

**9-11 Horne Terrace  
Edinburgh**

**Sheet Piling Specification**

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**Goodson  
Associates**

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**9-11 Horne Terrace  
Edinburgh**

**Sheet Piling Specification**

**Client: AMA (New Town) Ltd**

**Date: November 2016**

**Project No: 13046**



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<b>Contract number: 13046</b>		<b>Signature</b>	<b>Date</b>
Prepared by:	Sarah Neill		10 November 2016
Checked by:	Frank Boyne		11 November 2016

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Appendix 1	I3046/SK03
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## 1.0 Site Location and Description

The site is located on Horne Terrace, Edinburgh (National Grid Reference NT242725). Directly north of the site boundary is the Union Canal. To the east and west residential properties bound the site (existing tenement to the west and new build apartments to the east). Horne Terrace runs along the southern site boundary, with residential properties beyond.

The site is currently occupied by a warehouse type building that is to be demolished before the works commence.

## 2.0 Nature of the Works

The Works comprise of the installation of the sheet piles along the edge of the footpath along the bank of the Union Canal. The sheet piles are to have an anticipated maximum retaining height of 1.5m with an overburden of 10 kN/m<sup>2</sup>.

Please refer to SK03 accompanying this specification for clarification.

## 3.0 Design Standards and Design Life

The pile design and execution is to be in accordance with the following standards and a design life of 50 years:

- BS EN 12063:1001 Execution of Special Geotechnical Work – Sheet Pile Walls
- BS EN 1991-1:1994 Eurocode 1 - Basis of Design and Actions on Structures – Part 1: Basis of Design
- BS EN 1992-1:1994 Eurocode 2 - Design of Concrete Structures – Part 1-1: General Rules and Rules for Buildings
- BS EN 1993-1-1:1994 Eurocode 3 - Design of Steel Structures – Part 1: General Rules and Rules for Buildings
- BS EN 1993-5: 1998 Eurocode 3 - Design of Steel Structures – Part 5: Piling
- BS EN 1997-1:1994 Eurocode 7 - Geotechnical Design – Part 1: General Rules

## 4.0 Site Investigation

The existing geo-environmental investigation for the site carried out by Resource and Environmental Consultants Ltd. in 2008 indicates that three boreholes were carried out.

The borehole logs are included in this specification along with a drawing which provides approximate locations of these boreholes.

In general, the strata consisted of made ground (to depths of between 1.65m bgs and 2.0m bgs), alluvial soils and sandy clay. Obstructions meant that Boreholes 1 and 3 terminated within clay, whilst weathered mudstone was encountered at 5.25-5.45m bgs in Borehole 2 and this was considered to be bedrock.

Ground water was encountered in all three boreholes. When the survey was carried out, the depths of the water in the canal and in Borehole 1 were similar, at 1.67m and 1.70m respectively.

