



LAMPIRAN



LAMPIRAN A
SURVEI KUESIONER

LEMBAR KUESIONER

Identifikasi Dan Analisis Risiko Kecelakaan Kerja dengan Metode *Failure Mode And Effect Analysis* (FMEA) dan *Fault Tree Analysis* (FTA) beserta Pengendalian Risiko pada Konstruksi Bangunan Minyak dan Gas Bumi Lepas Pantai (Studi Kasus Pada Proyek X)

1. Pendahuluan

Kuesioner ini disusun untuk keperluan penyelesaian Tugas Akhir dengan judul “Identifikasi dan Analisis Risiko Kecelakaan Kerja dengan Metode *Failure Mode and Effect Analysis* (FMEA) dan *Fault Tree Analysis* (FTA) beserta Pengendalian Risiko pada Konstruksi Bangunan Minyak dan Gas Bumi Lepas Pantai (Studi Kasus Pada Proyek X)” untuk mengidentifikasi potensi dan penyebab risiko kecelakaan kerja pada proyek konstruksi bangunan minyak dan gas bumi lepas pantai secara khusus pada Proyek X. Kuesioner ini ditujukan secara khusus kepada orang – orang yang terlibat dalam proyek.

2. Tujuan Survei

Tujuan dari survei kuesioner ini adalah responden diminta untuk mengisi survei keparahan (*severity*), kejadian (*occurrence*) dan deteksi (*detection*) dengan skala angka 1 s/d 10 sesuai dengan keadaan yang terjadi pada proyek.

3. Kerahasiaan Informasi

Kuesioner semata – mata ditujukan untuk keperluan penyelesaian Tugas Akhir oleh sebab itu jawaban dari Bapak/Ibu/Saudara akan dijamin kerahasiaannya. Maka dari itu, saya mohon kesediaannya mengisi kuesioner ini dengan lengkap, jujur dan sesuai dengan keadaan sebenarnya agar informasi ilmiah yang disajikan nantinya dapat dipertanggungjawabkan.

Saya mengucapkan terima kasih banyak atas kesediaan Bapak/Ibu/Saudara yang telah bersedia menjadi responden untuk mengisi kuesioner penelitian Tugas Akhir ini.

4. Data Responden

Nama :

Jabatan :

Pengalaman kerja :

5. Petunjuk Pengisian Kuesioner

Isilah kuesioner dengan memberikan penilaian pada setiap kolom keparahan, kejadian dan deteksi yang telah tersedia dengan berpedoman pada skala rating dari tabel di bawah ini.

Tabel 1. Skala Keparahan (*Severity*)

Tingkat	Dampak	Akibat Luka
10	Kehilangan nyawa atau merubah kehidupan individu	Kematian beberapa individu (masal, lebih dari 1)
9		Kematian individu (seseorang)
8		Perlu perawatan serius dan menimbulkan cacat permanen
7	Berdampak besar pada individu sehingga tidak ikut lagi dalam aktivitas	Dirawat lebih dari 12 jam, dengan luka pecah pembuluh darah, hilang ingatan hebat, kerugian besar, dll
6		Dirawat lebih dari 12 jam, patah tulang, tulang bergeser, radang dingin, luka bakar, susah bernafas dan lupa ingatan sementara, jatuh/terpeleset
5	Dampak yang diterima sedang (individu hanya 1 sampai 2 hari tidak ikut dalam aktivitas)	Keseleo/terkilir, retak/patah ringan, kram atau kejang
4		Luka bakar ringan, luka gores/tersayat, frosnip (radang dingin/panas)
3	Dampak diterima kecil (individu masih dapat ikut dalam aktivitas)	Melepuh, tersengat panas, keseleo ringan, tergelincir atau terpeleset ringan
2		Tersengat matahari, memar, teriris ringan, tergores
1	Tidak berdampak (individu tidak mendapat dampak yang terasa)	Terkena serpihan, tersengat serangga, tergigit serangga

Tabel 2. Skala Kejadian (*Occurrence*)

Tingkat	Probabilitas Kejadian	Tingkat Kejadian
10	Sangat tinggi dan tidak bisa dihindari	>1 dalam 2
9		1 dalam 3
8	Tinggi dan sering terjadi	1 dalam 8
7		1 dalam 20
6	Sedang dan kadang terjadi	1 dalam 80
5		1 dalam 400
4	Rendah dan relatif jarang terjadi	1 dalam 2.000

Tingkat	Probabilitas Kejadian	Tingkat Kejadian
3	Sangat rendah dan hampir tidak pernah terjadi	1 dalam 15.000
2		1 dalam 150.000
1		1 dalam 1.500.000

Tabel 3. Skala Deteksi (*Detection*)

Tingkat	Deteksi
9-10	Sangat rendah
7-8	Rendah (2 dari 10 kasus)
4-6	Sedang (5 dari 10 kasus)
3	Tinggi (terdeteksi ketika proses berlangsung) (6-7 dari 10 kasus)
2	Sangat tinggi (ditemukan ketika kegagalan telah terjadi saat proses berlangsung)
1	Kejadian pasti terjadi dan telah diketahui penyebabnya (9 dari 10 kasus)

