22 June 2023

[redacted]

Project Number: N23028

Dear Mark

Catherine Hill Bay Wharf – High-risks, Rectification/Partial Demolition Options

Upon visual inspection of the Catherine Hill Bay wharf significant deterioration was observed and BG&E have flagged several key observations that could be considered high-risk to the public.

Please find attached hereafter several options and actions we recommend to the Department of Planning and Environment to make-safe the wharf for pedestrians in the immediate future.

- Option 1, Partial Demolition - **$571,000**
  - As BG&E understands, the wharf has been closed to pedestrians for some time. However, over the years, further works have been undertaken to prevent pedestrians from accessing the deck. BG&E propose, that if demolition of the wharf is recommended that the removal of one or multiple spans would prevent access until further works are scoped and completed.
  - Please refer to the attached technical memo – CETM01-A for recommendations regarding the possible demolition/removal of the 'on land' portion of the wharf.
- Option 2, Rectification, Temporary Fencing, and Deck Safety - **$378,000**
  - BG&E propose installation of temporary fencing to create an exclusion zone under the wharf. Within the tidal zone this could be completed using large concrete blocks and typical temporary fencing on top. Warning signs would also need to be provided outlining risks. This could be installed using the same large reach crane and spider crane as nominated in CETM01 (attached). Repairs can be completed via EWP or temporary scaffolding.
  - Pedestrian access is possible below the Catherine Hill Bay wharf between bents 28 and approx. 18, depending on tidal movements. BG&E have highlighted several observations regarding concrete and steel elements that we consider to be a high-risk to the public and would recommend immediate action be taken to make-safe these observations.

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- Recommendations - **$60,000 & $618,000**
    - Just north of bent 28 sits a dilapidated retaining wall comprised of timber walers, steel piles, and angular circular hollow section bracing. The bracing is severely corroded and, in most cases, no longer offering support. It is BG&E's opinion that this retaining wall, whilst likely originally designed to support much higher earth loads, is no longer functional. The erosion of the ground behind this wall has exposed the concrete abutment at bent 28. We would recommend demolishing this wall.
    - Whilst public access is restricted from the wharf deck, BG&E did observe severe deterioration of handrails, catwalks, and steel plates. We would recommend these be removed to prevent a fall hazard and new handrails be installed to isolate any pedestrians from these areas. Please refer to the highlighted sections and associated photos for the scope of these works.

Should you wish to discuss any aspect of the attached, please contact the undersigned.

[redacted]

[redacted]

Attach.

Demolition Option 1 – Removal of Decking and Associated Support Structure
Wharf Recommendations 1 – Concrete Elements
Wharf Recommendations 2 – Steel Elements
Miscellaneous Recommendation 1 – Retaining Wall and Steel Elements
Miscellaneous Recommendation 2 – Handrails and Catwalks
WT Partnership Costings Report

Demolition Option 1

Removal of Decking and Associated Support Structure

As BG&E understands, the wharf has been closed to pedestrians for some time. However, over the years, further works have been undertaken to prevent pedestrians from accessing the deck. BG&E propose, that if demolition of the wharf is recommended that the removal of one or multiple spans would prevent access until further works are scoped and completed.

Please refer to the attached technical memo – CETM01-A for recommendations regarding the possible demolition/removal of the 'on land' portion of the wharf.

Technical Note – Catherine Hill Bay Wharf Investigations – Demolition Option 1

Project Number	**N23028**
Client	**NSW Department of Planning**
Date	**9 June 2023**
Document Number	**CETN01**
Revision	**A**
Prepared By	[redacted]
Reviewed By	[redacted]
Approved By	[redacted]

1 Introduction

The Catherine Hill Bay Wharf is an existing bulk cargo ship loading wharf, located south of Newcastle. The wharf structure has been abandoned for several years. We understand that multiple options for the future of the wharf structure are being investigated, including repair and reopen to public, partial demolition or full demolition. This technical note summarises the preliminary investigations undertaken for a partial demolition case.

2 Proposed works

This option of partial demolition would involve removing one or multiple spans of the wharf so that it is no longer connected to land at grade. This would prevent access to the remainder of the wharf and remove the section of the wharf that is in the poorest condition. The key advantage of this strategy is that all works could be completed without the need for a marine contractor or barge rental, which we understand to be a costly exercise.

This option would be completed by setting up a large reach mobile crane at the location shown on the attached markup. This crane would be used to lift off as many of the precast planks as could be reached. The precast planks from grids 1-7 have a mass of approximately 2500kg. The remaining planks that could not be reached from the large crane, could be lifted down and moved to within reach of the large crane using a 12T spider crane, EWP and excavator.

Once all of the precast planks had been removed, steel members could be cut and removed with the use of the two cranes and EWP.

The wharf structure from grid 7 to 26 would remain, pending materials and structural team investigations to confirm safety.

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3 Summary of elements to be removed

3.1 Table 1: Approximate Element Summary

Element	Method of removal	Number of Elements
Precast Planks (3x2x0.18m)	Crane out in 2.5t pieces	Approx. 56
Primary Beams (610UB125 TBC)	Crane out in 12m sections (1.7t)	Approx. 16
Secondary steel members, handrails ect.	Remove via EWP/Spider crane (100kg)	100-150
Bent columns, bracing	Remove via EWP/Spider crane (500kg pieces)	Approx. 32
Misc. concrete	Jackhammer	16 columns

4 Attachments

N23028 – DEMO OPTION 1.pdf

GENERAL ARRANGEMENT ELEVATION

ELEVATION A (MT-1000)

SCALE 1 : 500

Revision In Progress

REV	DATE	DESCRIPTION	BVD

REVISIONS

CLIENT

Newcastle Office —
Suite 2, Level 3, 426 King St,
Newcastle NSW 2302
P / +61 2 4902 3000
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PROJECT: CATHERINE HILL BAY JETTY

CATHERINE HILL BAY, NSW

STATUS: ISSUED FOR INFORMATION
NOT TO BE USED FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
MC	ZA	-	-

DATUM | GRID | SCALE: at A1 size

TITLE: GENERAL ARRANGEMENT

PROJECT No. N23028

DRAWING No. MT-1000

REV

3 COST ESTIMATE

Demolition Option

WT were instructed to provide cost estimates for the partial demolition of the wharf involving removing multiple spans to prevent pedestrian access. This option was based on a general arrangement sketch provided, along with approximate quantities of elements to be removed. Rates applied are based on first principles from our internal database or comparable projects.

Indirect costs were included with percentages applied for preliminaries, overheads, client costs and contingency. Escalation has been excluded from the estimate. Summary of total costs is outlined below (see full breakdown in Appendix A).

DESCRIPTION	OPTION 1
DIRECT COSTS	
Demolition	$245,000
INDIRECT COSTS	
Prelims, OH & Profit	$81,000
Client Costs	$82,000
Contingency	$163,000
TOTAL	**$571,000**

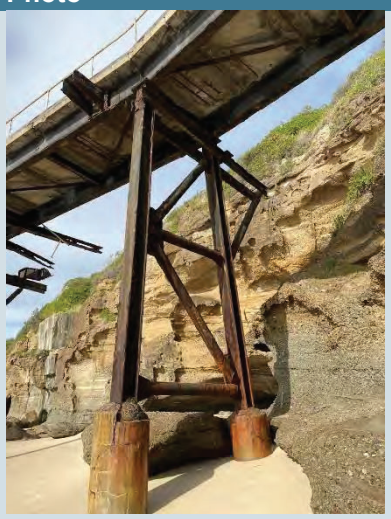
Wharf Recommendations 1

We propose installation of temporary fencing to create an exclusion zone under the wharf. Within the tidal zone this could be done using large concrete blocks and typical temporary fencing on top. Also need to provide warning signs outlining risks. This could be installed using the same large reach crane and spider crane as nominated in CETM01. Repairs to be done via EWP or temporary scaffolding.

Concrete Elements

Pedestrian access is possible below the Catherine Hill Bay wharf between bents 28 and approx. 18, depending on tidal movements. BG&E have highlighted the following observations regarding concrete elements that we consider to be a high-risk to the public and would recommend immediate action be taken to make-safe these observations.

Observation, Risk, and Comment	Photo
Concrete spalling on the edge of the precast decking. **Quantity**: Approx 10 sq.m **Risk**: Potential fall hazard from spalling concrete onto pedestrians walking underneath. **Recommendation**: Remove deleterious material over the trafficable zone and patch with a suitable, high-strength cementitious material to temporarily protect embedded reinforcement.	 Photo 1
Concrete spalling and exposed reinforcement on the underside of the precast decking. **Quantity**: Approx 15 sq.m **Risk**: Potential fall hazard from spalling concrete onto pedestrians waking underneath. **Recommendation**: Remove deleterious material over the trafficable zone and patch with a suitable, high-strength cementitious material to temporarily protect embedded reinforcement.	 Photo 2

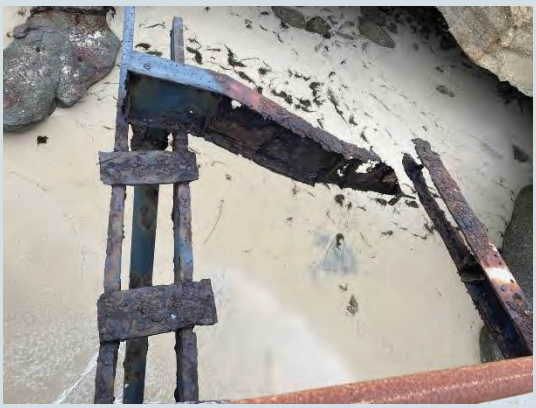
Observation, Risk, and Comment	Photo
	 Photo 3

Wharf Recommendations 2

We propose installation of temporary fencing to create an exclusion zone under the wharf. Within the tidal zone this could be done using large concrete blocks and typical temporary fencing on top. Also need to provide warning signs outlining risks. This could be installed using the same large reach crane and spider crane as nominated in CETM01. Repairs to be done via EWP or temporary scaffolding.

Steel Elements

Pedestrian access is possible below the Catherine Hill Bay wharf between bents 28 and approx. 18, depending on tidal movements. BG&E have highlighted the following observations regarding steel elements that we consider to be a high-risk to the public and would recommend immediate action be taken to make-safe these observations.

Observation, Risk, and Comment	Photo
Corroded steel elements. **Location:** **Quantity**: Approx 2 m **Risk**: Potential fall hazard from corroded steel elements falling onto pedestrians walking underneath. **Recommendation**: Remove corroded element over the trafficable zone.	 Photo 4

Observation, Risk, and Comment	Photo
Corroded secondary beam steel elements. **Location:** **Quantity**: Approx 15 m **Risk**: Potential fall hazard from corroded steel elements falling onto pedestrians walking underneath. **Recommendation**: Remove corroded element over the trafficable zone.	 **Photo 5**
Corroded secondary beam and diagonal circular hollow section brace steel elements. **Location:** **Quantity**: Approx 15 m **Risk**: Potential fall hazard from corroded steel elements falling onto pedestrians walking underneath. **Recommendation**: Remove corroded element over the trafficable zone.	 **Photo 6**

Observation, Risk, and Comment	Photo
Corroded secondary beam steel elements. **Location:** **Quantity**: Approx 5 m **Risk**: Potential fall hazard from corroded steel elements falling onto pedestrians walking underneath. **Recommendation**: Remove corroded element over the trafficable zone.	 **Photo 7**
Corroded diagonal bracing steel elements. **Location:** **Quantity**: Approx 10 m **Risk**: Potential fall hazard from corroded steel elements falling onto pedestrians walking underneath. **Recommendation**: Remove corroded element over the trafficable zone.	 **Photo 8**

Observation, Risk, and Comment	Photo
Corroded secondary beam steel elements. **Location:** **Quantity**: Approx 20 m **Risk**: Potential fall hazard from corroded steel elements falling onto pedestrians walking underneath. **Recommendation**: Remove corroded element over the trafficable zone.	 Photo 9
Corroded diagonal bracing steel elements. **Location:** **Quantity**: Approx 10 m **Risk**: Potential fall hazard from corroded steel elements falling onto pedestrians walking underneath. **Recommendation**: Remove corroded element over the trafficable zone.	

Miscellaneous Recommendation 1

Retaining Wall and associated Steel Elements

Just north of bent 28 sits a dilapidated retaining wall comprised of timber walers, steel piles, and angular circular hollow section bracing. The bracing is severely corroded and, in most cases, no longer offering support. It is BG&E's opinion that this retaining wall, whilst likely originally designed to support much higher earth loads, is no longer functional. The erosion of the ground behind this wall has exposed the concrete abutment at bent 28. We would recommend demolishing this wall.

Photo 10

Photo 11

Photo 12

Photo 13

Miscellaneous Recommendation 2

Handrails and Catwalks

Whilst public access is restricted from the wharf deck, BG&E did observe severe deterioration of handrails, catwalks, and steel plates. We would recommend these be removed to prevent a fall hazard and new handrails be installed to isolate any pedestrians from these areas. Please refer to the highlighted sections and associated photos for the scope of these works.

Wharf Recommendations

WT were provided details for wharf recommendations which included works to the wharf that were considered high-risk to the public and require immediate action to be taken. These were separated into remediation works to prevent potential fall hazards from spalling concrete, and potential fall hazards from corroded steel elements. Both recommendations include temporary fencing to create an exclusion zone under the wharf. The costs for the temporary works have been accounted for in Recommendation 1 only.

The rates for each recommendation were applied independently based on the information provided, which consisted of photographs and brief descriptions of the elements requiring action. Assumptions were made on the methodology to be utilised, including plant and labour requirements, and the disposal of material off site.

Indirect costs were included as described above. Summary of total costs is outlined below (see full breakdown in Appendix A).

DESCRIPTION	RECOMMENDATION 1	RECOMMENDATION 2
DIRECT COSTS		
Temporary Works	$118,000	$0
Repair Works	$34,000	$0
Demolition	$0	$14,000
INDIRECT COSTS		
Prelims, OH & Profit	$50,000	$5,000
Client Costs	$51,000	$5,000
Contingency	$101,000	$10,000
TOTAL	**$354,000**	**$33,000**

Miscellaneous Recommendations

WT were provided details for two miscellaneous recommendations. The first was to remove a retaining wall which included demolition and disposal of steel, concrete, and timber items. The second was to remove all damaged or corroded handrails and catwalks along the jetty and install new handrailing to prevent fall hazards. It has been assumed that the installation of new handrails is the be applied around the full perimeter of the existing jetty to provide maximum protection.

Once again, photos were provided to highlight to extent of the damaged and dilapidated structures. Similar assumptions were applied to these works regarding plant and labour requirements, whilst taking into consideration site constraints and necessary precautions needed for a structure in this condition.

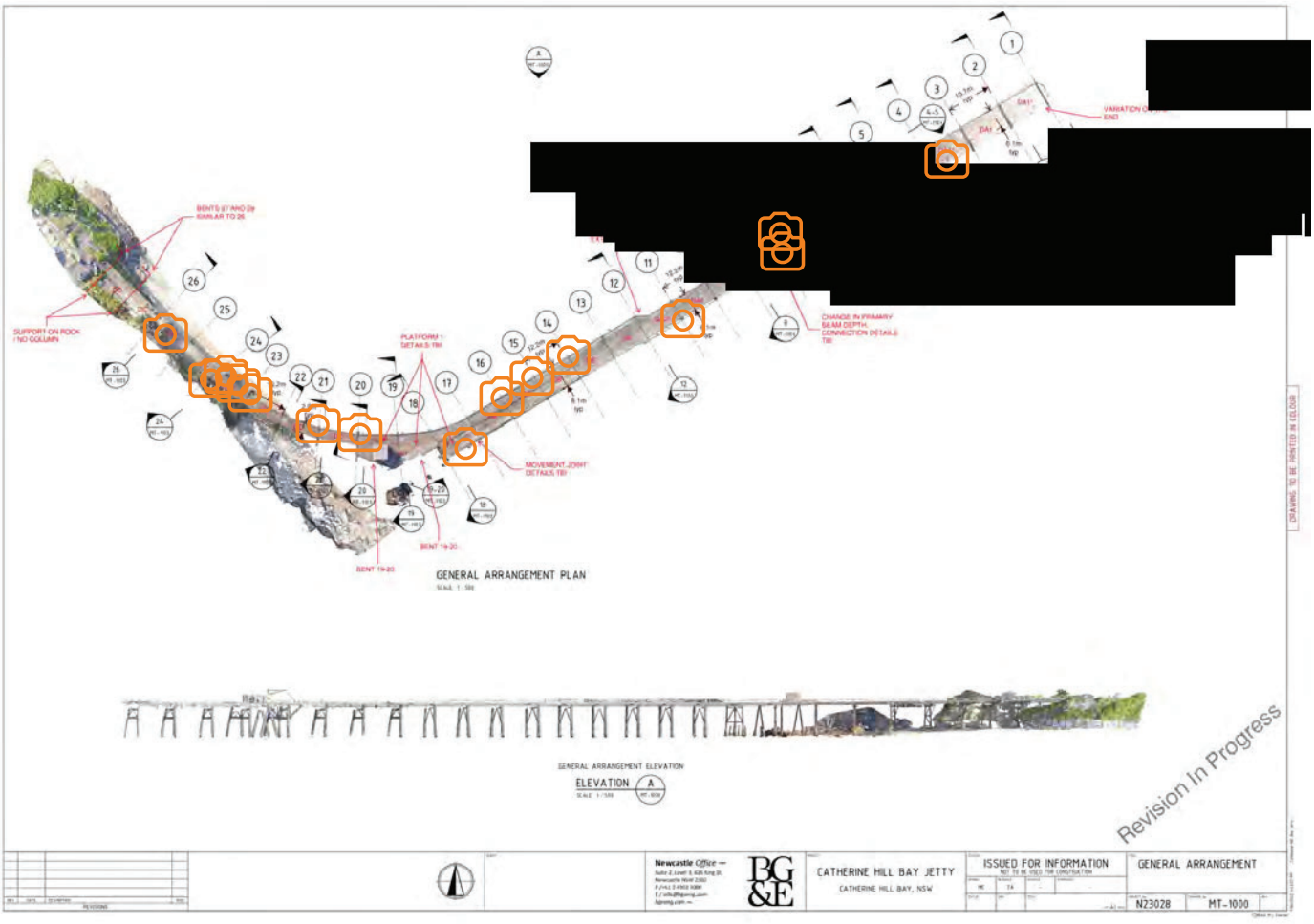
Indirect costs were included as described above. Summary of total costs is outlined below (see full breakdown in Appendix A).

