TELFORD CIVIL
DESIGN & CONSTRUCTION EXCELLENCE

Flood Impact Assessment
180 North Road, Eastwood

Prepared For
Mr. George Elias

Project No.
TEL2021185

City of Ryde
Approved Plans
LDA No. LDA2022/0402
Date: 2 March 2023
Council Officer: Colin Murphy
Subject to Conditions of Consent

Issue A November 2022

Telford Consulting Pty Ltd
Sydney + Brisbane

Tel: +61 2 7809 4931
Level 4, 470 Church Street, Parramatta NSW 2150
info@telfordcivil.com.au

Document Information

Project No: TEL2021185				
Report Type: Flood Impact Assessment				
Site Address: 180 North Road, Eastwood NSW 2122				
Document Filename: TEL2021185.FIA.DA - 180 North Road, Eastwood, revA .doc				
Issue A		**Position**	**Date**	**Comments**
Prepared By	Estephan Zakhia	Civil Engineer	25 November 2022	Nil
Reviewed By	Michel Chaaya	Principal Engineer	25 November 2022	Nil

Disclaimer

The advice and information contained within this report relies on the quality of the records and other data provided by the Client and obtained from Council along with the time and budgetary constraints imposed.

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

Telford Consulting Pty Ltd have been commissioned to undertake a Flood Impact Assessment for the Proposed Two Storey Dwelling Development at 180 North Road, Eastwood.

This report will:

1. Determine the existing stormwater characteristics of the overland flowpath hydraulics and capacity;
2. Define the flood risk for the proposed development in accordance with the *City of Ryde Council DCP* Flood Risk Management Policy;
3. Set development levels for the proposed development in accordance with Council's guidelines;
4. Discuss risk management in accordance with Council's Flood Risk Management Guidelines; and
5. Provide flood risk management procedures for the proposed development.

This report has been prepared generally in accordance with City of Ryde Council advice, Council's Flood Risk Management Policies and other reference documents.

2 SITE DETAILS

2.1 Location

The proposed development site is located within the municipality of City of Ryde Council and is identified as Lot 3 on DP 387071. The property has a total site area of approximately 796.7m² by title. The site is bounded by North Road to the East, by vacant lot to the south and west, and by built up allotments to the north.

Figure 2-1 below shows the site's location outlined in red and the overland flowpath in blue arrows.

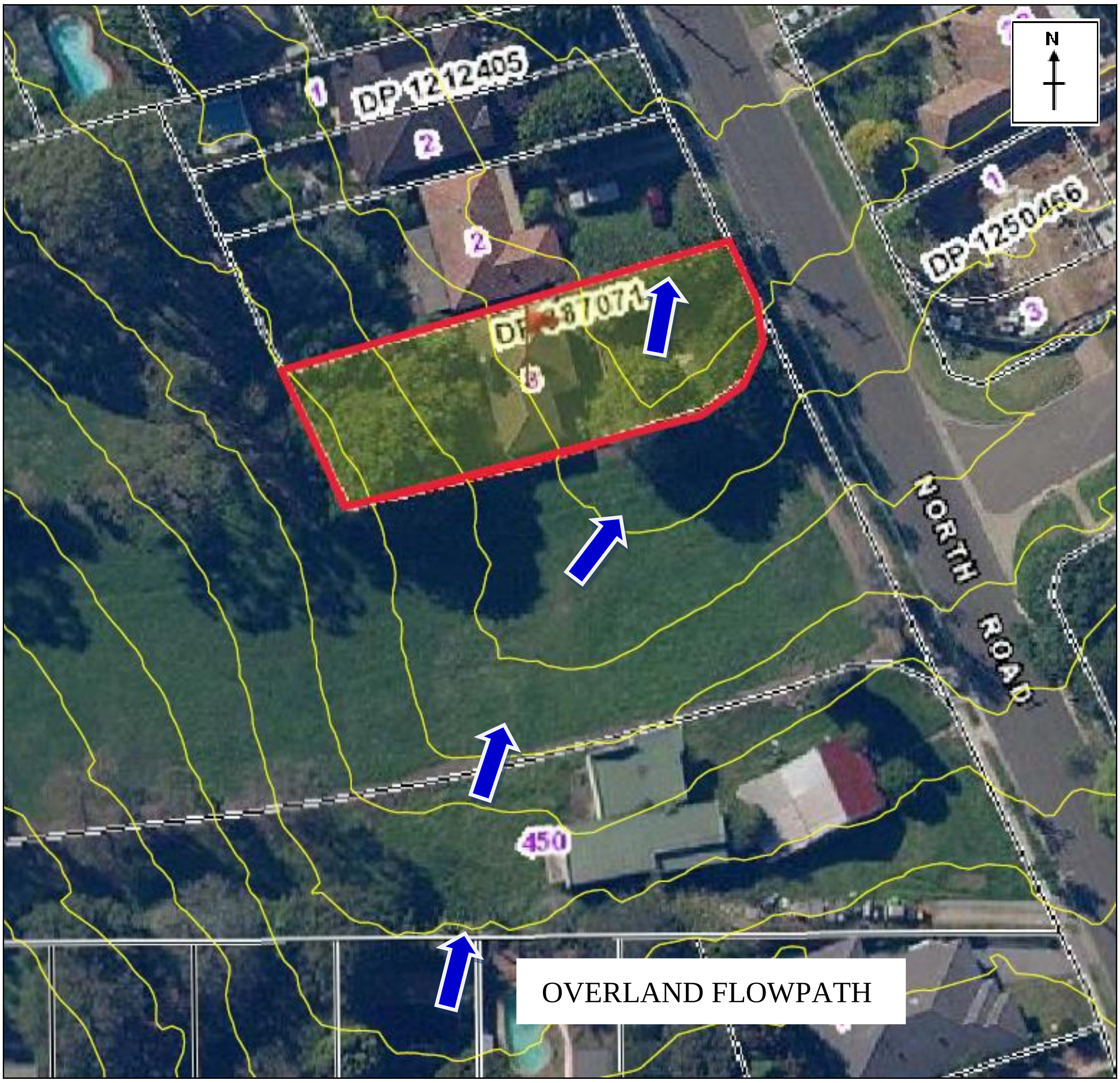


Figure 2-1– Site Location

2.2 Proposed Development

The proposed development will see the demolition of the existing structures and the construction of a two storey dwelling development. Access to the site shall be via North Road.

Refer to **Figure 2-2** for the site plan, and **Appendix B** for the architectural plans of the proposed development.

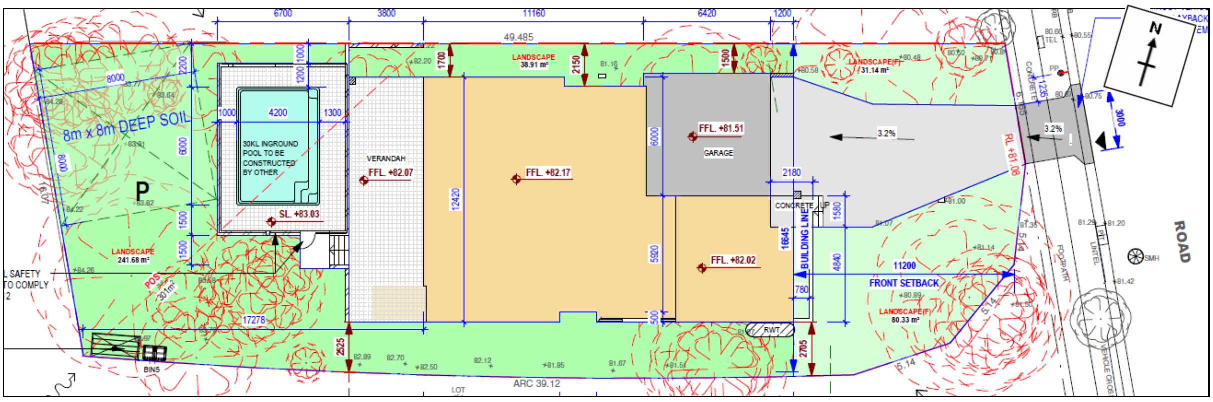


Figure 2-2 – Site Plan

2.3 Topography and Drainage

The topography of the upstream catchment is entirely urbanised area.

Available LIDAR data illustrate the subject site forms part of a local overland flowpath with a catchment area of approximately **2.85ha** in size.

Figure 2-3 below shows the upstream catchment area in blue.

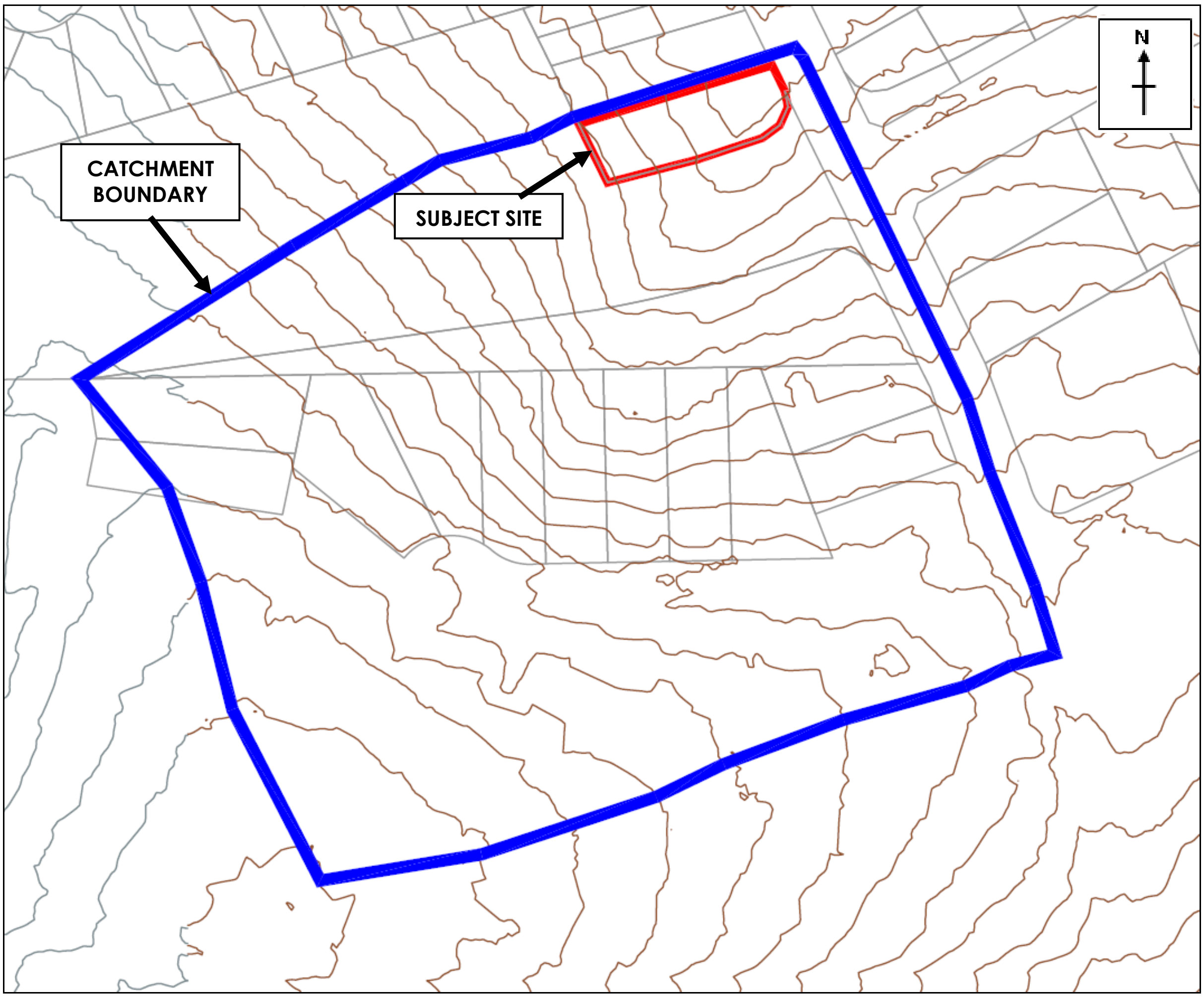


Figure 2-3 - Catchment Map

3 FLOOD IMPACTS

3.1 External Catchment Flow

DRAINS ILSAX model was used for the 1 in 100 year ARI event to analyse the existing catchment and determine the volume of overland flow entering the site.

DRAINS is an integrated hydrological and hydraulic model. It is capable of modelling the hydrology through an ILSAX module including detention storages. Model parameters for sub catchment storages have been selected from recommended design values from the following data sources:

- Catchment roughness values – Based on aerial photography, site inspections and previous experience with similar hydrologic assessment; and
- Intensity-Frequency-Duration (IFD) values and rainfall temporal patterns were sourced from the Australian Government, Bureau of Meteorology.

The model result for the overland flowpath's existing urban catchment is shown in the table below:

Table 3-1 – Catchment Flow

Scenario	100year Flow (m^3/s)
2.85ha Existing Overland Flow Catchment	1.61

Refer to **Appendix C** for *DRAINS Model Layout* results.

There are several hydraulic parameters often used to simulate overland flows. As seen in **Table 3-2** below, this was not required in this instance.

Table 3-2 - Hydraulic Parameters

Scenario	100 year Peak Flow Capacity (m^3/s)
Upstream Pipe Network Storage (An allowance for upstream pipe storage has not been made)	**N/A**
Catchment Bypass (An allowance for bypass such as intercepting roads have not been made as mentioned above)	**N/A**

3.2 Hydraulic Analysis

The open channel flow hydraulic analysis in HEC-RAS was conducted for the 'pre-development' and 'post-development' scenarios.

A Manning's 'n' value of 0.035 for grass and 0.013 for road pavement areas were adopted.

The existing structures within the neighbouring properties were modelled as full obstruction in the pre-development and post-development scenarios.

The existing structures within the subject site have been also modelled as complete blockage in the pre-development scenario.

For the post development scenario, the proposed development, with exception for the Family, Kitchen and Verandah, was modelled as elevated on piers to allow for overland flow underneath. Refer to **Figure 3-1** for a concept plan.

The proposed driveway into the elevated garage was also modelled as elevated on piers.

As the overland flowpath underneath the elevated footprint might be blocked with time due to vegetation, debris, and other actions, a 70% blockage factor was incorporated for this subfloor area.

Refer to **Figure 3-1** below for a concept plan of the proposed development.

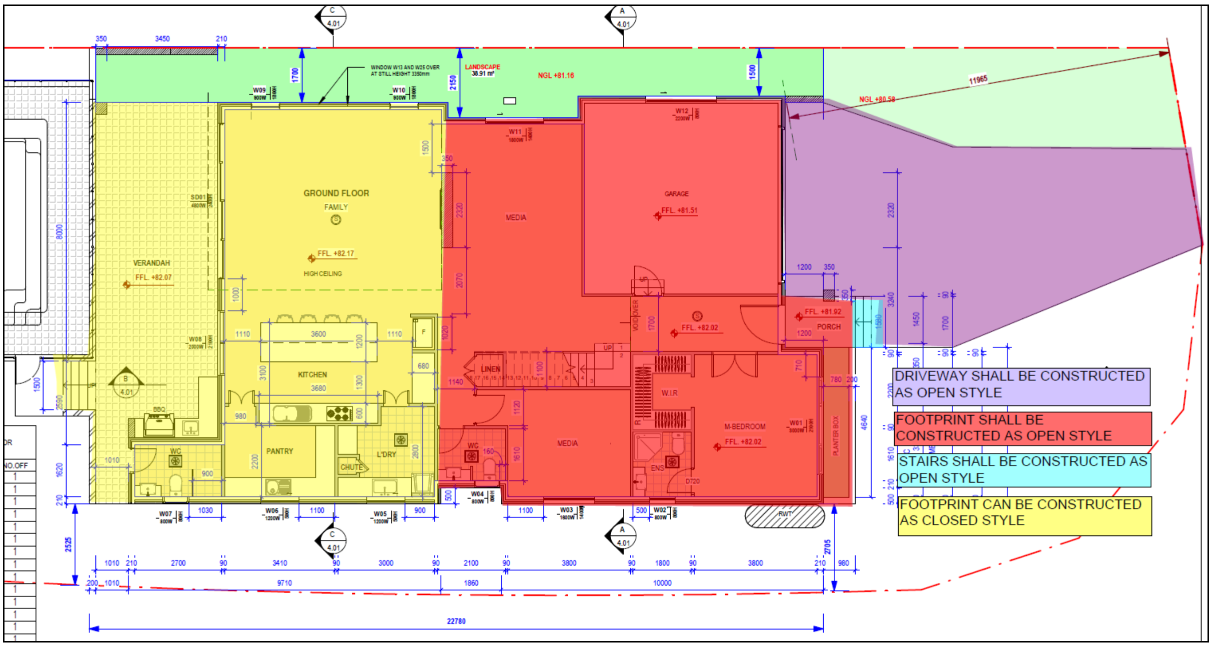
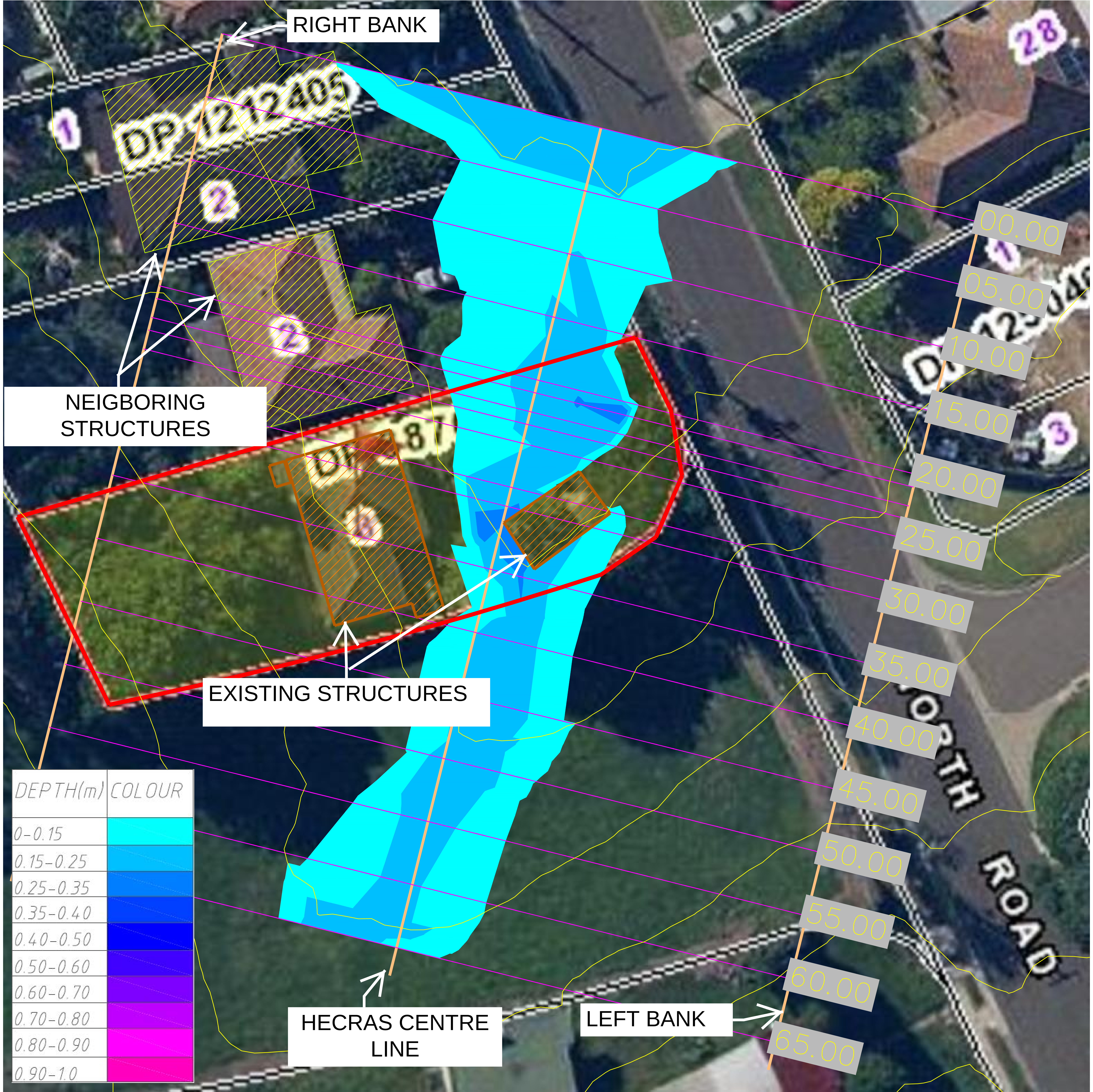


