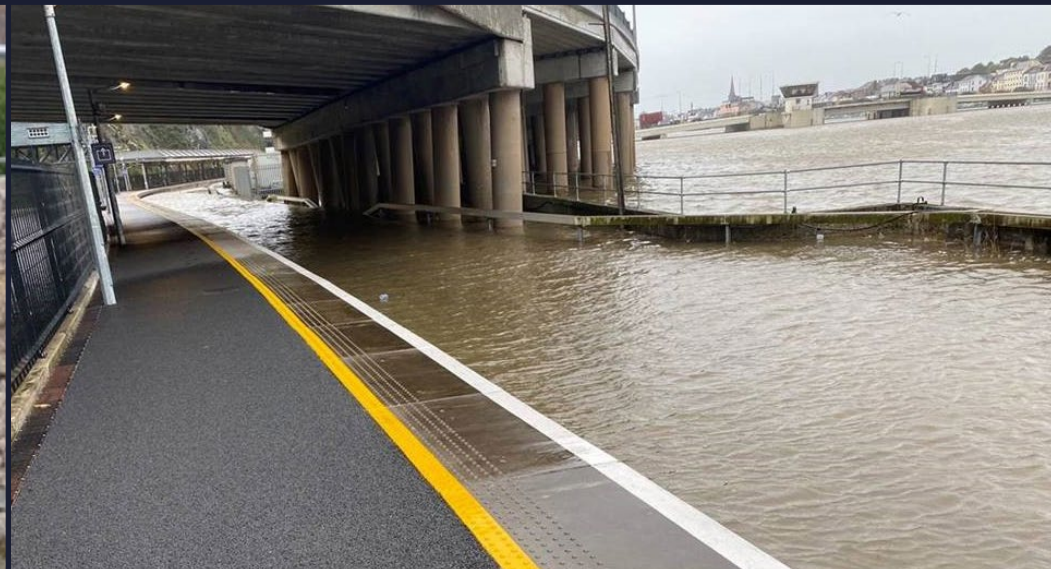




Waterford City Public Infrastructure Project

Flood Defences West

.....
Environmental Impact Assessment Report
Volume 3 Figures | October 2021
.....



List of Volumes comprising this Environmental Impact Assessment Report

Volume 1 Non-Technical Summary

Volume 2 Main Text

Volume 3 Figures

Note:

These EIAR Drawings have been prepared by the Project Team for the purposes of undertaking the Environmental Impact Assessment of the proposed development. The project design led by Roughan & O'Donovan has been developed by a multidisciplinary team with inputs from the following team members:

- Roughan & O'Donovan Consulting Engineers – Team Leaders, Report Authors and Scheme Designers
- Waterford City and County Council – Overall Project Management
- G-NET 3D – Photomontages

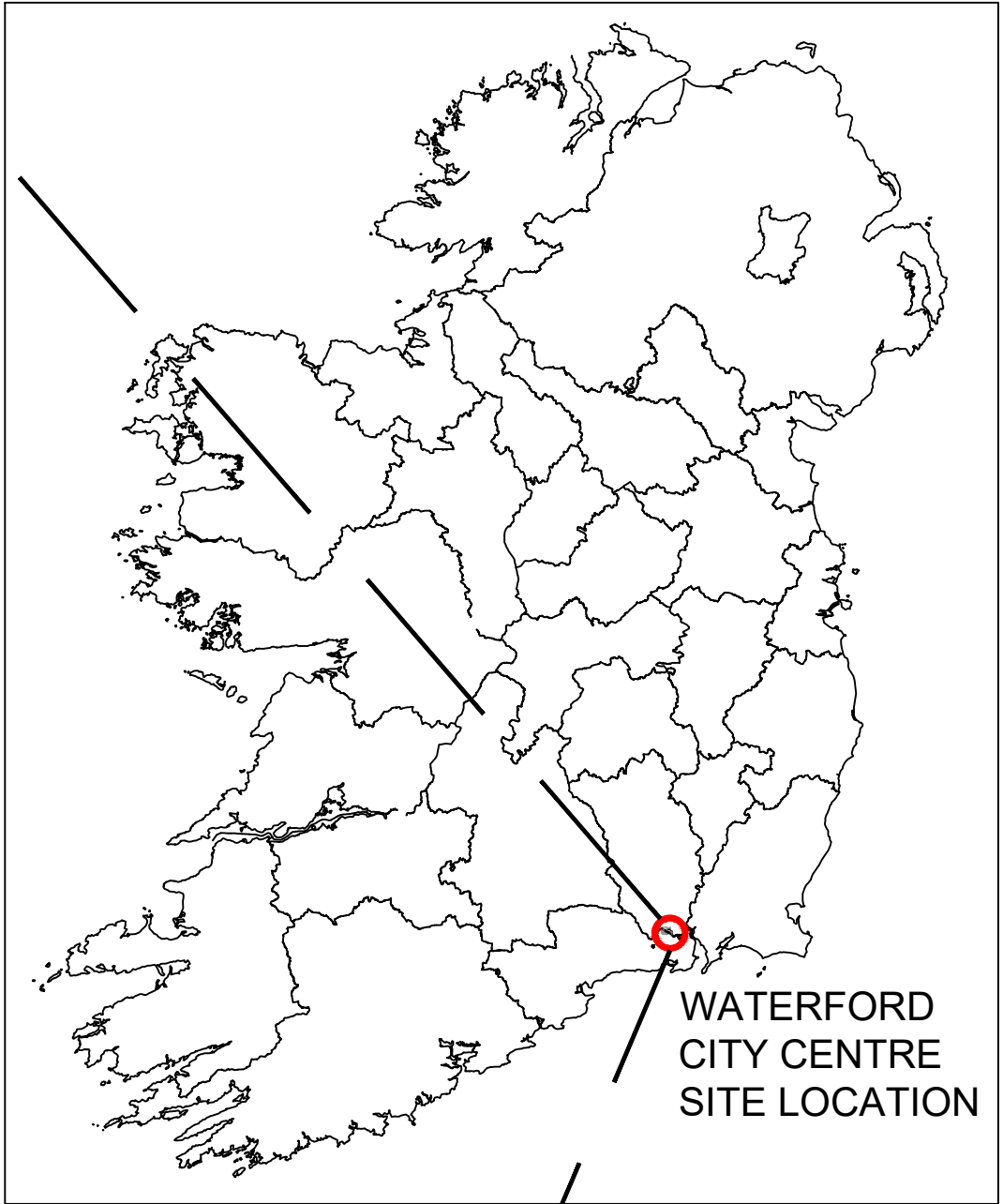
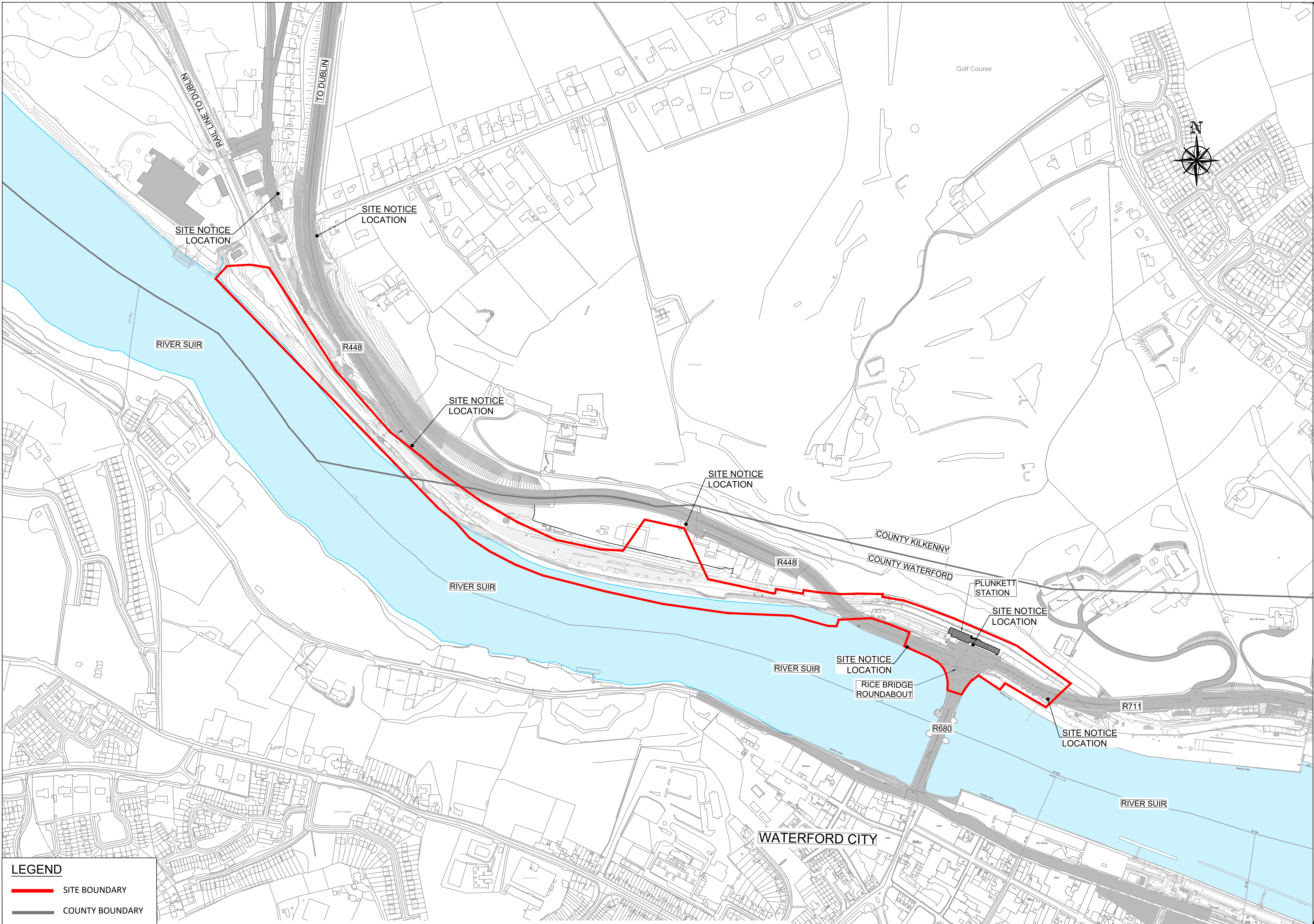
Roughan & O'Donovan have led the preparation of this EIAR with the assistance of the Design Team members listed above and the following specialist environmental consultants, who have undertaken studies for the following environmental topics.

- AWN Consulting – Noise & Vibration and Air Quality & Climate
- IAC Archaeology – Archaeology, Architecture & Cultural Heritage
- Murray and Associates – Landscape & Visual Assessment

**Waterford City Public Infrastructure Project
Flood Defences West
Environmental Impact Assessment Report
Volume 3**

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LOCATION MAP

N.T.S.

EIAR NOTE:

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LOCATION PLAN

A1 SCALE 1:7000
A3 SCALE 1:3500

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Project
Title

WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT
FLOOD DEFENCES WEST

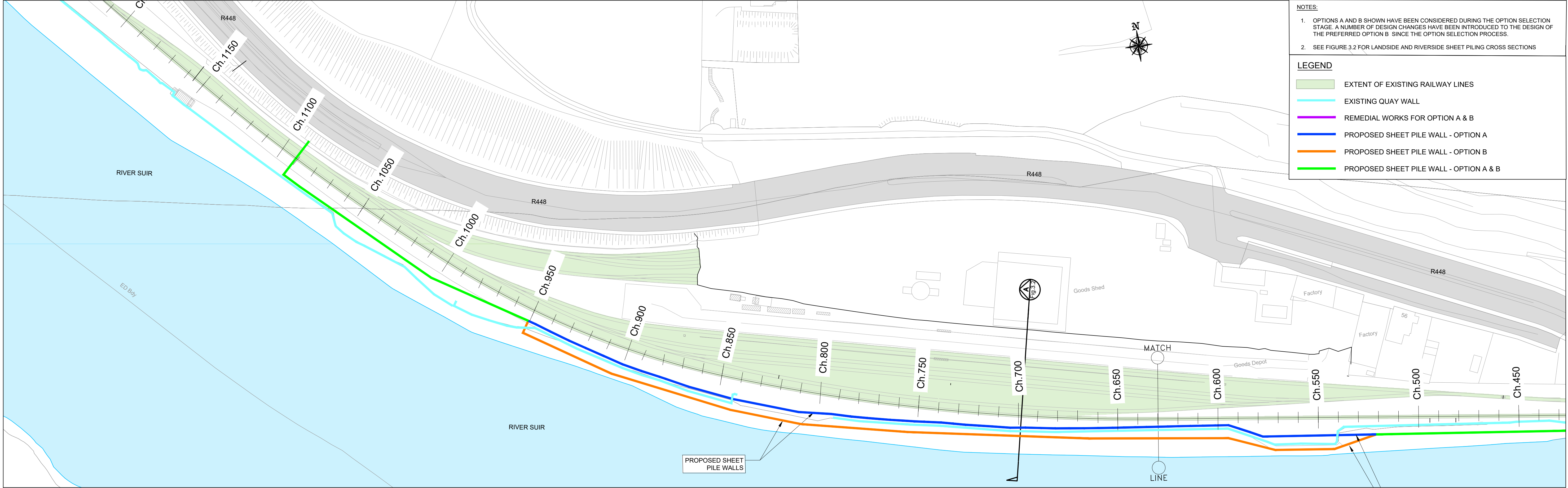
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

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Location Plan of Proposed Development

Designed: YB	File: 18.141	Status: E.I.A.R.
Drawn: IM	Job No: 18.141	
Checked: BC	Scale: AS SHOWN	Drawing No: FIG 1.1
Approved: TD	Date: OCTOBER 2021	Rev: -

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NOTES:

1. OPTIONS A AND B SHOWN HAVE BEEN CONSIDERED DURING THE OPTION SELECTION STAGE. A NUMBER OF DESIGN CHANGES HAVE BEEN INTRODUCED TO THE DESIGN OF THE PREFERRED OPTION B SINCE THE OPTION SELECTION PROCESS.

2. SEE FIGURE 3.2 FOR LANDSIDE AND RIVERSIDE SHEET PILING CROSS SECTIONS

LEGEND

EXTENT OF EXISTING RAILWAY LINES

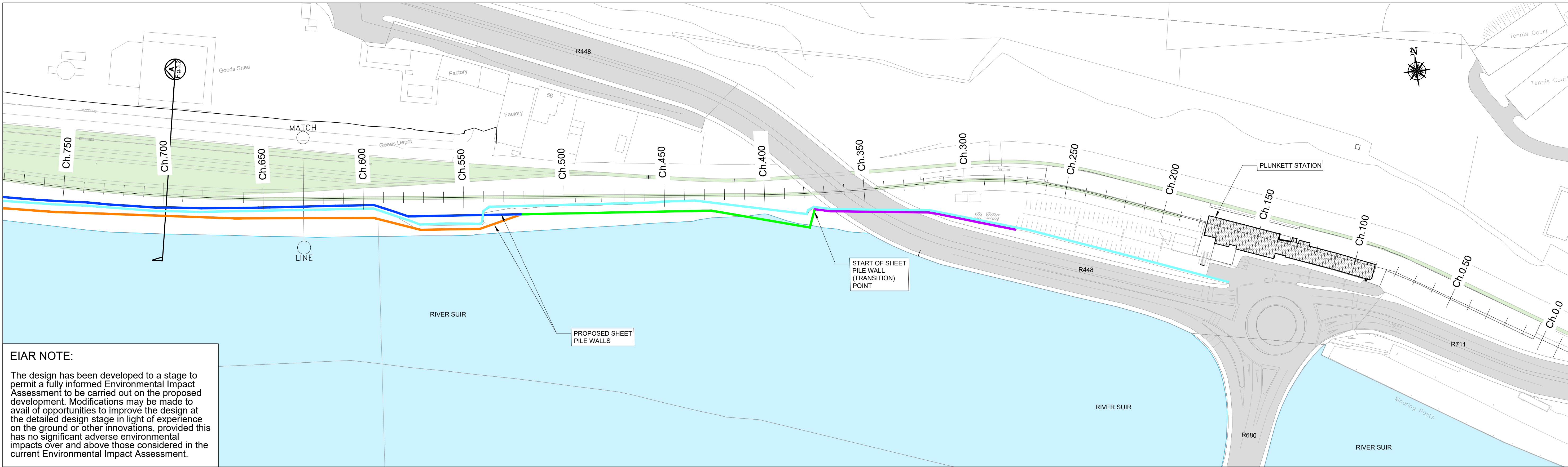
EXISTING QUAY WALL

REMEDIAL WORKS FOR OPTION A & B

PROPOSED SHEET PILE WALL - OPTION A

PROPOSED SHEET PILE WALL - OPTION B

PROPOSED SHEET PILE WALL - OPTION A & B



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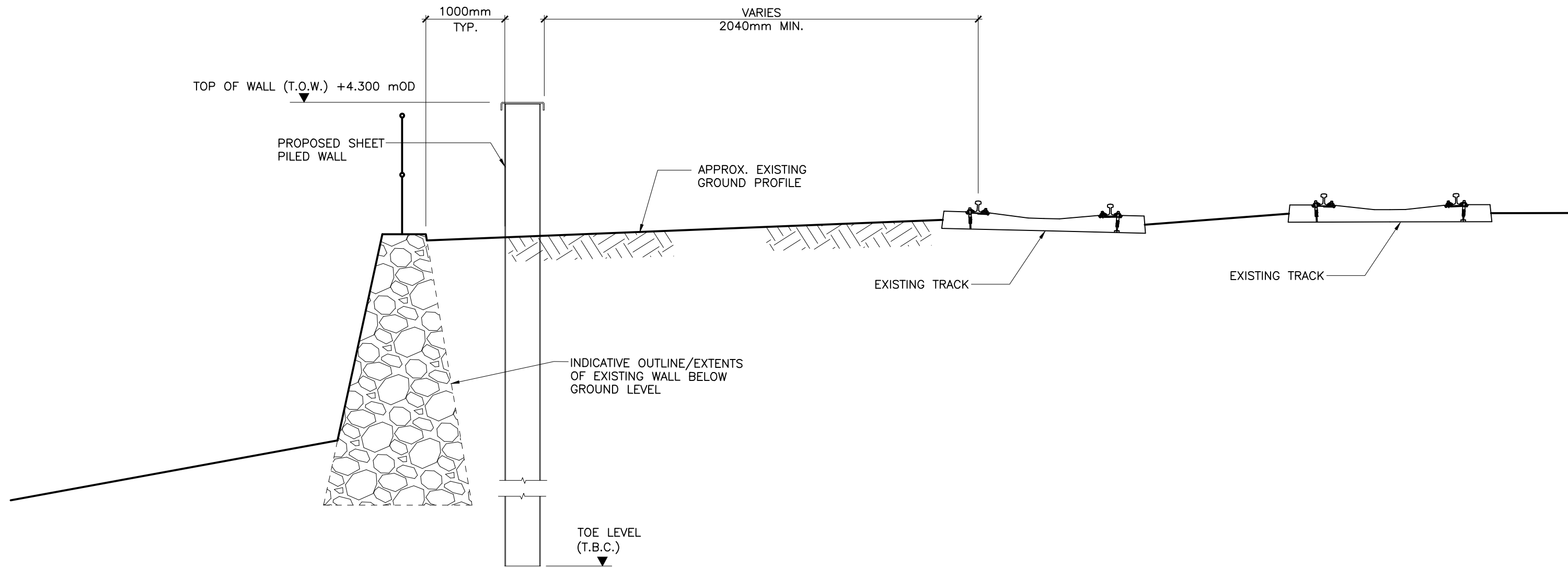


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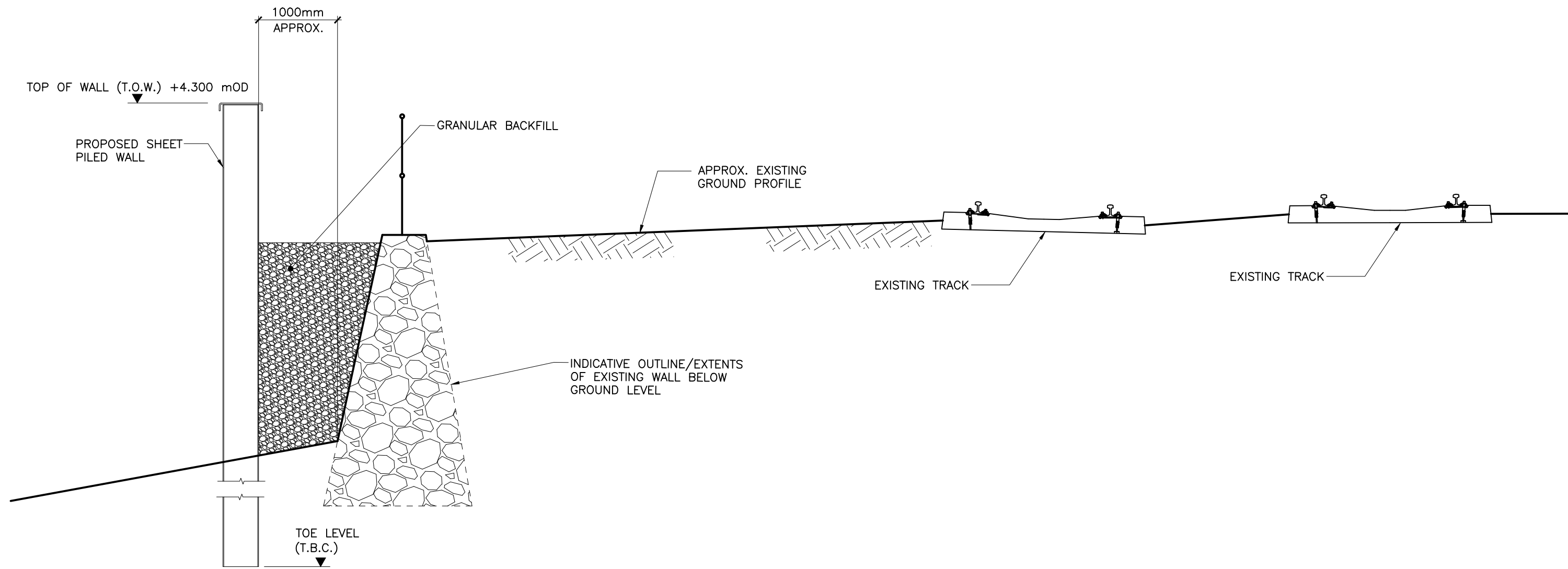
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Checked: BC	Scale: 1:1000 (@ A3)	Drawing No:	FIG 3.1
Approved: TD	Date: OCTOBER 2021	Rev:	-

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SECTION A
A1 SCALE 1:100
A3 SCALE 1:50

TYPICAL CROSS SECTION OF LANDSIDE INSTALLATION (OPTION A)



SECTION A
A1 SCALE 1:100
A3 SCALE 1:50

TYPICAL CROSS SECTION OF RIVERSIDE INSTALLATION (OPTION B)

NOTES:

1. PROPOSED TOP OF SHEET PILE (+4.300MOD) TO PROVIDE 1:200 YEAR COMBINED TIDAL/ FLUVIAL PROTECTION DURING FLOOD EVENT INCLUDING 300MM FREEBOARD ALLOWANCE.
2. SHEET PILE SECTION DEPTH OF 450MM ASSUMED. PRESSED STEEL CAPPING BEAM PROPOSED.
3. THE PROPOSED SHEET PILE ALIGNMENT ON PLAN AND THE CLEARANCES TO NEAREST RUNNING EDGE OF RAILWAY IS SUBJECT TO AGREEMENT WITH IARNRÓD ÉIREANN.
4. A MINIMUM WIDTH 1000MM SHALL BE PROVIDED, WHERE FEASIBLE, BETWEEN THE BACK OF EXISTING QUAY WALL AND THE NEAREST FACE OF THE PROPOSED SHEET PILE TO MINIMISE RISK OF CLASHES WITH THE EXISTING WALL.
5. WHERE FEASIBLE, A MINIMUM 2040MM DISTANCE FROM NEAREST RUNNING EDGE OF RAILWAY TO THE PROPOSED SHEET PILE SHALL BE PROVIDED TO ACCOMMODATE A LINESIDE WALLWAY.
6. THE PROPOSED SHEET PILE WALL WILL NOT BE DESIGNED TO RESIST NOTIONAL IMPACT FORCES ARISING FROM A DERAILMENT.

