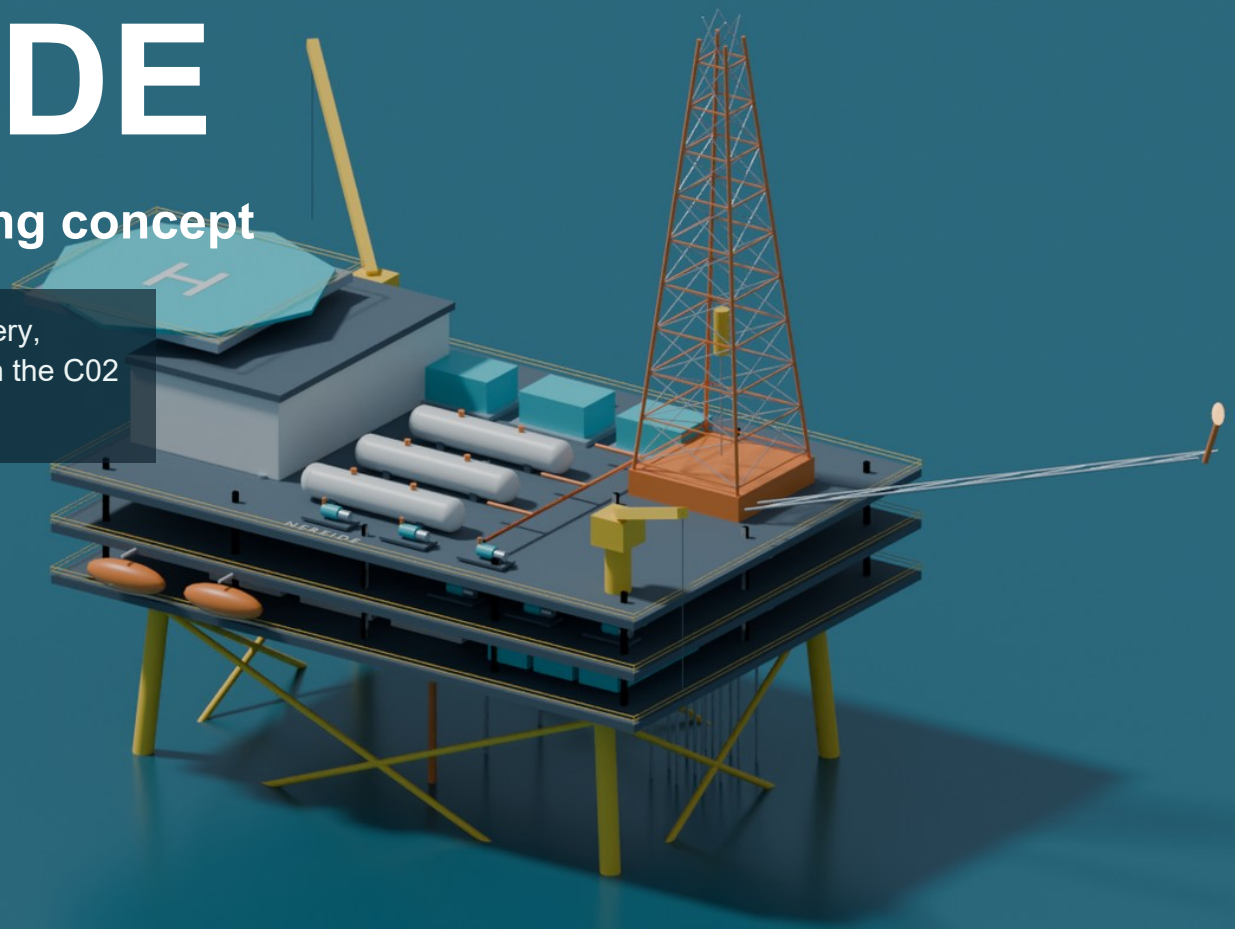
NEREIDE

Offshore engineering concept

A close view of the jacket, machinery, drilling equipment and interfaces in the C02 platform model.



NEREIDE combines a four-leg jacket, three decks, production modules, drilling equipment and accommodation. The close views trace the model from seabed to topsides, documenting equipment positions, interfaces and the coordination decisions needed for the next design issue.

Geometry revision

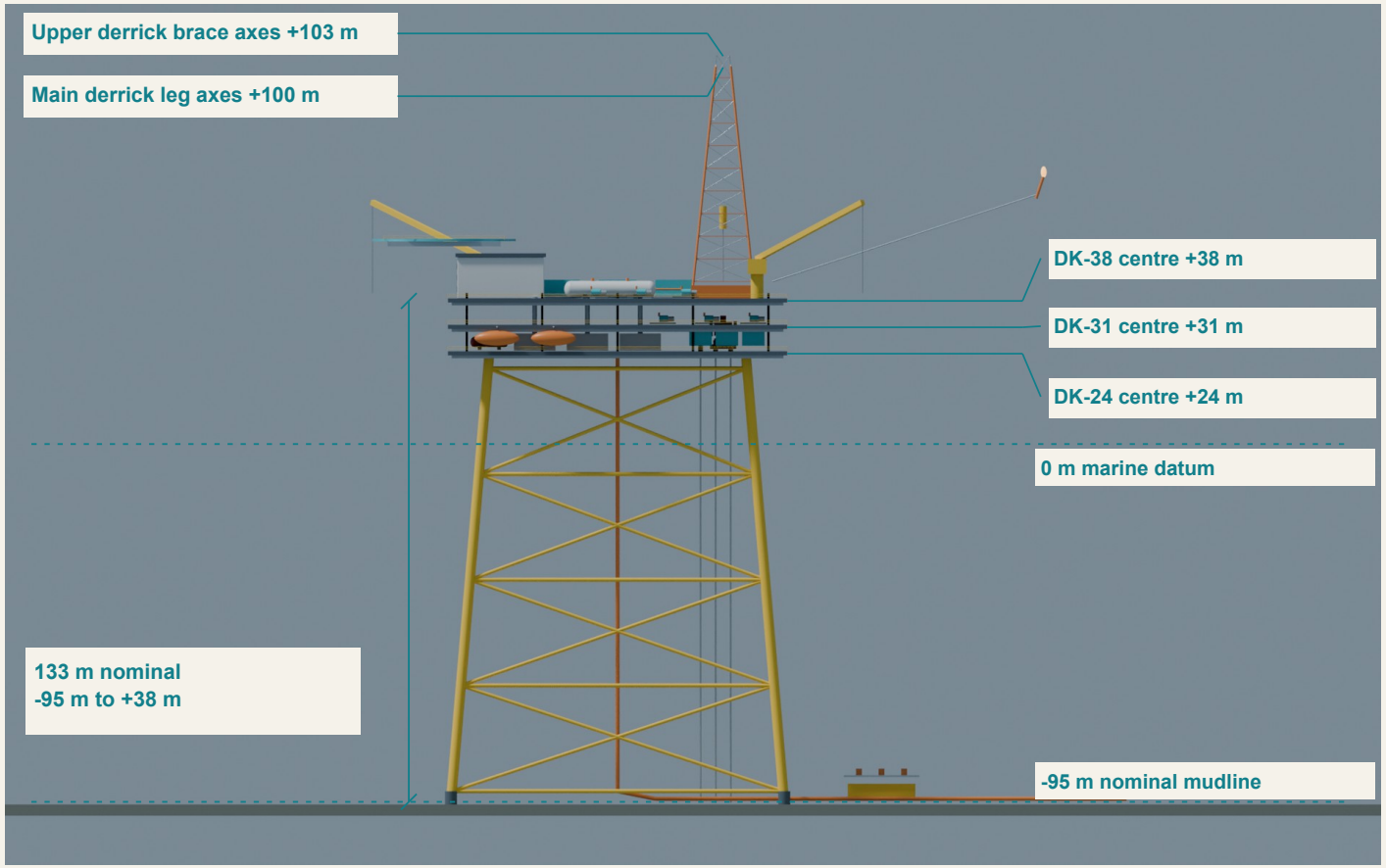
C02

Nominal topsides

90 × 64 m

Design basis and coordinate frame

A single local coordinate system supports the plans, elevations and equipment positions in this document.



General arrangement in local coordinates; the helideck, cranes and flare extend outside the deck rectangle.

Coordinates are synthetic local east, north and up, in metres. The model has no EPSG reference or surveyed location. Its marine datum is z = 0.

The nominal mudline is -95 m. The visual seabed box has an upper face at -95.5 m, so the two references differ by 0.5 m. Resolve that convention before developing foundations or subsea clearances.

