

**Appendix B**  
**Borehole logs**

Causeway Geotech Ltd					Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH106		
Method: 0.00 1.20 Inspection Pit 1.20 2.30 Rotary Drilling 2.30 7.00 Rotary Coring					Co-ords: 308842.77mE	Client: Irish Water	Sheet 1 of 1		
Plant: Hand Excavator+Comacchio 205					238647.09mN	Client's Representative: Tobin Consulting Engineers	Scale: 1:50		
					Ground Level: 49.61MOD	Dates: 24/11/2014	Crew: JC		
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs
2.30 - 3.10						0.10	CONCRETE		
						49.51 0.10	MADE GROUND - Brown sandy angular to subangular fine to coarse GRAVEL		
						0.30			
						49.21 0.40	Firm brown slightly sandy gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.		
3.10 - 4.45	100	73	21	12		0.60			
						48.61 1.00	Stiff greyish brown slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.		
						0.40			
						48.21 1.40	Weak dark grey LIMESTONE. Probably highly weathered (recovered as clayey sandy angular to subangular gravel and cobbles)		
4.45 - 5.50	100	79	44	7		0.90			
						47.31 2.30	Medium strong thinly to thickly laminated dark grey ARGILLACEOUS LIMESTONE interbedded with medium to widely spaced very thin beds of weak black CARBONACEOUS MUDSTONE with occasional pyrite veins.		
							Partially weathered with some oxidation staining along joint surfaces.		
							Discontinuity Set 1: Bedding/lamination planes, 10 to 20°, very close to medium spaced, planar, smooth, typically closed to occasionally open, stained brown to 4.3m, clean below. Discontinuity Set 2: white calcite veins, very close to closely spaced, randomly orientated, typically subparallel to bedding, stepped to curved, typically closed with calcite infill <1-20mm thick. <u>2.75-2.80m: Pyrite-rich.</u> <u>2.80-3.10m: Extremely weak - possible fault gouge.</u>		
5.50 - 7.00	100	53	0	20		4.70			
						42.61 7.00	End of core at 7.00 m		

Remarks

<b>Core Barrel:</b> +6		<b>Water Strikes:</b>		
<b>Flush Type:</b>		Struck (m)	Rose to (m)	Time (min)
<b>Water Added:</b>		<b>Casing:</b>		
From (m)	To (m)	To (m)	Diameter (mm)	




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Causeway Geotech Ltd				Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH107			
Method: 0.00 1.20 Inspection Pit 1.20 2.50 Rotary Drilling 2.50 7.00 Rotary Coring				Co-ords: 309008.92mE 238655.10mN	Client: Irish Water	Sheet 1 of 1			
Plant: Hand Excavator+Comacchio 205				Ground Level: 54.19MOD	Client's Representative: Tobin Consulting Engineers	Scale: 1:50			
				Dates: 26/11/2014	Crew: JC	Logged By: DOM +MFG			
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs
1.20	SPT (S)				N=33 (2,2/5,9,7,12)	(0.10) 54.09 0.10	TOPSOIL		
						(0.60) 53.49 0.70	Firm brown slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.		
2.50 - 3.40	100	94	0	20		(0.50) 52.99 1.20	Firm light brown sandy gravelly CLAY with occasional cobbles. Gravel is subangular to subrounded, fine to coarse. Cobbles are subangular to subrounded.		
						(0.30) 52.69 1.50	Extremely weak dark grey LIMESTONE. (Probably highly weathered - recovered as angular to subangular fine to coarse gravel)		
3.40 - 4.70	100	100	59			(1.00)	Weak to medium strong dark grey LIMESTONE.		
						(3.70)	Medium strong thinly to thickly laminated dark grey ARGILLACEOUS LIMESTONE.  Partially weathered to 3.9m with some increased fracturing and oxidation staining along discontinuity surfaces.  Discontinuity Set 1: Bedding, very close to medium spaced, 20 to 40°, planar, smooth, typically closed to open at close to medium spacing, clean to stained orangey brown above 3.9m.		
4.70 - 6.20	70	70	70	7			4.70-6.20m: Assumed zone of core loss.		
							No recovery. Probably LIMESTONE.		
6.20 - 7.00	0	0	0	NR		(0.80) 47.99 6.20	No recovery. Probably LIMESTONE.		
						47.19 7.00	End of core at 7.00 m		

Remarks	<b>Core Barrel:</b>		<b>Water Strikes:</b>		
	+6		Struck (m)	Rose to (m)	Time (min)
	<b>Flush Type:</b>				
	<b>Water Added:</b>		<b>Casing:</b>		
From (m)	To (m)	To (m)	Diameter (mm)		