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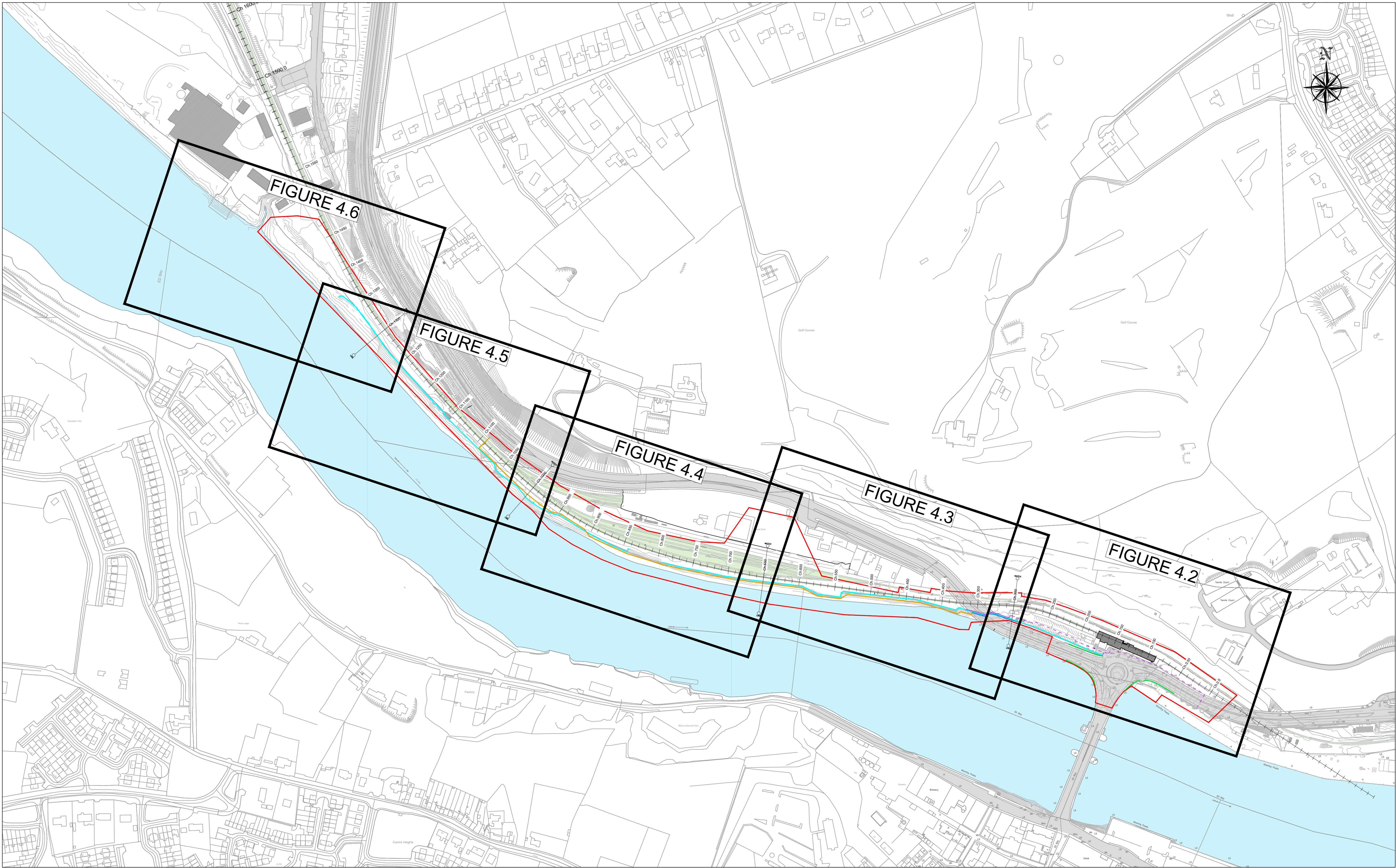


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Project Title		Drawing Title:			
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Sheet Pile Layout for Options A and B at Ch.700			
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	Checked:	BC	Scale:	AS SHOWN	
	Approved:	TD	Date:	OCTOBER 2021	
			Drawing No:	FIG 3.2	Rev:
					-

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Project
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**WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT
FLOOD DEFENCES WEST**

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:
Proposed Extents of Structural Works Sheet - Key Plan

Designed: YB	File:	Status: E.I.A.R.
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Checked: BC	Scale: 1:2500 (@ A3)	Drawing No: FIG 4.1
Approved: TD	Date: OCTOBER 2021	Rev: -

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NOTES:

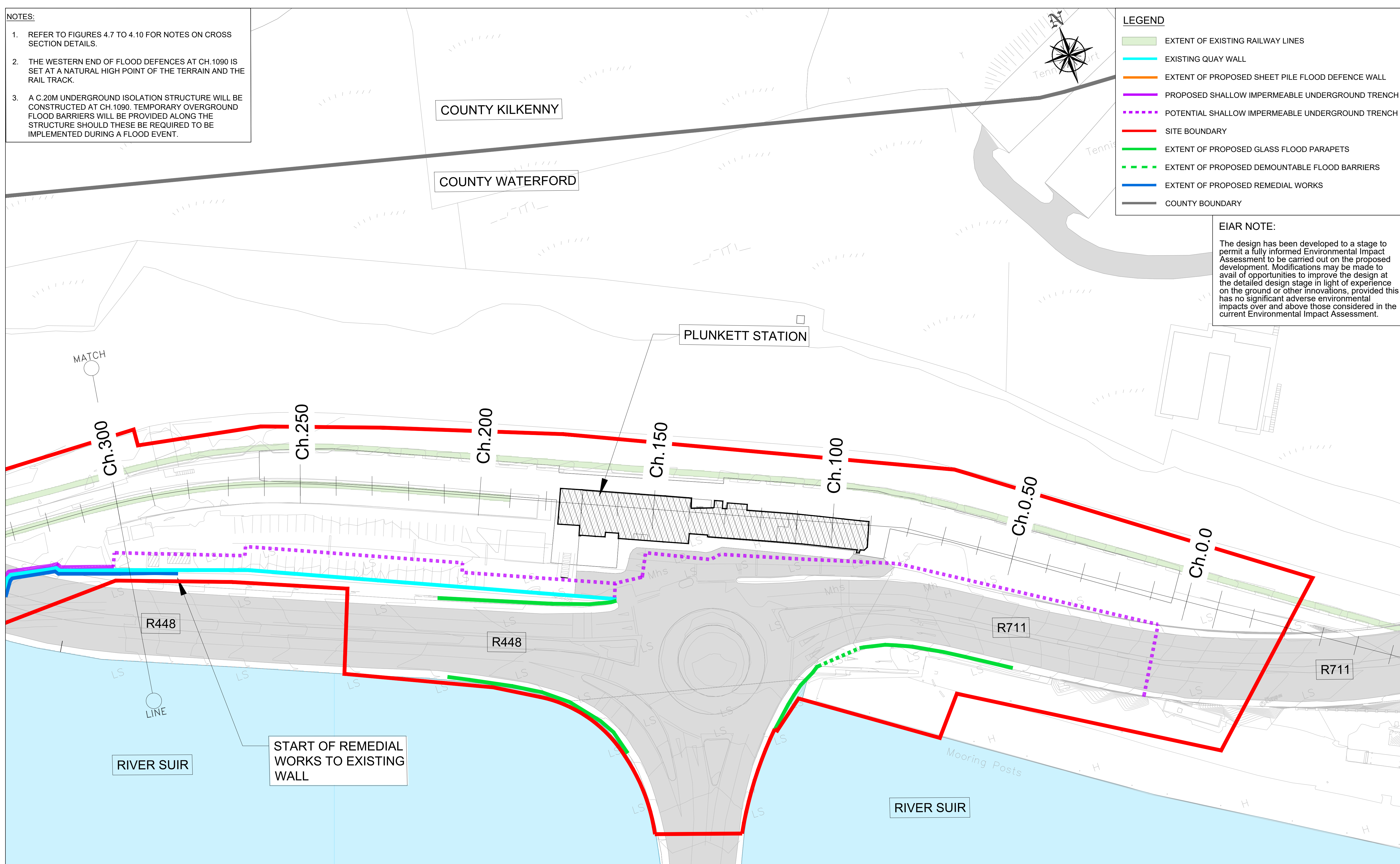
1. REFER TO FIGURES 4.7 TO 4.10 FOR NOTES ON CROSS SECTION DETAILS.
2. THE WESTERN END OF FLOOD DEFENCES AT CH.1090 IS SET AT A NATURAL HIGH POINT OF THE TERRAIN AND THE RAIL TRACK.
3. A C.20M UNDERGROUND ISOLATION STRUCTURE WILL BE CONSTRUCTED AT CH.1090. TEMPORARY OVERGROUND FLOOD BARRIERS WILL BE PROVIDED ALONG THE STRUCTURE SHOULD THESE BE REQUIRED TO BE IMPLEMENTED DURING A FLOOD EVENT.

LEGEND

- EXTENT OF EXISTING RAILWAY LINES
- EXISTING QUAY WALL
- EXTENT OF PROPOSED SHEET PILE FLOOD DEFENCE WALL
- PROPOSED SHALLOW IMPERMEABLE UNDERGROUND TRENCH
- POTENTIAL SHALLOW IMPERMEABLE UNDERGROUND TRENCH
- SITE BOUNDARY
- EXTENT OF PROPOSED GLASS FLOOD PARAPETS
- EXTENT OF PROPOSED DEMOUNTABLE FLOOD BARRIERS
- EXTENT OF PROPOSED REMEDIAL WORKS
- COUNTY BOUNDARY

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**WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT
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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:

**Proposed Extents of Structural Work
Sheet 1 of 5**

Designed: YB	File:	Status: E.I.A.R.
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Approved: TD	Date: OCTOBER 2021	Rev: -

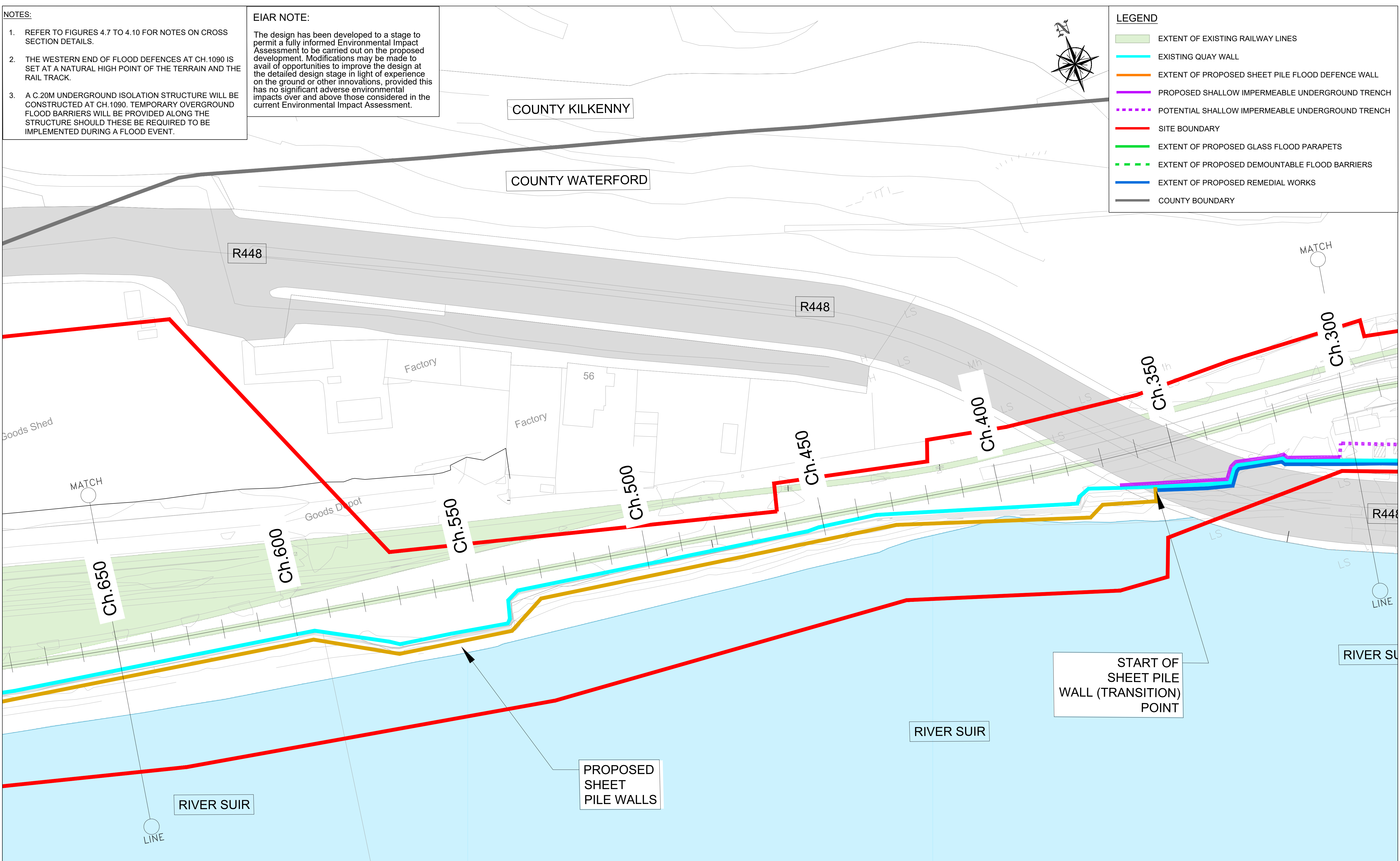
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NOTES:

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2. THE WESTERN END OF FLOOD DEFENCES AT CH.1090 IS SET AT A NATURAL HIGH POINT OF THE TERRAIN AND THE RAIL TRACK.
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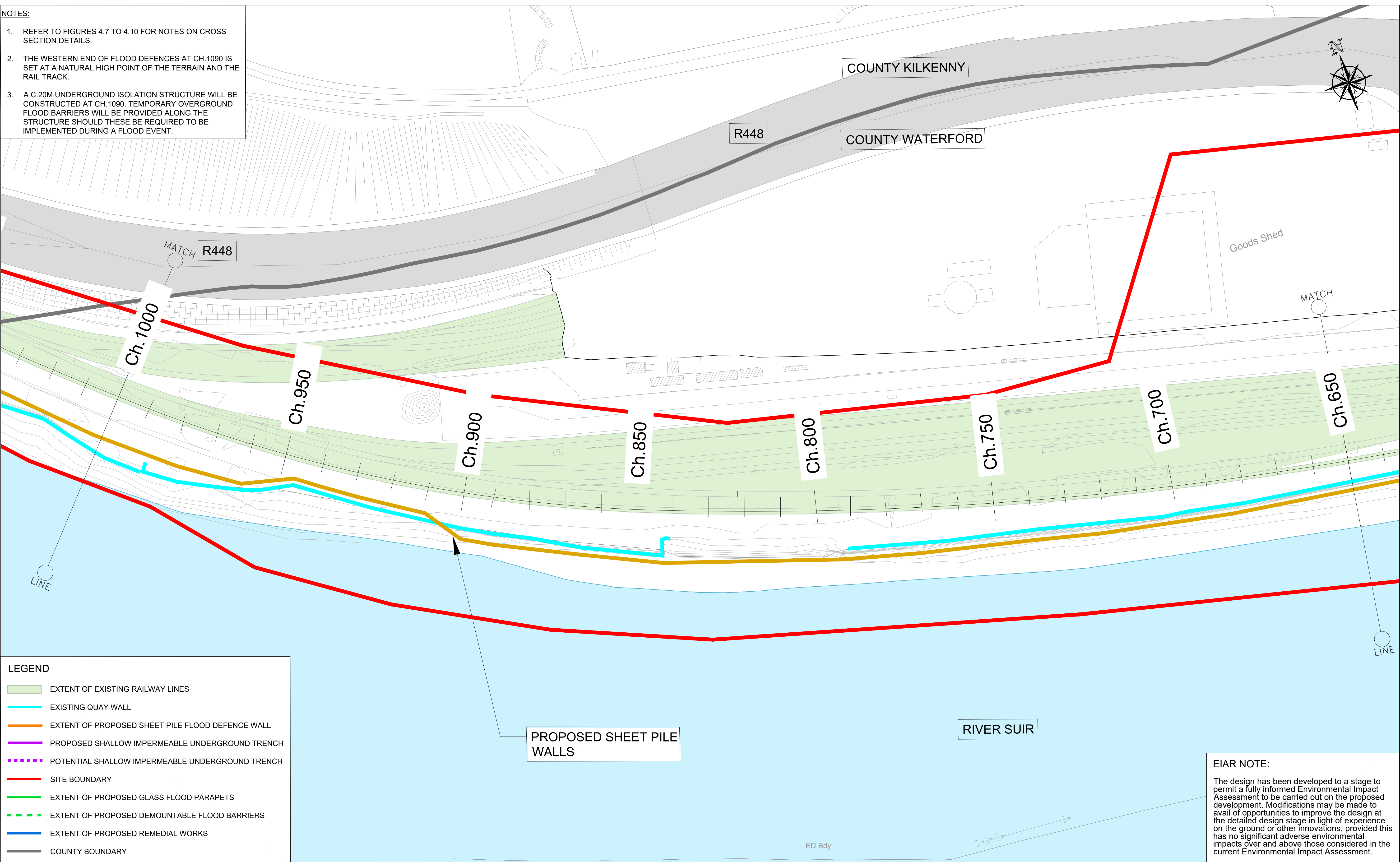
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	ENVIRONMENTAL IMPACT ASSESSMENT REPORT	

Drawing Title: Proposed Extents of Structural Works Sheet 2 of 5			
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Approved: TD	Date: OCTOBER 2021		

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NOTES:

1. REFER TO FIGURES 4.7 TO 4.10 FOR NOTES ON CROSS SECTION DETAILS.
2. THE WESTERN END OF FLOOD DEFENCES AT CH.1090 IS SET AT A NATURAL HIGH POINT OF THE TERRAIN AND THE RAIL TRACK.
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Project
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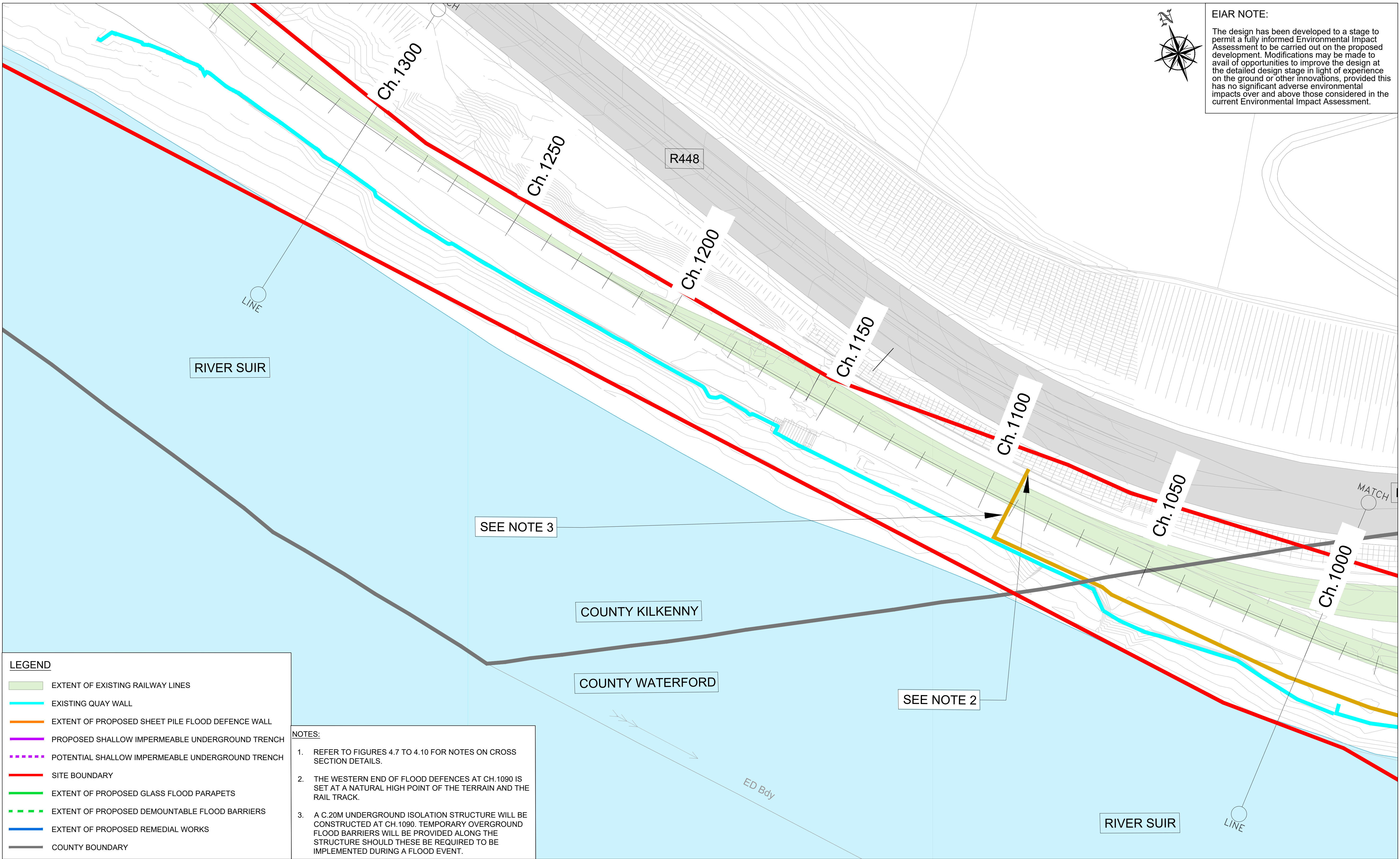
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:

Proposed Extents of Structural Works
Sheet 3 of 5

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Approved: TD	Date: OCTOBER 2021	Rev: -

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LEGEND

- EXTENT OF EXISTING RAILWAY LINES
- EXISTING QUAY WALL
- EXTENT OF PROPOSED SHEET PILE FLOOD DEFENCE WALL
- PROPOSED SHALLOW IMPERMEABLE UNDERGROUND TRENCH
- POTENTIAL SHALLOW IMPERMEABLE UNDERGROUND TRENCH
- SITE BOUNDARY
- EXTENT OF PROPOSED GLASS FLOOD PARAPETS
- EXTENT OF PROPOSED DEMOUNTABLE FLOOD BARRIERS
- EXTENT OF PROPOSED REMEDIAL WORKS
- COUNTY BOUNDARY

- NOTES:**
- REFER TO FIGURES 4.7 TO 4.10 FOR NOTES ON CROSS SECTION DETAILS.
 - THE WESTERN END OF FLOOD DEFENCES AT CH.1090 IS SET AT A NATURAL HIGH POINT OF THE TERRAIN AND THE RAIL TRACK.
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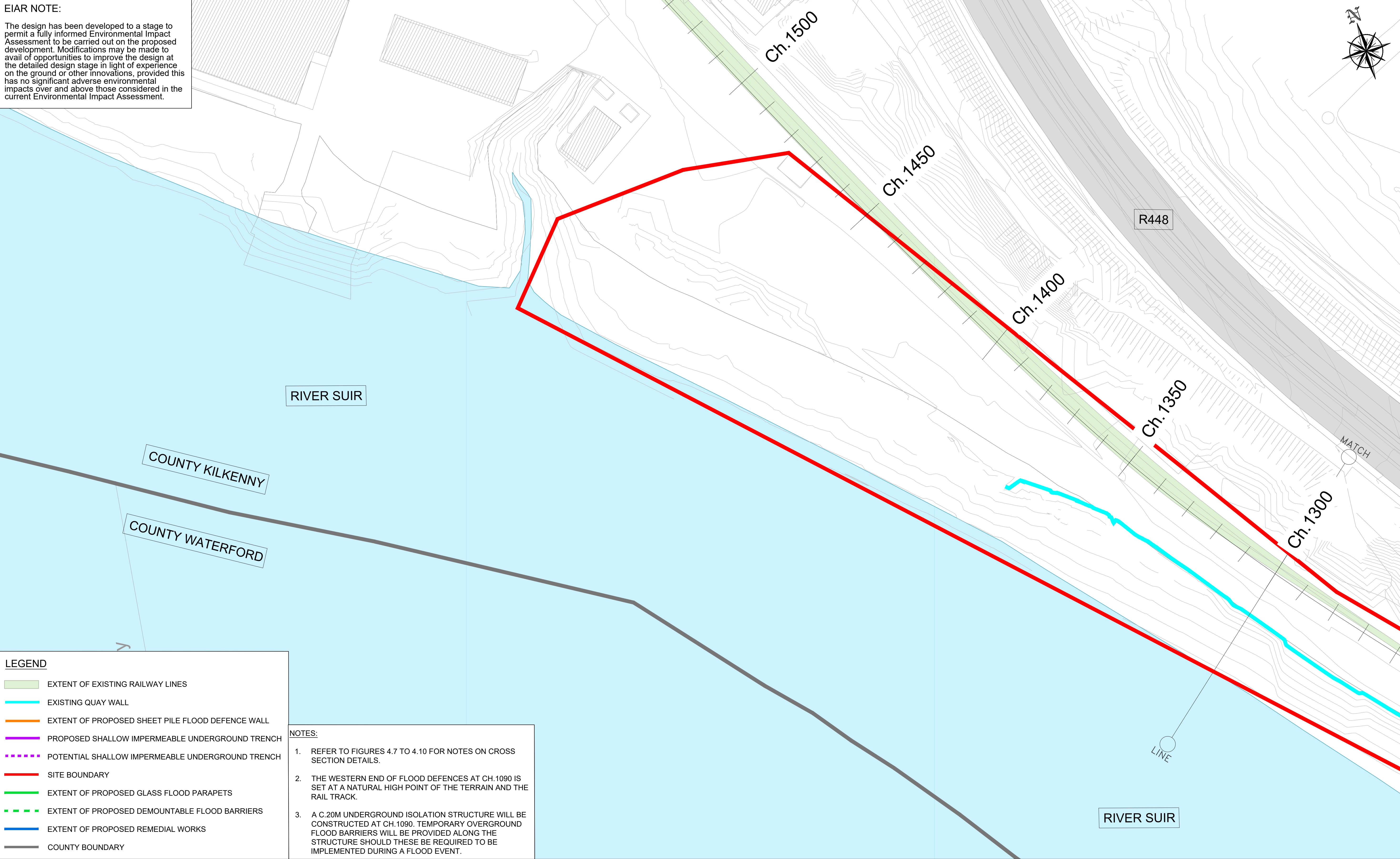
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**Proposed Extents of Structural Works
Sheet 4 of 5**