6. Survei Kuesioner

NO	TASK	RISKS & ACCIDENT SCENARIO	SEVERITY	OCCURRENCE	DETECTION
		HAZARD			
1	Yard Specific Activities				
1.1	Topside/Jacket/Subsea Structure Critical & Heavy Lifting	Un-proper rigging configuration			
		Poor Communication			
		Material Counterfeit			
		Catch in between, struck by			
		Drop object			
		Bad weather			
1.2	Topsides load-out with Heavy lifting Method	Equipment Mishandling			
		Natural disaster (earthquake, tsunami, typhoon, etc)			
1.3	Topside load-out with Multi wheel/Dolly load out method	Equipment Mishandling			
		Natural disaster (earthquake, tsunami, typhoon, etc)			
1.4	Jacket load-out with Heavy lifting Method	Equipment Mishandling			
		Natural disaster (earthquake, tsunami, typhoon, etc)			
1.5	Topside/Jacket load-out with Multi wheel/Dolly load out method	Equipment Mishandling			
		Unstable ground			
		Natural disaster (earthquake, tsunami, typhoon, etc)			
1.6	Topside/Jacket load-out with skidding method	Whipped by tension cable			
		Natural disaster (earthquake, tsunami, typhoon, etc)			
1.7	Security at Yard	Brawl, riot, attack, strike			
2	Offshore Construction Routine Activities				

NO	TASK	RISKS & ACCIDENT SCENARIO	SEVERITY	OCCURRENCE	DETECTION
		HAZARD			
2.1	Work on barge/Vessel	Barge/vessel loses control, drifting, stranded, collision with the installation facilities (offshore platforms, sea lines, jackets, etc.)			
		Collision with others vessel, fisherman boat			
		Brawl, riot, attack			
		Anchor placed/or hit at subsea structures/ pipeline			
		Fire onboard			
		Spill			
2.2	Personnel transfer at offshore	Man Over Board caused by struck by			
		Man Over Board and drowning			
		Fall from personnel basket			
		Man Over Board during climbing boat landing or V-shape ladder			
2.3	Sea transportation	Collision with others vessel, fisherman boat			
		Collision with the installation facilities (offshore platforms sea lines, jackets, etc.)			
		Man Over Board, drowning			
2.4	Working above water	Man Over Board, drowning			
		Man Over Board from/ with scaffolding			
		Man Over Board struck by			
2.5	Loading/unloading	Accidental release of pollutant to sea			
2.6	Working in remote area/Lone working	Medivac constraint, distance from shore, weather/sea condition			
2.7	Handling/Lifting	Catch in between, struck by			
		Drop object			
		Crane Collapse			
		Un-proper ballasting system/Vessel unstable			
		Bad weather			
		Boom crane collide with existing facilities			
2.8	Mooring/Anchoring	Hit existing facilities			
		Pinch Point			
		Uncontrolled mooring line			

NO	TASK	RISKS & ACCIDENT SCENARIO	SEVERITY	OCCURRENCE	DETECTION
		HAZARD			
		Broke, snapback mooring/anchor line			
		Winch engine failed			
2.9	Bunkering	Pinch Point			
		Collision			
		Spill			
3	Towing of Jacket, Topsides & Oppurtunance with Barge				
3.1	Towing	Collision with others vessel			
		Collision with the installation facilities (offshore platforms, sea lines, jackets, etc.)			
		Security thread / Piracy			
		Bad weather			
4	Jackets & Topsides Installation				
4.1	Jacket and Topsides Critical & Heavy lifting	Equipment Mishandling			
4.2	Diving operation	Diver disorientation			
		Diver fatigue, panic, stress			
		Hit by equipment/material/moving vessel			
		Pinch by material			
		Leaking bail out cylinder, Umbilical entanglement			
		Wave generated from vessel passing			
		Wild animal			
		Diving equipment malfunction			
4.3	Piling operation	Failure in pile driving			
		Shallow gas, explosion, fire			
		Expose noise /vibration to animal surround (mammal, etc)			
5	Riser Installation (modification in existing facilities)				
5.1	Riser Heavy Lifting	Equipment Mishandling			
5.2	ROV operation	Disengage of ROV, equipment loss			
		Electric shock during onboard preparation			
		Falling Object to ROV			
		Bad weather			

NO	TASK	RISKS & ACCIDENT SCENARIO	SEVERITY	OCCURRENCE	DETECTION
		HAZARD			
		Moving object, Uncontrolled/ Unauthorized vessel/ boat movement			
5.3	SIMOPS with production	Fire, explosion			
		Spill			
5.4	Welding, cutting grinding	Electric shock			
		Explosion, fire			
6	Topsides Hook-Up				
6.1	Critical & Heavy lifting	Equipment Mishandling			
6.2	MPFM Radioactive source installation	Irradiation			
6.3	SIMOPS with drilling	Fire, explosion			
		Spill			
		Man Over Board			
7	Sealine Installation				
7.1	Transportation of pipeline	Collision with others vessel, fisherman boat			
		Barge / vessel lose control, drifting, stranded, collision with the installation facilities (offshore platforms, sea lines, jackets, etc.)			
		Security thread/Piracy			
		Spill			
7.2	Hydrotest/Pigging/Leak Test	Accidental release of pollutant to sea			
		Burst, struck by, energy released			
7.3	Field Joint Coating	Fire, explosion			
		Pollution			
		Toxic, dust inhale			
7.4	Pipe laying activity	Tensioner failure, stinger broken, sheave block failure			
		Struck by moving pipe			
		Uncontrolled release of pipe, uncontrolled cable movement			
		Bad Weather			
		Anchor failure			
		Collision to other facilities due to drifting			