  
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Causeway Geotech Ltd					Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH108							
<b>Method:</b> 0.00    1.20    Inspection Pit 1.20    2.60    Rotary Drilling 2.60    6.80    Rotary Coring					<b>Co-ords:</b> 309256.52mE 238767.91mN		<b>Client:</b> Irish Water	Sheet 1 of 1 <b>Scale:</b> 1:50						
					<b>Plant:</b> Hand Excavator+Comacchio 205		<b>Ground Level:</b> 59.37MOD	<b>Client's Representative:</b> Tobin Consulting Engineers	<b>Crew:</b> JG					
					<b>Dates:</b> 02/12/2014		<b>Logged By:</b> DOM +MFG							
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs					
1.20	SPT (S)				86 (5,8/86 for 220mm)	(0.20) 59.17    0.20 (2.30)	TOPSOIL  Stiff to very stiff dark grey slightly sandy slightly gravelly slightly silty CLAY with occasional cobbles and boulders. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.							
2.00	SPT (S)				50 (8,18/50 for 25mm)									
2.60 - 3.60		100	64	46		56.87    2.50	Medium strong thinly to thickly laminated dark grey speckled white fossiliferous ARGILLACEOUS LIMESTONE interbedded with medium to widely spaced very thin beds of weak black CARBONACEOUS LIMESTONE.  Partially weathered with some slight brown staining along joint surfaces.							
3.60 - 4.60				15			Discontinuity Set 1: bedding planes, close to medium spaced, 15 to 30°, planar to curved, smooth, typically closed to occasionally open at close to medium spaced intervals, clean.  Discontinuity Set 2: joints, widely spaced, subvertical to 70°, planar to stepped, rough, open, locally stained light brown.							
4.60 - 5.60		100	95	92										
5.60 - 6.60				5		(4.30)								
6.60 - 6.80		100	91	66										
				15										
		100	82	57										
				5										
		100	80	40		52.57    6.80	End of core at 6.80 m							
<b>Remarks</b>							<b>Core Barrel:</b>		<b>Water Strikes:</b>					
							7		Struck (m)	Rose to (m)	Time (min)			
							<b>Flush Type:</b>							
							<b>Water Added:</b>		<b>Casing:</b>					
From (m)	To (m)	To (m)	Diameter (mm)											
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Causeway Geotech Ltd				Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH109			
Method: 2.50 6.20 Rotary Coring 1.20 2.50 Rotary Drilling 0.00 1.20 Inspection Pit				Co-ords: 309775.62mE 239127.79mN	Client: Irish Water	Sheet 1 of 1			
Plant: Comacchio 205+Hand Excavator				Ground Level: 71.94MOD	Client's Representative: Tobin Consulting Engineers	Scale: 1:50			
				Dates: 03/12/2014	Crew: JG	Logged By: MFG +DOM			
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs
1.20	SPT (S)				N=18 (3,4/5,4,4,5)	(0.30) 71.64 0.30	TOPSOIL		
						(2.00)	Stiff brownish grey slightly sandy slightly gravelly slightly silty CLAY with occasional cobbles and boulders. Sand is fine to coarse. Gravel is angular to subangular fine to coarse.		
2.00	SPT (S)				55 (4,4/55 for 125mm)				
2.50 - 3.50				NI		69.64 2.30	Destructured dark grey LIMESTONE - recovered as brownish grey angular to subangular fine to coarse clayey gravel		
3.50 - 4.50	97	62	26	7		(0.35) 69.29 2.65	Medium strong thinly laminated dark grey speckled white fossiliferous ARGILLACEOUS LIMESTONE with medium to widely spaced very thin beds of weak black CARBONACEOUS LIMESTONE.		
				20		Partially weathered to 3.5m with orangey brown staining on joint surfaces, typically unweathered below.			
4.50 - 5.50	100	100	95	7		(3.55)			
5.50 - 6.20	100	97	31	20					
				7					
	100	56	27	7		65.74 6.20	----- End of core at 6.20 m		

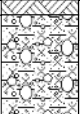
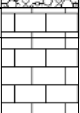
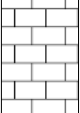
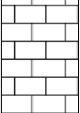
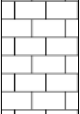
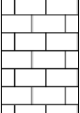

  

Remarks	<b>Core Barrel:</b> 7		<b>Water Strikes:</b>		
			Struck (m)	Rose to (m)	Time (min)
	<b>Flush Type:</b>				
<b>Water Added:</b>		<b>Casing:</b>			
From (m)	To (m)	To (m)	Diameter (mm)		



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Causeway Geotech Ltd				Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH110			
Method: 0.00 1.20 Inspection Pit 1.20 2.80 Rotary Drilling 2.80 7.50 Rotary Coring				Co-ords: 310992.31mE 239835.86mN	Client: Irish Water	Sheet 1 of 1			
Plant: Hand Excavator+Comacchio 205				Ground Level: 76.98MOD	Client's Representative: Tobin Consulting Engineers	Scale: 1:50			
				Dates: 04/12/2014		Crew: JG			
						Logged By: DOM +MFG			
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs
0.50	ES					(0.30) 76.68 0.30	MADE GROUND		
1.00	ES						Stiff brownish grey slightly sandy slightly gravelly slightly silty CLAY with occasional cobbles. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
1.20	SPT (S)				N=17 (3,3/3,4,5,5)				
2.00	SPT (S)				N=25 (5,5/6,6,6,7)	(2.50)			
3.20 - 4.20						74.18 2.80 (0.40) 73.78 3.20	Weak dark grey LIMESTONE. Probably destructured - recovered as clayey angular gravel.		
4.20 - 5.20	100	96	56				Medium strong thinly laminated grey to dark grey ARGILLACEOUS LIMESTONE. Partially weathered with some clay lining along joint surfaces.		
5.20 - 6.20							Discontinuity Set 1: Bedding planes, extremely closely spaced, subhorizontal to 20°, planar, smooth, typically closed to occasionally open at close to medium spacings, unstained to lined with grey clay <1mm thick.		
6.20 - 7.20	100	100	68						
7.20 - 7.50	100	98	54	7		(4.30)			
	100	83	67						
	100	100	100			69.48 7.50	End of core at 7.50 m		
Remarks					Core Barrel:		Water Strikes:		
					Flush Type:		Struck (m)	Rose to (m)	Time (min)
					Water Added:		Casing:		
					From (m)	To (m)	To (m)	Diameter (mm)	
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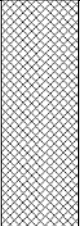
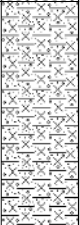
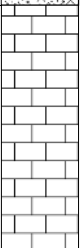
Causeway Geotech Ltd					Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH111				
<b>Method:</b> 1.00 5.40 Rotary coring 0.00 1.00 Hand dug					<b>Co-ords:</b> 311065.92mE 239873.57mN		<b>Client:</b> Irish Water				
							<b>Client's Representative:</b> Tobin Consulting Engineers				
<b>Plant:</b> Comacchio 205+Hand tools					<b>Ground Level:</b> 76.63MOD		<b>Dates:</b> 12/12/2014				
							<b>Logged By:</b> MFG +DOM				
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs		
1.00 - 1.40						(0.10) 76.53 0.10	TOPSOIL				
						(0.70)	Firm to stiff brown slightly sandy slightly gravelly slightly silty CLAY with occasional cobbles and boulders. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.				
1.40 - 1.90	88	63	48	6		75.83 (0.20) 75.63 1.00	Dark grey LIMESTONE. Highly weathered (Driller's description)				
							Medium strong thinly laminated dark grey ARGILLACEOUS LIMESTONE.				
1.90 - 2.70	70	0	0	NI			Partially weathered to 2.4m with some increased fracturing and clay lining along joint surfaces.				
							Discontinuity Set 1: Bedding planes, extremely closely spaced, subhorizontal to 20°, planar, smooth, typically closed to occasionally open at very close to close spacings, unstained to lined with clay film <1mm thick above 2.4m depth.				
2.70 - 4.00	91	90	70	8			Discontinuity Set 2: joint, subvertical, planar to curved, infilled with calcite, running from 4.7m to 5.4m				
							2.25-2.40m: Weak, slightly fissile shaley LIMESTONE				
4.00 - 5.40	100	100	93	6		(4.40)					
	97	97	56	4							
						71.23 5.40	End of core at 5.40 m				
Remarks							Core Barrel:		Water Strikes:		
							Flush Type:		Struck (m)	Rose to (m)	Time (min)
							Water Added:		Casing:		
							From (m)	To (m)	To (m)	Diameter (mm)	
											