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Approved: TD	Date: OCTOBER 2021	Rev: -

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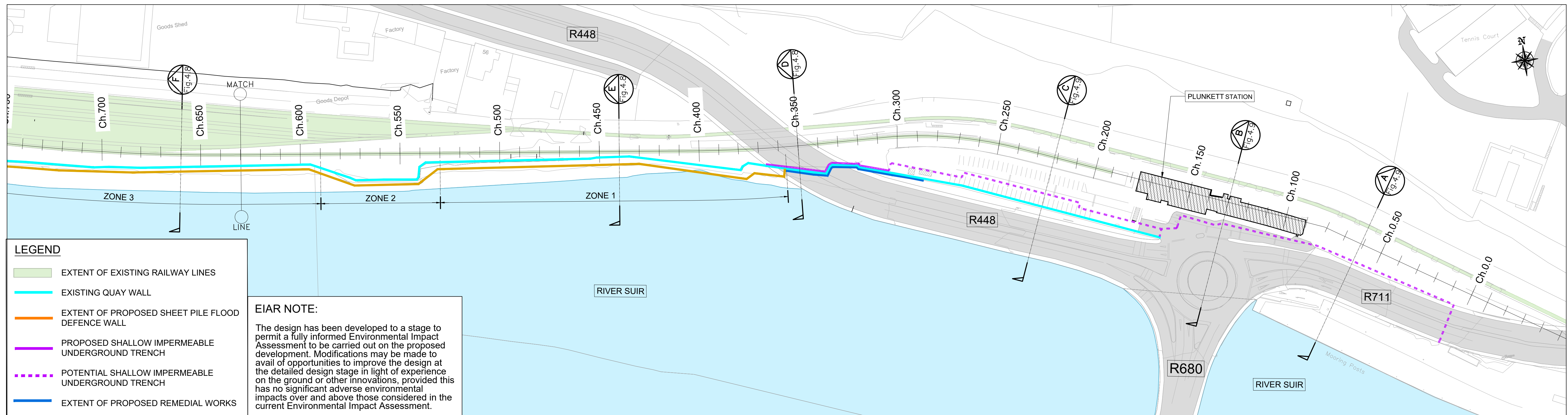
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Drawing Title:
Proposed Extents of Structural Works Sheet 5 of 5

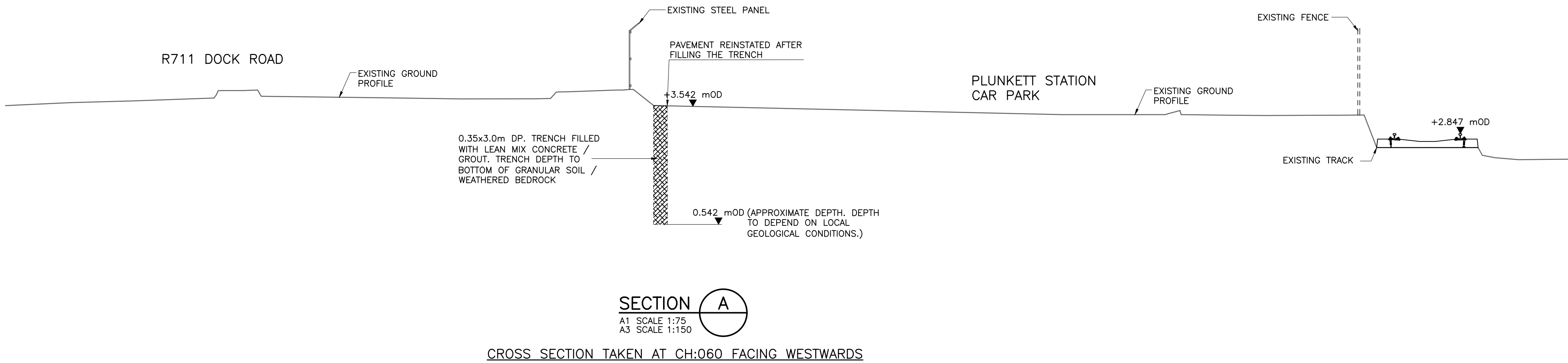
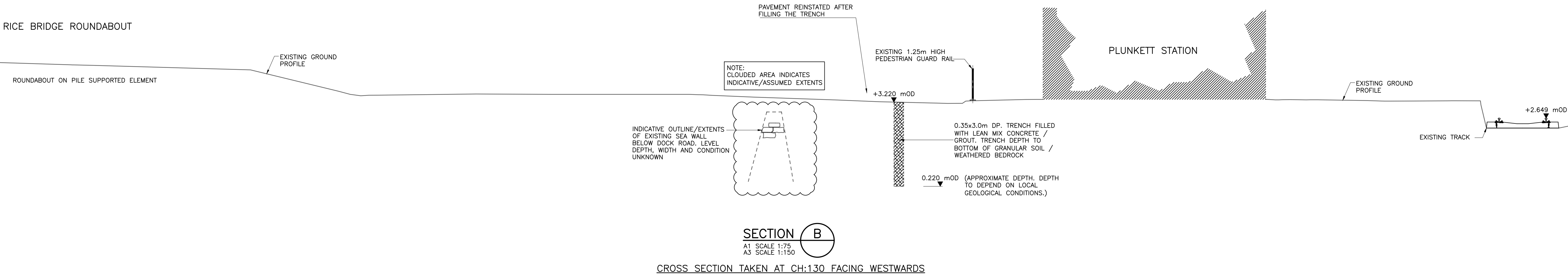
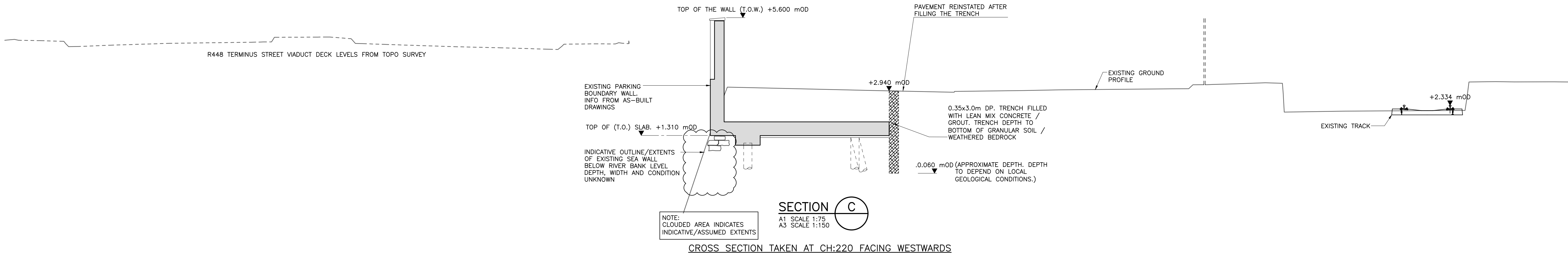
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Checked: BC	Scale: 1:500 (@ A3)	Drawing No: FIG 4.6
Approved: TD	Date: OCTOBER 2021	Rev: -

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FLOOD PROTECTION SHEET LAYOUT (WEST)						
	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	ZONE 6
	CHAINAGE 360-530	CHAINAGE 530-590	CHAINAGE 590-790	CHAINAGE 790-840	CHAINAGE 840-910	CHAINAGE 910-1090
PILE TOE (mOD)	-11.000	-17.000	-10.000	-11.500	-9.500	-6.000
TOTAL HEIGHT OF SHEET PILE	15.300	21.300	14.300	15.800	13.800	10.300
PILE SECTION	AZ20-700	AZ42-700	AZ20-700	AZ42-700	AZ20-700	AZ20-700
DISTANCE TO NEAREST RAIL	5.400 (MIN) 13.900 (MAX)	7.200 (MIN) 15.000 (MAX)	6.800 (MIN) 12.800 (MAX)	12.800 (MIN) 13.800 (MAX)	10.100 (MIN) 13.800 (MAX)	9.25 (MIN) (*) 10.100 (MAX)
(*) NOTE = DOES NOT INCLUDE TRANSVERSE STRUCTURE						



- NOTES:
- HAND DIGGING TO BE EMPLOYED AROUND UTILITIES TO ADEQUATELY PROTECT SERVICES AND UTILITES.
 - TRENCH TO BE CONSTRUCTED IN SHORT SECTIONS TO MINIMISE THE TIME TRENCH IS LEFT OPEN.



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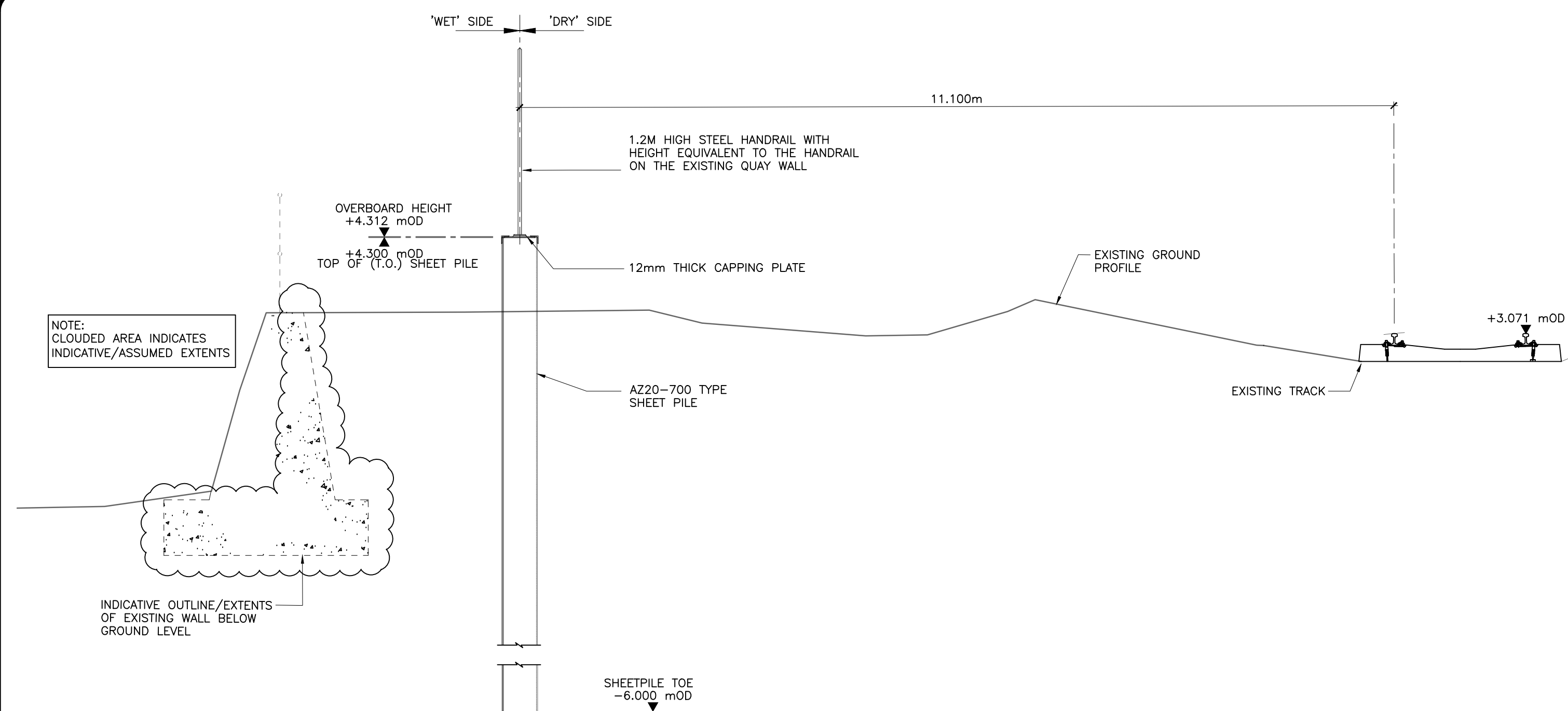


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Project Title	WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		
	ENVIRONMENTAL IMPACT ASSESSMENT REPORT		

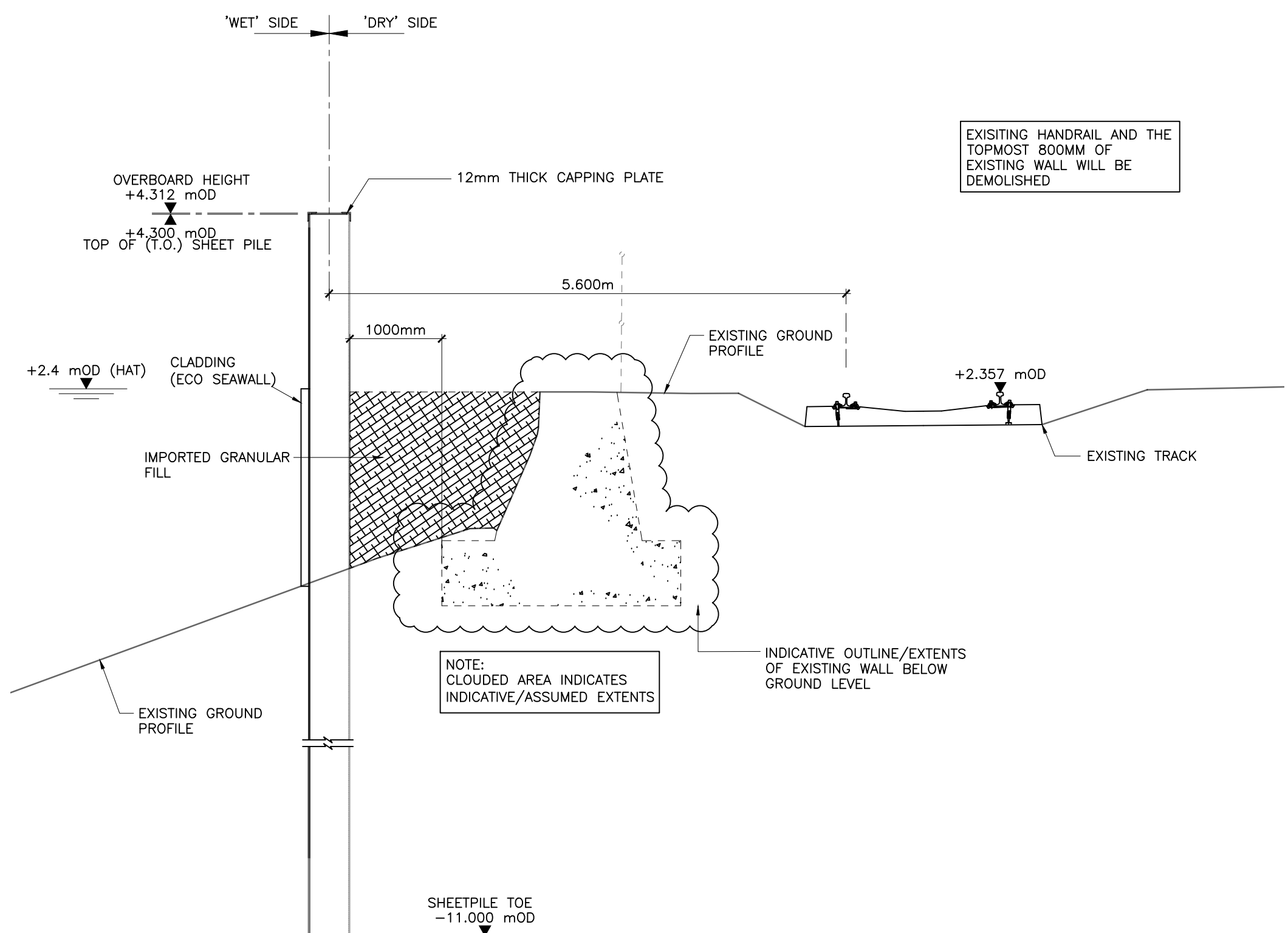
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Approved: TD	Date: OCTOBER 2021		

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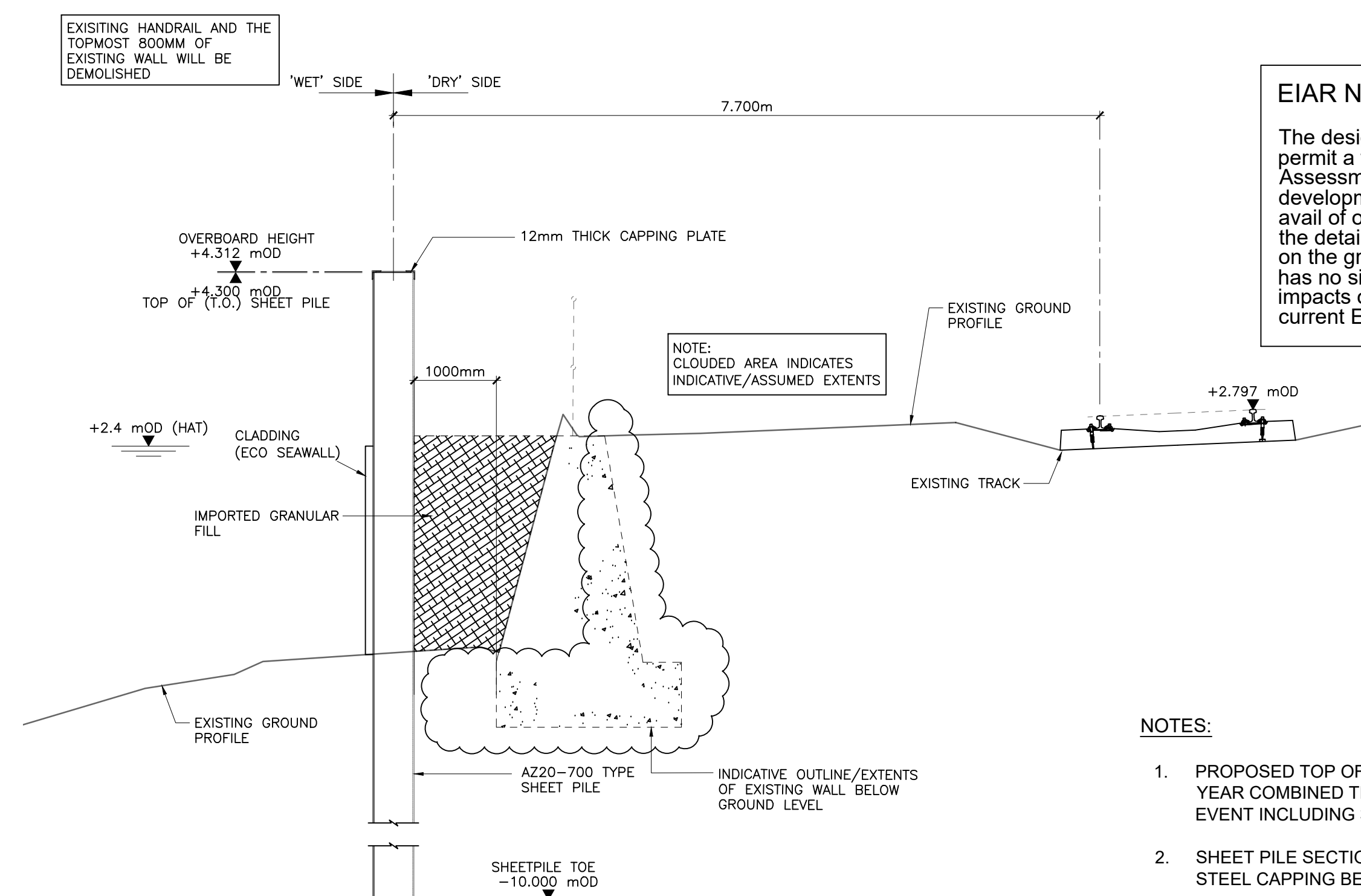
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A1 SCALE 1:50
A3 SCALE 1:100

SECTION TAKEN AT CH:970 FACING WESTWARDS



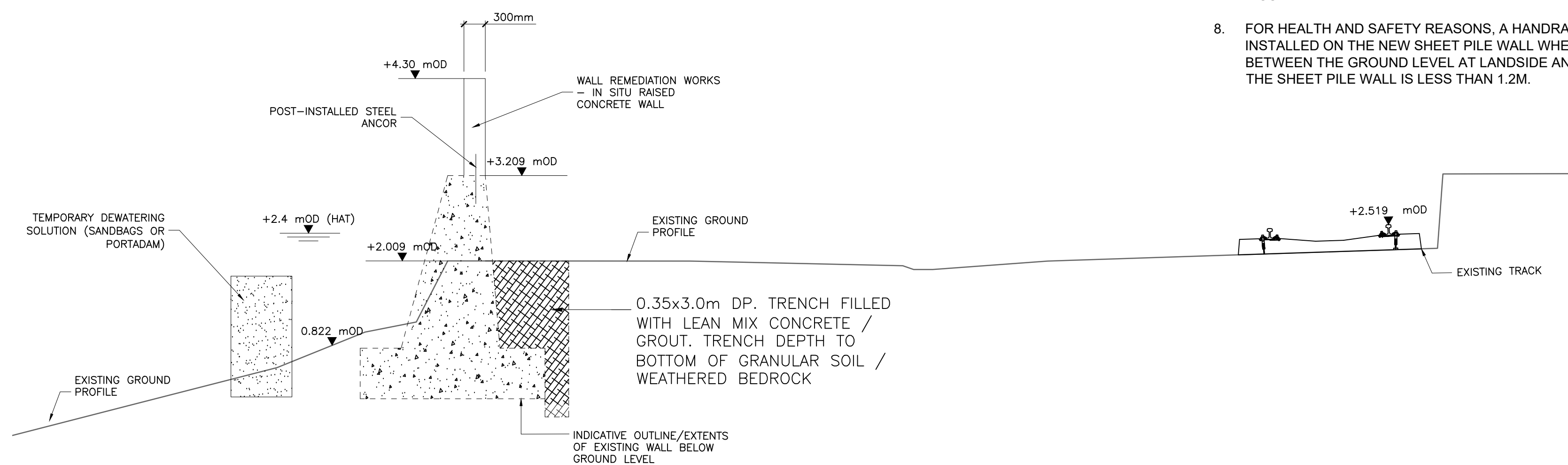
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A3 SCALE 1:100

SECTION TAKEN AT CH:440 FACING WESTWARDS



SECTION **F**
A1 SCALE 1:50
A3 SCALE 1:100

SECTION TAKEN AT CH:660 FACING WESTWARDS



SECTION **D**
A1 SCALE 1:50
A3 SCALE 1:100

SECTION TAKEN AT CH:350 FACING WESTWARDS

EIAR NOTE:

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NOTES:

1. PROPOSED TOP OF SHEET PILE (+4.300MOD) TO PROVIDE 1:200 YEAR COMBINED TIDAL/ FLUVIAL PROTECTION DURING FLOOD EVENT INCLUDING 300MM FREEBOARD ALLOWANCE.
2. SHEET PILE SECTION DEPTH OF 450mm ASSUMED. PRESSED STEEL CAPPING BEAM PROPOSED.
3. A MINIMUM WIDTH 1000mm SHALL BE PROVIDED, WHERE FEASIBLE, BETWEEN THE FRONT AND BACK OF EXISTING QUAY WALL AND THE NEAREST FACE OF THE PROPOSED SHEET PILE TO MINIMIZE RISK OF CLASHES WITH THE EXISTING WALL.
4. THE PROPOSED SHEET PILE WALL WILL NOT BE DESIGNED TO RESIST NOTIONAL IMPACT FORCES ARISING FROM A DERAILMENT.
5. RIVERSIDE SHEET PILE WALL INSTALLATION WILL BE UNDERTAKEN FROM BARGE. BARGE IS EXPECTED TO BE SET-UP A MINIMUM OF 6M FROM THE FRONT OF FACE OF EXISTING MASONRY QUAY WALL.
6. PRE-CAST CONCRETE CLADDING ("ECO-SEAWALL") WILL BE INSTALLED TO THE INTERTIDAL ZONE OF THE RIVERSIDE SHEET PILE WALL TO ENHANCE MARINE BIODIVERSITY.
7. NO DRAINAGE WORKS ARE SHOWN ON THESE CROSS SECTIONS. REFER TO FIG. 4.11. TO 4.20 FOR DRAINAGE WORKS FIGURES.
8. FOR HEALTH AND SAFETY REASONS, A HANDRAIL WILL BE INSTALLED ON THE NEW SHEET PILE WALL WHERE HEIGHT BETWEEN THE GROUND LEVEL AT LANDSIDE AND THE TOP OF THE SHEET PILE WALL IS LESS THAN 1.2M.

