Project No: 2018-053
Revision No: DA Issue (Rev D)
Date: 6 March 2020

FLOOD STUDY REPORT

Proposed Torrens Title Subdivision and new Dwelling House

at

15 Alto Avenue, Seaforth

for

Matt Deeran

Report Prepared By:

WATERDESIGN CIVIL ENGINEERS
ABN 779 281 667 29
1 Flame Tree Place
Cherrybrook NSW 2126

Phone: 0417 671646
Email: waterdesign@hotmail.com

Contents

1 Overview

1.1 Purpose

This report has been commissioned at the request of Matt Deeran to determine the localised flooding impacts of an overland flow path from Councils Stormwater Drainage system that traverses through the development site.

1.2 Proposed Development

The proposed development involves the construction of two new two storey residential dwellings and Torrens title subdivision of one lot into two.

1.3 Scope of Report

The scope of this report is as follows:

- Obtain information from the local council such as contoured catchment maps, existing drainage infrastructure and hydrological data.
- Undertake hydrological calculations to determine the 1% AEP catchment flow rate draining through the development site.
- Undertake hydraulic modelling of the overland flow path to determine the extent of 1% AEP storm inundation within the vicinity of the site.
- Determine the impact the proposed development will have on the overland flow path and vice versa.
- Determine the minimum finished level of the proposed residential dwellings in accordance with Manly Council's Engineering Design Specification – Auspec One.

2 Site Conditions and Hydrology

2.1 Site and Drainage Characteristics

The development site has an existing Council 825mm diameter reinforced concrete pipe within an easement to drain water 1.83 wide that traverses through the site in a north to south direction. The Council easement and drainage pipe is located within the proposed vacant lot to be created as part of the proposed development. The depth to the invert level of the existing Council pipe is approximately 1.4m to 1.5m (Refer to Annexure F).

The overland flow path assessment has been modelled with the construction of a new dwelling house and detached garage and studio with the Council easement and drainage pipe dissecting the proposed structures.

2.2 Topography

The majority of the development site is gently sloping of approximately 5% grade that falls across the site in a north to south direction.

2.3 Catchment Flows

The catchment flows draining through the site can be seen in the Catchment Map (Refer to Annexure A). The rational method was used to calculate the catchment flows.

Catchment Flow

Catchment Area = 8.43 ha
Time in Concentration Tc = 17 min
Coefficient of Runoff = 0.883
Rainfall Intensity I_{100} = 175 mm/hr

$$Q = \frac{CIA}{360} = \frac{0.883 \times 175 \times 8.43}{360} = \mathbf{3.62\ m3/s}$$

Existing 825mm diameter Pipe Capacity @ 7.4% grade = **4.3 m3/s**

Total Catchment Overland Flow

Assume a 50% Blockage factor to the Council 825mm diameter pipe;

Therefore, Total $Q = 3.62 - \frac{4.3}{2} =$ **1.47 m3/s**

3 Flood Assessment

3.1 Flood Assessment Methodology

The hydraulic computer software HEC-RAS River Analysis System Version 4.1.0 was used to model the overland flow path.

The determination of the overland flow cross-section profiles was derived from the following:

- Site Survey Job Ref. 16123Sheet 2 of 2 Rev A dated 30.03.2017by Survey Plus
- Contour map by Northern Beaches Council Online Mapping Tool
- Ground Floor Plan Job No. CC00 Dwg No. 02 Rev C dated April 2018 by Classic Country Cottages

3.2 Modelled Cross-Sections

Twelve cross-section profiles was used to model the overland flow path starting upstream at the northern boundary of the development site and terminating seven metres downstream of the common boundary between 15 and 17 Alto Avenue.

The proposed new dwelling house on proposed Lot 1 has been designed in a manner as to direct overland flows between the building structures. The structures adjacent the overland flow path shall be designed with a drop edge beam to act as a flood wall to the overland flow path.

The existing ground levels of the overland flow path between the building structures is proposed to be lowered by excavating between 0.1m to 0.2m in depth to ensure that a minimum 0.50m cover is maintained above the existing Council pipe. A longitudinal section along the Council pipe has been provided to demonstrate the provision of adequate pipe cover.

3.3 Mannings ‘n’ Channel Roughness Coefficients

Mannings ‘n’ friction coefficient values were derived from chapter 14 of the Australian Rainfall and Runoff manual. The manning’s ‘n’ values used in the hydraulic modelling was as follows:

- Short Grasses - 0.035
- Concrete – 0.012

4 Hydraulic Modelling Results

4.1 Summary of Results

The location of cross-sections used to model the overland flow path for the pre-development and post-development scenarios is represented on the 1% AEP Overland Flow Path Inundation Plan – Drawing No. 2018053Pre and 2018053Post respectively in Annexure B. The HEC-RAS output summary data can also be found in Annexure C.

The 1% AEP catchment flow rate draining through the site is Q = 3.62 m3/s. The existing 825mm diameter Council pipe has a capacity of 4.3 m3/s. A 50% blockage factor to the pipe capacity was adopted and therefore the residual overland flow rate used in the modelling of the overland flow path for the 1% AEP storm event was Q = 1.47 m3/s.

A comparison of the flood level results for the 1% AEP storm event pre-development and post-development scenarios can be found in Table 4.1.

Design Chainage	Pre-Development 1% AEP Storm Flood Level	Post-Development 1% AEP Storm Flood Level	Change in Flood Level
(m)	(m)	(m)	(m)
15.0	86.04	85.97	- 0.07
13.5	85.97	85.86	- 0.11
10.0	85.66	85.60	- 0.06
7.4	85.55	85.30	- 0.25
5.0	85.20	85.21	+ 0.01
0.0	84.98	84.98	0.00
-1.0	84.97	84.97	0.00
-2.0	84.86	84.86	0.00
-7.0	84.62	84.62	0.00

***Table 4.1** – Pre Development & Post Development 1% AEP Overland Flow Flood Levels*

In accordance with Manly Council's Engineering Design Specification – Auspec One, the finished floor level of the new dwelling on proposed Lot 1 adjacent an overland flow path is required to be a minimum 0.5 metres above the 1% AEP flood level as shown in Table 4.2.

Design Chainage	Minimum Channel Base Invert Level	100 year ARI Top Water Level	Minimum Finished Floor Level	Velocity Depth Product
(m)	(m)	(m)	(m)	(m2/s)
15.0	85.79	85.97	-	0.19
13.5	85.67	85.86	86.36	0.30
10.0	85.42	85.60	86.10	0.38
7.4	85.15	85.30	85.80	0.39
5.0	85.05	85.21	85.71	0.36
3.35	84.92	85.08	85.58	0.37
1.65	84.80	84.87	85.37	0.17
0.0	84.74	84.98	85.48	0.14
-1.0	84.50	84.97	-	-
-2.0	84.46	84.86	-	-
-7.0	84.39	84.62	-	-

***Table 4.2** – 1% AEP Overland Flow Levels and Minimum Finished Floor Levels*

4.2 Conclusion

In conclusion, the HEC-RAS model demonstrates that the overland flow path inundation area for the 1% AEP storm draining through the site will travel between the proposed new dwelling house and studio/garage fronting Alto Avenue.

As a result of the proposed development the flow path flood levels are decreased between the proposed buildings due to the lowering of the ground levels. However, there is no change to the flood levels at the common boundaries of the upstream and downstream properties and therefore will have no detrimental impact on the adjoining properties.

4.3 Recommendations

As a result of the hydraulic modelling undertaken at the site for the proposed development the following recommendations are proposed:

1. The proposed finished ground floor level of the main residence and studio shall not be less than RL 86.36 at Chainage 13.5 and RL 85.37 at Chainage 1.65, which provides a minimum 500 mm freeboard above the corresponding 1% AEP flood level.

2. The proposed garage shall have a finished floor level not less than RL 85.80 at Chainage 7.4 which provides a 500mm freeboard above the corresponding 1% AEP flood level.

3. All structures below the 1% AEP flood level plus a 500mm freeboard shall be constructed with flood compatible building components.

4. The supports of any structure shall be designed by a qualified structural engineer to withstand the forces of floodwaters, debris and buoyancy up to the 1% AEP flood level plus a 500mm freeboard.

Disclaimer - This flood study report is intended for the purposes of constructing a proposed residential dwelling house as depicted in the Ground Floor Plan Job No. CC155 Dwg No. 02 Rev C dated 05.11.2019 by Classic Country Cottages ONLY and cannot be used for the purposes of planning other developments on the subject property or for proposed developments on neighbouring properties.

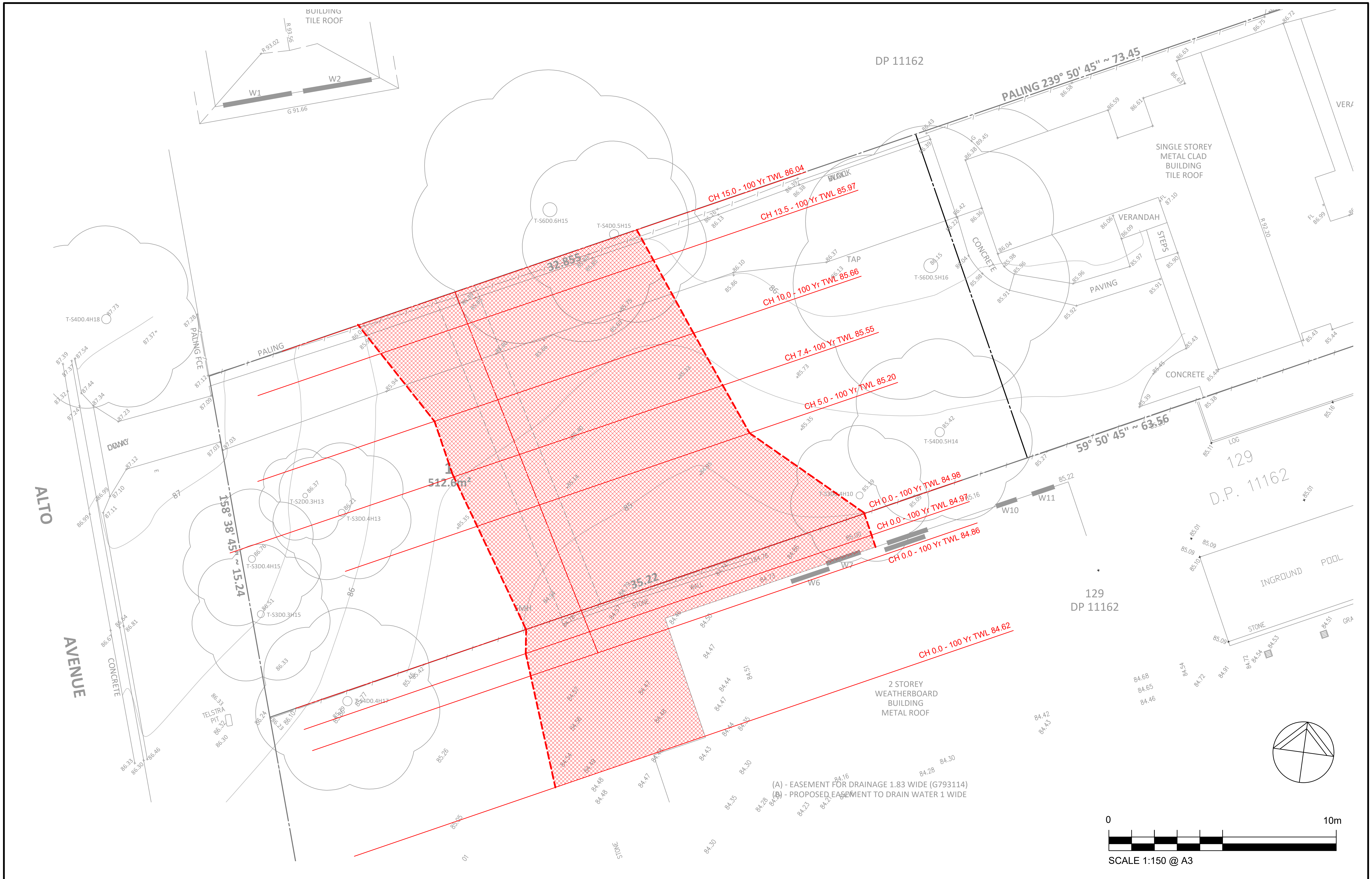
ANNEXURE A

Catchment Map


Stormwater
50
Enter address...
BANTRY RESERVE
JUDITH STREET
RESERVE STREET
CLONTARF STREET
WATERVIEW STREET
KIRKWOOD STREET
BURNT STREET
SEAFORTH
SEAFORTH OVAL
WAKEHURST PARKWAY
ALTO AVENUE
GARIGAL NATIONAL PARK
Aerial Photo
Map Data © Northern Beaches Council. Image © Jacobs & Aerometrex.
60m

Annexure B

Pre-Development 1% AEP Storm Overland Flow Path Inundation Plan



DP 11162
PALING 239° 50' 45" ~ 73.45
BUILDING
TILE ROOF
W1
W2
SINGLE STOREY
METAL CLAD
BUILDING
TILE ROOF
VERANDAH
STEPS
CONCRETE
PAVING
TAP
PALING
PALING FCE
ALTO
AVENUE
CONCRETE
158° 38' 45" ~ 15.24
CH 15.0 - 100 Yr TWL 86.04
CH 13.5 - 100 Yr TWL 85.97
CH 10.0 - 100 Yr TWL 85.66
CH 7.4- 100 Yr TWL 85.55
CH 5.0 - 100 Yr TWL 85.20
CH 0.0 - 100 Yr TWL 84.98
CH 0.0 - 100 Yr TWL 84.97
CH 0.0 - 100 Yr TWL 84.86
CH 0.0 - 100 Yr TWL 84.62
32.855
1
512.6m²
35.22
59° 50' 45" ~ 63.56
W6
W7
W10
W11
129
D.P. 11162
129
DP 11162
INGROUND POOL
2 STOREY
WEATHERBOARD
BUILDING
METAL ROOF
(A) - EASEMENT FOR DRAINAGE 1.83 WIDE (G793114)
(B) - PROPOSED EASEMENT TO DRAIN WATER 1 WIDE
0
10m
SCALE 1:150 @ A3

WATERDESIGN CIVIL ENGINEERS

1 FLAME TREE PLACE
CHERRYBROOK NSW 2126
MOBILE: 0417 671646
EMAIL: waterdes@bigpond.net.au
ABN: 77 928 166 729

© All design and drawings are the property of Waterdesign Civil Engineers. This drawing must not be used, reproduced or copied without the written approval of Waterdesign Civil Engineers.

