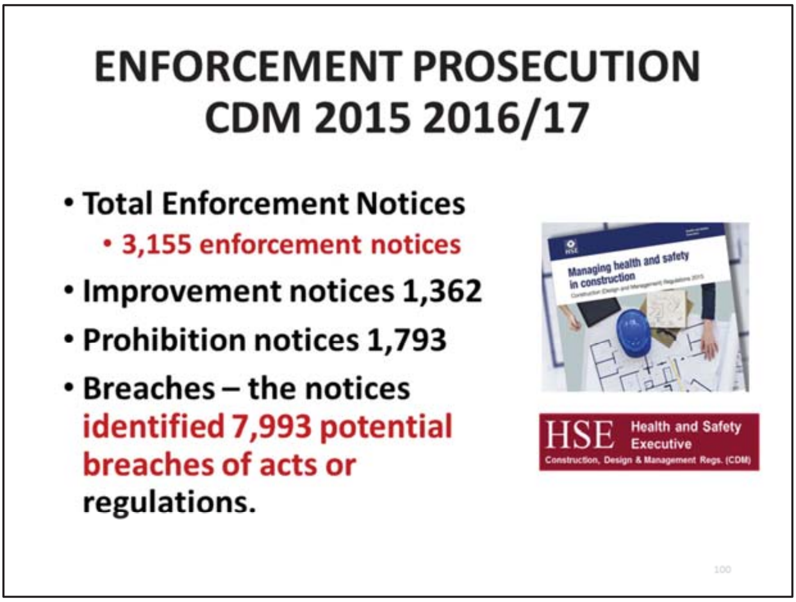
ROLE OF EDUCATION SECTORS

- **Diffusing OSHCI(M) Principles through ACE textbooks and Course work;**
- **Develop and distribute AEC OSHCI(M) education modules;**
- **Develop and distribute educational programs to OSH professionals**
- **Include OSHCI(M) processes in the accreditation of engineering and architecture programs;**



Module 4 : CASE STUDY OF PtD

Instructor will further up explanations on the case study have shown that the design of a project is related to a significant percentage of construction injuries and fatalities. Prevention through design (PtD), also referred to as " design for construction safety " and " safety in design " , is a concept in which the safety and health of those who construct or manufacture a product is taken into consideration when designing the product.



ENFORCEMENT PROSECUTION
CDM 2015 2016/17

- **Total Enforcement Notices**
- **3,155 enforcement notices**
- **Improvement notices 1,362**
- **Prohibition notices 1,793**
- **Breaches – the notices identified 7,993 potential breaches of acts or regulations.**

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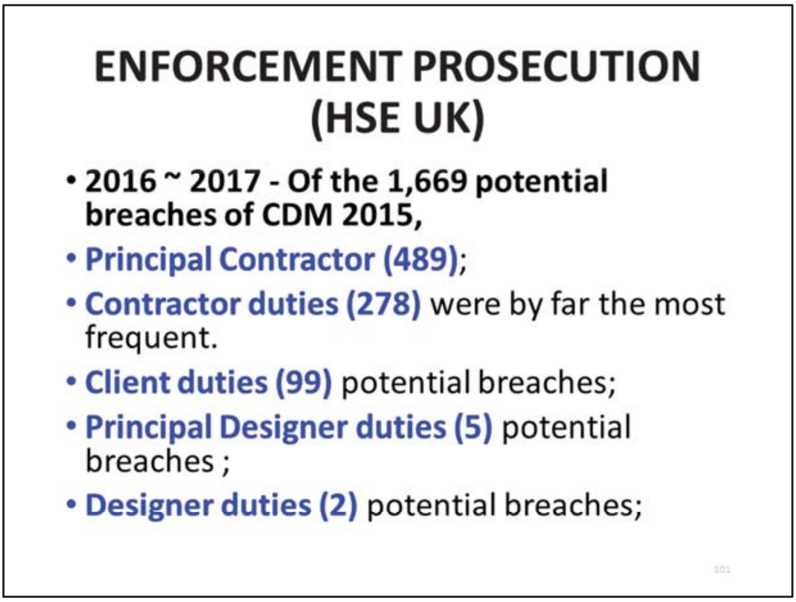


ENFORCEMENT PROSECUTION (HSE UK)

- **2016 ~ 2017 - Of the 1,669 potential breaches of CDM 2015,**
- **Principal Contractor (489);**
- **Contractor duties (278) were by far the most frequent.**
- **Client duties (99) potential breaches;**
- **Principal Designer duties (5) potential breaches ;**
- **Designer duties (2) potential breaches**

POTENTIAL BREACHES

- **Principal Contractors;**

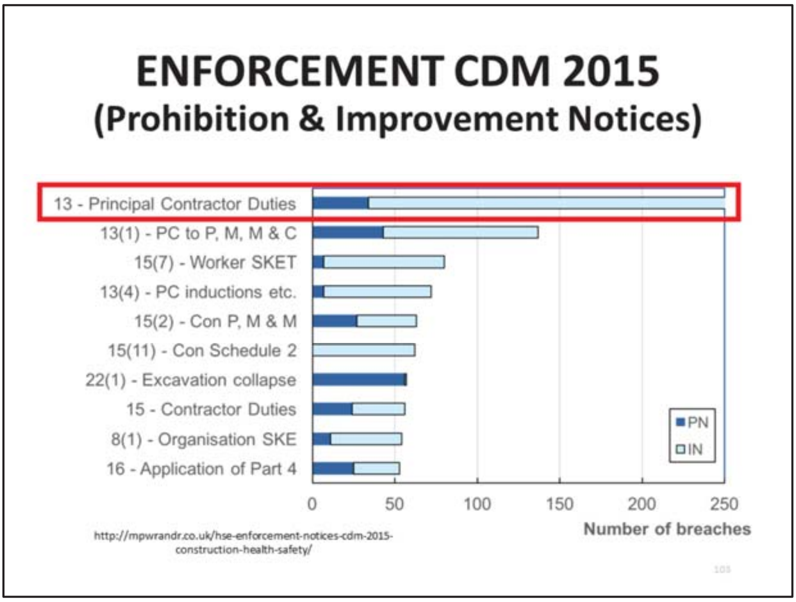
The duty to plan, manage, monitor and coordinate the work.

- **Contractors;**

the planning, managing and monitoring duties skills, knowledge, experience and training (primarily of site managers and site supervisors) for the provision of welfare facilities

- **General requirements for all construction sites(646) breaches**

Excavations (86), Fire (58) and Stability of structures (54) Principal Contractors & Contractors can be charged subject to WHO is performing the work;



DESCRIBE EACH BREACH;

Reg.13 Duties of a principal contractor in relation to safety and health at the construction phase
PC to P, M, M & C
13.(1) The principal contractor must plan, manage and monitor the construction phase and coordinate matters relating to safety and health during the construction phase to ensure that, so far as is reasonably practicable, construction work is carried out without risks to health or safety.

Reg.15 Duties of contractors
- Worker SKET
15.(7) A contractor must not employ or appoint a person to work on a construction site unless that person has, or is in the process of obtaining, the necessary skills, knowledge, training and experience to carry out the tasks allocated to that person in a manner that secures the safety and health of any person working on the construction site.

Reg.13 Duties of a principal contractor in relation to safety and health at the

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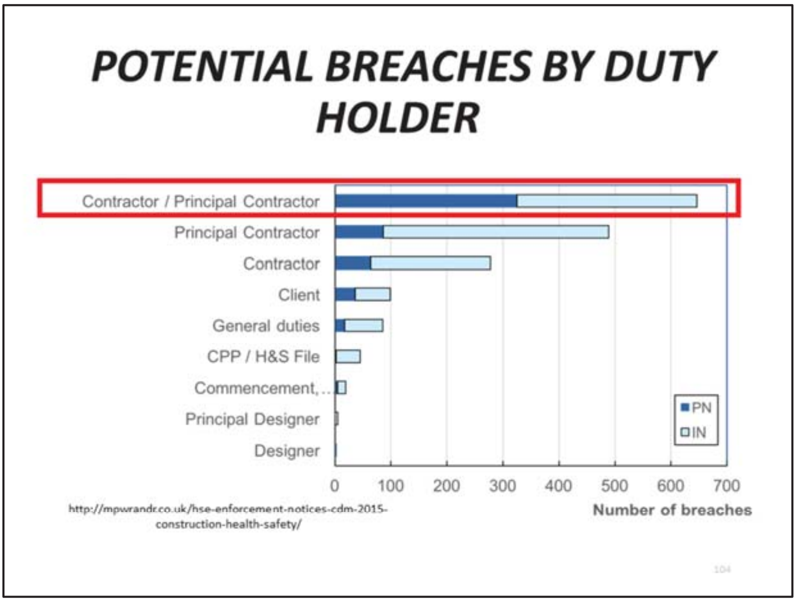
construction phase
- PC Inductions etc.
Reg.13(4) The principal contractor must ensure that—
(a) a suitable site induction is provided;
(b) the necessary steps are taken to prevent access by unauthorised persons to the construction site; and
(c) facilities that comply with the requirements of Schedule 2 are provided throughout the construction phase.

Reg.15 Duties of contractors
- Con, P, M & M
Reg.15(2) A contractor must plan, manage and monitor construction work carried out either by the contractor or by workers under the contractor's control, to ensure that, so far as is reasonably practicable, it is carried out without risks to safety and health.

Reg.15(11) A contractor must ensure, so far as is reasonably practicable, that the requirements of Schedule 2 are complied with so far as they affect the contractor or any worker under that
contractor's control.
SCHEDULE 2 Minimum welfare facilities required for construction sites
- Sanitary conveniences
- Washing facilities
- Drinking water
- Changing rooms and lockers
- Facilities for rest

Reg.22 Excavations
Reg.22(1) All practicable steps must be taken to prevent danger to any person, including, where necessary, the provision of supports or battering, to ensure that—
(a) no excavation or part of an excavation collapses;

PART 3- safety and health duties and roles
General duties
Reg. 8.—(1) A designer (including a principal designer) or contractor (including a principal contractor) appointed to work on a project must have the **skills, knowledge and experience,** and, if they are an organisation, the organisational capability, necessary to fulfil the role that they are appointed to undertake, in a manner that secures the safety and health of any person affected by the project.



Describe the potential breaches

Amid a recent spate of high-profile health and safety failures in the retail sector, Bureau Veritas is reminding duty holders that ensuring an in-depth understanding of the full breadth of their responsibilities and keeping a close ear to the ground is vital to preventing 'another accident waiting to happen'.

In 2017, a record number of retailers faced fines of over £1m for health and safety offences. Most notably, one of the UK's largest retail chains was given a hefty food safety fine last year after mouse droppings were found at a number of its stores nationwide, while another household goods retailer was fined £2.2million when an employee was tragically paralyzed after a cage full of paint tins fell on her.

Typically, in a large part of such instances investigations have revealed failings around ensuring a holistic safety, robust protocol and, in turn, poor staff training.

To prevent such incidents developing in the first place, reviewing current risk systems and improving the due diligence of duty holders is essential, leading inspection and certification firm Bureau Veritas has advised.

Vicky Shah, Retail and Hospitality Lead at Bureau Veritas, said: "2017 has been awash

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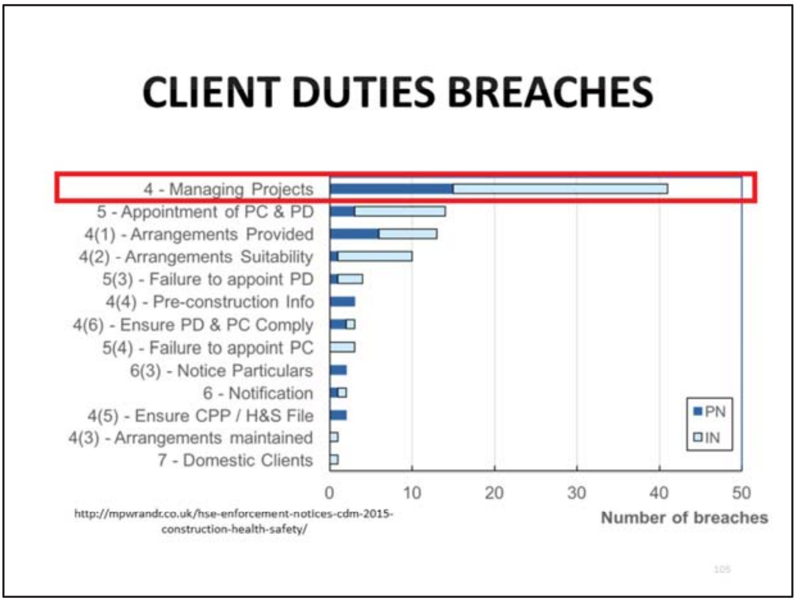
with numerous high profile health and safety breaches in the retail sector which have resulted in grave safety concerns and, in worse case scenarios, caused major accidents. For retailers, such breaches not only result in prosecution and a hefty fine but irreparable damage to their reputation – a risk many can ill-afford in the current climate.”

According to Bureau Veritas, a large part of the problem lies with misunderstanding what a duty holder is, with the Health & Safety Executive (HSE) defining a duty holder as the named responsible person whose role is to ensure any potential health and safety risk is assessed, and that procedures are put in place to reduce the risk as is ‘reasonably practicable’.

However, given the narrow scope of the regulation and the lack of organisational pull through, duty holders are often left wondering what the law says about their responsibilities and what the consequences are if they fail to comply, says Bureau Veritas.



Part 2 Client duties

Reg.4 Client duties in relation to managing projects.

4.(1) A client must make **suitable arrangements for managing a project,** including the allocation of sufficient time and other resources.

(2) Arrangements are suitable if they ensure that—

(a) the construction work can be carried out, so far as is reasonably practicable, without risks to the health or safety of any person affected by the project; and

(b) **the facilities required by Schedule 2 are provided** in respect of any person carrying out construction work.

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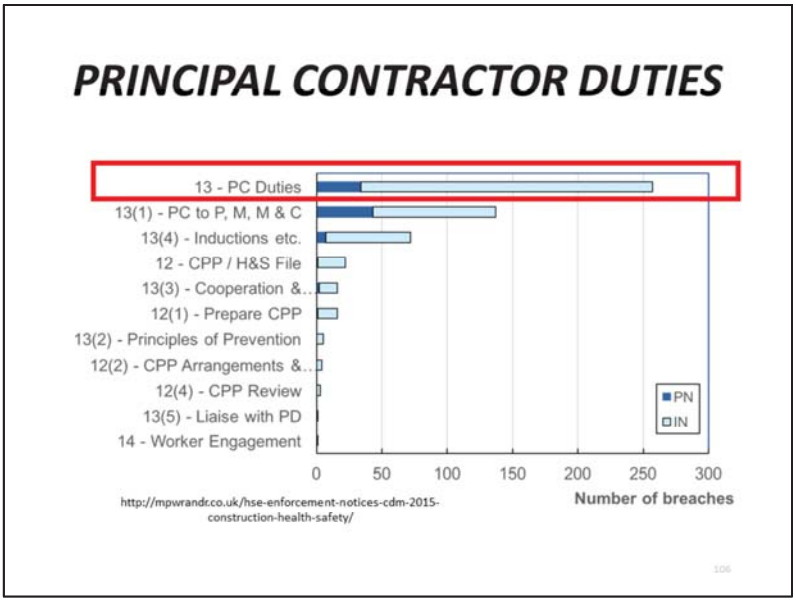


PRINCIPAL CONTRACTOR DUTIES

A principal contractor is appointed by the client to control the construction phase of any project involving more than one contractor.

Principal contractors have an important role in managing health and safety risks during the construction phase so they must have the skills, knowledge, experience and, where relevant, organisational capability to carry out this work.

The principal contractor must:

Plan, manage, monitor and coordinate the entire construction phase.
Take account of the health and safety risks to everyone affected by the work (including members of the public), in planning and managing the measures needed to control them.
Liaise with the client and principal designer for the duration of the project to ensure that all risks are effectively managed.
Prepare a written construction phase plan PDF before the construction phase begins, implement, and then regularly review and revise it to make sure it remains fit for purpose.
Have ongoing arrangements in place for managing health and safety throughout the

construction phase.

Consult and engage with workers about their health, safety and welfare.

Ensure suitable welfare facilities are provided from the start and maintained throughout the construction phase.

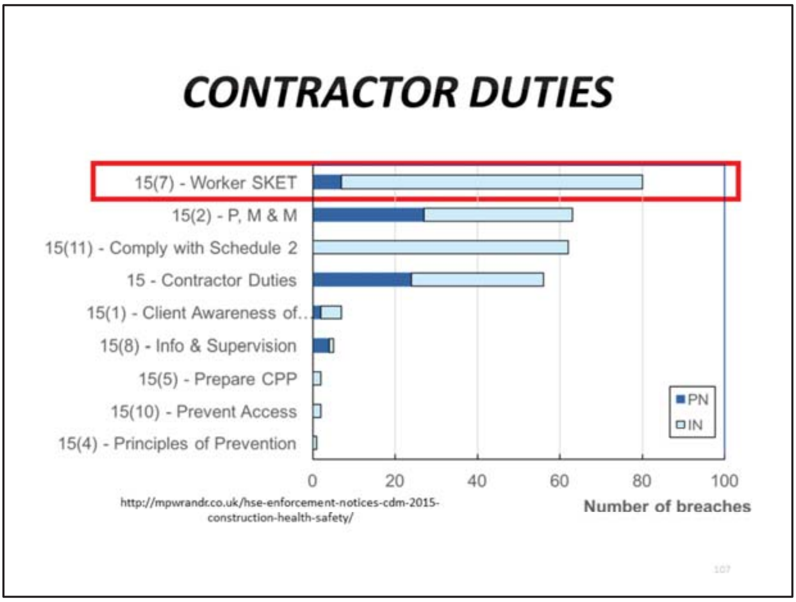
Check that anyone they appoint has the skills, knowledge, experience and, where relevant, the organisational capability to carry out their work safely and without risk to health.

Ensure all workers have site-specific inductions, and any further information and training they need.

Take steps to prevent unauthorised access to the site.

Liaise with the principal designer to share any information relevant to the planning, management, monitoring and coordination of the pre-construction phase.

When working for a domestic client, the principal contractor will normally take on the client duties as well as their own as principal contractor. If a domestic client does not appoint a principal contractor, the role of the principal contractor must be carried out by the contractor in control of the construction phase.



CONTRACTOR DUTIES

A contractor is anyone who directly employs or engages construction workers or manages construction work. Contractors include sub-contractors, any individual self-employed worker or business that carries out, manages or controls construction work. They must have the skills, knowledge, experience and, where relevant, the organisational capability to carry out the work safely and without risk to health.

Contractors and the workers under their control are most at risk of injury and ill health from construction work. Contractors therefore have an important role in planning, managing and monitoring their work to ensure any risks are controlled.

Contractors on all projects must:

Make sure the client is aware of the client duties under CDM 2015 before any work starts.
Plan, manage and monitor all work carried out by themselves and their workers, taking into account the risks to anyone who might be affected by it (including members of the public) and the measures needed to protect them.
Check that all workers they employ or appoint have the skills, knowledge, training and experience to carry out the work, or are in the process of obtaining them.

Make sure that all workers under their control have a suitable, site-specific induction, unless this has already been provided by the principal contractor.
Provide appropriate supervision, information and instructions to workers under their control.
Ensure they do not start work on site unless reasonable steps have been taken to prevent unauthorised access.
Ensure suitable welfare facilities are provided from the start for workers under their control, and maintain them throughout the work.
In addition to the above responsibilities, contractors working on projects involving more than one contractor must:

Coordinate their work with the work of others in the project team.
Comply with directions given by the principal designer or principal contractor.
Comply with parts of the construction phase plan PDF relevant to their work.

CDM failing costs Crest Nicholson £800k 29 Sep 2016

David Cole, who was contracted to Harlequin Brickwork, was working as a foreman on the construction site in Wokingham. Work started in 2013 and is due to be completed next April.

On 7 December 2014 he walked along the nearside of the HGV, which had reversed into a T junction. The vehicle suddenly pulled forward and turned towards the pavement, hitting him.

He was pulled underneath the vehicle and sustained life-threatening injuries; his skin was removed from his left arm and leg and he needed pinning surgery to repair a fractured hip. His left leg is now 2 cm shorter than his right.

Reading Crown Court was told that Crest Nicholson had failed to effectively plan and manage the workplace transport. The safety and health Executive (HSE) said the accident could have been avoided had the company ensured workers stayed behind the pedestrian barriers and did not walk on the road, and prevented HGVs reversing hundreds of metres at once.

Crest Nicholson pleaded guilty to breaching Reg 36(1) of the Construction (Design and

Management) Regulations 2007, which states that pedestrians and vehicles must be able to move around a construction site without risks to safety. It was fined £800,000 plus £10,984 costs.

HSE inspector John Berezansky said: "David Cole suffered life-changing injuries because Crest Nicolson did not properly manage and monitor the workplace transport of their construction site."

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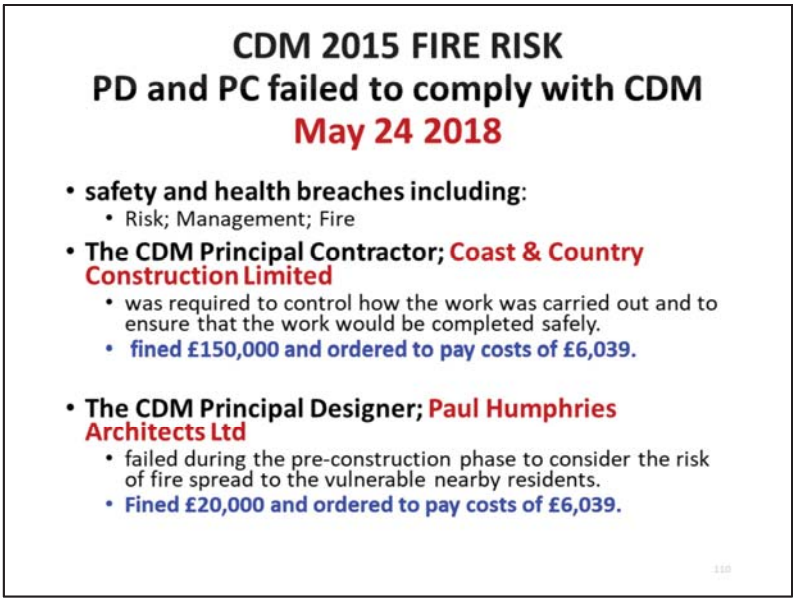
Developer lands £200k fine for CDM breaches 12 Sep 2017

Verrall-Withers said the worker supervising had now been engaged as a contractor. “Sivaneswaran hadn’t appointed anyone in writing,” he said. “I had already written to him and said that the worker supervising, who I’d met in October, had no safety and health training, had been working dangerously on the roof and should not be left to supervise the work”.

The inspector added that Sivaneswaran had not appointed a principal contractor. He had also failed to engage a site manager and provided none of the required site documentation. He served a prohibition notice, closing the site down until a suitable contractor was appointed.

Selliah Sivguru Sivaneswaran, of Harlyn Drive, Pinner, pleaded guilty to breaching reg 13(1) and 4(1) of the Construction (Design and Management) Regulations 2015 at an earlier hearing at Westminster Magistrates' Court on 25 July but the judge delayed the sentencing to 30 August, so he could consider the case and to give Sivaneswaran time to provide financial records.



CDM 2015 FIRE RISK
PD and PC failed to comply with CDM May 24 2018

1. Background of Breach
- PC & PD put Dementia patients living at a care home in Exmouth were put at risk of death because a building firm and architect company ignored safety and health rules.

2, Breaches
- Risk – uncontrolled high-risk activities putting workers at risk of death, serious injuries or ill health including falls from height, fire, slips and trips and poorly controlled wood dust.
- Management – a “total disregard” for **safety and health and site management; and**
- Fire – risk of fire spread associated with the construction of a timber frame extension adjoining an existing building where physically and/or mentally impaired residents of the home were put at risk of injury or death due to the possibility of fire spreading into the home.

3. PC & PD Charged and pleaded guilty
- PC Coast & Country Construction Limited – of Concord Road, Exmouth did not attend court but were found guilty in their absence to breaching Section 2 (1) and 3 (1) of the

safety and health at Work etc. Act 1974, and have been fined £150,000 and ordered to pay costs of £6,039.
- PD Paul Humphries Architects Ltd – of Salterton Road, Exmouth pleaded guilty to breaching Regulation 11 (1) and 11 (3) of the Construction (Design and Management) Regulations 2015, and have been fined £20,000 and ordered to pay costs of £6,039.

Design Best Practice - Promoting Safety in Design
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CODE TO THE WEBSITE

The Australian Work Health and Safety Strategy 2012-2022 is underpinned by the principle that well-designed healthy and safe work will allow workers to have more productive lives. This can be more efficiently achieved if hazards and risks are eliminated through good design. The ten principles of good work design. This handbook contains ten principles which demonstrate how to achieve good design of work and work processes. Each is general
in nature so they can be successfully applied to any workplace, business or industry.
The ten principles for good work design are structured into three sections:
1. Why good work design is important
2. What should be considered in good work design, and
3. How good work is designed

The most effective design process begins at the earliest opportunity during the conceptual and planning phases. At this early stage there is the greatest chance of finding ways to design out hazards, incorporate effective risk control measures and design-in efficiencies.

Effective design of good work considers:

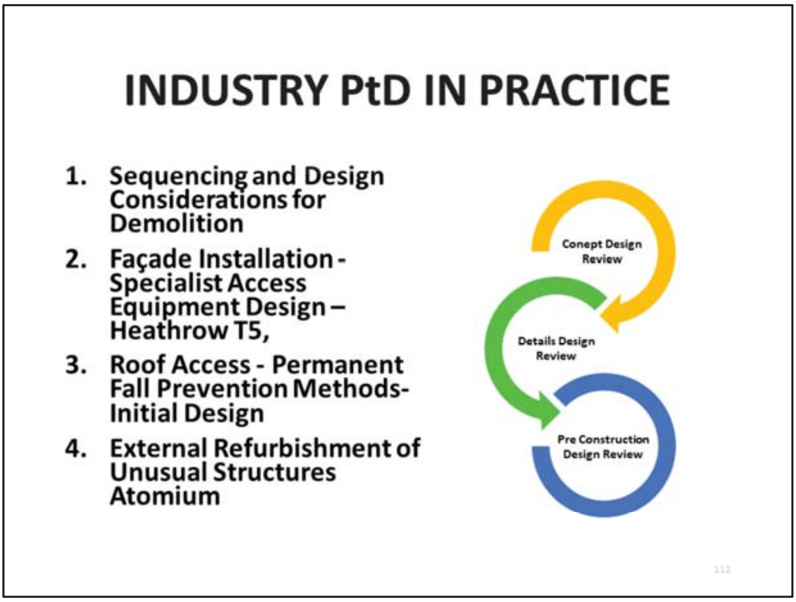
The work:
> how work is performed, including the physical, mental and emotional demands of the tasks and activities
➢ the task duration, frequency, and complexity, and
➢ the context and systems of work.

The physical working environment:
> the plant, equipment, materials and substances used, and
➢ the vehicles, buildings, structures that are workplaces.

The workers:
> physical, emotional and mental capacities and needs.
Effective design of good work can radically transform the workplace in ways that benefit the business, workers, clients and others in the supply chain.

Failure to consider how work is designed can result in poor risk management and lost opportunities to innovate and improve the effectiveness and efficiency of work.

The principles for good work design support duty holders to meet their obligations under the WHS laws and also help them to achieve better business practice generally



Designers can play a role in worker safety and health during decommissioning and refurbishment. High-profile hazards such as asbestos and lead-based paint are still prevalent in older buildings. A complete investigation, including a site survey, would assist designers in their assessment of construction hazards.

The Sequencing and Design Considerations for Demolition
1st Step - Façade Installation - Specialist Access Equipment Design – Heathrow T5,
2nd step - Roof Access - Permanent Fall Prevention Methods- Initial Design
3rd Step External Refurbishment of Unusual Structures Atomium

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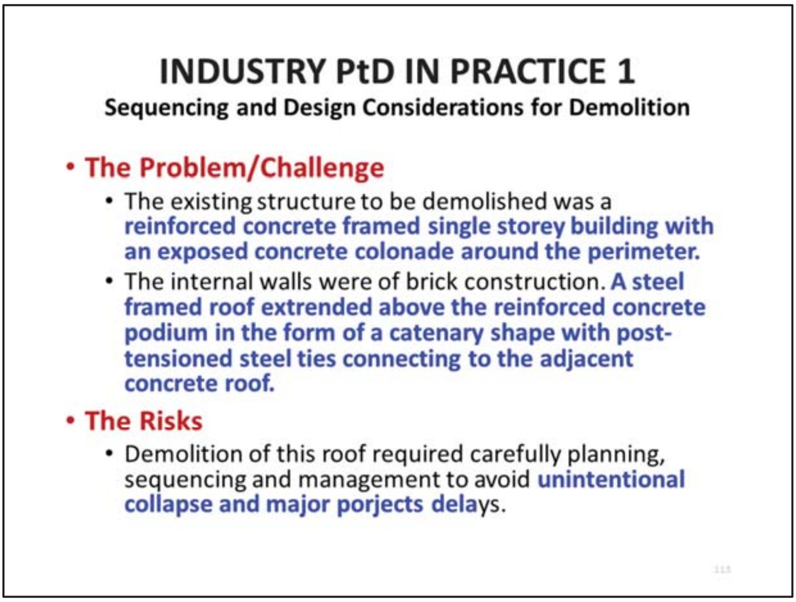


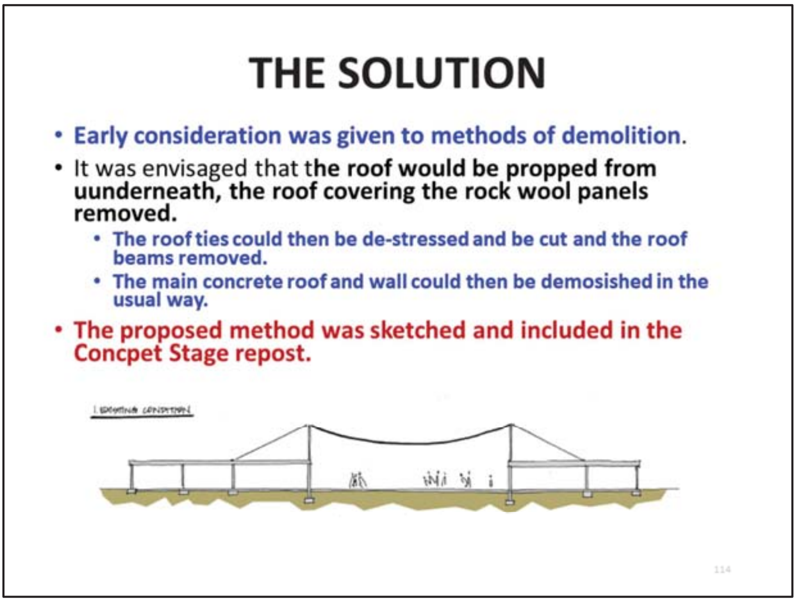
Designers should also consider the work that must be performed to demolish or refurbish a structure.

Initiating a site assessment is a key first step. Specifically, these design suggestions should be considered.

1. **Before demolishing and renovating any roof structure that is damaged, ensure that an engineering survey is performed by a competent person to determine the condition of the roof, trusses, purlins, and the structure itself. This survey would evaluate the stability of the structure and its components. The survey should suggest how fall-protection devices will be incorporated into the damaged structure.**

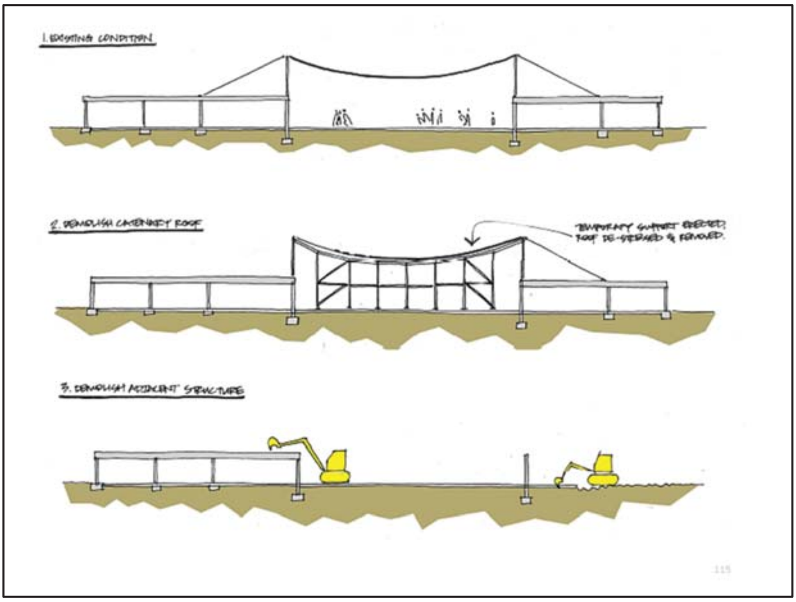
2. Before demolishing and renovating any structure, ensure that an engineering survey is performed by a competent person to determine the condition of the structure, evaluate the possibility of unplanned collapse, and plan for potential hazards. These hazards include a high level of dust.

3. Identify potentially hazardous materials such as asbestos and lead paint and take precautions to minimize worker exposure to them.



THE SOLUTION

- **Early consideration was given to methods of demolition.**
- **It was envisaged that the roof would be propped from underneath, the roof covering the rock wool panels removed.**
- **The roof ties could then be de-stressed and be cut and the roof beams removed.**
- **The main concrete roof and wall could then be demolished in the usual way.**
- **The proposed method was sketched and included in the Concept Stage repost.**



Given the specialist nature of demolition work, a demolition plan might be prepared to collate the key information relevant to the work into a single document, including some information relevant to work health and safety. A demolition plan should not duplicate a WHS management plan or SWMS but may reference them.

A demolition plan may include:

- the location of the site on which the structure to be demolished stands
- the overall height of the structure above ground level and the least distance from the structure to each site boundary
- the type of building (occupancy class), its structural support system and the principal materials of its construction
- the proposed methods of demolition including the number and types of major items of plant
- the proposed methods for handling and disposing of demolished materials and, in particular, of hazardous materials
- the proposed methods of controlling and maintaining access and egress to workplace
- the proposed sequence of carrying out the demolition works and an estimate of the time (in days) it is likely to take to complete all of each of the stages of the work
- the proposed hoardings, scaffolding and fencing and of any overhead sidewalk protection

- **any other plans, illustrations, written documents, or specialist reports as may be necessary to support the proposed methods of work or protective structures**
- **traffic management arrangements, which includes managing vehicles and mobile plant hazards in relation to operation at the workplace and interaction with the public.**
- **the location and condition of the following:**
- **underground essential services including:**
- **electricity, drainage and sewerage**
- **gas**
- **water**
- **communications cables (for example, telephone, radio and television relay lines)**
- **hydraulic pressure mains**
- **liquid fuel lines**
- **lubrication systems**
- **process lines (chemical, acid)**
- **above ground essential services**
- **hazardous materials, including asbestos**
- **underground structures such as a basement, cellars, or storage tanks**
- **any confined spaces where work will be undertaken**
- **the general condition of structures on adjoining properties, particularly where these are close to or on the boundaries of the demolition workplace**
- **the effect demolition may have on people working in adjoining properties or seeking access to and egress from those properties, and**
- **the emergency arrangements, which should include equipment for the rescue**
- **of injured persons. Some of the issues to be considered when undertaking an engineering investigation include:**
- **obtaining the as-built details of the component members (if available)**
- **identifying the type of structural system involved**
- **conducting a search for engineering details specifying size, type and configuration**
- **of reinforcement and the strength of materials (if available) and the located documents referenced**
- **assessing the current load-carrying capacity of the structure, taking into account:**
- **the strength requirements of the relevant structural technical standards current**
- **at the time of construction and the strength and loading requirements of those now current**
- **degradation of the original properties of the materials used due to time, weathering, wear, or other deleterious causes, and**
- **the capacity of the structure as a whole and individual members to sustain superimposed loads without:**
  - premature collapse of any member; or
  - deforming to an extent which will lead to static instability of the member itself or to connected members.
- **verifying the composition or quality of structural components, if necessary, using**
- **methods such as:**
- **core drilling**
- **electronic reinforcement location, and**
- **exposure of reinforcement**

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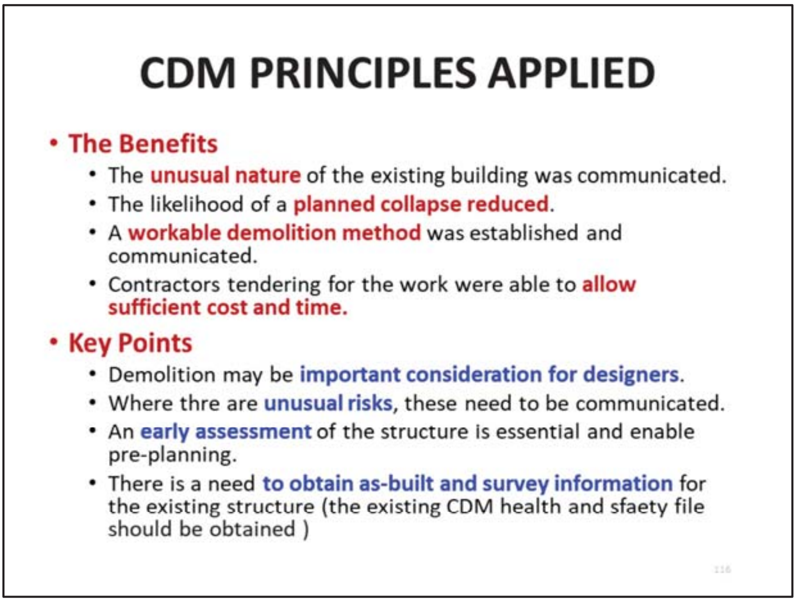
- ❖ assessing any loss of structural strength resulting from any destructive investigation methods used
- ❖ identification and location of floor penetrations to facilitate construction or structural Irregularities. assessing whether the proposed methods and sequence of demolition can be executed without causing unpremeditated collapse of the whole or part of the structure, and
- ❖ identifying any other details of the structure regarding strength, construction or contents which will influence the selection of demolition methods/procedures.



The Construction (Design and Management) Regulations (CDM Regulations) are intended to ensure that health and safety issues are properly considered during a project's development so that the risk of harm to those who build, use and maintain structures is reduced.

They require that designers, principal designers, principal contractors and contractors to take account of the 'principles of prevention' in carrying out their duties. The principles of prevention are specified in Schedule 1 of the Management of Health and Safety at Work Regulations 1999 which apply to all industries, including construction. They provide a framework to identify and implement measures to control risks and in general terms are:

(a) Avoid risks where possible.

(b) Evaluate those risks that cannot be avoided.

(c) Put in place measures that control them at source.

(d) Adapt the work to the individual, especially regarding the design of workplaces, the choice of work equipment and the choice of working and production methods, with a view, in particular, to alleviating monotonous work, work at a predetermined

work rate and to reducing their effect on health.

(e) Adapt to technical progress.

(f) Replace the dangerous by the non-dangerous or the less dangerous.

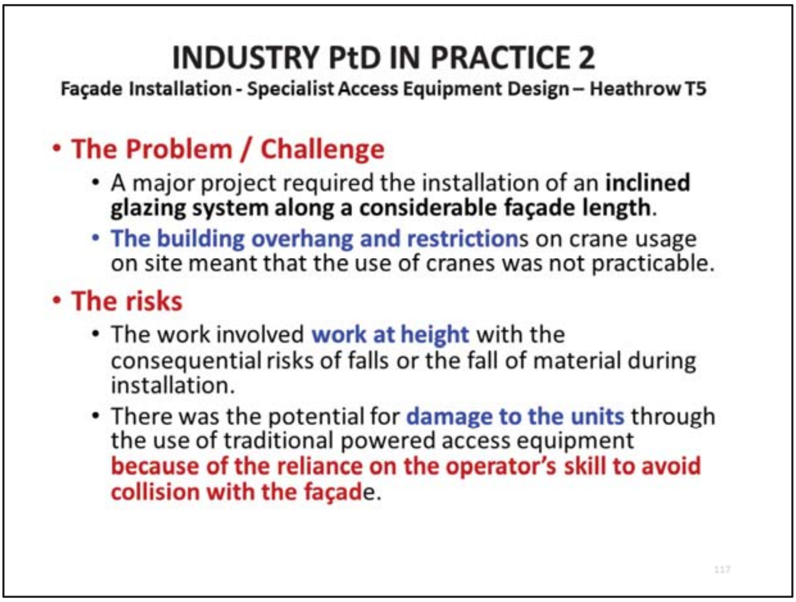
(g) Develop a coherent overall prevention policy which covers technology, organisation of work, working conditions, social relationships and the influence of factors relating to the working environment.

(h) Give collective protective measures priority over individual protective measures.

(i) Give appropriate instructions to employees.

The Benefits

- **The unusual nature of the existing building was communicated.**
- **The likelihood of a planned collapse reduced.**
- **A workable demolition method was established and communicated.**
- **Contractors tendering for the work were able to allow sufficient cost and time.**
- Key Points
- **Demolition may be important consideration for designers.**
- **Where thru are unusual risks, these need to be communicated.**
- **An early assessment of the structure is essential and enable pre-planning.**
- **There is a need to obtain as-built and survey information for the existing structure (the existing CDM health and safety file should be obtained)**



The Problem / Challenge

- **A major project required the installation of an inclined glazing system along a considerable façade length.**
- **The building overhang and restrictions on crane usage on site meant that the use of cranes was not practicable.**
- **The risks**
- **The work involved work at height with the consequential risks of falls or the fall of material during installation.**
- **There was the potential for damage to the units through the use of traditional powered access equipment because of the reliance on the operator's skill to avoid collision with the façade.**

lint: BAM Nuttall
Equipment: 32 boom and scissor lifts as well as three Titan boom lifts
Innovation: Secondary guarding systems, bespoke height limiting systems and fire suppression kits
Project: Part of a £103 million project to refurbish the Main tunnel at Heathrow airport, Nationwide Platforms provided a range of powered access platforms along with a number of bespoke safety solutions

Challenges and Solutions

Measuring a total of 2,520 metres, the tunnel required considerable work at a height of 4.8 metres

To minimise the risk of trapping/crushing, Nationwide Platforms developed a bespoke solution for its large deck scissor lifts which both physically and electronically prevented the scissor pack opening past a height of 4.3 metres. To further reduce risks, all boom lifts were fitted with the company's secondary guarding system, SkySiren®, and more than 150 operators, along with BAM's Incident Response Team, were provided on-site familiarisation and toolbox talks on emergency lowering and rescue procedures.

A safe, efficient and cost effective method of installation was needed to fit cumbersome soffit/fire boards

To help with the installation of more than 5,000 soffit/fire boards, Nationwide Platforms supplied a number of Titan boom lifts. Featuring the platform size of a large scissor lift, the adaptability of a boom lift and the lifting capacity of a telehandler, the Titans proved ideal for the task. Its 1,800kg platform capacity allowed multiple boards to be loaded into the platform, while the ability to rotate the platform 180 degrees provided engineers access to the full width of the tunnel, reducing the need to continually reposition the boom.

To eliminate all potential risks of injury and damage in the event of a MEWP fire

In order to raise tunnel working safety standards, Nationwide Platforms procured a fire suppression system which, in the event of a fire, would smother the MEWP engine compartment with foam. An audible alarm also sounds, warning the operator that the system has been activated. All machines were also fitted with Chalwyn values to further reduce the risk of fire.

With overnight road closures in place, BAM was faced with substantial fines should the tunnel failed to reopen

With the tunnel closed from 10.30pm to 5.30am, work was delivered within an intensive period of time. Faced with fines up to £250,000 every 15 minutes to ensure the tunnel reopened on time, Nationwide Platforms worked in conjunction with BAM to provide its Incident Response Team with a comprehensive retrieval procedure on how to safely remove the MEWPs in case of an emergency.

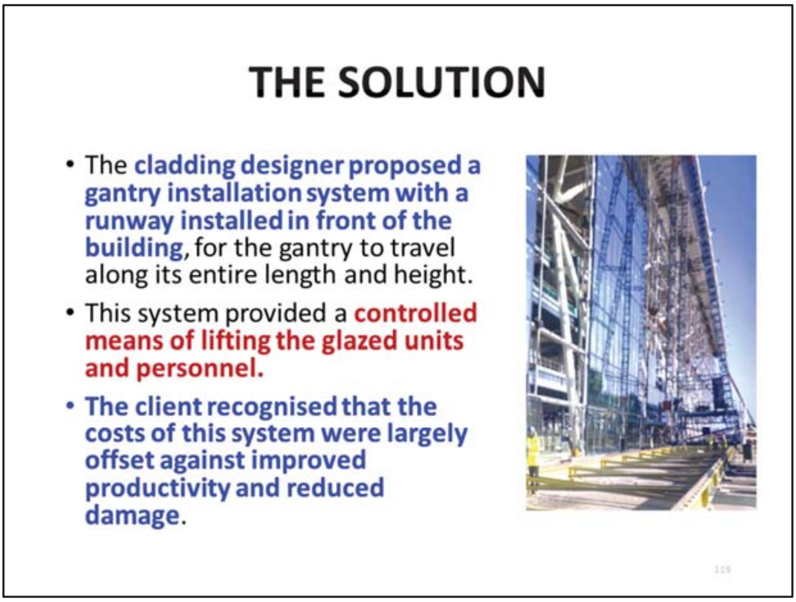
FAÇADE INSTALLATION - SPECIALIST ACCESS EQUIPMENT DESIGN – HEATHROW T5

The Problem / Challenge

A major project required the installation of an inclined glazing system along a considerable façade length. The building overhang and restrictions on crane usage on site meant that the use of cranes was not practicable.

The risks

The work involved work at height with the consequential risks of falls or the fall of material during installation. There was the potential for damage to the units through the use of traditional powered access equipment because of the reliance on the operator's skill to avoid collision with the façade.



The solution

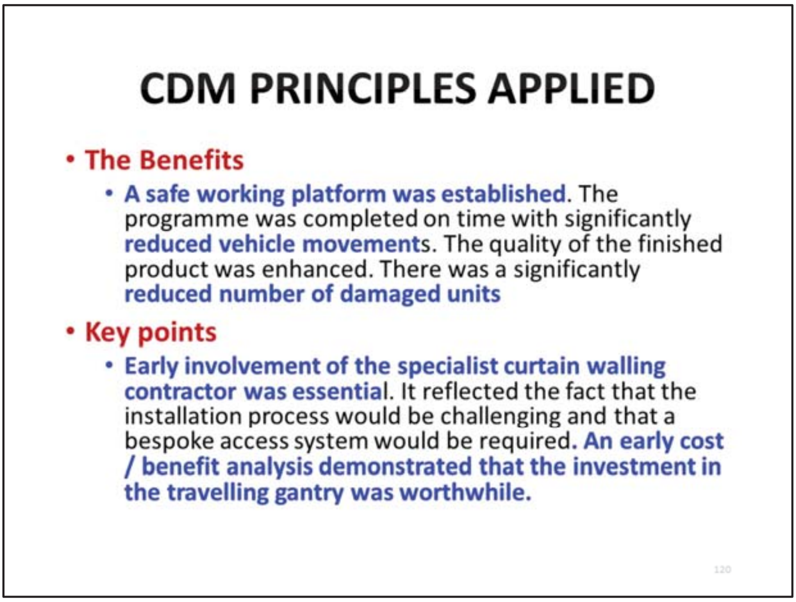
The cladding designer proposed a gantry installation system with a runway installed in front of the building, for the gantry to travel along its entire length and height. This system provided a controlled means of lifting the glazed units and personnel. The client recognized that the costs of this system were largely offset against improved productivity and reduced damage.

The benefits

A safe working platform was established. The programme was completed on time with significantly reduced vehicle movements. The quality of the finished product was enhanced. There was a significantly reduced number of damaged units

Key points

Early involvement of the specialist curtain walling contractor was essential. It reflected the fact that the installation process would be challenging and that a bespoke access system would be required. An early cost / benefit analysis demonstrated that the investment in the travelling gantry was worthwhile.



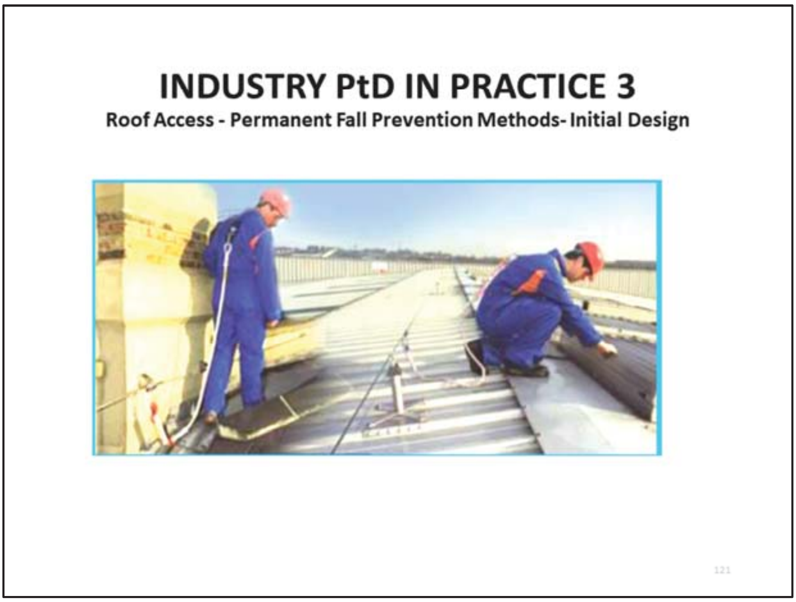
CDM PRINCIPLES APPLIED

- **The Benefits**

A safe working platform was established. The programme was completed on time with significantly reduced vehicle movements. The quality of the finished product was enhanced. There was a significantly reduced number of damaged units

- **Key points**

Early involvement of the specialist curtain walling contractor was essential. It reflected the fact that the installation process would be challenging and that a bespoke access system would be required. An early cost / benefit analysis demonstrated that the investment in the travelling gantry was worthwhile

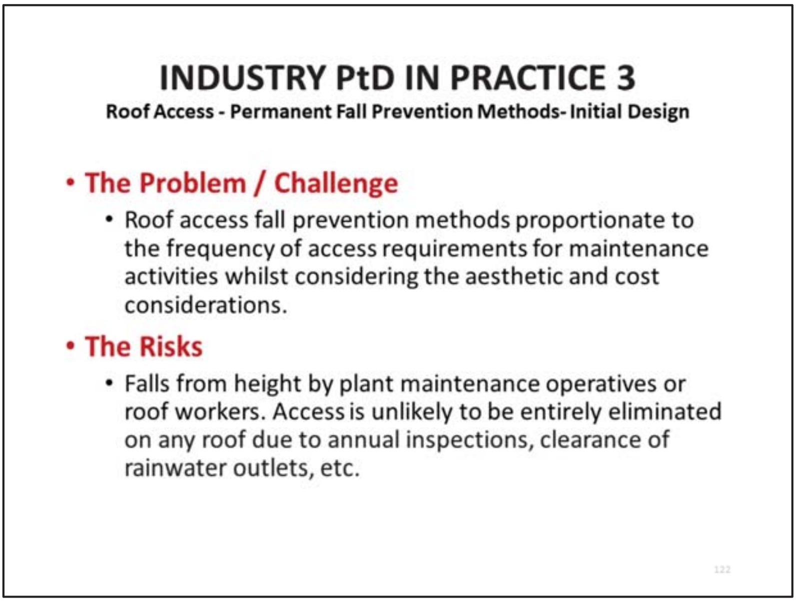


INDUSTRY PtD IN PRACTICE 3 Roof Access - Permanent Fall Prevention Methods- Initial Design

It is important to differentiate between the ‘where and how’ and the ‘why’ causes of falls from height. ‘Where and how’ causes are considered to be related to issues such as was the fall from a roof, a ladder or through a hole. The ‘why’ causes are considered to relate to ergonomic and human factors, and are typically not addressed in the literature, hence the need for workshops to address the ‘why’ issue.
Some of the ‘where and how’ causes of falls from height are generic and occur in all industries such as falls from ladders whilst others are specific to particular industries.