DESCRIPTION	RECOMMENDATION 1	RECOMMENDATION 2
DIRECT COSTS		
Demolition	$26,000	$59,000
New Construction	$0	$207,000
INDIRECT COSTS		
Prelims, OH & Profit	$8,000	$88,000
Client Costs	$8,000	$88,000
Contingency	$42,000	$177,000
TOTAL	**$59,000**	**$618,000**

Handrails and Catwalks - Photo Report - June 13, 2023

Prepared by : [redacted]

13 June 2023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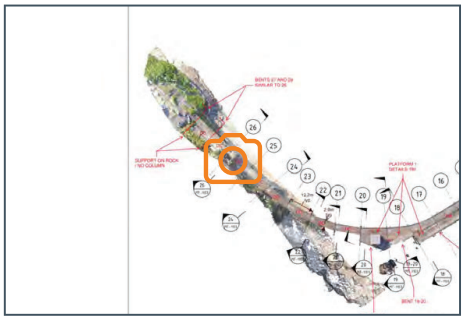
GENERAL ARRANGEMENT ELEVATION
ELEVATION A
Revision In Progress
CATHERINE HILL BAY JETTY
CATHERINE HILL BAY, NSW
ISSUED FOR INFORMATION
GENERAL ARRANGEMENT
N23028
MT-1000

Missing and Deteriorated Handrail



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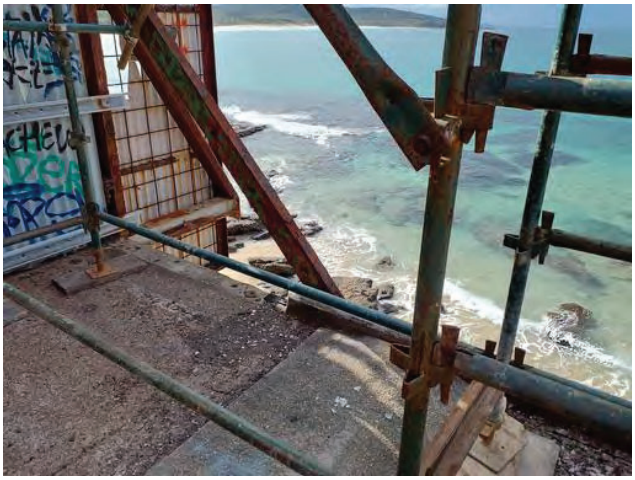

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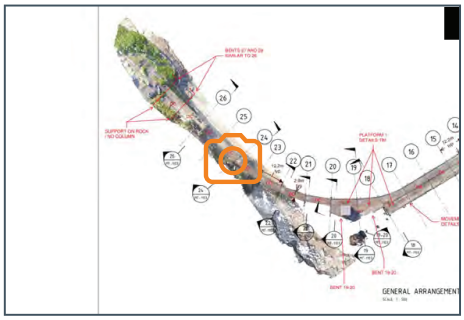
Missing Handrail



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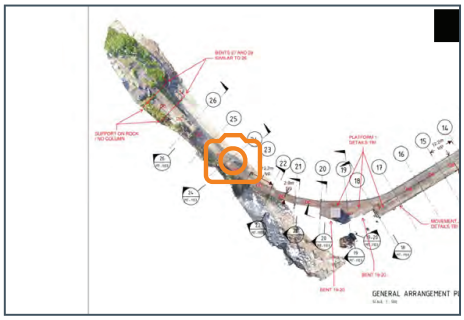
Handrail Connection Corroded



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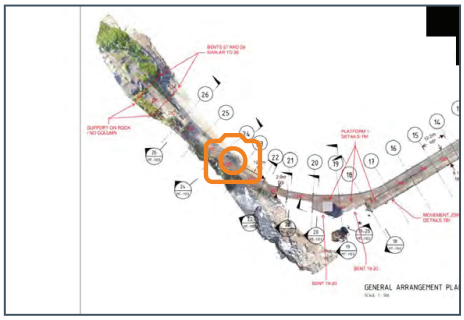
Handrail Connection Corroded



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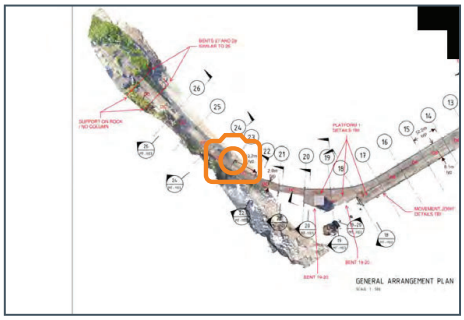
Damaged Handrail



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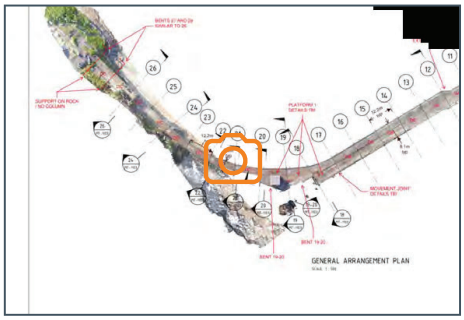

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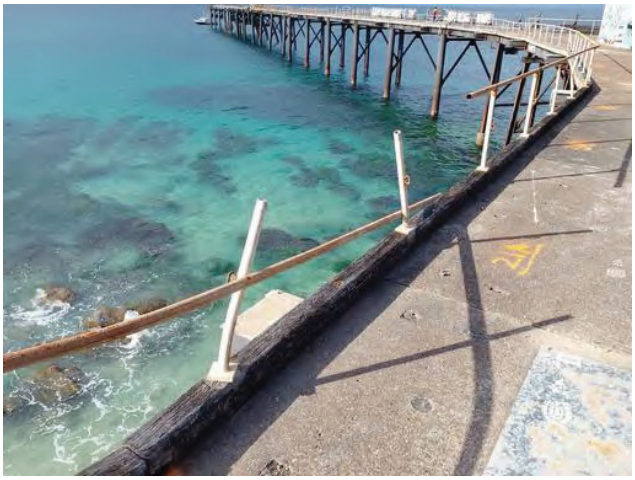

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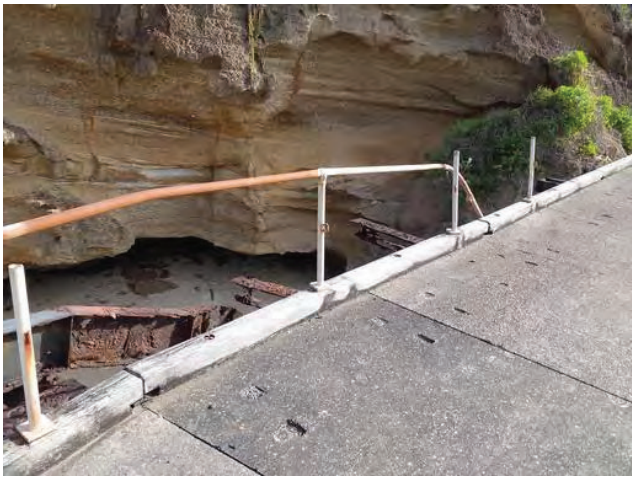

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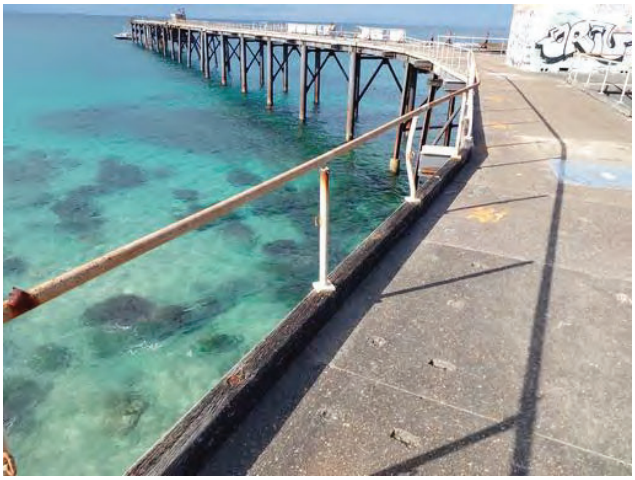

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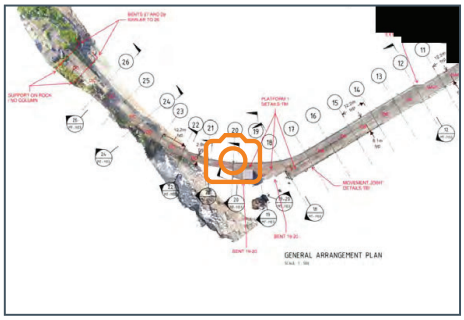

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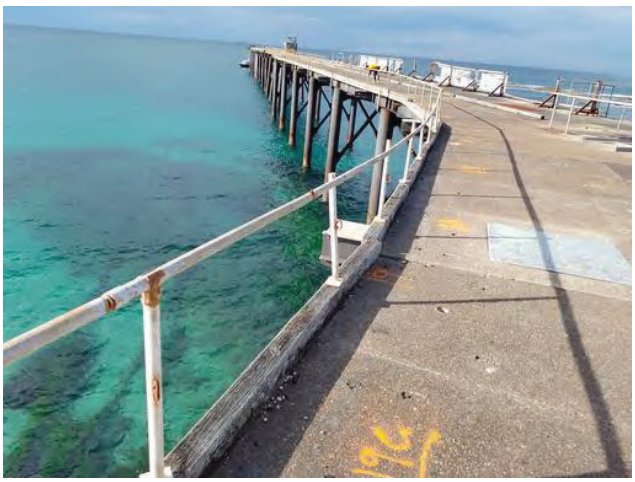

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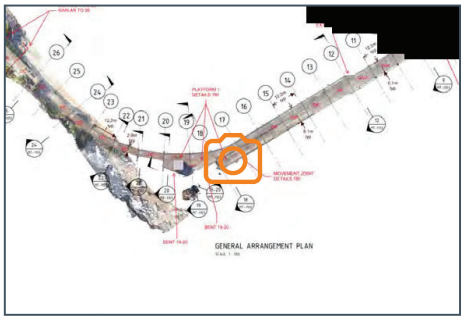

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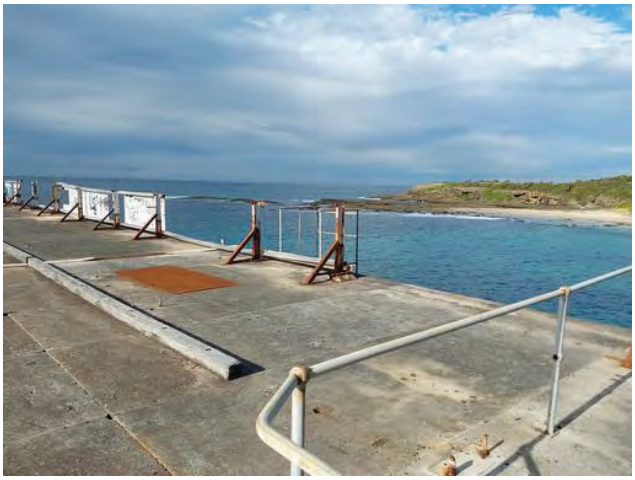

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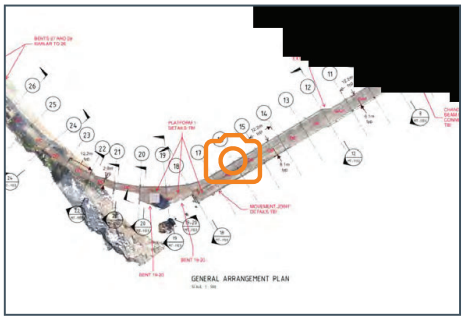

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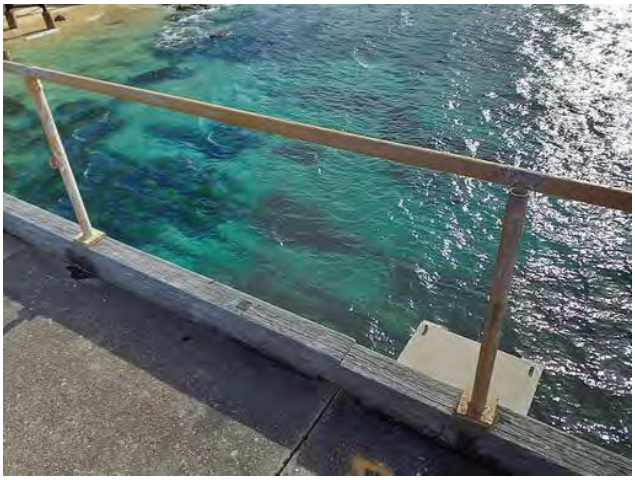

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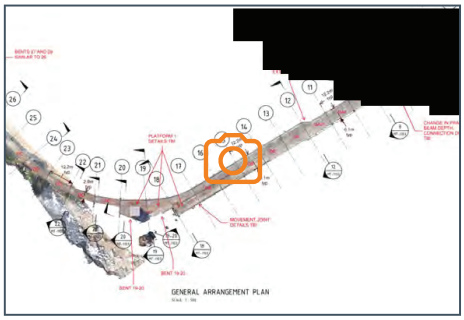

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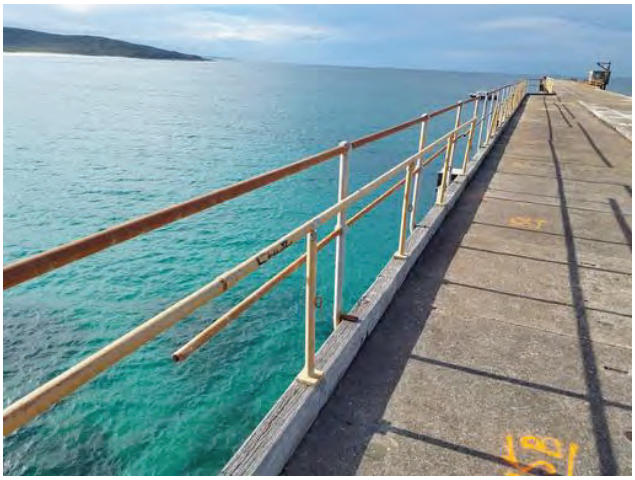

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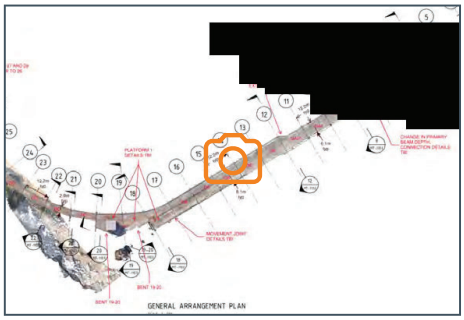

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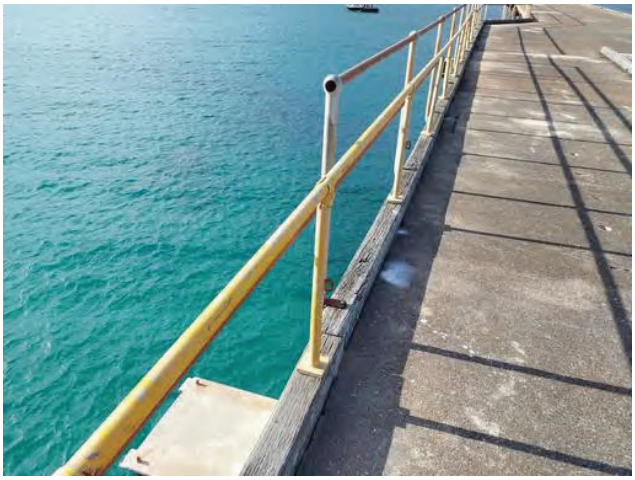

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[redacted]

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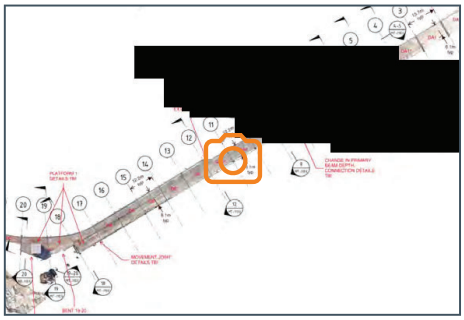

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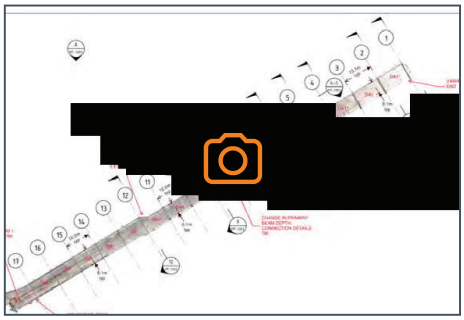
13 June 2023 2:00 pm

Added by:
[redacted]