HASIL SURVEI KUESIONER

NO	TASK	HAZARDS – RISKS & ACCIDENT SCENARIO	SEVERITY					OCCURRENCE					DETECTION				
		HAZARD	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5
1	<i>Yard Specific Activities</i>																
1.1	<i>Topside/Jacket/Subsea Structure Critical & Heavy Lifting</i>	<i>Un-proper rigging configuration</i>	8	8	7	8	8	2	3	2	4	3	9	8	8	9	8
		<i>Poor Communication</i>	8	7	8	8	7	2	3	4	3	4	9	8	9	9	8
		<i>Material Counterfeit</i>	8	9	8	8	8	2	2	3	4	2	9	8	8	8	9
		<i>Catch in between, struck by</i>	8	7	7	8	7	2	3	3	2	4	9	9	8	9	9
		<i>Drop object</i>	8	7	8	8	8	2	2	2	4	3	9	8	8	9	8
		<i>Bad weather</i>	8	7	8	7	7	2	3	2	3	3	9	9	8	9	9
1.2	<i>Topsides load-out with Heavy lifting Method</i>	<i>Equipment Mishandling</i>	8	7	8	8	9	2	3	4	3	2	9	8	8	9	8
		<i>Natural disaster (earthquake, tsunami, typhoon, etc)</i>	8	7	7	8	7	2	4	3	2	3	9	8	8	6	8
1.3	<i>Topside load-out with Multi wheel/Dolly load out method</i>	<i>Equipment Mishandling</i>	8	8	7	7	8	2	3	4	2	4	9	8	7	8	7
		<i>Natural disaster (earthquake, tsunami, typhoon, etc)</i>	8	7	8	8	8	2	2	4	4	4	6	6	7	8	8
1.4	<i>Jacket load-out with Heavy lifting Method</i>	<i>Equipment Mishandling</i>	8	7	8	9	7	2	3	3	4	3	9	8	8	8	9
		<i>Natural disaster (earthquake, tsunami, typhoon, etc)</i>	8	7	7	7	8	2	3	3	3	2	9	8	8	8	8
1.5	<i>Topside/Jacket load-out with Multi wheel/Dolly load out method</i>	<i>Equipment Mishandling</i>	8	7	7	7	7	2	3	4	2	4	9	9	8	9	9
		<i>Unstable ground</i>	8	7	7	8	8	2	3	3	2	2	9	9	9	9	9
		<i>Natural disaster (earthquake, tsunami, typhoon, etc)</i>	8	7	8	8	7	2	3	4	2	4	6	8	8	9	9
1.6	<i>Topside/Jacket load-out with skidding method</i>	<i>Whipped by tension cable</i>	8	8	7	7	7	2	3	4	4	2	9	9	9	8	8
		<i>Natural disaster (earthquake, tsunami, typhoon, etc)</i>	8	8	8	9	7	2	2	2	4	3	6	8	9	8	8
1.7	<i>Security at Yard</i>	<i>Brawl, riot, attack, strike</i>	8	8	7	8	7	2	3	4	3	3	9	7	8	7	8
2	<i>Offshore Construction Routine Activities</i>																
2.1	<i>Work on barge/Vessel</i>	<i>Barge/vessel loses control, drifting, stranded, collision with the installation facilities (offshore platforms, sea lines, jackets, etc.)</i>	6	7	6	6	7	5	3	4	5	4	9	9	8	9	9

NO	TASK	HAZARDS – RISKS & ACCIDENT SCENARIO	SEVERITY					OCCURRENCE					DETECTION				
		HAZARD	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5
		Collision with others vessel, fisherman boat	3	3	3	2	3	7	6	6	6	6	8	8	9	8	10
		Brawl, riot, attack	6	6	6	6	6	4	5	3	5	4	9	9	7	9	9
		Anchor placed/or hit at subsea structures/ pipeline	6	5	6	6	6	6	4	5	4	5	8	6	8	8	7
		Fire onboard	8	6	8	7	5	5	4	4	4	5	7	8	7	8	7
		Spill	4	5	4	5	5	6	6	4	6	6	8	8	6	6	6
2.2	Personnel transfer at offshore	Man Over Board caused by struck by	6	5	6	4	4	5	5	4	5	3	8	9	8	8	9
		Man Over Board and drowning	6	5	4	5	4	4	3	4	4	6	8	7	8	5	8
		Fall from personnel basket	6	5	6	4	6	4	4	4	4	3	8	9	8	8	9
		Man Over Board during climbing boat landing or V-shape ladder	6	6	4	6	6	6	5	4	4	4	8	7	8	8	7
2.3	Sea transportation	Collision with others vessel, fisherman boat	6	6	6	5	6	4	4	5	6	6	9	7	8	6	8
		Collision with the installation facilities (offshore platforms sea lines, jackets, etc.)	6	4	6	6	6	4	4	4	3	3	7	8	6	8	7
		Man Over Board, drowning	6	4	6	6	5	3	4	4	5	5	7	7	8	6	8
2.4	Working above water	Man Over Board, drowning	6	5	6	4	5	5	5	5	5	9	6	8	8	9	
		Man Over Board from/ with scaffolding	6	5	5	4	4	4	4	5	5	5	7	7	6	7	8
		Man Over Board struck by	6	6	5	4	4	5	4	6	4	4	7	7	8	6	8
2.5	Loading/unloading	Accidental release of pollutant to sea	6	5	5	6	5	4	5	5	4	4	6	8	7	7	8
2.6	Working in remote area/Lone working	Medivac constraint, distance from shore, weather/sea condition	6	5	6	6	4	6	4	4	5	4	7	8	7	6	7
2.7	Handling/Lifting	Catch in between, struck by	6	4	4	5	4	4	4	5	4	5	7	7	7	6	8
		Drop object	6	5	6	4	6	6	4	5	4	5	7	6	6	6	6
		Crane Collapse	6	5	5	5	6	5	6	4	4	6	7	5	8	7	6
		Un-proper ballasting system/Vessel unstable	6	6	6	5	4	6	4	4	6	5	8	8	8	6	8
		Bad weather	6	6	4	6	5	4	4	5	4	5	9	7	8	7	7
		Boom crane collide with existing facilities	6	5	6	5	6	4	4	6	4	5	9	8	8	8	8
2.8	Mooring/Anchoring	Hit existing facilities	6	5	4	6	5	6	5	4	4	4	9	7	6	6	8