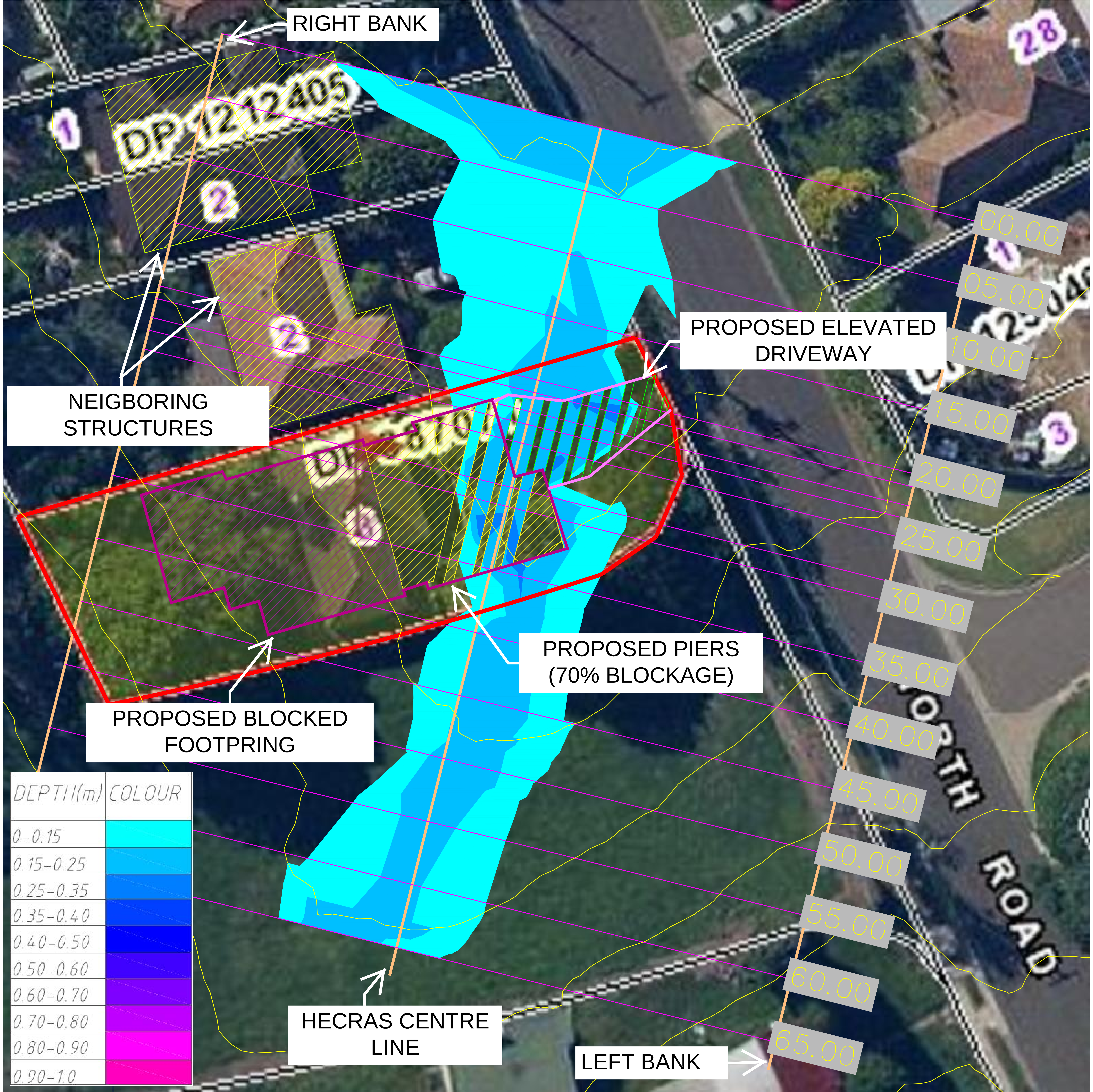
Figure 3-1 - Concept Plan

Figure 3-2 - Hec-Ras sections and Pre Development Flood Extent



RIGHT BANK
NEIGBORING STRUCTURES
EXISTING STRUCTURES
HECRAS CENTRE LINE
LEFT BANK
00.00
05.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
50.00
55.00
60.00
65.00
DP 1212405
DEPTH(m)
COLOUR
0-0.15
0.15-0.25
0.25-0.35
0.35-0.40
0.40-0.50
0.50-0.60
0.60-0.70
0.70-0.80
0.80-0.90
0.90-1.0

Figure 3-3 - Hec-Ras sections and Post Development Flood Extent



RIGHT BANK
PROPOSED ELEVATED DRIVEWAY
NEIGBORING STRUCTURES
PROPOSED PIERS (70% BLOCKAGE)
PROPOSED BLOCKED FOOTPRING
HECRAS CENTRE LINE
LEFT BANK
DP 1212405
00.00
05.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
50.00
55.00
60.00
65.00
ROAD
DEPTH(m)
COLOUR
0-0.15
0.15-0.25
0.25-0.35
0.35-0.40
0.40-0.50
0.50-0.60
0.60-0.70
0.70-0.80
0.80-0.90
0.90-1.0

Tabulated below in **Table 3-3, Table 3-4 & Table 3-5** are the calculated site flood levels, depths and velocities from the external catchment draining onto the proposed development site.

Table 3-3 - Pre-Development Flood Data

Chainage	100 year Peak Flow (m3/s)	Water Surface Level (m)	Flow Depth (m)	Velocity (m/s)	vd
65	1.610	83.300	0.210	0.990	0.21
60	1.610	82.950	0.180	1.030	0.19
55	1.610	82.640	0.190	1.090	0.21
50	1.610	82.340	0.220	1.150	0.25
45	1.610	82.010	0.220	1.080	0.24
40	1.610	81.670	0.240	1.170	0.28
35	1.610	81.360	0.260	1.130	0.29
30	1.610	81.050	0.260	1.270	0.33
28.5	1.610	80.950	0.240	1.230	0.30
25	1.610	80.750	0.200	1.130	0.23
23.5	1.610	80.740	0.220	0.840	0.18
22.5	1.610	80.730	0.230	0.760	0.17
21	1.610	80.730	0.300	0.600	0.18
20	1.610	80.720	0.250	0.690	0.17
15	1.610	80.610	0.180	1.090	0.20
10	1.610	80.450	0.160	0.860	0.14
5	1.610	80.160	0.140	1.070	0.15
0	1.610	80.160	0.260	0.280	0.07

Table 3-4 - Post-Development Flood Data

Chainage	100 year Peak Flow (m3/s)	Water Surface Level (m)	Flow Depth (m)	Velocity (m/s)	vd
65	1.610	83.300	0.210	0.990	0.21
60	1.610	82.950	0.180	1.030	0.19
55	1.610	82.640	0.190	1.090	0.21
50	1.610	82.340	0.220	1.150	0.25
45	1.610	82.010	0.220	1.080	0.24
40	1.610	81.670	0.240	1.170	0.28
35	1.610	81.360	0.260	1.200	0.31
30	1.610	81.040	0.250	1.210	0.30
28.5	1.610	80.960	0.240	1.170	0.28
25	1.610	80.790	0.240	1.330	0.32
23.5	1.610	80.750	0.230	1.160	0.27
22.5	1.610	80.730	0.230	1.070	0.25
21	1.610	80.730	0.300	0.750	0.22
20	1.610	80.720	0.250	0.750	0.19
15	1.610	80.610	0.180	1.090	0.20
10	1.610	80.450	0.160	0.860	0.14
5	1.610	80.160	0.140	1.070	0.15
0	1.610	80.160	0.260	0.280	0.07

Table 3-5 - Pre-Development vs. Post Development Flood Data

Chainage	Flow Depth Difference (m)	Pre-Development VD	Post Development VD	Difference VD
65	0.000	0.21	0.21	0.00
60	0.000	0.19	0.19	0.00
55	0.000	0.21	0.21	0.00
50	0.000	0.25	0.25	0.00
45	0.000	0.24	0.24	0.00
40	0.000	0.28	0.28	0.00
35	0.000	0.29	0.31	0.02
30	-0.010	0.33	0.30	-0.03
28.5	0.010	0.30	0.28	-0.01
25	0.040	0.23	0.32	0.09
23.5	0.010	0.18	0.27	0.08
22.5	0.000	0.17	0.25	0.07
21	0.000	0.18	0.22	0.04
20	0.000	0.17	0.19	0.02
15	0.000	0.20	0.20	0.00
10	0.000	0.14	0.14	0.00
5	0.000	0.15	0.15	0.00
0	0.000	0.07	0.07	0.00

It is important to note that although there is a slight increase in the VD product and water level at some areas, the VD product and water level are considered acceptable and within council's standards.

As can be seen from **Table 3-5** above, there is an increase in water level up to 0.04 at cross section 25. This increase is limited within the subject site and will not cause any impact on any neighbouring property.

4 CRITERIA FOR SETTING FLOOR LEVELS

All precautions within the planning and design stages of the proposed development should be taken to ensure that the risk of flood impacts are minimised.

City of Ryde Council's DCP sets the development levels for all developments impacted by flooding.

Table 4-1 below shows the minimum floor level for the proposed development in accordance with Council's DCP.

Table 4-1 - Minimum Development Levels

Building Element	Design Requirement	Design Level
Minimum Habitable Floor Level – Lounge & Media *(Interpolating between stations 35 & 40)*	1 in 100 year ARI plus 0.50m freeboard	82.02m
Minimum Habitable Floor Level – Dining & Kitchen *(Interpolating between stations 45 & 40)*	1 in 100 year ARI plus 0.50m freeboard	82.17m
Minimum Garage Floor Level *(Interpolating between stations 30 & 35)*	1 in 100 year ARI plus 0.30m freeboard	81.51m

5 FLOOD CLASSIFICATION

Three Flood Classifications have been defined as follows:

1. **High Flood Risk Precinct;** This has been defined as the area of land below the 100-year flood event that is either subject to a high hydraulic hazard or where there are significant evacuation difficulties.

   The high flood risk precinct is where high flood damages, potential risk to life or evacuation problems would be anticipated, or development would significantly and adversely affect flood behaviour. Most development should be restricted in this precinct. In this precinct, there would be a significant risk of flood damages without compliance with flood related building and planning controls.

2. **Medium Flood Risk Precinct;** This has been defined as land below the 100 year flood event that is not within a High Flood Risk Precinct. This is land that is not subject to a high hydraulic hazard or where there are no significant evacuation difficulties.

   In this precinct there would still be a significant risk of flood damage, but these damages can be minimised by the application of appropriate development controls

3. **Low Flood Risk Precinct;** This has been defined as all land within the floodplain (ie. Within the extent of the probable maximum flood) but not identified within either a High Flood Risk or a Medium Flood Risk Precinct. The Low Flood Risk Precinct is that area above the 100 year flood event.

   The Low Flood Risk Precinct is where risk of damages are low for most land uses. The Low Flood Risk Precinct is that area above the 100 year flood and most land uses would be permitted within this precinct.

6 FLOOD SAFETY AND AMENITY ISSUES

The subject site is identified as **Medium Flood Risk.** Council has adopted some restrictions for the following:

1. To ensure the proposed development does not result in unreasonable social, economic or environmental impacts upon the amenity or ecology of an area;
2. To minimise the safety risk by ensuring the provision of reliable access from areas affected by flooding;
3. To minimise the damage to private property and council assets;
4. To ensure the proposed development does not have an adverse impact on other properties;
5. To ensure all occupants a safe refuge within the site or establish evacuation procedures to a safe refuge above the flood levels outside the site;
6. Set all external power points, air conditioning units, hot water systems and pumps for rainwater tanks above the habitable floor levels.

7 FLOOD RESTRICTIONS

***Floor Levels*:** The floor levels of the proposed development are to be in accordance with the advice given in this report (**Section 4**).

***Building Components*:** All proposed structures in the flooded area are to have flood compatible building components below the flood levels. A structural assessment is advised prior to occupation of building by an accredited Structural Engineer.

Climate Change: It is recommended to review this flood impact assessment every 10 years particularly with the potential effects of climate change and increased rainfall intensities.

In order for the proposed development to not have adverse impacts on surrounding properties, it is recommended that open style fencing should be adopted within the floodway (if fencing is to be replaced) to ensure no blockages/obstructions to external flows. It is also recommended that no OSD basin retaining walls, garden bed etc. impeded flows within the floodway.

8 FLOOD RISK MANAGEMENT

The proposed development complies with Council's flood evacuation requirements. In order to evacuate, residents would not have to travel through deep water to reach a place of refuge above the PMF flood waters.

It is anticipated that residents could seek refuge above the PMF within the proposed units on the first floor level.

9 CONCLUSION

This Flood Impact Assessment has been prepared to support the Proposed Dual Occupancy Development at 180 North Road, Eastwood.

The report concluded the below:

- The subject site is affected by the 100-year storm event.
- Portion of the proposed development is proposed to be elevated on piers to allow for overland flow underneath.
- Floor levels for the proposed development are addressed in accordance with Council's guidelines and are stated within **Section 4** of the report.

This report shows that the requirements of the Council can be achieved, and therefore recommends that the proposed development proceeds.

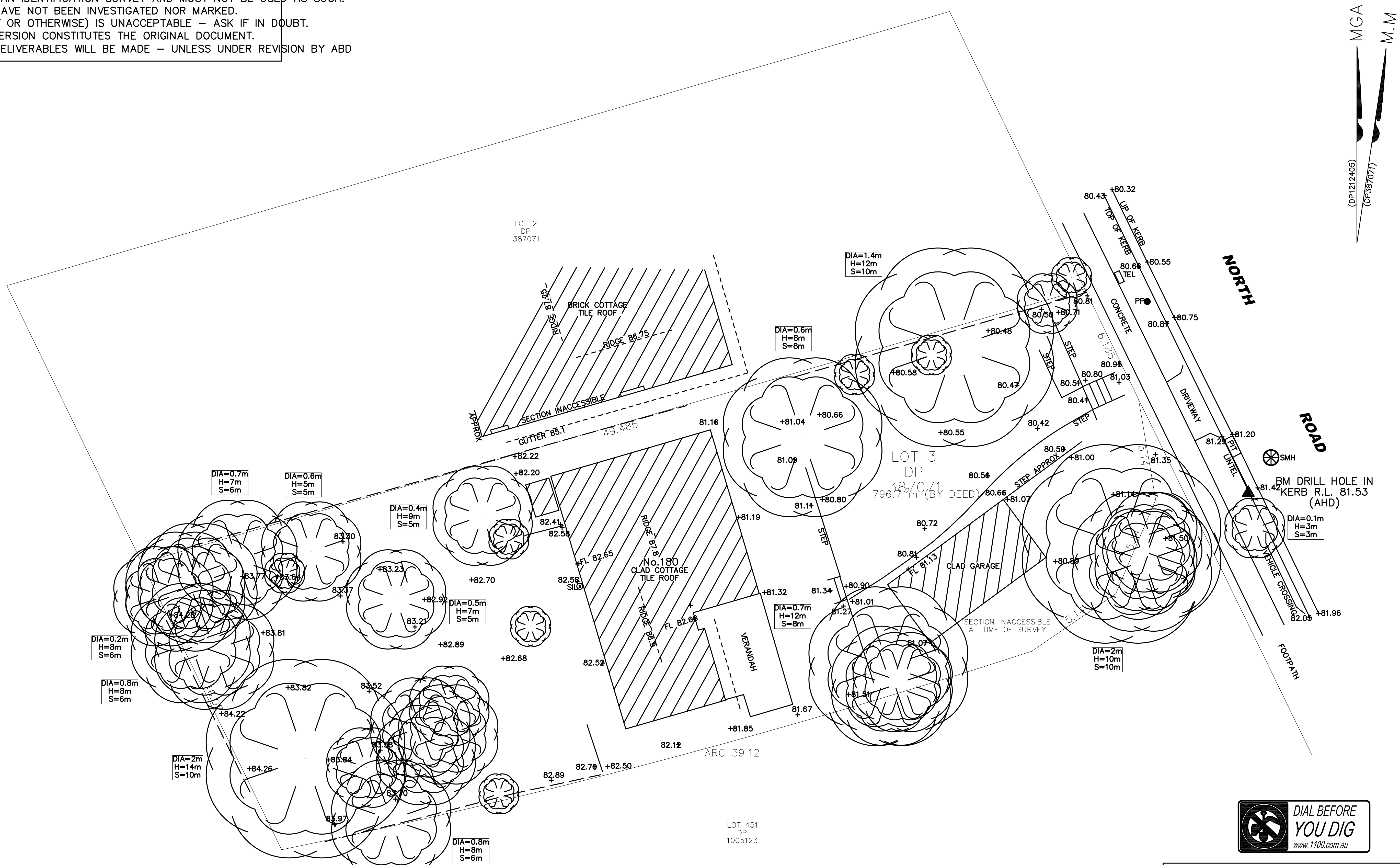
10 REFERENCES

1. Australia Government, Bureau of Meteorology Website http://www.bom.gov.au/
2. City of Ryde Council – Development Control Plan 2014
3. New South Wales Government – Floodplain Development Manual – The management of flood liable land, April 2005

11 APPENDICES

Appendix A SURVEY PLAN

WARNING
THIS PLAN IS NOT AN IDENTIFICATION SURVEY AND MUST NOT BE USED AS SUCH.
THE BOUNDARIES HAVE NOT BEEN INVESTIGATED NOR MARKED.
SCALING (DIGITALLY OR OTHERWISE) IS UNACCEPTABLE – ASK IF IN DOUBT.
THE DIGITAL PDF VERSION CONSTITUTES THE ORIGINAL DOCUMENT.
NO RE–ISSUE OF DELIVERABLES WILL BE MADE – UNLESS UNDER REVISION BY ABD