CLIENT NAME: MATT DEERAN

PROJECT TITLE: NEW DWELLING HOUSE, 15 ALTO AVENUE, SEAFORTH NSW

DRAWING TITLE: PRE-DEVELOPMENT OVERLAND FLOWPATH FLOOD EXTENTS

DRAWN: A.L

DATE: 03.09.2018

JOB No: 2018-053

APPROVED BY: ANDREW LAM, MIEAust B.E. Civil (Hons)

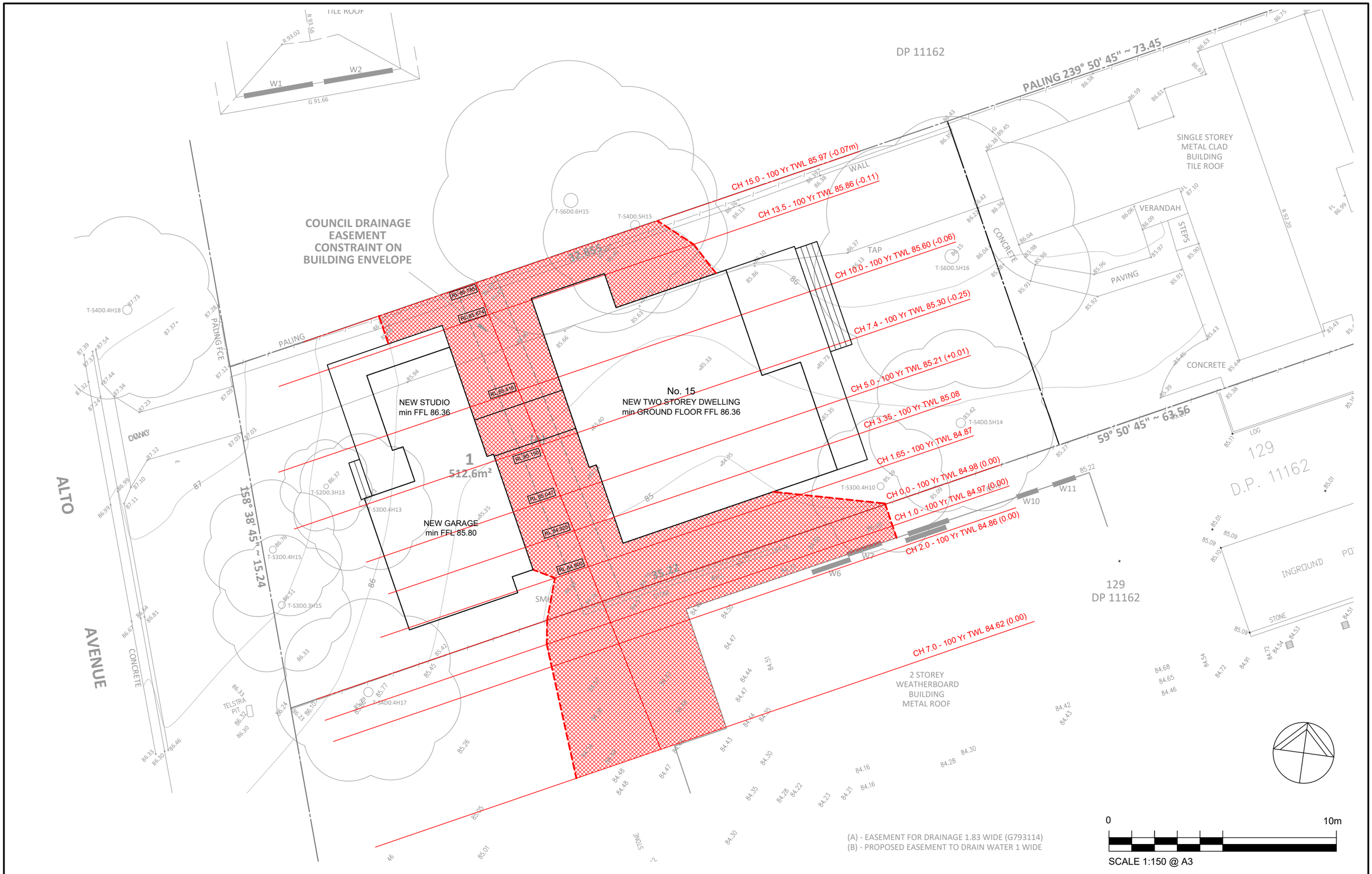
DWG NO: OF1

no. IN SET: 2

No.	REVISION / ISSUE DESCRIPTION	DATE
A	Cross Sections Added	11.11.19

Annexure C

Post-Development 1% AEP Storm Overland Flow Path Inundation Plan



WATERDESIGN
CIVIL ENGINEERS
1 FLAME TREE PLACE
CHERRYBROOK NSW 2126
MOBILE: 0417 671646
EMAIL: waterdes@bigpond.net.au
ABN: 77 928 166 729
© All design and drawings are the property of Waterdesign Civil Engineers. This drawing must not be used, reproduced or copied without the written approval of Waterdesign Civil Engineers.

CLIENT NAME: MATT DEERAN

PROJECT TITLE: NEW DWELLING HOUSE
15 ALTO AVENUE
SEAFORTH NSW

DRAWING TITLE: POST-DEVELOPMENT
OVERLAND FLOWPATH
FLOOD EXTENTS

DRAWN: A.L
DATE: 03.09.2018
JOB No: 2018-053
APPROVED BY: ANDREW LAM MIEAust B.E. Civil (Hons)
DWG NO: OF2
no. IN SET: 2

No.	REVISION / ISSUE DESCRIPTION	DATE
B	Building Envelope Amended & Cross Sections Added	11.11.19
A	Finished Ground Levels & Building Obstructions Added	10.06.19