The Influence Network used in the roofing workshop was the same as the network used in the new build construction workshop (and therefore the same as the generic falls from height network). Roofing is generally considered as construction activity and so the factors affecting roofing and how these can be structured are largely similar to those for the construction industry as a whole.

Domestic as well as industrial roofing, and new construction as well as repair/maintenance were covered in the workshop including the following activities:
• SLATING AND TILING; including clay, concrete, natural and man made slate, steel, bitumen and wooden shingles and shakes.
• SHEETING AND CLADDING; including profiled self supporting fiber cement, steel, aluminum and fully supported metals with fillers, sealants, fixings and fasteners and roof lights.
• FLAT ROOFING; including built up felt roofing, single ply, mastic asphalt, liquid applied waterproofing and dry seal.

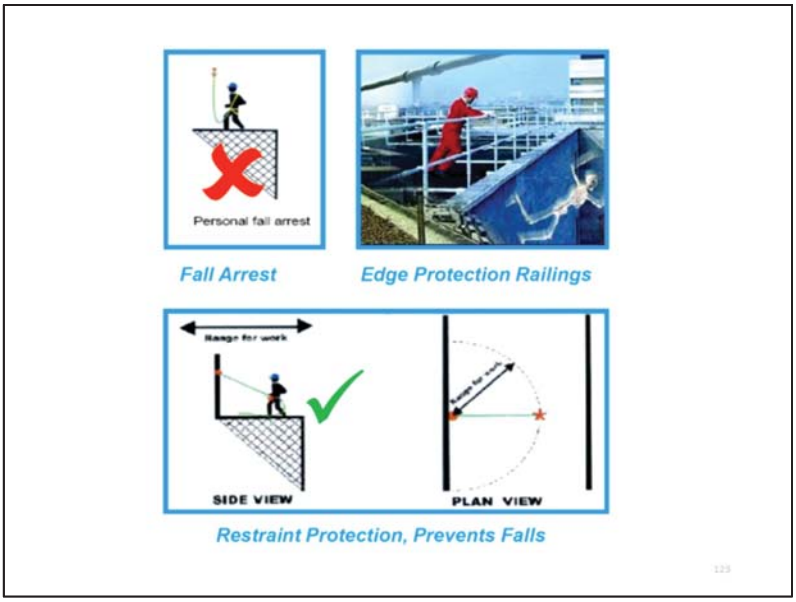


INDUSTRY PtD IN PRACTICE 3

Roof Access - Permanent Fall Prevention Methods- Initial Design

The Problem / Challenge
Roof access fall prevention methods proportionate to the frequency of access requirements for maintenance activities whilst considering the aesthetic and cost considerations.

The Risks
Falls from height by plant maintenance operatives or roof workers. Access is unlikely to be entirely eliminated on any roof due to annual inspections, clearance of rainwater outlets, etc.



INDUSTRY PtD IN PRACTICE 3
Roof Access - Permanent Fall Prevention Methods- Initial Design

Often it was possible for participants to give one rating score for the industry perhaps reflecting the fact that the workshop covered a particular trade. Many of the ratings which were given tended towards the higher end of the scale, which, as described in Section 9.2, reflects the fact that one of the delegates was from the NFRC who represent the more professional end of roofing. However, differences were picked up in certain areas such as between new build and domestic repair/maintenance and between larger and smaller companies. In general, smaller companies involved in domestic roof work and repair/maintenance tended to pull the ratings down. The lower set of ratings has been used in the analysis in order to focus on the areas of the industry where improvements are most needed.

The factors ranked as having the most potential influence on falls from height in roofing are shown in Figure . At the Direct level, there is a clear distinction between factors with a high influence and those with very little. Competence, risk perception, compliance, suitable human resources, conditions and safety equipment/PPE clearly stand out as the most important factors with none of the others weighted above medium.

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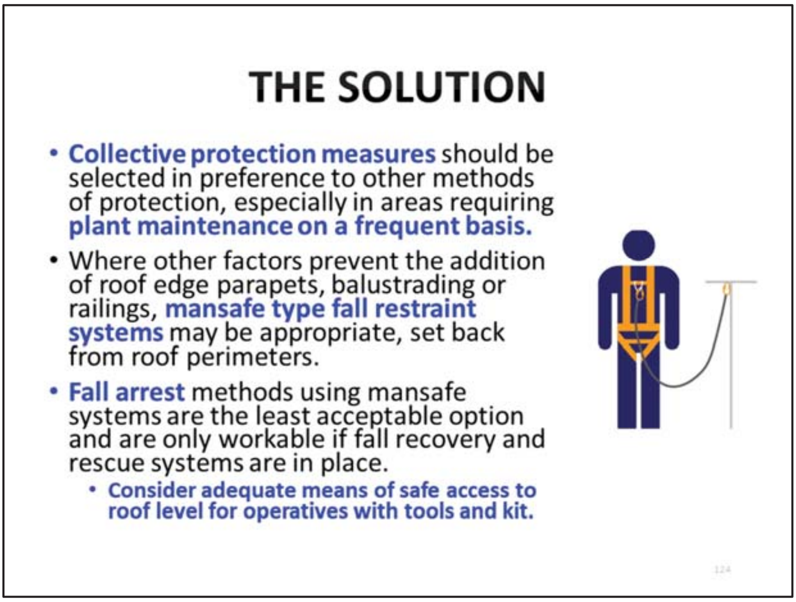
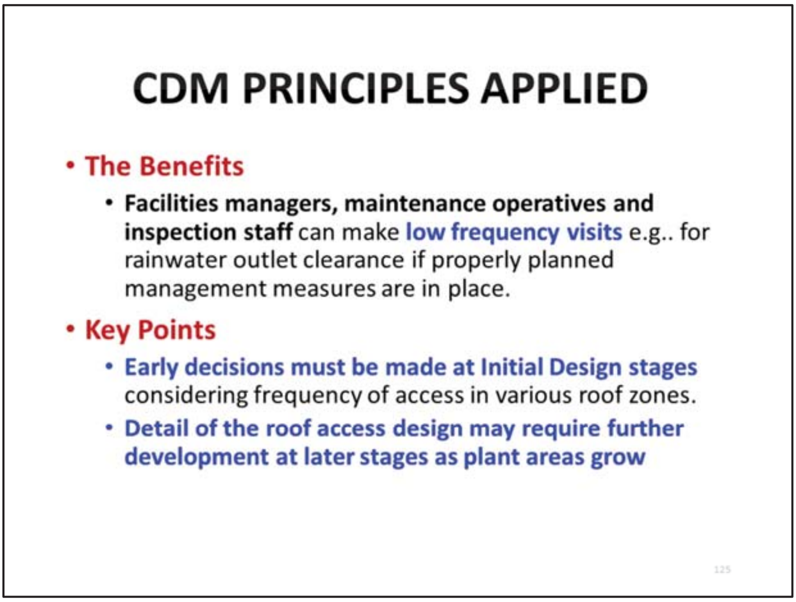
At the Organisational level, the factors ranked as most important are training, safety culture and design followed by recruitment and selection, procedures and management/supervision. Company culture and safety management emerge as most significant at the Policy level followed by contracting strategy and organisational structure.



THE SOLUTION

- **Collective protection measures should be selected in preference to other methods of protection, especially in areas requiring plant maintenance on a frequent basis.**
- **Where other factors prevent the addition of roof edge parapets, balustrading or railings, man safe type fall restraint systems may be appropriate, set back from roof perimeters.**
- **Fall arrest methods using man safe systems are the least acceptable option and are only workable if fall recovery and rescue systems are in place.**
- **Consider adequate means of safe access to roof level for operatives with tools and kit.**



CDM PRINCIPLES APPLIED

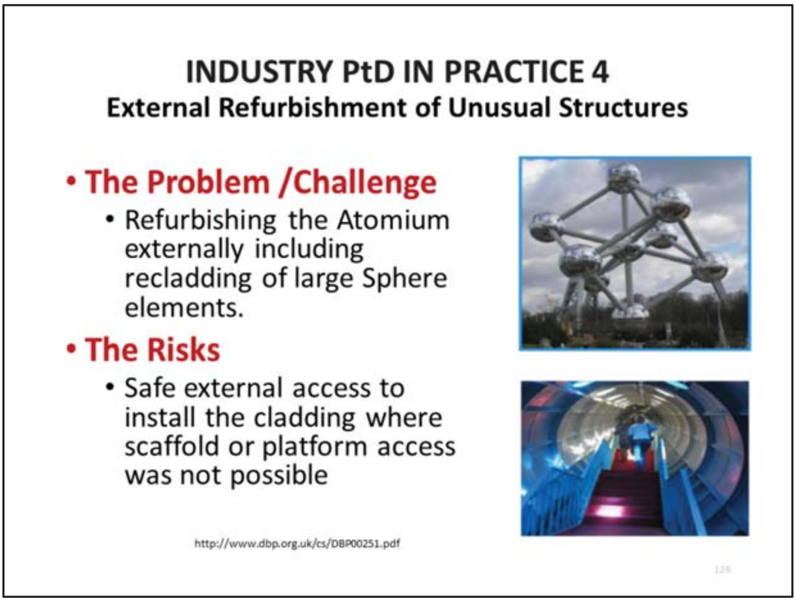
❖ **The Benefits**

- **Facilities managers, maintenance operatives and inspection staff can make low frequency visits e.g.. for rainwater outlet clearance if properly planned management measures are in place.**

❖ **Key Points**

- **Early decisions must be made at Initial Design stages considering frequency of access in various roof zones.**

Detail of the roof access design may require further development at later stages as plant areas grow



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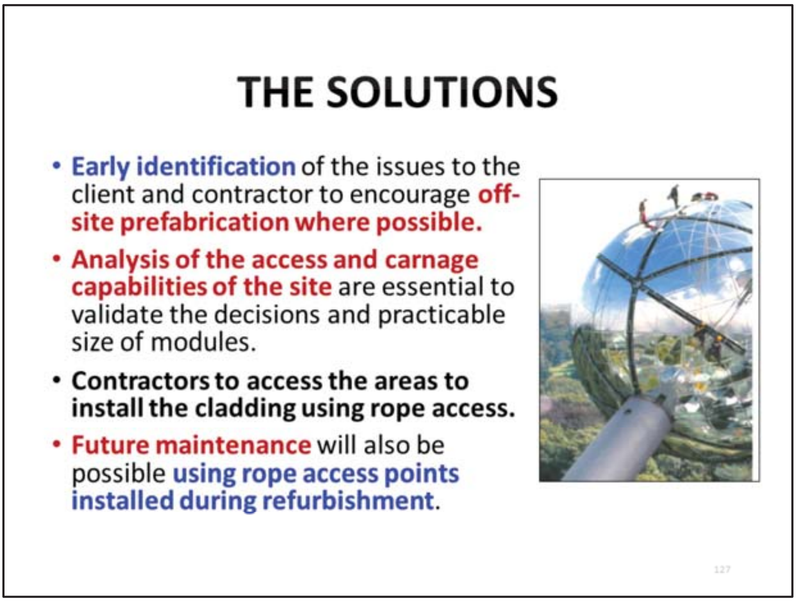
INDUSTRY PtD IN PRACTICE 4

External Refurbishment of Unusual Structures

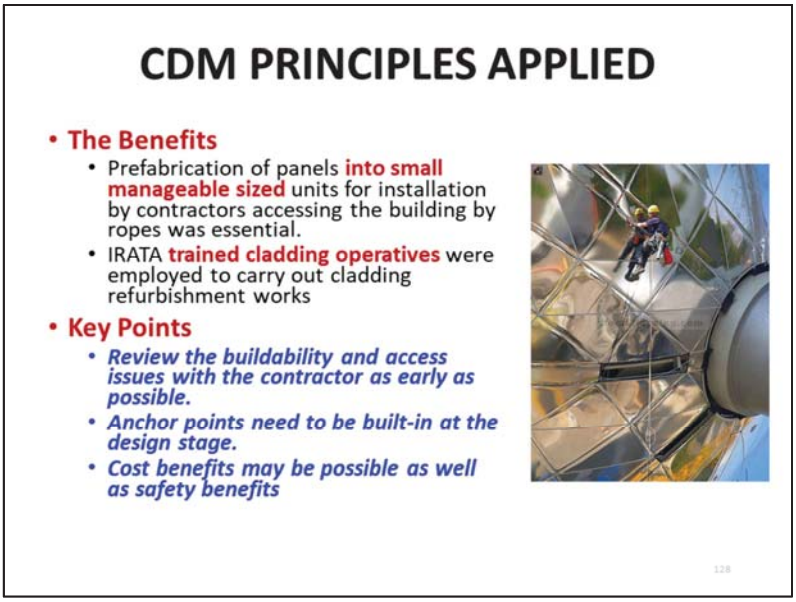
❖ The Problem /Challenge
Refurbishing the Atomium externally including recladding of large Sphere elements.

❖ The Risks
Safe external access to install the cladding where scaffold or platform access was not possible



THE SOLUTIONS

- **Early identification of the issues to the client and contractor to encourage off-site prefabrication where possible.**
- **Analysis of the access and carnage capabilities of the site are essential to validate the decisions and practicable size of modules.**
- **Contractors to access the areas to install the cladding using rope access.**
- **Future maintenance will also be possible using rope access points installed during refurbishment**



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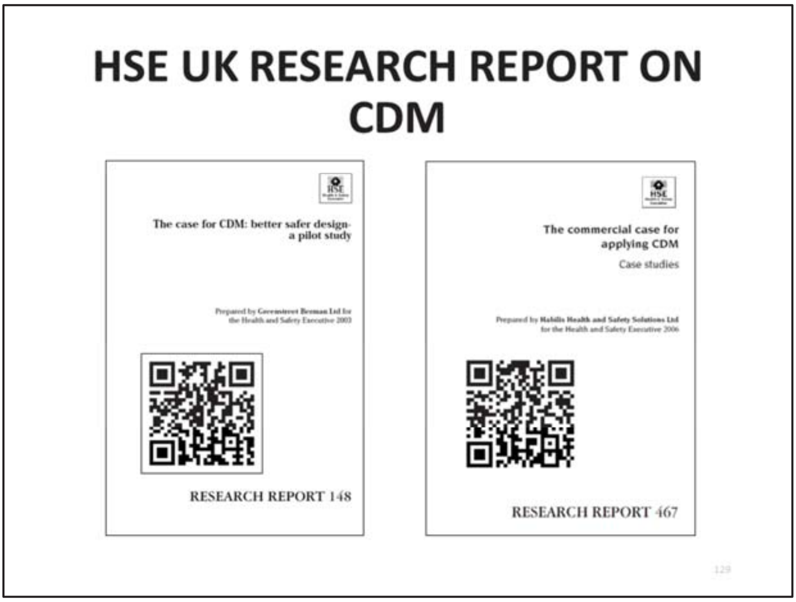
CDM PRINCIPLES APPLIED

❖ **The Benefits**

- **Prefabrication of panels into small manageable sized units for installation by contractors accessing the building by ropes was essential.**
- **IRATA trained cladding operatives were employed to carry out cladding refurbishment works**

❖ **Key Points**

- **Review the buildability and access issues with the contractor as early as possible.**
- **Anchor points need to be built-in at the design stage.**
- **Cost benefits may be possible as well as safety benefits**



HSE UK RESEARCH REPORT ON CDM

The Construction (Design and Management) Regulations 1994 (CDM) have placed specific statutory duties on Designers and Clients when they are part of the construction team. Engagement by the professionals within industry has not been as enthusiastic as it should have been and Health and Safety Executive Research Report 218 shows that many Designers are missing the opportunities the framework of the Regulations provides to manage design aspects of projects effectively and deliver safety on the projects in which they are engaged. Clients frequently miss the economic benefits that are inextricably linked to effective health and safety management. On the positive side there are examples of outstanding teamwork with innovative designs being built by highly competent contractors.

Accidents on construction projects have both direct and indirect costs which frequently exceed any profit margin. A simple exercise to compare the costs of relatively minor accidents against profit margins is worth while for any company. On the other hand there are real benefits to be won by teams working to deliver active project success for clients. This report is a simple selection of some of the examples of the business benefits relating to early design decisions that are linked to CDM. This selection can only include a few of the many standard or unusual ideas that a highly

creative, problem solving industry continues to generate and ideally should be the beginning of a wider sharing of good practice.

The examples considered were selected because they were able to demonstrate the linkage between commercial benefits and health and safety. They provide industry exemplars. Essentially the message is clear: professional added value design in its widest sense as part of the delivery of successful projects is inextricably linked to professional health and safety management.

From Cradle to Cradle – Workshop on Planning and Design for Safety in Project Life Cycle for Public Housing Developments”

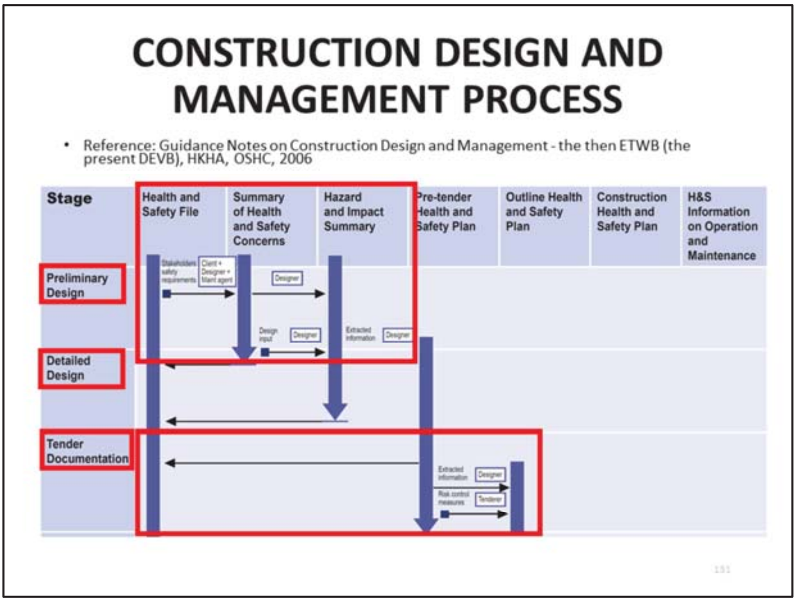
Embracing the 4Cs: Caring, Customer-focused, Creative and Committed as our core values, we, serving as a public sector client strive to uplift site safety standards and foster safety culture through the supply chain. With globalization, greater social awareness and more efficient communication network, the concept of corporate social responsibility beyond the traditional framework has gained new impetus. Promoting site safety is a key dimension to our policy that underscores both our own, and our business partners' corporate social responsibility.

It is our firm belief that quality and safety must go hand in hand. 'Safety First' is a fundamental principle and safety assurance is a prerequisite for productivity. Achieving site safety requires commitment from every player in the construction and maintenance works value chain, team building, and a robust management framework for both contractors and service providers. We aim to provide the catalyst to help raise industry safety standards, we also require them to work diligently on contractual obligations where site safety has been built into the system.

We seek to install a safety culture and continually enhance site safety and health standards via means conducive to proactively mitigating and managing risks by fostering the creation and maintenance of environmentally friendly, clean, and well-organised work sites.

Under the umbrella of the Safety and Health Policy, the Housing Authority strive to:

- **enhance the safety and health of all persons involved in Housing Authority projects**
- **provide information on safety and health criteria**
- **make safety and health performance one of the considerations in tender selection**
- **monitor contractor's safety performance by independent and in-house assessment**
- **compile safety profiles of contractors for continuous assessment**
- **promote safe construction technology through partnership.**



CONSTRUCTION DESIGN AND MANAGEMENT PROCESS

Describe the CDM Process

1. Preliminary Design Stage
- Establish the Safety & Health File from Stakeholders requirments
- Stakeholders may comprise of but not limited to Client + Designers + Maintenance Agents
- Output of design review exercise to list summary of Safety & Health Concerns
- At this stage its is also consider the Concpet Design Review

2. Detail Design Stage
- Design Input information will exposed the Hazards and Risk
- Summarise the out put for the designer to use for detail design stage
- Designers are required to DESIGN OUT THE RISK.(Expected result is NO RESIDUAL RISK)

3. At the Tender Documentation Stage
- Establish a Pre Tender Health & Safety Plan
- Designers use these information and provide Risk Control Plans to be TENDERED IN

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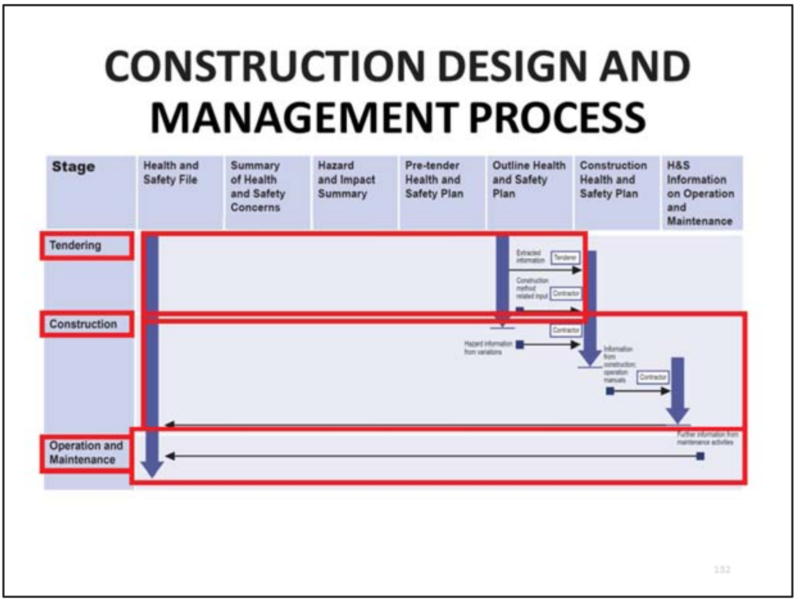


CONSTRUCTION DESIGN AND MANAGEMENT PROCESS

4. Tendering Stage
- The tenderer extarct the information and Outline safety and health Plan;
- Contractor determine and provide the Contsruction Method related input;
- Update Heath & Safety File

5. Construction Stage
- Contractors review Hazard information from Health & Safety Plan;
- Hence establish Construction Health & Safety Plan with information of Constrtruction Operation Manuals;
- Manage Site Safety & Health
- Update Health & Safety File

6. Operations & Maintenance
- Update further information on Operations & Maintenance
- Updat into Health & Safety File
- Handover to Client and later to Facility Managers

HONG KONG CDM

Background

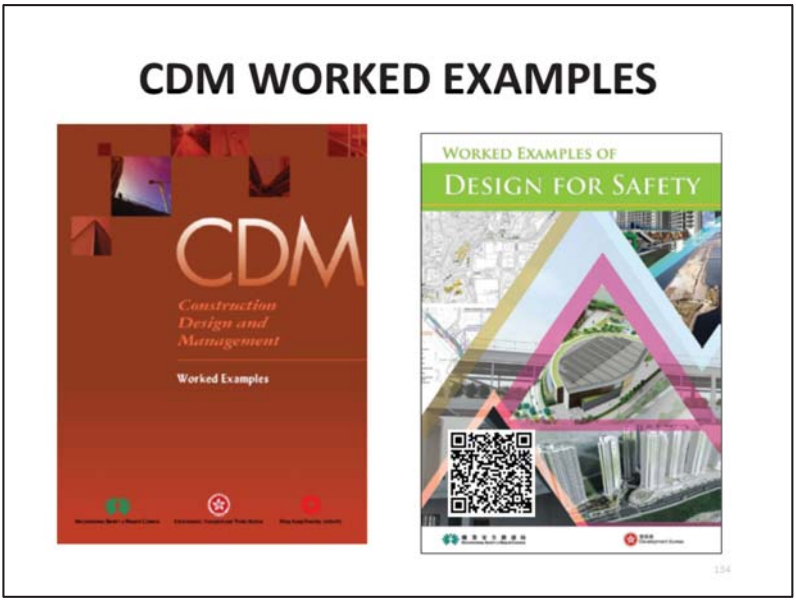
In January 2001, the Construction Industry Review Committee (CIRC) appointed by the Chief Executive of the Hong Kong Special Administrative Region stressed that site safety was a shared responsibility of the regulator, employers and employees. It also suggested that to achieve better safety performance in the whole project life cycle, hazards identification and mitigation should start from the early design stage and be carried through subsequent phases of project development, implementation, maintenance and demolition. The CIRC considered that the model under UK's Construction (Design and Management) Regulations (CDM Regulations) might provide a basis for achieving the above objectives. The UK model emphasized that stakeholders including clients, designers and contractors should contribute towards the avoidance, reduction and management of health and safety risks during all stages of a project.

The Essence of CDM

This new paradigm of construction safety management is referred to as 'Construction Design and Management' (CDM) in this Guidance Notes. The main objective of CDM system is to achieve:

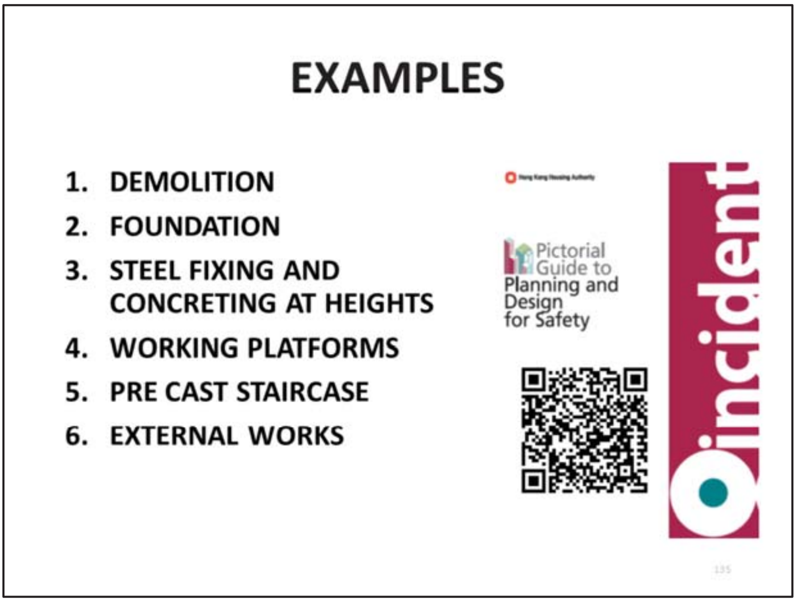
i) Identification of potential health and safety hazards, and cost-effective mitigation

measures at early stage of a project and continue throughout project delivery;
ii) Early involvement and effective co-operation of all stakeholders through timely provision of relevant and necessary information; and
iii) Clear demarcation of the roles and responsibilities of the parties responsible for coordinating and providing relevant project data on risks at all stages of a project.
The former Works Bureau [now part of the Environment, Transport and Works Bureau (ETWB)] and the Housing Authority (HA) have taken the lead to explore the use of the CDM approach by incorporating practicable features of the UK's CDM model for trial implementation in public works and public housing projects. This guidance document is prepared based on the experience gained from the trials with due emphasis placed on the importance of integrating the CDM system with existing project management process in order to ensure balanced considerations be given to all aspects of a project.



CDM WORKED EXAMPLES

Housing Department is committed to "Planning and Design for Safety". The in-house design guides and design checklists are the main design for safety reference during the design development process from conceptual layout to detailed design stages. The project team would hold regularly meeting to discuss any safety issues during the design stage and construction stage. Additionally, the Project Design Review Committee and Detailed Design Review Panel of the Housing Department represented by the Development & Construction and Estate Management Divisions actively evaluate the design proposals and raise project specific comments on sustainability, buildability and maintainability based on the potential safety, health and environmental hazards aspects. The residual risks information will be passed on to the estate management team who in charge of estate maintenance.



OTHER RELATED CDM WORKED EXAMPLES

Construction and maintenance works involving temporary or transient working environment entail inherent hazards and they are "never safe enough". Bearing in mind that "right attitudes produce right actions", managing safety throughout the project life cycle should not merely be a notion; it should in effect underpin the everyday actions of all practitioners for all project undertakings. As a proactive and caring public sector developer, the Housing Authority (HA) has always been striving to promote safety and health through our system drivers along the supply chain. Further to bestowal of the Safety Leadership Award (first runner-up in the Client-Developer Category) to HA in 2010 for our continuous efforts in initiating and maintaining safe leadership actions that have positively influenced the entire industry, the Lighthouse Club and Construction Industry Council have recently presented the Safety Leadership Award 2016 (Gold Award in the Client-Developer Category) to HA in recognition of our exemplary safety leadership in practice through the inception, design and construction of our projects. Our commitment to engagement with safety management system, addressing safety in the design process and implementation of safe working practices during the construction phase are commended. Indeed, "Safety First" is always an integral part of our work and this is our "Safety DNA".

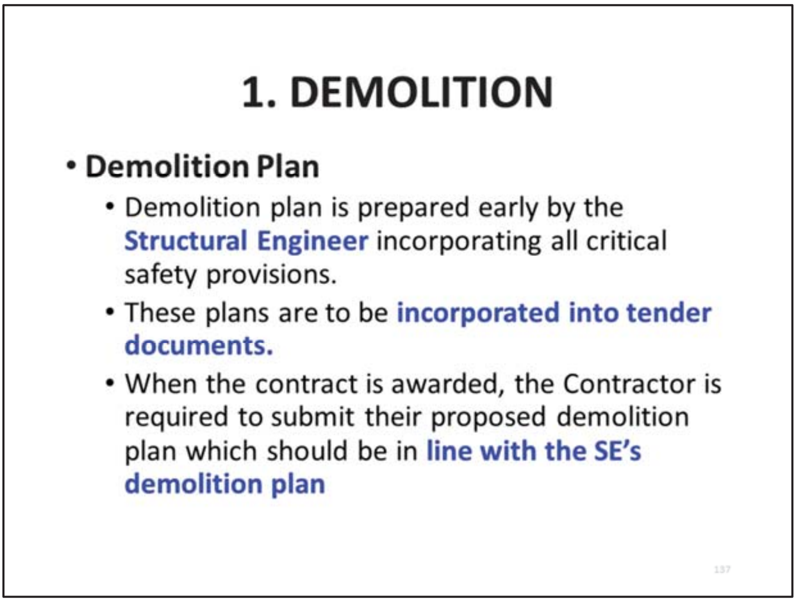
It is my pleasure to witness the success of the Planning & Design for Safety Workshop held on 31 March 2010. The signing of the charter with stakeholders pledging our

commitment to observe and drive planning and design for safety is really a fruitful achievement of the workshop. We emphasize "ZERO incident" as a performance goal to provoke vigilance on all fronts.

Module 5 :SAFETY THROUGH EARLY SYSTEM PLANNING AND STRUCTURAL DESIGN APPROACH FOR DEMOLITION, FOUNDATION AND BUILDING CONTRACTS

This module presents safe-design considerations pertaining to architectural design and construction. It contains specific examples of common workplace hazards related to construction and illustrates ways design can make a difference. There are several case studies to facilitate class discussions. One section of slides presents the Prevention through Design (PtD) concept, another set summarizes architectural design principles, and a third set illustrates applications of the PtD concept to real-world construction scenarios.

This slide module is intended to facilitate incorporation of the PtD concept into your architectural design course. You may wish to supplement the information presented in this module and may assign projects, class presentations, or homework as time permits. Sections may be presented independently of the whole. Presentation times are approximate, based on our presentation experience.



1. DEMOLITION

Designers can play a role in worker safety and health during decommissioning and refurbishment. High-profile hazards such as asbestos and lead-based paint are still prevalent in older buildings. A complete investigation, including a site survey, would assist designers in their Assessment of construction hazards.

Demolition Plan

- **Demolition plan is prepared early by the Structural Engineer incorporating all critical safety provisions.**
- **These plans are to be incorporated into tender documents.**
- **When the contract is awarded, the Contractor is required to submit their proposed demolition plan which should be in line with the SE's demolition plan**

DEMOLITION PLANNING FEATURES

Double deck hoarding / covered walkway to protect pedestrians; locations and extent of hoarding should be clearly defined

Scaffold, nylon mesh and periphery catch platforms / fans to prevent demolished debris from falling out of the block

DEMOLITION PLANNING FEATURES

Designers should also consider the work that must be performed to demolish or refurbish a structure.

Initiating a site assessment is a key first step. Specifically, these design suggestions should be considered.

1. **Before demolishing and renovating any roof structure that is damaged, ensure that an engineering survey is performed by a competent person to determine the condition of the roof, trusses, purlins, and the structure itself. This survey would evaluate the stability of the structure and its components. The survey should suggest how fall-protection devices will be incorporated into the damaged structure.**

2. Before demolishing and renovating any structure, ensure that an engineering survey is performed by a competent person to determine the condition of the structure, evaluate the possibility of unplanned collapse, and plan for potential hazards. These hazards include a high level of dust.

3. Identify potentially hazardous materials such as asbestos and lead paint and take

precautions to minimize worker exposure to them.

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DEMOLITION PLANNING FEATURES

The route for movement of mechanical breaker must be defined in Demolition Plan. Adequate propping should be provided underneath

Stacking of demolished debris not to exceed allowable height. Debris is to be cleared from time to time

139

DEMOLITION PLANNING FEATURES

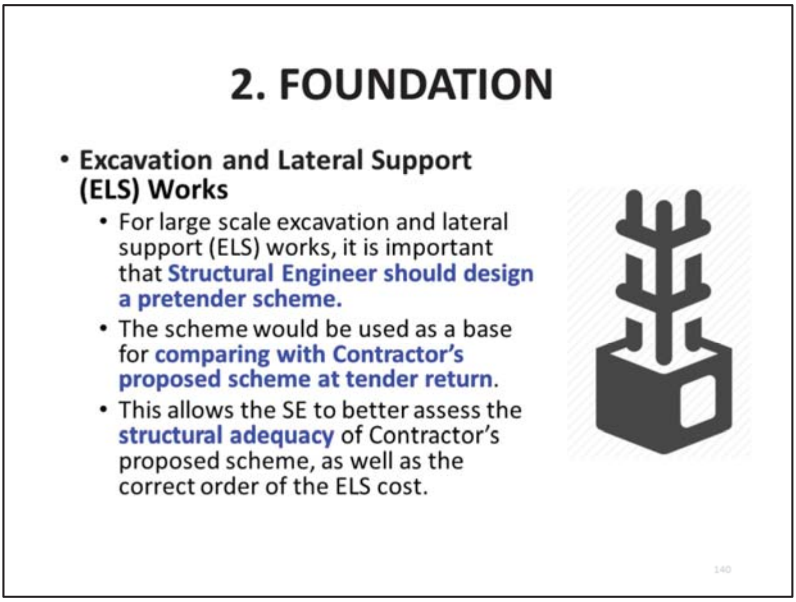
The route for movement of mechanical breaker must be defined in Demolition Plan. Adequate propping should be provided underneath. Stacking of demolished debris not to exceed allowable height. Debris is to be cleared from time to time.

Demolition work is one of the most Demolition work is one of the most dangerous operations in construction. dangerous operations in construction

Reasons/causes:

- ❖ **Easy to cause injury to human workers due to the difficulty of accessing into or working inside a building which is under demolition.**
- ❖ **Falling of smaller objects or debris from the demolishing building.**
- ❖ **Falling of partially demolished structure.**
- ❖ **Collapse of unstable structure due to original structure being disturbed.**
- ❖ **Employing inappropriate methods to demolish**
- ❖ **Collapse of heavy demolition equipment due to inadequate support of the partially demolished structure.**
- ❖ **Collapse of the partially demolished structure due to the accommodation of large amount of uncleared**
- ❖ **debris.**

❖ **Congested site environment that easily cause damages to human workers, or to the third parties and their properties that are situated nearby the demolition site.**



FOUNDATION

A foundation is a lower portion of building structure that transfers its gravity loads to the earth. Foundations are generally broken into two categories: shallow foundations and deep foundations. A tall building must have a strong foundation if it is to stand for a long time.

To make a foundation, we normally dig a trench in the ground, digging deeper and deeper until we come to subsoil, which is more solid than the topsoil that is used to grow plants and crops. When the trench is deep enough, we fill it with any strong, hard material we can find. Sometimes we pour in concrete into the trench, which we strengthen even more by first putting long thin round pieces of steel into the trench. When the concrete dries, the steel acts like the bones in our body to tie the foundation together. We call this reinforced concrete.

Excavation and Lateral Support (ELS) Works

Bulk excavation, even if shallow, can be dangerous if not properly designed. Authorized persons, registered structural engineers (RSE) and registered geotechnical engineers (RGE) are reminded to take adequate precautions to ensure public safety whenever excavation is found necessary as part of the work. Reference shall be made

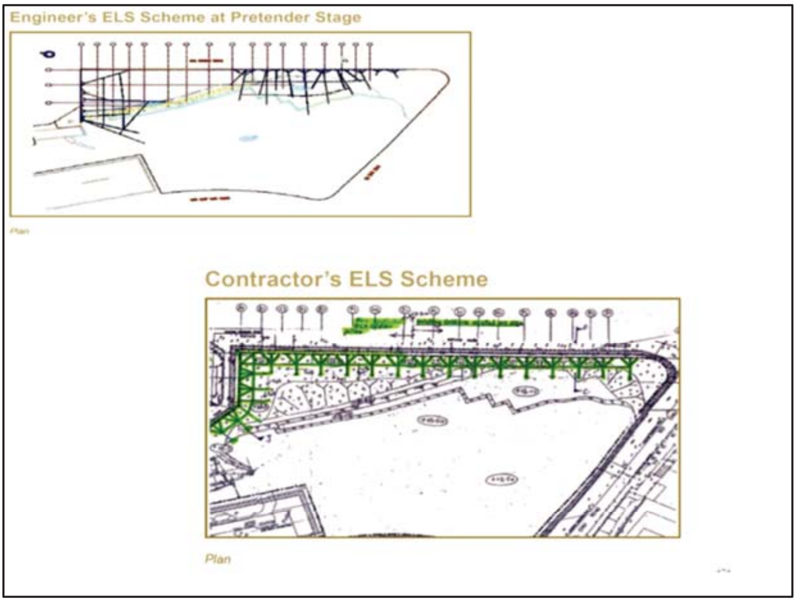
to PNAP APP-18 and PNAP APP-137 on details of monitoring requirements if piling and similar operations are included.

Criteria for Submission of Excavation and Lateral Support Plans

1. **In general terms, excavation and lateral support (ELS) plans are required under Building (Administration) Regulation 8(1)(bc) to be submitted for approval where excavations of substantial depth are to be carried out, the collapse of which would cause serious consequences.**

2. ELS plans will be required to be submitted to the Buildings Department (BD) for approval where the excavation works to be carried out are:
(a) deeper than 2.5 m and greater than 5 m in length; and
(b) liable to affect any road, building, structure, slope steeper than 30° or water main 75 mm in diameter or greater, the affected area being defined as within the 45° line up from the base of the excavation to the ground surface.
3. Where the above conditions apply, consent to commence ELS works would not be given if ELS plans, as prescribed in Building (Administration) Regulation 8(1)(bc), have not been submitted and approved.
4. Where ELS plans are required to be submitted for approval as stipulated above, an RSE would be required to prepare and sign the plans and structural design as well as the structural assessment report of the effects of the excavation and dewatering on adjoining structures. For ELS plans with excavation depth deeper than 4.5m, an RGE would be required to prepare and sign the supporting documentations, such as geotechnical assessment, geotechnical details and calculations, geotechnical reports, site investigation reports or ground investigation reports, which should accompany the ELS plans submission. It is permissible to have the ELS plans submitted in two stages, provided that the first stage submission demonstrates the feasibility of the entire scheme. Plans submitted at the first stage should show the lateral support system, for example sheet piles or a diaphragm wall, together with a strutting layout and the construction sequence. The supporting geotechnical documentation should also be provided. Calculations submitted at the first stage should include realistic ground movement estimates for the entire works. The second stage submission normally would include the structural details of the lateral support system, including detailing of the struts for each stage of excavation according to the approved first stage submission.

❖ **Excavation and Lateral Support (ELS) Works**
- **For large scale excavation and lateral support (ELS) works, it is important that Structural Engineer should design a pretender scheme.**
- **The scheme would be used as a base for comparing with Contractor's proposed scheme at tender return.**
- **This allows the SE to better assess the structural adequacy of Contractor's proposed scheme, as well as the correct order of the ELS cost.**



Engineer ELS scheme at Pretender Stage and contractor ELS schemes

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Excavation and Lateral Support (ELS) Works

142

Excavation and Lateral Support (ELS) Works

In general, excavation means to loosen and take out materials leaving space above or below ground. Sometimes in civil engineering term earthwork is used which include backfilling with new or original materials to voids, spreading and levelling over an area. British Standard CP6031 gives standards and recommendation to earthworks covering embarkment and cuttings, levelling and compacting, and the use of earthmoving plants etc.

Excavation and earthmoving plants Advantages of using mechanical plant in excavation :
a) work done quicker,
b) avoid dangerous condition of work by human workers, say, existence of ground water or collapse of soil,
c) achieve greater depth,
d) use fewer manpower and work done in lower cost (for larger scale work only)

Disadvantages
a) involve larger running and maintenance costs,
b) require a larger operating area,
c) access provision to working area,

d) less flexible in work planning,
e) idling time increase cost of work,

STEEL FIXING AND CONCRETING AT HEIGHTS

Steel fixers shape and fit the steel bars or mesh structures that are used to reinforce concrete in construction projects. They read building plans to determine what materials are required for a particular job and set out the materials that they are going to use. Steel fixers cut and shape steel bars, and weld, wire or clip structural steel materials into place. They also fabricate other reinforcing structures such as beams, footing pads or other special units. Steel fixers work all around the state on both large and small construction projects, from building new houses in our suburbs, to erecting schools, hospitals or other large buildings in our regional towns and remote areas.

Steel fixers work on building sites as well as in pre-cast concrete plants. Conditions may be loud and dirty, and they may work at heights, which can be dangerous. They usually work regular hours, but may be required to work longer hours when aiming to meet deadlines.

Steel fixers use a variety of hand and power tools, including industrial wire or bolt cutters, guillotines and power saws. They work with steel rods, bars and mesh structures, as well as also working with concrete They also use welding gear to weld steel structures into place. As they sometimes work at heights they also use ladders, scaffolding and elevated work platforms. They are also required to wear safety gear

such as helmets, work boots and harnesses. They may also use hydraulic jacks and tensioning mechanisms to test their work.

The placement of concrete in Fox Blocks needs to follow the recommended procedures for flow rates, lifts heights, and consolidation, plus the specifications for concrete design mix, slump and aggregate size. All of these aspects are specific to the design and placement of concrete in an ICF wall, and vary from the specifications for regular concrete forming systems. Concrete design and placement, fall heights, lift heights, and consolidation are all details that must be considered individually to work together for a successful Fox Blocks build. In reality, these are all independent issues that must each be considered individually for a Fox Blocks build.

CONCRETE PLACEMENT RATE

The speed or flow rate at which concrete is placed has many variables that must be considered prior to placement. For example:
- **Linear Length**
- **Height of Wall**
- **Temperature**
- **Concrete Mix**
- **Placement Method**
- **Available Manpower**
- **Overall Time From Start to Finish.**

4. WORKING PLATFORM

Good housekeeping in working area

Working platform provided for steel fixing works at heights (above 2m)

WORKING PLATFORM

The term 'working platform' is defined by the Work at Height Regulations 2005 as any surface from which work can be carried out, or as a means of access to or egress from a place of work, including:

Scaffold.
Suspended scaffold.
Cradles.
Roofs.
Floors.
Mobile elevating work platforms (MEWPs).
Trestles.
Gangways.
Gantries.
Stepladders and stairways.
Before the 2005 Regulations, working platforms were defined as fully-boarded platforms with handrails and toe boards.

For a platform to be suitable for working at height, it must be:

- **Of sufficient size to allow safe passage and use of equipment and materials.**
- **Free from trip hazards or gaps.**
- **Clean and tidy.**
- **Fitted with handrails and toe boards if necessary.**
- **Not overloaded (this is particularly relevant to trestles that are loaded with blockwork).**
- **Erected on firm level ground to ensure equipment remains stable.**
- **Before working platforms are used they must be inspected carefully to ensure they are fit for purpose and have been properly assembled or installed. If a platform is exposed to conditions that are liable to result in danger or damage, then it must continue to be inspected at regular intervals.**

See also: Working platforms for tracked plant: good practice guide to the design, installation, maintenance and repair of ground-supported working platforms.

Working platform with adequate railings and toe boards was provided during working at heights

Permanently installed steps, stairs or ramps, etc. shall comply with the Acts and Local Authority requirements. The requirements and standards for access and platforms varies considerably, depending on usage, so this section is for basic guidance only. All access ways and stairs must have a minimum head clearance of

2.1 metres vertically above the stair nosing.

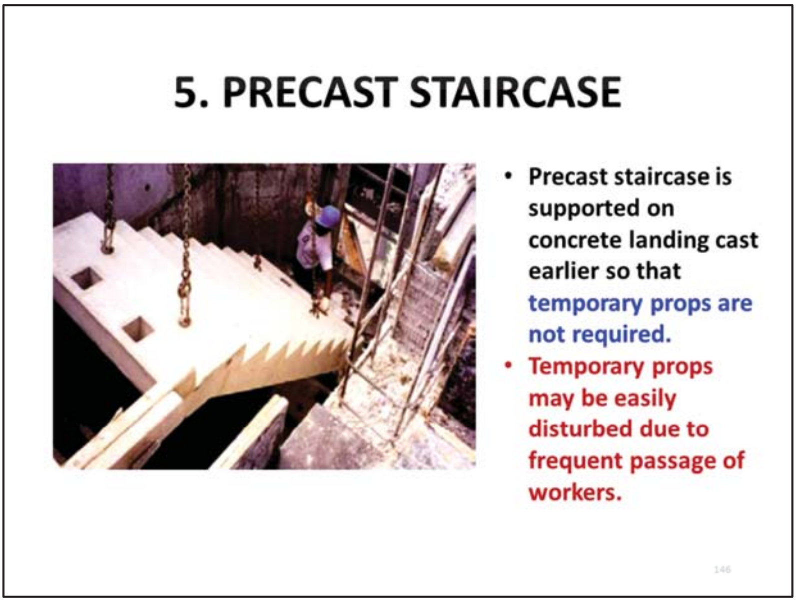
Doorways should not open directly onto a stair or ramp. A level landing or platform is required.

For open-sided stairs and ramps, the minimum width is 685 mm. When enclosed between walls, etc., the minimum width is increased to 815 mm, and where two persons have to pass, the minimum width is 1 metre.

Guardrails should be fitted to all exposed edges

Handrails are provided to assist balance; guardrails to prevent falls. The top rail should be at least 1.0 metre above the floor or front of the stair nosing. For guardrails, a midtrial shall be fitted. A toe board should be fitted anywhere there is a danger of tools or materials being lost over the edge.

Landings shall be placed so that stairs, ladders or ramps are divided into approximately equal sections. The minimum width and depth of a landing shall be the width of the steps or stairs; this shall be clear of any swinging door or other obstruction. Landings shall be level, with guardrails fitted.



PRECAST STAIRCASE

The main factor that contributes to the success of a precast building project is 'integration' of all building professionals. Professionals stated here include architects, engineers, clients, contractors and sub-contractors. The involvement of all players at an early stage is critical to a precast project. The fundamental mindset of all professionals has to be changed to achieve "Total Building Performance". Conventionally, consultants are more concerned with meeting clients' needs, regulatory requirements, design soundness and functionality while clients are more concerned with cost and the end product. Contractors, on the other hand, are more concerned with the building process. Very often, contractors are tasked to convert a traditional cast in-situ (Architectural and Structural) design to a precast design. The design development will involve modification to the consultants' design intent. As such, it is not uncommon for the contractor to face strong resistance from the consultant team. This is to be predicted as any player tends to be defensive if his 'professional' views are being challenged.

Today, the fragmentation approach towards design and construction among the professionals within a project is evident in most projects. A shift in paradigm is crucial to achieve success in any project. This section attempts to provide a guide for the construction of a precast project. The reader should refine the contents by Precast

staircase is supported on concrete landing cast earlier so that temporary props are not required. Temporary props may be easily disturbed due to frequent passage of workers.