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Causeway Geotech Ltd					Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH112			
Method: 0.00 7.00 Rotary Drilling					Co-ords: 311792.60mE	Client: Irish Water	Sheet 1 of 1			
Plant: Beretta T41					240612.28mN	Client's Representative: Tobin Consulting Engineers	Scale: 1:50			
					Ground Level: 78.80MOD	Dates: 03/02/2015	Crew: GT			
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs	
						(0.30) 78.50 0.30	TOPSOIL			
1.50 1.50	SPT (S) D				N=14 (2,2/3,4,3,4)	(2.00) 76.50 2.30	Firm brown slightly sandy gravelly slightly silty CLAY with occasional cobbles. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.			
3.00 3.00	SPT (S) D				N=52 (12,10/14,12,12,14)		Very stiff grey black slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse			
4.50 4.50	SPT (S) D				50 (25 for 40mm/50 for 40mm)	(4.70)				
						71.80 7.00	End of core at 7.00 m			
Remarks						Core Barrel:		Water Strikes:		
						Flush Type:		Struck (m)	Rose to (m)	Time (min)
						Water Added:		Casing:		
						From (m)	To (m)	To (m)	Diameter (mm)	
								7.00	200	








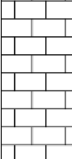
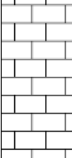




Causeway Geotech Ltd					Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH113			
Method: 0.00 8.00 Rotary Drilling					Co-ords: 311888.63mE	Client: Irish Water	Sheet 1 of 1			
Plant: Beretta T41					241154.58mN	Client's Representative: Tobin Consulting Engineers	Scale: 1:50			
					Ground Level: 78.77MOD	Dates: 03/02/2015	Crew: GT			
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs	
1.50 1.50					N=12 (2,2/3,2,3,4)	(2.00) 76.77 2.00	MADE GROUND - brown slightly sandy gravelly slightly silty CLAY			
3.00 3.00					N=18 (5,4/5,4,4,5)	(2.50) 74.27 4.50	Stiff dark grey to black slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse			
4.50 4.50					50 (25 for 50mm/50 for 60mm)	(3.50) 70.77 8.00	Very stiff dark grey to black slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.			
6.00 6.00					50 (25 for 35mm/50 for 50mm)	(3.50)				
							End of core at 8.00 m			
Remarks						Core Barrel:		Water Strikes:		
						Flush Type:		Struck (m)	Rose to (m)	Time (min)
						Water Added:		Casing:		
						From (m)	To (m)	To (m)	Diameter (mm)	
								2.00	200	
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Causeway Geotech Ltd				Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH114			
Method: 8.50 14.50 Rotary Coring 0.00 8.50 Rotary Drilling				Co-ords: 312375.60mE	Client: Irish Water	Sheet 1 of 2			
Plant: Beretta T41				241410.32mN	Client's Representative: Tobin Consulting Engineers	Scale: 1:50			
				Ground Level: 85.66MOD	Dates: 04/02/2015	Crew: GT			
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs
1.50						(1.50)	MADE GROUND - Hardcore fill with pockets of brown CLAY.		
1.50	SPT (S) D				N=19 (2,2/3,4,5,7)	84.16 1.50	Stiff becoming very stiff grey slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
3.00									
3.00	SPT (S) D				N=24 (3,4/5,6,7,6)				
4.50									
4.50	SPT (S) D				50 (25 for 60mm/50 for 50mm)	(7.00)			
8.50 - 9.50						77.16 8.50	No recovery. Probably distinctly weathered to destructured LIMESTONE.		
9.50 - 10.50						(3.00)			
	0	0	0						
	0	0	0						
Continued on next sheet									
Remarks					Core Barrel: T210		Water Strikes:		
					Flush Type:		Struck (m) 8.50	Rose to (m) 8.50	Time (min) 10
					Water Added:		Casing:		
					From (m)	To (m)	To (m)	Diameter (mm)	




Causeway Geotech Ltd					Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH114		
Method: 8.50 14.50 Rotary Coring 0.00 8.50 Rotary Drilling					Co-ords: 312375.60mE	Client: Irish Water	Sheet 2 of 2		
Plant: Beretta T41					241410.32mN	Client's Representative: Tobin Consulting Engineers	Scale: 1:50		
					Ground Level: 85.66MOD	Dates: 04/02/2015	Crew: GT		
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs
10.50 - 11.50	0	0	0						
11.50 - 12.50	100	95	88	20		74.16 11.50	Medium strong grey, white and yellow largely recrystallised LIMESTONE with very closely spaced coarse sand to medium gravel sized vugs.  Distinctly weathered: vugs throughout, clay present on joints above 11.65m.  DS1: Joints, close to medium spaced, subhorizontal to 30°, stepped and irregular, rough, open, clean.  DS2: Joints, widely spaced, 60-70°, planar to slightly irregular, rough, open, patchy yellow staining, 1mm yellowish grey clay present on joint at 11.5-11.65m.  <u>13.1-14.0m: Assumed zone of core loss.</u>		
12.50 - 13.50	65	60	60	4		(3.30)			
13.50 - 14.50	54	37	14	NI					
14.50 - 14.80	100	100	100	8					
				3		70.86 14.80	End of core at 14.80 m		
Remarks						Core Barrel: T210		Water Strikes: Struck (m)   Rose to (m)   Time (min) 8.50   8.50   10	
						Flush Type:		AGS	
						Water Added: From (m)   To (m)		Casing: To (m)   Diameter (mm)	
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Causeway Geotech Ltd				Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH115			
<b>Method:</b> 0.00 3.00 Rotary Drilling 3.00 8.80 Rotary Coring				<b>Co-ords:</b> 312836.67mE 241631.51mN	<b>Client:</b> Irish Water	Sheet 1 of 1			
<b>Plant:</b> Beretta T41				<b>Ground Level:</b> 78.92MOD	<b>Client's Representative:</b> Tobin Consulting Engineers	Scale: 1:50			
					<b>Dates:</b> 31/01/2015	Crew: MFG			
						Logged By: DOM			
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs
1.50 - 1.50	SPT (S) D				N=13 (2,3/2,3,4,4)	(0.30) 78.62 0.30	TOPSOIL  Firm brown slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse, gravel is subangular to subrounded fine to coarse.		
3.00 - 4.00	95	70	0			(2.70) 75.92 3.00	Medium strong thinly laminated dark grey to black slightly carbonaceous ARGILLACEOUS LIMESTONE.  Partially weathered: oxidation staining on some joints, closer fracture spacing, especially above 6.3m.  DS1: Bedding, subhorizontal to 10°, planar, smooth, typically closed to often open at very close spacing.  DS2: Joints, medium spaced, 20-30°, stepped, rough, open, oxidised brown.  DS3: Thin calcite veins, widely spaced, 70-80°, planar, smooth to rough, typically closed, occasionally open, 1mm calcite fill, stained brown.		
4.00 - 5.00	90	70	0	18					
5.00 - 6.00	90	60	0						
6.00 - 7.00	100	90	22			(5.80)			
7.00 - 8.00	100	100	63	10					
8.00 - 8.80	100	100	20			70.12 8.80	End of core at 8.80 m		
<b>Remarks</b>					<b>Core Barrel:</b> T2101		<b>Water Strikes:</b> Struck (m)   Rose to (m)   Time (min)		
					<b>Flush Type:</b>				
					<b>Water Added:</b> From (m)   To (m)		<b>Casing:</b> To (m)   Diameter (mm)		
							3.00   200		
							www.causewaygeotech.com © Causeway Geotech Ltd		