THE SUBJECT LAND IS BURDENED BY COVENANT G33423 AS NOTIFIED ON THE TITLE.
THE SUBJECT LAND IS BURDENED BY CAVEAT AP158553 IN FAVOUR OF THE NEW SOUTH WALES TRUSTEE & GUARDIAN

DIAL BEFORE YOU DIG
www.1100.com.au

IMPORTANT NOTES:

a) The cadastral overlay shown on this plan has not been established by survey and is sh approximate positions only. If any structure is to be erected upon the land then the b corners MUST be marked.
b) Underground services have not been surveyed and, if shown, are in approximate positio End users are warned to establish line and depth of buried assets prior to any excava A "dial before you dig" search MUST be made before any construction works can comm
c) Windows, doors, roof profiles and elevated structures are surveyed by remote measuren are shown in indicative positions only. All detail (including levels) shown on this plan MU used for accurate design purposes unless verified on–site before hand.
d) All spot levels shown are based on Australian Height Datum (origin PM 32088 RL 90.2

I, ROSS ALBERT ROBINSON, hereby certify that the land comprised in this plan was surveyed under my supervision and in accordance with Part 2 Division 1 Clause 9(1) of the Surveying & Spatial Information Regulation, 2017 and was completed on: 16/05/2021

Registered Land Surveyor — *Date 17/05/2021*
BOSSI ID: SU001922

NOTE: ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE
SCALE: 1:100

AB DIMENSIONS PTY LTD
Engineering Surveyors
Sydney Office: 115 Waminda Avenue, Campbelltown 2560
Email: abdimensions@hotmail.com Contact: 0426262332

SURVEY	DRAWN	CHKD	AMENDMENTS	EXAMD	APPD	DATE	No.
A.B.	A.B.	R.R.	ISSUED FOR INFORMATION PURPOSES ONLY			17/05/21	A

CLIENT: RIDGE DESIGNS
TITLE: DETAIL SURVEY OF LAND AT 180 NORTH ROAD, EASTWOOD NSW 2122
SCALE 1 : 100
DRAWING No. A1–21147–1–
SHEET 1 of 1 A1

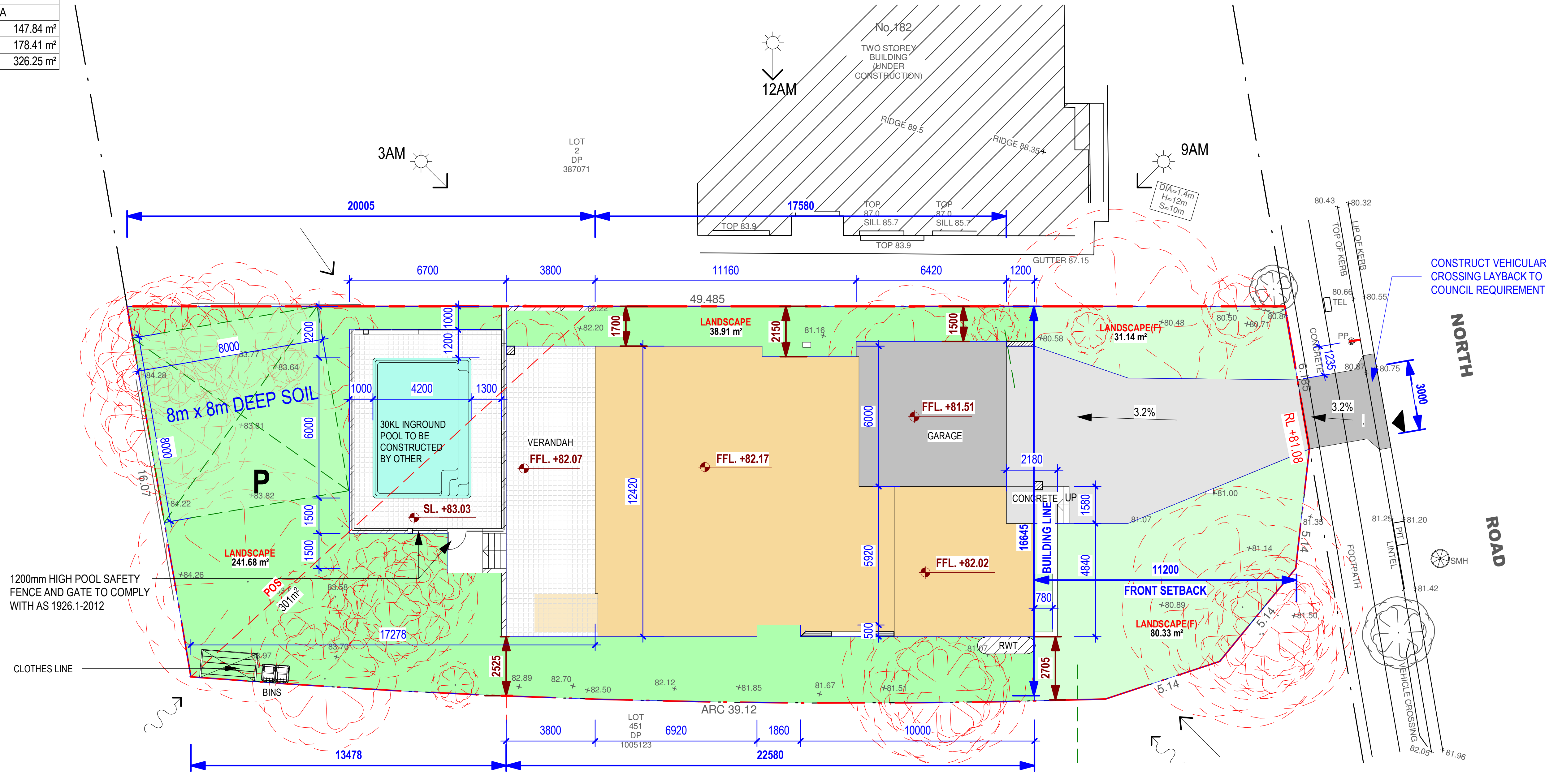
Appendix B DEVELOPMENT LAYOUT PLANS

SITE AREA		796.7m²	
STANDARD		PROPOSED	COMPLIES
FSR 0.5:1	398.35m²	326.25 m²	Yes

PROPOSED FLOOR AREA

	AREA
FIRST FLOOR	147.84 m²
GROUND FLOOR	178.41 m²
TOTAL PROPOSED FLOOR AREA	326.25 m²

PROPOSED TWO STOREY DWELLING
180 North Road EASTWOOD 2122
LOT 3 DP387071



COLOUR LEGEND:

- GROUND FLOOR GRID LINE
- FIRST FLOOR GRID LINE
- FIRST FLOOR LINE OVER
- ROOF LINE OVER

LEGEND

- RWT — 2800L RAINWATER TANK TO COMPLY WITH BASIX REQUIREMENTS
- HWS — GAS INSTANTANEOUS 5 STARS

SITE ANALYSIS LEGEND:

- VEHICULAR ENTRY
- SUN DIRECTION - 21 JUNE
- EXISTING GROUND CONTOURS
- NEIGHBOURING WINDOWS FACING SITE
- PREVAILING SUMMER WINDS
- EXISTING TREE TO BE REMAIN
- EXISTING GROUND LEVEL
- P — PRIVATE OPEN SPACE
- PREVAILING WINTER WINDS
- EXISTING TREE TO BE REMOVED
- NOISE SOURCE
- L — LETTER BOX

DRIVEWAY NOTE:

THE DRIVEWAY GRADIENT IS LESS THAN 12.5% AND COMPLIES WITH THE REQUIREMENTS OF AS 2890.1

RYDE DCP 2014- PART 3.3	REQUIRED	PROPOSED	
40% of the area forward of the building line must be landscaped Front area : 173.83 m²	69.5m²	111.47 m²	COMPLIES

1 SITE LAYOUT AND SITE ANALYSIS PLAN

SCALE 1 : 200

0 2 4 8 16m 1:200

NOTES

1. ALL DIMENSIONS AND FLOOR AREAS TO BE VERIFIED BUILDER PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK. ANY DISCREPANCIES ARE TO BE CONFIRMED BY THE DESIGNER.
2. LEVELS SHOWN ARE APPROXIMATE UNLESS ACCOMPANIED BY REDUCED LEVELS BY A REGISTERED SURVEYOR.
3. FIGURED DIMENSIONS ARE TO BE TAKEN IN PREFERENCE TO SCALING.
4. ALL BOUNDARY CLEARANCES MUST BE VERIFIED BY THE SURVEYOR PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK.
5. WHERE ENGINEERING OR HYDRAULIC DRAWINGS ARE REQUIRED, SUCH MUST TAKE PREFERENCE TO THIS DRAWING.
6. STORMWATER TO BE CONNECTED AND DISCHARGED TO COUNCIL'S REQUIREMENTS AND TO AS 3500.3.1990
7. ALL SERVICES TO BE LOCATED AND VERIFIED BY THE BUILDER WITH THE RELEVANT AUTHORITIES PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK

REV	BY	AMENDMENT	DATE
A	LT	ISSUED FOR DA APPROVAL	03.11.2022

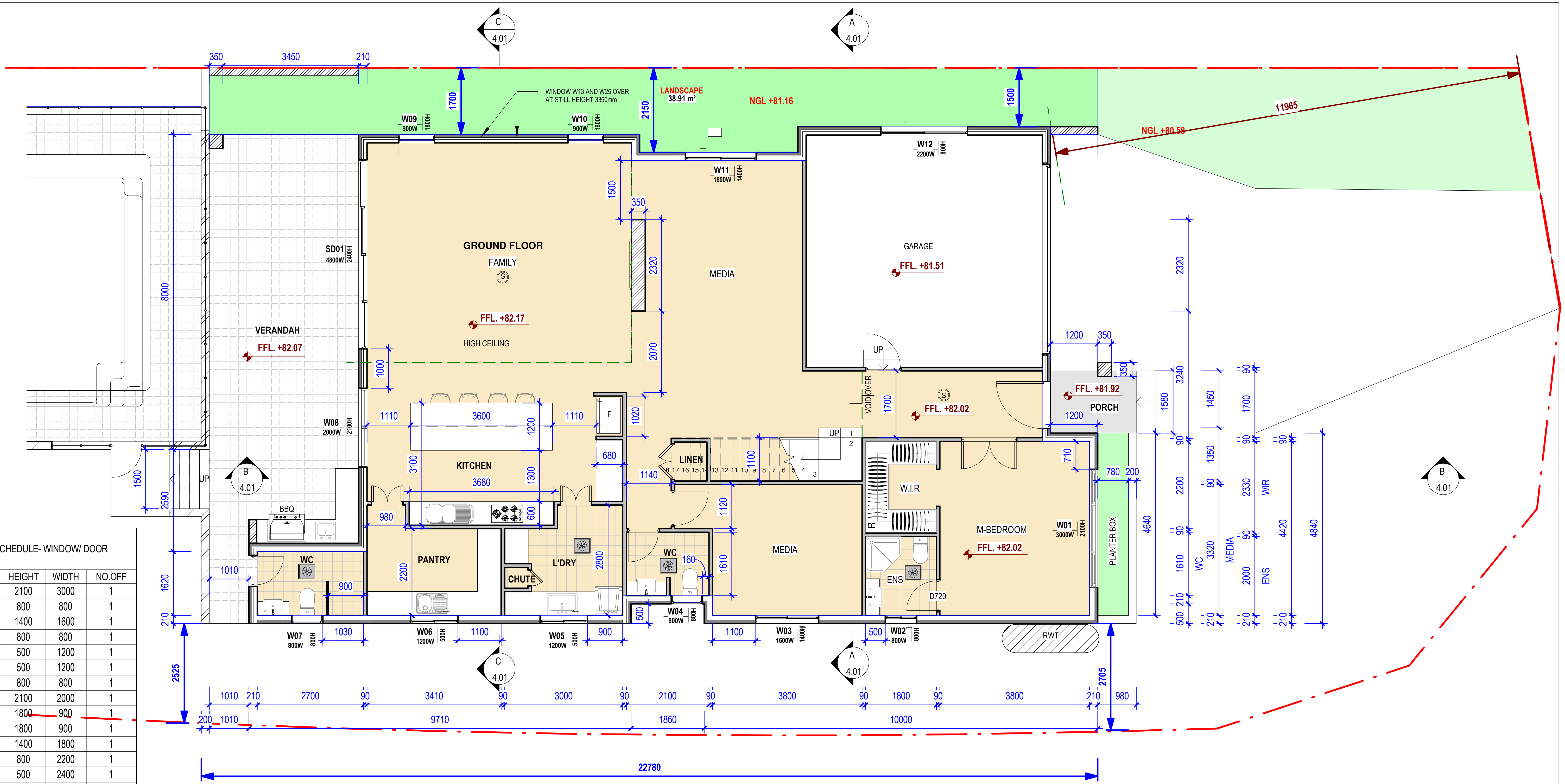
PROJECT	PROPOSED TWO STOREY DWELLING 180 North Road EASTWOOD 2122 LOT 3 DP387071
CLIENT	Mr. GEORGE ELIAS
TITLE	SITE PLAN

RIDGE DESIGNS
ABN 60 167 981 982
G01/ 2A COOKS AVENUE
CANTERBURY , NSW 2193
PHONE: (02)97871595 FAX:97871095

RYDE CITY COUNCIL

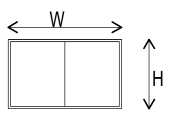
TRUE NORTH
SURVEY REFERENCE

DESIGNED G.M	CHECKED G.M
DRAWN	LT
SCALE	As indicated @ A3
JOB No	22048
REVISION	A
DRAWING NUMBER	1.01



SCHEDULE- WINDOW/ DOOR

MARK	HEIGHT	WIDTH	NO.OFF
W01	2100	3000	1
W02	800	800	1
W03	1400	1600	1
W04	800	800	1
W05	500	1200	1
W06	500	1200	1
W07	800	800	1
W08	2100	2000	1
W09	1800	900	1
W10	1800	900	1
W11	1400	1800	1
W12	800	2200	1
W13	500	2400	1
W14	2500	1200	1
W15	1800	900	1
W16	1800	900	1
W17	800	2000	1
W18	800	2000	1
W19	800	2200	1
W20	700	1200	1
W21	800	2000	1
W22	500	2000	1
W23	800	1000	1
W24	800	2200	1
W25	500	2400	1
SD01	2400	4800	1
SD02	2300	3600	1



- ALL WINDOWS & DOORS SCHEDULE DIMENSIONS ARE TO BE CHECKED AND VERIFIED ON-SITE BY THE BUILDER PRIOR TO THE COMMENCEMENT OF WORKS INCLUDING ANY MANUFACTURING, ORDERING, INSTALLATION AND THE LIKE. ANY INCONSISTENCIES OR CONFLICTS ARE TO BE BROUGHT TO THE ATTENTION OF RIDGE DESIGNS.
- OPENABLE BEDROOM WINDOWS TO BE PROTECTED TO PART 3.9.2.6 OF THE BCA AND OTHER ROOMS TO PART 3.9.2.7 OF THE BCA.

NOTE:

MECHANIAL VENTILATION TO COMPLY WITH THE BCA NCC 2016 PART 3.8.5 VENTILATION / 3.8.5.2 VENTILATION REQUIREMENTS

SK SKY LIGHT

S SMOKE ALARMS - INTERCONNECTED TO PART 3.7.5 OF THE BCA
LIFT OFF HINGES

HEIGHTS OF THE BALUSTRADE OF THE BALCONY TO COMPLY WITH BCA 3.9.2.3 CONSTRUCTION OF BARRIERS TO PREVENT FALLS

1 GROUND FLOOR PLAN

SCALE 1 : 100

0 1 2 4 8m 1:100

NOTES

1. ALL DIMENSIONS AND FLOOR AREAS TO BE VERIFIED BUILDER PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK. ANY DISCREPANCIES ARE TO BE CONFIRMED BY THE DESIGNER.
2. LEVELS SHOWN ARE APPROXIMATE UNLESS ACCOMPANIED BY REDUCED LEVELS BY A REGISTERED SURVEYOR.
3. FIGURED DIMENSIONS ARE TO BE TAKEN IN PREFERENCE TO SCALING.
4. ALL BOUNDARY CLEARANCES MUST BE VERIFIED BY THE SURVEYOR PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK.
5. WHERE ENGINEERING OR HYDRAULIC DRAWINGS ARE REQUIRED, SUCH MUST TAKE PREFERENCE TO THIS DRAWING.
6. STORMWATER TO BE CONNECTED AND DISCHARGED TO COUNCIL'S REQUIREMENTS AND TO AS 3500.3.1990
7. ALL SERVICES TO BE LOCATED AND VERIFIED BY THE BUILDER WITH THE RELEVANT AUTHORITIES PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK

REV	BY	AMENDMENT	DATE
A	LT	ISSUED FOR DA APPROVAL	03.11.2022

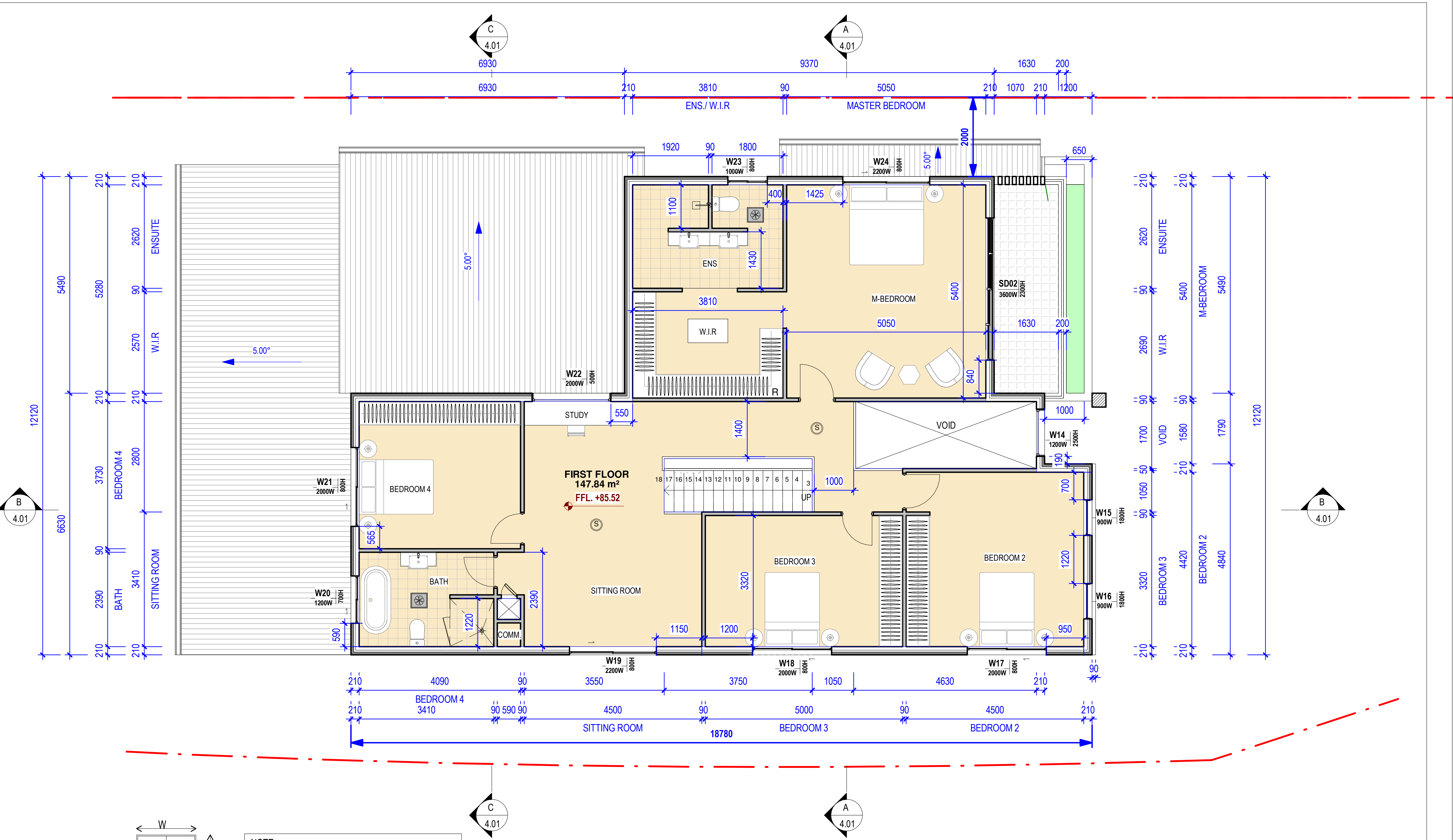
PROJECT	PROPOSED TWO STOREY DWELLING 180 North Road EASTWOOD 2122 LOT 3 DP387071
CLIENT	Mr. GEORGE ELIAS
TITLE	GROUND FLOOR PLAN