Treads and risers on any stairway must be of uniform dimensions. The rise of each tread and the going (depth) will be governed by available space but should comply with the following criteria:

- **The pitch of the stair should be between 20 degrees to 45 degrees from the horizontal.**
- **The height of the rise and depth of the going of each step should approximate the formula, `twice the rise plus the going equals 600 mm, e.g. rise of 160 mm, going of 28O mm, 2 x 160+280=600 mm.**

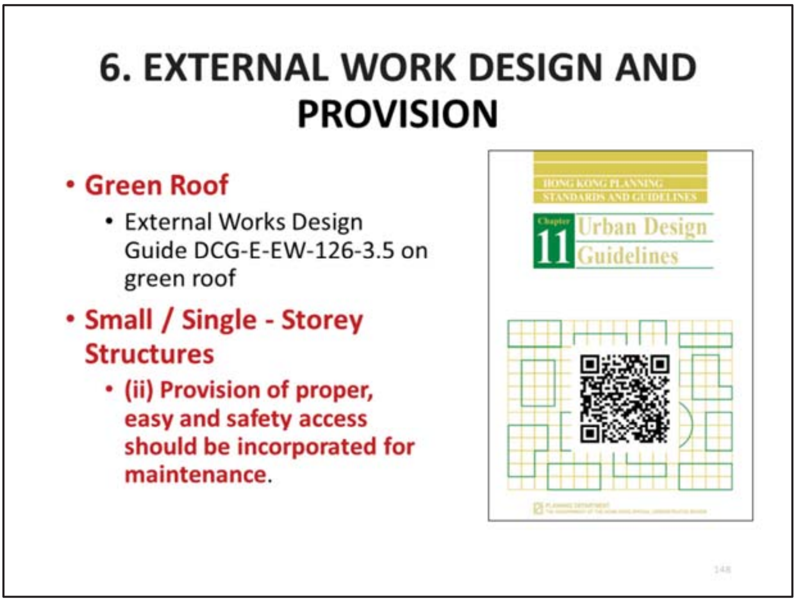
The maximum number of stairs between landings should be 18, with no more than two flights without a change of direction.

Module 6 :SAFETY CONSIDERATIONS FOR CLEANSING & MAINTENANCE WORKERS AND END USERS

By doing things right, you and your co-workers will commit yourselves to safety on the job and everyone will benefit. Accidents occur in many ways but most often can be traced back to one of two basic factors: ignorance or carelessness. You must always be concerned with your own safety and with the safety of others around you.

The following is a general list of safety precautions you must observe in any work area:

- **Don’t fool around. “Horseplay” is one of the biggest causes of injuries on the job and it may be grounds for dismissal.**
- **Never work while under the influence of drugs or alcohol, as you are a hazard to yourself and your co-workers.**
- **Pay particular attention to moving objects, such as equipment, dollies, mixers, and slicers.**
- **Walk, do not run, in the work areas.**
- **Stay completely alert on the job.**
- **Avoid back strain by lifting properly.**



EXTERNAL WORK DESIGN AND PROVISION

The term 'external works' describes any works carried out to the external environment of a building project. These can be works to functional as well as aesthetic features.

BRE describe external works as: 'All items outside the building footprint but inside the site boundary, encompassing wastewater and surface water drains, supply of utilities (e.g. gas, electricity and cabled services), footpaths, and access for vehicles including car parks and hard standings to be found in the vicinity of buildings.' (Ref: BRE building elements: foundations, basements and external works)

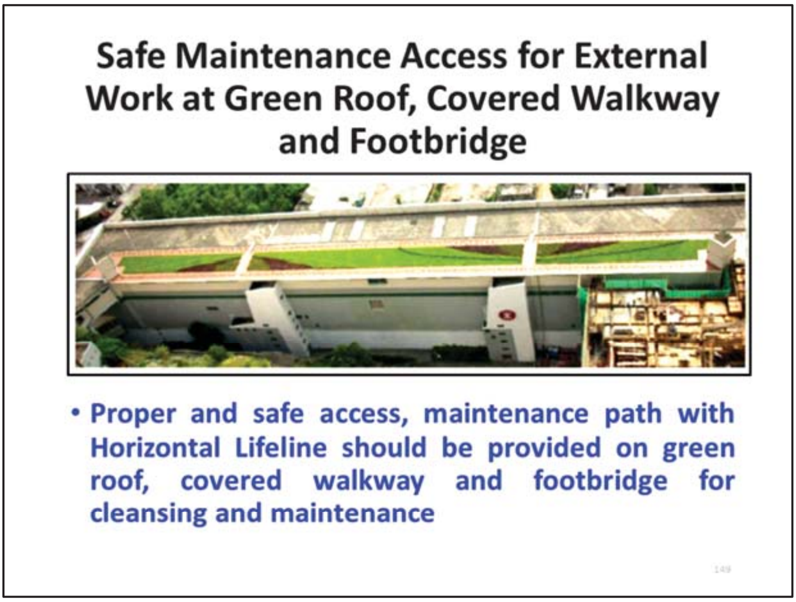
RICS' New Rules of Measurement Part 3 (NRM3) offers guidance on external works which it categorizes as:

Site preparation works.
Roads, paths, pavings and surfacings.
Soft landscaping, planting and irrigation systems.
Fencing, railings and walls.
External fixtures.
External drainage.

External services.
Minor building works and ancillary buildings.

Green Roof
External Works Design Guide DCG-E-EW-126-3.5 on green roof
Small / Single - Storey Structures
(ii) Provision of proper, easy and safety access should be incorporated for maintenance.

Green roofs are pretty simple constructions that can be fitted to most buildings with a suitably flat top. They work best when there is less than 20-30 degrees of slope to contend with and all consist of the same basic elements: A waterproofing membrane, a layer of soil, with the vegetation of choice on top. Extensive roofs will have a thinner layer of soil and are suitable for shallow rooted plants such as mosses and sedum that are fairly easy to maintain. An intensive roof garden has deeper soil and so can cope with hardier flora, even trees with stronger roots. The first thing you will need to consider is whether your green roof can take the weight of a full grown garden on top. Your installer will have to take into account not only the dry weight of your garden but also how much it will weigh once that first downpour comes. Most roofs should be able to take this additional burden but a full survey might ease worries if you think you could be heading for a nasty accident. It may that your roof will need some additional support before it is safe to proceed.



Safe Maintenance Access for External Work at Green Roof, Covered Walkway and Footbridge.

As a general rule for working at height, the first priority is to consider 'collective' measures such as guardrails, particularly where more frequent access is needed by a variety of workers with limited high-level operational experience or training. Using the best guardrail system that meets modern architectural requirements without compromising design, or safety demands.

Straight, curved or inclined styles are available in either freestanding or fixed forms. A folding upright version, which is concealed from ground level when not in use, minimizes visual intrusion. As an alternative to collective protection at the roof edge, It is ideal for containing designated access ways for more frequent use, for example to services, photovoltaic zones or wind turbines. For such applications, Latchways' range of anti-slip roof walkways provides the firm footing that may not be available on the green roof itself.

In practice, guardrails are generally limited to flat roofed areas, and there may be situations where collective solutions are not suitable for perimeter protection. Here, cable-based fall restraint or fall arrest systems offer the least invasive solution. These systems consist of cables secured by fixed anchor points, forming a permanent

element of the building. The posts contain an energy-absorbing coil that limits load transfer to the roof panel, which is therefore not damaged in the event of a fall. The posts are top-fixed to the roof panel, therefore protecting the integrity of the roof. Critically, Constant Force systems must be specifically designed for, and tested in conjunction with, each particular roofing system, and endorsed by the roofing system manufacturer.

An appropriate Personal Protective Equipment (PPE) body harness can then be attached by a prescribed length lanyard via a device to the cable at the access point onto the roof. This enables hands-free movement around the roof area as needed without disengaging the lanyard. With Latchways' Constant Force post system, up to three workers can use the system at one time. A prescribed level of training, procedures for rescue and detailed signage are all essential.

Providing full access After collective protection, the WAHR hierarchy favors 'fall restraint', where the operative's movement is restricted to safer areas, over 'fall arrest', which limits the fall and its consequences where operatives are allowed into areas of fall risk—although both are recognized as valid.

While most systems are designed for restraint, there is clearly still a need to access areas on some green roofs where falls might be possible. In addition to keeping operatives away from roof edges, preventing access to roof lights, which can become even more fragile with age, and other hazards within the roof area can also be handled by well-planned cable systems. Design and detailing Latchways' specialist designers have the expertise to design safety systems allowing full access for maintenance of extensive green roofs using either guardrails or Constant Force post technology. In addition, provision can be made for other maintenance needs which might involve dedicated walkways, perhaps with guardrail systems, to access service areas. Special requirements may also be needed for pitched or curved green roofs.

The Latchways Constant Force post system has been fully tested in conjunction with each of the leading green roofing systems and specific details developed. In general terms, a small pebbled area clear of vegetation is needed around each post, as shown. Standard details have already been developed for various manufacturers' green roof systems. Details can be adapted easily to suit bespoke green roof and substrate depths described earlier

Safe Access to Green Roof

Provision should always be made for safe access to the roof for routine maintenance, which may include man-safe systems with harness and attachment points, internal access hatches or an externally mounted bracket to secure a ladder.

As all green roofs will need to be to be accessed at least twice a year for routine maintenance, it is a fundamental requirement of the design of the roof structure that safe access is provided for. The two important points are; safe access on to the roof by people and maintenance equipment and the safety of individuals once on the roof, ie handrail balustrades at the correct height, stable surfaces that are slip resistant etc.

- **Metal Scaffolding to Roof**
- **Safe Arrest System**
- **Automatic Irrigation System**
- **Choice of plant material with low maintenance species, e.g. drought tolerant type**

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Safe Maintenance Access to Vertical Greening

Skyrise greening will continue to be explored by urban planners, designers, developers, consumers, as a potential design strategy to bring visual-spatial relief to the high density urban environment. Simultaneously, skyrise greenery has also created diverse elevated workspace conditions.

Walkway is cleared of outdoor furniture during maintenance for aerial platform to access green walls.

The top portion of an inclined green wall can be challenging to access from the front. A Vertical Personnel Lift may not suffice. Use small tree/palm with light crown to avoid shadowing plants behind, or just have a broader planter for more space between wall and tree. Access to green wall for maintenance is difficult .

If a boom lift is to be deployed, adequate access/exit points, corridor clearance and loading provisions for the equipment's must be designed/catered for the safety purposed.

Safe Maintenance Access to Footbridge

One of the biggest risks faced by bridge workers is falling from a higher level of a bridge to a lower one. This often happens because workers use the wrong equipment to access hard-to-reach sections of bridges. They retrofit equipment designed for other purposes or come up with temporary solutions to get to those areas. If your firm does any work on bridges, it should always provide workers with equipment specifically designed for it.

This could include:

Bridge walkers, which can securely lower workers up to 20 feet below a bridge, even if space is limited Hydra platforms – able to move workers up to 35 feet below a bridge. They have a work platform that can be rotated to give workers easy access to the edge of the bridge deck Paxton-Mitchel snoopers, which provide safe access to even the most hard-to-reach areas of the largest bridges UBITs – highly flexible articulated units that can lower workers almost 26 feet below the bridge deck Each type of bridge access equipment fills a specialized bridge construction need. It's important to work with a reputable firm that can recommend the correct equipment for the job.

TIP: Is cost keeping your firm from using the equipment you need to do the job right?

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Don't forget that you can rent equipment at an affordable price. Learn more.

2. Eye and Face Protection

OSHA requires that bridge workers use eye and face protection, including safety glasses and face shields, at all times. Eye and facial injuries typically happen because foreign objects and particles enter the eye while welding, cutting, grinding, nailing, or working with concrete. Extreme winds, sparks from welding or electrical work, smoke, and exposure to dangerous chemicals are hazards that can cause eye and facial damage as well.

According to OSHA, employers are required to make sure all employees exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation use appropriate eye or face protection. OSHA provides a comprehensive list of eye protection recommendations on their website.

3. Fire Blanketing

Many serious injuries on bridge construction sites happen when the utility lines, cables, and piping that cross them are damaged by construction equipment. That's why it's important to always be prepared and have fire control tools handy, including fire blanketing. A fire blanket is a sheet of fire retardant material that can be placed over a fire in order to smother it. It's considered the best way to control an electrical or other utility-related fire.

4. Foot Protection

Workplace accidents and deaths related to slips, trips, and falls increased significantly last year. One way to reverse this trend is for workers to wear the correct shoes on the job. According to OSHA, employers must make sure that employees use protective footwear when they are:

In areas where there's a danger of foot injuries due to falling or rolling objects doing work where it's possible an object could pierce the sole of a shoe In need of protection from an electrical hazard, such as a static discharge or electric shock

5. Under-Bridge Protection

Bridge utility lines can be damaged by construction equipment, tampering, weather incidents, and natural disasters. These threats can lead to loss of utility service, expensive repair costs, and injury or loss of life. Protection Under Bridge (PUB) systems are caging units designed to protect vulnerable utility lines under bridges. They can help ensure ongoing utility service, along with worker and community safety. Contact an expert on these systems to find out how installing them could make the bridges you work on safer.

6. High-Visibility Safety Equipment

People working on bridges and roadways are required to wear special colorful and reflective clothing. It makes workers visible to drivers in work zones, which helps prevent accidents before they happen.

The rules governing this type of apparel are published by the American National Standards Institute. Reflective safety apparel used for road and bridge work must comply with ANSI/ISEA 107-2010. These garments are designed to provide different levels of protection depending on the type of work being done and where and when it's taking place. Reviewing the guidelines will help you select the right protective gear for your bridge construction workers.

Tip: ANSI standards also include care recommendations for reflective protective clothing. Following these guidelines will ensure it stays in good shape and continues to provide adequate worker protection.

7. Hand Protection
According to the U.S. Centers for Disease Control and Prevention (CDC), workplace hand injuries account for 1,080,000 emergency medical visits per year in the U.S. And according to the Bureau of Labor Statistics, hand injuries including cuts and puncture wounds cost the construction industry $382 million each year.

It's not surprising that 70 percent of workers who experienced these injuries were not wearing gloves. The remaining 30 percent of injured workers were wearing gloves, but they were not wearing the right kind for the type of work they were doing or their gloves were damaged. A Liberty Mutual Research Institute for Safety study found that wearing gloves reduces hand injury risk by 60 percent.

Under OSHA's hand protection guidelines, employers are required to make sure that workers use appropriate hand protection when they're exposed to:

- Harmful substances
- Sharp objects that could cause cuts or lacerations
- Work that could lead to severe abrasions or punctures
- Heat or chemicals that could cause burns
- Weather extremes
- If your firm provides your workers with standard cotton or leather gloves, you should reconsider. Manufacturers today offer innovative hand protection products made out of high-tech materials designed to meet specific needs. Plus, they're more comfortable, making it easier for workers to do their jobs. Some types of gloves offer up to 300 percent more abrasion and cut resistance than leather ones.

Did you know? According to the Bureau of Labor Statistics and the National Safety Council, the average hand injury claim is more than $6,000 and the average workers' compensation claim for lost time due to these injuries is almost $7,500.

8. Head Protection
OSHA requires that workers on bridge sites wear hard hats when:

- Objects could fall on them
- They could bump their head on fixed objects

- They could come into contact with electrical hazards (a big risk for bridge utility workers)
- Construction workers building the Golden Gate Bridge.

Did you know? One of the first building projects that required the use of hardhats was the construction of the Golden Gate Bridge back in 1933. Chief engineer Joe Strauss wanted workers to be safe and mandated that they all wear regular hard hats and people doing sand-blasting use ones with face shields.

Today, most hard hats are made from high-density polyethylene (HDPE) or advanced engineering resins, such as Ultem. Some feature a rolled edge that acts as a rain gutter to channel rainwater to the front, allowing water to drain off the bill instead of running down the wearer's neck.

Many hard hats are designed with ventilation to keep wearers cool and comfortable. Accessories such as face shields, sun visors, earmuffs and hearing protection, and perspiration-absorbing lining cloths could also be incorporated into the design depending on the needs of bridge workers. Attachments can include radios, walkie-talkies, mirrors, lights, pagers, and cameras.

Make it a rule to regularly inspect hard hats for dents, cracks, or deterioration. If there's any damage, they should be replaced. They should also be replaced after a heavy blow or electrical shock. Keeping hard hats in good condition is critical for worker safety.

9. Signage and Barriers

Something as simple as using adequate signage and appropriate barriers can provide a great amount of protection for workers on bridge construction sites. OSHA standards require that traffic control signs, signals, barricades, or devices must be used to protect construction employees from traffic hazards, such as motorists inadvertently entering the work space or exiting the highway in the wrong place.

Tip: Set up temporary traffic control signs and barriers within a reasonable time prior to construction. Many sites do this long before construction begins, and motorists become complacent when they don't see work being done. Placing warning signs and devices when work actually starts will help keep drivers alert.

10. Safe Vehicles

The vast majority of deaths that occur in bridge and road construction zones in the U.S. happen because a worker is hit by a piece of construction equipment or other vehicle.

- That's why it's critical that all vehicles used on-site have safety features, including:

- Working headlights and brake lights
- Windshield wipers and defogging or defrosting devices
- Audible horns
- Back-up alarms
- Safety glass with no distortions

- **Proper mirrors**
- **Adequate seating and seat belts**
- **Regularly inspect equipment and all the safety features to make sure everything is in good working order.**

DESIGN FOR SAFETY DfS PROFESSIONALS

Regulations has been gazette and published on 10 July 2015. It will come into operation on 1 August 2016.

The key provisions of the proposed WSH (DfS) Regulations are:

1. To place duties on developers and designers
The proposed Regulations will place duties on developers and designers to identify and address foreseeable risks throughout the lifecycle of a construction project. Where risks cannot be mitigated by design interventions, it will have to be communicated to those involved in the construction project.

2. To require implementation of a DfS review process throughout every phase of the construction project
The implementation of a DfS review process throughout every phase of the construction project (or whenever design changes are made) would ensure that risks in the design are highlighted and managed in a systematic and coordinated way. By making it a mandatory requirement, we can ensure that time and resources are set aside to address the WSH risks at the design and planning stage.

3. To require a DfS register for all construction projects
To ensure vital information is communicated downstream, the regulations will require proper record keeping of WSH risk for future reference via a DfS register. The DfS register will record (i) safety and health issues identified during the design reviews and actions taken; and (ii) risks that cannot be removed through design changes. The DfS register should be a live document which will be updated as and when new WSH risks are identified.

4. To allow developers to appoint a DfS professional
Developers have the option to discharge their duties, such as the facilitation of the DfS review process and the preparation of a DfS register, to a DfS professional. Nonetheless, to ensure that developers take responsibility for the risks they create, they would have to make arrangements to ensure that the DfS professional carries out his assigned duties with due diligence.

5. To mandate it for projects with contract value of $10 million and above
For a start, we propose for the Regulations to apply only to projects with contract value of $10 million and above. Over the last two years, about 80% of fatal accidents and dangerous occurrences in the construction industry were contributed by projects with contract value of $10 million and above.

SINGAPORE EXPERIENCE

Window air-conditioner units are a reliable and simple-to-install solution to keep a room cool while avoiding the costly construction of a central air system. Better yet, when the summer heat dies down, these units can be easily removed for storage, and you can use the windowsill for other purposes

Window AC units come in various sizes and cooling capacities, and it is important to choose the one that best fits the needs of the room. Check the square footage of the room you need to cool and match that to a window AC unit. If the room is unusually hot or cool, you can adjust the air-conditioner cooler capacity accordingly.

Other factors that affect the performance of an air-conditioner are number of people in the room and how large the doorways are into other spaces.

Most units are meant to fit in double-hung windows, but there are models designed for casement windows as well. When choosing a window to place the air conditioner in, keep fire safety in mind. An air conditioner can block egress in the event of a fire, especially if the unit is in a room with only one window.

Installing a window air-conditioner is best done with two people. These units can be

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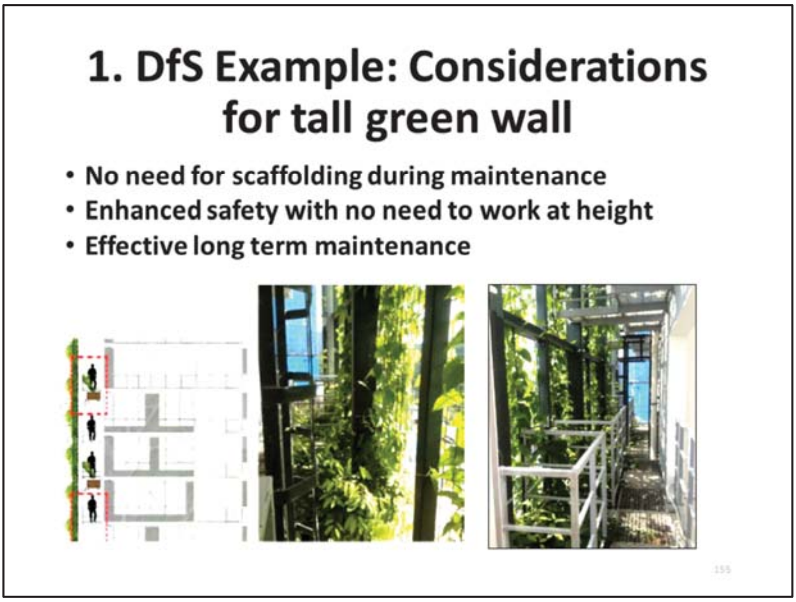
heavy and awkward, and the last thing you want is for your AC unit to fall out of the window or on your floor.

Installation is easiest with a double-hung windows. Most air-conditioner units will come with a kit that includes window extensions and mounting brackets. These will ensure an air-tight fit and help secure the window. It's best to pre-fit all attachments onto your window before drilling any holes.

Start by raising the lower pane and place the unit in the windowsill. Don't release it until you know it is solidly in place. If your windowsill isn't wide enough to support the air-conditioner, you can buy a bracket that attaches to the underside of the unit and your exterior wall. Next, slide out the unit's extensions to fill the empty window space. Then, level the unit according to the manufacturer's instructions. Most air-conditioner models should tip slightly to the outside to drain condensation. However, keep in mind that some units may not be designed to tilt.

Fasten the unit to the brackets or lower the window pane onto the unit to lock it into place. Most models will have you secure the upper windowpane into place to prevent movement. Next, secure the extensions to the window jamb. Finally, seal the unit. On the inside, use weather-stripping provided by the manufacturer; on the outside, use calk around the perimeter to ensure a good seal.



DfS Example: Considerations for tall green wall

The early stage of green wall structure design will consider the safety and health accident fatality at site. The actual situations when the maintaince process will less incident happen were the preventive design to avoid accident already install .

- **No need for scaffolding during maintenance**
- **Enhanced safety with no need to work at height**
- **Effective long term maintenance**

ANIMATE AND DESCRIBE

Gardens by the Bay is one of the largest garden projects of its kind in the world. Ultimately, the site will total 101 hectares comprising three distinct gardens – Bay South, Bay East and Bay Central.

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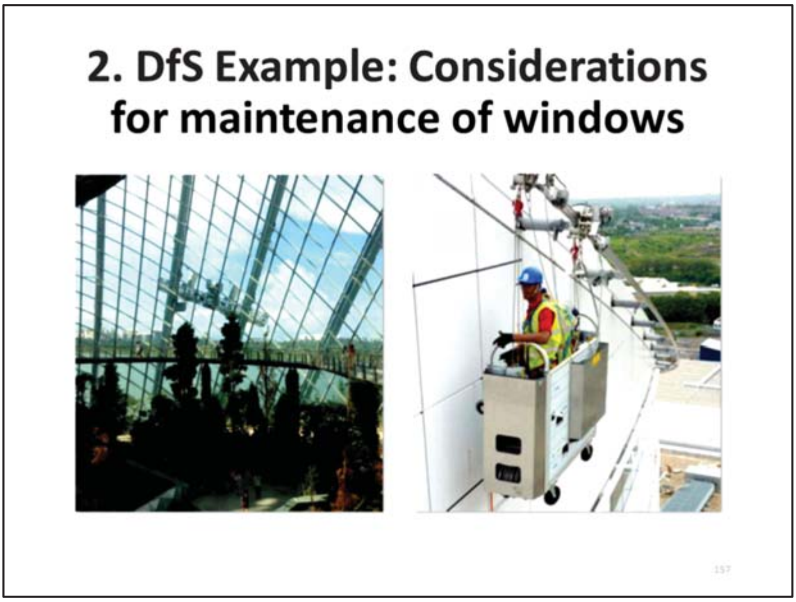
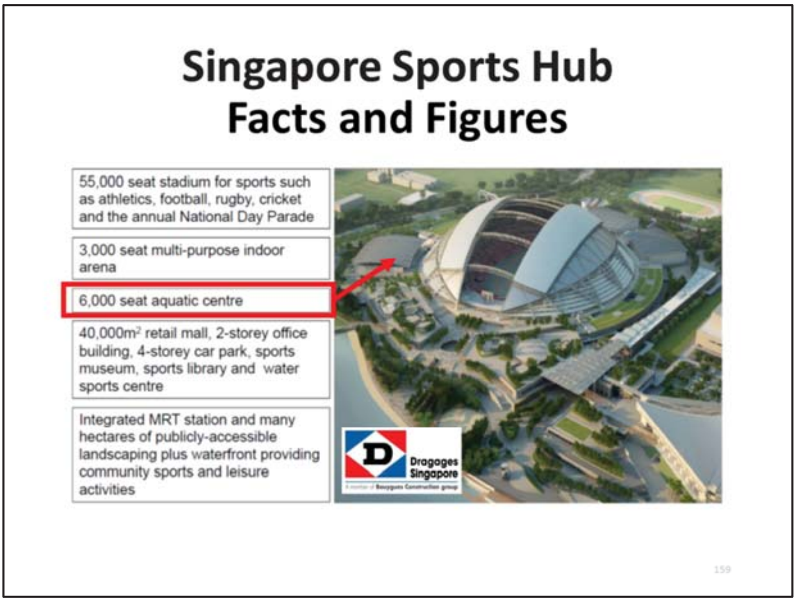


DfS Example: Considerations for maintenance of windows

New buildings are often beautiful - they meet required energy standards and are functional for occupants. The designers/architects have done a very good job, and the mayor or city manager is pleased, as this new building meets the community's needs and is state of the art. But, behind the scenes, building managers and their technicians (who must maintain the building for the next 30 to 40 years) may see things differently

From the maintenance standpoint, an ideal building is one in which all stakeholders' needs are met vs. a design showcase that cannot be sustained over the life of the building. There exists a middle ground that takes into account customer requirements, energy efficiency of the facility, reputation of the design firm, maintainability of the facility, reputation of officials responsible for approving design, and costs of the facility - and many other aspects. There are no perfect buildings - either by design, maintainability, customer need, or a corporate culture point of view. Everyone is in the mix together; those who must live in, use, pay for, and maintain the building over its life are the ones most impacted by building deficiencies

. DfS Example The Aquatic Centre
Case Studies – Making it safer for Maintenance Staff



The Singapore Sports Hub is a fully integrated sports, entertainment and lifestyle hub in Kallang, Singapore. Built in 2014 to host sporting and entertainment events, it replaced the former National Stadium on the recommendation of then Community Development and Sports Minister Abdullah Tarmugi in Parliament in 2001.[1] His proposal was based on a Committee on Sporting Singapore report[2] to promote a culture of sports in the city-state.

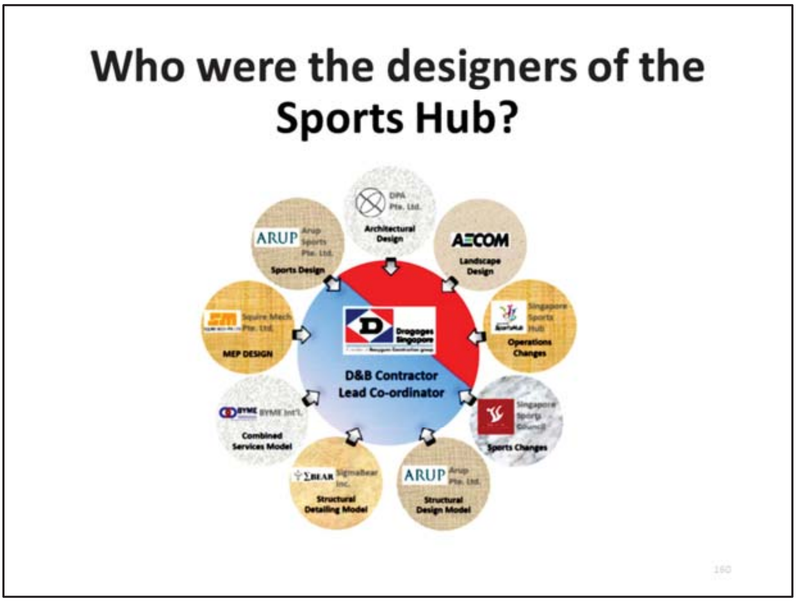
It is the first and largest sports facilities infrastructure Public-Private-Partnership (PPP) project in the world and Singapore's flagship PPP project of this nature. Following an Invitation to Tender by the then Singapore Sports Council in 2006, the consortium SportsHub Pte Ltd comprising four equity partners, InfraRed Capital Partners, Dragages Singapore, Cushman & Wakefield Facilities & Engineering, and Global Spectrum Asia, won the bid for the project on January 19, 2008. It was officially appointed on August 25, 2010 to design, build, finance and operate the Singapore Sports Hub for a period of 25 years.

Construction of the Singapore Sports Hub began with a ground-breaking ceremony on 29 September 2010,[3] before the former arena there was demolished. Served primarily by the Stadium MRT station, it was completed in June 2014 and, among others, rolled out a new 55,000-seat National Stadium with the largest free-spanning retractable dome roof in the world,[4][5] an aquatic center, a multi-sport indoor

arena, and a water sports facility. The Singapore Sports Hub, which incorporated an existing 12,000-seat Singapore Indoor Stadium, began operations on June 30, 2014 for the general public to start using its facilities.[6] Prime Minister Lee Hsien Loong officially opened it 13 months later on July 26, 2015.[7]

The Rugby World Club 10s on 21–22 June 2014 was the first sporting event at the new national stadium.[8] The clash between Singapore and Juventus on 16 August 2014 was the first football game there.[9]

Since opening its doors, the Sports Hub has been a venue for major international, regional and local events. It has played host to the 2015 SEA Games, 2016 Singapore National Day Parade, BNP Paribas WTA Finals, HSBC Singapore Rugby Sevens, International Champions Cup and superstars Madonna, Coldplay and Jay Chou.



COLLOBORATION REALISED

Singapore Sports Hub is a sports and entertainment complex in Kallang, Singapore, which is designed to host international, national and community scale events. Undertaken under a public-private partnership, the 35ha facility is part of the Greater Marina Bay master plan to transform Singapore into an international business and leisure destination.

The Singapore SportsHub Pte Consortium has been appointed to execute and operate the project for a 25-year period. The consortium includes Dragages Singapore, HSBC Infrastructure Fund III, United Premas and Global Spectrum Pico. In November 2013, OCBC Bank signed a 15-year agreement with the consortium to serve as the premier founding partner for the Singapore Sports Hub.

Construction of the S$1.33bn ($1.08bn) project began in October 2012 and inauguration was held in June 2014.

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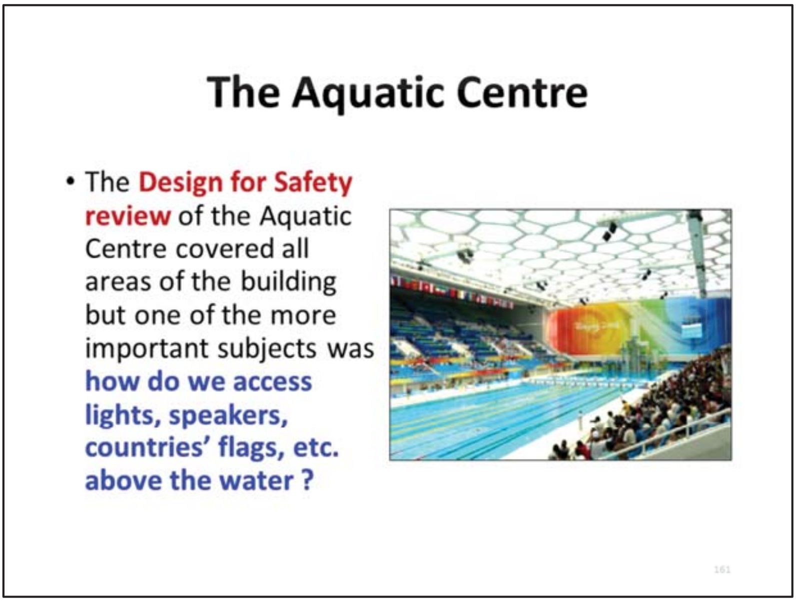
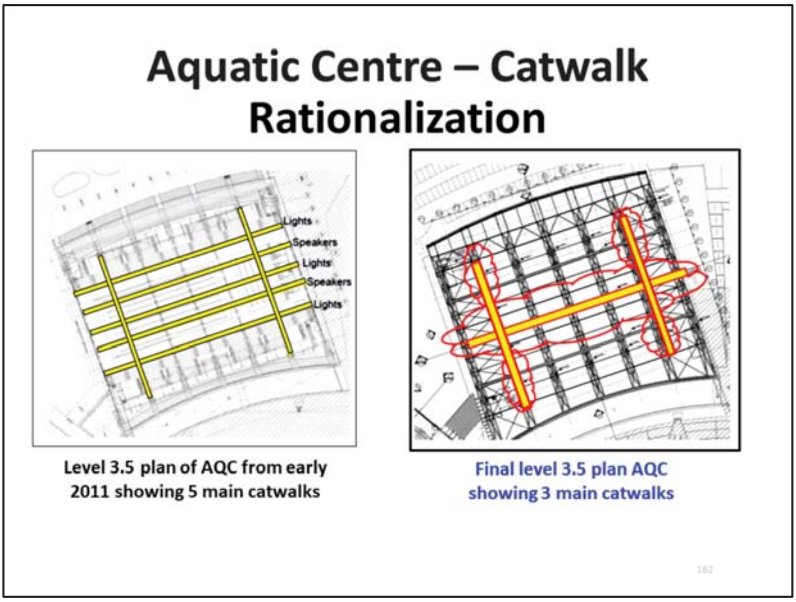


Aquatic Centre – Design Review = Catwalk reduction

- **The design for safety process highlighted the requirement for safe access above the water but the initial technical reports on the TV lights, the event speakers, the emergency speakers and the cooling fans put them in so many different locations <u>that we would not be able to access them all from catwalks</u>.**
- **Over the months we worked with the lighting and audio-visual designers to align their services so that they could all be accessed from just three catwalks running the length of the pool.**
- **This effort was successful.**
- **The result will ensure safe access for all roof-mounted services and obviates the need for any scaffolding in the future (except for exceptional circumstances) which will keep our maintenance staff safe and our operations costs down.**



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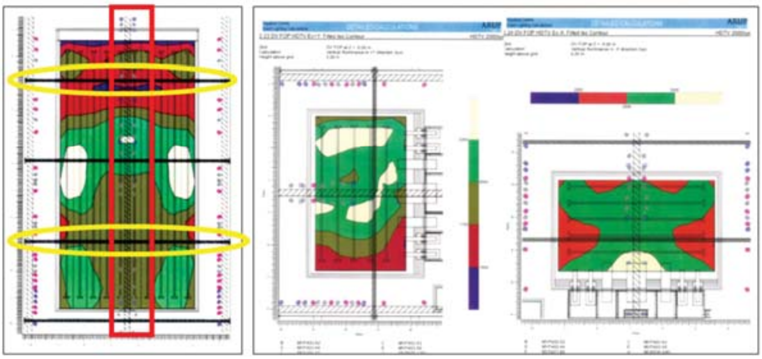
Describe

1. Location in YELLOW early plan of 5 main catwalks

2. Location in RED CLOUD of the final 3 Main Catwalk

Detail drawings from Arup's Sport lighting report



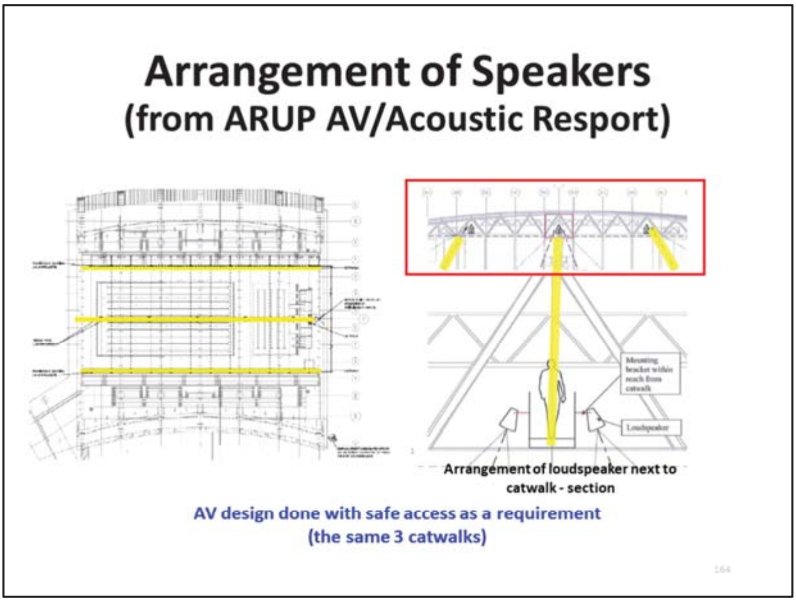
Lighting design done starting with safe access as a requirement (3 catwalks)

Describe:

1. Ligthing Design base on safe access requirement through lighting calculations of Vertical Illuminance

2. Ligting Report Fig.1

- **RED BOX 1Overall Layout. Y Axis**
- **YELLOW BOX 3 Catwalk X Axis**



Descibe:

1. Catwalk location in YELLOW

2. Cross section of Catwalk identifying speaker locations.

3. RED Box indicating 3 Catwalk location cross section

FINAL OUTCOME DISCRIBE BASE ON THE PICTURE

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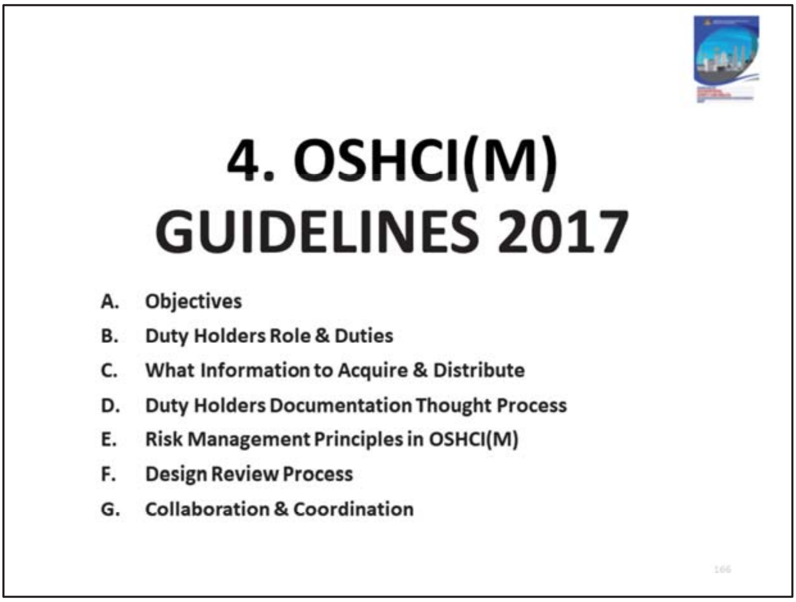
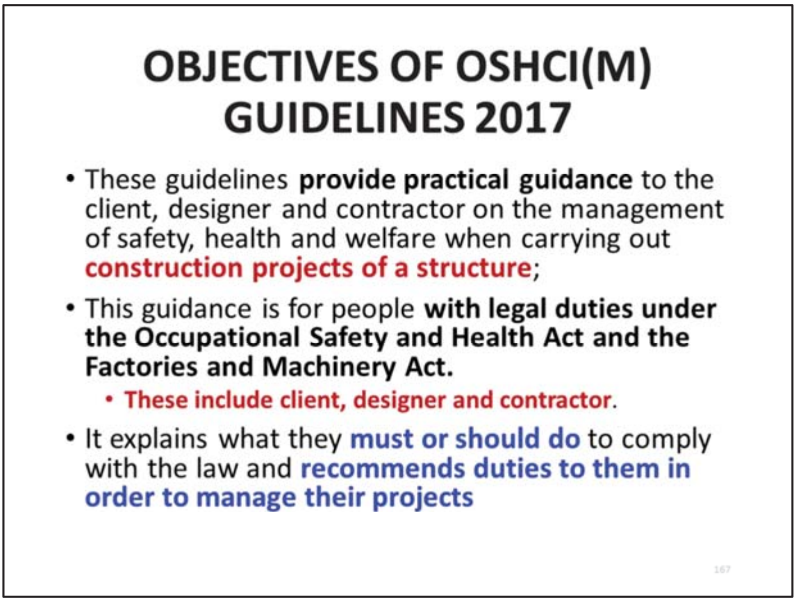


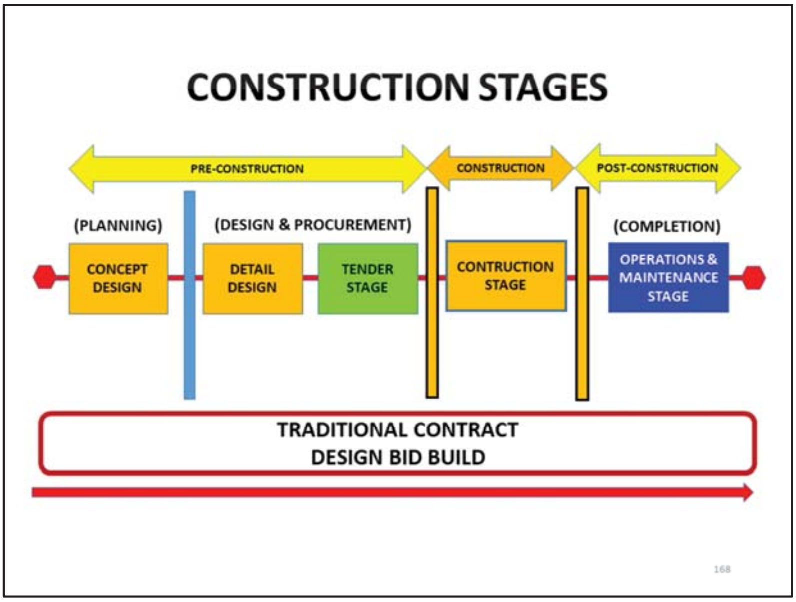
Module 6: OSHCI(M) GUIDELINES 2017

This module consist of 6 sub module that will be explain to the participate. It is include the OSHCI objective that implement to the constructions industry. It will be follow by Duty Holders Role & Duties, What Information to Acquire & Distribute, Duty Holders Documentation Thought Process, Risk Management Principles in OSHCI(M) Design Review Process and the last sub module will be the Collaboration & Coordination.



OBJECTIVES OF OSHCI(M) GUIDELINES 2017

- **These guidelines provide practical guidance to the client, designer and contractor on the management of safety, health and welfare when carrying out construction projects of a structure;**
- **This guidance is for people with legal duties under the Occupational Safety and Health Act and the Factories and Machinery Act.**
- **These include client, designer and contractor.**
- **It explains what they must or should do to comply with the law and recommends duties to them in order to manage their projects**
- **To integrate OSH into project management system; and**
- **To encourage project-wide cooperation**
- **improve planning and management from inception**
- **early identification of hazard**



Construction project management requires the skills and expertise of a traditional project manager but applied to the construction industry. Because a construction project is always shifting, an ideal construction project manager must possess a large array of experience and know-how to handle diverse teams and meet assorted objectives.

In the traditional constructions building there are divide into:

1. Pre Constructions
❖ Panning the concept of design building
❖ Design and procurement phase including of detail design and tender stage

2. Constructions
❖ Constructions Stage

3. Post Constructions
❖ Completions including the phase of operations and maintaince

All these three(3) phase the building will be pass over to the actual owner .

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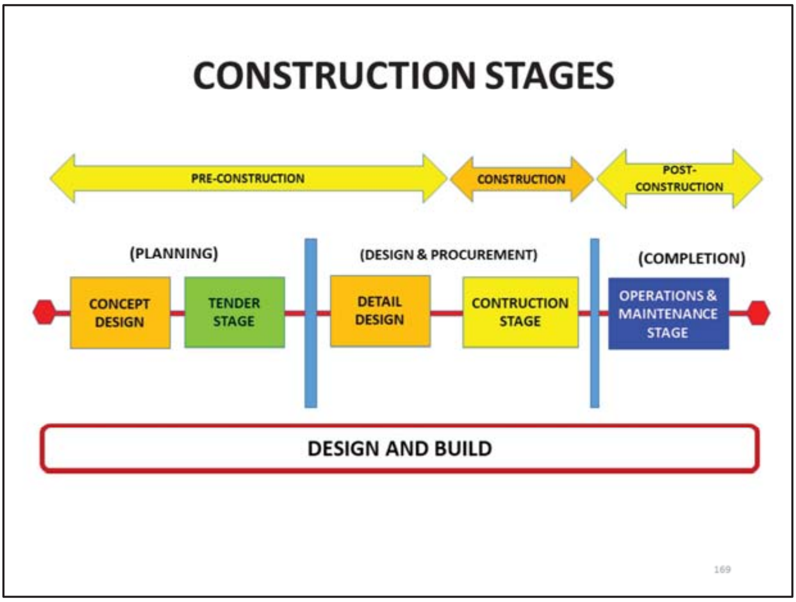

Describe APPOINTING OF Pre constructions ,constructions dan post constructions

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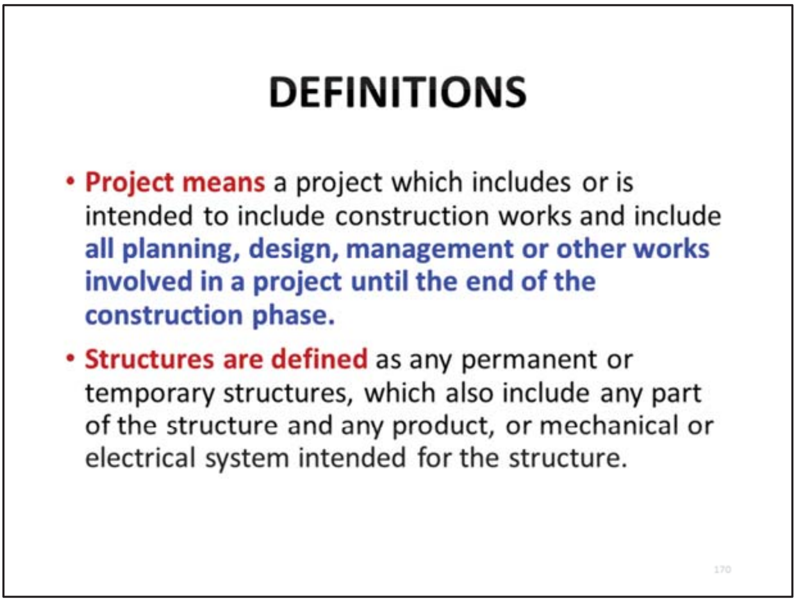
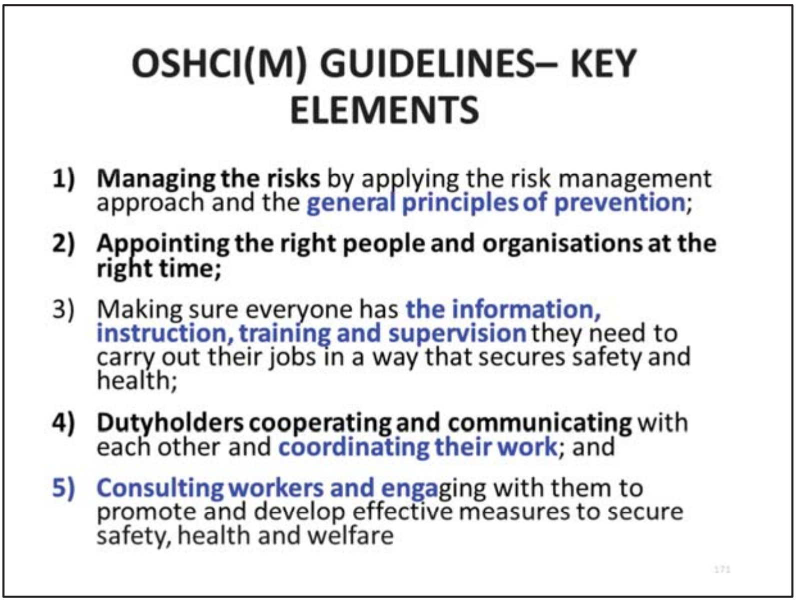


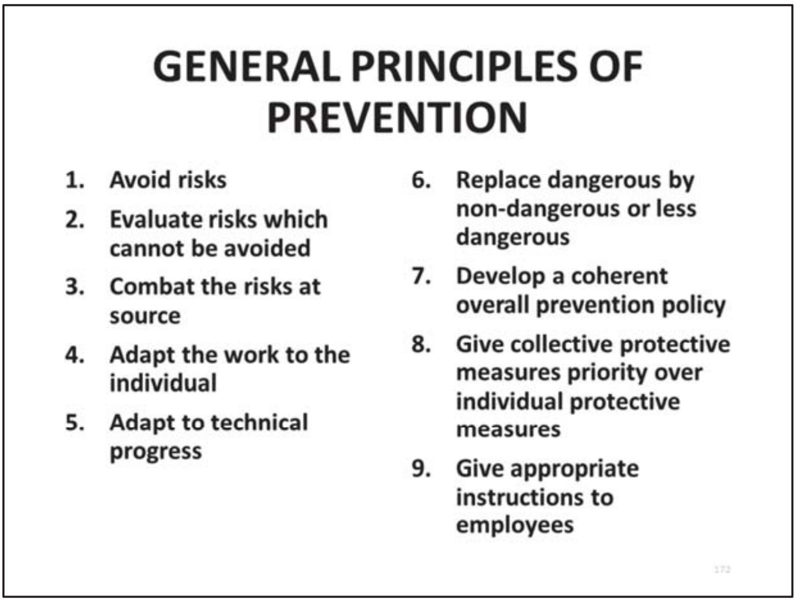
DEFINITIONS

- **Project means a project which includes or is intended to include construction works and include all planning, design, management or other works involved in a project until the end of the construction phase.**
- **Structures are defined as any permanent or temporary structures, which also include any part of the structure and any product, or mechanical or electrical system intended for the structure.**



OSHCI(M) GUIDELINES– KEY ELEMENTS

- **Managing the risks by applying the risk management approach and the general principles of prevention;**
- **Appointing the right people and organizations at the right time;**
- **Making sure everyone has the information, instruction, training and supervision they need to carry out their jobs in a way that secures safety and health;**
- **Duty holders cooperating and communicating with each other and coordinating their work; and**
- **Consulting workers and engaging with them to promote and develop effective measures to secure safety, health and welfare**



escribe each principles.