Missing Handrail from Bent 8 full North Side



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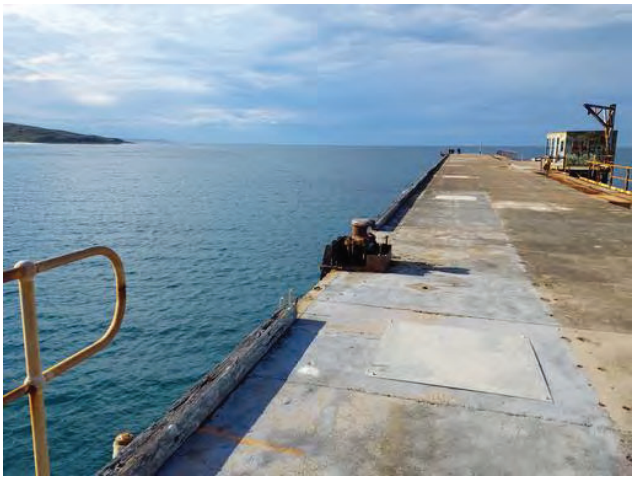

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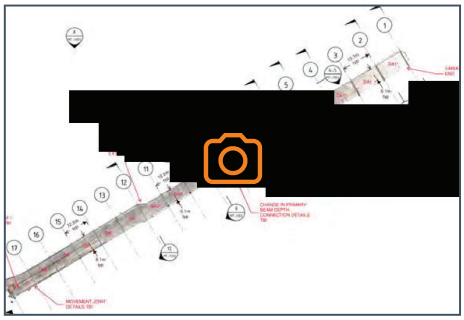
Corroded Catwalk



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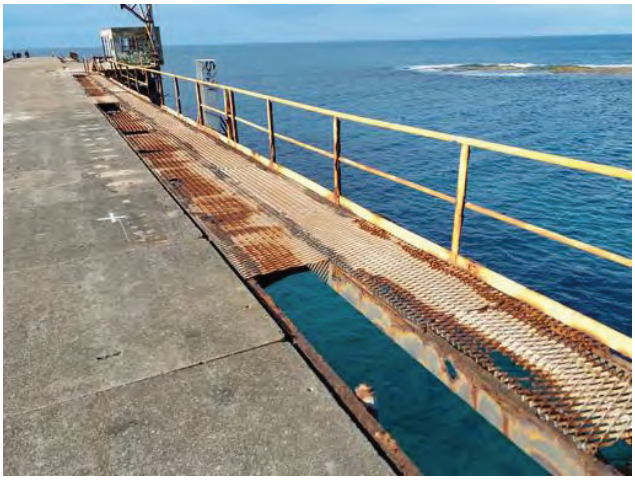

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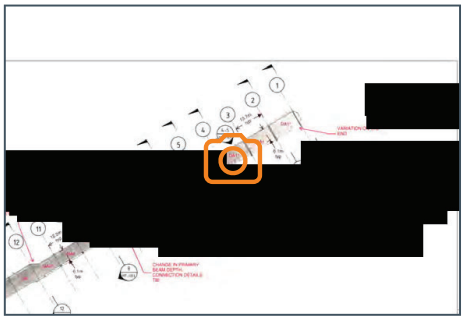
13 June 2023 2:05 pm

Added by:
[redacted]

Corroded Catwalk



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Added on:
13 June 2023 2:09 pm

Added by:
[redacted]

Technical Note – Catherine Hill Bay Wharf Investigations – Demolition Option 2 – Full Demolition

Project Number	**N23028**
Client	**NSW Department of Planning**
Date	**08 August 2023**
Document Number	**CETN02**
Revision	**A**
Prepared By	[redacted]
Reviewed By	[redacted]
Approved By	[redacted]

1 Introduction

The Catherine Hill Bay Wharf is an existing bulk cargo ship loading wharf, located south of Newcastle. The wharf structure has been abandoned for several years. We understand that multiple options for the future of the wharf structure are being investigated, including repair and reopen to public, partial demolition or full demolition. This technical note summarises the preliminary investigations undertaken for a full demolition case.

2 Proposed works

In this scenario, the entire wharf would be removed. Please refer to the previous technical note (CETN01-A) which outlines the proposed demolition for the section of wharf which is accessible from the land/beach, specifically bents 20-26.

From bents 1-20, the wharf structure is suspended over the ocean, with the original drawings indicating an approximate height above low tide of 10m and a low tide depth of 10m at the eastern end of the wharf. BG&E anticipate that this section of the wharf would be removed used a combination of different barges. The primary barge that would be required, would be a jack up barge that has an approximate total payload capacity of around 200T and suitable to work in waters up to 15m deep. The jack up barge would be used to support a crawler crane and EWP's to undertake the demolition. The crawler crane would then be used to remove the wharf in small sections and transfer the removed materials too secondary barge(s). The secondary barge(s) would be a **shallow draft** landing barge with an approximate pay load capacity of 75-100T that can transfer the removed material to the beach and then using excavators the materials can be moved along the beach to within reach of the mobile crane as per CETN01-A.

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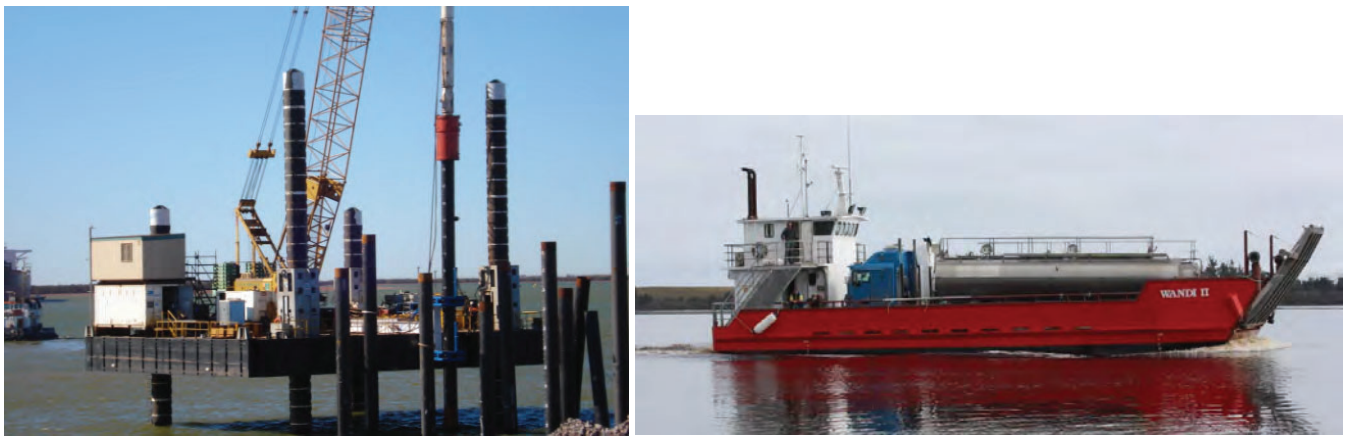

Figure 1 - Example Jack Up Barge (L) and Shallow Draft Landing Barge (R)

GENERAL ARRANGEMENT ELEVATION

ELEVATION A
SCALE 1 : 500
MT-1000

Revision In Progress

REV	DATE	DESCRIPTION	RVD
		REVISIONS	

CLIENT

Newcastle *Office* —
Suite 2, Level 3, 426 King St,
Newcastle NSW 2302
P / +61 2 4902 3000
E / info@bgeeng.com
bgeeng.com —

BG&E

PROJECT
CATHERINE HILL BAY JETTY
CATHERINE HILL BAY, NSW

STATUS
ISSUED FOR INFORMATION
NOT TO BE USED FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
NS	ZA	-	-

DATUM | GRID | SCALE | A1 SIZE

TITLE
GENERAL ARRANGEMENT

PROJECT No. N23028
DRAWING No. ST-0011 / MT-1000
REV A

Technical Note – Catherine Hill Bay Wharf Investigations – Remediation Option

Project Number	**N23028**
Client	**NSW Department of Planning**
Date	**08 August 2023**
Document Number	**CETN03**
Revision	**A**
Prepared By	[redacted]
Reviewed By	[redacted]
Approved By	[redacted]

1 Introduction

The Catherine Hill Bay Wharf is an existing bulk cargo ship loading wharf, located south of Newcastle. The wharf structure has been abandoned for several years. We understand that multiple options for the future of the wharf structure are being investigated, including repair and reopen to public, partial demolition or full demolition. This technical note summarises a proposed construction methodology for remediation of the structure in its current state. It should be noted that this methodology is general in nature, and provided as a high level overview only.

2 Proposed works

In this scenario the repair recommendations made by the BG&E structural engineering team would be carried out, refer to section 6 of their report. Once carried out, new construction works to repurpose the use of the wharf, such as the installation of new lighting and balustrades could be undertaken. The work to remediate the structure could be broken into the following phases: enabling works, demolition, repairs and replacement, new works. It is envisaged that the works would be conducted in a gird by grid fashion.

2.1 Enabling works

The following enabling works would likely be required:

- Temporary scaffolding
    - a temporary scaffolding deck would be constructed under the entire length of the wharf. This scaffolding would be supported from the primary beams and provide full personnel access the underside of the wharf, utilising the existing access hatches within the precast planks.
    - The scaffolding would also be designed to enable environmental protection measures to be installed, specifically, encapsulation of the wharf structure to ensure that during cleaning and painting no material entered the ocean.
- Installation of site sheds and site power ect.
- Site perimeter fencing
- Site security measures (CCTV ect)
- Detailed materials and structures engineering inspection and reporting to be undertaken to enable all members to be tagged, assessed and remediation details to be detailed.

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2.2 Demolition

The following demolition works would likely be required:

- Remove of the on-land portion of the wharf (refer to CETN-01 for description of this).
- Removal of precast planks that can not be repaired using concrete saws to cut the planks into small pieces.
- Removal of any existing ancillary furniture, such as; existing building, handrails, catwalks ect.
- Removal of any existing cross bracing members under the deck.

2.3 Repairs and Replacement

Following the demolition works, the following sequence of repairs and replacement would likely be required:

- Replace all secondary beams with new beams directly next to the existing, once installed existing secondary beams could be removed.
- Undertake repairs/strengthening on primary beams, at splice joint locations and then at connection to the bents.
- Remediate any damaged concrete planks that were not removed.
- Replace any heavily damaged tertiary beams.

Once the deck members had all be remediated, then work on the bents could include:

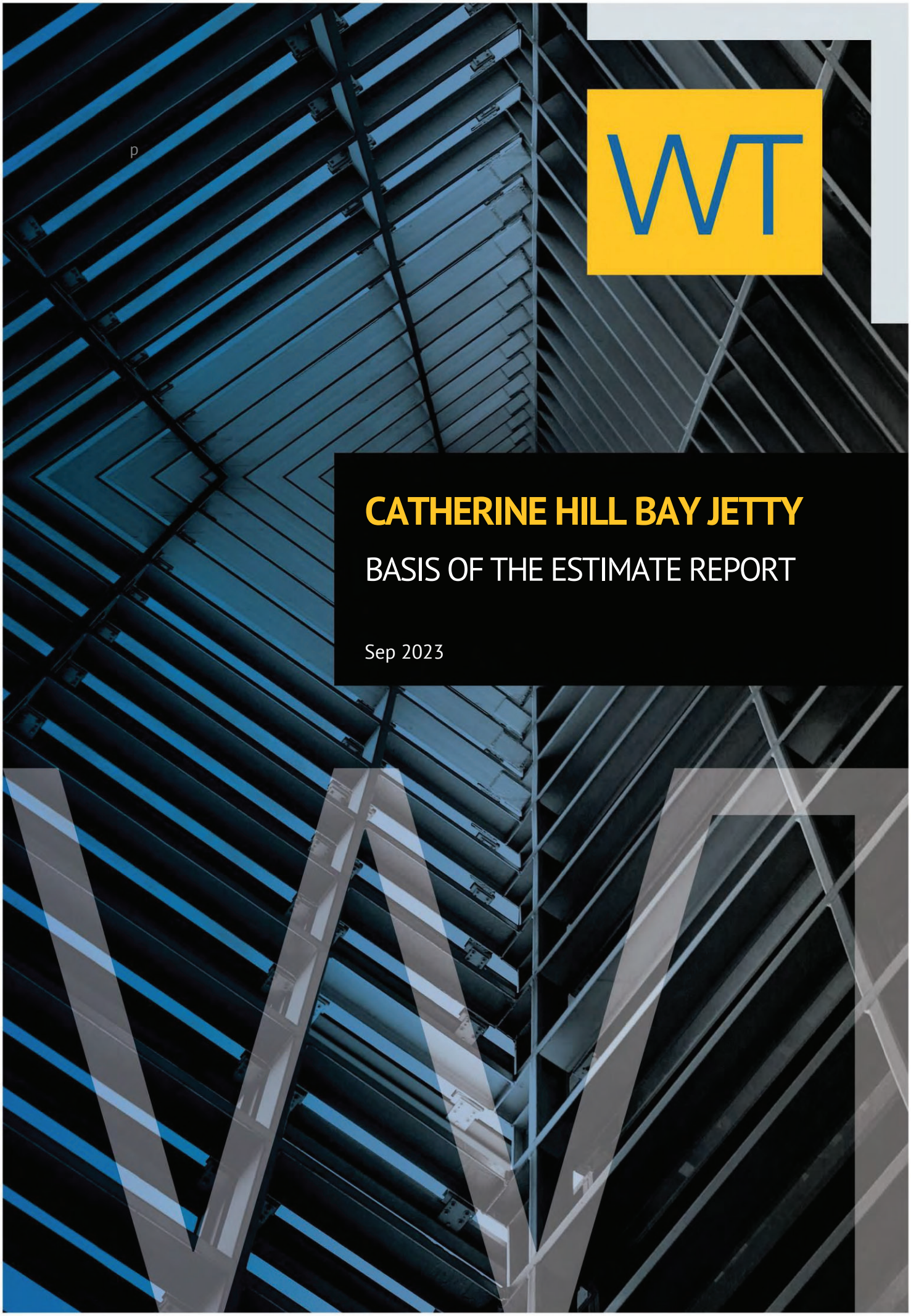
- Installation of site welded steel plates to replace the existing bolted splice connections.
- Replacement/repair of the corroded brace members.

During all the above repairs, members would have their rust removed, and members with signification section loss would be strengthened. Following this, all members could be painted.

2.4 New works

Once the repairs had been completed, works to transform the use of the wharf could be undertaken such as:

- Provision of new services
- New balustrades
- New lighting
- New approach structure to connect the remaining wharf to the land.



CATHERINE HILL BAY JETTY

BASIS OF THE ESTIMATE REPORT

Sep 2023

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CONTACT

DETAIL	DESCRIPTION
Name of Company/Trading Name	WTP Australia Pty Ltd
ABN	69 605 212 182
Name of Representative	[redacted]
Position	National Director
Head Office Address	L26, 45 Clarence Street, Sydney NSW 2000
Telephone	+61 2 9929 7422
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DOCUMENT STATUS	NAME	DATE
PREPARED BY	[redacted]	15 September 2023
REVIEWED BY	[redacted]	15 September 2023
E-SIGNATURE APPROVED		

REVISION NO.	REVISION DATE	DRAFT. FINAL
0	6 September 2023	Draft
1	15 September 2023	Draft

1 DISCLAIMER

This report was prepared by WTP Australia (WT) for the sole and exclusive benefit of BG&E for the purpose of assisting the client with cost estimation for various works to Catherine Hill Bay Wharf.

The report is meant to be read as a whole, and sections should not be read or relied upon out of context. The report includes information provided by the Client and by certain other parties, unless specifically stated otherwise.

This report contains the expression of the professional opinion of WT, based on information available at the time of preparation. The quality of information, conclusions and estimates contained herein are consistent with the intended level of accuracy as set out in this report, as well as the circumstances and constraints under which this report was prepared.

1.1 ACRONYMS

The following are some of the key acronyms and defined terms referenced within this report.

ACRONYM	DEFINITION
BOQ	Bill of Quantities
CHS	Circular Hollow Section
EWP	Elevating Work Platform
GST	Goods and Services Tax
SOR	Schedule of Rates
TPC	Total Project Cost
UB	Universal Beam
UC	Universal Column

2 PROJECT INFORMATION

PROJECT NAME	LOCATION	PROJECT MANAGER
Catherine Hill Bay Jetty Works	Catherine Hill Bay, NSW	[redacted]

3 SUMMARY OF COSTS

DESCRIPTION	TOTAL COSTS
Option 1: Demolition Option 1	$803,000
Option 1: Wharf Recommendation 1	$359,000
Option 1: Wharf Recommendation 2	$57,000
Option 1: Miscellaneous Recommendation 1	$93,000
Option 1: Miscellaneous Recommendation 2	$765,000
Option 2: Full Demolition	$8,903,000
Option 3: Repair, Strengthen & Replace	$15,544,000

Please refer to Appendix A for a detailed summary of each option, including an in-depth quantification breakdown of each section for Option 3.

4 PROJECT BACKGROUND

This report has been prepared for BG&E for the Catherine Hill Bay Jetty Works. The project is currently at the stage whereby multiple feasibility options and recommendations are being explored based on limited design information.

The Catherine Hill Bay Wharf is an existing bulk cargo ship loading wharf, located south of Newcastle. The wharf structure has been abandoned for several years, and it is understood that multiple options for the future of the wharf structure are being investigated, including repair and reopen to public, partial demolition or full demolition.

The site locality is within the City of Lake Macquarie Local Government Area. Figure 1 below provides an insight in the size and location of the structure, and confirms that both landside and marine plant will be required during repair and demolition works.