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Project
Title

**WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT
FLOOD DEFENCES WEST**

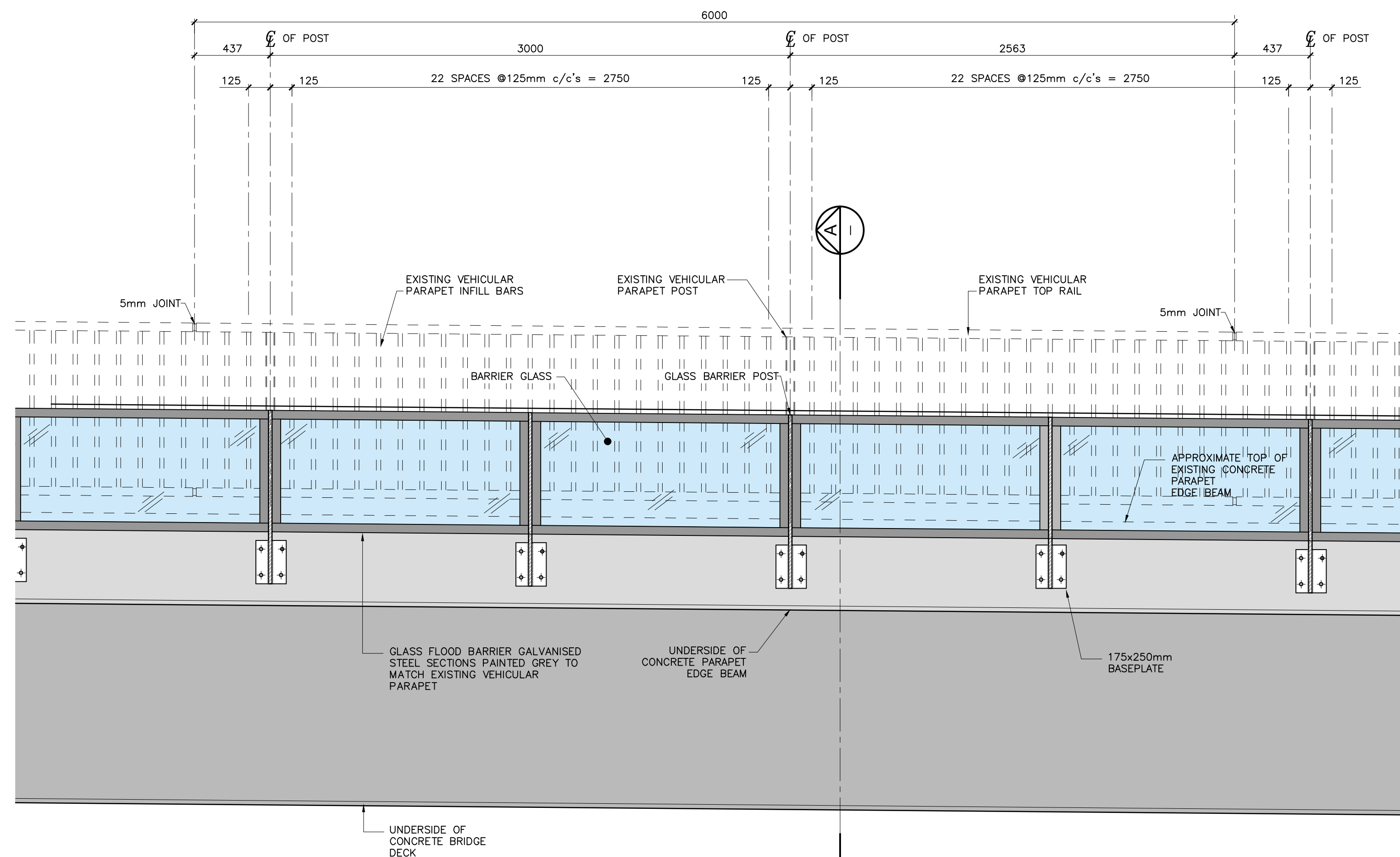
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:

Indicative Cross Sections of Structural Works - Sheet 2 of 2

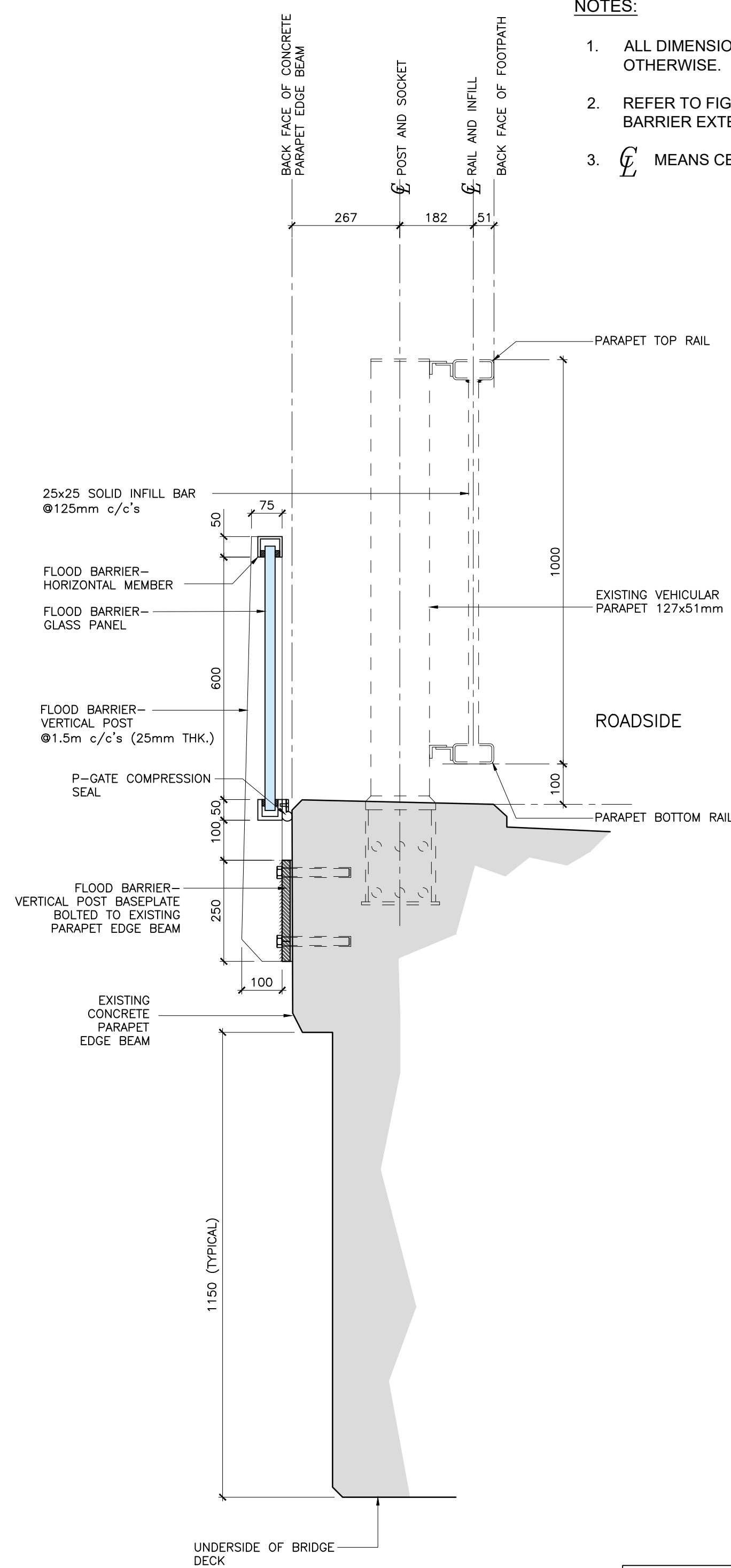
Designed: YB	File:	Status: E.I.A.R.
Drawn: IM	Job No: 18.141	
Checked: BC	Scale: AS SHOWN	Drawing No: FIG 4.9
Approved: TD	Date: OCTOBER 2021	Rev: -

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ELEVATION-TYPICAL GLASS FLOOD BARRIER ARRANGEMENT

A1 SCALE 1:20
A3 SCALE 1:40



SECTION A
A1 SCALE 1:10
A3 SCALE 1:20

- NOTES:
- ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.
 - REFER TO FIGURES 4.1 & 4.2 FOR PROPOSED GLASS FLOOD BARRIER EXTENTS.
 - MEANS CENTRE LINE

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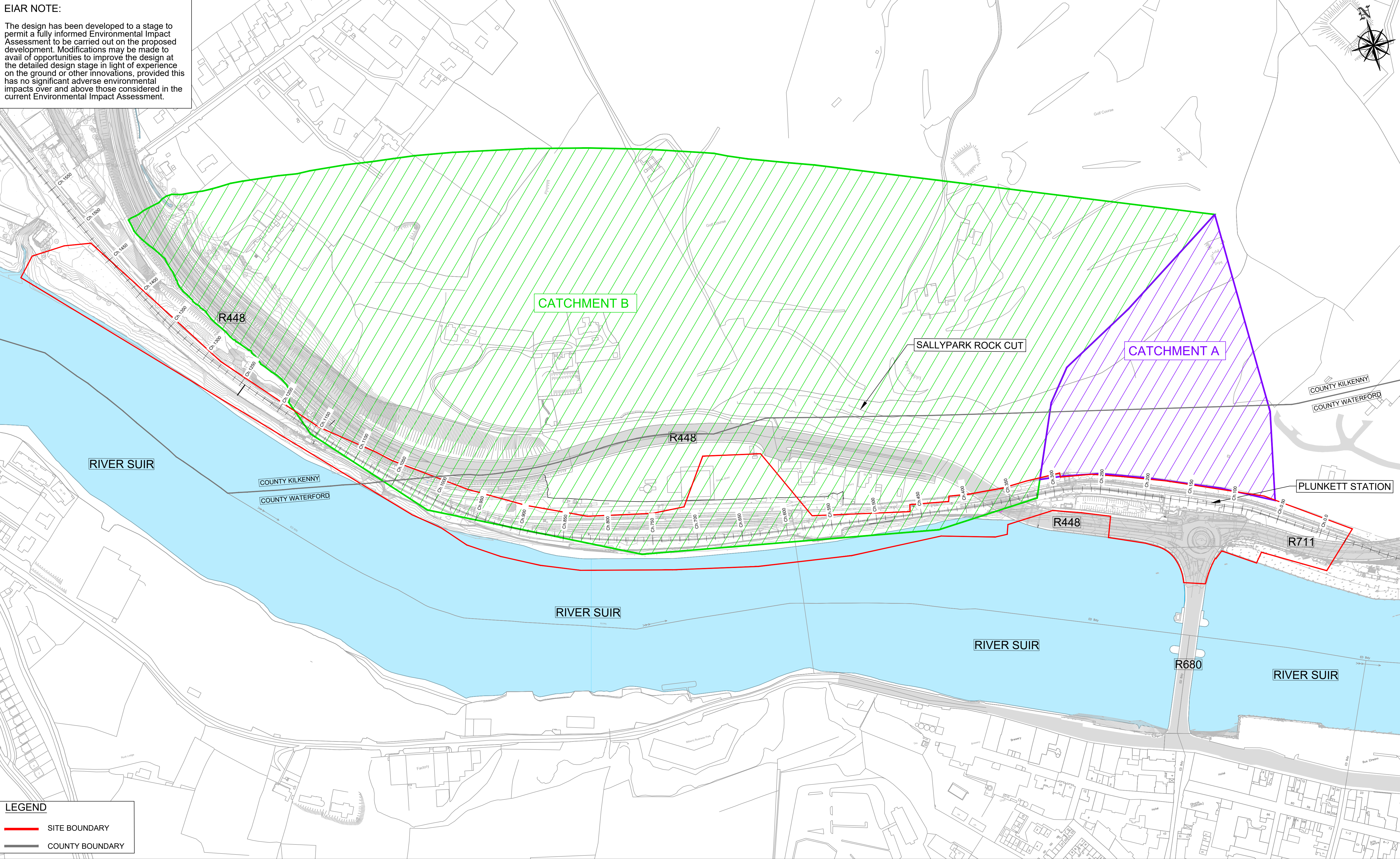
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Project Title		WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Drawing Title:	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT				Indicative Elevation & Section of Glass Flood Barriers	
Designed:	CS	File:		Status:	E.I.A.R.
Drawn:	AR	Job No:	18.141		
Checked:	BC	Scale:	AS SHOWN	Drawing No:	FIG 4.10
Approved:	TD	Date:	OCTOBER 2021	Rev:	

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LEGEND

— SITE BOUNDARY

— COUNTY BOUNDARY

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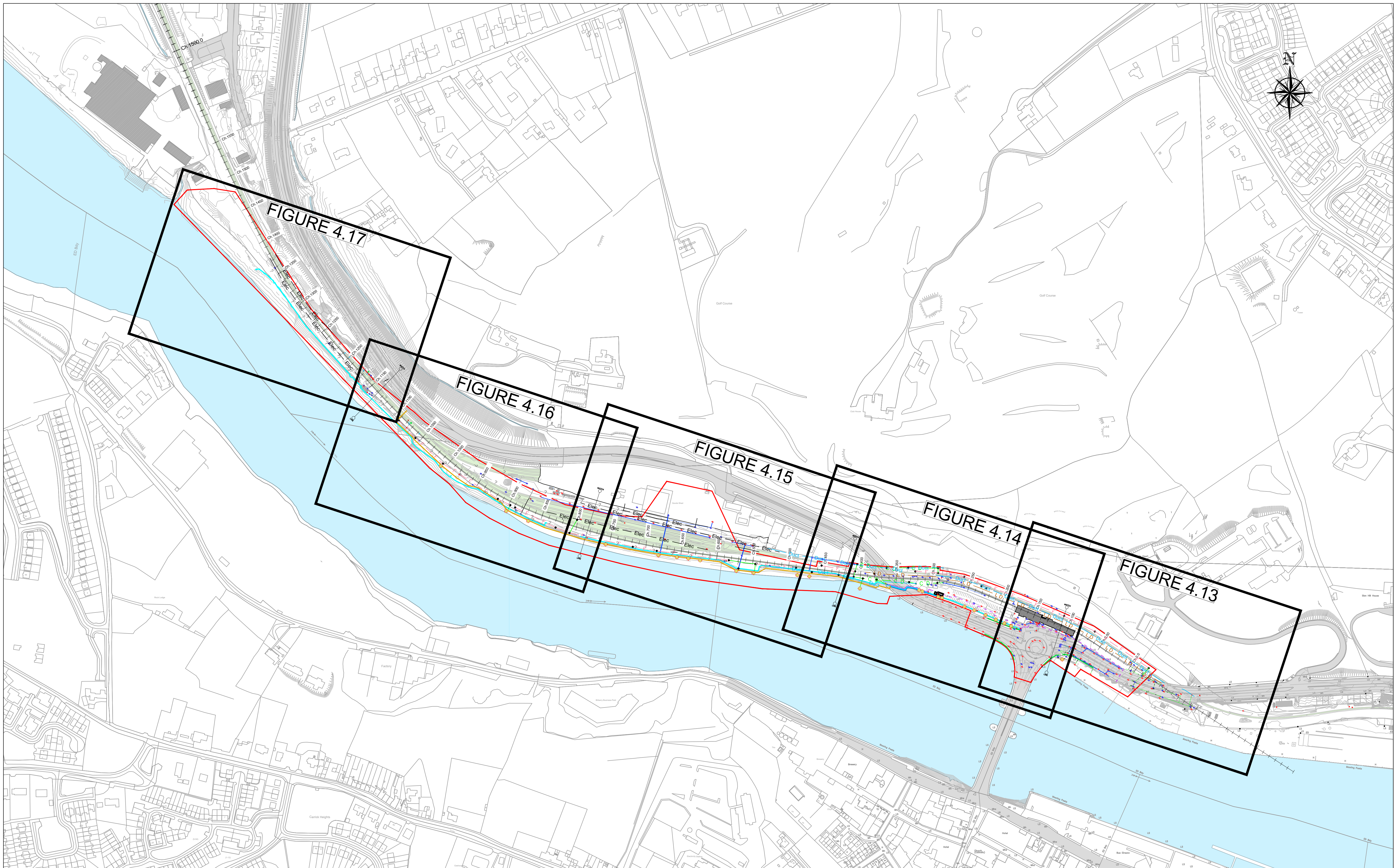
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Project Title WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Drawing Title: Existing Drainage Catchments	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Designed: CD Drawn: SC Checked: CD Approved: TD	File: 18.141 Job No: 1:2000 (@ A3) Date: OCTOBER 2021 Status: E.I.A.R. Drawing No: FIG 4.11 Rev: -

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Project
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**WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT
FLOOD DEFENCES WEST**

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:
Proposed Drainage Layout - Key Plan

Designed: YB	File:	Status: E.I.A.R.
Drawn: IM	Job No: 18.141	
Checked: BC	Scale: 1:2500 (@ A3)	Drawing No: FIG 4.12
Approved: TD	Date: OCTOBER 2021	Rev: -

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LEGEND

EXTENT OF RAILWAY LINES

SITE BOUNDARY

PROPOSED SHEET PILE WALL

PROPOSED WALL - REMEDIAL WORKS

EXISTING QUAY WALL

EXISTING STORM WATER DRAIN

EXISTING MANHOLE/ INSPECTION CHAMBER

EXISTING GULLY

EXISTING DRAINAGE OUTFALL IDENTIFIED BY VISUAL INSPECTION (exact location & invert level to be confirmed)

PROPOSED FILTER DRAIN

PROPOSED CARRIER DRAIN

PROPOSED SURFACE WATER CARRIER DRAIN

PROPOSED MANHOLE

PROPOSED NON-RETURN VALVE

PROPOSED CLASS 1- BY-PASS SEPARATOR

NOTES:

1. SEE FIGURES 4.18 AND 4.19 FOR PUMPING STATION DETAILS.

2. SEE FIGURE 4.20 FOR OUTFALL STRUCTURE DETAILS.

3. A C.20M UNDERGROUND ISOLATION STRUCTURE WILL BE CONSTRUCTED AT CH.1090. TEMPORARY OVERGROUND FLOOD BARRIERS WILL BE PROVIDED ALONG THE STRUCTURE SHOULD THESE BE REQUIRED TO BE IMPLEMENTED DURING A FLOOD EVENT.

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Project Title		Drawing Title:	
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		PROPOSED DRAINAGE LAYOUT SHEET 1 OF 5	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Status: E.I.A.R.	
Designed: CD	File:	Job No: 18.141	Drawing No: FIG 4.13 Rev: -
Drawn: SC	Scale: 1:500 (@ A3)	Date: OCTOBER 2021	
Checked: CD	Date:		
Approved: TD			

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LEGEND

EXTENT OF RAILWAY LINES

SITE BOUNDARY

PROPOSED SHEET PILE WALL

PROPOSED WALL - REMEDIAL WORKS

EXISTING QUAY WALL

EXISTING STORM WATER DRAIN

EXISTING MANHOLE/ INSPECTION CHAMBER

EXISTING GULLY

EXISTING DRAINAGE OUTFALL IDENTIFIED BY VISUAL INSPECTION (exact location & invert level to be confirmed)

PROPOSED FILTER DRAIN

PROPOSED CARRIER DRAIN

PROPOSED SURFACE WATER CARRIER DRAIN

PROPOSED MANHOLE

PROPOSED NON-RETURN VALVE

PROPOSED CLASS 1- BY-PASS SEPARATOR

NOTES:

1. SEE FIGURES 4.18 AND 4.19 FOR PUMPING STATION DETAILS.

2. SEE FIGURE 4.20 FOR OUTFALL STRUCTURE DETAILS.

3. A C.20M UNDERGROUND ISOLATION STRUCTURE WILL BE CONSTRUCTED AT CH.1090. TEMPORARY OVERGROUND FLOOD BARRIERS WILL BE PROVIDED ALONG THE STRUCTURE SHOULD THESE BE REQUIRED TO BE IMPLEMENTED DURING A FLOOD EVENT.

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The main map illustrates the proposed drainage layout for the Waterford City Public Infrastructure Project, specifically the Flood Defences West. It shows a series of drainage channels (Ch.450 to Ch.100) running along the riverbank. Key features include: existing and proposed outfalls of various sizes (1500mm, 1000mm, 3000mm); a proposed pumping station; a petrol separator; a signal cabin; and various levels (e.g., 3.12m OD, 2.29m OD, 3.00m OD, 5.16m OD, 4.94m OD, 3.86m OD). The map also shows existing infrastructure like R711 Road Overbridge, bridge piers, and Plunkett Station. A north arrow is located in the top right corner. A photograph in the bottom left shows an existing outfall structure in the river bank.

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Project Title

WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST

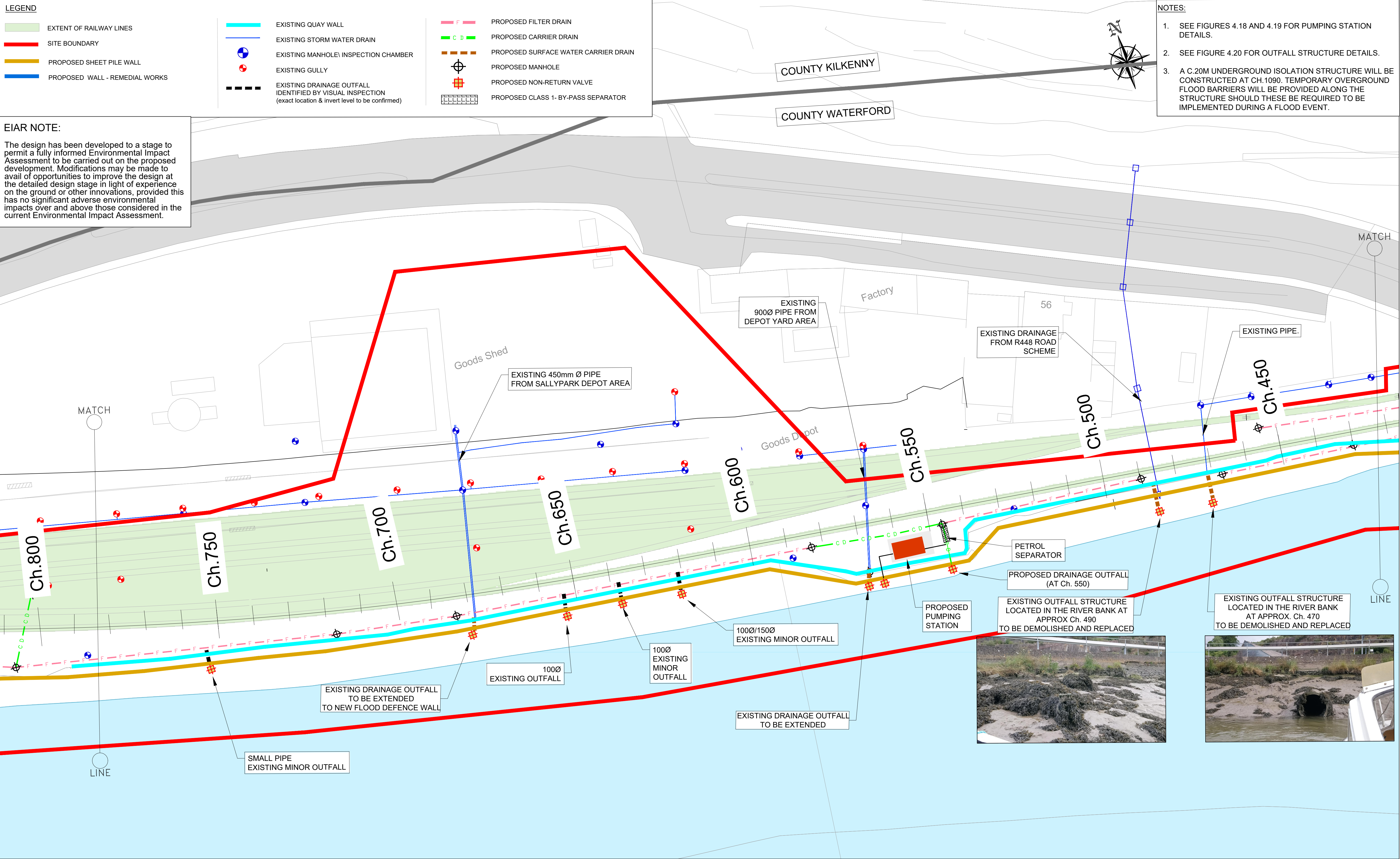
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Drawing Title:

PROPOSED DRAINAGE LAYOUT SHEET 2 OF 5

Designed: CD	File:	Status: E.I.A.R.
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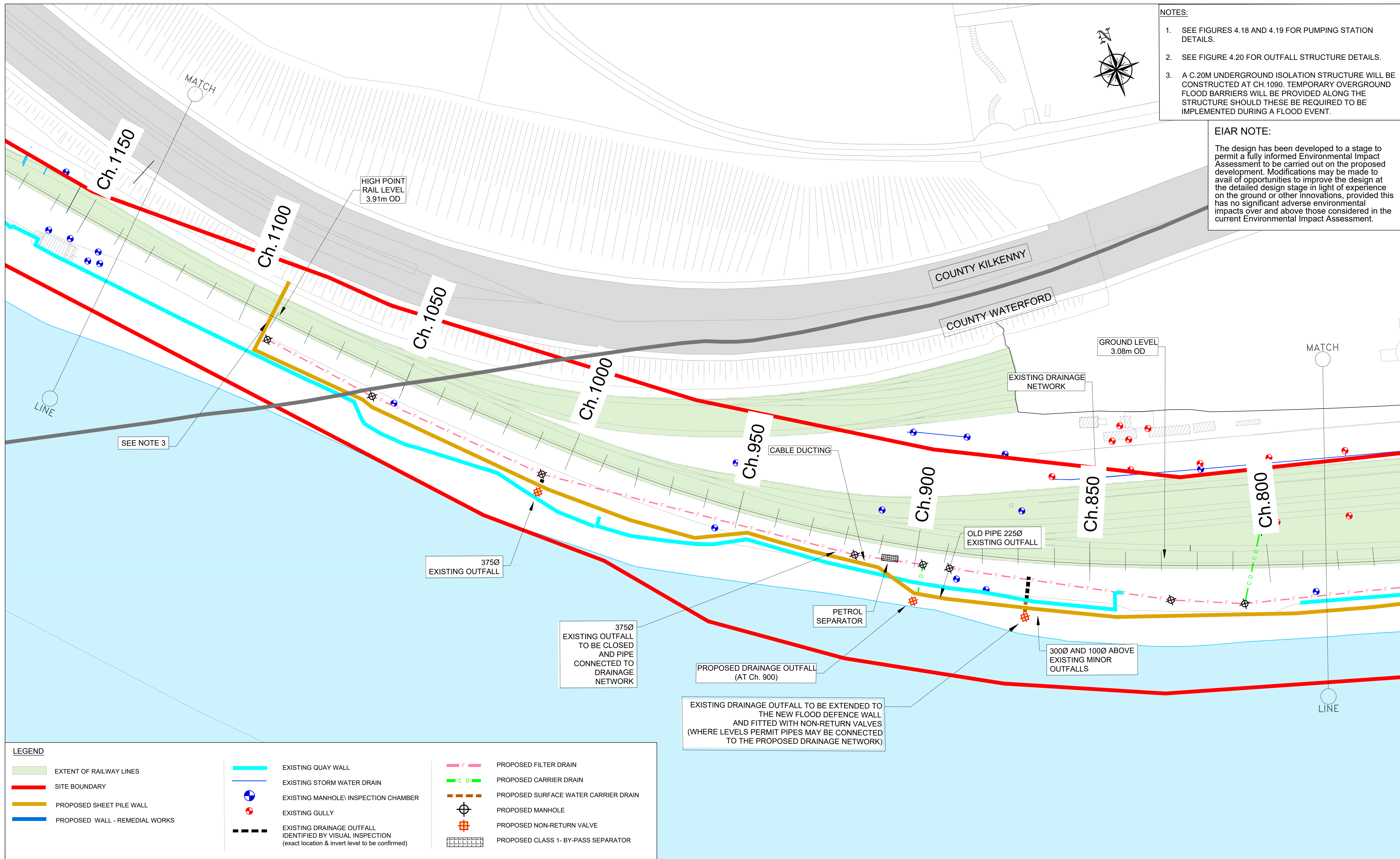
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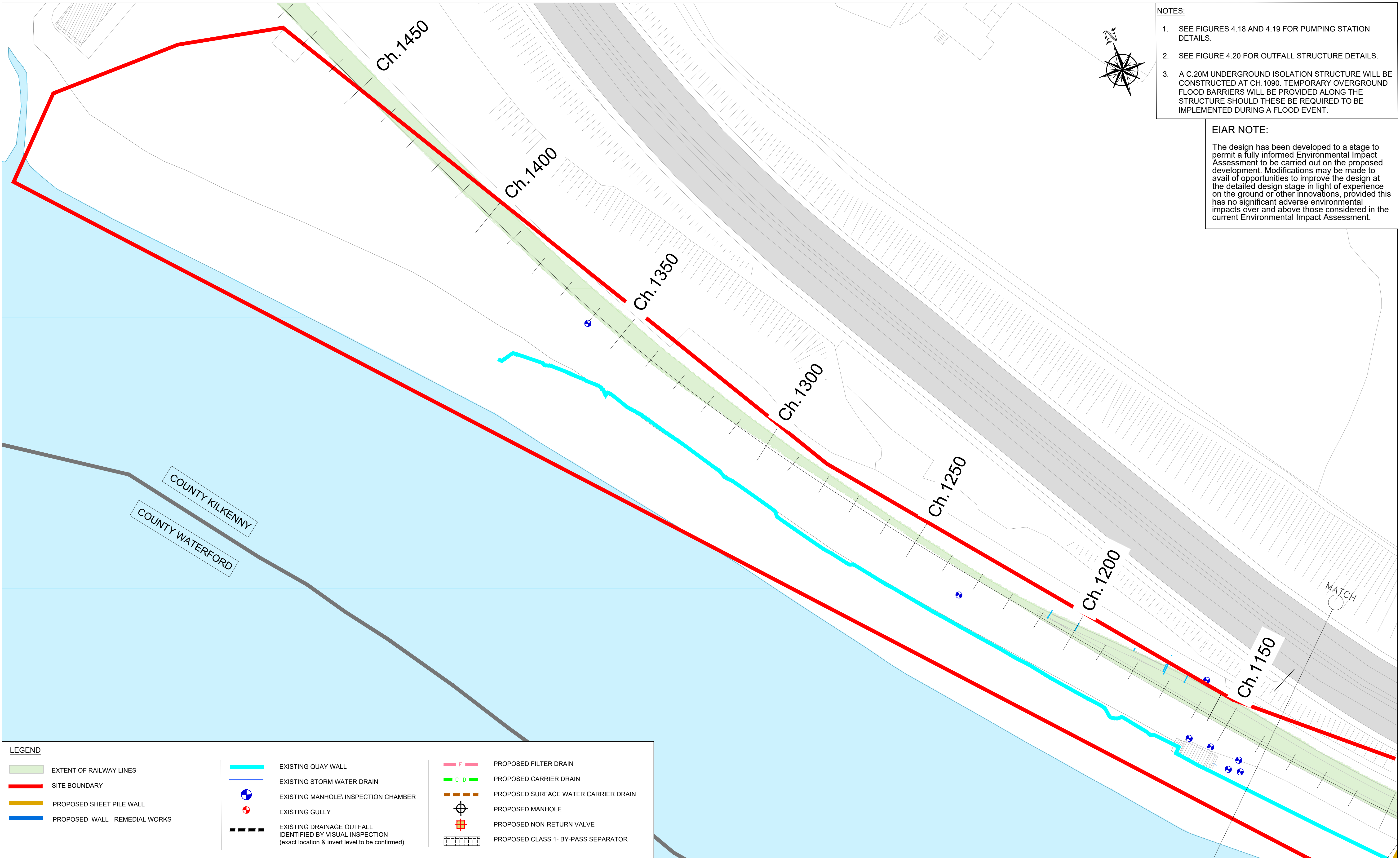
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Project Title	WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST	
	ENVIRONMENTAL IMPACT ASSESSMENT REPORT	

Drawing Title: PROPOSED DRAINAGE LAYOUT SHEET 3 OF 5			
Designed: CD	File:	Status:	E.I.A.R.
Drawn: SC	Job No: 18.141		
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Approved: TD	Date: OCTOBER 2021	Rev:	-

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- NOTES:
- SEE FIGURES 4.18 AND 4.19 FOR PUMPING STATION DETAILS.
 - SEE FIGURE 4.20 FOR OUTFALL STRUCTURE DETAILS.
 - A C.20M UNDERGROUND ISOLATION STRUCTURE WILL BE CONSTRUCTED AT CH.1090. TEMPORARY OVERGROUND FLOOD BARRIERS WILL BE PROVIDED ALONG THE STRUCTURE SHOULD THESE BE REQUIRED TO BE IMPLEMENTED DURING A FLOOD EVENT.

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LEGEND

EXTENT OF RAILWAY LINES

SITE BOUNDARY

PROPOSED SHEET PILE WALL

PROPOSED WALL - REMEDIAL WORKS

EXISTING QUAY WALL

EXISTING STORM WATER DRAIN

EXISTING MANHOLE/ INSPECTION CHAMBER

EXISTING GULLY

EXISTING DRAINAGE OUTFALL IDENTIFIED BY VISUAL INSPECTION (exact location & invert level to be confirmed)

PROPOSED FILTER DRAIN

PROPOSED CARRIER DRAIN

PROPOSED SURFACE WATER CARRIER DRAIN

PROPOSED MANHOLE

PROPOSED NON-RETURN VALVE

PROPOSED CLASS 1- BY-PASS SEPARATOR

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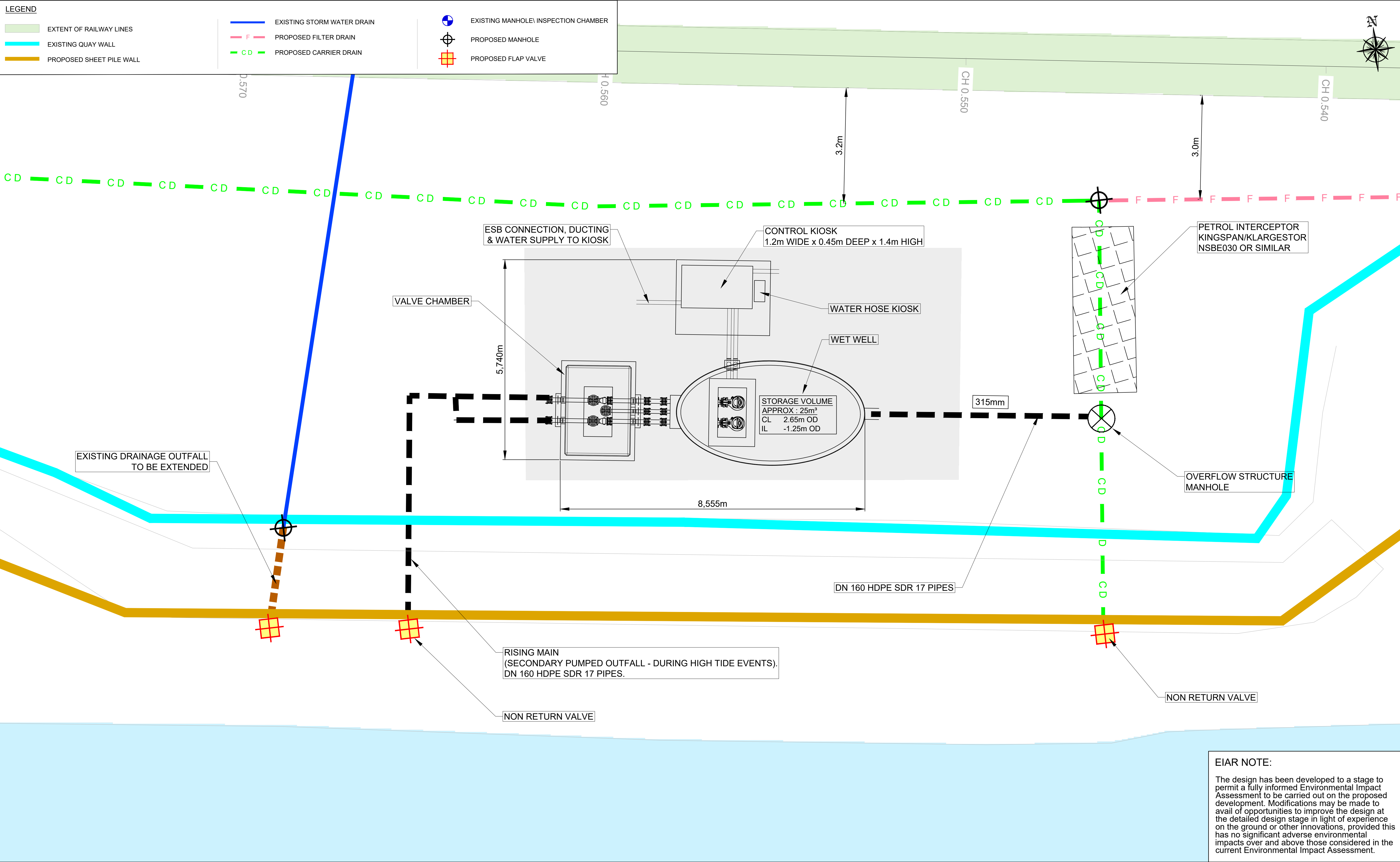
Project Title
**WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT
FLOOD DEFENCES WEST**

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:
**PROPOSED DRAINAGE LAYOUT
SHEET 5 OF 5**

Designed: CD	File:	Status: E.I.A.R.
Drawn: SC	Job No: 18.141	
Checked: CD	Scale: 1:500 (@ A3)	Drawing No: FIG 4.17
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Project
Title

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FLOOD DEFENCES WEST

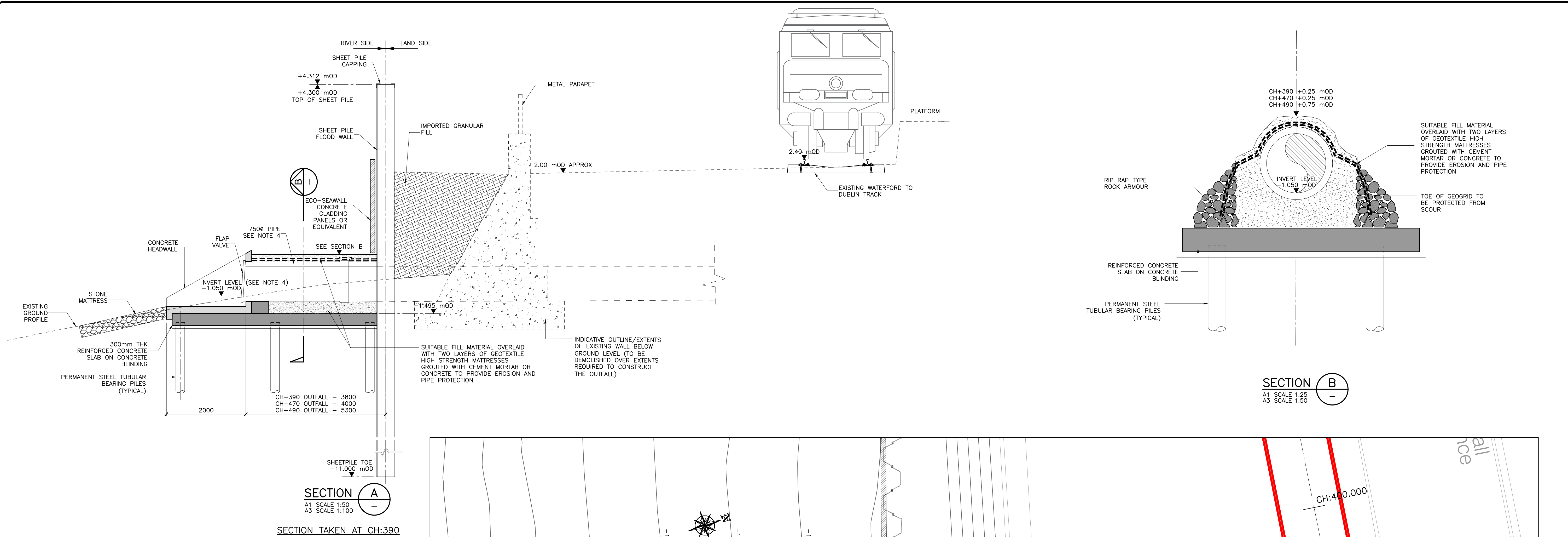
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:

PROPOSED PUMPING STATION CH0+550
SHEET 2 OF 2

Designed: CD	File:	Status: E.I.A.R.
Drawn: SC	Job No: 18.141	
Checked: CD	Scale: 1:500 (@ A3)	Drawing No: FIG 4.19
Approved: TD	Date: OCTOBER 2021	Rev: -

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- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES (MM) AND ALL LEVELS ARE IN METERS (M) UNLESS NOTED OTHERWISE.
 - DO NOT SCALE FROM DRAWING.
 - ALL LEVELS ARE TO ORDNANCE DATUM MALIN HEAD.
 - NEW OUTFALL AT CH+390 DETAILED ON THE DRAWING. EXISTING OUTFALLS WITHIN THE RIVER WHICH WILL BE DEMOLISHED AND REPLACED BY NEW OUTFALL STRUCTURES ARE AS OUTLINED BELOW;
 - CH+470 - EXISTING 750MM DIAMETER PIPE - PIPE INVERT LEVEL AT OUTFALL -0.5mOD (ESTIMATED BASED ON AVAILABLE SURVEY DATA & VISUAL RECORDS (LEVELS TO BE CONFIRMED ON SITE))
 - CH+490 EXISTING 600MM DIAMETER PIPE - PIPE INVERT LEVEL AT OUTFALL -0.800mOD

DRAINAGE OUTFALL - PLAN

A1 SCALE 1:50
A3 SCALE 1:100

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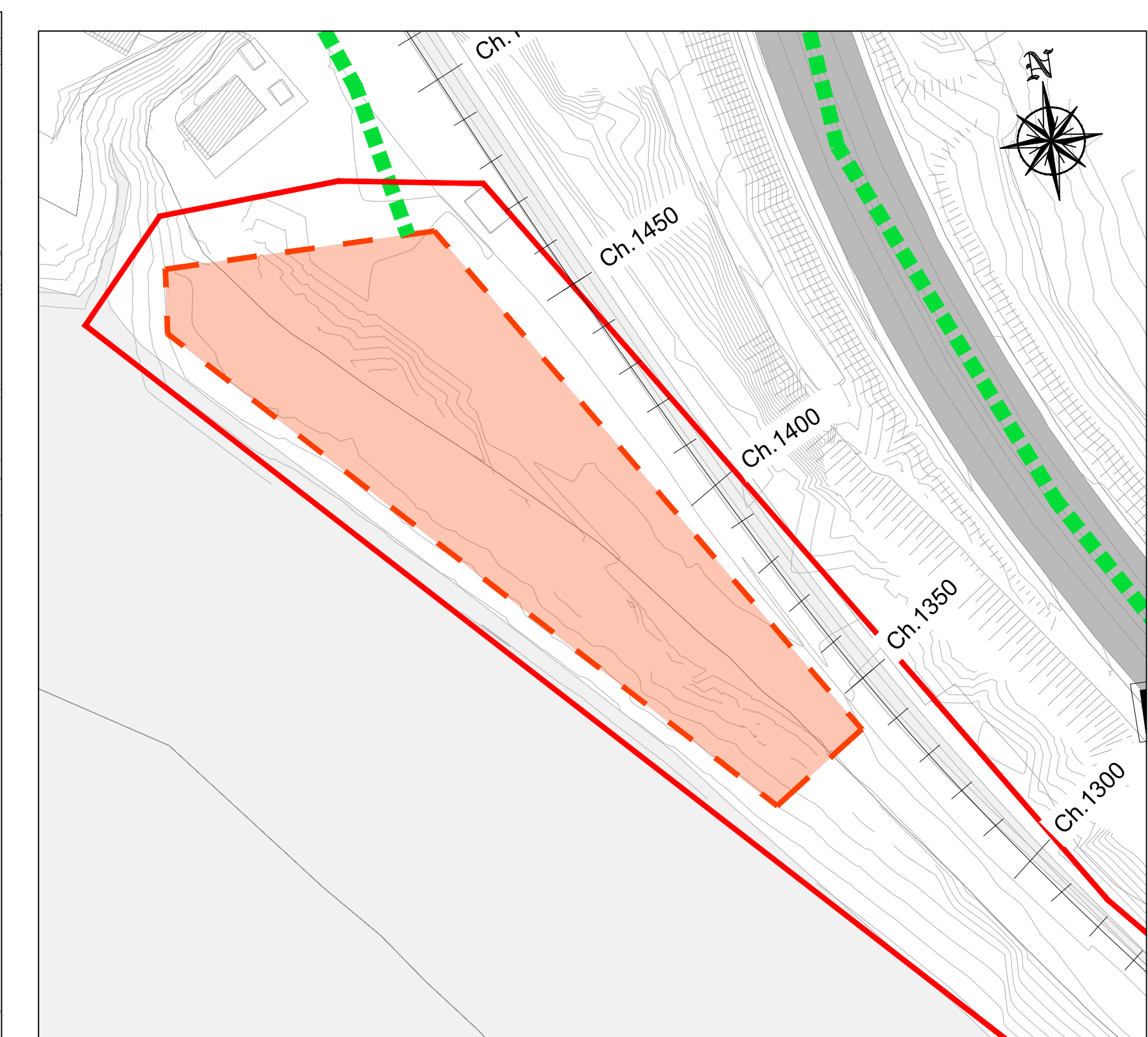
Project Title
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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:
Proposed Surface Water Outfall Structures

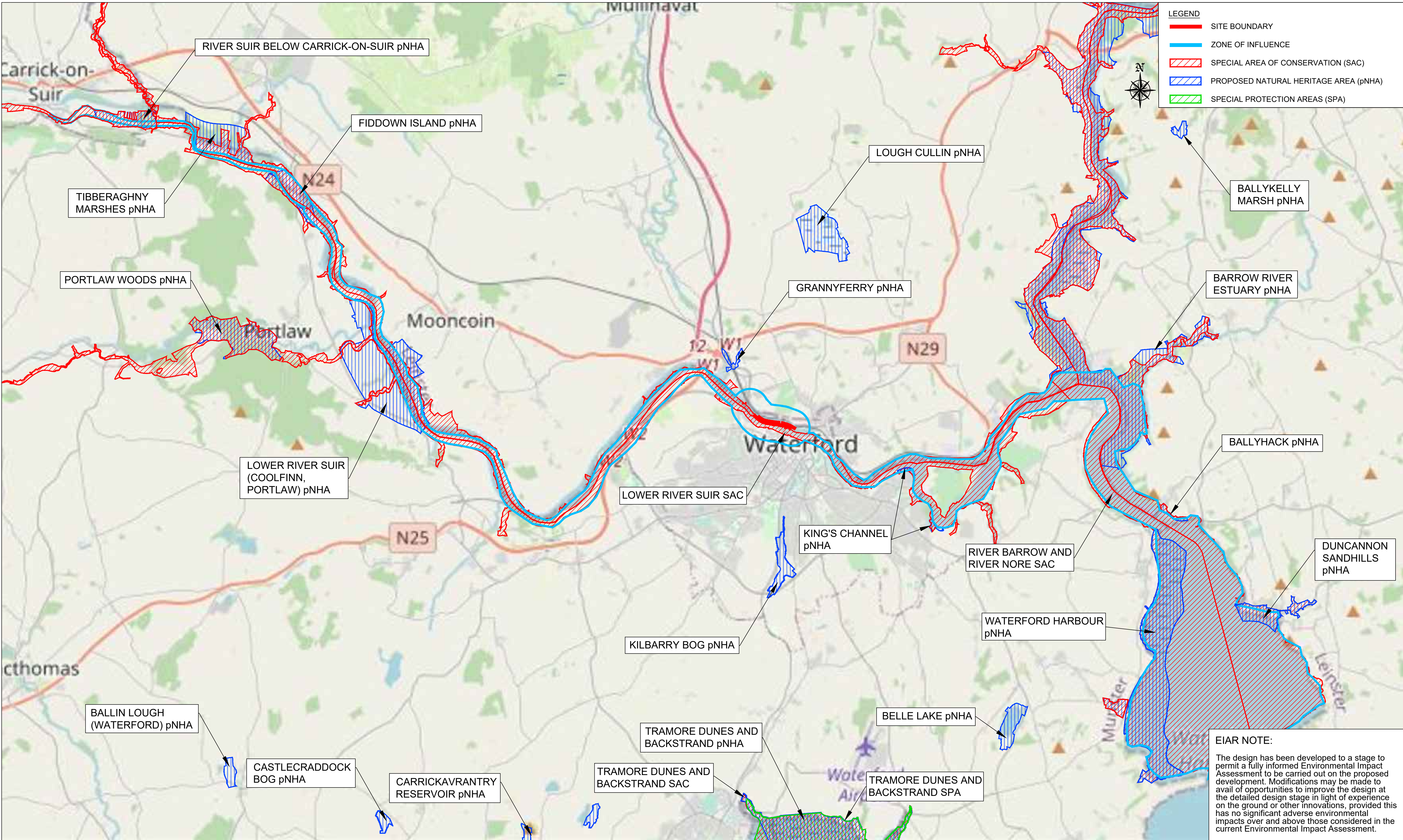
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Drawn: AR	Job No: 18.141	
Checked: BC	Scale: AS SHOWN	Drawing No: FIG 4.20
Approved: TD	Date: OCTOBER 2021	Rev: -

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The map shows the Goods Shed area with the proposed Goods Shed location highlighted in orange. The map includes a north arrow and a scale bar. The proposed Goods Shed is located between Ch. 650 and Ch. 700. The map also shows the Goods Shed area, Ch. 650, Ch. 600, Ch. 700, and Ch. 750. The map includes a north arrow and a scale bar.

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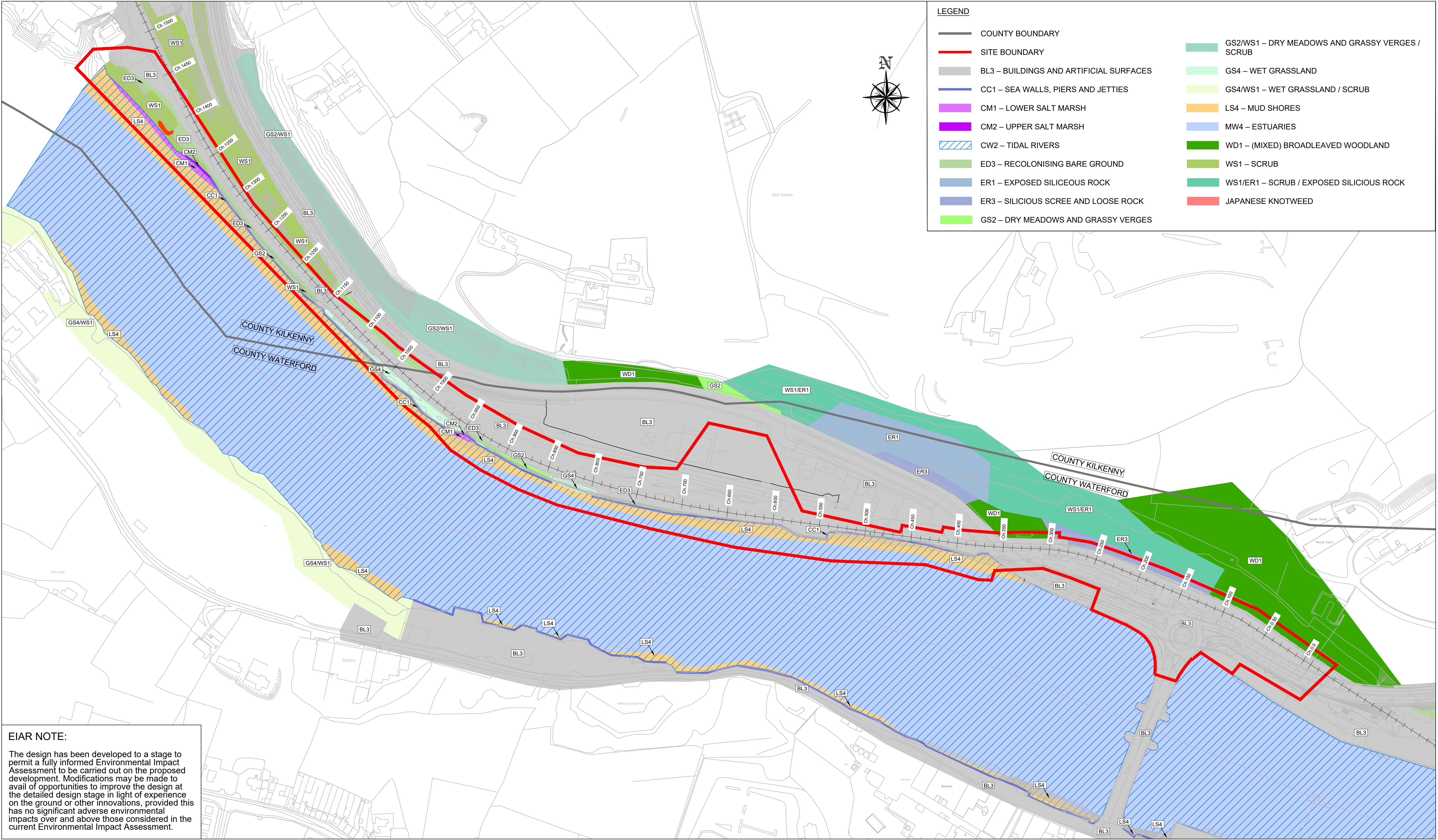
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Drawing Title:

Location of Designated Sites

Designed: KTS	File:	Status: E.I.A.R.
Drawn: IM	Job No: 18.141	
Checked: OOK	Scale: 1:50,000 @A3	Drawing No: FIG 7.1
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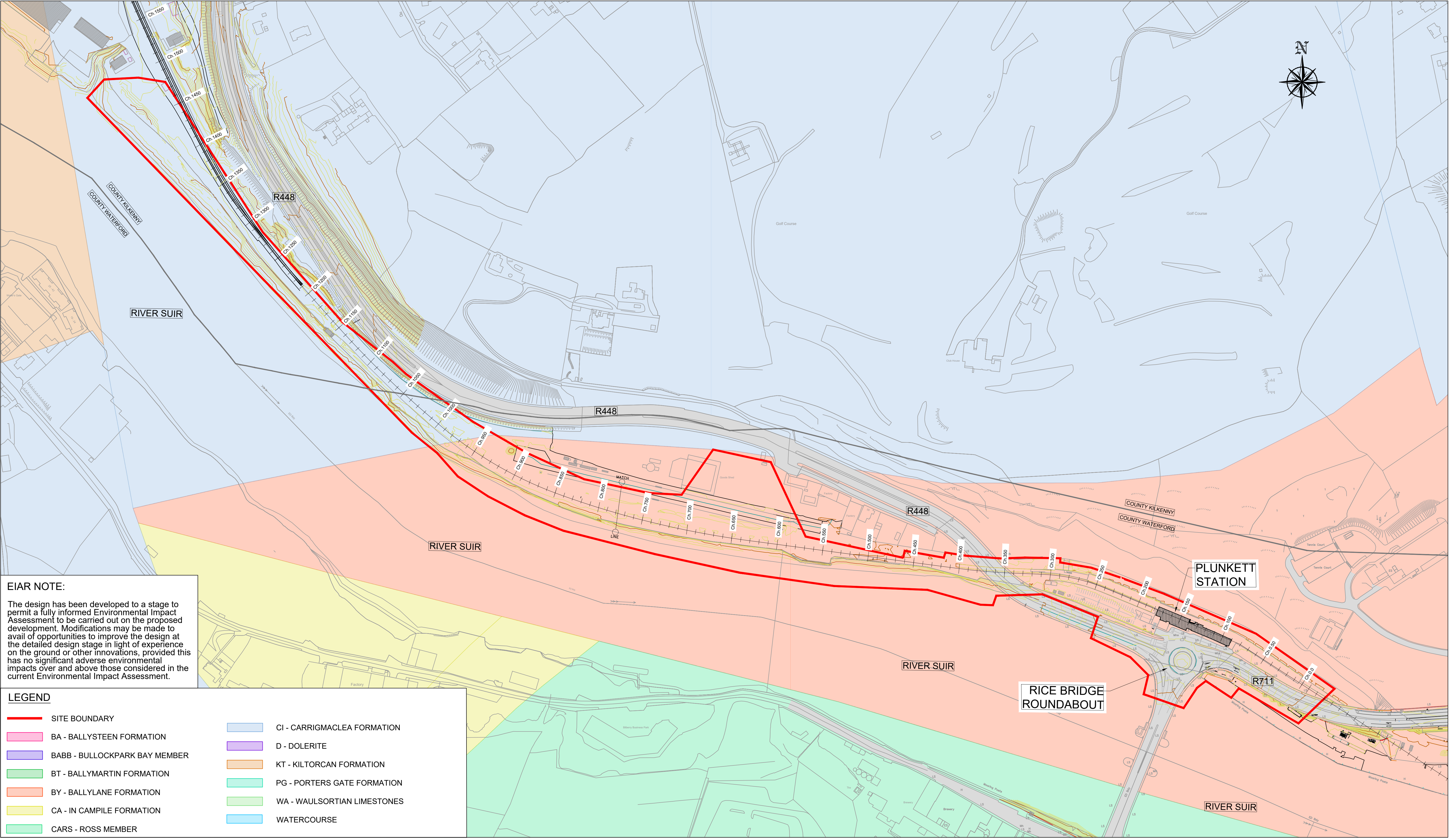
Project Title
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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:
Habitat Map

Designed: OOK	File:	Status: E.I.A.R.
Drawn: IM	Job No: 18.141	
Checked: OOK	Scale: 1:2000 @A3	Drawing No: FIG 7.2
Approved: TD	Date: OCTOBER 2021	Rev: -

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LEGEND			
	SITE BOUNDARY		CI - CARRIGMACLEA FORMATION
	BA - BALLYSTEEN FORMATION		D - DOLERITE
	BABB - BULLOCKPARK BAY MEMBER		KT - KILTORCAN FORMATION
	BT - BALLYMARTIN FORMATION		PG - PORTERS GATE FORMATION
	BY - BALLYLANE FORMATION		WA - WAULSORTIAN LIMESTONES
	CA - IN CAMPILE FORMATION		WATERCOURSE
	CARS - ROSS MEMBER		

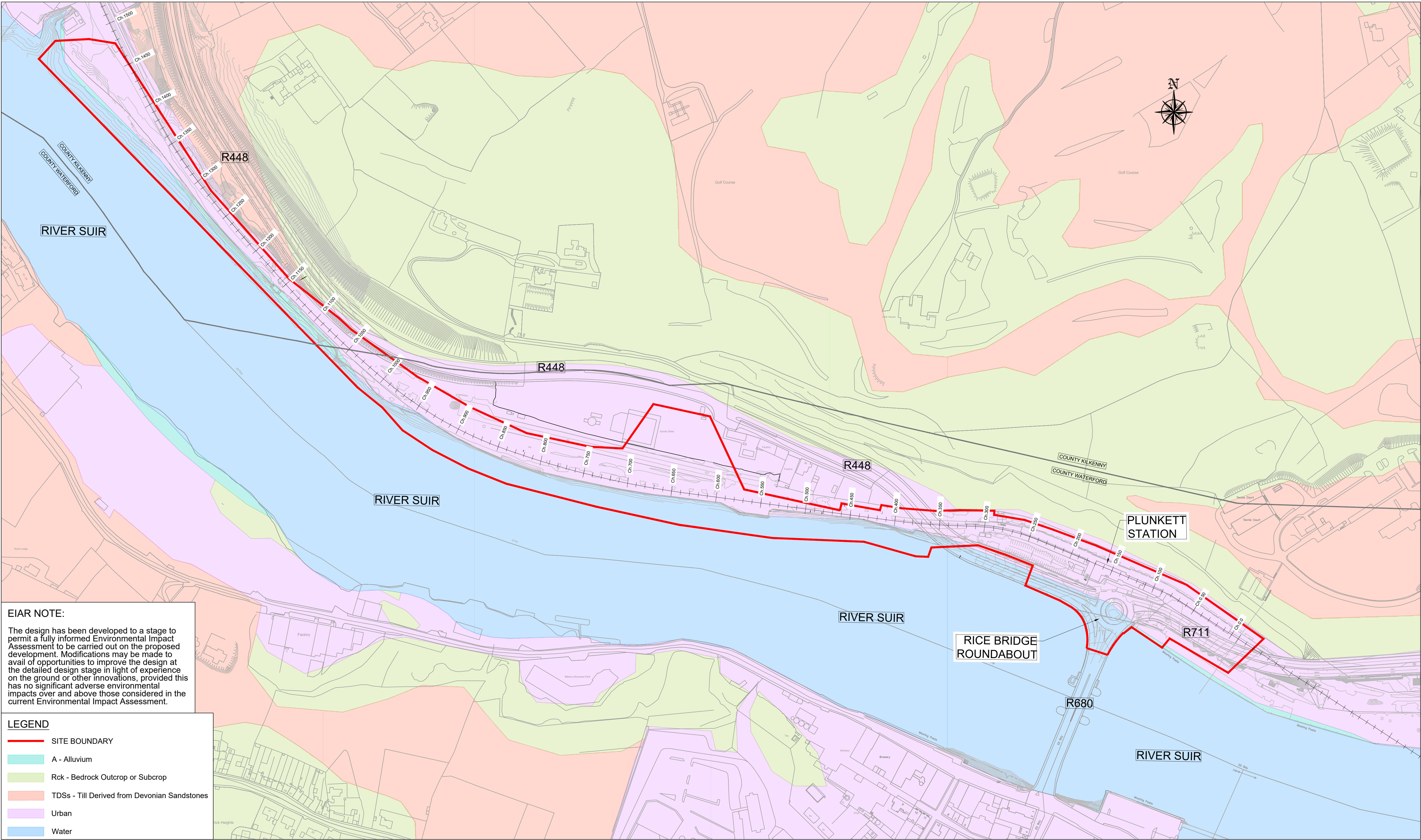
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Project Title		Drawing Title:	
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Bedrock Geology	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT			
Designed: YB	File:	Status: E.I.A.R.	
Drawn: IM	Job No: 18.141		
Checked: BC	Scale: 1:2000 (@ A3)	Drawing No: FIG 8.1	Rev: -
Approved: TD	Date: OCTOBER 2021		

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- LEGEND**
- SITE BOUNDARY
 - A - Alluvium
 - Rck - Bedrock Outcrop or Subcrop
 - TDSs - Till Derived from Devonian Sandstones
 - Urban
 - Water

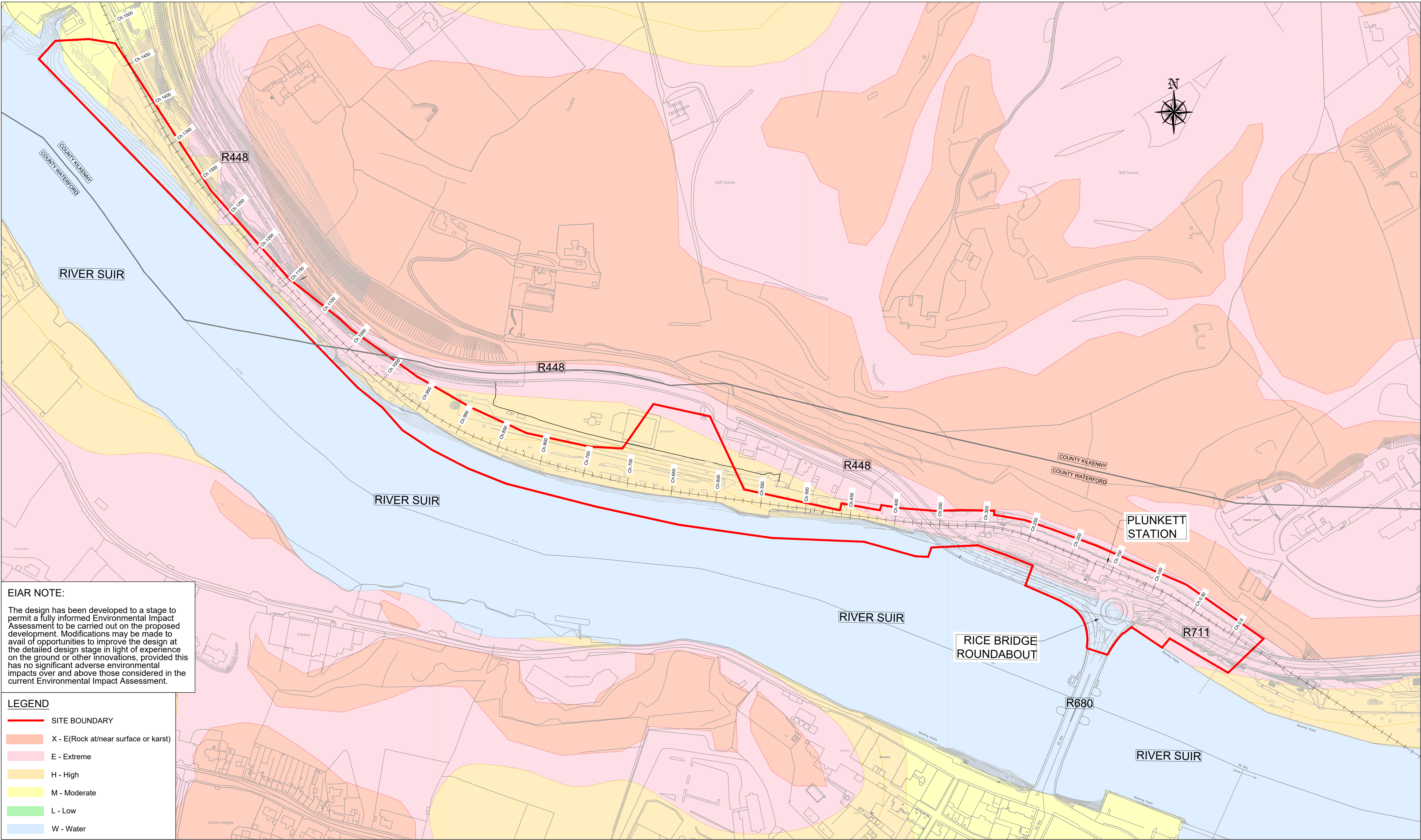
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Project Title		Drawing Title:	
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Quaternary Geology	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Designed: DC	Status: E.I.A.R.
		Drawn: IM	Job No: 18.141
		Checked: CS	Scale: 1:2000 @A3
		Approved: TD	Date: OCTOBER 2021
		Drawing No: FIG 9.1	Rev: -

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- LEGEND**
- SITE BOUNDARY
 - X - E(Rock at/near surface or karst)
 - E - Extreme
 - H - High
 - M - Moderate
 - L - Low
 - W - Water

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Project Title		Drawing Title:	
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Groundwater Vulnerability	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Designed: DC	File:
		Drawn: IM	Job No: 18.141
		Checked: CS	Scale: 1:2000 @A3
		Approved: TD	Date: OCTOBER 2021
		Status: E.I.A.R.	Drawing No: FIG 9.2
			Rev: -

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Photomontage Methology

The computer-generated images of the proposed development were prepared by G-NET 3D.

Photography

The photos for high tide views were taken on the February 5th, 2021. Photos for low tide views were taken on March 9th, 2021.

A Canon Eos T5i camera was used for all photography. Leica GS08plus Smart Antenna was used to record accurate coordinates and levels at the viewpoints.

Modelling

Preparation of an accurate 3D model of proposed sheet piling and glass balustrades using drawings supplied by Roughan & O'Donovan Consulting Engineers.

Setup

The following information is used to accurately position the model of the proposed development into the photographs:

- Site survey,
- Photographs,
- The camera location of each photograph is accurately marked on the location OSi map.

To match the 3D camera view with the photograph we take the following steps: The camera height is taken from information gathered on the levels from where the photos are taken. The height levels of the proposed development are outlined on the site. Focal length is based on the photograph EXIF info.

This data is imported into our 3D software and the 3D camera is matched with the selected photographs. To match the 3D camera accurately we use all the above data and the reference 3D models. The reference 3D models are existing structures ie., buildings, roads, lamps, etc which are visible on the photographs. These items are modelled based on the survey information. After all above conditions are fulfilled and we are satisfied that the camera matches correctly, we proceed to the next step.

Rendering

We apply the materials and textures prior to rendering the photomontage images. Light settings are adjusted to match the brightness of the photographs and sun is positioned according to the date and time the photo was taken.

Post processing

This process means incorporating a 3D image of the proposed flood defence structures into the photograph to achieve final photo realistic effect.



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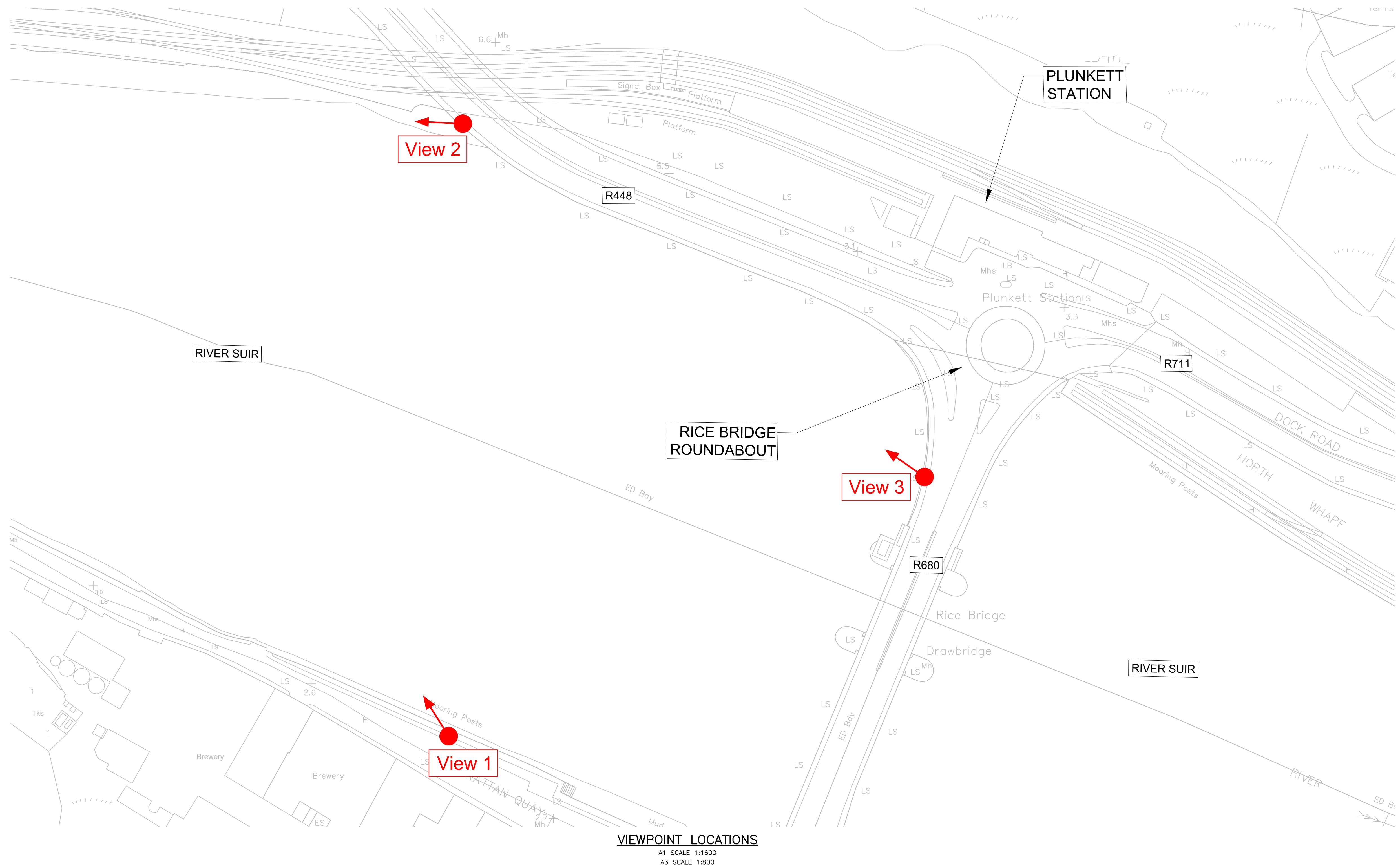
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Project
Title
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT
FLOOD DEFENCES WEST

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:
Photomontage Methodology

Designed: YB	File:	Status: E.I.A.R.
Drawn: IM	Job No: 18.141	
Checked: BC	Scale: 1:6000 @A3	Drawing No: FIG 11.1
Approved: TD	Date: OCTOBER 2021	Rev: -



Information on the Viewpoints:

View No	Easting	Northing	Height Level (m)	Camera Focal Length
View 1	660005.9530	612913.4190	2.5980	18mm
View 2	660011.2800	613143.4960	9.6850	18mm
View 3	660184.6080	613010.8180	7.6270	18mm

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Project Title		WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Drawing Title:	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT				Viewpoint Locations	
Designed:	YB	File:		Status:	E.I.A.R.
Drawn:	IM	Job No:	18.141		
Checked:	BC	Scale:	1:6000 @A3	Drawing No:	FIG 11.2
Approved:	TD	Date:	OCTOBER 2021	Rev:	-

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Project Title		Drawing Title:	
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Viewpoint 01 Existing view at High Tide	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Designed: YB	Status: E.I.A.R.
		Drawn: IM	Job No: 18.141
		Checked: BC	Scale: 1:6000 @A3
		Approved: TD	Date: OCTOBER 2021
		Drawing No: FIG 11.3	Rev: -

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Project Title		Drawing Title:	
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Viewpoint 01 Proposed view at High Tide	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Status: E.I.A.R.	
Designed: YB	File:	Job No: 18.141	Drawing No: FIG 11.4 Rev: -
Drawn: IM	Scale: 1:6000 @A3	Date: OCTOBER 2021	
Checked: BC	Date: OCTOBER 2021		
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Project
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WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT
FLOOD DEFENCES WEST

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:

Viewpoint 01
Existing view at Low Tide

Designed: YB	File:	Status: E.I.A.R.
Drawn: IM	Job No: 18.141	
Checked: BC	Scale: 1:6000 @A3	Drawing No: FIG 11.5
Approved: TD	Date: OCTOBER 2021	Rev: -

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Project Title	WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST			Drawing Title: Viewpoint 01 Proposed view at Low Tide		
	ENVIRONMENTAL IMPACT ASSESSMENT REPORT			Designed: YB	File:	Status: E.I.A.R.
				Drawn: IM	Job No: 18.141	
				Checked: BC	Scale: 1:6000 @A3	Drawing No: FIG 11.6
				Approved: TD	Date: OCTOBER 2021	Rev: -

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Project
Title

**WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT
FLOOD DEFENCES WEST**

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:

Viewpoint 02
Existing view at High Tide

Designed: YB	File:	Status: E.I.A.R.
Drawn: IM	Job No: 18.141	
Checked: BC	Scale: 1:6000 @A3	Drawing No: FIG 11.7
Approved: TD	Date: OCTOBER 2021	Rev: -

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Project Title WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Drawing Title: Viewpoint 02 Proposed view at High Tide	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Designed: YB Drawn: IM Checked: BC Approved: TD	File: Job No: 18.141 Scale: 1:6000 @A3 Date: OCTOBER 2021
		Status: E.I.A.R.	Drawing No: FIG 11.8 Rev: -

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Project Title	WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST	
	ENVIRONMENTAL IMPACT ASSESSMENT REPORT	

Drawing Title: Viewpoint 02 Existing view at Low Tide			
Designed: YB	File:	Status: E.I.A.R.	
Drawn: IM	Job No: 18.141		
Checked: BC	Scale: 1:6000 @A3	Drawing No: FIG 11.9	Rev: -
Approved: TD	Date: OCTOBER 2021		

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Project Title		Drawing Title:	
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Viewpoint 02 Proposed view at Low Tide	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Designed: YB	Status: E.I.A.R.
		Drawn: IM	Job No: 18.141
		Checked: BC	Scale: 1:6000 @A3
		Approved: TD	Date: OCTOBER 2021
		Drawing No: FIG 11.10	Rev: -