NO	TASK	HAZARDS – RISKS & ACCIDENT SCENARIO	SEVERITY					OCCURRENCE					DETECTION				
		HAZARD	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5
		<i>Pinch Point</i>	6	4	5	6	4	5	4	6	6	5	8	8	7	7	6
		<i>Uncontrolled mooring line</i>	6	6	5	4	5	4	5	5	4	4	6	8	8	7	8
		<i>Broke, snapback mooring/anchor line</i>	6	4	4	6	5	4	5	5	6	5	8	8	7	8	6
		<i>Winch engine failed</i>	6	4	5	4	6	6	6	6	4	4	8	7	8	6	7
2.9	<i>Bunkering</i>	<i>Pinch Point</i>	6	5	5	6	4	5	5	4	6	5	7	8	8	8	6
		<i>Collision</i>	6	6	5	6	5	4	4	5	4	6	6	8	7	7	7
		<i>Spill</i>	3	5	5	4	4	5	6	5	6	4	8	7	7	8	8
3	<i>Towing of Jacket, Topsides & Oppurtunance with Barge</i>																
3.1	<i>Towing</i>	<i>Collision with others vessel</i>	8	7	7	8	8	2	3	4	3	4	9	7	9	7	8
		<i>Collision with the installation facilities (offshore platforms, sea lines, jackets, etc.)</i>	8	8	7	7	7	2	4	4	2	2	9	6	8	8	8
		<i>Security thread / Piracy</i>	8	8	7	7	8	2	4	4	3	2	6	7	8	9	6
		<i>Bad weather</i>	8	7	7	8	7	2	4	2	3	4	9	8	9	8	7
4	<i>Jackets & Topsides Installation</i>																
4.1	<i>Jacket and Topsides Critical & Heavy lifting</i>	<i>Equipment Mishandling</i>	8	7	8	8	8	4	4	5	3	5	7	9	7	8	7
4.2	<i>Diving operation</i>	<i>Diver disorientation</i>	8	7	7	8	7	2	4	3	4	3	9	7	7	9	7
		<i>Diver fatigue, panic, stress</i>	8	8	7	7	7	2	4	3	4	3	9	7	8	8	9
		<i>Hit by equipment/material/moving vessel</i>	8	7	8	7	8	2	4	5	2	5	9	9	9	7	7
		<i>Pinch by material</i>	8	7	7	9	8	2	4	2	5	3	9	9	9	9	8
		<i>Leaking bail out cylinder, Umbilical entanglement</i>	8	7	8	8	8	2	2	3	3	2	9	8	7	9	8
		<i>Wave generated from vessel passing</i>	8	7	9	7	8	2	4	4	2	4	9	9	8	7	8
		<i>Wild animal</i>	8	8	7	8	7	2	2	2	3	2	9	8	9	7	8
		<i>Diving equipment malfunction</i>	8	7	7	8	7	2	4	3	2	5	9	8	7	7	7
4.3	<i>Piling operation</i>	<i>Failure in pile driving</i>	8	7	7	8	7	2	4	2	3	3	9	7	7	7	7
		<i>Shallow gas, explosion, fire</i>	8	7	7	8	7	2	2	2	4	4	9	7	7	7	7
		<i>Expose noise /vibration to animal surround (mammal, etc)</i>	8	9	7	7	7	2	3	2	2	4	9	7	8	8	7
5	<i>Riser Installation (modification in existing facilities)</i>																
5.1	<i>Riser Heavy Lifting</i>	<i>Equipment Mishandling</i>	8	7	6	7	8	3	4	5	4	4	7	5	6	8	7
5.2	<i>ROV operation</i>	<i>Disengage of ROV, equipment loss</i>	8	7	7	7	8	3	3	3	4	3	9	9	7	7	8