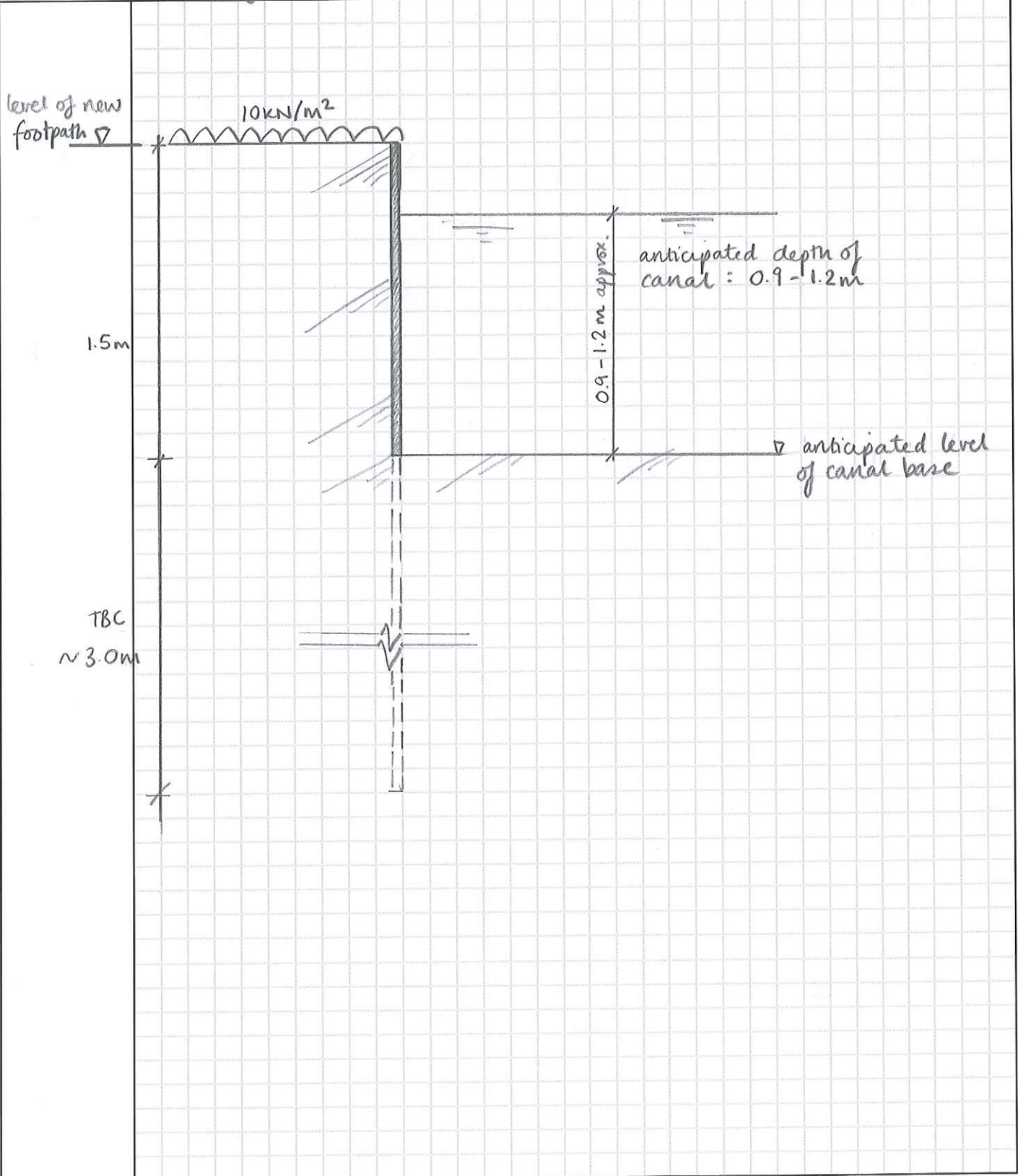
**Appendix I**  
**I3046/SK03**

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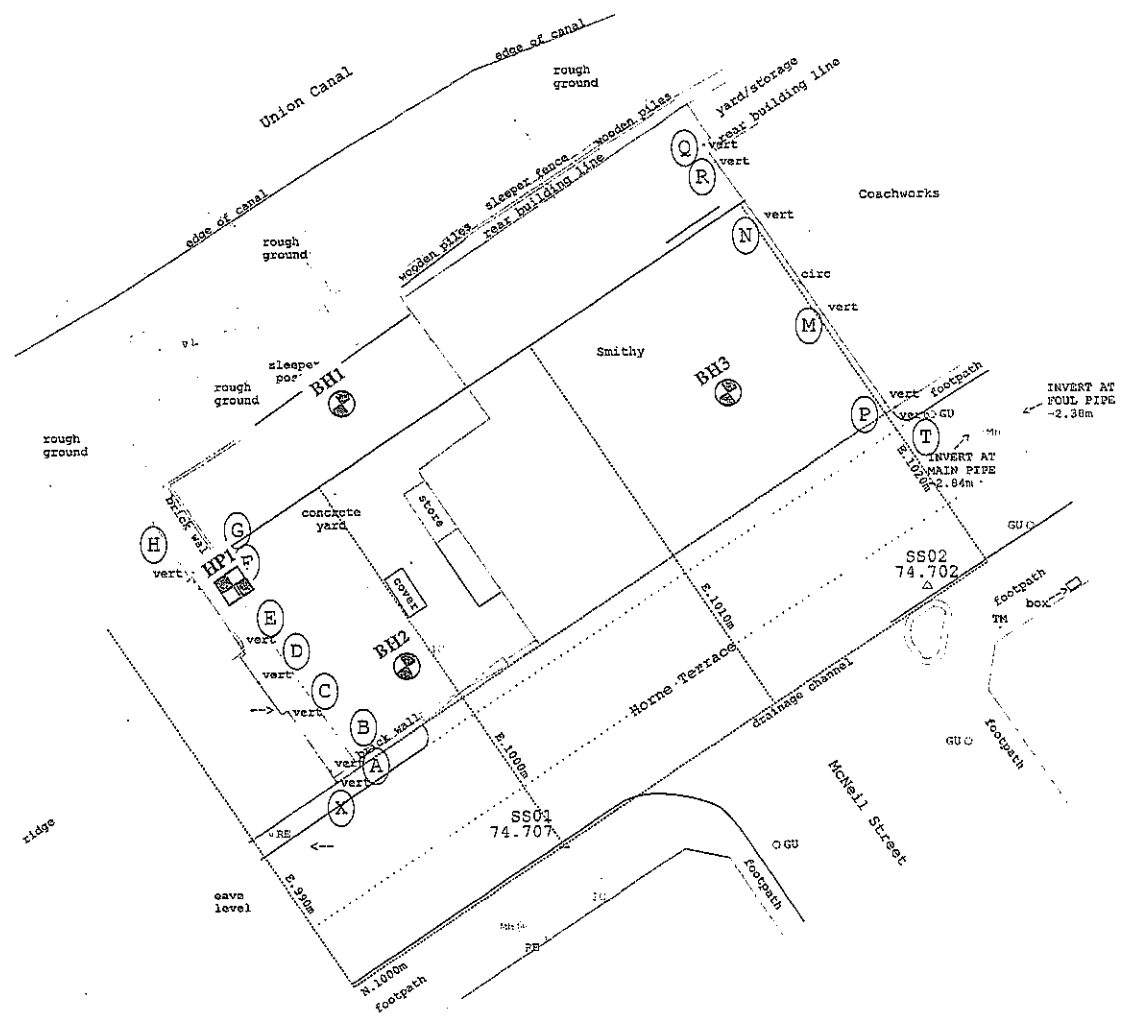
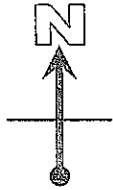
Consulting Civil and  
Structural Engineers

Contract	9-11 Hovne Terrace		
Prepared by	SN	Date	09.11.16
Ref No	13046	Sheet No	SK03 rev

Title *Sheet Piling Specification*



**Appendix 2**  
**Pages 48, 50-53 from Site Investigation Report**



Title		<b>REC Limited</b>	
APPROXIMATE TRIAL PIT AND BOREHOLE LOCATION PLAN		11 Law Place, Nerston Mains, East Kilbride, G74 4QL	
9-11 HORNE TERRACE, EDINBURGH		Job No.	Scale
		11693	NTS
		Drawn By	Date
		SDM	01/01/2008
			Fig. No.
			2

**REC Geotechnical Log**

**Borehole: BH1**



Resource & Environmental Consultants Ltd.

