Institute for Sustainability

iTransfer
sustainable ferry travel

SEStran Ferry Toolkit

Section 7: Specification for a Passenger Ferry Terminal

SEStran
South East of Scotland Transport Partnership

The Interreg IVB North Sea Region Programme
Investing in the future by working together for a sustainable and competitive region

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This document is part of iTransfer, a North Sea Region Interreg programme project, which is funded by the European Regional Development Fund.

iTransfer (Innovative Transport Solutions for Fjords, Estuaries and Rivers) aims to make ferry transport more freely accessible and sustainable, and encourage more people to travel by water. In areas in the North Sea Region (NSR) there are opportunities to replace existing vehicle routes with passenger ferries as a viable alternative. Travelling by ferry is more sustainable, easier and quicker. It can also provide lifeline services to remote communities.

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Section 7: Specification for a Passenger Ferry Terminal

1. Scope

1.1. Introduction

1.1.1. This document outlines the General Requirements for the design of a sustainable passenger ferry terminal. The main features of the design are:-

Pontoon	This is the 'landing stage' against which vessels will moor.
Piles (incl. yokes, etc)	These anchor the Pontoon in place.
Linkspan	The bridge between the Pontoon and the Bankseat
Bankseat	This is the bearing for the Linkspan and the passenger assembly area
Footways	These are designed to provide circulation areas around the bankseats and to allow access for pedestrians to the local footway network.
Bus Shelter	Passenger shelter for interchange with bus services
Highway	This provides access for vehicles to the bus turning circle, car drop-off points, taxi ranks. This also provides access to the car park and adjacent premises.
Car Park	
Landscape / Public Areas	Designated to give visual interest to the ferry facilities.
On-shore Facilities	These include the cycle lockers; security features; water replenishment; waste water discharge; refuelling & lubricant

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facilities and communications.

1.2. Operation

1.2.1. While the development and funding of the terminal may be provided by public authorities the operation is most likely to be handed over to the ferry operating company on completion.

1.3. Pontoons

1.3.1. These are the 'landing stages' against which vessels will moor and include their anchoring system, provided by piles. The Pontoons should be designed to such a shape and size as to safely accommodate the size of vessels likely to be mooring and passenger access and waiting facilities. The overall depth of the Pontoon should be determined to suit the design and stability requirements and to allow the freeboard determined by the vessel specification. Clearance from seabed should be at least 0.3m at

1.3.2. lowest astronomical tide (LAT) but may require to be greater than this dependent on the draft of vessels likely to use the pontoon. Although it is likely that the Pontoon should be of a steel plate construction the design could utilise any system practical to the Pontoon (i.e. using steel tubes, concrete, etc) providing that the design complies with the relevant design standards of the country in which it is being provided.

1.4. Appearance

1.4.1. The deck surface should be coated with an anti-slip coating suitable for a marine environment.

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1.4.2. All metalwork on the Pontoon should be protected with an appropriate coating sufficient to avoid maintenance, other than minimal touch ups, for a 20 year period.

1.4.3. All paintwork should comply with the appropriate standards of the country in which the pontoon will be provided for atmospheric corrosivity category and immersion category (sea) water with a high durability rating.

1.4.4. All coating materials should be compatible and obtained from one manufacturer.

1.4.5. The colour should be complementary to the surrounding environment.

1.4.6. Provision should be made for retro-fitting of corrosion protection anodes should they prove necessary.

2. Imposed Loading

2.1. The imposed vertical live loading at deck level should be sufficient to cater for pedestrian loading, superstructure loading and vehicle loading as appropriate. (e.g. 5kN/m2 for passenger only loading)

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2.2. The Pontoon should be designed to receive normal impact from vessels travelling at 3 knots at an approach angle of 25 degrees. As a worst case load the design must assume the ferry impacts the Pontoon at 90 degrees to the face whilst travelling at 3 knots.

2.3. The design should ensure that whilst receiving a normal ferry berthing load, and with the Linkspan fully loaded and the Pontoon only loaded between its landward face and its centre, that the Pontoon deck does not slope at a gradient more than 1:12 in any direction.

3. Wave Loading

3.1. The Contractor should ensure that the Pontoon and its piles are designed to meet the requirements of a 1:100 year storm. Wave Data should be provided by the local harbour authority.

4. Stability

4.1. The design should ensure that the Pontoon is designed with a metacentric height such that in the event of tilting the Pontoon will right itself and return to an even keel, and the deck slope will not exceed a 1:12 slope.

5. Roof Structure

5.1. The roof should be constructed from lightweight material.

5.2. The roof should be drained so as to prevent rainwater and internal condensation from falling onto people and the pontoon structure below. This will include ferry operating staff and. Gutters should be provided as

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appropriate. This water should be discharged back to the harbour without impact on passing passengers or ferry operating staff.

5.3. The structure supporting the roof should be provided with a means of preventing birds from alighting onto it.

6. Wind Shielding

6.1. Full height wind shielding should be provided to the sides and rear of the pontoon.

6.2. Wind shielding should be completely transparent and should be joined so as to prevent wind and rain / sea spray penetration.

6.3. Wind shielding should be constructed from suitably robust material to resist accidental and malicious damage. Should panels become damaged then the fixings and joints should allow for their easy and rapid removal and replacement.

6.4. Wind shielding should be fixed to the pontoon structure and such fixings should allow for differential movement without compromising the wind and rain /sea spray resistance of the shielding.

7. Waiting Room

7.1. The waiting room should be designed in accordance with the general requirements of the appropriate Building Regulations.

7.2. The room should be detailed, constructed and fitted out to ensure that it is airtight to comply with Building Regulations.

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7.3. Air Conditioning: The system within the waiting room should be sized to enable the inside temperature to be kept, in summer, at 24OC with an outside air temperature of 30OC and, in winter, 22OC with an outside air temperature of -10OC. During the night, when the pontoon is not in use, the temperature should be maintained at not less than 5OC. Air Conditioning should be installed such as to ensure that 20% by volume of the waiting room is replaced with fresh air every hour.

7.4. Lighting: General lighting should be required in the waiting room to a standard maintained illuminance of 150 lux. The system should be capable of being reduced to 100 and 50 lux for control variability. Lighting should be in accordance with the requirements of Building Regulations for Lighting and using the principles of “Sustainable Construction” Chapter 9 – Lighting and Daylight (2008) published by Elesevier Butterworth-Heinemann.

7.5. The floor should achieve a U-value of 0.25W/m2K with a vapour control layer on the warm side of the insulation. The floor covering should be vinyl.

7.6. All external walls should be metal stud and should achieve a U-value of 0.35W/m2K with a vapour control layer on the warm side of the insulation.

7.7. The roof should be a warm deck construction to achieve a U-value of 0.35W/m2K with a vapour control layer on the warm side of the insulation. The roof should be laid to fall so that any rain or sea spray should be drained away even when the pontoon is keeled over at an adverse gradient of 1:20. This water should be drained to a gutter and discharged back to the harbour without impact on passing passengers or ferry operating staff. The roof should be provided with a means of preventing birds from alighting onto it.