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Project Title		Drawing Title:	
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Viewpoint 03 Existing view	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Designed: YB	File:
		Drawn: IM	Job No: 18.141
		Checked: BC	Scale: 1:6000 @A3
		Approved: TD	Date: OCTOBER 2021
		Status: E.I.A.R.	Rev: -
		Drawing No: FIG 11.11	

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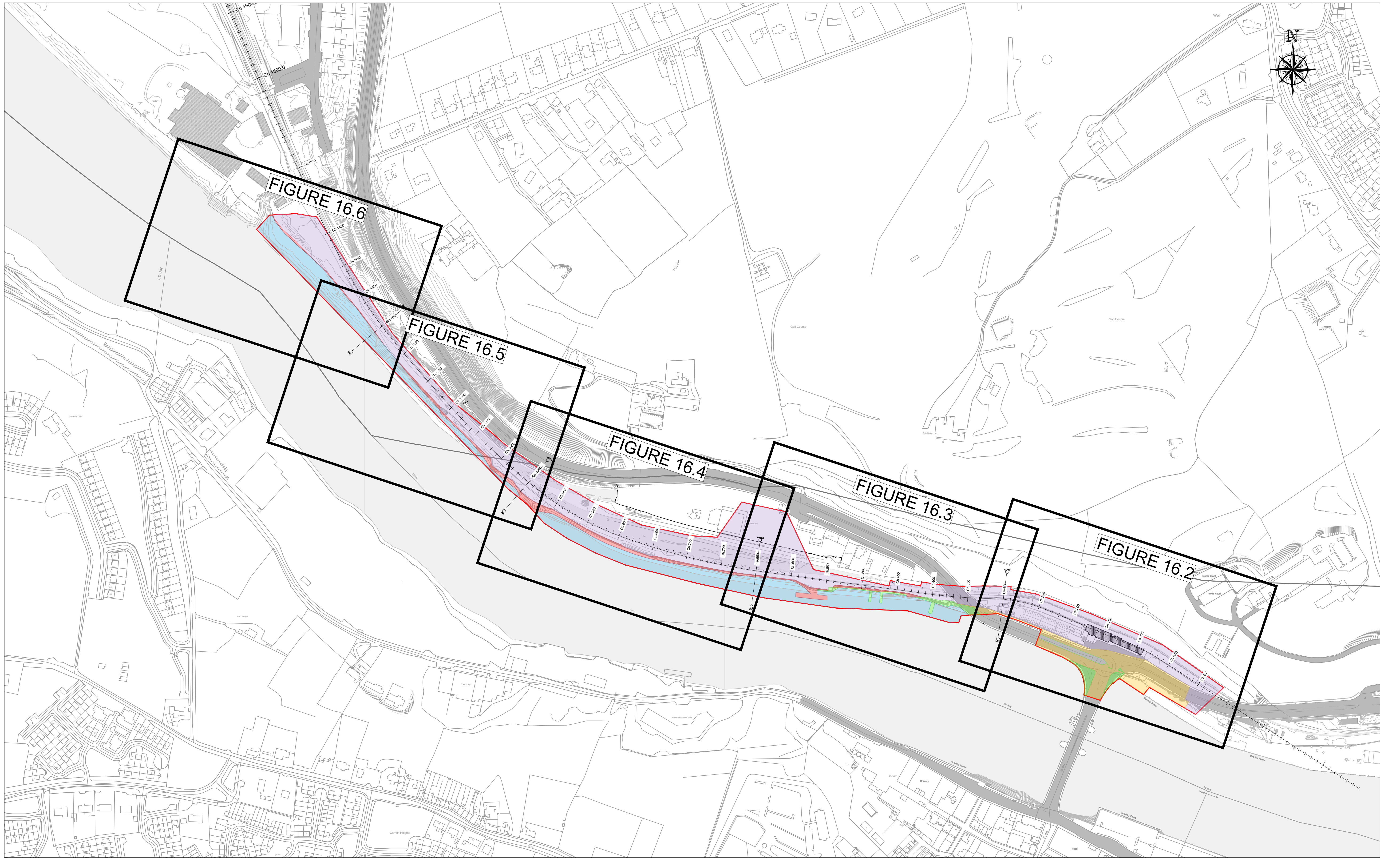
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Project Title	WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST			Drawing Title: Viewpoint 03 Proposed view		
	ENVIRONMENTAL IMPACT ASSESSMENT REPORT			Designed: YB	File:	Status: E.I.A.R.
Project Title	Drawn: IM	Job No:	18.141	Checked: BC	Scale: 1:6000 @A3	Drawing No: FIG 11.12
	Approved: TD	Date:	OCTOBER 2021			Rev: -

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Project
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**WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT
FLOOD DEFENCES WEST**

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:
Landownership within the Site Boundary - Key Plan

Designed: DC	File:	Status: E.I.A.R.
Drawn: IM	Job No: 18.141	
Checked: CS	Scale: 1:2000 @A3	Drawing No: FIG 16.1
Approved: TD	Date: OCTOBER 2021	Rev: -

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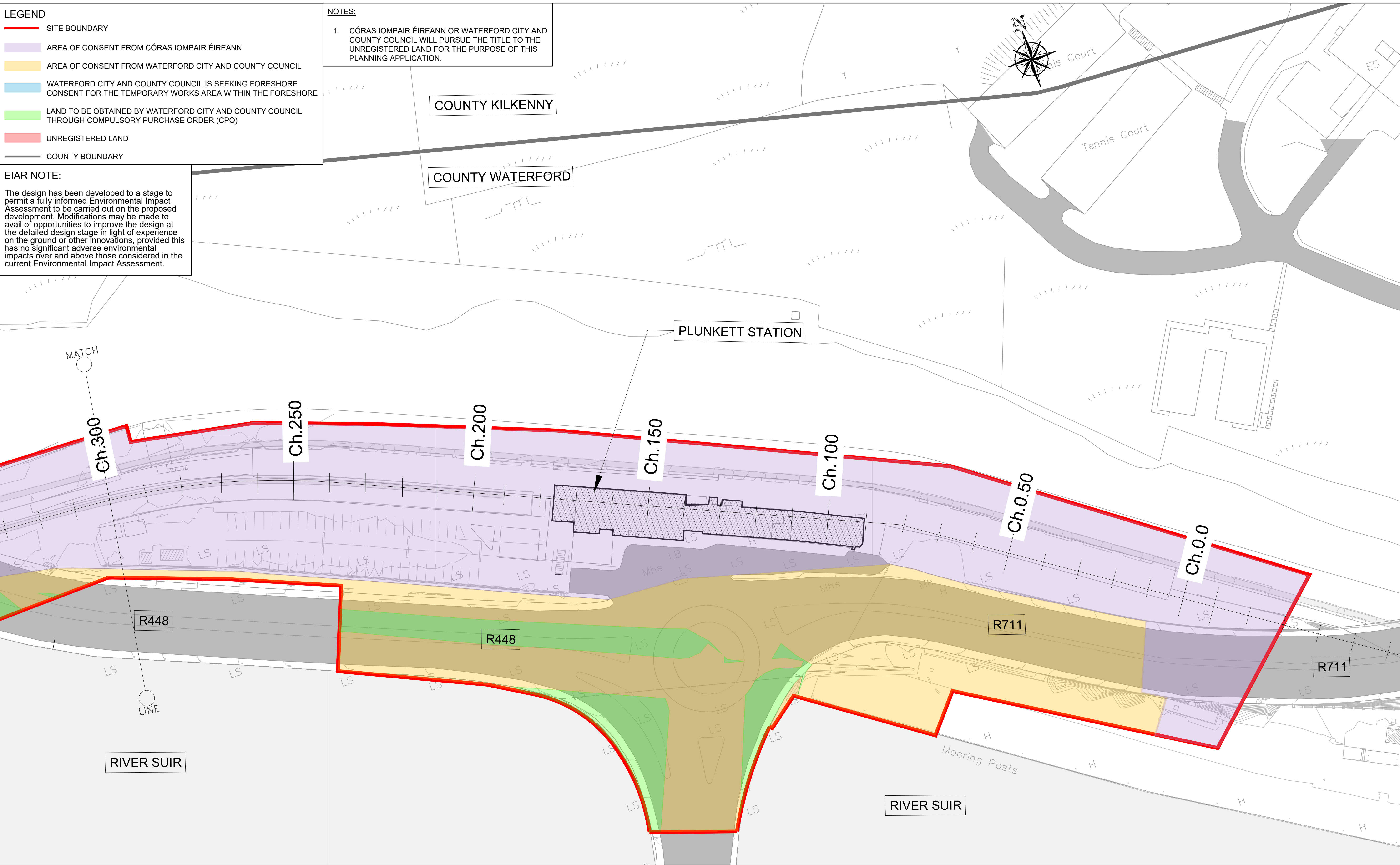
- SITE BOUNDARY
- AREA OF CONSENT FROM CÓRAS IOMPAIR ÉIREANN
- AREA OF CONSENT FROM WATERFORD CITY AND COUNTY COUNCIL
- WATERFORD CITY AND COUNTY COUNCIL IS SEEKING FORESHORE CONSENT FOR THE TEMPORARY WORKS AREA WITHIN THE FORESHORE
- LAND TO BE OBTAINED BY WATERFORD CITY AND COUNTY COUNCIL THROUGH COMPULSORY PURCHASE ORDER (CPO)
- UNREGISTERED LAND
- COUNTY BOUNDARY

NOTES:

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Project Title	WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		
ENVIRONMENTAL IMPACT ASSESSMENT REPORT			

Drawing Title: Landownership within the Site Boundary Sheet 1 of 5			
Designed: YB	File:	Status: E.I.A.R.	
Drawn: IM	Job No: 18.141		
Checked: BC	Scale: 1:500 (@ A3)	Drawing No: FIG 16.2	Rev: -
Approved: TD	Date: OCTOBER 2021		

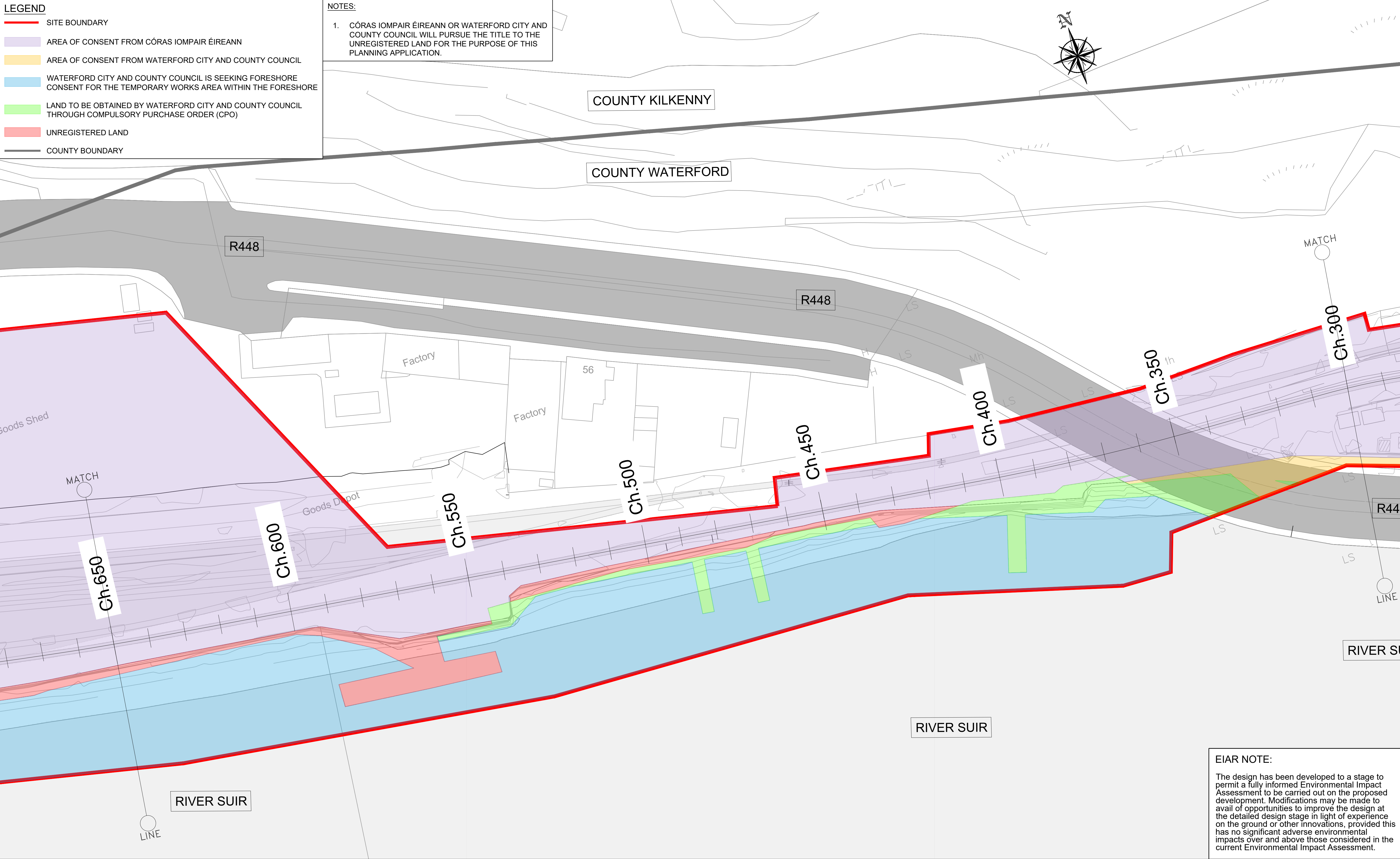
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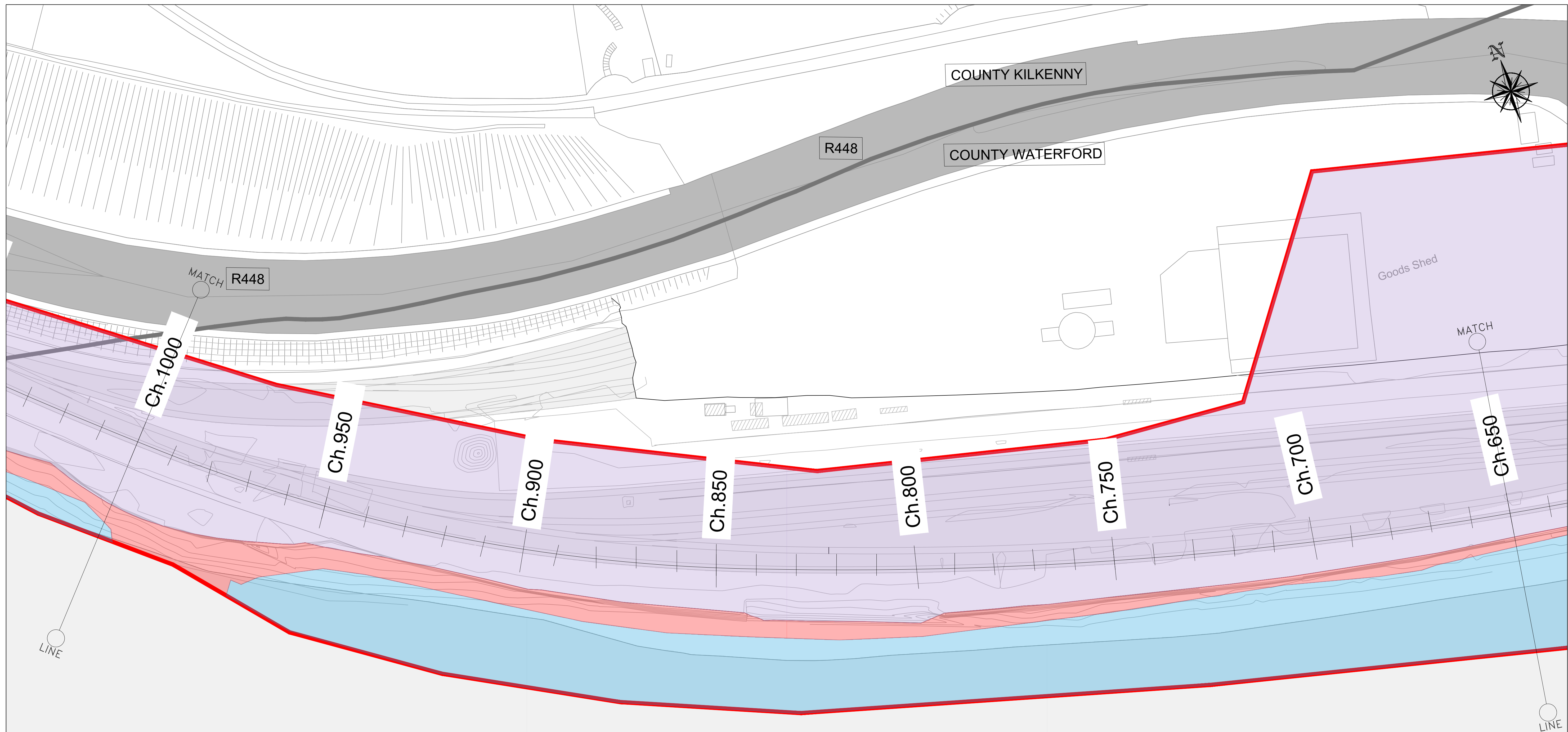
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Project Title		Drawing Title:	
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Landownership within the Site Boundaries Sheet 2 of 5	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Designed: YB	Status: E.I.A.R.
		Drawn: IM	Job No: 18.141
		Checked: BC	Scale: 1:500 (@ A3)
		Approved: TD	Date: OCTOBER 2021
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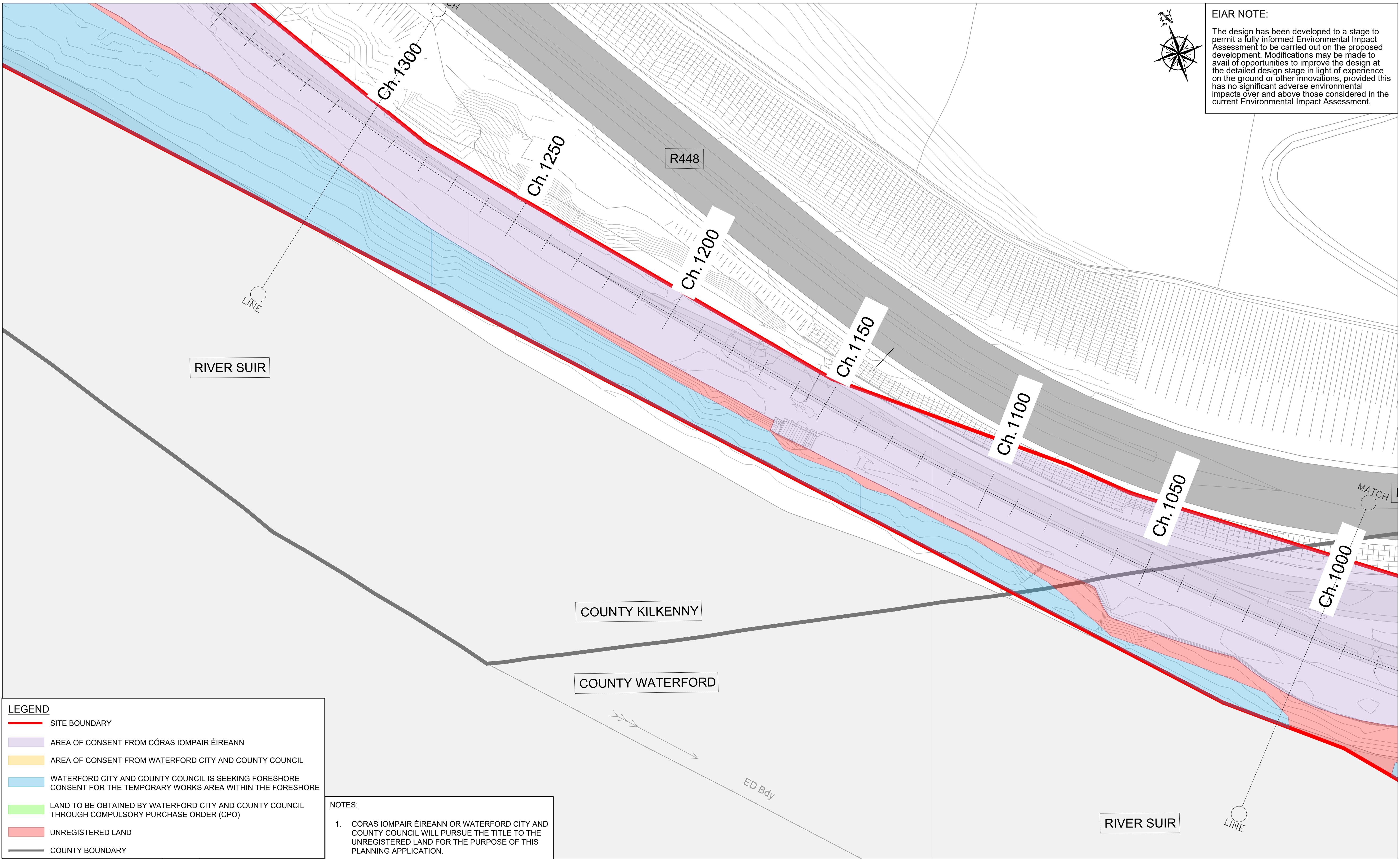
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Project Title		Drawing Title:	
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Landownership within the Site Boundaries Sheet 3 of 5	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Designed: YB	File:
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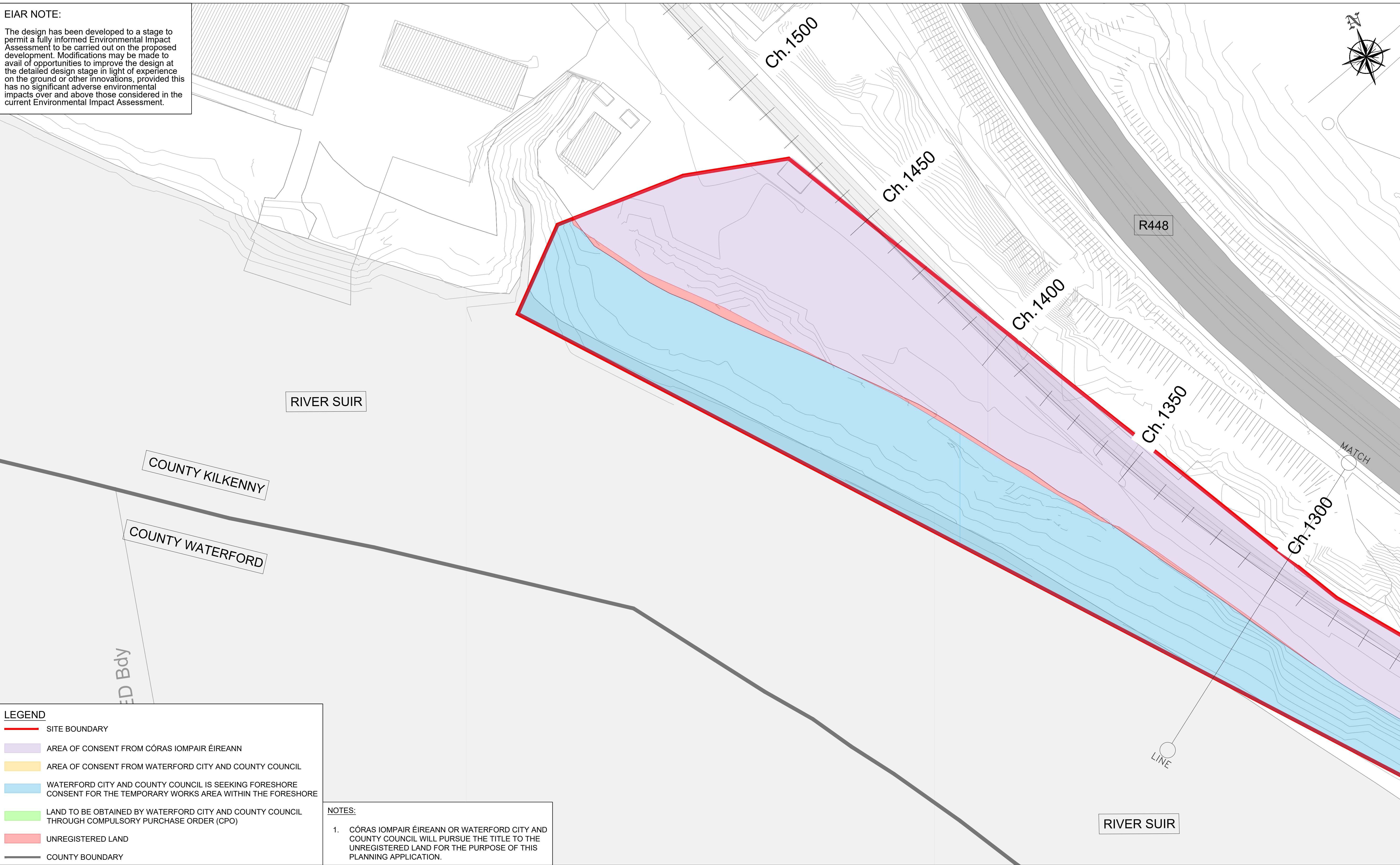
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Project Title	WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST			Drawing Title: Landownership within the Site Boundaries Sheet 4 of 5			
	ENVIRONMENTAL IMPACT ASSESSMENT REPORT			Designed: YB		File:	Status: E.I.A.R.
Drawn: IM				Job No: 18.141			
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Approved: TD				Date: OCTOBER 2021		Rev: -	