Figure 1 – Wharf Plan

Below is a summary of the options being explored:

- Option 1: Demolition Option 1 – This option of partial demolition involves removal of multiple spans of the landside section of the wharf so that it is no longer connected to land at grade. This would prevent pedestrian access to the remainder of the wharf and remove the section of the wharf that is in the poorest condition.
- Option 1: Wharf Recommendation 1 – This option proposes installation of temporary fencing to create an exclusion zone under the landside section of the wharf. Work can then be performed to rectify concrete elements that are considered to be a high-risk to the public such as concrete spalling and exposed reinforcement.
- Option 1: Wharf Recommendation 2 - This option proposes installation of temporary fencing to create an exclusion zone under the landside section of the wharf. Work can then be performed to rectify corroded steel elements that are considered to be a high-risk to the public, and require immediate action to be taken.
- Option 1: Miscellaneous Recommendation 1 – North of the wharf is a dilapidated retaining wall comprised of timber walers, steel piles, and angular circular hollow section bracing. The bracing is severely corroded and, in most cases, no longer offering support so demolition of the wall is recommended.
- Option 1: Miscellaneous Recommendation 2 – There is severe deterioration of handrails, catwalks, and steel plates along the full length of the wharf. These are required to be removed to prevent a fall hazard and new handrails are to be installed to isolate any pedestrians from these areas.
- Option 2: Full Demolition – In this option the entire wharf will be removed. The wharf would be removed in small sections utilising both landside and marine plant.
- Option 3: Repair, Strengthen & Replace – In this option the wharf will be repaired and strengthened where it is deemed necessary. An assessment of steel and concrete elements has been undertaken, leading to recommendations of whether to clean & coat, remove or repair individual elements, to ensure the structure is safe to access.

5 PROJECT SCOPE

KEY FEATURES OF THE PROJECT	
LENGTH / AREA OF THE PROJECT	Landside deck length: 100m Landside deck area: 340m2 Marine deck length: 250m Marine deck area: 2,100m2
PROJECT TYPE (Greenfield vs Brownfield)	The project will be undertaken in a brownfield site
SCOPE	• Demolition works • Replacement of steel & concrete elements • Cleaning/blasting & coating steel members • Repair & strengthen steel elements • Rectifying concrete elements • Temporary fencing
NEW STRUCTURES	New steel and concrete elements
DEMOLITION	Existing steal members, concrete planks & retaining walls
ENVIRONMENTAL ISSUES	Temporary screening material during blasting/cleaning & coating to reduce environmental impacts
ABORIGINAL IMPACTS	No allowance or impact included for aboriginal finds
ARCHAEOLOGICAL IMPACTS	No allowance or impact included for archaeological finds
UTILITIES	No allowance or impact included for utilities
CONSTRUCTION ISSUES	The following construction issues include but not limited to the following: • Construction staging and temporary works • Replacement of large steel columns & piles • Availability of marine plant • Temporary road & beach closures • Adverse / unpredictable weather & sea conditions
NOISE TREATMENT	Not applicable
PROPERTY ACQUISITION	Not applicable

6 PROJECT SCOPE DESCRIPTION

The scope of the project has been based on the following documents:

- N23028-LTR-WT-0001 - High-risk Rectification/Demolition Options
- N23028 – Demo Option 2
- N23028-CETN02-A - Demolition Option 2 – Full Demolition
- Summary of Members to be Replaced of Maintained
- Q15783 Bgeeng – Quotation for Catherine Hill Bay Jetty
- 230607 Catherine Hill Bay Reality Model

The work includes:

- Demolition of existing steel members, catwalks and handrailing
- Demolition of existing precast concrete planks and concrete column bases
- Demolition of retaining wall
- Installation of new steel members and handrailing
- Installation of new precast concrete planks
- Repairing and strengthening existing steel members
- Cleaning/blasting existing steel members
- Applying protective coating to existing members
- Replacement of movement joints
- Temporary protection to damaged concrete decking
- Installation of fencing mounted on concrete blocks

7 METHODOLOGY

The estimate has been developed using a combination of first principle build ups, quotes where applicable and benchmarking rates from past projects with similar scope. The estimate prepared is based on the information provided by BG&E.

WT has not been provided with a construction method statement and has used its best judgements to determine the program duration and sequence together with the labour and plant requirements.

8 ASSUMPTIONS

The assumptions used to prepare the estimate include:

- Project duration to be approximately 35-75 weeks (depending on preferred option)– To be confirmed with the staging plan as design is further developed.
- Project to be undertaken in individual stages - To be confirm with the staging plan as design is further developed.
- Night-shift allowances have not been made for the works.

- A further 5m added to the length of each column or pile during demolition and replacement works, to allow for sections not visible below sand level.
- A jackup barge with crawler crane and long reach EWP will be used throughout all marine works, with a shallow draft landing barge used to transport new and existing materials.
- All existing steel members will be cleaned, and relevant protective coating applied (Option 3 only).
- All existing steel members (including piles below sea level) to use protective coating Duremax GFX, with a second coating of Weathermax HBR for all existing steel members above the tidal/splash zone (Option 3 only).
- Dive team has been allowed for during the underwater coating and removal of marine columns and piles.
- Scaffolding will be installed to the underside of the deck (Option 3 only).
- Screening material has been allowed for during cleaning/blasting and coating steel members (Option 3 only).
- Landside large mobile crane and excavator will be used to transport and lift all existing materials from the beach area.
- Assumed each precast concrete plank is 3x2x0.18m.
- Assumed 50 precast planks required to be replaced (Option 3 only).
- Assumed movement joints between Bent 18-28 required to be replaced (Option 3 only).

9 ALLOWANCES

DESCRIPTION OF WORK	COMMENTS
INDIRECT COSTS	• Construction Management & Supervision • Mobilisation & Demobilisation of Plant • Site Running Costs • General Plant & Equipment Support • Safety Allowances • Insurances, Fees & Levies • Plan and Monitoring • Margin & Profit
DIRECT COSTS	• Supply, Fabrication & Delivery of Materials • Temporary Works • Disposal of Materials Offsite

10 PRELIMINARIES

It has been estimated costs associated with site establishment including site sheds, portable toilets and utility connections, running costs, site demobilisation, based on the whole duration of the project.

The costs relating to construction management and supervision, have also been taken into account for the project duration and personnel required for the proposed project i.e. project manager, site engineer, supervision, surveyor and others. A total of 25% of the direct costs have been allowed for this item.

11 TRAFFIC MANAGEMENT

The estimate has not allowed for any traffic management due to the remoteness of the site location.

12 SUPPLY RATES

WT has quantified the necessary materials and disciplines for the proposed project and contacted suppliers and subcontractors to provide the most accurate rates applied in the market where applicable. Where WT was unable to get supplier and or subcontractors near the project, we have applied benchmarking rates from past projects with similar scope.

13 OVERHEADS AND MARGIN

Corporate overheads allow for head office operating costs such as payroll, human resources, finance, etc. Margin and profit allowances have been based on similar projects, with a total of 8% of the direct costs allowed for this item.

14 CLIENT COSTS

These costs are associated with project and commercial management fees, external consultant fees and planning approvals. A total of 25% of the construction costs have been allowed for this item.

15 RISK CONTINGENCY

WT has conducted a deterministic method of contingency assessment for this estimate. For a concept level estimate (AACE Class 3 or 4) such as this, 40% of the total base estimate costs has been allowed which is deemed within acceptable range for this class of estimate.

16 ESCALATION

WT has not applied escalation to the Estimated Value as the anticipated start date is currently unknown.

17 LIMITATIONS

The conclusions presented herein are based on the information made available to us during the current design phase and may be subject to change should the information upon which they are based is determined to be false, inaccurate, or incomplete.

The purpose and contents of this document are intended solely for the recipient. If you are not the intended recipient, you are hereby notified that you must not disseminate, copy, or take any action in reliance on it.

18 EXCLUSIONS AND EXCEPTIONS

- Excavation in rock
- Contaminated material
- Asbestos
- Major utilities work
- Escalation
- GST
- Risk assessment (probabilistic)

19 DRAWING LIST

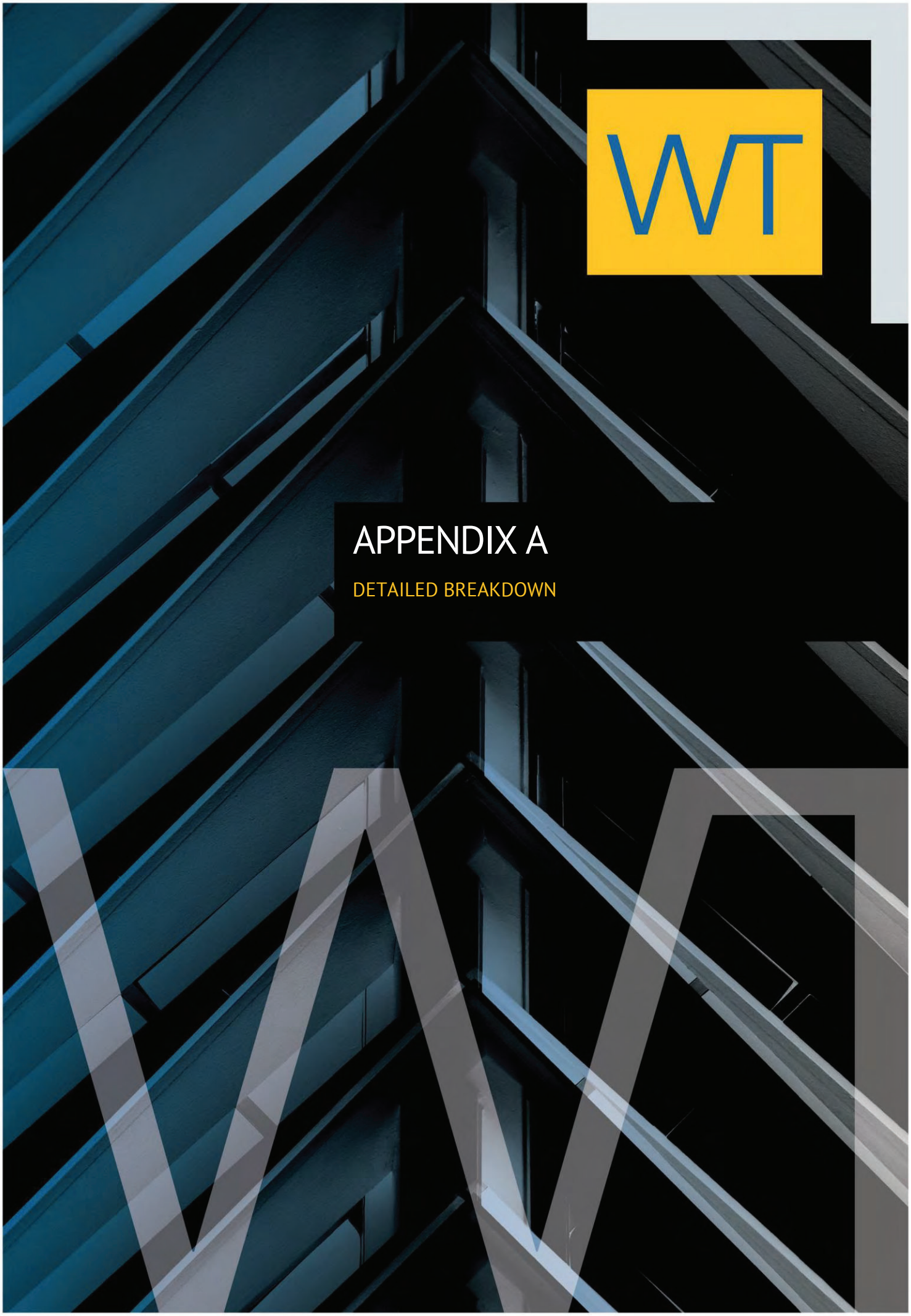
WT's quantification for the Catherine Hill Bay Jetty scope was based on a number of documents issued by BG&E, focussing predominantly on the following drawings:

- N23028 – Demo Option 2
- 230607 Catherine Hill Bay Reality Model

20 ESTIMATING TEAM

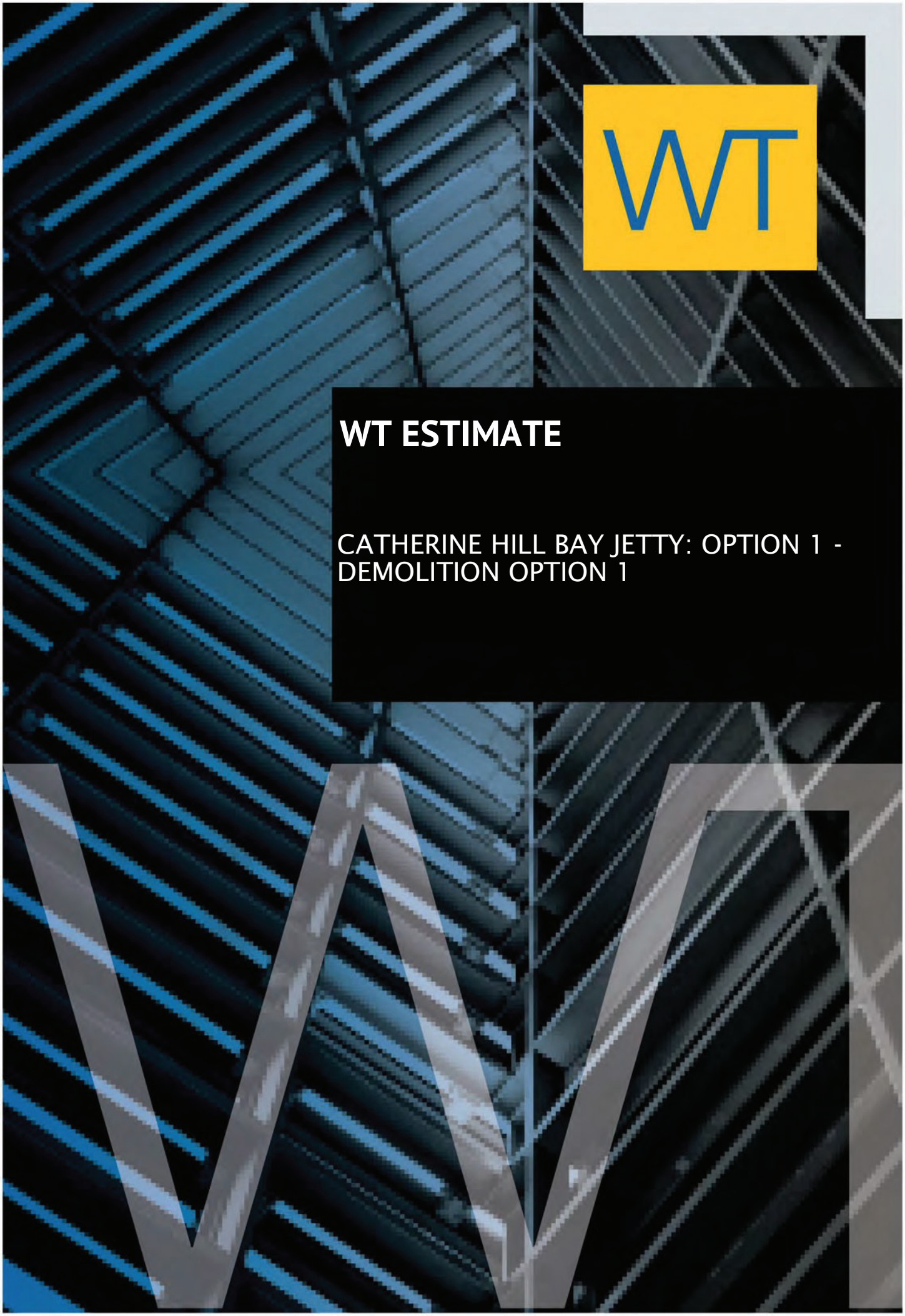
WT has put together a team of professionals who have extensive relevant experience in cost management of significant infrastructure projects:

ROLE	RESOURCE
Director in Charge	[redacted]
Project Lead	[redacted]
Quantity Surveyor	[redacted]



APPENDIX A

DETAILED BREAKDOWN



WT ESTIMATE

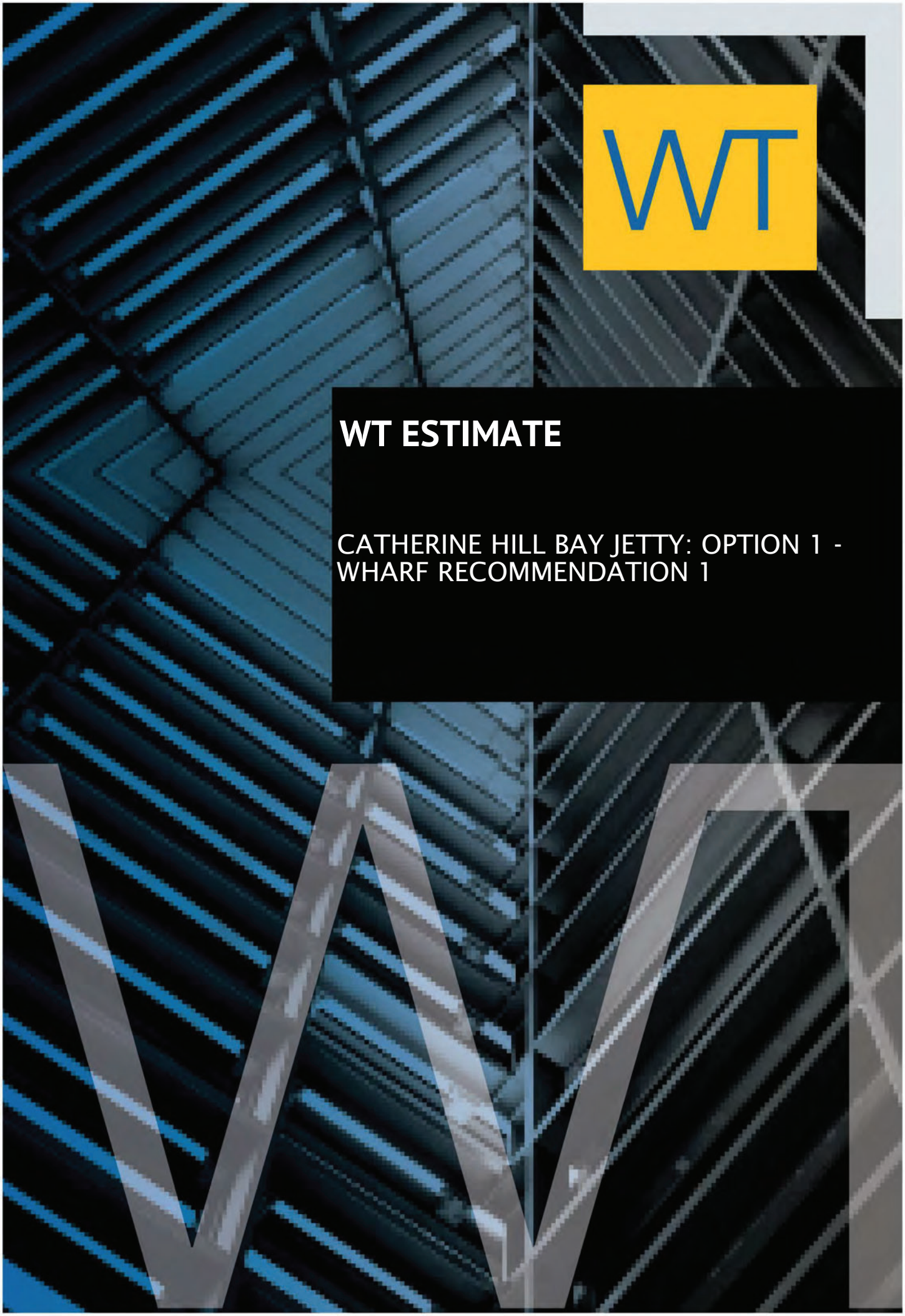
CATHERINE HILL BAY JETTY: OPTION 1 - DEMOLITION OPTION 1

WT ESTIMATE

OPTION 1 - DEMOLITION OPTION 1

Estimate Summary

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Demolition Option 1 – Removal of Decking and Associated Support Structure				
	DIRECT COSTS				
	DEMOLITION				
	Concrete Works - Landside				
1/N	Removal of precast concrete planks; 3x2x0.18m; including disposal off site	57	no	1,598.00	91,086
1/P	Removal of concrete column bases; including disposal off site	12	no	1,335.00	16,020
	Steel Works - Landside				
1/Q	Removal of primary steel beams; 610 UB125; including disposal off site	196	m	409.75	80,311
1/R	Removal of steel columns; 310 UC118; including disposal off site	272	m	407.86	110,938
1/S	Removal of steel circular bracing; 230 CHS; including disposal off site	105	m	201.50	21,158
1/T	Removal of bracing; 200 PFC; including disposal off site	52	m	100.21	5,211
1/U	Removal of tie brace beams; 200 UB; including disposal off site	20	m	99.94	1,999
1/V	Removal of bracing; 100x75x8 UA; including disposal off site	113	m	96.70	10,927
1/W	Removal of handrailing; including disposal off site	135	m	54.60	7,394
	TOTAL DIRECT COSTS				345,043
	INDIRECT COSTS				
1/X	Preliminaries, OH & Profit	345,043	%	33.00	113,864
	TOTAL CONSTRUCTION COSTS				458,907
1/Y	Client Costs	458,907	%	25.00	114,727
	TOTAL BASE ESTIMATE				573,634
1/Z	Contingency	573,634	%	40.00	229,454
	Escalation			Excl.	
	TOTAL				**803,088**
	Total Cost				**803,088**



WT ESTIMATE

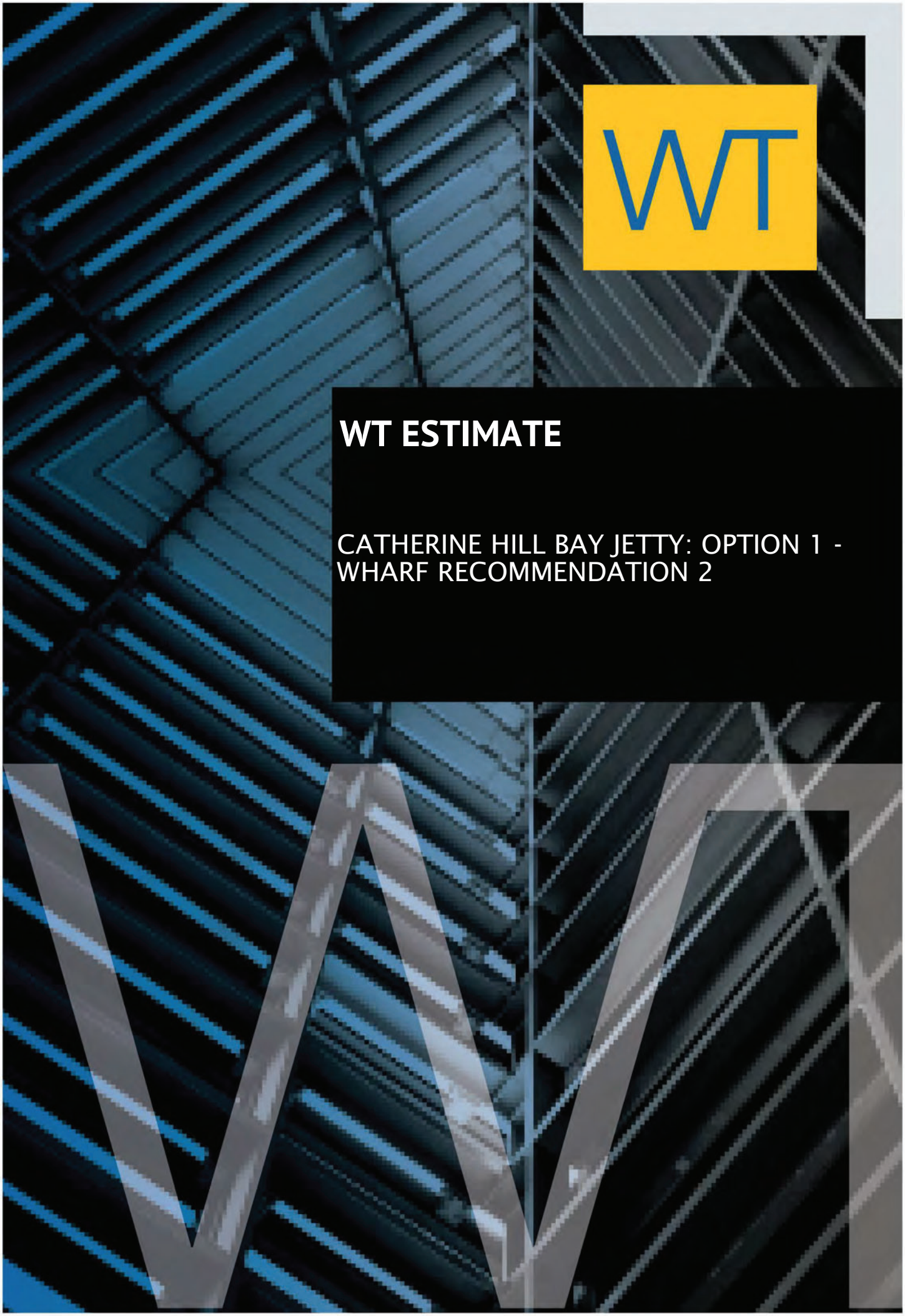
CATHERINE HILL BAY JETTY: OPTION 1 - WHARF RECOMMENDATION 1

WT ESTIMATE

OPTION 1 - WHARF RECOMMENDATION 1

Estimate Summary

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Wharf Recommendation 1 – Concrete Elements				
	DIRECT COSTS				
	TEMPORARY WORKS				
	Fencing				
1/H	Installation of fencing mounted on concrete blocks	120	m	977.50	117,300
1/J	Allowance for signage	1	item	1,000.00	1,000
	REPAIR WORKS				
	Concrete Works				
1/K	Temporary protection for exposed reinforcement to concrete spalling on edge of precast decking	10	m2	1,440.00	14,400
1/L	Temporary protection for exposed reinforcement to concrete spalling on underside of precast decking	15	m2	1,440.00	21,600
	TOTAL DIRECT COSTS				154,300
	INDIRECT COSTS				
1/M	Preliminaries, OH & Profit	154,300	%	33.00	50,919
	TOTAL CONSTRUCTION COSTS				205,219
1/N	Client Costs	205,219	%	25.00	51,305
	TOTAL BASE ESTIMATE				256,524
1/P	Contingency	256,524	%	40.00	102,610
	Escalation			Excl.	
	TOTAL				**359,133**
	Total Cost				**359,133**



WT ESTIMATE

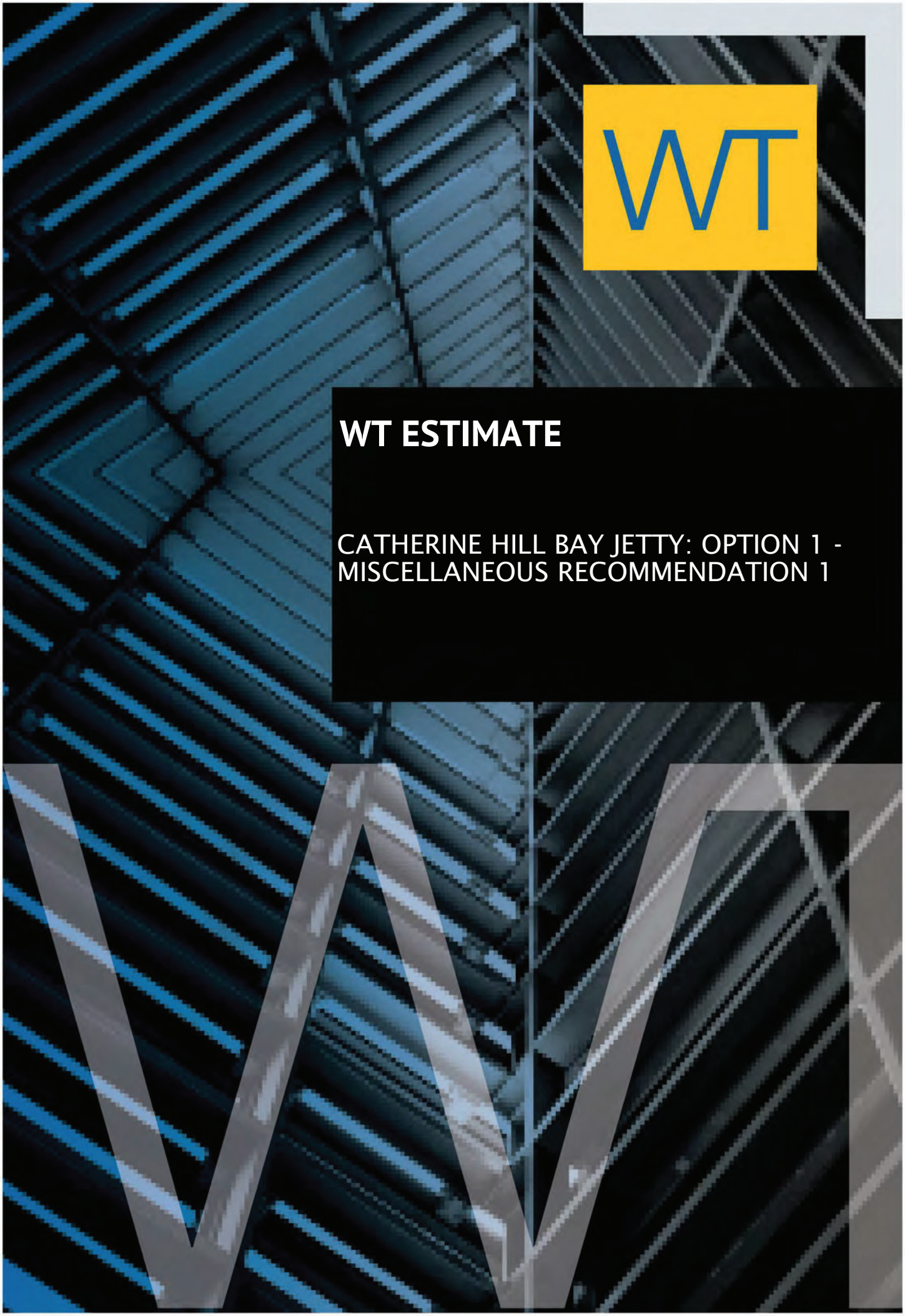
CATHERINE HILL BAY JETTY: OPTION 1 - WHARF RECOMMENDATION 2

WT ESTIMATE

OPTION 1 - WHARF RECOMMENDATION 2

Estimate Summary

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Wharf Recommendation 2 – Steel Elements				
	DIRECT COSTS				
	TEMPORARY WORKS				
	Fencing				
1/J	Installation of fencing mounted on concrete blocks	120	m	Incl. Wharf Recom 1	0
1/K	Allowance for signage	1	item	Incl. Wharf Recom 1	0
	DEMOLITION				
	Steel Works				
1/L	Removal of corroded secondary beam steel element; including disposal off site	52	m	409.75	21,307
1/M	Removal of corroded diagonal circular hollow section brace steel element; including disposal off site	5	m	201.50	1,008
1/N	Removal of corroded diagonal bracing steel element; including disposal off site	20	m	100.21	2,004
	TOTAL DIRECT COSTS				24,319
	INDIRECT COSTS				
1/P	Preliminaries, OH & Profit	24,319	%	33.00	8,025
	TOTAL CONSTRUCTION COSTS				32,344
1/Q	Client Costs	32,344	%	25.00	8,086
	TOTAL BASE ESTIMATE				40,430
1/R	Contingency	40,430	%	40.00	16,172
	Escalation			Excl.	
	TOTAL				**56,602**
	Total Cost				**56,602**



WT ESTIMATE

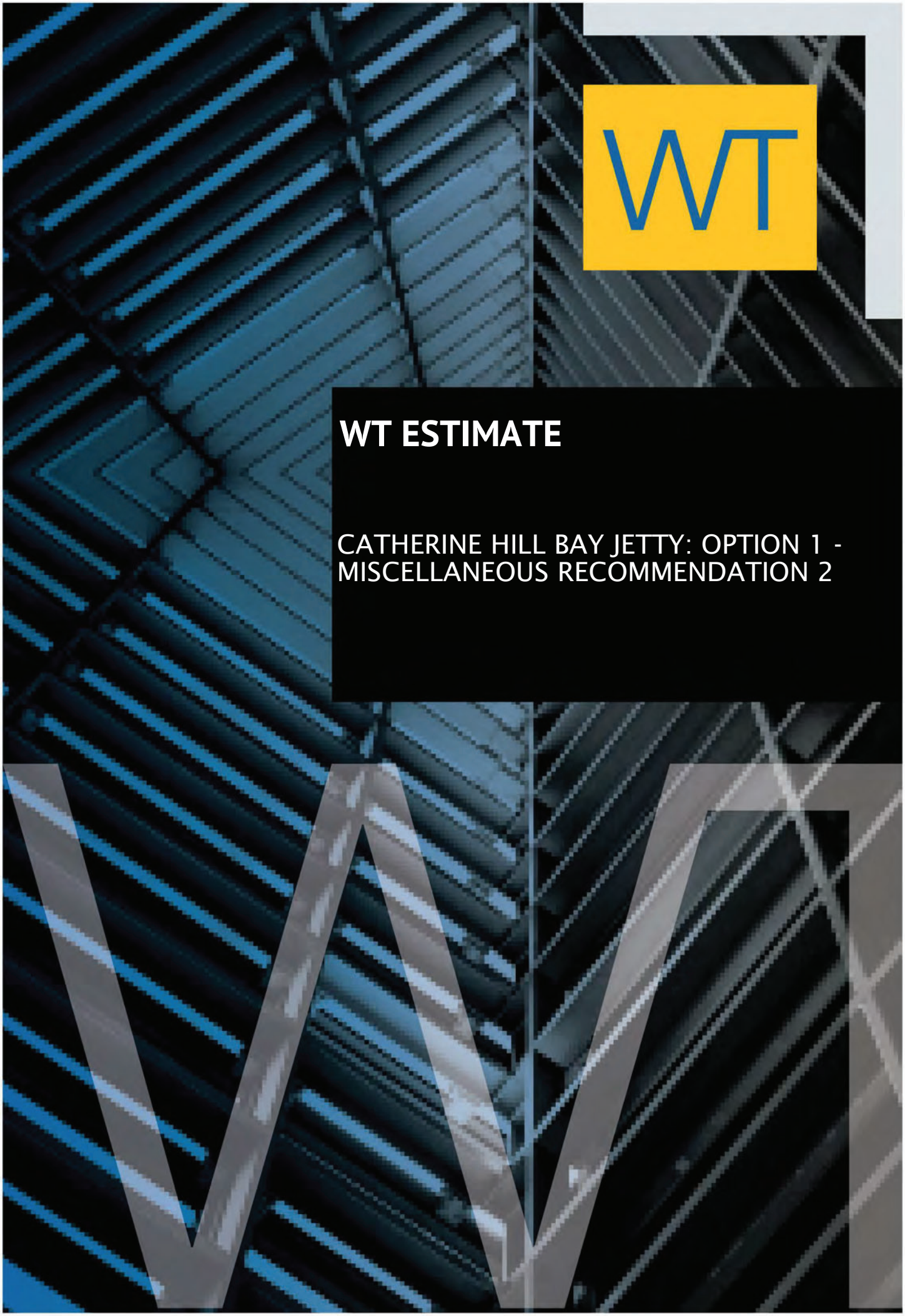
CATHERINE HILL BAY JETTY: OPTION 1 - MISCELLANEOUS RECOMMENDATION 1

WT ESTIMATE

OPTION 1 - MISCELLANEOUS RECOMMENDATION 1

Estimate Summary

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Miscellaneous Recommendation 1 – Retaining Wall and Steel Elements				
	DIRECT COSTS				
	DEMOLITION				
	Steel Works				
1/G	Removal of steel piles & angular circular hollow section bracing; including disposal off site	90	m	311.86	28,067
	Concrete Works				
1/H	Removal of concrete footing; including disposal off site	6	no	815.00	4,890
	Miscellaneous				
1/J	Removal of timber waler retaining wall; including disposal off site	40	m2	180.00	7,200
	TOTAL DIRECT COSTS				40,157
	INDIRECT COSTS				
1/K	Preliminaries, OH & Profit	40,157	%	33.00	13,252
	TOTAL CONSTRUCTION COSTS				53,409
1/L	Client Costs	53,409	%	25.00	13,352
	TOTAL BASE ESTIMATE				66,762
1/M	Contingency	66,762	%	40.00	26,705
	Escalation			Excl.	
	TOTAL				**93,466**
	Total Cost				**93,466**



WT ESTIMATE

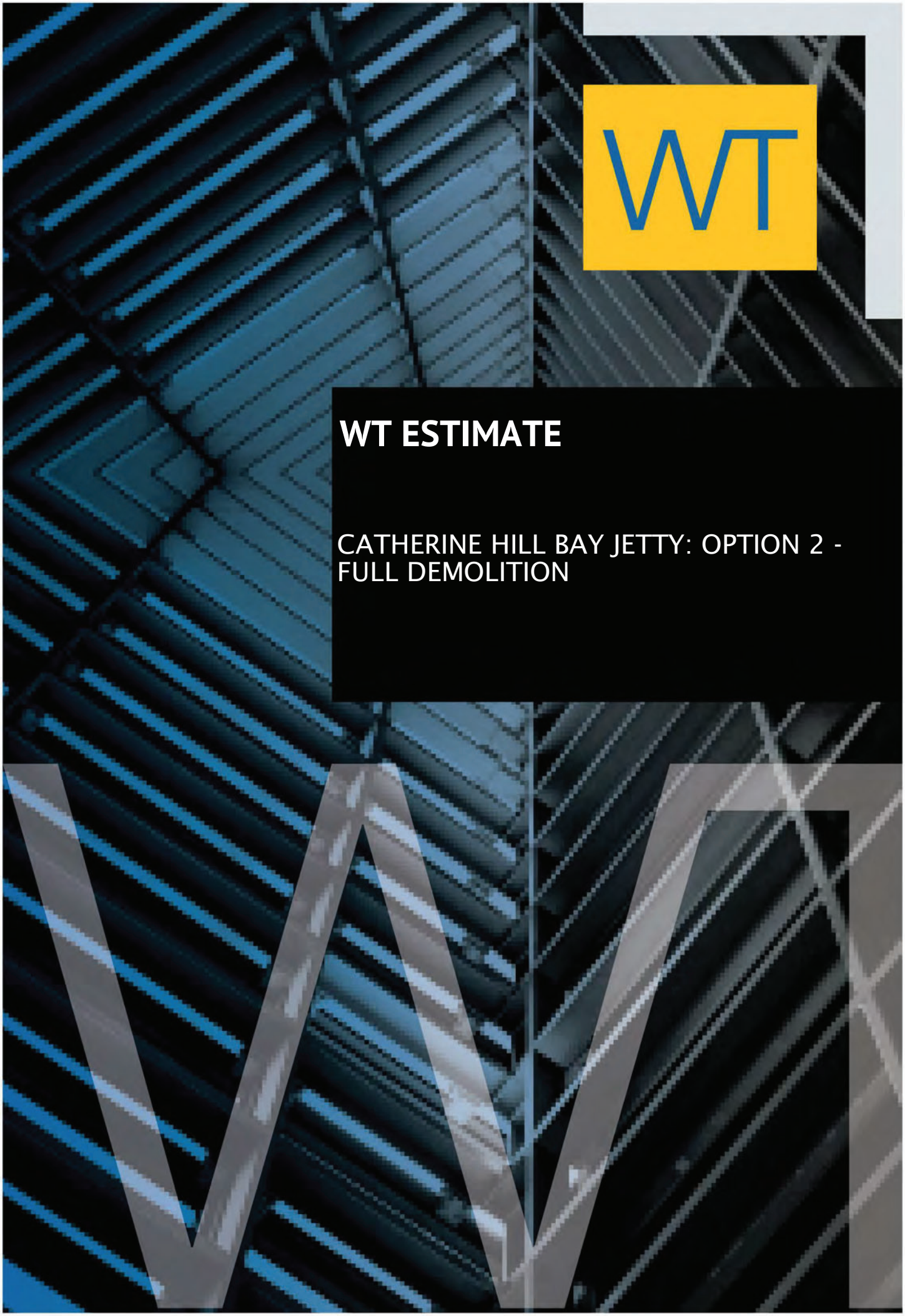
CATHERINE HILL BAY JETTY: OPTION 1 - MISCELLANEOUS RECOMMENDATION 2

WT ESTIMATE

OPTION 1 - MISCELLANEOUS RECOMMENDATION 2

Estimate Summary

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Miscellaneous Recommendation 2 – Handrails and Catwalks				
	DIRECT COSTS				
	DEMOLITION				
	Steel Works				
1/G	Removal of damaged / coroded handrailing; including disposal off site	460	m	54.60	25,116
1/H	Removal of damaged / coroded catwalks; including disposal off site	219	m2	125.40	27,441
	NEW CONSTRUCTION				
	Handrail & balustrades				
1/J	Installation of new handrailing around wharf deck perimeter	701	m	393.80	276,054
	TOTAL DIRECT COSTS				328,611
	INDIRECT COSTS				
1/K	Preliminaries, OH & Profit	328,611	%	33.00	108,442
	TOTAL CONSTRUCTION COSTS				437,053
1/L	Client Costs	437,053	%	25.00	109,263
	TOTAL BASE ESTIMATE				546,316
1/M	Contingency	546,316	%	40.00	218,526
	Escalation			Excl.	
	TOTAL				**764,842**
	Total Cost				**764,842**



WT ESTIMATE

CATHERINE HILL BAY JETTY: OPTION 2 - FULL DEMOLITION

WT ESTIMATE

OPTION 2 - FULL DEMOLITION

Estimate Summary

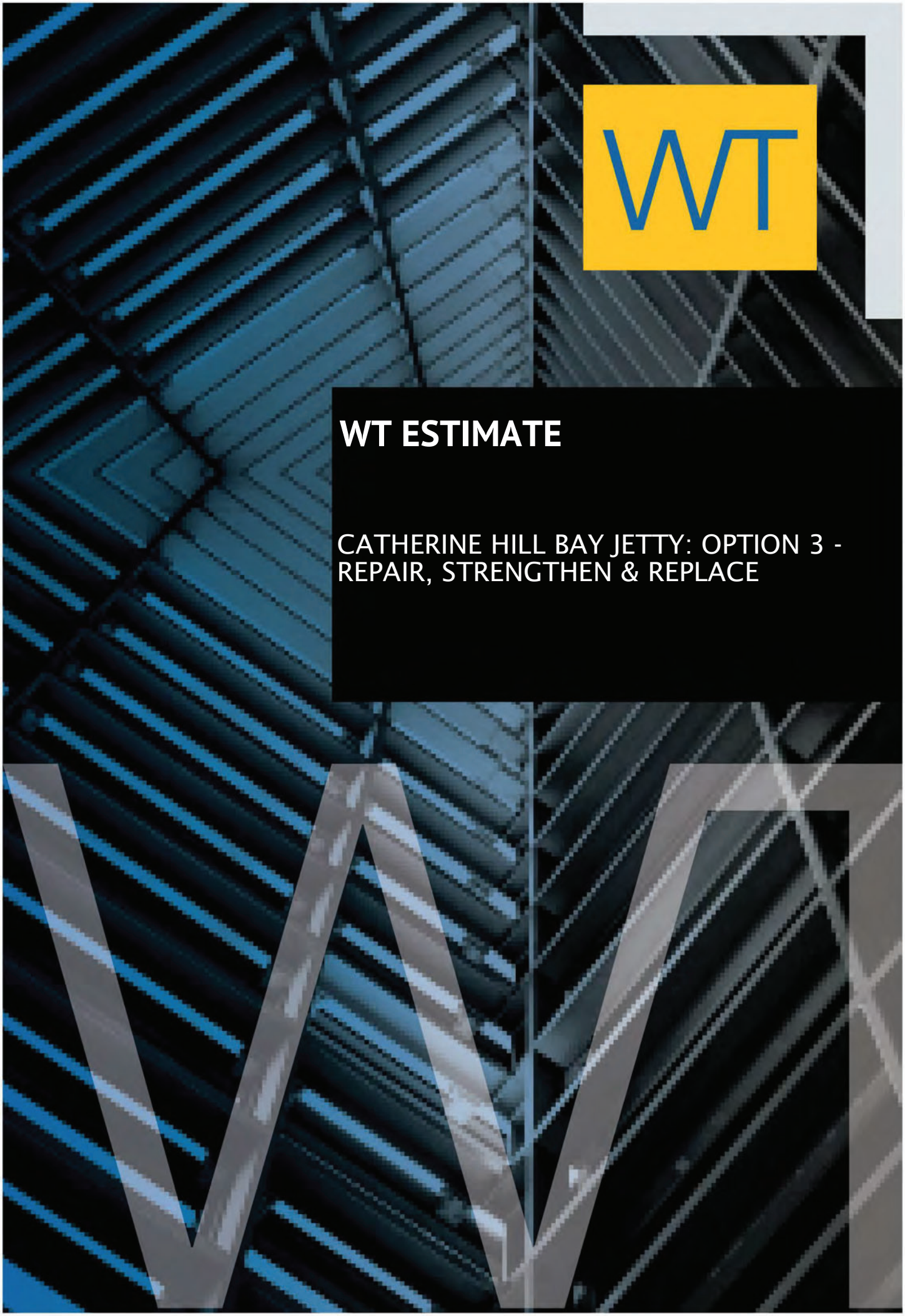
REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Option 2 – Full Demolition				
	DIRECT COSTS				
	Concrete Works - Landside				
1/A	Removal of precast concrete planks; 3x2x0.18m; including disposal off site	57	no	1,598.00	91,086
1/B	Removal of concrete column bases; including disposal off site	12	no	1,335.00	16,020
	Steel Works - Landside				
1/C	Removal of primary steel beams; 610 UB125; including disposal off site	196	m	409.75	80,311
1/D	Removal of steel columns; 310 UC118; including disposal off site	272	m	407.86	110,938
1/E	Removal of steel circular bracing; 230 CHS; including disposal off site	105	m	201.50	21,158
1/F	Removal of bracing; 200 PFC; including disposal off site	52	m	100.21	5,211
1/G	Removal of tie brace beams; 200 UB; including disposal off site	20	m	99.94	1,999
1/H	Removal of bracing; 100x75x8 UA; including disposal off site	113	m	96.70	10,927
1/J	Removal of handrailing; including disposal off site	135	m	54.60	7,394
	Concrete Works - Marine				
1/K	Removal of precast concrete planks; 3x2x0.18m; including disposal off site	313	no	2,398.20	750,637
1/L	Removal of concrete column bases; including disposal off site	14	no	3,682.80	51,559
	Steel Works - Marine				
1/M	Removal of steel circular columns & bracing; 760 CHS; including disposal off site	924	m	1,224.63	1,131,557
1/N	Removal of primary steel beams; 760 UB244; including disposal off site	96	m	1,143.48	109,774
1/P	Removal of primary steel beams; 760 UB197; including disposal off site	96	m	915.27	87,866
1/Q	Removal of primary steel beams; 610 UB125; including disposal off site	255	m	895.83	228,437
1/R	Removal of primary steel beams; 610 UB113; including disposal off site	98	m	892.59	87,474
1/S	Removal of steel columns; 310 UC118; including disposal off site	226	m	988.85	223,480
1/T	Removal of secondary steel members; 530 UB92; including disposal off site	115	m	671.40	77,211
1/U	Removal of secondary steel members; 460 UB74; including disposal off site	189	m	666.54	125,976
1/V	Removal of tertiary steel members; 410 UB60; including disposal off site	192	m	447.24	85,870
1/W	Removal of tertiary steel members; 360 UB57; including disposal off site	318	m	446.43	141,965
1/X	Removal of bracing; 270x9.3 CHS; including disposal off site	241	m	447.24	107,785
1/Y	Removal of bracing; 230 CHS; including disposal off site	68	m	444.54	30,229
1/Z	Removal of secondary steel members & tie bracing; 200 UB; including disposal off site	31	m	221.46	6,865
1/AA	Removal of bracing; 100x75x8 UA; including disposal off site	400	m	218.22	87,288
1/AB	Removal of handrailing; including disposal off site	324	m	54.60	17,668
1/AC	Removal of steel grated catwalks; including disposal off site	219	m2	125.40	27,441

WT ESTIMATE

OPTION 2 - FULL DEMOLITION

Estimate Summary

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Miscellaneous - Marine				
2/A	Removal of former maintenance / inspection sheds; including disposal off site	2	no	12,136.00	24,272
	TOTAL DIRECT COSTS				3,748,397
	INDIRECT COSTS				
2/B	Mobilisation & demobilisation of plant	1	item	102,000.00	102,000
2/C	Preliminaries, OH & Profit	3,748,397	%	33.00	1,236,971
	TOTAL CONSTRUCTION COSTS				5,087,368
2/D	Client Costs	5,087,368	%	25.00	1,271,842
	TOTAL BASE ESTIMATE				6,359,209
2/E	Contingency	6,359,209	%	40.00	2,543,684
	Escalation			Excl.	
	TOTAL				**8,902,893**
	Total Cost				**8,902,893**



WT ESTIMATE

CATHERINE HILL BAY JETTY: OPTION 3 - REPAIR, STRENGTHEN & REPLACE

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Summary

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Option 3 - Repair, Strengthen & Replace				
	DIRECT COSTS				
	Concrete Works - Landside				
	Precast concrete planks				86,705
	Movement joints				20,520
	Steel Works - Landside				
	Bent 21 works				88,965
	Bent 22 works				97,583
	Bent 23 works				97,583
	Bent 24 works				92,089
	Bent 25 works				92,089
	Bent 26 works				92,089
	Bent 27 works				92,089
	Bent 28 works				92,089
	Handrailing works				77,258
	Concrete Works - Marine				
	Precast concrete planks				426,840
	Movement joints				17,100
	Steel Works - Marine				
	Bent 1 works				209,455
	Bent 2 works				209,455
	Bent 3 works				209,455
	Bent 4 works				304,175
	Bent 5 works				304,175
	Bent 6 works				209,455
	Bent 7 works				209,455
	Bent 8 works				200,048
	Bent 9 works				182,734
	Bent 10 works				182,734
	Bent 11 works				185,900
	Bent 12 works				205,957
	Bent 13 works				205,957
	Bent 14 works				205,957

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Summary

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Bent 15 works				205,957
	Bent 16 works				205,957
	Bent 17 works				213,651
	Bent 18 works				359,688
	Bent 19 works				389,232
	Bent 20 works				241,243
	Handrailing works				223,621
	Steel grated catwalk works				27,441
	Temporary Works - Marine				
	Scaffolding Works				336,961
	TOTAL DIRECT COSTS				6,601,663
	INDIRECT COSTS				
2/A	Mobilisation & demobilisation of plant	1	item	102,000.00	102,000
2/B	Preliminaries, OH & Profit	6,601,663	%	33.00	2,178,549
	TOTAL CONSTRUCTION COSTS				8,882,212
2/C	Client Costs	8,882,212	%	25.00	2,220,553
	TOTAL BASE ESTIMATE				11,102,764
2/D	Contingency	11,102,764	%	40.00	4,441,106
	Escalation			Excl.	
	TOTAL				**15,543,870**
	Total Cost				**15,543,870**

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	PRECAST CONCRETE PLANKS				
	Deck				
	Keep				
3/A	Precast concrete planks; 3x2x0.18m	46	no	0	0
	Replace				
3/B	Precast concrete planks; 3x2x0.18m	10	no	8,671	86,705
	Total - Precast concrete planks				**86,705**
	MOVEMENT JOINTS				
	Deck				
	Keep				
3/C	Movement joints; approx 3m length	0	no	0	0
	Replace				
3/D	Movement joints; approx 3m length	8	no	2,565	20,520
	Total - Movement joints				**20,520**
	BENT 21 WORKS				
	Frame				
	Remove				
3/E	Brace 3; 200 PFC	9.0	m	100	900
	Replace				
3/F	Column 1; 310 UC118	17.0	m	1,621	27,603
3/G	Column 2; 310 UC118	17.0	m	1,621	27,603
3/H	Brace 1; 230 CHS	3.1	m	841	2,599
3/J	Brace 2; 230 CHS	5.3	m	841	4,457
	Deck				
	Clean & Coating				
3/K	Primary member 1; 610 UB125	12.2	m	485	5,919
3/L	Primary member 2; 610 UB125	12.2	m	485	5,919
	Remove				
3/M	Bracing; 100x75x8 UA	14.0	m	97	1,349
3/N	Tie brace; 200 UB	2.5	m	100	249
	Connections				
	Clean & Coating				
3/P	Primary splice	1	no	1,110	1,110
	Replace				
3/Q	Arrangement of welded plates; Primary member to bent	6	no	1,183	7,098
3/R	Welded connection; Column to vertical bracing	4	no	1,040	4,160
	Total - Bent 21 works				**88,965**

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	BENT 22 WORKS				
	Frame				
	Remove				
4/A	Brace 3; 200 PFC	9.0	m	100	900
	Replace				
4/B	Column 1; 310 UC118	17.0	m	1,621	27,603
4/C	Column 2; 310 UC118	17.0	m	1,621	27,603
4/D	Brace 1; 230 CHS	3.1	m	841	2,599
4/E	Brace 2; 230 CHS	10.6	m	841	8,915
	Deck				
	Clean & Coating				
4/F	Primary member 1; 610 UB125	12.2	m	485	5,919
4/G	Primary member 2; 610 UB125	12.2	m	485	5,919
	Remove				
4/H	Bracing; 100x75x8 UA	14.0	m	97	1,349
4/J	Tie brace; 200 UB	2.5	m	100	249
	Connections				
	Clean & Coating				
4/K	Primary splice	1	no	1,110	1,110
	Replace				
4/L	Arrangement of welded plates; Primary member to bent	6	no	1,183	7,098
4/M	Welded connection; Column to vertical bracing	8	no	1,040	8,320
	Total - Bent 22 works				**97,583**
	BENT 23 WORKS				
	Frame				
	Remove				
4/N	Brace 3; 200 PFC	9.0	m	100	900
	Replace				
4/P	Column 1; 310 UC118	17.0	m	1,621	27,603
4/Q	Column 2; 310 UC118	17.0	m	1,621	27,603
4/R	Brace 1; 230 CHS	3.1	m	841	2,599
4/S	Brace 2; 230 CHS	10.6	m	841	8,915
	Deck				
	Clean & Coating				
4/T	Primary member 1; 610 UB125	12.2	m	485	5,919
4/U	Primary member 2; 610 UB125	12.2	m	485	5,919
	Remove				
4/V	Bracing; 100x75x8 UA	14.0	m	97	1,349

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
5/A	Tie brace; 200 UB	2.5	m	100	249
	Connections				
	Clean & Coating				
5/B	Primary splice	1	no	1,110	1,110
	Replace				
5/C	Arrangement of welded plates; Primary member to bent	6	no	1,183	7,098
5/D	Welded connection; Column to vertical bracing	8	no	1,040	8,320
	Total - Bent 23 works				**97,583**
	BENT 24 WORKS				
	Frame				
	Remove				
5/E	Brace 3; 200 PFC	4.9	m	100	491
	Replace				
5/F	Column 1; 310 UC118	17.0	m	1,621	27,603
5/G	Column 2; 310 UC118	17.0	m	1,621	27,603
5/H	Brace 1; 230 CHS	3.1	m	841	2,599
5/J	Brace 2; 230 CHS	9.5	m	841	7,990
	Deck				
	Clean & Coating				
5/K	Primary member 1; 610 UB125	12.2	m	485	5,919
5/L	Primary member 2; 610 UB125	12.2	m	485	5,919
	Remove				
5/M	Bracing; 100x75x8 UA	14.0	m	97	1,349
5/N	Tie brace; 200 UB	2.5	m	100	249
	Connections				
	Clean & Coating				
5/P	Primary splice	1	no	1,110	1,110
	Replace				
5/Q	Arrangement of welded plates; Primary member to bent	6	no	1,183	7,098
5/R	Welded connection; Column to vertical bracing	4	no	1,040	4,160
	Total - Bent 24 works				**92,089**
	BENT 25 WORKS				
	Frame				
	Remove				
5/S	Brace 3; 200 PFC	4.9	m	100	491
	Replace				
5/T	Column 1; 310 UC118	17.0	m	1,621	27,603

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
6/A	Column 2; 310 UC118	17.0	m	1,621	27,603
6/B	Brace 1; 230 CHS	3.1	m	841	2,599
6/C	Brace 2; 230 CHS	9.5	m	841	7,990
	Deck				
	Clean & Coating				
6/D	Primary member 1; 610 UB125	12.2	m	485	5,919
6/E	Primary member 2; 610 UB125	12.2	m	485	5,919
	Remove				
6/F	Bracing; 100x75x8 UA	14.0	m	97	1,349
6/G	Tie brace; 200 UB	2.5	m	100	249
	Connections				
	Clean & Coating				
6/H	Primary splice	1	no	1,110	1,110
	Replace				
6/J	Arrangement of welded plates; Primary member to bent	6	no	1,183	7,098
6/K	Welded connection; Column to vertical bracing	4	no	1,040	4,160
	Total - Bent 25 works				**92,089**
	BENT 26 WORKS				
	Frame				
	Remove				
6/L	Brace 3; 200 PFC	4.9	m	100	491
	Replace				
6/M	Column 1; 310 UC118	17.0	m	1,621	27,603
6/N	Column 2; 310 UC118	17.0	m	1,621	27,603
6/P	Brace 1; 230 CHS	3.1	m	841	2,599
6/Q	Brace 2; 230 CHS	9.5	m	841	7,990
	Deck				
	Clean & Coating				
6/R	Primary member 1; 610 UB125	12.2	m	485	5,919
6/S	Primary member 2; 610 UB125	12.2	m	485	5,919
	Remove				
6/T	Bracing; 100x75x8 UA	14.0	m	97	1,349
6/U	Tie brace; 200 UB	2.5	m	100	249
	Connections				
	Clean & Coating				
6/V	Primary splice	1	no	1,110	1,110
	Replace				
6/W	Arrangement of welded plates; Primary member to bent	6	no	1,183	7,098

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
7/A	Welded connection; Column to vertical bracing	4	no	1,040	4,160
	Total - Bent 26 works				**92,089**
	BENT 27 WORKS				
	Frame				
	Remove				
7/B	Brace 3; 200 PFC	4.9	m	100	491
	Replace				
7/C	Column 1; 310 UC118	17.0	m	1,621	27,603
7/D	Column 2; 310 UC118	17.0	m	1,621	27,603
7/E	Brace 1; 230 CHS	3.1	m	841	2,599
7/F	Brace 2; 230 CHS	9.5	m	841	7,990
	Deck				
	Clean & Coating				
7/G	Primary member 1; 610 UB125	12.2	m	485	5,919
7/H	Primary member 2; 610 UB125	12.2	m	485	5,919
	Remove				
7/J	Bracing; 100x75x8 UA	14.0	m	97	1,349
7/K	Tie brace; 200 UB	2.5	m	100	249
	Connections				
	Clean & Coating				
7/L	Primary splice	1	no	1,110	1,110
	Replace				
7/M	Arrangement of welded plates; Primary member to bent	6	no	1,183	7,098
7/N	Welded connection; Column to vertical bracing	4	no	1,040	4,160
	Total - Bent 27 works				**92,089**
	BENT 28 WORKS				
	Frame				
	Remove				
7/P	Brace 3; 200 PFC	4.9	m	100	491
	Replace				
7/Q	Column 1; 310 UC118	17.0	m	1,621	27,603
7/R	Column 2; 310 UC118	17.0	m	1,621	27,603
7/S	Brace 1; 230 CHS	3.1	m	841	2,599
7/T	Brace 2; 230 CHS	9.5	m	841	7,990
	Deck				
	Clean & Coating				
7/U	Primary member 1; 610 UB125	12.2	m	485	5,919

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
8/A	Primary member 2; 610 UB125	12.2	m	485	5,919
	Remove				
8/B	Bracing; 100x75x8 UA	14.0	m	97	1,349
8/C	Tie brace; 200 UB	2.5	m	100	249
	Connections				
	Clean & Coating				
8/D	Primary splice	1	no	1,110	1,110
	Replace				
8/E	Arrangement of welded plates; Primary member to bent	6	no	1,183	7,098
8/F	Welded connection; Column to vertical bracing	4	no	1,040	4,160
	Total - Bent 28 works				**92,089**
	HANDRAILING WORKS				
	Deck				
	Replace				
8/G	Handrailing	177	m	435	77,258
	Total - Handrailing works				**77,258**
	PRECAST CONCRETE PLANKS				
	Deck				
	Keep				
8/H	Precast concrete planks; 3x2x0.18m	273	no	0	0
	Replace				
8/J	Precast concrete planks; 3x2x0.18m	40	no	10,671	426,840
	Total - Precast concrete planks				**426,840**
	MOVEMENT JOINTS				
	Deck				
	Keep				
8/K	Movement joints; approx 5m length	16	no	0	0
	Replace				
8/L	Movement joints; approx 5m length	4	no	4,275	17,100
	Total - Movement joints				**17,100**
	BENT 1 WORKS				
	Frame				
	Clean & Coating				
8/M	Column 1; 760 CHS	20.0	m	1,348	26,968
8/N	Column 2; 760 CHS	20.8	m	1,350	28,095
8/P	Brace 1; 760 CHS	5.2	m	779	4,036

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
9/A	Brace 2; 760 CHS	6.0	m	779	4,659
9/B	Brace 3; 270x9.3 CHS	8.3	m	380	3,156
	Deck				
	Clean & Coating				
9/C	Primary member 1; 760 UB244	13.7	m	847	11,614
9/D	Primary member 2; 760 UB197	13.7	m	836	11,472
9/E	Secondary member; 530 UB92	15.5	m	642	9,975
9/F	Tertiary member; 410 UB60	27.4	m	546	14,983
	Remove				
9/G	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
9/H	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
9/J	CHS brace splice	1	no	2,708	2,708
9/K	Primary splice	1	no	1,628	1,628
9/L	Tertiary splice	1	no	1,340	1,340
	Replace				
9/M	Arrangement of welded plates; Primary member to bent	10	no	2,222	22,222
9/N	Arrangement of welded plates; Secondary to primary member	18	no	2,105	37,883
9/P	Arrangement of welded plates; Tertiary to secondary member	12	no	2,011	24,135
	Total - Bent 1 works				**209,455**
	BENT 2 WORKS				
	Frame				
	Clean & Coating				
9/Q	Column 1; 760 CHS	20.0	m	1,348	26,968
9/R	Column 2; 760 CHS	20.8	m	1,350	28,095
9/S	Brace 1; 760 CHS	5.2	m	779	4,036
9/T	Brace 2; 760 CHS	6.0	m	779	4,659
9/U	Brace 3; 270x9.3 CHS	8.3	m	380	3,156
	Deck				
	Clean & Coating				
9/V	Primary member 1; 760 UB244	13.7	m	847	11,614
9/W	Primary member 2; 760 UB197	13.7	m	836	11,472
9/X	Secondary member; 530 UB92	15.5	m	642	9,975
9/Y	Tertiary member; 410 UB60	27.4	m	546	14,983
	Remove				
9/Z	Plan bracing; 100x75x8 UA	21.0	m	218	4,583

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Connections				
	Keep				
10/A	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
10/B	CHS brace splice	1	no	2,708	2,708
10/C	Primary splice	1	no	1,628	1,628
10/D	Tertiary splice	1	no	1,340	1,340
	Replace				
10/E	Arrangement of welded plates; Primary member to bent	10	no	2,222	22,222
10/F	Arrangement of welded plates; Secondary to primary member	18	no	2,105	37,883
10/G	Arrangement of welded plates; Tertiary to secondary member	12	no	2,011	24,135
	Total - Bent 2 works				**209,455**
	BENT 3 WORKS				
	Frame				
	Clean & Coating				
10/H	Column 1; 760 CHS	20.0	m	1,348	26,968
10/J	Column 2; 760 CHS	20.8	m	1,350	28,095
10/K	Brace 1; 760 CHS	5.2	m	779	4,036
10/L	Brace 2; 760 CHS	6.0	m	779	4,659
10/M	Brace 3; 270x9.3 CHS	8.3	m	380	3,156
	Deck				
	Clean & Coating				
10/N	Primary member 1; 760 UB244	13.7	m	847	11,614
10/P	Primary member 2; 760 UB197	13.7	m	836	11,472
10/Q	Secondary member; 530 UB92	15.5	m	642	9,975
10/R	Tertiary member; 410 UB60	27.4	m	546	14,983
	Remove				
10/S	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
10/T	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
10/U	CHS brace splice	1	no	2,708	2,708
10/V	Primary splice	1	no	1,628	1,628
10/W	Tertiary splice	1	no	1,340	1,340
	Replace				
10/X	Arrangement of welded plates; Primary member to bent	10	no	2,222	22,222
10/Y	Arrangement of welded plates; Secondary to primary member	18	no	2,105	37,883

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
11/A	Arrangement of welded plates; Tertiary to secondary member	12	no	2,011	24,135
	Total - Bent 3 works				**209,455**
	BENT 4 WORKS				
	Frame				
	Clean & Coating				
11/B	Column 1; 760 CHS	40.0	m	1,348	53,937
11/C	Column 2; 760 CHS	20.8	m	1,350	28,095
11/D	Column 3; 760 CHS	41.4	m	1,348	55,766
11/E	Brace 1; 760 CHS	10.4	m	779	8,072
11/F	Brace 2; 760 CHS	6.1	m	779	4,753
11/G	Brace 2B; 760 CHS	6.9	m	779	5,376
11/H	Brace 3; 270x9.3 CHS	7.1	m	380	2,684
11/J	Brace 3A; 270x9.3 CHS	7.8	m	380	2,950
	Deck				
	Clean & Coating				
11/K	Primary member 1; 760 UB244	13.7	m	847	11,614
11/L	Primary member 2; 760 UB197	13.7	m	836	11,472
11/M	Secondary member; 530 UB92	15.5	m	642	9,975
11/N	Tertiary member; 410 UB60	27.4	m	546	14,983
	Remove				
11/P	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
11/Q	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
11/R	CHS brace splice	1	no	2,708	2,708
11/S	Primary splice	1	no	1,628	1,628
11/T	Tertiary splice	1	no	1,340	1,340
	Replace				
11/U	Arrangement of welded plates; Primary member to bent	10	no	2,222	22,222
11/V	Arrangement of welded plates; Secondary to primary member	18	no	2,105	37,883
11/W	Arrangement of welded plates; Tertiary to secondary member	12	no	2,011	24,135
	Total - Bent 4 works				**304,175**
	BENT 5 WORKS				
	Frame				
	Clean & Coating				
11/X	Column 1; 760 CHS	40.0	m	1,348	53,937

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
12/A	Column 2; 760 CHS	20.8	m	1,350	28,095
12/B	Column 3; 760 CHS	41.4	m	1,348	55,766
12/C	Brace 1; 760 CHS	10.4	m	779	8,072
12/D	Brace 2; 760 CHS	6.1	m	779	4,753
12/E	Brace 2B; 760 CHS	6.9	m	779	5,376
12/F	Brace 3; 270x9.3 CHS	7.1	m	380	2,684
12/G	Brace 3A; 270x9.3 CHS	7.8	m	380	2,950
	Deck				
	Clean & Coating				
12/H	Primary member 1; 760 UB244	13.7	m	847	11,614
12/J	Primary member 2; 760 UB197	13.7	m	836	11,472
12/K	Secondary member; 530 UB92	15.5	m	642	9,975
12/L	Tertiary member; 410 UB60	27.4	m	546	14,983
	Remove				
12/M	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
12/N	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
12/P	CHS brace splice	1	no	2,708	2,708
12/Q	Primary splice	1	no	1,628	1,628
12/R	Tertiary splice	1	no	1,340	1,340
	Replace				
12/S	Arrangement of welded plates; Primary member to bent	10	no	2,222	22,222
12/T	Arrangement of welded plates; Secondary to primary member	18	no	2,105	37,883
12/U	Arrangement of welded plates; Tertiary to secondary member	12	no	2,011	24,135
	Total - Bent 5 works				**304,175**
	BENT 6 WORKS				
	Frame				
	Clean & Coating				
12/V	Column 1; 760 CHS	20.0	m	1,348	26,968
12/W	Column 2; 760 CHS	20.8	m	1,350	28,095
12/X	Brace 1; 760 CHS	5.2	m	779	4,036
12/Y	Brace 2; 760 CHS	6.0	m	779	4,659
12/Z	Brace 3; 270x9.3 CHS	8.3	m	380	3,156
	Deck				
	Clean & Coating				
12/AA	Primary member 1; 760 UB244	13.7	m	847	11,614

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
13/A	Primary member 2; 760 UB197	13.7	m	836	11,472
13/B	Secondary member; 530 UB92	15.5	m	642	9,975
13/C	Tertiary member; 410 UB60	27.4	m	546	14,983
	Remove				
13/D	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
13/E	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
13/F	CHS brace splice	1	no	2,708	2,708
13/G	Primary splice	1	no	1,628	1,628
13/H	Tertiary splice	1	no	1,340	1,340
	Replace				
13/J	Arrangement of welded plates; Primary member to bent	10	no	2,222	22,222
13/K	Arrangement of welded plates; Secondary to primary member	18	no	2,105	37,883
13/L	Arrangement of welded plates; Tertiary to secondary member	12	no	2,011	24,135
	Total - Bent 6 works				**209,455**
	BENT 7 WORKS				
	Frame				
	Clean & Coating				
13/M	Column 1; 760 CHS	20.0	m	1,348	26,968
13/N	Column 2; 760 CHS	20.8	m	1,350	28,095
13/P	Brace 1; 760 CHS	5.2	m	779	4,036
13/Q	Brace 2; 760 CHS	6.0	m	779	4,659
13/R	Brace 3; 270x9.3 CHS	8.3	m	380	3,156
	Deck				
	Clean & Coating				
13/S	Primary member 1; 760 UB244	13.7	m	847	11,614
13/T	Primary member 2; 760 UB197	13.7	m	836	11,472
13/U	Secondary member; 530 UB92	15.5	m	642	9,975
13/V	Tertiary member; 410 UB60	27.4	m	546	14,983
	Remove				
13/W	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
13/X	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
13/Y	CHS brace splice	1	no	2,708	2,708

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
14/A	Primary splice	1	no	1,628	1,628
14/B	Tertiary splice	1	no	1,340	1,340
	Replace				
14/C	Arrangement of welded plates; Primary member to bent	10	no	2,222	22,222
14/D	Arrangement of welded plates; Secondary to primary member	18	no	2,105	37,883
14/E	Arrangement of welded plates; Tertiary to secondary member	12	no	2,011	24,135
	Total - Bent 7 works				**209,455**
	BENT 8 WORKS				
	Frame				
	Clean & Coating				
14/F	Column 1; 760 CHS	20.0	m	1,348	26,968
14/G	Column 2; 760 CHS	20.8	m	1,350	28,095
14/H	Brace 1; 760 CHS	5.2	m	779	4,036
14/J	Brace 2; 760 CHS	6.0	m	779	4,659
14/K	Brace 3; 270x9.3 CHS	8.3	m	380	3,156
	Deck				
	Clean & Coating				
14/L	Primary member 1; 610 UB113	12.2	m	699	8,526
14/M	Primary member 2; 610 UB113	12.2	m	699	8,526
14/N	Secondary member (Type DA1 deck); 530 UB92	5.2	m	642	3,325
14/P	Secondary member (Type DA2 deck); 460 UB74	10.4	m	585	6,059
14/Q	Tertiary member; 360 UB57	24.4	m	515	12,564
	Remove				
14/R	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
14/S	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
14/T	CHS brace splice	1	no	2,708	2,708
14/U	Primary splice	1	no	1,628	1,628
14/V	Tertiary splice	1	no	1,340	1,340
	Replace				
14/W	Arrangement of welded plates; Primary member to bent	10	no	2,222	22,222
14/X	Arrangement of welded plates; Secondary to primary member (Type DA1 deck)	6	no	2,105	12,628
14/Y	Arrangement of welded plates; Secondary to primary member (Type DA2 deck)	12	no	2,069	24,832
14/Z	Arrangement of welded plates; Tertiary to secondary member (Type DA1 deck)	4	no	2,108	8,434
14/AA	Arrangement of welded plates; Tertiary to secondary member (Type DA2 deck)	8	no	1,970	15,760
	Total - Bent 8 works				**200,048**