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7.8. Windows should be provided around the complete perimeter of the room except for the external door and store room. All windows should be constructed from double glazed, polyester powder coated, thermally broken aluminium. All windows should achieve a U-value of 2.2W/m2K. All windows should have trickle ventilators. Every third window should have an opening of 300mm hinged from the top and to be fitted with handles with locks. Specific windows should be capable of being fully opened where required for emergency escape purposes and should be fitted with handles with locks.

7.9. The entrance door should be polyester powder coated aluminium with a double glazed toughened glass window suitable for forward viewing. The door should be self-closing (slam-proof) even on an adverse gradient of 1:20 with satin stainless steel pull handle / push plate. The door should be equipped with mortice deadlock. A 'Fire Exit' sign should be fitted internally above the door head and 'Fire Door – Keep Clear' sign fitted externally. The door should be fitted with Sealmaster or similar threshold seal system.

7.10. The store room should contain electrical communication and cleaning equipment and should be suitably ventilated to maintain temperature control similarly to the public waiting area. The walls should be metal stud with secure glazed information boards attached to their internal public face for use by the ferry operating staff only. The store room door should be washer hinged (1½ pairs) with mortice deadlock and satin stainless steel lever latch handles and kicking plate. The door should be a fire door and is thus to be fitted with a self-closing device, smoke seal and intumescent strips.

7.11. Suspended ceiling should be provided throughout using a 600 x 600 mm module ceiling tile with clip-in system and should be moisture resistant.

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7.12. A BREEAM rating of excellent should be required. This will require the following:

- Post construction acoustic testing should be carried out in order to demonstrate that the target for indoors ambient noise levels, reverberation times, etc are in accordance with the requirements of the regulations in the country in which the pontoon should be provided.

- At least 80% of the materials used in the roof, frame, external walls, doors and windows should be responsibly sourced in accordance with the BREEAM compliance requirements. Theses require that materials should be sourced from a manufacturer with a certified Environmental Management System (EMS) such as ISO 14001 or EMAS, covering at least the processing stage of the product.

- Designing for robustness: Suitable durability measures should be incorporated into the design and construction to ensure that vulnerable parts of the room are protected from damage, such as:

    - Robust external wall construction (Severe Duty)
    - Kick plates / impact protection on doors
    - Hard wearing and easily washable finishes in heavily used areas.

7.13. Fire Extinguishers: Fire extinguishers should be installed within the waiting room to local fire brigade regulations and guidance.

7.14. Waste bins should be installed throughout the pontoon of minimum volume 150 litres. Bins should be made from solid lightweight material and designed to enable rapid bomb threat detection.

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7.15. Aluminium metal seats should be provided in the waiting room with arm rests in banks of three. The seats should be open weaved and powder coated to a colour complementary to the surrounding environment,

8. Detailing

8.1. All steel fabrication should be carried out using good marine practice (i.e. avoiding triple point welds, etc).

9. Levels and Gradients

9.1. Levels on the pontoon should be such that the linkspan's running plate is founded +2.825m above water level where it meets the surface of the pontoon. This level is such as to minimize the length of the linkspan and its gradient at extreme low water levels.

9.2. Where internal ramps are provided they should be a minimum of 2.8m wide between handrails and of a maximum gradient of 1:12. Rest platforms should be provided for every 750mm of height rise and of minimum length 1.5m.

10. Emergency Floatation

10.1. If the design is reliant upon void space for floatation the Pontoon should be compartmentalised such that each compartment should be isolated from the remaining compartments. The design will ensure that the Pontoon will remain afloat and upright in the event that two compartments are breached and become fully flooded.

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10.2. Each compartment should have a separate watertight inspection hatch, which can be secured so that no unauthorised persons should be able to gain access.

10.3. The decking immediately in the region above each inspection hatch will need to be easily removed or lifted.

11. Piles

11.1. The design will identify the most appropriate pile diameter to withstand the pile loads.

11.2. The piles should be of sufficient height to allow anchorage and floatation of the Pontoon such that at Highest Astronomical Tide (HAT) +1m surge there should be at least 1m of pile above the highest point of the yoke.

11.3. The Contractor should comply with the appropriate standards of the country in which the operation should take place when undertaking all piling and design work.

11.4. Noise and vibration controls should be in accordance with the appropriate standards of the country in which the operation should take place during installation.

11.5. Installation of the Pontoon should be programmed so that it can be installed as quickly as possible after the piles have been installed.

11.6. All floating plant used in the construction of the piles, and the piles themselves, must be positioned, sufficiently anchored and provided with visual warnings such as lighting, so as not to become an obstruction or

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hazard to other users of the waterway in accordance with any agreements with the relevant port or harbour authority.

11.7. Maximum horizontal allowable deflection of the Piles whilst under normal berthing and tidal load at HAT should be 150mm.

11.8. Where the yokes connect the Pontoon to the Piles, the design will ensure that 'D' fenders are installed between the yoke and the pile around the pile circumference.

11.9. The pile yokes that fix the Pontoon to the piles should be designed such that the Pontoon can be removed and replaced within a short period by using easily accessible bolted connections. The yoke will also include a chain and padlock system that will connect the pontoon to the pile (independently of the yoke arms) for nominal security in case of vandalism.

11.10. The design will require that after installation of the piles that they have been installed with sufficient accuracy such that at all stages of the tide (LAT to 1m above HAT) there is still sufficient distance between the piles and their yokes to allow free movement without twisting the Pontoon and that the following dimensions are complied with. The minimum gap between any pile and the inside face of any D fender should be 10mm and the maximum space should be 75mm.

12. Lighting

12.1. General lighting should be required on the Pontoon to a standard maintained illuminance of 40 to 50 lux (exc. waiting room). Lighting should be in accordance with the requirements of Building Regulations, the Code for Lighting published by CIBSE (2006) and using the principles of "Sustainable

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Construction" Chapter 9 – Lighting and Daylight (2008) published by Elesevier Butterworth-Heinemann.

12.2. Navigation lighting should be positioned so that the piles at low tide do not obscure the lights from the main navigation channel but are also in locations where they will not be at risk from collision damage.

12.3. Navigation lights should be fixed to standards at either end of Pontoon at heights of 2.5m and 4.5m from the surface of the deck.

12.4. Access to navigation lights should be provided in order that one person in storm conditions can carry out maintenance checks or repairs without the need of using steps or a ladder. The method chosen will require securing or locking so that unauthorised persons are unable to gain access.

12.5. The type of navigational lighting should be Orga HSL18(R)SA or equivalent, but must project a steady red light.

13. Safety Ladders

13.1. Safety ladders should be constructed at each end of the Pontoon. Handholds should be constructed up to a height of 1m above the deck level to provide assistance to persons accessing the Pontoon from the water in an emergency situation.

13.2. Solid construction of the ladders will only be down to keel level, below this level a chain construction should be used to ensure the bottom rung is 1.2m below water level.

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13.3. The ladders should be removable so that maintenance checks and repairs can be carried out. However, the ladders will require securing so that unauthorised persons cannot remove them.

14. Mooring Points

14.1. Bollards should be positioned along front (passenger berthing) and rear faces of the Pontoon. They should be placed at even centres spread along the full length of the Pontoon on either side. The pull out load for each cleat should be determined by the design characteristics of the mooring vessels.

15. Fendering/Skirting

15.1. Skirting should be formed of black Plaswood and should be positioned around the Pontoon, extending from deck level to 100mm below water level with 50 x 50mm chamfering to top face. It is the intention that no fendering should be needed around the Pontoon and that the boats mooring will utilise their own fenders.

15.2. The pile yokes should be fitted with D fenders around their external edges to offer nominal impact protection.

16. Design Life

16.1. All construction should have a minimum design life of 20 years and it should be required to prove that all materials, fixings, etc. used are capable of achieving this life.

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17. Maintenance

17.1. All design will ensure that visual and physical maintenance checks can be easily achieved.

17.2. A maintenance schedule with identified costs should be required at the Tender stage.

17.3. The schedule will identify the necessary checks at the following stages or at any other stages that are necessary with the design.

- Monthly activities
- Six monthly activities
- Yearly activities
- Five yearly activities
- Ten yearly activities

18. Pedestrian Restraint Systems

18.1. Pedestrian restraint systems should be designed in accordance with the relevant national standard.

18.2. Parapets to be fixed to the Pontoon structure and not to the decking and should be designed in accordance with the relevant national standard for pedestrian parapets.

18.3. Construction of parapets to prevent falls over heights greater than 1000mm should consist of 3 rails positioned at 150mm, 500mm and 1100mm from deck level, suitable for crowd control. The top rail should be 40mm

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diameter. These should also be used against all transparent wind-shielded surfaces.

18.4. Handrails against all other surfaces should be tubular with a diameter of 40mm and positioned at a height of 1.1m from the deck level. They should be continuous with the top rail of the handrail.

19. Crowd Control

19.1. Detachable stainless steel chains and fixings should be provided as a means of crowd control within the open public areas of the pontoon. The system should be capable of corralling passenger crowds up to the capacity of the ferry vessel waiting to board a ferry whilst allowing ferry passengers to disembark without restriction to the linkspan.

19.2. The chains should be supported on removable steel posts where necessary. The chains, posts and fixings should be capable of resisting full pedestrian parapet loading on free edges and fixings should be flush with the deck once the posts have been removed. Suitable covers should be provided to the fixings to prevent dirt and debris from accumulating within the fixing. Fixings should be suitably drained.

20. Wheelchair Access

20.1. All construction should be dimensioned and positioned so that wheelchairs can gain access to the Pontoon from both the waterside and Linkspan.

20.2. A minimum clearance of 1.5m must be provided anywhere on the Pontoon (this should include distances from cleats).

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21. Drainage and Kerbs

21.1. The pontoon open space surfaces should be sloped to allow drainage to the outer edges of the pontoon even under full loading and long-term deflection such that no ponding should occur.

21.2. An upstand of at least 100mm high should be provided at the edge of internal footways. Allowance should be made for the drainage of surface water at the free edges by means of local gaps in the upstand.

22. Grab Lines

22.1. Grab lines should be installed around the Pontoon. These should be constructed from 20mm diameter rope or galvanised chain to allow a sufficient handhold to be maintained by person or persons in the water.

23. Freeboard

23.1. The freeboard should be 1000mm to top of Plaswood measured once the Pontoon and Linkspan are in place and in still water conditions in an unloaded state.

24. Cable Ducts

24.1. Power and communications should be taken into the Pontoon via separate ducting attached to the Linkspan and into a drawpit that can be easily accessed without hindering foot access from the Linkspan. From this drawpit separate ducts should be laid to the waiting room store room and

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each of the navigation lights. Power and communication ducting should be kept separate.

24.2. In addition two spare cable ducts should be laid from the drawpit underneath the perimeter of the pontoon for future possible power and communications. Spare ducts should be fitted with nylon draw cords. The ducts will terminate beneath the decking and the decking will span over the ducts but in such a way that a small panel can be removed for future connections.

24.3. The drawpit will incorporate decoupling points to the cables to allow the Pontoon to be removed from the Linkspan at short notice.

24.4. The drawpit should include an isolation switch for the power supply.

24.5. *Note: Switchgear should be provided on the bankseat area to enable separate isolation of the communications and power supply to the linkspan and pontoon.*

24.6. All cables and drawpits should be secured in such a way that it will avoid malicious or accidental damage and water damage.

24.7. All ducts should be installed as “air to air” through the hull to avoid the risk of flooding of the hull via the ducts.

25. Electrical Fittings and Cables

25.1. All fittings are cables should be IP66 rated. The cables will require to be protected at all of the articulation points.

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26. Communications

26.1. An ADSL Data link cable should be provided to the store room within the waiting room with access to the internet.

26.2. A server should be located within the storeroom with appropriate Operating System loaded and a local VDU screen for maintenance and internet access.

26.3. A wireless broadband router should be provided in the store room with access via the datalink cable to the internet. This should be of sufficient power to provide wireless broadband connection for the use of passengers within the waiting room.

26.4. A telephone should be located within the store room for use by ferry operating staff only.

26.5. No. Flat panel 50" (min.) VDU's should be suspended from the ceiling within the waiting area for ferry service and safety information and connected to the server.

27. Water Supply

27.1. A single supply of fresh water of a potable quality should be supplied from the land.

27.2. Piping and connections will meet the requirement of the relevant water authority and any water by-laws at all states of the tide.

27.3. All pipes and connections should be frost proof.

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27.4. Water should be accessed at the Pontoon by 4 no. screw taps which will have a threaded nozzle suitable for connections.

27.5. The taps are provided for ferry water tank refilling and pontoon maintenance purposes only and will not be open for the public to utilise. They should be of sufficient robustness to avoid accidental or malicious damage.

27.6. The taps should be faced to allow easy access for ferry operating staff from Pontoon deck. They should be located away from public open access areas.

27.7. Provision will need to be made on the Pontoon deck to allow water from tap to run off into the harbour without ponding.

27.8. Tap to be positioned at a height above 1m, but not exceeding 1.5m above the deck level.

27.9. The diameter of the water supply pipes and/or the need for a break tank will be determined by the capacity and speed of filling required of the vessel tanks to meet the turn round times determined by the timetable.

28. Power Connection (non-Lighting)

28.1. Power connections are required for the heating of the waiting room and for use by the communication equipment. In addition sufficient 240V power connections are required within the waiting room for use by passengers (i.e. laptop computer power) and for maintenance equipment. These should be located in the floor of the waiting room with double socket outlets located between seats to accord with Building Regulations and ease of use by seated passengers.