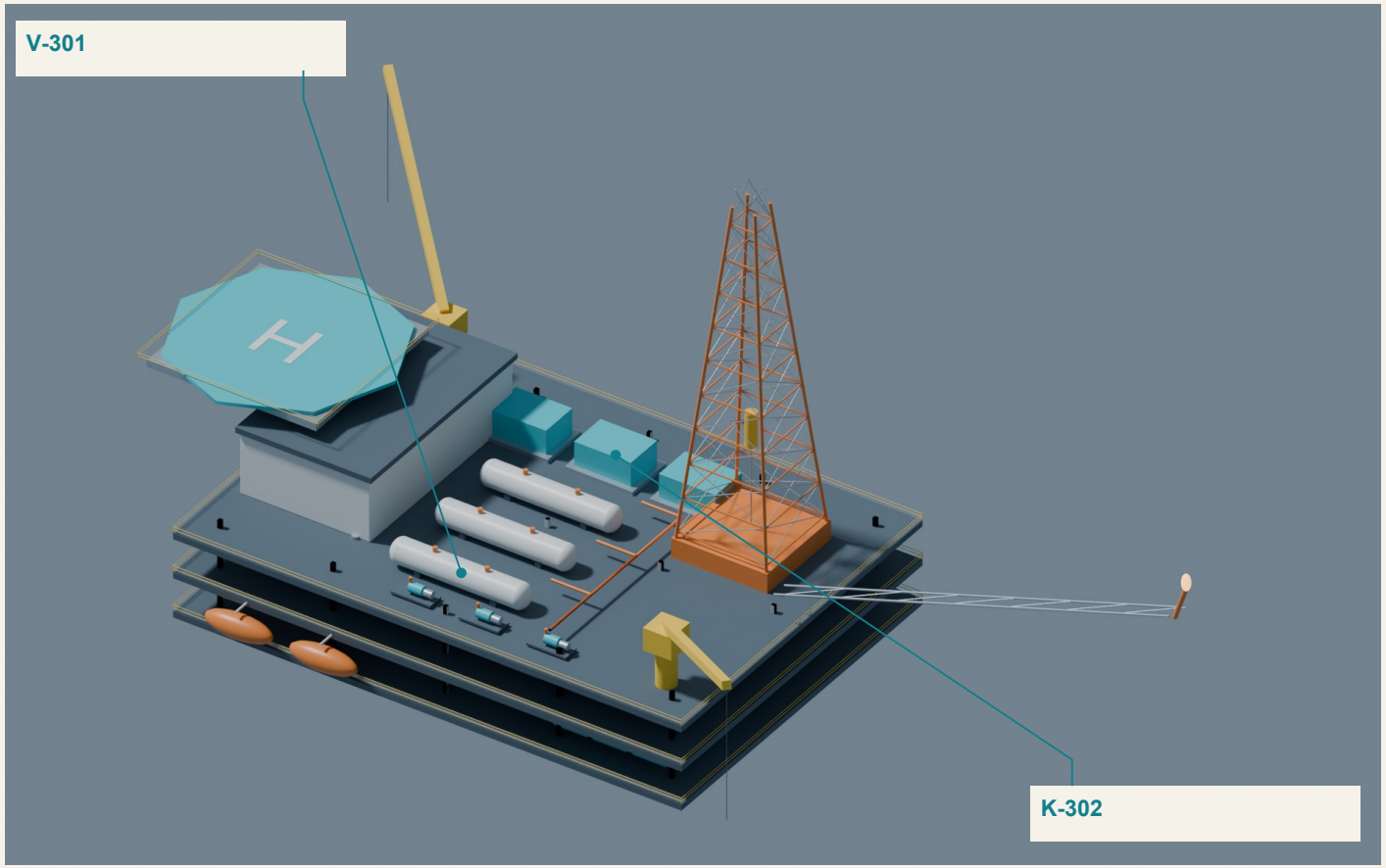
Basis register

Item	Value / status
Topside rectangle	90 × 64 m, model fact
Oil production	60,000 bbl/day, assumption
Nominal mudline	z = -95.00 m
Seabed proxy top	z = -95.50 m

Dimensions describe geometric envelopes; they do not establish equipment duty.

Arrangement by location

The upper deck carries the visible production train; lower levels contain utilities, mud equipment and well access.



Topsides arrangement with the jacket and long RISER members hidden for clarity.

V-301 to V-303 have shell axes at z = +41 m, above DK-38. Compression-module centres lie along y = +18 m. Accommodation occupies the west side; the derrick centre is at x = 28 m, y = 12 m.

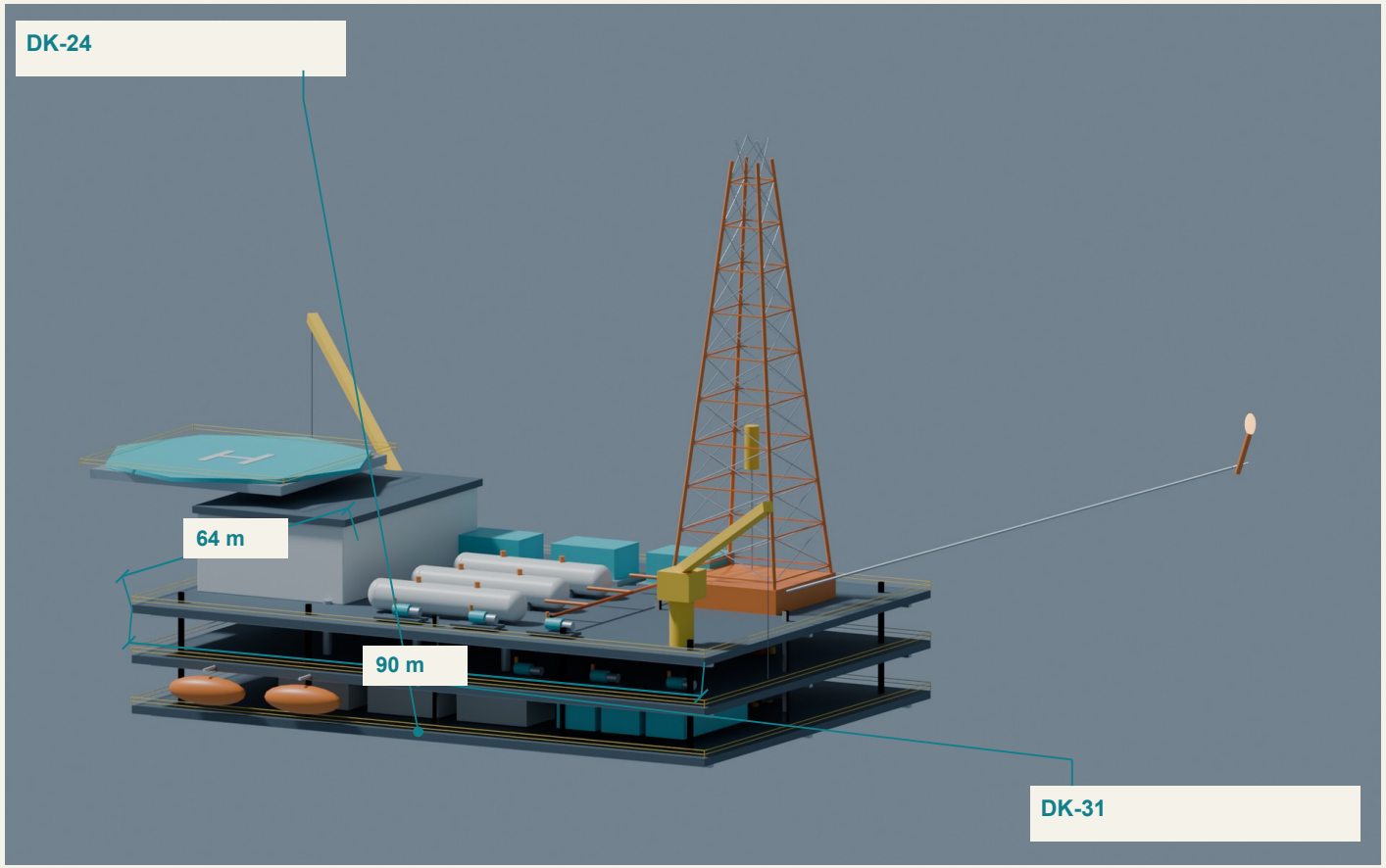
These positions identify interfaces worth reviewing together. They do not establish hazardous-area boundaries, safe separation distances or approved escape routes.

Representative positions

Object	Centre (x, y, z), m
V-301 shell	(-2, -20, 41)
K-302 module	(0, 18, 41)
LQ-501 envelope	(-31, 1, 44)
BOP central body proxy	(28, 12, 30)

Deck levels and gross area

The deck elevations locate the centres of solid deck envelopes, rather than surveyed walking surfaces.



Deck-centre datums and slab faces beside the modelled stack. Nominal levels differ from future structural top-of-steel datums.

Each deck envelope is 1.10 m deep. The 7.00 m centre-to-centre spacing leaves 5.90 m between adjacent slab faces, before allowing for beams, equipment or services.

Each 90 × 64 m rectangle has a gross plan area of 5,760 m². The three rectangles total 17,280 m². This geometric sum includes no deduction for openings and is not a usable floor-area or equipment-loading schedule.

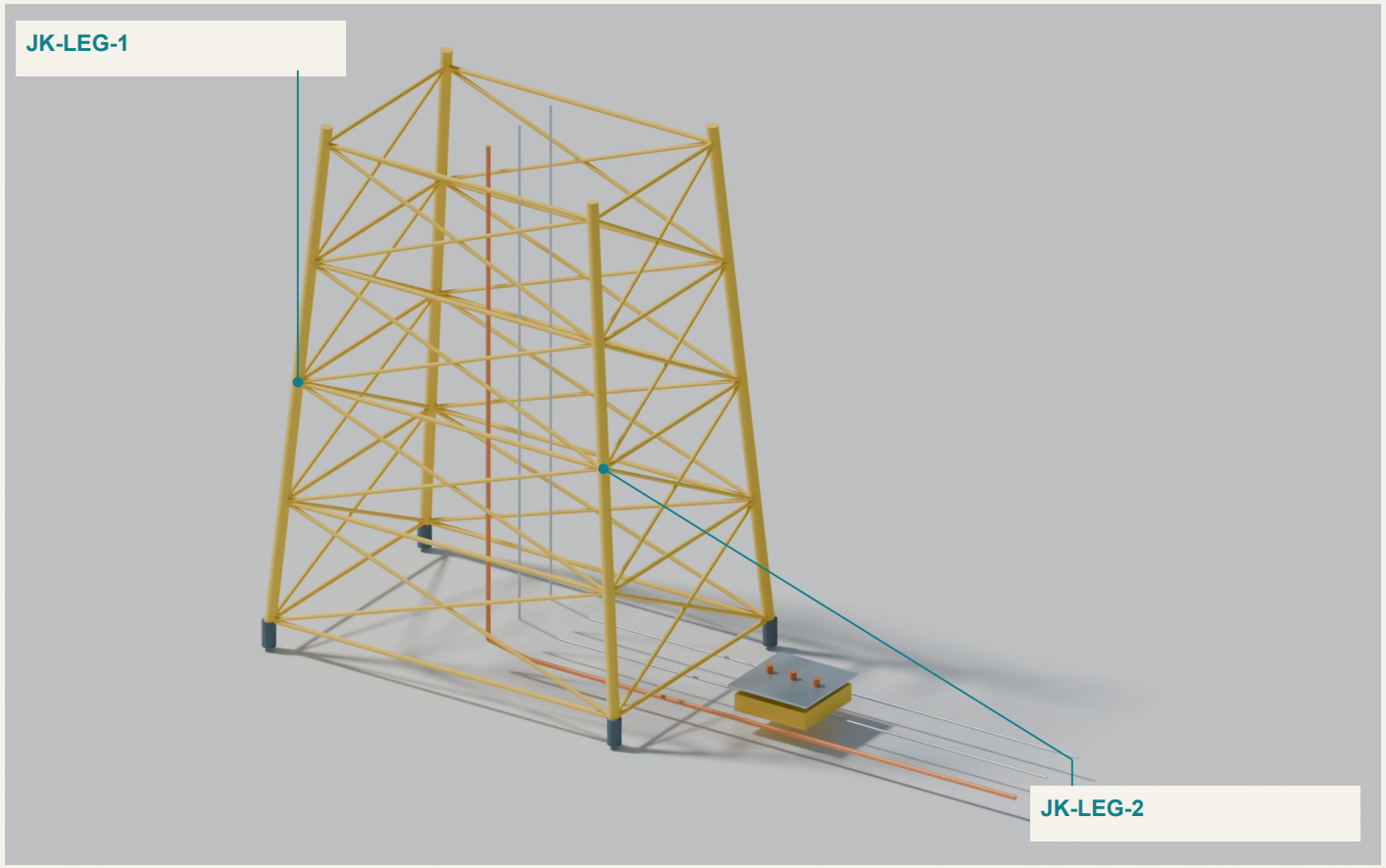
Deck envelope elevations

Tag	Centre / upper face, m
DK-24	24.00 / 24.55
DK-31	31.00 / 31.55
DK-38	38.00 / 38.55

No deck penetration, local load capacity or net headroom is certified.

Jacket geometry

Four inclined legs connect the broad base footprint to a narrower interface beneath the topsides.



Full jacket with the sea surface removed; dimensions refer to member axes unless stated otherwise.

The leg centre lines run from z = -96 m to +24 m. Their nominal diameter is 2.70 m and each axis is 120.641 m long. These are solid geometric members; wall thickness and material grade are not assigned.

At the upper interface, leg axes form a 68 × 46 m rectangle. The lower axis rectangle is approximately 88.571 × 59.916 m. Wave, current, wind and seismic actions must be defined before these proportions can be assessed structurally.

Jacket reference geometry

Parameter	Value
Leg-axis vertical rise	120.00 m
Leg-axis length	120.641 m
Top leg-axis positions	x = ±34; y = ±23 m

Bracing and connection nodes

The frame contains explicit member axes, while its joints remain simplified intersections of geometric solids.

The jacket includes 20 horizontal members and 32 diagonal braces. Horizontal rings occur at z = -92, -64, -36, -8 and +20 m, with 28 m spacing between rings.

Horizontal-member diameter is 1.10 m; diagonal-brace diameter is 0.96 m. Node detailing must establish member continuity, weld geometry, local reinforcement and inspection access. The current intersections provide locations for that work, without demonstrating joint capacity or fatigue life.

Frame components

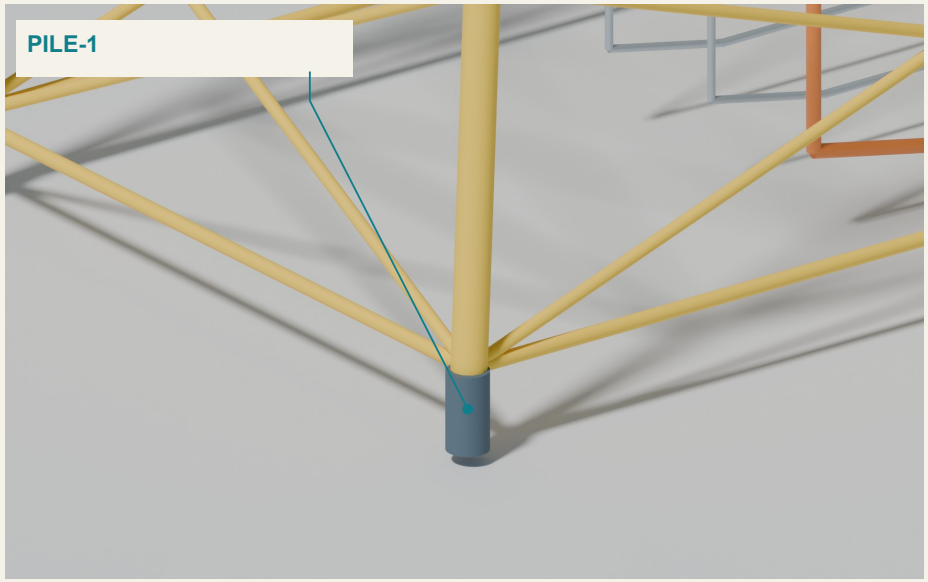
Family	Count / nominal diameter
JK-HORIZONTAL	20 / 1.10 m
JK-BRACE	32 / 0.96 m
JK-LEG	4 / 2.70 m



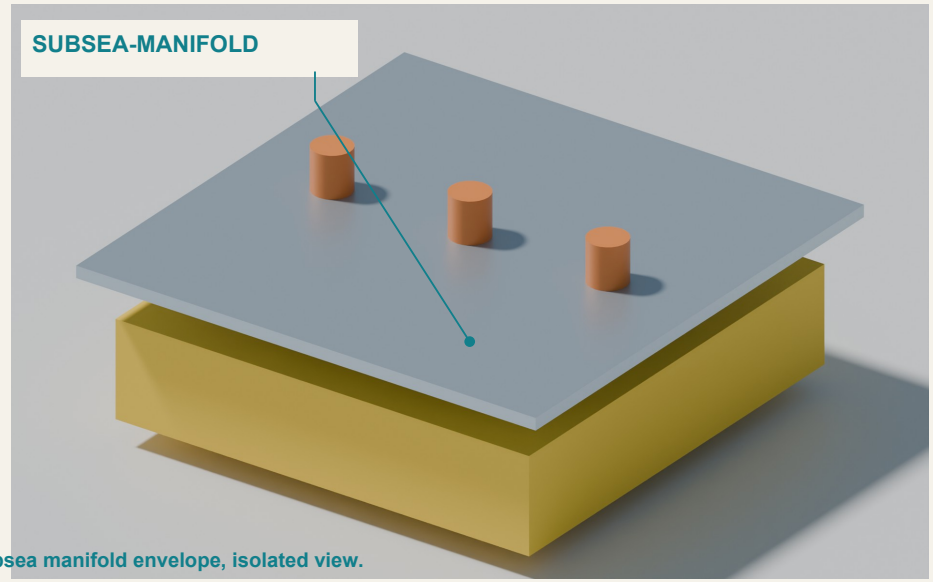
Close view of jacket legs, horizontals and braces at a modelled connection node.

Mudline, piles and manifold

Four pile placeholders and an outboard manifold define the foundation and subsea interfaces around the jacket.



Mudline detail of a jacket leg, pile placeholder and nearby bracing.



Subsea manifold envelope, isolated view.

Four PILE objects are 3.20 m in diameter and 6.00 m long, centred at z = -95 m. Their extents are -98 to -92 m. The 6 m geometric length must not be described as pile embedment.

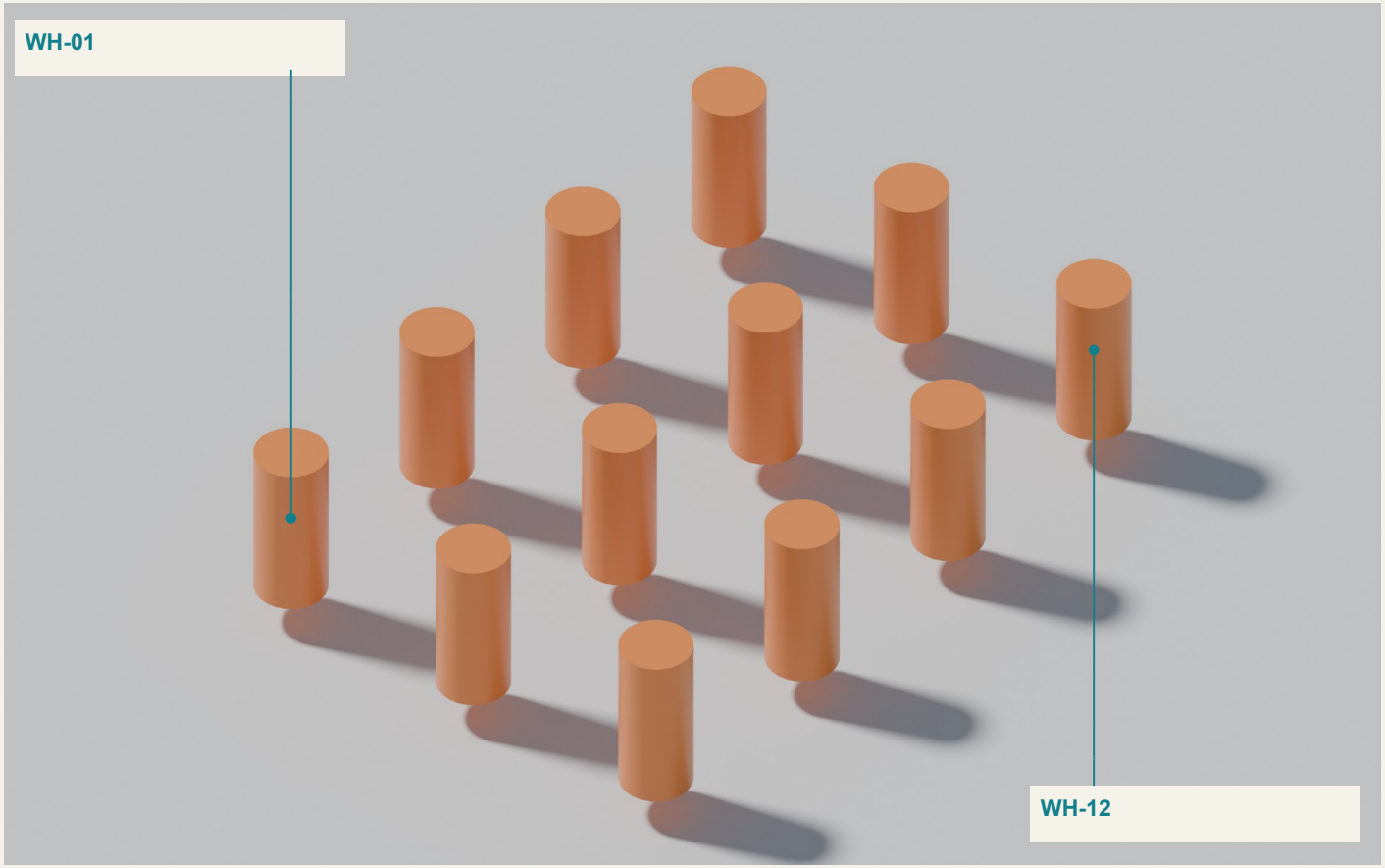
The manifold envelope is 18 × 18 × 4 m, centred at (70, 0, -92). Its lower face is 1 m above the nominal mudline. Actual foundation penetration, scour protection, settlement and seabed support remain open design inputs.

Seabed interfaces

Object / reference	Elevation, m
Nominal mudline	-95.00
Seabed proxy upper face	-95.50
Manifold lower face	-94.00
Pile proxy lower end	-98.00

Twelve well slots

The twelve wellheads form a regular 3 by 4 grid; vertical members tagged RISER-01 to RISER-12 extend towards the nominal mudline.



The twelve wellhead envelopes, isolated with decks and vertical RISER members hidden.

WH-01 to WH-12 have centres at z = +26 m. Their x coordinates are 22, 26 and 30 m; y coordinates are 5, 9, 13 and 17 m. Adjacent centres are 4 m apart.

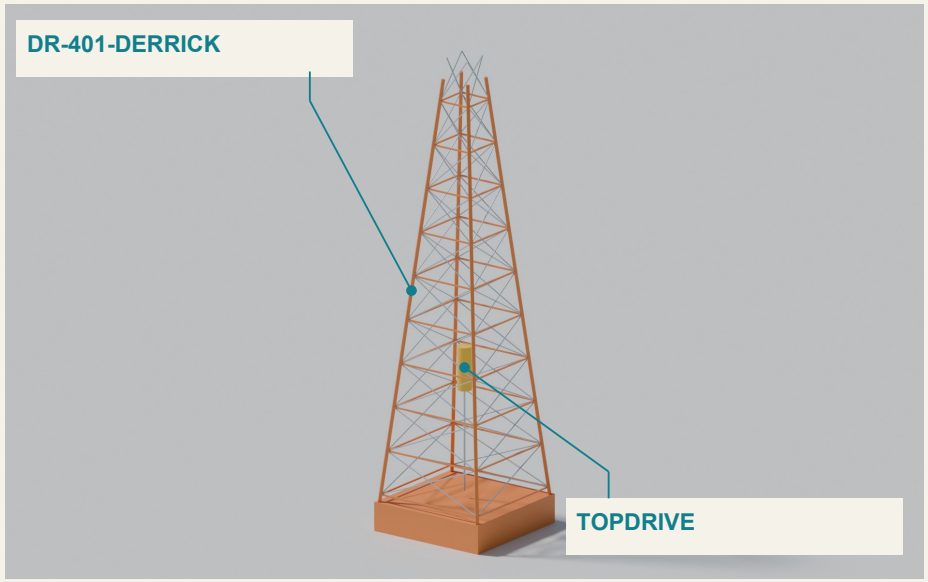
The BOP and derrick axis is at (28, 12), between wellhead centres. Rig skidding, well selection and the drilling opening remain to be coordinated.

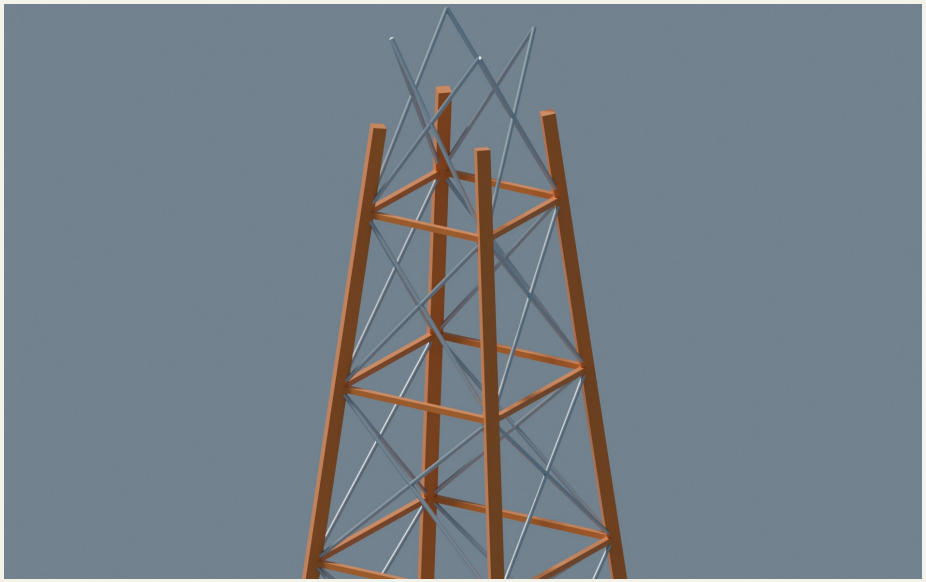
Well-bay geometry

Item	Model value
Wellhead body	Diameter 1.30 m; height 3.00 m
RISER-01 to RISER-12	Diameter 0.44 m; axis length 119 m
RISER axis endpoints	z = -95 to +24 m

Derrick and top drive

A 17 × 17 m substructure supports the drilling tower above the upper deck.





Derrick frame and top drive, with a closer view of the upper tower.

DR-401-SUBSTRUCTURE spans +38 to +42 m. Main leg axes rise 58 m to +100 m, tapering from a 16 × 16 m base square to 4 × 4 m. Upper DR-CROSS axes reach +103 m; their connection to the shorter legs remains unresolved.

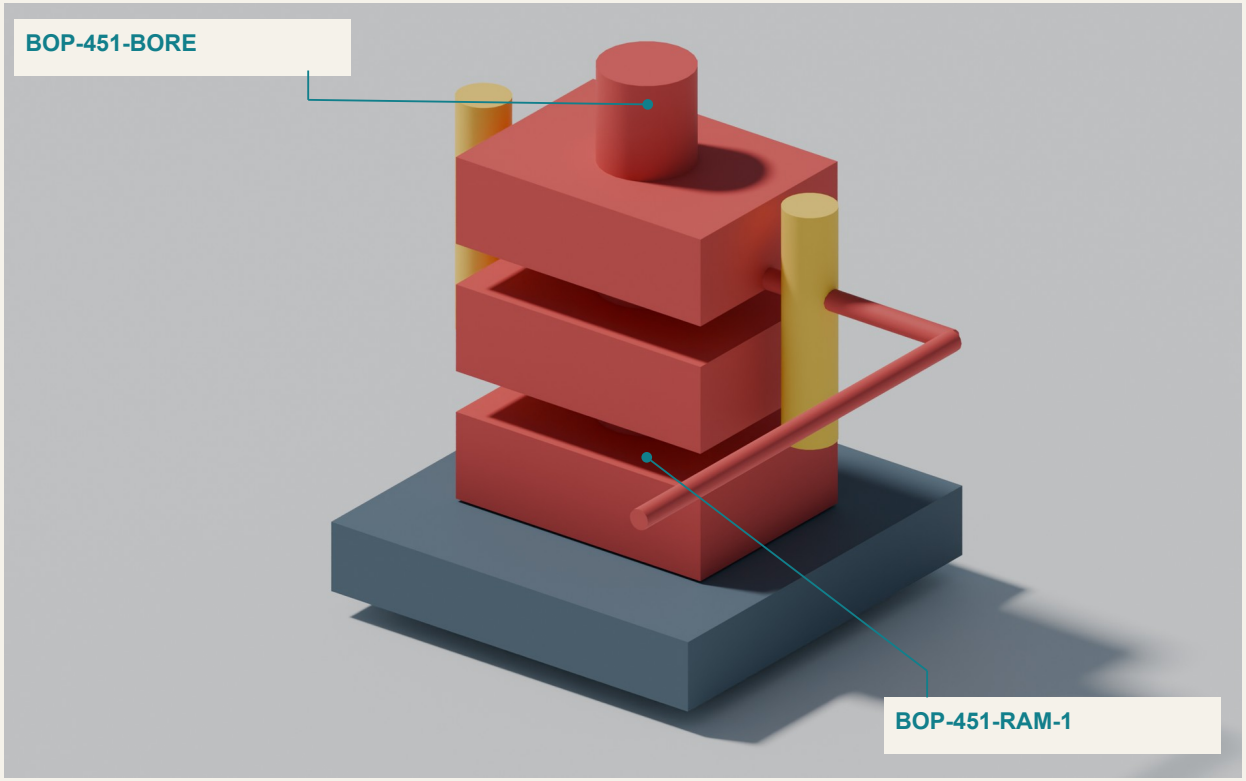
TOPDRIVE is a 2 m diameter, 6 m high cylinder centred at +60 m. Its position defines neither operating stroke nor hoisting capacity. Coordinate drill-floor datum, setback, handling route and structural reactions.

Drilling structure

Reference	Geometry
Derrick centre	x = 28; y = 12 m
Derrick leg-axis top	z = +100 m
Upper brace-axis endpoint	z = +103 m
TOPDRIVE extent	z = +57 to +63 m

BOP arrangement and deck opening

C02 adds the BOP body, ram blocks, accumulators and choke-line envelopes.



BOP components, with decks hidden.

BOP-451 comprises three ram-block proxies, two accumulator placeholders and a solid body tagged BOP-451-BORE. The body has no modelled working bore; its dimensions are not a manufacturer's specification.

The body spans +26 to +34 m; DK-31 spans +30.45 to +31.55 m. Coordinate the drilling opening, supports and removal path before developing an installation layout.

BOP geometry

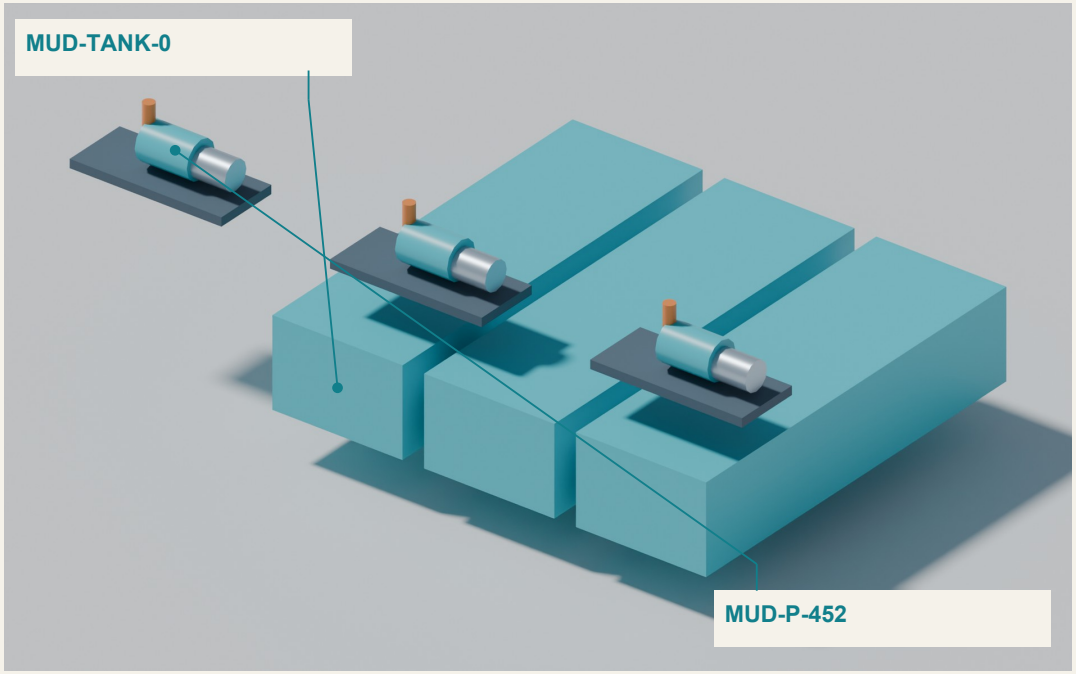
Component	Envelope / elevation
Central solid body	Diameter 1.60 m; height 8.00 m
Ram-block centres	z = 27.2 / 29.4 / 31.6 m
BOP skid	7 × 7 × 1.2 m; centre z = 25.8 m

Coordination finding Rig axis: 2.24 m from nearest wellhead. BOP body intersects uncut DK-31.

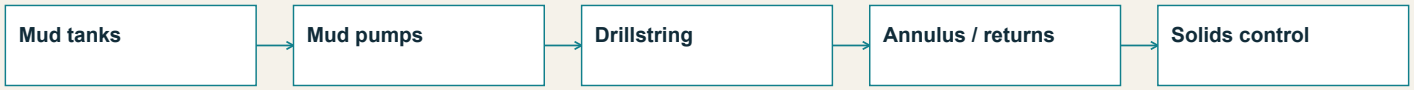
OSHA explains general functions; it does not validate this layout.

Mud tanks and pump skids

Three mud-tank envelopes and three pump packages occupy two deck levels.



Tank and pump envelopes isolated from the decks; short line segments indicate discharge routing.



Proposed functional sequence; not a piping model

MUD-TANK-0 to -2 are 6 × 18 × 4 m boxes centred at z = +28 m. Their x positions are 22, 29 and 36 m; all lie at y = -18 m. The boxes reserve external space, not usable fluid capacity.

MUD-P-452 to -454 occupy skids near DK-31. The circulation scheme must connect tanks, suction and discharge headers, drillstring, returns and solids-control equipment. The modelled segments do not define a complete loop or prove hydraulic continuity or well-control performance.

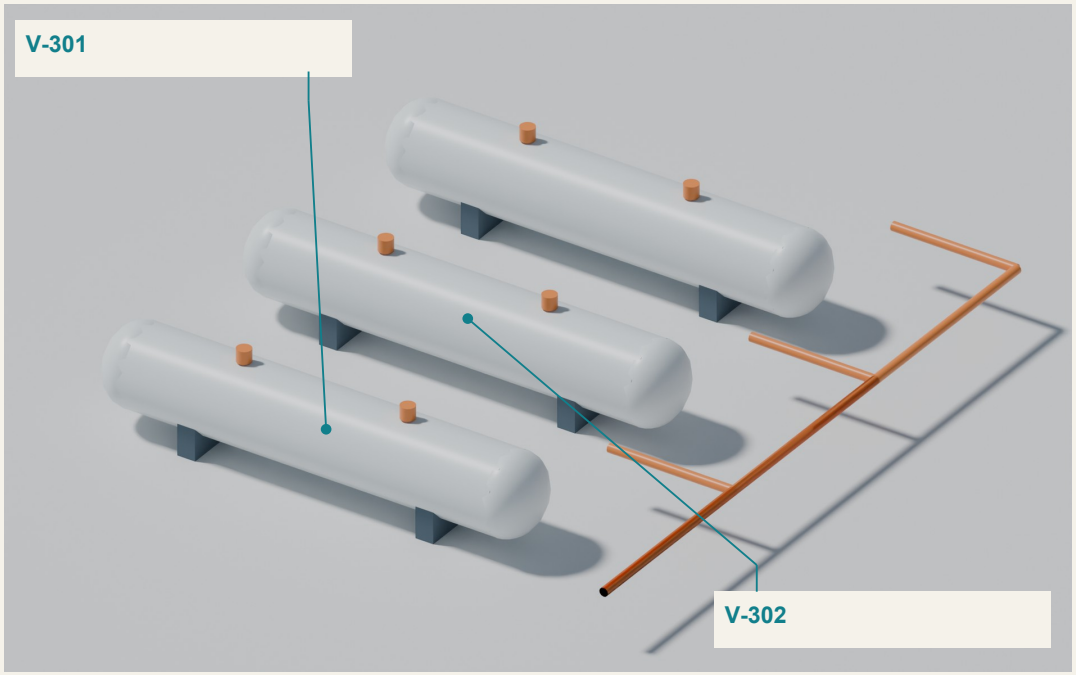
Pump-skid locations

Tag	Skid centre (x, y, z), m
MUD-P-452-SKID	(12, -24, 32)
MUD-P-453-SKID	(24, -24, 32)
MUD-P-454-SKID	(36, -24, 32)

Each skid proxy is 7 × 3 × 0.4 m.

Separator train and process basis

Three horizontal vessel shells provide a geometric production-train arrangement above the upper deck.



Three vessel shells with end-head, nozzle and saddle proxies, isolated from the surrounding deck.



Narrative roles, not simulated process results

V-301, V-302 and V-303 each have a 21 m cylindrical shell-axis length and 4.40 m nominal diameter. Their axes are at z = +41 m, with 12 m spacing in y. End heads and nozzles extend beyond those shell dimensions.

The assumed process route takes wellstream to separation, then oil towards export, gas towards compression and produced water towards treatment. The 60,000 bbl/day basis does not size these vessels. The process basis must define phase behaviour, water cut, gas rate, residence-time criteria and operating conditions.

Shell-axis centres

Tag	Centre (x, y, z), m
V-301	(-2, -20, 41)
V-302	(-2, -8, 41)
V-303	(-2, 4, 41)

Production pump packages

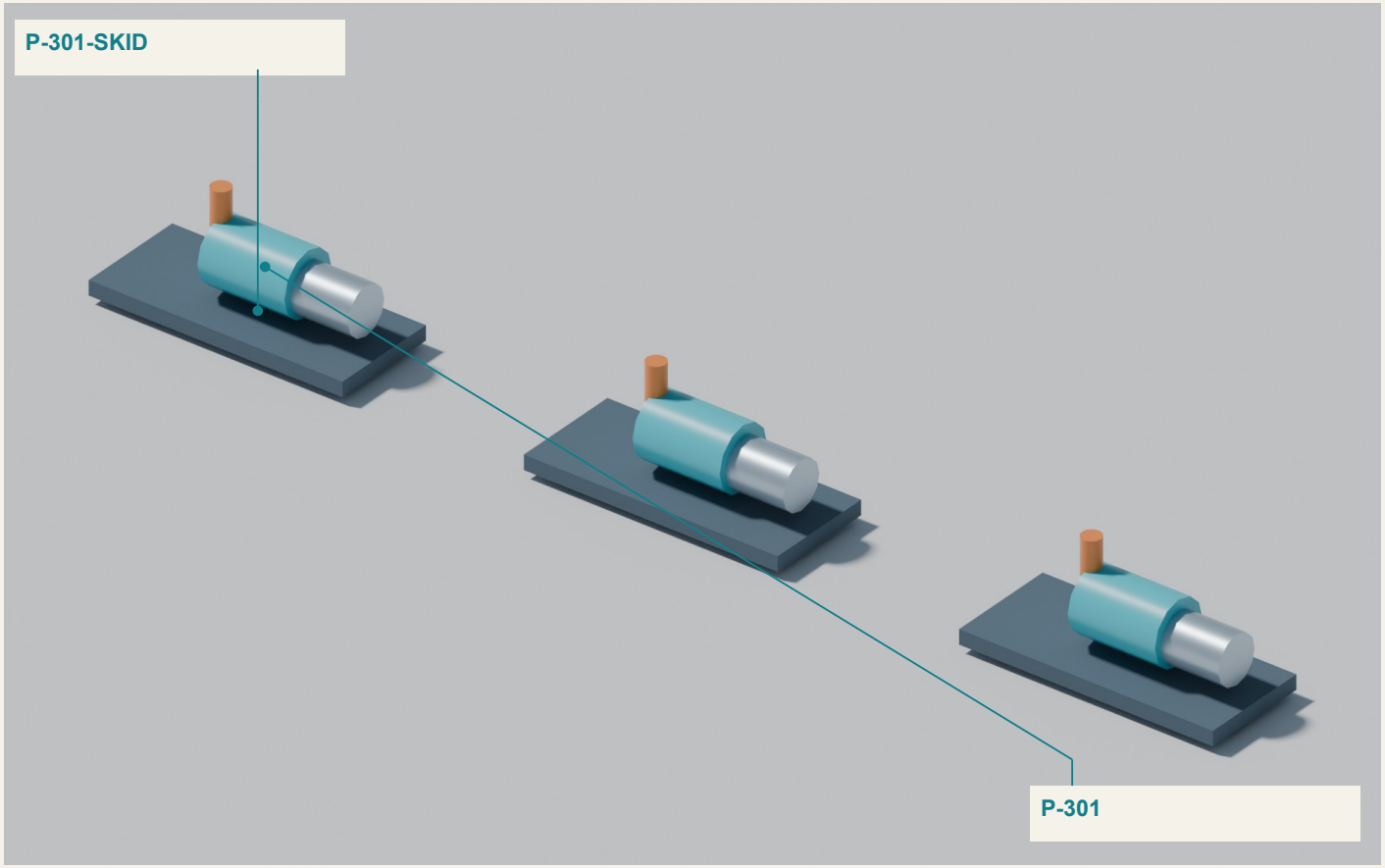
Repeated P-301 to P-303 pump-and-motor packages occupy the south side of the upper deck.

Each skid envelope is 7 × 3 × 0.4 m. The P-301 body is 2.40 m long and 1.70 m in diameter; its motor envelope is 1.60 m long and 1.30 m in diameter.

The packages reserve space; suction conditions, head, efficiency and motor power remain undefined. Confirm nozzle levels, isolation access, lifting points and component-withdrawal space beside the vessels before fixing skid positions.

Repeated package family

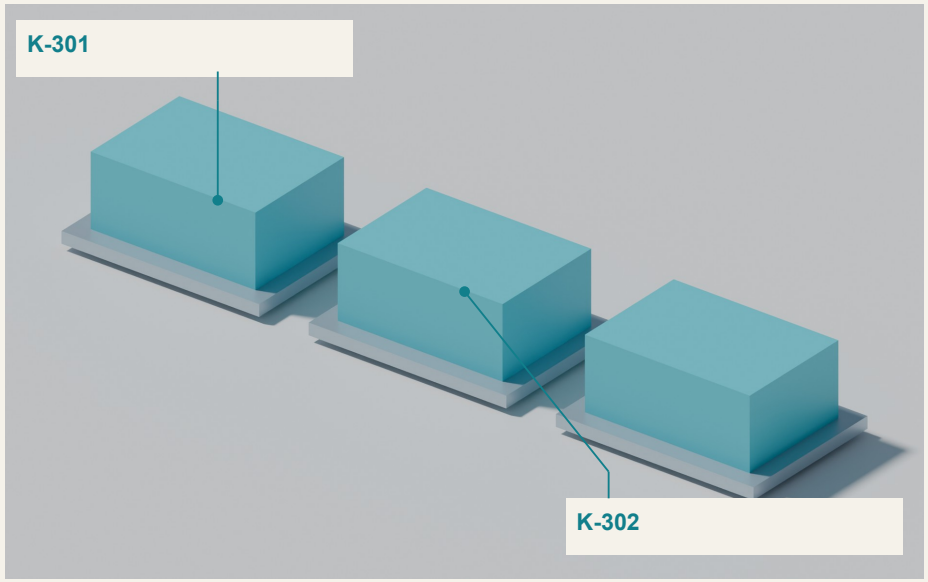
Element	Nominal geometry
Skid	7 × 3 × 0.4 m
Pump body	2.40 m axis / 1.70 m diameter
Motor body	1.60 m axis / 1.30 m diameter

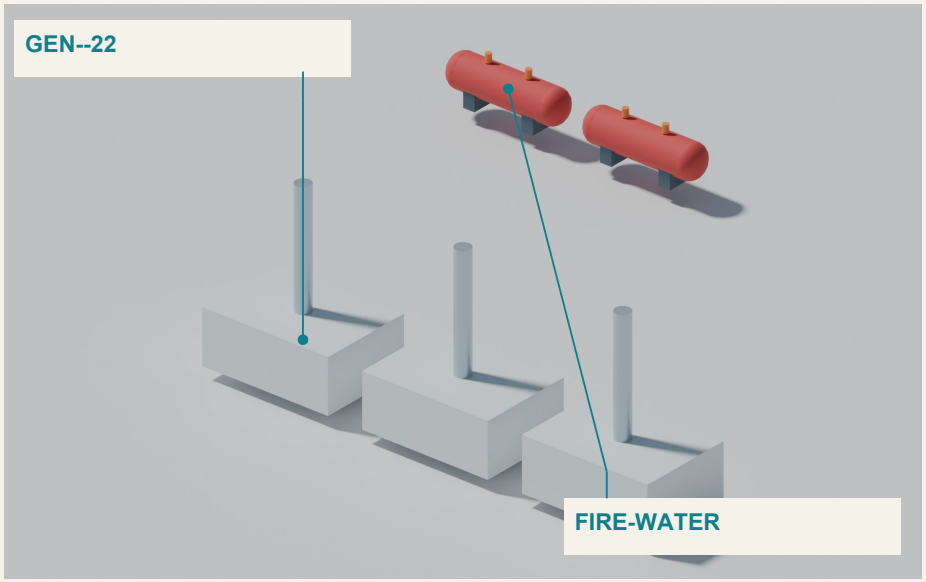


Pump bodies, motors, skid bases and discharge segments, shown without surrounding equipment.

Compression, power and firewater

Compression modules occupy the upper deck, with generator and firewater envelopes on a lower level.





Upper-deck compression modules, with generators and firewater vessels isolated in the companion view.

K-301 to K-303 are compression-module boxes on the upper deck. Three generator envelopes sit lower, with centres at z = +27 m. Two FIRE-WATER vessel bodies are also represented at that level.

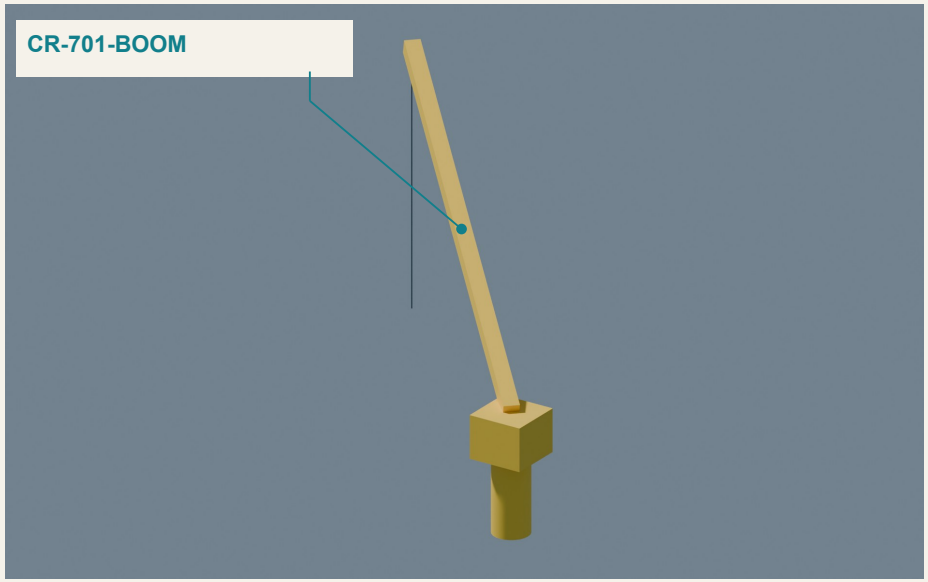
Determine the gas composition and compression duty before selecting machines. The electrical load list, starting cases, emergency supply and firewater-demand basis should then set capacities and operating philosophy. Repetition in the model does not establish duty/standby allocation or reliability.

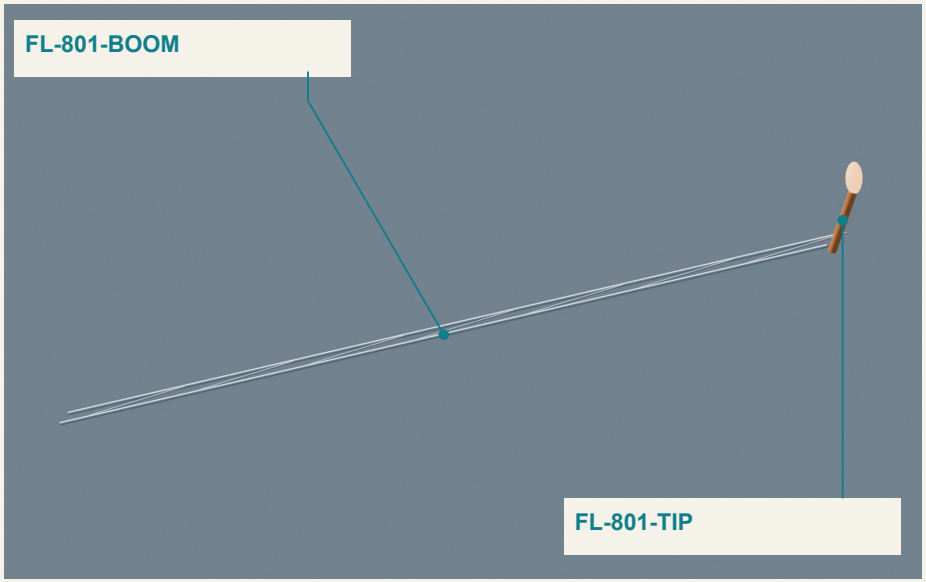
Utility envelopes

Family	Count / size
Compression modules	3 / 10 × 7 × 5 m each
Generator envelopes	3 / 11 × 8 × 4.5 m each
FIRE-WATER shells	2 / 8 m axis; 2.80 m diameter

Flare boom and crane geometry

Outboard structures extend the working envelope beyond the nominal 90 × 64 m deck rectangle.





Flare-boom members and tip, with the CR-701 crane shown in the companion view.

The main flare-boom axes run from x = 41 to 111 m and rise from z = 43 to 66 m. Their 70 m horizontal projection and 23 m rise give an axis length of 73.682 m.

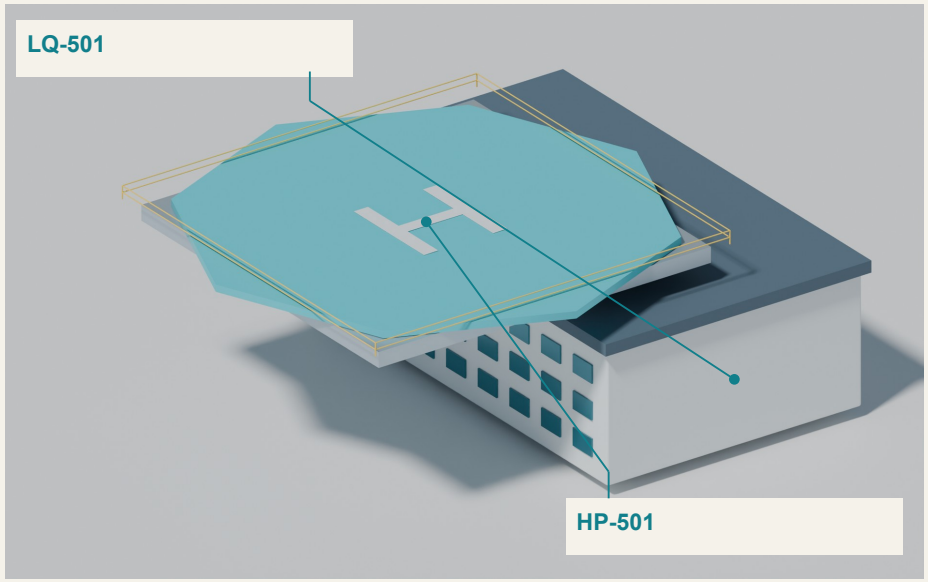
The two crane booms are different lengths. Neither geometry establishes a load chart. Review lifted loads, rigging, slew envelopes and structural reactions, alongside flare radiation and gas-dispersion studies. The boom positions alone do not demonstrate thermal separation or lifting access.

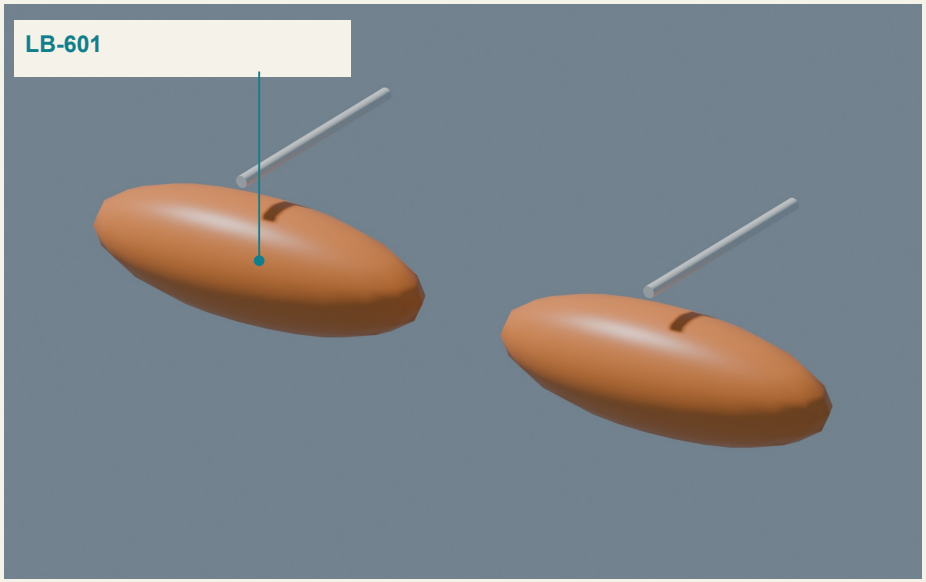
Outboard structure

Reference	Axis geometry
CR-701-BOOM	45.000 m length
CR-702-BOOM	41.049 m length
FL-801-TIP	Endpoint (113, 0, 71) m

Accommodation and marine access

The west-side accommodation and helideck sit above the decks, with lifeboat envelopes below.





Accommodation and helideck envelopes, with the two lifeboat placeholders shown separately.

LQ-501 is 23 × 38 × 11 m, centred at (-31, 1, 44). Its footprint is 874 m²; no room schedule, occupancy or internal fire separation is modelled.

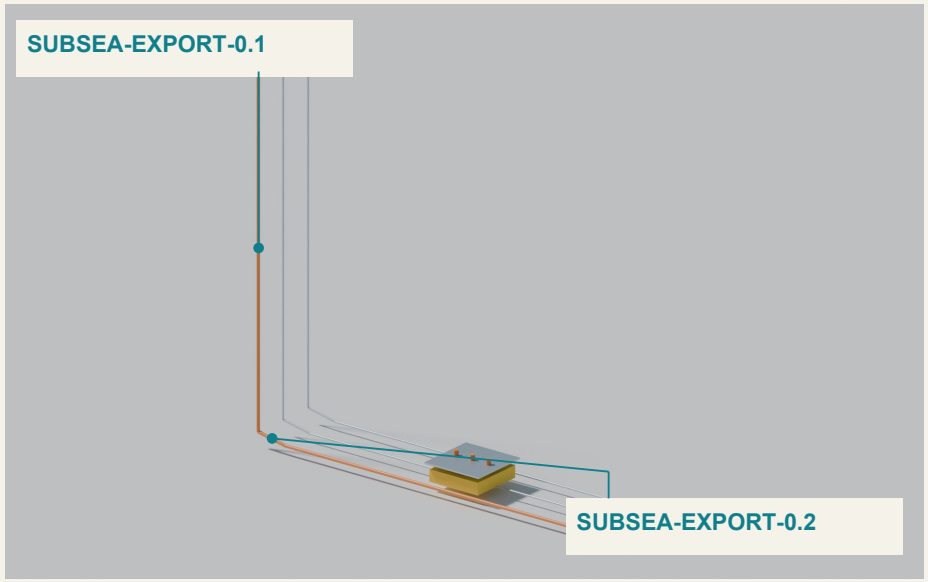
HP-501 has a nominal 38 m diameter and centre elevation +54 m. Its western extent is x = -65 m, 20 m beyond the deck edge. Two lifeboat envelopes share the display tag LB-601. Helideck suitability, evacuation capacity and escape-route independence require their own design criteria and checks.

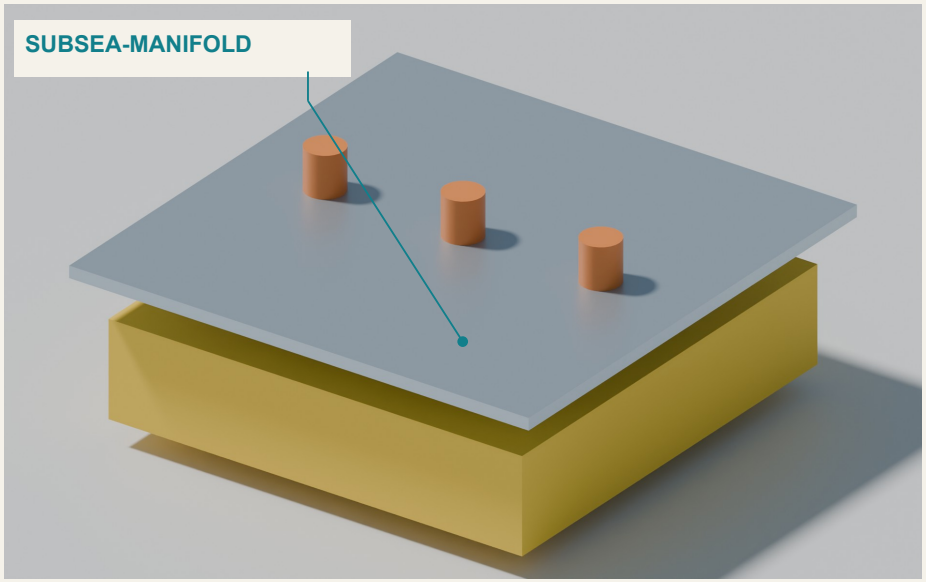
Personnel-area geometry

Object	External dimensions
LQ-501	23 × 38 × 11 m
HP-501	Diameter 38 m; thickness 0.60 m
LB-601, two instances	12 × 4 × 4 m each

Subsea export and riser interfaces

Three export-line envelopes descend towards the seabed and the outboard manifold.





Export routes and manifold, with a separate close view of the frame and valve proxies.

Each string comprises 116 m vertical, 10.198 m inclined and 125 m horizontal segments: 251.198 m along the axes. The seabed section is at z = -94 m.

One envelope diameter is 1.10 m; two are 0.60 m. Wall thickness, line class and flow assurance are undefined. The junctions are not detailed bends, and routing does not define a connected export system or P&ID.

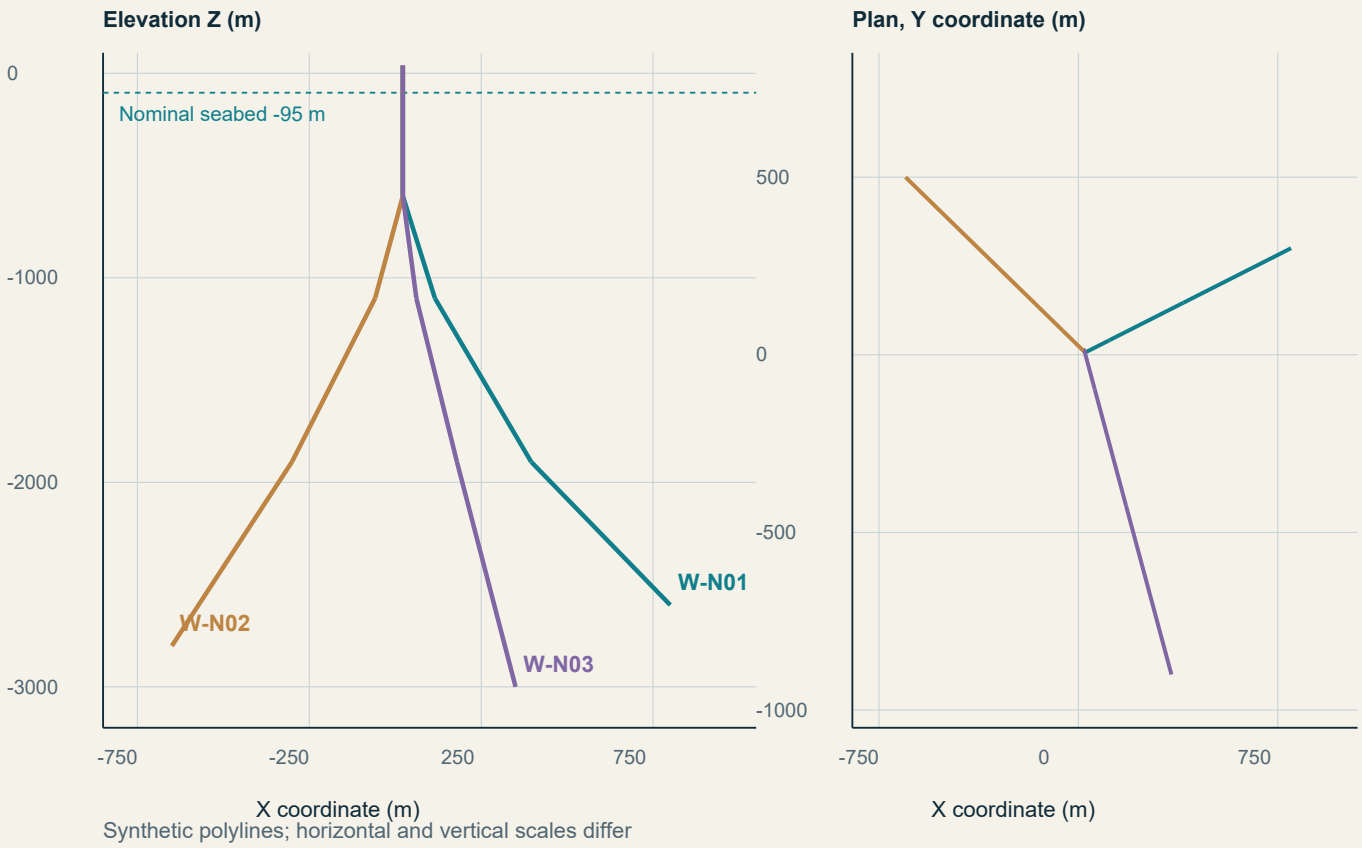
Typical string coordinates

Segment	Axis endpoints, m
Vertical	(0, y, 24) to (0, y, -92)
Transition	(0, y, -92) to (10, y, -94)
Horizontal	(10, y, -94) to (135, y, -94)

Strings lie at y = -12, 0 and +12 m.

Synthetic survey and well profiles

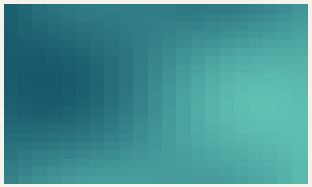
The generated survey and well datasets illustrate plotting and datum conventions.



Synthetic polylines; horizontal and vertical scales differ

Three synthetic well paths, referenced to +38 m and plotted with independent horizontal and vertical scales.

Synthetic bathymetry



441 generated points
40 m grid
800 x 800 m

Z range -96.22 to -93.78 m

The bathymetric grid has 441 generated points at 40 m spacing over 800 × 800 m. Four fictional boreholes extend 60 m below the nominal seabed. These datasets do not shape the flat seabed model.

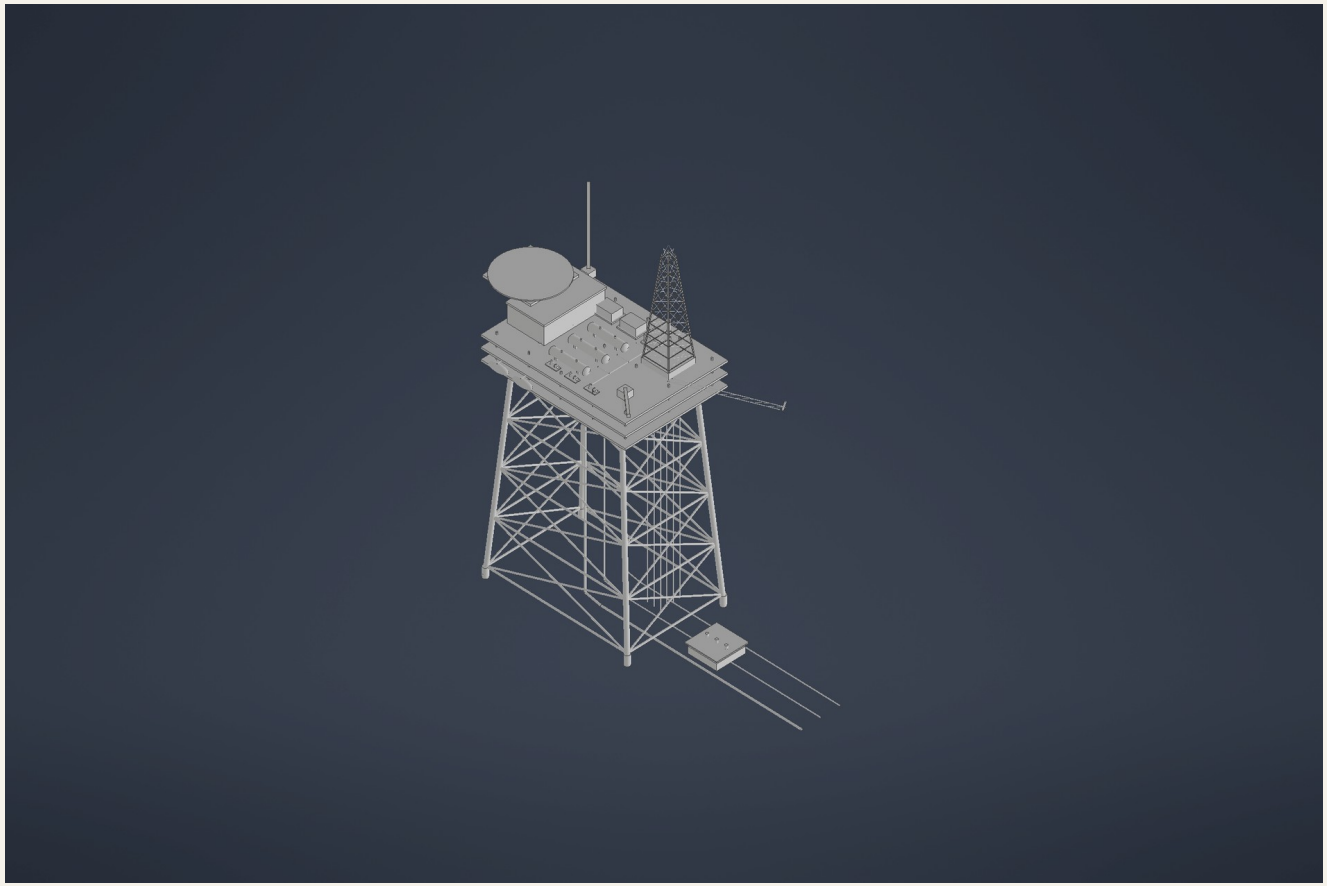
Three illustrative well paths start at z = +38 m above WH-01 to WH-03; wellhead centres are at +26 m. MD sums straight segment lengths from that origin, while TVD = 38 - z. Minimum-curvature, anticollision and reservoir calculations have not been performed.

Final synthetic path values

Path / head	MD, m	TVD, m
W-N01 / WH-01	2,825.03	2,638
W-N02 / WH-02	3,000.79	2,838
W-N03 / WH-03	3,234.44	3,038

Native CAD and traceability

The visual scene and native CAD files contain different levels of geometric detail.



Native CAD solids for the same concept; repeated display tags require instance identifiers.

The scene has 475 primitives. The 397 selected for CAD export match the C02 Revit solid and Inventor occurrence counts; 78 additional objects supply environment and visual detail.

Inventor has 104 unique part files and ten system assemblies. The C02 summary records 114 referenced documents with none missing. Revit reopened with zero invalid solids and zero warnings. These file checks do not validate engineering performance, fabrication detail or operational logic.

C02 representation register

Representation	Observed count
Visual scene primitives	475
Revit solids / Inventor occurrences	397 / 397
Unique IPT files / native systems	104 / 10
IFC4 building-element proxies	397

Grounded Inventor assemblies are spatial arrangements, not a mechanism simulation.

Engineering gates and primary references

The next issue should resolve these interfaces against a defined site and operating basis.

First reconcile the marine and structural datums, the BOP-to-slot alignment, deck penetrations and equipment support levels. Then establish metocean, geotechnical and process inputs before selecting rated equipment.

The next issue needs a coordinated general arrangement, equipment list, process flow diagrams and P&IDs, structural load cases, a maintenance study and safety reviews. End-of-life planning must address well abandonment and facility removal. The references explain general functions and lifecycle stages; none validates the synthetic project numbers.

First coordination issue

Well centre, BOP and deck opening

Issue status

Concept review, C02 geometry

R01 **BSEE / BOEM: offshore exploration and production lifecycle**
General lifecycle context; not project dimensions.

R02 **BSEE: decommissioning**
Well abandonment and facility end-of-life context.

R03 **OSHA: well control and blowout preventers**
General BOP, choke manifold and accumulator functions.

R04 **SLB Energy Glossary: separator**
General oil, gas and water separation function.

R05 **NOAA: hydrographic survey equipment**
Multibeam survey method context, not the synthetic grid.

R06 **SLB Energy Glossary: measured depth**
Along-hole depth terminology; project MD is polyline arithmetic.

R07 **SLB Energy Glossary: true vertical depth**
Vertical-depth and datum terminology.