ANNEXURE D

Pre-Development HEC-RAS Output Data

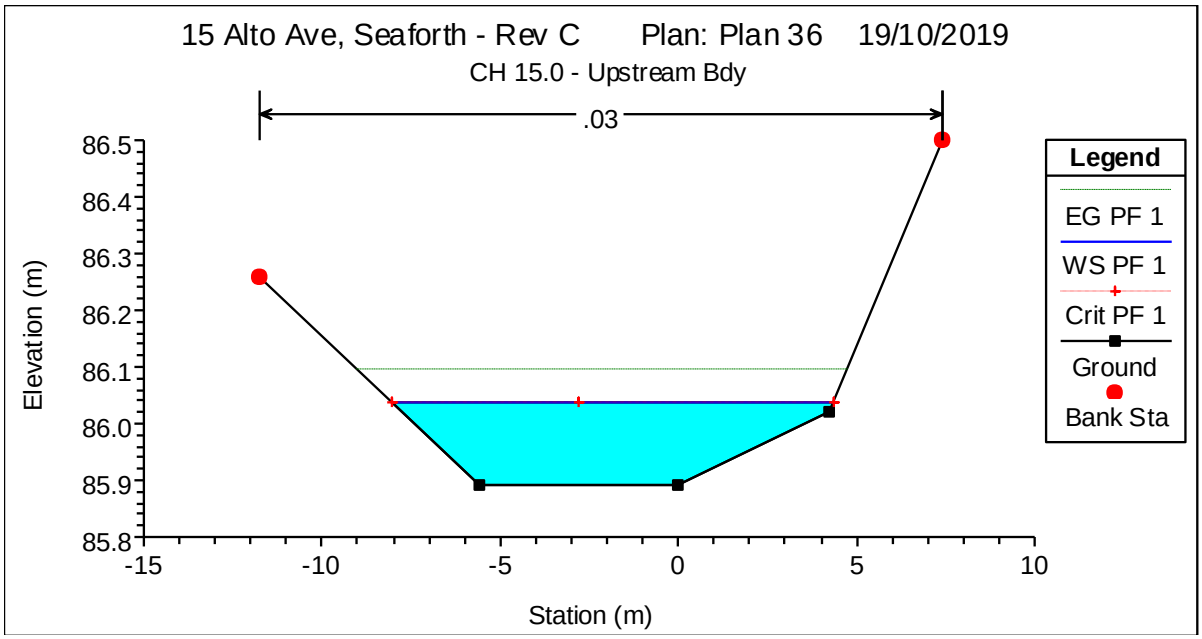


Figure D1 – Pre-Development HEC-RAS Cross-Section 15.0

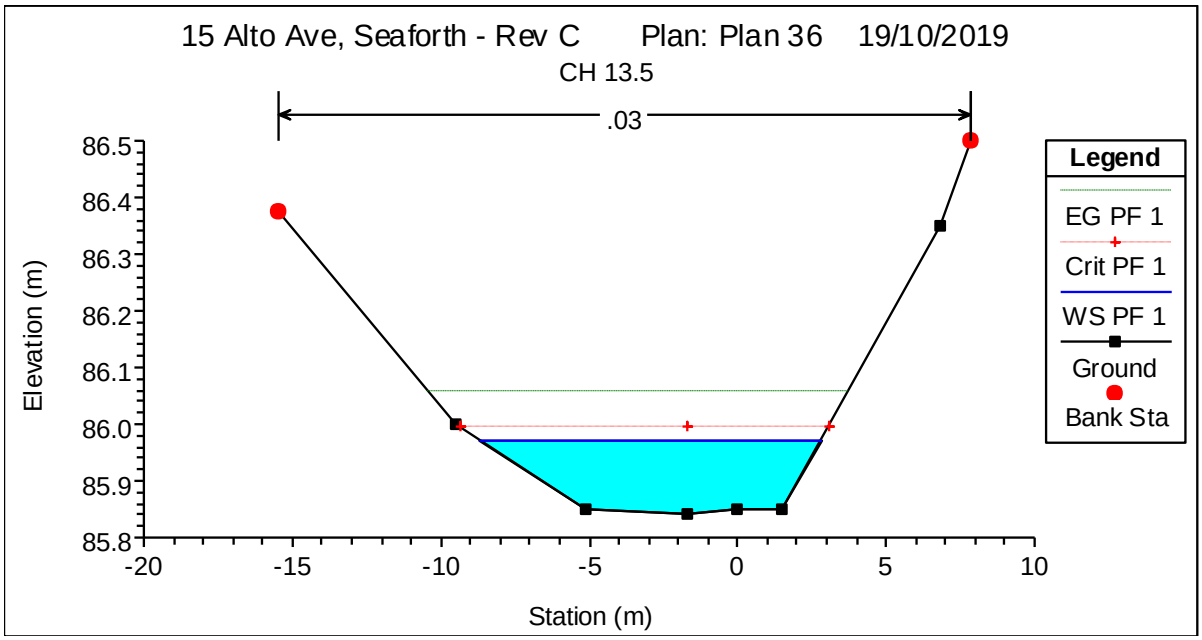


Figure D2 – Pre-Development HEC-RAS Cross-Section 13.5

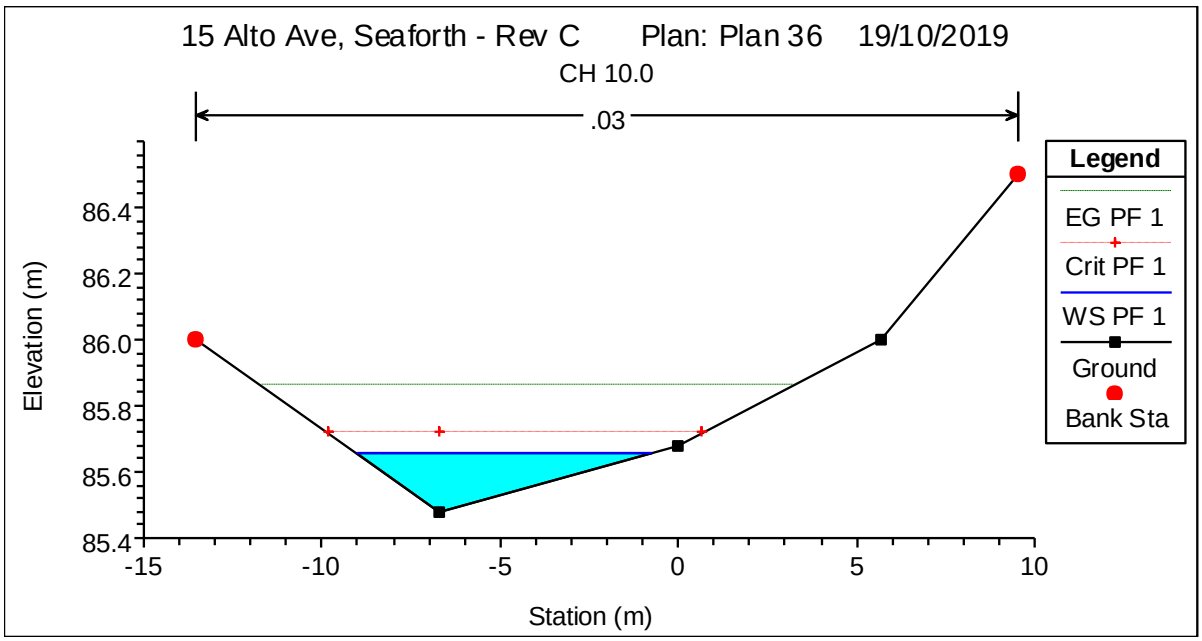


Figure D3 – Pre-Development HEC-RAS Cross-Section 10.0

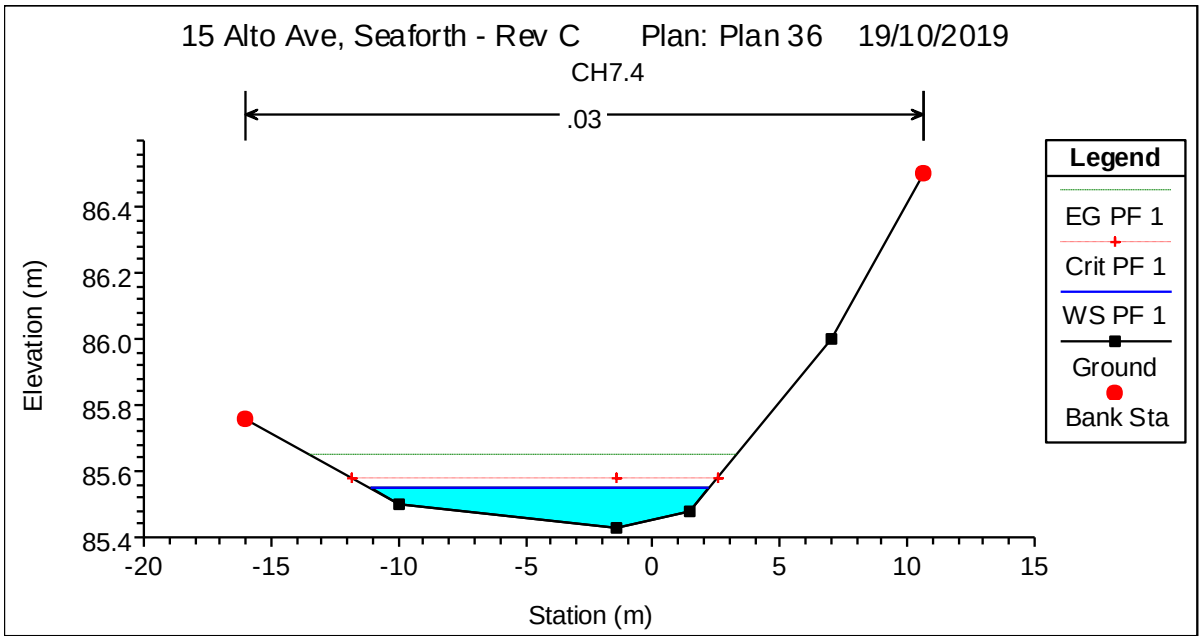


Figure D4 – Pre-Development HEC-RAS Cross-Section 7.4

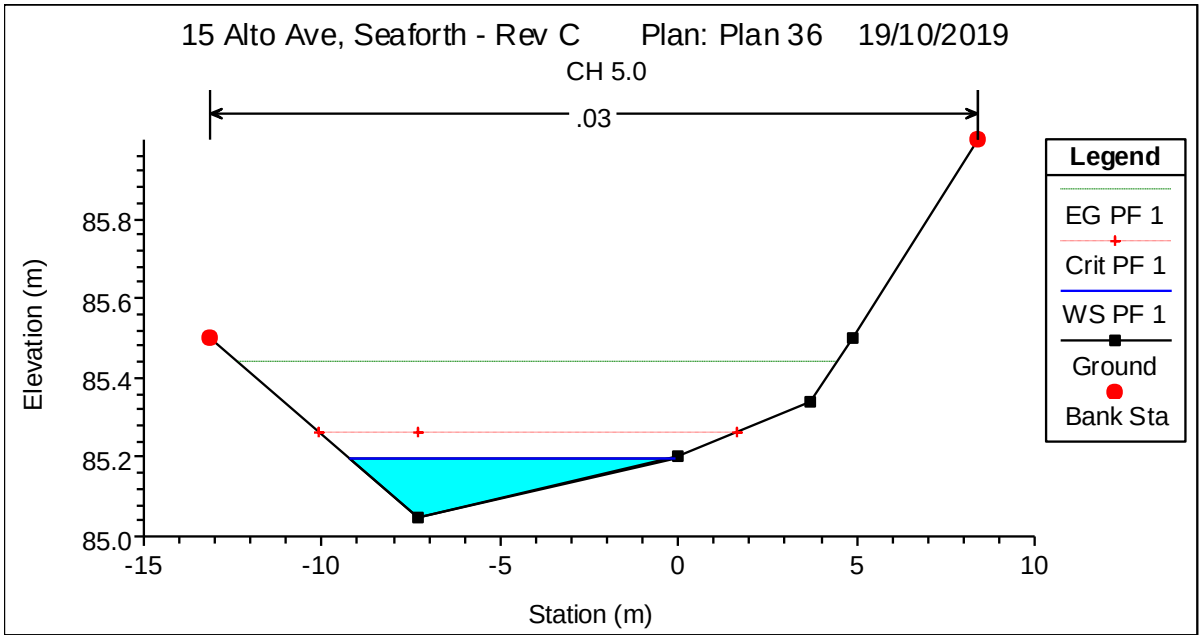


Figure D5 – Pre-Development HEC-RAS Cross-Section 5.0

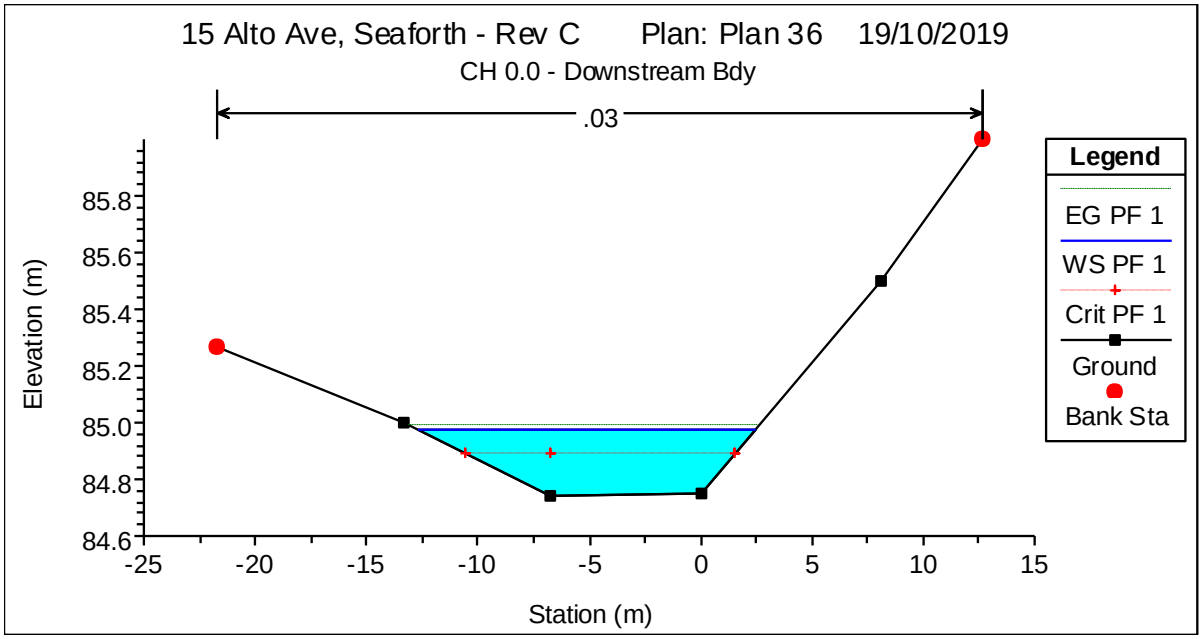


Figure D6 – Pre-Development HEC-RAS Cross-Section 0.0

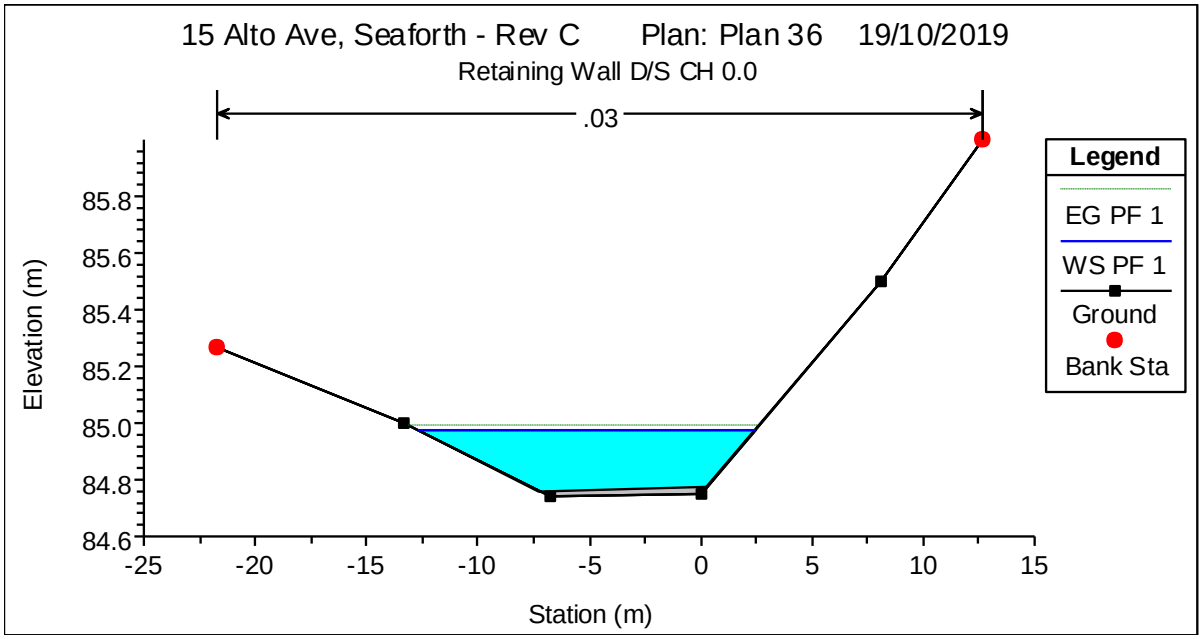


Figure D7 – Pre-Development HEC-RAS Cross-Section Retaining Wall Weir Structure

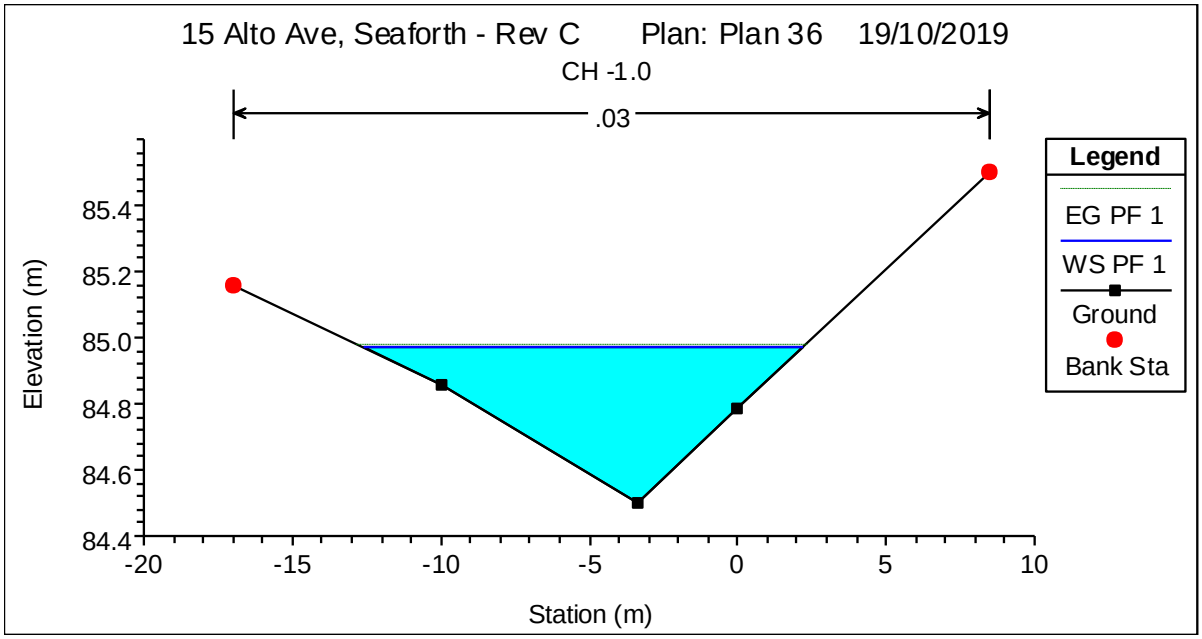


Figure D8 – Pre-Development HEC-RAS Cross-Section -1.0

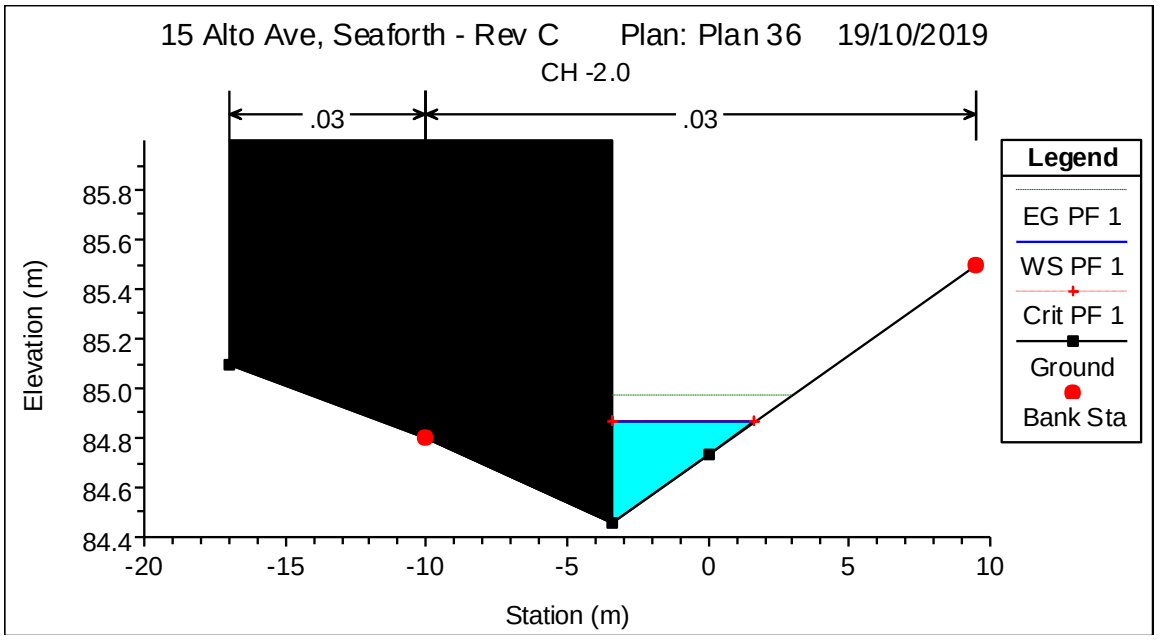


Figure D9 – Pre-Development HEC-RAS Cross-Section -2.0

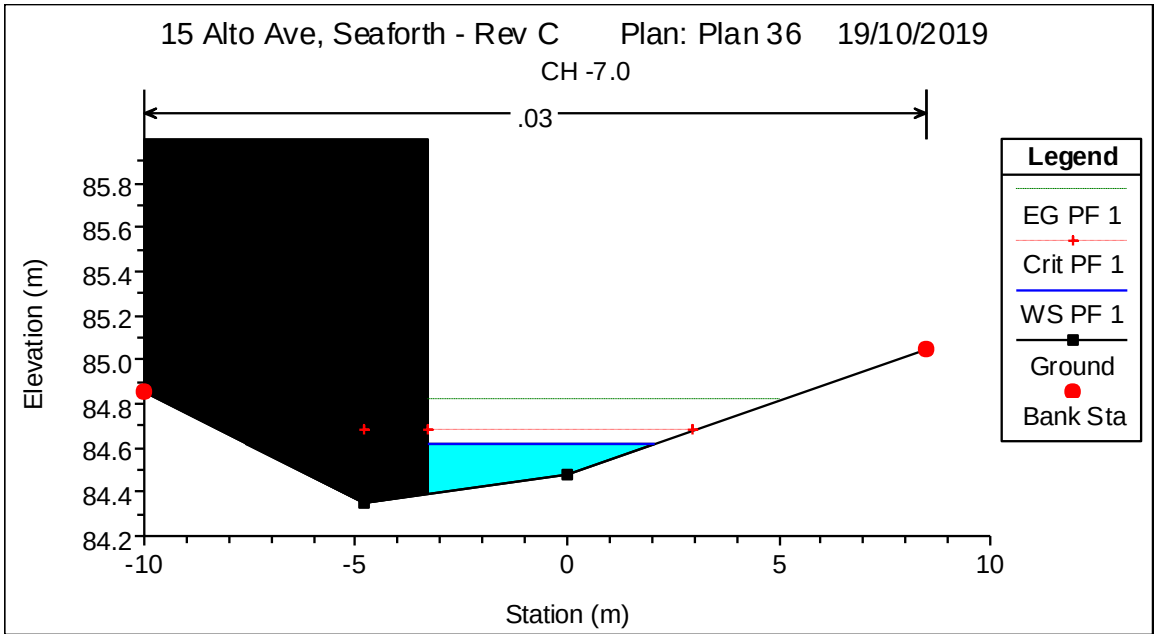


Figure D10 – Pre-Development HEC-RAS Cross-Section -7.0

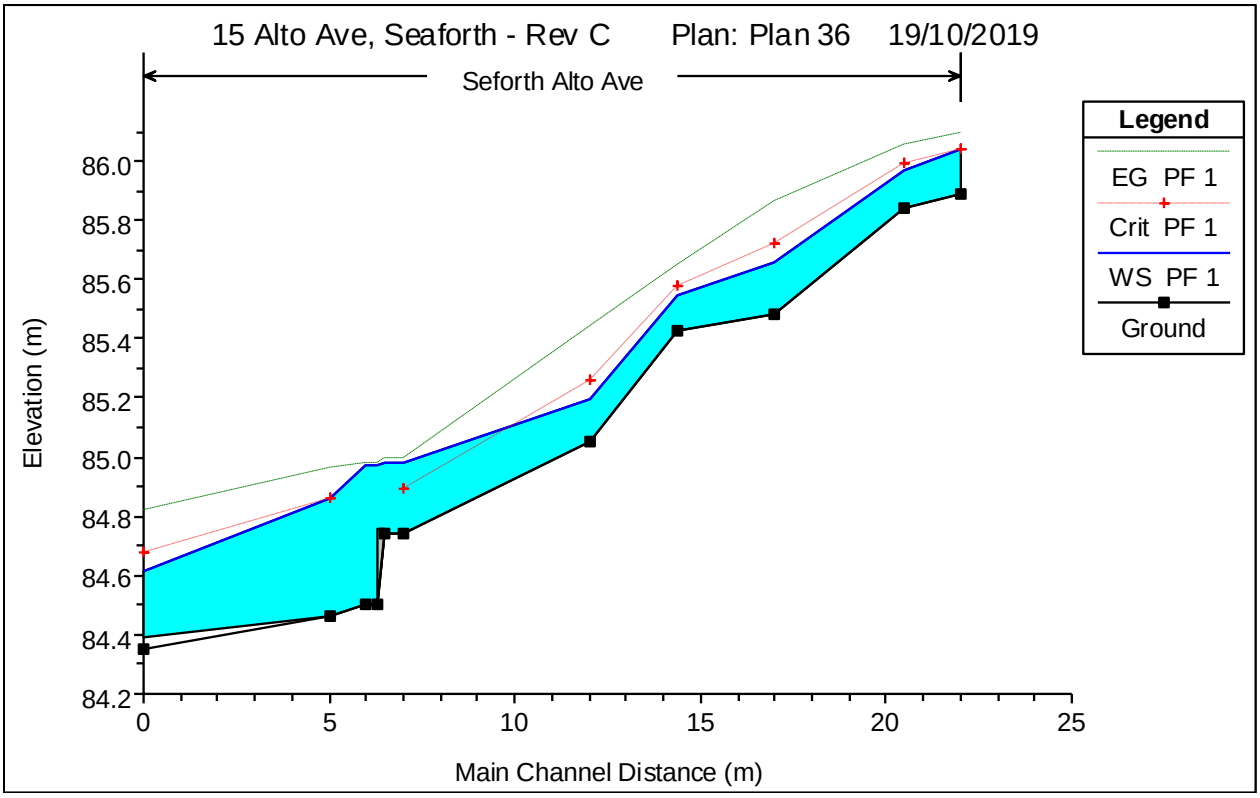


Figure D11 – Pre-Development HEC-RAS Longsection

HEC-RAS Plan: Pre-Dev River: Seforth Reach: Alto Ave Profile: PF 1 Reloac

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)	
Alto Ave	15.0	PF 1	1.47	85.89	86.04	86.04	86.10	0.019255	1.07	1.38	12.43	1.02
Alto Ave	13.5	PF 1	1.47	85.84	85.97	85.99	86.06	0.033933	1.31	1.13	11.47	1.33
Alto Ave	10.0	PF 1	1.47	85.48	85.66	85.72	85.86	0.091337	2.00	0.73	8.27	2.15
Alto Ave	7.4	PF 1	1.47	85.43	85.55	85.58	85.65	0.054833	1.42	1.03	13.31	1.63
Alto Ave	5.0	PF 1	1.47	85.05	85.20	85.26	85.44	0.137247	2.18	0.68	9.13	2.55
Alto Ave	0.0	PF 1	1.47	84.74	84.98	84.89	84.99	0.003214	0.58	2.55	15.19	0.45
Alto Ave	-0.5		Inl Struct									
Alto Ave	-1.0	PF 1	1.47	84.50	84.97		84.98	0.001202	0.43	3.40	14.84	0.29
Alto Ave	-2.0	PF 1	1.47	84.46	84.86	84.86	84.97	0.017201	1.43	1.03	5.06	1.01
Alto Ave	-7.0	PF 1	1.47	84.39	84.62	84.68	84.82	0.052344	1.98	0.74	5.35	1.70