RIDGE DESIGNS
ABN 60 167 981 982
G01/ 2A COOKS AVENUE
CANTERBURY , NSW 2193
PHONE: (02)97871595 FAX:97871095

RYDE CITY COUNCIL

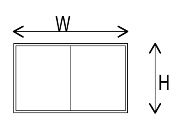
TRUE NORTH
SURVEY REFERENCE

DESIGNED G.M	CHECKED G.M
DRAWN	LT
SCALE	1 : 100 @ A3
JOB No	22048
DRAWING NUMBER 2.01	REVISION A



SCHEDULE- WINDOW/ DOOR

MARK	HEIGHT	WIDTH	NO.OFF
W01	2100	3000	1
W02	800	800	1
W03	1400	1600	1
W04	800	800	1
W05	500	1200	1
W06	500	1200	1
W07	800	800	1
W08	2100	2000	1
W09	1800	900	1
W10	1800	900	1
W11	1400	1800	1
W12	800	2200	1
W13	500	2400	1
W14	2500	1200	1
W15	1800	900	1
W16	1800	900	1
W17	800	2000	1
W18	800	2000	1
W19	800	2200	1
W20	700	1200	1
W21	800	2000	1
W22	500	2000	1
W23	800	1000	1
W24	800	2200	1
W25	500	2400	1
SD01	2400	4800	1
SD02	2300	3600	1



- ALL WINDOWS & DOORS SCHEDULE DIMENSIONS ARE TO BE CHECKED AND VERIFIED ON-SITE BY THE BUILDER PRIOR TO THE COMMENCEMENT OF WORKS INCLUDING ANY MANUFACTURING, ORDERING, INSTALLATION AND THE LIKE. ANY INCONSISTENCIES OR CONFLICTS ARE TO BE BROUGHT TO THE ATTENTION OF RIDGE DESIGNS.
- OPENABLE BEDROOM WINDOWS TO BE PROTECTED TO PART 3.9.2.6 OF THE BCA AND OTHER ROOMS TO PART 3.9.2.7 OF THE BCA.

NOTE:

MECHANIAL VENTILATION TO COMPLY WITH THE BCA NCC 2016 PART 3.8.5 VENTILATION / 3.8.5.2 VENTILATION REQUIREMENTS

SK SKY LIGHT

S SMOKE ALARMS - INTERCONNECTED TO PART 3.7.5 OF THE BCA
LIFT OFF HINGES

HEIGHTS OF THE BALUSTRADE OF THE BALCONY TO COMPLY WITH BCA 3.9.2.3 CONSTRUCTION OF BARRIERS TO PREVENT FALLS

1 FIRST FLOOR PLAN

SCALE 1 : 100

0 1 2 4 8m 1:100

NOTES

1. ALL DIMENSIONS AND FLOOR AREAS TO BE VERIFIED BUILDER PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK. ANY DISCREPANCIES ARE TO BE CONFIRMED BY THE DESIGNER.
2. LEVELS SHOWN ARE APPROXIMATE UNLESS ACCOMPANIED BY REDUCED LEVELS BY A REGISTERED SURVEYOR.
3. FIGURED DIMENSIONS ARE TO BE TAKEN IN PREFERENCE TO SCALING.
4. ALL BOUNDARY CLEARANCES MUST BE VERIFIED BY THE SURVEYOR PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK.
5. WHERE ENGINEERING OR HYDRAULIC DRAWINGS ARE REQUIRED, SUCH MUST TAKE PREFERENCE TO THIS DRAWING.
6. STORMWATER TO BE CONNECTED AND DISCHARGED TO COUNCIL'S REQUIREMENTS AND TO AS 3500.3.1990
7. ALL SERVICES TO BE LOCATED AND VERIFIED BY THE BUILDER WITH THE RELEVANT AUTHORITIES PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK

REV	BY	AMENDMENT	DATE
A	LT	ISSUED FOR DA APPROVAL	03.11.2022

PROJECT	PROPOSED TWO STOREY DWELLING 180 North Road EASTWOOD 2122 LOT 3 DP387071
CLIENT	Mr. GEORGE ELIAS
TITLE	FIRST FLOOR PLAN

RIDGE DESIGNS
ABN 60 167 981 982
G01/ 2A COOKS AVENUE
CANTERBURY , NSW 2193
PHONE: (02)97871595 FAX:97871095

RYDE CITY COUNCIL

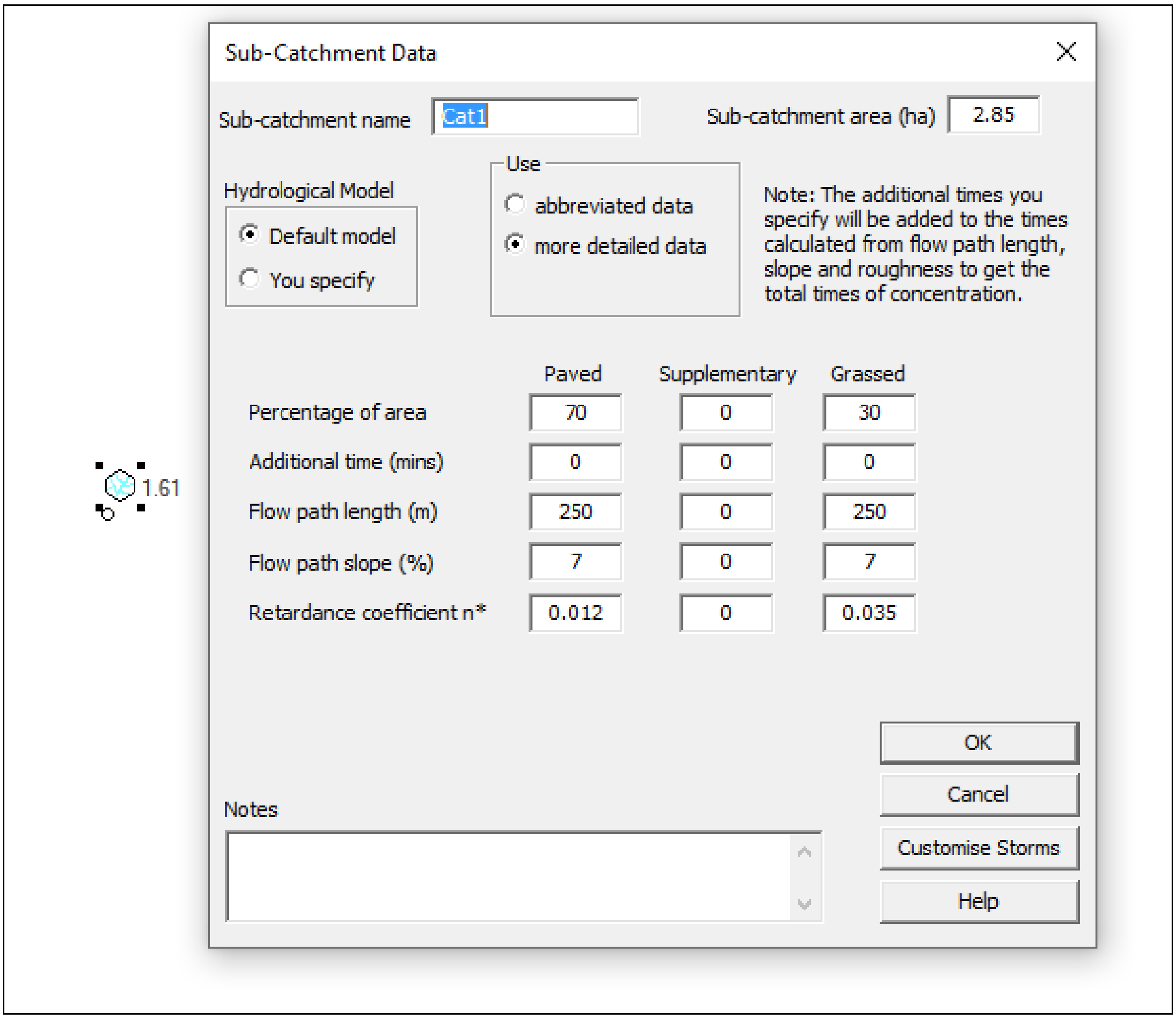
TRUE NORTH
SURVEY REFERENCE

DESIGNED G.M	CHECKED G.M
DRAWN	LT
SCALE 1 : 100	@ A3
JOB No	22048
REVISION	A

DRAWING NUMBER 2.02

Appendix C DRAINS MODEL LAYOUT & RESULTS

DRAINS Model Layout with results

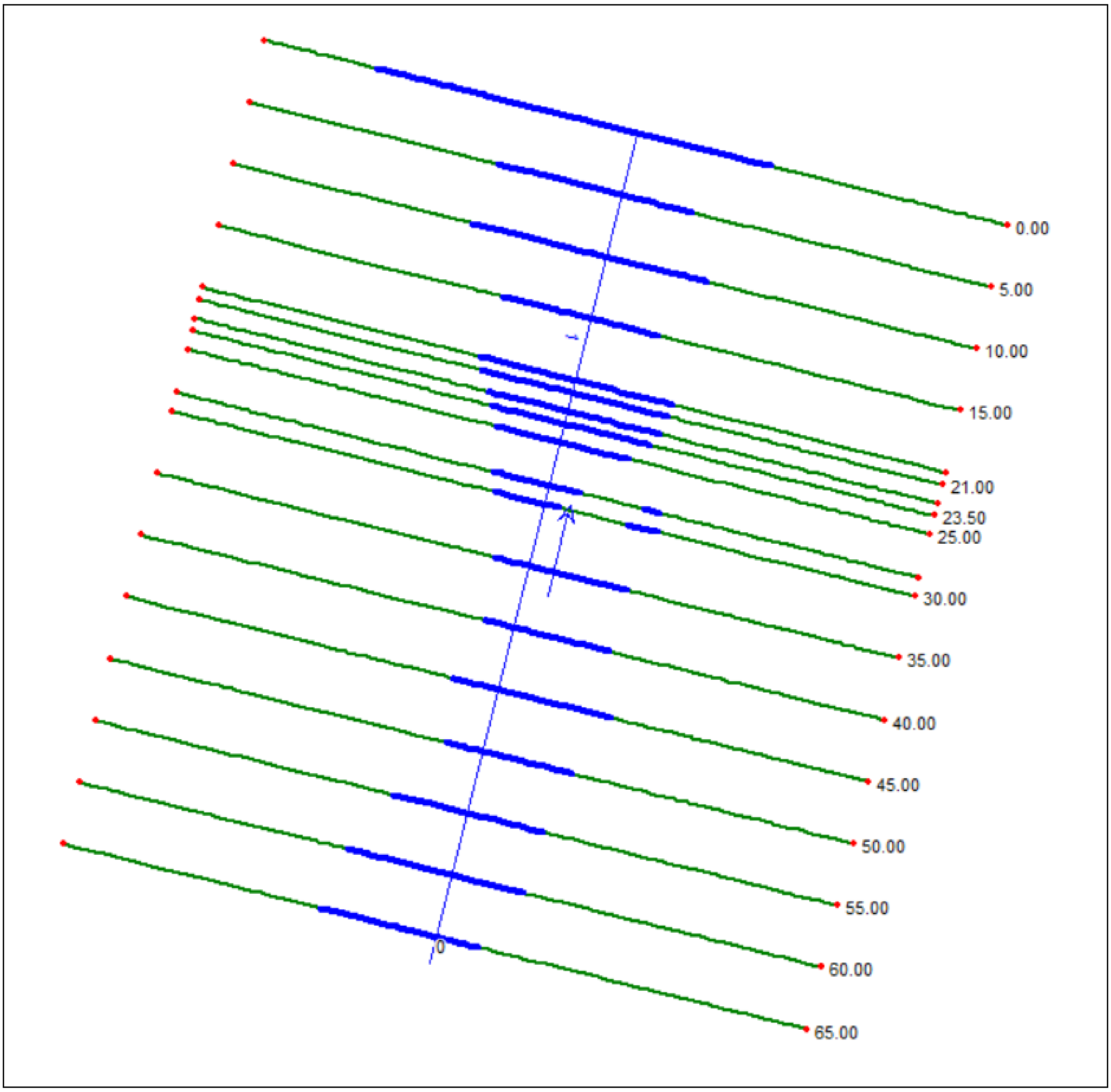


DRAINS DATA

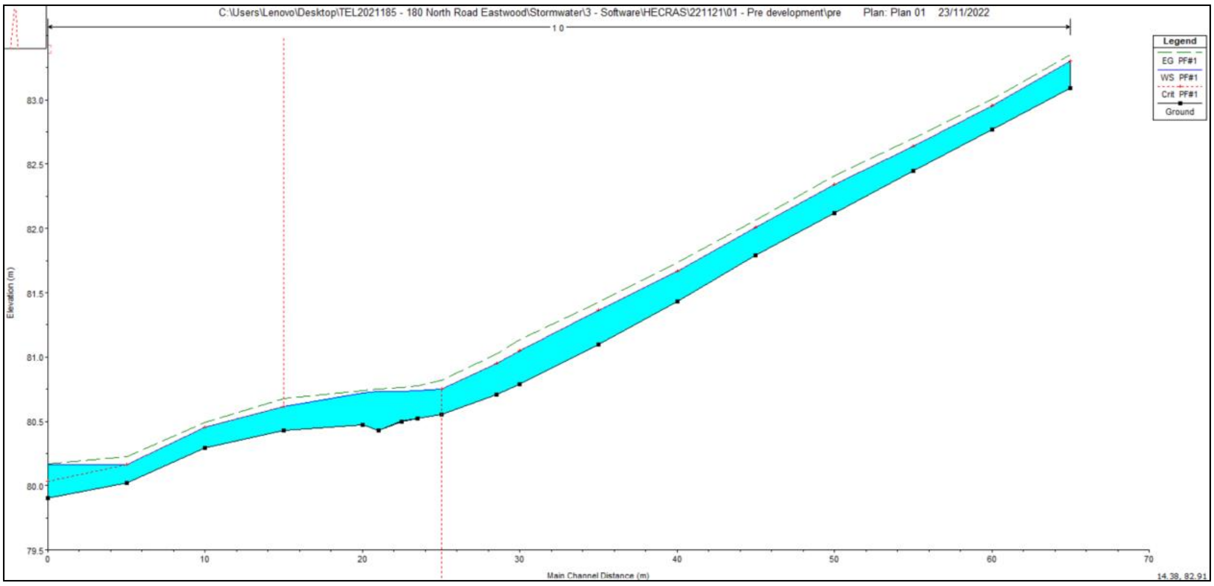
DRAINS results prepared from Version 2021.01							
PIT / NODE DETAILS				Version 8			
Name	Max HGL	Max Pond	Max Surface	Max Pond	Min	Overflow	Constraint
		HGL	Flow Arriving	Volume	Freeboard	(cu.m/s)	
			(cu.m/s)	(cu.m)	(m)		
SUB-CATCHMENT DETAILS							
Name	Max	Paved	Grassed	Paved	Grassed	Supp.	Due to Storm
	Flow Q	Max Q	Max Q	Tc	Tc	Tc	
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)	
Cat1	1.614	1.337	0.278	3.32	6.31	0	1% AEP, 5 min burst, Storm 1

Appendix D HEC-RAS OUTPUT DATA

HEC-RAS Plan View (Pre-Development Scenario)

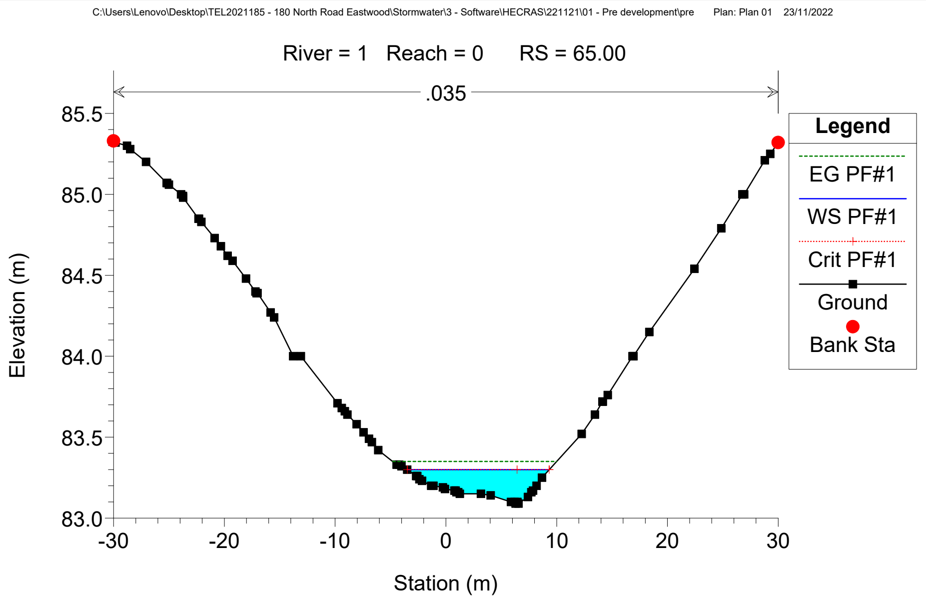


HEC-RAS Long Section (Pre-Development Scenario)