NO	TASK	HAZARDS – RISKS & ACCIDENT SCENARIO	SEVERITY					OCCURRENCE					DETECTION				
		HAZARD	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5
		Electric shock during onboard preparation	8	7	7	7	7	3	3	3	2	4	9	8	9	7	8
		Falling Object to ROV	8	8	7	8	8	3	4	3	3	3	6	9	9	6	9
		Bad weather	8	7	7	7	7	2	2	2	4	4	9	7	8	8	9
		Moving object, Uncontrolled/ Unauthorized vessel/ boat movement	8	8	8	7	8	3	2	3	3	2	9	7	9	8	7
5.3	SIMOPS with production	Fire, explosion	8	8	7	7	9	3	3	4	4	2	6	9	7	8	8
		Spill	8	7	6	7	7	3	3	3	2	4	9	6	9	7	7
5.4	Welding, cutting grinding	Electric shock	7	8	7	8	7	6	5	4	6	4	7	7	9	7	8
		Explosion, fire	7	6	7	7	7	4	4	5	4	4	9	7	8	7	8
6	Topsides Hook-Up																
6.1	Critical & Heavy lifting	Equipment Mishandling	8	7	7	8	7	3	4	2	4	4	7	7	8	7	7
6.2	MPFM Radioactive source installation	Irradiation	8	7	8	7	8	3	3	4	3	3	7	8	7	8	7
6.3	SIMOPS with drilling	Fire, explosion	8	7	6	7	6	3	4	4	3	4	6	7	6	8	7
		Spill	6	8	6	8	7	3	3	3	4	5	8	6	7	7	7
		Man Over Board	8	6	8	7	8	3	4	4	4	3	6	6	6	6	8
7	Sealine Installation																
7.1	Transportation of pipeline	Collision with others vessel, fisherman boat	8	7	8	7	9	3	2	4	5	4	9	9	8	7	7
		Barge / vessel lose control, drifting, stranded, collision with the installation facilities (offshore platforms, sea lines, jackets, etc.)	8	8	8	8	7	3	2	2	3	4	6	8	8	5	8
		Security thread/Piracy	8	7	8	8	7	3	4	4	4	2	9	7	6	7	7
		Spill	8	8	8	7	7	3	3	4	2	3	9	8	8	7	7
7.2	Hydrotest/Pigging/Leak Test	Accidental release of pollutant to sea	8	7	7	8	7	3	3	3	2	2	9	9	9	9	8
		Burst, struck by, energy released	8	7	7	7	7	3	3	4	3	4	9	9	8	6	7
7.3	Field Joint Coating	Fire, explosion	8	8	8	7	7	2	4	3	4	4	9	8	8	9	7
		Pollution	8	8	7	8	7	2	3	3	3	4	9	7	8	8	7
		Toxic, dust inhale	8	8	8	8	7	2	2	2	4	2	9	7	8	7	9
7.4	Pipe laying activity	Tensioner failure, stinger broken, sheave block failure	8	7	8	7	7	2	3	3	3	2	9	8	7	8	7

NO	TASK	HAZARDS – RISKS & ACCIDENT SCENARIO	SEVERITY					OCCURRENCE					DETECTION				
		HAZARD	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5
		<i>Struck by moving pipe</i>	8	8	7	8	7	3	3	2	4	3	6	7	7	9	8
		<i>Uncontrolled release of pipe, uncontrolled cable movement</i>	8	7	8	9	7	3	4	2	4	4	6	7	8	8	7
		<i>Bad Weather</i>	8	8	8	7	8	3	4	3	2	2	9	8	7	9	7
		<i>Anchor failure</i>	8	8	9	9	9	3	4	4	2	3	9	7	8	7	9
		<i>Collision to other facilities due to drifting</i>	8	9	7	7	8	3	4	4	2	4	9	8	9	7	9

Tabel 1. Daftar Identitas Responden

No	Responden	Jabatan	Pengalaman Kerja (Tahun)
1	R1	<i>Project Manager</i>	35
2	R2	<i>HSE Manager</i>	20
3	R3	<i>HSE Coordinator</i>	17
4	R4	<i>HSE Officer</i>	12
5	R5	<i>Supervisor</i>	13



LAMPIRAN B
SURVEI WAWANCARA

HASIL WAWANCARA (TAHAP 1)

Identifikasi Dan Analisis Risiko Kecelakaan Kerja dengan Metode *Failure Mode And Effect Analysis (FMEA)* dan *Fault Tree Analysis (FTA)* beserta Pengendalian Risiko pada Konstruksi Bangunan Minyak dan Gas Bumi Lepas Pantai (Studi Kasus Pada Proyek X)

Hasil wawancara berikut merupakan hasil rangkuman wawancara (Tahap 1) kepada narasumber 1, 2 dan 3 yaitu HSE *manager*, HSE *coordinator* dan HSE *officer*.

No	Pertanyaan	Keterangan
1	Apakah seluruh pekerjaan yang tercantum pada dokumen HSE <i>Risk Register</i> relevan terhadap pekerjaan yang ada di Proyek X?	Seluruh pekerjaan yang tercantum pada dokumen HSE <i>Risk Register</i> relevan terhadap pekerjaan yang ada di Proyek X. HSE <i>Risk Register</i> tersebut disusun khusus untuk Proyek X.
2	Apakah seluruh pekerjaan yang tercantum pada dokumen HSE <i>Risk Register</i> dikerjakan seluruhnya oleh pihak kontraktor Proyek X?	Tidak, terdapat beberapa pekerjaan yang dikerjakan oleh pihak subkontraktor seperti pekerjaan <i>diving operation</i> dan ROV (<i>Remotely Operated Vehicle</i>).

HASIL WAWANCARA (TAHAP 2)

Identifikasi Dan Analisis Risiko Kecelakaan Kerja dengan Metode *Failure Mode And Effect Analysis (FMEA)* dan *Fault Tree Analysis (FTA)* beserta Pengendalian Risiko pada Konstruksi Bangunan Minyak dan Gas Bumi Lepas Pantai (Studi Kasus Pada Proyek X)

Hasil wawancara berikut merupakan hasil rangkuman wawancara (Tahap 2) kepada narasumber 1, 2 dan 3 yaitu *HSE manager*, *HSE coordinator* dan *HSE officer*.