Figure D12 – Pre-Development HEC-RAS Results Summary Table

ANNEXURE E

Post-Development HEC-RAS Output Data

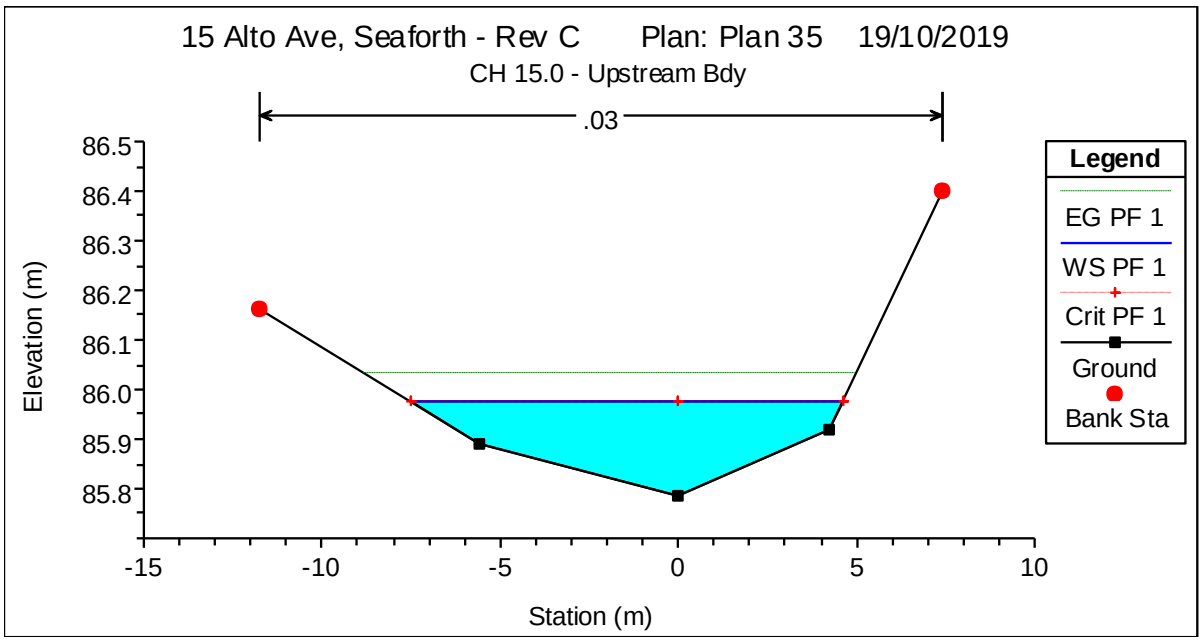


Figure E1 – Post-Development HEC-RAS Cross-Section 15.0

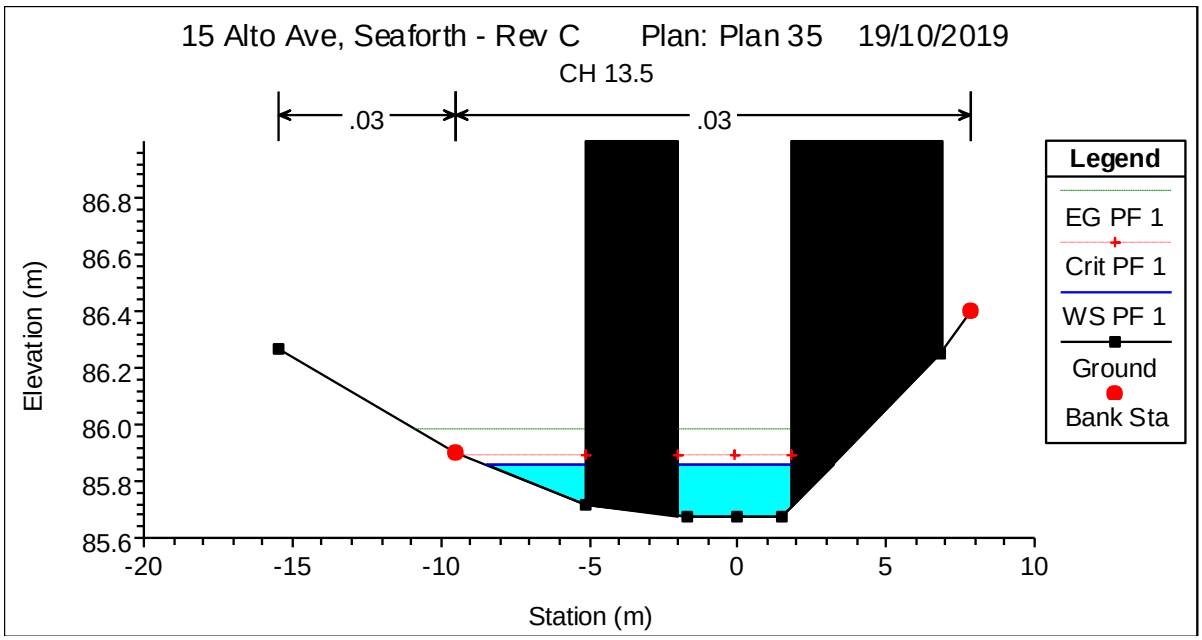


Figure E2 – Post-Development HEC-RAS Cross-Section 13.5

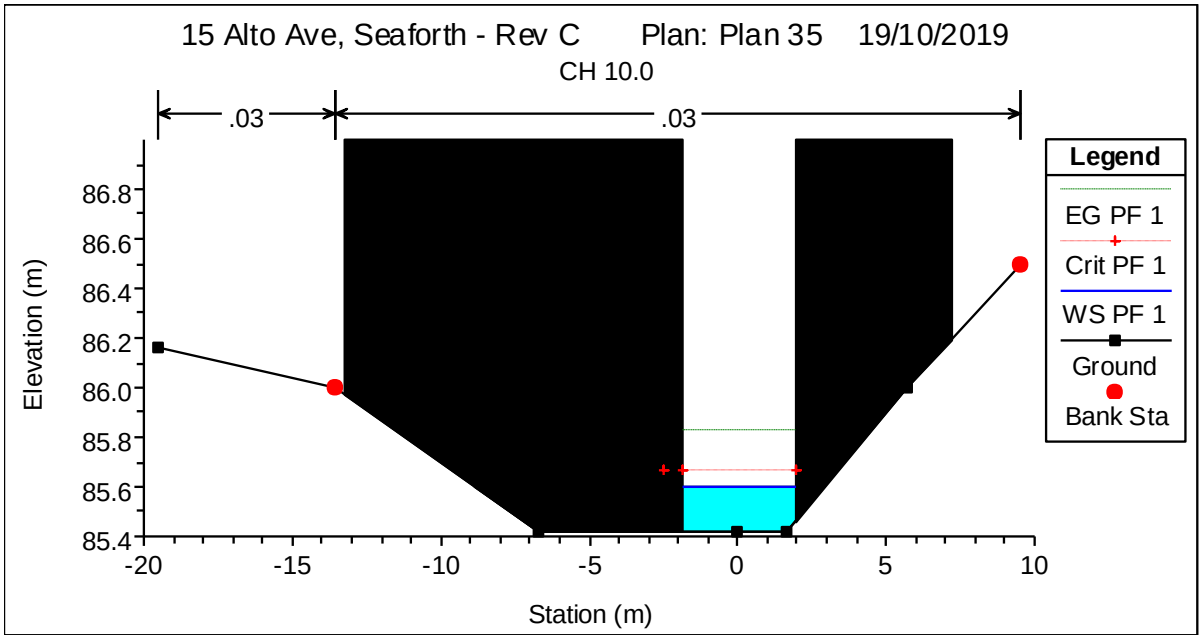


Figure E3 – Post-Development HEC-RAS Cross-Section 10.0

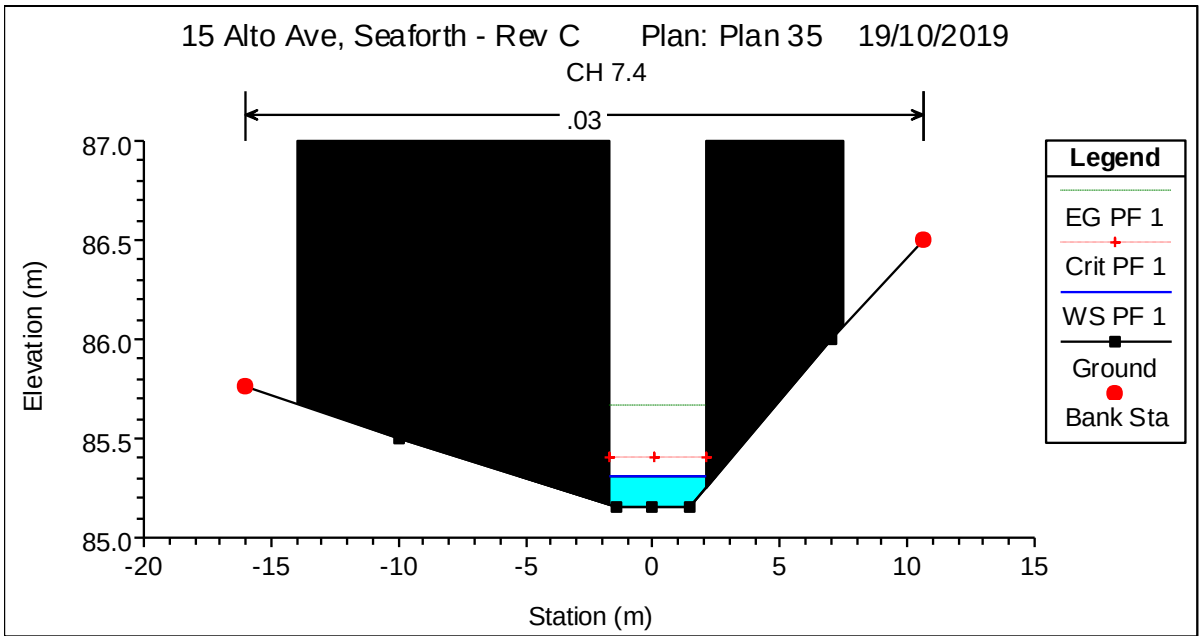


Figure E4 – Post-Development HEC-RAS Cross-Section 7.4

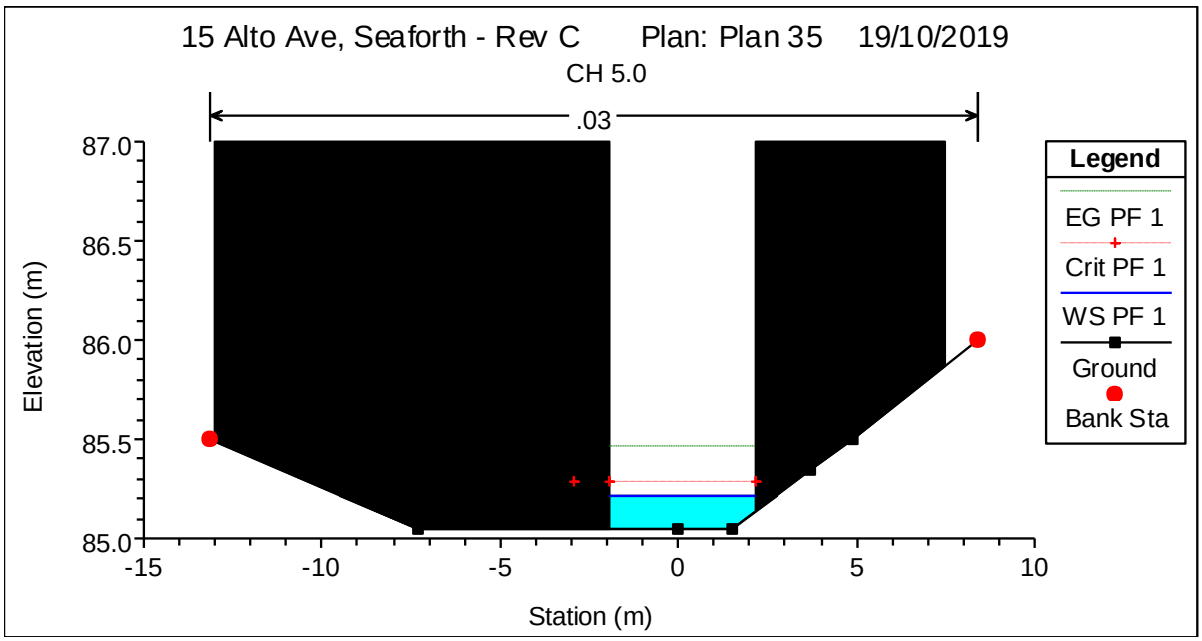


Figure E5 – Post-Development HEC-RAS Cross-Section 5.0

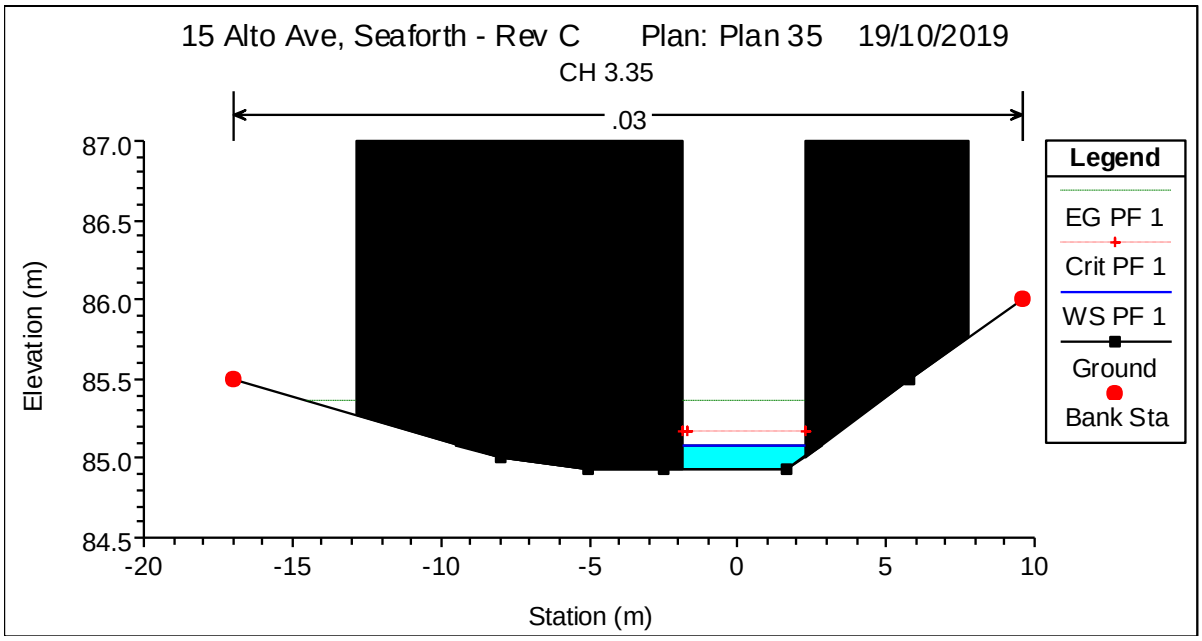


Figure E6 – Post-Development HEC-RAS Cross-Section 3.35

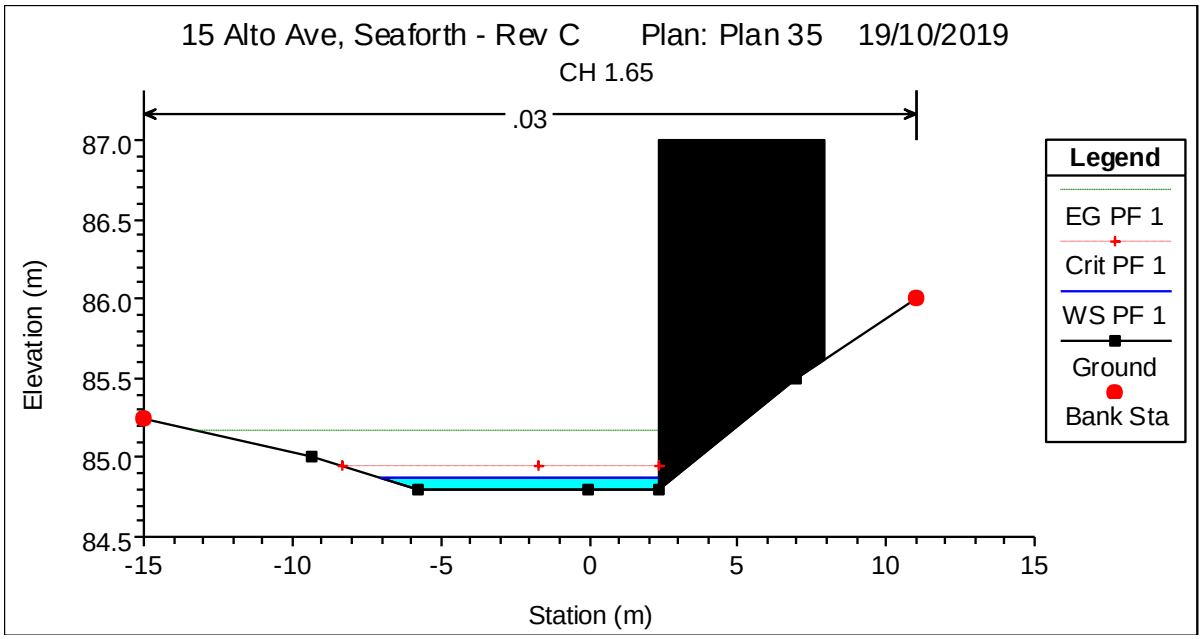


Figure E7 – Post-Development HEC-RAS Cross-Section 1.65

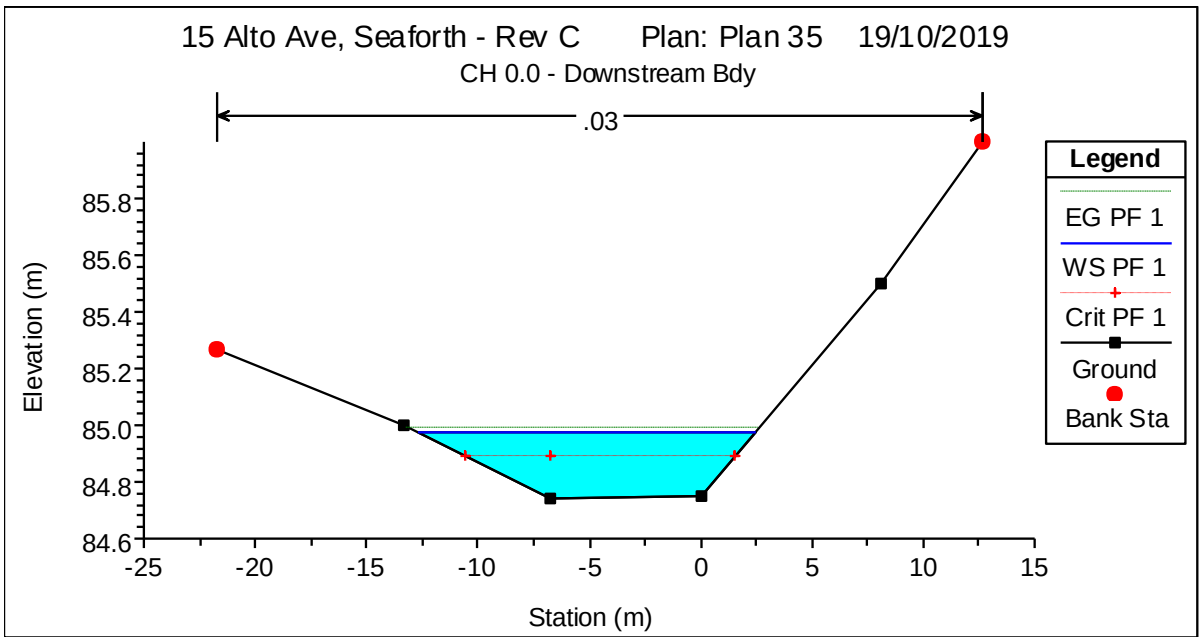


Figure E8 – Post-Development HEC-RAS Cross-Section 0.0

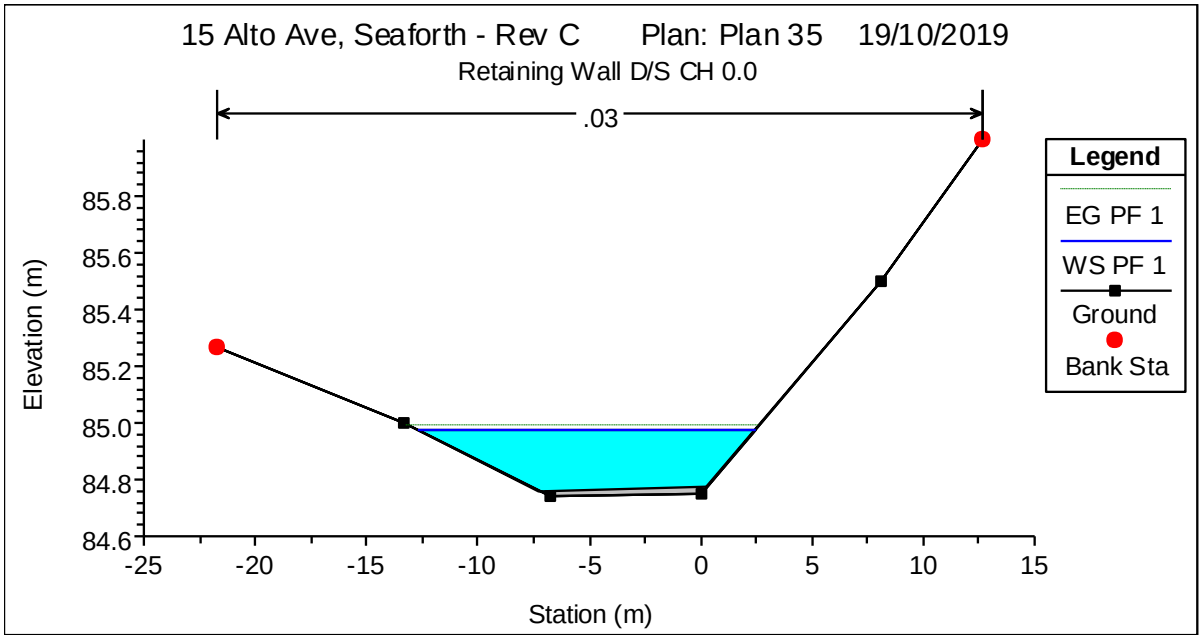


Figure E9 – Post-Development HEC-RAS Retaining Wall Weir Structure

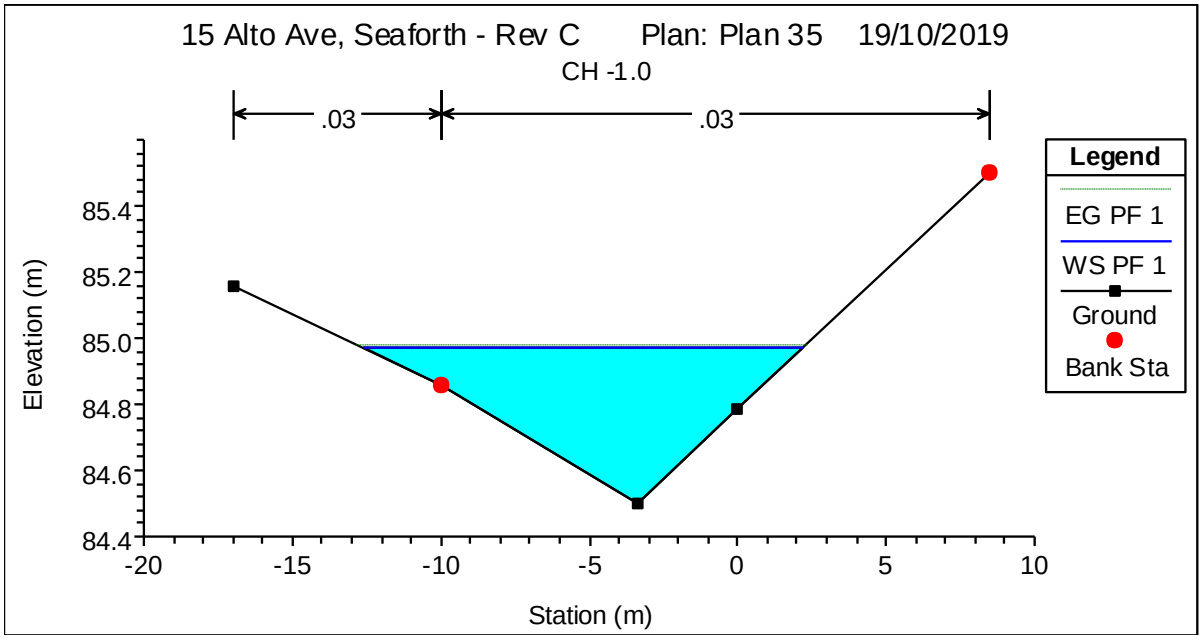


Figure E10 – Post-Development HEC-RAS Cross-Section -1.0

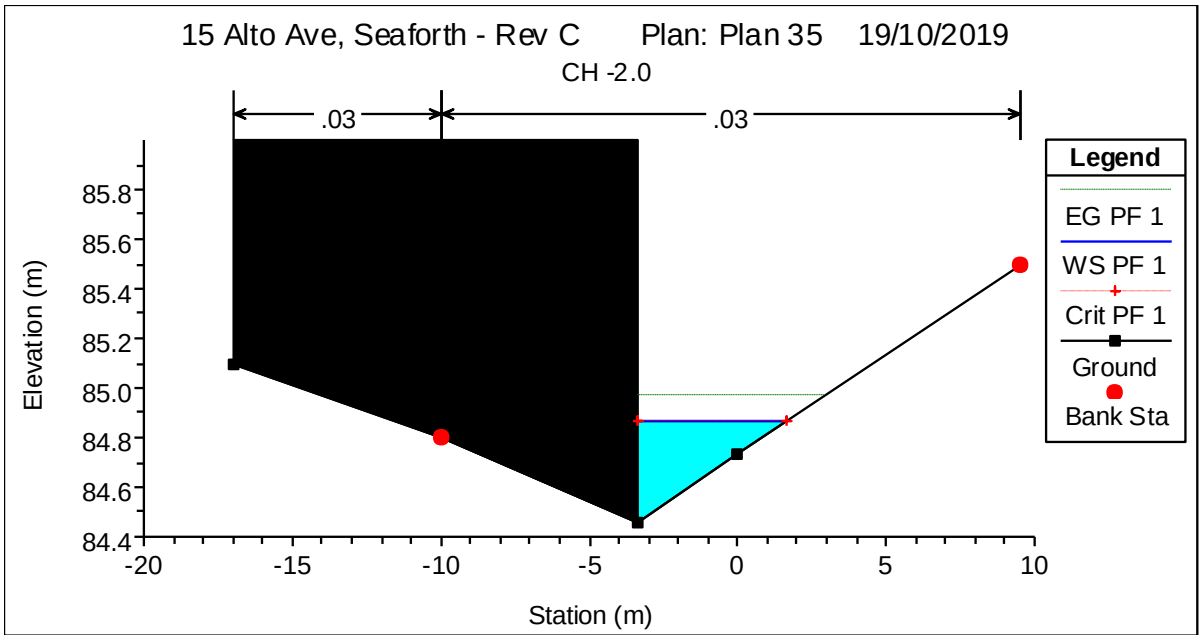


Figure E11 – Post-Development HEC-RAS Cross-Section -2.0

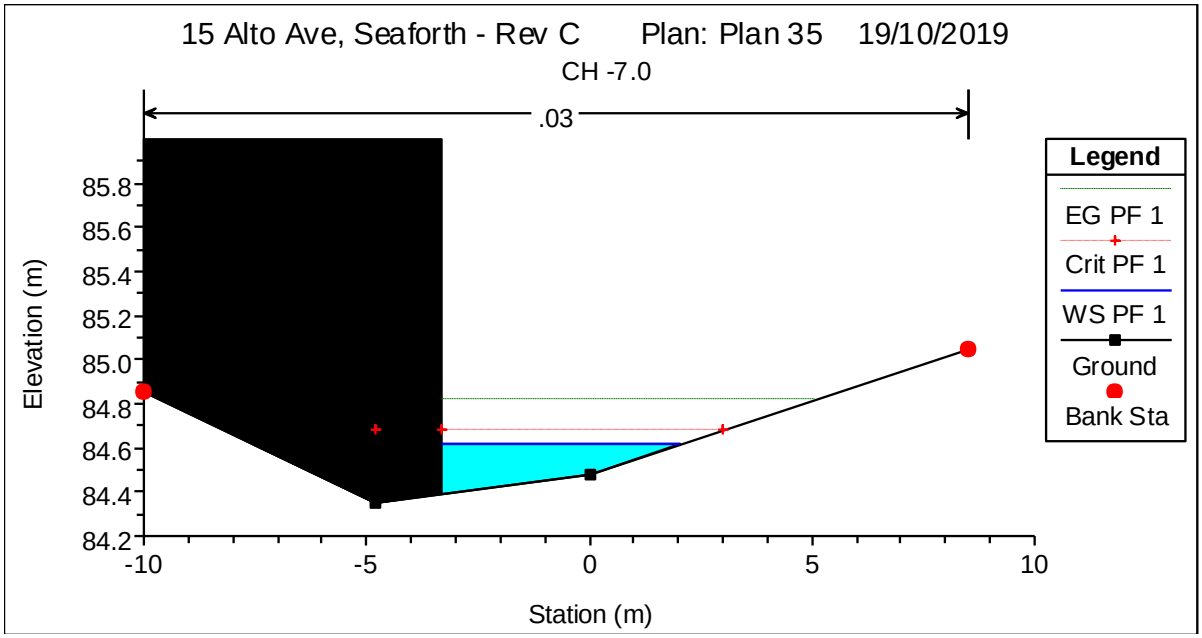


Figure E12 – Post-Development HEC-RAS Cross-Section -7.0

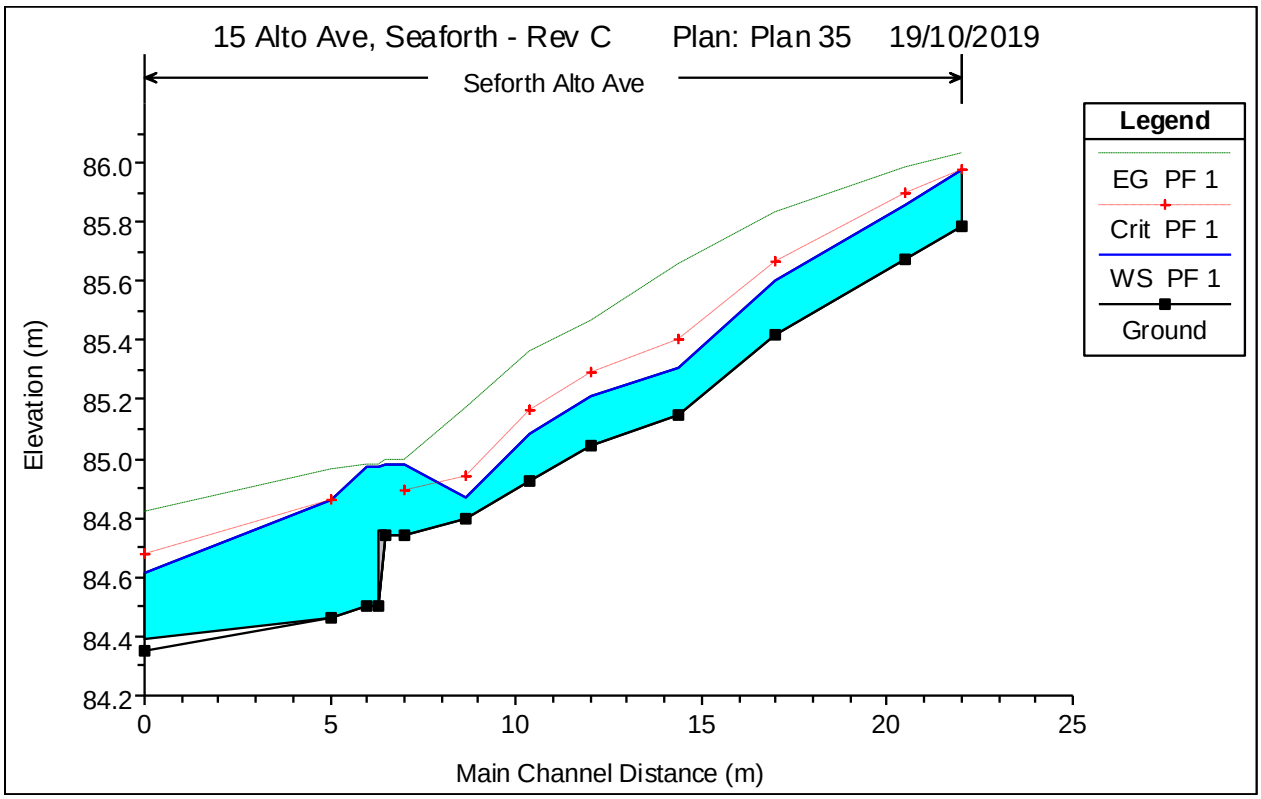


Figure E13 – Post-Development HEC-RAS Longsection

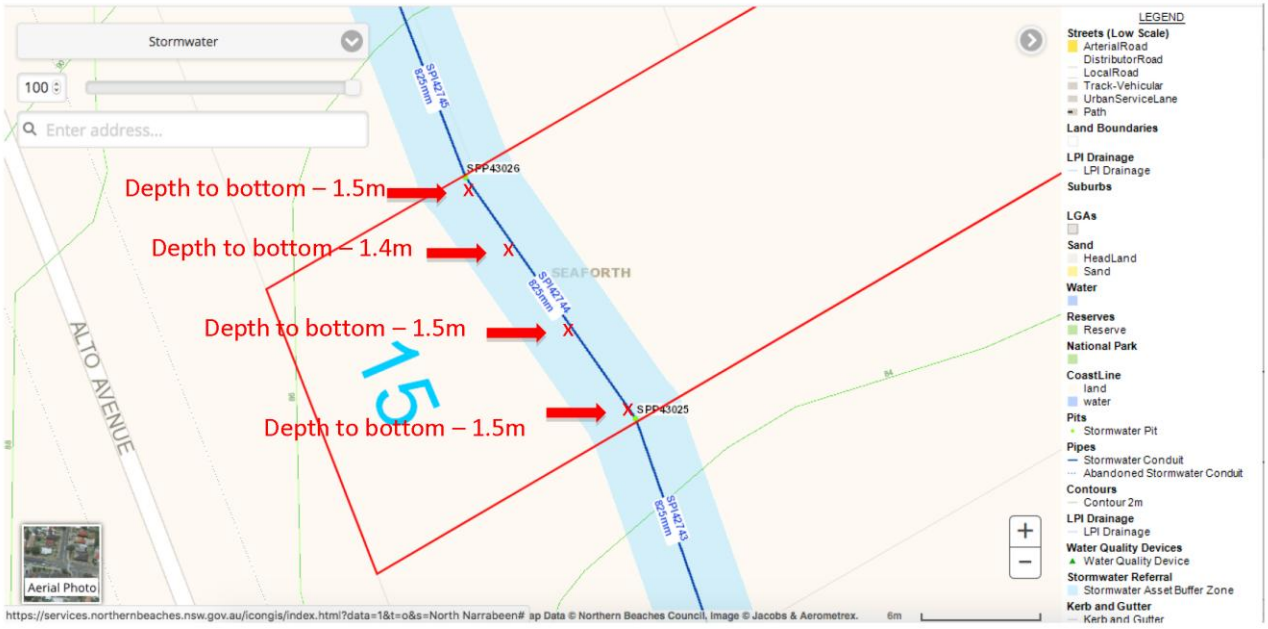
HEC-RAS Plan: Post Dev River: Seforth Reach: Alto Ave Profile: PF 1 Reload

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Alto Ave	15.0	PF 1	1.47	85.79	85.97	85.97	86.03	0.018687	1.07	1.38	12.12	1.01
Alto Ave	13.5	PF 1	1.47	85.67	85.86	85.90	85.99	0.037665	1.58	0.93	7.18	1.41
Alto Ave	10.0	PF 1	1.47	85.42	85.60	85.66	85.83	0.044468	2.13	0.69	3.80	1.60
Alto Ave	7.4	PF 1	1.47	85.15	85.30	85.41	85.66	0.087607	2.64	0.56	3.80	2.21
Alto Ave	5.0	PF 1	1.47	85.05	85.21	85.29	85.47	0.055065	2.22	0.66	4.15	1.77
Alto Ave	3.35	PF 1	1.47	84.92	85.08	85.16	85.36	0.066089	2.34	0.63	4.15	1.93
Alto Ave	1.65	PF 1	1.47	84.80	84.87	84.94	85.17	0.213065	2.45	0.60	9.38	3.09
Alto Ave	0.0	PF 1	1.47	84.74	84.98	84.89	84.99	0.003195	0.57	2.56	15.20	0.45
Alto Ave	-0.5		Inl Struct									
Alto Ave	-1.0	PF 1	1.47	84.50	84.97		84.98	0.001052	0.45	3.39	14.81	0.28
Alto Ave	-2.0	PF 1	1.47	84.46	84.86	84.86	84.97	0.017201	1.43	1.03	5.06	1.01
Alto Ave	-7.0	PF 1	1.47	84.39	84.62	84.68	84.82	0.052344	1.98	0.74	5.35	1.70

Figure E14 – Post-Development HEC-RAS Results Summary Table

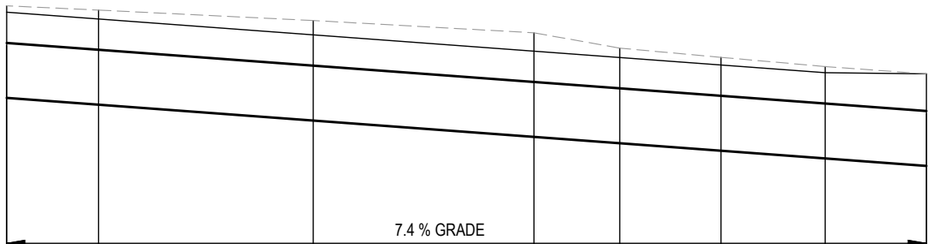
Annexure F

Council Pipe Depth Diagram



Annexure G

Council Pipe Longitudinal Section



	UPSTREAM BOUNDARY						DOWNSTREAM BOUNDARY
EXISTING GROUND LEVEL	85.890	85.820	85.650	85.450	85.200	85.050	84.900	84.780
PROPOSED GROUND LEVEL	85.785	85.674	85.416	85.150	85.047	84.925	84.800	84.780
PIPE COVER (m)	0.500	0.500	0.501	0.502	0.502	0.502	0.503	0.605
PIPE OBVERT (m)	85.285	85.174	84.915	84.648	84.545	84.423	84.297	84.175
PIPE INVERT	84.390	84.279	84.020	83.753	83.650	83.528	83.402	83.280
CHAINAGE	15.0	13.5	10.0	7.4	5.0	3.35	1.65	0.0

SCALE: HORIZONTAL 1:100 @ A3
VERTICAL 1:100 @ A3

WATERDESIGN
CIVIL ENGINEERS
1 FLAME TREE PLACE
CHERRYBROOK NSW 2126
MOBILE: 0417 671646
EMAIL: waterdes@bigpond.net.au
ABN: 77 928 166 729
© All design and drawings are the property of Waterdesign Civil Engineers. This drawing must not be used, reproduced or copied without the written approval of Waterdesign Civil Engineers.