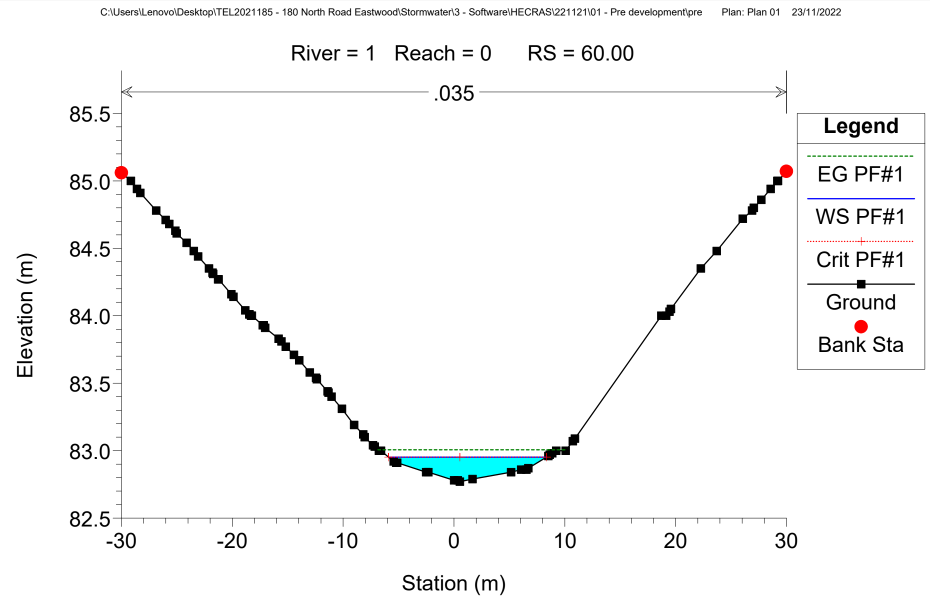


HEC-RAS Tabulated Results (Pre-Development Scenario)

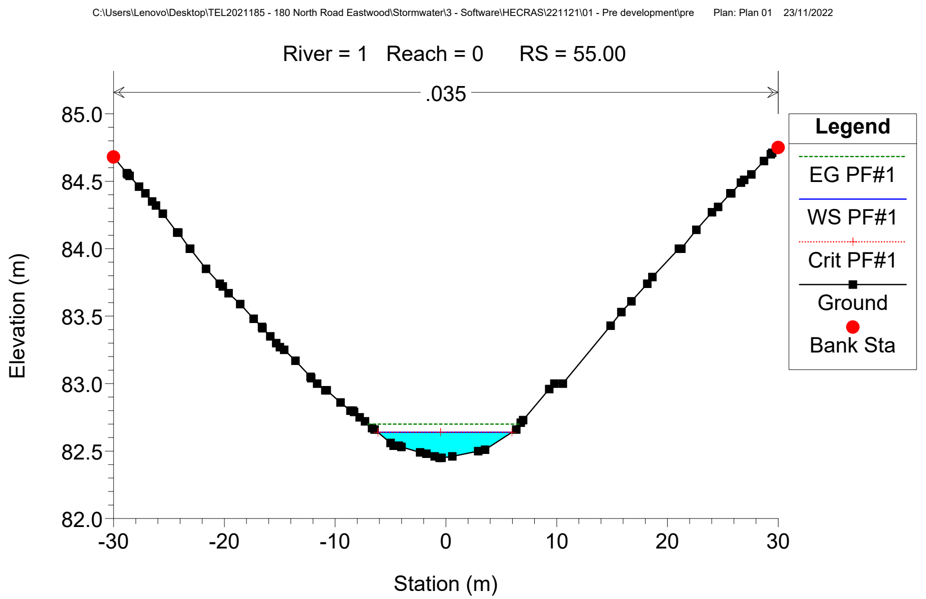
HEC-RAS Plan: Plan 01 River: 1 Reach: 0 Profile: PF#1												
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
0	65.00	PF#1	1.61	83.09	83.30	83.30	83.35	0.018845	0.99	1.63	12.81	0.89
0	60.00	PF#1	1.61	82.77	82.95	82.95	83.01	0.025032	1.03	1.56	14.27	1.00
0	55.00	PF#1	1.61	82.45	82.64	82.64	82.70	0.024048	1.09	1.48	12.10	1.00
0	50.00	PF#1	1.61	82.12	82.34	82.34	82.41	0.023266	1.15	1.40	10.29	1.00
0	45.00	PF#1	1.61	81.79	82.01	82.01	82.07	0.025231	1.08	1.49	12.85	1.01
0	40.00	PF#1	1.61	81.43	81.67	81.67	81.74	0.023389	1.17	1.38	10.02	1.00
0	35.00	PF#1	1.61	81.10	81.36	81.36	81.43	0.023483	1.13	1.42	10.73	1.00
0	30.00	PF#1	1.61	80.79	81.05	81.05	81.13	0.023295	1.27	1.27	7.70	1.00
0	28.50	PF#1	1.61	80.71	80.95	80.95	81.02	0.023146	1.23	1.31	8.39	1.00
0	25.00	PF#1	1.61	80.55	80.75	80.75	80.82	0.023481	1.13	1.42	10.76	1.00
0	23.50	PF#1	1.61	80.52	80.74		80.77	0.010753	0.84	1.93	12.83	0.69
0	22.50	PF#1	1.61	80.50	80.73		80.76	0.008625	0.76	2.12	13.87	0.62
0	21.00	PF#1	1.61	80.43	80.73		80.75	0.004498	0.60	2.67	15.12	0.46
0	20.00	PF#1	1.61	80.47	80.72		80.74	0.007277	0.69	2.34	15.64	0.57
0	15.00	PF#1	1.61	80.43	80.61	80.61	80.68	0.025609	1.09	1.47	12.61	1.02
0	10.00	PF#1	1.61	80.29	80.45	80.45	80.49	0.020196	0.86	1.87	19.03	0.88
0	5.00	PF#1	1.61	80.02	80.16	80.16	80.22	0.031966	1.07	1.51	15.77	1.10
0	0.00	PF#1	1.61	79.90	80.16	80.03	80.17	0.001000	0.28	5.65	31.86	0.22



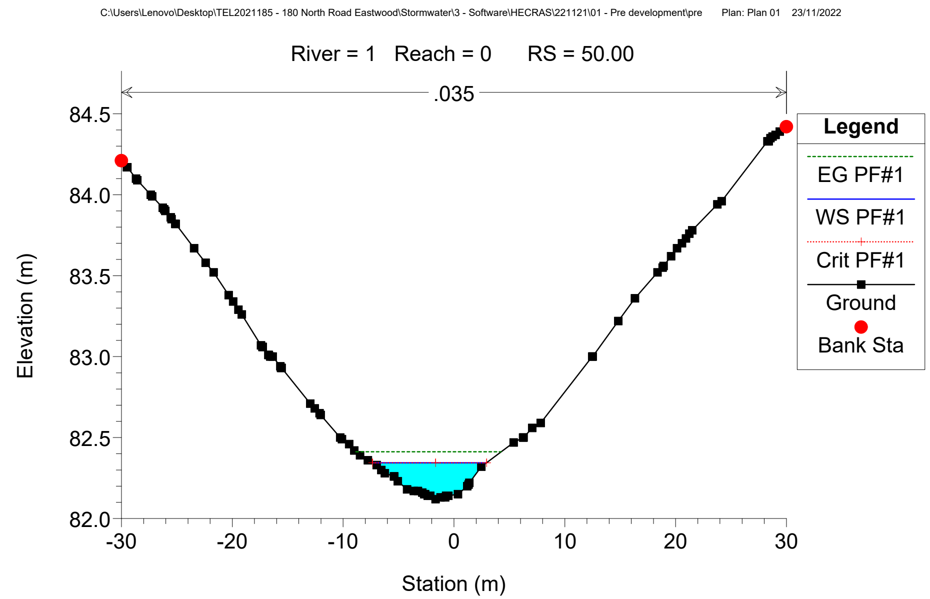
C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 65.00
.035
Elevation (m)
85.5
85.0
84.5
84.0
83.5
83.0
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta



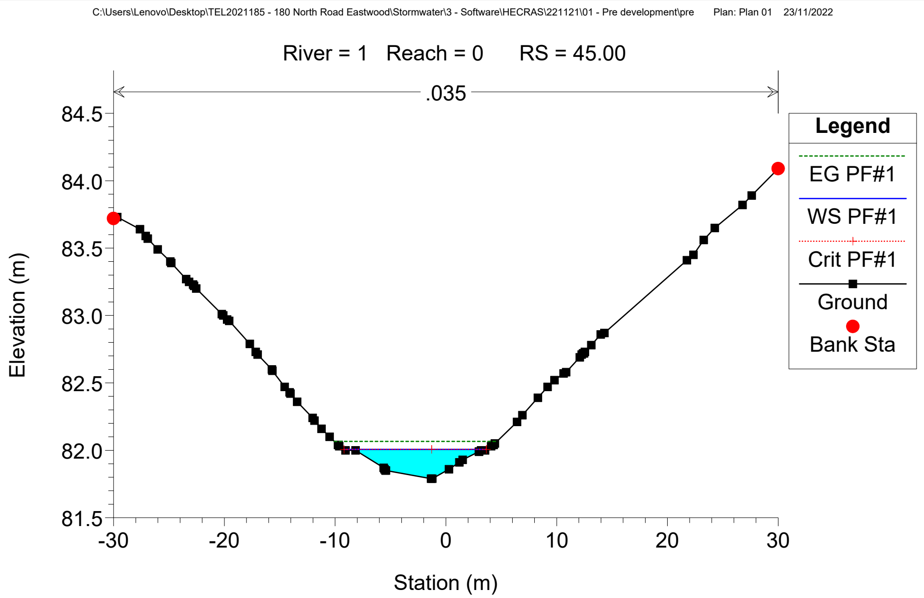
C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 60.00
.035
Elevation (m)
85.5
85.0
84.5
84.0
83.5
83.0
82.5
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

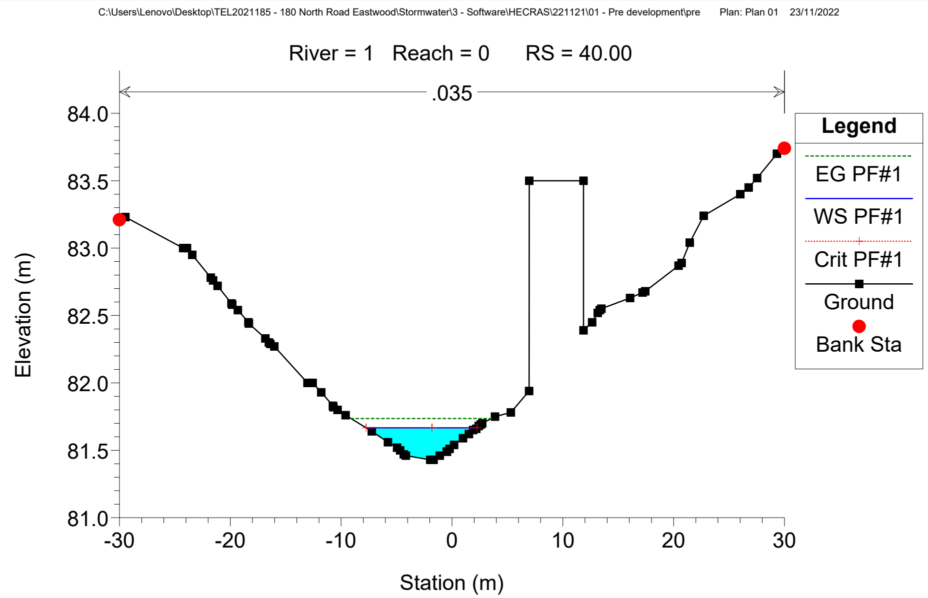


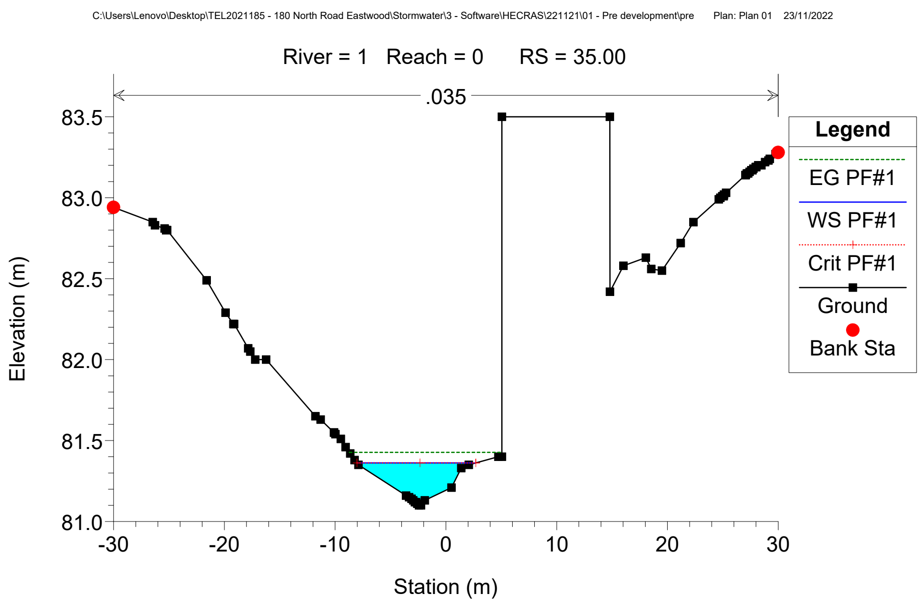
C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 55.00
.035
Elevation (m)
85.0
84.5
84.0
83.5
83.0
82.5
82.0
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

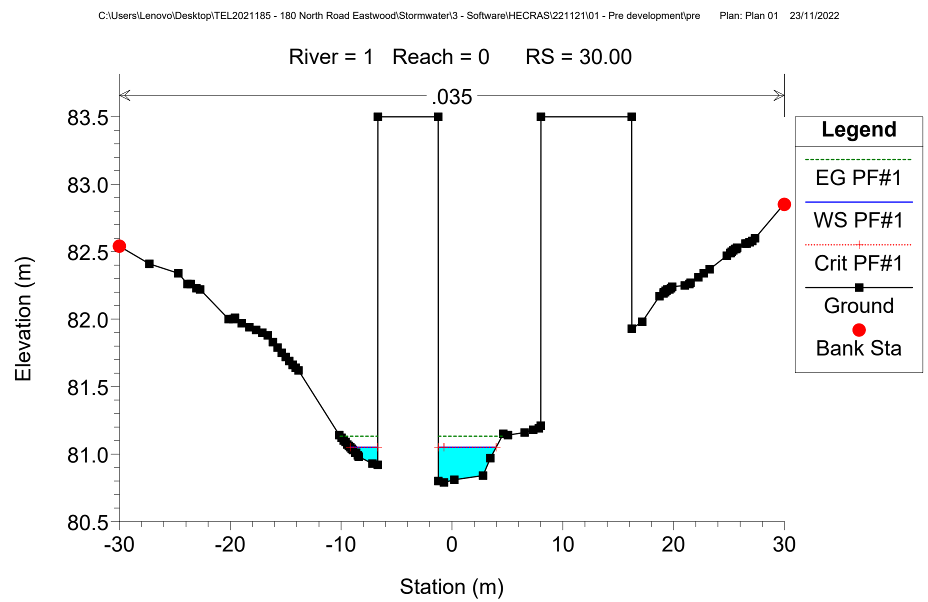


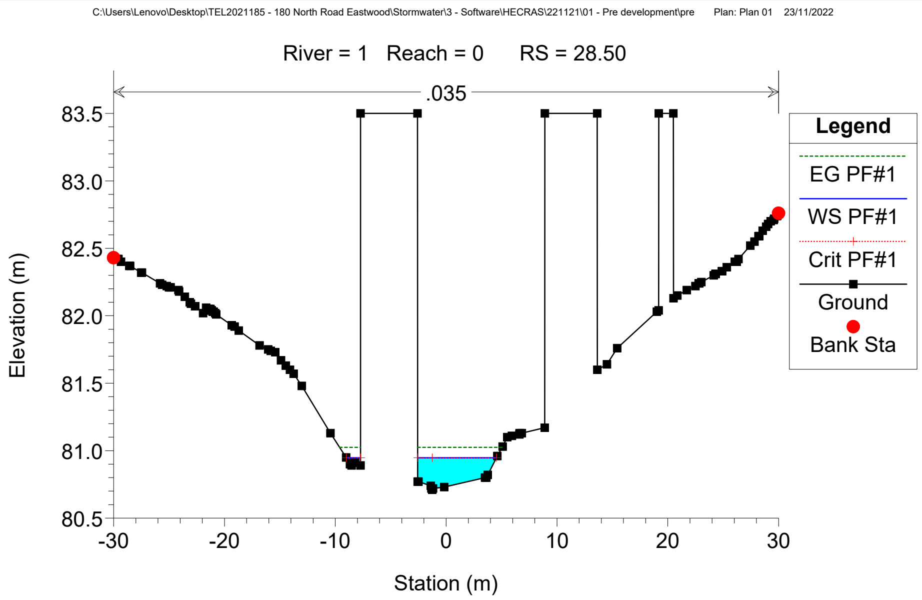
C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 50.00
.035
Elevation (m)
84.5
84.0
83.5
83.0
82.5
82.0
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

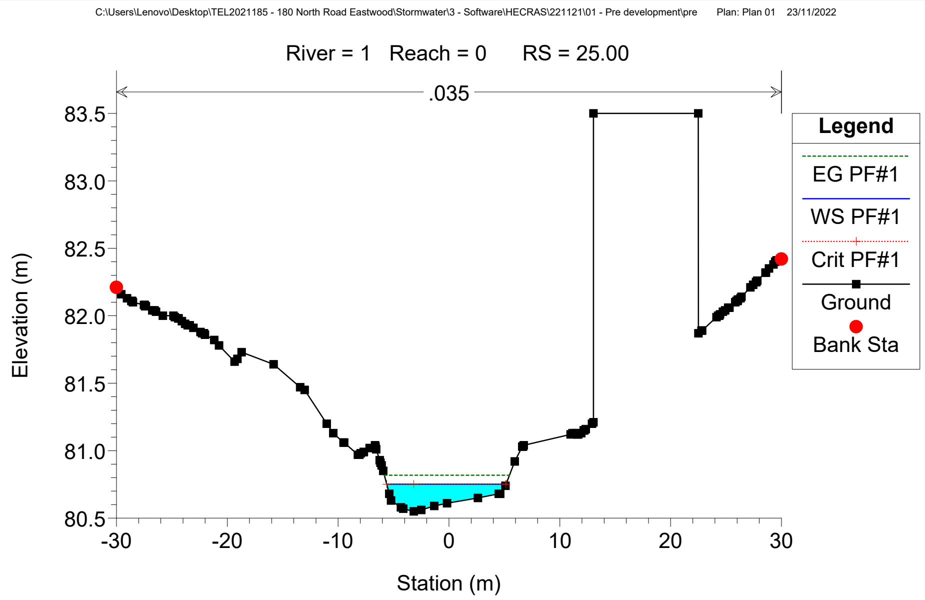

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 45.00
.035
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
84.5
84.0
83.5
83.0
82.5
82.0
81.5
-30
-20
-10
0
10
20
30