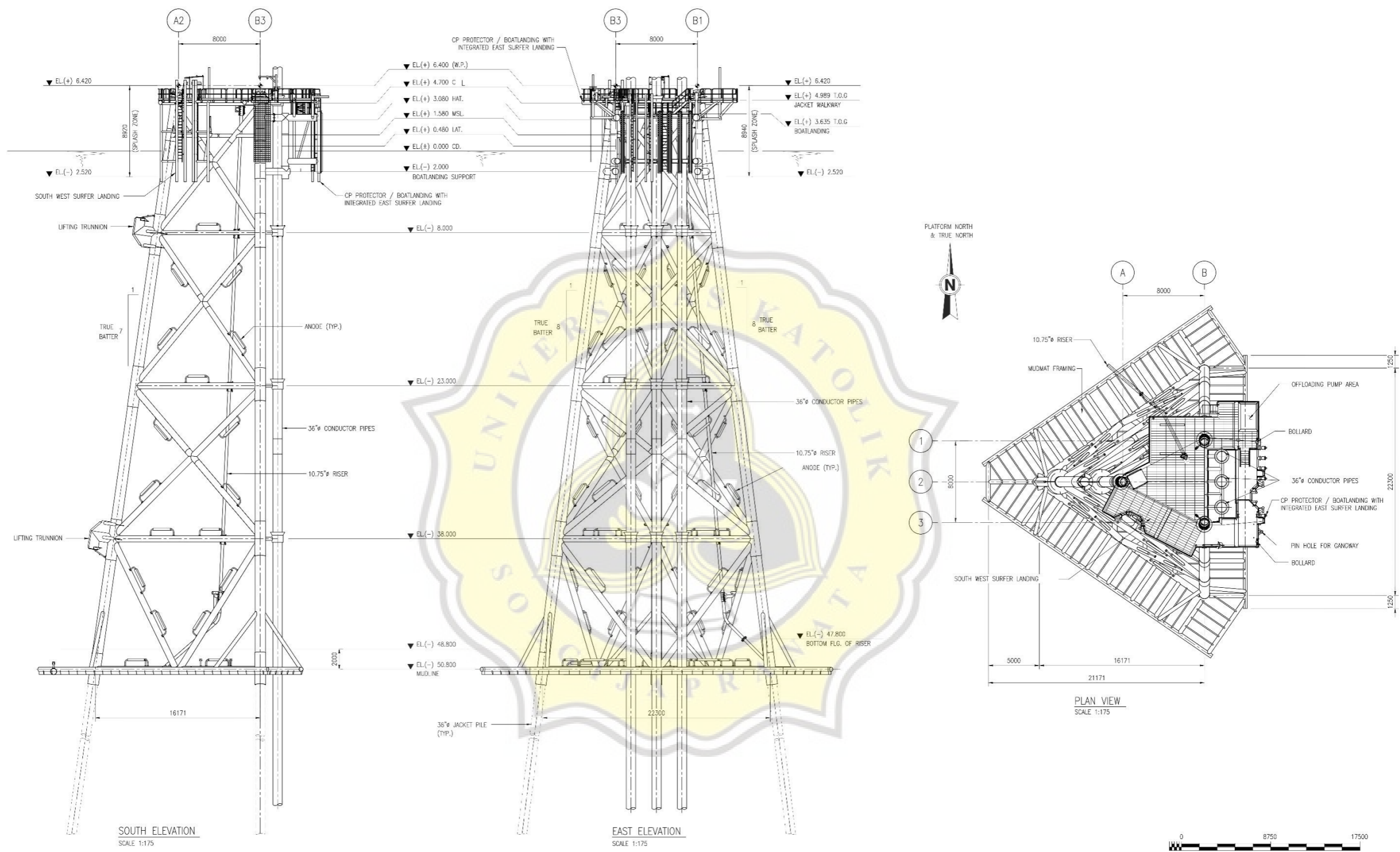
No	Pertanyaan	Keterangan
1	Penyebab dari terjadinya <i>hazard electrical shock</i> pada <i>task welding, cutting, grinding</i> pada <i>riser installation</i> ?	Bahaya tersebut biasanya disebabkan dari tidak menggunakan APD lengkap, kurang memahami metode kerja, kurang koordinasi antar pekerja, kondisi pekerja, kurangnya perawatan terhadap alat yang digunakan, kondisi alat tidak baik, lingkungan kerja kurang baik, lantai licin, posisi kerja terbatas, kurangnya manajemen oleh HSE.
2	Penyebab dari terjadinya <i>hazard equipment mishandling</i> pada <i>task jacket and topsides critical and heavy lifting</i> pada <i>jacket and topsides installation</i> ?	Bahaya tersebut biasanya disebabkan dari kondisi pekerja seperti kelelahan, kurang istirahat, tidak enak badan, kurang hati – hati, kurangnya inspeksi alat sebelum dilakukan, kondisi alat yang buruk, ruang gerak terbatas, cuaca buruk, kurangnya rambu keselamatan, kurangnya manajemen oleh HSE.
3	Penyebab dari terjadinya <i>hazard barge/vessel loses control, drifting, stranded, collision with the installation facilities</i> pada <i>task work on barge</i> pada <i>offshore construction routine activity</i> ?	Bahaya tersebut biasanya disebabkan dari terburu – burunya dan kurang hati – hati pekerja, kondisi pekerja kelelahan, kurang konsentrasi, kurang istirahat, kurangnya pemeliharaan alat, kondisi alat yang buruk, kurangnya manajemen oleh HSE.