Causeway Geotech Ltd					Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH116			
Method: 0.00 2.00 Rotary Drilling 2.00 9.70 Rotary Coring					Co-ords: 313163.53mE 241590.94mN	Client: Irish Water	Sheet 1 of 1			
Plant: Beretta T41					Ground Level: 75.64MOD	Client's Representative: Tobin Consulting Engineers	Scale: 1:50			
					Dates: 02/02/2015	Crew: GT	Logged By: DOM +MFG			
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs	
						(0.30) 75.34 0.30	TOPSOIL			
1.50 1.50	SPT (S) D				N=14 (2,2/4,3,4,3)	(1.70)	Firm brown slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse			
2.00 - 3.00	45	0	0			73.64 2.00	Weak thinly laminated black CARBONACEOUS LIMESTONE.  Distinctly weathered: brown oxidised joints, weakened, much closer fracture spacing.  DS1: Joints, very closely spaced, all angles but typically 60-80°, planar and stepped, rough, open, brown oxidation staining.			
3.00 - 4.00	40	0	0	NI			DS1: Bedding, 20-40°, planar, smooth, typically closed to occasionally open at very close to close spacing.			
4.00 - 5.00	45	5	0							
5.00 - 6.00	45	25	0	20		(6.80)				
6.00 - 7.00	40	5	0							
7.00 - 8.80	25	2	0	NI						
8.80 - 9.70	100	61	49	20 6		66.84 8.80 (0.90) 65.94 9.70	Medium strong thinly laminated dark grey ARGILLACEOUS LIMESTONE.  DS1: Bedding thinly laminated 40 to 50°, planar, smooth, typically closed to often open between 8.8 and 9.25m at very close spacing no staining.			
							----- End of core at 9.70 m			
Remarks						Core Barrel: T2101		Water Strikes:		
						Flush Type:		Struck (m)	Rose to (m)	Time (min)
						Water Added:		Casing:		
						From (m)	To (m)	To (m)	Diameter (mm)	

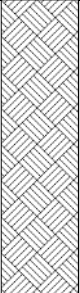

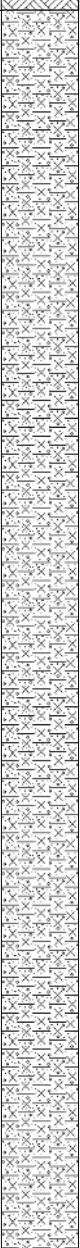
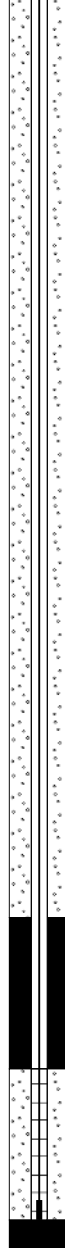
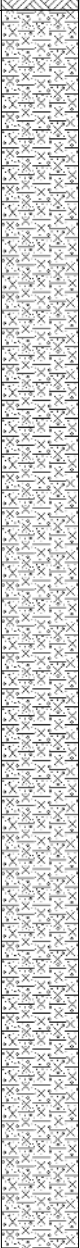
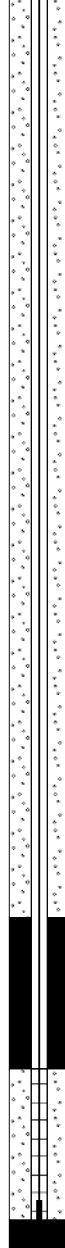
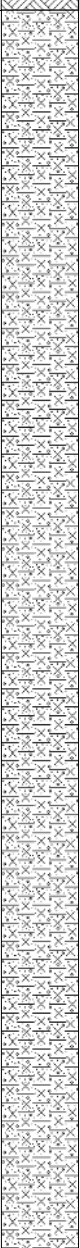
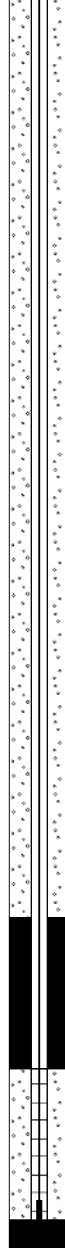
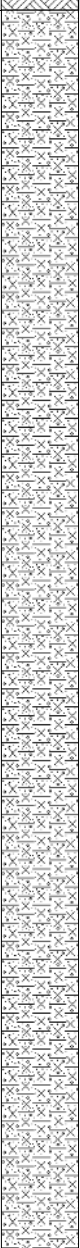
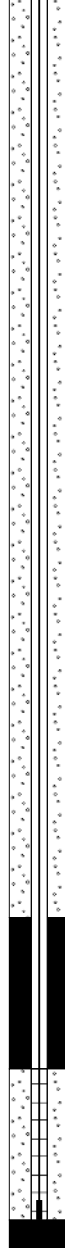
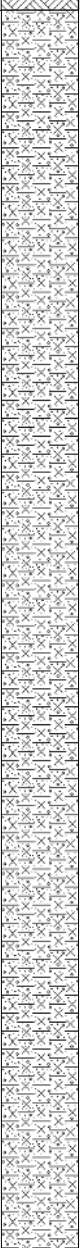
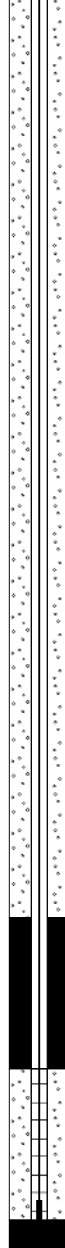


