

Neil M Craigie Pty Ltd

ACN 074 582 282 ABN 29 074 582 282

Waterway Management Consultants

24 December 2010

██████████
Development Services Planner
Melbourne Water Corporation
(By Email)

Dear ██████████,

**RE: RIVERWOOD RETIREMENT VILLAGE
9 CANNING STREET AVONDALE HEIGHTS
UPDATE REPORT ON FLOODPLAIN MODIFICATIONS**

This report is an update of the previous document dated 4 December 2008 and has been prepared to address some recent further minor changes to the layout for the open space floodplain areas within the proposed retirement village development which is under construction at 9 Canning Street, Avondale Heights.

These latest changes reflect village design amendments which have followed the property ownership transfer to Tigcorp and renaming to Riverwood Retirement Village.

You will recall that MWC have previously indicated approval-in-principle to the floodplain development proposals dating back to 4 November 2005 in letter to The Planning Group dated 23 November 2005 (MW Ref 2782). That development plan is attached as Figure 1 (Sheets 1 and 2) for ease of reference and to also show the location of floodplain cross-sections used in the HEC-RAS hydraulic model.

Thereafter design iterations occurred in 2007 and 2008 which resulted in deletion of the stepped narrow linear wetland system in favour of a swale upstream of Cross-section 22, and issue of update reports on floodplain impacts.

The floodplain modification plan included in the report of 4 December 2008 is attached as Figure 2. The plan extended only to cross-section 22 as no other changes were proposed upstream of this point compared with the 2007 version.

Following submission of the 4 December 2008 update report, approval-in-principle was again given by MWC in letter dated 3 February 2009 (MW Ref 2782-copy attached as Appendix 1).

The new December 2010 floodplain landscape concept plan for Riverwood is attached as Figure 3 and the detail floodplain grading plan as Figure 4 (Sheets 1-3).

Director Neil McKinnon Craigie BE(Civil), MEngSci, MIEAust, CPEng

Email: nmccraigie@bigpond.com

15 Mulawa Street Croydon, Vic. 3136, Australia

Telephone & Fax: (03) 9725 1053

The latest design differs from the December 2008 plan only in regard to minor changes to the northern wetland area and the bowling greens:

- the bowling green site has been converted to passive green space and has been lowered by 0.5 m to increase floodplain storage and reduce intrusion into the floodplain area;
- the wetland pool originally located in the lee (north) of the former bowling green has been reduced in size to straighten the development boundary, ease batter slopes and eliminate significant retaining walls;
- no changes apply at or upstream of XS 21.5, and downstream of XS 21.

Floodplain Hydraulic Modelling

HEC-RAS and MUSIC models for existing conditions and the previous development proposals were consolidated and submitted to MWC with the report of 4 December 2008.

For completeness, all previous HEC-RAS model results have been included in this report:

- Tables 1 and 2 repeat the key results from the HEC models from the original report of 18/9/03. Table 1 relates to existing conditions whilst Table 2 provides results for the then proposed future conditions.
- Table 3 provides results for the 2005 development plan.
- Table 4 provides results for the 2007 development plan.
- Table 5 provides results for the December 2008 development plan.
- Table 6 provides results for the December 2010 development plan.

Note: As has been the case for all previous models the floodplain base level at each cross-section has been set at the NTWL for the proposed wetland system and not the base of the wetlands. Hence the results under-estimate flood flow capacity and over-estimate velocities in the wetlands precincts. As the same assumption is made for all modification models the results are directly comparable.

The August 2007 model is identical to the previous versions upstream of XS 23 and downstream of XS 20.

The December 2008 model is identical to the August 2007 model at and upstream of XS 22, and at and downstream of XS 20.

The December 2010 model is identical to the December 2008 model at and upstream of XS 21.5 and downstream of XS 21.

As discussed in the report dated 29/8/03, in the Addendum dated 18/9/03, in the review dated November 2005, the update report of 6 August 2007, and the update

report of 4 December 2008, the results in December 2010 again prove that the proposed floodplain modifications cause no significant detrimental impact on river flooding conditions.

Floodplain Storage Volumes

Overall the HEC-RAS model infers total floodplain storage between the Canning St bridge and XS 24 has now been further increased cf. existing conditions and the approved December 2008 proposal and there has been no reduction in time of passage of peak flow.

The HEC-RAS model provides storage estimates based on cross-sectional averaging. Whilst the trend or change from one model to the next is correct, actual storage volumes will differ from quantities derived using full digital terrain models of the before and after constructed surfaces.

Detailed quantities of floodplain storage have been taken out by WBCM P/L using a digital terrain model derived from the floodplain grading plan shown on Figure 4 (Sheets 1-3). The DTM has verified that compared with the December 2008 proposal, the current design increases floodplain storage volume by 3,840 m³.

Water Quality Treatment

In regard to wetland area the 2007 development plan created water surface area of 3,600 m² including the terminal irrigation storage pond of 500 m². The swale inlet drainage system was restored for a length of approximately 120 m upstream of XS 22.

The December 2008 design retained the swale but increased water surface area to 5,000 m² including the terminal irrigation storage pond of 1,150 m².

The December 2010 design retains the swale but reduces water surface area to 4,800 m² including the terminal irrigation storage pond of 1,150 m².

The MUSIC model (Version 3) has been used to check water quality treatment performance. As before, inflows from the Camlarni Court external catchment are to be diverted into the system and the final pond in the wetland system will be designed as an irrigation storage with the treated stormwater being used for site irrigation and for maintenance of water levels in the remainder of the wetland system (7 ML/yr mean total demand).

The MUSIC results at the inlet and outlet from the irrigation pond are listed in Table 1 below and verify that best practice standards for both water quality discharged into the irrigation storage and the residual discharged from the site to the river will be easily exceeded.

Parameter	Source loads	Inlet Loads to Irrigation Pond	% Load Reduction in wetlands	Outlet Loads to River	% Load Reduction Overall
Flow (ML/yr)	49.2	44.7	9	36.9	25
Total Suspended Solids (kg/yr)	9,620	1,200	88	929	90
Total Phosphorus (kg/yr)	20.0	4.9	76	4.3	78
Total Nitrogen (kg/yr)	141	73	48	60	58
Gross Pollutants (kg/yr)	1,830	0	100	0	100

Local catchment peak flow mitigation

The change to wetland surface area also changes onsite flood storage in the airspace overhead.

The report of 29/8/03 defined the active storage volume required to maintain peak discharges at existing conditions values for all (local catchment storm runoff) events up to and including the 100 year ARI event as 4,090 m³.

The free surface overflow level for the wetland system is 3.75 m (ie., the level above which ponded stormwater in the wetland system can begin to freely escape to the river). At this level the active storage volume available above NTWL in the wetland system on the 2008 plans is still in excess of 5,300 m³. Therefore the proposals comply easily with peak flow mitigation requirements for local catchment runoff.

In summary the proposed finished surface levels, wetland areas and water levels shown on the attached December 2010 concept plan (Figures 3 and 4) comply easily with all best practice requirements for floodplain management and stormwater quality and quantity management.

Request

MWC have previously indicated approval-in-principle to the floodplain development proposals dating back to 4 November 2005 in letter to The Planning Group dated 23 November 2005 (MW Ref 2782).

Following submission of the 4 December 2008 update report, approval-in-principle was again given by MWC in letter dated 3 February 2009 (MW Ref 2782-copy attached as Appendix 1).

It is now requested that MWC confirm that the final December 2010 floodplain modifications as shown on Figures 3 and 4:

- still comply with MWC and best practice requirements, and
- are approved in principle, subject to submission of detail plans in the usual way.

Please do not hesitate to contact me if there are any queries in regard to this submission.

For your ease of reference I have also attached copies of the 4 December 2008 report and the new HEC-RAS geometry and MUSIC V3 models.

Yours faithfully,

Neil M Craigie

Attachments to Email

HEC-RAS geometry file:	AvonHtsDevel 24 Dec 10 FutCondNMC (Avon.g07)
MUSIC V3 file:	9 Canning St V3 24 Dec 10 Mel 1959 6 min
Pdf file:	Floodplain Update Report 4 Dec 08 for MWC

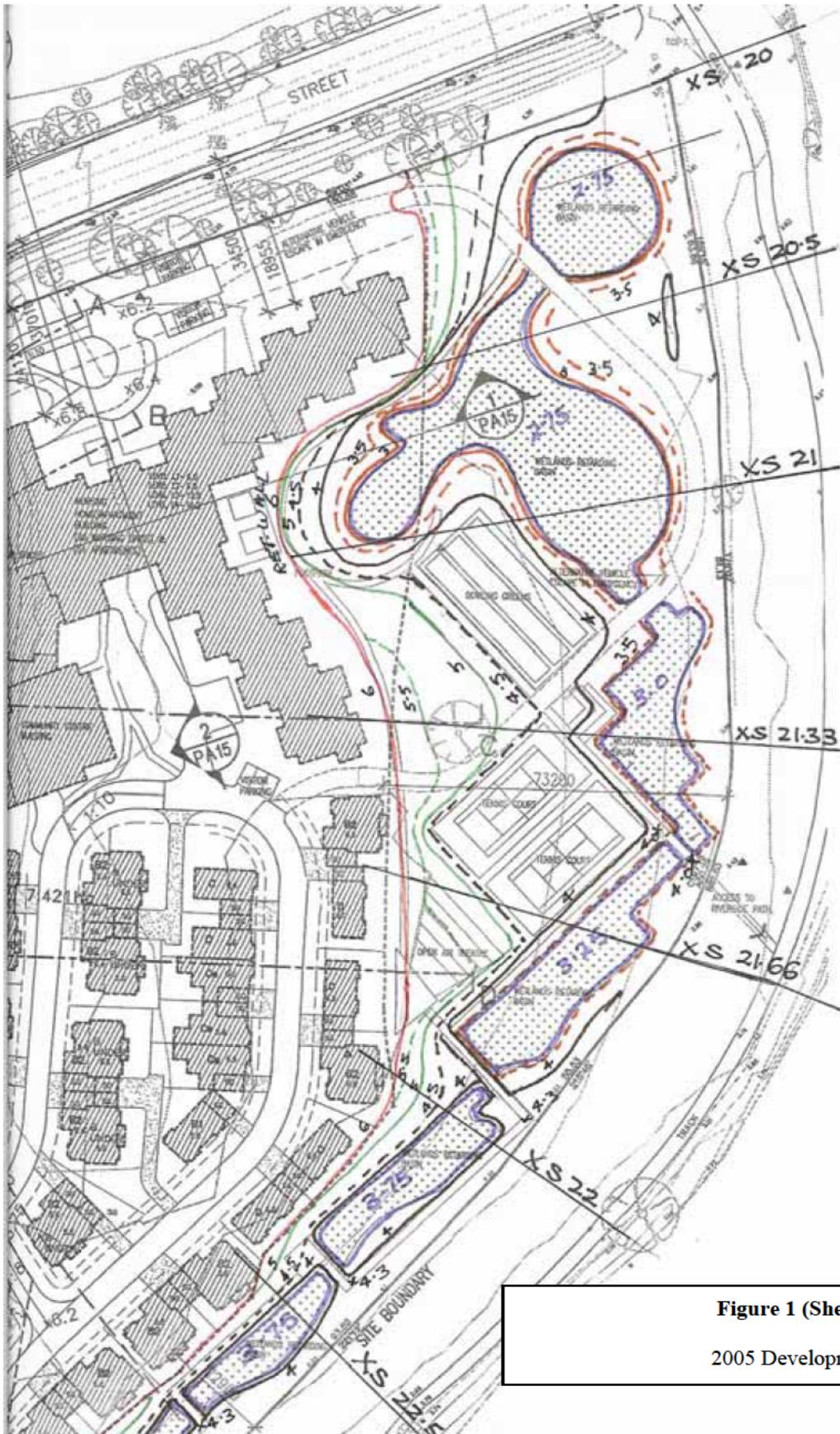


Figure 1 (Sheet 1 of 2)
2005 Development Plan

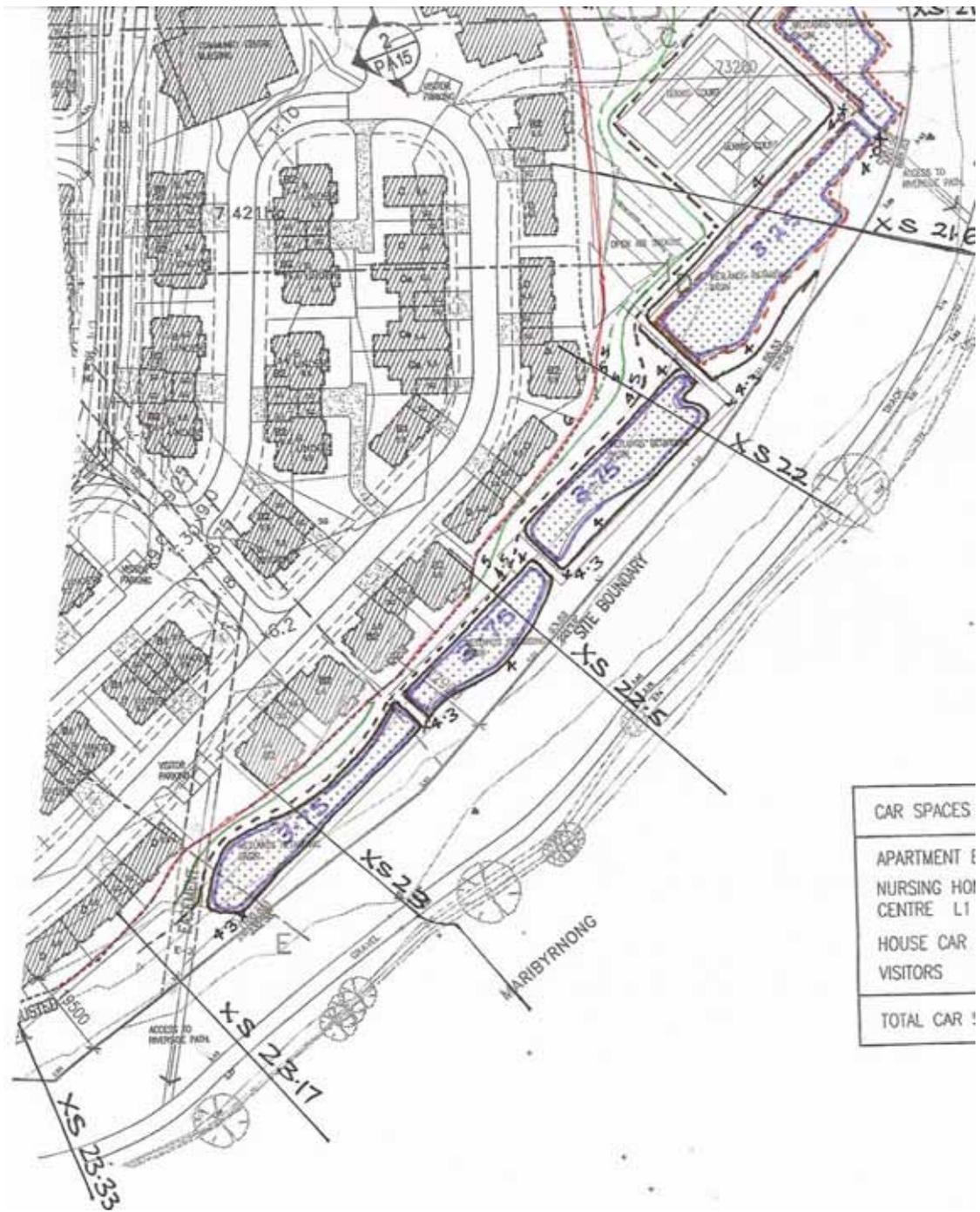


Figure 1 (Sheet 2 of 2)

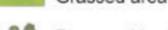
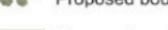
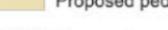
2005 Development Plan



Figure 2
December 2008 Development Plan (ERM)

Landscape Concept

LEGEND

-  Proposed feature trees (refer to Tender Drawings for species)
-  Proposed trees (refer to Tender Drawings for species)
-  Proposed groundcovers (refer to Tender Drawings for species)
-  Grassed area
-  Proposed boulders
-  Proposed pedestrian path
-  Proposed granitic sand
-  Proposed outdoor chess board
-  Proposed pergola / bbq area
-  Proposed pergola
-  Proposed platform seat
-  Proposed bench seat
-  Proposed vegetable patch planting (refer to Tender Drawings for species)
-  Proposed playground
-  Proposed Jetty



RIVERWOOD FLOODPLAIN LANDSCAPE CONCEPT PLAN

Project No: 0124288	Drawing No: LS 01
Date: 03/12/10	Drawing size: A1
Drawn by: CM	Reviewed by: BP
Issue: A	

0 25m
Scale 1:500 @ A1

LANDSCAPE ARCHITECTURE
URBAN DESIGN

L1 101 Lakeside Street
SPRING HILL, QLD
AUSTRALIA 4171
TELEPHONE 61 7 309 8333
FACSIMILE 61 7 309 8301
WWW.ERM.COM



Figure 3
 Riverwood Floodplain Landscape Concept Plan, Dec 2010 (ERM)

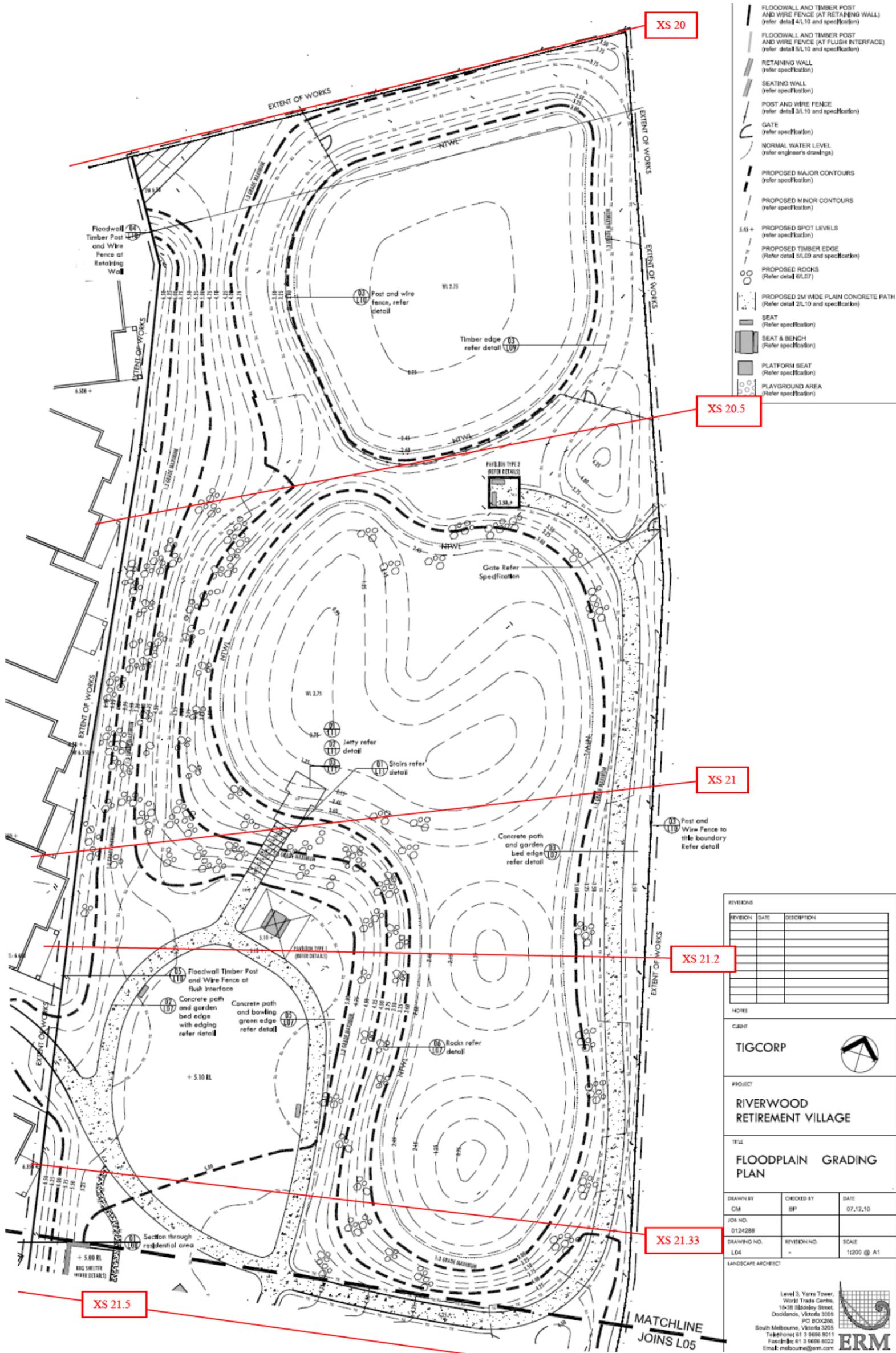


Figure 4 (Sheet 1 of 3)
 Riverwood Floodplain Grading Plan, Dec 2010 (ERM)

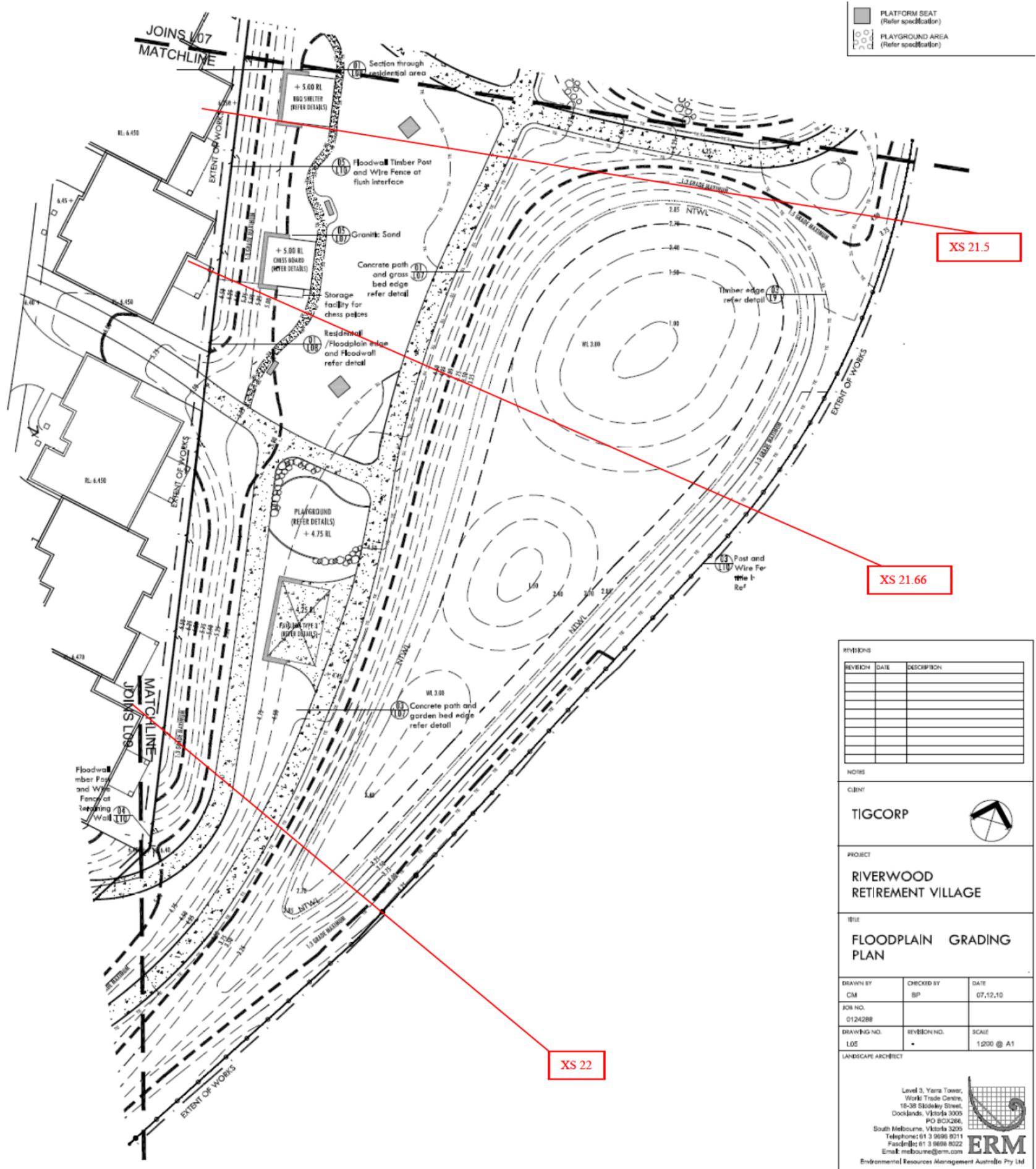


Figure 4 (Sheet 2 of 3)
 Riverwood Floodplain Grading Plan, Dec 2010 (ERM)

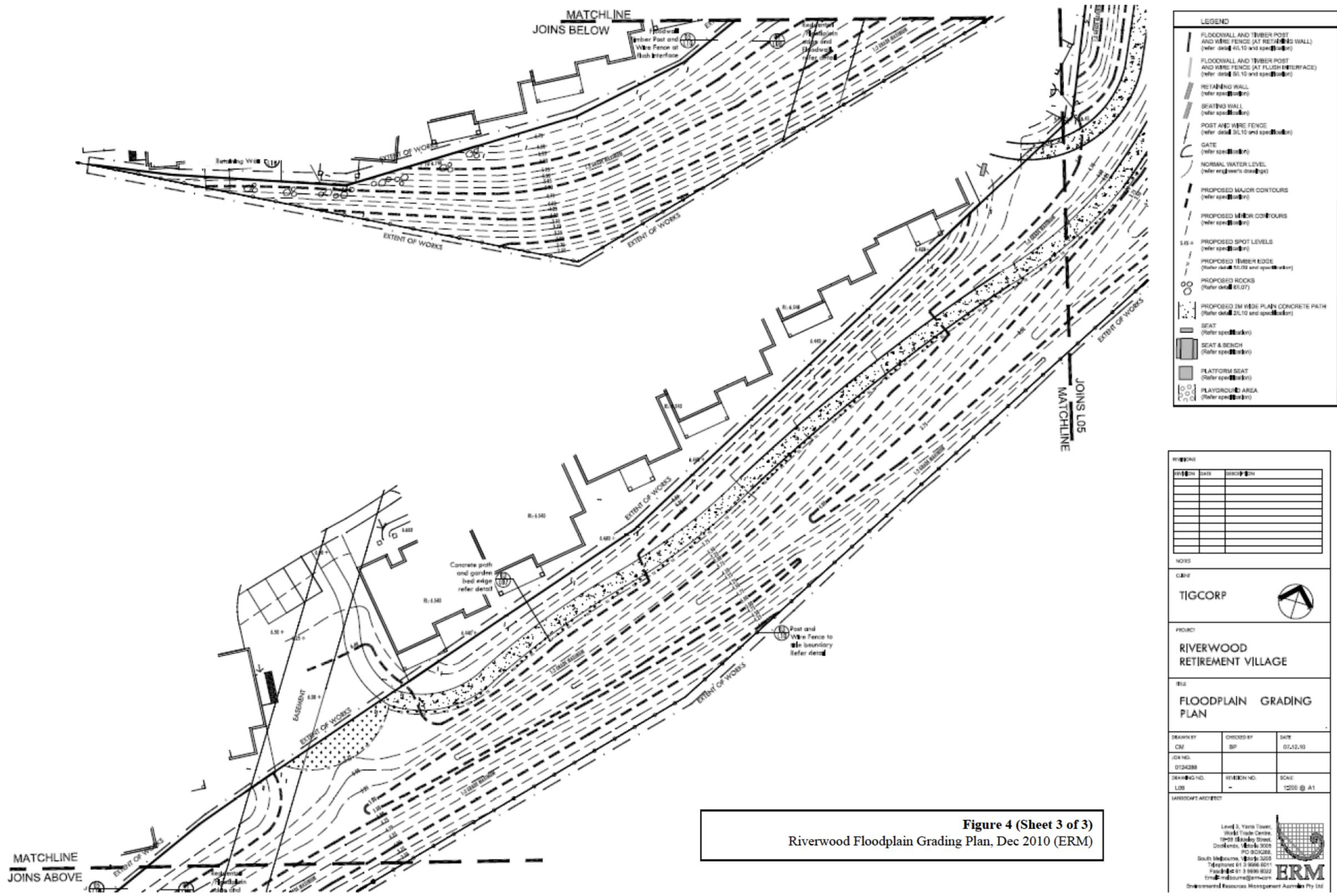


Figure 4 (Sheet 3 of 3)
 Riverwood Floodplain Grading Plan, Dec 2010 (ERM)

*Riverwood RV, 9 Canning Street, Avondale Heights Development
Update Report for Floodplain Modifications, 4 December 2008*

TABLE 1 Existing Conditions, Avondale Heights Development (Maribyrnong River MWC HEC Model, Upstream Canning Street)															
River Sta	Q Total	Min Ch El	W.S. Elev	E.G. Elev	Flow Area	Volume	Trvl Tme Avg	Vel Chnl	Vel Left	Vel Right	Power Chan	Power LOB	Power ROB	Froude # Chl	Froude # XS
	(m³/s)	(m)	(m)	(m)	(m²)	(1000 m³)	(hrs)	(m/s)	(m/s)	(m/s)	(N/m s)	(N/m s)	(N/m s)		
24	870.00	-3.61	5.81	6.32	376.34	2441.90	0.74	3.49	0.95	0.96	99.14	10.97	11.15	0.38	0.32
23.8333*	870.00	-3.27	5.81	6.30	382.34	2422.92	0.73	3.41	0.94	0.92	93.16	10.24	10.13	0.38	0.32
23.6666*	870.00	-2.93	5.81	6.27	387.97	2403.69	0.72	3.30	0.97	0.93	93.74	10.71	10.53	0.37	0.33
23.5*	870.00	-2.60	5.80	6.25	399.13	2384.11	0.72	3.25	0.88	0.92	90.32	8.15	10.08	0.37	0.33
23.3333*	870.00	-2.26	5.82	6.21	428.03	2363.71	0.71	3.10	0.88	0.87	78.99	7.74	8.75	0.36	0.32
23.1666*	870.00	-1.92	5.82	6.19	427.39	2342.71	0.70	3.01	0.95	0.88	80.13	9.25	9.21	0.36	0.32
23	870.00	-1.58	5.76	6.17	405.00	2322.23	0.70	3.08	0.94	0.91	88.45	9.12	10.16	0.37	0.35
22.5*	870.00	-2.87	5.78	6.12	446.50	2295.34	0.69	2.82	0.73	0.79	58.73	4.19	6.56	0.32	0.31
22	870.00	-4.15	5.80	6.10	485.05	2264.68	0.68	2.60	0.56	0.72	41.15	2.08	4.74	0.28	0.28
21.6666*	870.00	-3.80	5.76	6.08	470.07	2234.39	0.67	2.69	0.59	0.72	45.73	2.38	4.77	0.29	0.30
21.3333*	870.00	-3.44	5.72	6.06	458.24	2205.67	0.66	2.77	0.62	0.73	55.17	2.78	5.27	0.31	0.32
21	870.00	-3.09	5.69	6.04	449.83	2177.49	0.65	2.84	0.65	0.68	61.46	3.26	4.54	0.32	0.34
20.5	870.00	-3.06	5.71	6.01	487.46	2150.92	0.64	2.71	0.75	0.71	48.13	3.56	4.83	0.31	0.30
20	870.00	-3.06	5.64	5.99	424.43	2123.03	0.64	2.84	0.90	0.75	55.17	5.81	5.52	0.32	0.31
19.77	Bridge														

*Riverwood RV, 9 Canning Street, Avondale Heights Development
Update Report for Floodplain Modifications, 4 December 2008*

TABLE 2 Proposed Future Conditions, September 2003, Avondale Heights Development (Maribyrnong River MWC HEC Model, Upstream Canning Street)															
River Sta	Q Total	Min Ch El	W.S. Elev	E.G. Elev	Flow Area	Volume	Trvl Tme Avg	Vel Chnl	Vel Left	Vel Right	Power Chan	Power LOB	Power ROB	Froude # Chl	Froude # XS
	(m³/s)	(m)	(m)	(m)	(m²)	(1000 m³)	(hrs)	(m/s)	(m/s)	(m/s)	(N/m s)	(N/m s)	(N/m s)		
24	870.00	-3.61	5.81	6.32	376.08	2438.47	0.74	3.49	0.95	0.96	99.32	10.99	11.16	0.38	0.32
23.8333*	870.00	-3.27	5.80	6.29	381.97	2419.50	0.73	3.41	0.94	0.93	93.39	10.26	10.15	0.38	0.32
23.6666*	870.00	-2.93	5.80	6.26	387.34	2400.30	0.73	3.31	0.97	0.93	94.14	10.74	10.57	0.37	0.33
23.5*	870.00	-2.60	5.80	6.24	396.67	2380.79	0.72	3.21	0.98	0.91	87.42	10.64	9.76	0.37	0.32
23.3333*	870.00	-2.26	5.81	6.21	421.53	2360.57	0.71	3.08	0.95	0.87	77.89	9.47	8.63	0.36	0.31
23.1666*	870.00	-1.92	5.81	6.18	425.81	2339.75	0.71	3.00	0.99	0.88	78.88	10.30	9.06	0.35	0.31
23	870.00	-1.58	5.75	6.16	403.93	2319.32	0.70	3.09	0.94	0.91	89.06	9.17	10.22	0.37	0.35
22.5*	870.00	-2.87	5.78	6.12	440.82	2293.24	0.69	2.82	0.77	0.79	58.61	4.84	6.54	0.32	0.30
22	870.00	-4.15	5.80	6.09	494.96	2264.35	0.68	2.56	0.61	0.71	39.29	2.51	4.53	0.27	0.27
21.6666*	870.00	-3.80	5.81	6.07	553.95	2233.40	0.67	2.47	0.64	0.66	35.59	2.72	3.72	0.27	0.25
21.3333*	870.00	-3.44	5.79	6.05	540.52	2201.87	0.66	2.52	0.67	0.67	41.84	3.27	4.01	0.28	0.26
21	870.00	-3.09	5.73	6.03	490.55	2172.34	0.65	2.69	0.70	0.65	52.10	3.89	3.86	0.30	0.30
20.5	870.00	-3.06	5.73	6.02	501.74	2147.13	0.64	2.66	0.77	0.70	45.12	3.73	4.53	0.30	0.29
20	870.00	-3.06	5.64	5.99	424.43	2122.31	0.64	2.84	0.90	0.75	55.17	5.81	5.52	0.32	0.31
19.77	Bridge														

*Riverwood RV, 9 Canning Street, Avondale Heights Development
Update Report for Floodplain Modifications, 4 December 2008*

TABLE 3 Proposed Future Conditions, Development Plan November 2005, Avondale Heights Development (Maribyrnong River MWC HEC Model, Upstream Canning Street)															
River Sta	Q Total	Min Ch El	W.S. Elev	E.G. Elev	Flow Area	Volume	Trvl Tme Avg	Vel Chnl	Vel Left	Vel Right	Power Chan	Power LOB	Power ROB	Froude # Chl	Froude # XS
	(m3/s)	(m)	(m)	(m)	(m2)	(1000 m3)	(hrs)	(m/s)	(m/s)	(m/s)	(N/m s)	(N/m s)	(N/m s)		
24	870.00	-3.61	5.81	6.32	376.59	2449.68	0.74	3.48	0.95	0.96	98.97	10.95	11.13	0.38	0.32
23.8333*	870.00	-3.27	5.81	6.30	382.52	2430.69	0.74	3.40	0.94	0.92	93.04	10.23	10.12	0.38	0.32
23.6666*	870.00	-2.93	5.81	6.27	387.93	2411.45	0.73	3.30	0.97	0.93	93.77	10.71	10.53	0.37	0.33
23.5*	870.00	-2.60	5.81	6.24	397.29	2391.92	0.72	3.21	0.98	0.91	87.05	10.61	9.73	0.37	0.32
23.3333*	870.00	-2.26	5.82	6.21	422.23	2371.66	0.72	3.08	0.95	0.87	77.53	9.45	8.60	0.36	0.31
23.1666*	870.00	-1.92	5.82	6.19	426.56	2350.81	0.71	2.99	0.99	0.88	78.48	10.27	9.02	0.35	0.31
23	870.00	-1.58	5.79	6.17	420.56	2330.01	0.70	3.00	0.97	0.88	81.63	9.59	9.41	0.36	0.33
22.5*	870.00	-2.87	5.81	6.13	458.94	2302.94	0.69	2.75	0.78	0.78	54.76	4.89	6.13	0.31	0.29
22	870.00	-4.15	5.83	6.11	511.59	2273.07	0.68	2.53	0.60	0.70	37.60	2.44	4.34	0.27	0.26
21.6666*	870.00	-3.80	5.82	6.09	538.40	2242.08	0.67	2.53	0.61	0.68	37.94	2.42	3.97	0.27	0.26
21.3333*	870.00	-3.44	5.80	6.08	529.66	2211.17	0.66	2.57	0.65	0.68	43.91	3.01	4.21	0.28	0.27
21	870.00	-3.09	5.84	6.04	639.51	2178.32	0.65	2.31	0.69	0.56	32.51	3.37	2.43	0.26	0.22
20.5	870.00	-3.06	5.78	6.03	547.21	2148.26	0.64	2.51	0.78	0.66	37.74	3.77	3.80	0.28	0.26
20	870.00	-3.06	5.64	5.99	424.43	2122.31	0.64	2.84	0.90	0.75	55.17	5.81	5.52	0.32	0.31
19.77	Bridge														

*Riverwood RV, 9 Canning Street, Avondale Heights Development
Update Report for Floodplain Modifications, 4 December 2008*

**TABLE 4 Proposed Future Conditions, Current Floodplain Development Plan August 2007, Avondale Heights Development
(Maribyrnong River MWC HEC Model, Upstream Canning Street)**

River Sta	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	E.G. Elev (m)	Flow Area (m2)	Volume (1000 m3)	Trvl Tme Avg (hrs)	Vel Chnl (m/s)	Vel Left (m/s)	Vel Right (m/s)	Power Chan (N/m s)	Power LOB (N/m s)	Power ROB (N/m s)	Froude # Chl	Froude # XS
24	870.00	-3.61	5.80	6.31	375.98	2451.30	0.74	3.49	0.95	0.96	99.40	10.99	11.17	0.38	0.32
23.8333*	870.00	-3.27	5.80	6.29	381.76	2432.34	0.74	3.41	0.94	0.93	93.53	10.27	10.16	0.38	0.32
23.6666*	870.00	-2.93	5.80	6.26	387.36	2413.14	0.73	3.31	0.97	0.93	94.13	10.74	10.56	0.37	0.33
23.5*	870.00	-2.60	5.80	6.24	396.69	2393.63	0.72	3.21	0.98	0.91	87.42	10.64	9.76	0.37	0.32
23.3333*	870.00	-2.26	5.81	6.21	421.55	2373.41	0.72	3.08	0.95	0.87	77.88	9.47	8.63	0.36	0.31
23.1666*	870.00	-1.92	5.81	6.18	421.93	2352.67	0.71	3.02	0.98	0.88	80.71	10.05	9.26	0.36	0.32
23	870.00	-1.58	5.79	6.16	420.63	2331.97	0.70	3.00	0.97	0.88	81.68	9.61	9.41	0.36	0.33
22.5*	870.00	-2.87	5.81	6.13	461.45	2304.83	0.70	2.75	0.78	0.77	54.28	4.95	6.08	0.31	0.29
22	870.00	-4.15	5.83	6.10	517.41	2274.74	0.69	2.51	0.61	0.70	36.88	2.54	4.25	0.27	0.26
21.6666*	870.00	-3.80	5.83	6.08	564.06	2243.00	0.67	2.46	0.62	0.66	35.02	2.54	3.66	0.27	0.25
21.3333*	870.00	-3.44	5.80	6.07	545.91	2211.09	0.66	2.53	0.65	0.67	42.15	2.96	4.04	0.28	0.27
21	870.00	-3.09	5.82	6.04	603.03	2178.73	0.65	2.41	0.68	0.58	37.03	3.39	2.76	0.27	0.24
20.5	870.00	-3.06	5.78	6.03	547.44	2149.57	0.64	2.50	0.78	0.66	37.70	3.77	3.80	0.28	0.26
20	870.00	-3.06	5.64	5.99	424.60	2123.61	0.64	2.84	0.90	0.75	55.11	5.81	5.51	0.32	0.31
19.77	Bridge														

*Riverwood RV, 9 Canning Street, Avondale Heights Development
Update Report for Floodplain Modifications, 4 December 2008*

**TABLE 5 Proposed Future Conditions, Floodplain Development Plan 4 December 2008, Avondale Heights Development
(Maribyrnong River MWC HEC Model, Upstream Canning Street)**

River Sta	Q Total	Min Ch El	W.S. Elev	E.G. Elev	Flow Area	Volume	Trvl Tme Avg	Vel Chnl	Vel Left	Vel Right	Power Chan	Power LOB	Power ROB	Froude # Chl	Froude # XS
	(m3/s)	(m)	(m)	(m)	(m2)	(1000 m3)	(hrs)	(m/s)	(m/s)	(m/s)	(N/m s)	(N/m s)	(N/m s)		
24	870.00	-3.61	5.82	6.33	377.17	2444.95	0.74	3.48	0.95	0.96	98.57	10.92	11.10	0.38	0.32
23.8333*	870.00	-3.27	5.82	6.30	383.03	2425.93	0.73	3.40	0.94	0.92	92.72	10.20	10.09	0.38	0.32
23.6666*	870.00	-2.93	5.82	6.28	388.71	2406.67	0.73	3.30	0.97	0.93	93.27	10.67	10.48	0.37	0.32
23.5*	870.00	-2.60	5.82	6.25	398.12	2387.09	0.72	3.20	0.98	0.90	86.55	10.58	9.68	0.37	0.32
23.3333*	870.00	-2.26	5.83	6.22	423.17	2366.80	0.72	3.07	0.95	0.86	77.06	9.41	8.55	0.36	0.31
23.1666*	870.00	-1.92	5.82	6.20	423.67	2345.98	0.71	3.01	0.98	0.88	79.79	9.99	9.18	0.36	0.32
23	870.00	-1.58	5.81	6.18	422.48	2325.19	0.70	2.99	0.96	0.88	80.68	9.56	9.32	0.36	0.33
22.5*	870.00	-2.87	5.82	6.14	463.30	2297.94	0.69	2.74	0.78	0.77	53.70	4.93	6.02	0.31	0.29
22	870.00	-4.15	5.85	6.11	519.43	2267.73	0.68	2.50	0.61	0.70	36.53	2.53	4.22	0.27	0.25
21.6666*	870.00	-3.80	5.85	6.10	561.82	2235.98	0.67	2.46	0.63	0.66	34.81	2.61	3.65	0.27	0.25
21.5	870.00	-3.44	5.75	6.08	477.43	2213.92	0.66	2.73	0.60	0.72	52.82	2.55	5.05	0.30	0.32
21.3333*	870.00	-3.44	5.78	6.06	517.56	2206.11	0.66	2.60	0.65	0.69	45.76	3.02	4.38	0.29	0.28
21.2	870.00	-3.44	5.78	6.05	519.56	2188.30	0.66	2.56	0.70	0.68	43.41	3.66	4.16	0.28	0.27
21	870.00	-3.09	5.80	6.04	556.88	2175.89	0.65	2.46	0.75	0.59	39.48	4.38	2.94	0.27	0.25
20.5	870.00	-3.06	5.74	6.02	513.48	2148.73	0.64	2.63	0.76	0.69	43.72	3.57	4.40	0.30	0.28
20	870.00	-3.06	5.64	5.99	424.60	2123.61	0.64	2.84	0.90	0.75	55.11	5.81	5.51	0.32	0.31
19.77	Bridge														

*Riverwood RV, 9 Canning Street, Avondale Heights Development
Update Report for Floodplain Modifications, 4 December 2008*

**TABLE 6 Proposed Future Conditions, Floodplain Development Plan 24 December 2010, Riverwood Retirement Village
(Maribyrnong River MWC HEC Model, Upstream Canning Street)**

River Sta	Q Total	Min Ch El	W.S. Elev	E.G. Elev	Flow Area	Volume	Trvl Tme Avg	Vel Chnl	Vel Left	Vel Right	Power Chan	Power LOB	Power ROB	Froude # Chl	Froude # XS
	(m3/s)	(m)	(m)	(m)	(m2)	(1000 m3)	(hrs)	(m/s)	(m/s)	(m/s)	(N/m s)	(N/m s)	(N/m s)		
24	870.00	-3.61	5.82	6.33	377.31	2445.54	0.74	3.48	0.95	0.96	98.47	10.91	11.09	0.38	0.32
23.8333*	870.00	-3.27	5.82	6.31	383.19	2426.51	0.73	3.40	0.94	0.92	92.62	10.20	10.08	0.38	0.32
23.6666*	870.00	-2.93	5.82	6.28	388.87	2407.24	0.73	3.30	0.96	0.93	93.17	10.66	10.47	0.37	0.32
23.5*	870.00	-2.60	5.82	6.25	398.29	2387.65	0.72	3.20	0.98	0.90	86.45	10.57	9.67	0.37	0.32
23.3333*	870.00	-2.26	5.83	6.22	423.36	2367.35	0.72	3.07	0.95	0.86	76.96	9.41	8.55	0.36	0.31
23.1666*	870.00	-1.92	5.83	6.20	423.87	2346.52	0.71	3.01	0.98	0.88	79.68	9.98	9.17	0.36	0.32
23	870.00	-1.58	5.81	6.18	422.70	2325.72	0.70	2.99	0.96	0.88	80.57	9.55	9.31	0.36	0.33
22.5*	870.00	-2.87	5.83	6.14	463.52	2298.46	0.69	2.74	0.78	0.77	53.63	4.93	6.01	0.31	0.29
22	870.00	-4.15	5.85	6.12	519.67	2268.24	0.68	2.50	0.61	0.70	36.49	2.53	4.21	0.27	0.25
21.6666*	870.00	-3.80	5.85	6.10	562.11	2236.47	0.67	2.46	0.63	0.66	34.76	2.61	3.64	0.27	0.25
21.5	870.00	-3.44	5.76	6.08	477.74	2214.40	0.66	2.73	0.60	0.72	52.74	2.55	5.04	0.30	0.32
21.3333*	870.00	-3.44	5.79	6.06	531.02	2206.48	0.66	2.56	0.66	0.68	43.57	3.12	4.18	0.28	0.27
21.2	870.00	-3.44	5.77	6.05	524.87	2188.42	0.66	2.58	0.65	0.69	44.90	3.02	4.30	0.29	0.28
21	870.00	-3.09	5.80	6.04	558.79	2175.93	0.65	2.46	0.74	0.59	39.76	4.23	2.96	0.28	0.25
20.5	870.00	-3.06	5.74	6.02	513.48	2148.73	0.64	2.63	0.76	0.69	43.72	3.57	4.40	0.30	0.28
20	870.00	-3.06	5.64	5.99	424.60	2123.61	0.64	2.84	0.90	0.75	55.11	5.81	5.51	0.32	0.31
19.77	Bridge														

APPENDIX 1

MWC Letter dated 3 February 2009



Melbourne Water Corporation
ABN 81 945 386 953
100 Wellington Parade
East Melbourne 3002 Victoria
PO Box 4342
Melbourne 3001 Victoria
Telephone 131 722
Facsimile 03 9235 7200
www.melbournewater.com.au

03 February 2009

Mr Neil Craigie
Neil M Craigie Pty Ltd
15 Mulawa Street
Croydon, VIC 3136

Dear Mr Neil Craigie

Re: Update Report on Floodplain Modifications

Property: 9 Canning Street, Avondale Heights 3034
Melb Water Ref: 2782

Thank you for your letter and report of 27 January 2009 regarding the floodplain modifications at 9 Canning Street, Avondale Heights.

The report and landscape master plan of date 4 December 2008 prepared by consultant 'Neil Craigie Pty Ltd' shows that the following modifications have been made to the previous plan of 2007.

1. The bowling green area has been raised by 1 metre to accommodate access ramp slope requirements from the adjacent community building. The finished surface level of the bowling green is proposed at 5.3 metres to Australian Height Datum (AHD). Previously, it was set at a level of 4.3 metres to AHD in the 2007 plan.
2. The wetland area and irrigation ponds have been increased and land bridges now separate the various cells with culvert controls between each cell.

Upon reviewing the submitted report, Melbourne Water is satisfied that the modifications to the 2007 landscape plan will be able to proceed without having any significant adverse impacts on the Maribyrnong River floodplain.

Melbourne Water would have no objection to the proposed development provided detailed construction plans including calculations of cut and fill balance are provided to Melbourne Water for formal approval.



If you have any enquiries, please contact me on telephone 9235 7195.

Yours sincerely \



Land Development