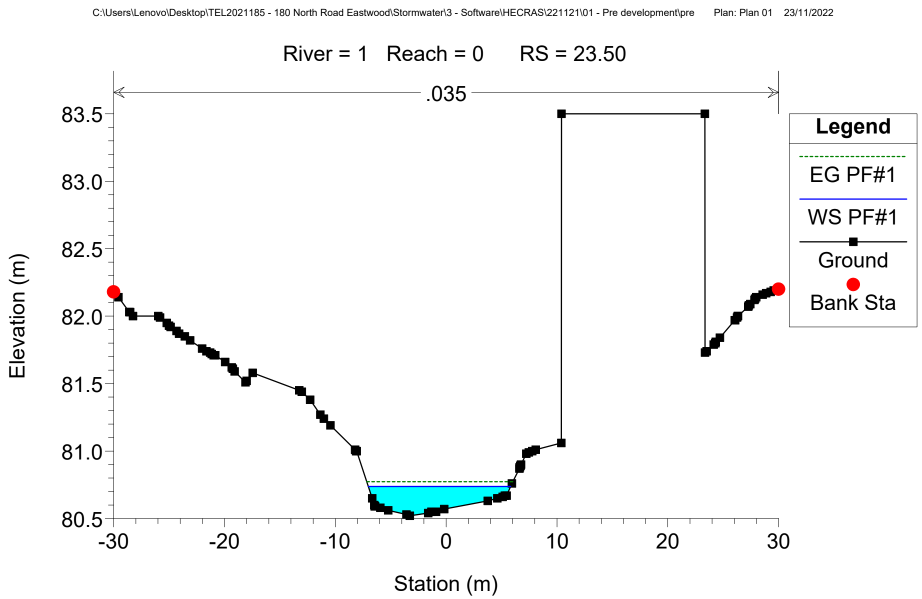

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 40.00
.035
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
84.0
83.5
83.0
82.5
82.0
81.5
81.0
-30
-20
-10
0
10
20
30

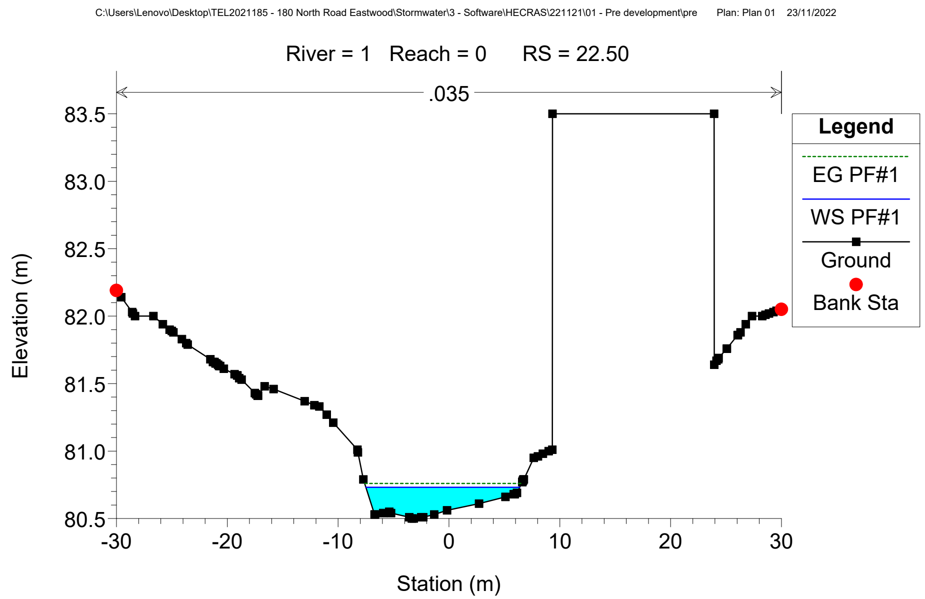

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 35.00
.035
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
83.5
83.0
82.5
82.0
81.5
81.0
-30
-20
-10
0
10
20
30

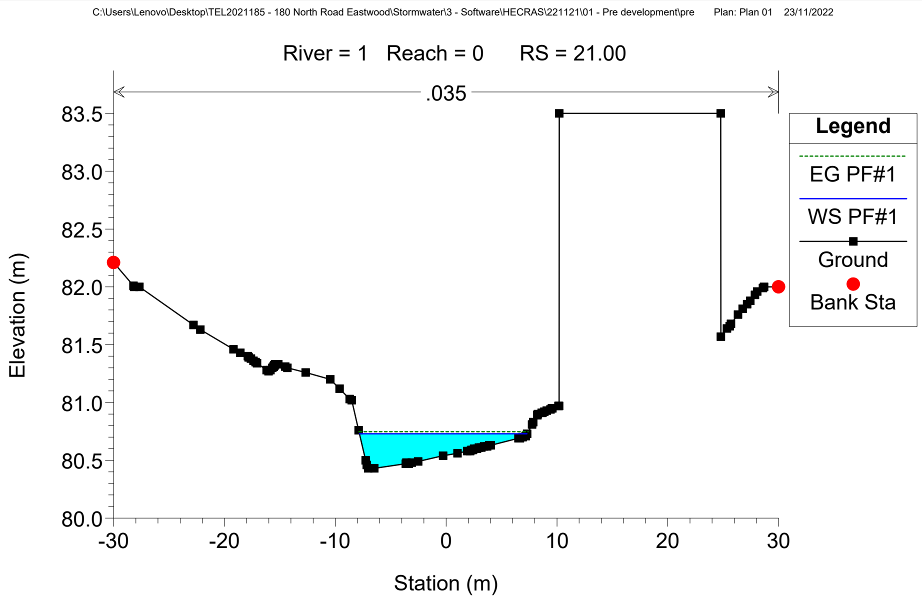

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 30.00
.035
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
83.5
83.0
82.5
82.0
81.5
81.0
80.5
-30
-20
-10
0
10
20
30

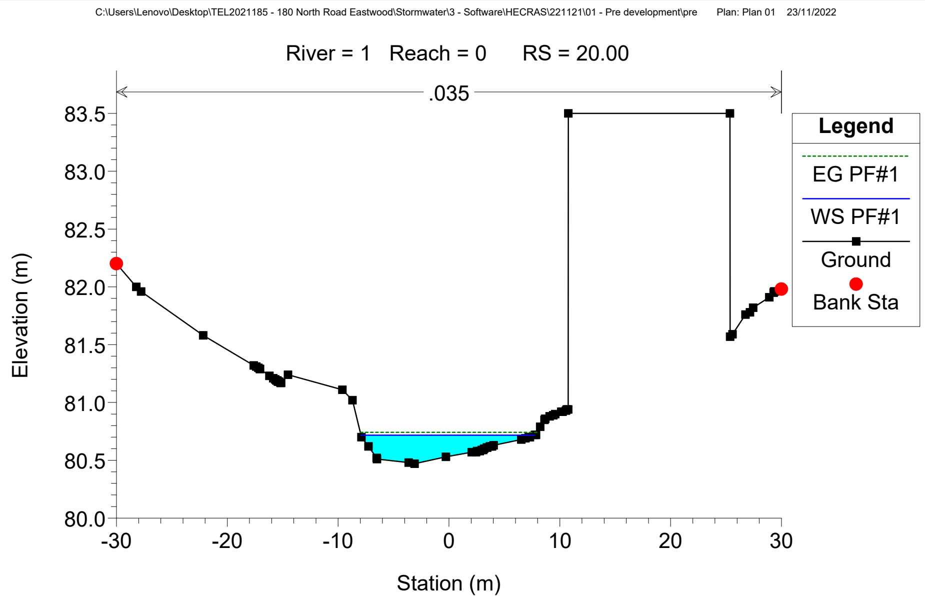

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 28.50
.035
Elevation (m)
83.5
83.0
82.5
82.0
81.5
81.0
80.5
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

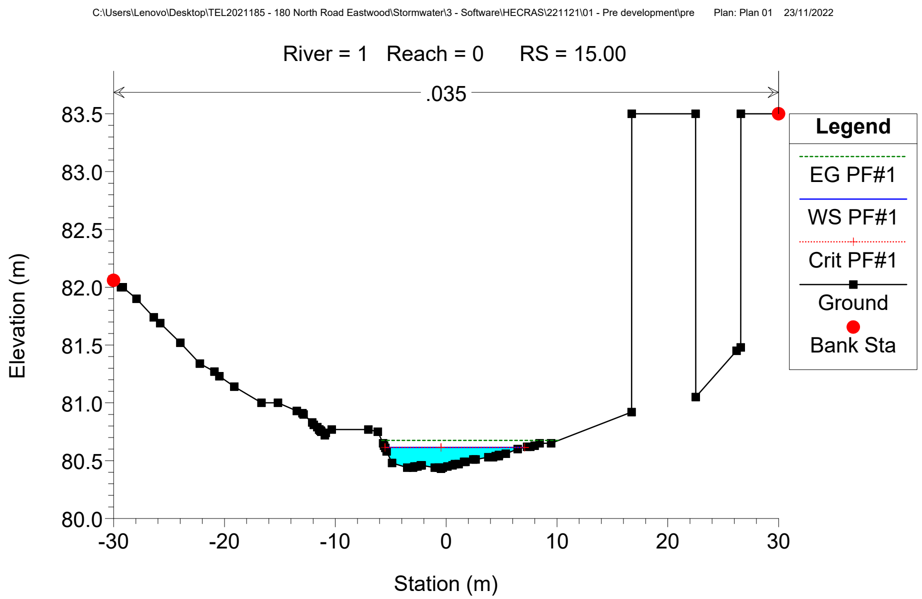

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 25.00
.035
Elevation (m)
83.5
83.0
82.5
82.0
81.5
81.0
80.5
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

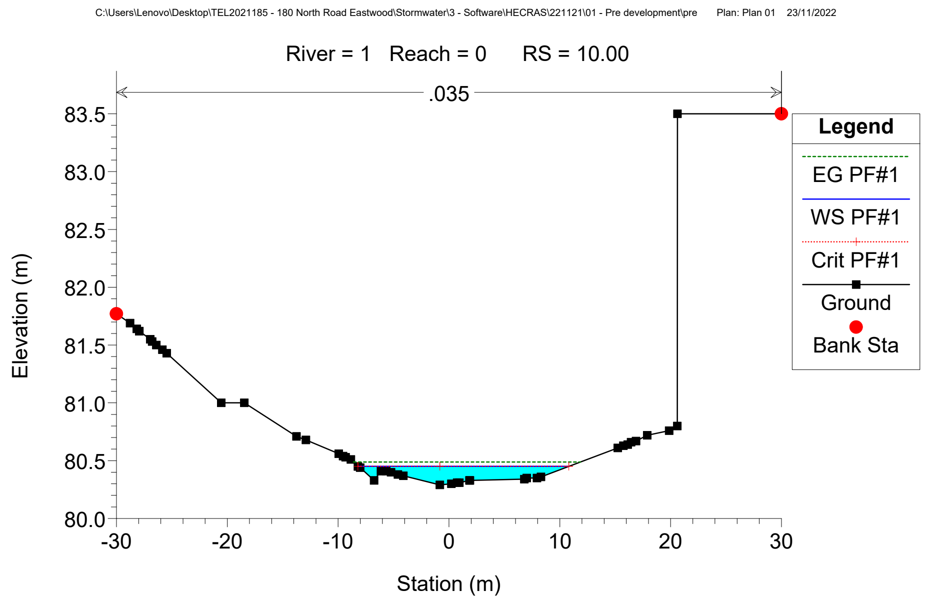

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 23.50
.035
Elevation (m)
83.5
83.0
82.5
82.0
81.5
81.0
80.5
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

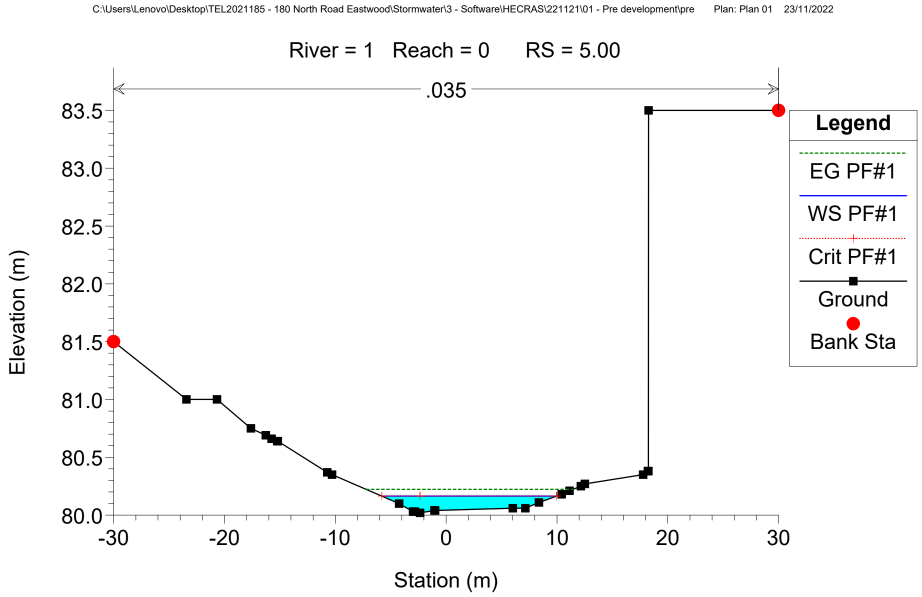

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 22.50
.035
Elevation (m)
83.5
83.0
82.5
82.0
81.5
81.0
80.5
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

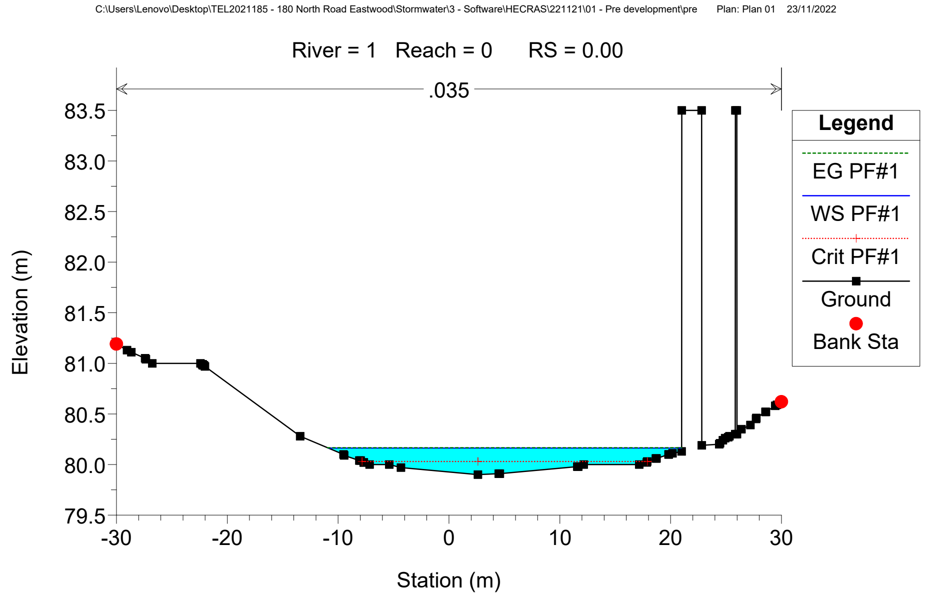

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 21.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 20.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

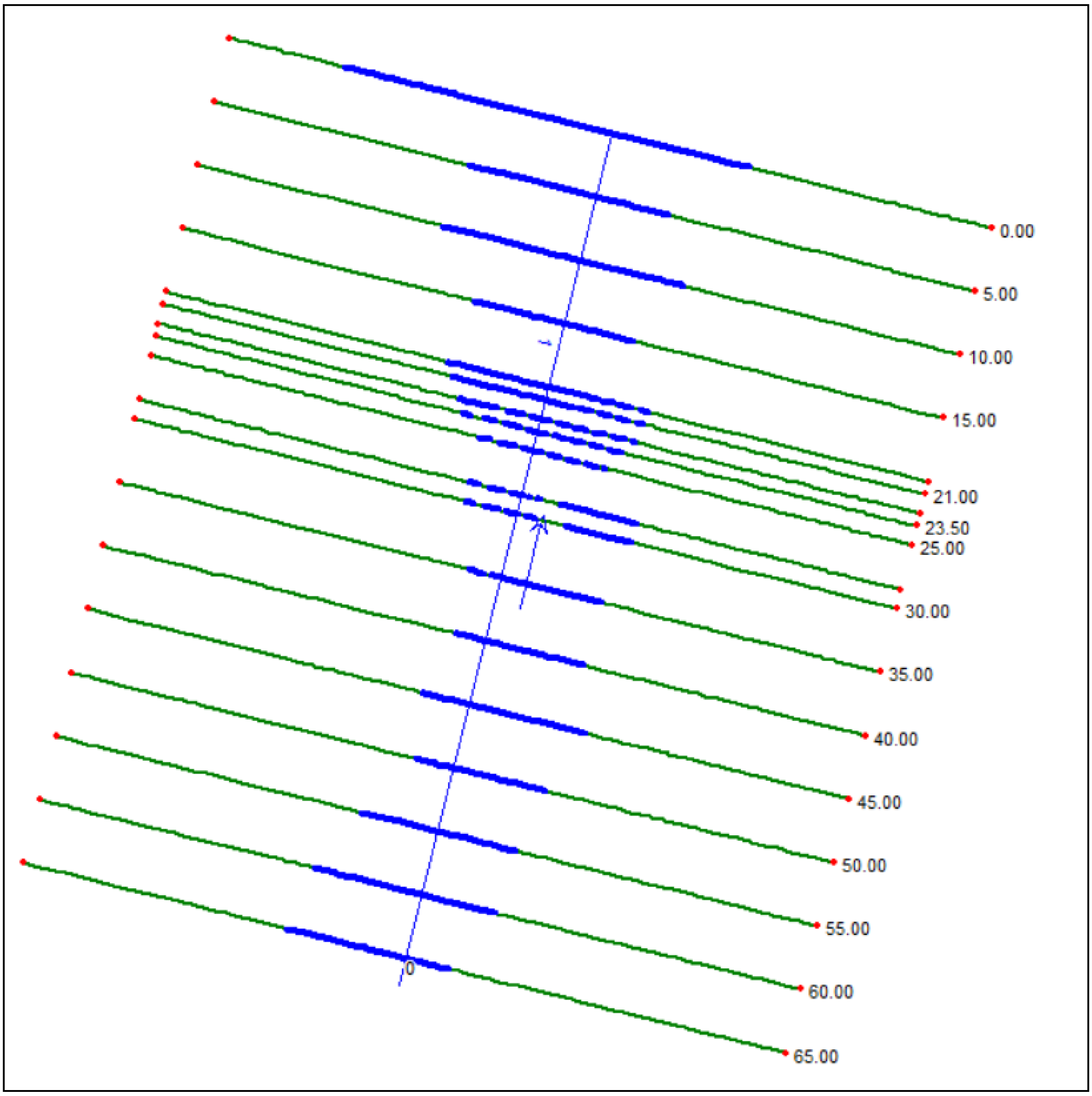

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 15.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 10.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