CLIENT NAME: MATT DEERAN

PROJECT TITLE: NEW DWELLING HOUSE
15 ALTO AVENUE
SEAFORTH NSW

DRAWING TITLE: PIPE LONGITUDINAL SECTION

DRAWN: A.L
DATE: 03.09.2018
JOB No: 2018-053
APPROVED BY: ANDREW LAM MIEAust B.E. Civil (Hons)
DWG NO: PL1
no. IN SET: 1

No.	REVISION / ISSUE DESCRIPTION	DATE

Annexure H

Plan of Subdivision with Indicative Building Envelope Restrictions

NOTES

- Do not scale from this plan.
- This purpose of this plan is to show a proposed subdivision layout. It must not be used for any other purpose.
- Boundary dimensions and areas have been compiled from the current subject site Deposited Plan. No boundaries have been surveyed or marked. If any work is to be undertaken on or adjacent to a boundary then a Boundary Survey is recommended to define the boundaries of the site.
- All proposed lot dimensions, areas and easements shown are approximate only and subject to services and engineering design, regulatory approval, construction, final survey and registration of the Plan of Subdivision at Land and Property Information NSW.
- Underground stormwater service location and levels are shown as per ground markings provided by an underground service locating consultant and are approximate only. SurveyPlus Pty Ltd takes no responsibility for the accuracy or completeness of any underground service information. The underground service locating consultant should be contacted directly to determine the accuracy of ground markings provided by them. Other visible services have been located by survey. It is recommended to contact Dial Before You Dig and the relevant service authority prior to commencement of any work.
- This drawing and the information it contains is copyright and remains the property of SurveyPlus Pty Ltd. It must not be copied, used or altered without the express authority of SurveyPlus.
- These notes form an integral part of this plan and any other plan that relies on the information shown herein.

N N

MGA (BY SURVEY)

MM (BY DP 11162)

D
DP385547

B
DP387463

135
DP 11162

134
DP 11162

133
DP 11162

132
DP 11162

131
DP 11162

129
DP 11162

PRINCE EDWARD ROAD

ALTO AVENUE

2
512.5m²

1
519.5m²

EXISTING SINGLE STOREY METAL CLAD BUILDING TILE ROOF

INDICATIVE BUILDING ENVELOPE (DWELLING) 130.5m²

INDICATIVE BUILDING ENVELOPE (GARAGE) 71m²

STW PIPE 1.5m DEEP SL 85.96 IL 84.46 825mm Ø

STW PIPE 1.5m DEEP SL 85.38 IL 83.88 825mm Ø

STW PIPE 1.5m DEEP SL 84.95 IL 83.45 825mm Ø

40.135
19.4
15.06
27.90
33.33
1.36
(1.23)
8.025
(7.69)
(4.20)
(1.08)
(10.60)
(0.9)
(4.95)
(4.70)
(6.39)
(0.5)
(1.98)
(0.2)
(0.95)
(5.27)
(6.30)
(0.965)
(0.74)
(1.47)
(5.235)
(4.245)
(0.35)
(1.98)
(0.35)
(3.09)
(0.33)
(2.365)
(A)
(11.56)
(B)
(2.03)
(1)
35.665
15.24

(A) - EASEMENT FOR DRAINAGE 1.83 WIDE (G793114)
(B) - PROPOSED EASEMENT TO DRAIN WATER 1 WIDE

0m 1 2 3 4 5 10

SCALE 1:100 @ A1

DIAL BEFORE YOU DIG www.1100.com.au

CLIENT
Shannon Deeran

	REVISION / DATE	REVISION DETAILS	SURVEY BY	DRAWN BY	CHECKED BY
D	28.02.2020	UPDATE PROPOSED SUBDIVISION BOUNDARY AND BUILDING ENVELOPES	--	PK	PK/JM
C	11.06.2019	STORMWATER DATA ADDED AND PROPOSED BUILDING ENVELOPE UPDATED (PROPOSED LOT 1)	PK	CE	GC
B	14.03.2019	TREE DETAILS UPDATED	--	PK	PK
A	30.06.2017	INITIAL ISSUE	--	CE	PM

surveyplus
land development consultants
We make it easy.
We make it happen.
02 9651 2921
info@surveyplus.com.au
www.surveyplus.com.au

DATE OF SURVEY	6.06.2019
ORIGIN OF LEVELS	N / A
ORIGIN OF COORDS	PM 365 (MGA)
CONTOUR INTERVAL	N / A

DRAWING TITLE

PROPOSED SUBDIVISION PLAN
PROPOSED SUBDIVISION OF LOT 130 DP 11162
No. 15 ALTO AVENUE, SEAFORTH

SCALE	1:100 @ A1
REVISION	D
SHEET	1 OF 2
REF	16123_SUB_1D

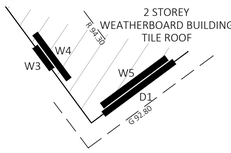
INTERESTS RELATING TO THE SUBJECT SITE:
The Certificate of Title for Lot 130 DP11162 ordered on 01.03.2017 identified the following interests (refer to the original 88B Instrument or Dealing creating the interest for specific terms - we recommend this be undertaken prior to design or construction):
- Reservations and conditions in the crown grant(s) ~ (Not investigated).
- Easement for drainage affecting the land shown so burdened in Vol 6185 Fol 109 (G793114) ~ (Denoted (A) on the plan).

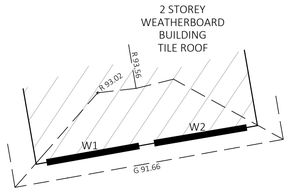
NOTES
- Do not scale from this plan.
- Plan coordinates have been determined from ground (real) distances and are related to an MGA (grid) point of origin. A scale factor must be applied to convert plan coordinates to true MGA grid coordinates.
- The purpose of this Detail Survey plan is to show detail and levels for planning and design. Do not use the information shown for any other purpose.
- Contours are an indication of the topography and should only be used for planning purposes. Spot levels only should be used for detailed design.
- Boundary dimensions and areas have been compiled from the current subject site Deposited Plan.
- A preliminary fixation of subject site boundaries has been made. If any work is to be undertaken on or adjacent to a boundary then a Boundary Survey is recommended to define the boundaries of the site.
- The relationship of built form and natural features to boundaries is diagrammatic and if critical should be confirmed by a Boundary Survey. Boundary setbacks shown are approximate only.
- Underground service locations are approximate only and have been scaled using Dial Before You Dig service diagrams current on the date of survey. Other visible services have been located by survey. It is recommended to contact Dial Before You Dig and the relevant service authority prior to commencement of any work.
- Underground stormwater service location and levels are shown as per ground markings provided by an underground service locating consultant and are approximate only. SurveyPlus Pty Ltd takes no responsibility for the accuracy or completeness of any underground service information. The underground service locating consultant should be contacted directly to determine the accuracy of ground markings provided by them. Other visible services have been located by survey. It is recommended to contact Dial Before You Dig and the relevant service authority prior to commencement of any work.
- Only those windows visible and unobscured from within the subject property on the date of survey have been located.
- Tree information and footprint location is approximate and if critical may require further assessment.
- This drawing and the information it contains is copyright and remains the property of SurveyPlus Pty Ltd. It must not be copied, used or altered without the express authority of SurveyPlus.
- These notes and interests noted in the Certificate of Title form an integral part of this plan and any other plan that relies on the information shown herein.
- This purpose of this plan is to show a proposed subdivision layout. It must not be used for any other purpose.
- All proposed lot dimensions, areas and easements shown are approximate only and subject to services and engineering design, regulatory approval, construction, final survey and registration of the Plan of Subdivision at Land and Property Information NSW.

LEGEND

G	- GUTTER
HYD [H]	- HYDRANT
IL XX.XX	- INVERT LEVEL RL XX.XX
PP ●	- POWER POLE
R	- RIDGE / ROOF
SI ∘	- SIGN
SIP ◎	- SEWER INSPECTION PIT
SL XX.XX	- SURFACE LEVEL RL XX.XX
SMH (S)	- SEWER MANHOLE
STW	- STORMWATER
TAP ⋊	- WATER TAP
TPIT [T]	- TELECOMMUNICATION PIT
WM ▬	- WATER METER
——E——	- OVERHEAD ELECTRICITY WIRES
——G——	- UNDERGROUND GAS (APPROX. LOCATION)
——S——	- UNDERGROUND SEWER (APPROX. LOCATION)
——UT——	- UNDERGROUND COMMUNICATIONS (APPROX. LOCATION)
——W——	- UNDERGROUND WATER (APPROX. LOCATION)
——USW——	- UNDERGROUND STORMWATER SERVICE (APPROX. LOCATION BY USL)

WINDOW/DOOR SCHEDULE		
No.	TOP RL	BOT. RL
W1	91.45	89.96
W2	91.45	89.96
W3	89.93	89.27
W4	92.19	91.02
W5	92.18	90.67
D1	90.01	NOT VIS.
W6	90.94	89.96
W7	87.91	86.56
W8	90.94	90.15
W9	87.58	86.47
W10	87.75	86.02
W11	87.75	86.02





D
DP 385547

B
DP 378463

DP 11162

129
DP 11162

EXISTING DWELLING TO BE RETAINED

CARPORT TO BE DEMOLISHED

SINGLE STOREY METAL CLAD BUILDING TILE ROOF

VERANDAH

1 519.5m²

2 512.5m²

CLOTHES LINE

SHED

2 STOREY WEATHERBOARD BUILDING METAL ROOF

INDICATIVE BUILDING ENVELOPE (DWELLING) 130.5m²

INDICATIVE BUILDING ENVELOPE (GARAGE) 71m²

239° 50' 45" ~ 73.45

8° 55' 45" ~ 19.4

59° 50' 45" ~ 63.56

158° 38' 45" ~ 15.24

40.135

33.33

35.665

15.06

27.90

8.025

(A) - EASEMENT FOR DRAINAGE 1.83 WIDE (G793114)
(B) - PROPOSED EASEMENT TO DRAIN WATER 1 WIDE

BENCHMARK
NAIL IN KERB
RL 86.06m (AHD)

TREE DIAGRAM
APPROXIMATE TREE RADIUS SPREAD
TRUNK DIAMETER
APPROXIMATE TREE HEIGHT

0m 1 2 3 4 5 10
SCALE 1:100 @ A1

DIAL BEFORE YOU DIG www.1100.com.au

ALTO AVENUE

PRINCE EDWARD ROAD

CLIENT	REVISION / DATE	REVISION DETAILS	SURVEY BY	DRAWN BY	CHECKED BY
Shannon Deeran	D 28.02.2020	UPDATE PROPOSED SUBDIVISION BOUNDARY AND BUILDING ENVELOPES	--	PK	PK/JM
	C 11.06.2019	STORMWATER DATA ADDED AND PROPOSED BUILDING ENVELOPE UPDATED (PROPOSED LOT 1)	PK	CE	GC
	B 14.03.2019	TREE DETAILS UPDATED	--	PK	PK
	A 30.06.2017	INITIAL ISSUE	PK	CE	PM

surveyplus land development consultants
We make it easy. We make it happen.
02 9651 2921
info@surveyplus.com.au
www.surveyplus.com.au

DATE OF SURVEY	30.03.2017 & 6.06.2019
ORIGIN OF LEVELS	PM 364 RL 91.923 (AHD)
ORIGIN OF COORDS	PM 365 (MGA)
CONTOUR INTERVAL	0.5m

DRAWING TITLE
DETAIL SURVEY PLAN
PROPOSED SUBDIVISION OF LOT 130 DP 11162
No.15 ALTO AVENUE, SEAFORTH

SCALE	1:100 @ A1
REVISION	D
SHEET	2 OF 2
REF	16123_SUB_1D