



Memorandum

5 February 2016

To	Michael Czarnecki		
Copy to	[REDACTED]		
From	[REDACTED]	Tel	(07) 3316 3000
Subject	Webber Esplanade revetment wall	Job no.	[REDACTED]

1 Introduction

It is understood that the Department of Environment and Heritage Protection (EHP) is investigating a complaint regarding the construction of the revetment wall at Webber Esplanade by Cook Shire Council.

2 Chronology

The following chronological summary is provided;

- Development permit IPDC00316405D11 was issued on the 15 August 2006, for the revetment wall located on Lot 82, Plan BS246 and Lot 83 Plan BS161.
- Tony Lickiss (Council) engaged GHD early February 2014 to complete an assessment of the 'as-constructed' revetment wall. Our assessment is summarised in the memorandum dated 24 February 2014.
- Due to our concerns, lack of site presence during construction and lack of construction record from Council, design certification by GHD, in order for Council to secure an amended approval was not provided.
- On 26 May 2014, the original development permit was amended, and changed assessment manager conditions were issued by the Department of State Development Infrastructure and Planning (DSDIP).
- A Statutory Declaration, certifying construction of the works, was provided by Tony Lickiss on the 24 June 2014, Registered Professional Engineer of Queensland (RPEQ) 8021.

3 Response to EHP

It is understood that EHP's investigations have identified that Council is potentially non-compliant with conditions 1, 2 and 4 of the changed assessment manager conditions.

3.1 Condition 1

Condition 1:

Development must be carried out generally in accordance with the following plans and/or documents, except as modified by these assessment manager conditions:

- Cook Shire Council –Webber Esplanade – Cooktown Revetment Wall – As Built Design General Arrangement Plan' Reference No CSC-C001, Version A1, dated 20/5/2014.
 - Cook Shire Council –Webber Esplanade – Cooktown Revetment Wall – As Built Design Sections Sheet 1 of 2, Reference No CSC-C002, Version A1, dated 20/5/2014.
 - Cook Shire Council –Webber Esplanade – Cooktown Revetment Wall – As Built Design Sections Sheet 2 of 2, Reference No CSC-C003, Version A1, dated 20/5/2014.
-

3.2 Condition 1 response

Comparison of survey undertaken on 19 January 2016 by Cook Shire Council against drawings CSC-C001, CSC-C002 and CSC-C003 has been undertaken. Refer to attachments 41-29566 SK001 to SK008. The following comments are provided on the survey comparison;

- The constructed slope is somewhat variable, with sections slopes 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 21 and 24 generally flatter than the design slope of 1 vertical to 2 horizontal.
- Section 20, 22, 23 have a steeper slope than the design slope of 1 vertical to 2 horizontal.
- For the majority of sections, the rock toe is not clearly distinguishable compared to the design profile.
- It is noted that complete survey coverage over the complete design profile, has not been provided in sections 22, 23 and 24.
- Survey of the seabed has not been provided. To aid further investigation, survey of the seabed is recommended.

In the majority of section comparisons, the construction slope exceeds (flatter) than the design slope of 1 vertical to 2 horizontal.

The survey undertaken by Cook Shire Council was on the finished armour slope and crest only. Survey to confirm armour, filter and core rock type and layer thickness has not been undertaken and therefore we currently are not in a position to confirm whether Condition 1 above is completely satisfied.

It is noted that photographs have been provided, however it is generally not clear where the photos were taken with respect to the structure and at which point in time in the construction sequence the photos were taken. Recommendations around further investigation, in order to provide further commentary around Condition 1, are provided below in Section 4.

3.3 Condition 2

Condition 2:

All works are to be constructed in accordance with the drawings and specification listed in this changed approval notice.

The drawings are those listed in Condition 1 above.

There are significant discrepancies between these drawings and GHD drawings dated February 2014 of the constructed sea wall, prepared by GHD for Council,. These drawings are described as follows:

- 'Cook Shire Council Webber Esplanade –Cooktown Revetment Wall – As Built Design Check, drawing number SKOO1; and
- 'Cook Shire Council Webber Esplanade –Cooktown Revetment Wall – As Built Design Check – Sections SH1, drawing number SKOO2; and
- 'Cook Shire Council Webber Esplanade –Cooktown Revetment Wall – As Built Design Check – Sections SH2, drawing number SKOO3; and
- 'Cook Shire Council Webber Esplanade –Cooktown Revetment Wall – As Built Design Check – Sections SH3, drawing number SKOO4; and

In particular, the seaward slopes depicted in the GHD drawings are significantly steeper than the seaward slopes depicted in Drawings CSC-001, CSC-002, and CSC-003, which indicates that the wall is built to a steeper slope than the drawings listed in the changed assessment manager conditions. Field observations recently conducted by EHP staff also indicate that the seaward slope of the sea wall is steeper than that depicted in the drawings listed in the changed assessment manager conditions.

It is also alleged that key elements of the as constructed sea wall (toe rock, armour rock, and core fill) are not constructed with the materials depicted in the plans listed in the changed assessment manager conditions.

3.4 Condition 2 response

It is noted that the 'as-constructed' survey comparison, as shown in 41-27466 SK001, SK002, SK003 and SK004 (dated February 2014) was made against the originally approved seawall design (dated September 2005) and not against the following drawings referred to within the amended approvals;

- 'Cook Shire Council' – Webber Esplanade – Cooktown – Revetment Wall – As Built Design General Arrangement Plan', Reference No CSC-C001, Version A1, dated 20/05/2014.
- 'Cook Shire Council' – Webber Esplanade – Cooktown – Revetment Wall – As Built Design Sections Sheet 1 of 2', Reference No CSC-C002, Version A1, dated 20/05/2014.
- 'Cook Shire Council' – Webber Esplanade – Cooktown – Revetment Wall – As Built Design Sections Sheet 2 of 2', Reference No CSC-C003, Version A1, dated 20/05/2014.

It is understood that the as-constructed survey provided by Council and relied upon to create SK001, SK002, SK003 and SK004, did become superseded due to further construction by Cook Shire Council.

Refer to Condition 1 response for comparison of 'as-constructed' survey with drawings CSC-001, CSC-002 and CSC003.



3.5 Condition 4

Condition 4

This approval does not constitute a ruling on the structural safety of the works. It is the responsibility of the applicant to ensure adequacy of the design, construction and ongoing maintenance of the works.

It is alleged that Council has not ensured the adequacy of the construction of the works, for the following reasons:

- The original design by GHD was for the sea wall to be able to withstand wave and water level conditions from a design storm of event with a 2% Annual Exceedance Probability (AEP). A key element of this design was for the crest of the wall to be at a height which enables it to withstand water and wave levels corresponding to this design storm event, and to ensure overtopping volumes are within relevant guideline values. The 'as constructed' drawings listed in the changed assessment manager conditions indicate that the wall does not meet these guideline values, and has not been built to meet the 2% AEP criteria as set out in the Department of Environment and Heritage Protection's Operational Policy "Building and Engineering Standards for Tidal Works", dated 25 March 2013.

It is also alleged that this appears to contradict section 2(b)(vi) of the certification provided by Mr Lickiss, which states that 'the works... are designed and constructed in accordance with all appropriate Australian Standards and guidelines except as detailed in the minimum design criteria in the Department of Environment and Heritage Protection's operational policy Building and Engineering Standards for Tidal Works'.

- The outer slope of the sea wall has a slope steeper than the as-constructed drawings referred to in the changed assessment manager conditions; this may place additional loads on the underlying sea bed material, which may result in movement of the wall.

3.6 Condition 4 response

The 'as-constructed' survey shows that the crest level, for most sections in attached 41-29566 SK-001 to SK-008, has generally been constructed above the design level of +2.52 m AHD. Sections 21 through to 23 show a finish level slightly below the design level of +2.52 m AHD.

GHD provided advice to Tony Lickiss on the overtopping risk and provided recommendations with regards to paving the crest, based on Tony's intention to have a final crest level below the original and approved crest elevation of +4.0 m AHD. The overtopping risk assessment was undertaken based on 'as-constructed' assumptions which are still to be confirmed. This includes armour, filter, core rock type, size and layer thickness.

Rather than re-running an overtopping assessment based on revetment assumptions, we recommend further investigative works, as detailed below in section 4.

Tony Lickiss states on the 24th June 2014 that his certification of construction is in accordance with all appropriate Australian Standards and guidelines except as detailed in the minimum design criteria in the Department of Environment and Heritage Protection's operation policy Building and engineering standards for tidal works. The requirements of the EHP's operation policy are therefore not part of the certification, presumably because the constructed works do not comply with EHP's operational policy. In

our view the certification by Tony Lickiss is flawed and does not meet the requirements of the amended approval conditions.

Oaths Act 1867

Statutory Declaration

QUEENSLAND
TO WIT

I,

of in the State of Queensland

do solemnly and sincerely declare that

1. I am a Registered Professional Engineer of Queensland under the provisions of the Professional Engineers Act 2002 and have relevant experience in the civil construction of tidal works.

2. I Certify that:


(a) The works (including any other associated works) have been constructed in accordance with the approved drawings CSC-C001, CSC-C002, CSC-C003 and the conditions of the DA SPD-0414-006809 with the exception of the footpath as shown which will be constructed as staged works. A separate statutory Declaration will cover the completion of these footpath works.