**Equipment and Methods:** Competitor Dart Rig

**Location:** 9-11 Horne Terrace, Edinburgh (11693)

**Client:** Bielski Associates

**Ground Level:**

**Coordinates:**

**Date:** 04/12/2007

Installat ion	Description	Reduced	Legend	Depth (m)	Sample/Tests			Field Records
					Depth	Sample		
						Type	No.	
	Ground Surface	0.00		0.00	0.00	E 0.10m.	E1	
	MADE GROUND : Dark brown, silty, slightly gravelly sand. Gravel is angular to sub-rounded of brick and sandstone. Occasional slate, concrete, tile, glass and metal.	-0.50				E 0.55m.	E2	
	MADE GROUND : Dark grey and black, slightly silty, gravelly sand of ash. Gravel is angular of brick and ash. Frequent angular cobbles of brick, sandstone and concrete. Occasional timber fragments.			1.00	1.00	E 1.00m.	E3	
						D 1.4-1.85	D4 S5	SPT 1.4-1.85m.
							U6	U87 1.4-2.00m.
		-2.00		2.00	2.00	E 2.00m.	E7	
	Uncompact, dark grey, slightly gravelly SILT / CLAY with frequent wood fragments. Fine sand partings in places.					D 2.0-2.45	D8 S9	SPT 2.0-2.45m.
							U10	U87 2.0-3.00m.
		-3.00		3.00	3.00	E 3.00m.	E11	
	Soft - firm, dark grey, silty, sandy, slightly gravelly CLAY. Gravel is sub-rounded of sandstone.					D 3.0-3.45	D12 S13	SPT 3.0-3.45m.
							U14	U87 3.0-3.70m.
		-3.70				E 3.70m.	E15	
	End of Log			4.00	4.00			
				5.00	5.00			

Notes: U-undisturbed B-bulk D-disturbed SPT-standard penetration test U-U100 CPT-cone penetration test

**Remarks**

Inspection pit dug to 1.40m.  
Water encountered @ 1.70m.

**Notes**

Standpipe installed to 3.70m. Terminated on obstruction @ 3.70m.

**Logged by:** SJS

**Scale:**

**FIG:**

**REC Geotechnical Log**

**Borehole: BH2**



Resource & Environmental Consultants Ltd.

**Equipment and Methods:** Competitor Dart Rig

**Location:** 9-11 Horne Terrace, Edinburgh (11693)

**Client:** Bielski Associates

**Ground Level:**

**Coordinates:**

**Date:** 04/12/2007

Installat ion	Description	Reduced	Legend	Depth (m)	Sample/Tests			Field Records	
					Depth	Sample			Test
						Type	No.		
	Ground Surface	0.00		0.00	0.00				
	MADE GROUND : Brick.	-0.25							
	MADE GROUND : Brown, silty, gravelly sand. Gravel is angular to sub-angular of brick, sandstone and dolerite	-0.70				E 0.30m.	E1		
	MADE GROUND : Dark grey, gravelly, coarse sand of ash. Gravel is angular of ash, brick and slag.	-1.00				E 0.75m.	E2		
	POSSIBLE MADE GROUND : Very poorly consolidated with voids, grey/brown and orange/brown, sandy, slightly gravelly clay. Gravel is angular to sub-rounded of sandstone	-1.65				E 1.60m. D 1.6-2.05	E3 D4 S5	SPT 1.6-2.05m.	
	Very soft, grey, sandy CLAY with frequent wood fragments and occasional bands/lenses of brown pseudofibrous peat.	-2.30				E 2.00m. D 2.0-2.45	U6 E7 D8 S9	U87 1.6-2.00m. SPT 2.0-2.45m.	
	Very soft, grey, sandy, slightly gravelly SILT / CLAY. Gravel is sub-rounded of sandstone and mudstone	-2.90					U10	U87 2.0-3.00m.	
	Loose - medium dense, yellow/brown, clayey, gravelly, coarse SAND. Gravel is sub-rounded of sandstone and quartz. Occasional thin bands/lenses of compact, brown silt.	-3.45				E 3.00m. D 3.0-3.45	E11 D12 S13	SPT 3.0-3.45m.	
	Firm, dark grey, slightly sandy, slightly gravelly CLAY. Gravel is sub-rounded of sandstone, quartz and mudstone.	-4.00					U14	U87 3.0-4.00m.	
	Medium dense, brown, fine to coarse but mostly medium SAND. Occasional thin bands/lenses of orange/brown, sandy clay near the base.	-5.00				E 4.00m. D 4.0-4.45	E15 D16 S17	SPT 4.0-4.45m.	
	Grey, weathered MUDSTONE.	-5.25				E 5.00m. D 5.0-5.45	E19 D20 S21	SPT 5.0-5.45m.	
	End of Log	-5.45							