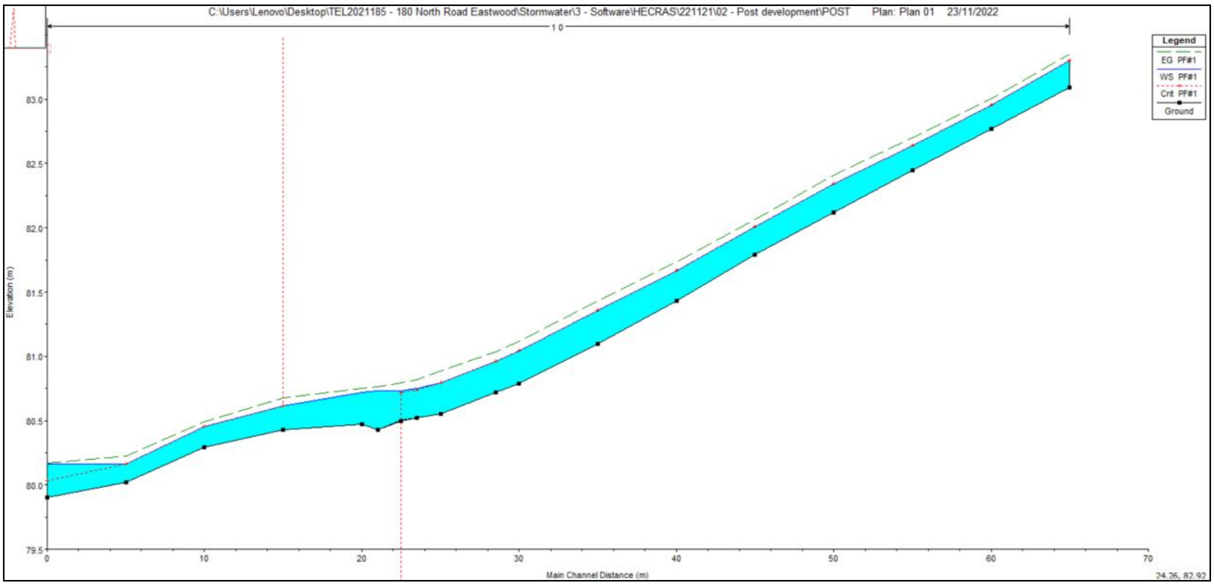

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 5.00
.035
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
83.5
83.0
82.5
82.0
81.5
81.0
80.5
80.0
-30
-20
-10
0
10
20
30
Station (m)


C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\01 - Pre development\pre Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 0.00
.035
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
83.5
83.0
82.5
82.0
81.5
81.0
80.5
80.0
79.5
-30
-20
-10
0
10
20
30
Station (m)

HEC-RAS Plan View (Post-Development Scenario)

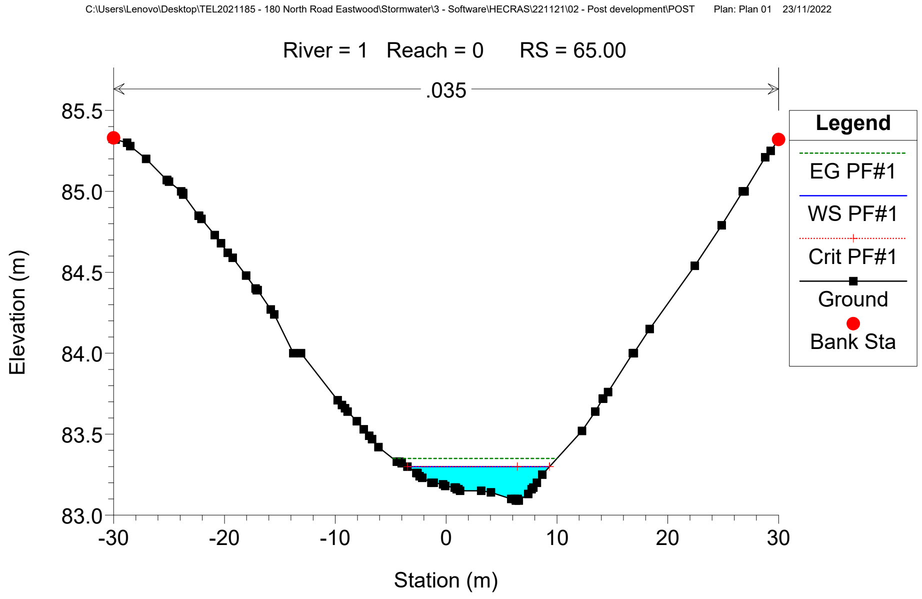


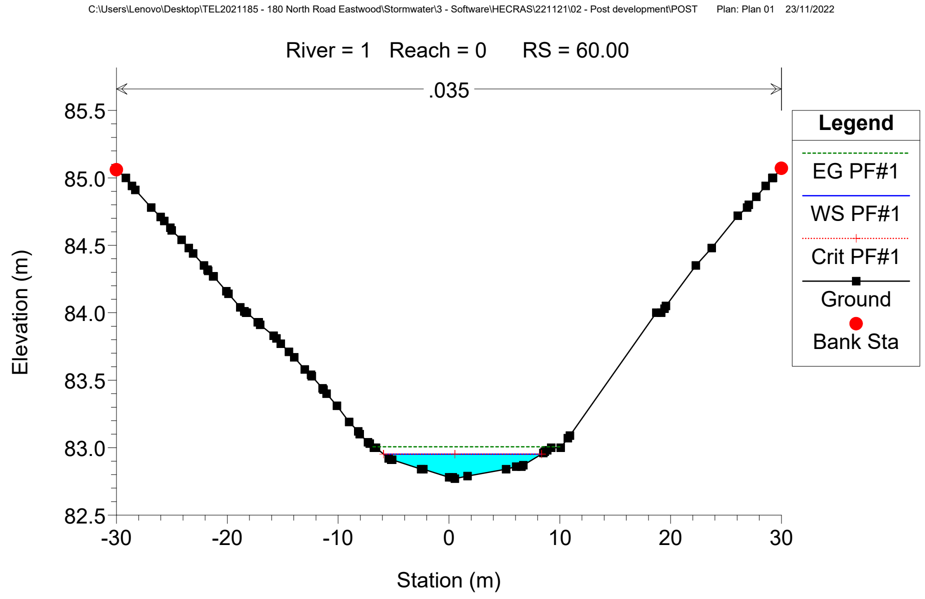
HEC-RAS Long Section (Post-Development Scenario)

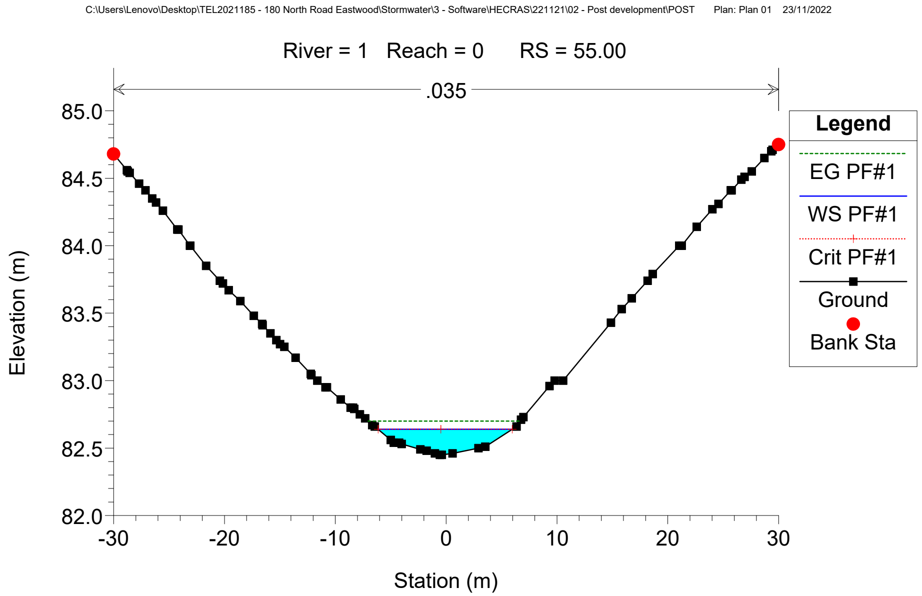


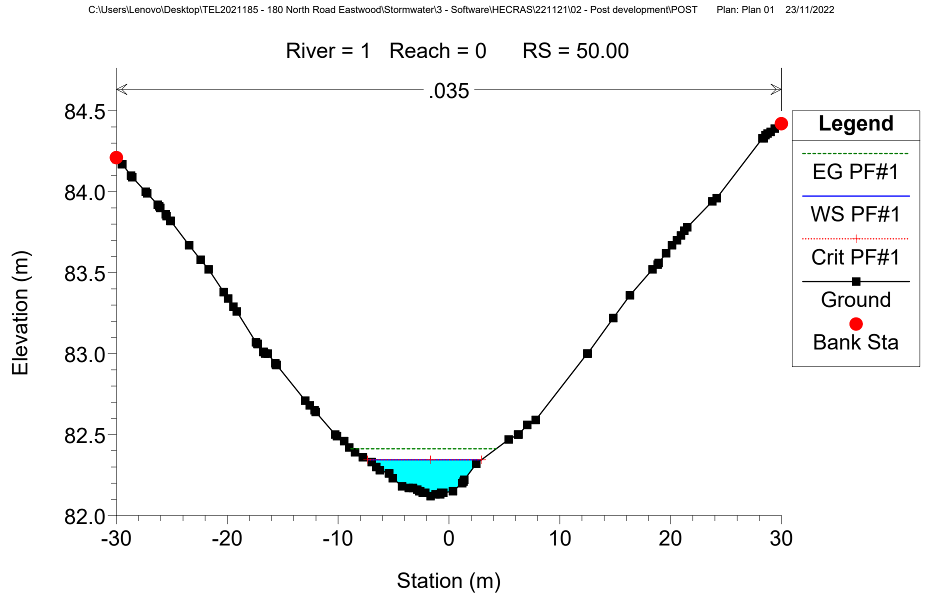
HEC-RAS Tabulated Results (Post-Development Scenario)

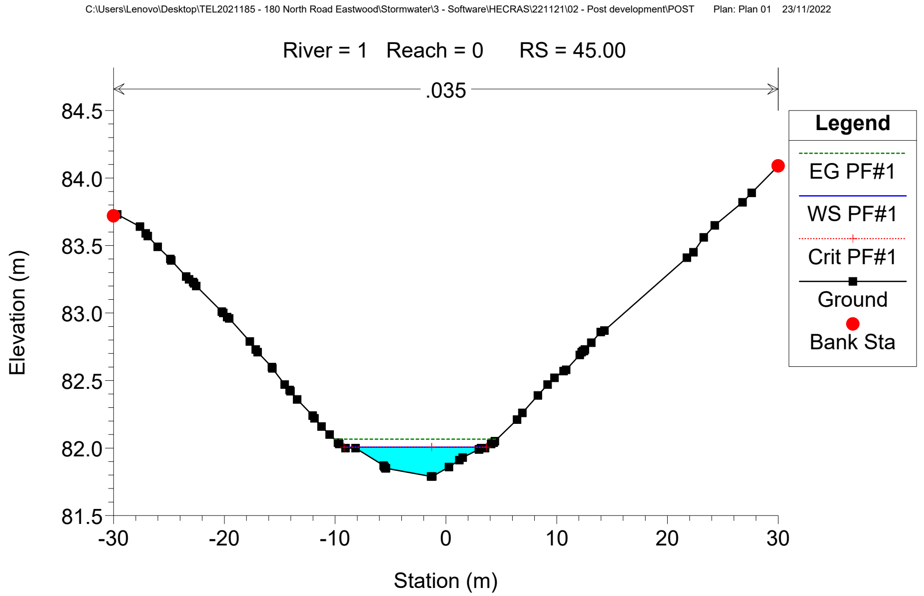
HEC-RAS Plan: Plan 01 River: 1 Reach: 0 Profile: PF#1												
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
0	65.00	PF#1	1.61	83.09	83.30	83.30	83.35	0.018845	0.99	1.63	12.81	0.89
0	60.00	PF#1	1.61	82.77	82.95	82.95	83.01	0.025032	1.03	1.56	14.27	1.00
0	55.00	PF#1	1.61	82.45	82.64	82.64	82.70	0.024048	1.09	1.48	12.10	1.00
0	50.00	PF#1	1.61	82.12	82.34	82.34	82.41	0.023266	1.15	1.40	10.29	1.00
0	45.00	PF#1	1.61	81.79	82.01	82.01	82.07	0.025231	1.08	1.49	12.85	1.01
0	40.00	PF#1	1.61	81.43	81.67	81.67	81.74	0.023389	1.17	1.38	10.02	1.00
0	35.00	PF#1	1.61	81.10	81.36	81.36	81.43	0.025964	1.20	1.35	10.00	1.04
0	30.00	PF#1	1.61	80.79	81.04	81.04	81.12	0.028230	1.21	1.33	8.87	1.00
0	28.50	PF#1	1.61	80.72	80.96	80.96	81.03	0.030068	1.17	1.37	9.66	0.99
0	25.00	PF#1	1.61	80.55	80.79	80.79	80.88	0.031257	1.33	1.21	6.63	1.00
0	23.50	PF#1	1.61	80.52	80.75	80.74	80.82	0.025407	1.16	1.39	8.31	0.90
0	22.50	PF#1	1.61	80.50	80.73	80.72	80.79	0.023889	1.07	1.50	10.09	0.89
0	21.00	PF#1	1.61	80.43	80.73		80.76	0.009491	0.75	2.14	13.12	0.59
0	20.00	PF#1	1.61	80.47	80.72		80.75	0.009673	0.75	2.16	14.52	0.62
0	15.00	PF#1	1.61	80.43	80.61	80.61	80.68	0.025609	1.09	1.47	12.61	1.02
0	10.00	PF#1	1.61	80.29	80.45	80.45	80.49	0.020196	0.86	1.87	19.03	0.88
0	5.00	PF#1	1.61	80.02	80.16	80.16	80.22	0.031966	1.07	1.51	15.77	1.10
0	0.00	PF#1	1.61	79.90	80.16	80.03	80.17	0.001000	0.28	5.65	31.86	0.22

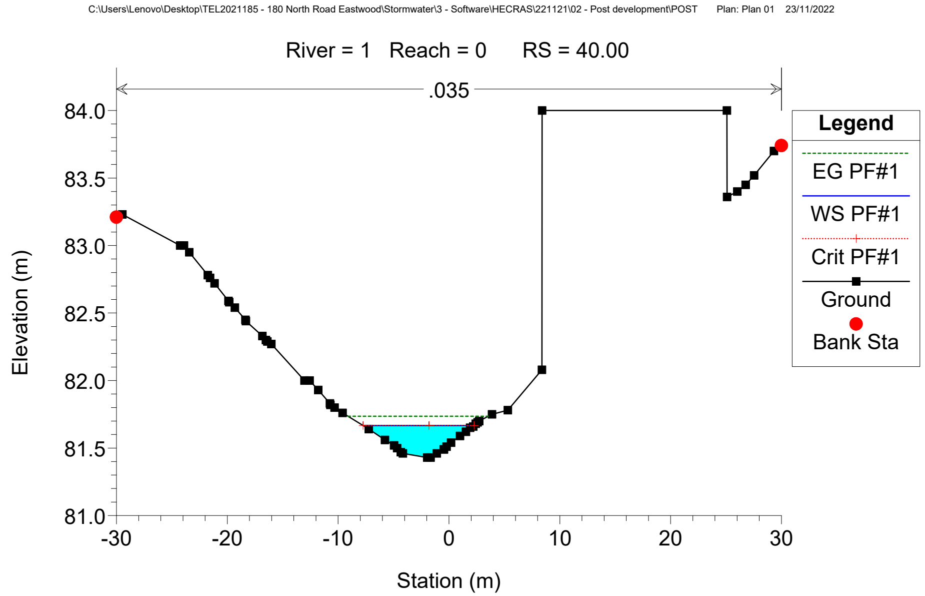

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 65.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

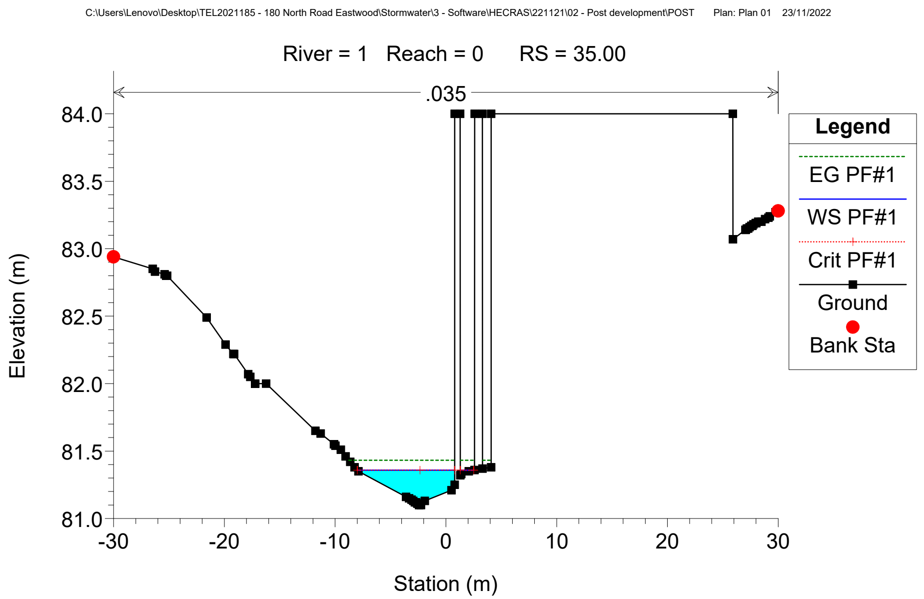

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 60.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

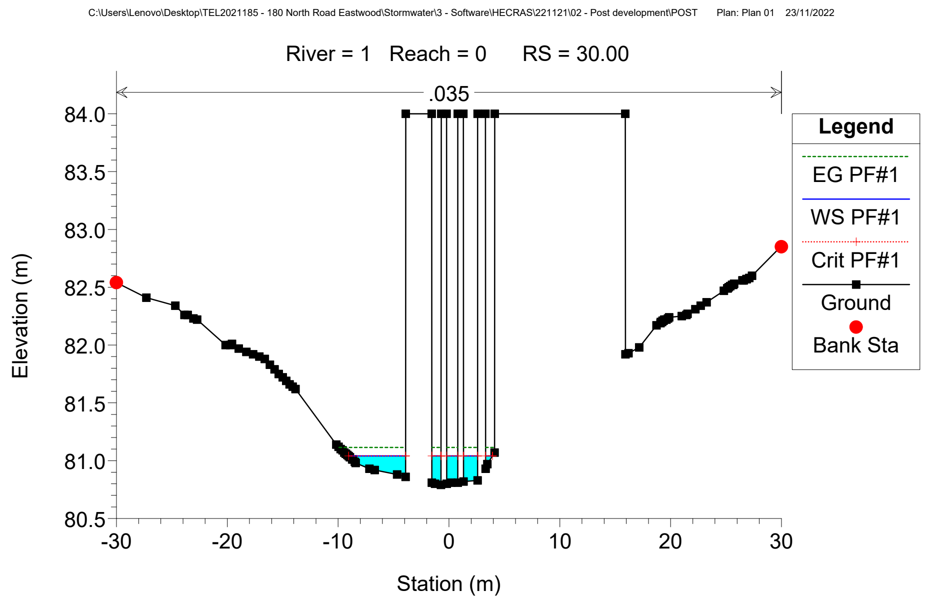

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 55.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