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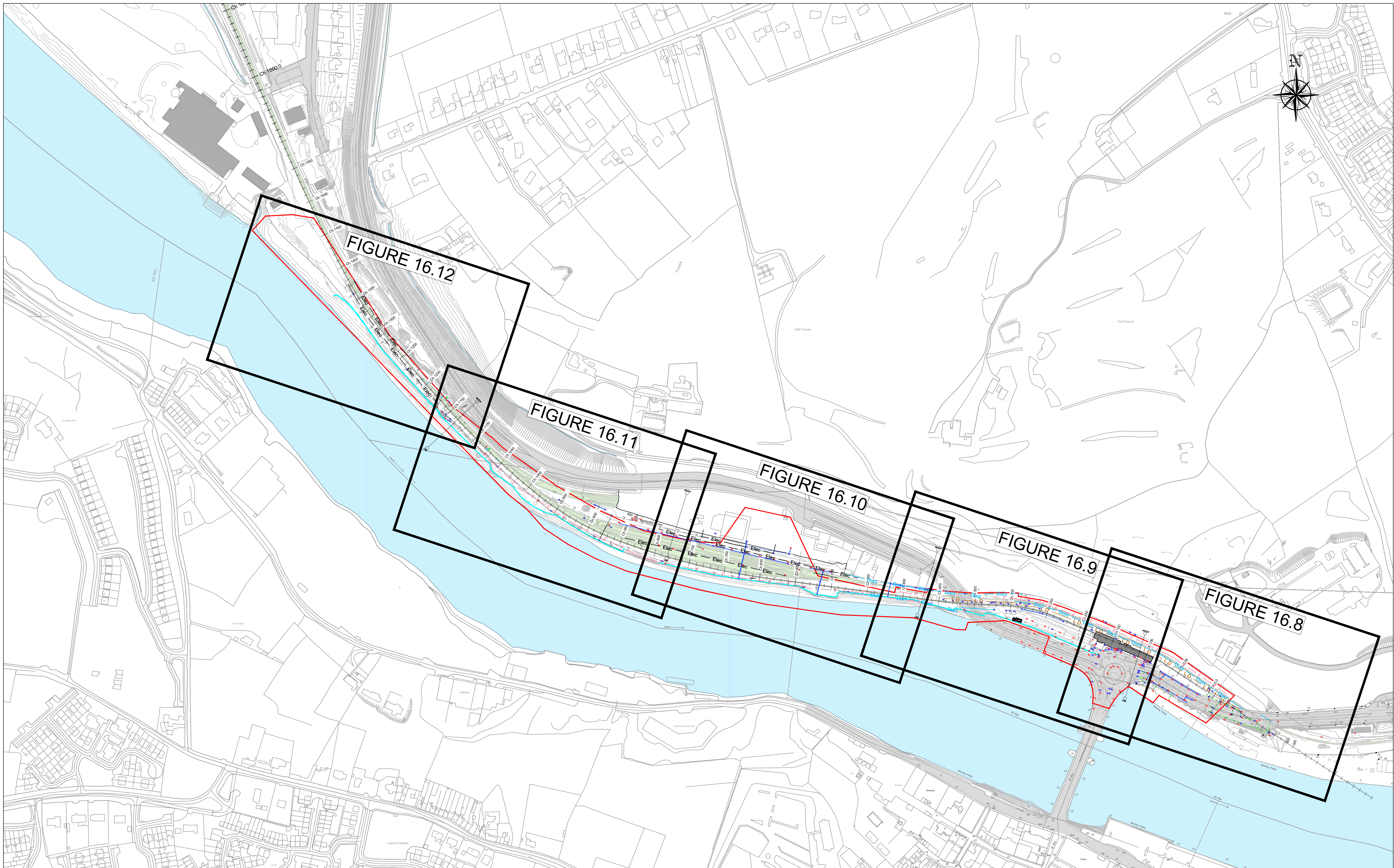
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Project Title		Drawing Title:	
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		Landownership within the Site Boundaries Sheet 5 of 5	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Designed: YB	File:
		Drawn: IM	Job No: 18.141
		Checked: BC	Scale: 1:500 (@ A3)
		Approved: TD	Date: OCTOBER 2021
		Status: E.I.A.R.	Drawing No: FIG 16.6
			Rev: -

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Project Title

WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT
FLOOD DEFENCES WEST

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Drawing Title:

Existing Drainage and Utilities Layout - Key Plan

Designed: YB	File:	Status: E.I.A.R.
Drawn: IM	Job No: 18.141	
Checked: BC	Scale: 1:2500 (@ A3)	Drawing No: FIG 16.7
Approved: TD	Date: OCTOBER 2021	Rev: -

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LEGEND

EXTENT OF RAILWAY LINES

EXISTING QUAY WALL

SITE BOUNDARY

UNKNOWN CABLE LINES

EXISTING STORM WATER DRAIN

EXISTING ELECTRICAL LINES

EXISTING DUCTING

EXISTING LAND DRAIN

EXISTING WATERMAIN

EXISTING MANHOLE\ INSPECTION CHAMBER

EXISTING GULLY

EXISTING LAMPOST

EXISTING ESB BOX

EXISTING TRAFFIC LIGHT

NOTES:

1. DRAINAGE AND UTILITY SURVEYS ARE INCLUDED FOR INFORMATION ONLY. NO DRAINAGE OR UTILITY SURVEYS ARE AVAILABLE FROM CH980-CH2200.

EIAR NOTE:

The design has been developed to a stage to permit a fully informed Environmental Impact Assessment to be carried out on the proposed development. Modifications may be made to avail of opportunities to improve the design at the detailed design stage in light of experience on the ground or other innovations, provided this has no significant adverse environmental impacts over and above those considered in the current Environmental Impact Assessment.

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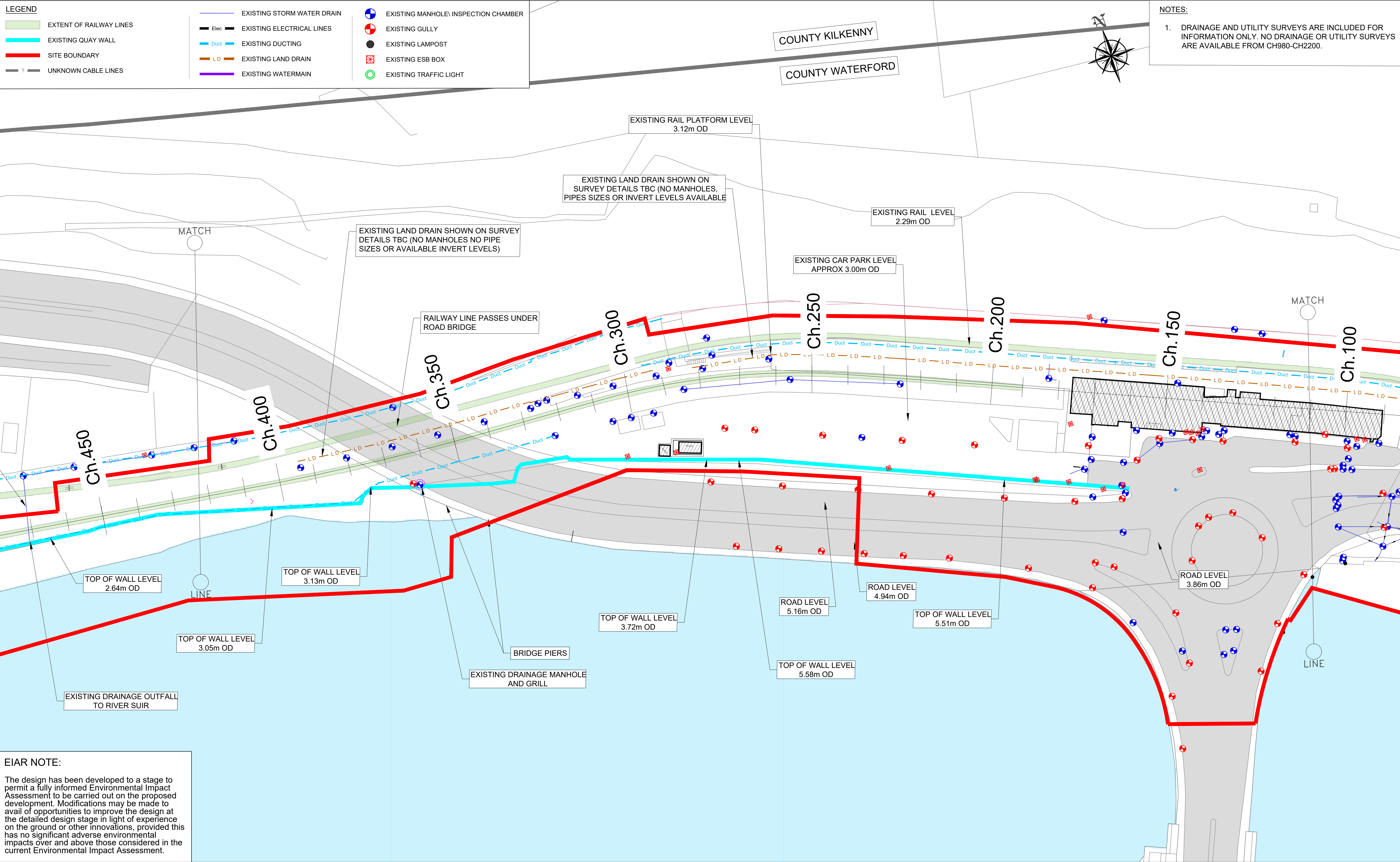
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Project Title		Drawing Title:	
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		EXISTING DRAINAGE & UTILITIES LAYOUT SHEET 1 OF 5	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Status: E.I.A.R.	
Designed: CD	File:	Job No: 18.141	Drawing No: FIG 16.8 Rev: -
Drawn: SC	Scale: 1:500 (@ A3)	Date: OCTOBER 2021	
Checked: CD	Date: OCTOBER 2021		
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Project Title	WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST	
Designated:	CD	File:
Drawn:	SC	Job No:
Checked:	CD	Scale:
Approved:	TD	Date:

Drawing Title:		EXISTING DRAINAGE & UTILITIES LAYOUT SHEET 2 OF 5	
Designed:	CD	File:	Status:
Drawn:	SC	Job No:	E.I.A.R.
Checked:	CD	Scale:	Drawing No:
Approved:	TD	Date:	FIG 16.9

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LEGEND

EXTENT OF RAILWAY LINES

EXISTING QUAY WALL

SITE BOUNDARY

?

UNKNOWN CABLE LINES

EXISTING STORM WATER DRAIN

Elec

EXISTING ELECTRICAL LINES

Duct

EXISTING DUCTING

LD

EXISTING LAND DRAIN

EXISTING WATERMAIN

EXISTING MANHOLE/ INSPECTION CHAMBER

EXISTING GULLY

EXISTING LAMPOST

EXISTING ESB BOX

EXISTING TRAFFIC LIGHT

COUNTY KILKENNY

COUNTY WATERFORD

MATCH

Factory

56

EXISTING 900Ø PIPE.

Ch.450

Ch.500

Ch.550

Ch.600

Ch.650

Ch.700

Ch.750

Ch.800

Goods Shed

EXISTING 450mm Ø PIPE (EXACT SIZE TBC)

EXISTING 900Ø PIPE.

Goods Dropt

TOP OF WALL LEVEL 2.64m OD

TOP OF WALL LEVEL 3.05m

EXISTING DRAINAGE OUTFALL TO RIVER SUIR

TOP OF WALL LEVEL 2.61m OD

EXISTING DRAINAGE OUTFALL TO RIVER SUIR

TOP OF WALL LEVEL 2.49m OD

EXISTING DRAINAGE OUTFALL TO RIVER SUIR

TOP OF WALL LEVEL 2.74m OD

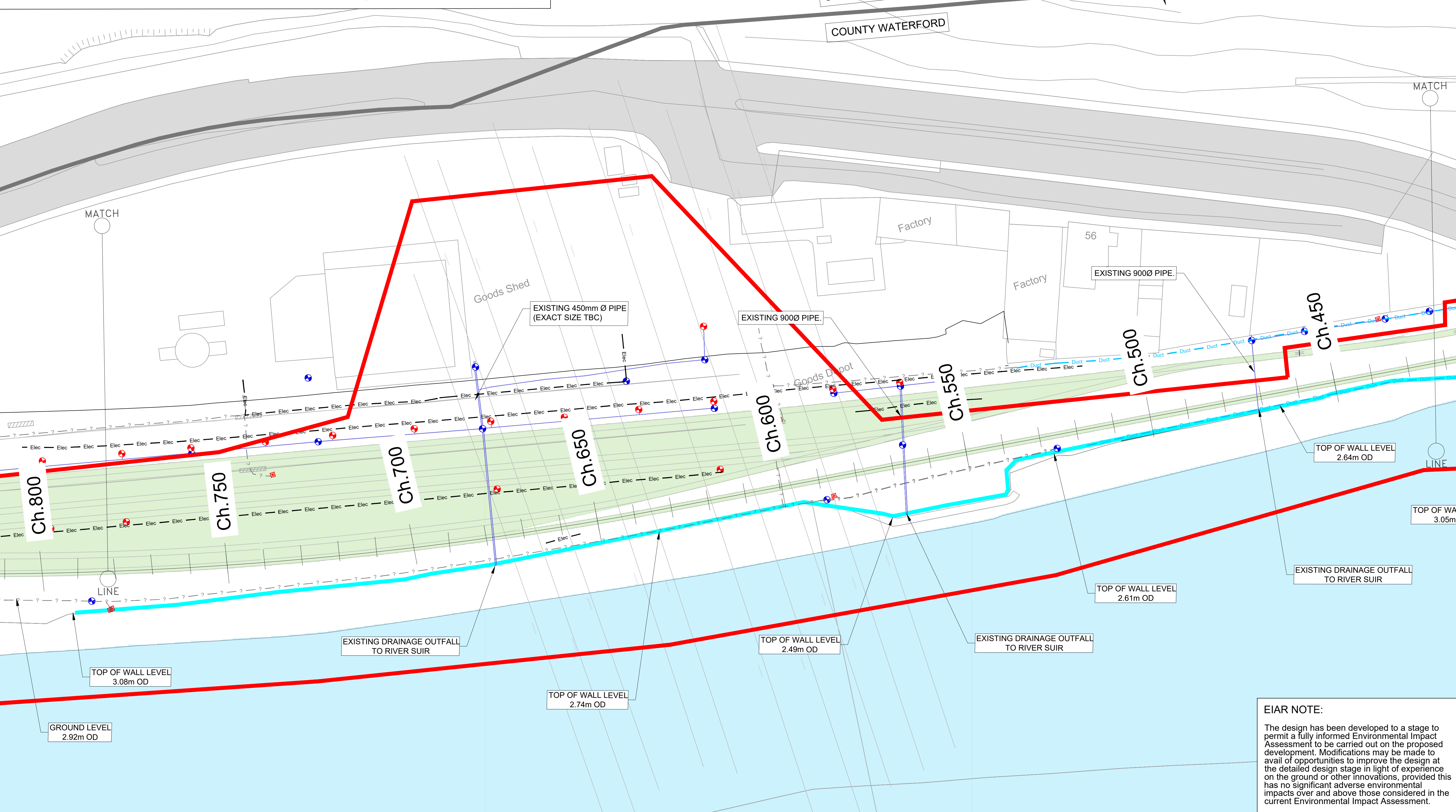
GROUND LEVEL 2.92m OD

TOP OF WALL LEVEL 3.08m OD

LINE

NOTES:

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Project Title
**WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT
FLOOD DEFENCES WEST**

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Designed: CD
Drawn: SC
Checked: CD
Approved: TD

File:
Job No: 18.141
Scale: 1:500 (@ A3)
Date: OCTOBER 2021

Status: E.I.A.R.
Drawing No: FIG 16.10
Rev: -

EXISTING DRAINAGE & UTILITIES LAYOUT
SHEET 3 OF 5

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

LEGEND

EXTENT OF RAILWAY LINES

EXISTING QUAY WALL

SITE BOUNDARY

UNKNOWN CABLE LINES

— Elec —

EXISTING STORM WATER DRAIN

— Duct —

EXISTING ELECTRICAL LINES

— LD —

EXISTING DUCTING

EXISTING LAND DRAIN

EXISTING WATERMAIN

EXISTING MANHOLE/ INSPECTION CHAMBER

EXISTING GULLY

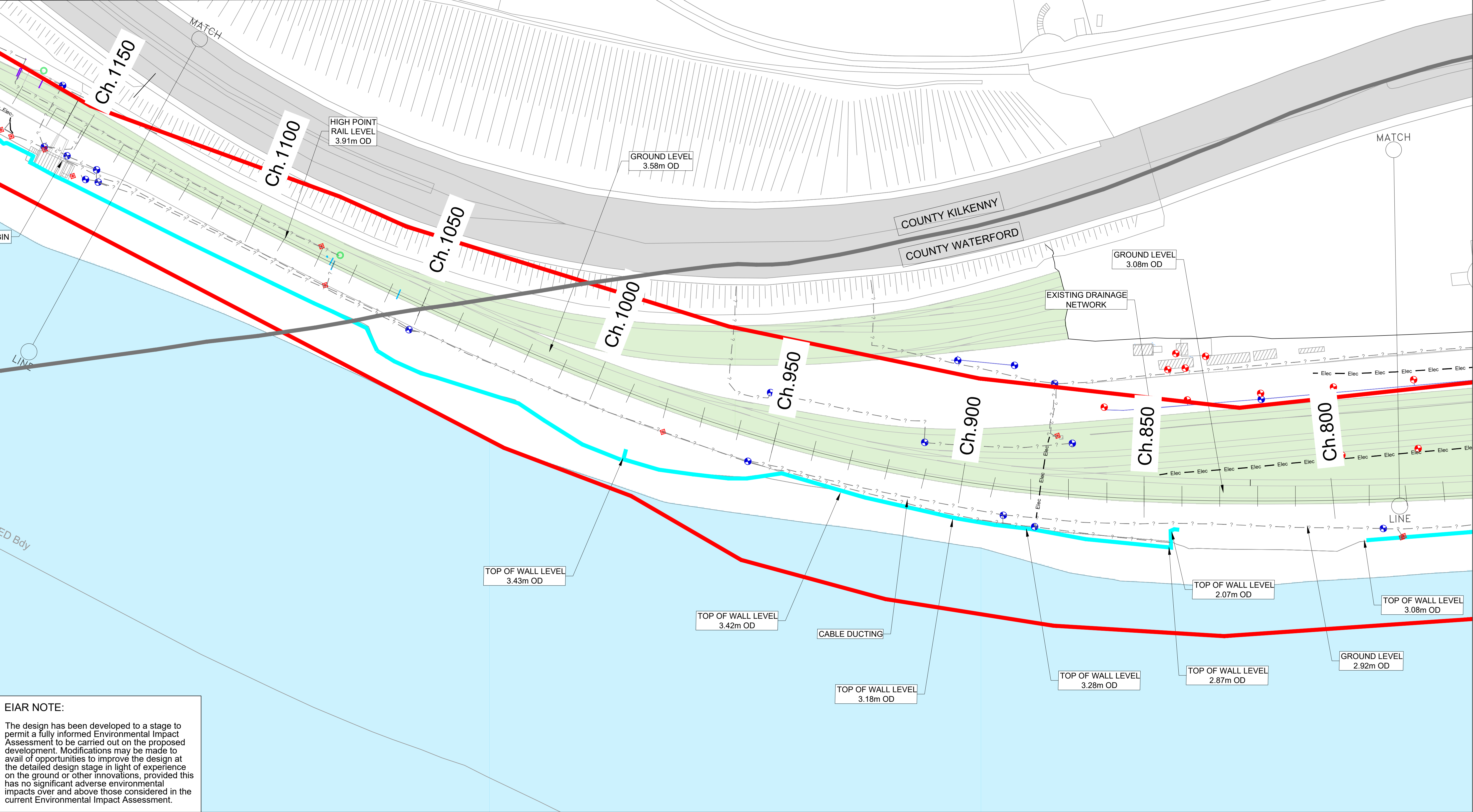
EXISTING LAMPOST

EXISTING ESB BOX

EXISTING TRAFFIC LIGHT

NOTES:

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EIAR NOTE:

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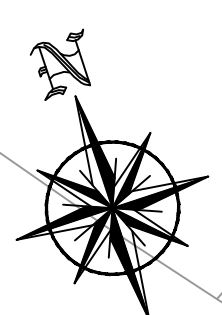
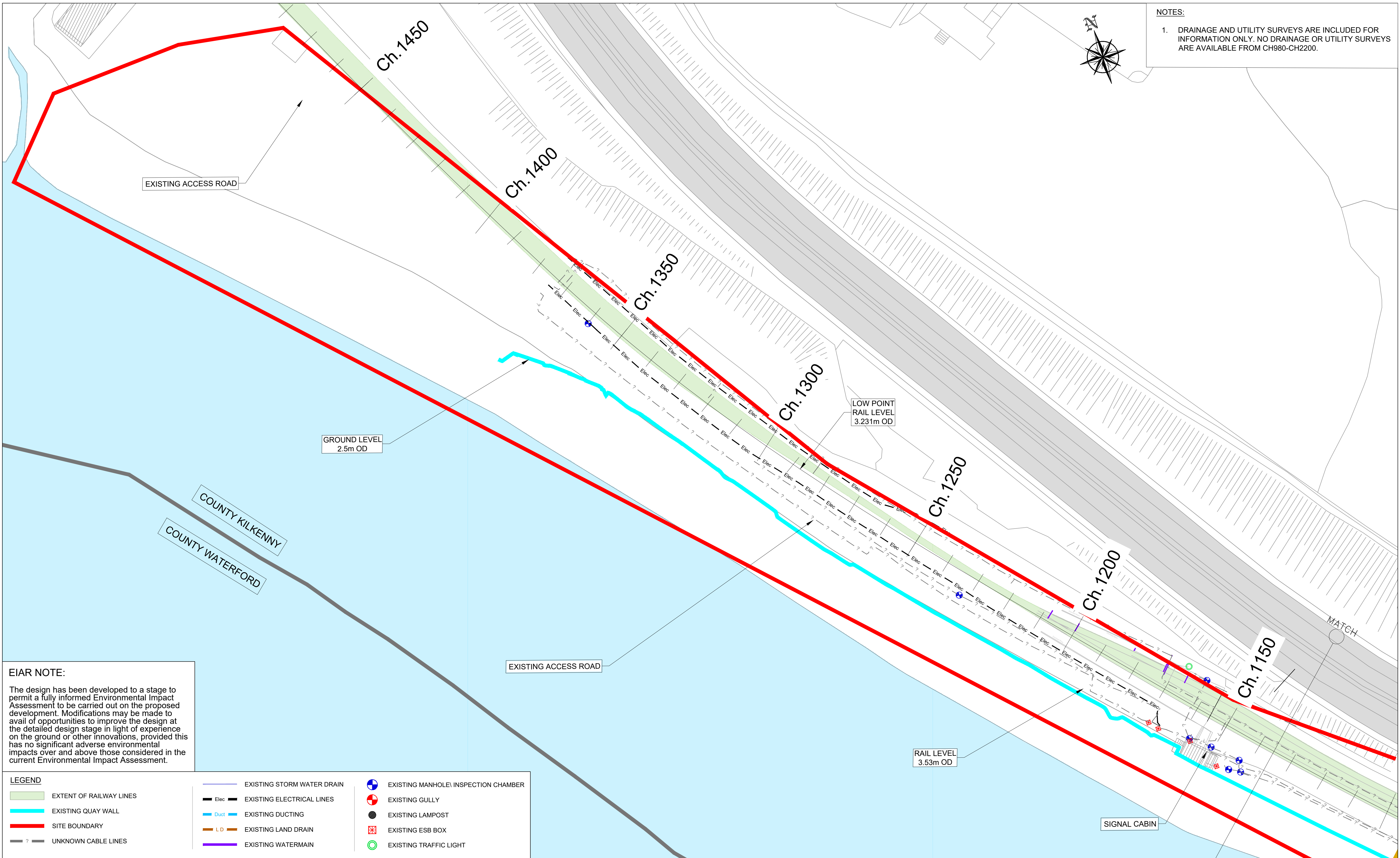
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Project Title		Drawing Title:	
WATERFORD CITY PUBLIC INFRASTRUCTURE PROJECT FLOOD DEFENCES WEST		EXISTING DRAINAGE & UTILITIES LAYOUT SHEET 4 OF 5	
ENVIRONMENTAL IMPACT ASSESSMENT REPORT		Designed: CD	File:
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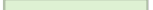
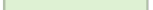


NOTES:

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LEGEND					
	EXTENT OF RAILWAY LINES		EXISTING STORM WATER DRAIN		EXISTING MANHOLE/ INSPECTION CHAMBER
	EXISTING QUAY WALL		EXISTING ELECTRICAL LINES		EXISTING GULLY
	SITE BOUNDARY		EXISTING DUCTING		EXISTING LAMPOST
	UNKNOWN CABLE LINES		EXISTING LAND DRAIN		EXISTING ESB BOX
			EXISTING WATERMAIN		EXISTING TRAFFIC LIGHT

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ENVIRONMENTAL IMPACT ASSESSMENT REPORT				Designed: CD Drawn: SC Checked: CD Approved: TD		File: Job No: 18.141 Scale: 1:500 (@ A3) Date: OCTOBER 2021		Status: E.I.A.R. Drawing No: FIG 16.12 Rev: -	

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