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28.2. Additional power connections should be supplied outside of the waiting room for maintenance equipment. These should be suitably voltage rated and provided with self-closing covers suitable for use in an exposed marine environment (sea spray). They should be located in relatively sheltered locations (i.e. away from the prevailing winds and harbour entrance).

28.3. All cabling should be selected and installed so that minimal damage will occur due to movement caused by tidal motion – where necessary armoured cabling should be used.

29. Emergency Equipment

29.1. Two life belts should be supplied and installed – one at either end of the handrail to the ferry berthing face.

30. Security

30.1. Digital CCTV security coverage should be provided in the waiting room, pontoon public open space (incl. ferry passenger berthing face) and rear pontoon face (min. 3 cameras)

30.2. Cameras should be CCTV over IP and linked / integrated into an appropriate security centre.

30.3. Cameras should be located such that malicious or accidental damage to the cameras can be avoided.

30.4. “Help Panels” should be provided on the pontoon such that a press of the button will connect the member of the public to a security person in the

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Security Centre . The “Help Panel” should allow two-way communication and should be located in a highly visible position within easy reach of passengers (both able and disabled). One Panel should be provided within the waiting room and one panel on the public open area. The Panels should be a minimum of 300mm diameter and painted white. The buttons should be arranged so as to minimize the possibility of them being pressed accidently. The Panel should have two buttons:

- Large (approx. 50mm diameter) Red Button for Emergency purposes
- Smaller Blue Button for Information purposes.

31. Rock Armour Wave Energy Dissipation

31.1. Rock armour wave energy dissipation is recommended to avoid the effect of wave reflection from any adjacent harbour walls.

31.2. Rock armour should be designed for a 100 year design life and to withstand a 1 in 200 year storm event.

31.3. It should be assumed that the 1 in 200 year storm occurs at the Highest Astronomical Tide (HAT) which will lead to a conservative design approach.

31.4. Still Water Levels should be assumed using the following equation: Still water level = HAT+ Sea level rise + Surge

31.5. Sea Level Rise should be taken as 900mm over 100 years (PPS25)

31.6. Surge should be taken as 140mm [McConnell (1998)].

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31.7. A maximum allowable slope angle (1 in 1.5) and minimum allowable damage levels should be used in the design.

32. The Linkspans

32.1. These are the bridges that connect the Pontoons to the land. The Linkspans should be of rigid construction with articulated connections to both the Pontoon and Bankseat. The Linkspan will have a span determined by the tidal range and height of adjacent harbour walls and should be fabricated from structural steel.

33. Appearance

33.1. The Linkspan should be designed to the appropriate national standard.

33.2. All metalwork on the Linkspan should be protected with an appropriate coating sufficient to avoid maintenance, other than first stage maintenance (minimal touch ups), for a 20 year period. The colour should be in accordance with the Client's instruction taking account of relevant environmental constraints.

33.3. All coating materials should be compatible and obtained from one manufacturer.

34. Loading

34.1. The vertical live loading on the Linkspan will require taking account of pedestrian and vehicle loading. (5kN/m² for pedestrian only). All live and dynamic loadings will need to be taken into account in the design.

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35. Articulation

35.1. The linkspan should have fixed bearings on the pontoon and roller bearings on the bankseat beam and should be suitably designed to cope with all pontoon movements.

35.2. Inevitable movement between the Linkspan and Pontoon decks will necessitate localised articulation. Local utilisation of a gritted stainless steel running plate which at worst should be at a gradient of 1:7 would be permissible provided it can be fixed and allowed to move without damage.

35.3. Cable couplers should be installed at both ends of the Linkspan to provide connections for power, communication and water cables. Couplers should need to withstand flexing caused by the movement between the Pontoon and Linkspan and be of IP66 rating. The purpose of these coupling points should allow for linkspan and bankseat to be removed separately for maintenance purposes.

35.4. The bearing on the Pontoon will need to be able to absorb all the movement anticipated on the structure at all states of the tide (LAT to HAT + 1m) incorporating any tilt on the Pontoon caused by adverse loadings, pile movement and yaw.

35.5. Cables from ducts on the Linkspan should be connected to land based drawpit that can be easily accessed without hindering foot access from the Linkspan. Decoupling points should be provided in this chamber along with isolators.

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35.6. Three ducted connections from the Linkspan to the drawpit should be provided. The drawpit should be large enough for separation of power and telecoms cables.

35.7. A localised facility should be provided by the Linkspan such that the water supply can be decoupled. This water pipe will need frost protection.

36. Roof Structure

36.1. The linkspan should be equipped with a semi-transparent roof designed to minimise solar gain and sealed to shed surface water to either side without dripping onto the side glazing. Gutters may be designed to prevent dripping and these should be drained via downpipes at either end of the linkspan to discharge directly into the harbour.

36.2. A gap may be provided between the roof and wind shielding to allow cross ventilation of the linkspan but the roof must overlap the wind shielding in a vertical direction to minimize penetration by wind-blown rain.

36.3. The roof should have lips at either end of the linkspan to prevent rainwater from dripping onto passengers as they enter and exit.

37. Wind Shielding

37.1. Side glazing (wind shielding) should be provided to either side of the linkspan to protect passengers from windblown rain.

37.2. Wind shielding should be completely transparent and should be joined so as to prevent wind and rain / sea spray penetration.

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37.3. Wind shielding should be constructed from suitably robust material to resist accidental and malicious damage. Should panels become damaged then the fixings and joints should allow for their easy and rapid removal and replacement.

37.4. Wind shielding should be fixed to the linkspan structure and such fixings should allow for differential movement without compromising the wind and rain / sea spray resistance of the shielding.

37.5. A gap may be provided between the wind shielding and the floor to allow cross-ventilation of the linkspan but the wind shielding must overlap the floor in a vertical direction to minimize penetration by wind-blown rain.

38. Hand Rails

38.1. Tubular handrails with diameter of 40mm should be positioned at a height of 1.1m from Linkspan deck level.

38.2. Hand railing should be fixed to the linkspan structure and not to the decking.

39. Emergency Connection

39.1. The Linkspan should be chained to the Pontoon and Bankseat. There should be two chains at each end of the Linkspan.

39.2. The chain will need to be of a suitable diameter to provide anchorage, in normal flow conditions, of the Pontoon and Linkspan to the Bankseat should the piles fail. The fixing chains should be positioned such that they will give nominal support in keeping the Linkspan upright should the piles fail.

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40. Crowd Control

40.1. The minimum internal clear span width of the Linkspan should be 2.4m in order to allow reasonable passage for persons and wheelchairs. Crowd control warning signs should also be provided.

41. Cable Ducts

41.1. Power, communications and water supplies should be taken via ducts across the Linkspan to the Pontoon. Three ducts should be installed for this task. A fourth duct should be provided as a spare which should be screw-capped at either end.

41.2. The ducts will need to be of a sufficient size to allow additional cables to be run in the future if required. Draw cords should be provided within all ducts.

41.3. For maintenance and repair purposes the ducts will need to be accessible by authorised persons but located such that malicious or accidental damage can be avoided.

42. Electrical Fittings and Cables and Pipes

42.1. All should be IP66 rated. The design will need to indicate how it will avoid damage to all services at the articulation points.

43. Lighting

43.1. Two red navigation lights should be installed centrally – one either side of the link span. These lights will flash (5 seconds on – 5 seconds off).

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43.2. Access provision to navigation lights should be provided in order that one person in storm conditions can carry out maintenance checks or repairs.

43.3. The lights will require securing or locking so that unauthorised persons are unable to access or remove them. They should also be selected such that they are vandal resistant (i.e. a grilled bulkhead style light).

43.4. General lighting is required on the Linkspan to provide a standard maintained illuminance of 40 to 50 lux. Lighting should be positioned to avoid facing seaward to avoid glare to vessels.

44. Removal Facilities

44.1. It is anticipated that during the Pontoons life there should be occasions when the Pontoon will have to be removed, but the Linkspan kept in place. The design will demonstrate how this should be achieved and what plant should be needed. Similarly it is anticipated that the Linkspan may have to be removed for maintenance, again the Design will have to demonstrate how this should be achieved and what plant should be needed. Any thrust points, lifting points, etc that are necessary to achieve this should be incorporated into the design and protected both on the linkspan and the dockside.

45. Design Life

45.1. The design should ensure that all construction has a sufficient design life to avoid maintenance, other than first stage maintenance (i.e. minimal touch ups), for a 20 year period, and should be required to prove that all materials, fixings, etc. used are capable of achieving this life.

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46. Maintenance

46.1. All design will ensure that visual and physical maintenance checks can be easily achieved.

46.2. The design will provide a maintenance schedule with identified costs. These schedules and costs will need to be identified at the Tender stage. The design will identify the necessary checks at the following stages or at any other stages that are necessary.

- Monthly activities
- Six monthly activities
- Yearly activities
- Five yearly activities
- Ten yearly activities
-

47. Anti-Crush Boat Barrier

47.1. There is a risk that small vessels will moor up to the pontoon beneath the linkspan at high tide and that, at low tide, the linkspan will lower and crush the vessel. To mitigate this, the design will include warning barriers adjacent to the linkspan on chains to physically obstruct vessels.

48. The Bankseat

48.1. This is the bearing for the Linkspan on the land. The bankseat provides the transition from the link span connection to the proposed new Footway which surrounds the bankseat. The area is delineated by a security fence which is capable of closure when the service is not operating. Otherwise

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entry and exit is controlled by a turnstile arrangement designed to limit passenger numbers on the pontoon to safe limits. The area can also provide a service area for waste and utility connections.

49. Appearance

49.1. The bankseat construction should be designed to match the adjacent harbour wall construction finishes.

49.2. Surfacing should match the general surround to the bankseat area.

49.3. The design should ensure that all construction has a sufficient design life to avoid maintenance, other than first stage maintenance (i.e. minimal intervention), for a 20 year period, and should be required to prove that all materials, fixings, etc. used are capable of achieving this life.

50. Loading

50.1. The design should be capable of carrying the applied loads from the link span when in normal operation and in the event of the piles failing.

51. Drawpit

51.1. A drawpit should be constructed adjacent to landing point, with a lockable, waterproof ductile or GRP cover that can be easily accessed, without hindering foot access from the Linkspan (see **section 4**)

51.2. The drawpit will incorporate decoupling points to the cables.

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52. Cable Ducts

52.1. Cable ducts of sufficient size and quantity in order to carry the required power cables and water supply should be installed.

52.2. An additional duct should also be installed, which should be a spare for any additional future requirements. In total 4 ducts should be needed (one for power, one for telecoms, one for water and one spare). All four of these will need to be run to the connection points arranged with the utility companies.

52.3. Cable ducts used must be suitable for internment within reinforced concrete.

53. Surface Water Discharge

53.1. Surface water discharge from the Bankseat should be discharged in a maintainable manner without it causing erosion or being a visual impairment.

54. Lighting

54.1. The lighting specification and limitations will comply with the appropriate standard for the country in which the facility is being delivered for lighting of roads and public amenity areas. An Illuminance standard of 30 Lux (avg) (Overall Uniformity (Uo) = 0.4) should be provided.

55. Effect Measure Limitations

- Sky Glow: Upward light ratio (ULR) % < 0
- Light into windows: Vertical Illuminance (Lux) 1
- Source intensity: Candelas <500

- Building luminance: Candela / m2 < 5

55.1. Lighting should be directed downwards and equipment should limit the level of light spill and glare.

55.2. Siting of the lighting equipment should be done so not to compromise the various CCTV cameras and other imaging equipment used by the security services. They should also be chosen to reduce the visual impact of the equipment.

56. Signage and Crowd Control

56.1. Access / Egress to the bankseat area should be controlled through a full height, external grade, double turnstile with roof enabling simultaneous pedestrian two-way flow with directional signs. A secondary access door [1.5m wide (min.)] for waste removal, disabled access, deliveries and emergency exit should be provided with push button control and automatic opening (both sides of the door). Both turnstile and door should be lockable out of operating hours.

56.2. Crowd control warning signage should be considered if a risk assessment indicates a significant risk of crowding.

57. Pedestrian Restraint System

57.1. Construction of parapets should be required to prevent falls over heights greater than 1000mm and to control public access. Where adjacent to other parapets it should match those parapets.

57.2. Pedestrian restraint systems should be designed in accordance with the relevant standards of the country in which the facility should be provided.

57.3. Parapets should be fixed to the bankseat and harbour wall coping.

57.4. Where it is not required to match adjacent parapets, parapets should as a minimum standard consist of 3 rails positioned at 150mm, 500mm and 1200mm from ground level, suitable for crowd control with the top rail 40mm diameter.

57.5. Handrails against all other surfaces should be tubular with a diameter of 40mm and positioned at a height of 1.1m from the ground level.

57.6. Hinged gates should be provided to allow access for maintenance personnel to areas away from public access. The gates should be wide enough to allow unrestrained passage of equipment required for maintenance operations (incl. waste storage bins).

58. Security Fencing

58.1. Security fencing should be provided around the bankseat to resist out-of hours access to the linkspan and pontoon.

58.2. The security fencing should be strong yet aesthetically pleasing, designed to match the quality of the surrounding buildings.

58.3. The fencing should be 3000mm high and designed to further deter intruders.

58.4. Where the security fence terminates at the harbour wall cope, extra protection should be added to prevent intruders from climbing around the ends

59. Footways

59.1. Footways should be designed to blend into other development plans for the area.

60. Design and Appearance

60.1. Footpaths should have a maximum gradient of 1:20 and a maximum crossfall of 1:50.

60.2. Construction should have a sufficient design life to avoid maintenance, other than first stage maintenance (i.e. minimal intervention), for a 20 year period, including all materials, fixings, etc.

60.3. Where the footway can be accessed by vehicles (i.e. all areas except where restricted by permanent bollards or fencing) all materials (including access covers) should be designed for medium duty trafficking.

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61. Surfacing

61.1. Footway surfacing and construction should be in accordance with the standards of the local highway authority and be designed to complement the surrounding environment.

62. Surface Water Discharge

62.1. The design of the Footways will allow surface water from the Footway to discharge onto the roads or into car park bays. Only in exceptional circumstances should drainage directly into the harbour be permitted.

63. Lighting

63.1. The lighting specification and limitations will comply with the appropriate standard for the country in which the facility is being delivered for lighting of roads and public amenity areas. An Illuminance standard of 30 Lux (avg) (Overall Uniformity (Uo) = 0.4) should be provided.

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64. Effect Measure Limitations

- Sky Glow: Upward light ratio (ULR) % < 0
- Light into windows: Vertical Illuminance (Lux) 1
- Source intensity: Candelas <500
- Building luminance: Candela / m2 < 5

64.1. Lighting should be directed downwards and equipment should limit the level of light spill and glare.

64.2. Sitting of the lighting equipment should be done so not to compromise the various CCTV cameras and other imaging equipment used by the security

65. Signage

65.1. Permanent signage should comply with the appropriate standard of the country in which the facility should be provided.

66. Pedestrian Restraint Systems

66.1. Construction of parapets should be required to prevent falls over vertical heights greater than 1000mm and to control public access. Where adjacent to other parapets it should match those parapets.

66.2. Pedestrian restraint systems should be designed in accordance with the relevant standards of the country in which the facility should be provided.

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66.3. Parapets should be fixed to the bankseat and harbour wall coping.

66.4. Where it is not required to match adjacent parapets, parapets should as a minimum standard consist of 3 rails positioned at 150mm, 500mm and 1200mm from ground level, suitable for crowd control with the top rail 40mm diameter.

66.5. Handrails against all other surfaces should be tubular with a diameter of 40mm and positioned at a height of 1.1m from the ground level.

66.6. Guardrail posts should be curved inwards (i.e. towards the footway) against harbour wall drops. Posts for other situations can be vertical.

67. Bus Shelter

67.1. Where the ferry service interchanges with bus services, a bus shelter should be provided with sufficient accommodation for the number of passengers the ferry can carry for up to 20 minutes.

68. Appearance

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68.1. The appearance of the shelter should be designed to match that of surrounding structures and to fit within future development plans for the area. Where there is nothing appropriate to match against, the shelter should be designed to match that of the pontoon.

69. Construction

69.1. The shelter should be a metal structure and frame with polycarbonate windows and grp seating.

69.2. The shelter should have a sufficient design life to avoid maintenance, other than first stage maintenance (i.e. minimal intervention), for a 20 year period, including al materials, fixings, etc.

69.3. The shelter should be completely transparent to enable CCTV monitoring for safety and security purposes. Sides and roof should be glazed with multiple openings for entry and exit to avoid people being trapped by individuals. These openings should be clearly delineated with differentially coloured edging strips for visually disabled passengers.

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69.4. The bottom edge of the side glazing should be raised off the ground to prevent wind-blown debris from being trapped within the shelter.

69.5. Internal wind shielding should be provided to prevent wind-blown rain from blowing through the structure.

69.6. The shelter should have grp pad seats provided for 60% of the total capacity of the shelter each equipped with arm-rests to assist disabled passengers and prevent their use for sleeping by vagrants.

69.7. Surfacing within the shelter should match the adjacent footway.

70. Lighting

70.1. The shelter should be equipped with lighting to 50 lux maintained illuminance.

71. Passenger Information

71.1. The shelter should contain timetable displays and should be equipped with display units for Real Time Passenger Information.

72. Highway

72.1. Infrastructure at the harbour should be designed for two-way vehicle movement to join with the existing highway network either under local authority or port ownership using local distributor road standards as agreed by the local highway authority.

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73. Design and Appearance

73.1. All construction should have a sufficient design life to avoid maintenance, other than first stage maintenance (i.e. minimal intervention), for a 20 year period, including all materials, fixings, etc.

73.2. Pavement should be designed to resist the applied loading of the predicted traffic over the 20 year design life.

73.3. All materials (including access covers) should be designed for heavy duty trafficking.

73.4. Materials should be chosen to provide a quality finish, to complement and enhance the surrounding built or natural environment and incorporating hard and soft landscaping to break up the visual impact of the highway.

74. Surfacing

74.1. Highway should be designed using the design standards of the relevant highway authority of the country in which the facility is to be provided.

75. Surface Water Discharge

75.1. Surface water discharge should be designed using the principles of sustainable urban drainage to avoid rapid run off and allow gradual discharge with appropriate storage provision.

76. Signage

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76.1. Permanent signage should comply with the appropriate standard of the country in which the facility should be provided.

77. Automatic Rising Bollards

77.1. These should be hollow tubular section in galvanised steel. Width should be 150 – 200mm diameter rising to a height above ground 600mm – 800mm. Bollards should be linked controlled to operate simultaneously and spaced at 1.5m centres with no gap greater than 1.5m.

77.2. Bollards should be robust and manufactured from thick steel section. They should be capable of withstanding the impact of an 18 tonne gross vehicle weight at 8kph.

77.3. Bollards should be hydraulically controlled and locked in the raised position when not in operation. The fail safe position should be in the lowered position.

77.4. Bollard operation should be automatically controlled by the approach of an approved vehicle and should have a fast operation of around 4 – 6 seconds. The approach detector should be capable of being controlled by the vehicle driver from within the vehicle and an exit detector will raise the bollard after the vehicle has completely passed the detector.

77.5. A ferry service help point should be installed close to the entry set of bollards. This should be linked to a bollard control room for assistance.

78. Lighting

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78.1. The lighting specification and limitations should comply with the appropriate standards of the country in which the facility is to be provided. The following levels are suggested as a guide.

79. Effect Measure Limitations

- Sky Glow: Upward light ratio (ULR) % < 0
- Light into windows: Vertical Illuminance (Lux) 1
- Source intensity: Candelas <500
- Building luminance: Candela / m2 < 5

79.1. Lighting should be directed downwards and equipment should limit the level of light spill and glare.

79.2. Siting of the lighting equipment should be done so not to compromise the various CCTV cameras and other imaging equipment used by the security services. They should also be chosen to reduce the visual impact of the equipment. Where CCTV is in use lamps with a colouring rendering index (RA) >= 60 should be used.

79.3. All lamps should be capable of being automatically turned off and on according to pre-set hours of operation (e.g. 06:30 – 22:00hrs).

79.4. Design of lighting columns and heads should be chosen to complement and enhance the surrounding built or natural environment and while being functional should add value by providing an architectural feature in keeping with their surroundings.

80. Car Parking

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80.1. Car parking should be designed to accommodate the maximum accumulation of cars during the day. This should be calculated taking account of the arrival rate of passengers and their predicted mode choice. Circulation roads should be designed as two-way but should be narrowed at entry and exit barriers. Designated/marked routes for pedestrian movement should be incorporated in the design to maximise pedestrian safety.

81. Design and Appearance

81.1. Car Park surfacing should have a maximum gradient of 1:20 and a maximum cross-fall of 1:40.

81.2. All construction should have a sufficient design life to avoid maintenance, other than first stage maintenance (i.e. minimal intervention), for a 20 year period, including materials, fixings, etc.

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81.3. All materials (including access covers) should be designed for heavy duty trafficking.

81.4. Materials should be chosen to provide a quality finish, to complement and enhance the surrounding built or natural environment and incorporating hard and soft landscaping to break up the visual impact of the car parking.

82. Surfacing

82.1. Car parking should be designed using the design standards of the relevant highway authority of the country in which the facility is to be provided.

83. Surface Water Discharge

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83.1. Surface water discharge should be designed using the principles of sustainable urban drainage to avoid rapid run off and allow gradual discharge with appropriate storage provision.

83.2. Falls in the circulation roads should be such as to direct surface water into car park bays. Where this cannot be achieved road gullies should be provided at suitable intervals to drain into underground drainage designed in accordance with sustainable urban drainage standards.

84. Vehicle Restraint Systems

84.1. Construction of vehicle restraint parapets is required to prevent vehicle falls over vertical heights greater than 1000mm where vehicles can normally pass within 2000mm of the edge of the fall.

84.2. Vehicle Parapets should be designed to provide containment of a car of mass 1,500kg travelling at 80kph (impact speed) with an impact angle of 20O

84.3. Vehicle Parapets should be 1.25m high but no mesh infill is required.

84.4. Vehicle Parapets should be aluminium to reduce maintenance costs.

84.5. The foundations for the vehicle parapets should be appropriate for the restraint class.

85. Car Park Entrance/Exit Barriers

85.1. The system should incorporate an automated ticket machine at the entrance barrier and a payment processor at the exit barrier. Both stations

should also feature a help desk button, LCD message display, voice annunciation, intercom speaker and microphone.

85.2. All construction should have a sufficient design life to avoid maintenance, other than first stage maintenance (i.e. minimal intervention), for a 20 year period, including all materials, fixings, etc.

85.3. Construction of the barriers should be such that the barriers are clearly delineated. Should vehicles accidently hit the barrier arm, the unit should be robust enough to withstand collisions at speeds less than 2kph. The arm and internal mechanism should be easily replaceable in the event of greater impact.

85.4. As a car approaches the entrance, the unit should instruct the user via LCD display and voice annunciation should verbally assist by playing simple instructions. The unit should produce a magnetic stripe parking ticket or similar before opening the entrance barrier for the passing of one car only. While on board the ferry service the parking ticket could be validated to provide free or reduced charge parking for ferry passengers as required.

85.5. On exiting the car park, the exit unit will request this validated ticket and if the user has a ticket, which is not validated, the unit will automatically calculate the appropriate fee. The unit should again instruct the user via LCD display and voice annunciation should verbally assist by playing simple instructions. The user should have a choice of payment by credit/debit card or cash and all change should be calculated and refunded accordingly. The unit should therefore require acceptance slots for coins, credit cards and also a payment receipt slot and a small change compartment. Only once the transaction has been successfully completed, should the station instruct the

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barrier gate to open. The barrier should completely close within 4 – 6 secs of the vehicle passing the barrier exit detector.

85.6. Both units should be equipped with a help button, intercom speaker and microphone. These features including both barriers should be directly linked to security. In situations, such as in emergencies, the security staff should have total control over barrier opening in order to assist all users of the car park.

86. Signage

86.1. Signage required within the car park should include parking fee tariffs for ferry and non-ferry passengers.

87. Lighting

87.1. The lighting specification and limitations should comply with the appropriate standards of the country in which the facility is to be provided. The following levels are suggested as a guide.

88. Effect Measure Limitations

- Sky Glow: Upward light ratio (ULR) % < 0
- Light into windows: Vertical Illuminance (Lux) 1
- Source intensity: Candelas <500
- Building luminance: Candela / m2 < 5

88.1. Lighting should be directed downwards and equipment should limit the level of light spill and glare.

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88.2. Siting of the lighting equipment should be done so not to compromise the various CCTV cameras and other imaging equipment used by the security services. They should also be chosen to reduce the visual impact of the equipment. Where CCTV is in use lamps with a colouring rendering index (RA) >= 60 should be used.

88.3. All lamps should be capable of being automatically turned off and on according to pre-set hours of operation (e.g. 06:30 – 22:00hrs).

88.4. Design of lighting columns and heads should be chosen to complement and enhance the surrounding built or natural environment and while being functional should add value by providing an architectural feature in keeping with their surroundings.

89. Security

89.1. Digital CCTV security coverage should be provided to give good coverage of the car park. Particular coverage should be given to the entry and exit barriers and images should be sufficient to enable vehicle licence plate recognition.

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89.2. Cameras should be CCTV over IP and linked / integrated into a Security Centre.

89.3. Cameras should be located such that malicious or accidental damage to the cameras can be avoided.

89.4. A “Help Panel” should be provided adjacent to the linkspan head such that a press of the button will connect the member of the public to a security person in the Security Centre. The “Help Panel” should allow two-way communication and should be located in a highly visible position within easy reach of passengers (both able and disabled). The Panels should be a minimum of 300mm diameter and painted white. The buttons should be arranged so as to minimize the possibility of it being pressed accidently. The Panel should have two buttons, one large (approx. 50mm diameter) Red Button for Emergency purposes and one smaller Blue Button for Information purposes.

90. Landscape / Public Art

90.1. Landscaped / Public Art areas should be established to either provide a softer, aesthetically pleasing, more colourful aspect to the area or to provide a visual reminder of the history of the harbour.

91. Public Art

91.1. The Public Art should be culturally relevant and should be visually stunning. It should not need to be provided with an explanatory plaque for its meaning to be clear to local people.

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91.2. Public Art should be of a high quality using materials that have a sufficient design life to avoid maintenance, other than first stage maintenance (i.e. minimal intervention), for a 20 year period.

91.3. Public Art should be chosen and positioned so that it does not block sightlines for vehicles or pedestrians.

91.4. Public Art should be chosen and positioned so that it does not encroach on footways or roads and does not provide a hazard to the public (either able bodied or disabled).

92. Plant Site Preparation

92.1. Planting sites should be adequately graded and locations agreed.

92.2. A 250 – 300 mm deep bed should be prepared, with the top 75–100 mm consisting of topsoil. The bed should be firm but not compact. The top 75mm of soil should be loose, moist and free of large clods and stones. For most applications, all stones larger than 50 mm in diameter, roots, litter and any foreign matter should be raked and removed.

92.3. The site should be sufficiently well draining to enable moisture uptake by the plants but no ponding allowed. Drainage onto adjacent surfaces should not be allowed.

92.4. The topsoil should be chosen to support native plant species.

93. Planting

93.1. Biodegradable matting should be used to reduce the invasion of weeds.

93.2. Only native species of plants should be chosen. No peat should be present in the compost.

93.3. Plants should be chosen and positioned so that, when mature, they will not block sightlines for vehicles, pedestrians or CCTV.

93.4. Plants should be chosen and positioned so that they do not encroach on footways or roads.

94. Cycle lockers

94.1. Although the ferry is likely to be able to take bicycles on board, cycle lockers should be provided at both ends of the ferry route for those commuters / users who wish to cycle to one end of the ferry service and then continue their onward journey by other means.

95. Appearance

95.1. Upright lockers can be provided in order to minimize their footprint within the harbour infrastructure.

95.2. Cycle lockers should be coloured to complement the surrounding environment.

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96. Design

96.1. Lockers should be designed to be corrosion resistant and to be free-draining both internally and externally.

96.2. All construction should have a sufficient design life to avoid maintenance, other than first stage maintenance (i.e. minimal intervention), for a 20 year period, including materials, fixings, etc.

96.3. Cycle lockers should be designed so as to be easily installed, additional units added and individually removed without the need for special foundations.

96.4. Guiderails should be provided internally for ease of storage and to ensure that there is no metal to metal contact between the bicycle and locker.

96.5. Lockers should be designed for users to be able to leave equipment either on the bicycle or hung within the locker (i.e. panniers, pump, lights, tools, cycle-computer, helmet and waterproofs).

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97. Security

97.1. Cycle lockers should be resistant to external attack and should be graffiti and vandal resistant.

97.2. Lockers should be equipped with a secure external locking mechanism and have ability for users to secure their bicycle to the locker with their own padlock.

97.3. The external locking mechanism should have the capability for coin or token operated locks.

97.4. The locks should be designed to allow the locker administrator to be able to independently open the cabinet without disturbing the cyclist's own padlock. Lockers should be sited so as to be capable of having their doors in full view of CCTV security cameras.

98. Refuelling & Lubricant Facilities

98.1. The ferry service will require refuelling facilities. In order to achieve a good price for suitable fuel and lubricant, storage tank are required which meet the approval of the planning authorities fuel officer.

99. Design

99.1. The tanks should be fuel / lubricant storage tanks with a capacity of at least 40,000 litres (8,795 gallons) diesel, 2,000 litre fresh lubricants and 2,000 litre waste lubricants.

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99.2. The tanks should be heavy-duty double cylinder design with dished ends, constructed from steel. They should be quick to install are required to be self-supporting, not requiring any civils work prior to installation. A large fuel cabinet should provide access to tank connections and dispensing equipment.

99.3. The tanks should be fully bunded and have pressure tested inner tanks; built in accordance with the latest environmental regulations.

99.4. The Unit(s) is required to be capable of being operated with or without mains electric connection.

100. Pump and Control Equipment

100.1. The unit should incorporate an integral pump and control equipment. The integral pump should be in the form of a fuel / lubricant dispensing system that uses a 25mm reinforced delivery hose for diesel and a mesh intake filter for pump protection.

100.2. Hose storage should be capable of accommodating sufficient length to enable connection to the ferry vessel's fuel tank(s)

100.3. A Control unit should be provided for level display and system management. It is required to give accurate and reliable tank level indication.

100.4. Control equipment should include a Fuel / Oil-Proof combined over-fill / low level & bund alarm system, capacitance liquid level sensors, integral 24Vd.c. power supply unit, mains power indication LED, and red flashing warning LED's, multi tone sounder & sounder isolation switch, external 3 way

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warning light. The equipment should also include a mains electric connection panel.

101. Services

102. Power

102.1. A power supply to within the site should be required to the specification of the local power company and the capacity of the supply should make allowance for future expansion of the terminal.

103. Fresh Water

103.1. Fresh water is required to fill tanks within the ferries and for maintenance purposes on the pontoons. Fresh water is also required for fire-fighting services.

103.2. A supply to within the site should be required to the specification of the local water company and the capacity of the supply should make allowance for future expansion of the terminal.

104. Waste Water Discharge

104.1. Waste water discharge is required from the ferry waste water tanks.

104.2. A connection to the local waste water system should be required to the specification of the local waste water authority and the capacity should make allowance for future expansion of the terminal.

105. Telecommunications

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105.1. An ASDL connection should be required within the site with local exchange facilities to service all telephone points.

106. Ferry Ticket Dispensers

106.1. The ferry service should be designed to operate with minimum operational staff. Ticket dispensing machines should be located on the pontoons or the harbour both inside and outside the waiting room to enable passengers to buy their ticket before boarding.

107. Design & Appearance

107.1. Ticket dispensers should be able to issue single and return tickets for ferry passengers following payment in a simple-to-use manner with a minimum of button pushing. They should be easy-to-use with a user friendly interface.

107.2. The machines should have a modern, attractive design, contrasting build materials and finishes to enhance the overall image of the ferry service.

107.3. Up to 3 languages should be incorporated for user instructions.

107.4. Machines and displays should be fully compliant with disability legislation.

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107.5. All construction should have a sufficient design life to avoid maintenance, other than first stage maintenance (i.e. minimal intervention), for a 10 year period, including all materials, fixings, etc. in a sea spray environment.

108. Payment Method

108.1. Up to 4 different coin denominations should be accepted and allowed to reach a specific vend value. Machines should be provided with a 4 litre coin box.

108.2. Up to 3 different bank notes denominations should be accepted and allowed to reach a vend value in combination with coins.

108.3. Machines should be capable of giving refunds and change.

108.4. A wide variety of cards should be accepted including high security and specially encoded magnetic cards, debit cards, credit cards, pre-paid chip cards and re-chargeable chip cards. This should include SMART Cards used for travel in the local area.

108.5. Payments using mobile phone technology should also be accepted.

109. Communication

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109.1. Machines should be capable of GPRS, GSM, Wi-Fi and ADSL connection for control, management reporting, remote servicing, and error solving.

109.2. A push-button intercom connection should be provided to enable the user to communicate to a control centre if they are having problems using the machine.

110. Security

110.1. Machines should be capable of resisting attack for up to 15 minutes.

110.2. They should have a “locked by default” mechanism and off-line security control mechanisms. If unauthorised opening takes place then the machines should send a remote alert to the machines control centre and security centre.

111. Maintenance

111.1. The machine should have an integrated auto diagnosis software package.

111.2. The subassemblies should be easily accessible and common to all devices.

111.3. Diagnostic programs should be able to test each element without unnecessary transactions.

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111.4. A maintenance ticket should be able to be issued that summarises all the operations performed for maintenance.

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