Causeway Geotech Ltd			Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH117															
Method: 0.00 6.00 Cable Percussion			Co-ords: 314059.18mE 241569.93mN	Client: Irish Water	Sheet 1 of 1															
Plant: Dando 3000			Ground Level: 72.59MOD	Client's Representative: Tobin Consulting Engineers	Scale: 1:50															
				Dates: 12/01/2015	Crew: CC															
					Logged By: DOM															
Depth (m)	Sample / Test	Casing Depth (m)	Water Depth (m)	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs												
0.35 - 1.20	B				(0.35) 72.24 0.35	TOPSOIL														
1.20 1.20 - 1.65	D U				(1.45)	Stiff brown slightly sandy slightly gravelly silty CLAY with rare cobbles. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.														
1.80 - 3.00 2.00 2.00	B SPT(S) D			N=43 (4,6/10,10,11,12)	70.79 1.80	Firm to stiff dark grey to black slightly sandy slightly gravelly slightly silty CLAY with occasional cobbles and lenses of gravelly sand. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.														
3.00 - 3.45	U																			
3.50 3.50 - 4.00	D B																			
4.00 4.00	SPT(S) D			N=44 (5,7/9,11,12,12)	(4.20)															
4.50 - 5.00	B																			
5.00 5.00	SPT(S) D			N=41 (6,6/8,10,10,13)																
6.00 6.00	SPT(S) D			N=38 (4,8/9,9,10,10)	66.59 6.00	----- End of borehole at 6.00 m														
<b>Remarks</b> SPTs carried out using SPT hammer CC04. Borehole terminated at scheduled completion depth.						<b>Chiselling:</b> <table border="1"> <thead> <tr> <th>From (m)</th> <th>To (m)</th> <th>Time (hh:mm)</th> </tr> </thead> <tbody> <tr> <td>0.00</td> <td>1.20</td> <td>01:00</td> </tr> </tbody> </table>	From (m)	To (m)	Time (hh:mm)	0.00	1.20	01:00	<b>Water Strikes:</b> <table border="1"> <thead> <tr> <th>Struck (m)</th> <th>Rose to (m)</th> <th>Time (min)</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Struck (m)	Rose to (m)	Time (min)				
From (m)	To (m)	Time (hh:mm)																		
0.00	1.20	01:00																		
Struck (m)	Rose to (m)	Time (min)																		
						<b>Water Added:</b> <table border="1"> <thead> <tr> <th>From (m)</th> <th>To (m)</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	From (m)	To (m)			<b>Casing:</b> <table border="1"> <thead> <tr> <th>To (m)</th> <th>Diameter (mm)</th> </tr> </thead> <tbody> <tr> <td>6.00</td> <td>200</td> </tr> </tbody> </table>	To (m)	Diameter (mm)	6.00	200					
From (m)	To (m)																			
To (m)	Diameter (mm)																			
6.00	200																			
						www.causewaygeotech.com © Causeway Geotech Ltd														

Causeway Geotech Ltd				Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH118				
<b>Method:</b> 0.00 8.50 Cable Percussion 8.50 13.60 Rotary Drilling				<b>Co-ords:</b> 314809.73mE 241591.19mN	<b>Client:</b> Irish Water	Sheet 1 of 2				
<b>Plant:</b> Dando 2000+Baretta T41				<b>Ground Level:</b> 70.22MOD	<b>Client's Representative:</b> Tobin Consulting Engineers	Scale: 1:50				
					<b>Dates:</b> 22/01/2015	Crew: MMC+GT				
						Logged By:				
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs	
0.00 - 0.50	B					(0.40)	TOPSOIL - Brown slightly sandy clay with rootlets.			
0.50	D					69.82 0.40	Stiff brown slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subrounded to angular fine to coarse of sandstone			
1.20 1.20 - 1.65 1.20 - 1.65	SPT (S) D B				N=16 (2,3/4,3,4,5)	(1.60)				
2.00 2.00 - 2.45 2.00 - 2.45	SPT (S) D B				N=20 (4,5/6,4,5,5)	68.22 2.00	Stiff, becoming very stiff downhole, dark grey slightly sandy gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subrounded to angular fine to coarse of sandstone			
3.00 3.00 - 3.45 3.00 - 3.45	SPT (S) B D				N=20 (5,4/6,4,5,5)					
4.00 4.00 - 4.45 4.00 - 4.45	SPT (S) B D				N=22 (6,6/5,5,5,7)					
5.00 5.00 - 5.45 5.00 - 5.45	SPT (S) B D				N=23 (6,5/6,5,6,6)	(6.50)				
6.50 6.50 - 6.95 6.50 - 6.95	SPT (S) B D				N=31 (7,8/7,8,8,8)					
8.00 8.00 - 8.45 8.00 - 8.45	SPT (S) D B				N=32 (8,7/9,8,8,7)	61.72 8.50	Very stiff dark grey slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse.			
10.00	SPT (S)				50 (25 for 20mm/50 for 30mm)					
Continued on next sheet										
<b>Remarks</b>					<b>Core Barrel:</b>		<b>Water Strikes:</b>			
					<b>Flush Type:</b>		<b>Struck (m)</b>	<b>Rose to (m)</b>	<b>Time (min)</b>	
							11.50	11.50	10	
					<b>Water Added:</b>		<b>Casing:</b>			
<b>From (m)</b>	<b>To (m)</b>	<b>To (m)</b>	<b>Diameter (mm)</b>							
		13.60	150							
www.causewaygeotech.com © Causeway Geotech Ltd										