All designers and contractors involved in the planning and execution of construction work must take into account the general principles of prevention when carrying out their respective duties. As a fundamental requirement of the Management of Health and Safety at Work Regulations 1999, the principles provide a framework to identify and implement practical and procedural measures to protect the safety and health of workers, and those who may be adversely affected by work activities.

In practice, the general principles of prevention require an approach that goes beyond 'simple' methodologies, such as the hierarchy of control. So, just what are these general principles of prevention and how might they be applied in practice?

9 Principles of Prevention
1 Avoid risks
Logically, the most effective way of avoiding risk is to entirely eliminate the hazard that gives rise to risk in the first place.

Example: The hazards associated with entering underground chambers in sewage treatment plants include surface and foul water systems. If the design can be changed so that such places are open to the general atmosphere and well ventilated, those

hazards won't be present.

2 Evaluate the risks that can't be avoided

When evaluating risks, it's important to take a structured and collaborative approach; communication between designers and contractors is essential if the risks are to be adequately evaluated. Designers need to liaise with others to establish how different aspects of designs interact and influence health and safety. Design reviews that focus on health and safety issues, alongside other key aspects of the project, should also be carried out.

It's important to keep a written record of the evaluative decisions. This will help essential information be passed on to others, making it clear what needs to be done and providing an information base from which to carry out reviews.

Project specific risk assessments and associated method statements should also be prepared, implemented and monitored by the contractors who are carrying out construction work.

3 Combat risks at the source

Risks should be addressed, or dealt with, at the source. In other words, the control measures should be close to the danger point and effective in reducing the risk.

Example: Wood dust can be harmful if inhaled. Circular saws with effective mechanical dust extraction systems are designed so that the dust is immediately captured at the point of creation, combating the risk at the source.

4 Adapt the work to the individual

Just like physical limitations, people have limits when it comes to their ability to analyse cognitive data, such as instructions or instrumentation readings. Monotonous work can be alleviated by adapting the design of workplaces, the choice of work equipment and the choice of working and production methods.

Example: The working environment can be a source of stress when it is too hot, too cold or too noisy. Adding in repetitive, monotonous tasks can increase risk. By involving those who carry out the work, or the end users of the structure, when considering such ergonomic issues is a useful way of ensuring those risks are minimised.

5 Adapt to technical progress

Technology continues to influence the modern workplace, so it's important to keep informed about the latest technical knowledge when selecting working methods, equipment, materials and work equipment. In general, technical progress leads to improved performance, better ergonomics and reduced risks.

Example: Work in confined spaces may expose people to non-respirable atmospheres, and toxic and flammable gases. Older gas monitoring equipment has now largely been replaced with multi-function gas detectors. New technology has also led to video systems that can remotely inspect confined spaces such as sewers.

6 Replace the dangerous with the non-dangerous or the less dangerous
Commonly known as 'substitution', this principle involves reviewing the choices that are available and then selecting the ones that either pose no danger to workers, or selecting the ones where the dangers are reduced. A broad sweep of hazards in the working environment, the task, materials, plant and tools, should be considered. Substitution can also involve changing the proposed process.

Example: Mechanical fixing systems can reduce the overall risk when compared to alternative chemical fixing systems. Water-based paints can be substituted for those that contain harmful solvents. Using low-temperature asphalt can helps prevent exposure to toxic substances when carrying out road repairs.

Designers and contractors should ensure they are aware of what is available to substitute with safer alternatives.

7 Develop a coherent overall prevention policy
Checklist To effectively control risks, the whole safety system needs to be considered. This includes the individual, task, plant and equipment, the organization, the management of the whole project, and the wider environment.

It's important not to simply focus on the immediate hazards that are common to the construction industry; there is also a need to identify the underlying factors that cause injuries. These are often associated with the culture of an organization, or on the project.

Culture strongly influences the attitudes and behavior of everyone involved, and is usually addressed under the theme of 'human failure'. Advice on reducing the incidence of both errors and violations is now widely available, and many contractors are introducing behavioral change programmed that, if led from the very top of the organization, can demonstrate commitment at every level and lead to a raising of standards on site.

8 Give collective protective measures priority over individual protective measures
Collective protective measures control the risks to more than one person and have major advantages over individual protective measures. Personal protective measures rarely prevent accidents from occurring. Instead, they may mitigate the outcome, but only if they are correctly fitted and worn.

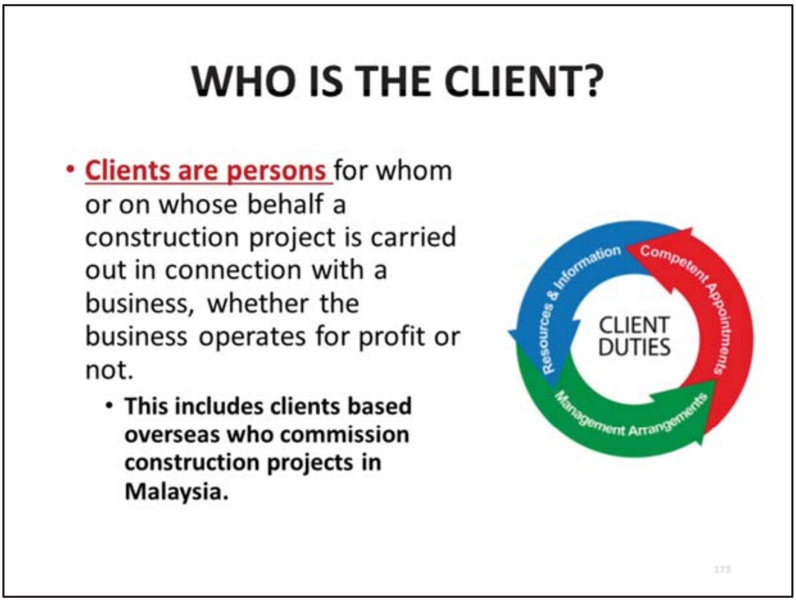
Example: A properly fixed and positioned guard rail at the edge of a working platform protects everyone from falling and requires no action by the workers who benefit from it. Safety harnesses, however, require individuals to make use of them. They need suitable anchorages and fall arrest devices that must be available and suitably maintained. Harnesses often create considerable practical difficulties in their use. Hence, the likelihood of harnesses achieving the same degree of success as a guard rail in preventing injuries is small.

9 Give appropriate instructions to worker

Appropriate instructions should describe the risks in the proposed work and refer to the protective measures that should be in place - equipment to be used, personal protective equipment to be worn etc.

Instructions should be communicated in a way that is readily understood by the workers. In other words, be both comprehensible and relevant. Common communication techniques include induction training, toolbox talks, daily briefings, and providing written or pictorial instructions.

Given the complexity of challenges that the construction industry faces in terms of operational risks, an integrative approach by designers and contractors when planning construction work is essential if risks are to be effectively managed. 'ERIC Saves People' (ERIC-SP) is certainly a useful starting point, however, taking account of all of the general principles of prevention is a fundamental requirement of CDM 2015

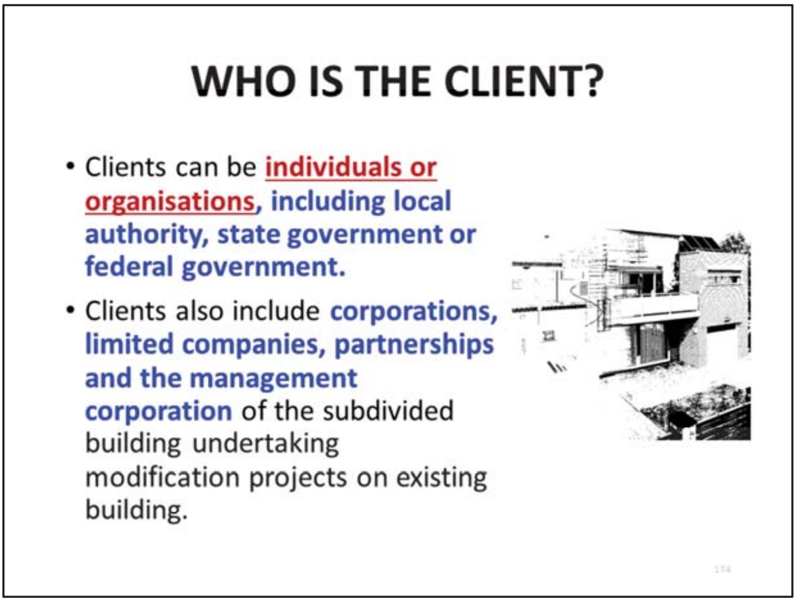


WHO IS THE CLIENT?

Clients are persons for whom or on whose behalf a construction project is carried out in connection with a business, whether the business operates for profit or not. This includes clients based overseas who commission construction projects in Malaysia.

Clients have a major role to play in the promotion of a systematic approach to the management of health and safety in construction. They will set the tone of the project and make decisions crucial to its development. It is vital that sufficient time and resources are allowed to enable the CDM duty holders to carry out their responsibilities safely.

The client is the person for whom the project is carried out. In the case of notifiable projects, clients must appoint a Principal Designer and a Principal Contractor. Those clients without construction expertise must rely on the advice of professional experts on how best to meet their duties, but both the Principal Designer and Principal Contractor will need the clients support and input to be able to carry out their work effectively. The client remains responsible for ensuring that client duties are met.



WHO IS THE CLIENT

- ❖ **Clients can be individuals or organizations, including local authority, state government or federal government.**
- ❖ **Clients also include corporations, limited companies, partnerships and the management corporation of the subdivided building undertaking modification projects on existing building.**

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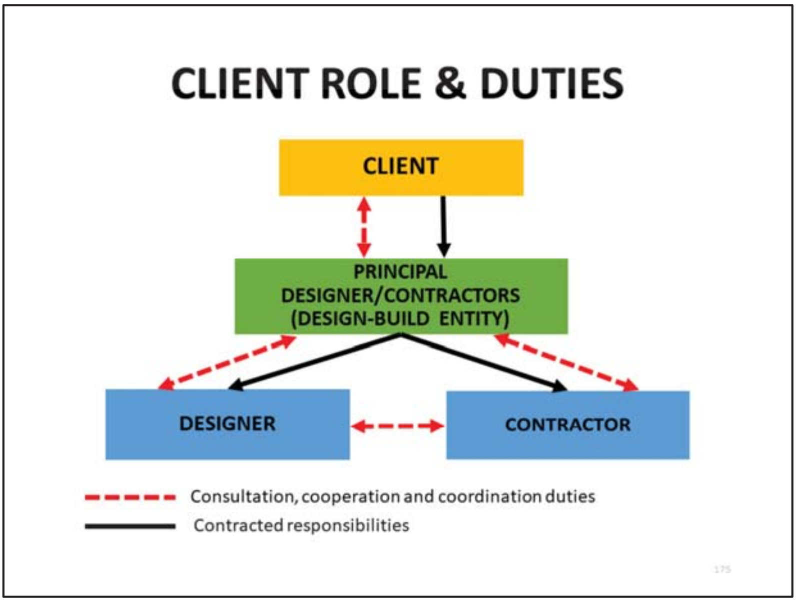


CLIENT ROLE & DUTIES

The client has a key influence on the outcome of a construction project because the project is originated by the client, often the client sets the overall programme and the client pays for the work to be executed. Clients should set the ground rules for health and safety even though the extent of their involvement in the project will not depend upon their own knowledge and experience of construction processes.

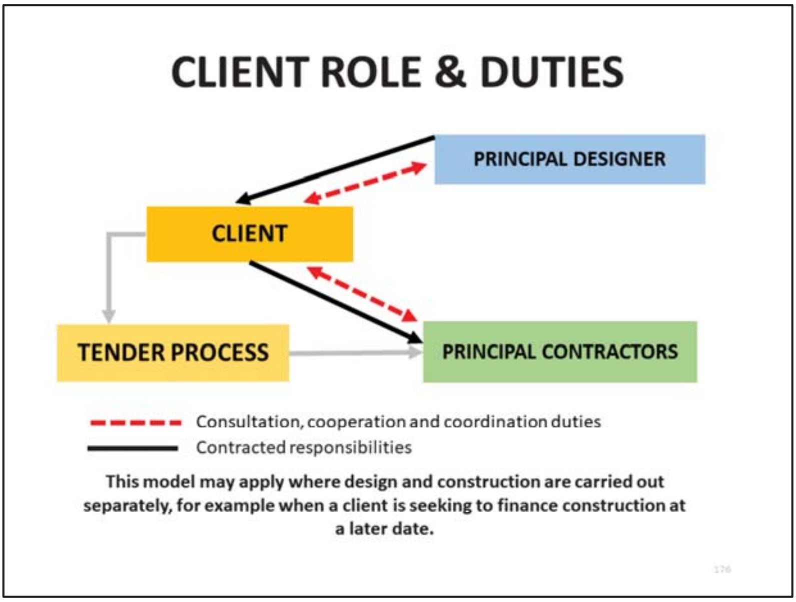
Large clients may have their own comprehensive in-house design team, and even their own direct labour contracting team. There is nothing to prevent such clients using these resources to provide the roles of Lead Designer, designer or principal contractor providing they are competent to do the work in accordance with the regulations. Smaller clients will need to buy-in the expertise they need and may need to seek professional advice on the competence of appointments they make.

On all projects the client must verify that adequate management arrangements are in place to ensure that the roles, functions and responsibilities of all members of the project team are clear and understood. The organizations and individuals working on the project should know their roles, responsibilities and authorities and their relationship with other members of the team.

This will include:

- **checking that there is good co-operation and communication between designers and contractors;**
- **checking that there is adequate protection for the client's workers and/or members of the public;**
- **checking to make sure that adequate welfare facilities have been provided by the contractor; and**
- **checking that the arrangements which the contractor agreed to make to control key risks on site have been implemented.**

On notifiable projects the Client is required to notify the relevant authority involve design audits and site inspections and audits. On non-notifiable projects the client will either have to perform these checks themselves or obtain this assistance from others, which may be a person or organisation who has the competence to act in this role, for example the principal designer or principal contractor or a third party with relevant knowledge and expertise.



CLIENT ROLE & DUTIES

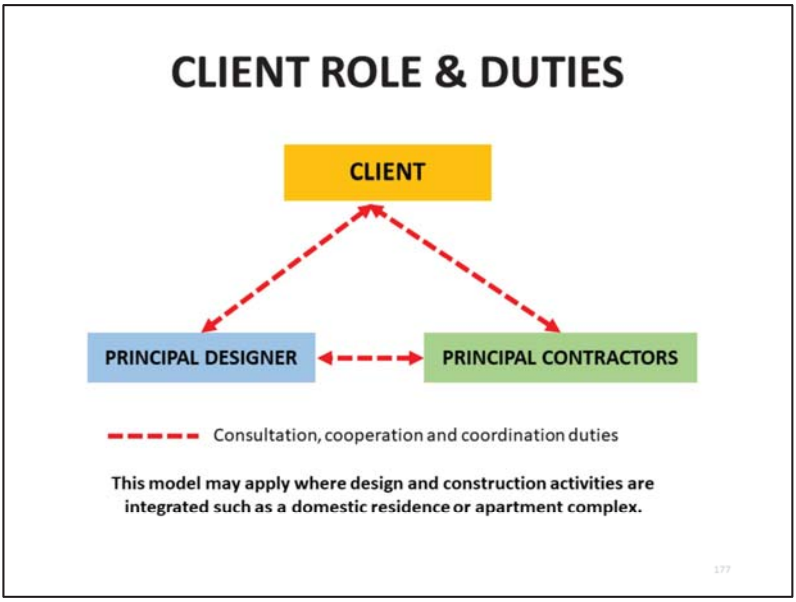
The client shall establish arrangements for confirming the adequate co-operation and co-ordination between all members of the project team. This is effectively performed by the Principal Designer and the Principal Contractor and the client may just monitor their performances.

On all projects the client will need to be intimately involved in the project design and the project construction processes in order to confirm that the various parties are co-operating with each other and coordinating their designs and/or construction activities to comply with the legislation and produce an efficient and effective project.

Where the client cannot, or is unwilling to, cease his normal work activities while construction work takes place on the site, an interface problem can arise. This interface problem may cause the client's employees being put at risk by the construction work and, more rarely, construction workers being put at risk by the client's activities. In these cases the client must provide the management and co-ordination requirements as part of the 'pre-construction information' and liaise closely with the contractors to ensure that the co-ordination is effective during the construction phase.

As construction work develops and changes from day to day the health and safety management arrangements, as contained within the construction phase plan on notifiable projects, may need frequent adjustment. On-going cooperation and co-ordination will be needed at each phase, possibly requiring regular meetings involving the client and contractors' on-site management. Each party is responsible for briefing its own staff on co-ordination requirements and the precautions to be taken. This will be very important where constant re-routing of traffic and pedestrians is necessary. Whenever possible, construction work should be completely separated off from the client's work activities.

This model may apply where design and construction are carried out separately, for example when a client is seeking to finance construction at a later date.



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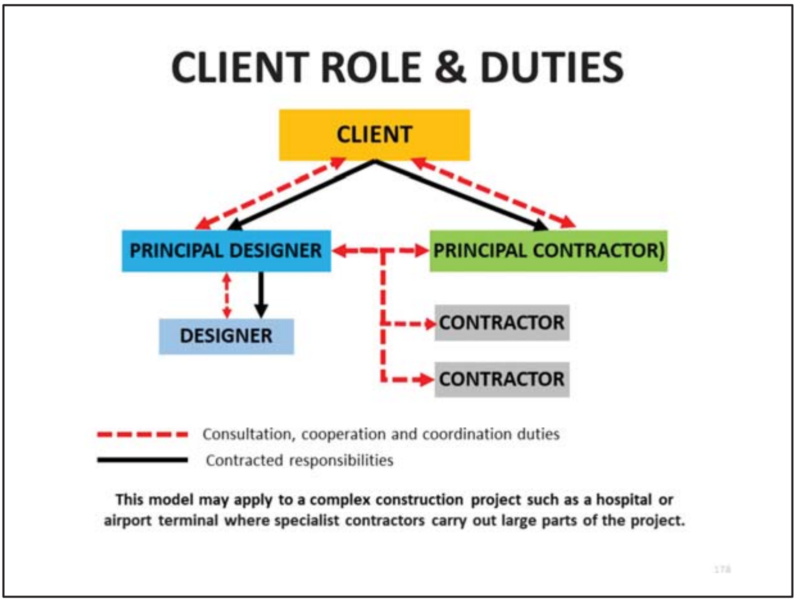
CLIENT ROLE & DUTIES

A key part of the client's role on notifiable projects is to appoint a competent principal designer and competent principal contractor. The principal designer will oversee the design and planning of a project and assist the client in the performance of the client's duties. The principal contractor is responsible for managing the health and safety aspects of the construction.

The principal designer should be appointed as soon as possible after commencement of the initial design. The principal contractor should be appointed as soon as the client knows enough about the project to select a suitable contractor, so that they can make contributions to the health and safety of the design. Only one principal designer and one principal contractor may be appointed to the project at any one time, although the appointments may be changed.

On non-notifiable projects the client still has duties to perform under the regulations. The client may well have formal arrangements in place with the principal designer and principal contractor which state how the project is to be managed and subsequent duties discharged.

This model may apply where design and construction activities are integrated such as a domestic residence or apartment complex.



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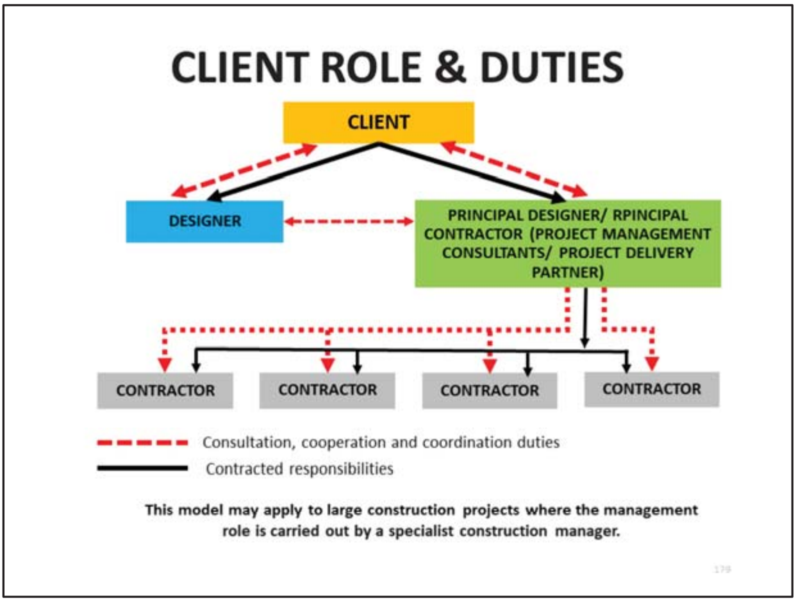
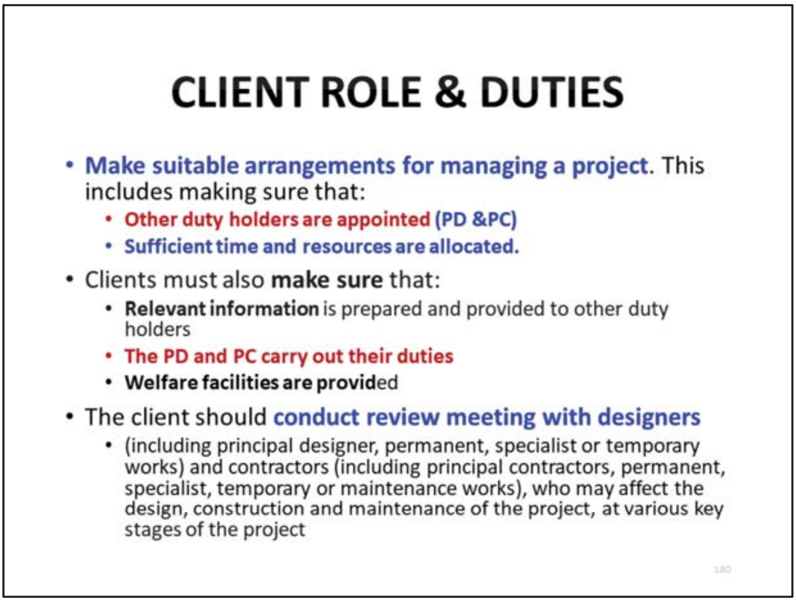
CLIENT ROLE & DUTIES

This model may apply to a complex construction project such as a hospital or airport terminal where specialist contractors carry out large parts of the project



CLIENT ROLE & DUTIES

This model may apply to large construction projects where the management role is carried out by a specialist construction manager.



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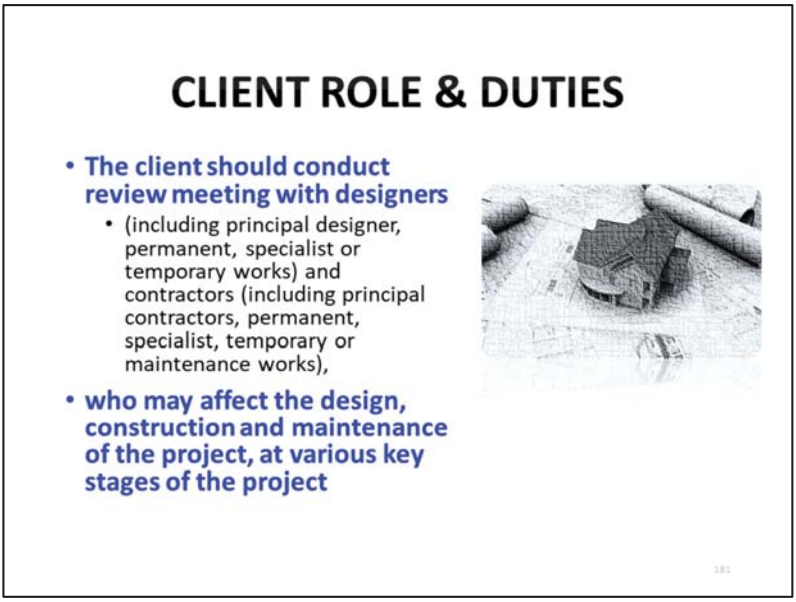
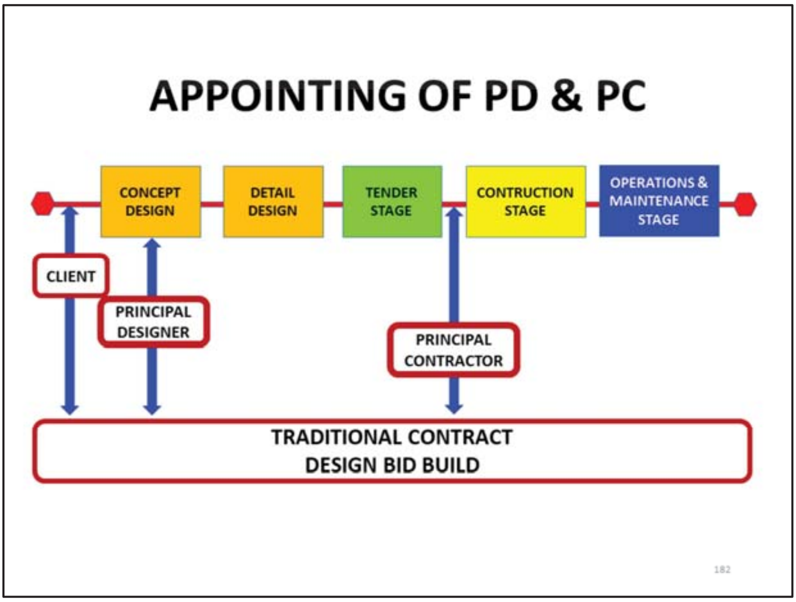
CLIENT ROLE & DUTIES

- **Make suitable arrangements for managing a project. This includes making sure that:**
  - ❖ **Other duty holders are appointed (PD &PC)**
  - ❖ **Sufficient time and resources are allocated.**
- **Clients must also make sure that:**
  - ❖ **Relevant information is prepared and provided to other duty holders**
  - ❖ **The PD and PC carry out their duties**
  - ❖ **Welfare facilities are provided**
- **The client should conduct review meeting with designers**
  - ❖ **(including principal designer, permanent, specialist or temporary works) and contractors (including principal contractors, permanent, specialist, temporary or maintenance works), who may affect the design, construction and maintenance of the project, at various key stages of the project**

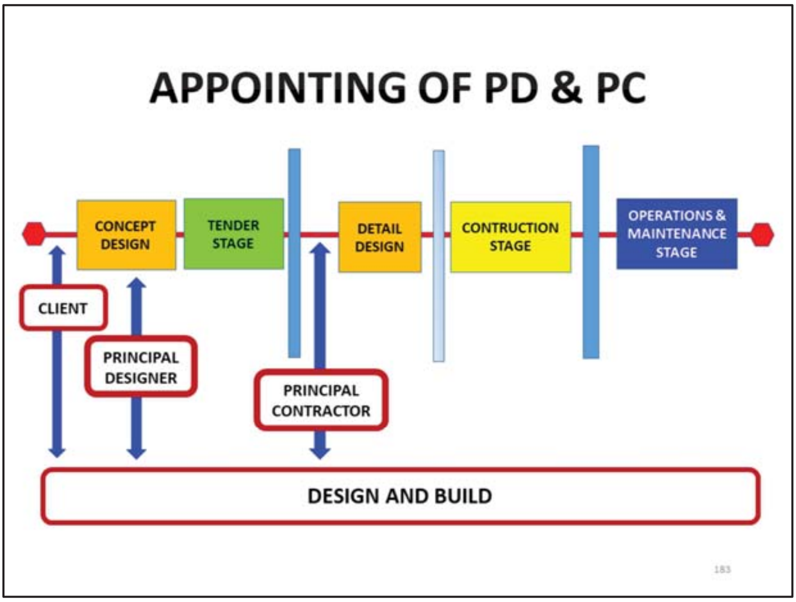


CLIENT ROLE & DUTIES

- **The client should conduct review meeting with designers (including principal designer, permanent, specialist or temporary works) and contractors (including principal contractors, permanent, specialist, temporary or maintenance works),**
- **who may affect the design, construction and maintenance of the project, at various key stages of the project**



Describe APPOINTING OF PD & PC



APPOINTING OF PD & PC

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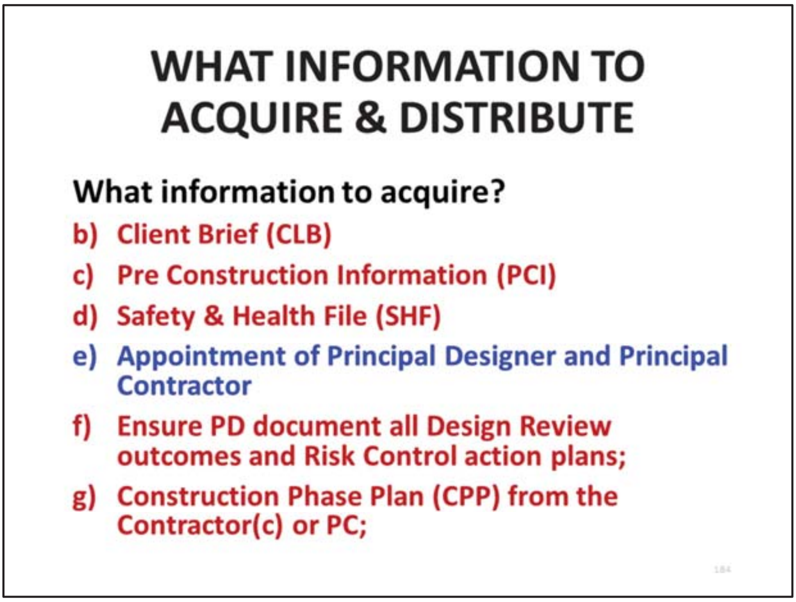
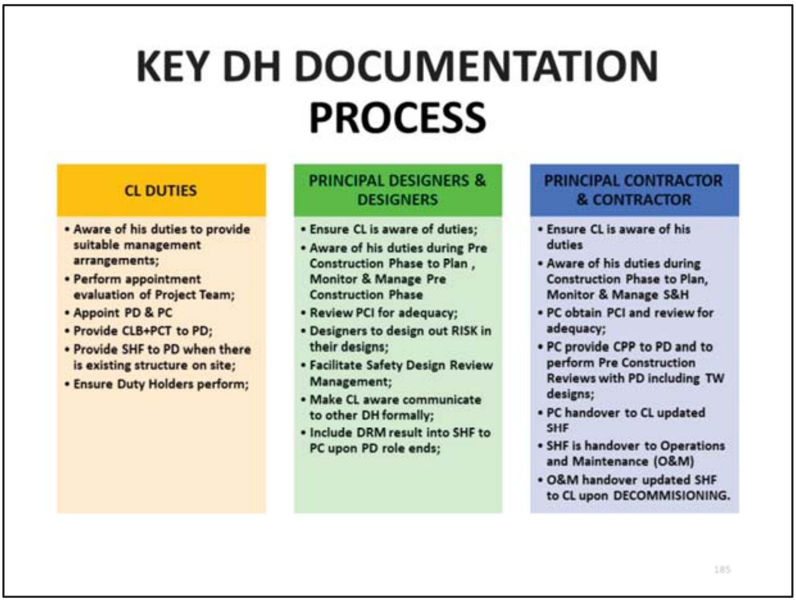


WHAT INFORMATION TO ACQUIRE & DISTRIBUTE

What information to acquire?

- **Client Brief (CLB)**
- **Pre Construction Information (PCI)**
- **Safety & Health File (SHF)**
- **Appointment of Principal Designer and Principal Contractor**
- **Ensure PD document all Design Review outcomes and Risk Control action plans;**
- **Construction Phase Plan (CPP) from the Contractor(c) or PC;**



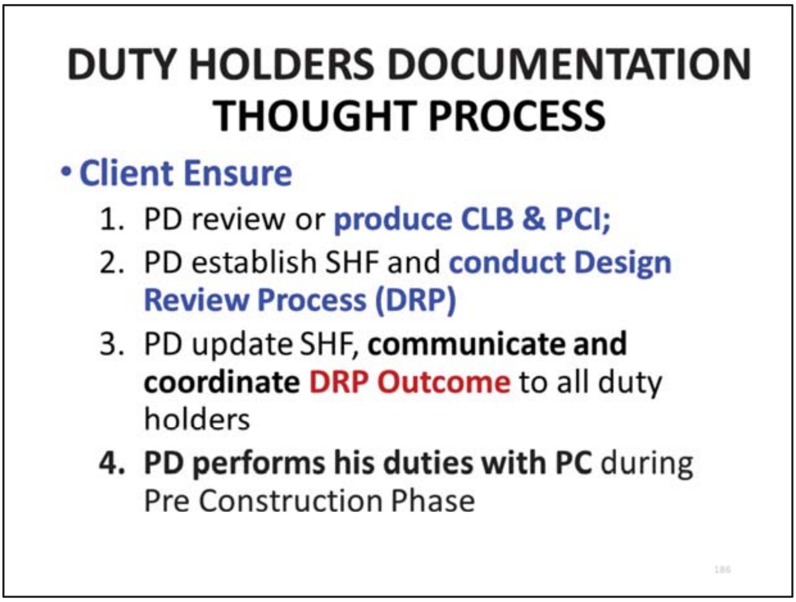
KEY DH DOCUMENTATION PROCESS

CL DUTIES
Aware of his duties to provide suitable management arrangements;
Perform appointment evaluation of Project Team;
Appoint PD & PC
Provide CLB+PCT to PD;
Provide SHF to PD when there is existing structure on site;
Ensure Duty Holders perform

PRINCIPAL DESIGNERS & DESIGNERS
Ensure CL is aware of duties;
Aware of his duties during Pre Construction Phase to Plan , Monitor & Manage Pre Construction Phase
Review PCI for adequacy;
Designers to design out RISK in their designs;
Facilitate Safety Design Review Management;
Make CL aware communicate to other DH formally;
Include DRM result into SHF to PC upon PD role ends;

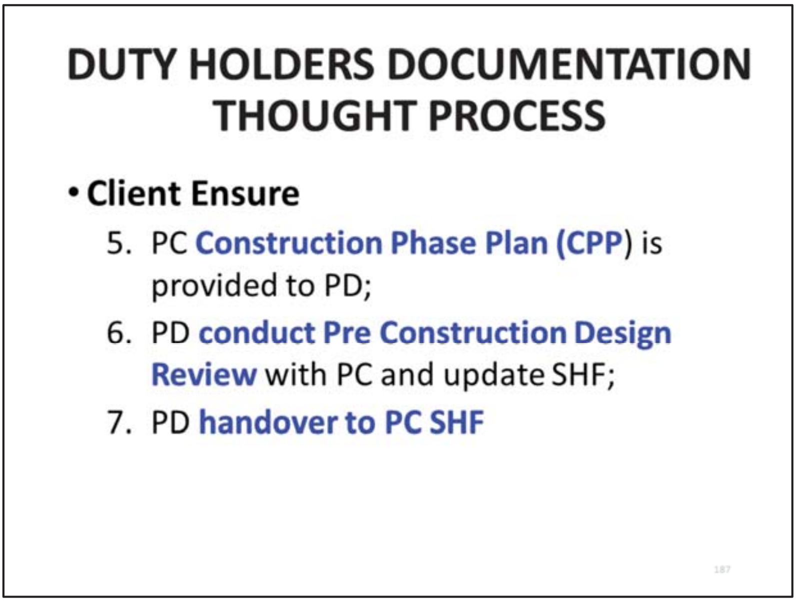
PRINCIPAL CONTRACTOR & CONTRACTOR

Ensure CL is aware of his duties
Aware of his duties during Construction Phase to Plan, Monitor & Manage S&H
PC obtain PCI and review for adequacy;
PC provide CPP to PD and to perform Pre Construction Reviews with PD including TW designs;
PC handover to CL updated SHF
SHF is handover to Operations and Maintenance (O&M)
O&M handover updated SHF to CL upon DECOMMISIONING



DUTY HOLDERS DOCUMENTATION THOUGHT PROCESS

Client Ensure
PD review or produce CLB & PCI;
PD establish SHF and conduct Design Review Process (DRP)
PD update SHF, communicate and coordinate DRP Outcome to all duty holders
PD performs his duties with PC during Pre Construction Phase

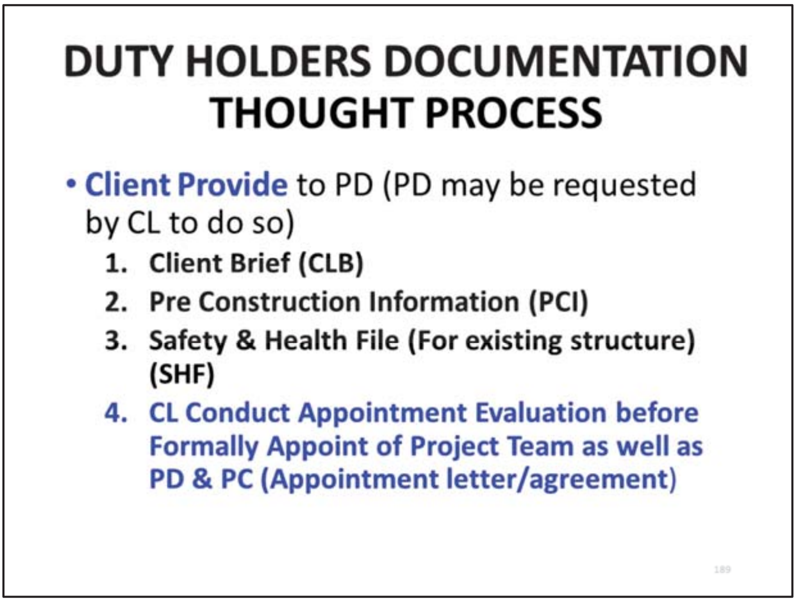


DUTY HOLDERS DOCUMENTATION THOUGHT PROCESS

Client Ensure
PC Construction Phase Plan (CPP) is provided to PD;
PD conduct Pre Construction Design Review with PC and update SHF;
PD handover to PC SHF

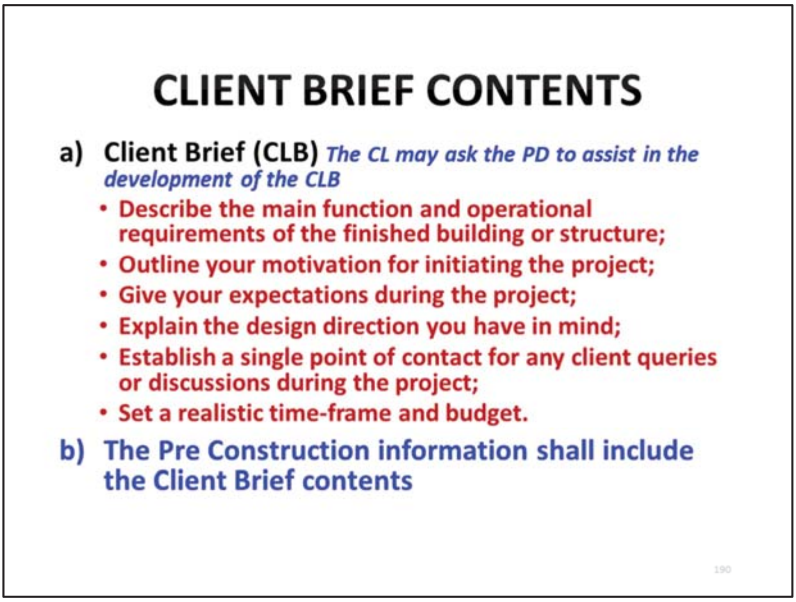
DUTY HOLDERS DOCUMENTATION THOUGHT PROCESS

Client Ensure
PC handover to CL updated SHF
SHF is handover to Operations and Maintenance (O&M)
O&M handover updated SHF to CL upon DECOMMISIONING;



DUTY HOLDERS DOCUMENTATION THOUGHT PROCESS

Client Provide to PD (PD may be requested by CL to do so)
Client Brief (CLB)
Pre Construction Information (PCI)
Safety & Health File (For existing structure) (SHF)
CL Conduct Appointment Evaluation before Formally Appoint of Project Team as well as PD & PC (Appointment letter/agreement)



CLIENT BRIEF CONTENTS

❖ **Client Brief (CLB) The CL may ask the PD to assist in the development of the CLB**

- **Describe the main function and operational requirements of the finished building or structure;**
- **Outline your motivation for initiating the project;**
- **Give your expectations during the project;**
- **Explain the design direction you have in mind;**
- **Establish a single point of contact for any client queries or discussions during the project;**
- **Set a realistic time-frame and budget.**

❖ **The Pre Construction information shall include the Client Brief contents**

PRE CONSTRUCTION INFORMATION CONSIDERATION

The Client must provide Pre-construction Information (PCI) as soon as practicable to every designer and contractor appointed (or being considered) to the project **Notes:** 1) PCI – is information in the client's possession or which is reasonably obtainable by or on behalf of the client, which is relevant to the construction work and is of an appropriate level of detail and proportionate to the risks involved. 2) PCI includes A) information about – i) the project; ii) planning and management of the project; iii) safety and health hazards; and B) information in any existing safety and health file. 3) PCI should be gathered and added to as design process progresses.

THE PROJECT	
Has the client prepared a project brief? If so, attach a copy or state where held	
What are the key dates of the construction phase?	
Is there any other information regarding the project which should be included in the PCI?	
PLANNING AND MANAGEMENT OF THE PROJECT	
What resources and time are being allocated to each stage of the project?	
What are the arrangements to ensure there is cooperation between duty holders and that the work is coordinated?	
Is there any other information regarding the project planning and management which should be included in the PCI?	

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PRE CONSTRUCTION INFORMATION CONSIDERATION

The Client must provide Pre-construction Information (PCI) as soon as practicable to every designer and contractor appointed (or being considered) to the project
Notes:

1)PCI – is information in the client's possession or which is reasonably obtainable by or on behalf of the client, which is relevant to the construction work and is of an appropriate level of detail and proportionate to the risks involved.

2)PCI includes A) information about – i) the project; ii) planning and management of the project; iii) safety and health hazards; and B) information in any existing safety and health file.

3)PCI should be gathered and added to as design process progresses

SAFETY AND HEALTH HAZARDS	
What are design and construction safety and health hazards (of the site)? (E.g. asbestos as revealed by surveys, location of existing services etc.)	
How they will these hazards be addressed?	
Are there any other matters relating to design and construction health or safety hazards which should be included in the PCI? (e.g. structural drawings)	
INFORMATION IN ANY SAFETY & HEALTH FILE (SHF)	
Is there an existing SHF prepared under the Guideline on OSHCI (M) 2017? If so, attach a copy or state where it can be seen	
What relevant information is in the existing SHF which should be included in the PCI?	
OTHER INFORMATION	
Is there any other information which should be included in the PCI?	

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PRE CONSTRUCTION INFORMATION CONSIDERATION

- What are design and construction safety and health hazards (of the site)?
 (E.g. asbestos as revealed by surveys, location of existing services etc.)

- How they will these hazards be addressed?
Are there any other matters relating to design and construction health or safety hazards which should be included in the PCI?
(e.g. structural drawings)

- Is there an existing SHF prepared under the Guideline on OSHCI (M) 2017?
If so, attach a copy or state where it can be seen
- What relevant information is in the existing SHF which should be included in the PCI?

PRE – CONSTRUCTION HEALTH, SAFETY AND ENVIRONMENT INFORMATION

- **PROJECT**: **Horden Decommissioning**
- **LOCATION**: Land off Kilburn Drive, Seaview Industrial Estate Near Peterlee, County Durham
- **CLIENT**: Coal Authority
- **DATE:** September 2012

https://data.gov.uk/data/contracts-finder-archive/download/758269/514908a7-bc52-4062-b69d-e16ce5e9f274

193

PRE – CONSTRUCTION HEALTH, SAFETY AND ENVIRONMENT INFORMATION

Project Description
Phase 2
The project is the decommissioning of the active Minewater Treatment Plant at Horden. The works
involved in the project are for the dismantling, removal and disposal from site of the following (please
refer to Works Information & Plant Description document for comprehensive details):-
- **Removal and disposal of fibreglass silo/reactors**
- **Removal and disposal of clarifier tanks**
- **Removal and disposal of centrifuge**
- **Removal and disposal of caustic soda tanks and associated lines**
- **Removal and disposal of lime dosing storage tank, mixer and dosing lines**
- **Take down of centrifuge/press and mixing building, including taking up some concrete areas**
- **Take out all gantries**
- **Removal of ochre sludge deposits**

Phase 3
These works involve:-

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? Readjustment of existing palisade fence around treatment scheme.
? Construction of new kiosk building to house electrical equipment.
? Take up hard standings and foundations for all of treatment works cut back to lines show on general arrangements plan

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1.0 DESCRIPTION OF THE PROJECT
1.1 Project Description
1.2 Details of Client, CDM Co-ordinator & Other Contractors
1.3 Extent & Location of Existing Records & Plans
1.3.1 Existing Drawings
1.3.2 Exiting Health and safety File
1.3.3 Other Drawings and Reports

2.0 CLIENT'S CONSIDERATIONS & MANAGEMENT REQUIREMENTS

2.1 Planning For and Managing Construction Work Including Safety Goals for the Project
2.1.1 Structure and Organisation
2.1.2 Safety Goals
2.1.3 Arrangements for Monitoring and Review
2.1.4 Communication and Liaison Between Client and Others
2.1.5 Unforeseen Eventualities
2.1.6 Communication of Continuing Health & Safety Issues
2.1.7 Security Requirements
2.1.8 Welfare Facilities

2.2 Health & Safety Requirements of Client's Employees / Others Involved in the Project
2.2.1 Site Hoarding Requirements
2.2.2 Client Permits
2.2.3 Fire Precautions
2.2.4 Emergency Procedures and Means of Escape
2.2.5 Prohibitive / Restricted Areas and Authorisation Requirements
2.2.6 Client's Designated Confined Spaces
2.2.7 Smoking and Parking Restrictions

4.0 SIGNIFICANT DESIGN AND CONSTRUCTION HAZARDS
4.1 Design Assumptions, Sequence and Control Measures
4.2 Arrangements for Coordination On Going Design Work
4.2.1 Changes to Design Principles
4.2.2 Ongoing Design Items
4.2.3 Contractors Design Items

4.3 Information on Significant Risks Identified During Design
4.3.1 Position and Design to Minimise Risks from Site Hazards
4.3.1.1 Overhead/Underground Services
4.3.1.2 Traffic management On/Around the Site
4.3.1.3 Contaminated Ground
4.3.1 Health Hazards
4.3.1.1 Hazardous Substances
4.3.1.2 Noise and Vibration
4.3.1.3 Manual Handling
4.3.1.4 Waterborne Diseases
4.3.2 Safety Hazards
4.3.3.1 Excavations
4.3.3.2 Plant and Equipment
4.3.3.3 Lifting Operations

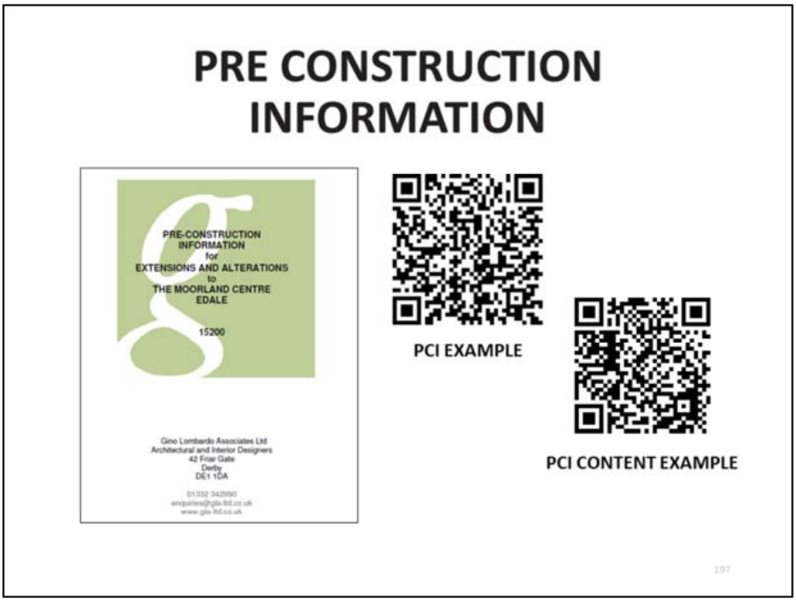
Horden Minewater Treatment Plant Decommissioning Works Information & Plant Description

Decommissioning of Horden Minewater Treatment Plant will be carried out under three separate contracts and phases of work:

Phase 1 - to remove the majority of residual chemicals from all plant that is to be dismantled and removed (this Phase of the works has been completed).

Phase 2 - to dismantle and remove from site redundant equipment in the former Active Plant area including a concrete bund and some operational sludges. The information in this document relates to the Phase 2 works. A detailed scope of works is provided in Section 3.0 of this document.

Phase 3 - dismantle and remove the temporary building housing the pump control / electrical control panels and relocate to a new building, break out redundant concrete hard-standing, complete any landscaping and realign the perimeter security fence. (Phase 3 will be undertaken by the Coal Authority's nominated Mine water Build Contractor)



The 2015 Construction (Design and Management) Regulations require that construction clients provide pre-construction information as soon as is practicable to every designer and contractor appointed, or being considered for appointment, to the project. Where there is more than one contractor, the principal designer should provide advice and help compile the pre-construction information and provide it to the designers and contractors.

The regulations define pre-construction information as 'information in the client's possession or which is reasonably obtainable by or on behalf of the client, which is relevant to the construction work and is of an appropriate level of detail and proportionate to the risks involved, including information about:

The project.
Planning and management of the project.
Health and safety hazards, including design and construction hazards and how they will be addressed.
Information in any existing health and safety file'.
Pre-construction information should be provided in a convenient form and should be clear, concise and easily understandable. It should be prepared early in the project so that it can provided to designers and contractors as part of the tendering or procurement process. This enables those preparing bids to assess the resources they

will need to allocate to perform their duties under the regulations.

