

**Mumbles Pier
Restoration and
RNLI Lifeboat
Station, The
Mumbles, Swansea**

**Historic Building
Assessment**

Prepared by:
The Environmental
Dimension Partnership

On Behalf of:
AMECO & RNLI Trading

October 2010

H_EDP1249_03c_281010_AC_rc

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Section 1 Introduction

- 1.1 This historic building assessment has been prepared by the Environmental Dimension Partnership (hereafter 'EDP') on behalf of AMECO & RNLI Trading, who are hereafter referred to as the 'clients' in this report.
- 1.2 It has been researched and written with regard to the proposed submission of planning and listed building consent applications in relation to refurbishment works to Mumbles Pier, along with the construction of a new lifeboat station at the end of the Pier, during October 2010.
- 1.3 The Mumbles Pier, together with the attached lifeboat station and slipway, has been designated as a Grade II listed building [Ref. SS63258750].
- 1.4 This assessment builds on the baseline research, which was presented in a Heritage Statement for the Mumbles Pier and Foreshore development (EDP 2010). This established the 'significance' of designated and undesignated heritage assets at the site, which covered the pier and land and structures associated with it.
- 1.5 In doing so, this report provides an assessment of the proposed restoration and redevelopment of the Mumbles pier, lifeboat station and slipway on its special architectural and historic interest, recognised through designation as a statutorily listed building, and provide commentary on the appropriateness of the scheme.
- 1.6 This is required to assist the Local Planning Authority; in this instance the City and County of Swansea (CCS), to fulfil their statutory obligations under the Planning (Listed Buildings and Conservation Areas) Act 1990 (DoE 1990) and to ensure that the proposed scheme meets the requirements of national and local planning policy.

Section 2 The Site

- 2.1 The following paragraphs describe the heritage asset to which this assessment relates and provide contextual information on its history, form and fabric. As such, they provide a summary overview of the asset's overall significance, in addition to that of key elements of its structure. In doing so, this section builds upon the baseline research, which is set out in EDP's Heritage Statement (see EDP 2010).

Location and Boundaries

- 2.2 The Mumbles is a small town located on the south west side of Swansea Bay, some five kilometres from Swansea City Centre, which is concentrated on the west side of the River Tawe mouth and the dock complex located adjacent.
- 2.3 Although they were formerly separate settlements, The Mumbles is now effectively joined to Oystermouth, further to the north-west, which is focused on the sandy bay in front and dominated by the medieval castle on the slopes above.
- 2.4 The site comprises Mumbles Pier, which is located one kilometre to the south east of the historic settlement, at the point where the promontory disintegrates into a series of rocky islands that terminate at 'Mumbles Head'. The pier projects north eastwards into the bay from a man-made platform on the shoreline below the cliffs.
- 2.5 The landing platform at the end of the pier (known as the 'pier head') is centred on approximately National Grid Reference (NGR) SS 6330 8750.

Description of the Asset

- 2.6 The site contains a single statutorily listed building. This is the Mumbles Pier, Lifeboat Station and Slipway, which are together designated at Grade II [Ref. SS63258750]. The citation is reproduced in full as **Appendix EDP 1**.

The Pier

- 2.7 Mumbles Pier is designated as a Grade II listed building and was erected between 1892 and 1898. It was built by Mayoh & Haley of London, to a design by W. Sutcliffe Marsh, for a total expenditure of £17,000.
- 2.8 However, the existing fabric of the pier has been put together over the course of its lifetime and, in many respects, dates from a period of rebuilding and restoration that took place following World War Two (see EDP 2010).
- 2.9 It was intended to form the terminus of the Swansea and Mumbles Railway and therefore conceived as little more than a grand landing stage for the numerous passenger ships and steamers plying their trade in the waters of the Bristol Channel. However, even from the outset, there was some provision for 'promenading and bands', even if the pier was never equipped with ornate buildings.
- 2.10 When completed, the pier was 835 feet long, with a neck width of 25 feet. The platform measured 135 feet in length and 84 feet wide. Its original construction can be summarised as *cast iron piles braced with steel rails and tie rods carrying steel lattice girders, which were themselves braced transversely. The latter then supported*

pitch pine joists that were laid across the structure and then finished with pitch pine deck pieces laid lengthways along the pier (see EDP 2010).

- 2.11 Notwithstanding the fact that a petition to the House of Lords recognised that the pier had been 'largely rebuilt' since the war, it is evident that the substantive character, detailing and certain fabric from the original phase of construction still survives. Most obviously, this includes the grouped cast iron piles, which are braced with tie rods and characterise the structure all the way to the end of the head.
- 2.12 The cross-braced tie rods remain intact and so do the steel rails mentioned in contemporary descriptions, but they are only exposed at low tide. The large holes in the capitals of the cast iron piles, which are clearly visible from the landing stage at the distal end of the head, are believed to have been required for 'screw piling' the piles into place (John Bollom pers. comm.).
- 2.13 Whereas the cast iron piles survive, in their original intended arrangement, all the way to the end of the pier, the transverse-braced, longitudinal lattice girders, which are so characteristic of this structure, now only extend to the outward end of the pier neck.
- 2.14 Instead, the deck to the pier head is supported on modern steel girders, which do not sit at all well with the cast iron piles and form an uncharacteristic and un-Victorian confusion in the structural and architectural appearance. Unfortunately, the available historic images do not provide sufficient detail of the end of the pier to confirm the form of construction that was employed originally.
- 2.15 Nonetheless, it is clear that the tops of the cast iron piles reach a higher level beneath the pier head than they do beneath the pier neck. This suggests that they probably supported a cut-down version of the lattice-work girders, which are employed in the rest of the pier and which are so characteristic of its form and fabric.
- 2.16 However, discussions with AMECO have also concluded that, whereas the existing lattice-work girders maintain the historic character of the pier, as shown on pre-war photographs, they do not represent original fabric. Instead, it is recorded that the original girders were replaced by AMECO in the period following World War Two, when the pier's fabric, from the top of the piles upwards, was largely replaced.
- 2.17 The current owners of the pier, whose family oversaw the restoration, recall that the works included the removal and replacement/ renovation of all fabric above the tops of the cast iron piles. It has been cited that, whilst the cast iron panels to the balustrades were retained and refitted, the majority of other features, including the brackets and handrails associated with them, were replaced with new. Photographic evidence makes clear that the restoration of these features was fundamentally consistent with the character and appearance of the original fabric.
- 2.18 At the same time, it is equally clear that the original deck surface of pitched pine has been replaced throughout, with softwood joists and boards. Investigation of the fabric indicates that some of the timberwork has been replaced in the very recent past, presumably as a result of ongoing deterioration.
- 2.19 Although there is widespread evidence for deterioration in the fabric of the pier structure, easily the most visible area of trauma and decay is located on the south side of the head, where the deck has been affected by recent fire and has all but disintegrated. As a result, this area has had to be fenced off to prevent access, thereby facilitating the establishment of the kittiwake colony.

- 2.20 Equally, it is clear that the timber joists have also failed on this (seaward) side of the structure, leading to localised collapse, which, like the exposed steelwork, has provided numerous suitable opportunities for the nesting kittiwakes.
- 2.21 As set out previously, the pier was originally intended for promenading, where visitors could enjoy the sea air, as well as for providing a means of access to the pleasure boats and steamers, which plied their trade across the Bristol Channel. Accordingly, it was not provided with any visitor attractions, such as a concert hall or theatre, in contrast with other Victorian piers in England and Wales.
- 2.22 Instead it was furnished with two amusement booths/shelters, one of which served as a public toilet, located on platforms projecting out on both sides of the pier neck. These were located mid-way along the structure. In addition, there was a centrally positioned bandstand on the wider platform at the head. None of the original structures survive and nor does the tramway that formerly ran along the one side.
- 2.23 Indeed, the only undoubtedly original fixtures and fittings, which survive presently, comprise (1) the decorative cast iron panels along the sides of the pier stem and the head and (2) the cast iron benches, which face inwards towards the former bandstand.
- 2.24 However, whilst the panels are clearly highly characteristic of the pier in its original intended form, and undoubtedly make a significant contribution to its special architectural or historic interest, the hand rails that connect them together, as well as the brackets that hold them in place, are reported to have been replacements installed by AMECO in the period after World War Two (J. Bollom pers. comm.).
- 2.25 However, it is clear that, even if neither the brackets nor the handrails represent original historic fabric, both clearly maintain the historic character of the pier as it was intended in the last decade of the 19th century. In both cases, the existing fabric mimics features of the original pier that are shown on historic photographs.
- 2.26 Unfortunately, the provision of the three-tier concrete landing stage at the end of the pier, in the post-Second World War period, appears to have required the decorative railings at the end of the head to be removed. They were replaced with a rather uncharacteristic and unsightly length of tubular steel railing, which has the appearance of a temporary structure that has gained a degree of permanence through neglect. These modern railings evidently add nothing to the historic character of the pier.
- 2.27 The cast iron benches, which are provided around the broad platform at the end of the pier, and are simply finished with backs displaying inter-twined dolphins, are also likely to be original, although there do not appear to be any good quality contemporary images of this end of the pier structure, only distant shots from the buildings located on the foreshore area or from the railway station.
- 2.28 Even so, whilst it is highly likely that the wooden slats are recent replacements, it is undoubtedly the case that these benches contribute significantly to the character of the pier. It is therefore unfortunate that those on the south side have deteriorated to such an extent, as they are one of the few remaining decorative elements at the pier.
- 2.29 Historic photographs do not indicate that there were regularly spaced lamp posts along the centreline of the pier, as there are now. Instead, they appear to have been located in pairs along the handrails on either side of the structure. Accordingly, if the existing gas lamp posts, which were manufactured by Revo of Tipton (West Midlands), are original to Mumbles Pier, they are certainly not in their intended locations.

- 2.30 The entrance to the pier is also a modern replacement, although historic maps do illustrate that there was a structure for this purpose located at this point. The present version comprises two flanking towers of wood panelling and an archway that is painted white and overflies the paired steel gates.
- 2.31 As set out previously, two flights of steel steps lead down to the three-storey concrete landing stage at the distal end of the broad platform. This was added in the 1950s and replaced the original landing stage and associated fishing platforms, which wrapped around the sides of the pier. The existing structure is of very limited architectural interest and contributes little to the pier's character, being primarily used by anglers.

The Lifeboat House and Slipway

- 2.32 The lifeboat house is located on the north side of the pier, where it is situated at the landward end of a long slipway that adopts a parallel alignment. The boat house dates from 1922 and is known to have been added to a pre-existing slipway, which was actually constructed during World War One (1916).
- 2.33 It is reached by a simple steel-framed lattice girder walkway, which is carried on three evenly spaced concrete platforms, each comprising four horizontally braced uprights arranged on a rectangular plan form, and leads off to the north from about the mid-point of the pier neck.
- 2.34 The slipway is of all but identical concrete construction, but it is also provided with additional cross-bracing, presumably to support the greater weight of the boat. It is finished with a simple concave linear deck running down to the water.
- 2.35 The lifeboat house is a simple, but charmingly characteristic built structure, which is of clap-board construction and arranged on a east-west alignment, in order to fit on the top of the earlier slipway. It is finished with a simple cross-plan gabled roof and large 'T-shaped' window openings in three of the elevations. The fourth elevation, on the north east side, has large double doors opening on to the slipway, in addition to a pair of T-shaped casements located in the gable above.
- 2.36 Although they are not contemporary, and are not even functionally related, the Mumbles Pier and lifeboat house together form an interesting group, which not only characterises this corner of Swansea Bay, but forms a highly distinctive and recognisable landmark in long distance views from the north west, where it is framed by the intermittent rocky mass of The Mumbles.

Significance of the Asset

- 2.37 The citation document states that Mumbles Pier is designated '*...principally for its special interest as one of only six iron piers to survive in Wales, of which this is the third longest*'. Nevertheless, it should be re-emphasised that it is only listed at Grade II, which is by far the commonest of three grades of listed building.
- 2.38 Nevertheless, there is no doubt that it is of at least regional importance, if not actually national importance, given its well documented background and close association with the first passenger carrying railway line in the world.
- 2.39 As well as this historic and architectural significance, the pier, and associated lifeboat house, has an aesthetic importance, which derives from its contribution to the

character of the historic settlement at The Mumbles, as well as both the enjoyment and appreciation of the wider landscape of Swansea Bay.

- 2.40 In that context, the pier and lifeboat house may be regarded as locally iconic structures, which characterise the surrounding area. Their retention and long term preservation in a sound and stable condition should therefore be a priority. This has clearly been recognised by CCS in the preparation of their Development Framework.
- 2.41 At the moment, however, this objective is in jeopardy due to the ongoing deterioration of the pier, caused in large part by the substantial cost of maintenance and repair when compared with the income generated from visitors and anglers who use it. The loss of the pier as a viable visitor attraction would obviously be a massive loss, not only for the historic environment but also the local economy, which benefits greatly from it.
- 2.42 Turning to the fabric of the pier itself, it is very clear that the various structural and decorative elements are of different levels of 'significance'. The assessment is based largely, but certainly not solely, on their originality, but also focuses on their contribution to the pier's outward historic character and appearance.
- 2.43 In that way, it is clear that the cast iron piles and cast iron panels and benches are undoubtedly of greatest significance to the structure, as they not only represent the last remaining fabric of the original pier, but also make an important contribution to its wider character and public presentation. Indeed, these elements continue to link the existing pier with the iconic structure that is depicted on postcards and photographs from the late 19th and early 20th centuries.
- 2.44 In contrast, whereas those same historic postcards and photographs illustrate that the pier was provided with a latticework girder construction, linking the cast iron piles, from the outset, the available evidence indicates that the existing structure is not original, but is instead the result of 'restoration' in the mid 20th century (EDP 2010).
- 2.45 However, whilst the existing latticework is not apparently original, it is evident that, in its present form, it at least maintains the historic character of the pier and makes an important contribution to its outward presentation.
- 2.46 The same is true of the handrails and brackets, which connect the cast iron panels defining the outer edges of the pier structure. However, AMECO have confirmed that, in both cases, the existing elements were replaced in the post-war period. Even so, the handrails and brackets both replicate features of the pier, which can clearly be discerned on historic images (see EDP 2010).
- 2.47 Finally, whilst the timber decking also maintains the character of the original pier structure, it is very clear that it is no older than mid 20th century date. Moreover, it has been laid very poorly and forms a very rudimentary and unsatisfactory surface to the pier neck and head, which does little to enhance its presentation. On that basis, it is concluded that the existing timber decking and superstructure is of only very limited significance to the pier's special architectural and historic interest.

Section 3 The Proposed Scheme

- 3.1 The following paragraphs summarise the programme of restoration and redevelopment, which is proposed for the Mumbles Pier and will be subject to a detailed planning application and listed building consent application.
- 3.2 They are based on the scheme drawings, comprising plans, sections and elevations, as well as details where appropriate, which are all presented in **Appendix EDP 2**.
- 3.3 Following instruction in spring 2010, EDP has undertaken extensive liaison with Opus, who have designed the proposed scheme for the site. This has focused on the identification of key elements of the pier's form and fabric, which contribute to its special architectural and historic interest and should therefore be preserved/enhanced.
- 3.4 This process crystallised in the production of the baseline Heritage Statement, referenced here as EDP (2010), which addressed both the pier and adjacent foreshore as functional components of the local historic environment. The document was subsequently provided to Peter Ashby of Cadw, who confirmed that he accepted it as a baseline for consideration of the two schemes being brought forward.
- 3.5 The scheme for the pier and lifeboat house, as it was constituted at that time, was reviewed by EDP and Opus in light of the Heritage Statement's completion. This concluded that further refinement was required for certain elements of the proposals, most notably the treatment of the cast iron piles and the re-use of the decorative cast iron panels to the balustrades along the pier and flanking the head.
- 3.6 Accordingly, the final iteration of the scheme, which forms the basis for the drawings set out in **Appendix EDP 1**, incorporates a significant degree of 'inherent mitigation', which includes more sensitive treatment of the cast iron piles and the retention of the decorative cast iron balustrade panels, but also affords greater attention to the future, by considering the reversibility of the proposals being put forward.
- 3.7 In essence, the proposed works will affect the pier in two ways; namely (1) through changes to its layout/use and (2) changes to its historic fabric. These two areas are described in turn and form the basis for the assessment presented in Section 7.

Layout and Use

- 3.8 For the most part, there would be no change in the use of the pier, with the entirety of the stem and some of the head remaining available for a range of leisure activities.
- 3.9 The only noteworthy change in use would be restricted to the pier head, where the construction of a new boathouse for the RNLI would take up circa 50% of the existing platform space. Even so, this would still preserve the all round visibility of Swansea Bay, with opportunities for visitors to access both sides of the pier head, as well as the end.

The Boathouse Design

- 3.10 The current boathouse proposal represents the culmination of seven years of design evolution, during which time it has undergone numerous revisions since responding to the RNLI's initial Brief (see **Appendix EDP 3**).
- 3.11 These revisions have been made in light of changing operational, as well as commercial, requirements, learned through the implementation of design solutions for similar projects at Tenby and Padstow, but also in response to the sensitivities of the listed pier structure and the aesthetics of its wider setting within the Bay, and particularly its visual relationship with the existing lifeboat station and the Mumbles Head Lighthouse.
- 3.12 They have been implemented in light of consultation with key stakeholder groups, such as Cadw, CCS and the local parish councillors, and in parallel with the emergence and adoption of the Mumbles Pier and Foreshore Development Framework, which recognises not only the importance of the RNLI to the area, but also the benefits of developing an 'attraction' on the pier to increase visitors numbers, and hence revenue for the threatened Grade II listed building.
- 3.13 The result of that process has been a move away from an entirely new, free-standing lifeboat house, built to the north or south of the pier, and towards the adoption and refinement of a new building centred on the pier head, but provided with its own system of piled foundations to minimise the impact upon the historic fabric.
- 3.14 Therefore, the proposal has evolved into Scheme 10A, which recognises and addresses the delicate balance between the RNLI's operational and commercial requirements, the aesthetic sensitivity of the location and the importance of the pier's historic form, fabric and character. At the same time, it maintains its amenity to user groups, most notably the anglers, who make a significant contribution to the pier's annual revenue.
- 3.15 The proposed boathouse is arranged on an essentially rectangular plan form and will read as a tall single storey building. This is to accommodate the offshore lifeboat at the existing deck level, where there will also be an Operations Room, store rooms and fuel dispenser, all of which are accessed from the landward end (see **Appendix EDP 2**).
- 3.16 Whilst there will not be a full internal first floor, there will be a public gallery running along the south side, where it will be accessed by a flight of stairs at the south west corner. Changing rooms and a muster area for the crew will be provided on the northern side of the structure, again accessed from the landward end.
- 3.17 In addition, the proposed boathouse will be provided with an undercroft. This will extend to all but the landward end of the structure and will accommodate the launching mechanism for the offshore lifeboat, as well as providing fuel storage facilities, the winch motor and the foul drainage pump on the north side.
- 3.18 With regard to the building's outward appearance, the design has been chosen to combine appropriate operational facilities with a high quality, characteristic and yet environmentally 'sensitive' form of architecture.
- 3.19 Accordingly, the elevations will be clad in Siberian larch and the roof, which has been designed to mimic the appearance of a billowing sail, will be of zinc. The Austrian edge gutters will be finished in the same material. Iroko windows will be provided on the three main elevations, in order to create a low impact building.

- 3.20 As set out above, the construction of the sloping slipway will require the demolition of the three-tier concrete landing stage. In combination with the construction of the proposed undercroft, it will also require four of the cast iron column tops to be removed and stored for future reinstatement (see **Appendix EDP 2**).
- 3.21 In turn, the proposed demolition of the three-tier concrete landing stage would, without alternative provision, curtail use by local anglers, thereby cutting off an important revenue stream enjoyed by AMECO and used to maintain/repair the pier structure.

The Fishing Platform Design

- 3.22 It is proposed that two new fishing platforms will be provided on the north and south sides of the pier head, in order to provide for anglers and maintain this important source of income for the owners and operators, AMECO.
- 3.23 The two new fishing platforms will be located on both long elevations to the pier head, where they will take up circa 50% of the existing length. They will be cantilevered out from the new pier superstructure and supported on new piles driven into the seabed adjoining.
- 3.24 The design of the new piles has been chosen to not detract from the character and appearance of the retained historic fabric. The same is true of the new balustrades that are proposed to be erected around the perimeter of the platforms. These will comprise an arrangement of galvanised steel stanchions and handrails, the design of which has been carefully considered to work in harmony with the retained historic fabric.
- 3.25 The 'hi-grip' decking boards, which form the surface of the new fishing platforms, will be at approximately the same level as the tops to the cast iron columns; in other words, somewhat lower than the deck to the pier head adjacent. However, this will mean that they are at a similar level to the top of the existing three-tier landing stage.
- 3.26 Both fishing platforms will be accessed from the landward side, via flights of steps leading down from the main deck of the pier head. In each case this will require the removal of one section of the existing balustrade and one section of cast iron seating. It will either be retained for future use or re-erected elsewhere at the site.

The Lifeboat Station

- 3.27 It is not proposed to change the form or fabric of the existing offshore lifeboat station in any way (see below). However, with the proposed relocation of the RNLI's operations to the pier head, the existing building would effectively become redundant.
- 3.28 With that in mind, and given that the structure forms a component part of the listed building, along with its slipway and the pier, AMECO and the RNLI are actively investigating potential new uses/users and the result of that process will be the subject of separate planning and listed building consent applications in the future.

Fabric and Structure

- 3.29 This section summarises the scope of retention, removal and replacement of fabric at the pier, excluding the three-tier concrete landing stage discussed previously.

Fabric to be Retained

- i. The cast iron columns, screw piles and bracing components, with the exception of any that are found to be at or beyond their serviceable lifespan and four 'column tops' within the proposed boathouse footprint;
- ii. The decorative cast iron balustrade panels;
- iii. The decorative cast iron bench frames around the perimeter of the pier head, with the exception of those which would prevent access to the new fishing platforms on each side; and
- iv. The lamp posts.

Fabric to be Removed

- i. The steel latticework sub-structure;
- ii. The timber joists;
- iii. The timber waling beams along the pier sides; and
- iv. The timber decking.

Replacement Fabric (where decay dictates)

- i. The bracing members to the cast iron piles; and
 - ii. The steel joist to the pier head.
- 3.30 The existing steel latticework would be replaced with a series of galvanised steel arched beams, bridging the space between each cast iron column in a single span.
- 3.31 The existing transverse steel bracing members would be replaced with fabricated curved steel soffit beams.
- 3.32 The existing timber waling beams would be replaced with galvanised steel edge beams, which would be connected to the pier sub-structure.
- 3.33 The existing surface to the pier would be replaced with 120 x 45mm hardwood decking boards on a 50 x 200mm hardwood plate.
- 3.34 The existing 'roll top' stanchions and handrails to the pier balustrades would be replaced with new units in painted galvanised steel and furnished with a bottom rail. These would match the balustrade panels in use around the base of the pier.

Section 4

The Legislative and Planning Policy Framework

- 4.1 This section summarises the legislative and planning policy considerations, which are pertinent to the assessment of potential impacts upon the pier.

Existing Legislation

- 4.2 Section 66 of the Planning (Listed Buildings and Conservation Areas) Act (1990) clearly states that “...in considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses” (see DoE 1990).

National Planning Policy

- 4.3 Planning Policy Wales (PPW) Third Edition, adopted in July 2010 (WAG 2010), and Welsh Office Circular 61/96 *Planning and the Historic Environment: Historic Buildings and Conservation Areas* (WO 1996) together set out the national framework for the management of the ‘historic environment’ through the planning process.
- 4.4 Paragraph 6.5.9 of PPW states that “...where a development proposal affects a listed building or its setting, the primary material consideration is the statutory requirement to have special regard to the desirability of preserving the building, or its setting, or any features of special architectural or historic interest which it possesses”.
- 4.5 The preceding paragraph (Paragraph 6.5.8) observes that:
- “There should be a general presumption in favour of the preservation of listed buildings. The continuation or reinstatement of the original use should generally be the first option when the future of a listed building is considered. However, not all original uses will now be viable or necessarily appropriate. The application of development and listed building controls should recognise the need for flexibility where new uses have to be considered to secure a building’s survival. The aim should be to identify the optimum viable use that is compatible with the character and setting of an historic building.”*
- 4.6 Indeed, Paragraph 12 of Circular 61/96 observes that “...new uses may be the key to the preservation of a building or area and controls over land use, density, plot ratio, daylighting and other planning matters should be exercised sympathetically where this would enable an historic building or area to be given a new lease of life”.
- 4.7 More specifically, Paragraph 70 then states that “...the issues that are generally relevant to the consideration of all listed building consent applications are:
- (i) *The importance of the building, its intrinsic architectural and historic interest and rarity, in both national and local terms;*
 - (ii) *The particular physical features of the building...which justify its inclusion in the list: list descriptions may draw attention to features of particular interest or value, but they are not exhaustive and other features of importance (eg interiors) may come to light after the building’s inclusion on the list;*

- (iii) *The building's setting and its contribution to the local scene, which may be very important; e.g. where it forms an element in a group, park, garden or other townscape or landscape, or where it shares particular architectural forms or details with other buildings nearby; and*
- (iv) *The extent to which the proposed works would bring substantial benefits for the community, in particular by contributing to the economic regeneration of the area or the enhancement of its environment (including other listed buildings).*

- 4.8 Paragraph continues by noting that "...many listed buildings can sustain a degree of sensitive alteration or extension to accommodate continuing or new uses. Indeed, cumulative changes reflecting the history of use and ownership are themselves an aspect of the special interest of some buildings, and the merit of new alterations or additions, especially where they are generated within a secure and committed long term ownership, should not be discounted" (WO 1996).
- 4.9 However, Paragraph 97 adds a note of caution, when it states that "...the listing grade is a material consideration, but is not in itself a reliable guide to the sensitivity of a building to alteration or extension. For example, many Grade II buildings are humble, once common building types which have been listed precisely because they are relatively unaltered examples of their sort. They can have their special interest ruined by unsuitable alteration or extension as readily as can Grade I or II* structures".
- 4.10 Finally, Paragraph 97 adds that "...achieving a proper balance between the special interest of a listed building proposals for alterations or extensions is demanding and should always be based on specialist expertise; but it is rarely impossible, if reasonable flexibility and imagination are shown by all parties involved" (WO 1996).
- 4.11 Therefore, whilst national planning policy re-emphasises the legislative requirement to preserve the listed building, its setting and any features of special architectural or historic interest which it possesses, it also recognises that LPAs must balance their obligations against the need for flexibility in the consideration of applications for alterations, which would secure viable long term futures for historic buildings.

Local Planning Policy

- 4.12 Policy EV7 of the *Swansea Unitary Development Plan* (adopted 2008), which covers proposed extensions and alterations to listed buildings, presents the criteria, against which the acceptability of the planning permission and LBC applications for Mumbles Pier will ultimately be determined. This is set out in full below.

Policy EV7

Extensions or alterations to a listed building will not be permitted unless they safeguard the following:

- (i) *The character of the listed building in terms of its scale, design, materials and features which it possesses that are of special architectural or historic interest, and*
- (ii) *The historic form and structural integrity of the building.*

The change of use of listed buildings will be permitted where this contributes towards the retention of a building without having an adverse effect on its character, special interest or structural integrity.

Supplementary Planning Guidance

- 4.13 The *Mumbles Pier and Foreshore Development Framework* was formally adopted by CCS in April 2009 (CCS 2009) and forms Supplementary Planning Guidance (SPG). This provides background information on the present condition of the pier, in addition to presenting a series of planning and development principles for restoration, refurbishment and reuse.
- 4.14 The introduction (Section 1.0) observes that “...*Mumbles Pier is in urgent need of restoration and without intervention will reach the end of its maintainable life. The owners and operators, Amusement Equipment Co Ltd (AMECO), have demonstrated a continuing commitment to its operation for over seventy years. The company wishes to rebuild and restore this iconic feature of Swansea and Gower to ensure its future for generations to come*” (see CCS 2009).
- 4.15 Accordingly, Section 2.0 of the adopted development framework adds that “...*the ambition for the site is to...rejuvenate an established and historical attraction* “. It continues by stating that:
- “It is recognised that this key location has the potential to be redeveloped as an improved and sustainable tourist and visitor destination. The underlying theme is the restoration of the Pier, a Grade II listed building, through a phased regeneration project that can provide the necessary funding. The Pier also provides access to the RNLI offshore lifeboat and boathouse, which is important to retain”*
- 4.16 Nonetheless, CCS, through the adoption of the Development Framework, recognises that the Pier “...*requires substantial repair and reconstruction*” and reports the results of a structural survey completed by Kaymac Marine and Civil Engineers in May 2007. This identified that costs for repair would exceed £3 million (CCS 2009).
- 4.17 Indeed, in Paragraph 3.4, the Development Framework states that “...*the pier, although still in limited use, requires substantial repair and reconstruction*”. It then recognises that the pier “...*stands in a particularly harsh and corrosive environment, being subject to immersion in seawater twice a day to a depth of 12 metres, and experiences the effects of severe winter storms*” (CCS 2009).
- 4.18 Furthermore, Paragraph 3.4 also observes that CCS has previously identified that Mumbles Pier is a ‘Building at Risk’, based on the application of the Cadw methodology, comprehensively concluding that it is “...*vulnerable and that...without maintenance the process of decline will continue*” (CCS 2009).
- 4.19 As far as the lifeboat station is concerned, Paragraph 3.5 states that:
- “There has been an RNLI Lifeboat presence in Mumbles since 1866 and there has been a slipway off the north side of the pier since 1916. When the next generation of lifeboat comes into service in Mumbles in 2011, the current facility will no longer be suitable. The RNLI, who operate from the pier on a licence basis, have indicated their intention to construct a new lifeboat station to replace the existing facility. The importance of the continued presence of the RNLI on the site is acknowledged along*

with their contribution to the area's history. Their presence is expected to become more crucial as more visitors are attracted to the area and the region's importance as a coastal tourist destination grows"

4.20 Section 6.0 of the Development Framework presents a list of 13 planning and development principles for the site. The first three state that there should be a comprehensive approach to the pier and adjoining foreshore areas, with new development achieving a high standard of design, a distinct identity and sense of place, as well as a highly sustainable design for buildings, spaces and public areas, enhancing the seafront and respecting the character and natural environment (see CCS 2009).

4.21 As far as the pier is concerned, Paragraph 6.3 states that "*...the works to the Pier relate primarily to its restoration to secure its long term future as a landmark in Swansea Bay*". It then adds that:

"The Swansea Bay Strategy seeks to support the continued presence of the RNLI at the Pier, and encourages the redevelopment of the existing slipway and boat hall for alternative uses. Although the RNLI proposals for a new lifeboat station will be prepared separately, it is critical that they are fully integrated into the larger Pier scheme, and that together they adopt a high quality design appropriate to their unique setting"

4.22 Finally, turning to 'Public Realm Design', Paragraph 6.9 states that "*...the profile of Mumbles Head, the Pier and Lighthouse are iconic landmarks, proposals should utilise and enhance these recognisable features and protected views*" (CCS 2009).

Section 5 The Structural Context

- 5.1 The pier has been subject to a long term programme of structural inspection by KAYMAC Marine and Civil Engineering, who have assisted AMECO in keeping the structure open and safe for visiting members of the public.
- 5.2 Their most recent report on the structural condition of the pier was issued in March of this year and is included as **Appendix EDP 4**. The following paragraphs summarise key points taken from that report. These form a baseline for understanding the changes that are proposed to be completed on the 'asset', in order to secure its long term future.

Introduction

- 5.3 In recognising that Mumbles Pier is '*...typical of the pier design of the Victorian period*', the KAYMAC report observes that the asset is of:

"...lattice steelwork on hollow cast iron columns supported on circular hollow cast iron screw piles, with an open boarded pitch pine deck on timber joist beams. At regular intervals along the pier length the column heads are braced by steel lattice work. The ornate cast iron hand railing and parapet at the deck perimeter is supported on a longitudinal waling beam fixed to the ends of the transverse decking joist beams"

- 5.4 Turning to the methodology, the inspection process is stated as comprising "*...simple foot access to the elevated elements from the deck level, and then foot access from the beach at low water to examine the sub-structure of the pier*".
- 5.5 It is also noted that "*...detailed examinations of all the main timber joist beams and the extension beams at the inner, central and outer waists and the pier head was carried out to determine the size and condition of each member*".
- 5.6 Finally, a "*...more general examination of the steel and cast iron elements of the structure below deck level was carried out, and only substantial defects were noted for the purpose of this report*" (see **Appendix EDP 4**).

The Current Structural Position

- 5.7 The March 2010 KAYMAC report records that 181 out of 492 timber joists, equating to over 36%, were categorized as being either 'poor' or 'damaged', such that they require either immediate replacement or replacement within a maximum of three years.
- 5.8 However, whilst it is observed that "*...the sagging of the cast iron seating along the pier edge and the cantilever effect of the detached timber beams remains approximately the same [as recorded in the 2009 inspection]*", this statement provides clear evidence that the ongoing deterioration of the pier's sub-structure is having a profound impact upon those architectural features which are of greatest significance to its *special* interest.
- 5.9 KAYMAC's recommendation in that regard is strongly re-emphasised and supported by EDP's assessment. In other words, they should "*...strip the derelict area on the*

*south side of the pier head to safeguard the existing seating and architectural steelwork to prevent the loss of these elements to the sea" (see **Appendix EDP 4**). In short, the decorative cast iron benches and balustrade panels are too important to be lost in this manner, irrespective of the planning and listed building consent applications' outcome.*

- 5.10 Furthermore, the waling timbers along both edges of the pier stem, which support the cast iron balustrades, were found to be in 'poor' condition at intervals along the length of the structure. Furthermore, 'severe' decay was identified in two locations on the north side of the pier and to a comparable extent on the south side.
- 5.11 Again, the deterioration of the waling timbers threatens the survival of the cast iron balustrades, which are amongst the few definitely original surviving features at the pier. The failure of those timbers could potentially mean the loss of the balustrade or, as a minimum, closure of the pier to visitors for health and safety reasons.
- 5.12 The timber deck surface was noted to be in 'generally good condition', but it is also recorded in the report that some remedial work had already been undertaken in the period since the previous inspection in 2009. At the same time, there is evidence that there has been an ongoing programme of replacement, at least as far as the deck is concerned, and it is unlikely that the surviving planks are of any age at all.
- 5.13 Turning to the sub-structure, the March 2010 KAYMAC report records that the cast iron columns throughout the pier length remain in 'good' condition. However, the same is not apparently true of the steel latticework that supports the timber joist beams.
- 5.14 KAYMAC observe that the latticework is *"...still in a poor condition from the area of the inner waist seaward"*. In addition, it is recorded that *"...the diagonal bracings preventing lateral flexing of the steel latticework between the central waist and the pier head remain in a similar condition to the previous inspections, having failed or [being] on the verge of failure"* (see **Appendix EDP 4**).
- 5.15 Moreover, 16 out of 52 diagonal steel braces, between the central waist and the pier head, were categorized as being 'poor' or were found to have failed completely already. This means that, based on KAYMAC's observations, over 30% of the steel braces are considered to require immediate or imminent replacement.
- 5.16 Opus International Consultants, who have designed the proposed scheme for the restoration and redevelopment of Mumbles Pier, have provided additional information in respect of its current structural integrity (see **Appendix EDP 5**).
- 5.17 It is noted that *"...the latticework is formed from back to back angles with shaped gusset plates to connect to the internal diagonal struts. The members used are of painted steelwork propped up to level from the tops of the existing cast iron columns on steel stools. The steelwork is now heavily corroded and nearing the end of its life"*. Accordingly, Opus continue by adding that:

"Lattice steelwork in a marine environment is notoriously difficult to maintain. The detailing of the joints means water is easily trapped in the crevices between the members. This leads to corrosion at the most critical points of the structure. The lattice components are generally thin sections for which rolled steel angles are normally used. It can prove difficult to retain straightness if these types of components are galvanised

individually whereas post fabrication galvanising of the completed member is unlikely to penetrate the inaccessible contact faces. Likewise, if one is to rely on paint systems for corrosion resistance, the multitude of small members are time consuming to paint and it is difficult to achieve the required paint thickness at the multitude of edges and corners. The relatively thinness of such structural components means that there is little sacrificial steel thickness to accommodate any corrosion meaning that it is essential to the life of the member to maintain the corrosion protection by regular maintenance. In the pier environment this is difficult and expensive to achieve"

- 5.18 Whilst the KAYMAC report states that the cast iron columns are themselves in good condition, it adds that three tie rods, located between Piles 39 and 40 and 65-71, have 'failed' already and a further four, between Piles 5-8, are in 'poor' condition and display evidence to indicate significant deterioration since the 2009 survey inspection.

Recommendations for Future Action

- 5.19 Based on the results of the March 2010 inspection, and evidence for ongoing deterioration of the pier structure, the KAYMAC report reached the following two recommendations for imminent action:
- i. Replace the existing steel latticework as soon as practicable to prevent further deterioration and possible closure of further sections of the pier to the public; and*
 - ii. Continual monitoring of all elements of the pier...in an annual inspection.*
- 5.20 Current conservation policy dictates that there should be 'minimum intervention', which would mean that only that historic fabric which is beyond economic repair should be removed and replaced, in order to maintain the 'integrity' of the structure and not, in effect, create a new version of comparable form and character.
- 5.21 However, Opus have estimated, based on discussions with KAYMAC, that, whilst around a third of the pier's sub-structure needs to be replaced now, or in the near future, the remainder would only have a viable life of up to 15 years.
- 5.22 With that in mind, it would make most sense for the opportunity to be taken for all of the 'compromised' fabric to be replaced in one single programme, This is because there will be significant costs involved in (a) closing the pier for the 18 months that the restoration and redevelopment is expected to require for completion and (b) providing the safe means of manual access for the works to proceed.
- 5.23 Accordingly, rather than duplicating these costs in 15 years time, or sooner if the fabric deteriorates more rapidly than anticipated, it would be desirable for the works to address all of the known and potential faults now and remedy them simultaneously. This would serve to ensure that short term maintenance costs are minimised, enabling AMECO to generate a fund for the first major overhaul, in 20 years time.
- 5.24 At the same time, it is considered appropriate for the opportunity to be taken to put in place measures to (a) maximise the lifespan of the pier structure and (b) minimise the input of resources required to maintain it in a sound and viable condition. These are themes taken up and addressed in Section 6, which details the economic context.

Section 6 The Economic Context

- 6.1 The following section summarises the baseline position in respect of the Mumbles Pier's economic circumstances. It draws on information that has been provided in correspondence from Fred and John Bollom of AMECO, but which is commercially sensitive and has not been reproduced here. At the same time, it is supported by a report from KAYMAC marine and civil engineering (see **Appendix EDP 6**).

Present Income

- 6.2 Based on figures compiled in July 2010, the present annual income for Mumbles Pier amounts to circa £36,500. This accrues entirely from the collection of tolls from visitors, at fifty pence each, and anglers, who pay £3.00 for a day permit.
- 6.3 At present, the RNLI pays only a peppercorn rent for the occupancy of the existing lifeboat station, which can only be accessed via the pier neck. At the same time, whilst each year witnesses numerous visits to the lifeboat station by local school parties, AMECO presently levies no charge and generates no income from these.

Present Costs

- 6.4 The principal annual cost associated with the operation of Mumbles Pier is generated by the salaries paid to the toll-collectors. This amounts to circa £22,000, based on figures provided by AMECO in July 2010 (John Bollom in litt).
- 6.5 In addition, further costs are generated by insurance, which has to cover the structural integrity of the pier, as well as public/employer's liability, annual inspections by KAYMAC marine and civil engineering and the upkeep of the navigation aids.
- 6.6 Therefore, as a business, the pier just about breaks even before any costs for repair and maintenance of the pier's structure are even considered. With the last round of major restoration and repair having been completed some 60 years ago, it is not surprising that CCS's Development Framework recognises that there is a £3 million deficit, which needs to be addressed to secure the listed building's long term future.

Present Repair Schedule and Costs

- 6.7 In spite of the fact that the pier routinely fails to make a profit, AMECO spends a sum of between £30,000 and £50,000 on maintenance and repairs each year. This investment is drawn from other areas of the business, such as the catering and entertainment facilities that are located on the platform at the pier base (John Bollom in litt).
- 6.8 However, there has been an ongoing reduction in the scale and quality of repairs and maintenance which can be undertaken for the capital sums available, as the costs of labour and materials have increased year on year, whilst their longevity and durability have decreased over the same time period (John Bollom in litt).
- 6.9 For instance, replacement of the timber joists, combing and decking is recorded as having traditionally cost £10,000 to £15,000 to install, without associated labour costs. This figure has apparently doubled over the last five years, yet in fact the quality

of timber, which is required to be obtained from sustainable sources, is now regarded as being much poorer.

- 6.10 Similarly, the recent increase in Health and Safety regulation has meant that repainting costs have also soared, as there is now a requirement for more extensive scaffolding to provide access to the pier's superstructure. At the same time, the new lead-free paints, which are required, appear to be less durable and require more frequent application.
- 6.11 The net result has been a year on year reduction in the scale and quality of repairs and maintenance at the pier because, whilst the available budget has remained essentially fixed, the cost of those works has increased exponentially. This reduced purchasing power has served to limit the repair/maintenance work completed each year, which is the opposite of what is required for an ageing listed building such as Mumbles Pier.

Repair Costs

- 6.12 In October 2008 KAYMAC Marine and Civil Engineering, who have a long standing association with the pier, and have undertaken annual inspections to ensure that it not only remains open, but also a viable asset for the owners AMECO, undertook an options appraisal for the refurbishment of Mumbles Pier.
- 6.13 This took the form of a letter sent to Fred and John Bollom (see **Appendix EDP 6**). It sets out costs associated with two options; these being (1) replacement on a like for like basis and (2) replacement with a 'castellated beam system'.
- 6.14 Option 1 involved, first of all, stripping the pier structure down to the cast iron columns, screw piles and bracing components, with the balustrade retained for re-use, but the timber decking and joists and deck steelwork discarded on the basis that it is either beyond its practical lifespan or will imminently be so.
- 6.15 Subject to a condition survey of the cast iron columns, screw piles and bracing components, the steel components would be cleaned down and re-painted and the remainder of the pier structure rebuilt with the same materials as those previously taken away. In effect, this would represent a replication of the process completed in the 1950s (see EDP 2010).
- 6.16 KAYMAC estimated that the costs for Option A would be circa £2.25 million, which would cover plant, labour and materials. Given the recent increase in commodity prices, it is likely that these costs represent an under-estimate now.
- 6.17 Once again, Option 2 involved the removal of all structural fabric down to the cast iron columns, screw piles and bracing components, with the cast iron balustrades retained for re-use within the restored pier (see **Appendix EDP 6**).
- 6.18 Subject to a survey and clean of the retained fabric, the deck steelwork would be replaced with galvanised castellated beams and steel support beams, which in turn would be used instead of the existing timber joists. These would sit on top of the flared heads of the cast iron columns. In addition, the timber decking and hand rails would be replaced with modular, pre-assembled units to reduce costs.
- 6.19 Nevertheless, on comparable terms with Option 1, KAYMAC estimated that the costs for the completion of Option 2 would be between £2.00 and £2.25 million. Therefore, at face value, there is at best a 10% cost saving by not replacing the existing pier fabric on a like for like basis and undertaking a more extensive modernisation.

- 6.20 However, KAYMAC's options appraisal concludes that, whilst the initial outlay of capital would be comparable in both cases, Option 2 provides a significant medium to long term benefit to the owners of the pier as a result of reduced maintenance costs.
- 6.21 For instance, within a period of 5-10 years from completion, KAYMAC estimate that costs for maintenance would be £10,000 to £15,000 for Option 2, but could in fact reach £20,000 for Option 1. This discrepancy would continue into the longer term, so that, within a period of 25 years, costs for Option 2 could be up to £15,000 pa less than those associated with the replacement of fabric on a like for like basis.

The Proposed Scheme

- 6.22 Correspondence from John Bollom, which has been provided to EDP in the preparation of this report, presents the economic rationale for the scheme that is currently being proposed for the restoration and redevelopment of the Mumbles Pier.
- 6.23 In simple terms, the aim of the scheme is to 'rebalance' the existing situation, whereby the income generated by the operation of the pier is insufficient to keep pace with the increased costs associated with its repair and maintenance, thereby leading to an ongoing deterioration in its condition and viability.
- 6.24 With that in mind, John Bollom has set out that the provision of a new offshore lifeboat station on the end of the pier would introduce a new income stream, as the RNLI would pay more than its existing peppercorn rent.
- 6.25 A second new income stream would be created by the re-use of the existing lifeboat station mid-way along the pier on the north side. It is presently intended that this structure would be converted for commercial use, including the adaptation of the existing slipway in order to provide boat access. Even so, as set out in Paragraph 3.24, works to the lifeboat station, including a proposed change of use, would be subject to separate applications for planning permission and listed building consent.
- 6.26 Thirdly, CCS's adopted Development Framework sets out that, in combination with the redevelopment of the foreshore for a new hotel and residential uses, as well as updated and improved public realm treatments, the restoration of Mumbles Pier could serve to create a new visitor attraction, thus generating increased revenue for AMECO.
- 6.27 On that basis, AMECO expect that, following the restoration of the pier, income could potentially exceed £100,000 per annum (J. Bollom in litt). However, whilst that represents a five-fold increase on existing income levels, it is still important that annual repair and maintenance costs are minimised as far as practically possible.
- 6.28 Therefore, the potential £15,000 annual saving, generated by following Option 2 within a period of 20-25 years from completion, would represent a significant proportion of the pier's total income.
- 6.29 Even in the short term, the lower costs associated with the castellated beam system of repair should enable AMECO to generate a working surplus, so that, with reduced annual repair costs in the longer term, it should be possible to prevent the catastrophic deterioration which has occurred to date.

Section 7

Assessment of Impacts on the Pier's Special Interest

- 7.1 This section presents an assessment of the proposed scheme on the special architectural and historic interest of the pier, in order for an informed decision to be made by the Local Planning Authority and Cadw on the appropriateness of the proposals being put forward.
- 7.2 In doing so, it builds on the details of the proposed scheme outlined in **Section 3**, but also brings in additional sources of information set out in **Sections 5** and **6**, which together add contextual background to the scheme design under consideration.

Impacts on Historic Fabric

- 7.3 As set out previously in **Section 3**, the proposed scheme would require the wholesale removal and replacement of the steel latticework sub-structure from the pier stem and the steel 'I-beams' from the head.
- 7.4 In addition, this process would extend to include the timber joists supporting the decking, the waling beams along the pier edges and the deck surface itself.

Context

- 7.5 The Heritage Statement (EDP 2010) records that it is unlikely that any of this fabric is original to the Victorian pier structure. Historic sources state that the pier was subject to almost total rebuilding in the years following the Second World War
- 7.6 Information provided by Fred and John Bollom of AMECO appears to confirm that only the cast iron piles and columns, benches and balustrade panels were retained and subsequently re-used within the 'restored' pier structure.
- 7.7 Whilst the steel latticework to the pier stem certainly maintains the 'character' of the pier, as it was intended by its Victorian designer, the I-beams of the pier head undoubtedly do not and, instead, actually detract from its special architectural and historic interest.
- 7.8 It is not possible to determine the form of construction originally used to support the hardwood decking of the pier head, as available historic images tend to be either from the pier itself, focused on the base and the pier platform or from the railway station, such that the head is at too small a scale to discern any certain detail (see EDP 2010).
- 7.9 However, given that the tops to the cast iron columns of the pier head are at a higher level than those used in the pier stem, it is likely that the sub-structure employed a lower profile version of the same latticework fabric encountered elsewhere. As a result, there would have been a consistency to the appearance of the pier, all along its length, as opposed to the harsh contrast, which presently characterises views from the shoreline in particular.
- 7.10 As far as the timber decking is concerned, the evidence indicates that it is likely to be all but entirely modern, not only as the pier was extensively rebuilt following the war, but also because there has been a rolling programme of piecemeal replacement, supervised by KAYMAC, in order to maintain the Mumbles Pier in a safe and operational condition.
- 7.11 The same is probably also true of the timber waling beams, which define the edges of the pier stem, as there appears to be a varying level of decay and deterioration evident

from the structural survey reports. This suggests that the timber is not of a consistent age. Given the limitations of access, it is uncertain whether this applies equally to the joists.

Impacts

- 7.12 It is concluded that the proposed replacement of the timber joists and deck surface would serve to have a negligible impact on the structure's special interest, as the latter at least is recorded as being of modern construction. More to the point, it is in very poor condition.
- 7.13 Indeed, it is considered that, in their present form, neither element makes a significant positive contribution to the listed building's special interest and, in the case of the decking fabric in particular, the creation of a new, high quality replacement, which reflects the structure's historic character and serves to improve its presentation, would actually have a net beneficial effect.

The Steel Latticework

- 7.14 The replacement of the existing steel latticework sub-structure, with galvanised steel arched beams, would certainly change the historic character of the listed building. There is no evidence to indicate that the pier has ever been provided with anything other than a latticework superstructure throughout its lifetime.
- 7.15 However, as set out previously, there is clear evidence that the existing steel latticework is not original to the building, but instead forms part of a programme of restorative works that were completed after the Second World War. Whilst the 'integrity' and quality of the restoration is very impressive, given the period of its implementation, it is clear that the fabric is deteriorating rapidly, to the extent that it could compromise the viability of the structure as a whole.
- 7.16 The provision of entirely new steel arched beams spanning the gaps between the cast iron columns, from the pier base to the end of the head, will create a high quality finish which adds character to the structure and also serves to reduce maintenance costs for the long term. At the same time, it will create a unified effect, which improves the presentation of the pier and brings it into line with the design aspirations for the nearby foreshore development.
- 7.17 Therefore, whilst the loss of the steel latticework would represent a minor-moderate adverse impact upon the special interest of the pier in the short term, even if it is not original, the use of a new design, employing high quality modern materials, to maintain the structure's character, would undoubtedly be appropriate if it delivered benefits over the long term.
- 7.18 In this instance, KAYMAC's cost-benefit analysis has demonstrated that, whilst there would be some limited short term cost savings by not replacing the 'shot' fabric, but employing a castellated beam design solution instead, there would be very substantial savings over the long term as a result of the more limited and easier maintenance regime.
- 7.19 Accordingly, whilst the loss of historic 'character' is regrettable, it would serve to create a net benefit, whereby the long term future of the pier, in a stable and viable condition, would be secured and a key objective of CCS's Development Framework delivered.

The Timber Waling Beams

- 7.20 As with so much of the existing pier structure, there are large question-marks against the originality of the timber waling beams which define the edges of the pier stem and, in so doing, form the base for the cast iron stanchions and panels of the balustrades.
- 7.21 However, whilst there is every reason to believe that the existing waling beams date from no earlier than the post-Second World War period, if not only because they are stratigraphically later than the deck fabric. Similarly, they may have been repaired and replaced on a rolling programme, in the same way as the timber deck, and so it is highly unlikely that their proposed removal would have more than a negligible impact in terms of loss of historic fabric.
- 7.22 On the other hand, these timbers do form a characteristic feature of the pier and, in the same way, also make a positive contribution to its presentation, particularly in the way they combine with the cast iron stanchions, panels and handrail that they support.
- 7.23 Nevertheless, their loss would not be of greater than minor adverse significance, in terms of the impact on the special interest of the listed building. At the same time, there would be at least some compensation, as the simplified design proposed for the pier stem would reduce ongoing repair and maintenance costs, thereby serving to minimise the likelihood of a future deterioration on the scale recognised in the adopted Development Framework.

The Balustrades

- 7.24 The Heritage Statement (EDP 2010) identified the balustrades as being of significance to the special architectural and historic interest of the pier and worthy of retention.
- 7.25 Indeed, the Heritage Statement identified the decorative cast iron panels as representing one of the few remaining fragments of undoubtedly original historic fabric. Whilst there is, in contrast, some doubt about the originality of the roll-top stanchions and the tubular handrails, taken as a whole, these components make a significant contribution to the character of the listed pier.
- 7.26 The proposed restoration and redevelopment would retain the overwhelming majority of the cast iron panels, with only those otherwise preventing access to the new fishing platforms, not being reinstated in their intended locations (see **Appendix EDP 2**).
- 7.27 Moreover, those panels that are not immediately restored, repainted and replaced would still be retained either (1) for future reinstatement or (2) use elsewhere within AMECO's scheme for the redevelopment of the Mumbles foreshore, in accordance with CCS's adopted Development Framework. The appropriate response can be discussed and agreed as part of the application process and secured by a condition of consent if appropriate.
- 7.28 As far as the roll-top stanchions and handrails are concerned, AMECO confirm that these components were direct replacements for the historic fabric when the pier was restored after the end of the Second World War (see EDP 2010). Once again, the integrity and quality of the restoration works carried out at that time is very impressive and it is clear that the fittings visible today accurately replicate the character of the Victorian design.
- 7.29 Their loss would be evaluated as being of minor adverse significance, as they make a limited, but nonetheless positive, contribution to the special interest of the listed building. However, on that basis, it must be emphasised that they are of less significance

than the cast iron panels they support and adorn and which are such a crucial feature of the historic structure.

- 7.30 The replacement design would at least maintain the 'character' of the historic pier, especially given that the same form of balustrade is already widely employed around the edge of the pier platform, which forms a key element of the proposed foreshore development.
- 7.31 At the same time, discussions with the client team, including the project architects, have concluded that the proposed replacement balustrade design offers significant benefits to the pier structure in the long term. Most particularly, the simplified design will reduce maintenance and repair costs, especially in terms of access requirements, which have come to account for an increasing proportion of the annual budget.
- 7.32 Accordingly, given that the primary reason for the pier's classification as a 'local building at risk' is the ongoing deterioration caused by the gap between increasing maintenance and repair costs and a seemingly fixed income stream, it is imperative that the restoration incorporates appropriate measures to ensure that the gap is closed over the longer term. Otherwise, it is all but inevitable that the objective of securing a viable and sustainable future for the structure, as described by CCS within the Development Framework, will be missed.

The Cast Iron Bench Frames

- 7.33 In common with the decorative cast iron panels (see above), the cast iron bench frames were identified as making a significant contribution to the special architectural and historic interest of the listed building within the Heritage Statement (see EDP 2010).
- 7.34 On the same basis, it was strongly recommended that they should be retained within any proposal for the restoration and redevelopment of the pier. For the most part, the current scheme recognises and achieves that objective, such that the overwhelming majority of the existing bench frames will be retained, restored, repainted and replaced, as set out in **Appendix EDP 2**.
- 7.35 It will be necessary to remove one short section of the benches from either side of the pier head, in order to create space for access to the new fishing platforms, which are proposed to be cantilevered out to the north and south.
- 7.36 Those bench frames, which are not immediately restored, repainted and replaced, would still be retained either (1) for future reinstatement or (2) use elsewhere within AMECO's scheme for the redevelopment of the Mumbles foreshore, in accordance with CCS's adopted Development Framework. The appropriate response can be discussed and agreed as part of the application process and secured by a condition of consent.
- 7.37 With that in mind, it is clear that the proposed scheme will maintain the character of the pier, in respect of the bench frames, and its impact would be reversible anyway. As a result, it is considered to be of only very minor significance.
- 7.38 Moreover, it is worth stressing that KAYMAC's most recent survey report has indicated that the cast iron bench frames are in imminent danger of falling into the sea on the south side because of the failure of the pier sub-structure (see **Appendix EDP 4**).
- 7.39 Therefore, it is very clear that 'doing nothing' would all but inevitably require the emergency removal and storage of the bench frames, to secure their preservation in the short term, or they will be lost altogether, when the south side of the pier head collapses in to the sea.

- 7.40 Whilst the current proposals for the pier restoration and redevelopment would require some removal of historic fabric, this would be (a) de minimus, (b) of temporary nature and (c) vital to ensure there is not catastrophic loss of important decorative features.

The Cast Iron Columns

- 7.41 Along with the cast iron benches and decorative balustrade panels, the cast iron piles and columns make a significant contribution to the special architectural and historic interest of the pier, as they were a key feature of the original Victorian design.
- 7.42 There is no doubt that they make a positive contribution to the character of the pier structure, which is otherwise defined by its outward simplicity and uncomplicated finish. Accordingly, it is recognised in the Heritage Statement (EDP 2010) that this feature of the building should be retained within any scheme for the restoration and or redevelopment of the site.
- 7.43 The installation of the proposed offshore lifeboat station would require the temporary and partial removal of all of the cast iron columns/piles from the pier head, in order to prevent damage during the construction phase, predicted to take 20 months to complete, and to undertake any remedial cleaning and maintenance that is required.
- 7.44 Thereafter, and as set out in **Section 3**, the installation of the proposed offshore lifeboat station would require the partial removal of just four cast iron columns over the long term. This would be restricted to those piles which would interrupt the launch and recovery of the offshore lifeboat via the slipway and would, even then, only extend to removal of the 'capital' (see EDP 2010).
- 7.45 This element of the column can be easily removed, without harming the fabric in any way. This means that the removed section can then be stored for future re-use, if changing operational requirements mean that the boathouse is no longer required. As a result, this element of the scheme will be fully reversible and therefore 'temporary'.
- 7.46 At the same time, the four piles would be located at the heart of the pier head and away from the edges, such that there would be no perceptible change when viewed from the foreshore. Accordingly, the historic character of the listed building would be maintained. Therefore, it is concluded that this element of the scheme would have a negligible impact on the special interest of the listed building.

Impacts on Historic Character

- 7.47 Aside from the replacement of fabric described above, the current proposals envisage no significant alterations to the majority of the pier structure. The pier stem would be left as an open space for public leisure, as it is presently.
- 7.48 **Section 3** describes the rationale behind the proposed changes to the pier head, which comprise the erection of a new offshore lifeboat house and two new fishing platforms to replace the three-tier concrete landing stage at the distal end.
- 7.49 The following paragraphs therefore summarise the likely impacts on the historic character of the pier resulting from the additions proposed in Section 3 (see above).

The Boathouse

- 7.50 **Section 3** summarises the evolution of the design for the proposed offshore lifeboat station. The proposals draw together two ideas, which are enshrined in the adopted

Development Framework for the site; namely that the RNLI should maintain a presence in the area and that it would be desirable to restore a focal point to the pier head.

- 7.51 As far as the RNLI is concerned, operational requirements and the need to maintain the setting of the Grade II listed pier, lifeboat station and slipway have dictated that the pier head represents the optimum location for a new facility in the Mumbles area.
- 7.52 It provides the RNLI with unrestricted access to the waters of Swansea Bay and beyond, without being dependent on the tide. At the same time, there is ready access for its crew and, in addition, the attractiveness of the pier will draw in visitors and generate sustainable income, which is vitally important for this charitable enterprise.
- 7.53 In turn, the RNLI closed off other options, which would have not have required listed building consent, but which would potentially have impacted upon the setting of the pier. In particular, these included free-standing options to either the north or south, which would have complicated the simple relationship between the existing boathouse, the pier and the lighthouse beyond, but which in turn would have provided no net benefit for the pier itself.
- 7.54 Although it is not the bandstand, which was envisaged in the evolution and adoption of the CCS Development Framework, the proposed boathouse will serve as a focal point upon which to hang the restoration of the pier and the regeneration of the wider area.
- 7.55 Of course, there is no historic precedent for anything greater than a circular 'rotunda' in the centre of the pier head, but the construction of the proposed boathouse provides a more secure long term source of funding for the owners, from which can be drawn sufficient resources to ensure that the pier does not deteriorate in the way it has done previously.
- 7.56 Whilst the option of reinstating the bandstand would be more in keeping with the historic character of the pier, it is questionable whether there is a desire for this form of entertainment any more. Equally, it must be uncertain if it would deliver the sustainable revenue stream that the maintenance and repair of the listed structure requires. For instance, it is highly unlikely that a bandstand would be a significant 'draw', more particularly outside the summer season.
- 7.57 In contrast, the boathouse would provide a stable and year-round source of income, which would not be dependent on the vagaries of the British weather or changing tastes and fashions. In that regard, whilst it might change the historic character of the listed building, it would, on the other hand, serve to secure its long term future and enable the owners to plan ahead accordingly. The reinstatement of a bandstand would only maintain uncertainty and instability.
- 7.58 At the same time, the erection of the boathouse would serve to create a form of shelter for visitors using the pier. Although it was not specifically intended as a 'pleasure pier', but was instead a grandiose landing stage for steamers and pleasure boats, the historic sources demonstrate that Mumbles Pier was provided with some small shelters. Whereas there is nothing remaining now, the erection of the boathouse would offer protection from the elements, thereby (and importantly) maintaining year-round appeal.
- 7.59 Equally, the installation of the proposed boathouse could be completed with only minimal impact upon the historic fabric. In turn, it would be reversible and therefore temporary in nature, depending on the operational lifetime of the facility. The only substantive loss of fabric would be driven by the need to have a clear slipway.

- 7.60 The boathouse would be founded on its own piles, which would not place undue stress on the historic fabric and, in turn, would reflect the structure's historic character. The structure itself would be large, but finished to a highly characteristic design and in a palette of materials which reflect the local environment. It would also be essentially temporary, with the option to remove it, if the RNLI's future operational requirements are found to be different, and its impact is therefore reversible.
- 7.61 Even so, when viewed from the Mumbles foreshore, or other parts of Swansea Bay, the proposed boathouse creates an attractive focal point to the pier, which does not detract from its understanding or appreciation. Indeed, the icreate photomontages clearly show that it would enjoy an harmonious relationship with both the lighthouse and the lifeboat station, respecting their 'scale' and 'massing' appropriately.
- 7.62 Accordingly, it is concluded that, whilst the construction of the proposed boathouse would represent a change to the historic character of the pier, and one for which there is no precedent in terms of scale or function, the design of the scheme would not adversely affect the special architectural or historic interest of the listed building.
- 7.63 Moreover, in comparison with the bandstand proposal, which is promoted through the adopted Development Framework, it would serve to deliver a reliable and stable, year-round source of income for the owners of the pier, which would enable them to plan and maintain a programme of repairs, ensuring a viable future for the listed structure.

The Fishing Platforms

- 7.64 As set out previously, the construction of the proposed offshore lifeboat station will require the removal of the three-tier landing stage, which was constructed in the post-Second World War period and intended for pleasure boats to moor whilst boarding and unloading passengers.
- 7.65 This structure is of no intrinsic architectural or historic interest and makes no significant contribution to the character of the Grade II listed pier. Nevertheless, it has become an important amenity for anglers and, as a result, an important source of revenue for AMECO. It is therefore important that a facility is maintained for this activity.
- 7.66 As **Appendix EDP 2** illustrates, the response has been the installation of two fishing platforms along the north and south sides of the pier head. These structures will be cantilevered off the cast iron columns of the pier head and then supported on new piles sunk into the seabed.
- 7.67 By being at a lower level than the deck of the pier head, and by not taking up the whole side elevation, these fishing platforms will be 'subservient' to the main structure and will not reduce its visibility or legibility when viewed from the Mumbles shoreline.
- 7.68 At the same time, they intend to replicate the landing berths, which were provided with the pier when it was originally designed and built. Although there are no clear depictions or illustrations of their form and fabric, the available historic maps show that they took up the entire side elevation on both the north and south sides of the pier.
- 7.69 It is uncertain how the landing berths were accessed, but it is possible that it was via the landing stage located at the distal end of the pier head. Certainly, there is no evidence for a clear means of pedestrian access from the sides, where the cast iron benches and balustrades are located, so the most likely scenario would have been from the end.
- 7.70 The construction of the fishing platforms will change the character of the pier, but, in reality, they will bring it closer to its original intended form and appearance. They have

been designed to not detract from the pier, but instead compliment it. This is clearly reflected in the subtlety of the finishes and the palette of materials, which are proposed to be used.

- 7.71 On that basis, it is concluded that the installation of the two new fishing platforms will not have an adverse impact upon the special architectural or historic interest of the building. Moreover, given that they will serve to maintain, and potentially increase, this important source of revenue for the owners of the pier, it is arguable that their installation will deliver a net benefit, which will be important for securing the long term future of the structure.

Section 8 Conclusions

- 8.1 The pier is a nationally important historic structure, a status which is clearly recognised through designation as a Grade II listed building. However, it is currently recognised as being 'at risk' at the local level, albeit using nationally identified and adopted criteria, as its structural condition deteriorates.
- 8.2 Accordingly, there is widespread concern that this important feature of the local landscape could collapse into the sea unless an appropriate solution is both identified and applied in the near future. The perilous nature of the present situation has been recognised by CCS through the preparation of a Development Framework, which has been adopted by the Council as SPG.
- 8.3 On the basis that 'doing nothing' is not an option, taken in the round, this report concludes that the proposed scheme for the restoration and redevelopment of Mumbles Pier represents a balanced and sensitive approach to the conservation of the historic built environment. Whilst there are 'losses' on the one hand, on the other the scheme will deliver a package of benefits that will secure its future and, at the same time, maintain its legibility and integrity.
- 8.4 Whilst some historic features of the pier, such as the steel latticework will be lost, the replacement fabric will maintain the 'character' of the asset, but, more importantly, they will serve to ensure that the near catastrophic deterioration evident today will not occur again and, in so doing, they will secure its viable long term future. Moreover, it is highly likely that much of the fabric will have to be replaced in the short term, just in order to keep the pier open and operational.
- 8.5 The installation of the RNLI's offshore lifeboat house would, likewise, change the character of the pier, and would cut across the adopted Development Framework's proposal for a bandstand to be reinstated on the pier head. However, it is concluded that the scale of change is appropriate and would not adversely affect the special interest of the pier. Moreover, it would provide a year-round, secure income stream, which a bandstand could not realistically hope to deliver.
- 8.6 Indeed, without obscuring or reducing the wide-ranging views of Swansea Bay, which can presently be enjoyed from the pier, it is clear that the construction of the proposed boathouse would enhance the 'appeal' of the site to visitors. At present there is no form of shelter from the elements, which, in West Wales, can frequently be severe. This would be remedied by the construction of the boathouse, which would offer year-round opportunities for visitors and thereby secure a predictable income stream for AMECO.
- 8.7 In the main, the proposal secures the retention and restoration of key historic features, including the overwhelming majority of the cast iron piles/columns, decorative cast iron bench frames and cast iron balustrade panels, which are so central to the pier's special interest. However, elsewhere, they propose the removal of fabric, which, although maintaining the character of the pier, actually dates from the second half of the 20th century, based on expert evidence.
- 8.8 On that basis, the proposals secure a net long term benefit at a relatively low short term cost, with even aspects such as the installation of the boathouse being reversible if, in the future, operational requirements dictate its closure or relocation. Accordingly, they

meet the objectives of CCS's adopted Development Framework, as well as national and local planning policy.

Section 9 References

Department of the Environment (DoE) 1990 *Planning (Listed Buildings and Conservation Areas) Act* (London)

The City and County of Swansea (CCS) 2008 *Swansea Unitary Development Plan* (Swansea)

The City and County of Swansea (CCS) 2009 *Mumbles Pier and Foreshore Development Framework* (Swansea)

The Environmental Dimension Partnership (EDP) 2010 *Mumbles Pier and Foreshore Development, The Mumbles, Swansea: Heritage Statement* (Unpublished)

Welsh Assembly Government (WAG) 2010 *Planning Policy Wales Second Edition* (Cardiff)

Welsh Office (WO) 1996 *Circular 61/96 Planning and the Historic Environment: Historic Buildings and Conservation Areas* (Cardiff)

Appendix EDP 1

Listed Building Citation for Mumbles Pier, Lifeboat Station and Slipway

CITY AND COUNTY OF SWANSEA

LISTED BUILDING	Mumbles Pier including Lifeboat Station and Slipway, Mumbles Swansea
Grade:-	II
Date of Notification:-	31.07.91 amended 29.10.99
National Grid Reference:-	SS6320087470
O.S. 1:10,000 Sheet No.:-	SS68NW
CADW Reference No.:-	11731
C & C of S Reference No.:-	LB:211

Notes:-

Location:-

Sited just W of Mumbles Head: pointing NE across Swansea Bay.

History:-

Built in 1897-8 by W Sutcliffe Marsh, engineer and Mayoh and Haley, contractors. The ironwork was supplied by Widnes Foundry Co. The pier was breached during World War II but was re-opened with a new landing stage in 1956 when the Lifeboat station and slipway were also added. The present entrance is an addition replacing the original turnstile.

The pier was the terminus for the Swansea and Mumbles Railway which had its origins as the first regular passenger rail service in the world. In 1865 the Llanelly Railway obtained permission to build a Mumbles branch and pier but it was never completed. The promoter of the existing pier was Sir John Jones Jenkins of the Rhondda and Swansea Bay Railway. The Act authorising its construction was passed in 1889, work began in 1892 and the pier was opened on 10th May 1898. Mumbles Pier quickly became a very popular place of recreation for Victorian and Edwardian society.

Exterior:-

A pier 255m long built on a sub-structure of cast-iron piles below a deck carried on steel framed lattice girders. The deck is laid with planks and has a cast iron parapet with open foliage panels. On each side are 3 refuges, of which the larger pair at the seaward end originally housed pavilions. At seaward end the pier broadens (originally with a bandstand in the centre) with benches around the edges the backs of which have cast iron intertwined dolphins. In the centre is a row of iron fluted gas lamps cast by Revo of Tipton. The entrance to the pier has simple wood panelled towers and arch painted white, gates and turnstiles. On the S side of the entrance the parapet continues on concrete posts and terminates in concrete steps to the foreshore. At the seaward end is a lower landing stage for pleasure steamers. It stands on timber posts and was rebuilt in 1956.

Midway along the N side of the pier is a lattice girder walkway to the lifeboat station. The walkway lifeboat station and the slipway are all supported by concrete piles. The lifeboat station is of clap-board construction under a pitched roof with projecting eaves, all painted maroon. It has T-shaped windows. The walkway leads to a doorway flanked by windows, while further R at lower level is a pair of windows. The W (landward side) has 4 T-shaped windows. The E side has double sliding doors to the slipway beneath a pair of T-shaped casements in the gable.

Listed:-

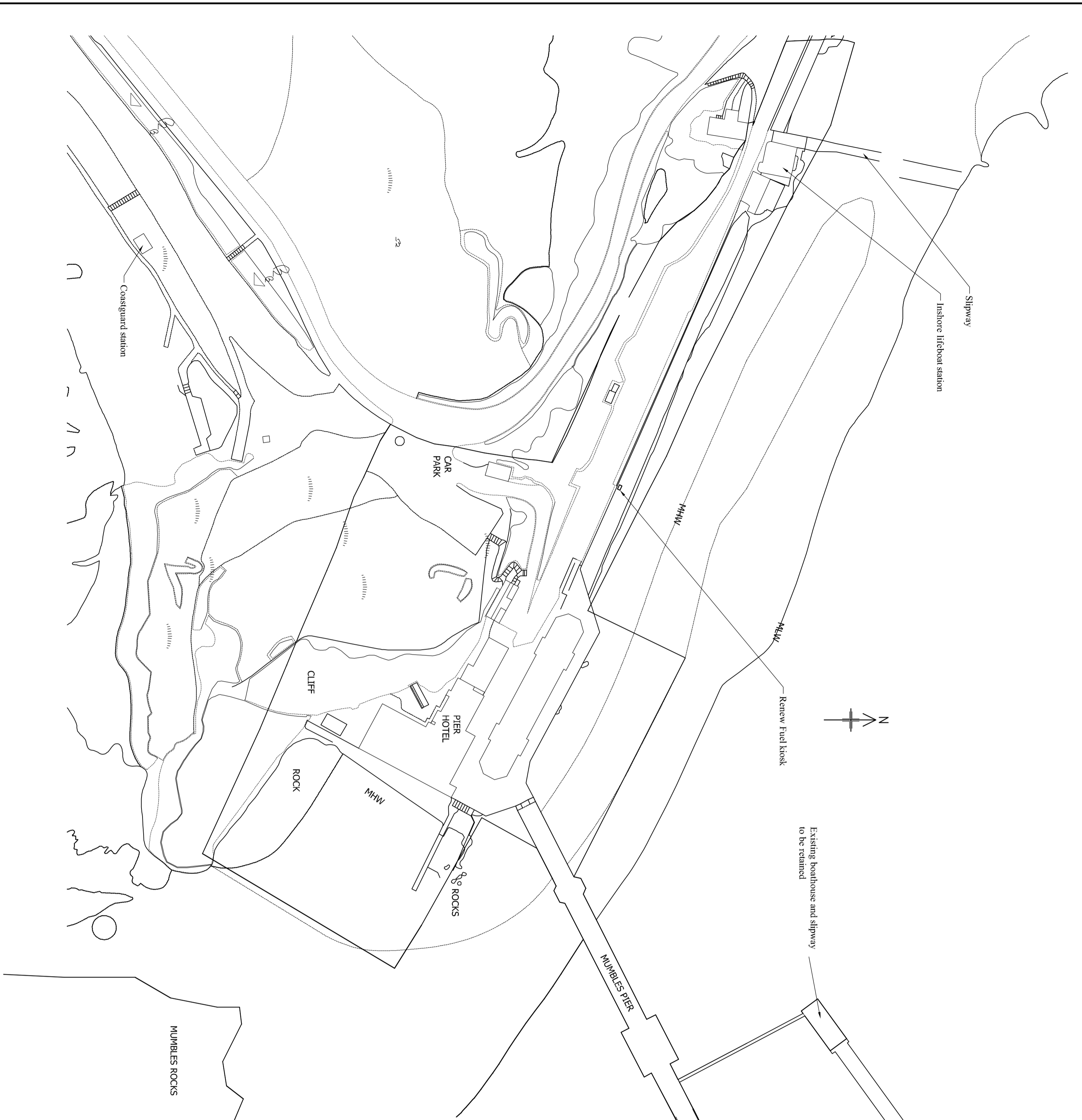
Listed principally for its special interest as one of only 6 iron piers to survive in Wales, of which this is the third longest.

Reference:-

Gabb, Gerald Life and Times of the Swansea and Mumbles Railway (1987)
Newman, John The Buildings of Wales : Glamorgan 1995 p 485
RCAHM Wales files

Appendix EDP 2

Proposed Scheme Drawings

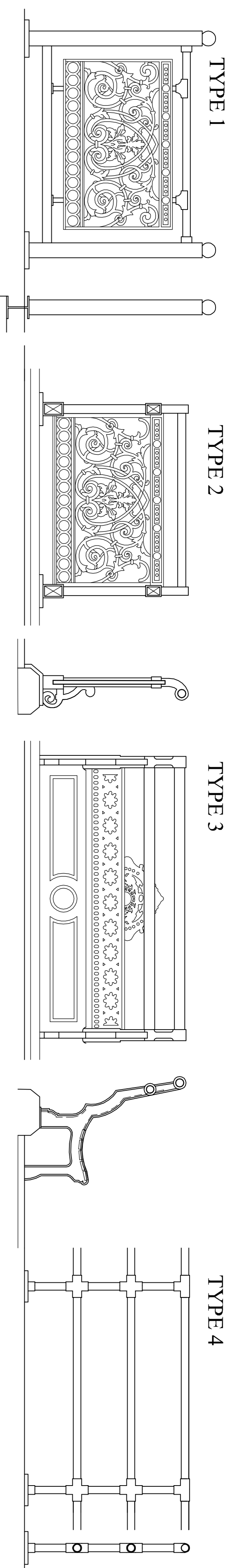


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P3	Lifeboat Station Option amended	31.08.10	ME	BH												
P2	Preliminary Issue	29.04.10	RFP	CGS												
Description	Date	Drawn	Reviewed													

<p>Royal National Lifeboat Institution</p>	<p>Fareham Office</p> <p>Opus International Consultants (UK) Ltd Modulus House Salferris Lane Fareham Hampshire PO16 0QS</p> <p>Telephone: 01329 822021 Facsimile: 01329 825274 Website: www.opusinternational.co.uk email: fareham@opusinternational.co.uk</p>
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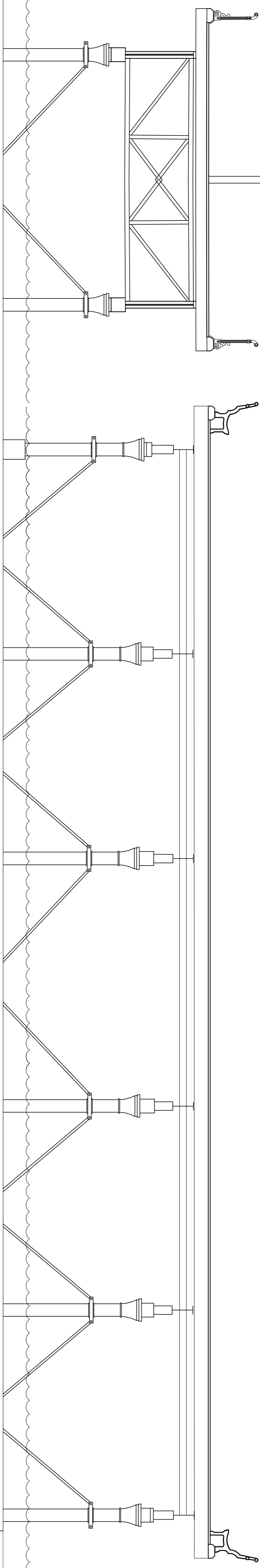
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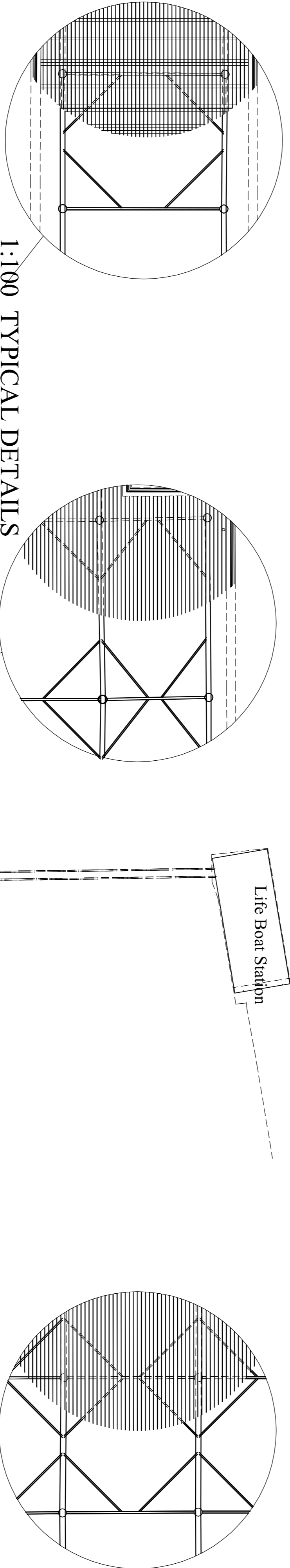


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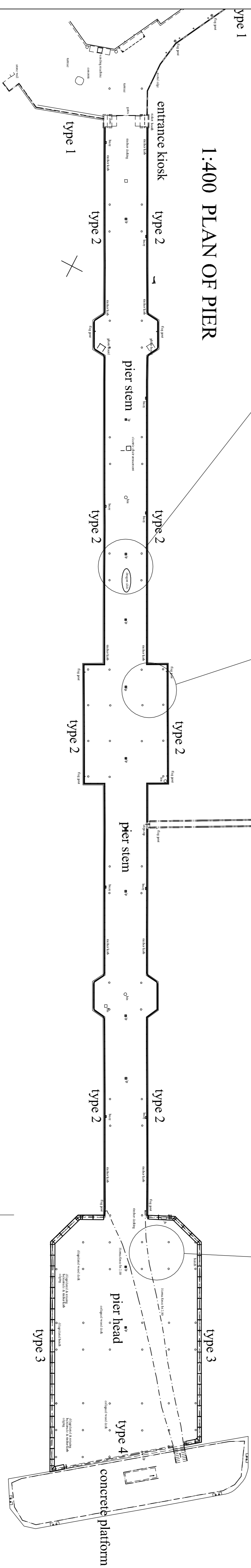
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1:50 TYPICAL SECTION THROUGH PIER HEAD

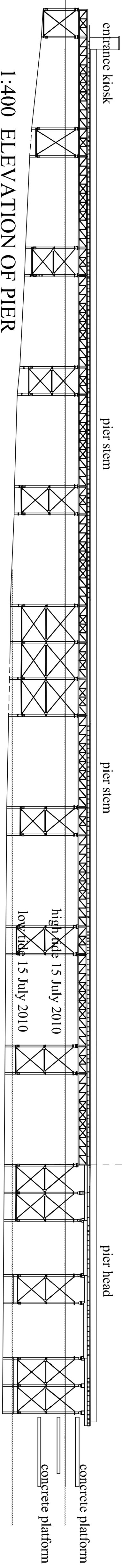


1:100 TYPICAL DETAILS



1:400 PLAN OF PIER

1:400 ELEVATION OF PIER



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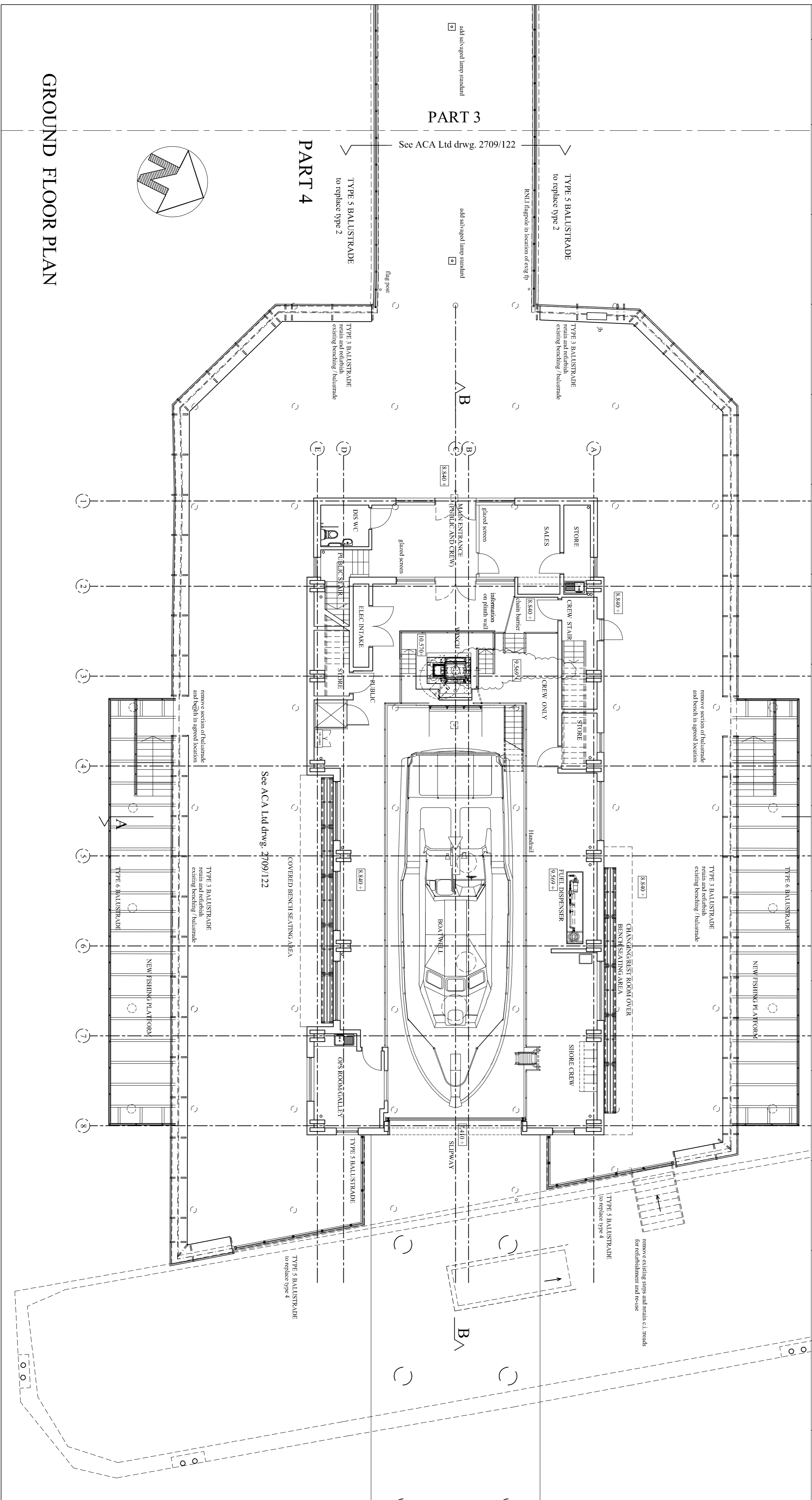
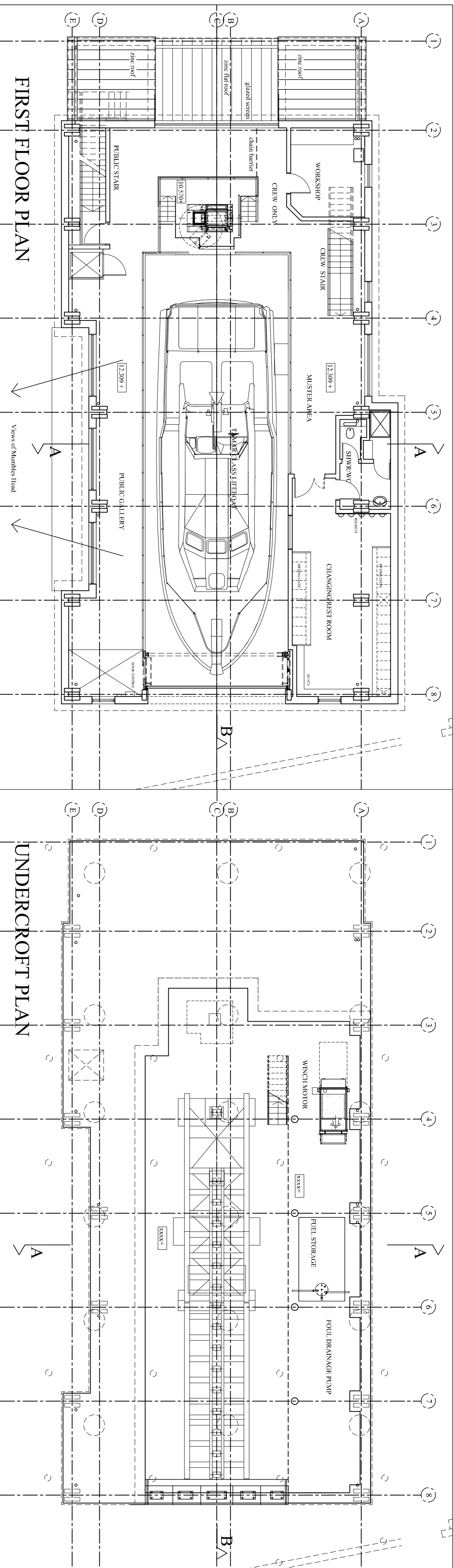
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**Proposed RNLI boathouse
 The Mumbles, Swansea**

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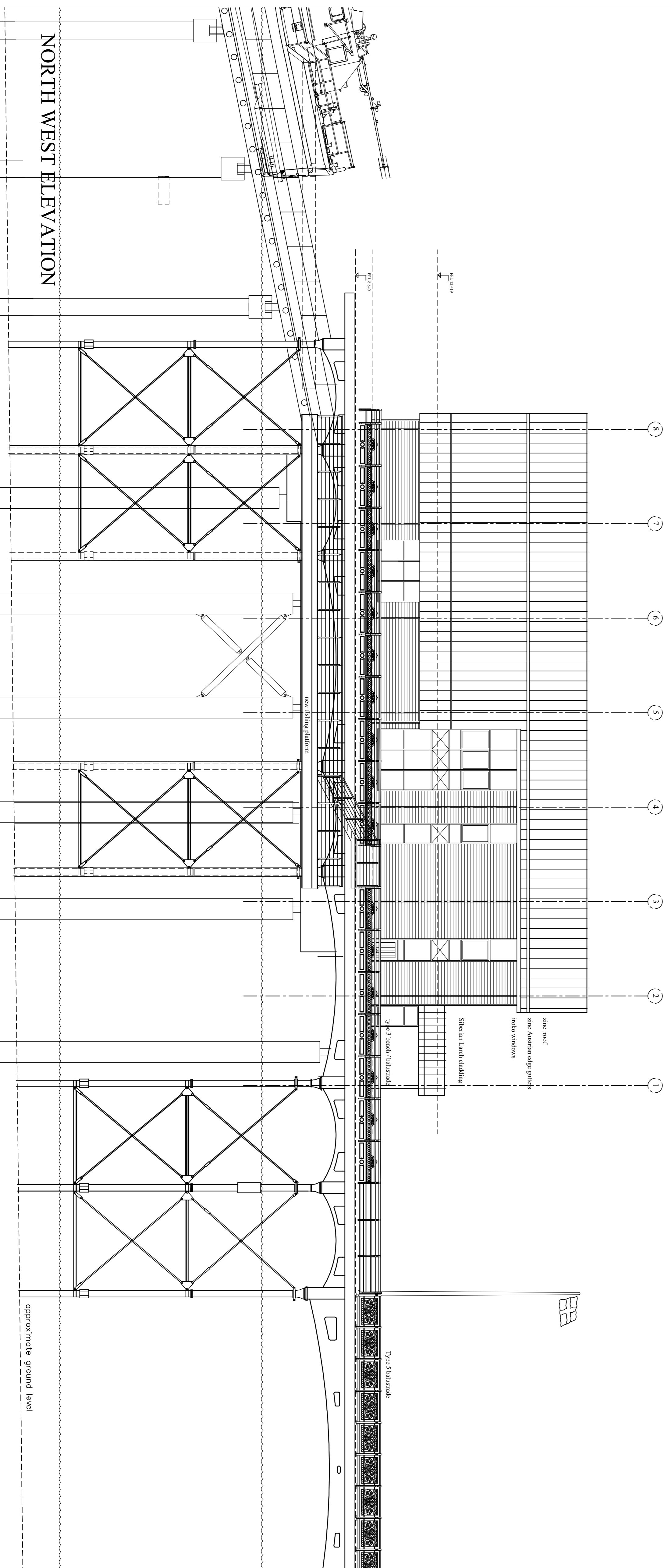
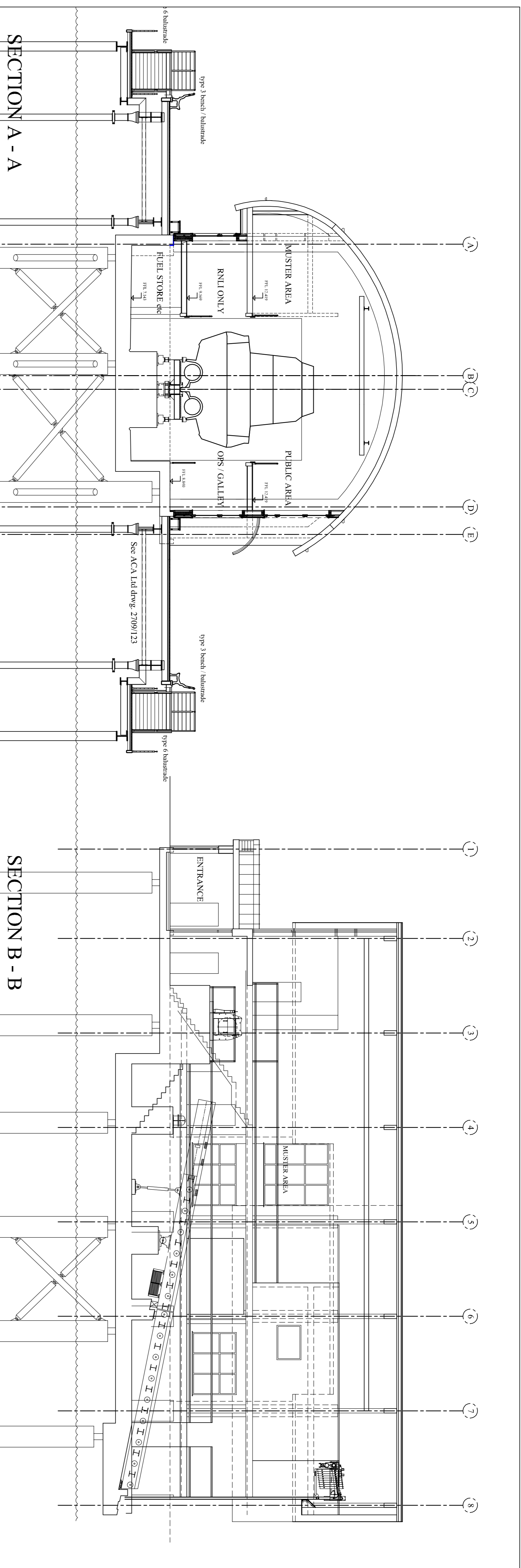
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 The Mumbles, Swansea**

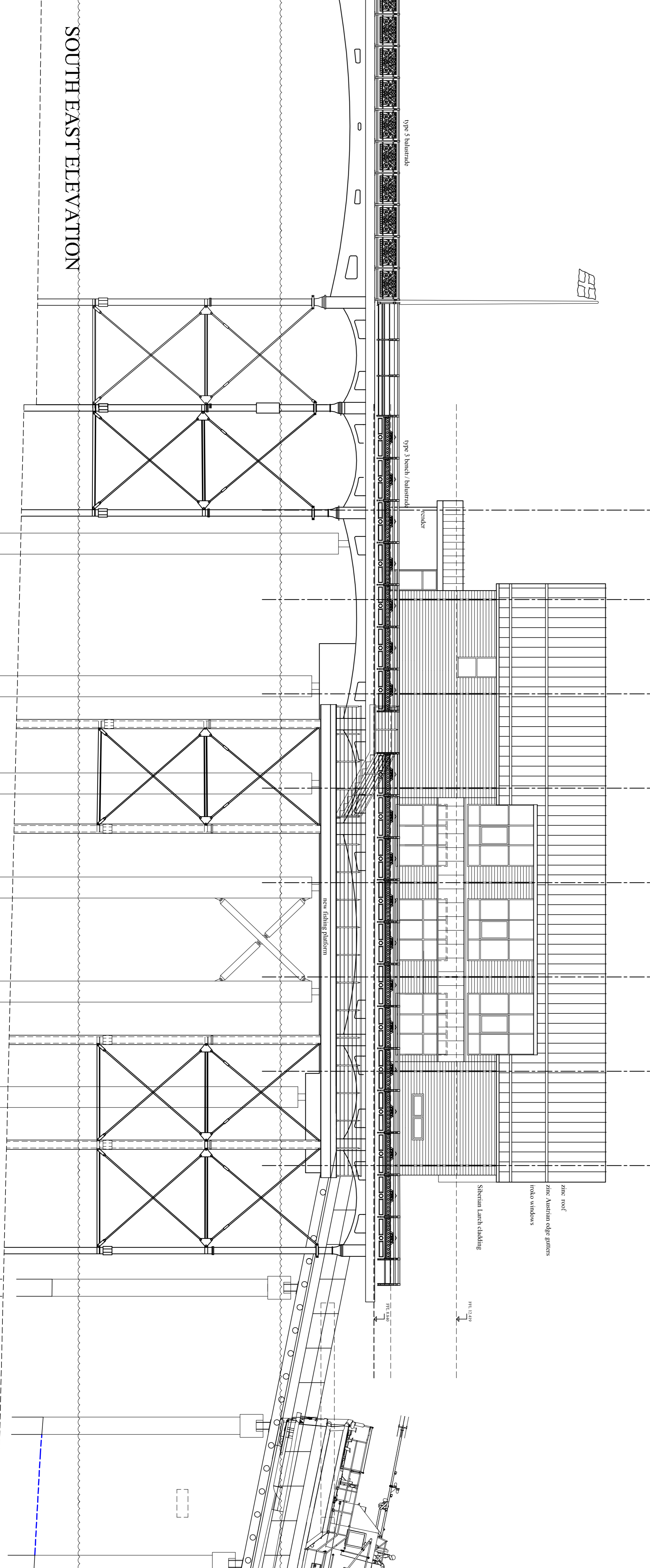
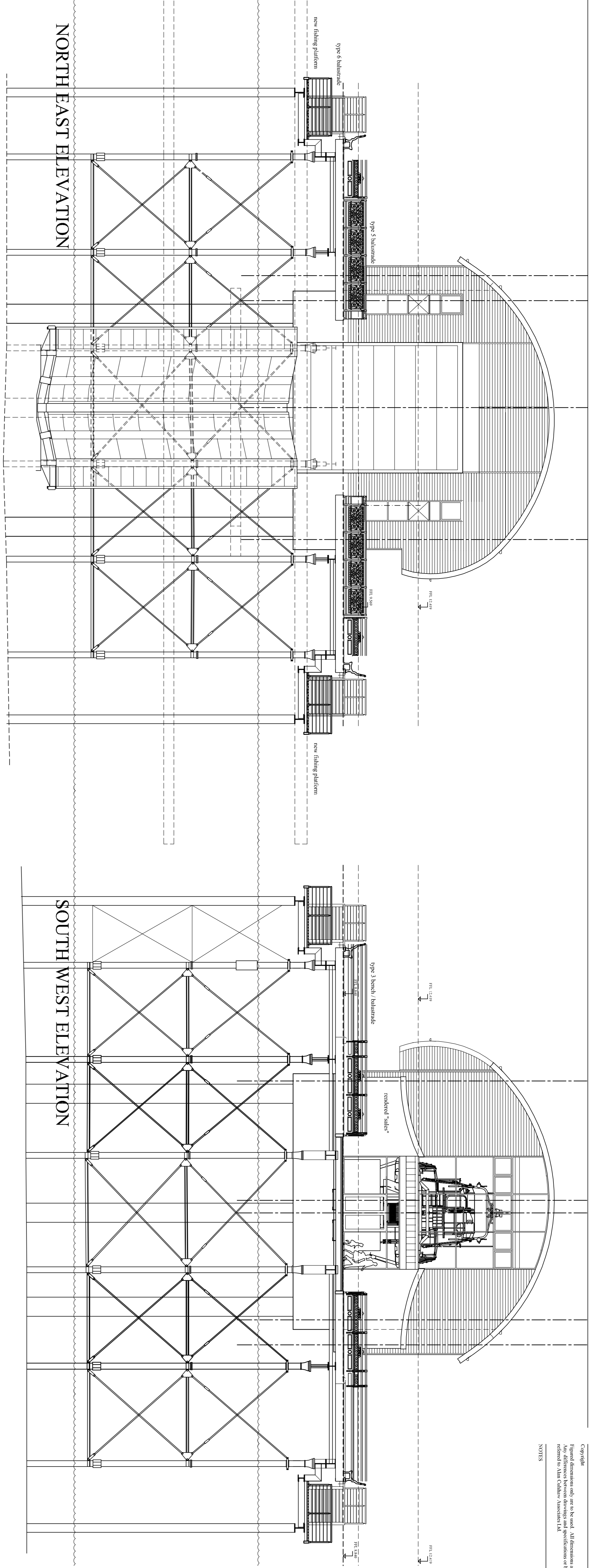
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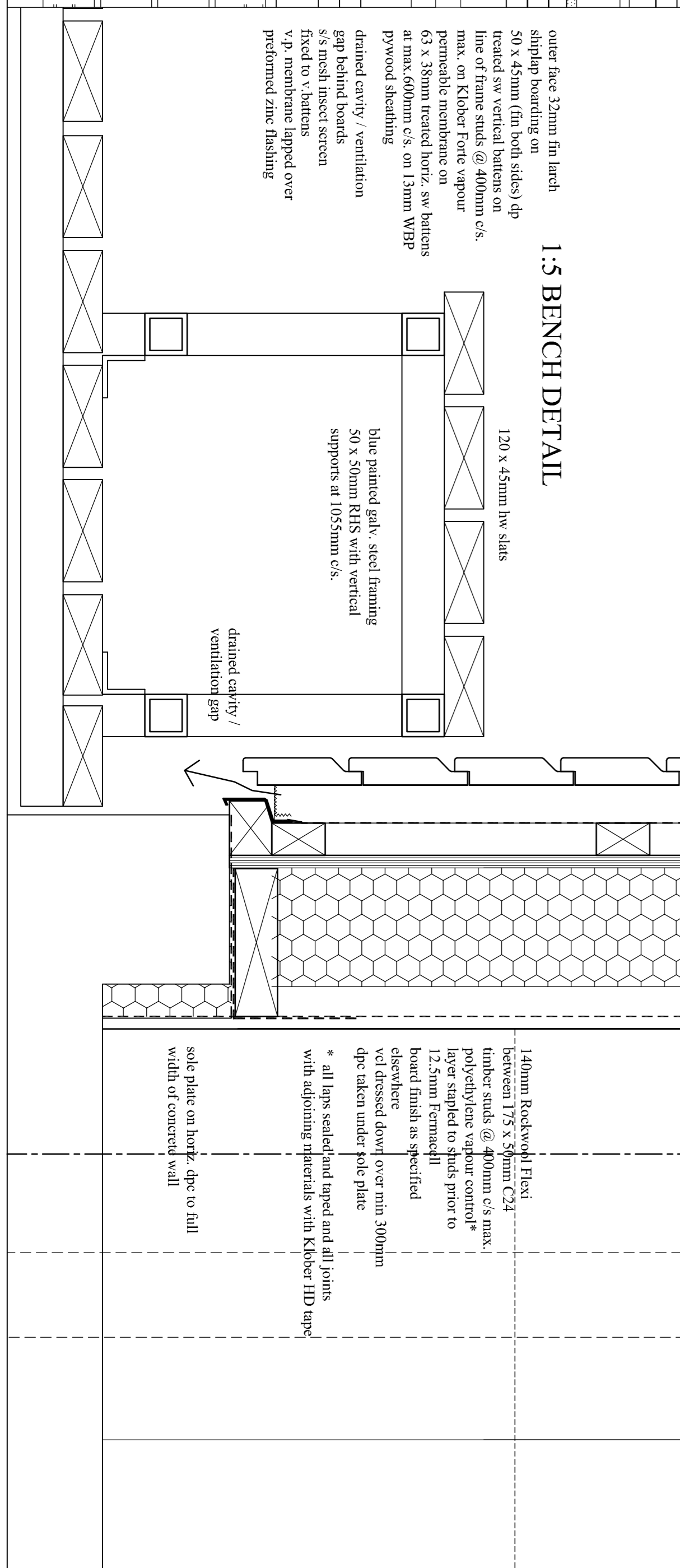
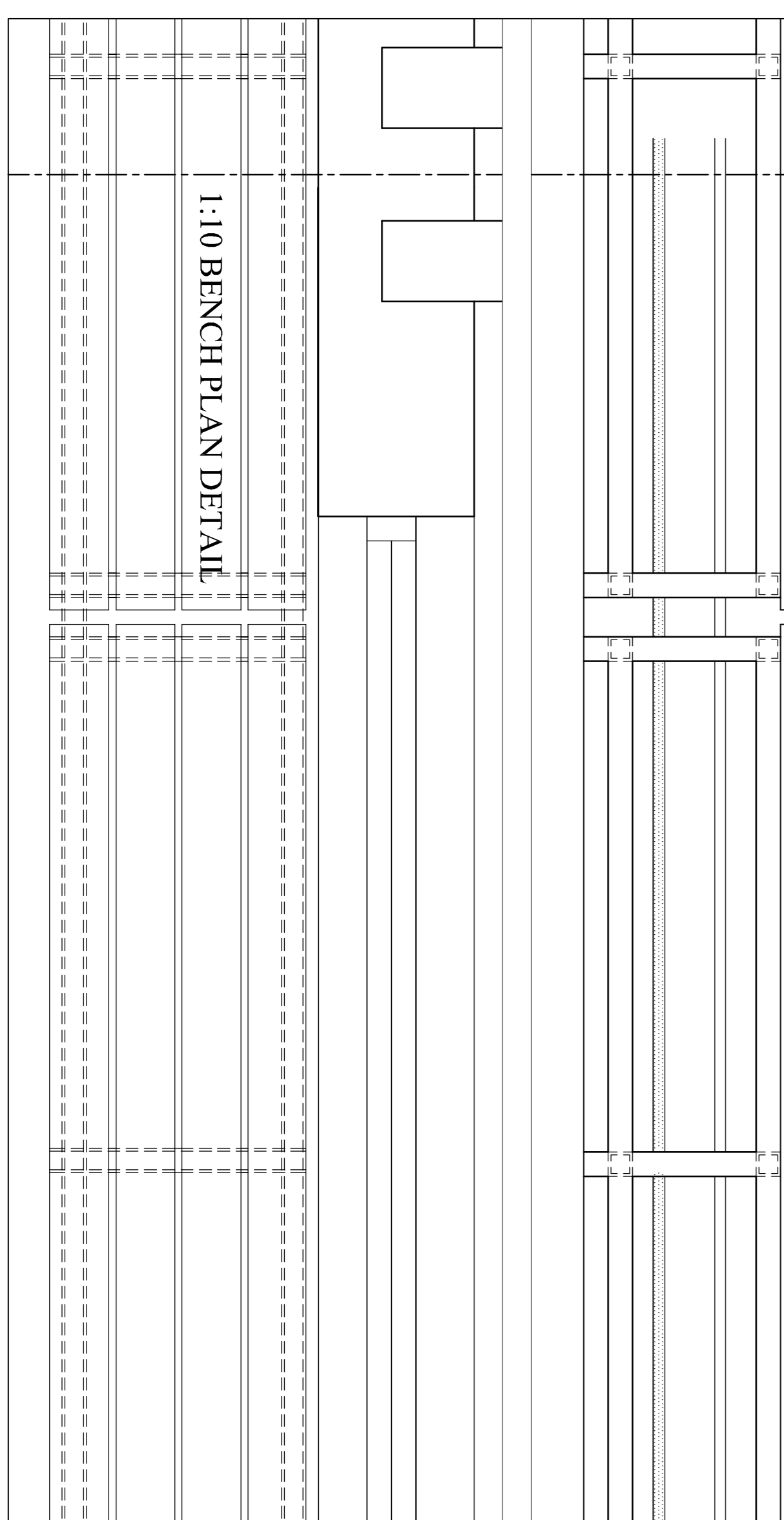
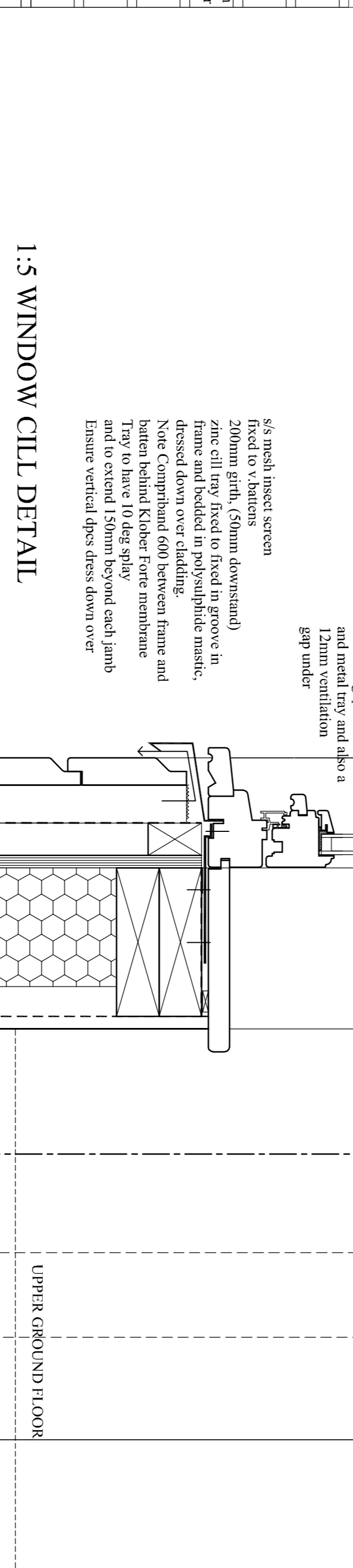
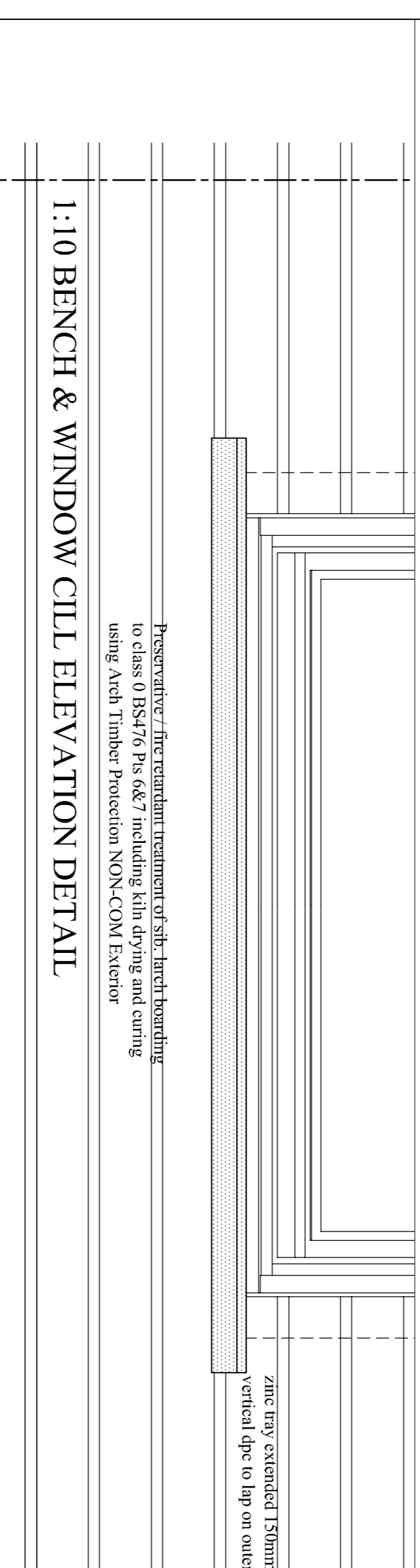
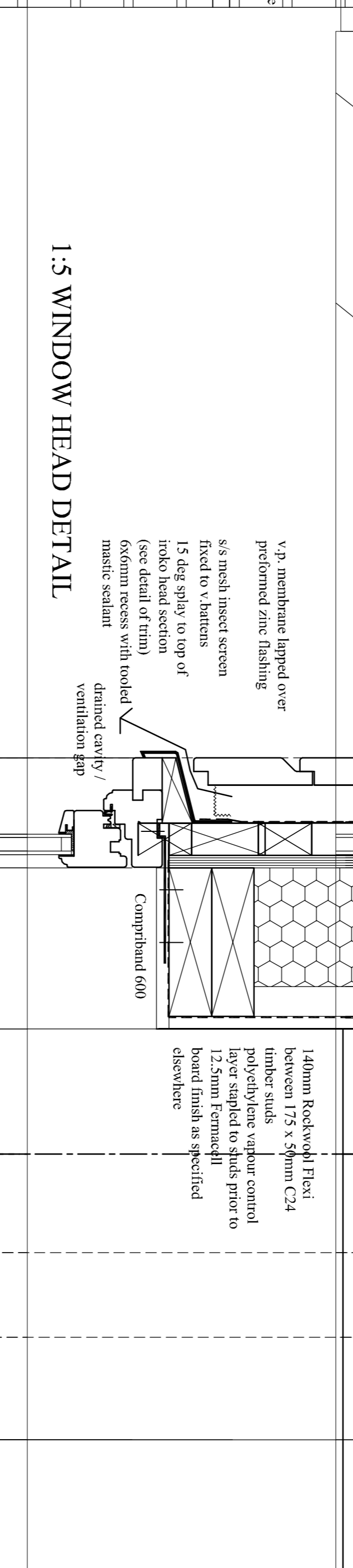
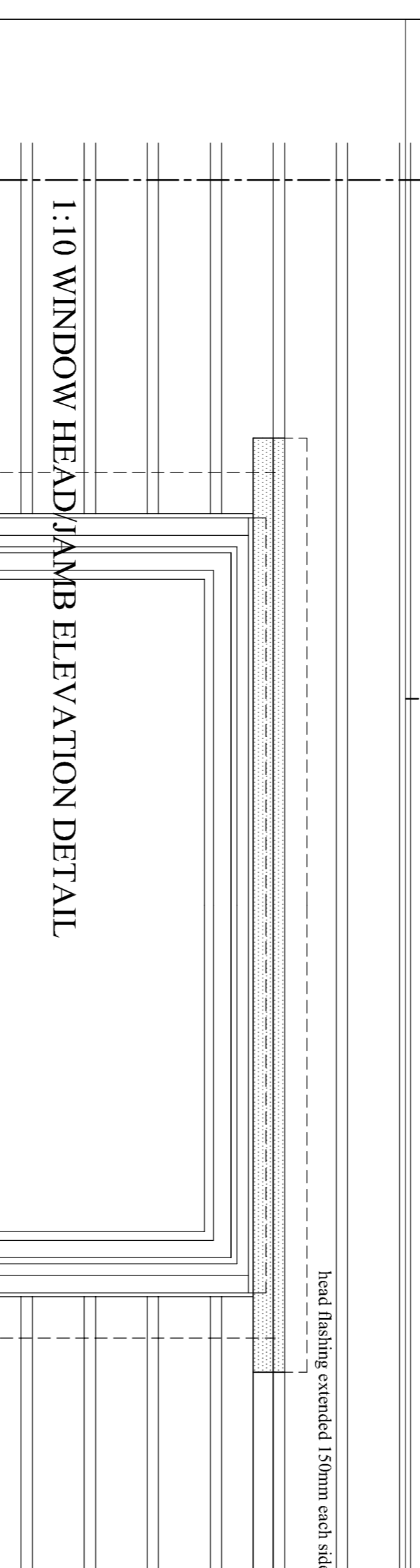
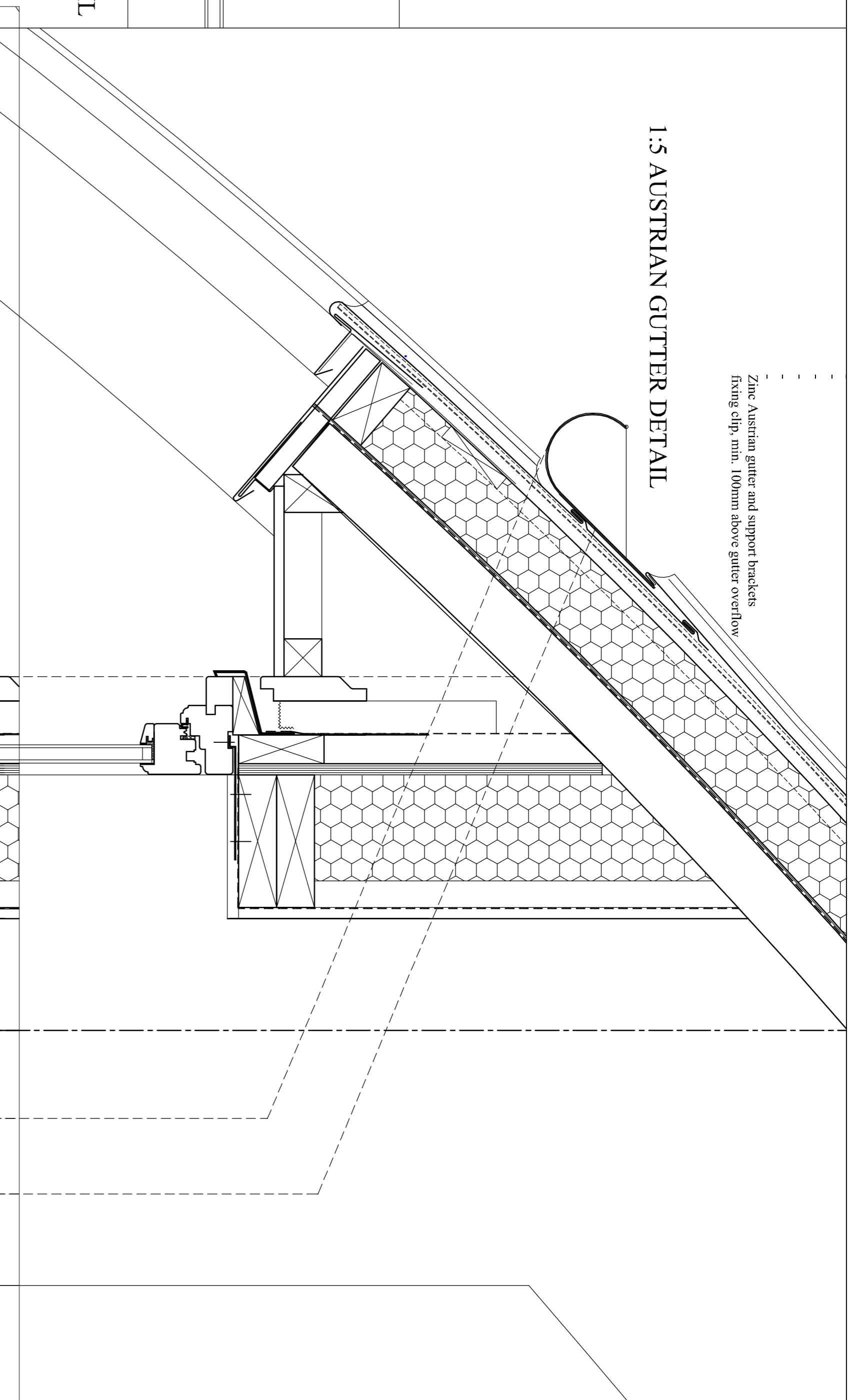
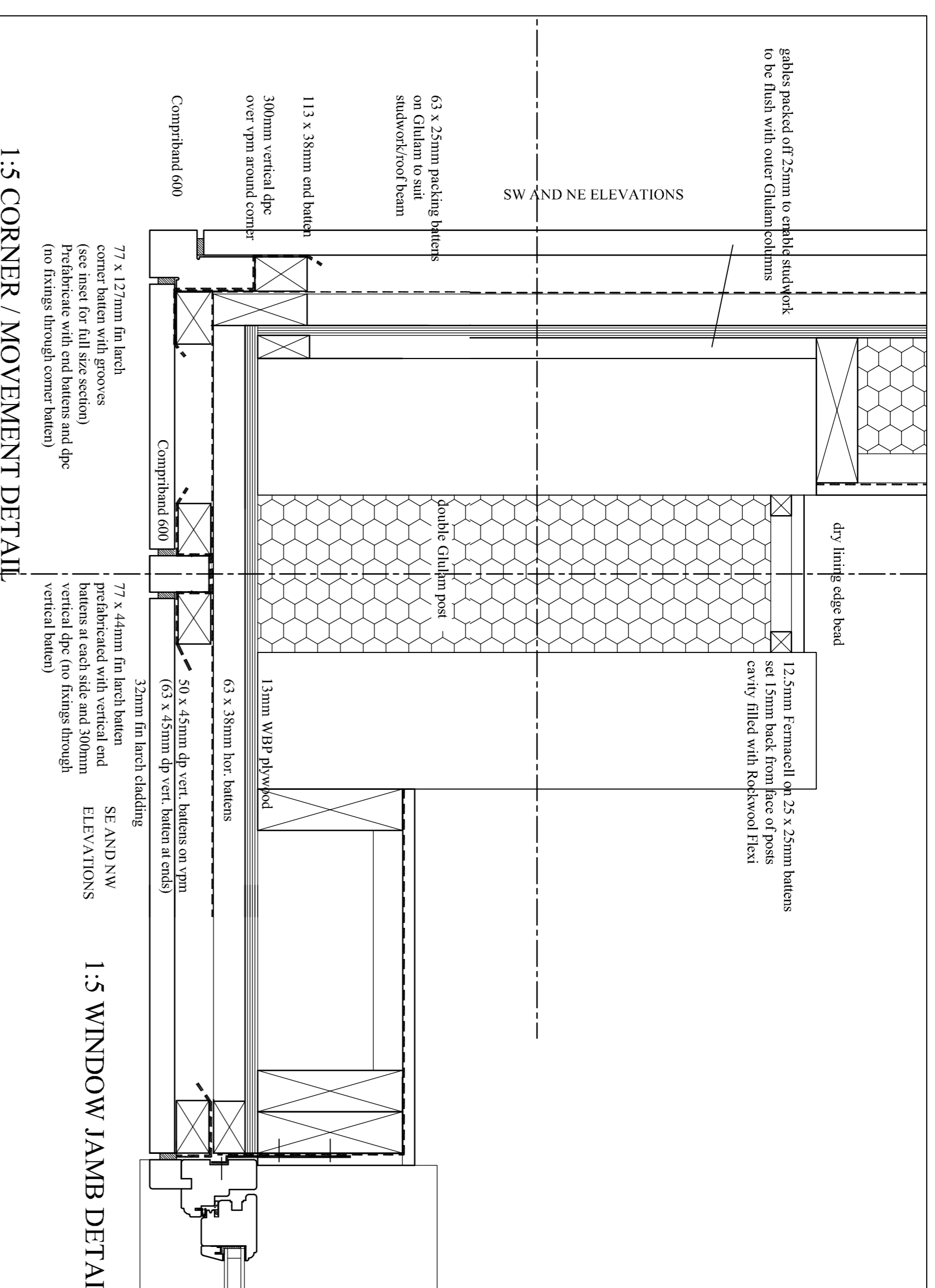
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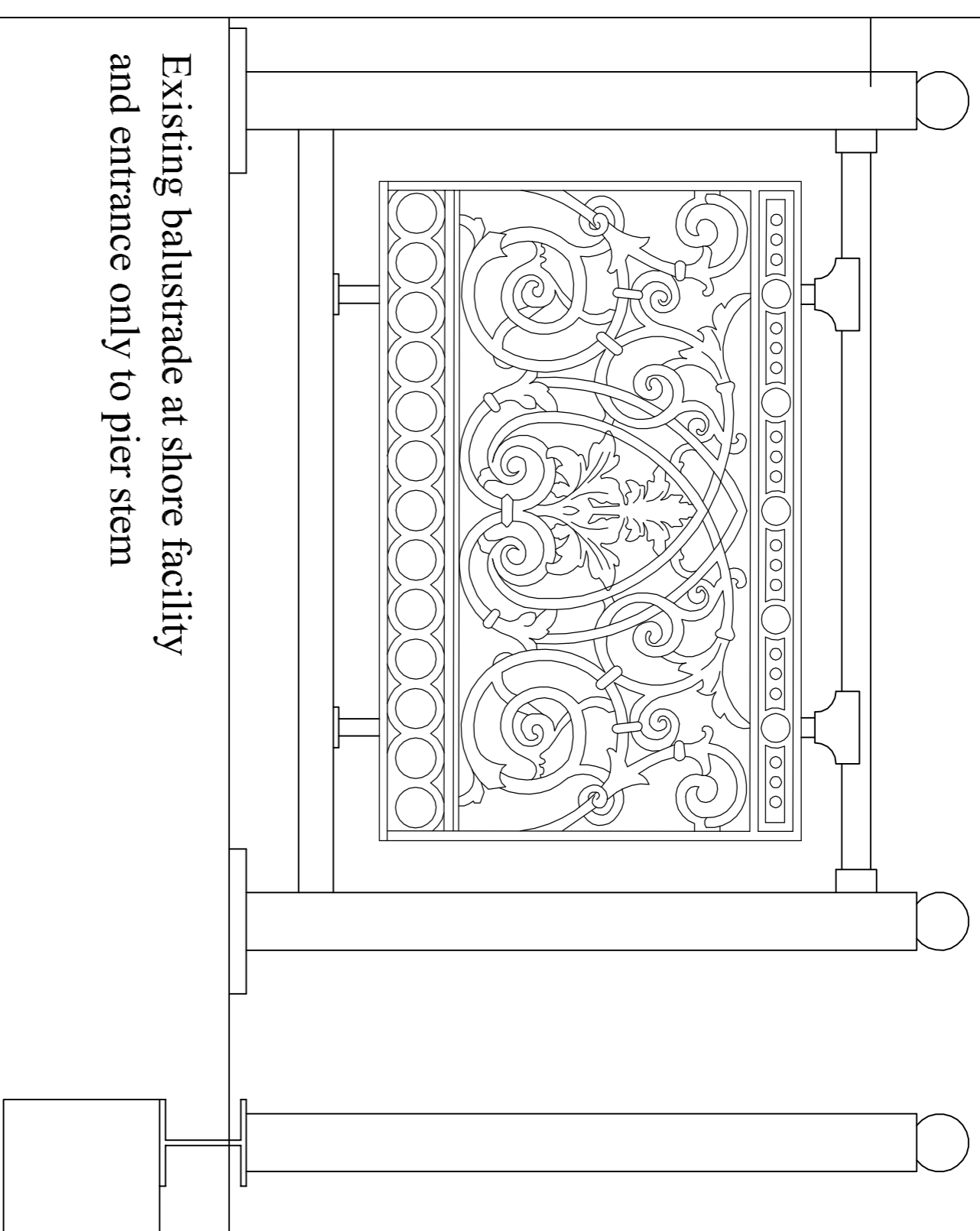
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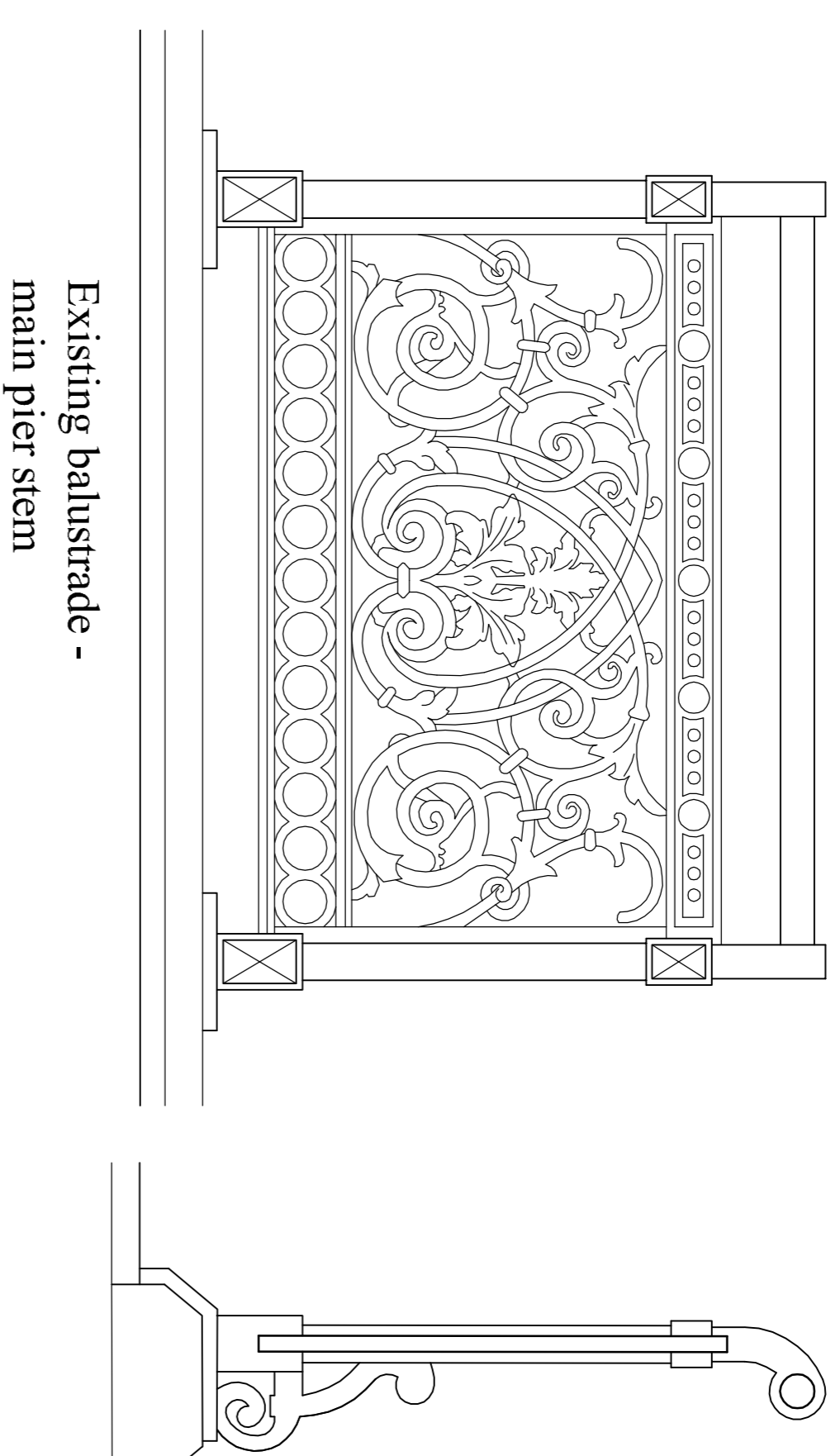
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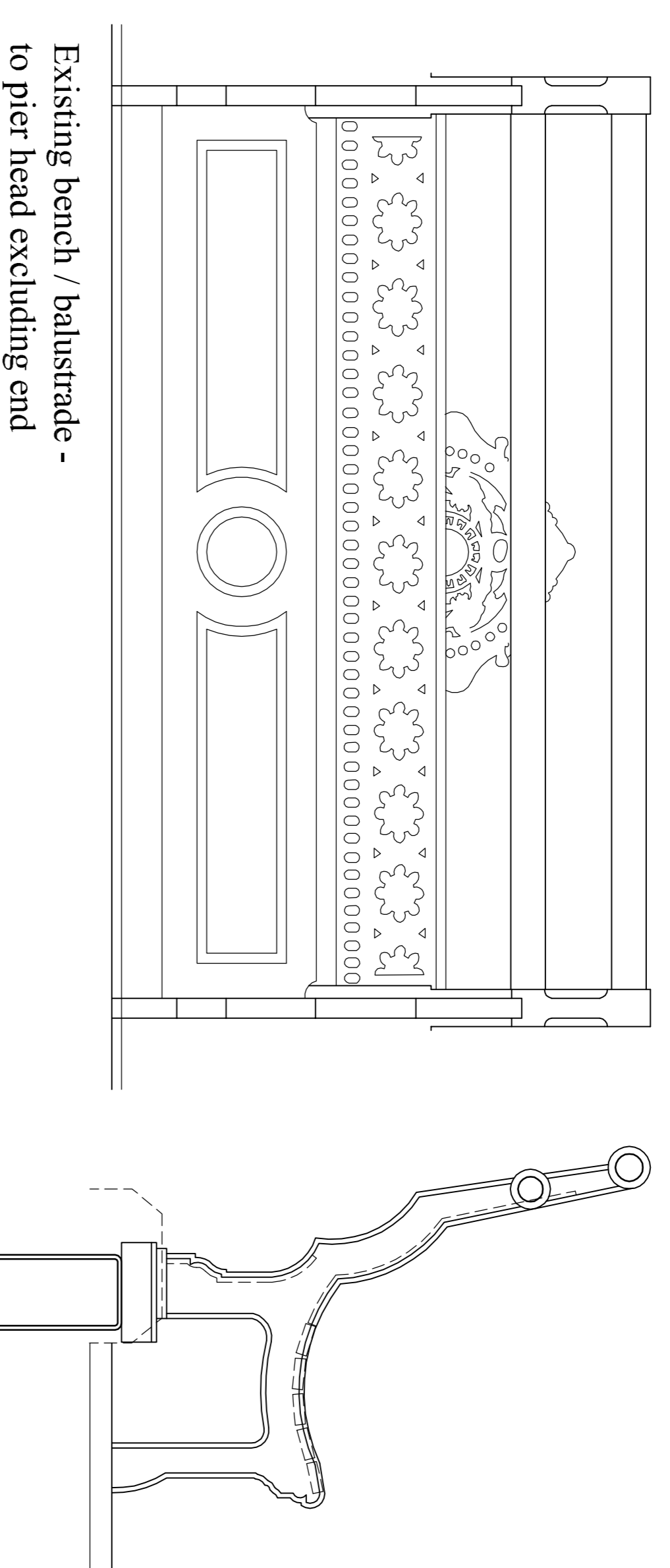
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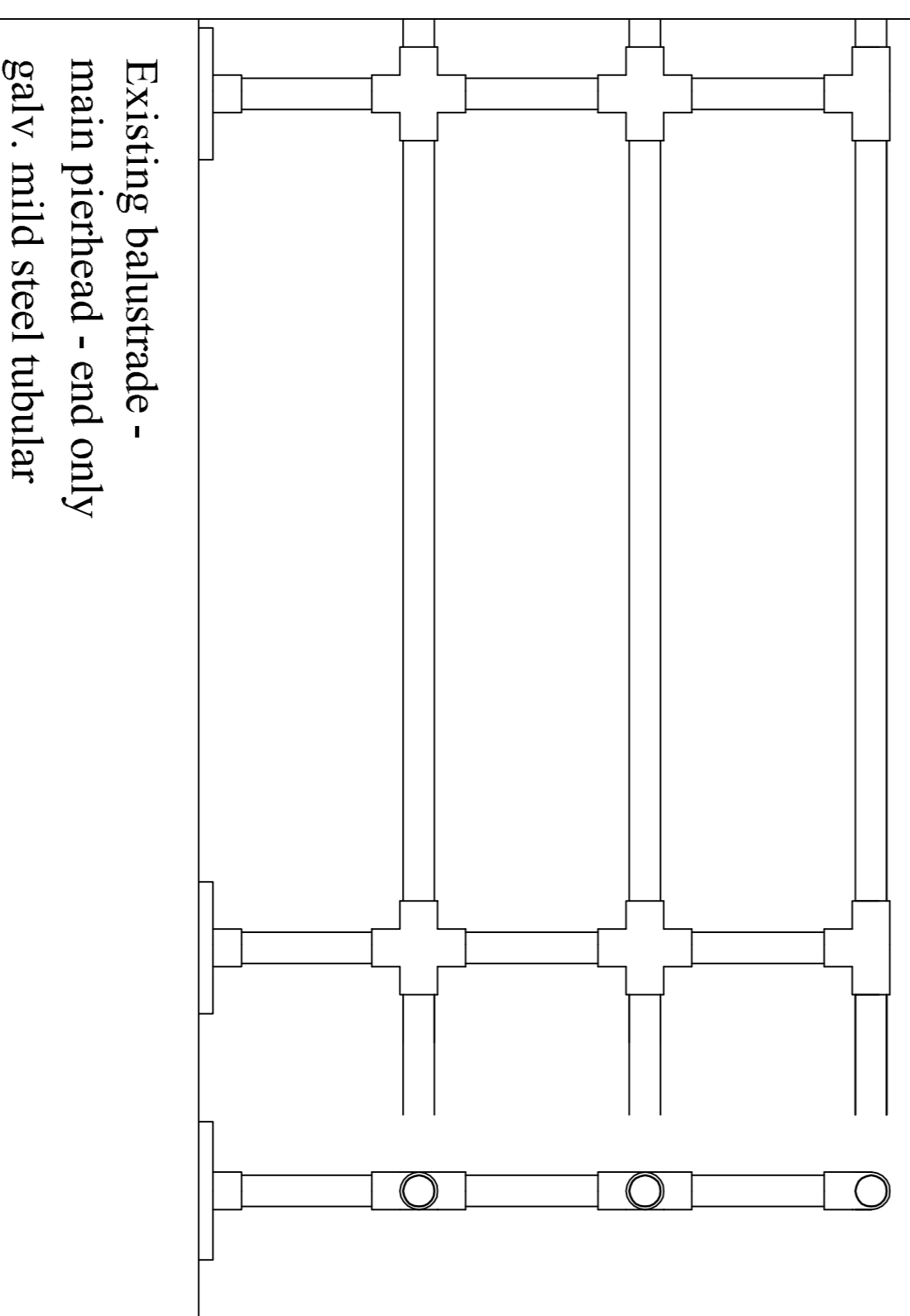
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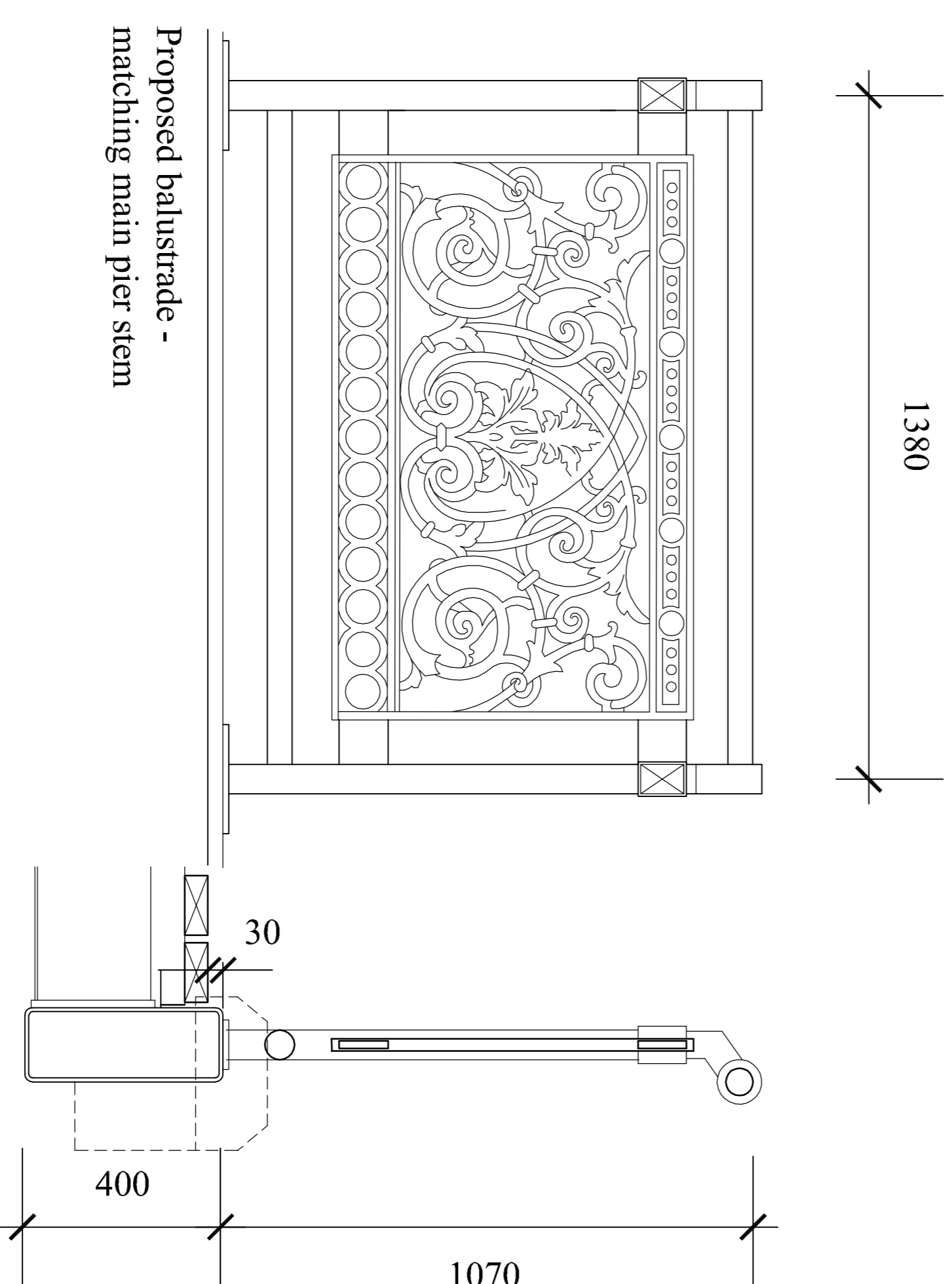
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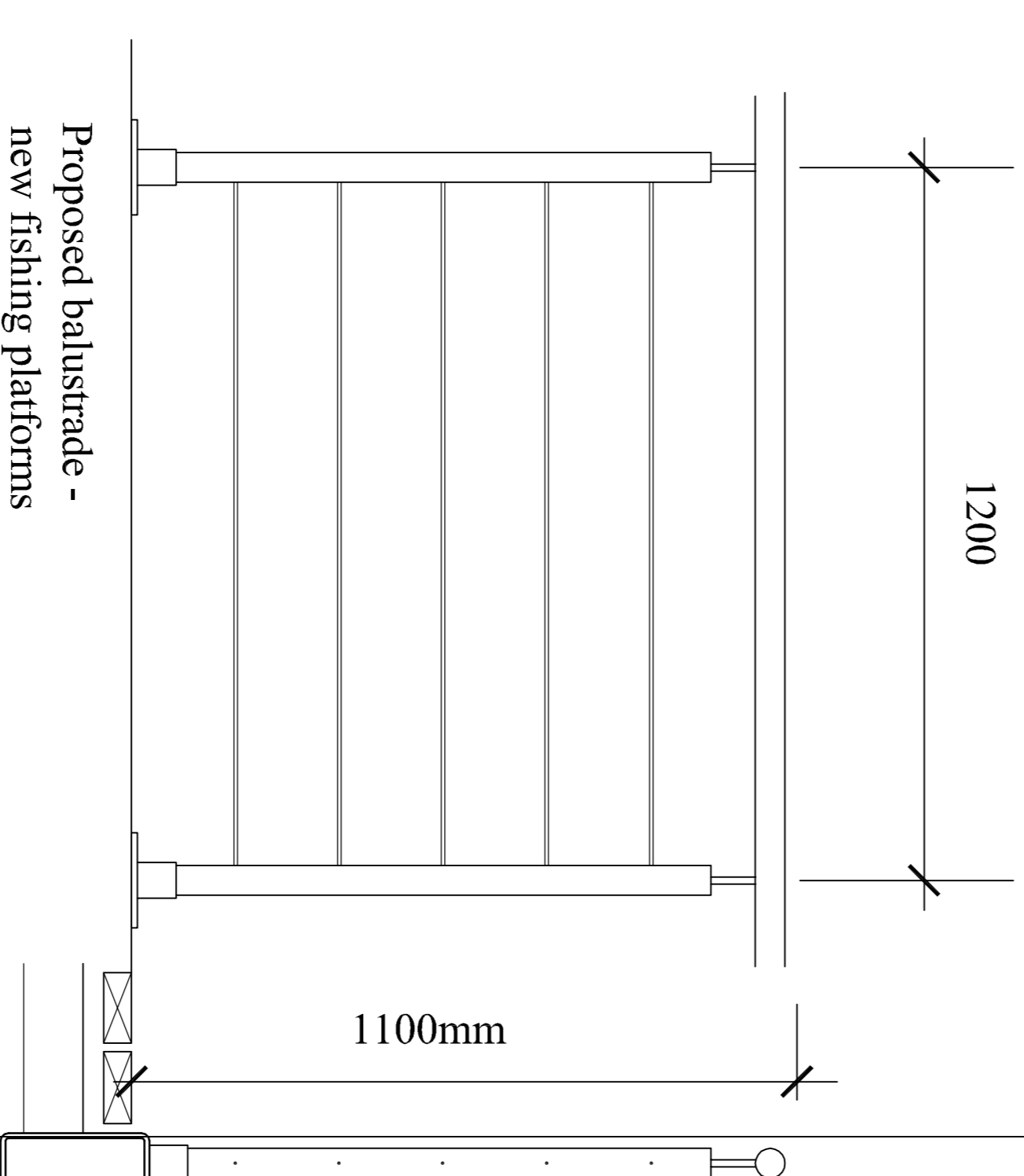
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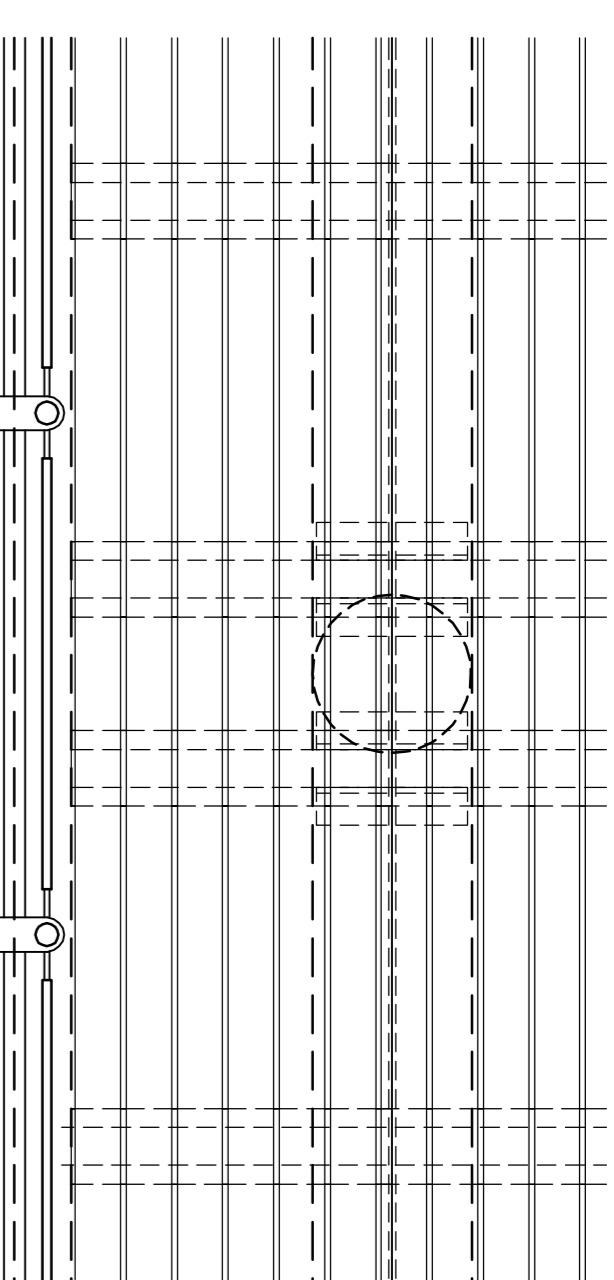
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 The Mumbles, Swansea**

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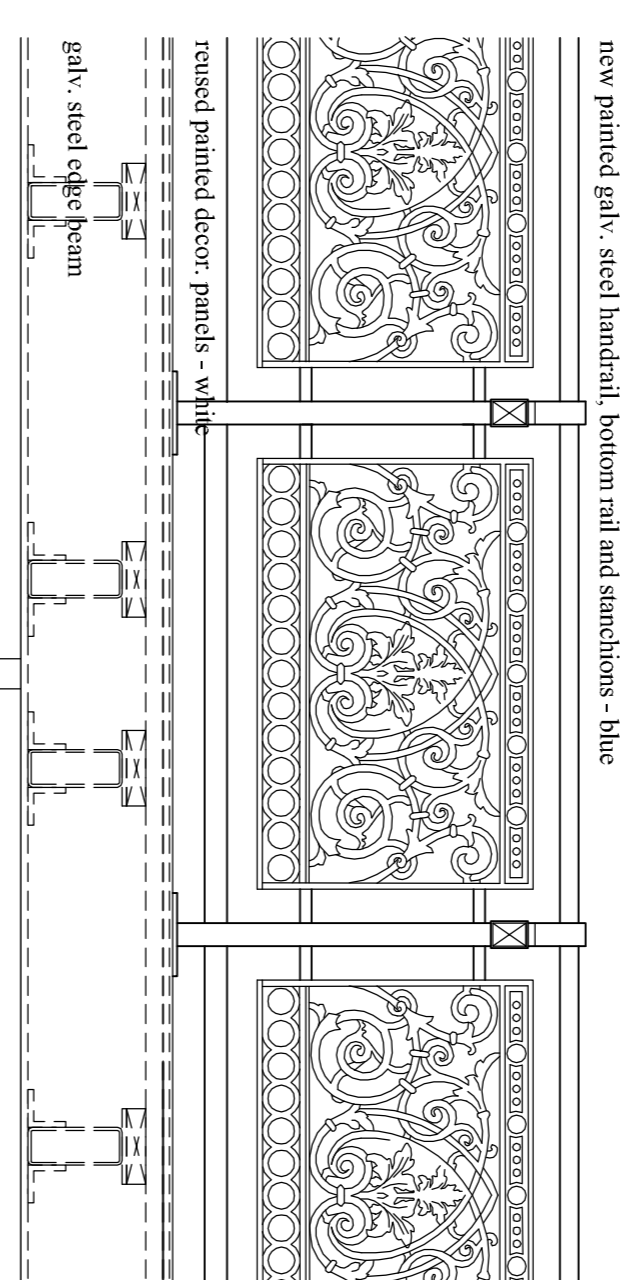
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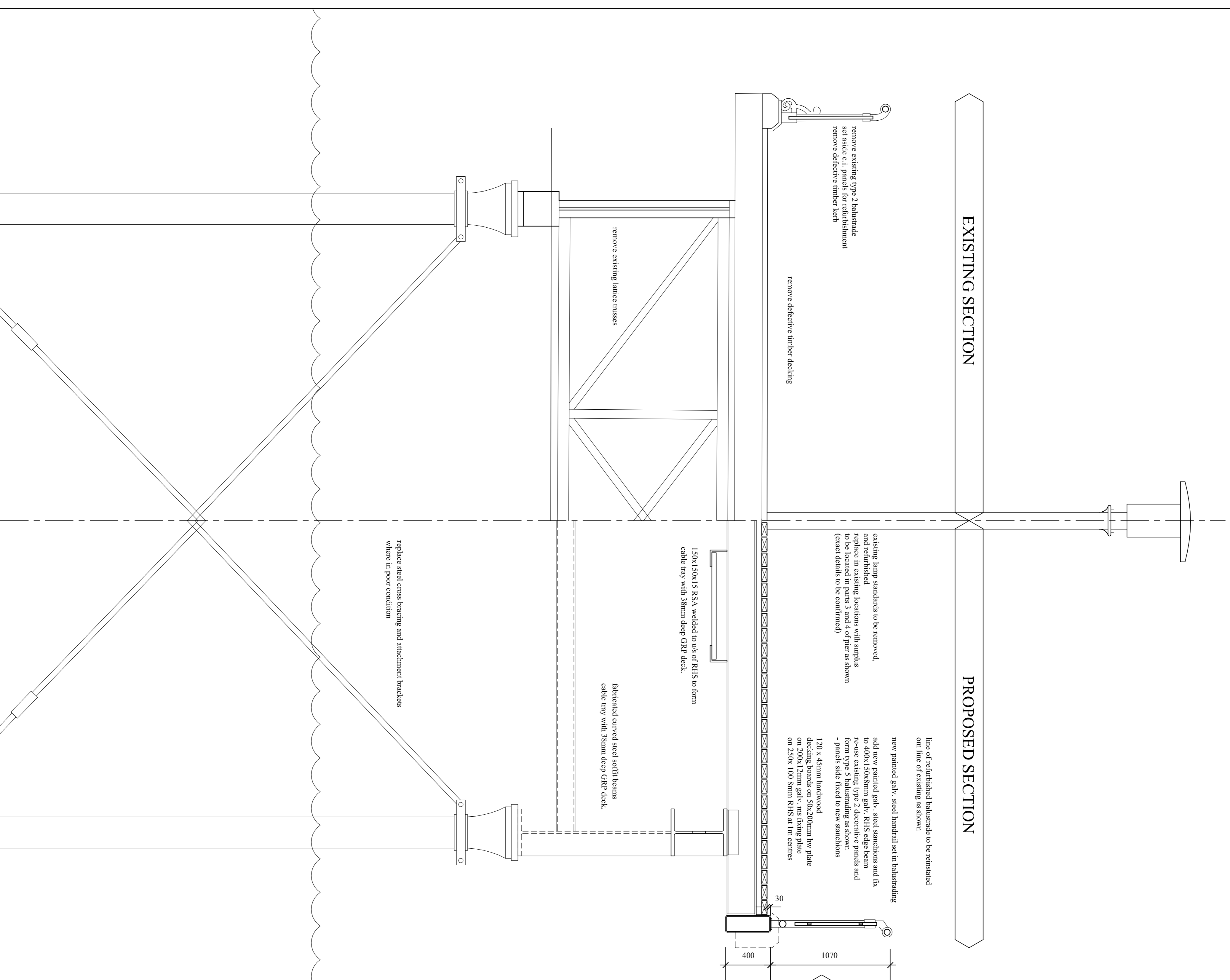
PART PLAN

PART ELEVATION



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PROPOSED SECTION



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 TYPICAL SECTION THROUGH
 PIER STEM

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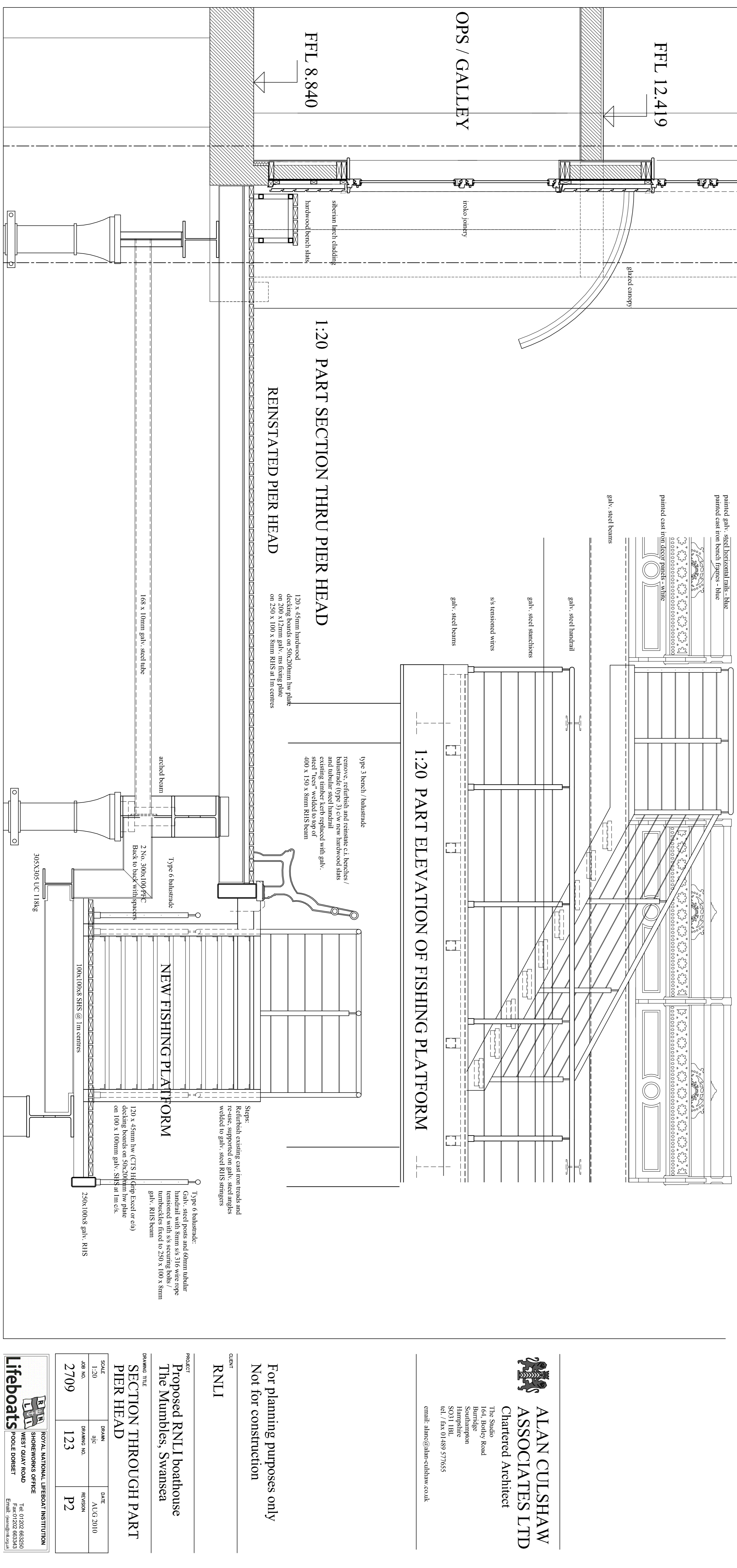
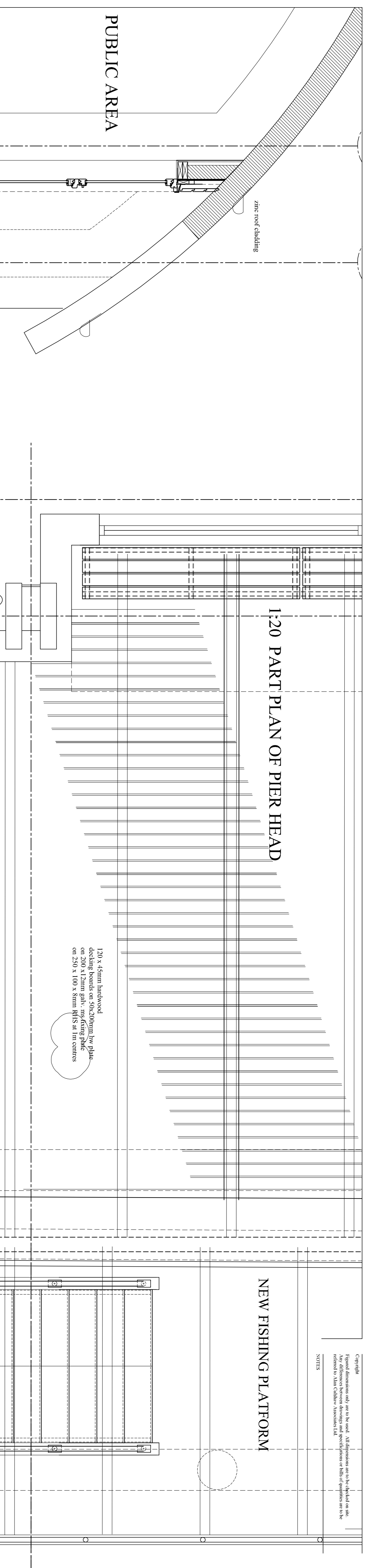
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Appendix EDP 3

Description of the Scheme's Evolution

Mumbles Lifeboat Station Evolution

1. Initial Scheme (2003) – Location 1

In 2003 the first two replacement slipway stations to accommodate the latest generation Tamar Lifeboat were being planned or under construction at Tenby and Padstow. For The Mumbles, an initial proposal was developed with an 'L' shaped plan form under a curved roof similar to the Tenby proposal.

The existing slipway station is located too far landward to enable launch at all states of the tide. Accordingly it was envisaged that this station be located at one of various locations but all seaward of the end of the existing listed pier and its landing stage.

The boathouse was conceived as a standalone facility. That is to include crew training rooms and LOMs (Local Operating Managers) Office.

It was identified that an EIA (Environmental Impact Assessment) is required and the scheme and details released to enable a scoping opinion to be carried out.

A borehole site investigation was initiated but revealed a considerable deepening of the founding formation at the intended locations off the end of the pier. In view of escalating costs the development of the EIA was put on hold whilst the alternatives, such as an afloat berth were considered. There were also concerns with the deteriorating condition of the listed pier over which access to the new building would be required for the life of the building.

2. Resurrected scheme (2007)

Some value engineering was achieved in the completion of the schemes at Tenby and Padstow which together with trials with the new Tamar lifeboat, as these stations went operational in 2006, identified a potential tighter design envelope. For example, an alternative main door and dispensing with the need to raise the lifeboat aerial within the building would allow a lower roof level to the station. Design developments of the Tamar Slipway station scheme at Bembridge also further reduced the spatial requirements by utilising the nearby inshore crew training rooms and LOM's office thus dispensing with this requirement in the slipway station.

The proposal for a Tamar Slipway station was therefore resurrected in 2007 but with the station located to one side of the pier and omitting the need for Crew training and LOM's office. By that time it was also appreciated that the relocation of the souvenirs sales outlet from Knab Rock to the new station would enhance the attraction to the pier visitors.

An 'L' shaped in plan building under a curved 'wave' roof was developed with the souvenirs sales to one side of the boathouse. Locations either side of the pier were considered with the toe of the slipway positioned beyond the -7.5m OD contour to enable launch and recovery of the lifeboat at all states of the tide.

Location 3 to the south of the pier was discounted for lifeboat operation reasons as the sea was known to be rougher for lifeboat recovery as illustrated by the close spacing of the seabed contours.

Redevelopment or development alongside the existing slipway boathouse as option 7 was substituted but would require a very long slipway and a dredge channel which could tend to rapidly silt up.

Locations 2 or 6 to the north of the pierhead were shortlisted as preferable by the RNLI for lifeboat operational reasons.

From a pier amenity viewpoint it was identified as important to maintain the views across the bay from the pierhead and for pier visitors to be able to reach the most seaward point of the final structure. This likewise tended to favour locations 2, 3 or 6 alongside the pierhead rather than off the end of the pier as location 1.

Retention of the existing slipway station was envisaged; investigations identified that there were potential alternative uses and options alongside the existing boathouse thought to compromise its character.

Whilst locations 2 and 6 were favoured over the earlier options it was thought necessary to consider the aesthetics of potentially three buildings on or in the vicinity of the pierhead. At the same time the local authorities Swansea Bay Regeneration plan was also evolving and promoting a feature building on the pier head so as to provide a 'point of arrival' for visitors to enhance it as an amenity. An on pier location 8 was also to be considered.

Key vantage points were therefore identified as one approaches The Mumbles, photomontages developed for alternatives, and generally an on-pier location 8 for the new boathouse favoured. This would restrict the building number to two, the existing and proposed boathouse, which visually tended to appear as two separate distinctive buildings from the closer vantage points such as alongside the existing inshore lifeboat station. Conversely a location alongside the north side of the pierhead demonstrated a merging of the two building styles from these vantage points.

3. Scheme 3 (2007)

This developed the architecture of the wave roof scheme at an off the pier location as used in both the on and off pier montages.

4. Scheme 4 (2008)

Scheme 3 was developed to sit onto the pier head and incorporated external ramps so as to achieve disabled access up to the ground floor, the level of which is preferred to be above the design flood risk level. The entrance locations to the boathouse and sales area were rationalised to reduce this ramping, separate entrances being provided to enable the boathouse and sales area to be opened to the public independently of each other.

With the on-pier location it was envisaged that the 1950's landing stage would be demolished but the existing slipway station would be found an alternative use as now potentially permitted by the seabed freeholder.

An important aspect is to maintain the historic fabric of the pier.

5. Scheme 5 (Nov 2008)

The measures to alleviate the flood risk in through the main doors were developed to avoid the need for the unsightly external ramps. The undercroft floor needs to be at a sufficiently high level to mitigate flood risk and to have sufficient headroom for mechanical plant. A split ground floor level internally enables level access into the building whilst the stepping up to the operational rooms enables retaining sufficient headroom to a sufficient area of the undercroft.

A variant with a pitched rather than curved roof was also developed but not favoured aesthetically.

6. Scheme 6 (H3 Feb. 2009)

Further variants were developed

- a. With a lower eaves but dormer roof
- b. an inset sales entrance to express the sales entrance
- c. balance the width of the building each side of the main door at the seaward end.
- d. lift relocated from the single storey sales foyer to within the 2 storey boathouse

The lower roof was retained but option with dormers dispensed with for aesthetic reasons and also the increased risk of roof leaks in such an exposed environment.

To enhance the amenity, increased glazing at a high level and also to the landward elevation to make the lifeboat more visible, was considered.

7. Scheme 7 (Spring 2009)

To enhance the amenity, bench seating was added under a canopy at the south side of the pier. An increase wrap around of the roof was sketched but not favoured so not taken forward.

8. Scheme 8 (H6 As presented to CADW/SSC March 2009 & DCfW June 2009)

Scheme 7 was tidied up for presentation to CADW and CCS, coloured up drawings produced and presented to DCfW.

9. Scheme 9 (Autumn 2009)

The building is moved to the south slightly so as to enable greater use of the north side of the pierhead which it is noted would enjoy the evening sun and thus perhaps attracts visitors at that time of the day.

The building has its main entrance centred onto the north aisle way of the pier stem. Whilst this increases amenity space at the north side it does diminish the useable space at the south side making provision of say an ice-cream kiosk or bandstand more difficult should this be required at some time in the future.

The fenestration was developed, replacing the round windows with conventional to increase the prominence of the lifeboat but also simplified to reduce clutter.

The spacing of the boathouse piles was regularised to suit the existing pile spacing.

Centring the main entrance onto the pierhead was considered but found to leave insufficient space past the building at the south side. Architecturally a boathouse

centred on the pier head was preferred so a reduction in the sales projection was considered by displacing the accommodation lengthways. However this only proved feasible if the whole of the sales area was displaced to one end as per scheme 10.

Side platforms were shown to the pierhead but at a lower level so as to accommodate the fisherman, similar to the existing landing stage. These would be sited within the footprint of the original timber landing stage.

The engineering of the boathouse foundation was also developed with a view to minimise the disturbance to the historic structure. ie boathouse piles equally spaced between historic piles to allow retention of the existing piles and their bracing arrangement. The reversibility of the addition of the boathouse was considered should this be required at some time in the future.

The ongoing affordability to maintain the pier structure was further considered in particular in the detailing of the pier stem repairs. For further details see heritage justification.

Scheme 9 was promoted and received good support at a parish presentation in June 2010. There were detailed suggestions in particular one that the boathouse entrance would be better centred on the pier.

10. Scheme 10 (2010)

An initial proposal suggested a two storey landward extension to accommodate the sales and stairs to first floor all under a single curved roof. Whilst this achieved a simple building form centred on the pier head as preferred by some parties the architecture was rather less dramatic than preferred by others.

This was developed into scheme 10A, drawing the single storey roof down to single storey height to enable the lifeboat to be viewed through the landward window and re-creating a wave roof form to the sales area, generally encompassing the operational and aesthetic objectives of the scheme. i.e.

- i. Refurbished pier and full extent of deck available for public use.
- ii. Replacement structure for the fishermen.
- iii. Uninterrupted views across the bay from the pierhead
- iv. Ability for the public to reach the end of the pier structure.
- v. A building to "arrive at" at the pierhead.
- vi. Distinctive building form.
- vii. Building centred onto the pierhead.
- viii. Lifeboat visible as one approaches the boathouse.
- ix. Amenity bench seating under a canopy roof.



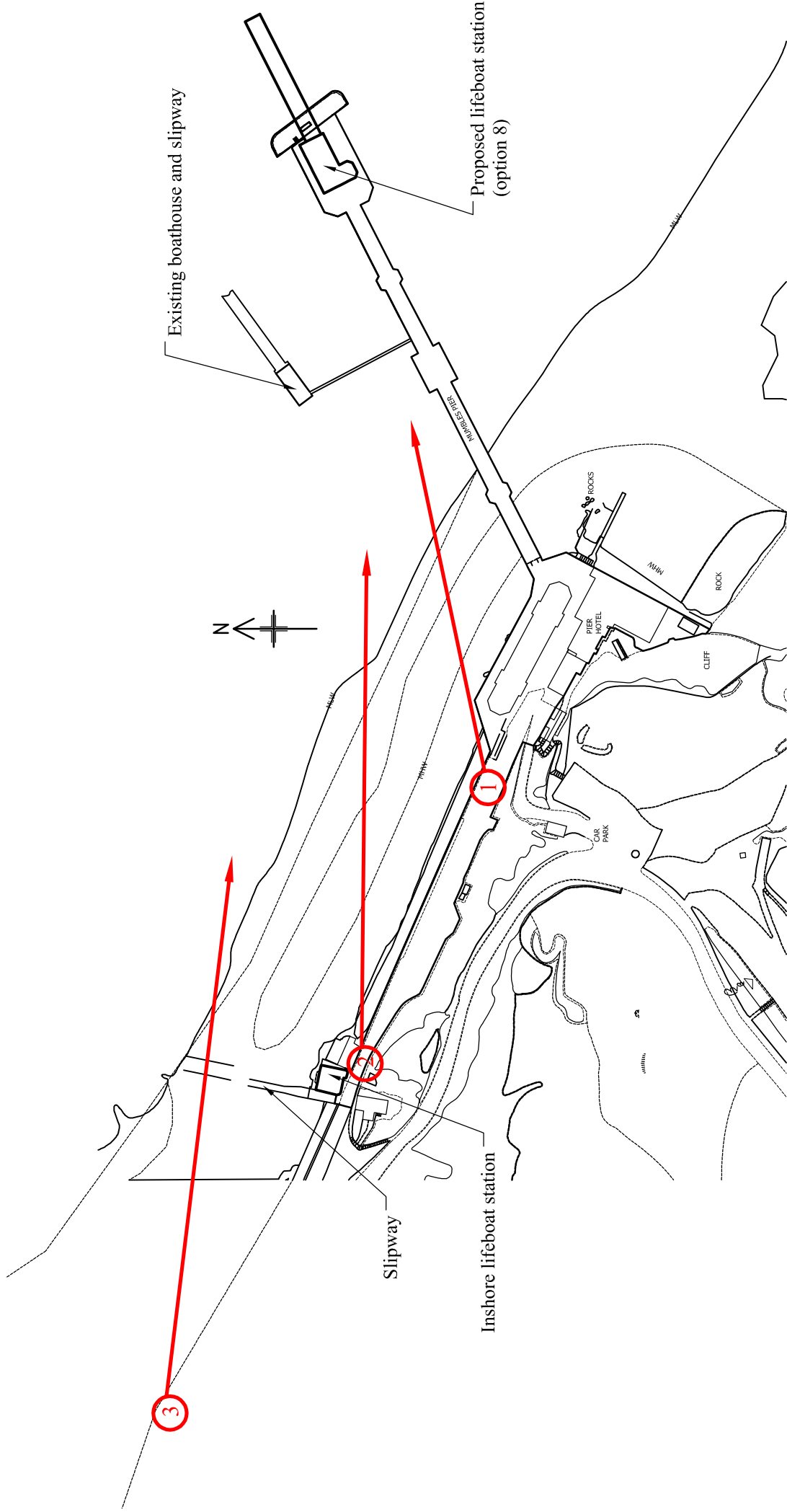
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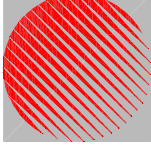


PHOTO MONTAGE 2
VIEW FROM WEST END OF
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PHOTO MONTAGE 3
VIEW FROM KNAB SLIPWAY



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Royal National Lifeboat Institution 				
 Opus International Consultants (UK) Ltd Opus International Consultants (UK) Ltd Modulus House Salters Lane Fareham Hampshire PO16 0QS Telephone: 01329 822021 Facsimile: 01329 825274 website: www.opusinternational.co.uk email: fareham@opusinternational.co.uk				
Client:	RNLI TRADING LTD			
Project:	THE MUMBLES LIFEBOAT STATION PROPOSED NEW ALB BOATHOUSE			
Drwg. Title:	VIEWS OF PROPOSED LIFEBOAT STATION			
Scale:	1:2500	Drawn: RFP	Reviewed: CGS	
Drwg.No:	6348(A3)SK1	Rev: P1	Date: JUNE 2009	
Status:	PRELIMINARY	Dips:		



POSITION 1
VIEW FROM EAST END OF PIER CAR PARK



POSITION 2
VIEW FROM WEST END OF PIER CAR PARK



POSITION 3
VIEW FROM KNAB SLIPWAY



POSITION 4
VIEW FROM OYSTERMOUTH CASTLE



POSITION 5
VIEW FROM SKETTY LANE

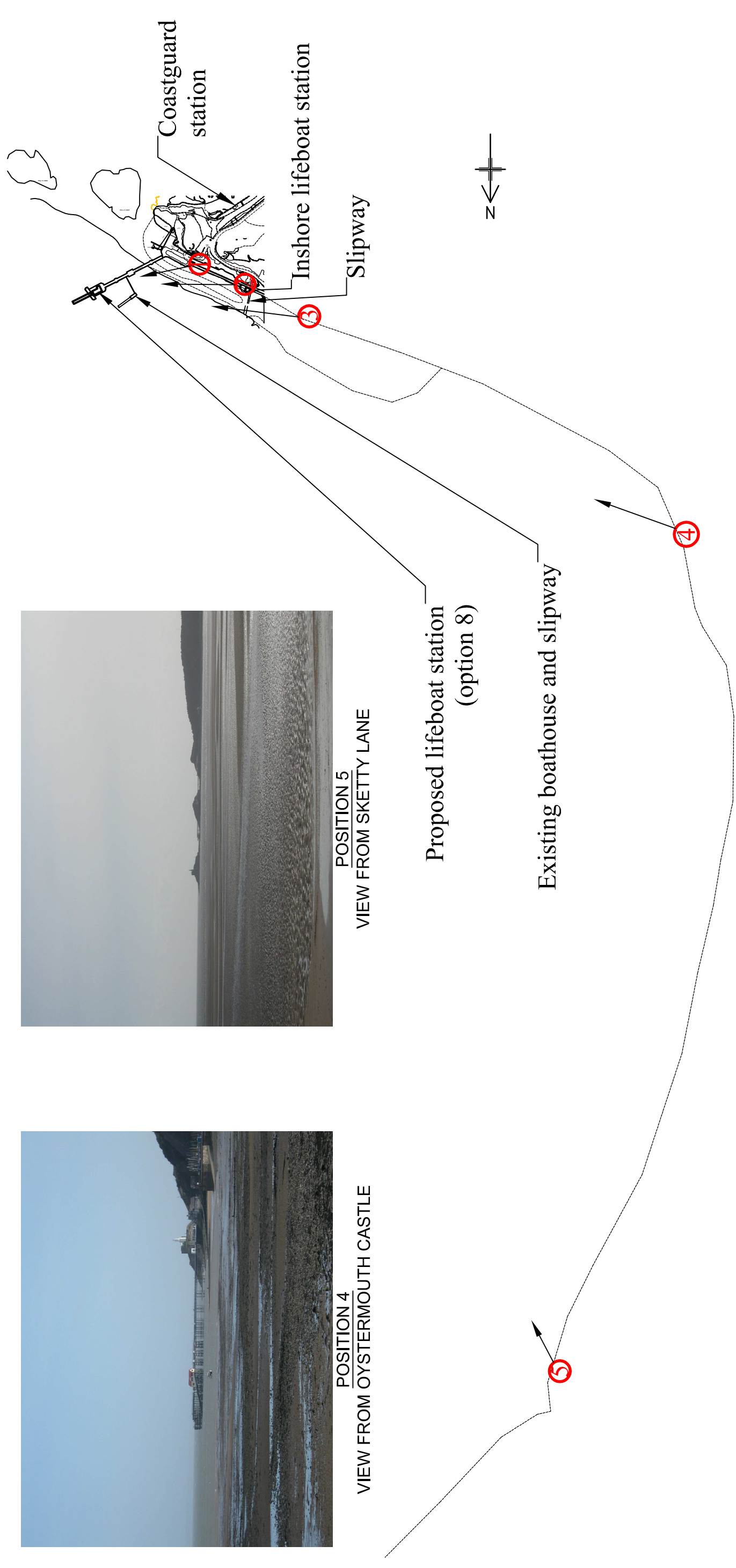




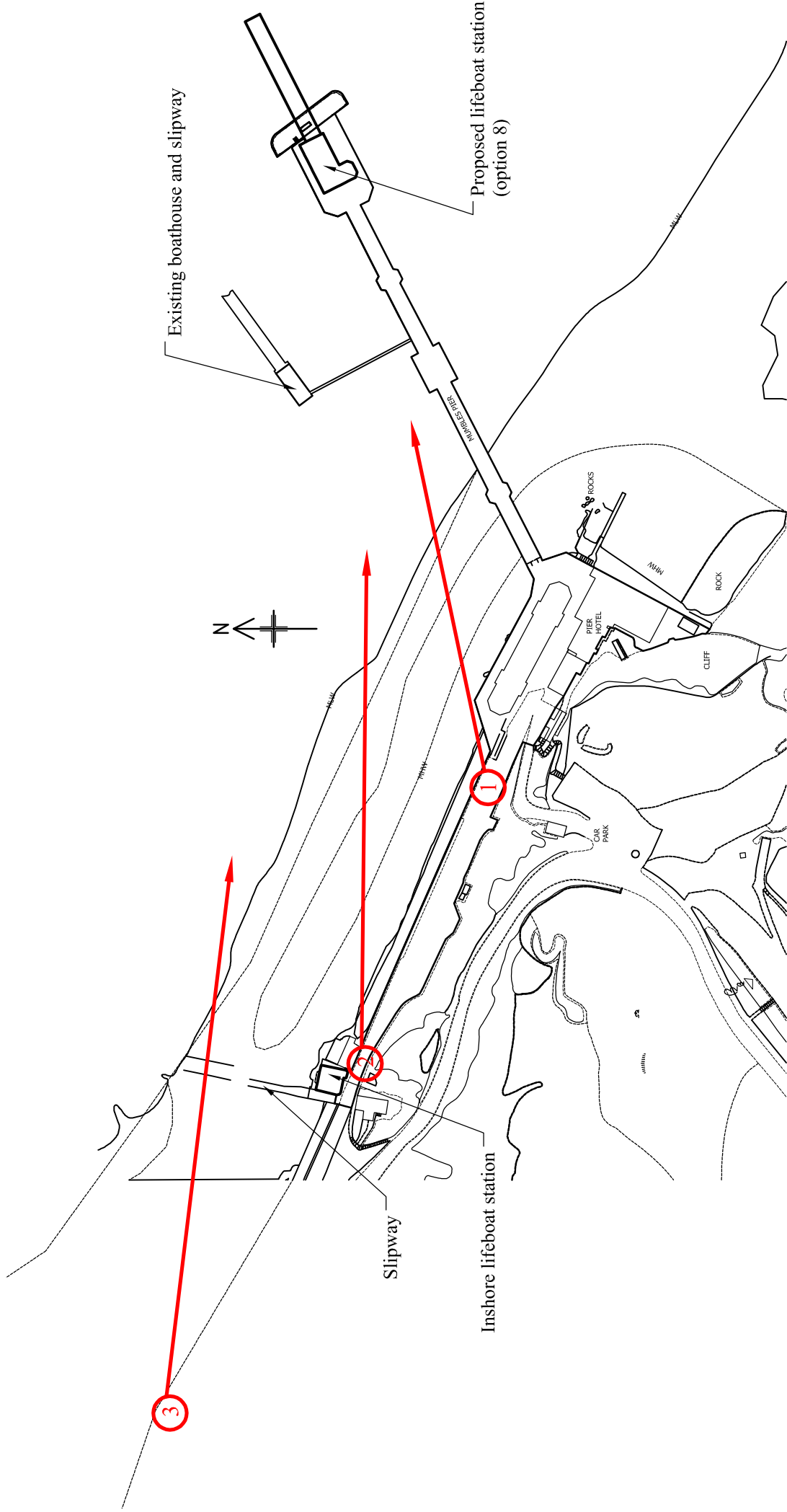
PHOTO MONTAGE 1
VIEW FROM EAST END OF
PIER CAR PARK





PHOTO MONTAGE 2
VIEW FROM WEST END OF
PIER CAR PARK



PHOTO MONTAGE 3
VIEW FROM KNAB SLIPWAY



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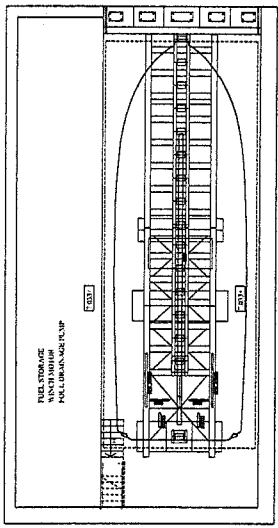
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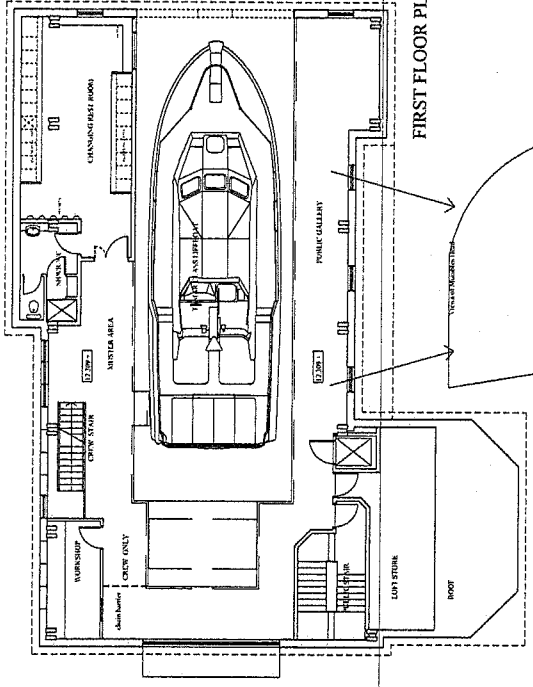
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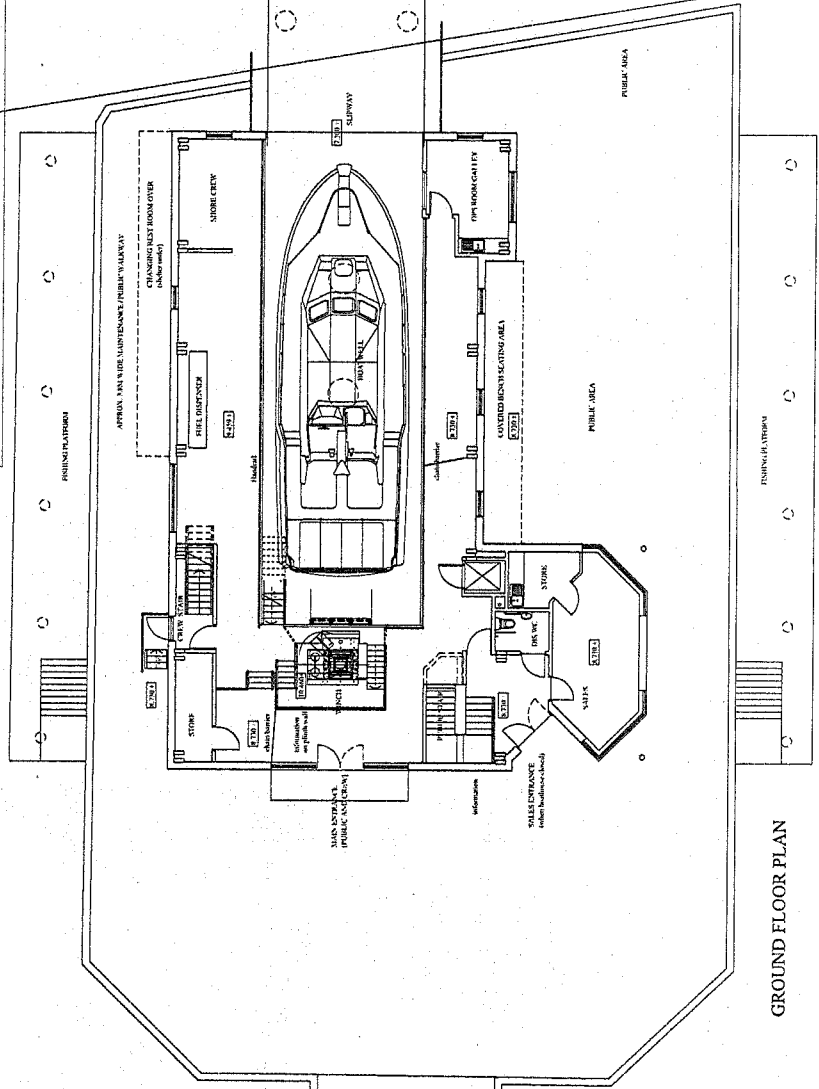
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BOATWELL PLAN



FIRST FLOOR PLAN

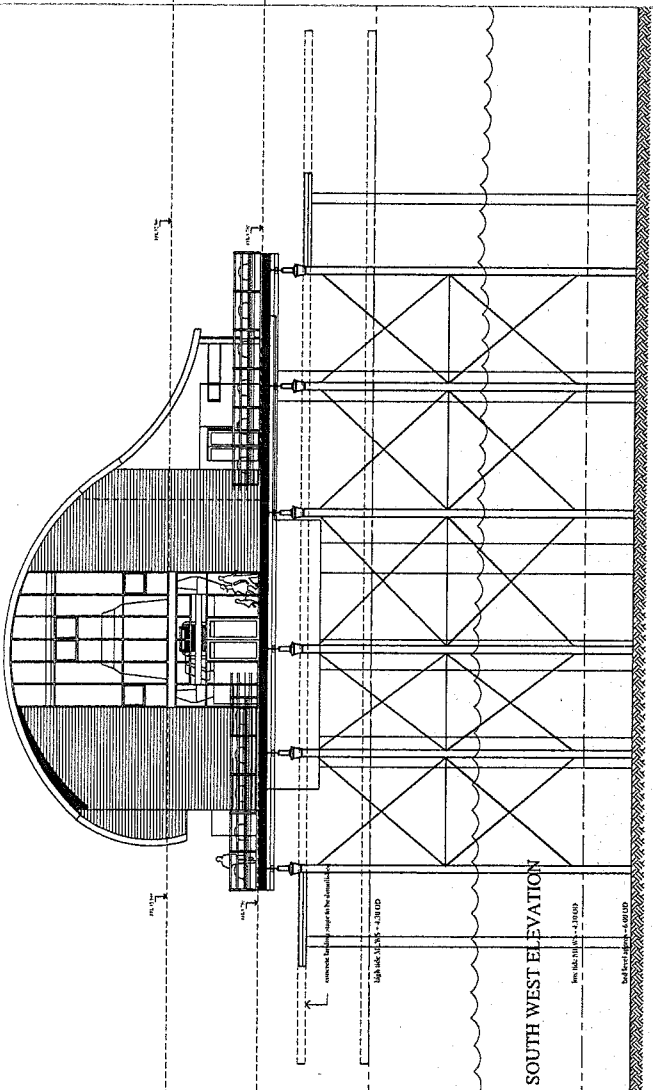


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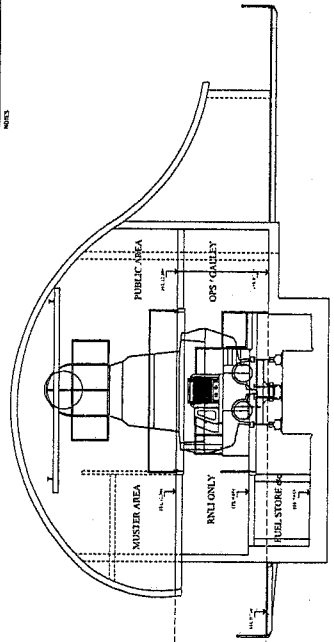
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NOTES



SOUTH WEST ELEVATION



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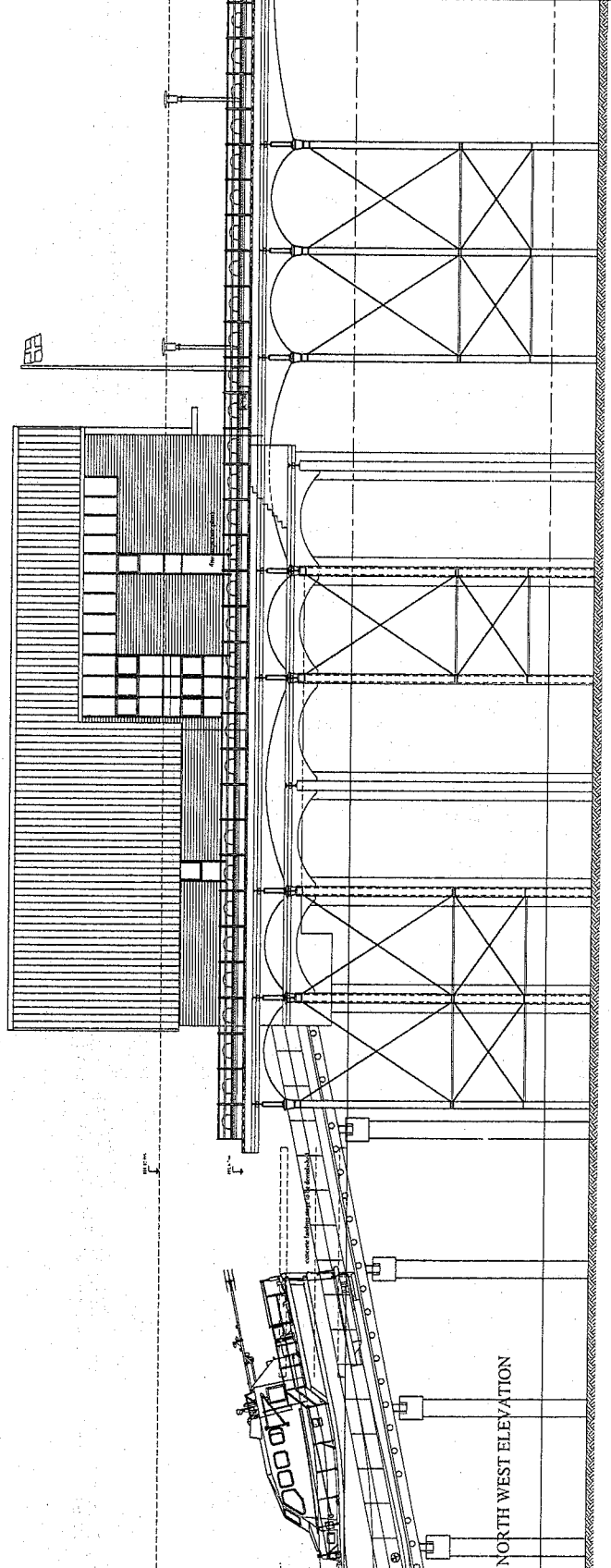
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POWER BOATSET



NORTH WEST ELEVATION

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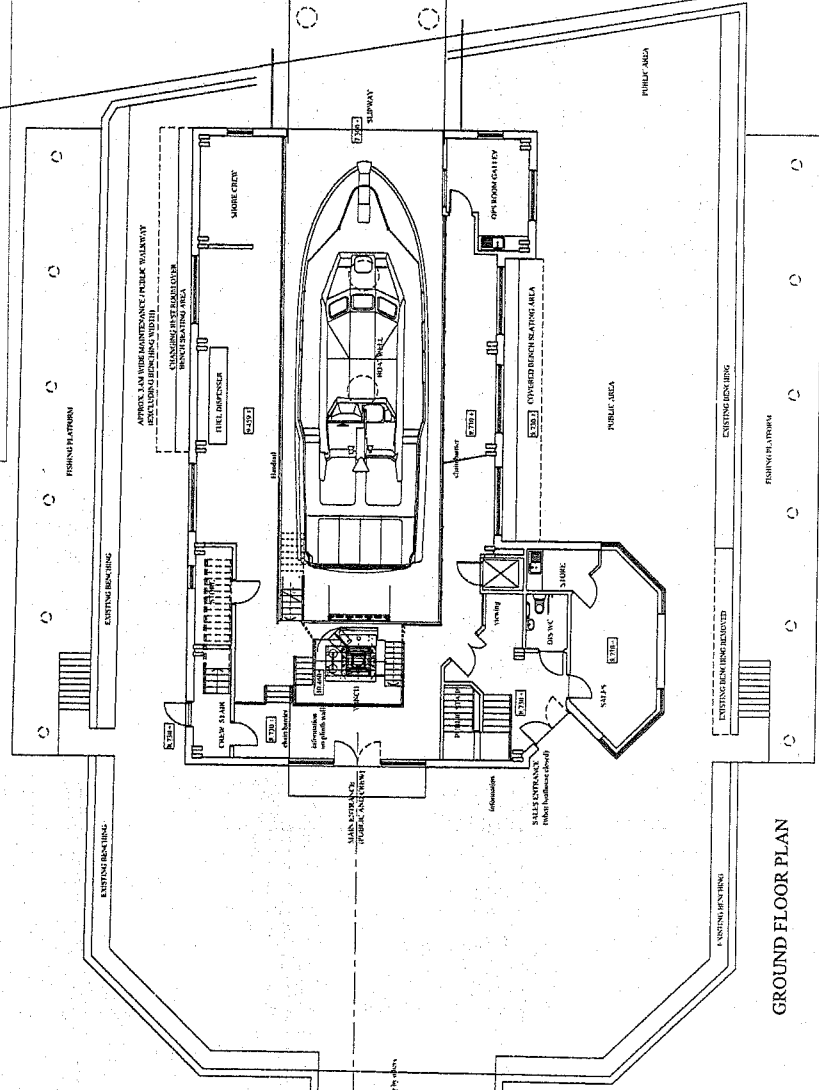
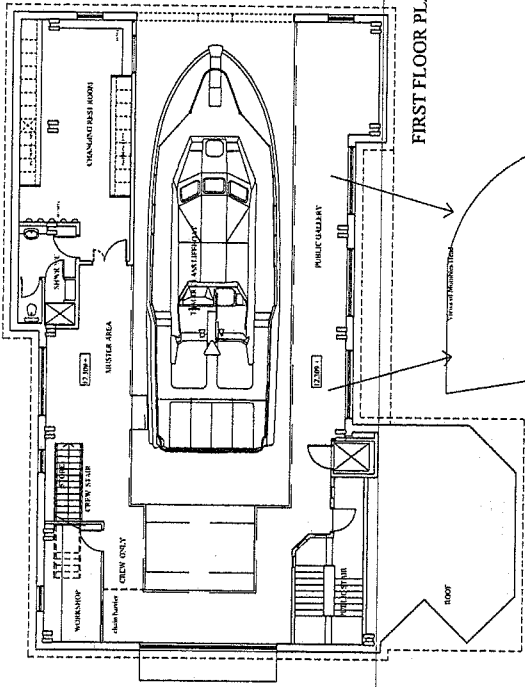
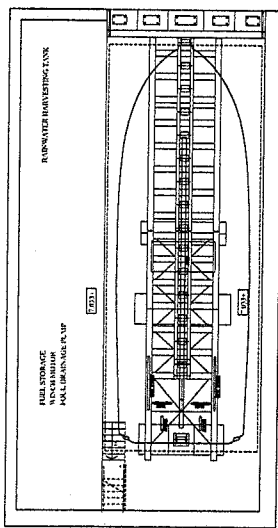
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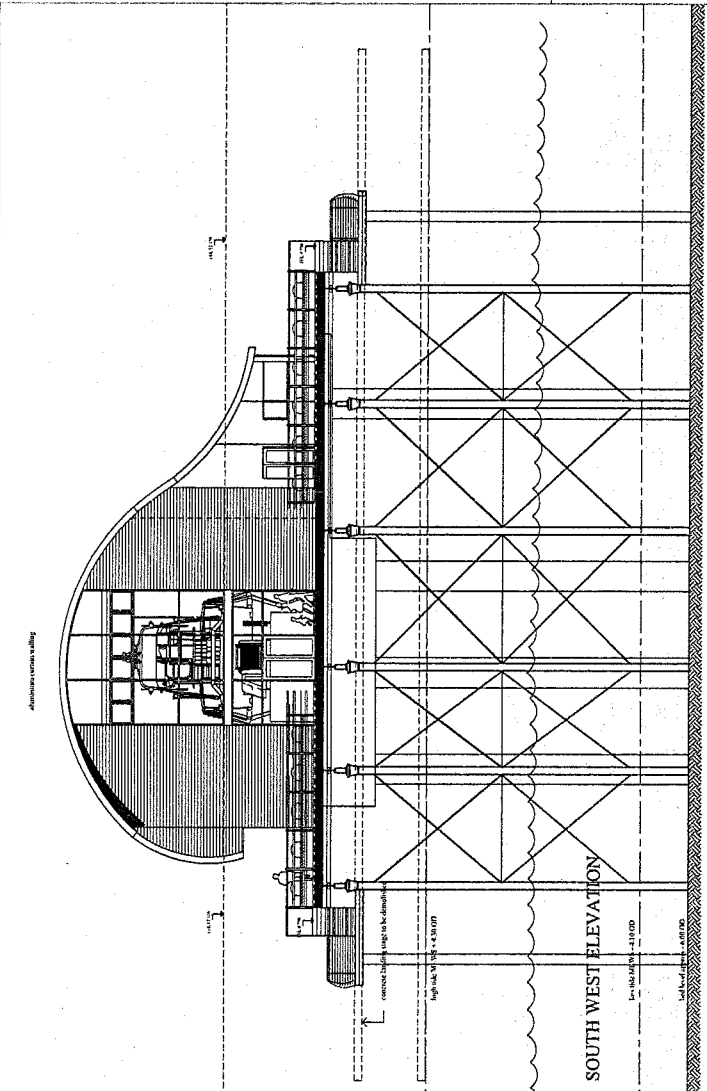
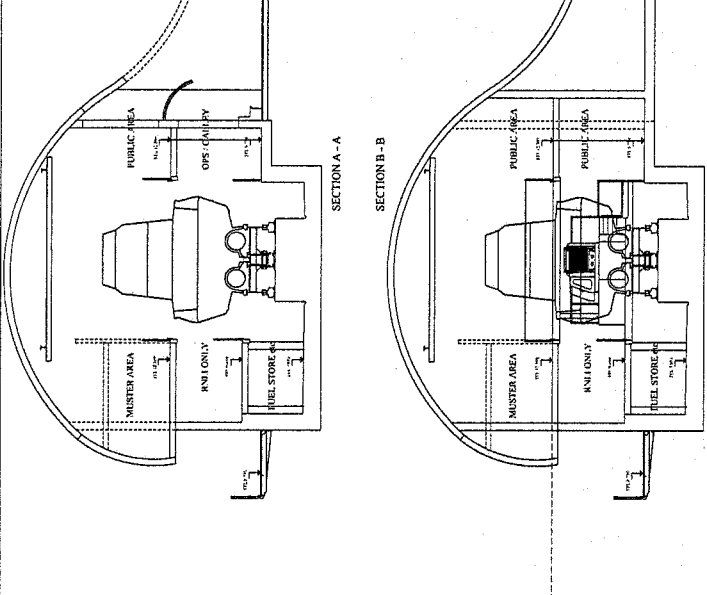
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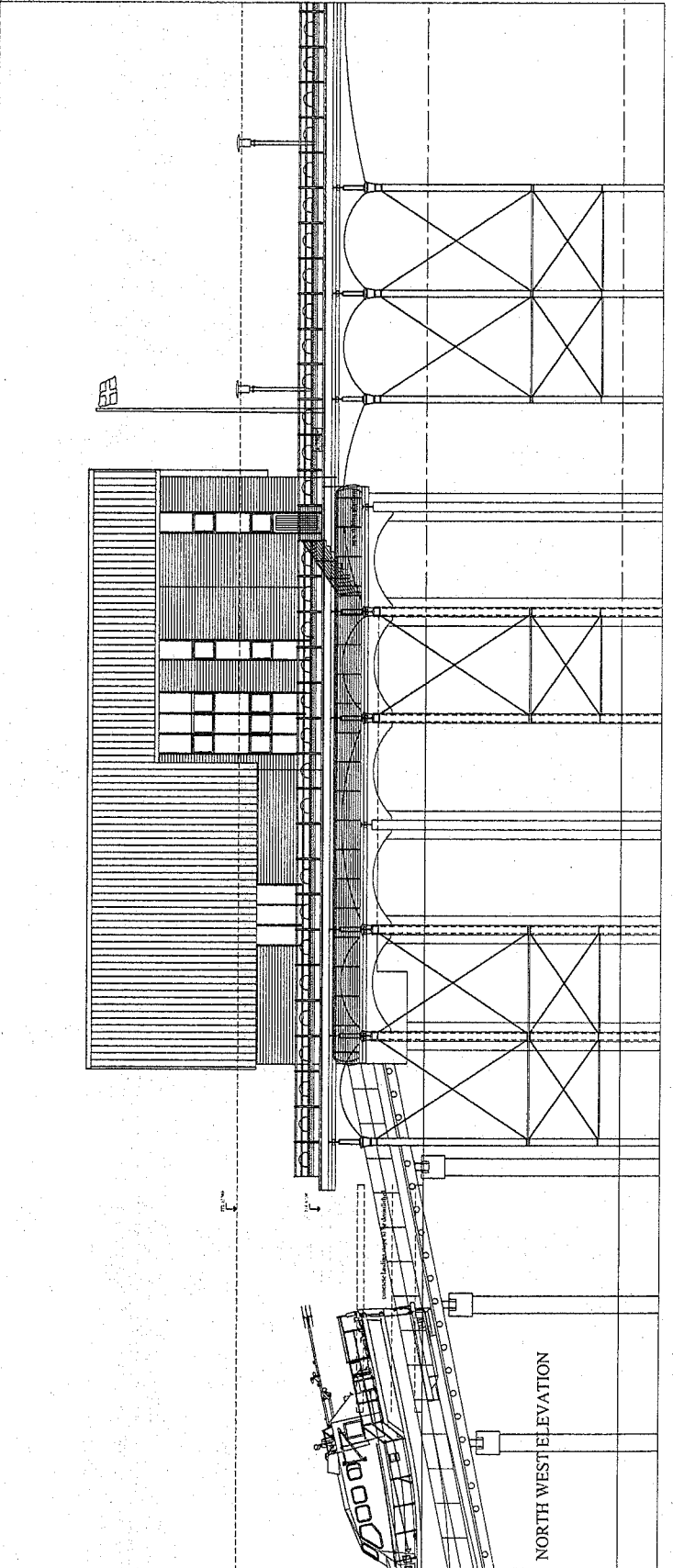
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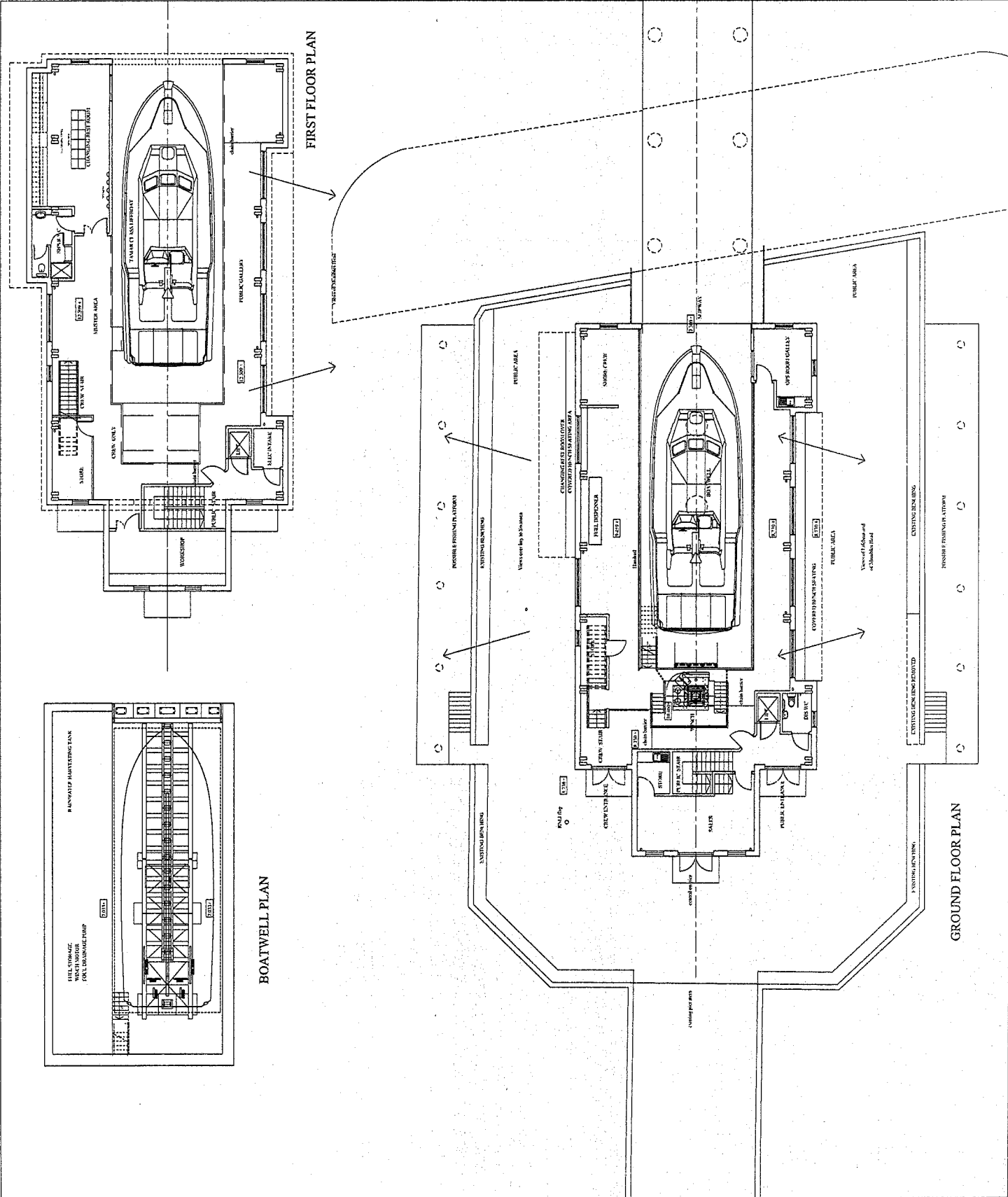
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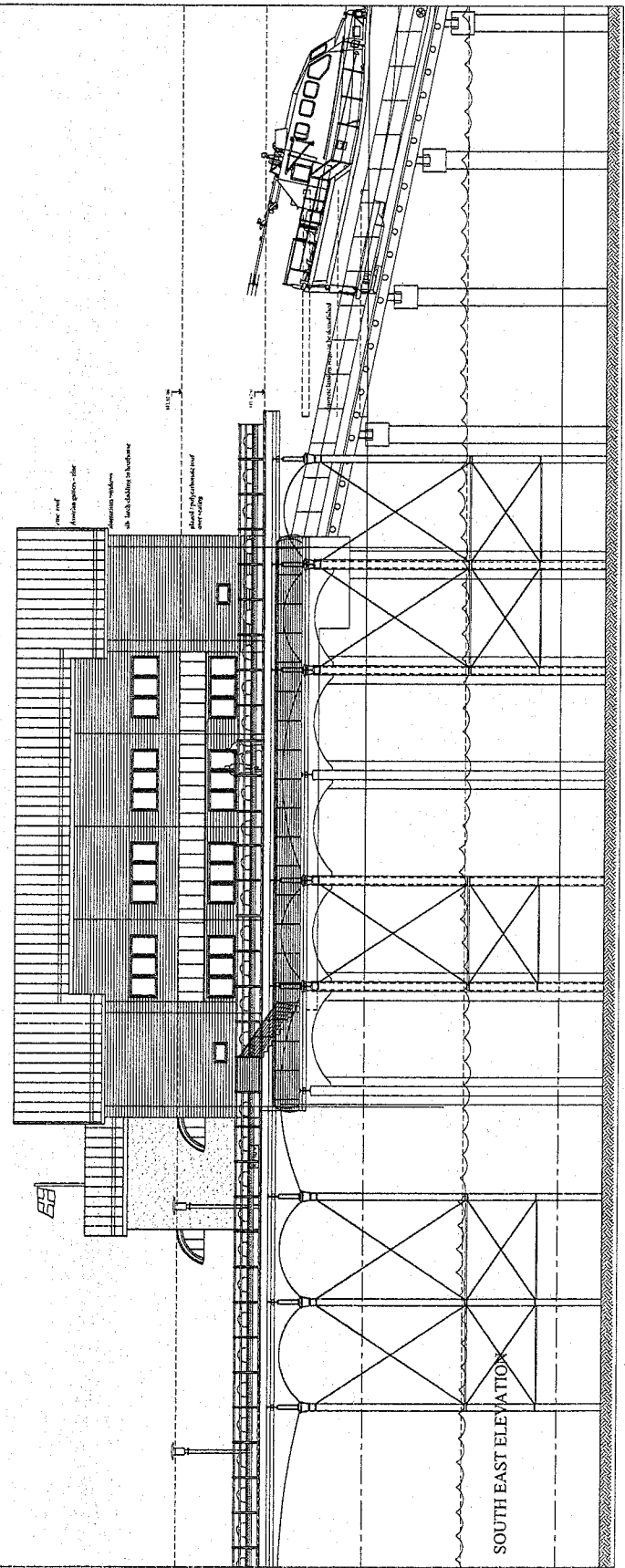
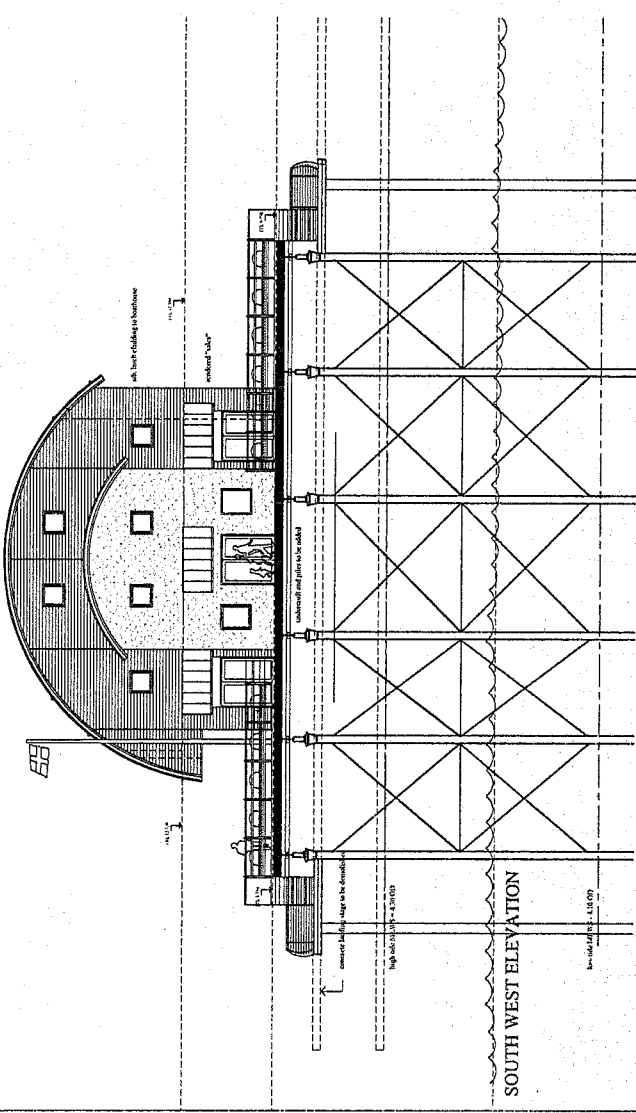
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Appendix EDP 4
KAYMAC Structural Inspection Report

KAYMAC
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Structural Inspection Report

Mumbles Pier

March 2010

Approved copy 1

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Originator:  Kaymac Marine & Civil Engineering Osprey Business Park Byng Street Landore Swansea SA1 2NX Tel: 01792 301818		Client: AMECO The Old Lifeboat Cottage Mumbles Swansea Glamorgan SA3 4E			
Authorisation					
Prepared by:	Chris Hanson Marine Surveyor TechIIMS J. Lippiett BSc (Hons) Project Manager	Signature	Date		
Checked By:	J. Dean BSc (Hons)	Signature	Date		
Approved by:	G. Crees	Signature	Date		
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1. SYNOPSIS

1.1 INSPECTION SYNOPSIS

Of the 492 timber joists inspected, 300 are categorised as satisfactory and require no remedial works at this time, 11 are categorised as satisfactory but requiring redial works, generally in the form of re-fixing or replacement of packing pieces, 87 are categorised as poor and will require replacing at best within the next 3 years subject to continual monitoring and review, and 94 joists are categorised as damaged and require immediate replacement.

In addition, of the 52 diagonal steel bracings inspected between the central waist and the pier head, 2 bracings were found to be in a satisfactory condition but are still not attached at the landward ends to the steel latticework, 5 are categorised as poor due to loss of section through the member due to corrosion and 11 have failed completely. (See plate 6). The condition of these members remains unchanged since the 2009 inspection, but the temporary scaffolding continues to provide adequate lateral restraint.

The inspection of the tie rods between the piers columns revealed a number of defects which require remedial works, 3 tie rods have failed; between piles 65 to 71 and 39 and 40. In addition, and a further 4 are in a poor condition and show significant deterioration since the 2009 inspection, between piles 5 and 7 and piles 7 and 8, with up to 70% depletion due to corrosion. (See plates 4 to 6).

The short term remedial works are therefore recommended;

- Replace the 16 failed or damaged lateral steel bracings in similar materials with galvanised finish.
- Maintain the fencing to the north bay of the outer waist to prevent public access until remedial work to the corroded lattice work has been carried out on the landward and seaward sides.
- Maintain the fencing to the north and south sides of the pier head to prevent public access until remedial work has been carried out.
- Strip the derelict area on the south side of the pier head to safeguard the existing seating and architectural steelwork to prevent loss of these elements to the sea. Budget cost previously submitted including scaffold access system - £35,000.00
- Remove the failed tie bars between piles 65 & 71 as indicated in the report and replace with new galvanised - Budget cost - £7,000.00.
- Remove the corroded tie bars between piles 5 & 6, 5 & 7, 6 & 8 and 7 & 8 as indicated in the report and replace with new galvanised - Budget cost - £28,000.00.
- Replace diagonal tie rod connecting bottom of pile 40 to top of pile 39; removed Autumn 2009 due to failure not yet replaced - Budget cost - £3,500.00.
- Replace the 94 timber joists and associated decking with like materials and remove old timbers from site. Beams 97 & 98 should be prioritised due to the deterioration since the previous inspection.
- Replace the 2 severely decayed waling beams to the north side of the pier head.

The recommended long term works for the pier remain unchanged;

- Replace the existing steel latticework as soon as practicable to prevent further deterioration and possible closure of further sections of the pier to the public
- Continual monitoring of all elements of the pier structure in annual inspection

2.0 INSPECTION

2.1 GENERAL DESCRIPTION & HISTORY

Mumbles Pier is located near Mumbles Head, a rocky promontory at the western end of Swansea Bay at OS Ref; SS630874. Designed by W Sutcliffe Marsh and built by the main contractors Mayoh and Haley of London in conjunction with the Widnes Foundry at a cost of some £17,000, Mumbles Pier was commissioned as the terminus for the Swansea to Mumbles railway. Originally 835ft (253m) in length, Mumbles Pier was officially opened on 10th May 1898 primarily as a landing stage for the Bristol Channel pleasure steamers, and is typical of the pier design of the Victorian period.

The pier was constructed of lattice steelwork on hollow cast iron columns supported on circular hollow cast iron screw piles, with an open boarded pitch pine deck on timber joist beams. At regular intervals along the pier length the column heads are braced by steel lattice work. The ornate cast iron hand railing and parapet at the deck perimeter is supported on a longitudinal waling beam fixed to the ends of the transverse decking joist beams.

A lifeboat station and walkway was added at a right-angle to the main pier neck c1920, and is still used by the RNLI today. On 1st October 1937 the running of Mumbles Pier was taken over by AMECO Ltd. In keeping with most other southern piers Mumbles Pier was sectioned as a defence measure in 1940 and it was a number of years after the war before the pier was finally repaired, re-opening on 9th June 1956. Substantial repair work was required prior to re-opening, and all elements above the cast iron columns were replaced in the early 1950's. It was during this time that a three-tiered concrete landing stage, on steel piles, was added at the pier-head. Shortly after re-opening the Swansea to Mumbles railway was closed.

2.2 INSPECTION METHOD

The inspection of Mumbles Pier consisted of simple foot access to the elevated elements from the deck level, and then foot access from the beach at low water to examine the sub-structure of the pier. Access to the seaward end of the pier for a visual inspection of the piles, columns and bracings was undertaken from the concrete landing stage. Detailed examinations of all the main timber joist beams and the extension beams at the inner, central and outer waists and the pier head was carried out to determine the size and condition of each member. The results of this inspection are detailed in sections 2.4-2.8 in tabulated format for ease of reference. To enable a programme of remedial works, each timber has been given a category which relates to the defect classification chart in section 2.9.

A more general examination of the steel and cast iron elements of the structure below deck level was carried out, and only substantial defects were noted for the purpose of this report. Again, these have been classified in sections 2.10 and 2.12 in tabulated format to allow for programmed remedial works to be carried out.

A detailed inspection of the concrete landing stage was not carried out at this time.

2.3 GENERAL CONDITION

The ornate cast iron handrail is in a generally good condition on both north and south sides of the pier, but would benefit from repainting in some areas with a suitable paint coat system after the appropriate preparation. A broken upstand was noted on the south handrail immediately east of the central waist (See plate no. 4).

A number of waling timbers are in a poor condition at intervals along both sides of the pier length. On the north side of the pier head, where the waling timbers are severely decayed in two locations, the area continues to be fenced off to prevent public access. On the south side, severely decayed waling timbers were noted at the central waist and immediately east of the central waist. (See Plates 5 & 6)

The south side of the pier head continues to remain in a derelict and dilapidated condition, but does not appear to have deteriorated to any great extent since the 2009 inspection. The sagging of the cast iron seating along the pier edge and the cantilever effect of the detached timber beams remains approximately the same. The safety fencing around these areas remains following the 2008 inspection and in conjunction with the fencing to the north side of the pier head, only a narrow walkway now remains for pedestrian access out to the landing stage.

The majority of the decking planks continue to remain in a generally good condition, with some remedial work to secure loose planks having been carried out on the pier head since the previous inspection. The area north of the pier centreline between beam nos. 96 and 99, where deflection of the decking planks of 30-40mm was noted in the 2009 survey, has been made good with the addition of new timber bracings below the decking.

One of the lighting stands at the approach to the pier head is leaning to the south and can be moved freely by hand due to decay of the timbers at the base of the column.

Generally, the cast iron columns throughout the pier length remain in a good condition, with hard marine growth up to 60mm thick, primarily barnacles *Balanus Balanus* & *B. Balanoides* and the Common Mussel *Mytilus Edulis* within the submerged and tidal zones. The repair to the column damaged due to impact with a vessel in 2005 remains in a good condition.

The steel lattice work which support the timber joist beams on the columns is still in a poor condition from the area of the inner waist seaward. In addition, the diagonal bracings preventing lateral flexing of the steel latticework between the central waist and the pier head remain in a similar condition to the previous inspections, having failed or are on the verge of failure. The structure continues to benefit from the installation of temporary scaffolding in these areas which has reinstated lateral support. The diagonal bracings which were not bolted following renovation to the central waist are still detached.

The pair of tie rods observed in the 2009 survey remain detached at the lower connection of the bottom tier between piles 65 and 71. This area is still considered too dangerous to approach to carry out remedial works due to the overhanging damaged elements to the south side of the pier head. The condition of the remaining tie rods connecting adjacent piles appearing to be generally good overall but heavy marine growth cover continues to prevent a more detailed inspection of these elements. A diagonal tie rod which had failed between piles 39 and 40 since the previous survey was subsequently removed by Kaymac in September 2009 and has yet to be replaced. Tie rods between piles 5 and 7 and 7 and 8 have further since the previous survey depleted where failure could occur within the next 1-2 years (See table in section 2.12).

Beam No.	Description	Defect	Category
1	250mm high steel 'I' beam with 100 x 50mm hardwood timber packer to upper side	No defects, recently installed	A
2	250mm high steel 'I' beam with 100 x 50mm hardwood timber packer to upper side	No defects, recently installed	A
3	250mm high steel 'I' beam with 100 x 50mm hardwood timber packer to upper	No defects, recently installed	A

2.4 Main Timber Decking Support Joists Conditional Survey Results

	side		
4	250mm high steel 'I' beam with 100 x 50mm hardwood timber packer to upper side	No defects, recently installed	A
5	300mm high timber beam	No defects, old beam removed	A
6	300mm high timber beam	No defects, old beam removed	A
7	300mm high timber beam	No defects, old beam removed	A
8	300mm high timber beam	No defects, old beam removed	A
9	300mm high timber beam	No defects, old beam removed	A
10	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
11	300mm high timber beam	Split horizontally and badly decayed along full length	A
12	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
13	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
14	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
15	300mm high timber beam	No defects, old beam in situ 300mm to seaward	A
16	300mm high timber beam	No defects, old beam in situ	A
17	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
18	300mm high timber beam	No defects, old beam in situ	A
19	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
20	300mm high timber beam	No defects, old beam in situ	A
21	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
22	300mm high timber beam	Decay to full width of replacement beam, old beam in situ	C
23	300mm high timber beam	Beam showing signs of decay on extreme north end	B
24	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ s/side (adjacent to lamp post 1)	A
25	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam removed	A
26	300mm high timber beam	No defects, old beam removed	A
27	300mm high timber beam	No defects, old beam in situ	A
28	300mm high timber beam	Old beam badly split and decayed over 2/3rds of length	C

Main Timber Decking Support Joists Conditional Survey Results (Cont.)

Beam No.	Description	Defect	Category
29	300mm high timber beam	Beam showing early stages of decay especially at ends	C
30	250mm high timber beam supported on 50mm hardwood packing pieces	Decayed top 50mm at centre of beam-old beam still in situ	B
31	250mm high timber beam supported on 50mm hardwood packing pieces	Beam showing signs of decay to extreme south end-old beam removed	B
32	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A

61	300mm high timber beam	Early signs of decay to top of beam-braced with timber straps	B
62	300mm high timber beam	Early signs of decay to top of beam	B
63	300mm high timber beam	Early signs of decay to top of beam	B
64	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
65	300mm high timber beam	Old beam showing advanced decay across full length of beam	C
65a	250mm high timber beam supported on 50mm hardwood packing pieces	Replacement beam showing early signs of decay to extreme north end-beam out of position	B
66	300mm high timber beam	beam split over full length and showing early signs of decay to north end	B
67	300mm high timber beam	Beam split across top and strapped at centre	B
68	300mm high timber beam	Old beam showing advanced decay across full width of beam	C
69	300mm high timber beam	beam split over full length at top and showing early signs of decay to final 1 metre on south end	B
70	300mm high timber beam	beam split over full length at top and showing early signs of decay to final 1 metre on south end	B
71	300mm high timber beam	No defects, old beam removed	A
72	300mm high timber beam	No defects, old beam in situ (adjacent to lamp post 2)	A
73	300mm high timber beam	No defects, old beam in situ	A
74	300mm high timber beam	No defects, old beam in situ	A
75	300mm high timber beam	Signs of early decay to top 50mm at centre	B
76	300mm high timber beam	No defects, old beam in situ	A
77	300mm high timber beam	Early signs of decay to top 50mm full width and advanced decay to full section on north side	C
78	300mm high timber beam	Advanced decay to full section on north side	C
79	300mm high timber beam	Early signs of decay to top 50mm full width	C
80	300mm high timber beam	Advanced decay to 1/3rd section at centre	C

Main Timber Decking Support Joists Conditional Survey Results (Cont.)

Beam No.	Description	Defect	Category
81	300mm high timber beam	Generally good condition but slight splitting on south end	B
82	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
83	300mm high timber beam	Generally good condition but slight splitting on south end	B
84	300mm high timber beam	Early signs of decay to top 1/3 rd of section full length	C

113	250mm high timber beam supported on 50mm hardwood packing pieces	Replacement beam showing advanced decay across 2/3rd length of beam- old beam in situ	C
114	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
115	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
116	250mm high timber beam supported on 50mm hardwood packing pieces	Advanced decay to final 1.5m on north side- old beam in situ	C
117	300mm high timber beam	Old beam showing advanced decay across full length of beam	C
118	250mm high timber beam supported on 50mm hardwood packing pieces	Replacement beam showing advanced decay across 2/3rd length of beam- old beam in situ (adjacent to lamp post 5)	C
119	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
120	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
121	250mm high timber beam supported on 50mm hardwood packing pieces	Advanced decay to final 1.5m on north side- old beam in situ	C
122	300mm high timber beam	Old beam showing advanced decay across top full length of beam	C
123	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
124	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
125	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
126	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
127	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
128	250mm high timber beam supported on 50mm hardwood packing pieces	Advanced decay to final 1.5m on north side- old beam in situ	C
129	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
130	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
131	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A

Main Timber Decking Support Joists Conditional Survey Results (Cont.)

Beam No.	Description	Defect	Category
132	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
133	300mm high timber beam	Old beam showing advanced decay across full length of beam	C
134	300mm high timber beam	Old beam showing advanced decay across full length of beam	C
135	300mm high timber beam	Splits on final 2m of south end	A
136	300mm high timber beam	Old beam showing advanced decay at top centre 1/3rd of beam	B
137	300mm high timber beam	Old beam showing advanced decay	B

		at top centre 1/3rd of beam	
138	300mm high timber beam	Advanced decay to final 2-3m on south side	C
139	300mm high timber beam	Old beam showing advanced decay at top centre 1/3rd of beam and advanced decay to final 1.5m on south side	C
140	300mm high timber beam	Advanced decay to final 2m on south side	C
141	300mm high timber beam	Old beam showing advanced decay at top centre 1/3rd of beam	C
142	300mm high timber beam	Old beam showing advanced decay at top centre 1/3rd of beam	C
143	300mm high timber beam	Advanced decay and splitting to final 1m on north side	B
144	300mm high timber beam	Generally good but splits at extreme south end	B
145	300mm high timber beam	New timber element replaced recently and in good condition	A
146	300mm high timber beam	New timber element replaced recently and in good condition	A
147	300mm high timber beam	New timber element replaced recently and in good condition	A
148	300mm high timber beam	New timber element replaced recently and in good condition	A
149	300mm high timber beam	New timber element replaced recently and in good condition	A
150	300mm high timber beam	New timber element replaced recently and in good condition	A
151	300mm high timber beam	New timber element replaced recently and in good condition	A
152	300mm high timber beam	New timber element replaced recently and in good condition	A
153	300mm high timber beam	New timber element replaced recently and in good condition	A
154	300mm high timber beam	New timber element replaced recently and in good condition	A
155	300mm high timber beam	New timber element replaced recently and in good condition	A

Main Timber Decking Support Joists Conditional Survey Results (Cont.)

Beam No.	Description	Defect	Category
156	300mm high timber beam	New timber element replaced recently and in good condition	A
157	300mm high timber beam	New timber element replaced recently and in good condition	A
158	300mm high timber beam	New timber element replaced recently and in good condition	A
159	300mm high timber beam	New timber element replaced recently and in good condition	A
160	300mm high timber beam	New timber element replaced recently and in good condition	A

161	300mm high timber beam	New timber element replaced recently and in good condition	A
162	300mm high timber beam	New timber element replaced recently and in good condition	A
163	300mm high timber beam	New timber element replaced recently and in good condition	A
164	300mm high timber beam	New timber element replaced recently and in good condition	A
165	300mm high timber beam	New timber element replaced recently and in good condition	A
166	300mm high timber beam	New timber element replaced recently and in good condition	A
167	300mm high timber beam	New timber element replaced recently and in good condition	A
168	300mm high timber beam	New timber element replaced recently and in good condition	A
169	300mm high timber beam	New timber element replaced recently and in good condition	A
170	300mm high timber beam	No defects, old beam removed	A
171	300mm high timber beam	No defects, old beam removed	A
172	300mm high timber beam	No defects, old beam removed	A
173	300mm high timber beam	No defects, old beam removed	A
174	300mm high timber beam	No defects, old beam removed	A
175	300mm high timber beam	No defects, old beam removed	A
176	300mm high timber beam	No defects, old beam removed	A
177	300mm high timber beam	Generally good; top 20mm of beam showing slight decay over full length	B
178	300mm high timber beam	Generally good; top 20mm of beam showing slight decay over full length	B
179	300mm high timber beam	Generally good; top 20mm of beam showing slight decay over full length (adjacent to lamp post 8)	B
180	300mm high timber beam	Generally good; top 50mm of beam showing slight decay at centre	B
181	300mm high timber beam	Beam showing advanced decay for the final 0.80m of the north end, and from the centre to the south end	C
182	300mm high timber beam	Beam showing advanced decay from centre to north side	C
183	300mm high timber beam	Beam showing advanced decay at centre and both extreme ends	C
184	300mm high timber beam	Generally good; top 50mm of beam showing slight decay from centre to south side	B

Main Timber Decking Support Joists Conditional Survey Results (Cont.)

Beam No.	Description	Defect	Category
185	300mm high timber beam	Old beam showing advanced decay across full length of beam	C
186	300mm high timber beam	Old beam showing advanced decay across full length of beam	C
187	250mm high timber beam	No defects, packing pieces missing from below beam- old beam in situ	A1
188	300mm high timber beam	Old beam showing advanced decay across full length of beam	C
189	300mm high timber beam	Old beam showing advanced decay across full length of beam	C
190	300mm high timber beam	Old beam showing advanced decay	C

Table 11: Main Timber Decking Support Joists Conditional Survey Results (Cont.)

		across full length of beam	
191	300mm high timber beam	No defects, old beam in situ	A
192	300mm high timber beam	Beam showing early signs of decay to top of beam full length	B
193	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
194	300mm high timber beam	Old beam showing advanced decay across full depth of beam at centre	C
195	300mm high timber beam	Old beam showing slight decay across full length of beam	B
196	300mm high timber beam	Old beam showing advanced decay across full depth of beam at centre and top 50mm full length of beam	C
197	300mm high timber beam	Beam showing early signs of decay to top 50mm full length of beam	B
198	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
198b	300mm high timber beam	Beam showing advanced signs of decay to top of beam full length- butted up to 198	C
199	250mm high timber beam supported on 50mm hardwood packing pieces	No defects, old beam in situ	A
200	300mm high timber beam	Old beam showing advanced decay across full length of beam	C
201	300mm high timber beam	Beam showing decay to top 50mm of beam from centre to south side	B
202	300mm high timber beam	No defects, old beam removed	A
203	300mm high timber beam	Old beam showing advanced decay across full length of beam	C
204	300mm high timber beam	No defects, old beam in situ	A
205	300mm high timber beam	Generally good; top 30mm of beam showing slight decay over full length	B
206	300mm high timber beam	Generally good; top 50mm of beam showing slight decay over full length but advanced decay to extreme north side	B

Main Timber Decking Support Joists Conditional Survey Results (Cont.)

Beam No.	Description	Defect	Category
207	2 x 300mm high timber beams	Beam showing early signs of decay to top of beam full length (adjacent to lamp post 9)	B
208	300mm high timber beam	No defects, old beam in situ	A
209	300mm high timber beam	No defects, old beam in situ	A
210	300mm high timber beam	No defects, old beam in situ	A
211	300mm high timber beam	Old beam showing slight decay 1m in from south side	B
212	300mm high timber beam	No defects, old beam in situ	A
213	300mm high timber beam	Old beam showing advanced decay across full length of beam	C

Table 12: Main Timber Decking Support Joists

214	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
215	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
216	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
217	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
218	300mm high timber beam	No defects- old beam in situ	A
219	300mm high timber beam	No defects- old beam in situ	A
220	300mm high timber beam	Old beam showing advanced decay across full length of beam	C
221	300mm high timber beam	No defects- old beam in situ (adjacent to lamp post 10)	A
222	300mm high timber beam	No defects- old beam in situ	A
223	300mm high timber beam	No defects- old beam in situ	A
224	300mm high timber beam	Beam showing advanced decay to final 2m of south side	B
225	300mm high timber beam	No defects, old beam removed	A
226	300mm high timber beam	Generally good; slight splitting final 2m of north side	B
227	300mm high timber beam	Generally good; top 50mm of beam showing slight decay over full length	B
228	300mm high timber beam	Generally good; top 30mm of beam showing slight decay over full length	B
229	300mm high timber beam	No defects- old beam in situ	A
230	300mm high timber beam	No defects- old beam in situ	A
231	300mm high timber beam	No defects- old beam in situ	A
232	300mm high timber beam	No defects- old beam in situ	A
233	300mm high timber beam	No defects- old beam in situ	A
234	300mm high timber beam	No defects, old beam removed	A
235	300mm high timber beam	No defects- old beam in situ (adjacent to lamp post 11, noggins decayed)	A
236	300mm high timber beam	Old beam showing advanced decay 3m in from south side	C
237	300mm high timber beam	No defects- old beam in situ	A
238	300mm high timber beam	Old beam showing advanced decay to final 1.5 south side	C

Main Timber Decking Support Joists Conditional Survey Results (Cont.)

Beam No.	Description	Defect	Category
239	300mm high timber beam	Old beam showing advanced decay to final 1.5 south side	C
240	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
241	300mm high timber beam	No defects, old beam in situ	A
242	300mm high timber beam	Top 50mm of beam showing slight decay over full length and full depth for final 1.5m of south side	B
243	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
244	250mm high timber beam supported on	No defects- old beam in situ	A

	50mm hardwood packing pieces		
245	250mm high timber beam supported on 50mm hardwood packing pieces	Beam showing slight decay to final 1m of south side	B
246	250mm high timber beam supported on 50mm hardwood packing pieces	Beam showing advanced decay to final 1m of south side	B
247	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
248	250mm high timber beam supported on 50mm hardwood packing pieces	Generally good; top 30mm of beam showing slight decay over full length- old beam in situ	B
249	300mm high timber beam	No defects- old beam in situ	A
250	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam removed	A
251	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
252	250mm high timber beam supported on 50mm hardwood packing pieces	Replacement beam showing decay to top 50mm from centre to south end	B
253	300mm high timber beam	Beam shows splitting and early stages of decay from centre to north end	B
254	300mm high timber beam	Generally good; top 20mm of beam showing slight decay over full length	B
255	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
256	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
257	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ- packer dropped out	A1
258	300mm high timber beam	Generally good; top 20mm of beam showing slight decay over full length	B
259	300mm high timber beam	No defects- old beam in situ	A
260	300mm high timber beam	Replacement beam showing decay to top 50mm from centre to south end	B
261	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
262	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A

Main Timber Decking Support Joists Conditional Survey Results (Cont.)

Beam No.	Description	Defect	Category
263	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam removed	A
264	300mm high timber beam	No defects- old beam in situ	A
265	300mm high timber beam	No defects, old beam in situ	A
266	300mm high timber beam	Top 50mm of beam showing slight decay over full length	B
267	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam removed	A
268	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam removed	A

269	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam removed	A
270	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam removed	A
271	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam removed	A
272	300mm high timber beam	No defects- old beam removed	A
273	300mm high timber beam	No defects- old beam in situ	A
274	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam removed	A
275	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam removed	A
276	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
277	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam removed	A
278	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam removed	A
279	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam removed	A
280	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
281	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
282	300mm high timber beam	No defects	A
283	300mm high timber beam	No defects	A
284	300mm high timber beam	Beam showing decay to top 50mm full length	B
285	300mm high timber beam	Beam showing decay to top 50mm full length	B
286	300mm high timber beam	Beam showing decay to top 50mm full length	B
287	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
288	250mm high timber beam supported on 50mm hardwood packing pieces	No defects- old beam in situ	A
289	300mm high timber beam	Beam showing decay to top 40mm full length	B
290	300mm high timber beam	Beam showing decay to top 50mm full length	B

Main Timber Decking Support Joists Conditional Survey Results (Cont.)

Beam No.	Description	Defect	Category
291	300mm high timber beam	No defects- old beam removed	A
292	300mm high timber beam	No defects- old beam in situ	A
293	300mm high timber beam	Top 50mm of beam showing slight decay over full length	B
294	300mm high timber beam	No defects- old beam removed	A
295	300mm high timber beam	Beam showing slight decay to top 50mm to final 1m of north side	B
296	300mm high timber beam	Beam showing slight decay to top 50mm full length and advanced decay to extreme end of north side	B

Table 1: Defects on existing timber beams

297	300mm high timber beam	No defects- old beam removed	A
298	300mm high timber beam	No defects- old beam removed	A
299	300mm high timber beam	No defects- old beam removed	A
300	300mm high timber beam	No defects- old beam removed	A
301	300mm high timber beam	No defects- old beam removed	A
302	300mm high timber beam	No defects- old beam removed	A
303	300mm high timber beam	No defects- old beam removed	A
304	300mm high timber beam	No defects- old beam removed	A
305	300mm high timber beam	No defects- old beam removed	A
306	300mm high timber beam	No defects- old beam removed	A

Beam No.	Description	Defect	Category
48n	250mm high timber beam with 50mm x 100mm hardwood timber packer to top	Extension to main beam on landward side-No defects	A
49n	250mm high timber beam with 50mm x 100mm hardwood timber packer to top	Extension to main beam on landward side-No defects	A
50n	250mm high timber beam with 50mm x 100mm hardwood timber packer to top	Extension to main beam on landward side-No defects	A
51n	250mm high timber beam with 50mm x 100mm hardwood timber packer to top	Extension to main beam on landward side-No defects	A
52n	250mm high timber beam with 50mm x 100mm hardwood timber packer to top	Extension to main beam on landward side-No defects	A
53n	250mm high timber beam with 50mm x 100mm hardwood timber packer to top	Extension to main beam on landward side-No defects	A
54n	250mm high timber beam with 50mm x 100mm hardwood timber packer to top	Extension to main beam on landward side-No defects	A
55n	250mm high timber beam with 50mm x 100mm hardwood timber packer to top	Extension to main beam on landward side-No defects	A

56n	250mm high timber beam with 50mm x 100mm hardwood timber packer to top	Extension to main beam on landward side-No defects	A
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2.5

**Inner Waist Timber Decking Support Extension Joists
Conditional Survey Results**

The main timber joists beams extend fully to the south side of the pier within the area of the inner waist and are extended only on the north side. The beam numbers are related to the main beam numbers in section 2.3, and are denoted n to indicate north.

2.6 Central Waist Timber Decking Support Extension Joists Conditional Survey Results

The main timber joist beams continue centrally to the pier within the area of the central waist and are extended both on the north side and south sides. The beam numbers are related to the main beam numbers in the section 2.3, and are denoted n to indicate north and s to indicate south.

Beam No.	Description	Defect	Category
129n	300mm high timber beam	Recently renewed-no defects	A
130n	300mm high timber beam	Recently renewed-no defects	A
131n	300mm high timber beam	Recently renewed-no defects	A
132n	300mm high timber beam	Recently renewed-no defects	A
133n	300mm high timber beam	Recently renewed-no defects	A
134n	300mm high timber beam	Recently renewed-no defects	A
135n	300mm high timber beam	Recently renewed-no defects	A
136n	300mm high timber beam	Recently renewed-no defects	A
137n	300mm high timber beam	Recently renewed-no defects	A
138n	300mm high timber beam	Recently renewed-no defects	A
139n	300mm high timber beam	Recently renewed-no defects	A
140n	300mm high timber beam	Recently renewed-no defects	A
141n	300mm high timber beam	Recently renewed-no defects	A
142n	300mm high timber beam	Recently renewed-no defects	A
143n	300mm high timber beam	Recently renewed-no defects	A
144n	300mm high timber beam	Recently renewed-no defects	A
145n	300mm high timber beam	Recently renewed-no defects	A
146n	300mm high timber beam	Recently renewed-no defects	A
147n	300mm high timber beam	Recently renewed-no defects	A
148n	300mm high timber beam	Recently renewed-no defects	A
149n	300mm high timber beam	Recently renewed-no defects	A
150n	300mm high timber beam	Recently renewed-no defects	A
151n	300mm high timber beam	Recently renewed-no defects	A
152n	300mm high timber beam	Recently renewed-no defects	A
153n	300mm high timber beam	Recently renewed-no defects	A
154n	300mm high timber beam	Recently renewed-no defects	A
155n	300mm high timber beam	Recently renewed-no defects	A
129s	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
130s	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
131s	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
132s	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
133s	250mm high timber beam supported on 50mm hardwood packing pieces	Beam has advanced decay on final 1m of south side	C
134s	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
135s	300mm high timber beam	No defects noted	A
136s	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
137s	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
138s	300mm high timber beam	No defects noted	A
139s	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A

**Central Waist Timber Decking Support Extension Joists
Conditional Survey Results (Cont.)**

Beam No.	Description	Defect	Category
140s	300mm high timber beam	Beam showing advanced decay to final 1m of south end	B
141s	300mm high timber beam	Beam showing signs of advanced decay over final 2m of south end	C
142s	300mm high timber beam	No defects	A
143s	300mm high timber beam	Beam showing advanced decay to both extreme ends	C
144s	300mm high timber beam	Beam showing signs of advanced decay over final 1m of south end	C
145s	300mm high timber beam	Beam showing advanced decay to full length	C
146s	300mm high timber beam	Beam showing advanced decay to final 2m of both ends	C
147s	300mm high timber beam	Beam showing advanced decay to final 2m of both ends	C
148s	300mm high timber beam	Beam showing advanced decay to final 2m of both ends	C
149s	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
150s	250mm high timber beam supported on 50mm hardwood packing pieces	Beam showing advanced decay to full length	C
151s	250mm high timber beam supported on 50mm hardwood packing pieces	Beam showing advanced decay to full length	C
152s	250mm high timber beam supported on 50mm hardwood packing pieces	Beam showing advanced decay to full length	C
153s	300mm high timber beam	Beam showing advanced decay to both extreme ends	C
154s	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
155s	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
155s1	300mm high timber beam	Coping support beam supporting north east coping return-advance decay to full beam length	C

2.7 Outer Waist Timber Decking Support Extension Joists Conditional Survey Results

The main timber joist beams continue centrally to the pier within the area of the outer waist and are extended in most cases both on the north side and south sides. The beam numbers are related to the main beam numbers in the section 2.3, and are denoted n to indicate north and s to indicate south. If 2 extension beams are present to the main beam, l & s are used to denote landward or seaward in relation to main beams. If beam numbers are not recorded, this means main beam runs full width without extension.

Beam No.	Description	Defect	Category
201nl	300mm high timber beam	No defects	A
201ns	300mm high timber beam	No defects	A
202n	300mm high timber beam	No defects	A
203nl	300mm high timber beam	Split along full length of beam and showing signs of advanced decay to both extreme ends	C
203ns	300mm high timber beam	No defects	A
204n	300mm high timber beam	Split along full length of beam and showing signs of decay to top 50mm	B
205nl	300mm high timber beam	No defects	A
205ns	300mm high timber beam	No defects	A
207n	300mm high timber beam	No defects	A
200s	300mm high timber beam	No defects	A
202sl	300mm high timber beam	Recently renewed-no defects	A
202ss	300mm high timber beam	Generally good but slight splitting around top of beam	A
204sl	300mm high timber beam	No defects	A
204ss	300mm high timber beam	No defects	A
206sl	300mm high timber beam	No defects	A
206ss	300mm high timber beam	Beam showing signs of advanced decay to both extreme ends	C

2.8 Pier Head Timber Decking Support Extension Joists Conditional Survey Results

The main timber joist beams continue centrally to the pier within the area of the pier head and are extended in two separate runs on the north side and originally on the south sides. The south side timbers are either missing or in a state of dilapidation and currently this section of the pier head is derelict; therefore the timber beam survey does not cover this area. The beam numbers are related to the main beam numbers in the section 2.3, and are denoted n to indicate inner extensions north of the main beam, and nn to indicate outer extensions north of the inner extension beams.

Beam No.	Description	Defect	Category
252n	300mm high timber beam	No defects	A
253n	300mm high timber beam	No defects-old beam in situ	A
254n	300mm high timber beam	Split along full length of beam and showing signs of advanced decay to top 60mm	C
255n	300mm high timber beam	No defects-old beam in situ	A
256n	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
257n	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
258n	300mm high timber beam	No defects-old beam in situ	A
259n	300mm high timber beam	No defects-old beam in situ	A
260n	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
261n	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
262n	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
263n	300mm high timber beam	Split along full length of beam and showing signs of advanced decay to top 100mm	C
264n	300mm high timber beam	Some splitting but generally sound	B
265n	300mm high timber beam	No defects	A
266n	300mm high timber beam	Some splitting but generally sound	B
267n	300mm high timber beam	Beam split and showing signs of early decay to both extreme ends	B
268n	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
269n	300mm high timber beam	No defects	A
270n	300mm high timber beam	Split along full length of beam and showing signs of advanced decay to top 50mm	C
271n	300mm high timber beam	No defects	A
272n	300mm high timber beam	Split along full length of beam and showing signs of advanced decay to top 50mm at centre	B
273n	300mm high timber beam	Some splitting but generally sound	B
274n	300mm high timber beam	Some splitting but generally sound	B
275n	300mm high timber beam	No defects-old beam in situ	A
276n	300mm high timber beam	No defects-old beam in situ	A
277n	300mm high timber beam	No defects-old beam in situ	A

Pier Head Timber Decking Support Extension Joists

Conditional Survey Results (Cont.)

Beam No.	Description	Defect	Category
278n	300mm high timber beam	No defects	A
279n	300mm high timber beam	No defects	A
280n	300mm high timber beam	Beam split and showing signs of early decay to both extreme ends	B
281n	300mm high timber beam	No defects	A
282n	300mm high timber beam	No defects-old beam in situ	A
283n	300mm high timber beam	No defects-old beam in situ	A
284n	300mm high timber beam	No defects	A
285n	300mm high timber beam	No defects-old beam in situ	A
286n	300mm high timber beam	No defects	A
287n	300mm high timber beam	Beam split and showing signs of early decay to both extreme ends	B
288n	300mm high timber beam	Beam split and showing signs of early decay to both extreme ends	B
289n	300mm high timber beam	Beam split and showing signs of early decay to both extreme ends	B
290n	300mm high timber beam	No defects-old beam in situ	A
291n	300mm high timber beam	No defects-old beam in situ	A
292n	300mm high timber beam	Beam split and showing signs of early decay to both extreme ends	B
293n	300mm high timber beam	Beam split and showing signs of early decay to both extreme ends	B
294n	300mm high timber beam	Beam split and showing signs of advanced decay to final 3m of north end	C
295n	300mm high timber beam	No defects-old beam in situ	A
296n	300mm high timber beam	No defects	A
297n	300mm high timber beam	Beam split and showing signs of early decay to final 1m of north end	B
298n	300mm high timber beam	Some splitting but generally sound	B
299n	300mm high timber beam	Some splitting but generally sound	B
300n	300mm high timber beam	No defects	A
301n	300mm high timber beam	No defects	A
302n	300mm high timber beam	Beam split and showing signs of advanced decay to full length	C
303n	300mm high timber beam	No defects	A
304n	300mm high timber beam	No defects	A
252nn	300mm high timber beam	Beam split and showing signs of advanced decay to full length	C
253nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
254nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
255nn	300mm high timber beam	Beam showing signs of early decay to final 1m of north end	B
256nn	300mm high timber beam	Some splitting but generally sound	B
257nn	300mm high timber beam	Beam showing signs of advanced decay to final 2m of north end	C

**Pier Head Timber Decking Support Extension Joists
Conditional Survey Results (Cont.)**

Beam No.	Description	Defect	Category
258nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
259nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
260nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
261nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
262nn	300mm high timber beam	No defects-old beam in situ	A
263nn	300mm high timber beam	Beam split but no sign of decay	B
264nn	250mm high timber beam supported on 50mm hardwood packing pieces	Slight splitting to north end-old beam in situ	A
265nn	250mm high timber beam supported on 50mm hardwood packing pieces	Beam showing signs of advanced decay to final 2m of north end-old beam in situ	C
266nn	250mm high timber beam supported on 50mm hardwood packing pieces	Slight splitting but generally good-old beam in situ	A
267nn	250mm high timber beam supported on 50mm hardwood packing pieces	Slight splitting and early signs of decay to final 1m of north end-old beam in situ	B
268nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
269nn	250mm high timber beam	Beam split and showing signs of advanced decay to north end-packers missing	C
270nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
271nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted	A
272nn	250mm high timber beam	Beam split and showing signs of early decay to both extreme ends	B
273nn	250mm high timber beam	No defects noted-packers missing	A1
274nn	300mm high timber beam	Some splitting but generally sound	B
275nn	300mm high timber beam	Beam showing signs of advanced decay to final 4m of north end	C
276nn	300mm high timber beam	Beam showing signs of advanced decay to final 1m of north end	C
277nn	300mm high timber beam	Beam generally good but out of vertical-old beam in situ	B
278nn	300mm high timber beam	Some splitting but generally sound	B
279nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
280nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
281nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
282nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
283nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ	A
284nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ, packer missing north end	A1

**Pier Head Timber Decking Support Extension Joists
Conditional Survey Results (Cont.)**

Beam No.	Description	Defect	Category
285nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ beam not fixed to steelwork	A
286nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects noted-old beam in situ beam not fixed to steelwork	A
287nn	300mm high timber beam	Beam split and showing signs of advanced decay to full length of beam, beam not fixed to steelwork	C
288nn	300mm high timber beam	Beam split and showing signs of advanced decay to full length of beam, beam not fixed to steelwork	C
289nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects-old beam in situ, beam not fixed to steelwork	A
290nn	250mm high timber beam	No defects-old beam in situ, no packers and beam not fixed to steelwork	A1
291nn	250mm high timber beam	No defects-old beam in situ, no packers and beam not fixed to steelwork	A1
292nn	250mm high timber beam	No defects-old beam in situ, no packers and beam not fixed to steelwork	A1
293nn	250mm high timber beam	No defects-old beam in situ, no packers and beam not fixed to steelwork	A1
294nn	300mm high timber beam	Beam showing signs of advanced decay to final 3m of north end	C
295nn	250mm high timber beam supported on 50mm hardwood packing pieces	No defects-old beam in situ, beam not fixed to steelwork	A1
296nn	250mm high timber beam	Beam split and showing signs of advanced decay to north end-packers missing, beam not fixed to steelwork	C
297nn	250mm high timber beam	No defects-old beam in situ, beam not fixed to steelwork, no packers	A1
298nn	250mm high timber beam	No defects-old beam in situ, beam not fixed to steelwork, no packers- old beam in situ	A1
299nn	300mm high timber beam	No defects noted	A
300nn	300mm high timber beam	No defects noted	A
301nn	300mm high timber beam	No defects noted	A
302nn	300mm high timber beam	No defects noted	A
303nn	300mm high timber beam	No defects noted	A
304nn	300mm high timber beam	No defects noted	A

2.9 Main & Extension Timber Decking Support Joists - Defect Classification

Category	Defect Classification
A	Good; Being an element with a predicted safe and useful life in excess of 5 years- no remedial work required to this element at present
A1	Satisfactory; Being an element with a predicted safe and useful life in excess of 5 years but with associated remedial works required as described within 1 year
B	Poor; Being an element with a predicted safe and useful life of less than 5 years- condition to be monitored in future annual inspections
C	Damaged; Being an element requiring repair within the shortest practicable time

**2.10 Lateral Diagonal Bracings-Central Waist to Pier Head
Conditional Survey Results**

Landward Side of Outer Waist

Bracing No.	Description	Category
1	Not bolted on landward end to main transverse stay	B1
2	Heavily corroded but in situ	B
3	Heavily corroded but in situ	B
4	Heavily corroded but in situ	B
5	Heavily corroded but in situ	B
6	Heavily corroded but in situ	B
7	Bracing heavily corroded and loss of section- temporary scaffolding support installed and secure	C
8	Bracing corroded through and failed	D
9	Bracing corroded through and failed	D
10	Heavily corroded but in situ- temporary scaffolding support installed and secure	B
11	Heavily corroded but in situ- temporary scaffolding support installed and secure	B
12	Heavily corroded but in situ	B
13	Heavily corroded but in situ- temporary scaffolding support installed and secure	B
14	Not bolted on landward end to main transverse stay	B1
15	Heavily corroded but in situ	B
16	Heavily corroded but in situ	B
17	Heavily corroded but in situ	B
18	Heavily corroded but in situ	B
19	Heavily corroded but in situ	B
20	Bracing heavily corroded and loss of section- temporary scaffolding support installed and secure	B
21	Heavily corroded but in situ	B
22	Heavily corroded but in situ	B
23	Bracing corroded through and failed- temporary scaffolding support installed and secure	D
24	Bracing heavily corroded and loss of section- temporary scaffolding support installed and secure	C
25	Bracing corroded through and failed	D
26	Heavily corroded but in situ- temporary scaffolding support installed and secure	B

**Lateral Diagonal Bracings-Central Waist to Pier Head
Conditional Survey Results (Cont.)**

Seaward Side of Outer Waist

Bracing No.	Description	Category
1	Heavily corroded but in situ	B
2	Heavily corroded but in situ	B
3	Heavily corroded but in situ	B
4	Heavily corroded but in situ	B
5	Heavily corroded but in situ	B
6	Bracing corroded through and failed	D
7	Bracing corroded through and failed- temporary scaffolding support installed and secure	D
8	Bracing corroded through and failed	D
9	Heavily corroded but in situ	B
10	Heavily corroded but in situ- temporary scaffolding support installed and secure	B
11	Heavily corroded but in situ- temporary scaffolding support installed and secure	B
12	Bracing heavily corroded and loss of section	C
13	Heavily corroded but in situ- temporary scaffolding support installed and secure	B
14	Heavily corroded but in situ	B
15	Heavily corroded but in situ	B
16	Heavily corroded but in situ	B
17	Heavily corroded but in situ	B
18	Heavily corroded but in situ	B
19	Bracing corroded through and failed	D
20	Bracing corroded through and failed- temporary scaffolding support installed and secure	D
21	Heavily corroded but in situ	B
22	Heavily corroded but in situ	B
23	Heavily corroded but in situ- temporary scaffolding support installed and secure	B
24	Bracing heavily corroded and loss of section- temporary scaffolding support installed and secure	C
25	Bracing corroded through and failed	D
26	Bracing corroded through and failed- temporary scaffolding support installed and secure	D

2.11 Lateral Diagonal Bracing- Defect Classification

Category	Defect Classification
A	Good; Being an element with a predicted safe and useful life in excess of 10 years-no remedial work required to this element at present
B	Satisfactory; Being an element with a predicted safe and useful life in excess of 5 years-no remedial work required to this element at present
B1	Satisfactory; Being an element with a predicted safe and useful life in excess of 5 years but associated remedial work required as soon as practicable
C	Poor; Being an element with a predicted safe and useful life of less than 5 years-condition to be monitored in future annual inspections
D	Damaged; Being an element requiring repair within the shortest practicable time

2.12 Tie Rod Conditional Survey Results

Description	Category
Diagonal tie rod connecting bottom of pile 7 to top of pile 5; 70% depletion of steel down to 17mm through corrosion above cruciform over a length of approximately 0.80m	D
Diagonal tie rod connecting bottom of pile 5 to top of pile 7; 70% depletion of steel down to 17mm through corrosion above cruciform over a length of approximately 0.80m	D
Diagonal tie rod connecting bottom of pile 5 to top of pile 6; 60% depletion of steel down to 20mm through corrosion above cruciform over a length of approximately 0.80m	D
Diagonal tie rod connecting bottom of pile 6 to top of pile 5; 60% depletion of steel down to 20mm through corrosion above cruciform over a length of approximately 0.80m	D
Diagonal tie rod connecting bottom of pile 6 to top of pile 8; 60% depletion of steel down to 20mm through corrosion above cruciform over a length of approximately 0.80m	D
Diagonal tie rod connecting bottom of pile 8 to top of pile 6; 60% depletion of steel down to 20mm through corrosion above cruciform over a length of approximately 0.80m	D
Diagonal tie rod connecting bottom of pile 8 to top of pile 7; 70% depletion of steel down to 17mm through corrosion above cruciform over a length of approximately 0.80m	D
Diagonal tie rod connecting bottom of pile 7 to top of pile 8; 60% depletion of steel down to 20mm through corrosion above cruciform over a length of approximately 0.80m	D
Diagonal tie rod connecting bottom of pile 40 to top of pile 39; removed due to failure not yet replaced.	D
Diagonal tie rod connecting pile 71 to pile 65 in the lower tier has broken off close to the lower connecting bracket at pile 65	D
Diagonal tie rod connecting pile 65 to pile 71 in the lower tier has broken off close to the lower connecting bracket at pile 71	D

2.13 Tie Rod- Defect Classification

Category	Defect Classification
A	Good; Being an element with a predicted safe and useful life in excess of 10 years-no remedial work required to this element at present
B	Satisfactory; Being an element with a predicted safe and useful life in excess of 5 years-no remedial work required to this element at present
C	Poor; Being an element with a predicted safe and useful life of less than 5 years-condition to be monitored in future annual inspections
D	Damaged; Being an element requiring repair within the shortest practicable time

Appendix A-Photographs

PHOTOGRAPH LOG SHEET



Plate 1	General view of south elevation of pier from centre waist
Orientation	Viewed from west to east
Structure	Mumbles Pier
Date	16/03/2010

PHOTOGRAPH LOG SHEET



Plate 2	General view of south elevation of pier viewed from the landing stage
Orientation	Viewed from east to west
Structure	Mumbles Pier
Date	16/03/2010

PHOTOGRAPH LOG SHEET



Plate 3	View of pile group showing missing diagonal bracing between piles 7 & 8 indicated by arrows
Orientation	Viewed from west to east
Structure	Mumbles Pier
Date	16/03/2010

PHOTOGRAPH LOG SHEET



Plate 4	Depletion of diagonal tie bar between piles 5 & 7
Orientation	Viewed from west to east
Structure	Mumbles Pier
Date	16/03/2010

PHOTOGRAPH LOG SHEET



Plate 5	Depletion of diagonal tie bar between piles 7 & 8
Orientation	Viewed from south to north
Structure	Mumbles Pier
Date	16/03/2010

PHOTOGRAPH LOG SHEET



Plate 6	Delamination and depletion of diagonal tie bar between piles 5 & 6
Orientation	Viewed from west to east
Structure	Mumbles Pier
Date	16/03/2010

PHOTOGRAPH LOG SHEET



Plate 4	View of central waist showing general condition-note broken corner upstand to handrail indicated by arrow
Orientation	Viewed from east to west
Structure	Mumbles Pier
Date	16/03/2010

PHOTOGRAPH LOG SHEET



Plate 5	Heavily decayed waling beam on south side of pier in central waist
Orientation	Viewed from north to south
Structure	Mumbles Pier
Date	16/03/2010

PHOTOGRAPH LOG SHEET



Plate 6	Advanced decay to waling timber on south side of pier to east side of central waist
Orientation	Viewed from northeast to southwest.
Structure	Mumbles Pier
Date	16/03/2010

PHOTOGRAPH LOG SHEET



Plate 7	General view towards pier head
Orientation	Viewed from west to east
Structure	Mumbles Pier
Date	16/03/2010

PHOTOGRAPH LOG SHEET



Plate 8	General view towards land
Orientation	Viewed from east to west
Structure	Mumbles Pier
Date	16/03/2010

PHOTOGRAPH LOG SHEET



Plate 9	Detached tie rods between piles 65 & 71 as indicated by arrows
Orientation	Viewed from east to west
Structure	Mumbles Pier
Date	16/03/2010

PHOTOGRAPH LOG SHEET



Plate 10	Lighting stand at approach to pier head leaning due to decayed timber at base. Deterioration since 2009 survey.
Orientation	Viewed from west to east
Structure	Mumbles Pier
Date	16/03/2010

Appendix EDP 5 Pier Refurbishment Notes

The Mumbles

Pier Refurbishment Notes

The most seaward bays of the existing cast-iron columns will be affected by the construction works for the proposed RNLI boathouse. Prior to the piling works starting the upper section of the cast-iron piles will be removed by unbolting an existing joint at the bottom of the upper section of cross-bracing. This section of the pile together with the bracing will be carefully removed to store and will be refurbished.

When the piling works are completed the cast-iron columns and bracing will be reinstated. Some seven of the existing cast-iron columns will need to have their head sleeved through the proposed concrete slab. Four cast-iron columns on the line of the proposed slipway will have the head section carefully removed and taken to store. In the event of the boathouse being demolished in the future the cast-iron column heads could be reinstated with a simple internal sleeve connection.

Where possible the existing bracing will be refurbished and replaced. However, much of the existing bracing has previously been replaced and where refurbishment is considered uneconomic new bracing will be provided.

The pier was extensively refurbished by Ameco in the 1950's. At this time the existing deck and longitudinal beams were taken down and replaced from the tops of the cast-iron columns up. Historic photos show a lattice truss type longitudinal beam to the stem but the structure to the pier head is indistinct. The column head level to the pier head is higher than those on the stem and, with a shorter span, it is likely that a shallower lattice beam or I-section girder was originally used but has been replaced with the rolled steel joists currently present.

The lattice work is formed from back to back angles with shaped gusset plates to connect to the internal diagonal struts. The members used are of painted steelwork propped up to level from the tops of the existing cast-iron columns on steel stools. The steelwork is now heavily corroded and nearing the end of its maintainable life. Approximately half of the pier sub-structure is accessible from the beach on low tides, but the remainder is always surrounded by water. This makes safe access to the underside pier deck extremely difficult.

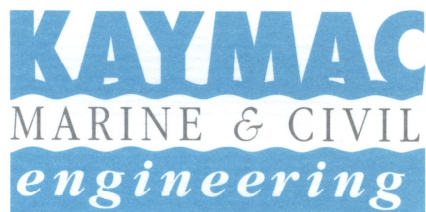
Lattice steelwork in a marine environment is notoriously difficult to maintain. The detailing of the joints means water is easily trapped in the crevices between the members. This leads to corrosion at the most critical points of the structure. The lattice components are generally thin sections for which rolled steel angles are normally used. It can prove difficult to retain straightness if these types of components are galvanised individually whereas post fabrication galvanising of the completed member is unlikely to penetrate the inaccessible contact faces. Likewise, if one is to rely on paint systems for corrosion resistance, the multitude of small members are time consuming to paint and it is difficult to achieve the required paint thickness at the multitude of edges and corners. The relatively thinness of such structural components means that there is little sacrificial steel thickness to accommodate any corrosion meaning that it is essential to the life of the member to maintain the corrosion protection by regular maintenance. In the pier environment this is difficult and expensive to achieve.

It is proposed to replace the lattice work with curved, castellated plate girder I-section beams as used on other piers around the coast. These members can be formed from thick plate steel and galvanised to give a 20 year life to first maintenance. It is also proposed to replace the timber deck joists with steel joists, similarly galvanised, in order to reduce the maintenance costs of the deck. The deck will be finished with hardwood timber deck boards as existing.

The existing bench seating balustrade to the pier head is original and it is proposed to carefully remove all this seating and the decorative back rests. These sections will be cleaned and repainted and re-used on completion of the pier head deck refurbishment. The timber slats which form the seat of the bench will be replaced. On both sides of the pier head a new access will be required for the proposed fisherman's platform. These will be formed by omitting one bay of the bench seating in each location. The two decorative backs to the benches not reinstated will be stored for re-use, or re-used if other backs a missing or beyond repair. On the end of the pier the original handrail has been replaced by a modern balustrade. This will be replaced with a balustrade to match that on the pier stem.

It is proposed to replace the pier stem balustrade with new whilst incorporating the existing cast iron panels. The existing baluster is fixed down to a timber combing at the edge of the deck which is in turn fixed down to the timber joists. The baluster is fixed using three coach screws into the timber combing. Two of these screws are on the outside of the balustrade and, therefore, difficult to fix without specialist access equipment. The baluster base plate is shaped to fit over the timber combing and the inner fixing is difficult to fix low down to the deck. This fixing has been analysed and does not comply with modern handrail loadings. The ability to slightly modify the detail of the pier structure can enable access for maintenance painting to the seaward side of the cast iron panels to be considerably eased by for example accommodating a cradle suspended from the new balustrade or the use of a cherry picker.

The integrity of the current balustrade design relies on the continuity of the top handrail. This has been repaired in sections over time and the continuity has been lost. Also, in order to replace one section of timber combing, large sections of the balustrade have had to be demounted as the existing balustrade detail does not allow removal of a short length. The timber combing is of hardwood and has to be shaped, wasting 25% of the section. Where it is replaced it has to be jointed into the existing, creating water traps and areas of potential further rot. To overcome these maintenance problems it is proposed to produce a new balustrade system utilising the cast-iron infill panels, as currently utilised on the roof of the pier near to the café. This will be fixed down to a new galvanised steel kerb and more easily maintained



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Appendix EDP 6

Letter from KAYMAC to AMECO

AMECO Amusements Ltd

Old Lifeboat Cottage
Mumbles
Swansea
West Glamorgan
SA3 4EN
10th October 2008
Our Ref: GJL 2056

For the Attention of Mr Fred & Mr John Bollom

Dear Sirs,

Re: MUMBLES PIER REFURBISHMENT

Further to our recent telephone conversation and your e-mail dated 30th September we are pleased to provide our **budget estimate** for the two options as follows:-

Option 1 – Replace on ‘like for like basis’

1. Remove existing timber decking, support joists and hand-railing retaining balustrade for possible re-use.
2. Remove existing deck steelwork consisting mainly lattice girders for most of its length down to the flared heads of the cast iron columns.
3. Clean down & carry out conditional survey of cast iron columns, screw piles and bracing components.
4. Provide suitable protective paint system to CI columns & piles.
5. Replace bracing components as required (Assume 100%)
6. Replace deck steelwork consisting lattice girders on a like for like basis from top of the flared heads of the cast iron columns.
7. Replace timber decking, support joists and hand-railing re-using shot blasted & painted balustrade panels where possible.

Option 1 Budget Estimate including plant, labour & materials - **£2,250,000 - £2,500,000**

Notional 25 year maintenance costs – Option 1

- a) Years 1-5 - £5,000.00 - £10,000.00 per annum
- b) Years 5-10 - £10,000.00 - £20,000.00 per annum
- c) Years 10-15 - £30,000.00 - £40,000.00 per annum
- d) Years 15-20 - £40,000.00 - £50,000.00 per annum
- e) Years 20-25 - £50,000.00 - £65,000.00 per annum

Option 2 – Replace with Castellated beam system

1. Remove existing timber decking, support joists and hand-railing retaining balustrade for possible re-use.
2. Remove existing deck steelwork consisting mainly lattice girders for most of its length down to the flared heads of the cast iron columns.
3. Clean down & carry out conditional survey of cast iron columns, screw piles and bracing components.
4. Provide suitable protective paint system to CI columns & piles.
5. Replace bracing components as required (Assume 100%)
6. Replace deck steelwork with galvanised Castellated beams and steel support beams (replacing the timber joists) from top of the flared heads of the cast iron columns including all timber decking and hand railing in modular pre-assembled units.

Option 2 Budget Estimate including plant, labour & materials - £2,000,000 - £2,250,000

Notional 25 year maintenance costs – Option 2

- a) Years 1-5 - £5,000.00 - £10,000.00 per annum
- b) Years 5-10 - £10,000.00 - £15,000.00 per annum
- c) Years 10-15 - £20,000.00 - £30,000.00 per annum
- d) Years 15-20 - £30,000.00 - £40,000.00 per annum
- e) Years 20-25 - £40,000.00 - £50,000.00 per annum

In preparing the above budget estimate we have assumed that the cast iron columns & screw piles are of serviceable condition, in addition we have made no allowance for the reconstruction or removal of the exiting landing stage as we assume that this element is outside this scope of work.

We trust we have interpreted your requirements accurately and that the information provided is adequate for the purpose.

Yours Faithfully

G.J.Lippiett
Operations Manager