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	BENT 9 WORKS				
	Frame				
	Clean & Coating				
15/A	Column 1; 760 CHS	20.0	m	1,348	26,984
15/B	Column 2; 760 CHS	20.0	m	1,348	26,984
15/C	Brace 1; 270x9.3 CHS	5.2	m	380	1,969
15/D	Brace 2; 270x9.3 CHS	10.6	m	380	4,038
	Deck				
	Clean & Coating				
15/E	Primary member 1; 610 UB113	12.2	m	699	8,526
15/F	Primary member 2; 610 UB113	12.2	m	699	8,526
15/G	Secondary member; 460 UB74	15.5	m	585	9,089
15/H	Tertiary member; 360 UB57	24.4	m	515	12,564
	Remove				
15/J	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
15/K	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
15/L	CHS brace splice	1	no	2,708	2,708
15/M	Primary splice	1	no	1,628	1,628
15/N	Tertiary splice	1	no	1,340	1,340
	Replace				
15/P	Arrangement of welded plates; Primary member to bent	6	no	2,165	12,987
15/Q	Arrangement of welded plates; Secondary to primary member	18	no	2,069	37,249
15/R	Arrangement of welded plates; Tertiary to secondary member	12	no	1,963	23,560
	Total - Bent 9 works				**182,734**
	BENT 10 WORKS				
	Frame				
	Clean & Coating				
15/S	Column 1; 760 CHS	20.0	m	1,348	26,984
15/T	Column 2; 760 CHS	20.0	m	1,348	26,984
15/U	Brace 1; 270x9.3 CHS	5.2	m	380	1,969
15/V	Brace 2; 270x9.3 CHS	10.6	m	380	4,038
	Deck				
	Clean & Coating				
15/W	Primary member 1; 610 UB113	12.2	m	699	8,526
15/X	Primary member 2; 610 UB113	12.2	m	699	8,526

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
16/A	Secondary member; 460 UB74	15.5	m	585	9,089
16/B	Tertiary member; 360 UB57	24.4	m	515	12,564
	Remove				
16/C	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
16/D	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
16/E	CHS brace splice	1	no	2,708	2,708
16/F	Primary splice	1	no	1,628	1,628
16/G	Tertiary splice	1	no	1,340	1,340
	Replace				
16/H	Arrangement of welded plates; Primary member to bent	6	no	2,165	12,987
16/J	Arrangement of welded plates; Secondary to primary member	18	no	2,069	37,249
16/K	Arrangement of welded plates; Tertiary to secondary member	12	no	1,963	23,560
	Total - Bent 10 works				**182,734**
	BENT 11 WORKS				
	Frame				
	Clean & Coating				
16/L	Column 1; 760 CHS	20.0	m	1,348	26,984
16/M	Column 2; 760 CHS	20.0	m	1,348	26,984
16/N	Brace 1; 270x9.3 CHS	5.2	m	380	1,969
16/P	Brace 2; 270x9.3 CHS	10.6	m	380	4,038
	Deck				
	Clean & Coating				
16/Q	Primary member 1; 610 UB113	12.2	m	699	8,526
16/R	Primary member 1A; 610 UB113	4.5	m	699	3,166
16/S	Primary member 2; 610 UB113	12.2	m	699	8,526
16/T	Secondary member; 460 UB74	15.5	m	585	9,089
16/U	Tertiary member; 360 UB57	24.4	m	515	12,564
	Remove				
16/V	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
16/W	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
16/X	CHS brace splice	1	no	2,708	2,708
16/Y	Primary splice	1	no	1,628	1,628

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
17/A	Tertiary splice	1	no	1,340	1,340
	Replace				
17/B	Arrangement of welded plates; Primary member to bent	6	no	2,165	12,987
17/C	Arrangement of welded plates; Secondary to primary member	18	no	2,069	37,249
17/D	Arrangement of welded plates; Tertiary to secondary member	12	no	1,963	23,560
	Total - Bent 11 works				**185,900**
	BENT 12 WORKS				
	Frame				
	Clean & Coating				
17/E	Column 1; 760 CHS	20.0	m	1,348	26,968
17/F	Column 2; 760 CHS	20.0	m	1,348	26,968
17/G	Brace 1; 270x9.3 CHS	7.2	m	380	2,734
17/H	Brace 2; 270x9.3 CHS	11.5	m	380	4,380
	Deck				
	Clean & Coating				
17/J	Primary member 1; 610 UB125	12.2	m	701	8,558
17/K	Primary member 2; 610 UB125	12.2	m	701	8,558
17/L	Secondary member; 460 UB74	21.6	m	585	12,616
17/M	Tertiary member; 360 UB57	36.6	m	515	18,846
	Remove				
17/N	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
17/P	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
17/Q	CHS brace splice	1	no	2,708	2,708
17/R	Primary splice	1	no	1,628	1,628
17/S	Tertiary splice	1	no	1,340	1,340
	Replace				
17/T	Arrangement of welded plates; Primary member to bent	6	no	2,227	13,363
17/U	Arrangement of welded plates; Secondary to primary member	18	no	2,069	37,249
17/V	Arrangement of welded plates; Tertiary to secondary member	18	no	1,970	35,461
	Total - Bent 12 works				**205,957**
	BENT 13 WORKS				
	Frame				
	Clean & Coating				
17/W	Column 1; 760 CHS	20.0	m	1,348	26,968

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
18/A	Column 2; 760 CHS	20.0	m	1,348	26,968
18/B	Brace 1; 270x9.3 CHS	7.2	m	380	2,734
18/C	Brace 2; 270x9.3 CHS	11.5	m	380	4,380
	Deck				
	Clean & Coating				
18/D	Primary member 1; 610 UB125	12.2	m	701	8,558
18/E	Primary member 2; 610 UB125	12.2	m	701	8,558
18/F	Secondary member; 460 UB74	21.6	m	585	12,616
18/G	Tertiary member; 360 UB57	36.6	m	515	18,846
	Remove				
18/H	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
18/J	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
18/K	CHS brace splice	1	no	2,708	2,708
18/L	Primary splice	1	no	1,628	1,628
18/M	Tertiary splice	1	no	1,340	1,340
	Replace				
18/N	Arrangement of welded plates; Primary member to bent	6	no	2,227	13,363
18/P	Arrangement of welded plates; Secondary to primary member	18	no	2,069	37,249
18/Q	Arrangement of welded plates; Tertiary to secondary member	18	no	1,970	35,461
	Total - Bent 13 works				**205,957**
	BENT 14 WORKS				
	Frame				
	Clean & Coating				
18/R	Column 1; 760 CHS	20.0	m	1,348	26,968
18/S	Column 2; 760 CHS	20.0	m	1,348	26,968
18/T	Brace 1; 270x9.3 CHS	7.2	m	380	2,734
18/U	Brace 2; 270x9.3 CHS	11.5	m	380	4,380
	Deck				
	Clean & Coating				
18/V	Primary member 1; 610 UB125	12.2	m	701	8,558
18/W	Primary member 2; 610 UB125	12.2	m	701	8,558
18/X	Secondary member; 460 UB74	21.6	m	585	12,616
18/Y	Tertiary member; 360 UB57	36.6	m	515	18,846
	Remove				
18/Z	Plan bracing; 100x75x8 UA	21.0	m	218	4,583

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Connections				
	Keep				
19/A	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
19/B	CHS brace splice	1	no	2,708	2,708
19/C	Primary splice	1	no	1,628	1,628
19/D	Tertiary splice	1	no	1,340	1,340
	Replace				
19/E	Arrangement of welded plates; Primary member to bent	6	no	2,227	13,363
19/F	Arrangement of welded plates; Secondary to primary member	18	no	2,069	37,249
19/G	Arrangement of welded plates; Tertiary to secondary member	18	no	1,970	35,461
	Total - Bent 14 works				**205,957**
	BENT 15 WORKS				
	Frame				
	Clean & Coating				
19/H	Column 1; 760 CHS	20.0	m	1,348	26,968
19/J	Column 2; 760 CHS	20.0	m	1,348	26,968
19/K	Brace 1; 270x9.3 CHS	7.2	m	380	2,734
19/L	Brace 2; 270x9.3 CHS	11.5	m	380	4,380
	Deck				
	Clean & Coating				
19/M	Primary member 1; 610 UB125	12.2	m	701	8,558
19/N	Primary member 2; 610 UB125	12.2	m	701	8,558
19/P	Secondary member; 460 UB74	21.6	m	585	12,616
19/Q	Tertiary member; 360 UB57	36.6	m	515	18,846
	Remove				
19/R	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
19/S	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
19/T	CHS brace splice	1	no	2,708	2,708
19/U	Primary splice	1	no	1,628	1,628
19/V	Tertiary splice	1	no	1,340	1,340
	Replace				
19/W	Arrangement of welded plates; Primary member to bent	6	no	2,227	13,363
19/X	Arrangement of welded plates; Secondary to primary member	18	no	2,069	37,249
19/Y	Arrangement of welded plates; Tertiary to secondary member	18	no	1,970	35,461

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Total - Bent 15 works				**205,957**
	BENT 16 WORKS				
	Frame				
	Clean & Coating				
20/A	Column 1; 760 CHS	20.0	m	1,348	26,968
20/B	Column 2; 760 CHS	20.0	m	1,348	26,968
20/C	Brace 1; 270x9.3 CHS	7.2	m	380	2,734
20/D	Brace 2; 270x9.3 CHS	11.5	m	380	4,380
	Deck				
	Clean & Coating				
20/E	Primary member 1; 610 UB125	12.2	m	701	8,558
20/F	Primary member 2; 610 UB125	12.2	m	701	8,558
20/G	Secondary member; 460 UB74	21.6	m	585	12,616
20/H	Tertiary member; 360 UB57	36.6	m	515	18,846
	Remove				
20/J	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
20/K	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
20/L	CHS brace splice	1	no	2,708	2,708
20/M	Primary splice	1	no	1,628	1,628
20/N	Tertiary splice	1	no	1,340	1,340
	Replace				
20/P	Arrangement of welded plates; Primary member to bent	6	no	2,227	13,363
20/Q	Arrangement of welded plates; Secondary to primary member	18	no	2,069	37,249
20/R	Arrangement of welded plates; Tertiary to secondary member	18	no	1,970	35,461
	Total - Bent 16 works				**205,957**
	BENT 17 WORKS				
	Frame				
	Clean & Coating				
20/S	Column 1; 760 CHS	20.0	m	1,348	26,968
20/T	Column 2; 760 CHS	20.0	m	1,348	26,968
20/U	Brace 1; 270x9.3 CHS	7.2	m	380	2,734
20/V	Brace 2; 270x9.3 CHS	11.5	m	380	4,380
	Deck				
	Clean & Coating				

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
21/A	Primary member 1; 610 UB125	12.2	m	701	8,558
21/B	Primary member 2; 610 UB125	12.2	m	701	8,558
21/C	Primary member 3; 610 UB125	9.6	m	701	6,706
21/D	Secondary member 1; 460 UB74	7.2	m	585	4,205
21/E	Secondary member 2; 460 UB74	7.6	m	585	4,451
21/F	Secondary member 3; 460 UB74	8.5	m	585	4,948
21/G	Tertiary member; 360 UB57	36.6	m	515	18,846
	Remove				
21/H	Plan bracing; 100x75x8 UA	21.0	m	218	4,583
	Connections				
	Keep				
21/J	Welded connection; Bent to bracing	2	no	0.00	0
	Clean & Coating				
21/K	CHS brace splice	1	no	2,708	2,708
21/L	Primary splice	1	no	1,628	1,628
21/M	Tertiary splice	1	no	1,340	1,340
	Replace				
21/N	Arrangement of welded plates; Primary member to bent	6	no	2,227	13,363
21/P	Arrangement of welded plates; Secondary to primary member	18	no	2,069	37,249
21/Q	Arrangement of welded plates; Tertiary to secondary member	18	no	1,970	35,461
	Total - Bent 17 works				**213,651**
	BENT 18 WORKS				
	Frame				
	Replace				
21/R	Column 1; 310 UC118	17.0	m	2,933	49,863
21/S	Column 2; 310 UC118	17.0	m	2,933	49,863
21/T	Column 3; 310 UC118	17.0	m	2,933	49,863
21/U	Column 4; 310 UC118	36.1	m	2,928	105,625
21/V	Brace 1; 230 CHS	18.6	m	1,449	26,944
21/W	Brace 2; 230 CHS	12.9	m	1,449	18,745
	Deck				
	Clean & Coating				
21/X	Primary member 1; 610 UB125	12.2	m	701	8,558
21/Y	Primary member 2; 610 UB125	12.2	m	701	8,558
21/Z	Primary member 3; 610 UB125	12.7	m	701	8,936
	Remove				
21/AA	Plan bracing; 100x75x8 UA	14.0	m	218	3,044
21/AB	Tie brace; 200 UB	2.5	m	221	551

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Connections				
	Clean & Coating				
22/A	Primary splice	1	no	1,628	1,628
	Replace				
22/B	Arrangement of welded plates; Primary member to bent	6	no	2,057	12,342
22/C	Welded connection; Column to vertical bracing	8	no	1,896	15,168
	Total - Bent 18 works				**359,688**
	BENT 19 WORKS				
	Frame				
	Replace				
22/D	Column 2; 310 UC118	17.0	m	2,933	49,863
22/E	Column 3; 310 UC118	17.0	m	2,933	49,863
22/F	Column 3; 310 UC118	17.5	m	2,930	51,281
22/G	Column 4; 310 UC118	36.1	m	2,928	105,625
22/H	Brace 1; 230 CHS	18.6	m	1,449	26,944
22/J	Brace 2; 230 CHS	12.9	m	1,449	18,745
	Deck				
	Clean & Coating				
22/K	Primary member 1; 610 UB125	12.2	m	701	8,558
22/L	Primary member 2; 610 UB125	12.2	m	701	8,558
22/M	Primary member 3; 610 UB125	6.2	m	701	4,328
22/N	Primary member 4; 610 UB125	10.9	m	701	7,667
	Remove				
22/P	Plan bracing; 100x75x8 UA	14.0	m	218	3,044
	Replace				
22/Q	Secondary member 1; 200 UB	8.1	m	812	6,577
22/R	Secondary member 2; 200 UB	9.7	m	812	7,868
22/S	Secondary member 3; 200 UB	7.8	m	812	6,342
	Connections				
	Clean & Coating				
22/T	Primary splice	1	no	1,628	1,628
	Replace				
22/U	Arrangement of welded plates; Primary member to bent	6	no	2,057	12,342
22/V	Arrangement of welded plates; Primary member to secondary	6	no	2,069	12,416
22/W	Welded connection; Column to vertical bracing	4	no	1,896	7,584
	Total - Bent 19 works				**389,232**
	BENT 20 WORKS				

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
	Frame				
	Replace				
23/A	Column 1; 310 UC118	17.0	m	2,933	49,863
23/B	Column 2; 310 UC118	17.0	m	2,933	49,863
23/C	Column 3; 310 UC118	17.0	m	2,933	49,863
23/D	Brace 1; 230 CHS	15.1	m	1,449	21,903
23/E	Brace 2; 230 CHS	11.3	m	1,449	16,311
	Deck				
	Clean & Coating				
23/F	Primary member 1; 610 UB125	12.2	m	701	8,558
23/G	Primary member 2; 610 UB125	12.2	m	701	8,558
23/H	Primary member 3; 610 UB125	5.1	m	701	3,598
	Remove				
23/J	Plan bracing; 100x75x8 UA	14.0	m	218	3,044
23/K	Tie brace; 200 UB	2.5	m	221	545
	Connections				
	Clean & Coating				
23/L	Primary splice	1	no	1,628	1,628
	Replace				
23/M	Arrangement of welded plates; Primary member to bent	6	no	2,057	12,342
23/N	Welded connection; Column to vertical bracing	8	no	1,896	15,168
	Total - Bent 20 works				**241,243**
	HANDRAILING WORKS				
	Deck				
	Replace				
23/P	Handrailing	523	m	428	223,621
	Total - Handrailing works				**223,621**
	STEEL GRATED CATWALK WORKS				
	Deck				
	Remove				
23/Q	Steel grated catwalks	219	m2	125	27,441
	Total - Steel grated catwalk works				**27,441**
	SCAFFOLDING WORKS				
23/R	Transport to Site	1	no	1,050.00	1,050
23/S	Hire Per Week	70	week	1,325.00	92,750
23/T	Labour to Erect	1	no	100,800.00	100,800
23/U	Labour to Dismantle	1	no	70,560.00	70,560

WT ESTIMATE

OPTION 3 - REPAIR, STRENGTHEN & REPLACE

Estimate Details

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
24/A	Transport from Site	1	no	1,050.00	1,050
	Additional costs				
24/B	Monthly inspections	12	no	70.00	840
24/C	Allowance for modifications	1	item	20,000.00	20,000
24/D	Allowance for traffic control	1	item	5,000.00	5,000
24/E	Allowance for subcontractor supervision	10	%	266,210.00	26,621
24/F	Allowance for extra cranage & supporting plant	5	%	266,210.00	13,311
24/G	Admin fee	1.5	%	331,981.50	4,980
	Total - Scaffolding Works				**336,961**