Designer must then take account of the pre-construction information when preparing or modifying designs.

Pre-construction information may be added to as the project progresses, and should be provided as appropriate to designers and contractors throughout the project before work starts on any particular element.

The amount of detail included in pre-construction information should be sufficient to ensure that significant risks can be anticipated, focussing on those risks that that could not reasonably be anticipated.

The 2007 Regulations Approved Code of Practice suggested that pre-construction information might include:

A description of the project.
Key dates.
Contact details for the project team.
The extent and location of existing information.
Project arrangements:
Planning and managing the construction work.
Communication and liaison.
Security.
Site hoarding.
Site transport.
Permit-to-work systems.
Fire precautions.
Emergency procedures.
Means of escape.
Authorisation requirements.
Confined spaces.
Smoking and parking restrictions.
Safety hazards.
Boundaries and access.
Restrictions on deliveries, waste collection or storage.
Adjacent land uses.
Existing services.
Ground conditions.
Existing structures.
Issues relating to plant and equipment.
Health and safety information in earlier design, construction or 'as-built' drawings.
Health hazards.
Asbestos.
Contaminated land.
Client's activities.
Storage of hazardous materials.

Significant design and construction hazards
Assumptions and working methods.
Arrangements for co-ordination of ongoing design work.
Significant risks identified during design.
Materials requiring particular precautions.
A description of the format of the Health and Safety File and any conditions relating to its content.

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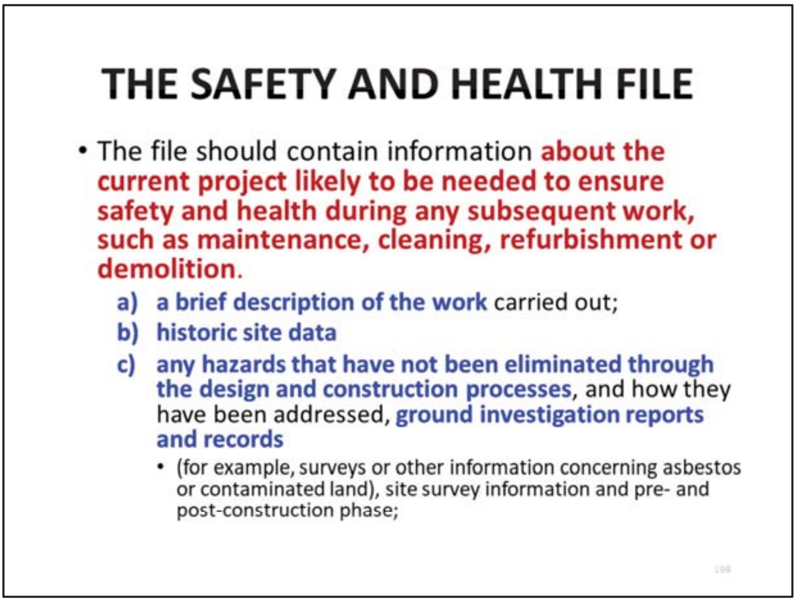


THE SAFETY AND HEALTH FILE

The health and safety file must be appropriate to the characteristics of the project and include a level of detail proportionate to the risks. It should only include relevant information that will be of help when planning future construction work and must be in a convenient form, clear, concise and easily understandable.

It does not need to include information about the construction process (which may be included in the construction phase plan), unless it may affect future works. It does not need to include contractual information, pre-construction information or information about the normal operation of the completed structure (which may be included in the building owners manual or the building log book).

The principal designer prepares the health and safety file during the pre-construction phase. They must then ensure it is appropriately reviewed, updated and revised to take account of the construction works and any changes that have occurred.

Where designers are not able to eliminate risks from the design, they must ensure appropriate information is included in the health and safety file. The principal contractor must also provide the principal designer with information for inclusion in the health and safety file.

If the principal designer's appointment finishes before the end of the project, the client must ensure that the principal designer passes the health and safety file to the principal contractor. The principal contractor must then ensure that the health and safety file is appropriately reviewed, updated and revised to take account of the construction works and any changes that have occurred.

At the end of the project, the principal designer, or where there is no principal designer, the principal contractor, must pass the health and safety file to the client.

Managing health and safety in construction, Construction (Design and Management) Regulations 2015, Guidance on Regulations suggests that the health and safety file might contain:

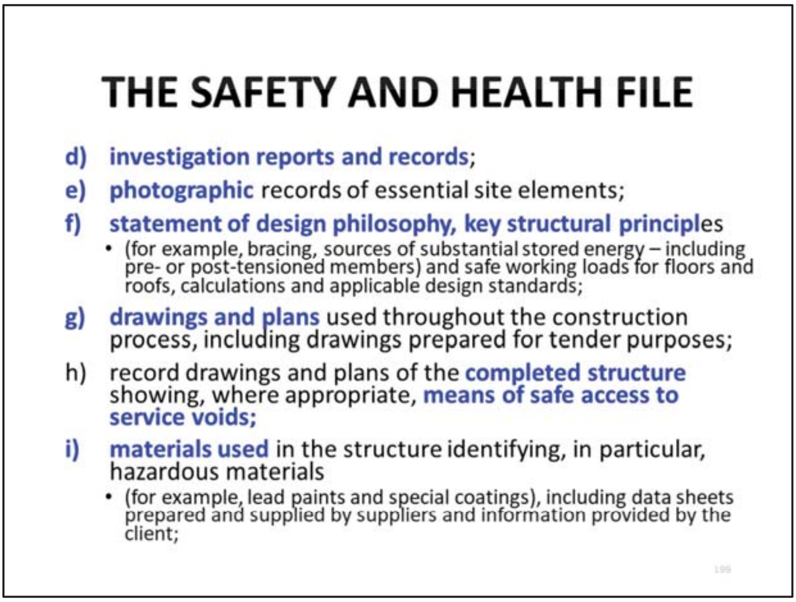
A brief description of the work carried out;
Any hazards that have not been eliminated through the design and construction processes, and how they have been addressed (e.g. surveys or other information concerning asbestos or contaminated land);
Key structural principles (e.g. bracing, sources of substantial stored energy – including pre- or post-tensioned members) and safe working loads for floors and roofs;
Hazardous materials used (e.g, lead paints and special coatings);
Information regarding the removal or dismantling of installed plant and equipment (e.g. any special arrangements for lifting such equipment);
Health and safety information about equipment provided for cleaning or maintaining the structure;
The nature, location and markings of significant services, including underground cables; gas supply equipment; fire-fighting services, etc;
Information and as-built drawings of the building, its plant and equipment (e.g. the means of safe access to and from service voids and fire doors).
The health and safety file must be kept up to date and available for inspection. If work is done to premises where a health and safety file already exists, the health and safety file should be updated if necessary and any gaps filled.

The health and safety file is normally kept for the lifetime of the building, meaning that it should be passed on to the new owners if the building is sold, and the new owners should be informed of its purpose and importance. There are no restrictions to the format that it has to be kept in, but it would be wise to ensure it is backed up.

If premises are leased, then the health and safety file to must be made available to the leaseholder. If there are multiple leaseholders, then those parts of the health and safety file relevant to the part of the building leased by each leaseholder must be made available to them. In multi-occupancy situations; for example, where a housing association owns a block of flats, the owner should keep and maintain the file, but ensure that individual flat occupiers are supplied with health and safety information concerning their home.

The file should contain information about the current project likely to be needed to

ensure safety and health during any subsequent work, such as maintenance, cleaning, refurbishment or demolition.
a brief description of the work carried out;
historic site data
any hazards that have not been eliminated through the design and construction processes, and how they have been addressed, ground investigation reports and records
(for example, surveys or other information concerning asbestos or contaminated land), site survey information and pre- and post-construction phase;



THE SAFETY AND HEALTH FILE

- **investigation reports and records;**
- **photographic records of essential site elements;**
- **statement of design philosophy, key structural principles**

(for example, bracing, sources of substantial stored energy – including pre- or post-tensioned members) and safe working loads for floors and roofs, calculations and applicable design standards;

- **drawings and plans used throughout the construction process, including drawings prepared for tender purposes;**

record drawings and plans of the completed structure showing, where appropriate, means of safe access to service voids;

- **materials used in the structure identifying, in particular, hazardous materials**

(for example, lead paints and special coatings), including data sheets prepared and supplied by suppliers and information provided by the client;

THE SAFETY AND HEALTH FILE

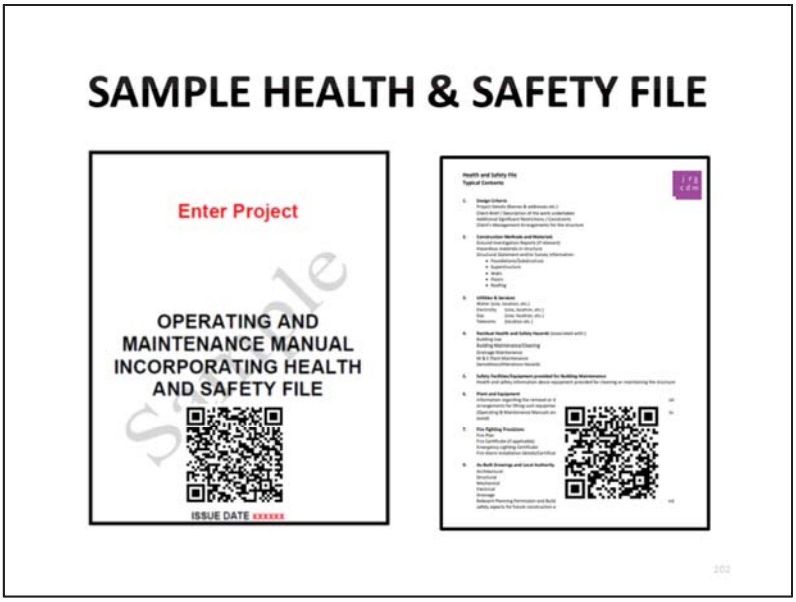
- **information regarding the handling and/or operation together with the relevant maintenance manuals, with particular regard to removal or dismantling of installed plant and equipment**
- **(for example, any special arrangements for lifting such equipment);**
- **safety and health information about equipment provided for cleaning or maintaining the structure;**
- **the results of proofing or load tests;**
- **the commissioning test results;**
- **the nature, location and markings of significant services, including**
- **underground cables; gas or fuel supply equipment; in-built safety features, for example emergency fire-fighting systems and fail-safe devices;**
- **information and as-built drawings of the building, its plant and equipment (for example, the means of safe access to and from service voids and fire doors).**

SAMPLE CDM DOCUMENTS AND TEMPLATES

Every Health and Safety File is ‘site specific’. It will be compiled in accordance with the client’s and the site’s safety specifications. The overall information requirements remain the same, and the site specific documents will be added. When we setup your Health and Safety File, it will consist of the following Documents:

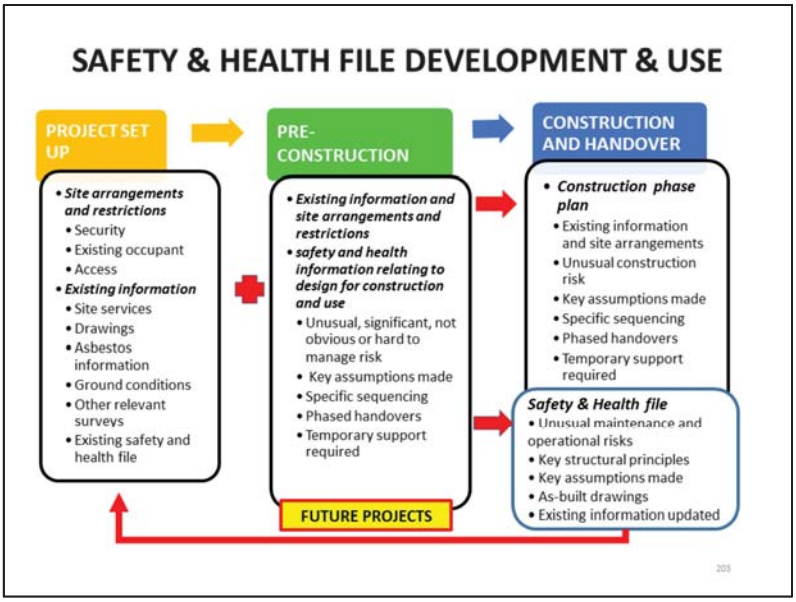
Contractor appointment letter. (Construction Regulation 5(3)(f) of the OHS A)
37(2) Agreement between client and contractor
Notification of Construction Work
Copy of the OHS Act
Company Occupational Health and Safety Management Plan
Company Occupational Health and Safety Policy
Letter of Good Standing – click here to apply.
Material Safety Data Sheets for hazardous materials used (if required)
Tax clearance certificate – click here to apply.
Risk Assessments
Safe work procedures (Site Specific)
Fall Protection plan (if required)
Legal appointment with proof of training (Ex. Chief Executive Officer, Risk Assessor, First Aider etc.)

Incident reporting procedures
Incident reports (General Administrative Regulation 9 (3) – Annexure 1)
Incident registers
Reports of accidents
Emergency preparedness documents
First aid documents
Induction records
Medical surveillance records
Safety communication (e.g. Toolbox talks)
Safety Plan
Registers (task and site specific, e.g. Confined space, PPE issue, hand tools etc.)
Minutes of safety meetings
Assessment reports
Inspection registers



SAMPLE HEALTH & SAFETY FILE

A Health and Safety File, otherwise known as a ‘Contractor Safety File’ is a record of information focusing on the management of health and safety on construction sites for contractors and sub-contractors. It protects the employer from criminal liability and proves compliance to the Occupational Health and Safety Act and Regulations.



SAFETY & HEALTH FILE DEVELOPMENT & USE

PROJECT SET UP
Site arrangements and restrictions
Security
Existing occupant
Access
Existing information
Site services
Drawings
Asbestos information
Ground conditions
Other relevant surveys
Existing safety and health file

PRE-CONSTRUCTION
Existing information and site arrangements and restrictions
safety and health information relating to design for construction and use
Unusual, significant, not obvious or hard to manage risk
Key assumptions made
Specific sequencing

Phased handovers
Temporary support required

CONSTRUCTION AND HANDOVER

Construction phase plan
Existing information and site arrangements
Unusual construction risk
Key assumptions made
Specific sequencing
Phased handovers
Temporary support required

Safety & Health file

- **Unusual maintenance and operational risks**
- **Key structural principles**
- **Key assumptions made**
- **As-built drawings**
- **Existing information update**

CLIENT FORMAL APPOINTMENTS

PROJECT TEAM
Designers
Contractors
OSHCIM DUTY HOLDERS
Principal Designer
Principal Contractor
PRE APPOINTMENT EVALUATION
General Contractors Evaluation
PD & PC Evaluation
FORMAL APPOINTMENT SCOPE & AGREEMENT
Consideration
Sample Appointment Letter/Agreement

REFERENCE PUBLICATIONS

This guideline is intended to assist companies who is engaging a contractor in establishing the OSH management in the contract, to ensure the hazards and risks associated with the works are controlled and reduced, and at the same time assist the employers to discharge their statutory duties

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Describe the handbook of construction Prey-qualification questionnaires

The PAS 91:2013 final version has now been finalized following consultation with industry bodies including Constructionline. The final version of PAS 91: 2013 was published on 8 April 2013 and Constructionline have also adopted the updated PAS91 as the basis of our own pre-qualification questionnaire.
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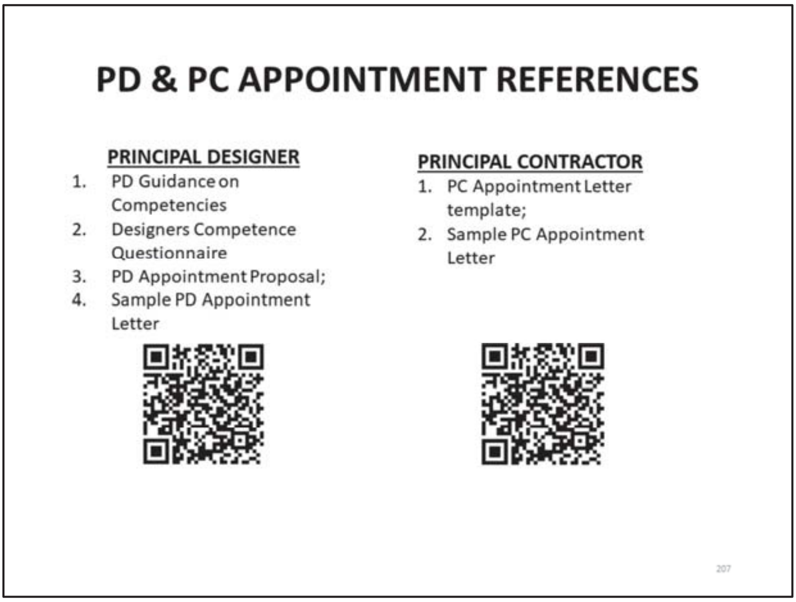

PD & PC APPOINTMENT REFERENCES

A principal designer is a designer who is an organization or individual (on smaller projects) appointed by the client to take control of the pre-construction phase of any project involving more than one contractor.

Principal designers have an important role in influencing how risks to health and safety are managed throughout a project. Design decisions made during the pre-construction phase have a significant influence in ensuring the project is delivered in a way that secures the health and safety of everyone affected by the work.

Principal designers must:

- ❖ **plan, manage, monitor and coordinate health and safety in the pre-construction phase. In doing so they must take account of relevant information (such as an existing health and safety file) that might affect design work carried out both before and after the construction phase has started**
- ❖ **help and advise the client in bringing together pre-construction information, and provide the information designers and contractors need to carry out their duties**
- ❖ **work with any other designers on the project to eliminate foreseeable health and safety risks to anyone affected by the work and, where that is not possible, take**

steps to reduce or control those risks
- ensure that everyone involved in the pre-construction phase communicates and cooperates, coordinating their work wherever required
- liaise with the principal contractor, keeping them informed of any risks that need to be controlled during the construction phase
- On a domestic client project where the domestic client does not appoint a principal designer, the role of the principal designer must be carried out by the designer in control of the pre-construction phase. When working for a domestic client, the client duties will normally be taken on by another duty holder (often the principal contractor on projects involving more than one contractor). However, the principal designer can enter into a written agreement with the domestic client to take on the client duties in addition to their own.

- PRINCIPAL DESIGNER
- PD Guidance on Competencies
- Designers Competence Questionnaire
- PD Appointment Proposal;
- Sample PD Appointment Letter

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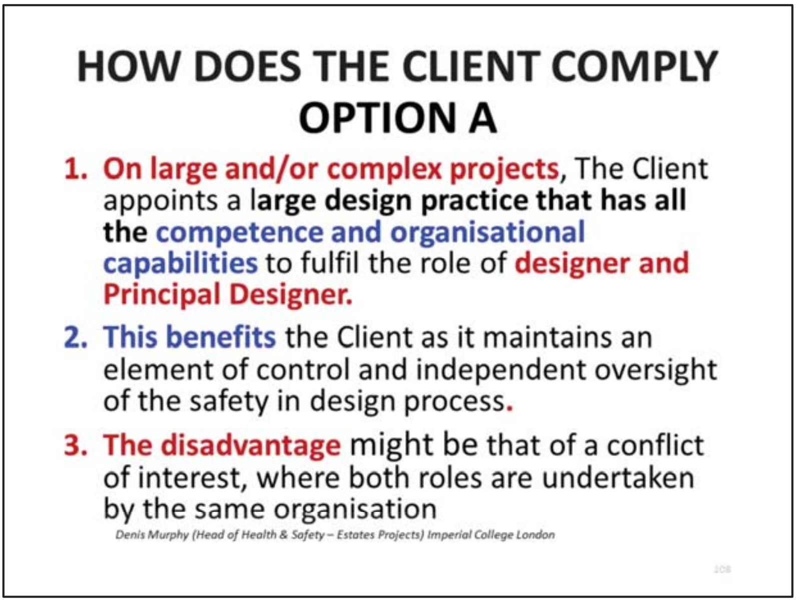
A principal contractor is appointed by the client to control the construction phase of any project involving more than one contractor.

Principal contractors have an important role in managing health and safety risks during the construction phase so they must have the skills, knowledge, experience and, where relevant, organisational capability to carry out this work.

The principal contractor must:
- plan, manage, monitor and coordinate the entire construction phase
- take account of the health and safety risks to everyone affected by the work (including members of the public), in planning and managing the measures needed to control them
- liaise with the client and principal designer for the duration of the project to ensure that all risks are effectively managed
- prepare a written construction phase plan PDF before the construction phase begins, implement, and then regularly review and revise it to make sure it remains fit for purpose
- have ongoing arrangements in place for managing health and safety throughout the construction phase
- consult and engage with workers about their health, safety and welfare
- ensure suitable welfare facilities are provided from the start and maintained throughout the construction phase
- check that anyone they appoint has the skills, knowledge, experience and, where relevant, the organisational capability to carry out their work safely and without risk to health
- ensure all workers have site-specific inductions, and any further information and training they need

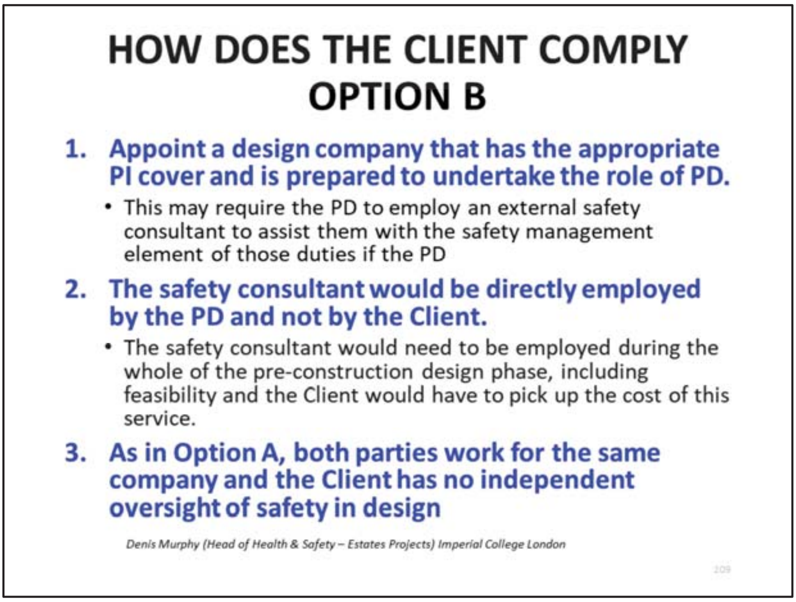
- ❖ **take steps to prevent unauthorised access to the site**
- ❖ **liaise with the principal designer to share any information relevant to the planning, management, monitoring and coordination of the pre-construction phase**

PRINCIPAL CONTRACTOR
PC Appointment Letter template;
Sample PC Appointment Letter



HOW DOES THE CLIENT COMPLY
OPTION A

- **On large and/or complex projects, The Client appoints a large design practice that has all the competence and organisational capabilities to fulfil the role of designer and Principal Designer.**
- **This benefits the Client as it maintains an element of control and independent oversight of the safety in design process.**
- **The disadvantage might be that of a conflict of interest, where both roles are undertaken by the same organization**



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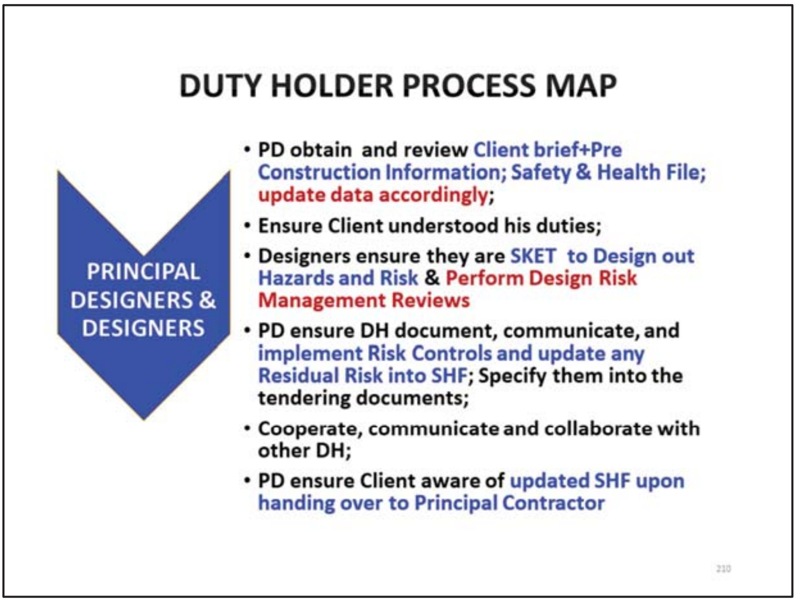
HOW DOES THE CLIENT COMPLY OPTION B

- **Appoint a design company that has the appropriate PI cover and is prepared to undertake the role of PD.**
- **This may require the PD to employ an external safety consultant to assist them with the safety management element of those duties if the PD**
- **The safety consultant would be directly employed by the PD and not by the Client.**
- **The safety consultant would need to be employed during the whole of the pre-construction design phase, including feasibility and the Client would have to pick up the cost of this service.**
- **As in Option A, both parties work for the same company and the Client has no independent oversight of safety in design**



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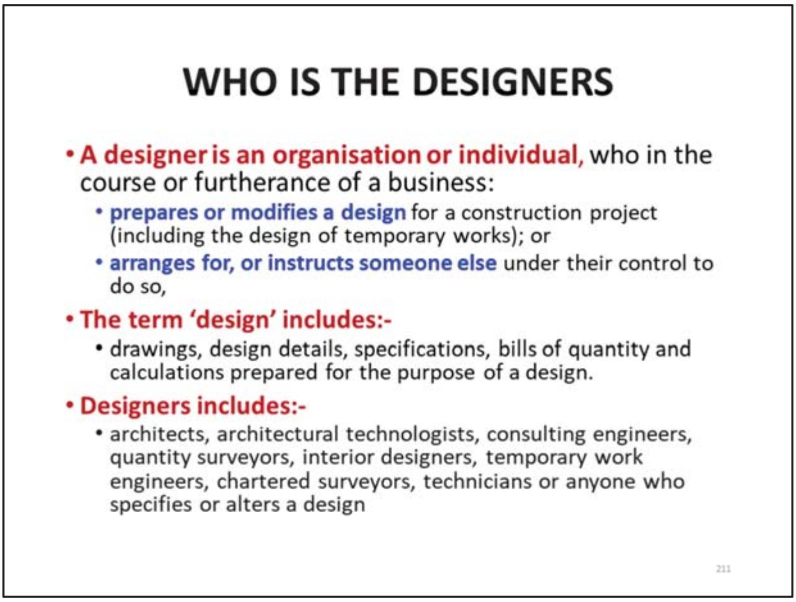
DUTY HOLDER PROCESS MAP

PRINCIPAL DESIGNERS & DESIGNERS

- PD obtain and review Client brief+Pre Construction Information; Safety & Health File; update data accordingly;
- Ensure Client understood his duties;
- Designers ensure they are SKET to Design out Hazards and Risk & Perform Design Risk Management Reviews
- PD ensure DH document, communicate, and implement Risk Controls and update any Residual Risk into SHF; Specify them into the tendering documents;
- Cooperate, communicate and collaborate with other DH;
- PD ensure Client aware of updated SHF upon handing over to Principal Contractor

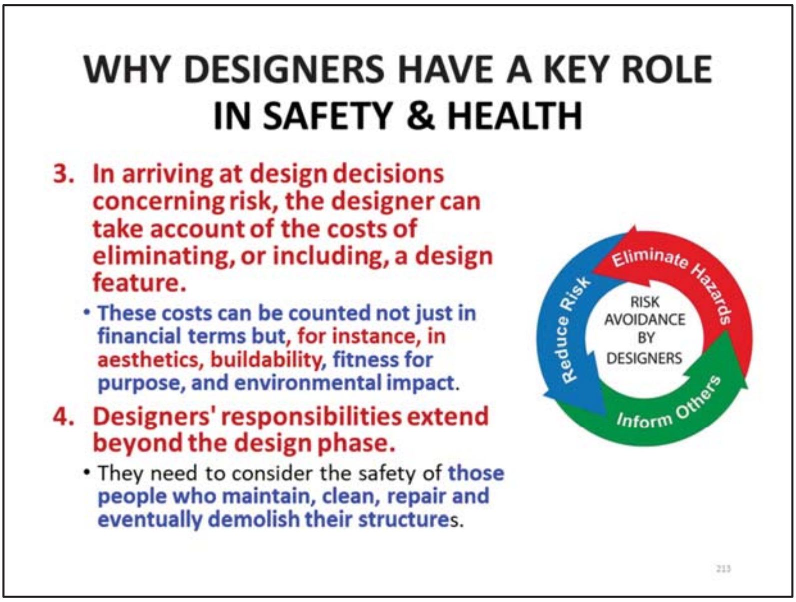


WHO IS THE DESIGNERS

- **A designer is an organization or individual, who in the course or furtherance of a business:**
- **prepares or modifies a design for a construction project (including the design of temporary works); or**
- **arranges for, or instructs someone else under their control to do so,**
- **The term 'design' includes:-**
- **drawings, design details, specifications, bills of quantity and calculations prepared for the purpose of a design.**
- **Designers includes:-**
- **architects, architectural technologists, consulting engineers, quantity surveyors, interior designers, temporary work engineers, chartered surveyors, technicians or anyone who specifies or alters a design**

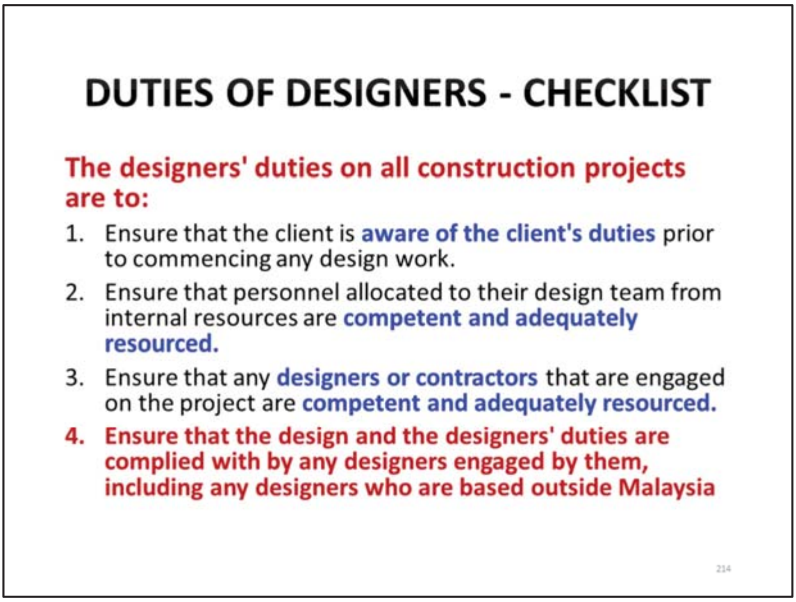
WHY DESIGNERS HAVE A KEY ROLE IN SAFETY & HEALTH

- **Designers have a key role to play in OSHCIM 2017 as they are in a unique position to reduce the risks that arise during construction work.**
- **The earlier that decisions are made by them, the greater will be the affect on construction health and safety and the influence of later design choices.**
- **It is vital to consider health and safety in the design process from the outset.**
- **Designers often consider health and safety in their designs by utilizing the 'Hierarchy of Risk Control' during the design process.**
- **This process allows them to eliminate or mitigate risks to health and safety within their designs.**
- **Where it is not possible to eliminate particular risks, information about them must be passed to the Principal Contractor for inclusion in the Construction Phase Plan.**



WHY DESIGNERS HAVE A KEY ROLE IN SAFETY & HEALTH

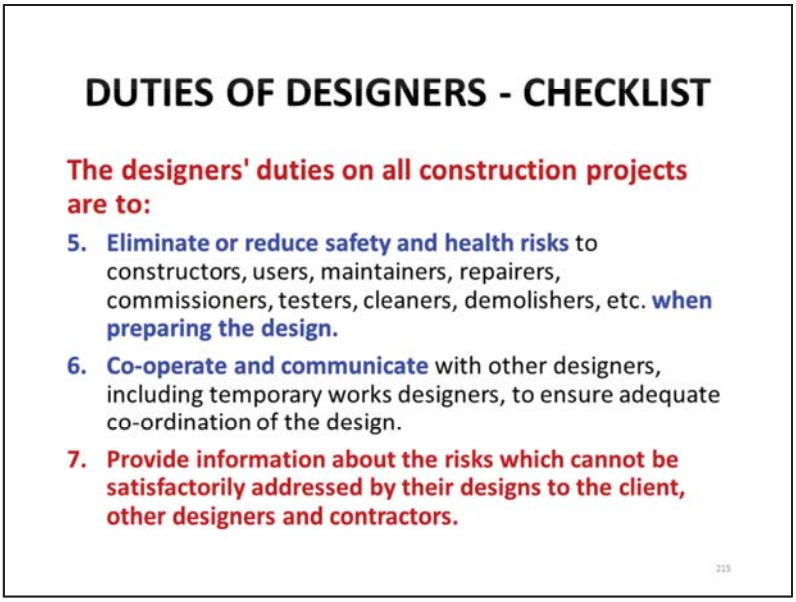
- **In arriving at design decisions concerning risk, the designer can take account of the costs of eliminating, or including, a design feature.**
- **These costs can be counted not just in financial terms but, for instance, in aesthetics, buildability, fitness for purpose, and environmental impact.**
- **Designers' responsibilities extend beyond the design phase.**
- **They need to consider the safety of those people who maintain, clean, repair and eventually demolish their structures.**



DUTIES OF DESIGNERS – CHECKLIST

❖ **The designers' duties on all construction projects are to:**

1. **Ensure that the client is aware of the client's duties prior to commencing any design work.**
2. **Ensure that personnel allocated to their design team from internal resources are competent and adequately resourced.**
3. **Ensure that any designers or contractors that are engaged on the project are competent and adequately resourced.**
4. **Ensure that the design and the designers' duties are complied with by any designers engaged by them, including any designers who are based outside**



5. ELIMINATE OR REDUCE RISKS BY DESIGN

So far as is reasonably practicable, the designer should eliminate or reduce safety and health risks to constructors, users, maintainers, repairers, commissioners, testers, cleaners, demolishers, etc. when preparing their design.

- **Designers will be required to establish ground rules for determining that which will be regarded as reasonably practicable.**
- **What frequency of personnel access to the edge of the roof or pier on a bridge for maintenance purposes would constitute the need for permanent edge protection?**
- **Would it be sufficient to make provision for the simple attachment of guard-rails for such work or even fixings for safety harnesses?**
- **Considerable guidance has been provided by DOSH and such bodies as the CIDB and other organization locally and/or internationally, showing various options for designers when attempting to eliminate and reduce risk by design.**
- **The designers' considerations for the reduction of risk by design do not relieve the constructor, maintainer, repairer, cleaner, etc. of their obligations to perform risk assessments and provide a safe and healthy workplace and system of work.**
- **The designers' knowledge of the construction, use, maintenance, repair, testing, commissioning, cleaning and demolition/dismantling processes and of the S&H legislation will provide an understanding of the risks that will be encountered..**
- **This information will be supplemented by guidance as and when applicable..**
- **The designer will also require some knowledge as to the types and frequency of**

maintenance, testing, repair and redecoration activities.

- **This will allow decisions to be taken about the resources necessary to overcome risks and make judgements on whether it is "reasonably practicable" to incorporate a particular facility into the design.**

It is essential that designers have a sound knowledge of health and safety issues, as required by the regulations, to ensure compliance with their duties.

Designers may wish to produce a hazard inventory associated with the design elements for both construction and post-construction work such as maintenance, cleaning, etc.

7. Provide information

Significant risks are not necessarily those that involve the greatest risks, but those, including health risks that are:

a) not likely to be obvious to a competent contractor or other designers;
b) unusual; or
c) likely to be difficult to manage effectively.

Information provided by the designer should be brief, clear, precise, and in a form suitable for the users.

This can be achieved using:

a) notes on drawings
  - This is preferred, since the notes will then be immediately available to those carrying out the work.
  - They can refer to other documents if more detail is needed, and be annotated to keep them up to date;

b) written information provided with the design
  - This should be project specific, and should only contain information which will be useful to those constructing or maintaining the structure;

c) suggested construction sequences
  - Showing how the design could be erected safely, where this is not obvious, for example suggested sequences for putting up pre-cast panel concrete structures.
  - Contractors may then adopt this method or develop their own approach.

The information should be provided by the designer to whomever needs it, including the client, other designers and contractors.

DUTIES OF DESIGNERS - CHECKLIST

On projects requiring LEGAL NOTIFICATION the designers' additional duties are to:

a) **Verify that the project has been notified** and that the **Principal Designer has been appointed** as soon as possible after commencement of initial or preliminary design.

b) **Co-operate with the Principal Designer** for the verification of design and designer compliance and the co-ordination of the design.

c) **Provide any information requested by the Principal Designer for the health and safety file.**

216

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DUTIES OF DESIGNERS – CHECKLIST

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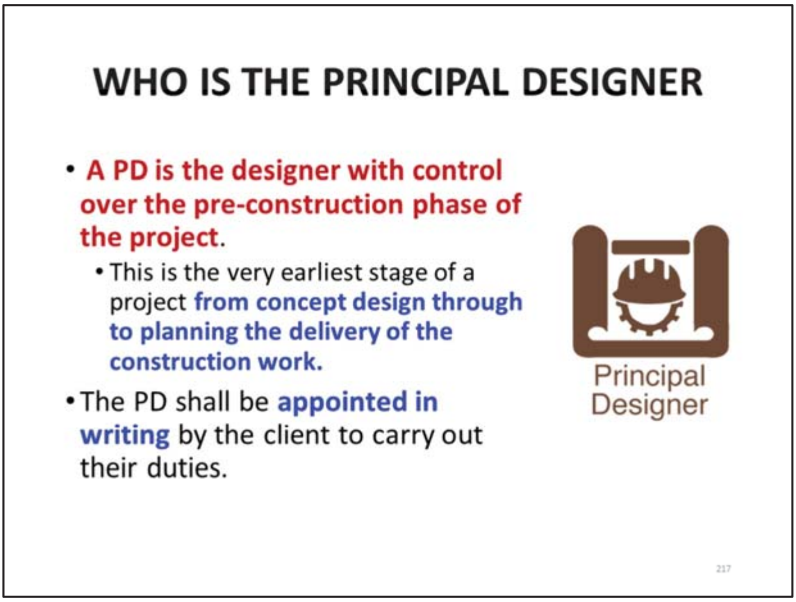
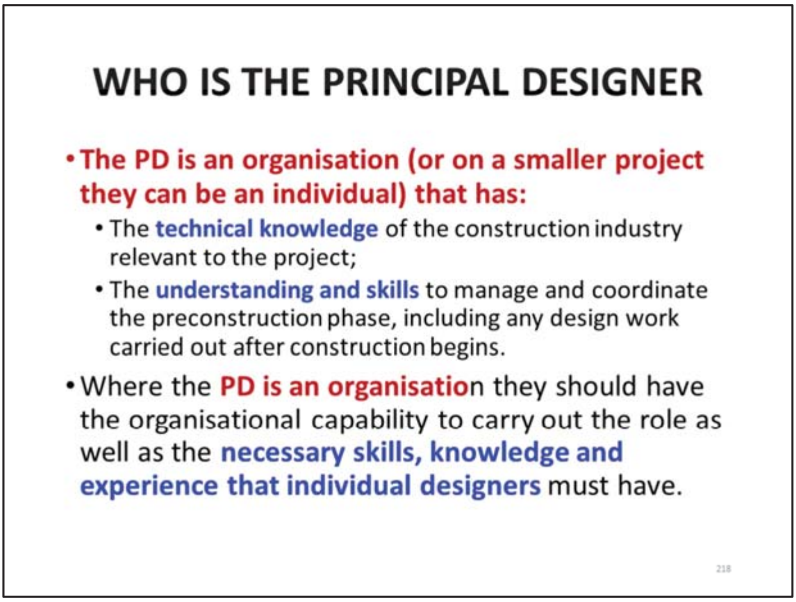


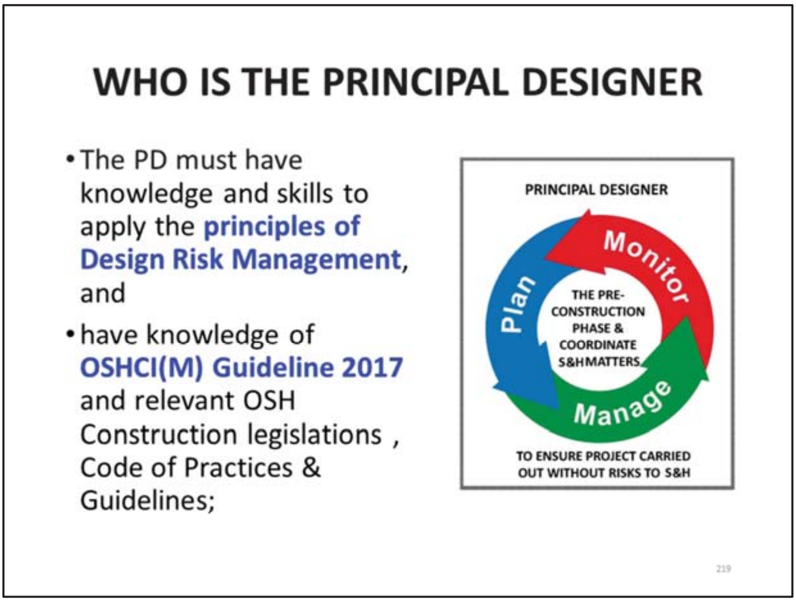
WHO IS THE PRINCIPAL DESIGNER

- ❖ **A PD is the designer with control over the pre-construction phase of the project.**
- **This is the very earliest stage of a project from concept design through to planning the delivery of the construction work.**
- **The PD shall be appointed in writing by the client to carry out their duties.**



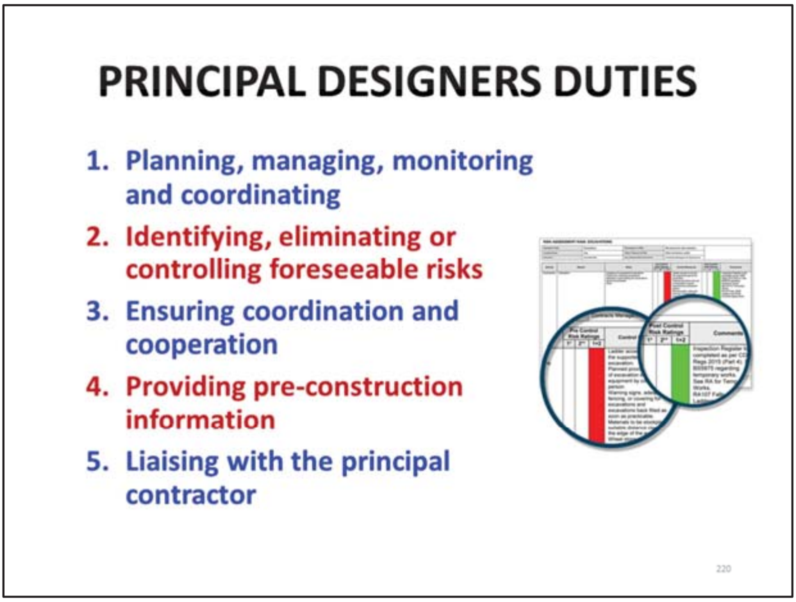
WHO IS THE PRINCIPAL DESIGNER

- **The PD is an organization (or on a smaller project they can be an individual) that has:**
- ❖ **The technical knowledge of the construction industry relevant to the project;**
- ❖ **The understanding and skills to manage and coordinate the preconstruction phase, including any design work carried out after construction begins.**
- **Where the PD is an organization they should have the organisational capability to carry out the role as well as the necessary skills, knowledge and experience that individual designers must have**



WHO IS THE PRINCIPAL DESIGNER

- **The PD must have knowledge and skills to apply the principles of Design Risk Management, and**
- **have knowledge of OSHCI(M) Guideline 2017 and relevant OSH Construction legislations , Code of Practices & Guidelines;**



PRINCIPAL DESIGNERS DUTIES

1. PLANNING, MANAGING, MONITORING AND COORDINATING
In carrying out the duty to plan, manage, monitor and coordinate the preconstruction phase, principal designers must take account of:

a) the general principles of prevention and, where relevant, the content of:
b) any construction phase plan.
- This will be relevant when the plan has implications for any design work that is carried out after the construction phase has started e.g. ground contamination discovered affecting the choice of piling method; and
c) any existing health and safety file.
- In cases where a health and safety file has been prepared as part of previous construction work on the building, the file should have information which will help the planning, management and coordination of the pre-construction phase.

This information should be taken into account, in particular, when decisions are being taken about design, technical and organisational issues in order to plan which items or stages of work can take place at the same time or in sequence; and when estimating the time needed to complete certain items or stages of work.

The principal designer's work should focus on ensuring the design work in the pre-construction phase contributes to the delivery of positive health and safety outcomes. Bringing together designers as early as possible in the project, and then on a regular basis, to ensure everyone carries out their duties will help to achieve this. This can be done as part of the normal design process. Regular design meetings chaired by the principal designer are an effective way to:

a) discuss the risks that should be addressed during the pre-construction phase;
b) decide on the control measures to be adopted; and
c) agree the information that will help in preparing the construction phase plan.

When appointing any designers, the principal designer must check that these designers have sufficient skills, knowledge, experience and (if they are an organisation) the organisational capability to carry out the work. These checks should be carried out before appointment takes place.

The principal designer's role continues into the construction phase when design work is carried out and when gathering and preparing information for the health and safety file.

2. IDENTIFYING, ELIMINATING OR CONTROLLING FORESEEABLE RISKS
Principal designers must ensure, as far as is reasonably practicable, that foreseeable risks to health and safety are identified. In practice, this will involve the principal designer working with other designers involved with the project. The risks that should be identified are those that are significant and are likely to arise:

a) while carrying out construction work; or
b) during maintenance, cleaning or the use of the building as a workplace once it is built.

Once the risks have been identified, principal designers must follow the approach to managing them set out in the general principles of prevention. The principal designer must, as far as reasonably practicable, ensure that the design team:

a) Eliminate the risks associated with design elements.
- If this is not possible (for instance because of competing design considerations such as planning restrictions, specifications, disproportionate costs or aesthetics):
b) Reduce any remaining risks; or
c) Control them, to an acceptable level.
- This relies on exercising professional judgement in considering how the risks can be managed. The focus should be on those design elements where there is a significant risk of injury or ill-health.

3. ENSURING COORDINATION AND COOPERATION
Principal designers must ensure that:
a) Everyone involved in working on the pre-construction phase cooperates with each other.

- They must establish that effective communication is occurring and that information is shared within the project team.
- This could involve holding meetings with others in the design team.
- Progress meetings with the client and the principal contractor also provide a way of ensuring work on the project is properly coordinated;
b) Designers comply with their duties (see designer duties).
- Appropriate checks should be made to ensure that designers are dealing with design risks appropriately.
-This can be done as part of the design process and through regular progress meetings;
c) Designers are providing information about elements of the design which present significant risks that cannot be eliminated.
- This should include information about unusual or complex risks that are more likely to be missed or misunderstood by contractors or others on the project rather than risks that are well-known and understood.

4. PROVIDING PRE-CONSTRUCTION INFORMATION

Pre-construction information is defined as information that is already in the client's possession or which is reasonably obtainable. It must be relevant, have an appropriate level of detail and be proportionate given the nature of risks to health or safety involved in the project.

The client has the main responsibility for pre-construction information. However, the principal designer must help and advise the client. The principal designer should help the client bring the information the client already holds (such as any existing health and safety file or asbestos survey) together. The principal designer should then:

a) assess the adequacy of existing information to identify any gaps in the information which it is necessary to fill; and
b) provide advice to the client on how the gaps can be filled and help them in gathering the necessary additional information.
b) provide, as far as they are able to, the necessary information promptly and in a convenient form to help designers and contractors who:
are being considered for appointment; or

- ***have already been appointed, to carry out their duties.***
- ***Further guidance on the requirements relating to the preconstruction information.***

5. LIAISING WITH THE PRINCIPAL CONTRACTOR

The principal designer must liaise with the principal contractor for the duration of their appointment. During the pre-construction phase this must cover sharing information that may affect the planning, management, monitoring and coordination of the construction phase - in particular, the information needed by the principal contractor to prepare the construction phase plan. Liaison should also extend into the construction phase to deal with on-going design and obtaining information for the health and safety file. This could be done by holding regular progress meetings with the principal contractor.

If the principal designer's appointment finishes before the end of the project, the

principal designer must ensure that the principal contractor has all the necessary information so that they:

a) are aware of the risks which have not been eliminated in the designs;
b)understand the means employed to reduce or control those risks; and
c) understand the implications for implementing the design work during the remainder of the project.

The principal designer should also arrange for a handover of the health and safety file to the principal contractor and make them aware of any issues that may need to be taken into account in reviewing, updating and completing it.

RISK MANAGEMENT PRINCIPLES

The core principles that drive decision-making for prioritizing and mitigating risk are likely embedded deep in most risk managers' brains, but as with many other bits of knowledge a review of the basics can be both reinforcing and refreshing. Our day-to-day work keeps us so busy we may not have the opportunity to provide basic education to organizational leaders, members of our department, physicians and staff about exactly what risk management is. Reinforcing these principles can help demonstrate how a robust risk management program supports achievement of the organization's mission and vision.

The five basic risk management principles of risk identification, risk analysis, risk control, risk financing and claims management can be applied to most any situation or problem. One doesn't realize that these principles are actually applied in daily life over and over until examples are brought to light. Using everyday examples in education programs as a way of introducing the principles, and then transitioning to scenarios and problems faced in patient care and healthcare operations, can be an effective teaching tool when promoting the contributions that risk management makes to the organization's success.

Risk identification is just what it sounds like – what risks are presented to me/my patient/my organization with the scenario in front of me? Using the everyday example of riding in or driving a car, one might identify the risk of having an accident due to poor maintenance of the car, failure to keep gas in the tank, speeding or driving under the influence. Other identified risks may be the risk of damaging property – either the car itself or someone else's property. There is a risk of financial loss if there isn't proper liability insurance in place, or if one gets a speeding ticket, and so forth.