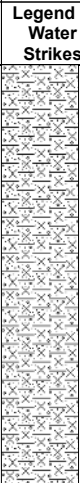
Causeway Geotech Ltd					Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH118			
<b>Method:</b> 0.00 8.50 Cable Percussion 8.50 13.60 Rotary Drilling					<b>Co-ords:</b> 314809.73mE 241591.19mN		<b>Client:</b> Irish Water			
							<b>Client's Representative:</b> Tobin Consulting Engineers			
<b>Plant:</b> Dando 2000+Beretta T41					<b>Ground Level:</b> 70.22MOD		<b>Dates:</b> 22/01/2015			
							<b>Logged By:</b>			
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs	
11.50					50 (25 for 0mm/50 for 0mm)	(5.10)				
13.00					50 (25 for 30mm/50 for 25mm)	56.62 13.60	End of core at 13.60 m			
<b>Remarks</b>							<b>Core Barrel:</b>	<b>Water Strikes:</b>		
							<b>Flush Type:</b>	Struck (m) 11.50	Rose to (m) 11.50	Time (min) 10
							<b>Water Added:</b>		<b>Casing:</b>	
From (m)   To (m)		To (m)   Diameter (mm)								
		13.60   150								
							<small>www.causewaygeotech.com © Causeway Geotech Ltd</small>			



Causeway Geotech Ltd						Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH119			
Method: 0.00 13.00 Rotary Drilling						Co-ords: 314889.92mE	Client: Irish Water	Sheet 1 of 2			
Plant: Beretta T41						241535.37mN	Client's Representative: Tobin Consulting Engineers	Scale: 1:50			
						Ground Level: 68.26MOD	Dates: 05/02/2015	Crew: GT			
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs		
1.50 1.50	SPT (S) D				N=18 (4,3/4,5,4,5)	(2.00)	TOPSOIL - Brown CLAY.				
3.00 3.00	SPT (S) D				N=27 (5,6/5,7,8,7)	66.26 2.00	Stiff becoming very stiff downhole slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse				
4.50 4.50	D SPT (S)				N=34 (7,8/9,8,9,8)						
6.00	SPT (S)				50 (25 for 10mm/50 for 0mm)	(11.00)					
7.50 7.50	SPT (S) D				50 (25 for 50mm/50 for 60mm)						
9.00	SPT (S)				50 (25 for 70mm/50 for 80mm)						
Continued on next sheet											
Remarks							Core Barrel:		Water Strikes:		
							Flush Type:		Struck (m)	Rose to (m)	Time (min)
							Water Added:		Casing:		
							From (m)	To (m)	To (m)	Diameter (mm)	




<b>Causeway Geotech Ltd</b>			<b>Project no.</b> 14-645	<b>Project Name:</b> Greater Dublin Drainage Scheme Ground Investigation	<b>Borehole No.</b> BH119
<b>Method:</b> 0.00 13.00 Rotary Drilling			<b>Co-ords:</b> 314889.92mE	<b>Client:</b> Irish Water	<b>Sheet 2 of 2</b>
<b>Plant:</b> Beretta T41			241535.37mN	<b>Client's Representative:</b> Tobin Consulting Engineers	<b>Scale:</b> 1:50
			<b>Ground Level:</b> 68.26MOD	<b>Dates:</b> 05/02/2015	<b>Crew:</b> GT
					<b>Logged By:</b> DOM

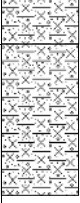
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs
						55.26 13.00	End of core at 13.00 m		

<b>Remarks</b>	<b>Core Barrel:</b>		<b>Water Strikes:</b>		
			<b>Struck (m)</b>	<b>Rose to (m)</b>	<b>Time (min)</b>
	<b>Flush Type:</b>				
<b>Water Added:</b>		<b>Casing:</b>			
<b>From (m)</b>	<b>To (m)</b>	<b>To (m)</b>	<b>Diameter (mm)</b>		




Causeway Geotech Ltd			Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH120						
Method: 0.00 11.50 Cable Percussion			Co-ords: 314972.58mE	Client: Irish Water	Sheet 1 of 2						
Plant: Dando 2000			241471.58mN	Client's Representative: Tobin Consulting Engineers	Scale: 1:50						
			Ground Level: 65.99MOD	Dates: 13/01/2015	Crew: CC						
Depth (m)	Sample / Test	Casing Depth (m)	Water Depth (m)	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs			
0.00 - 1.70	B					MADE GROUND - Firm brown grey CLAY with glass shards.					
0.50	ES				(1.70)						
1.00	ES										
1.20	D			N=10 (2,2/2,3,2,3)							
1.20	SPT(S)										
1.50	ES										
1.70 - 2.00	B				64.29 1.70	Stiff to very stiff brown slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse					
2.00	D			N=39 (4,6/9,9,10,11)							
2.00	ES										
2.00	SPT(S)				(1.40)						
3.00	D			N=45 (5,9/11,10,12,12)							
3.00	SPT(S)				62.89 3.10	Very stiff black slightly sandy gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.					
3.10 - 4.00	B										
4.00	D			50 (7,10/50 for 225mm)							
4.00	SPT(S)				(2.40)						
5.00	SPT(S)			N=35 (4,6/7,8,10,10)							
5.00	D										
5.50 - 6.50	B				60.49 5.50	Stiff black slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse					
6.50	D			N=23 (2,3/5,5,6,7)							
6.50	SPT(S)										
8.00	D			N=19 (3,3/4,5,5,5)							
8.00	SPT(S)				(5.00)						
8.00 - 9.00	B										
9.50	SPT(S)			N=29 (3,5/7,7,7,8)							
9.50	D										
Continued on next sheet											
<b>Remarks</b> SPTs carried out using SPT hammer CC04. Refusal met on possible large boulder at 11.50m						<b>Chiselling:</b> From (m)   To (m)   Time (hh:mm) 0.00   1.20   00:30 11.40   11.50   01:00			<b>Water Strikes:</b> Struck (m)   Rose to (m)   Time (min)		
						<b>Water Added:</b> From (m)   To (m)			<b>Casing:</b> To (m)   Diameter (mm)		
											
						www.causewaygeotech.com © Causeway Geotech Ltd					

<b>Causeway Geotech Ltd</b>		<b>Project no.</b> 14-645	<b>Project Name:</b> Greater Dublin Drainage Scheme Ground Investigation	<b>Borehole No.</b> BH120
<b>Method:</b> 0.00 11.50 Cable Percussion		<b>Co-ords:</b> 314972.58mE	<b>Client:</b> Irish Water	Sheet 2 of 2
<b>Plant:</b> Dando 2000		241471.58mN	<b>Client's Representative:</b> Tobin Consulting Engineers	<b>Scale:</b> 1:50
		<b>Ground Level:</b> 65.99MOD	<b>Dates:</b> 13/01/2015	<b>Crew:</b> CC
				<b>Logged By:</b> DOM


Depth (m)	Sample / Test	Casing Depth (m)	Water Depth (m)	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs
10.50 - 11.00	B				55.49 10.50	Stiff black slightly sandy gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
11.00	D				(1.00) 54.49 11.50			
						----- End of borehole at 11.50 m -----		

<b>Remarks</b> SPTs carried out using SPT hammer CC04. Refusal met on possible large boulder at 11.50m	<b>Chiselling:</b>			<b>Water Strikes:</b>		
	<b>From (m)</b>	<b>To (m)</b>	<b>Time (hh:mm)</b>	<b>Struck (m)</b>	<b>Rose to (m)</b>	<b>Time (min)</b>
	0.00	1.20	00:30			
	11.40	11.50	01:00			
	<b>Water Added:</b>			<b>Casing:</b>		
	<b>From (m)</b>	<b>To (m)</b>	<b>To (m)</b>	<b>Diameter (mm)</b>		
			11.40	200		




Causeway Geotech Ltd				Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH121			
Method: 0.00 4.30 Cable Percussion 4.30 11.90 Rotary Drilling				Co-ords: 315190.35mE 241508.11mN	Client: Irish Water	Sheet 1 of 2			
Plant: Dando 2000+Comacchio 405				Ground Level: 66.66MOD	Client's Representative: Tobin Consulting Engineers	Scale: 1:50			
				Dates: 13/01/2015		Crew: CC+GT			
						Logged By: DOM			
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs
0.20 - 1.20	B					(0.20) 66.46 0.20	MADE GROUND - Hardcore Fill		
0.50	ES						MADE GROUND - Firm very sandy gravelly CLAY with occasional boulders.		
1.00	ES								
1.20	SPT (S)		1.20		N=10 (2,3/3,3,2,2)				
1.20						(2.50)			
1.50	1.20 D ES								
2.00	SPT (S)		2.00		N=17 (2,2/6,6,3,2)				
2.00									
2.00 - 2.50	2.00 ES D B ES								
2.70	ES B					63.96 2.70	Very stiff black slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
2.70 - 3.00	B								
3.00	SPT (S)		3.00		50 (7,10/50 for 225mm)				
3.00									
3.50 - 4.00	D B					(1.80)			
4.00	D SPT (S)		4.00		50 (8,12/50 for 150mm)				
4.00						62.16 4.50	Very stiff to hard grey slightly sandy slightly gravelly slightly silty CLAY		
6.00	SPT (S)				50 (25 for 0mm/50 for 0mm)				
7.50	SPT (S)				50 (25 for 25mm/50 for 35mm)	(7.40)			
9.00	SPT (S)				50 (25 for 45mm/50 for 35mm)				
Continued on next sheet									
Remarks SPTs carried out using SPT hammer CC04.					Core Barrel:		Water Strikes:		
					Flush Type:		Struck (m)	Rose to (m)	Time (min)
							2.70	0.70	20
							10.50	0.70	20
					Water Added:		Casing:		
					From (m)	To (m)	To (m)	Diameter (mm)	
							4.30	200	
									
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<b>Causeway Geotech Ltd</b>					<b>Project no.</b> 14-645	<b>Project Name:</b> Greater Dublin Drainage Scheme Ground Investigation	<b>Borehole No.</b> BH121											
<b>Method:</b> 0.00 4.30 Cable Percussion 4.30 11.90 Rotary Drilling					<b>Co-ords:</b> 315190.35mE 241508.11mN	<b>Client:</b> Irish Water	<b>Sheet 2 of 2</b>											
<b>Plant:</b> Dando 2000+Comacchio 405					<b>Ground Level:</b> 66.66MOD	<b>Client's Representative:</b> Tobin Consulting Engineers	<b>Scale:</b> 1:50											
						<b>Dates:</b> 13/01/2015	<b>Crew:</b> CC+GT											
							<b>Logged By:</b> DOM											
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs									
10.50	SPT (S)				50 (25 for 0mm/50 for 0mm)	54.76 11.90	End of core at 11.90 m											
<b>Remarks</b> SPTs carried out using SPT hammer CC04.							<b>Core Barrel:</b>	<b>Water Strikes:</b>										
							<b>Flush Type:</b>	<table border="1"> <tr> <th>Struck (m)</th> <th>Rose to (m)</th> <th>Time (min)</th> </tr> <tr> <td>2.70</td> <td>0.70</td> <td>20</td> </tr> <tr> <td>10.50</td> <td>0.70</td> <td>20</td> </tr> </table>		Struck (m)	Rose to (m)	Time (min)	2.70	0.70	20	10.50	0.70	20
Struck (m)	Rose to (m)	Time (min)																
2.70	0.70	20																
10.50	0.70	20																
							<b>Water Added:</b>	<b>Casing:</b>										
							<table border="1"> <tr> <th>From (m)</th> <th>To (m)</th> <th>To (m)</th> <th>Diameter (mm)</th> </tr> <tr> <td></td> <td></td> <td>4.30</td> <td>200</td> </tr> </table>	From (m)	To (m)	To (m)	Diameter (mm)			4.30	200			
From (m)	To (m)	To (m)	Diameter (mm)															
		4.30	200															
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Causeway Geotech Ltd			Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH122									
Method: 0.00 10.50 Cable Percussion			Co-ords: 315511.95mE	Client: Irish Water	Sheet 1 of 2									
Plant: Dando 3000			241356.89mN	Client's Representative: Tobin Consulting Engineers	Scale: 1:50									
			Ground Level: 64.22MOD	Dates: 07/01/2015	Crew: CC									
Depth (m)	Sample / Test	Casing Depth (m)	Water Depth (m)	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs						
0.20 - 1.20	B				(0.20) 64.02 0.20	TOPSOIL								
1.20 - 1.20	SPT(S) D			N=16 (3,3/4,3,4,5)	(1.50)	Firm to stiff brown slightly sandy gravelly slightly silty CLAY with occasional cobbles and boulders. Gravel is subangular to subrounded fine to coarse. Sand is fine to medium.								
1.70 - 2.00	B				62.52 1.70	Very stiff black slightly sandy slightly gravelly slightly silty CLAY with occasional cobbles and boulders. Gravel is subangular to subrounded fine to coarse. Cobbles and boulders are subangular to subrounded.								
2.50 - 3.00	B													
3.00 - 3.00	D SPT(S)			50 (6,7/50 for 225mm)										
4.00 - 4.00	D SPT(S)			50 (4,7/50 for 215mm)										
4.50 - 5.00	B													
5.00 - 5.00	SPT(S) D			50 (7,13/50 for 200mm)										
6.00 - 6.50	B				(8.80)									
6.50 - 6.50	SPT(S) D			50 (25 for 125mm/50 for 150mm)										
7.00 - 7.50	B													
7.50 - 7.50	SPT(S) D			50 (9,12/50 for 225mm)										
9.00 - 9.00	D SPT(S)			50 (11,14/50 for 150mm)										
9.50 - 10.00	B													
Continued on next sheet														
Remarks SPT's carried out using SPT Hammer CC04						Chiselling:			Water Strikes:					
						From (m)	To (m)	Time (hh:mm)	Struck (m)	Rose to (m)	Time (min)			
						0.00	1.20	01:00	3.90	2.6	20			
						Water Added:			Casing:					
From (m)	To (m)	To (m)	Diameter (mm)											
		10.50	200											
														
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<b>Causeway Geotech Ltd</b>		<b>Project no.</b> 14-645	<b>Project Name:</b> Greater Dublin Drainage Scheme Ground Investigation	<b>Borehole No.</b> BH122
<b>Method:</b> 0.00 10.50 Cable Percussion		<b>Co-ords:</b> 315511.95mE	<b>Client:</b> Irish Water	Sheet 2 of 2
<b>Plant:</b> Dando 3000		241356.89mN	<b>Client's Representative:</b> Tobin Consulting Engineers	<b>Scale:</b> 1:50
		<b>Ground Level:</b> 64.22MOD	<b>Dates:</b> 07/01/2015	<b>Crew:</b> CC
				<b>Logged By:</b> DOM


Depth (m)	Sample / Test	Casing Depth (m)	Water Depth (m)	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs
10.40 10.50	SPT(S) D			50 (10, 13/50 for 200mm)	53.72 10.50	----- End of borehole at 10.50 m		

<b>Remarks</b> SPT's carried out using SPT Hammer CC04	<b>Chiselling:</b>			<b>Water Strikes:</b>		
	<b>From (m)</b>	<b>To (m)</b>	<b>Time (hh:mm)</b>	<b>Struck (m)</b>	<b>Rose to (m)</b>	<b>Time (min)</b>
	0.00	1.20	01:00	3.90	2.6	20
	<b>Water Added:</b>		<b>Casing:</b>			
	<b>From (m)</b>	<b>To (m)</b>	<b>To (m)</b>	<b>Diameter (mm)</b>		
			10.50	200		





Causeway Geotech Ltd				Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH123			
Method: 0.00 4.00 Cable Percussion 4.00 8.00 Rotary Drilling				Co-ords: 316520.88mE 241732.26mN	Client: Irish Water	Sheet 1 of 1			
Plant: Dando 3000+Beretta T41				Ground Level: 56.88MOD	Client's Representative: Tobin Consulting Engineers	Scale: 1:50			
				Dates: 08/12/2014	Crew: CC+SJ	Logged By: DOM			
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs
0.25 - 1.00	B					(0.25) 56.63 0.25	MADE GROUND: Grey GRAVEL (hardcore fill).		
1.00 1.00 1.30 - 2.00	1.00 SPT (S) D B		1.00		N=15 (3,3/3,4,4,4)	(1.05) 55.58 1.30	Firm to stiff dark brown slightly sandy gravelly silty CLAY with occasional cobbles and rare boulders. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.		
2.00 2.00	2.00 SPT (S) D B		2.00		N=19 (3,4/4,4,5,6)	(1.20) 54.38 2.50	Stiff dark brown slightly slightly sandy slightly gravelly slightly silty CLAY with occasional cobbles and rare boulders. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.		
2.50 - 3.00							Very stiff dark grey to black slightly sandy slightly gravelly slightly silty CLAY with occasional cobbles and rare boulders. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.		
3.00 3.00	3.00 D SPT (S)		3.00		50 (25 for 50mm/50 for 75mm)	(1.50)			
4.00 4.00	4.00 D SPT (S)		4.00		50 (25 for 65mm/50 for 50mm)	52.88 4.00	Dark grey slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
5.50	SPT (S)				50 (8,30/50 for 75mm)	(4.00)			
7.00	SPT (S)				50 (25 for 50mm/50 for 75mm)				
8.00	SPT (S)				50 (7,28/50 for 75mm)	48.88 8.00	----- End of core at 8.00 m		
Remarks					Core Barrel:		Water Strikes:		
					Flush Type:		Struck (m)	Rose to (m)	Time (min)
					Water Added:		Casing:		
					From (m)	To (m)	To (m)	Diameter (mm)	
							4.00	200	
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Causeway Geotech Ltd				Project no. 14-645	Project Name: Greater Dublin Drainage Scheme Ground Investigation	Borehole No. BH124			
Method: 0.00 4.60 Cable Percussion 4.60 10.00 Rotary Drilling				Co-ords: 317070.14mE 242222.29mN	Client: Irish Water	Sheet 1 of 1			
Plant: Dando 2000+Baretta T41				Ground Level: 57.53MOD	Client's Representative: Tobin Consulting Engineers	Scale: 1:50			
				Dates: 14/01/2015		Crew: CC+GT			
						Logged By: DOM			
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level & Depth	Stratum Description	Legend & Water Strikes	Backfill Installs
0.00 - 1.20	B						Firm brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.		
1.20	D		1.20		N=11 (2,2/3,2,3,3)	(2.10)			
1.20	SPT (S)				N=14 (2,2/3,3,4,4)				
1.50	1.20								
1.50 - 2.00	SPT (S)								
2.00	B		2.00		N=31 (2,4/7,7,8,9)	55.43 2.10	Very stiff grey slightly sandy slightly gravelly slightly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
2.00	SPT (S)								
2.10 - 3.00	D								
2.00	B								
3.00	3.00		3.00	2.9	N=45 (6,9/10,11,11,13)				
3.00	SPT (S)								
3.50 - 4.00	D								
3.00	B								
4.00	D		4.00	3.8	50 (9,12/50 for 150mm)				
4.00	SPT (S)								
6.00	SPT (S)				50 (25 for 10mm/50 for 10mm)	(7.90)			
7.50	SPT (S)				50 (25 for 80mm/50 for 100mm)				
7.50	D								
9.00	SPT (S)				50 (25 for 15mm/50 for 25mm)				
9.00	D								
						47.53 10.00	End of core at 10.00 m		
Remarks SPTs carried out using SPT hammer CC04.					Core Barrel:		Water Strikes:		
					Flush Type:		Struck (m) 2.90	Rose to (m) 2.60	Time (min) 20
					Water Added:		Casing:		
					From (m)	To (m)	To (m)	Diameter (mm)	
							4.60	200	
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