No	Pertanyaan	Keterangan
4	Pengendalian risiko yang telah diterapkan pada Proyek X?	Melakukan beberapa kegiatan untuk meminimalisir terjadinya kecelakaan kerja seperti <i>safety talk</i> , <i>safety tour</i> , <i>safety induction</i> . Selain itu pekerja diberi peringatan/teguran apabila melanggar ketentuan K3 yang telah diberlakukan di proyek. Pemeliharaan alat berat dilakukan secara berkala. Rambu – rambu peringatan harus tersedia pada lokasi – lokasi yang rawan terjadinya kecelakaan.





LAMPIRAN C
GAMBAR PROYEK



NOTES :

- ALL DIMENSIONS ARE IN MILLIMETER UNLESS NOTED OTHERWISE.
- ALL ELEVATIONS ARE IN METER WITH RESPECT TO CHART DATUM (CD +0.00) UNLESS NOTED OTHERWISE.
- AS-BUILT ELEVATION OF JACKET IS AS INDICATED ON DRAWING BUT TO BE REDUCED BY 18MM. SINCE INSTALLED ELEVATION OF JML1 JACKET IS LOWER BY -18MM COMPARED TO TARGET DESIGN ELEVATION. IT IS BASED ON JML1 POST INSTALLATION SURVEY REPORT ID-SMK-JML1-2040-380604 DATED MAY 11th, 2021.
- TOPSIDE ELEVATION IS MAINTAINED AS PER INITIAL DESIGN BY ADJUSTING THE TRANSITION PIECE.

DOCUMENT NO	DOCUMENT TITLE	Rev	Date	Status	Revision Memo	Issued by	Checked by	Approved by	Company
ID-SMK-JML1-2040-290316	JML1 - RISER CLAMP GENERAL ARRANGEMENT AND DETAILS								
ID-SMK-JML1-2040-294100	JML1 - JACKET BOATLANDING FRAMING AND BOLLARD								
ID-SMK-JML1-2040-290320	JML1 - JACKET TRUNNIONS LIFTING DETAILS								
ID-SMK-JML1-2040-290318	JML1 - JACKET V-SHAPE FRAMING								
ID-SMK-JML1-2040-290314	JML1 - JACKET ANODE LAYOUT AND DETAILS								
ID-SMK-JML1-2040-290302 TO 290306	JML1 - JACKET PLAN VIEW ELEVATION EL(+4.700 TO EL(-) 50.800	1.0	06-AUG-2021	ASB	AS BUILT	DR	HRF	TDT	
ID-SMK-JML1-2040-290301	JML1 - JACKET ELEVATION - ROWS	0.3	11-FEB-2021	APC	APPROVED FOR CONSTRUCTION	GM	HRF	TDT	
ID-ALL-2040-290101	JSN - STRUCTURAL GENERAL NOTES	0.2	15-JAN-2021	IFA	ISSUED FOR ACCEPTANCE	GM	HRF	TDT	
ID-ALL-2040-290100	JSN - STRUCTURAL DRAWING LIST	0.1	27-JUL-2020	IFC	ISSUED FOR COMMENT	GM	HRF	TDT	

CONTRACTOR: **PT. MEINDO ELANG INDAH**
Engineering and Construction

ENGINEERING, PROCUREMENT, SUPPLY, CONSTRUCTION, AND COMMISSIONING CONTRACT FOR NORTH SISI, NORTH NUBI AND JUMELAI PROJECT

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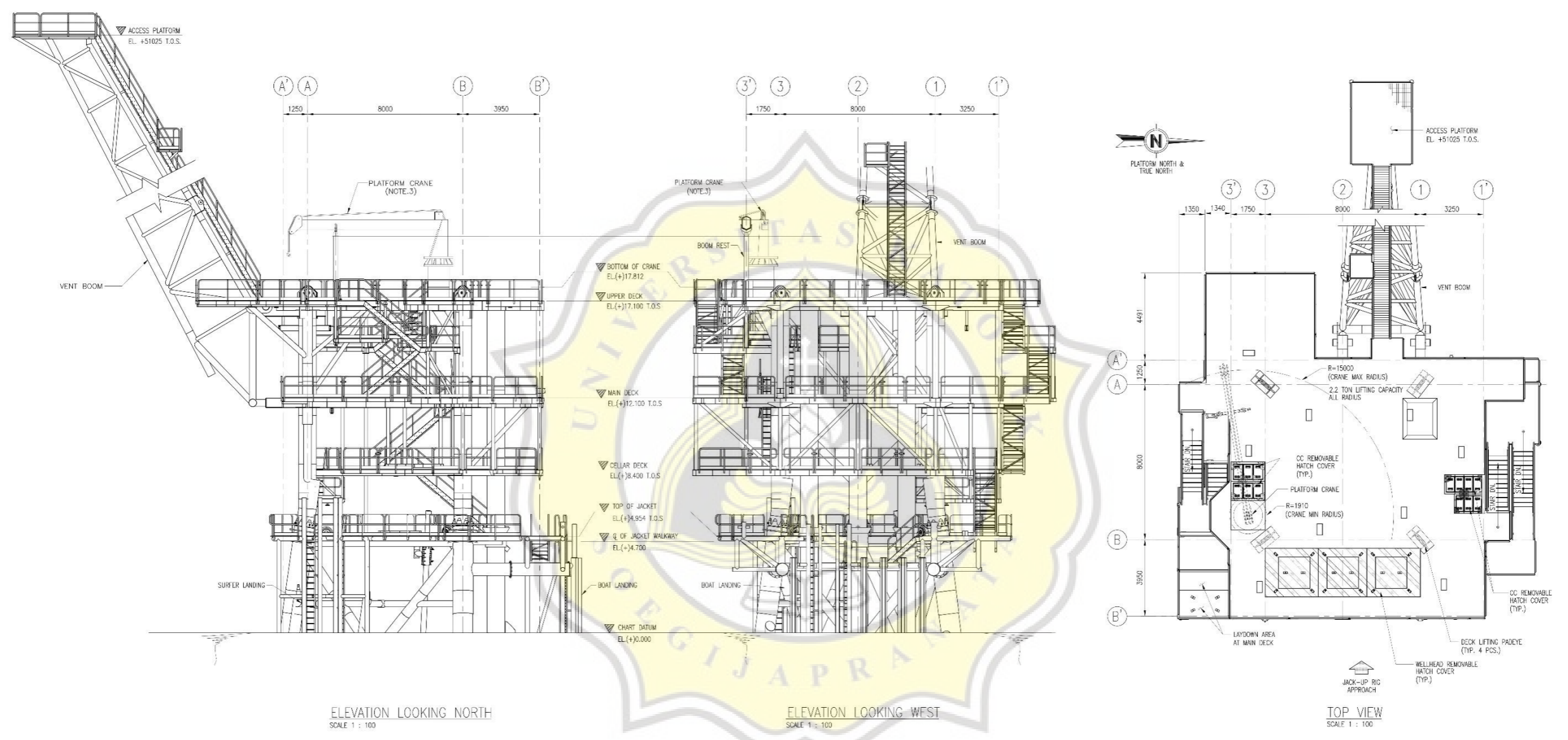
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JML1 JACKET GENERAL VIEW

Doc Type: DRW Syst./ S-Syst.: N/A Discipline: STR Electronic Filename: ID-SMK-JML1-2040-290300_JML1_Jacket_General_View_Rev_1.0

Company: MEINDO ELANG INDAH Rev: 1.0 Scale: AS SHOWN

Project: ID-SMK-JML1-2040-290300 Format: A1 Page: 1 OF 1



- NOTES :**
1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS NOTED OTHERWISE.
 2. ALL ELEVATIONS ARE IN METER WITH RESPECT TO CHART DATUM (CD +0.00) UNLESS NOTED OTHERWISE.
 3. FOR GENERAL DRAWING NOTES SEE DRAWING : ID-ALL-ALL-2040-290101.
 4. FOR DETAILS PLATFORM CRANE REFER TO DRAWING NO. ID-ALL-ALL-3859-237008-P-ALL-20-008.
 5. AS-BUILT ELEVATION OF JACKET AND DECK ARE AS INDICATED ON DRAWINGS BUT TO BE ADJUSTED BY DIFFERENCE VALUE ACCORDING TO TABLE BELOW SINCE INSTALLED ELEVATION IS DIFFERS COMPARED TO TARGET DESIGN ELEVATION.
IT IS BASED ON JML-1 POST INSTALLATION SURVEY REPORT DOC. NO. ID-SMK-JML1-2040-390806 DATED OCT. 25, 2021.

JML1-JACKET AND DECK AS BUILT ELEVATION			
DESCRIPTION	DESIGN ELEVATION (mm)	AS BUILT ELEVATION (mm)	DIFFERENCE (mm)
UPPER DECK (T.O.S.)	17100	17118	18
MAIN DECK (T.O.S.)	12100	12091	-9
CELLAR DECK (T.O.S.)	8400	8396	-4
TOP OF JACKET (T.O.S.)	4954	4778	-176

REV.	DATE	STATUS	REVISION MEMO	ISSUED BY	CHECKED BY	APPROVED BY	COMPANY
1.0	29-OCT-21	ASB	AS BUILT	PWT	HRF	TDI	
0.3	09-APR-21	AFC	APPROVED FOR CONSTRUCTION	PWT	HRF	TDI	
0.2	08-MAR-20	IFA	ISSUED FOR ACCEPTANCE	PWT	HRF	TDI	
0.1	18-SEP-20	IFC	ISSUED FOR COMMENT	PWT	HRF	TDI	

DOCUMENT NO	DOCUMENT TITLE
ID-SMK-JML1-2040-250203	JML1 - PLOT PLAN-PLAN VIEW-UPPER DECK
ID-SMK-JML1-2040-290318	JML1 - JACKET-Y-SHAPE FRAMING
ID-SMK-JML1-2040-290400	JML1 - JACKET-BOTLANDING FRAMING AND BOLLARD
ID-SMK-JML1-2040-290300	JML1 - JACKET-GENERAL VIEW
ID-SMK-JML1-2040-290427	JML1 - LIFTING ARRANGEMENT AND PADYE DETAILS
ID-SMK-JML1-2040-290415 TO 290417	JML1 - DECK-FLOORING AND HANDRAIL LAYOUT
ID-SMK-JML1-2040-290407 TO 290414	JML1 - DECK-TRUSSES ELEVATION ROW
ID-SMK-JML1-2040-290401 TO 290406	JML1 - DECK-MAIN FRAMING PLAN & SECONDARY FRAMING PLAN
ID-SMK-ALL-ALL-2040-290101	JSN - STRUCTURAL GENERAL NOTES
ID-ALL-ALL-2040-290100	JSN - STRUCTURAL DRAWING LIST



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Contract : 45000010745

JML1 DECK GENERAL VIEW

Doc. Type : DWG Synt / S. Syst. : N/A Discipline : SBR Drawn By : Filmoner 0-SMK-JML1-2040-290400-Des - Cover No. Bx. 1104g

Company : **ID-SMK-JML1-2040-290400** Rev. : 1.0 Scale : 1:100

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