The analysis of the risks identified begs one to ask, what is the worst that could happen? Put another way, how often could these adverse events happen (frequency), and if it does happen, what's the worst it could be (severity)? In our car scenario, the worst that could happen is someone loses their life. Additional analysis may determine the risk of being in an auto accident is low because the driver is never on the highway, only drives in good weather during daylight, on roads with speed limits of 30 miles per hour or less, in a well-maintained car, etc. As one can see, the analysis part of the risk management process should take the individual through several of these "what if" questions to help arrive at potential frequency and severity of an event.

Risk control offers opportunities for risk avoidance, risk prevention and risk reduction. The risk avoidance technique in our car example would be to not own a car or ride in a car. In reality, a minimal amount of risk still exists in that one could be hit by a car as a pedestrian, but in some scenarios, risk can be completely avoided. Risk prevention aims to reduce the frequency or likelihood of the event or loss. This might mean preventing car breakdowns by following maintenance and inspection schedules, keeping air in the tires and gas in the tank and following all driving laws. Risk reduction aims to lower the severity of a particular loss that has already occurred, for example ensuring property damage to another person's vehicle is repaired quickly so the time they are without a car is limited. The risk control program implemented will consider the various strategies already in place, and may introduce new techniques based on the findings of the analysis activity

Describe the construction hazards,

A construction site is any piece of land where a building is being built or repaired. Those who work on construction sites are often required to use large tools and pieces of machinery, work at height, and in environments where hazardous materials are present. Because of the nature of such work, working on construction sites can be dangerous.

This article will outline common construction hazards. It will provide a list of hazards on a construction site so that you are aware of the potential dangers and how to prevent them.

construction was found to be the main industry for fatal injuries to workers. Construction hazards are heavily dependent on the type of construction work that is being carried out. For example, working on scaffolding presents entirely different hazards to working with asbestos.

The top ten risks and hazards from working on construction sites are:

Working at height.
Moving objects.

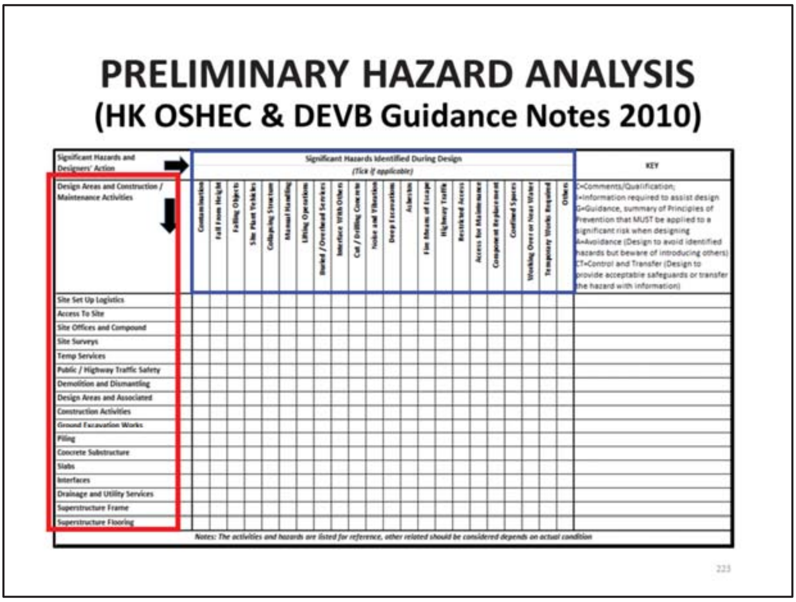
Slips, trips, and falls.
Noise.
Hand arm vibration syndrome.
Material and manual handling.
Collapsing trenches.
Asbestos.
Electricity.
Airborne fibers and materials

- Some of the hazards can be eliminated and reduce during design stage
order to manage work health and safety risks during the design stage, designers should consider

Physical design of a product.
Work layout to reduce the possibility of hazards occurring in the workplace.
Applying risk management principles to the design process to eliminate hazards that may occur during operation.
Designing work to minimise the risks to workers. Creating healthy and safe work requires jobs and tasks be designed to accommodate the abilities, diversity and vulnerabilities of workers, including those returning to work following injury or illness.
Within the Work Health and Safety Regulations there are a number of design duties in which several offences apply specifically to a person in control of design.

There are offences for designers who fail to eliminate or minimise risks (within the design process) in relation to:

noise (section 59)
hazardous manual tasks (section 61)
confined spaces (section 64)
plant (division 5.1.2, division 5.2.2)
construction work (section 295).
Summary



Describe the Matrix

1. X Axis are Design areas and Maintenance Activities

2. Y Axis Significant Hazards and Designers Action

DESIGN RISK KEY FOCUS (HAZARDS)

Foreseeable risks of a project may come from broad groupings of hazards. The following list may be used to assist in identifying hazards and controlling foreseeable risks associated with the design of a structure throughout its lifecycle.	
Earthworks • Excavations (for example, risks from earth collapsing or engulfment) • Location of underground services	**Structural safety** • Erection of steelwork or concrete frameworks • Load bearing requirements • Stability and integrity of the structure

Movement of people and materials
• Safe access and egress, including for people with disability
• Traffic management
  • Loading bays and ramps
  • Safe crossings
  • Exclusion zone
  • Site security
	Manual tasks
	▪ Methods of material handling
	▪ Accessibility of material handling
	▪ Loading docks and storage facilities
	▪ Workplace space and layout to prevent musculoskeletal disorders, including facilitating use of mechanical aids
	▪ Assembly and disassembly of pre-fabricated fixtures and fittings

224

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- **Earthworks**
❖ **Excavations (for example, risks from earth collapsing or engulfment)**
❖ **Location of underground services**

- **Structural safety**
❖ **Erection of steelwork or concrete frameworks**
❖ **Load bearing requirements**
❖ **Stability and integrity of the structure**

- **Movement of people and materials**
❖ **Safe access and egress, including for people with disability**
❖ **Traffic management**
❖ **Loading bays and ramps**
❖ **Safe crossings**
❖ **Exclusion zone**

❖ Site security

- Manual tasks

❖ Methods of material handling
❖ Accessibility of material handling
❖ Loading docks and storage facilities
❖ Workplace space and layout to prevent musculoskeletal disorders, including facilitating use of mechanical aids
❖ Assembly and disassembly of pre-fabricated fixtures and fittings

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Electrical safety • Earthing of electrical installations • Location of underground and overhead power cables • Protection of leads/cables Number and location of power points	**Noise exposure** • Exposure to noise from plant or from surrounding area
Plant • Tower crane locations, loading and unloading • Mobile crane loads on slabs • Plant and machinery installed in a building or structure • Materials handling plant and equipment • Maintenance access to plant and equipment • The guarding of plant and machinery • Lift installations	**Substances** • Exposure to hazardous substances and materials including insulation and decorative materials • Exposure to volatile organic compounds and off gassing through the use of composite wood products or paints • Exposure to irritant/ toxic dust and fumes • Storage and use of hazardous chemicals, including cleaning products

225

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DESIGN RISK KEY FOCUS (HAZARDS)

Explain about the :

❖ **Electrical Safety**
- **Earthing installations**
- **Locations of underground**
- **Protections power point**

❖ **Plant**
- **Tower Crane locations**
- **Mobile crane**
- **Plant and machinery installations**
- **Material handling**
- **Maintenance access**
- **Lift Installations**

❖ **Noise Exposure**
- **Exposure to noise from the plant**

❖ **Substance**

- Exposure to hazardous substance
- Exposure to volatile organic
- Exposure to toxic waste
- Storage and use hazard chemical

Amenities and facilities

- Access to various amenities and facilities such as storage, first aid rooms/sick rooms, rest rooms, meal and accommodation areas and drinking water

Fire and emergencies

- Fire risks
- Fire detection and fire fighting
- Emergency routes and exits
- Access for and structural capacity to carry fire tenders
- Other emergency facilities

Specific risks

- Exposure to radiation, for example, electromagnetic radiation
- Exposure to biological hazards
- Fatigue
- Working alone
- Use of explosives
- Confined spaces
- Over and under water work, including diving and work in caissons with compressed air supply

Falls prevention

- Guard rails
- Window heights and cleaning
- Anchorage points for building maintenance and cleaning
- Access to working spaces for construction, cleaning, maintenance and repairs
- Scaffolding
- Temporary work platforms
- Roofing materials and surface characteristics such as fragility, slip resistance and pitch

Working environment

- Ventilation for thermal comfort and general air quality and specific ventilation requirements for the work to be performed on the premise
- Temperature
- Lighting including that of plant room
- Acoustic properties and noise control, for example, noise isolation, insulation and absorption
- Seating
- Floor surfaces to prevent slips and trips
- Space for occupants

226

Describe the additional design risk key focus (hazards)

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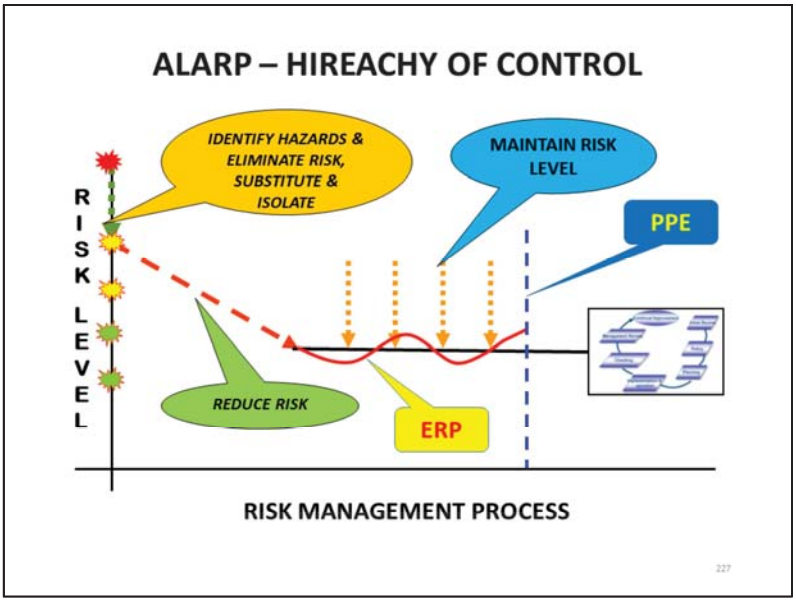

ALARP – HIREACHY OF CONTROL

Hierarchy of hazard control is a system used in industry to minimize or eliminate exposure to hazards. It is a widely accepted system promoted by numerous safety organizations. This concept is taught to managers in industry, to be promoted as standard practice in the workplace.

This guide has been produced to explain the concept of "reasonably practicable" in a simple way for HSE staff and incorporates guidance currently held on HSE's website. It's aimed mainly at staff new to HSE and those new to decision making.

Using “reasonably practicable” allows us to set goals for duty-holders, rather than being prescriptive. This flexibility is a great advantage but it has its drawbacks, too. Deciding whether a risk is ALARP can be challenging because it requires duty-holders and us to exercise judgement. In the great majority of cases, we can decide by referring to existing ‘good practice’ that has been established by a process of discussion with stakeholders to achieve a consensus about what is ALARP. For high hazards, complex or novel situations, we build on good practice, using more formal decision making techniques, including cost-benefit analysis, to inform our judgement.

The concept of “reasonably practicable” lies at the heart of the British health and

safety system. It is a key part of the general duties of the Health and Safety at Work etc. Act 1974 and many sets of health and safety regulations that we and Local Authorities enforce. HSC's policy is that any proposed regulatory action (Regulations, ACOPs, guidance, campaigns, etc.) should be based on what is reasonably practicable. In some cases, however, this may not be possible because the Regulations implement a European directive or other international measure that adopt a risk control standard different from "reasonably practicable" (i.e. different from what is ALARP).

Because ALARP is fundamental to the work of the whole organization, it is important that everyone, whatever their role, knows about it. Here are some specific reasons for you to know about ALARP and its relationship with good practice, but this is not an exhaustive list.

Policy makers and those engaged in Programme delivery need to know about ALARP because when you make proposals for HSC/E action to control health or safety risks, you need to make sure that, as far as possible, those controls will reduce the risks to employees (or other people, as the case may be) ALARP.
Enforcers need to know about ALARP because you will have to decide whether duty-holders have reduced their risks ALARP and so have complied with the law.
Technical specialists in HSE need to know about ALARP because you advise colleagues in HSE about whether control measures reduce risks ALARP and you help identify standards of risk control that are ALARP.

DESIGN RISK MANAGEMENT REFERENCES

The Construction (Design and Management) Regulations 2007 (CDM Regulations 2007) is a revision of a major piece of legislation within the wide portfolio of construction-related legislation. It seeks to improve the long term health and safety performance of the UK construction industry, with ownership of health and safety proactively undertaken by the integrated project team.
Good design has always embraced health and safety issues and design teams remain essential players as well as key contributors and communicators in matters of health and safety management. Designers have a legal responsibility to ensure that their designs account for health and safety at all stages within the holistic envelope of construction.

DESIGNERS - Design Risk Management

Design Risk Management: Contribution to Health and Safety gives detailed guidance to construction practitioners with design responsibility on how to identify and manage health and safety risks, and on the design strategies to be followed. It seeks to focus on accountability with due emphasis on the minimization of unnecessary bureaucracy and offers documentation trails that provide an insight to managing risk and not paperwork. Subsequently it offers a process by which designers can discharge their duties in compliance with the CDM Regulations.

QUALITATIVE RISK ASSESSMENT EXAMPLE FOR DESIGN REVIEW							
Design Review Rule1/Rule2/Rule3.							
Design Discipline:					Prepared By:	Checked By:	
* Persons at Risk: (1) Construction workers (2) Members of the Public (3) Maintenance workers							
** Action by: Principal Designer – include in the pre-construction health and safety plan / safety and health file							
Principal Contractor – manage risk during the construction phase							
Designer – take into consideration when preparing their designs							
Client – pass information to designers / planning supervisor							
Ref.	Activity	Hazard	Persons at Risk(s)	Design Measures taken, or being taken to eliminate or reduce the hazard	Information on the Residual Risk	Date Issue Raised	Action Required by:
#R1-1	Installation of equipment at height on existing / new structures	Possible injury through falling, overstretching, dropping of items.	(1) (2) (3)	Maximise pre-assembly / installation of infrastructure prior to site installation to minimise any requirement to use a MEWP. Maximise pretesting of equipment to eliminate faults following installation (eg soak testing). Provide appropriate means of edge protection to prevent falls from height. Maximise use of remote monitoring facilities to obviate the need for attendance at site during installation and commissioning phase of the works for fault diagnosis and rectification. The scheme designer is required to consider the access arrangements to all features to minimise / eliminate requirements in this regard.	Possible injury through falling, overstretching, dropping of items. The frequency and likelihood of occurrence will be reduced by the amount of pre-testing and preassembly that can be achieved prior to arrival at the site. This therefore needs to be maximised.	November 2018	PD,D,PC,C

229

What is Risk Analysis?

Once you have identified the risks that could affect your project, you need to determine which ones you will spend time and money on.

Risk analysis is the process of prioritizing risks based on the probability of the risk occurring and the impact it would have on the project.

There are two primary methods of risk analysis you can use on your project...

Qualitative Risk Analysis
Quantitative Risk Analysis
The main difference between these two methods of risk analysis is that qualitative risk analysis uses a relative or descriptive scale to measure the probability of occurrence whereas quantitative risk analysis uses a numerical scale.

Project Manager's Resource

Project Risk Analysis Made Ridiculously Simple

For example, a qualitative analysis would use a scale of "Low, Medium, High" to

indicate the likelihood of a risk event occurring.

A quantitative analysis will determine the probability of each risk event occurring. For example, Risk #1 has an 80% chance of occurring, Risk #2 has a 27% chance of occurring, and so on.

The rest of this article will focus on using qualitative analysis to prioritize and decide which risks your project should focus on.

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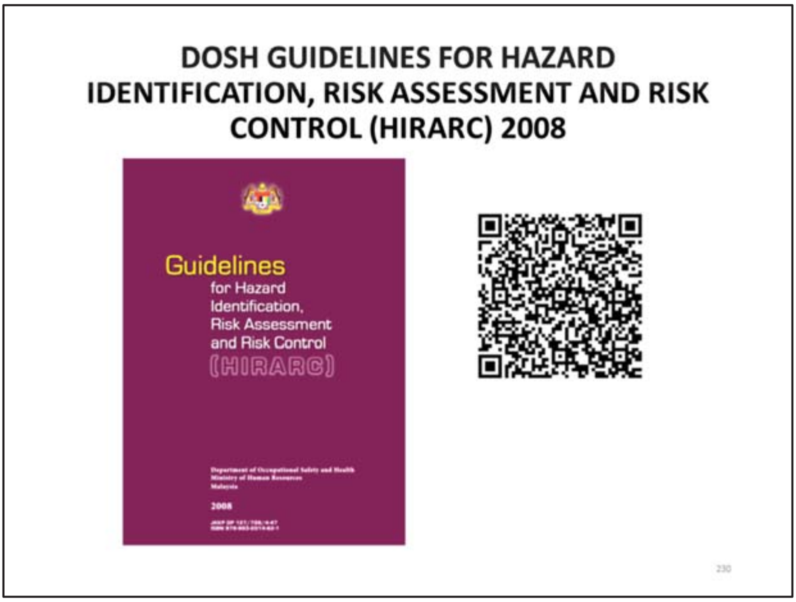


DOSH GUIDELINES FOR HAZARD IDENTIFICATION, RISK ASSESSMENT AND RISK CONTROL (HIRARC) 20 08

In recent years, Hazard Identification, Risk Assessment and Risk Control (HIRARC) has become fundamental to the practice of planning, management and the operation of a business as a basic of risk management. The organizations that have carried out risk assessment at the work place have noted numerous changes in their working practice. Those who have already carried out risk assessment in their work, have reported positive changes in their working practice, they recognize substandard act and working condition as they develop and take necessary corrective action. Legislation requires that this process should be systematic and be recorded so that the results are reliable and the analysis complete. The risk assessment process should be continuous and should not be regarded as a one-off exercise. In line with the Department approach of PREVENTIVE MEASURES as a way of enforcing the law on Occupational Safety and Health (OSH), it seems that HIRARC has became extremely important. With HIRARC, one will be able to identify hazard, analyze and assess its associated risk and then apply the suitable control measures.

LIKELIHOOD (LLH)	EXAMPLE	RATING
Most likely	The most likely result of the hazard / event being realized	5
Possible	Has a good chance of occurring and is not unusual	4
Conceivable	Might be occur at some time in future	3
Remote	Has not been known to occur after many years	2
Inconceivable	Is practically impossible and has never occurred	1

SEVERITY (SEV)	EXAMPLE	RATING
Catastrophic	Numerous fatalities, irrecoverable property damage and productivity	5
Fatal	Approximately one single fatality major property damage if hazard is realized	4
Serious	Non-fatal injury, permanent disability	3
Minor	Disabling but not permanent injury 2	2
Negligible	Minor abrasions, bruises, cuts, first aid type injury	1

231

The Risk Assessment Matrix

A Risk Assessment Matrix (RAM) is a tool to help you determine which risks you need to develop a risk response for.

The first step in developing a RAM is to define the rating scales for likelihood and impact.

In a qualitative analysis, likelihood or probability is measured using a relative scale. Here's an example Likelihood Scale definition...

RATING LIKELIHOOD DESCRIPTION

1 Very Low

- **Highly unlikely to occur. May occur in exceptional situations.**

2 Low

- **Most likely will not occur. Infrequent occurrence in past projects.**

3 Moderate

- **Possible to occur.**

4 High

- **Likely to occur. Has occurred in past projects.**

5 Very High

- **Highly likely to occur. Has occurred in past projects and conditions exist for it to occur on this project.**

Here's an example Impact Scale definition...

RATING IMPACT COST SCHEDULE
1 Very Low

- **No increase in budget**
- **No change to schedule**

2 Low

- **< 5% increase in budget**
- **< 1 week delay to schedule**

3 Moderate

- **5-10% increase in budget**
- **1 - 2 weeks delay to schedule**

4 High

- **10-20% increase in budget**
- **2 - 4 weeks delay to schedule**

5 Very High

- **> 20% increase in budget**
- **> 4 weeks delay to schedule**

Remember, these scales are very dependent on the specific details of your project.

For example, a "Low" likelihood of occurrence for one project may mean a risk event is unlikely to occur within the next 10 deployments. With another type of project "Low" may mean that a risk event is unlikely to occur within the next year.

The impact scale for your project could also include other considerations such as scope, political, and employee impacts.

With your rating scales prepared, you can create a Risk Assessment Matrix to help you categorize the Risk Level for each risk event.

RISK MATRIX TABLE

	Severity (SEV)				
Likelihood (LLH)	1	2	3	4	5
5	5	10	15	20	25
4	4	8	12	16	20
3	3	6	9	12	15
2	2	4	6	8	10
1	1	2	3	4	5

ACTION RATING

RISK	DESCRIPTION	ACTION
15 - 25	HIGH	A HIGH risk requires immediate action to control the hazard as detailed in the hierarchy of control. Actions taken must be documented on the risk assessment form including date for completion hazard as detailed in the hierarchy of control. Actions taken must be documented on the risk assessment form including date for completion
5 - 12	MEDIUM	A MEDIUM risk requires a planned approach to controlling the hazard and applies temporary measure if required. Actions taken must be documented on the risk assessment form including date for completion.
1 - 4	LOW	A risk identified as LOW may be considered as acceptable and further reduction may not be necessary. However, if the risk can be resolved quickly and efficiently, control measures should be implemented and recorded.

232

RISK MATRIX TABLE

The impact scale for your project could also include other considerations such as scope, political, and employee impacts.

With your rating scales prepared, you can create a Risk Assessment Matrix to help you categorize the Risk Level for each risk event.

Risk Assessment Matrix

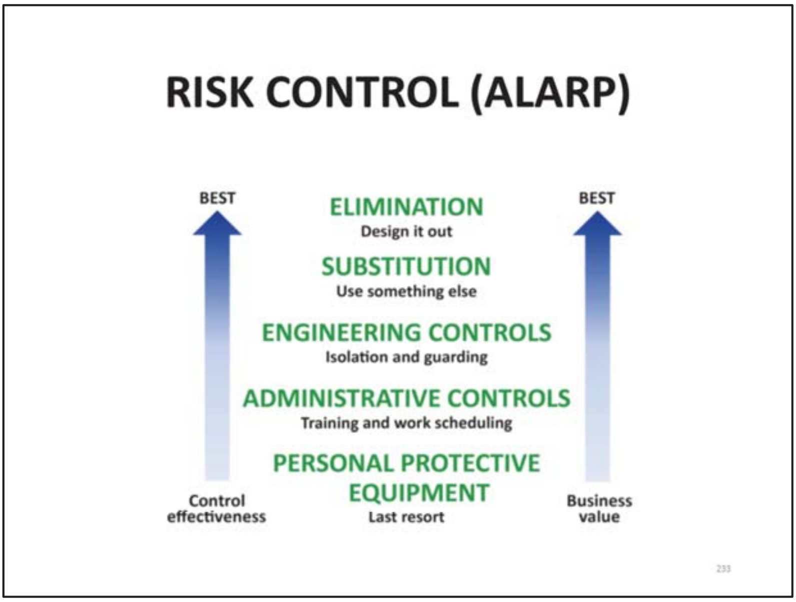
For example, if a risk event has a Moderate Likelihood of occurring and a High impact, it would be considered a Moderate Risk using the RAM shown above.

Qualitative Risk Assessment

Using your RAM and Rating Scales, you can then analyze the likelihood of each risk event occurring and its impact to determine what Risk Level it is at. This will give you the information you need to prioritize your list of project risks.

A qualitative risk assessment can also help you determine if there are any specific types or categories of risks that would require special attention or any risk events that need to be handled in the near-term.

The most challenging aspect of performing a qualitative risk analysis is defining your rating scales. But once that has been done, you can use them for the duration of the project to effectively manage your project's risks in a timely manner



RISK CONTROL (ALARP)

❖ **How to tell if a risk is ALARP**

Using "reasonably practicable" allows us to set goals for duty-holders, rather than being prescriptive. This flexibility is a great advantage. It allows duty-holders to choose the method that is best for them and so it supports innovation, but it has its drawbacks, too. Deciding whether a risk is ALARP can be challenging because it requires duty-holders and us to exercise judgment.

❖ **Deciding by good practice**

In most situations, deciding whether the risks are ALARP involves a comparison between the control measures a duty-holder has in place or is proposing and the measures we would normally expect to see in such circumstances i.e. relevant good practice. "Good practice" is defined in the general ALARP guidance as "those standards for controlling risk that HSE has judged and recognized as satisfying the law, when applied to a particular relevant case, in an appropriate manner." We decide by consensus what is good practice through a process of discussion with stakeholders, such as employers, trade associations, other Government departments, trade unions, health and safety professionals and suppliers.

Once what is good practice has been determined, much of the discussion with duty-holders about whether a risk is or will be ALARP is likely to be concerned with the relevance of the good practice, and how appropriately it has been (or will be) implemented.. Where there is relevant, recognised good practice, we expect duty-holders to follow it. If they want to do something different, they must be able to demonstrate to our satisfaction that the measures they propose to use are at least as effective in controlling the risk.

Deciding on 'first principles'
Where the situation is complex, it may be difficult to reach a decision on the basis of good practice alone. There may also be some cases (for example, a new technology) where there is no relevant good practice. In such cases, good practice should be followed as far as it can be, and then consideration given to whether there is any more that can be done to reduce the risk. If there is more, the presumption is that duty-holders will implement these further measures but this needs to be confirmed by going back to first principles to compare the risk with the sacrifice involved in further reducing it.

Often such "first principles" comparisons can be done qualitatively, i.e. by applying common sense and/or exercising professional judgment. or experience. For example if the costs are clearly very high and the reduction in risk is only marginal, then it is likely that the situation is already ALARP and further improvements are not required. In other circumstances the improvements may be relatively simple or cheap to implement and the risk reduction significant: here the existing situation is unlikely to be ALARP and the improvement is required. In many of these cases a decision can be reached without further analysis.

But there are some instances (often in high hazard industries or where there is a new technology with potentially serious consequences) where the situation is less clear-cut. In such cases, a more detailed comparison has to be undertaken. The trouble is that risk and sacrifice are not usually measured in the same units, so it's a bit like comparing apples and pears. In these instances, a more formal Cost Benefit Analysis (CBA) may provide additional insight to help come to a judgment.

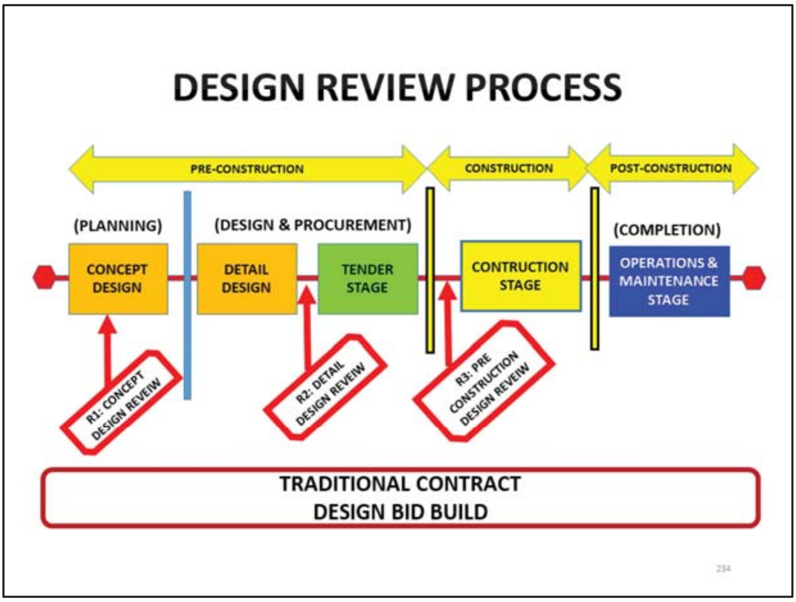
In a CBA, we convert both risk and sacrifice to a common set of units – money – so that we can compare them. We represent:

Sacrifice as a cost; and
Risk , in so far as it is being reduced, as a benefit.
There's more detail (such as which costs to take into account and which risks to consider) in the 'CBA checklist' and Directorates' own guidance.

We then compare the sacrifice (cost) and the risk reduction (benefits). In a standard CBA, the usual rule applied is that the measure should be adopted only if benefits outweigh costs. However, in ALARP judgments, the rule is that the measure must be adopted unless the sacrifice is grossly disproportionate to the risk. So, the costs can

outweigh benefits and the measure could still be reasonably practicable to introduce. How much costs can outweigh benefits before being judged grossly disproportionate depends on factors such as how big the risk is to begin with (the larger the risk, the greater can be the disproportion between the cost and risk).

This looks straightforward, but it is worth noting that there are many assumptions and uncertainties involved in CBA – further discussion can be found in 'HSE principles for Cost Benefit Analysis (CBA) in support of ALARP decisions' - and indeed in many aspects of risk analysis. In any case, the outcome of a CBA is only one of several considerations that go towards the judgment that a risk has been reduced ALARP. For example, in policy work and in those parts of operational work dealing with high hazards you may also need to consider how the public feel about the risk. There is more detail about taking account of such "societal concerns" in "Reducing Risks, Protecting People



DESIGN REVIEW PROCESS

Design review. Building design resolves client requirements into a set of instructions for the construction of a building that satisfies those requirements. It tends to follow a relatively consistent process of project definition followed by the iterative development of an increasingly detailed solution

The Port has developed a standardized, four-step Tenant Improvement Process to ensure that all
applicants comply with Port design standards and their lease agreements, thus providing the best
and most effective facilities at PDX. The four steps to the Tenant Improvement Process are as
follows:
1. Pre-Design Orientation Meeting
2. Schematic Design Review
3. Design Development Review
4. Construction Document Review and Port Construction Permit Issuance
Each applicant is required to become familiar with the content and intent of the Port design
standards and all other Port documents applicable to their location. Please contact the

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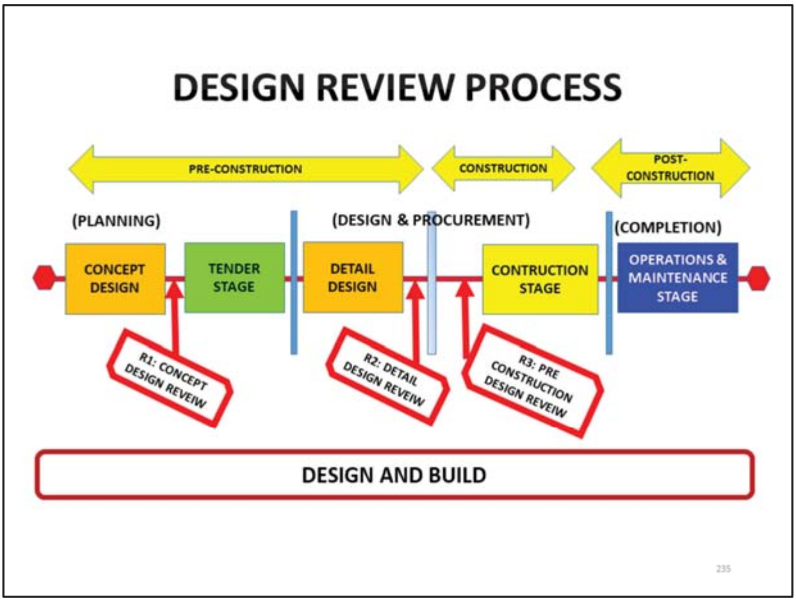
current
Tenant Improvement staff listed on the Port’s website or your Property Manager for these
documents. Each applicant shall require their design team and contractors to become familiar with
these documents, and to monitor design and construction activities as necessary to ensure
compliance. Please note that applicants are also required to comply with the applicable regulations
of other governing bodies, including the City of Portland, Multnomah County, the State of Oregon,
and the Federal Aviation Administration (FAA). The Americans with Disabilities Act (ADA) also
applies to development at PDX.
Each step of the Tenant Improvement process must be completed as outlined on the following
pages. Each step will be reviewed separately based upon the applicant’s submission package

The
Tenant Improvement Process is the Port’s official review of the applicant’s proposal, and is typically
mandatory process as outlined in lease agreements. All approvals and comments will be distributed
to the applicant in writing. The applicant may not proceed to the next step in the Tenant
Improvement Process until approval of the previous step is received from the Port. The Tenant
Improvement Process is coordinated by the Site and Facilities Design Section of the Port’s Planning
and Development Department, who can be contacted with questions or to make an appointment.
The Tenant Improvement stakeholder team consists of various Port employees from the Planning,
Business and Properties, Engineering, Operations, and Security departments, as well as others as
required by the type and complexity of the project. The Port’s Tenant Construction Permit process
is administered by the Aviation Tenant Construction Office; this process is discussed later in this
document.



DESIGN REVIEW PROCESS

Design development is the process of:

• Developing a clear and common understanding of the need/problem with the project sponsor,
• Understanding the required outcomes specified in the functional specification,
• Identifying the solution options to satisfy the needs/ problem articulated in the project proposal/functional specification,
• Selecting the preferred solution option that satisfies the needs and specified outcomes,
• Developing the preferred option through to the completion of detailed design, and
• Establishing a construction contract.

The design development process is a continuum

that relies on proper planning to ensure that all of the necessary data, information and considerations are available when required to maximize the efficiency of the process, and to avoid or at least minimize the potential for rework. Most projects will require community (or at least targeted) engagement and consultation, data and

information collection, special purpose studies, and investigations to be carried out in order to deliver a quality outcome with stakeholder approval. Some investigations and studies may identify further investigation and studies for specific purposes, e.g. for rare and endangered species. This is mainly associated with major projects but when required it could result in unavoidable rework.

Standard inputs to the design development process are:

- The Project Proposal (R1001),
- Relevant pre-project information, including known risks,
- Technical design details - Design Development Report (Form M4211 or M4212),
- Functional Specification or Brief,
- Engineering survey, and
- Reports from consultation, investigations and studies.

Standard Design Development Process Deliverables are:

- Options Analysis Report, including Templates R1002 or R1004 or R1005, as appropriate
- Business Case Report, including Template R1003 or R1004 or R1005, as appropriate, including Project Proposal Report for National Highways
- A Project Planning Report
- Detailed Design Report
- Scheme Prototype
- Completed Design Development Report (Form M4211 or M4212) Completed Risk Management Record (Form M4213)

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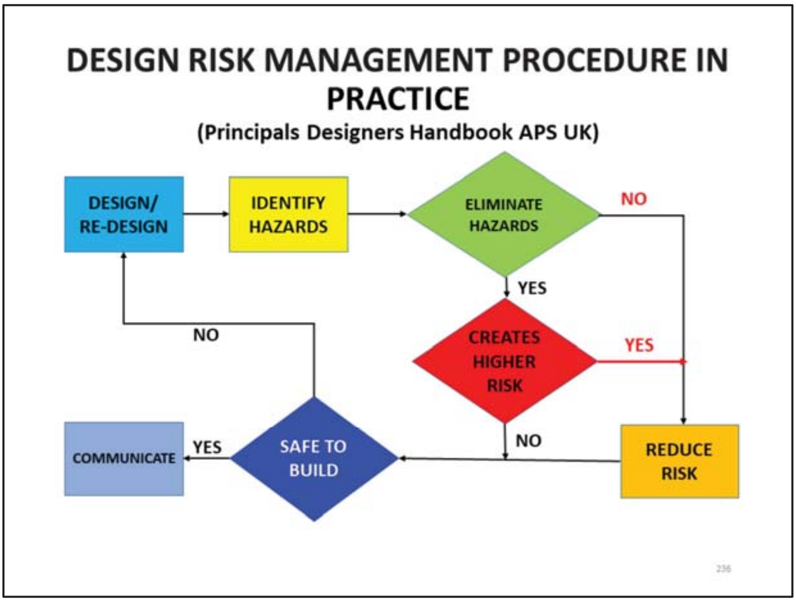

The new CDM regulations came into force on 6 April 2015 changing the face of construction health and safety risk management on construction projects, large and small. This handbook has been specifically written to provide straightforward, practical and easy-to-read guidance to anyone undertaking the new principal designer role. It is primarily aimed towards the needs of the sole practitioner or small/medium sized practices who offer principal designer services, either as a stand-alone service or in addition to other design services.

The Handbook is a quick, first point of reference for both new principal designers and experienced design risk practitioners and will help the industry achieve a proportionate response to health and safety design risk management in the pre-construction phase by helping those who have sufficient health and safety skill, knowledge and experience carry out the principal designer role, where they feel confident to do so.

The Principal Designer Handbook covers:

- **The principal designer role – provides an overview of the role; details the key responsibilities; and outlines how they differ on commercial and domestic projects.**
- **The principal designer in practice – includes details on fees and appointments; pre-construction information; design risk management; and how to prepare a health**

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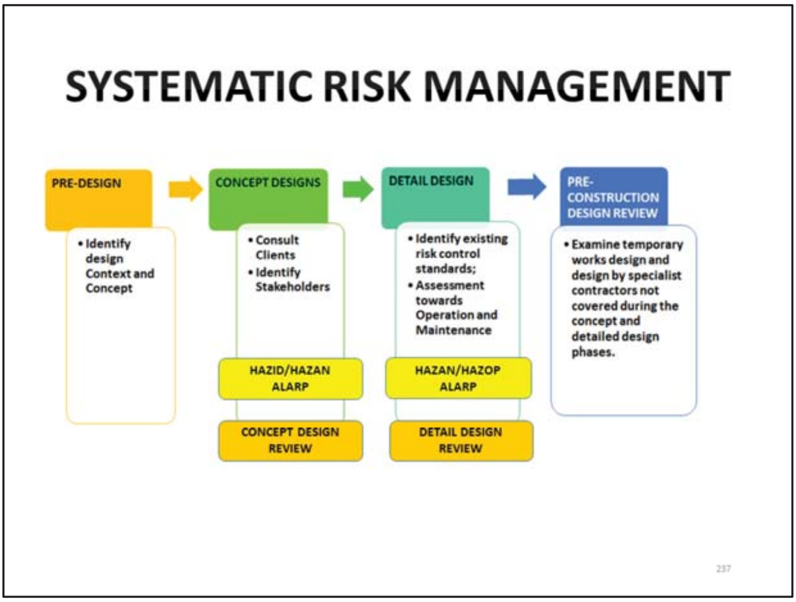
and safety file.

- **Liaison with the principal contractor – includes details of the construction phase plan; the continuing liaison required during the construction phase; and guidance on the defects liability period.**
- **Standard and exemplar documents – includes fees and appointment worked examples; examples of a health and safety file; and other useful templates which will be modified and updated as experience of the Regulations develop**
- **The key CDM roles – outlines the key roles and responsibilities for the Client, Designer, Principal Designer, Principal Contractor, Contractors, Workers, and CDM Advisor.**

The new Construction Design and Management (CDM) regulations 2015 came into force on 6 April, following a five-year evaluation of the CDM regulations 2007.

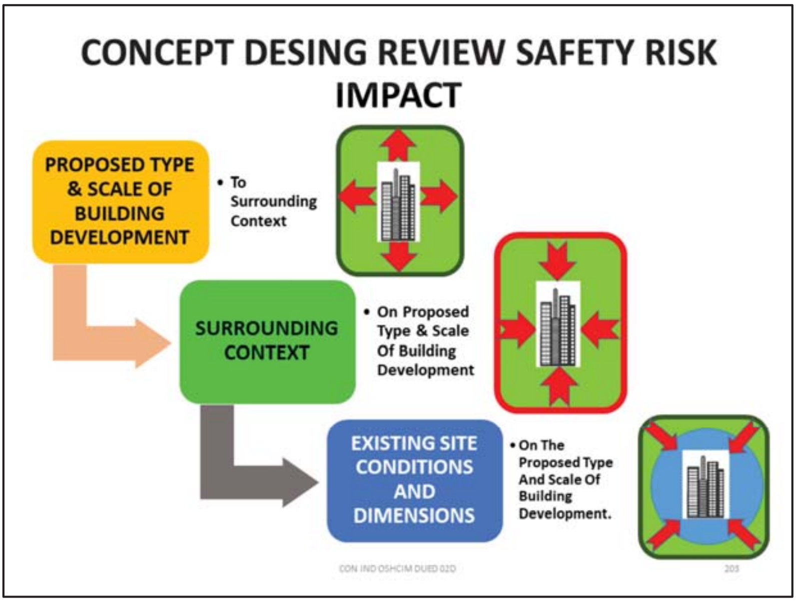
Whatever your role in construction, CDM aims to improve health and safety in the industry by helping you to:

- **sensibly plan the work so the risks involved are managed from start to finish**
- **have the right people for the right job at the right time**
- **cooperate and coordinate your work with others**
- **have the right information about the risks and how they are being managed**
- **communicate this information effectively to those who need to know**
- **consult and engage with workers about the risks and how they are being managed**



SYSTEMATIC RISK MANAGEMENT

Systematic risk management is expecting the unexpected – it is a tool which helps control risks in construction projects. Its objective is to introduce a simple, practical method of identifying, assessing, monitoring and managing risk in an informed and structured way. It provides guidance for implementing a risk control strategy that is appropriate to control construction projects at all levels. This paper will review systematic management approaches to risk. It discusses the allocation of risk and suggests that risk needs to be identified and managed early in the procurement process. In addition, a case study of a small project that was affected by difficult economic circumstances is included to demonstrate the effectiveness of systematic risk management.



Design work exhibits high degrees of both organisational and technological complexity. This complexity is evident in three domains, each of which is elaborated below: first, the structure of work (collaborating parties); second, the structure of information (knowledge transactions); and third, the structure of governance (contractual arrangements) actually in place (Lingard et al., 2007).

1. The structure of work

Safety in design is often described and defined relatively simply. However, the operating context for safety in design is intricate. Distinguishing elements of the construction design process include:

• complex inter organisational relationships
• sub clustering
• information dependencies, and
• considerable division of Labour.

Researchers often fail to:

• appropriately differentiate the design functions applied at each stage in delivering a building, and
• recognize that control and influence over design frequently rests with parties other than the principal designer or architect. Construction design teams are 'temporary,

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multidisciplinary and network-based organizations' (den Otter & Emmitt, 2008, p122). Design entails:

• a network of tasks that rely on contributions from a range of specialists, and the activation of a complex 'web' of inter-organisational relationships. It is difficult to sustain the view that design decisions are the sole preserve of 'the designer' – an abstract, undefined socio-technical role. In the construction industry, suppliers and subcontractors are often the parties that display innovation and independent decision making in designing and manufacturing specialized building components (Gray & Flanagan, 1989; Slaughter, 1993).

Construction is characterized by increasing product complexity and specialist contractors are often responsible for the detailed design of specific building elements (Haviland, 1996). Wright et al. (2003) concede that safety in design solutions are often driven by building systems manufacturers rather than by principal design consultants. Lingard et al. (2012; 2013) have presented a series of in-depth Australian construction industry case studies. The case study analysis reveals that external project stakeholders (for example, regulatory bodies and local authorities) played substantial roles in shaping design decisions, and influenced design decisions that had a positive impact on the H&S of construction workers.

2. The structure of information

Construction design work is complex and iterative. It is not simple and linear. Responsibility for a multitude of component parts is difficult to pinpoint.

Design tasks are situated in complex, interconnected networks that require active engagement from many specialists. The design process depends on information exchange and frequent, detailed interactions among specialists to ensure that a building/structure's components are compatible – they must fit together. Austin et al. (2000) analysed four typical building designs. They found that the building design process encompassed 7-10

literative loops, each involving 5-30 interrelated loops. There were around Safety in design approaches often superimpose on design activity a standard H&S risk management process. The expectation is that, prior to specific 'hold points' in developing a design:

• protocols for hazard identification will be prepared
• risk assessment will be undertaken, and
• appropriate risk controls will be selected.

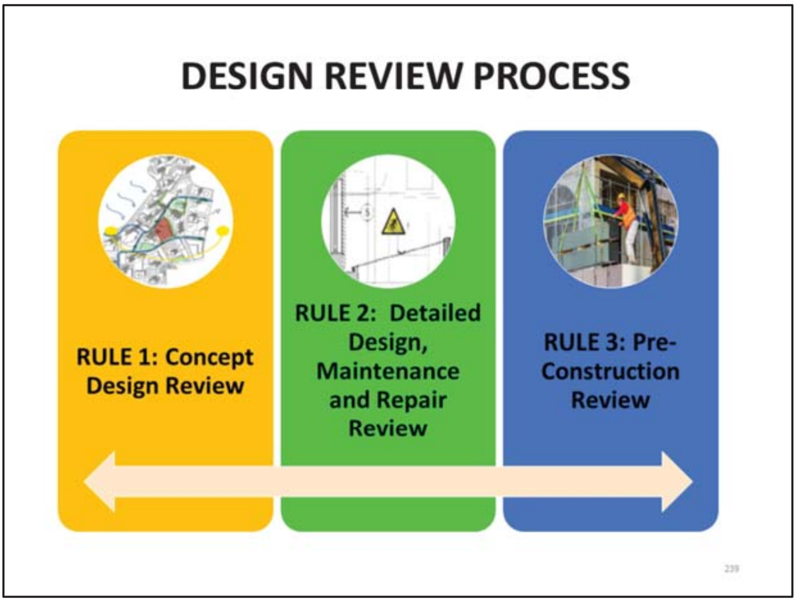
Standard H&S risk management assumes that all hazards will be clearly identified at the initiation of a linear risk management process. (A hazard is defined as conditions that have the potential to cause harm). The consequence of this approach is that if a hazard is not identified at the first step, it is excluded from any subsequent H&S risk analysis which assesses the likelihood that harm will eventuate, and the consequence of that harm. In effect, standard H&S risk management processes are blind to emergent hazards Standard risk management processes also assume that a project can be decomposed into its constituent parts and that controls can be implemented for risks

inherent in each part.

Decomposition is found in commonly accepted methods for managing:
• project scope (work breakdown structures and milestone plans)
• project time performance (project networks, and project evaluation and review techniques), and
• project costs (cost breakdown structures and earned value analysis).

However, Cooke-Davies et al. (2007) put the view that decomposition models are ill suited to analysing complex, nonlinear, dynamic systems, such as construction projects. Pavard and Dugdale (2006) argue that decomposition models have limited practical application to complex systems. For construction design work, it is arduous (and perhaps not feasible) to decompose system elements into design functions, professional contributions, or logical
'steps'. The system elements are in continuous interaction with one another, and with the external environment. Continuous interaction generates emergent properties, which in turn trigger emergent risks. Even a good understanding of component parts cannot guarantee that emergent properties and risks can be identified or anticipated.

3. The structure of governance
The governance structure of a construction project has significant implications for design responsibilities. Commercial and contractual relationships that stipulate the allocation of risk and resources have an effect on decision making and the distribution of responsibilities among parties (client/promoter, designer, contractor, specialist contractors/consultants). The role of each project participant varies according to the chosen project delivery strategy. A 'design and build' approach offers a natural opportunity to incorporate H&S in design.



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DESIGN REVIEW PROCESS OVERVIEW

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 1 records hazards and risk arising from the design and description of the risk control measures to be taken of**
    - (e.g., materials used, structural concepts, and safe system of work considered)

RULE 2: DETAILED DESIGN, MAINTENANCE AND REPAIR REVIEW

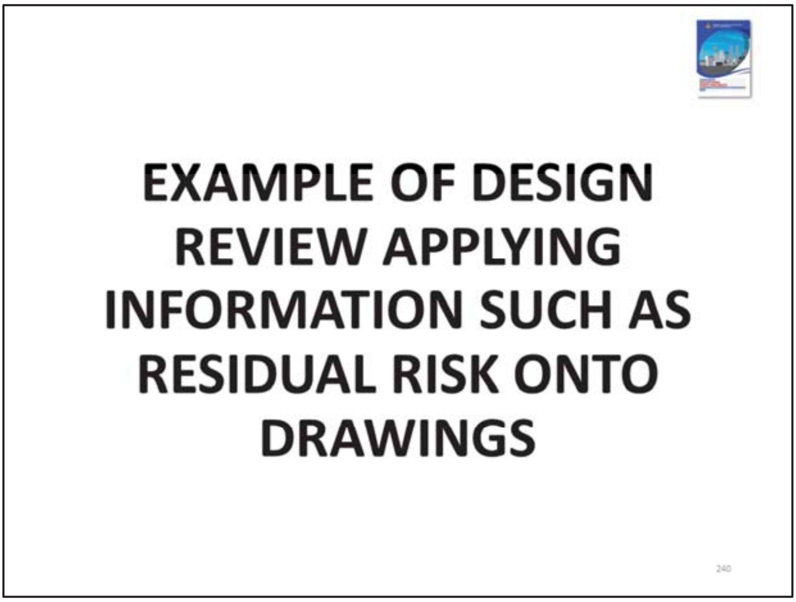
- **Detailed design, operations, maintenance and repair review should look at a building's detailed architectural and structural design.**
- **The review should determine risks involved in the construction methods, access and egress, and whether the design will create confined space or other hazards.**
- **Risks related to maintenance and repair of a building, such as cleaning methods, should also be studied.**
- **RULE 2 records risks and measures such as:**
    - Information provided by Contractor on mitigation of risks and hazards;
    - Residual hazards brought over to the maintenance phase; and
    - **Maintenance methods of the building, structure or equipment.**

For D&B contracts which the Contractor is in-charge of the project's design.

- **RULE 2 should be done with the Contractor's input.**
- **The Contractor can then highlight constraints that he or she will face when constructing the building or structure.**
- **This would further help in the DR process.**

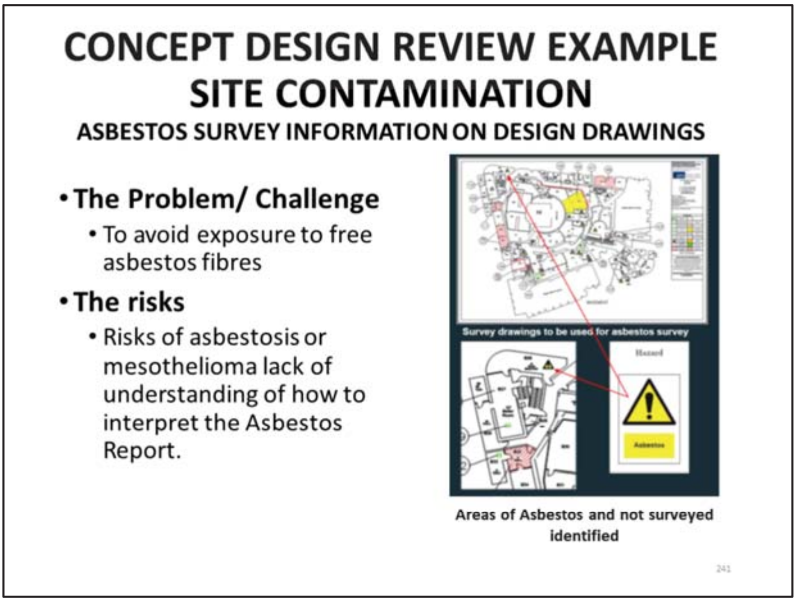
RULE 3: PRE-CONSTRUCTION DESIGN REVIEW

- **Pre-construction design review should examine temporary works design and design by specialist contractors not covered during the concept and detailed design phases.**
- **RULE 3 records risks and risk control measures for CRITICAL RSK activities such as:**
    - Shoring, trenches and deep excavation;
    - Heavy lifting; multiple load;
    - Confined spaces; and
    - Formwork and false work.



Module 7: EXAMPLE OF DESIGN REVIEW APPLYING INFORMATION SUCH AS RESIDUAL RISK ONTO DRAWINGS

Project development is an iterative and inclusive process that should consider the lifecycle of a project; from concept to detailed design, construction and then go onto consider the future use; maintenance, refurbishment and demolition of their project. The Safety in Design process should not stifle innovative design in fact it is an opportunity for designers to stretch the boundaries of the industry to create a practical pragmatic design solution.



CONCEPT DESIGN REVIEW EXAMPLE SITE CONTAMINATION ASBESTOS SURVEY INFORMATION ON DESIGN DRAWINGS

As a designer you will need to take account of the general principles of prevention when preparing or modifying your design including:

- **Workers, or anyone else who may be affected during construction.**
- **Those who may maintain or clean the building once it is built.**
- **Those who use the building as a workplace.**
- **Health and safety risks must be considered alongside other factors that influence the design:**

❖ **- Such as cost**
❖ **- Fit for purpose**
❖ **- Aesthetics**
❖ **- Environmental impact**

• When considering health and safety risks, you are expected to do what is reasonable at the time that the design is prepared, taking into account current industry knowledge and practice.
• Risks that cannot be addressed at the initial stage of a project should be reviewed later on, during the detailed design stage.
• You should take into account the requirement for maintenance, cleaning and access to the finished project.
• The level of detail required in passing on information about risks should be

proportionate to the risks involved.

• Insignificant risks can usually be ignored, as can risks arising from routine construction activities, unless the design compounds or significantly alters these risks

- **The Problem/ Challenge**

To avoid exposure to free asbestos fibers

- **The risks**

Risks of asbestosis or mesothelioma lack of understanding of how to interpret the Asbestos Report.

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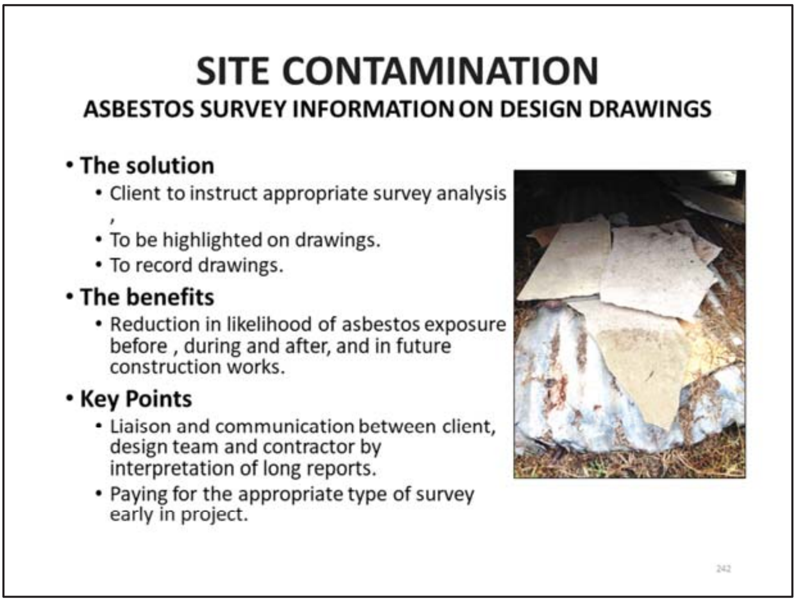

ASBESTOS SURVEY INFORMATION ON DESIGN DRAWINGS

This guidance has been prepared by the Health and Safety Executive (with the help of others, see Acknowledgements) to help people carrying out asbestos surveys and those with specific responsibilities for managing the risks from asbestos in non-domestic premises under regulation 4 of the Control of Asbestos
Regulations 2012 (CAR 2012).

1. It is also designed to provide guidance in situations where surveys may be carried out for other purposes, eg for 'managing' asbestos in domestic premises under wider health and safety legislation and for meeting the requirements of the Construction (Design and Management) Regulations 2007 (CDM).

2.It complements and supports other guidance on managing asbestos.3-5 2 Large amounts of asbestos-containing materials (ACMs) were used for a wide range of construction purposes in new and refurbished buildings until 1999 when all use of asbestos was banned. This extensive use means that there are still many buildings in Great Britain which contain asbestos. Where asbestos materials are in good condition and unlikely to be disturbed they do not present a risk. However, where the materials are in poor condition or are disturbed or damaged, asbestos fibers are released into the air, which, if breathed in, can cause serious lung diseases, including cancers.

3. Workers who disturb the fabric of buildings during maintenance, refurbishment, repair, installation and related activities may be exposed to asbestos every time they unknowingly work on ACMs or carry out work without taking the correct precautions. The purpose of managing asbestos in buildings is to prevent or, where this is not reasonably practicable, minimize exposure for these groups of workers and other people in the premises. To prevent this exposure, information is needed on whether asbestos is, or is likely to be, present in the buildings, so that an assessment can be made about the risk it presents and appropriate measures put in place to manage those risks.

4 .This guidance is aimed at:
n Surveyors who carry out asbestos surveys. It sets out how to survey premises for ACMs. In particular, it specifies the methodology to use in carrying out surveys and how to report and present the results. It also gives advice on how to recognise and sample suspected ACMs. In doing so, the guidance builds on and updates MDHS100 Surveying, sampling and assessment of asbestos containing materials, which it replaces. It also contains a specific section which outlines the survey strategy to use when surveying large numbers of similar properties (eg domestic housing). Those who commission surveys (eg clients/dutyholders). It sets out how to decide what type of survey is appropriate, how to select a competent surveyor, what the client should expect from a surveyor and what the client should provide to the surveyor. It also highlights issues (eg restricted access, excluded areas and other caveats) which not only reduce the effectiveness of the survey, but also have serious implications for managing asbestos. It also explains what checks should be made on the survey report to ensure its validity and accuracy (ie 'contract management')
The guidance will also be useful to building professionals, such as architects, designers, building surveyors and particularly demolition and asbestos removal contractors. For example, architects and building surveyors need to be aware of the requirement to carry out asbestos buildings surveys (and indeed can advise on the need for an asbestos survey before refurbishment and demolition projects). They should also be aware of the various types of surveys and be able to review completed surveys. Contractors need to be able to interpret asbestos surveys so that refurbishment or demolition can be planned and carried out safely. 6 The guidance does not cover airborne sampling or surveying contaminated land. These are specialised subjects outside the scope of this document.

The solution
Client to instruct appropriate survey analysis ,
To be highlighted on drawings.
To record drawings.
The benefits
Reduction in likelihood of asbestos exposure before , during and after, and in future construction works.
Key Points
Liaison and communication between client, design team and contractor by interpretation of long reports.

Paying for the appropriate type of survey early in project.

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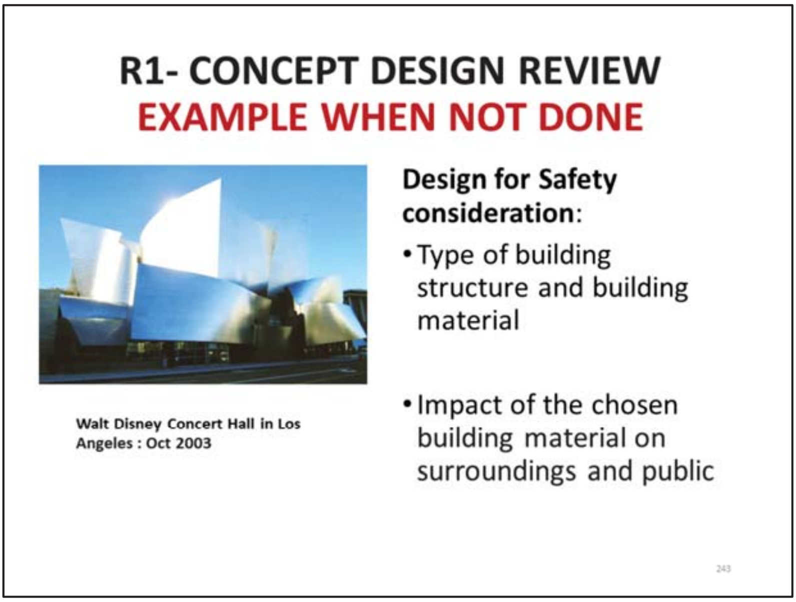

R1- CONCEPT DESIGN REVIEW EXAMPLE WHEN NOT DONE

Design for Safety consideration:
Type of building structure and building material

Impact of the chosen building material on surroundings and public

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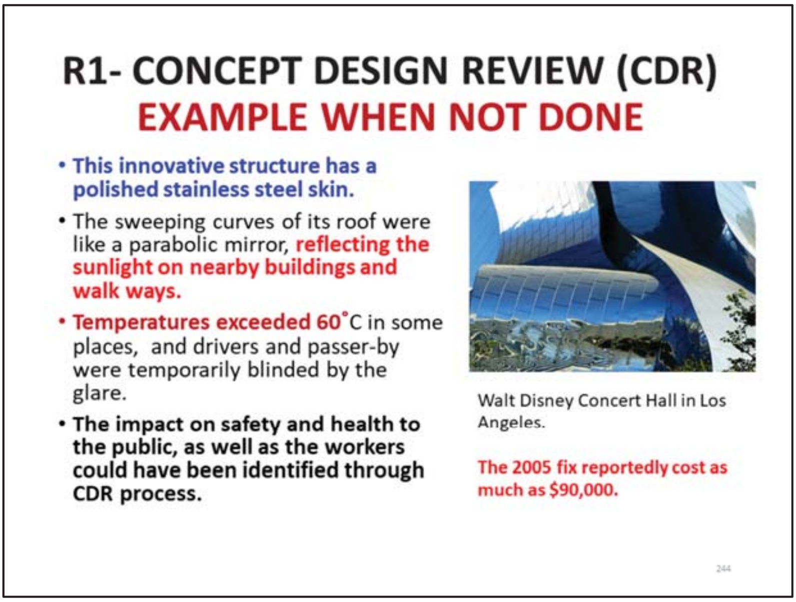


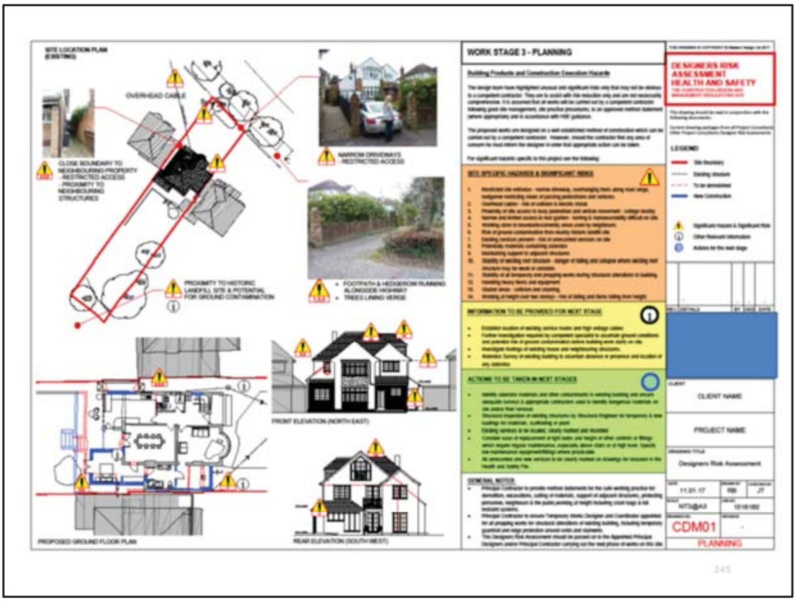
R1- CONCEPT DESIGN REVIEW (CDR) EXAMPLE WHEN NOT DONE

This innovative structure has a polished stainless steel skin.

The sweeping curves of its roof were like a parabolic mirror, reflecting the sunlight on nearby buildings and walk ways.

Temperatures exceeded 60˚C in some places, and drivers and passer-by were temporarily blinded by the glare.

The impact on safety and health to the public, as well as the workers could have been identified through CDR process.



Example of use of RAG List onto layout.
Everything can be shown on one drawing

When designing projects with the avoidance of risk in mind designers should apply the Hierarchy of Risk Control and the General Principles of Prevention. This is a series of steps to be followed when designing to eliminate and reduce risk by their design decisions, as follows:

Consider whether it is possible to eliminate or control the hazard and the resulting risk by designing it out, i.e. design the roof with permanent safety rails.
Next consider whether the risk can be combated in the design i.e. change design of items to be lifted to incorporate attachment points for lifting.
Next consider measures to control risk to all the workers i.e. design a one way system for vehicles visiting the site.
Only as a last resort should it be necessary to control risk by means of personal protection.
The General Principles of Prevention are the same in CDM as they are within the Management of Health and Safety at Work Regulations 1999.

Should risks remain which are not reasonably practicable to avoid after the application of the above hierarchy, then information needs to be given about them.

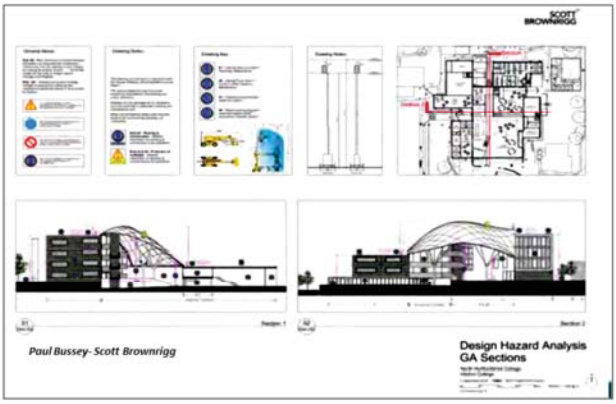
This information should be included with the design and included within the Pre-Construction Information to warn others of risks about which they cannot reasonably be expected to know.

In August 2010 the HSE re-published on their web site the red, amber and green lists. The red, amber and green lists (RAG Lists) are practical aides to designers on what to eliminate/avoid, and what to encourage. The HSE are keen to stress these are not "right" or "wrong" ideas but are a basis for a debate forum to take design safety onto the next level, and can be amended to be more specific to what a particular design organisation does

The findings of the preliminary design review are applied to the detailed design effort over a three to five month time frame, which includes system and component analyses, test plans and draft procedures, manufacturing drawings and plans, and product support plans. Detailed 3D drawings of the subsystem are prepared along with detailed integration information, such as expansion/contraction, system level connections, configurations, interface and controls. Final material selections are made, and machine tolerances are evaluated. This phase concludes with a one to two day in-person detailed design review (DDR) meeting

Maintenance corridor on external facades
Area of safety and health concerns
Routine maintenance work and planting work at the external of the building.
Falling from heights.
Identify the special risk problems
workers accessing the work area and performing their work tasks.
Improvement in design
Maintenance corridors are provided at typical floors.
Maintenance corridors are wide
Safe and easy access for the workers to the areas to maintain soft landscape or
Provision protective barriers to minimize the hazards of falling.

EXAMPLE OF DETAIL DESIGN REVIEW FOR O&M



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DESCRIBE the O&M plan layout constructions

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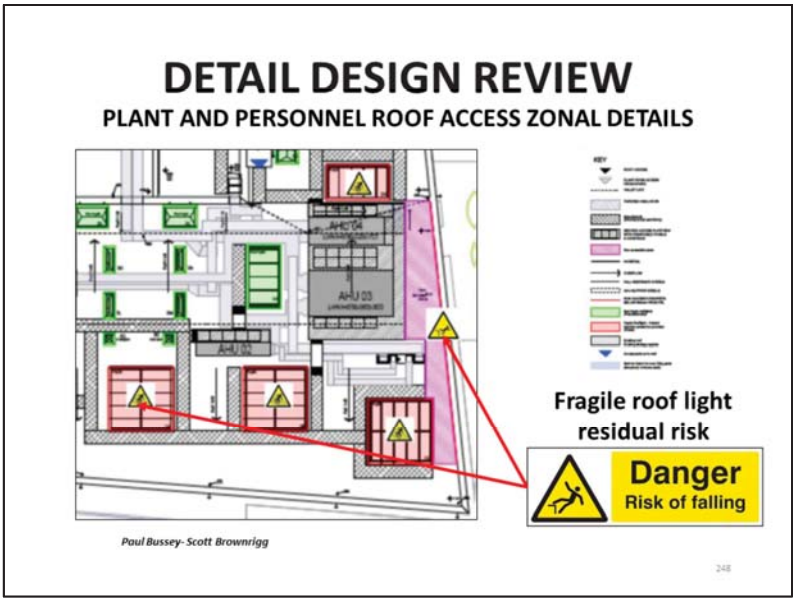

1. DESCRIBE THE GRAPIC LAYOUT PLAN.
2. NEXT DESCRIBE THE WA RNING LABLE ON THE LAYOUT DESCRBING RESIDUAL RISK OF FALLING

Space, and the cost of providing space, for plant and building services distribution is often at a premium. Pressure to reduce the spatial requirements for building services installations is therefore an understandable element of the
overall design process. However, considerable care is required if building services are to be designed and installed to provide adequate space for the safe and efficient maintenance of the installations. Difficulties can arise with meeting statutory levels of access to safely maintain the installation if space is inadequate. In extreme cases a significant amount of additional work may have to be undertaken after completion of the building to ensure compliance with statutory requirements. Even when safe access is provided, access to component parts can be so restricted that the cost of maintaining these parts imposes a significant additional operating cost on the maintenance of the building, e.g. if part of the system or plantroom enclosure has to be dismantled.

Where a component needs regular replacement during the life of the building, consideration must be given to how this is to be achieved without incurring excessive cost in the dismantling of large sections of the installation or building fabric to facilitate removal.

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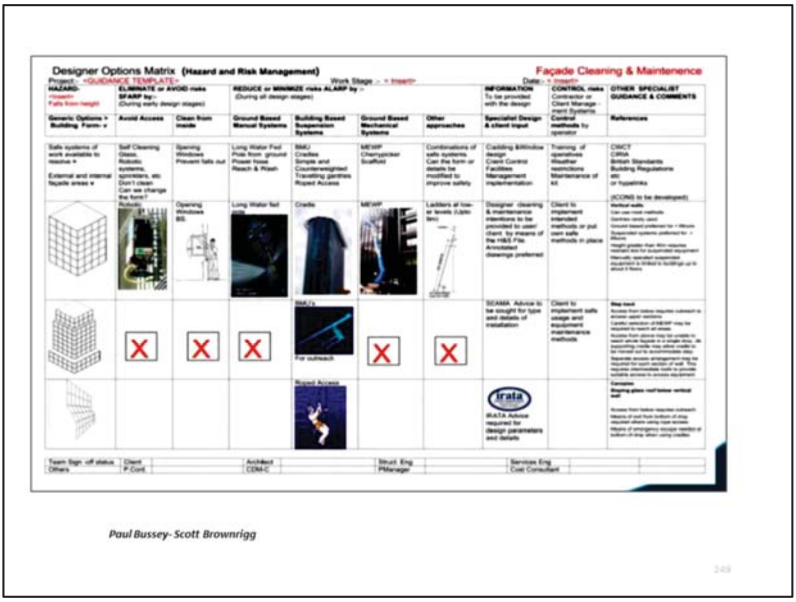

DESCRIBE the design risk matrix assessment table.

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R3 – PRE-CONSTRUCTION DESIGN REVIEW

Zone R3 is a zone where multi dwelling housing is appropriate and encouraged. Multi dwelling housing can take the form of townhouses or villas, but residential flat buildings are prohibited. The zone also allows for some other compatible uses including childcare centers, neighborhood shops and places of public worship. The R3 Medium Density zone facilitates a more dense urban form than the R2 zone and provides a transition between areas of single dwellings and residential flats

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.**
- **Height controls are no longer expressed in stores. Heights of buildings are controlled through a maximum number of metres which is mapped. The maximum height in the R3 zone is generally 9 m.**
- **The FSR in R3 is generally 0.7:1; however some areas have higher densities. Please refer to the floor space ratio maps for site specific controls.**

- **Developments in R3 must provide a minimum 30% landscaped area, which does not include any paved area.**

- **The minimum lot size in R3 is generally 550m2 or 700m2 for internal lots. These lots must have a minimum road frontage of 15m at the building line and must be a minimum of 27m deep. Please refer to the lot size maps for site specific controls.**

- **Note: Clause 4.3 and 4.4 should also be consulted to determine whether there are exceptions to the development standards.**

HEALTH HAZARDS

- All chemicals we use can potentially cause harm to our health so its very important that we understand what that hazards are and how to prevent exposure. There are four main classes of health hazard namely corrosive, toxic, harmful and irritant. These are then sub-divided into different categories depending on the degree of danger and assigned specific hazard statements

- Although safety hazards related to the physical characteristics of a chemical can be objectively defined in terms of testing requirements (e.g. flammability), health hazard definitions are less precise and more subjective. Health hazards may cause measurable changes in the body - such as decreased pulmonary function. These changes are generally indicated by the occurrence of signs and symptoms in the exposed employees - such as shortness of breath, a non-measurable, subjective feeling. Employees exposed to such hazards must be apprised of both the change in body function and the signs and symptoms that may occur to signal that change.

- The determination of occupational health hazards is complicated by the fact that many of the effects or signs and symptoms occur commonly in non-occupationally exposed populations, so that effects of exposure are difficult to separate from normally occurring illnesses. Occasionally, a substance causes an effect that is rarely

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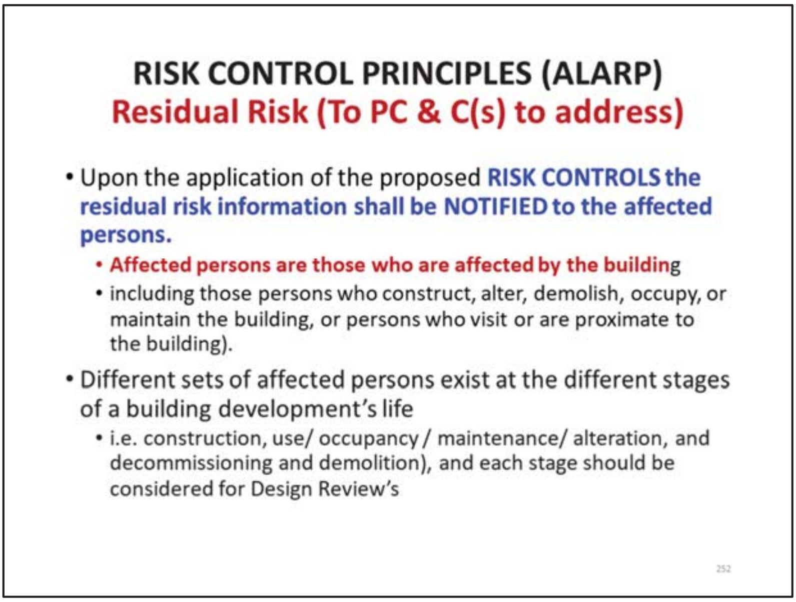
seen in the population at large, such as angiosarcomas caused by vinyl chloride exposure, thus making it easier to ascertain that the occupational exposure was the primary causative factor. More often, however, the effects are common, such as lung cancer. The situation is further complicated by the fact that most chemicals have not been adequately tested to determine their health hazard potential, and data do not exist to substantiate these effects.

- There have been many attempts to categorize effects and to define them in various ways. Generally, the terms "acute" and "chronic" are used to delineate between effects on the basis of severity or duration. "Acute" effects usually occur rapidly as a result of short-term exposures, and are of short duration. "Chronic" effects generally occur as a result of long-term exposure, and are of long duration



RISK CONTROL PRINCIPLES (ALARP)
Residual Risk (To PC & C(s) to address

Thus, determining that risks have been reduced ALARP involves an assessment of the risk to be avoided, of the sacrifice (in money, time and trouble) involved in taking measures to avoid that risk, and a comparison of the two.

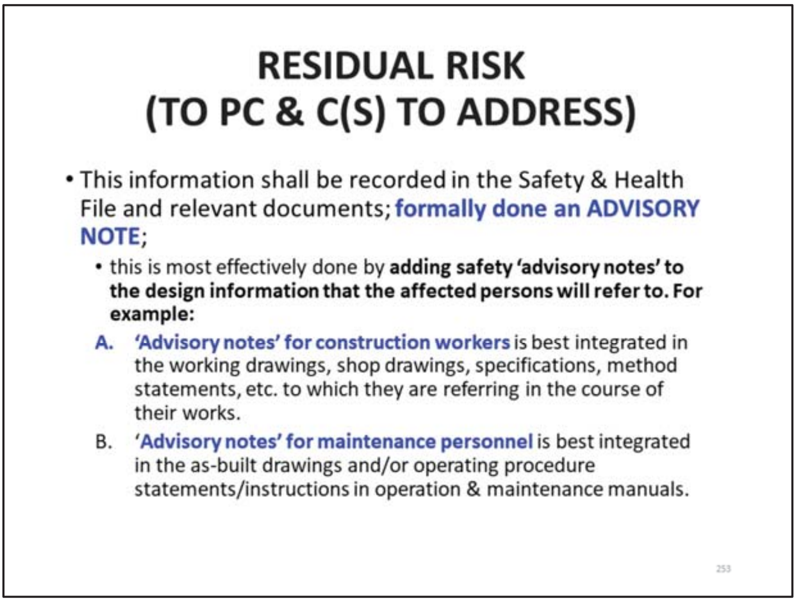
This process can involve varying degrees of rigour which will depend on the nature of the hazard, the extent of the risk and the control measures to be adopted. The more systematic the approach, the more rigorous and more transparent it is to the regulator and other interested parties. However, duty-holders (and the regulator) should not be overburdened if such rigour is not warranted. The greater the initial level of risk under consideration, the greater the degree of rigour HSE requires of the arguments purporting to show that those risks have been reduced ALARP.

- **Upon the application of the proposed RISK CONTROLS the residual risk information shall be NOTIFIED to the affected persons.**

- **Affected persons are those who are affected by the building including those persons who construct, alter, demolish, occupy, or maintain the building, or persons who visit or are proximate to the building).**

- **Different sets of affected persons exist at the different stages of a building development's life**

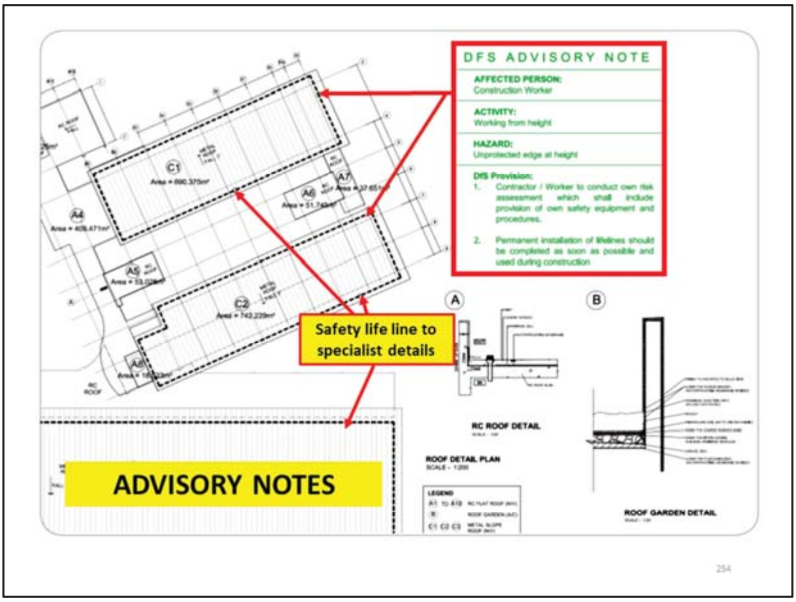
i.e. construction, use/ occupancy / maintenance/ alteration, and decommissioning and demolition), and each stage should be considered for Design Review's



RESIDUAL RISK
(TO PC & C(S) TO ADDRESS)

This information shall be recorded in the Safety & Health File and relevant documents; formally done an ADVISORY NOTE;

- **this is most effectively done by adding safety 'advisory notes' to the design information that the affected persons will refer to. For example:**
- **'Advisory notes' for construction workers is best integrated in the working drawings, shop drawings, specifications, method statements, etc. to which they are referring in the course of their works.**
- **'Advisory notes' for maintenance personnel is best integrated in the as-built drawings and/or operating procedure statements/instructions in operation & maintenance manuals.**



ANIMATE

1. **ADVISORY NOTE PRESCRIBED ON PLANS**
2. **NOTES ON SAFETY ISSUES-SAFETY LIFE LINE**

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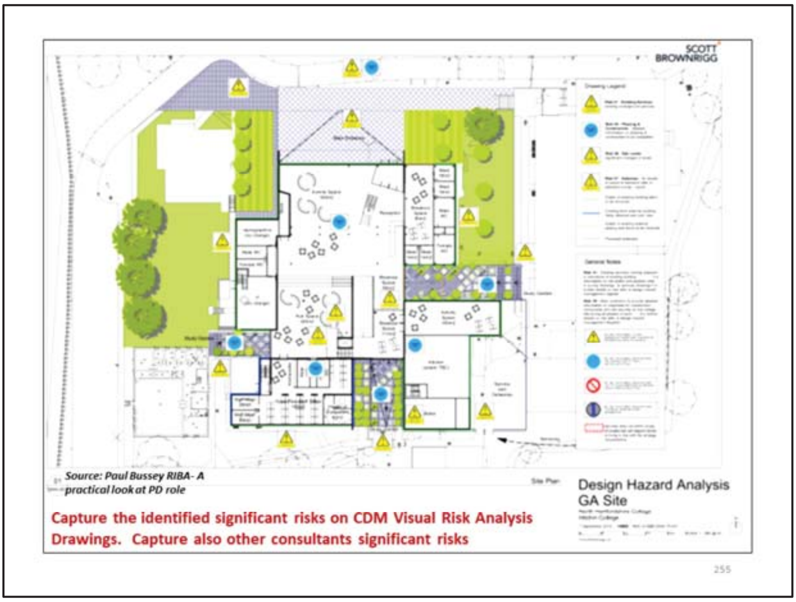
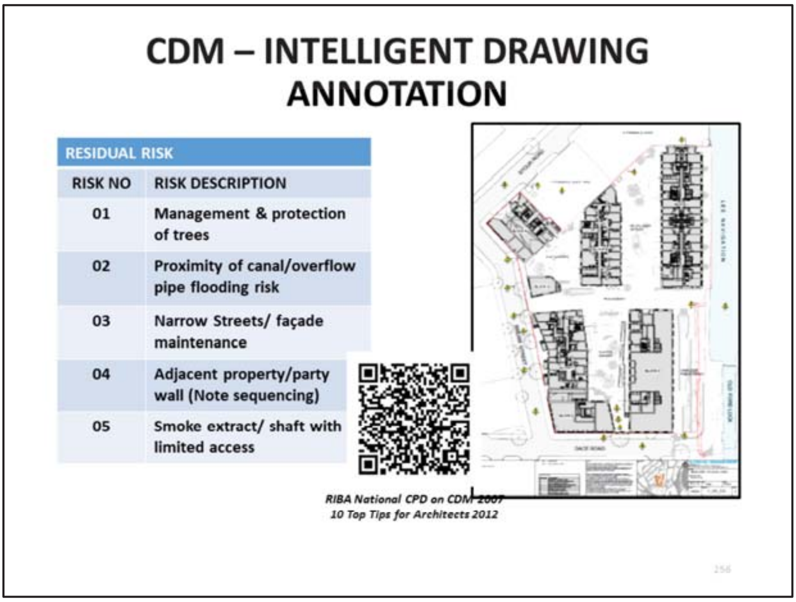


Design Hazard Analysis
Capture the identified significant risks on CDM Visual Risk Analysis Drawings. Capture also other consultants significant risks

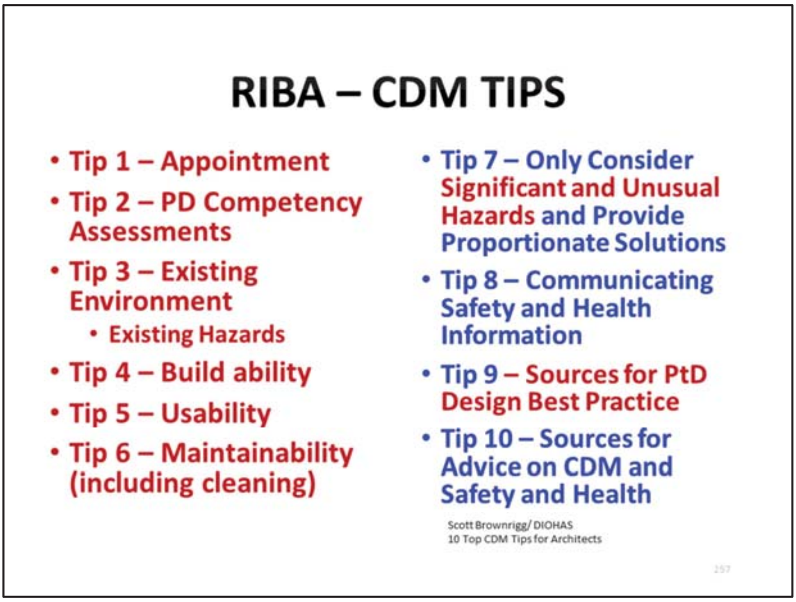


CDM – INTELLIGENT DRAWING ANNOTATION

Many different types of drawing can be used during the process of designing and constructing buildings. Some of the more commonly-used types of drawing are listed below, with links to articles providing further information.

On building projects, it is common for changes to be made during construction because of circumstances that emerge on site. As a result, it is common for as-built drawings to be prepared, either during the construction process or when construction is complete, to reflect what has actually been built.

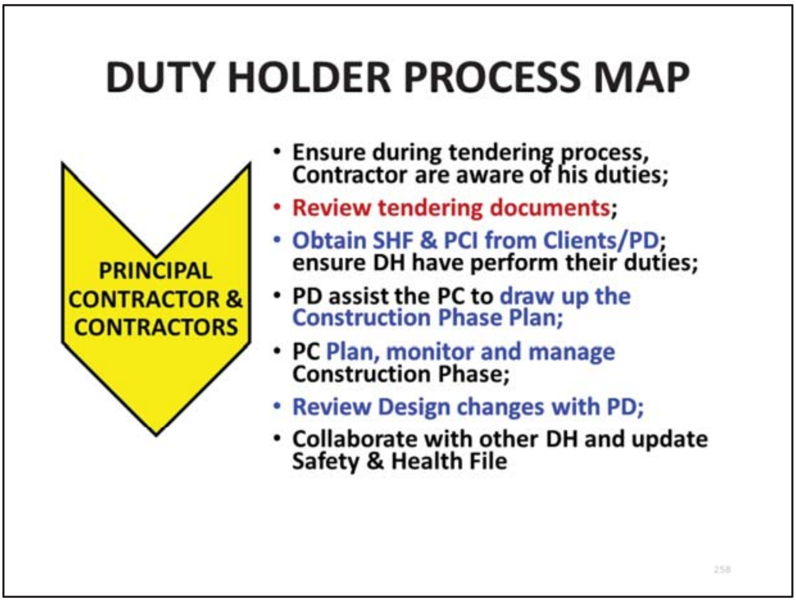
The contractor will generally mark up changes to the 'final construction issue' drawings on-site using red ink, and these can then be used by the consultant team to create record drawings showing the completed project



ANIMATE AND DESCRIBE

1. **RIBA ROYAL INSTITUTE OF BRISTISH ARCHITECT (RIBA)**
2. **LIST THE PD TIPS FOR CDM**
3. **DESCRIBE EACH LIST**

1) **T1 – TIMELY & FORMALIZE AGREEMENT & SCOPE**
2) **T2 – GOOD GOVERNANCE ON SELECTION TOWARDS VALIDITY & RELEVANCE**
3) **T3 – PR SHOILD BE VERY AWARE AND FAMILIR OF PROJECT HAZARDS**



DUTY HOLDER PROCESS MAP

- **Ensure during tendering process, Contractor are aware of his duties;**
- **Review tendering documents;**
- **Obtain SHF & PCI from Clients/PD; ensure DH have perform their duties;**
- **PD assist the PC to draw up the Construction Phase Plan;**
- **PC Plan, monitor and manage Construction Phase;**
- **Review Design changes with PD;**
- **Collaborate with other DH and update Safety & Health File**

Virtually everyone involved in a construction project has legal duties under CDM 2015. These 'duty holders' are defined as follows.

Client - Anyone who has construction work carried out for them. The main duty for clients is to make sure their project is suitably managed, ensuring the health and safety of all who might be affected by the work, including members of the public. CDM 2015 recognizes two types of client:

commercial clients have construction work carried out as part of their business. This could be an individual, partnership or company and includes property developers and companies managing domestic properties

domestic clients have construction work carried out for them but not in connection with any business – usually work done on their own home or the home of a family member. CDM 2015 does not require domestic clients to carry out client duties as these normally pass to other duty holders

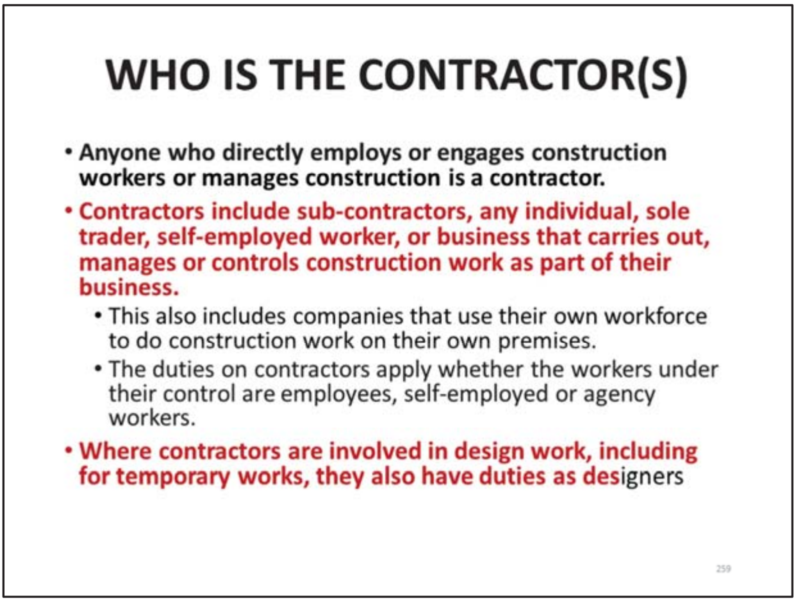
- **Designer - An organization or individual whose work involves preparing or modifying designs, drawings, specifications, bills of quantity or design calculations. Designers can be architects, consulting engineers and quantity surveyors, or anyone who specifies and alters designs as part of their work. They can also include tradespeople if they carry out design work. The designer's main duty is to eliminate, reduce or control foreseeable risks that may arise during construction work, or in the use and maintenance of the building once built. Designers work under the control of a principal designer on projects with more than one contractor.**

- **Principal designer - A designer appointed by the client to control the pre-construction phase on projects with more than one contractor. The principal designer's main duty is to plan, manage, monitor and coordinate health and safety during this phase, when most design work is carried out.**

- **Principal contractor - A contractor appointed by the client to manage the construction phase on projects with more than one contractor. The principal contractor's main duty is to plan, manage, monitor and coordinate health and safety during this phase, when all construction work takes place.**

- **Contractor - An individual or business in charge of carrying out construction work (eg building, altering, maintaining or demolishing). Anyone who manages this work or directly employs or engages construction workers is a contractor. Their main duty is to plan, manage and monitor the work under their control in a way that ensures the health and safety of anyone it might affect (including members of the public). Contractors work under the control of the principal contractor on projects with more than one contractor.**

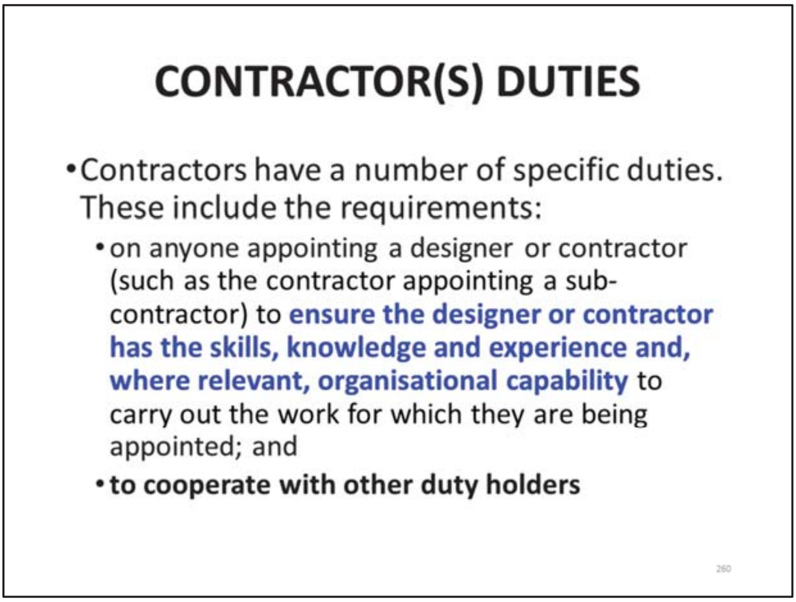
- **Worker - An individual who actually carries out the work involved in building, altering, maintaining or demolishing buildings or structures. Workers include: plumbers, electricians, scaffolders, painters, decorators, steel erectors and laborer's, as well as supervisors like foremen and chargehands. Their duties include cooperating with their employer and other duty holders, reporting anything they see that might endanger the health and safety of themselves or others. Workers must be consulted on matters affecting their health, safety and welfare.**



WHO IS THE CONTRACTOR(S)

- **An individual or business in charge of carrying out construction work (eg building, altering, maintaining or demolishing). Anyone who manages this work or directly employs or engages construction workers is a contractor. Their main duty is to plan, manage and monitor the work under their control in a way that ensures the health and safety of anyone it might affect (including members of the public). Contractors work under the control of the principal contractor on projects with more than one contractor.**

❖ **Anyone who directly employs or engages construction workers or manages construction is a contractor. Contractors include sub-contractors, any individual, sole trader, self-employed worker, or business that carries out, manages or controls construction work as part of their business. This also includes companies that use their own workforce to do construction work on their own premises. The duties on contractors apply whether the workers under their control are employees, self-employed or agency workers. Where contractors are involved in design work, including for temporary works, they also have duties as designers**



CONTR ACTOR(S) DUTIES

❖ **Contractors appointed by the client to coordinate the construction phase of a project where it involves more than one contractor. Plan, manage, monitor and coordinate health and safety in the construction phase of a project. This includes:**

- **liaising with the client and principal designer**
- **preparing the construction phase plan PDF**
- **organizing cooperation between contractors and coordinating their work**

Make sure:

- **suitable site inductions are provided**
- **reasonable steps are taken to prevent unauthorized access**
- **workers are consulted and engaged in securing their health and safety**
- **welfare facilities are provided**
- **Contractors – Those who carry out the actual construction work, contractors can be an individual or a company.**
- **Plan, manage and monitor construction work under their control so it is carried out without risks to health and safety.**

For projects involving more than one contractor, coordinate their activities with others in the project team – in particular, comply with directions given to them by the principal designer or principal contractor.

Contractors have a number of specific duties. These include the requirements:

- **on anyone appointing a designer or contractor (such as the contractor appointing a sub-contractor) to ensure the designer or contractor has the skills, knowledge and experience and, where relevant, organisational capability to carry out the work for which they are being appointed; and**
- **to cooperate with other duty holders**

1. MAKING CLIENTS AWARE OF THEIR DUTIES

- ❑ Contractors should not carry out any construction work on a project unless they are satisfied that the client is aware of the duties the client has under these guidelines.

In cases where the contractor is the only one involved,

- ❑ they should liaise directly with the client to establish this.
- ❑ Liaison can be done as part of routine business during early meetings with the client to discuss the project.
- ❑ Contractors should make sure they have a sufficient knowledge of client duties as they affect the project so they can give proper advice.
- ❑ The level of advice will depend on the knowledge and experience of the client and the complexities of the project.

2. PLANNING, MANAGING AND MONITORING CONSTRUCTION WORK

2.1 General

- Contractors are required to plan, manage and monitor the construction work under their control so it is carried out in a way that controls the risks to safety and health.
- The effort devoted to planning, managing and monitoring should be proportionate to the size and complexity of the project and the nature of risks involved.

On projects involving more than one contractor,

- **this will involve the contractor coordinating the planning, management and monitoring of their own work with that of the principal contractor and other contractors, and where appropriate the principal designer.**
- **Such coordination could involve regular progress meetings with other duty holders to ensure that the contractor's arrangements for planning, managing and monitoring their own work can feed into, and remain consistent with, the project-wide arrangements.**

For single contractor projects,

- **the arrangements to plan, manage and monitor the construction phase will normally be simpler.**

2.2 PLANNING

In planning the work, the contractor must take into account the risks to those who may be affected, for example,

- **members of the public and**
- **those carrying out the construction work.**

Planning should cover the same considerations as those for the principal contractor including considering the risks and ensuring the measures needed to protect those affected are in place.

On projects involving more than one contractor,

- **each contractor should plan their own work so it is consistent with the project-wide arrangements.**
- **Contractors should expect help from other duty holders, for example, the client who should provide the pre-construction information**

On single contractor projects,

- **the contractor is responsible for planning the construction phase and for drawing up the construction phase plan before setting up the construction site.**
- **The client should provide any relevant pre-construction information they possess and the time and other resources to help the contractor do this.**

2.3 Managing

The arrangements for managing construction work must take into account the same issues that principal contractors must consider

Managing

- **To manage the construction phase, principal contractors must ensure that:**
    a) those engaged to carry out the work are capable of doing so;
    b) effective, preventative and protective measures are put in place to control the risks; and
    c) the right plant, equipment and tools are provided to carry out the work involved.
- **Managing people to prevent and control risk requires leadership.**
    a) Principal contractors can demonstrate visible leadership through the actions

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of their managers.
b) These actions include setting standards for working practices and providing an example by following them.
c) Leaders in safety and health should have a strong grasp of what is needed in a given situation, make clear decisions, and be able to communicate effectively.

- **A systematic approach to managing should be taken to ensure workers understand:**
  a) the risks and control measures on the project;
  b) who has responsibility for safety and health;
  c) that consistent standards apply throughout the project and will be checked frequently;
  d) where they can locate safety and health information which is easily understandable, well organised and relevant to the site; and
  e) that incidents will be investigated and lessons learned.
- **Good supervision is part of showing leadership in safety and health. It:**
  a) focuses workers' attention on risks, and how to prevent them;
  b) shows commitment to establishing and maintaining the control measures;
  c) involves consulting effectively with workers, taking into account their views; and
  d) challenges unsafe conditions and working practices when they arise.

Principal contractors do not have to undertake detailed supervision of contractors' work

2.4 MONITORING

The contractor should monitor their work to ensure that the safety and health precautions are appropriate, remain in place and are followed in practice.
Effective monitoring by the contractor must address the same issues principal contractors must consider.

a) time and effort (with sufficient resource having been set aside for this at the planning stage
b) treating safety and health in the same way as other important aspects of the business;
c) taking prompt action where necessary; and
d) using a mix of performance measures – both active and reactive in nature, for example:
   i. routine checks of site access and work areas and plant and equipment, or health risk management to prevent harm (active);
   ii. investigating near-miss incidents and injuries as well as monitoring cases of ill health (reactive).

On projects involving more than one contractor, as part of the duty to cooperate with other duty holders,

- **the contractor should provide the principal contractor with any relevant information that stems from their own monitoring so the principal contractor can monitor the management of safety and health at a project-wide level.**

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Complying with directions and construction phase plan
For projects involving more than one contractor,

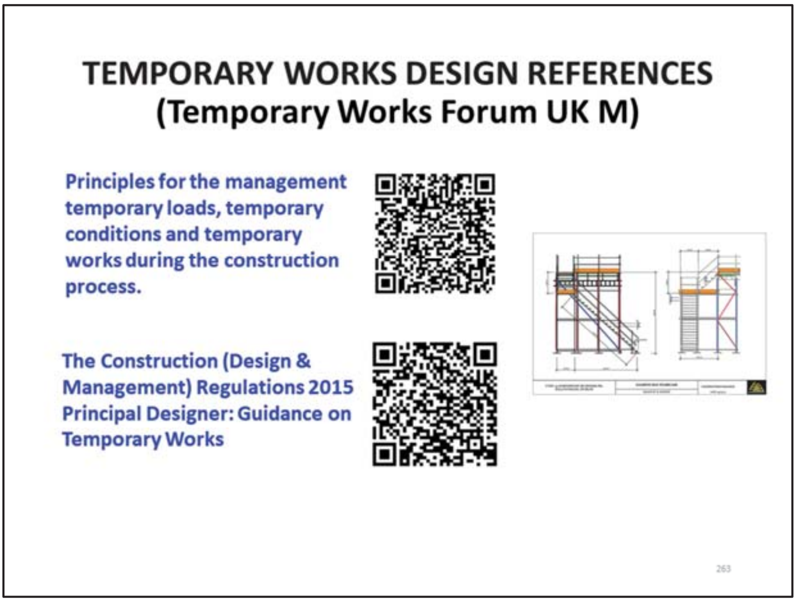
- **The contractor is required to comply with any directions to secure health and safety given to them by the principal designer or principal contractor**
- **They are also required to comply with the parts of the construction phase plan that are relevant to their work , including the site rules.**

Drawing up a construction phase plan
For single contractor projects,

- **the contractor must ensure a construction phase plan is drawn up as soon as practicable before the construction site is set up (regulation 15(5)). Guidance on contractors' duties in relation to the construction phase plan**

- **CONTRACTOR(S) DUTIES**

- **of the duty to cooperate with other duty holders,**
- **the contractor should provide the principal contractor with any relevant information that stems from their own monitoring so the principal contractor can monitor the management of safety and health at a project-wide level.**
- **Complying with directions and construction phase plan**
- **For projects involving more than one contractor,**
- **The contractor is required to comply with any directions to secure health and safety given to them by the principal designer or principal contractor**
- **They are also required to comply with the parts of the construction phase plan that are relevant to their work , including the site rules.**
- **Drawing up a construction phase plan**
- **For single contractor projects,**
- **the contractor must ensure a construction phase plan is drawn up as soon as practicable before the construction site is set up.**

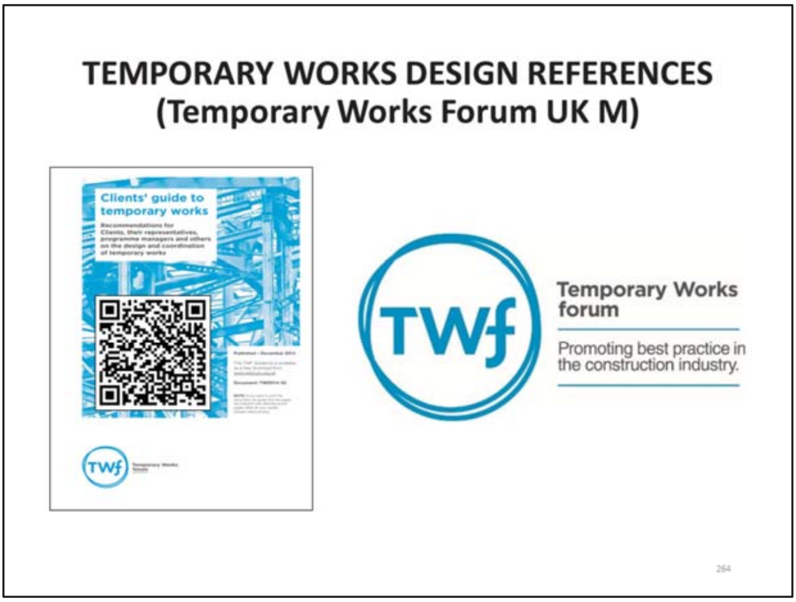


The client is the body for whom the project is carried out. On projects, clients, through the agency of their representatives, set the tone of the project by the appointments they make, the leadership and management behaviors they exhibit and reward, and the balance they set between programme duration, budget, quality and safety.

TEMPORARY WORKS DESIGN REFERENCES (Temporary Works Forum UK)

In defining the role of the client, the Construction (Design and Management) Regulations (CDM Regs)vi give a
useful starting point. First, these Regulations set out legal duties. More than that, they give an understanding of best practice which if acted upon will deliver not only health and safety, but also economy, speed and good quality.
With regard to temporary works the most important of the client duties5 given in the CDM Regs are:

- Select and appoint a competent and resourced CDM Co-ordinator6 and Principal Contractor
- Ensure appointed designers are competent
- Ensure that suitable management arrangements are made for the project
- Ensure that a Construction Phase Health and Safety Plan is produced and that it contains suitable management controls for temporary works
- Ensure sufficient time and resources are allowed for all stages of the project



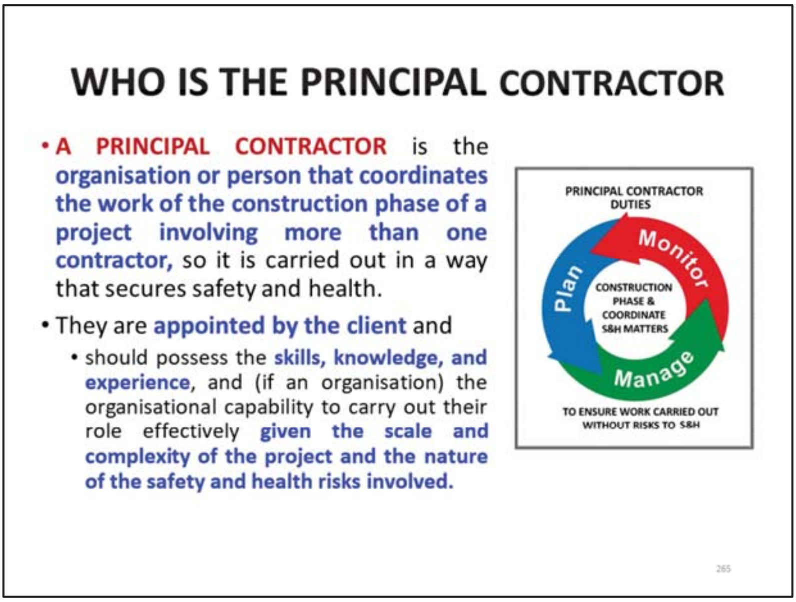
From these considerations we can see that it is in the client's interest that design teams include people and organization's who have practical and contemporary understanding of the construction process and temporary works appropriate to the works proposed. The design team will then be able to design a solution which ideally eliminates, but certainly reduces and simplifies, the temporary works; for the temporary works that remain, the team can ensure that there are safe and economic solutions, and that the scope and full performance specification for the temporary works are communicated to those who will design and use them.

In seeking to ensure that clients' interests are served with regard to temporary works, their representatives could
usefully challenge themselves with the following questions:

- In what way can I be assured that the permanent works design solution is developed to minimize risk from temporary conditions?
- In what way can I be assured that those temporary conditions of the permanent works that need temporary works to control them minimize the extent and complexity of the temporary works, eliminating, substituting and reducing them so far as reasonably practicable to minimize the risk overall?
- In what way can I be assured that the requirements for temporary works will be communicated effectively, with all criteria for performance, including sensitivities?
- In what way can I be assured that the risks from the temporary conditions and

temporary works are appropriately allocated and managed, in particular that the temporary conditions and temporary works will be managed competently and safely on site?

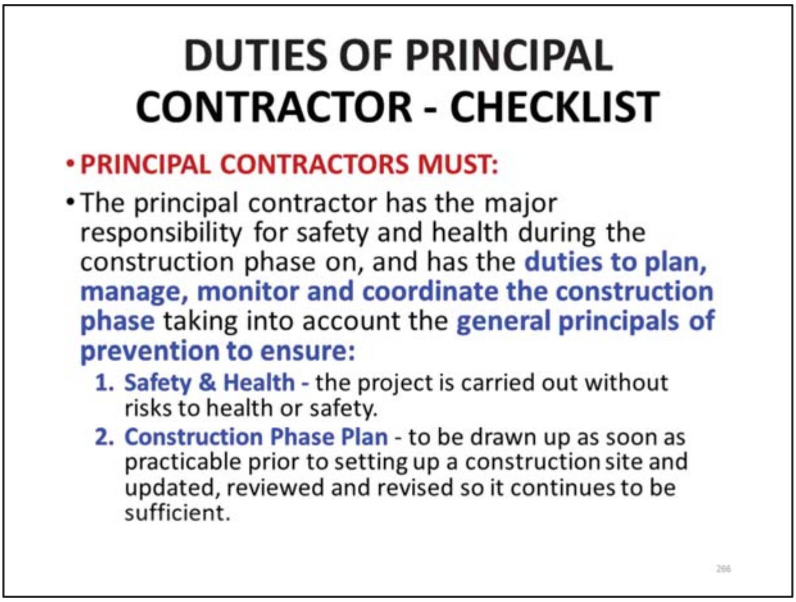
- **In what way can I be assured that the resources deployed (at all stages, including design of both permanent and temporary works) have the competence, time and resources to do the above?**
- **In what way can I be assured that the CDM Coordinator gives due priority to risks from temporary conditions and temporary works?**
- **How can I be assured that the structuring of the procurement strategy, and the influences that are applied, are not deleterious in any way to temporary.**



WHO IS THE PRINCIPAL CONTRACTOR

- **A PRINCIPAL CONTRACTOR is the organization or person that coordinates the work of the construction phase of a project involving more than one contractor, so it is carried out in a way that secures safety and health.**

- **They are appointed by the client and should possess the skills, knowledge, and experience, and (if an organization) the organisational capability to carry out their role effectively given the scale and complexity of the project and the nature of the safety and health risks involved**



DUTIES OF PRINCIPAL CONTRACTOR – CHECKLIST

Principal contractor is appointed by the client to control the construction phase of any project involving more than one contractor.

Principal contractors have an important role in managing health and safety risks during the construction phase so they must have the skills, knowledge, experience and, where relevant, organisational capability to carry out this work.

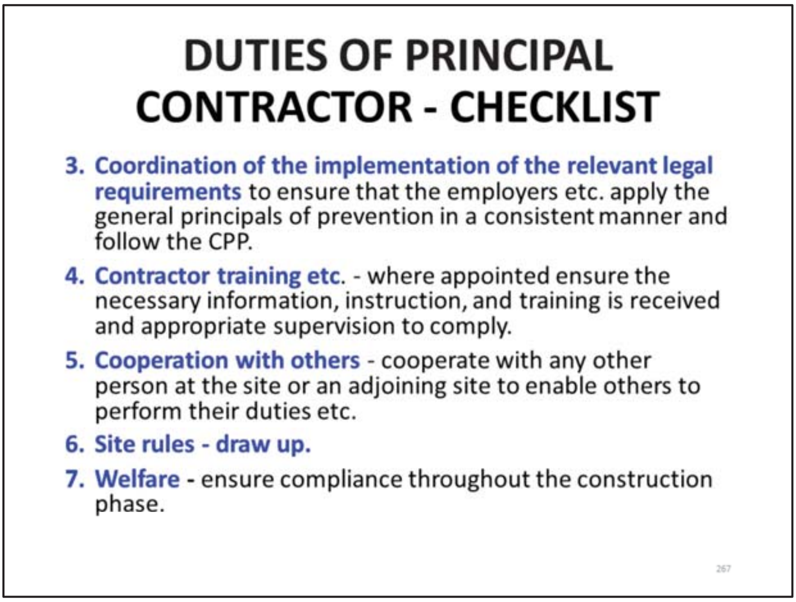
The principal contractor must:

- **Plan, manage, monitor and coordinate the entire construction phase take account of the health and safety risks to everyone affected by the work (including members of the public), in planning and managing the measures needed to control them liaise with the client and principal designer for the duration of the project to ensure that all risks are effectively managed prepare a written construction phase plan PDF before the construction phase begins, implement, and then regularly review and revise it to make sure it remains fit for purpose have ongoing arrangements in place for managing health and safety throughout the construction phase consult and engage with workers about their health, safety and welfare ensure suitable welfare** facilities are provided from the start and maintained throughout the construction phase check that anyone they appoint has the skills, knowledge, experience and, where relevant, the organisational capability to carry out their work safely and without risk to health ensure all workers have site-specific inductions, and any further information and training they need take steps to prevent unauthorized access to the site liaise with the principal designer to share any information relevant to the planning, management, monitoring and coordination of the pre-construction phase

- When working for a domestic client, the principal contractor will normally take on the client duties as well as their own as principal contractor. If a domestic client does not appoint a principal contractor, the role of the principal contractor must be carried out by the contractor in control of the construction phase. Alternatively, the domestic client can ask the principal designer to take on the client duties (although this must be confirmed in a written agreement) and the principal contractor must work to them as 'client' under CDM 2015.

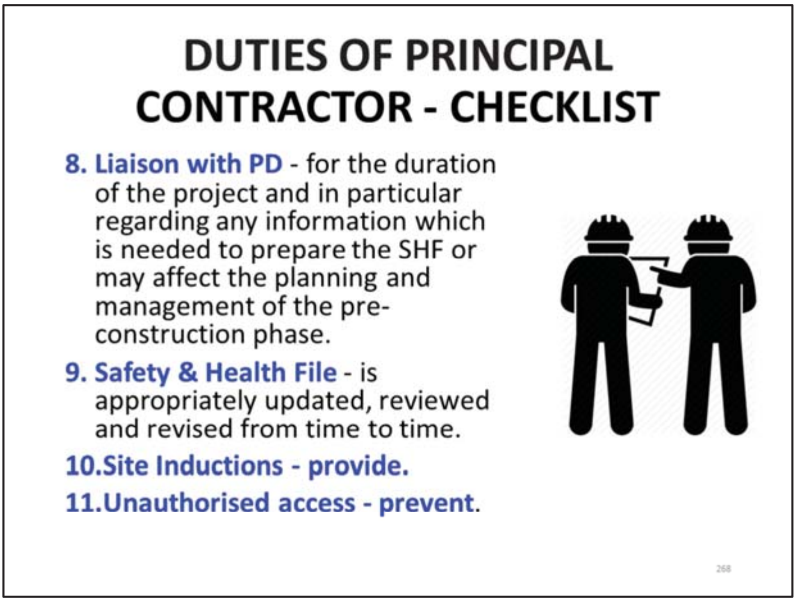
- The principal contractor has the major responsibility for safety and health during the construction phase on, and has the duties to plan, manage, monitor and coordinate the construction phase taking into account the general principals of prevention to ensure:

❖ Safety & Health - the project is carried out without risks to health or safety.
❖ Construction Phase Plan - to be drawn up as soon as practicable prior to setting up a construction site and updated, reviewed and revised so it continues to be sufficient.



DUTIES OF PRINCIPAL CONTRACTOR – CHECKLIST

- **Coordination of the implementation of the relevant legal requirements to ensure that the employers etc. apply the general principals of prevention in a consistent manner and follow the CPP.**
- **Contractor training etc. - where appointed ensure the necessary information, instruction, and training is received and appropriate supervision to comply.**
- **Cooperation with others - cooperate with any other person at the site or an adjoining site to enable others to perform their duties etc.**
- **Site rules - draw up.**
- **Welfare - ensure compliance throughout the construction phase.**



DUTIES OF PRINCIPAL CONTRACTOR – CHECKLIST

- ❖ **Liaison with PD - for the duration of the project and in particular regarding any information which is needed to prepare the SHF or may affect the planning and management of the pre-construction phase.**
- ❖ **Safety & Health File - is appropriately updated, reviewed and revised from time to time.**
- ❖ **Site Inductions - provide.**
- ❖ **Un authorized access - prevent**

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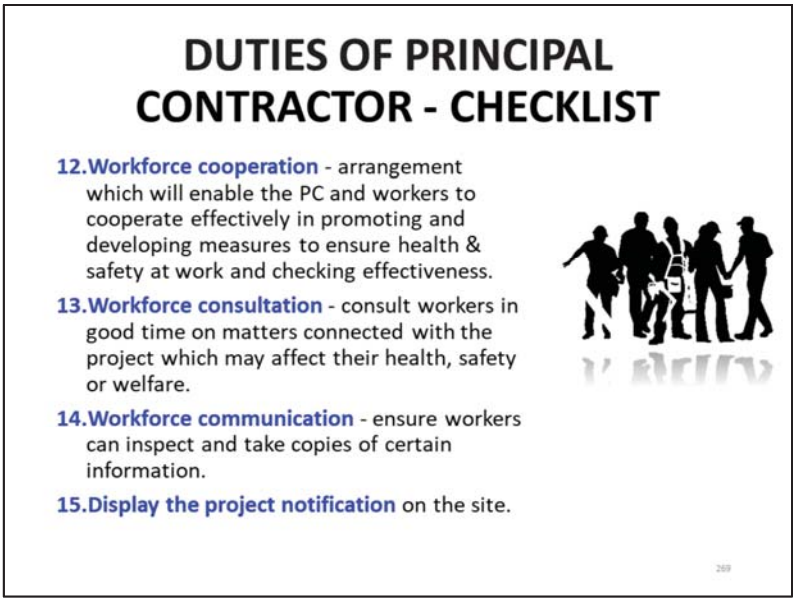

DESCRIBE DUTIES OF PRINCIPAL CONTRACTOR – CHECKLIST

- **Workforce cooperation - arrangement which will enable the PC and workers to cooperate effectively in promoting and developing measures to ensure health & safety at work and checking effectiveness.**
- **Workforce consultation - consult workers in good time on matters connected with the project which may affect their health, safety or welfare.**
- **Workforce communication - ensure workers can inspect and take copies of certain information.**
- **Display the project notification on the site.**

PROVIDING WELFARE FACILITIES

- The PC must ensure that **suitable and sufficient welfare facilities are provided and maintained throughout the construction phase**.
  - **What is suitable and sufficient will depend on the size and nature of the workforce involved in the project.**
  - Facilities must be made available before any construction work starts and should be maintained until the end of the project.
- Appendix 5. Minimum welfare facilities required for construction sites;
  - **Sanitary conveniences**
  - **Washing facilities**
  - **Drinking Water**
  - **Cleaning rooms and lockers**
  - **Facilities for rest**

Washing up
A purpose-built block contains toilet and shower facilities.

270

PROVIDING WELFARE FACILITIES

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- **What is suitable and sufficient will depend on the size and nature of the workforce involved in the project.**
- **Facilities must be made available before any construction work starts and should be maintained until the end of the project.**

❖ **Appendix 5. Minimum welfare facilities required for construction sites;**
- **Sanitary conveniences**
- **Washing facilities**
- **Drinking Water**
- **Cleaning rooms and lockers**
- **Facilities for rest**

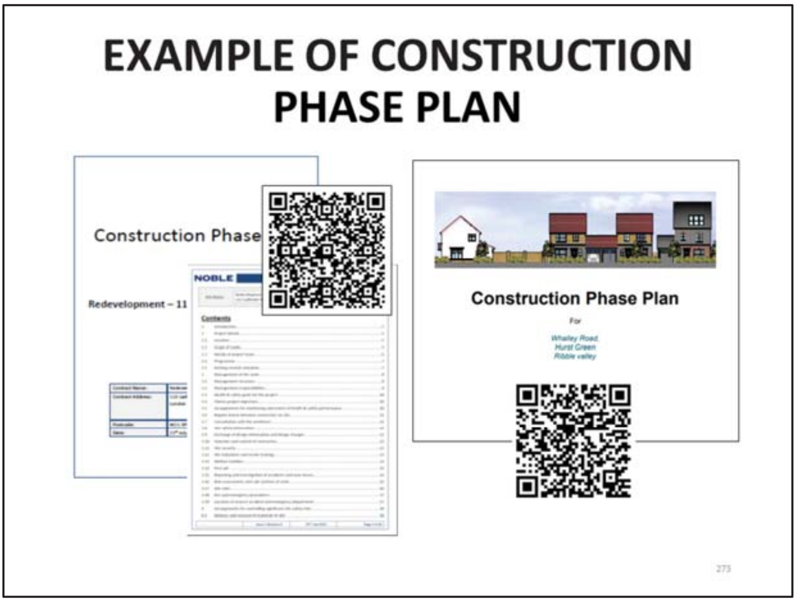
Describe the reference use as the guideline.

This information sheet is for duty holders involved in construction work. It replaces previous guidance contained in Provision of welfare facilities at transient construction sites and in Provision of welfare facilities at fixed construction sites. It gives guidance on the minimum welfare facilities that must be provided or made available to workers on construction sites. Construction workers need adequate toilet and washing facilities, a place to warm up and eat their food and somewhere to store clothing. However, these basic requirements are often neglected. A cold water tap and chemical toilet on their own are not adequate facilities. Good facilities can positively benefit health and well-being and can help to prevent dermatitis.

WEBSITE LINK

BUILDING CONSTRUCTION & ENGINEERING WORK

- **Guidelines on Occupational Safety and Health in Construction Industry (Excavation Work) 2017**
- **Guidelines Of Occupational Safety And Health In Construction Industry 2017**
- **Guidelines For Approval of Design Scaffolding 2016**
- **Calculation Loading of Scaffolding 2016**
- **Guidelines for Public Safety and Health at Construction Sites, 2007**
- **Guidelines for the Prevention of Falls at Workplaces, 2007**
- **Guidelines on Trenching for Construction Safety, 2000**
- **Guidelines on Occupational Safety and Health in Tunnel Construction, 1998**



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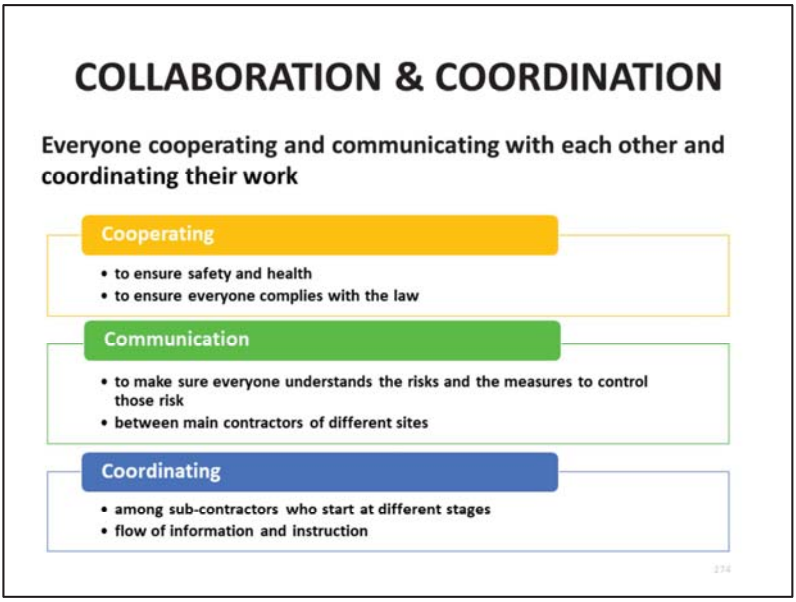
Under the Construction (Design and Management) Regulations 2015 (CDM 2015) a construction phase plan is required for every construction project. This does not need to be complicated.
If you are working for a domestic client, you will be in control of the project if you are the only contractor or the principal contractor.
You will be responsible for:

- **preparing a plan;**
- **organizing the work; and**
- **working together with others to ensure health and safety.**

You could be a builder, plumber or other tradesman, doing small-scale routine work such as:

- **installing a kitchen or bathroom;**
- **structural alterations, eg chimney breast removal;**
- **roofing work, including dormer windows;**
- **extension or loft conversionn.**

A simple plan before the work starts is usually enough to show that you have thought about health and safety.
If the job will last longer than 500 person days or 30 working days (with more than 20 people working at the same time) it will need to be notified to HSE and it is likely to be too complex for this simple plan format



COLLABORATION & COORDINATION

The Construction (Design and Management) Regulations (CDM Regulations) are intended to ensure that health and safety issues are properly considered during a project's development so that the risk of harm to those who have to build, use and maintain structures is reduced. They were introduced in 1994 and revised in 2007 and 2015.

The regulations require that, before the construction phase begins (that is, before the construction site is set up), the client ensures that a construction phase plan is drawn up by the contractor if there is only one contractor, or by the principal contractor if there is more than one contractor. If there is only one contractor, the contractor must either draw up a plan themselves, or make arrangements for it to be drawn up.

The construction phase plan records arrangements for managing significant health and safety risks associated with the construction of the project and is the basis for communicating those arrangements to those involved in the construction phase. It outlines the health and safety arrangements and site rules taking into account any industrial activities taking place on site, and, where applicable, must include specific measures concerning any work involving the particular risks listed in Schedule 3:

Work which puts workers at risk of burial under earthfalls, engulfment in swampland or falling from a height, where the risk is particularly aggravated by the nature of the work or processes used or by the environment at the place of work or site.
Work which puts workers at risk from chemical or biological substances constituting a particular danger to the safety or health of workers or involving a legal requirement for health monitoring.
Work with ionizing radiation requiring the designation of controlled or supervised areas under regulation 16 of the Ionising Radiations Regulations 1999.
Work near high voltage power lines.
Work exposing workers to the risk of drowning.
Work on wells, underground earthworks and tunnels.
Work carried out by divers having a system of air supply.
Work carried out by workers in caissons with a compressed air atmosphere.
Work involving the use of explosives.
Work involving the assembly or dismantling of heavy prefabricated components.
Pre-construction information provided by the client forms the basis of the construction phase plan. The plan must also take into account information the principal designer holds and any information obtained from designers. Designers must provide information about the significant risks they have been unable to eliminate and the steps taken to reduce or control those risks. The principal contractor must also liaise with the contractors to ensure the plan takes account of their views.

During the course of the project, the principal contractor (or contractor) must ensure that the construction phase plan is reviewed, updated and revised.

The client must ensure the plan adequately addresses arrangements for managing risks and that the principal contractor (or contractor) regularly reviews and revises the plan.

The plan should be easy to understand and as simple as possible, should only include information relevant to the project, should provide sufficient information proportionate to the scale and complexity of the project and the risks involved. It should not include generic risk assessments, records of how decisions were reached or detailed safety method statements.

The principal contractor must ensure that employers and, if necessary for the protection of workers, self-employed persons follow the construction phase plan. Contractors also required to comply with the plan.

Managing health and safety in construction, Construction (Design and Management) Regulations 2015, Guidance on Regulations suggests the following topics should be considered when drawing up the plan:

Module 8: Challenge ahead

Project management is an increasingly important part of construction. Project managers are intermediaries between stakeholders and construction workers. They're responsible for ensuring that everyone has what they need to complete the tasks necessary to deliver a construction project. It is a big task for anyone to take on and comes with challenges. In this article, I identify several common challenges in construction project management.

Undefined Goals
One of the biggest challenges in construction project management is undefined goals. Sometimes stakeholders don't know what exactly they want, other times they can't agree. However, when the goals aren't clear to a project manager it's difficult to manage the project. Project managers can help prevent this by asking direct questions and continuing to communicate questions throughout the project. A lack of defined goals is one of the big challenges in construction project management, but they too can be managed.

Changing Scope
Another one of the biggest challenges in construction project management is changing scope. Also known as scope creep, it can arise from a lack of defined goals. It can be a

huge reason why projects end up delayed or over budget. A good project manager can communicate concerns to scope changes to the stakeholders. Thereby informing them of all the changes to schedule and budget it will cause.

No Accountability

Another issue that creates challenges in construction project management is a lack of accountability. The project manager is responsible for laying out the goals of the project and assigning them. It's the responsibility of the project manager to ensure that all goals are assigned to the right person or team. Even then, a project manager must ensure all parties are held accountable for their tasks.

Lack of Risk Management

Risk management is important in construction as the risks are greater, and far more expensive than ever. One of the challenges in construction project management is managing risk, since the project manager is responsible for identifying potential problems and finding ways to mitigate it. They need to gather input and plan ways to prevent the project from veering off course. Without this, the project will most certainly go over budget or delayed.

Poor Communication

A lack of communication or poor communication can be the death of a project. Project managers need to have updates on project status and feedback, since project managers are responsible for updating their teams as to the requirements of the stakeholders and upper management. The project manager has to foster open communication or risk falling to the communication challenges in construction project management.

Unrealistic Expectations

Sometimes stakeholders have unrealistic expectations. Whether it's from impossible deadlines or a lack of resources. Unrealistic expectations create challenges in construction project management because they can hurt morale and productivity. With impossible deadlines looming or a lack of resources, teams sometimes become less productive. In some cases they won't make the deadline regardless of their high productivity. As the project manager, it's important to advocate for workers and against unrealistic expectations and set realistic ones.

Stakeholder Indifference

Stakeholder indifference can kill projects, and the lack of stakeholder participation is a common challenge in construction project management. When stakeholders are indifferent to the activity at the site, it can result in rework and delays. Project managers can communicate with the stakeholders and encourage feedback. Since it can be difficult to get participation, it's important to have contingency plans in case of issues.

Preparing for Challenges in Construction Project Management

Everyone has different tips and tricks that work well for their job. And for project management, it's no different. Great project managers have faced these challenges before and discovered how to avoid or mitigate their impact. One easy way to reduce

challenges in construction project management is through construction project management software. It is built to help project managers mitigate risks and reduce challenges and can be an invaluable addition to anyone's toolkit.

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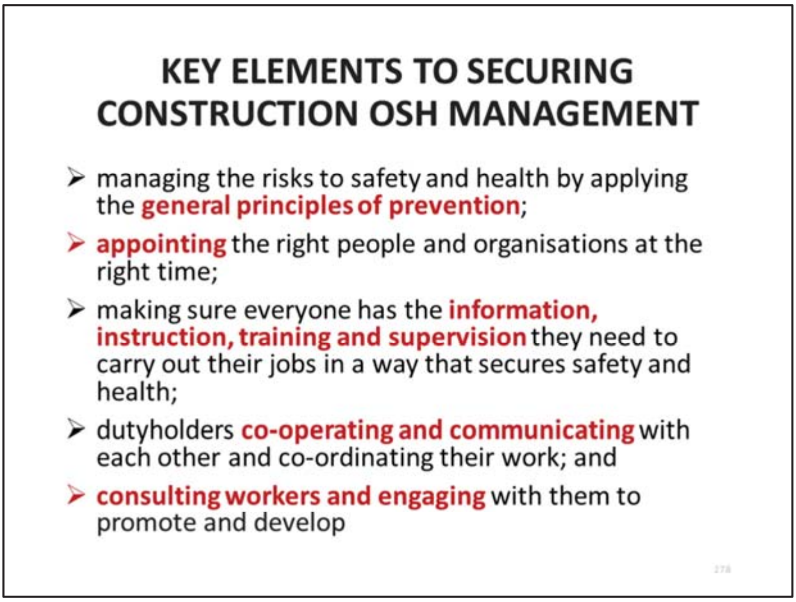
OSHCIM BUY IN PROCESS

Provide responsible employers, workers, and worker representatives with a sound, flexible framework for addressing safety and health issues on diverse construction job sites. They may be used by any construction company or job site, but they will be particularly helpful to small and medium-sized contractors. They also include guidance specifically aimed at general contractor employment, staffing agency employment, and multiemployer work situations. These recommended practices have been developed solely for the construction industry. Separate recommended practices are available for all other industries.

ISSUES ARISING TO INDUSTRY BUY IN

Challenges
- **To make meaningful improvements in how we manage our construction business;**
- **To review the skill sets required for our internal staff and external consultants and contractors;**
- **To review our commitment to safety, health and environmental leadership;**

Concerns
- **How new legislation would be interpreted and applied, and are understandable;**
- **How to define duty holders extent and scope of liabilities;**
- **Additional responsibilities, work load, documentation and overall COST;**

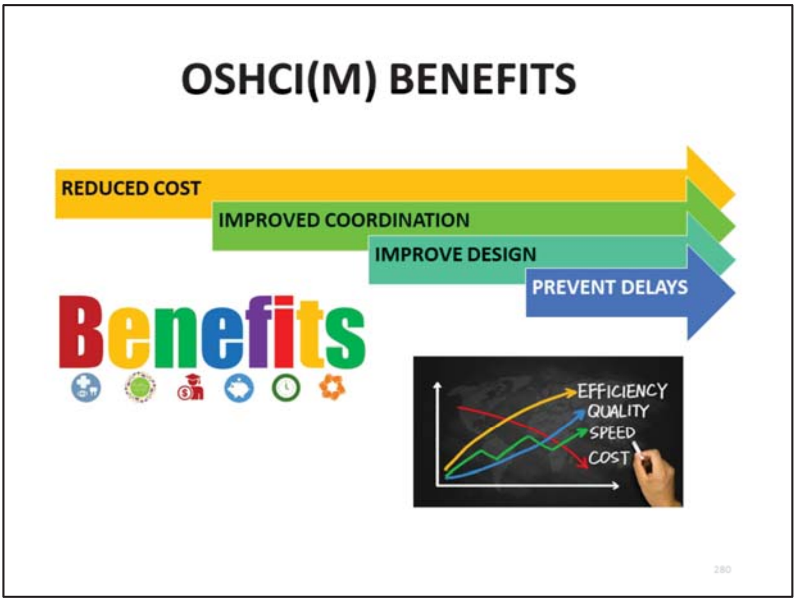


KEY ELEMENTS TO SECURING CONSTRUCTION OSH MANAGEMENT

- **managing the risks to safety and health by applying the general principles of prevention;**
- **appointing the right people and organizations at the right time;**
- **making sure everyone has the information, instruction, training and supervision they need to carry out their jobs in a way that secures safety and health;**
- **duty holders co-operating and communicating with each other and coordinating their work; and**
- **consulting workers and engaging with them to promote and develop**

describe the outcome that worker get

- **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**



REDUCED COSTS

While OSHCI(M) seem expensive to implement at the beginning, the long term advantages are certainly worth the added investment. With OSHCI(M) requiring project team members to cooperate closely on the design, planning and management of the construction project, there is decreased chance of costly issues arising and workplace accidents occurring, both which hinder project development and increase costs.

IMPROVED COORDINATION BETWEEN ALL PARTIES INVOLVED

- **OSHCI(M) Guidelines requires all those appointed with responsibility to work closely with contractors, the design team and clients to ensure all safety and health regulations are adhered to.**
- **The need for cooperation increases project communication early on, improving working relations between the various members and ensuring compliance with all project specifications.**
- **Working together enables project members to share their valuable knowledge and gain insights from each other that they may not have otherwise learned.**
    - **For instance, when a designer is faced with a difficulty in their design, having the contractor and PD (Principal designer) assigned from the beginning makes it easier to solve the problem with each project member**

offering their outlook on the issue.

IMPROVE DESIGN

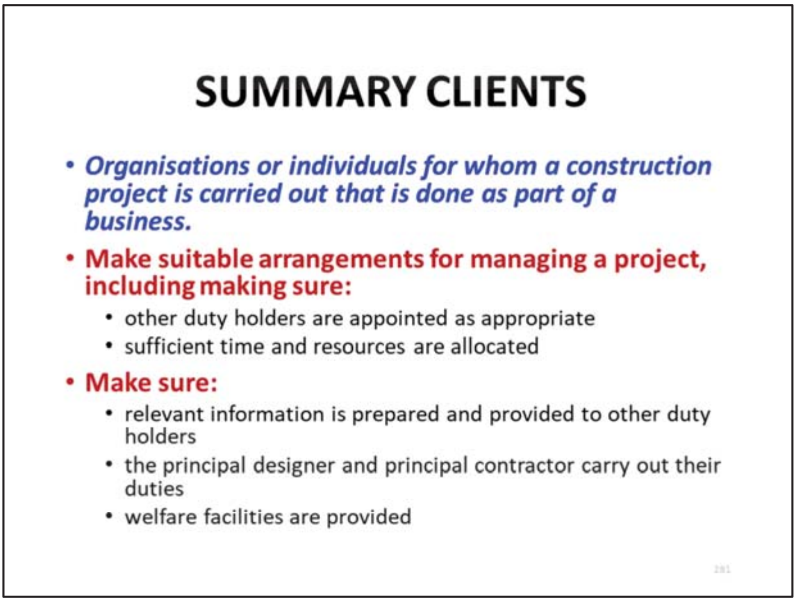
- Sharing valuable skills among project team members is not only useful when it comes to solving problems. Professional knowledge should be used to improve the overall construction project.
- Each project member will hold specialist experience from their previous work and there should be an effort to share these best practices to facilitate each project.
- There is also a focus on improving the safety and health aspect of a building's design, not just the construction phase of the project.

PREVENT DELAYS

- OSHCI(M) encourages open communication among the principal contractor and principal designer, giving the opportunity to both sides to make suggestions and offer their perspectives early on in the design stage.
- Prior to this, it had often been the case that project members weren't appointed at the beginning of the project, leaving them no opportunity to voice their opinion until after the design stage.
- With construction work already begun, it was left too late for a member's expertise to be integrated in the project.
- OSHCI(M) requires efficient planning and management at all project stages from the various project members. This ensures timely project completion, within budget and meeting all necessary specifications.

OSHCI(M) creates an efficient workforce and workplace, requiring project members to cooperate closely to focus on quality, the environment and safety and health management.

- Contractors in the commercial industry can benefit greatly from successful implementation of OSHCI(M) with reduced delays, improved designs, greater coordination between parties and lower project cost

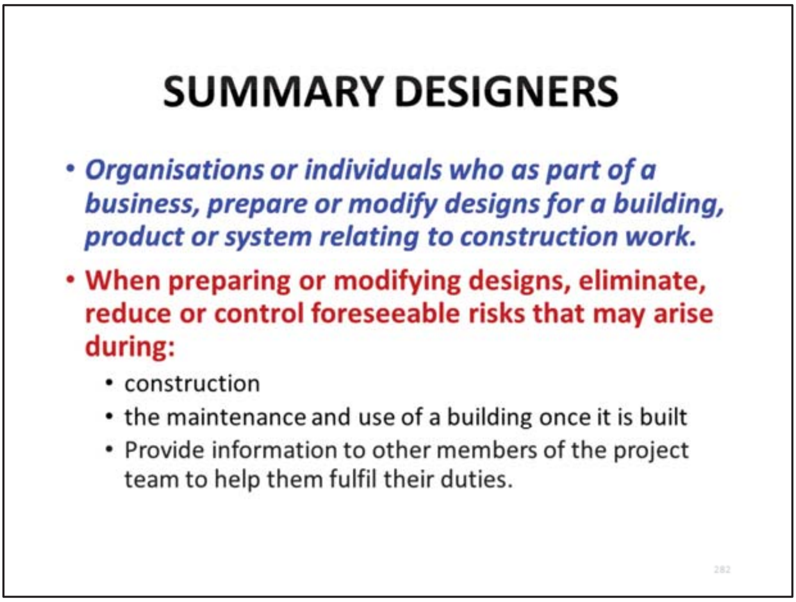


SUMMARY CLIENTS

- **Organizations or individuals for whom a construction project is carried out that is done as part of a business.**
- **Make suitable arrangements for managing a project, including making sure:**
- **other duty holders are appointed as appropriate**
- **sufficient time and resources are allocated**

Make sure:

- **relevant information is prepared and provided to other duty holders**
- **the principal designer and principal contractor carry out their duties**
- **welfare facilities are provided**



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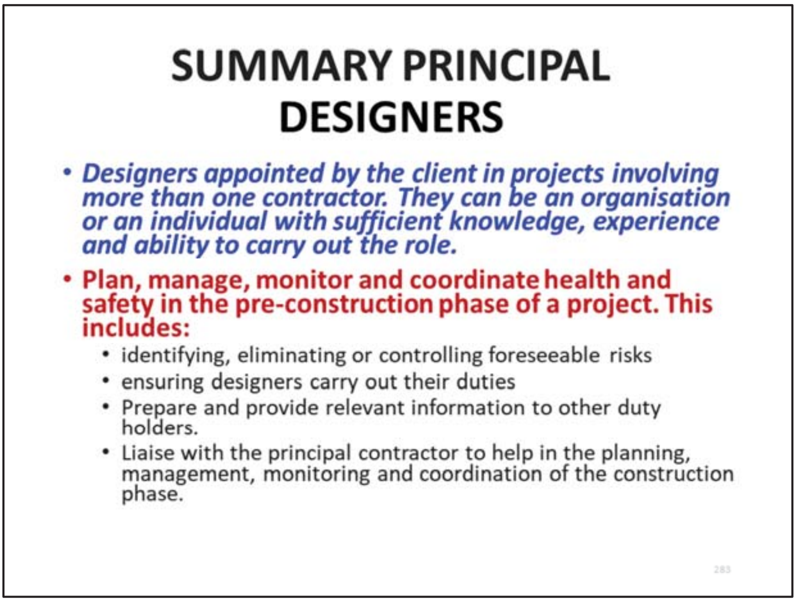
SUMMARY DESIGNERS

- **Organizations or individuals who as part of a business, prepare or modify designs for a building, product or system relating to construction work.**
- **When preparing or modifying designs, eliminate, reduce or control foreseeable risks that may arise during:**
- **construction**
- **the maintenance and use of a building once it is built**
- **Provide information to other members of the project team to help them fulfil their duties.**



SUMMARY PRINCIPAL DESIGNERS

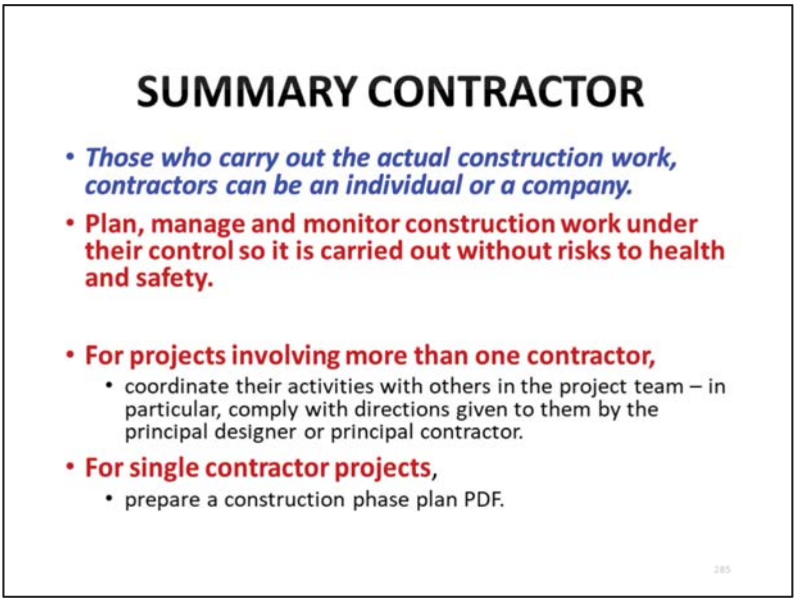
- **Designers appointed by the client in projects involving more than one contractor. They can be an organization or an individual with sufficient knowledge, experience and ability to carry out the role.**
- **Plan, manage, monitor and coordinate health and safety in the pre-construction phase of a project. This includes:**
- **identifying, eliminating or controlling foreseeable risks**
- **ensuring designers carry out their duties**
- **Prepare and provide relevant information to other duty holders.**
- **Liaise with the principal contractor to help in the planning, management, monitoring and coordination of the construction phase.**

SUMMARY PRINCIPAL CONTRACTOR

- **Contractors appointed by the client to coordinate the construction phase of a project where it involves more than one contractor.**
- **Plan, manage, monitor and coordinate health and safety in the construction phase of a project. This includes:**
- **liaising with the client and principal designer preparing the construction phase plan PDF**
- **organizing cooperation between contractors and coordinating their work**

Make sure:

- **suitable site inductions are provided**
- **reasonable steps are taken to prevent unauthorized access**
- **workers are consulted and engaged in securing their health and safety**
- **welfare facilities are provided**



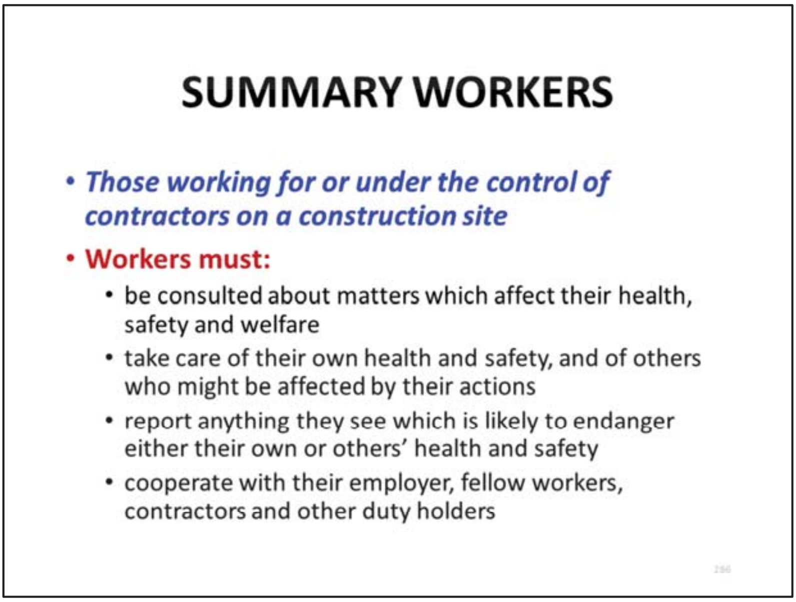
SUMMARY CONTRACTOR

Those who carry out the actual construction work, contractors can be an individual or a company.
Plan, manage and monitor construction work under their control so it is carried out without risks to health and safety.

- **For projects involving more than one contractor,**

coordinate their activities with others in the project team – in particular, comply with directions given to them by the principal designer or principal contractor.

For single contractor projects,
- **prepare a construction phase plan PDF.**



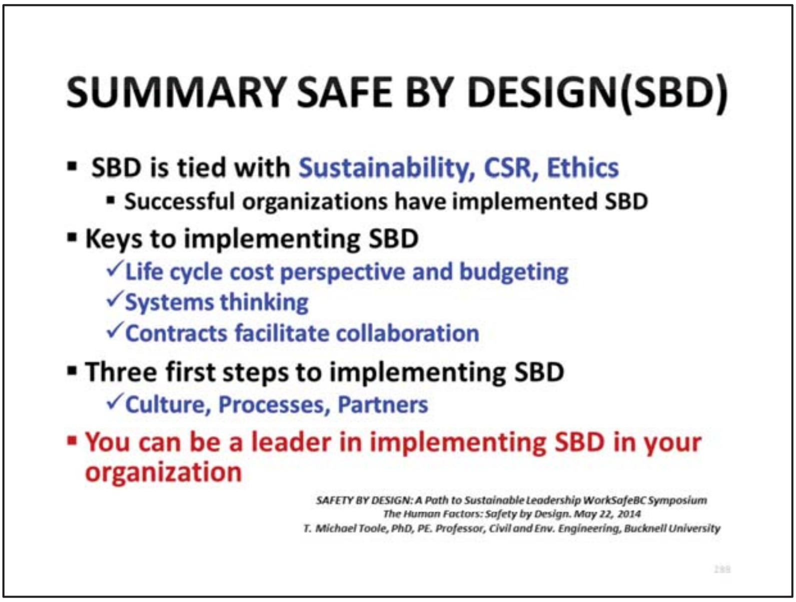
SUMMARY WORKERS
Those working for or under the control of contractors on a construction site

Workers must:
- **be consulted about matters which affect their health, safety and welfare**
- **take care of their own health and safety, and of others who might be affected by their actions**
- **report anything they see which is likely to endanger either their own or others' health and safety**
- **cooperate with their employer, fellow workers, contractors and other duty holders**

THE END GAME

❖ **Each general contractor establishes and implements a procedure to ensure the exchange of information about hazards present on site and the hazard control measures in place. Thus, all workers on the site are aware of worksite hazards, and the methods and procedures needed to control exposures to them how the establishment and safeness**

- **OSHCI(M) will eventually be legislated in the near future;**
- **Client duties in ensuring Construction Management safety & health begins from the Conceptual Phase on any project;**
- **Client shall ensure the duties holders are appointed and perform their duties through the project life cycle;**



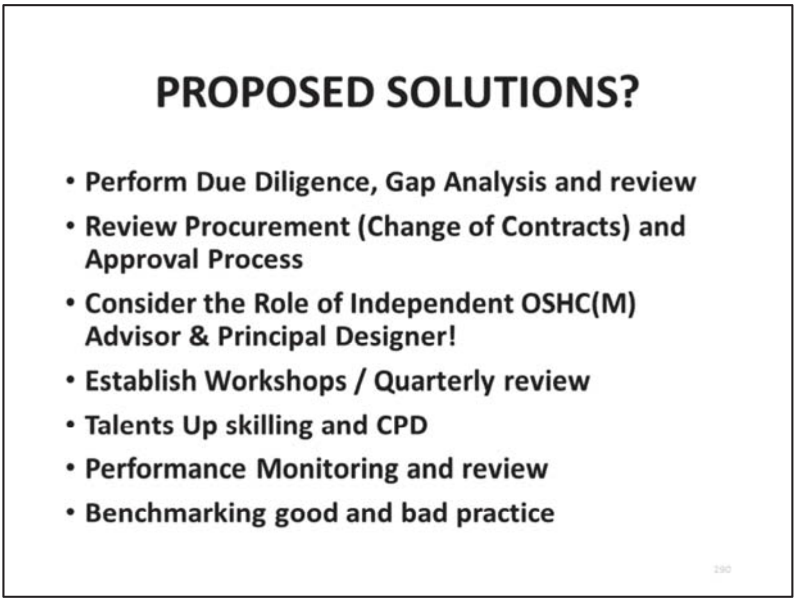
SUMMARY SAFE BY DESIGN(SBD)

❖ SBD is tied with Sustainability, CSR, Ethics Successful organizations have implemented SBD

Keys to implementing SBD

❖ Life cycle cost perspective and budgeting
❖ Systems thinking
❖ Contracts facilitate collaboration
❖ Three first steps to implementing SBD
❖ Culture, Processes, Partners
❖ You can be a leader in implementing SBD in your organization

DESCRIBE Malaysian scenario and expected happen in constructions sector



PROPOSED SOLUTIONS?

The Booming situations in constructions site now days showing the increasing of number of workers are assigned by employer to work at specific locations worksites under the direction and control of the employer. Examples include unskilled laborers or skilled trade workers from a staffing agency who may be placed in either short- or long-term assignments with a general contractor or other contractor. In these situations, it is important or the staffing agency and the host employer to communicate and coordinate to provide and maintain a safe work environment for their workers. (Note: Any employer on a multiemployer worksite may be a "joint employer" with a staffing agency if temporary workers are utilized.) In both temporary worker and multiemployer situations, safety is enhanced if employers establish mechanisms to coordinate their efforts and communicate effectively regarding their safety and health responsibilities to afford all workers equal protection against hazards. These mechanisms include measures to ensure that all workers on site (and their representatives) can participate in preventing injuries and illnesses. Failure to take these steps may undermine safety programs. For example, if the different employers have inconsistent policies for when and where to wear PPE, workers may mistakenly believe that the equipment is not needed, leading to injury. Inconsistent safety policies may also cause workers to question the credibility of safety and health programs, resulting in less meaningful employee engagement and participation.

- **Perform Due Diligence, Gap Analysis and review**
- **Review Procurement (Change of Contracts) and Approval Process**
- **Consider the Role of Independent OSHC(M) Advisor & Principal Designer!**
- **Establish Workshops / Quarterly review**
- **Talents Up skilling and CPD**
- **Performance Monitoring and review**
- **Benchmarking good and bad practice**


thank you
gracias
danke
謝謝
merci
obrigado
bedankt
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спасибо
ngiyabonga
teşekkür ederim
go raibh maith agat
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TTT