(b) The works ;

- (i) are suitable for the intended useage;
- (ii) are structurally adequate for its intended location and anticipated usage;
- (iii) are structurally adequate to allow for the scour resulting from flood and tidal conditions;
- (iv) do not impose loads on existing structures such that the design capabilities of these existing structures are exceeded;
- (v) would not adversely affect the stability of the bed and the banks of the waterway in which the works were constructed and works designed for significant scour;
- (vi) are designed and constructed in accordance with all appropriate Australian Standards and guidelines except as detailed in the minimum design criteria in the Department of Environment and Heritage Protection's operational policy Building and engineering standards for tidal works;
- (vii) do not adversely affect the usage of adjacent structures; and
- (viii) have non-slip surface

(c) the bed and the banks of the waterway for a distance of 15 metres around the site of the works are clear of all constructional debris.

And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the Oaths Act 1867.


Signature of declarant/deponent

Taken and declared before me at

this day of 2014



A Justice of the Peace/Commissioner for Declarations.

Figure 1 Statutory Declaration by Tony Lickiss

4 Recommendations

In the first instance, it is recommended that a meeting is called and attended by EHP, Council and GHD representatives to discuss our assessment and further works which we recommend are completed in order to complete an assessment of 'as constructed' revetment wall's expected performance against EHP's operational policy Building and Engineering Standards for Tidal Works. Based on our knowledge of the project and site to date, the following activities are recommended;

1. Site visual inspection of the revetment wall coupled with invasive 'peel backs'. The purpose of the 'peel backs' would be to determine the typical armour, filter and core rock thickness and grading.
2. Petrography and rock testing to a specification typical for marine rock revetment works.

It is noted that some damage to the existing footpath may occur during the invasive 'peel backs' due to the large machinery required to undertake the works. The number of 'peel backs' will be determined on site under the instruction of an RPEQ and at this stage, it is expected that the extent of works and will be a function of revetment consistency.

It is noted that the geotextile placement at back of wall is not proposed to be either checked and/or certified, unless directed otherwise by either Council and/or EHP.

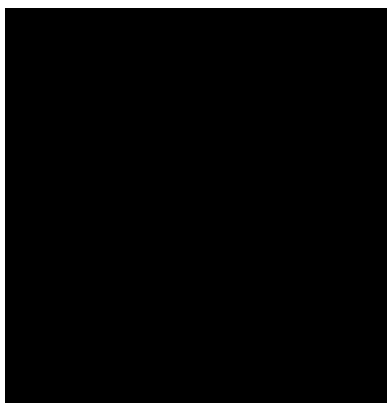


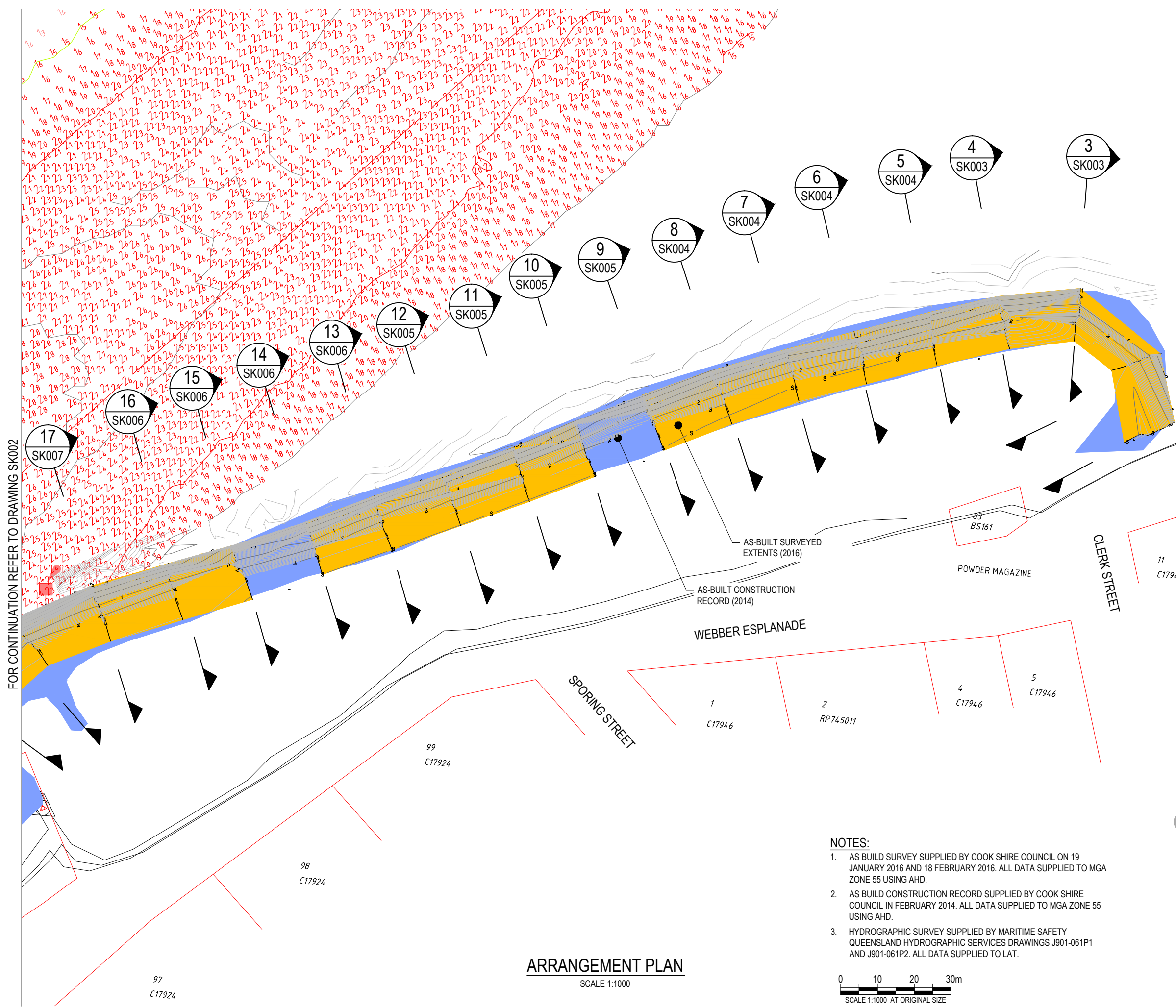
Figure 2 Existing site (photo supplied by Council on 19/01/2016)

Post insitu investigation, further assessment of the expected breakwater stability and performance under design event wave loading can be undertaken. In the event that remediation and/or reconstruction works are recommended to ensure revetment stability under design event wave loading, further geotechnical assessment would also be required to ensure that any remediation/reconstruction works do not compromise either short or long term revetment slope stability.

Following the insitu investigation, a short report on the assessed insitu condition and expected performance of the revetment wall would be provided to Council and EHP for consideration.

Regards





- LEGEND:**
- AS-BUILT SURVEYED EXTENTS (2016)
 - AS-BUILT CONSTRUCTION RECORD (2014)
 - HYDROGRAPHIC SURVEY
 - CADASTRAL BOUNDARY
 - MAJOR (1m) CONTOUR
 - MINOR (0.1m) CONTOUR

FOR CONTINUATION REFER TO DRAWING SK002

ARRANGEMENT PLAN
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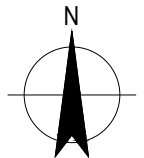
PRELIMINARY

rev	description	app'd	date
C	SEABED SURVEY EXTENDED	A.F	18/06/16
B	SEABED SURVEY ADDED	A.F	16/06/16

COOK SHIRE COUNCIL
WEBBER ESPLANADE
REVTMENT WALL AS-BUILT
DESIGN CHECK - SHEET 1 OF 2



145 Ann St Brisbane QLD 4000 Australia
GPO Box 668 Brisbane QLD 4001
T 61 7 3316 3000 F 61 7 3316 3333
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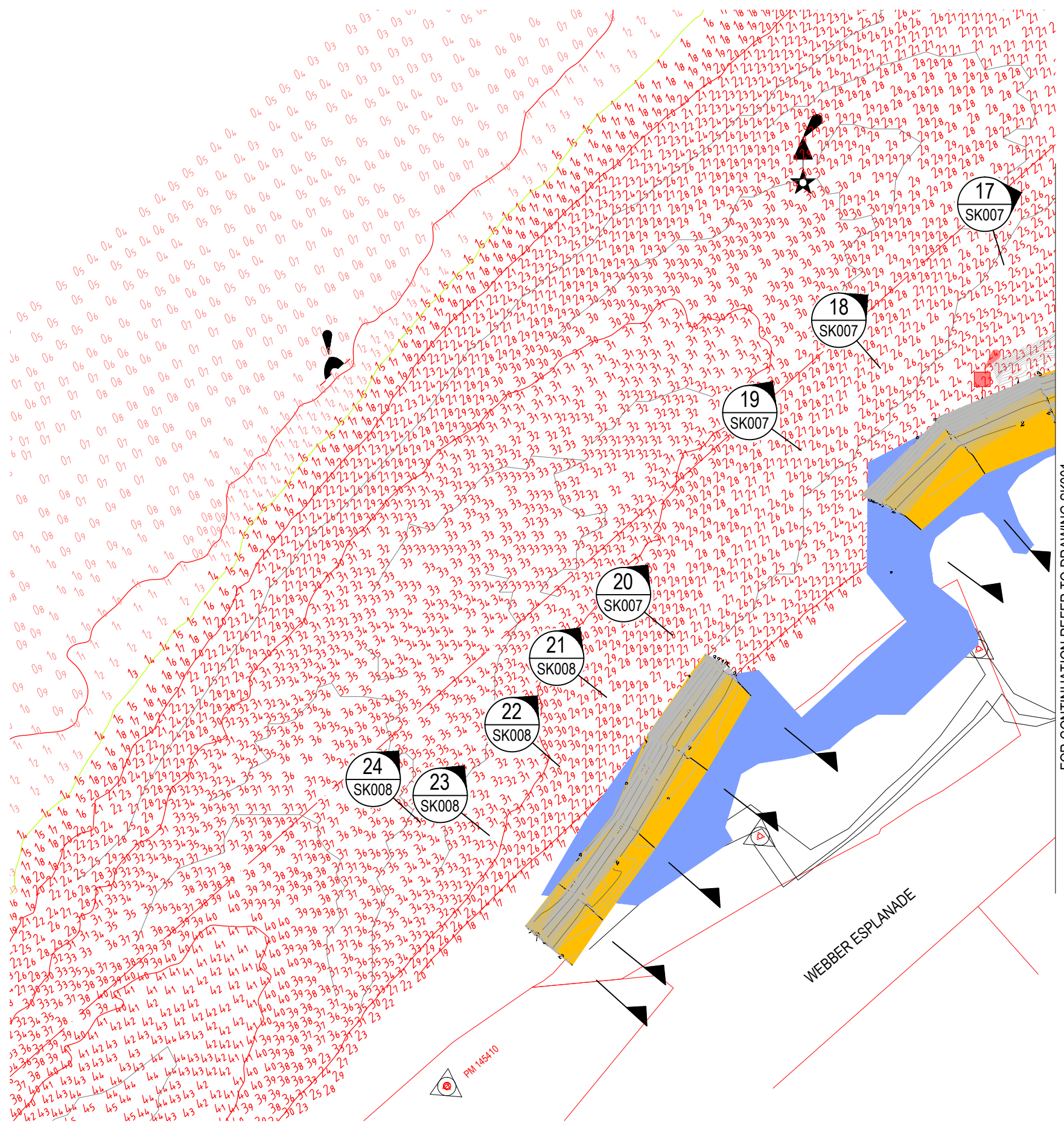
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date | FEB 2016 rev no. | C

approved (PD) **SK001**

NOTES:

1. AS BUILD SURVEY SUPPLIED BY COOK SHIRE COUNCIL ON 19 JANUARY 2016 AND 18 FEBRUARY 2016. ALL DATA SUPPLIED TO MGA ZONE 55 USING AHD.
2. AS BUILD CONSTRUCTION RECORD SUPPLIED BY COOK SHIRE COUNCIL IN FEBRUARY 2014. ALL DATA SUPPLIED TO MGA ZONE 55 USING AHD.
3. HYDROGRAPHIC SURVEY SUPPLIED BY MARITIME SAFETY QUEENSLAND HYDROGRAPHIC SERVICES DRAWINGS J901-061P1 AND J901-061P2. ALL DATA SUPPLIED TO LAT.





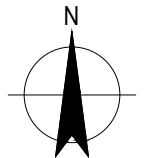
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 - AS-BUILT CONSTRUCTION RECORD (2014)
 - HYDROGRAPHIC SURVEY
 - CADASTRAL BOUNDARY

FOR CONTINUATION REFER TO DRAWING SK001

PRELIMINARY

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B	SEABED SURVEY ADDED	A.F	16/06/16

**COOK SHIRE COUNCIL
WEBBER ESPLANADE
REVTMENT WALL AS-BUILT
DESIGN CHECK - SHEET 2 OF 2**



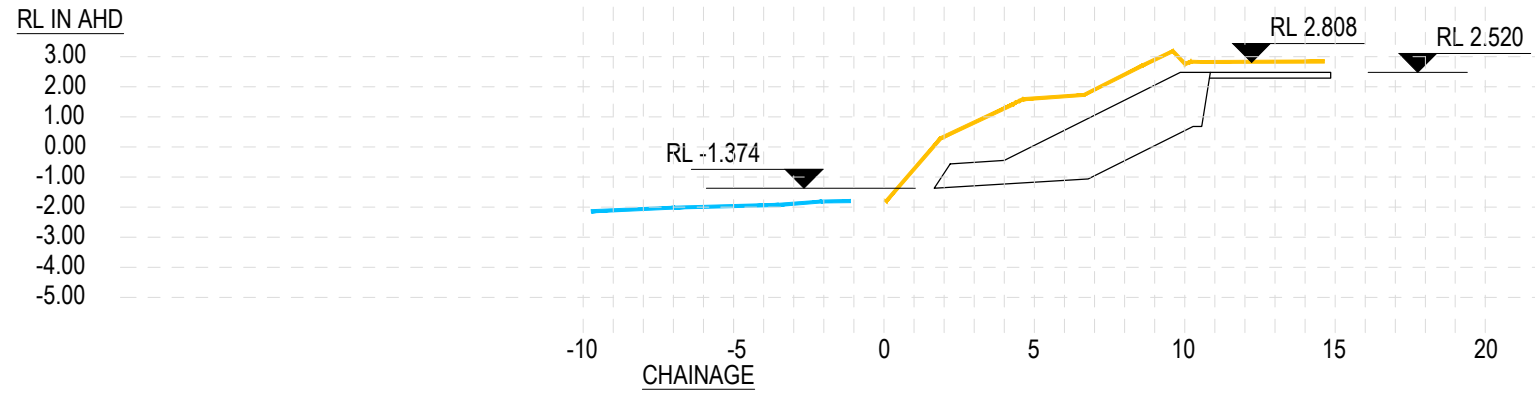
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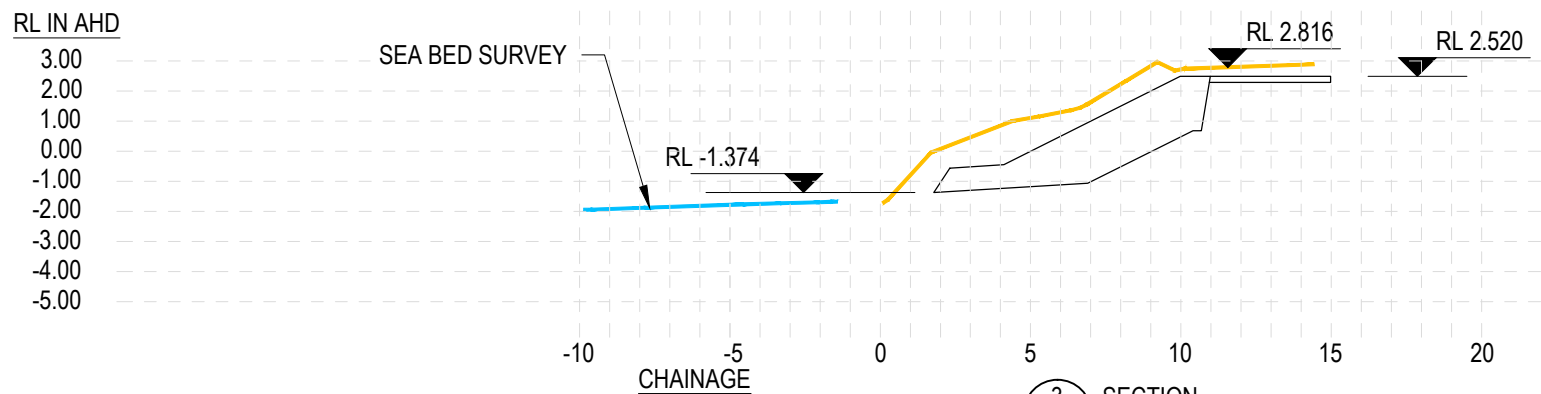
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date | FEB 2016 rev no. | C

approved (PD) **SK002**

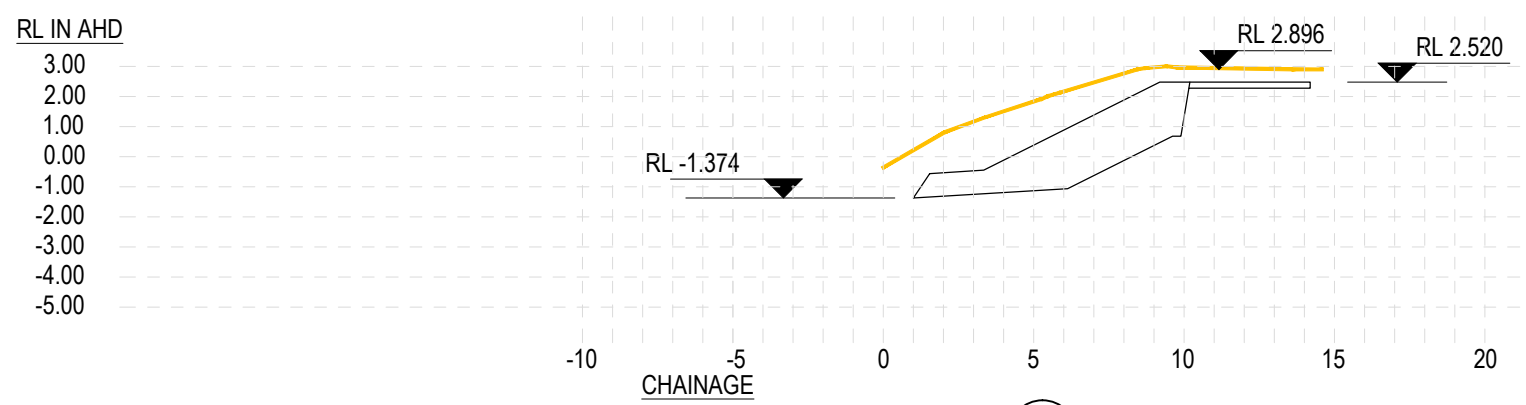
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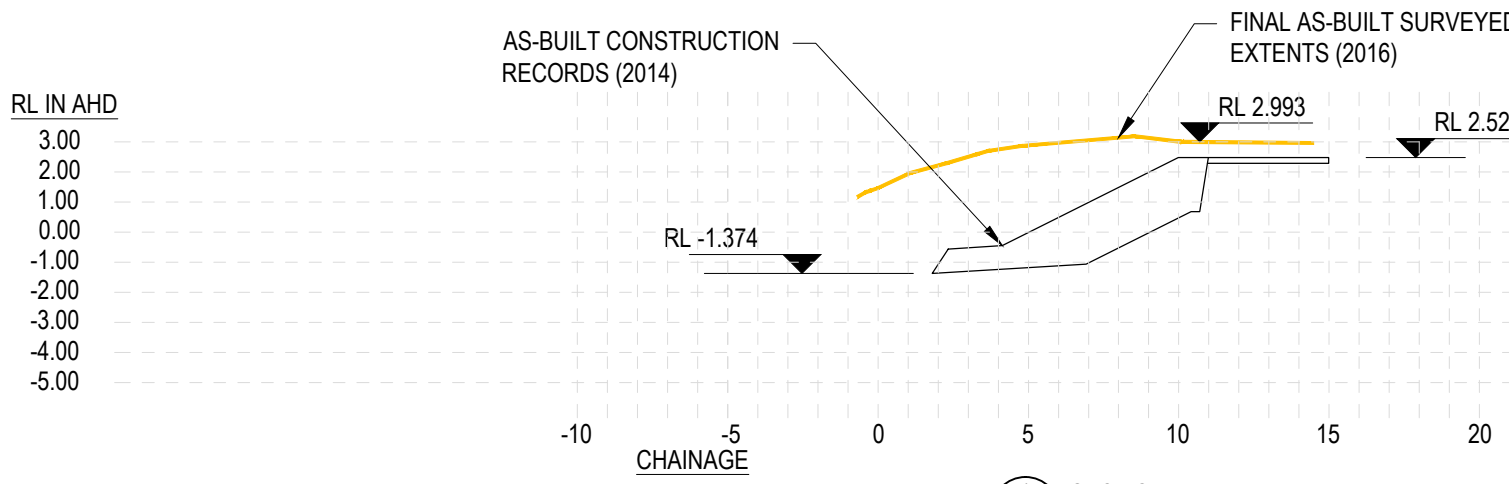
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3 SECTION
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2 SECTION
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1 SECTION
SK001 SCALE 1 : 250

PRELIMINARY

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B	SEABED SURVEY ADDED	A.F	16/06/16

COOK SHIRE COUNCIL
WEBBER ESPLANADE
REVTMENT WALL AS-BUILT
SECTION REVIEW - SHEET 1 OF 6

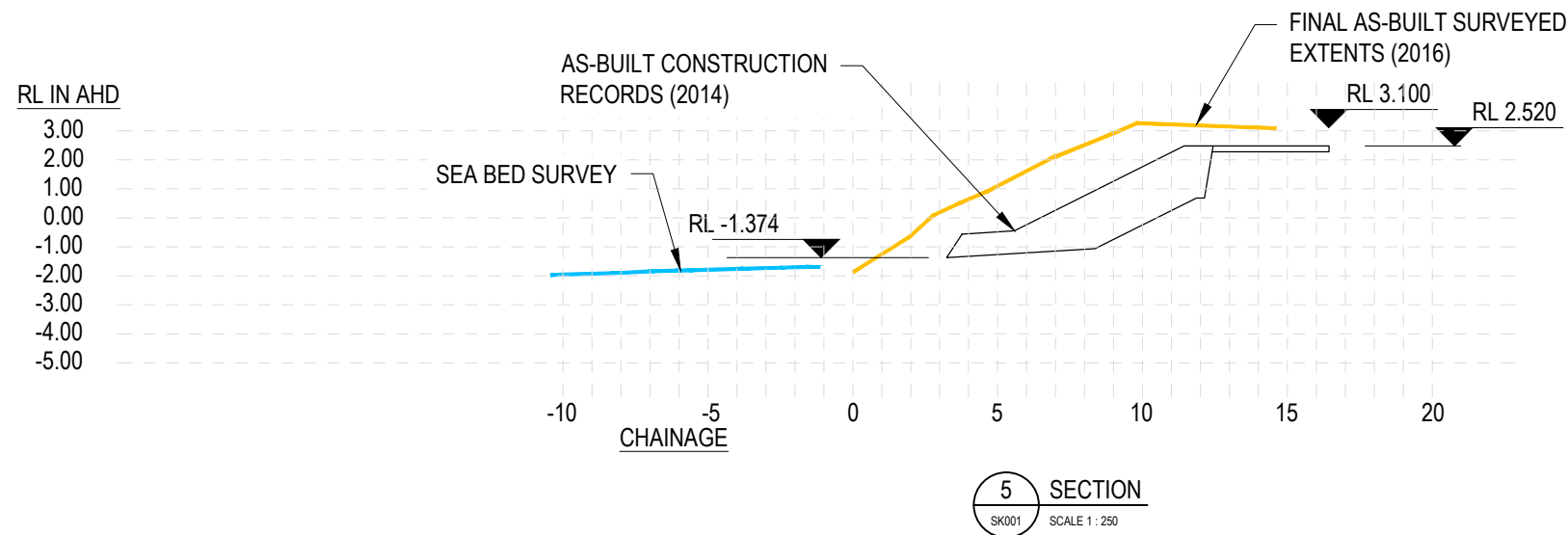
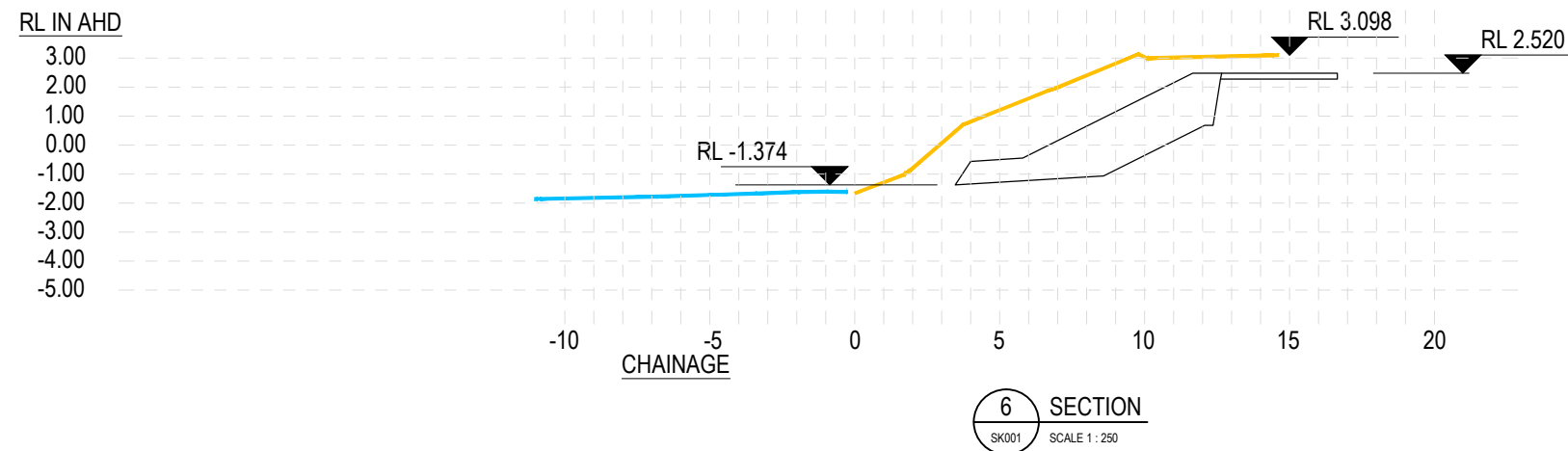
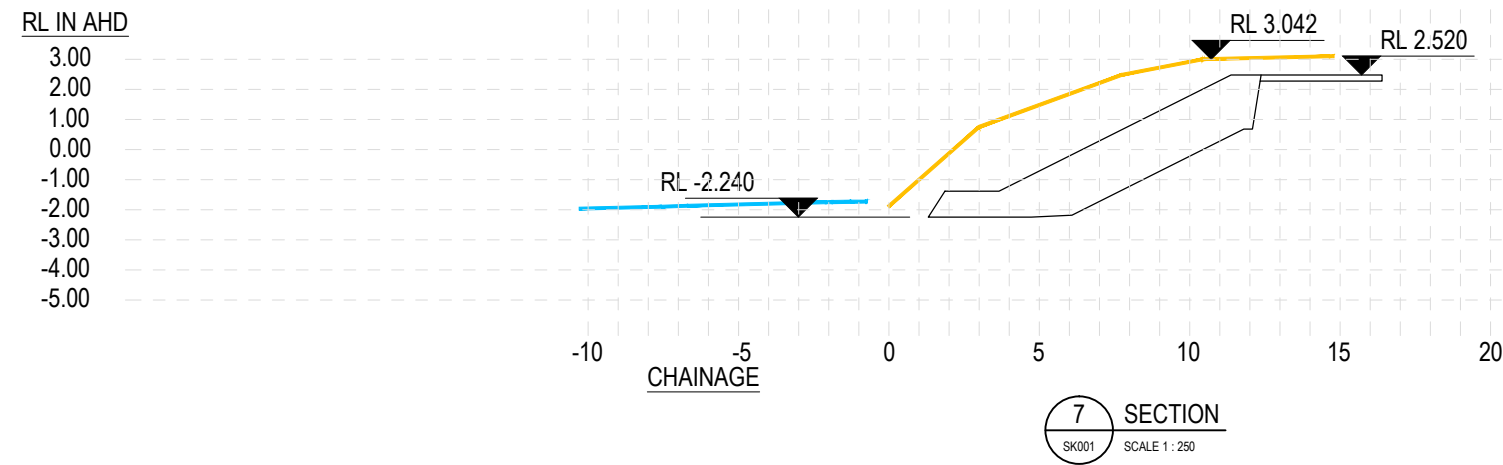
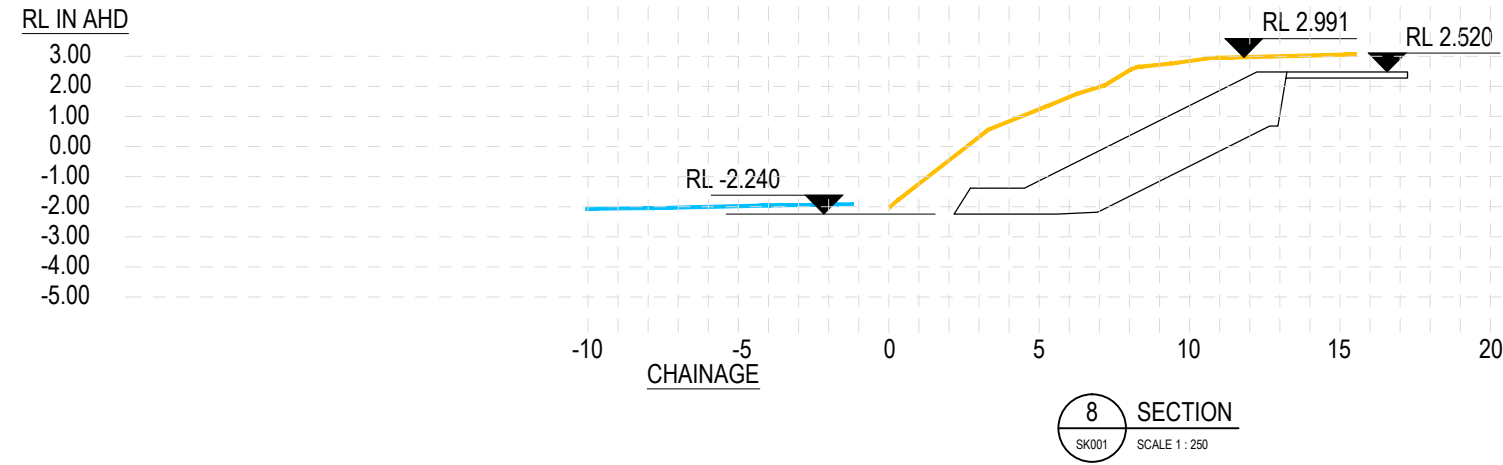


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date | FEB 2016 rev no. | C

approved (PD) **SK003**



PRELIMINARY

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B	SEABED SURVEY ADDED	A.F	16/06/16

**COOK SHIRE COUNCIL
WEBBER ESPLANADE
REVTMENT WALL AS-BUILT
SECTION REVIEW - SHEET 2 OF 6**

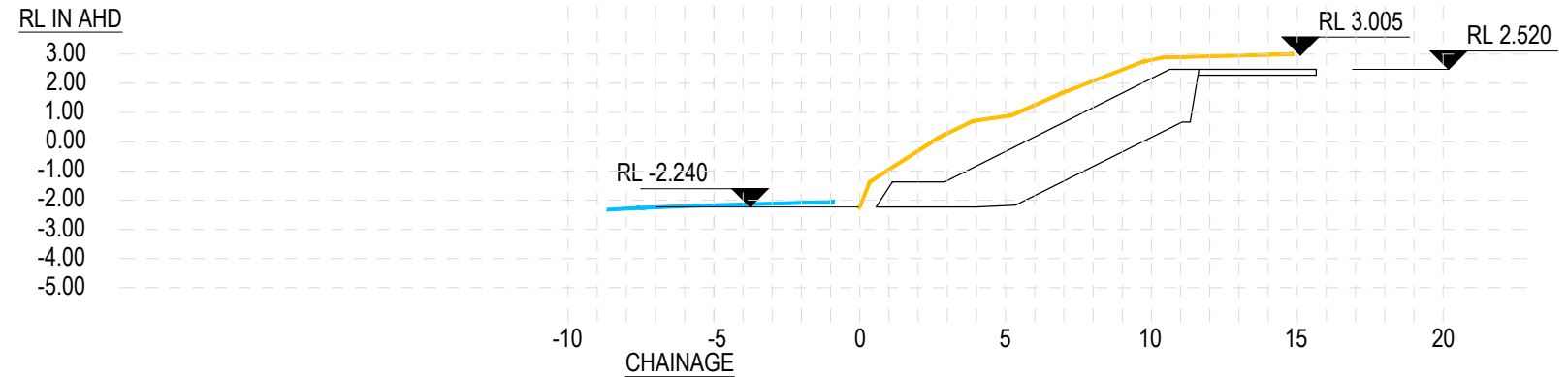


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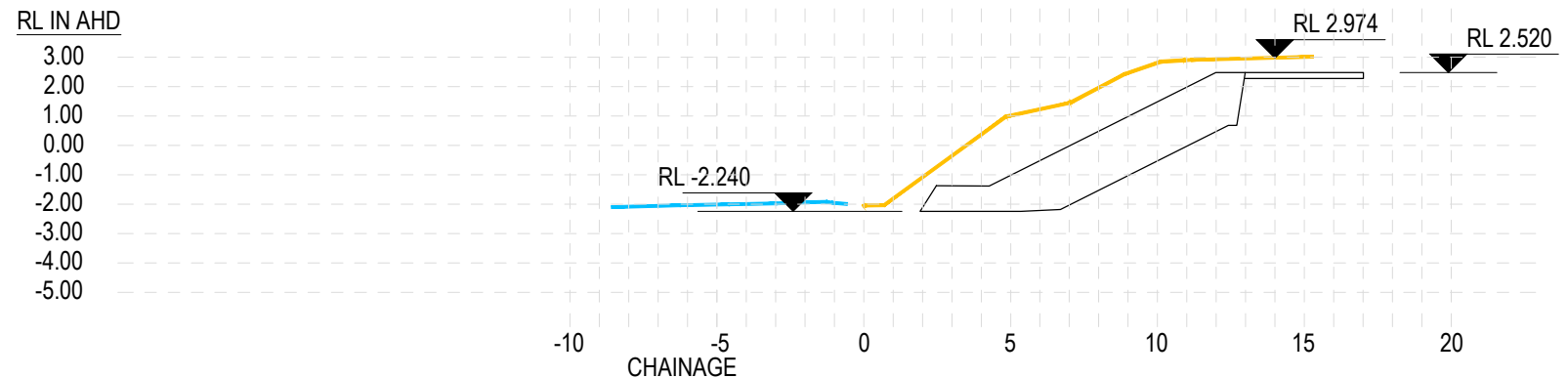
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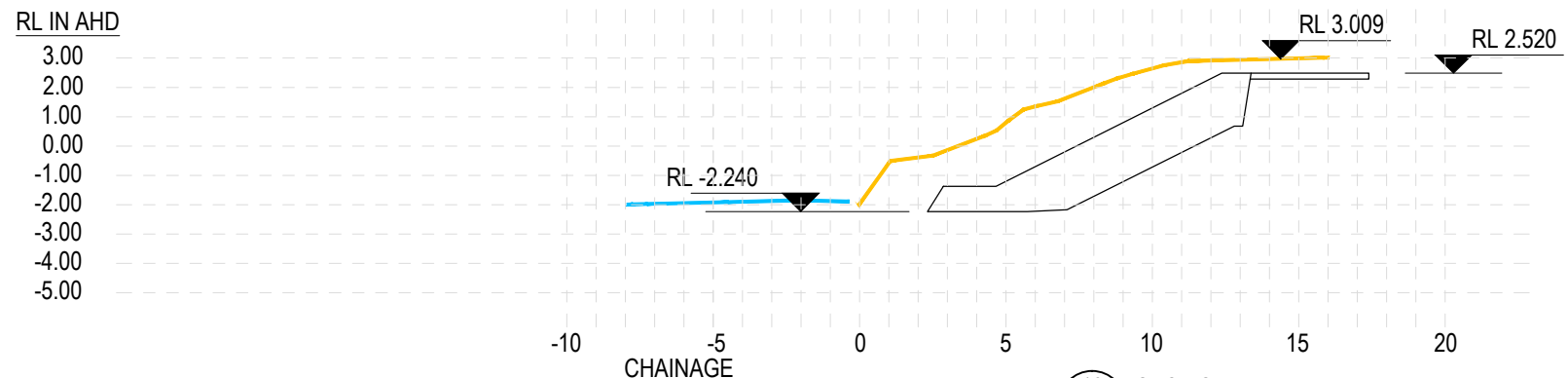
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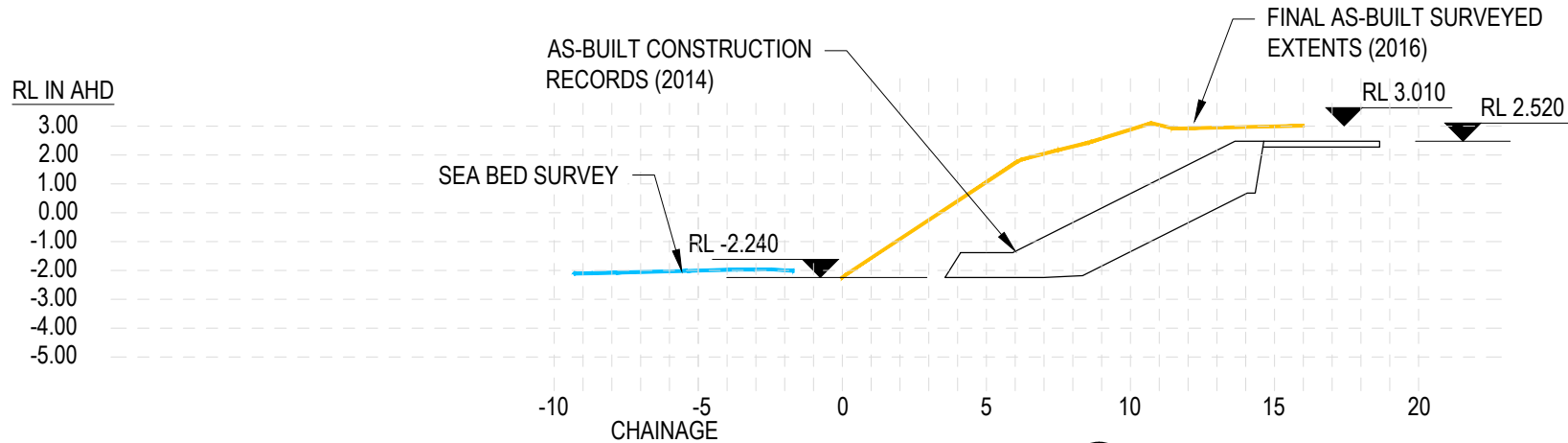
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11 SECTION
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10 SECTION
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PRELIMINARY

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B	SEABED SURVEY ADDED	A.F	16/06/16

**COOK SHIRE COUNCIL
WEBBER ESPLANADE
REVTMENT WALL AS-BUILT
SECTION REVIEW - SHEET 3 OF 6**

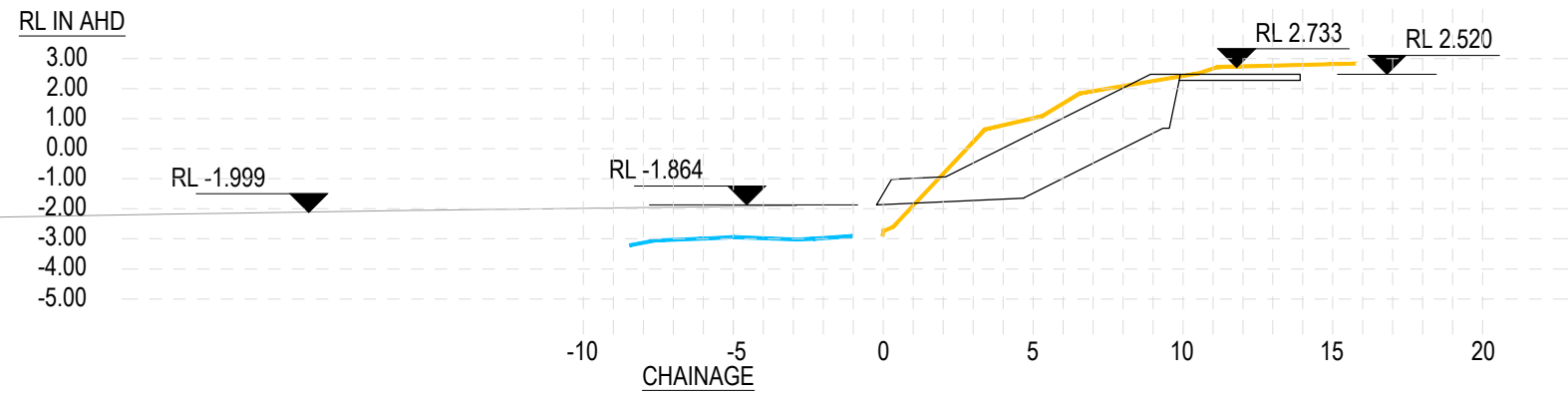


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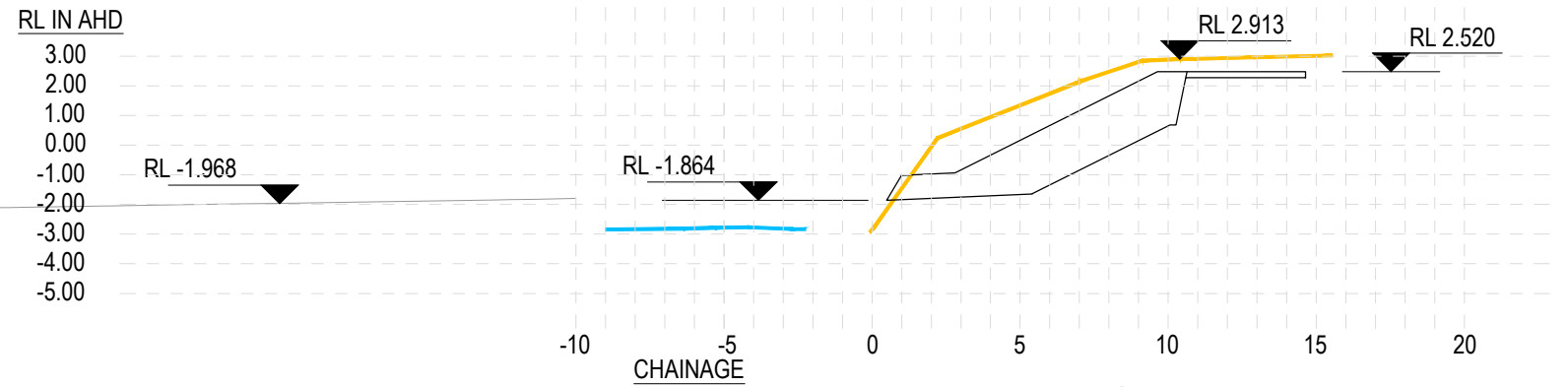
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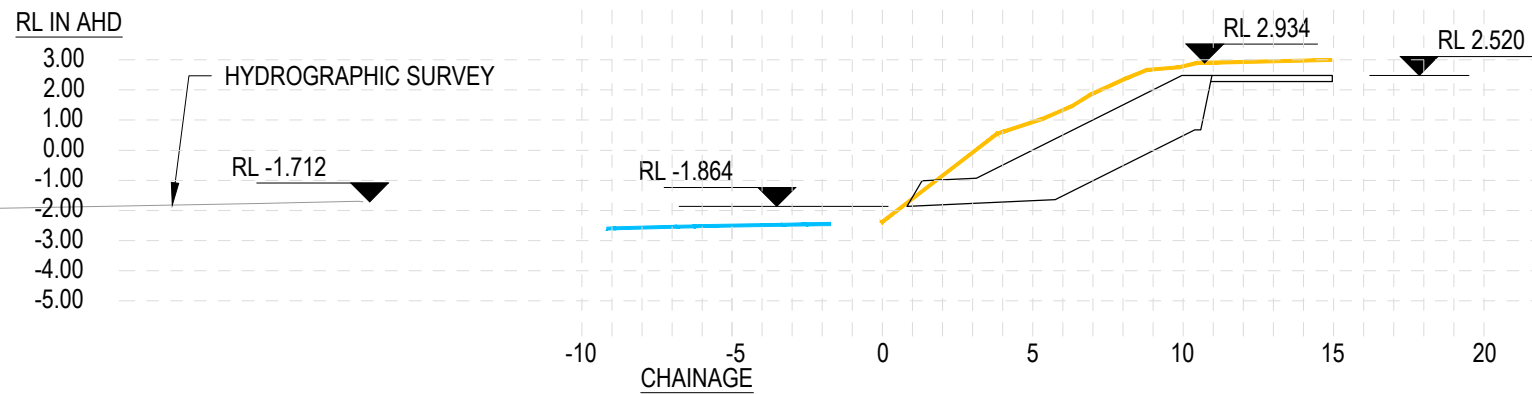
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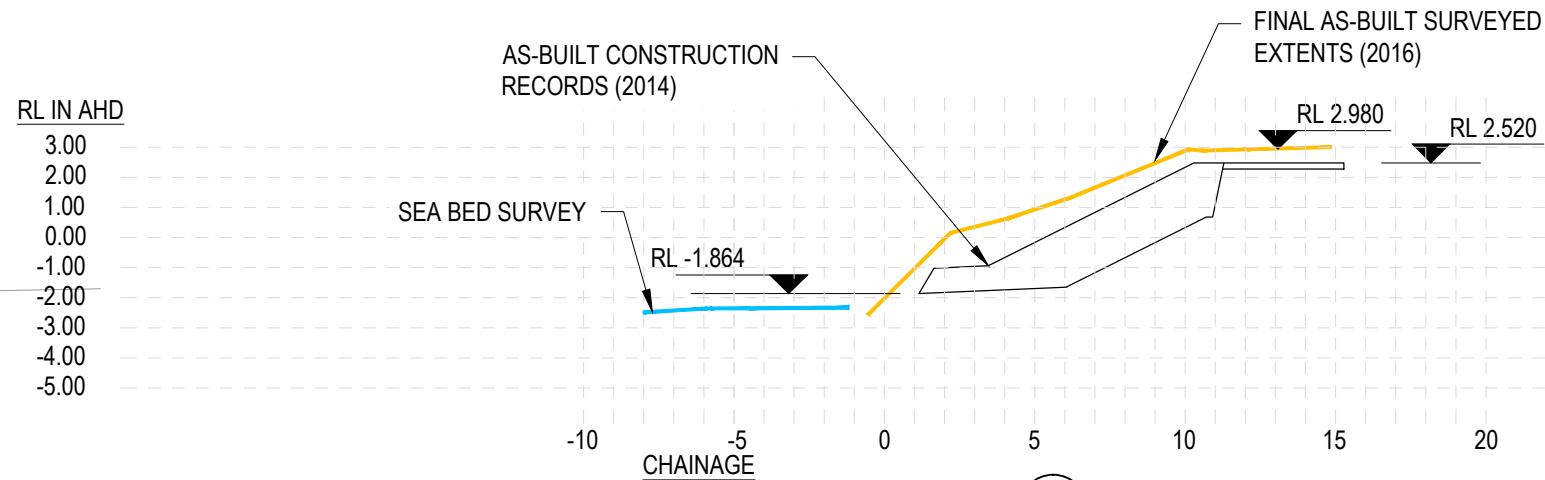
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14 SECTION
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13 SECTION
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PRELIMINARY

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B	SEABED SURVEY ADDED	A.F	16/06/16

COOK SHIRE COUNCIL
WEBBER ESPLANADE
REVTMENT WALL AS-BUILT
SECTION REVIEW - SHEET 4 OF 6

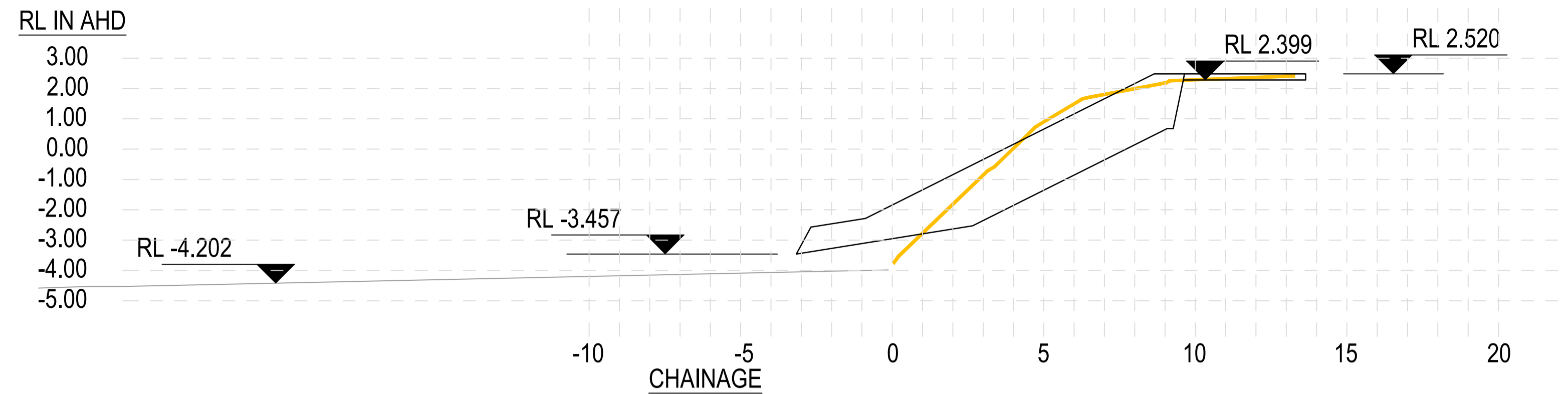


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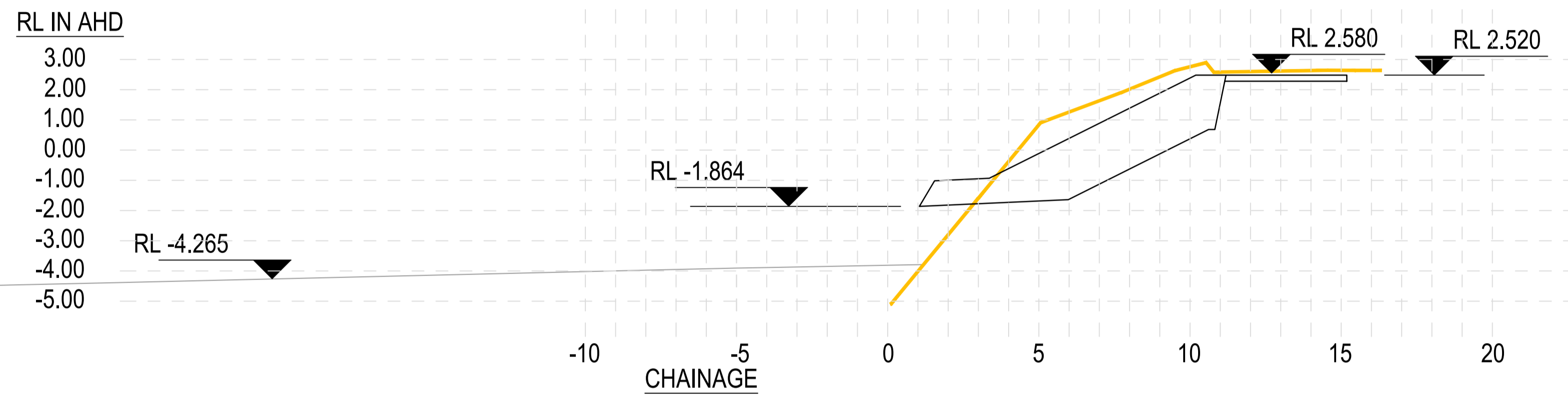
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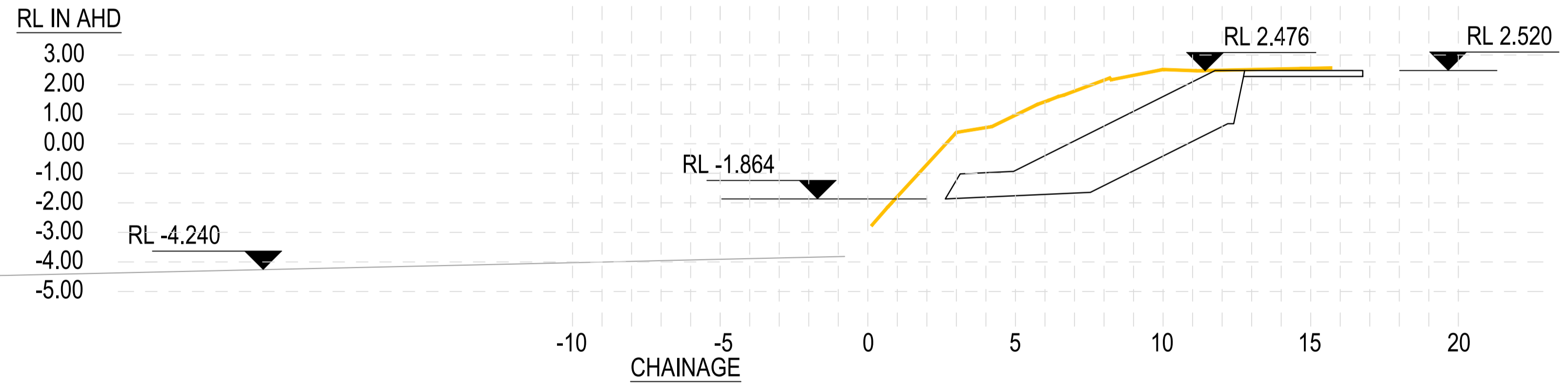
approved (PD) **SK006**



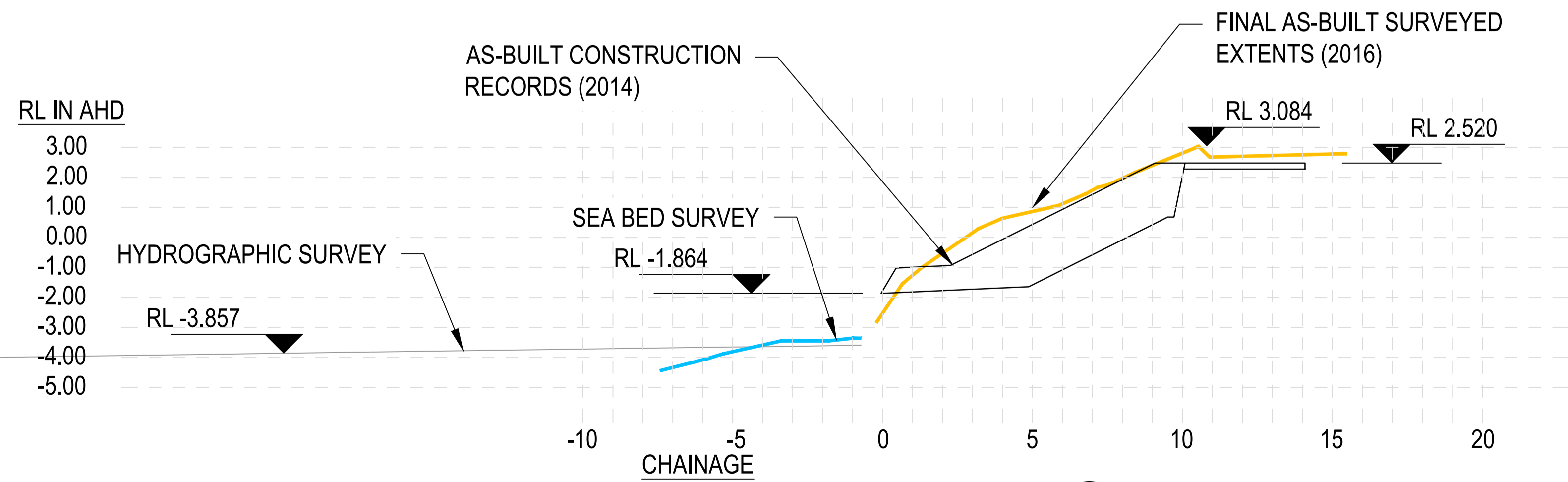
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19 SECTION
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18 SECTION
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17 SECTION
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PRELIMINARY

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C	SEABED SURVEY EXTENDED	A.F	18/06/16

COOK SHIRE COUNCIL
WEBBER ESPLANADE
REVTMENT WALL AS-BUILT
SECTION REVIEW - SHEET 5 OF 6

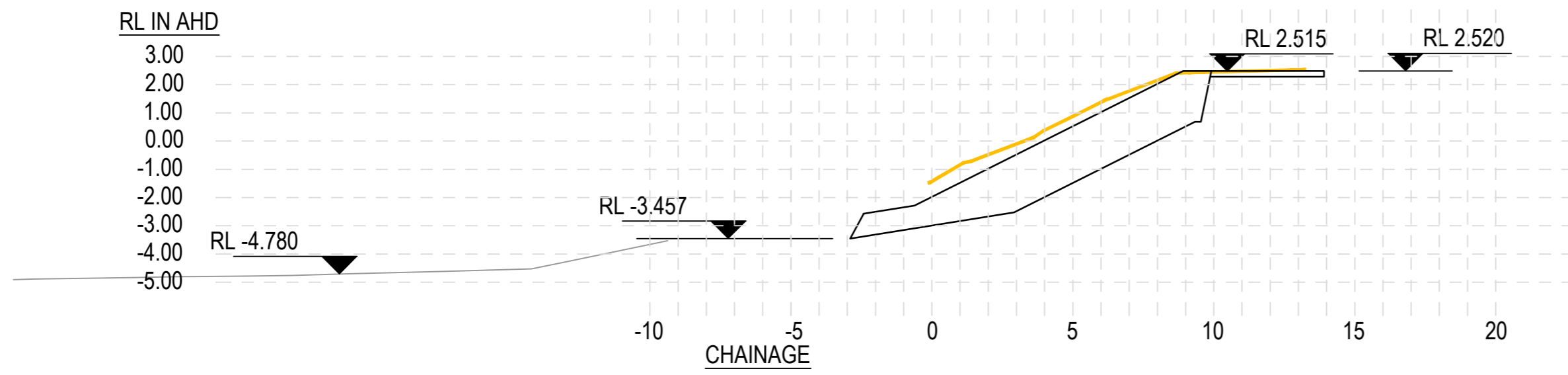


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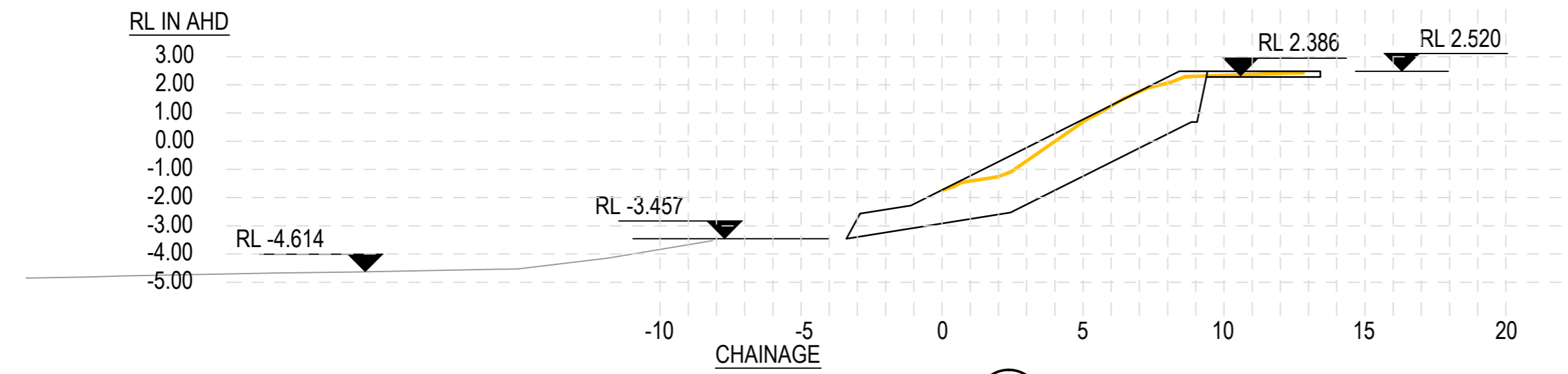
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date JUNE 2016 rev no. D

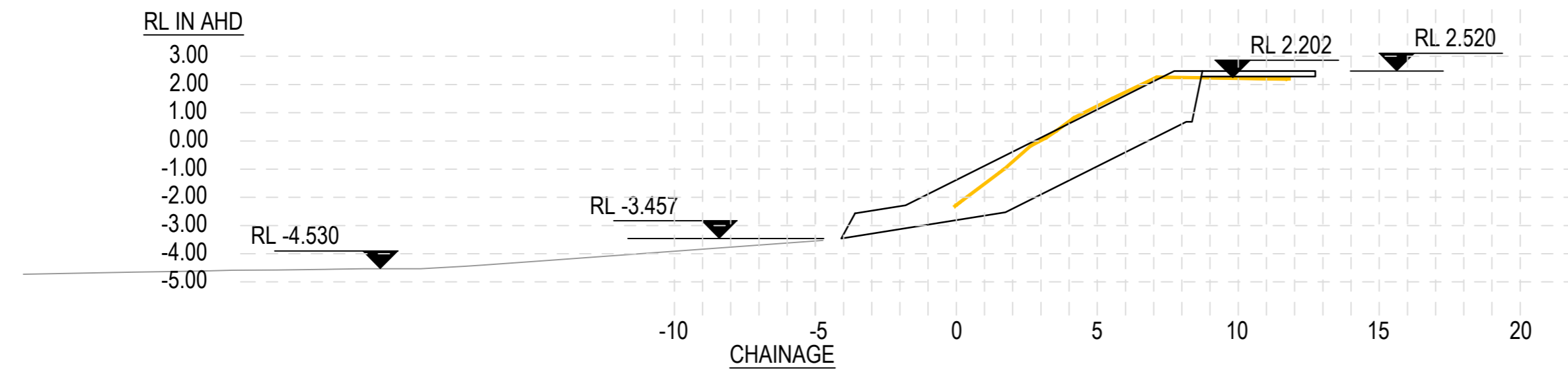
approved (PD) SK007



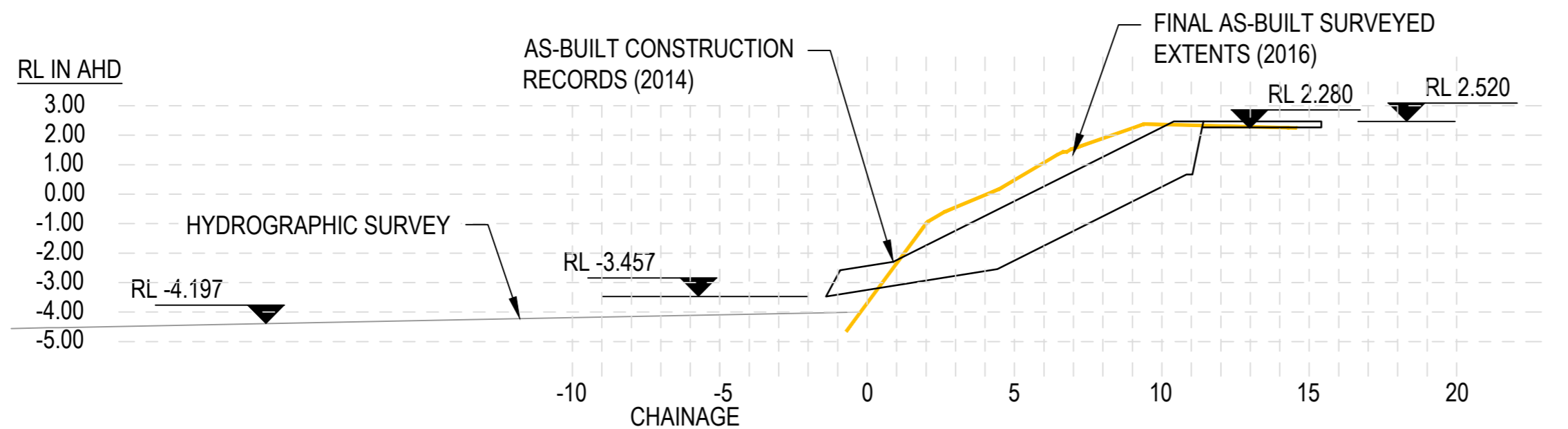
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23 SECTION
SK002 SCALE 1 : 250



22 SECTION
SK002 SCALE 1 : 250



21 SECTION
SK002 SCALE 1 : 250

PRELIMINARY

rev	description	app'd	date
D	SEABED SHOWN IN AHD	A.F	01/06/16
C	SEABED SURVEY EXTENDED	A.F	18/06/16

COOK SHIRE COUNCIL
WEBBER ESPLANADE
REVTMENT WALL AS-BUILT
SECTION REVIEW - SHEET 6 OF 6



145 Ann St Brisbane QLD 4000 Australia
GPO Box 668 Brisbane QLD 4001
T 61 7 3316 3000 F 61 7 3316 3333
E bnemail@ghd.com W www.ghd.com

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scale 1:250 for A3 job no. [REDACTED]
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