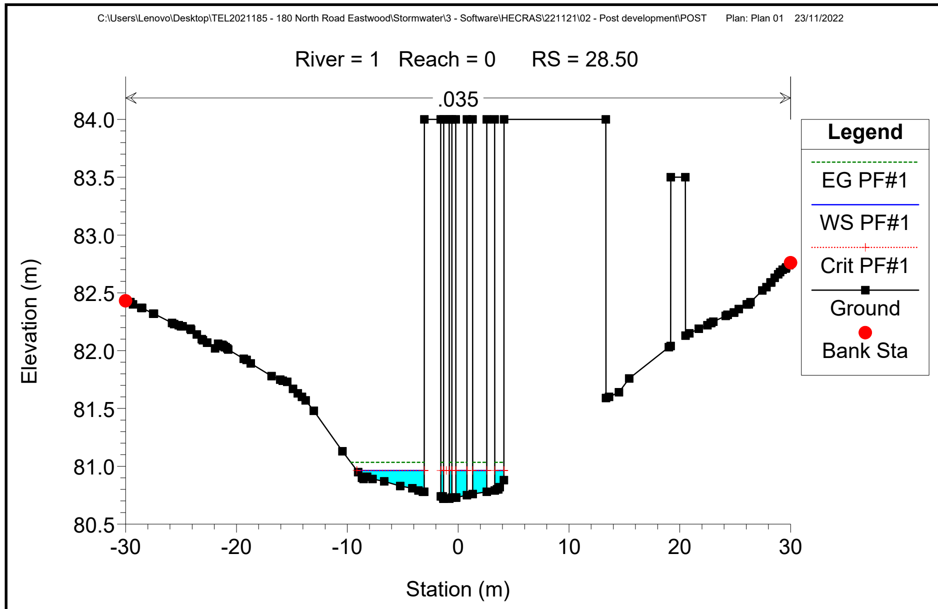

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 50.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

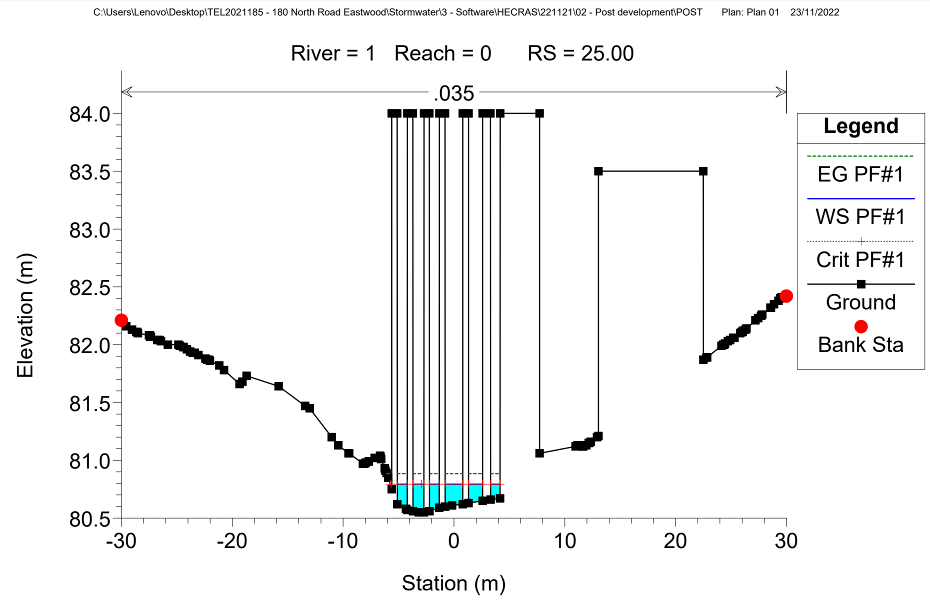

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 45.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

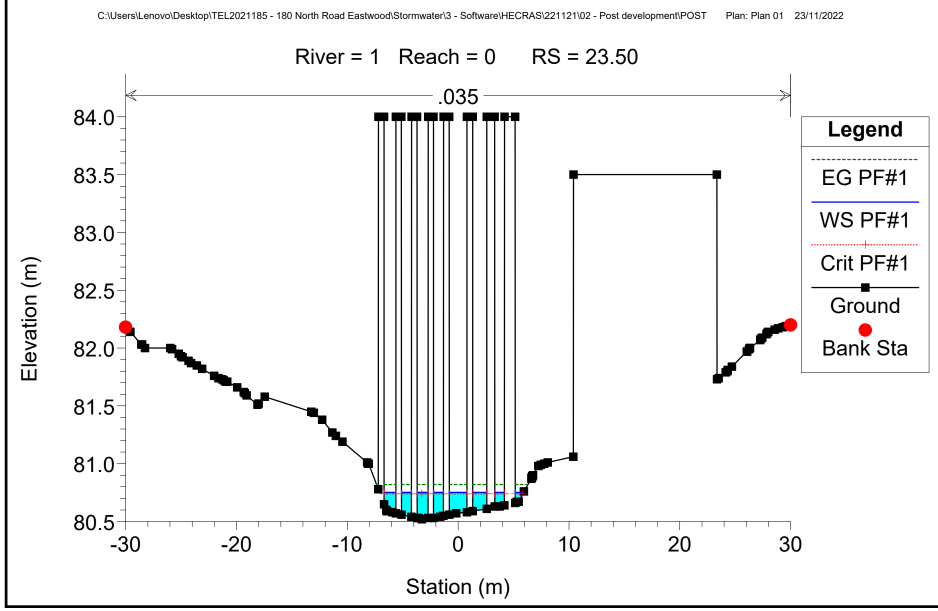

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 40.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

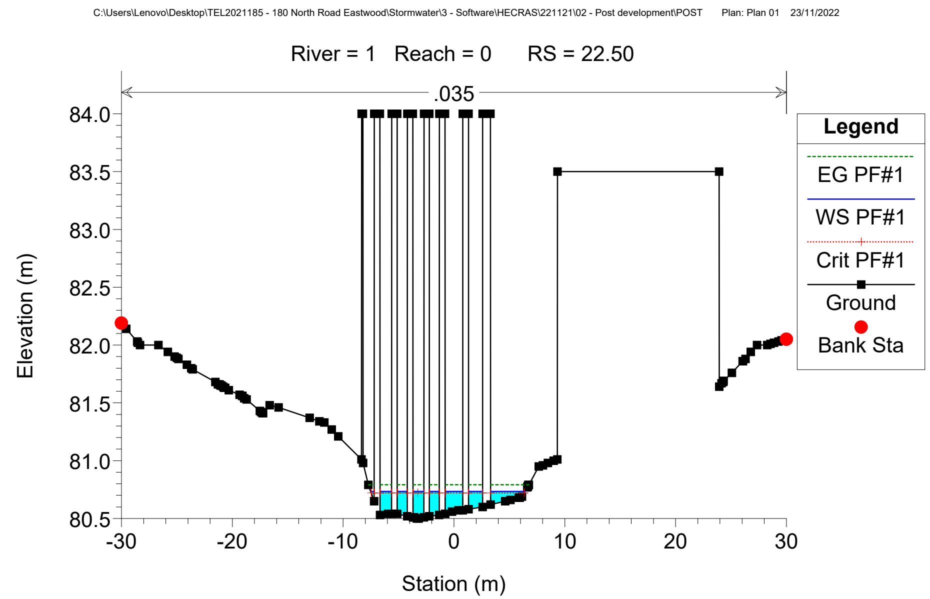

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 35.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

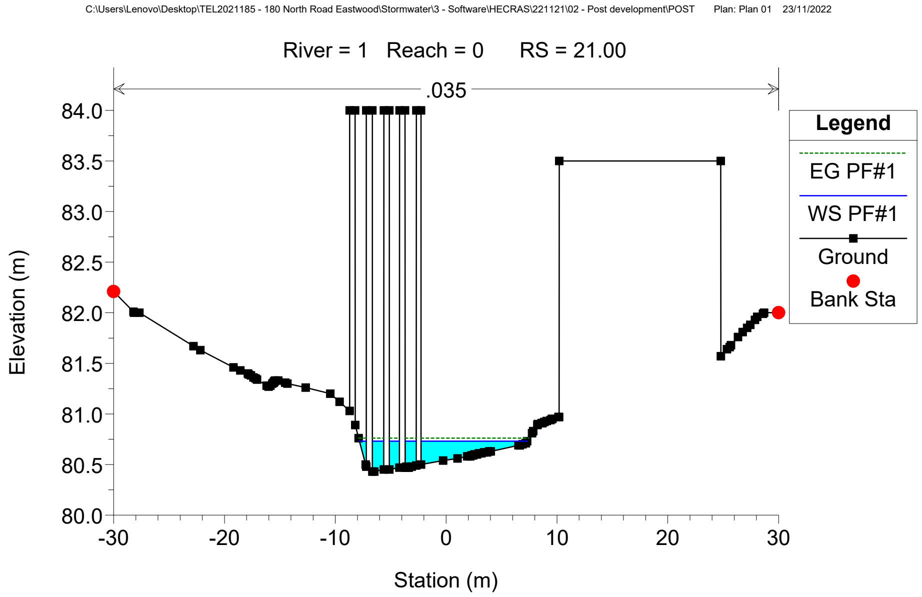

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 30.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

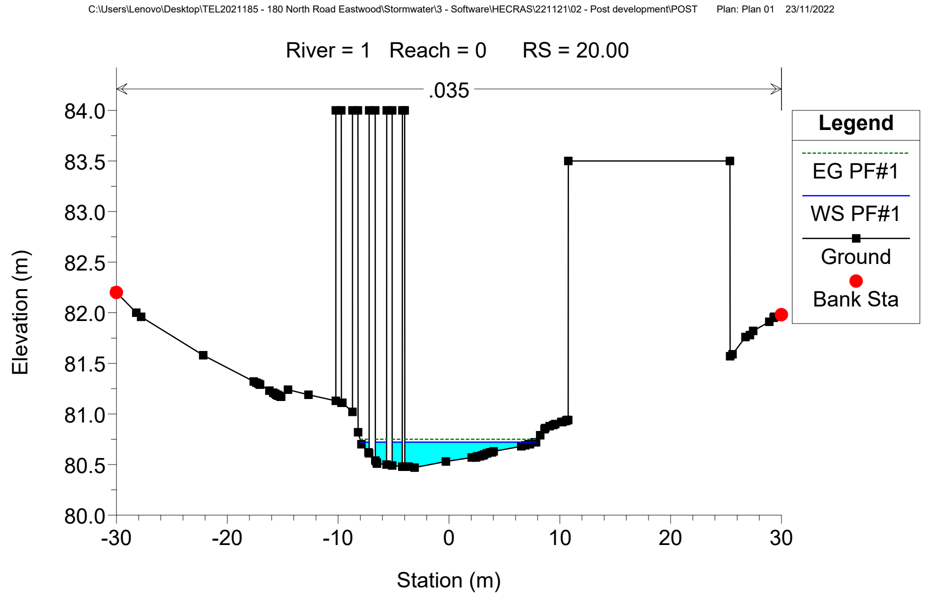

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 28.50
.035
Elevation (m)
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

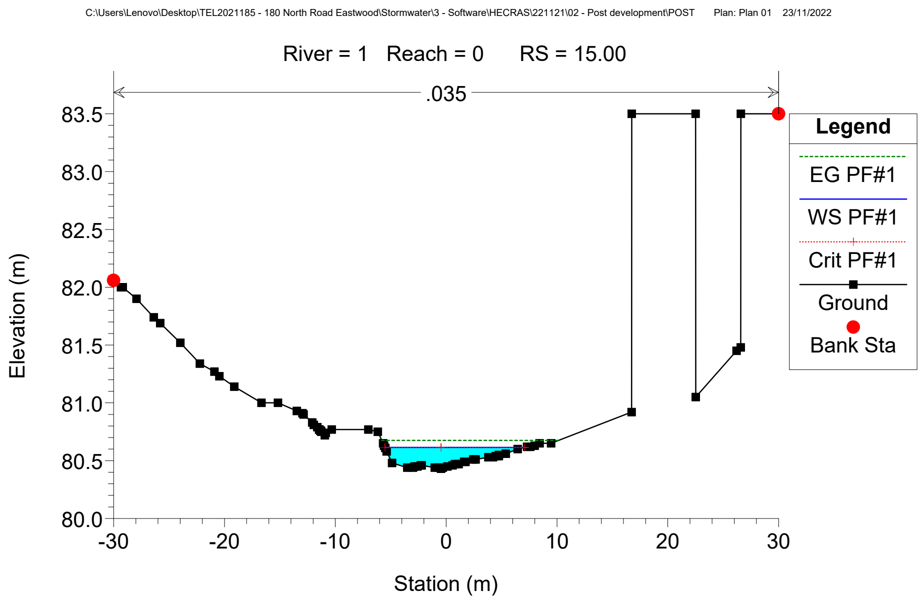

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 25.00
.035
Elevation (m)
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

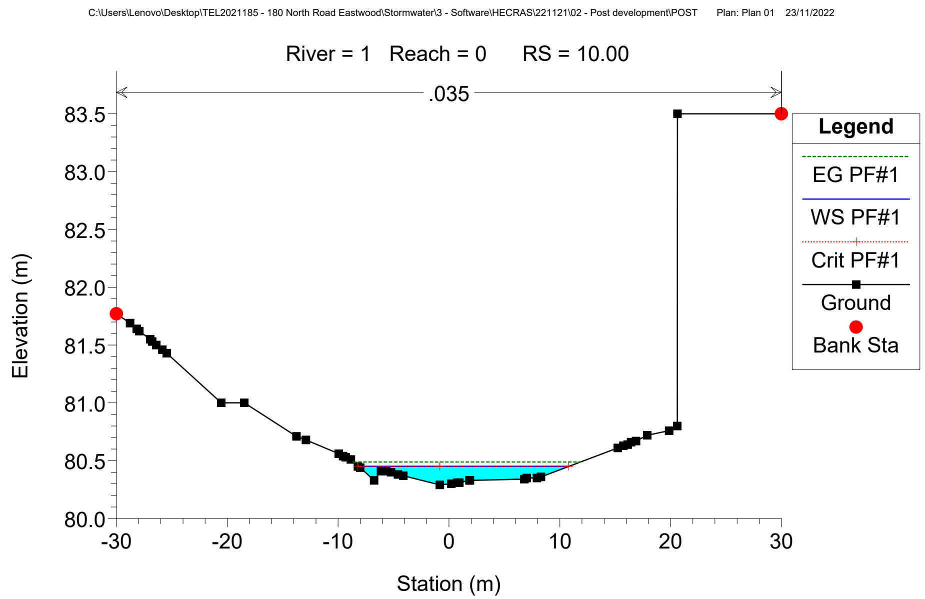

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 23.50
.035
Elevation (m)
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

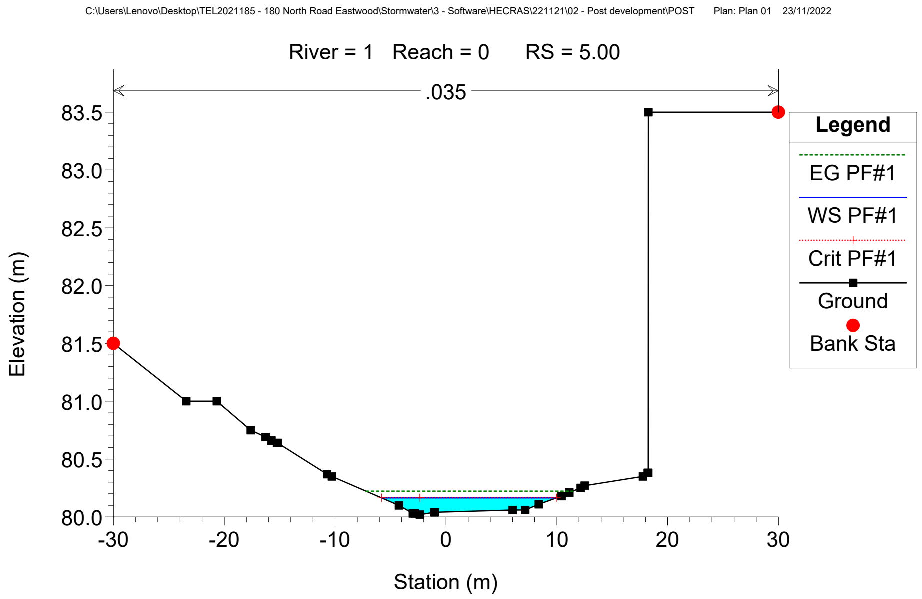

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 22.50
.035
Elevation (m)
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

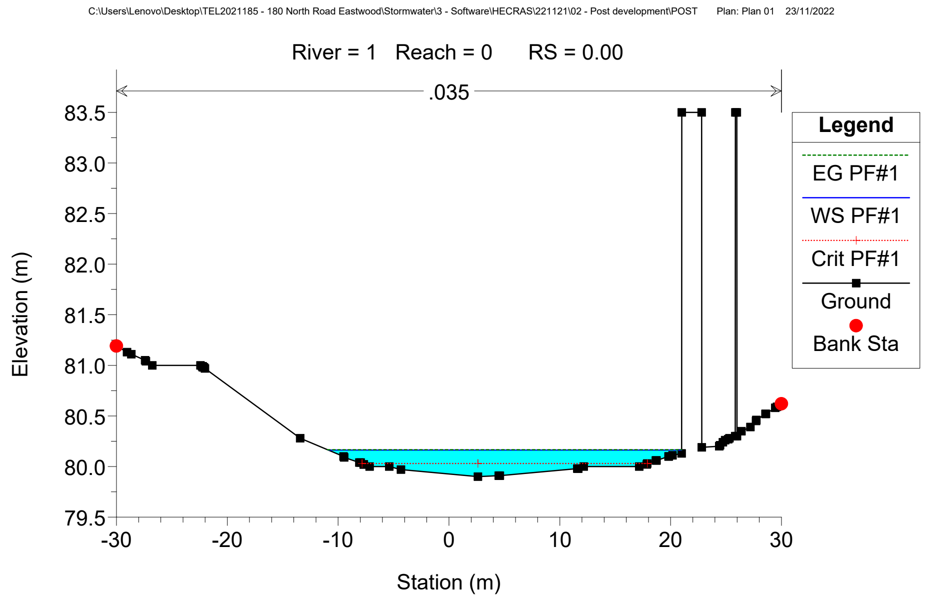

C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 21.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 20.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 15.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 10.00
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 5.00
.035
Elevation (m)
83.5
83.0
82.5
82.0
81.5
81.0
80.5
80.0
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


C:\Users\Lenovo\Desktop\TEL2021185 - 180 North Road Eastwood\Stormwater\3 - Software\HECRAS\221121\02 - Post development\POST Plan: Plan 01 23/11/2022
River = 1 Reach = 0 RS = 0.00
.035
Elevation (m)
83.5
83.0
82.5
82.0
81.5
81.0
80.5
80.0
79.5
-30
-20
-10
0
10
20
30
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta