

A Proposal for a Sustainable Aviation Fuel Production Facility, Port Talbot Docks

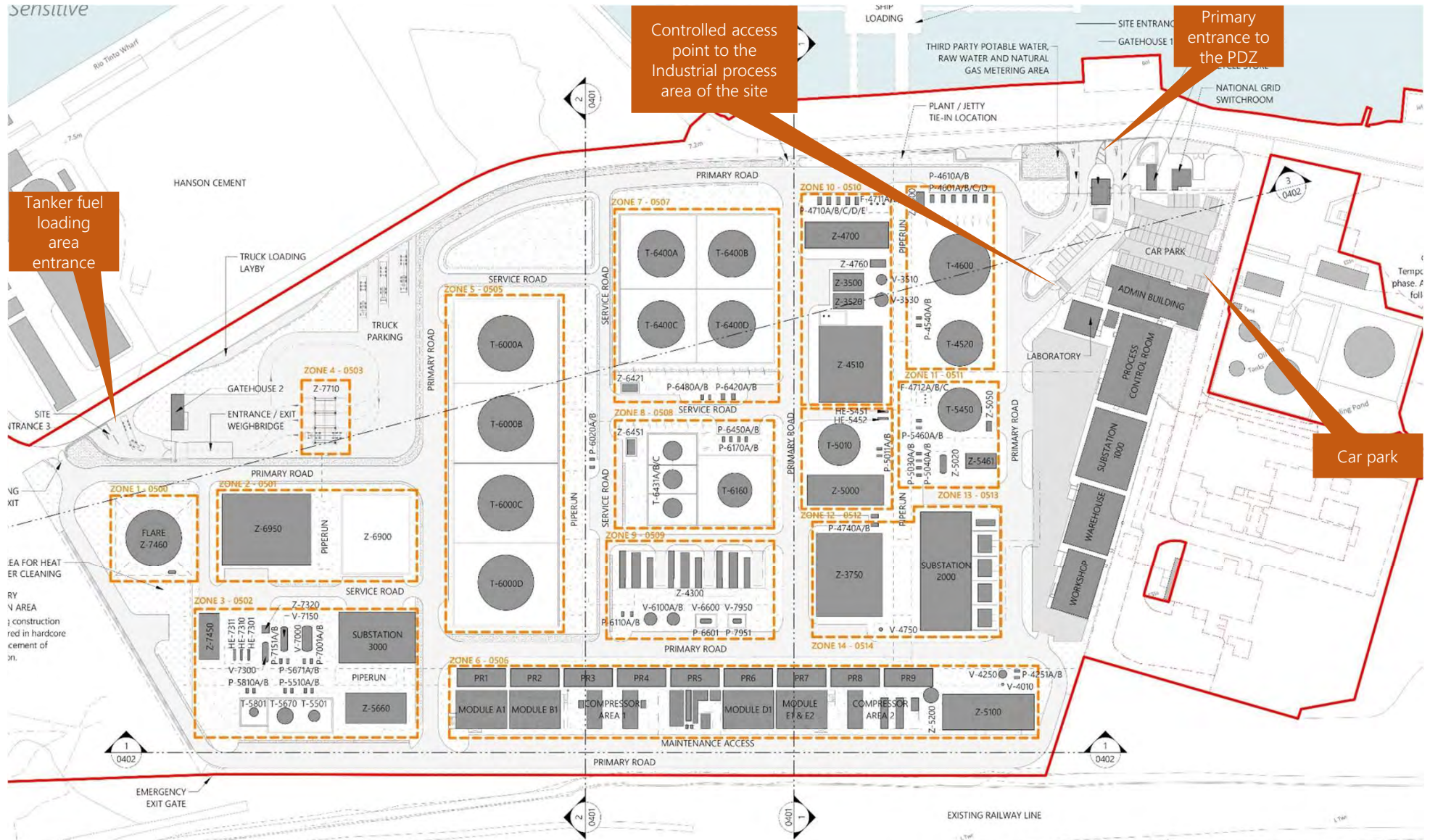


Figure 89 – Vehicle access strategy. Key components are fire separation, access to all areas for fire-fighting, division of traffic types into sensibly organised security focused operations.. Refer to drawing 2143.01-IA-ZZ-ST-DR-A-0215 Proposed PDZ Layout & Equipment List for full details.



A Proposal for a Sustainable Aviation Fuel Production Facility, Port Talbot Docks

6.0 Proposals

6.3 Amount, Mass and Scale

The amount, mass and scale of this development is dictated by the requirements of the industrial process design, but efforts have been made to contain the impact of the proposals by:

- Minimising heights through careful engineering of the equipment, and in particular the flare*
- Containing individual masses to a sensible amount and breaking equipment such as tanks into small items*
- Ensuring large items are provided in muted, matt colours*
- Configuring the development arrangement to reduce visual impact where possible by moving large equipment away from the prominent water frontage.*

The key constituents to the amount, mass and scale are:

a) Site Area – The PDZ has an area of 91,904m² of which:

- i. Administration area 4,970m²*
- ii. Tanker loading 6,186m²*
- iii. Industrial Process Area 80,748m²*

b) Buildings and Equipment – The buildings and equipment have a combined GEA of 17,614m²



EQUIPMENT LIST		EQUIPMENT LIST	
EQUIPMENT TAG	DESCRIPTION	EQUIPMENT TAG	DESCRIPTION
F-4711A/B/C	FILTERS	P-5401	PUMPS
F-4712A/B/C	WATER FILTERS	P-5460A/B	PUMPS
HE-5451	HEAT EXCHANGER	P-5510A/B	PUMPS
HE-5452	HEAT EXCHANGER	P-5671A/B	PUMPS
HE-7301	HEAT EXCHANGER	P-5810A/B	PUMPS
HE-7310	HEAT EXCHANGER	P-6020A/B	PUMPS
HE-7311	HEAT EXCHANGER	P-6110A/B	PUMPS
P-4251A/B	PUMPS	P-6170A/B	PUMPS
P-4540A/B/C	PUMPS	P-6420A/B	PUMPS
P-4601A/B/C	PUMPS	P-6480A/B	PUMPS
P-4610A/B	PUMPS	P-6450A/B	PUMPS
P-4710A/B/C/D/E	PUMPS	P-6601	PUMPS
P-4740A/B	PUMPS	P-6911A/B	PUMPS
P-5011A/B	PUMPS	P-7001A/B	PUMPS
P-5030A/B	PUMPS	P-7151A/B	PUMPS
P-5040A/B	PUMPS	P-7951	PUMPS

Table 4 – Proposed Equipment Table (Continued overleaf)



A Proposal for a Sustainable Aviation Fuel Production Facility, Port Talbot Docks

EQUIPMENT LIST		EQUIPMENT LIST	
EQUIPMENT TAG	DESCRIPTION	EQUIPMENT TAG	DESCRIPTION
S-6910	SUMP	V-4750	DRUM
T-4520	WATER TANK	V-6100A/B	HYDROCARBON VESSEL
T-4600	WATER TANK	V-6600	DRUM
T-5010	WATER TANK	V-7000	DRUM
T-5450	STORAGE TANK	V-7150	DRUM
T-5501	STORAGE TANK	V-7300	DRUM
T-5670	TANK	V-7950	DRUM
T-5801	STORAGE TANK	Z-3500	AIR COMPRESSOR PACKAGE
T-6000A/B/C/D	STORAGE TANK	Z-3520	AIR COMPRESSOR PACKAGE
T-6160	TANK	Z-3750	LIQUID NITROGEN PACKAGE
T-6400A/B/C	TANK	Z-4300	HYDROGEN GENERATION PACKAGE
T-6431A/B/C	TANK	Z-4500	METERING PACKAGE
V-3510	RECEIVER	Z-4510	TREATMENT PACKAGE
V-3530	RECEIVER	Z-4700	COOLING TOWER PACKAGE
V-4010	DRUM	Z-4760	PACKAGE
V-4250	DRUM	Z-5000	PACKAGE

Table 4 – Proposed Equipment Table (Continued overleaf)



A Proposal for a Sustainable Aviation Fuel Production Facility, Port Talbot Docks

EQUIPMENT LIST	
EQUIPMENT TAG	DESCRIPTION
Z-5020	PACKAGE
Z-5050	DOSING SYSTEM
Z-5100	BOILER PACKAGE
Z-5200	BOILER PACKAGE
Z-5461	PACKAGE
Z-5660	PACKAGE
Z-6421	PACKAGE
Z-6451	PACKAGE
Z-6900	COLLECTION BASIN
Z-6950	PACKAGE
Z-7320	PACKAGE
Z-7450	PACKAGE
Z-7460	GROUND FLARE PACKAGE
Z-7710	TANKER LOADING PACKAGE

Table 4 – Proposed Equipment Table



A Proposal for a Sustainable Aviation Fuel Production Facility, Port Talbot Docks

6.0 Proposals

6.3 Amount, Mass and Scale

The amount scale and mass can also be seen in the LVIA computer generated graphics of the proposals. Refer to Turley LVIA Assessment'. In this document it is clear to see that the proposals are generally low lying in the context of the neighbouring industrial developments, discreetly coloured finishes and in-keeping with the surroundings.



Figure 90-92 – Images demonstrating the amount of development, its scale and mass.



6.0 Proposals

6.4 Community safety

The proposals for this site are designed to promote safety as a priority. The key risks that are addressed are unauthorised access, theft of product, materials and equipment, fire safety and contamination each of which has a series of implications for other aspects of the scheme. Security design solutions to these issues include:

- a) **Counter Terrorism statement and Security** - The site is located in a secure port environment, with controlled gated access to all visitors. The PDZ gated access and egress routes (including the wharf) will also be secure and closely controlled by LanzaTech. The site perimeter will be enclosed by steel palisade fencing. LanzaTech will work closely with Associated British Ports (ABP) to ensure long-term safety and security of the facility, in line with the relevant standards at any given time.
- b) **CCTV Scheme** - A comprehensive scheme of CCTV will cover the site and the entrance areas. This will be monitorable from both gatehouses and the process control building. Key aspects of the surveillance scheme will include control of the 4no access/egress points to the site, the perimeter of the site, key process activities, all fuel storage locations and major buildings within the industrial process area of the PDZ. The CCTV will include infra-red surveillance, connections to passive detections systems, security lighting and site-wide tannoy.
- c) **Passive protection measures** - There is a large, existing bund to the rear of the site which raises the land up to the level of the former railway. This acts as a passive protection to vehicle access to the site along the southern perimeter. This extends along the western boundary and is supplemented by gabion retaining in places.
- d) **Active surveillance, guarding/security personnel** - The attendance at the gatehouses will be a 24 hour a day operation. Each gatehouse will be staffed by a minimum of 1no person and at some time 2no people.
- e) **Fencing and security** - The perimeter of the site is subject to a 2.4m high steel palisade fence with security topping. Inside the administration area on the boundary to the industrial process area of the PDZ the fence is 2.4m high palisade without a security topping but the palisades will be spiked. Inside the site areas such as substations are subject to 2.4m high chainlink fencing. All fencing has steel post set in concrete. Gates are formed in galvanised metal with the same screening as the fence of which they are part.
- f) **ANPR** - Automatic number plates recognition will be in use at all entrances / exits to the site to track which vehicles have entered and left the site.
- g) **Locking and management of the equipment that dispenses fuel** - To reduce the risk of theft of sustainable diesel fuel from the facility all dispensing equipment will be suitably fenced or enclosed and only operable with control keys available only from the gatehouses.
- h) **Lighting** - A controlled scheme of lighting has been provided that balances the needs of energy conservation, site security and wider visual amenity. Details can be found in the AECOM lighting information.



A Proposal for a Sustainable Aviation Fuel Production Facility, Port Talbot Docks

6.0 Proposals

6.4 Community safety

Fire design solutions to these issues include:

- a) **Assessment** - A detailed assessment of the fire risk and in particular the potential thermal radiation in the event of a fire has been made by ERM. A key point of this assessment has been the decision to limit the presence of potentially combustible items on site in so far as is possible to ensure safety. Notably significant landscaping and brown roofs within the site curtailed to the administration area only, limiting not only the combustible energy on site but also any sources of ignition from maintenance.
- b) **Material choices** - All building and equipment materials are constructed from non-combustible materials regardless of building height.
- c) **Building Design** - All buildings are to be built in accordance with Part B of the approved documents (Building Regulations) and are constructed to be low fire risk in nature with clear escape routes and few sources of ignition. It should be noted that some areas such as the warehouse, laboratory and workshop have inherent fire risks in terms of their function and careful planning of fire safety measures inside the building will be necessary.
- d) **Fire Fighting** - All aspects of the equipment and buildings are readily accessible by fire-fighting equipment with the provision of fire-fighting routes being considered from inception.. As the scheme progresses in design development hydrants and water tanks will be added to provide fire-fighting water supplies. These supplies are fed primarily by on site private water reserves. Key components of the active fire-fighting include deluge water suppression and foam systems that are designed specifically to accompany specific equipment and risks across the site.
- e) **Fire Planning** - A comprehensive scheme for the operation and management of the facility will be produced in conjunction with the fire service as the design progresses. It should be noted that the design of the scheme has been determined by various international and where available, British Standards, to determine a safe layout.

For more information on fire safety refer to documents supplied by Part B and ERM.

Contamination design solutions to these issues include:

- a) **Bunding of tanks** - All tanks and vessels containing potential contaminants will either be double skinned tanks with detection in the internal void or have external bunding arrangements capable of containing 120% of the volume stored. Typically, bunds will be a proprietary metal tank wall system in a finish to match the other aspects of the development on an impermeable concrete base. Each base will be fitted with an interceptor device that when full will close and ensure all spilt material is contained within the bund environment. Clean-up of bunds will involve material being drained from the enclosure by specialists and where possible, cleaned for re-use. The area would then be cleaned, repaired and recommissioned as required.
- b) **Interception** - A comprehensive scheme of drainage interception is provided and can be seen in JBA's documents and drainage design.
- c) **Control of effluents** - Waste materials and trade effluent are described in detail in Stopfords 'Waste Management Plan'

Flammable materials	Combustible materials
A material is considered flammable if it has a flash point of any temperature below 37.8 °C .	A material is considered combustible if it has a flash point higher than 37.8 °C and below 93.3 °C .



A Proposal for a Sustainable Aviation Fuel Production Facility, Port Talbot Docks

6.0 Proposals

6.5 Materials and Colours

Usage area	Material Description	Finish	Comments
Road - surface	Blacktop finish	Blacktop	Impermeable for SUDS purposes, road drainage required.
Road - Car park surface	Permeable pavers		Permeable for SUDS
Road - Kerbs	Concrete kerbs	Plain concrete	Variety of sizes/profiles to suit situation
Road - Whitelining	Thermoplastic markings	Selective topping and colours to suit location and purpose.	
Road - Pathways in car park area and around buildings	Blacktop finish	Blacktop, concrete kerb edging	Impermeable
Road - margins in PDZ, car park area and around tanker area	Aggregate	Grey colour	Suitable for pioneer species
Road - High traffic turning areas	Reinforced concrete	Plain concrete, brushed or tamped finish	Loading bays, weighbridges, turning areas
External works - Fencing 1	Palisade fence	Galvanised finish	Perimeters and sub-division of spaces. All 2.4m high with additional 300mm element below ground. Steel posts and security topping. Suggest rota spile to front facing areas and barbed wire elsewhere.
External works - Fencing 2	Chainlink	Galvanised finish	To substations within the site etc. All 2.4m high. Steel posts.
External works - Gates 1	Palisade framed gate, manual operation	Galvanised finish	Perimeters and sub-division of spaces. All 2.4m high with additional 300mm element below ground. Steel posts and security topping (rotaspikes)
External works - Gates 2	Chainlink framed gates, manual operation	Galvanised finish	To substations within the site etc. All 2.4m high. Steel posts.
External works - Traffic Barriers	Automated traffic barriers to entrances and exits	na	Controlled from gatehouse
External works - columns	Lighting, tannoy, CCTV columns	Galv steel to marine grade	Various locations
External works - Retaining structures	Stone filled gabions	Stone to match buildings	Various locations

Table 5 – Materials and Colours – External Works



A Proposal for a Sustainable Aviation Fuel Production Facility, Port Talbot Docks

6.0 Proposals

6.5 Materials and Colours

Usage area	Material Description	Finish	Comments
Industrial equipment - Tanks	Metal, steel or aluminium	Generally PPC / PVF type finish in white colour.	
Industrial equipment – Racking	Steel	Galvanised steel finish	
Industrial equipment – Stairs, guard rails	Steel	PPC finish in signal yellow RAL 1003/1018	
Industrial equipment – Flare	Steel	Galvanised steel finish	

Table 5 – Materials and Colours – Industrial Equipment

Usage area	Material Description	Finish	Comments
Buildings - cladding 1	Textured insulated panels	PVF, colourcoat or similar	For use on gatehouse 1 and admin building
Buildings - cladding 2	Built-up insulated cladding system	PVF, colourcoat or similar	For use on all other buildings
Buildings - Stonework	Welsh slate in rubble / splitface blockwork	Coloured mortar	For use on gatehouse 1 and admin building
Buildings - Below DPC course	Engineering bricks	Blue / Black facework quality masonry units, coloured mortar only on admin and gatehouse 1	For use on all buildings at low level
Buildings - Windows and doors	Aluminum double windows with glazing to MOD standard type 1	PPC type finish in dark grey	For use on all buildings at low level
Buildings - Roofs 1	Brown roof system	Aggregate	To assist ecology
Buildings - Roofs 2	Metal cladding and eaves detail around brown roofs	PPC aluminium, steel or similar, suited to marine environment	Shaped profiles
Buildings - Roofs 3	Built-up insulated cladding system	PVF, colourcoat or similar, system selected to suit marine environment	For use on all other buildings
Buildings - Rainwater goods	Aluminium cladding and eaves detail around brown roofs	PPC aluminium, steel or similar, suited to marine environment	All buildings
Buildings - Exposed columns and steelwork	Steel columns	Paint system for marine environment.	Admin building

Table 6 – Materials and colours - Buildings



6.0 Proposals

6.6 Visualisations



Figure 93 – Visualisation of the main entrance area



6.0 Proposals

6.6 Visualisations



Figure 94 – Visualisation of the gatehouse area



6.0 Proposals

6.6 Visualisations

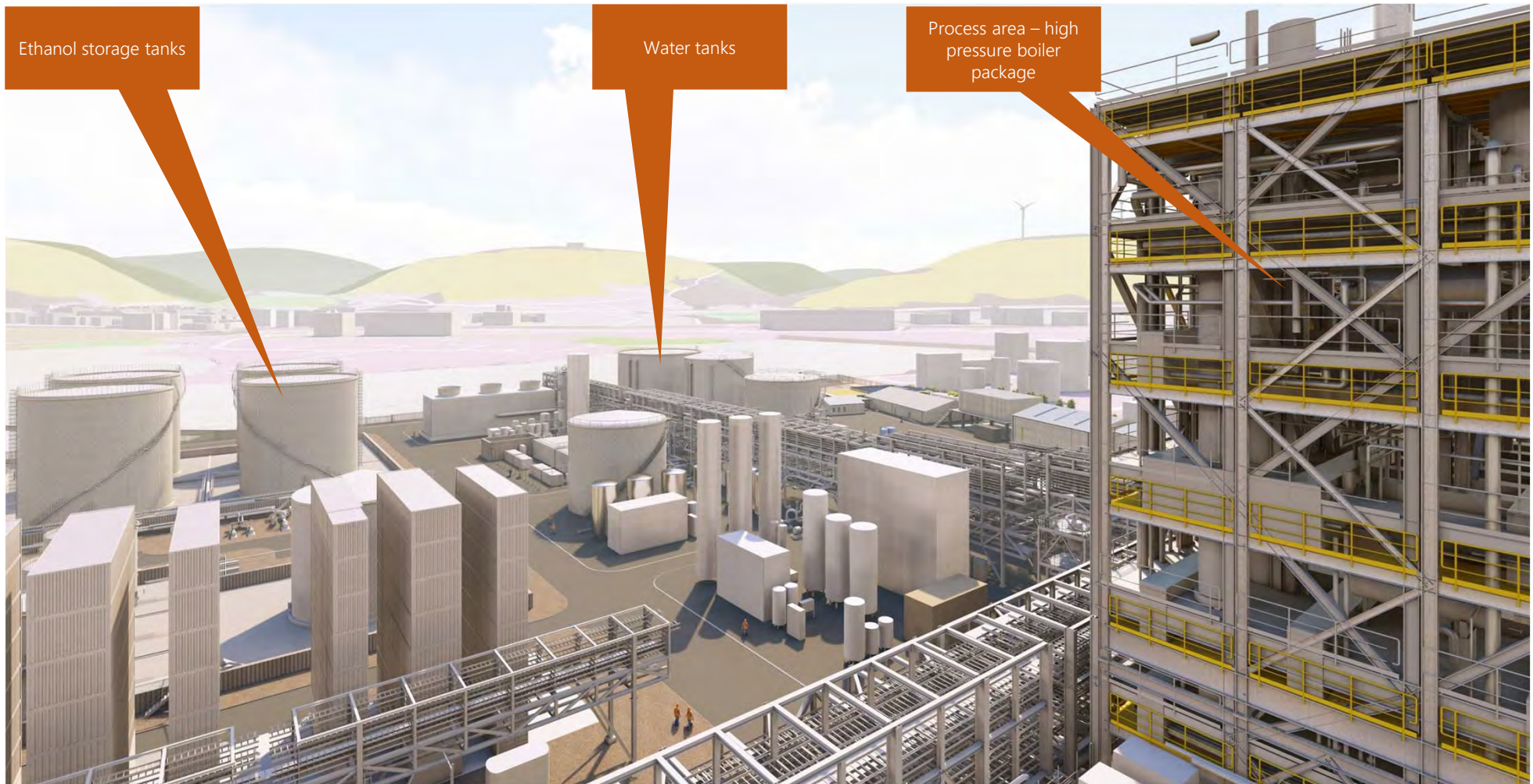


Figure 95 – Production development Zone, showing equipment and buildings



6.0 Proposals

6.6 Visualisations

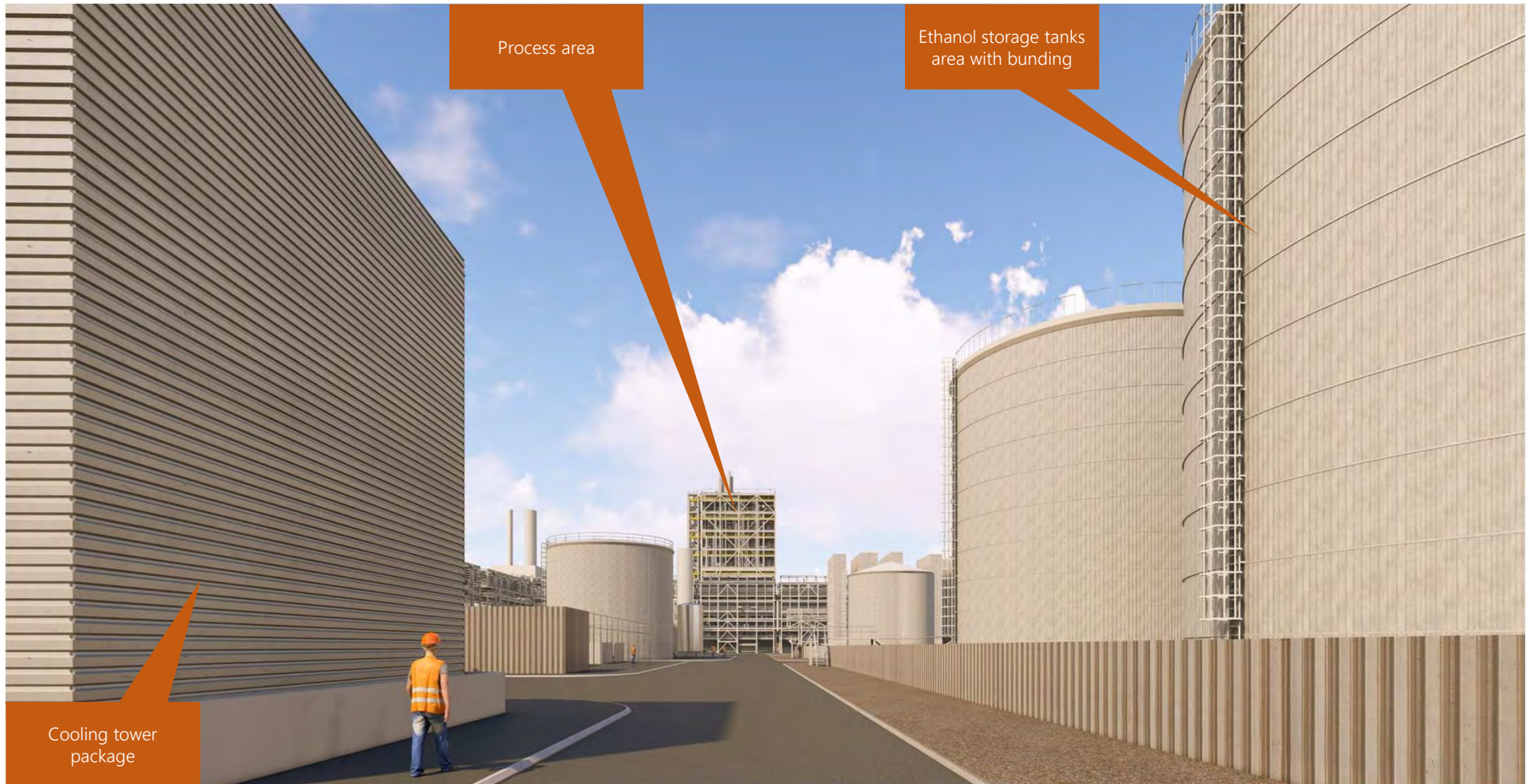


Figure 96 – High level view of the development, showing ethanol storage tanks, bunding and cooling towers



6.0 Proposals

6.6 Visualisations

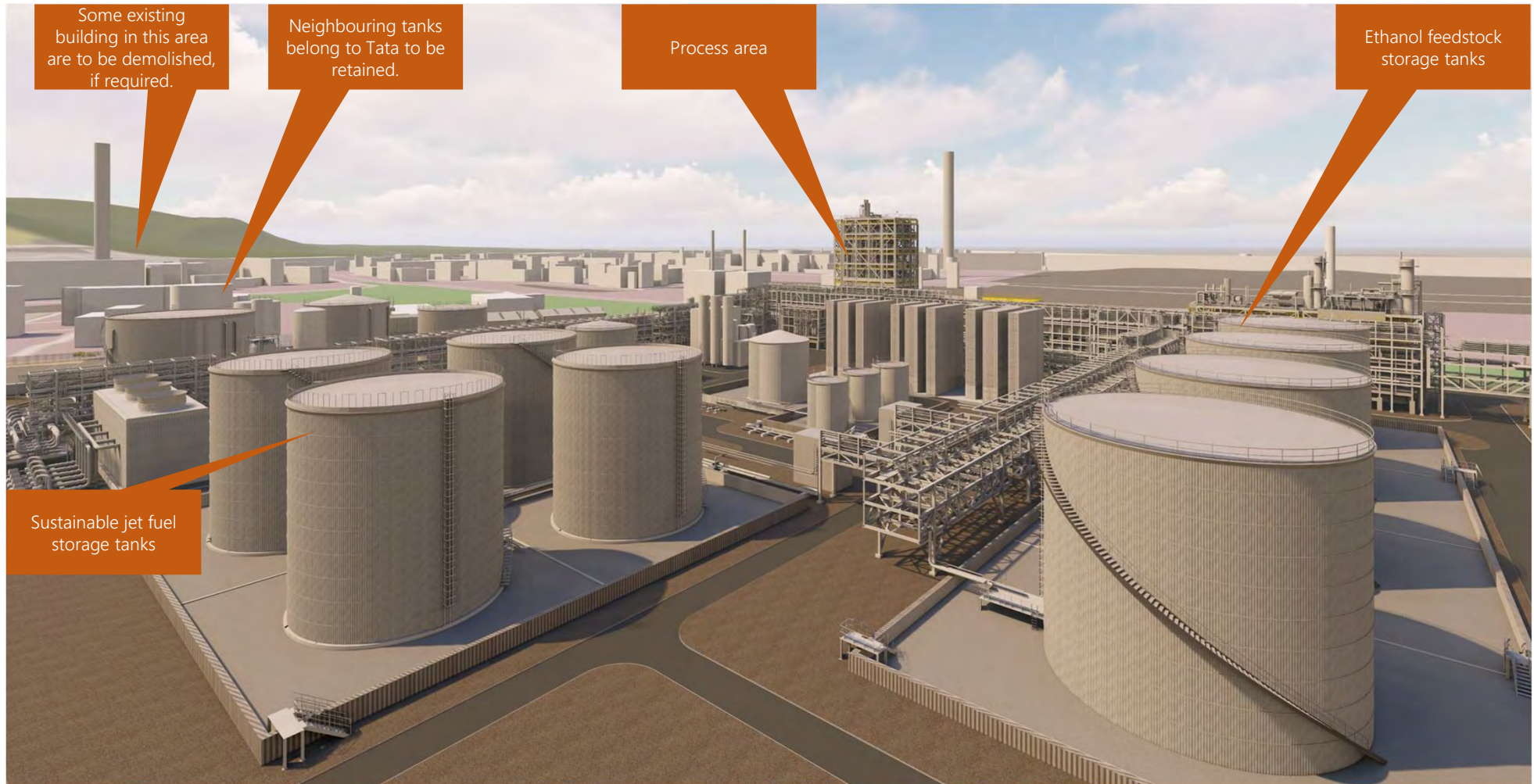


Figure 97 – High level view of the development



A Proposal for a Sustainable Aviation Fuel Production Facility, Port Talbot Docks



Figures 98 (top) and 99 (bottom) – View from A4241 towards the proposed development site, and aerial view over harbour

7.0 Proposals

7.1 Access and Movement

A full description of the access and movement on site can be found in the 'Transport Statement' prepared by SCP.

LanzaTech has chosen road and maritime delivery connections as the primary modes of access to the site. To manage the maritime aspects of this strategy a new jetty will be required, this is subject of a marine license. Ethanol will be delivered via the jetty and sustainable aviation fuel will be exported from the site via the same route.

The road access is much simpler in content with all vehicles arriving to the site from the controlled road environment of the port. Once at site vehicles will be signposted to one of two entrances.

- a) The first entrance is the general entrance to the PDZ and is controlled by gatehouse 1. Vehicles for employees and visitors commuting to the site will be collected in the administration area car park to the front of the site and not permitted to pass into the broader area of the site, (the industrial process area). Vehicles requiring access to the industrial process areas of the site, typically vans and other light goods vehicles will be permitted to pass the internal gates and travel via the network of roadways within the site. A key feature of the internal roadway layout is a perimeter road that allows maintenance vehicles to circulate the site freely. This is also an important component in ensuring that emergency vehicles can reach all areas easily. It is anticipated that the majority of visitor and staff travel to this area site will be by cars, vans and LGV sized vehicles, but the site is sized and designed to allow HGV's to pass freely. Cycles will not be permitted on the site therefore a covered cycle shelter is provided at the first entrance.*
- b) The second entrance is to the West of the site and for tankers collecting sustainable diesel fuel for distribution. Again, a gyratory system has been selected so that vehicles can enter this area of the site under the control of a gatehouse, be weighed on an entry weighbridge, park / wait, when necessary, then proceed to loading, reweighing and departure via an exit gate.*

These design characteristics ensure that the site is safe in use as well, as providing a workable system of secure and surveillance by restricting access and monitoring access points. Other aspects of road safety include a waiting bay for HGV vehicles outside the secure perimeter of the site to allow prevent congestion to the road network or the mouth of the tanker fuelling area, and an on-site one-way system.

Accessible parking spaces are provided in the car park area immediately adjacent to the administration building where they are most likely to be used. It should be noted that the site is largely both flat and level promoting good access for all when required.



8.0 Conclusion

8.1 Conclusion

This application is for the development of a world-leading facility for the production of sustainable fuels that will significantly reduce the carbon emissions from aviation and uses for diesel fuels both in the United Kingdom and beyond. There are also extensive local benefits including:

- Provision of local high-value employment opportunities directly at the facility*
- Generation of a range of other employment opportunities in the immediate area in supporting services.*
- Regeneration of the Crown Wharf area*
- A significant contribution to the Celtic Freeport Initiative and South Wales Industrial Cluster*
- Making an ongoing contribution to the Welsh economy*
- Contribute to the advancement of specialist knowledge in the field of sustainable fuel production in Wales*

The proposals are carefully formulated and designed to minimise any adverse impact on the wider Port Talbot area being well situated in an existing industrial area, creating low visual noise, lighting, traffic and air quality impacts.

It is concluded that this application is in the interests of Port Talbot, Wales and the UK and should be granted consent.