Notes:U-undisturbed B-bulk D-disturbed SPT-standard penetration test U-U100 CPT-cone penetration test

**Remarks**

Inspection pit dug to 1.60m.  
Water encountered @ 2.60m.

**Notes**

Terminated @ 5.45m on possible rock. Hole collapsed to 4.50m @ 5.00m.

Logged by: SJS

Scale:

FIG:

**REC Geotechnical Log**

**Borehole: BH3**



Resource & Environmental Consultants Ltd.

**Equipment and Methods:** Competitor Dart Rig

**Location:** 9-11 Horne Terrace, Edinburgh (11693)

**Client:** Bielski Associates

**Ground Level:**

**Coordinates:**

**Date:** 04/12/2007

Installation	Description	Reduced	Legend	Depth (m)	Sample/Tests			Field Records	
					Depth	Sample			Test
						Type	No.		
	Ground Surface	0.00		0.00					
	MADE GROUND : Concrete.	-0.10		0.00	0.00				
	MADE GROUND : Grey/brown, slightly silty, gravelly sand of ash and clinker.				E 0.30m.	E1			
					E 0.50m.	E2			
		-0.70							
	MADE GROUND : Dark brown, clayey, silty, gravelly sand. Gravel is sub-angular, fine to coarse of sandstone, dolerite and slag.			1.00	1.00	E 1.00m.	E3		
							U4	U87 1.2-2.00m. 96 Blows	
		-1.75							
	Probably dense, brown and orange/brown, clayey, silty, sandy GRAVEL. Gravel is fine to coarse, sub-rounded of sandstone.			2.00	2.00	E 2.00m.	E5 U6	U87 2.0-3.00m. 209 Blows	
				3.00	3.00	E 3.00m.	E7 U8	U87 3.0-3.90m. 131 Blows	
		-3.60							
	Stiff, grey/brown, sandy, slightly gravelly CLAY. Gravel is sub-angular to sub-rounded of sandstone and mudstone.	-3.90		4.00	4.00	E 3.90m.	E9		
	End of Log			5.00	5.00				

Notes: U-undisturbed B-bulk D-disturbed SPT-standard penetration test U-U100 CPT-cone penetration test

**Remarks**

Inspection pit dug to 1.20m.  
Borehole wet @ 3.00m.

**Notes**

Standpipe installed to 3.90m. Terminated @ 3.90m.

**Logged by:** SJS

**Scale:**

**FIG:**

**REC Geotechnical Log**

**Trial Pit: HP1**



Resource & Environmental Consultants Ltd.

**Equipment and Methods:** Hand Excavation

**Location:** 9-11 Horne Terrace (11693)

**Client:** Bielski Associates

**Ground Level:**

**Coordinates:**

**Date:** 04/12/2007

Description	Reduced	Legend	Depth (m)	Sample/Tests			Field Records	
				Depth	Sample			Test
					Type	No.		
Ground Surface	0.00		0.00	0.00	E 0.70m.	E1		
MADE GROUND : Type 1 with some glass and brick fragments.	-0.30							
MADE GROUND : Dark brown, sandy gravel with bricks, slag and glass.	-0.80							
MADE GROUND : Soft, light brown, gravelly, sandy clay.	-1.35							
End of Log			2.00	2.00				
			3.00	3.00				
			4.00	4.00				
			5.00	5.00				

Notes: U-undisturbed B-bulk D-disturbed SPT-standard penetration test U-U100 SV-shear vane

Remarks

Logged by: SL

Notes

Scale:

FIG: