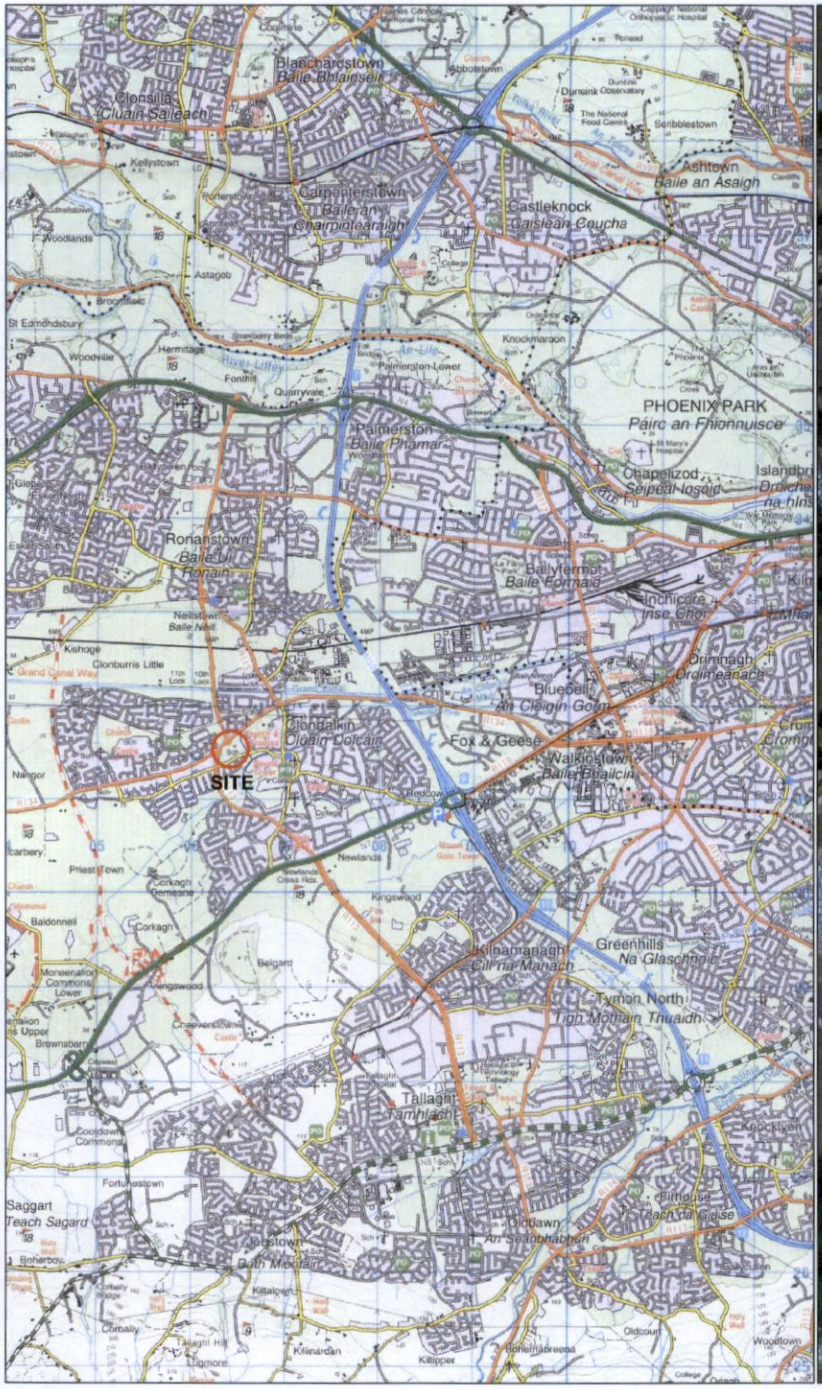
Appendix A Site and exploratory hole location plans



KEY:

ENGINEER:

Tobin Consulting Engineers

CLIENT:

Department of Education and Skills

PROJECT NAME:

Old Nangor Road Clondalkin

SITE ADDRESS (IF APPLICABLE):

TITLE:

Site location plan

SCALE:		DATE:	
SCALE		19-04-16	
DWG NO:	REV:	DRWN:	CHCK:
16-0016-SLoc-001		MD	DO'M

CAUSEWAY GEOTECH
Causeway Geotech
8 Drumahiskey Road
Balnamore
Ballymoney
Co. Antrim, BT53 7QL

KEY:

- BH - Borehole
- CBR - California bearing ratio
- IT - Infiltration Test
- TP - Trial Pit

N

ENGINEER:
Tobin Consulting Engineers

CLIENT:
Department of Education and Skills

PROJECT NAME:
Old Nangor Road Clondalkin

SITE ADDRESS (IF APPLICABLE):

TITLE:
Exploratory hole location plan

SCALE:		DATE:	
SCALE		19-04-16	
DWG NO:	REV:	DRWN:	CHCK:
16-0016-EHLoc-001		MD	DO'M

CAUSEWAY GEOTECH
Causeway Geotech
8 Drumahiskey Road
Balnamore
Ballymoney
Co. Antrim, BT53 7QL

Appendix B Borehole logs

CAUSEWAY GEOTECH

Project No.: 16-0116	**Project Name:** Old Nangor Road Clondalkin	**Borehole No.:** BH02
Coordinates: 306301.79 E 231482.23 N	**Client:** Department of Education and Skills	Sheet 1 of 1
Method: Cable Percussion	**Client's Representative:** Tobin Consulting Engineers	**Scale:** 1:50
Plant: Dando 2000	**Ground Level:** 64.09 mOD	**Dates:** 15/03/2016 - 15/03/2016	**Driller:** BM / **Logger:** DOM

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
						(0.50)		MADE GROUND - Brown clay fill		
0.50	B1				63.58	0.50		Stiff grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
1.00	B2									
1.00	D4									
1.00 - 1.45	SPT (S) N=24			N=24 (4,4/6,6,6,6)		(1.80)				
2.00	B3									
2.00	D5									
2.00 - 2.15	SPT (S)			41 (6 for 75mm/41 for 75mm)	61.78	2.30		End of borehole at 2.300m		

Remarks
Hand dug inspection pit from 0 to 1.20m

Water Added		Water Strike - General			
From (m)	To (m)	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Casing Details		Chiselling Details		
To (m)	Diam (mm)	From (m)	To (m)	Time (hh:mm)
		1.90	2.20	01:00

CAUSEWAY GEOTECH

Project No.: 16-0116	**Project Name:** Old Nangor Road Clondalkin		**Borehole No.:** BH03
Coordinates: 306404.90 E 231581.59 N	**Client:** Department of Education and Skills		Sheet 1 of 1
Method: Cable Perrcussion	**Client's Representative:** Tobin Consulting Engineers		**Scale:** 1:50
Plant: Dando 2000	**Ground Level:** 63.27 mOD	**Dates:** 14/03/2016 - 14/03/2016	**Driller:** BM **Logger:** DOM

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
0.50	B1							MADE GROUND - Brown clay fill		
1.00	B2					(1.90)				
1.00	D5									
1.00 - 1.45	SPT (S) N=24			N=24 (3,4/6,6,6,6)						
2.00	B3				61.37	1.90		Stiff grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
2.00 - 2.45	U7	2.00		Ublow=60 100%						
2.50	D6					(1.10)				
3.00	B4				60.27	3.00		End of borehole at 3.000m		
3.00 - 3.08	SPT (S)			0 (50 for 75mm/0 for 0mm)						

Remarks
Hand dug inspection pit from 0 to 1.20m

Water Added		Water Strike - General			
From (m)	To (m)	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
		3.00	3.00	10	3.00

Casing Details		Chiselling Details		
To (m)	Diam (mm)	From (m)	To (m)	Time (hh:mm)
		3.10	3.30	01:00

CAUSEWAY GEOTECH

Project No.: 16-0116	**Project Name:** Old Nangor Road Clondalkin	**Borehole No.:** BH04
Coordinates: 306290.24 E 231421.15 N	**Client:** Department of Education and Skills	Sheet 1 of 1
Method: Cable Percussion	**Client's Representative:** Tobin Consulting Engineers	**Scale:** 1:50
Plant: Dando 2000	**Ground Level:** 64.32 mOD	**Dates:** 14/03/2016 - 14/03/2016	**Driller:** BM
			Logger: DOM

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
0.50	B1					(1.80)		MADE GROUND - Brown clay fill		
1.00	B2									
1.00	D6									
1.00 - 1.45	SPT (S) N=15			N=15 (2,2/2,3,5,5)						
					62.52	1.80				
2.00	B3							Firm to stiff brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
2.00	D7									
2.00 - 2.45	U10	2.00		Ublow=60 100%		(1.00)				
					61.52	2.80				
3.00	B4							Very stiff greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
3.00	D8									
3.00 - 3.45	SPT (S) N=49			N=49 (8,13/9,12,14,14)		(1.50)				
4.00	B5									
4.00	D9									
4.00 - 4.15	SPT (S)			50 (17 for 75mm/50 for 75mm)	60.02	4.30		End of borehole at 4.300m		

Remarks
Hand dug inspection pit from 0 to 1.20m

Water Added	
From (m)	To (m)

Water Strike - General			
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
3.00	3.00	10	3.00

Casing Details	
To (m)	Diam (mm)

Chiselling Details		
From (m)	To (m)	Time (hh:mm)
4.10	4.50	01:00

CAUSEWAY GEOTECH

Project No.: 16-0116	**Project Name:** Old Nangor Road Clondalkin	**Borehole No.:** BH05
Coordinates: 306319.63 E 231453.65 N	**Client:** Department of Education and Skills	Sheet 1 of 1
Method: Cable Percussion	**Client's Representative:** Tobin Consulting Engineers	**Scale:** 1:50
Plant: Dando 2000	**Ground Level:** 64.32 mOD	**Dates:** 15/03/2016 - 15/03/2016	**Driller:** BM / **Logger:** DOM

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
								MADE GROUND - Brown clay fill		
0.50	B1									
						(1.80)				
1.00	B2									
1.00	D6									
1.00 - 1.45	SPT (S) N=13			N=13 (2,2/2,3,4,4)						
					62.52	1.80		Firm to stiff greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
2.00	B3									
2.00 - 2.45	U9	2.00		Ublow=35 100%						
						(1.20)				
3.00	B4				61.32	3.00		Very stiff grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse	▼	
3.00	D7									
3.00 - 3.45	SPT (S) N=41			N=41 (7,9/9,10,10,12)						
						(1.10)				
4.00	B5									
4.00	D8				60.22	4.10				
4.00 - 4.08	SPT (S)			0 (50 for 75mm/0 for 0mm)				End of borehole at 4.100m		

Remarks
Hand dug inspection pit from 0 to 1.20m

Water Added		Water Strike - General			
From (m)	To (m)	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
		3.10	3.10	10	3.10

Casing Details		Chiselling Details		
To (m)	Diam (mm)	From (m)	To (m)	Time (hh:mm)
		3.90	4.10	01:00

CAUSEWAY GEOTECH

Project No.: 16-0116	**Project Name:** Old Nangor Road Clondalkin		**Borehole No.:** BH06
Coordinates: 306372.16 E 231496.31 N	**Client:** Department of Education and Skills		Sheet 1 of 1
Method: Cable Percussion	**Client's Representative:** Tobin Consulting Engineers		**Scale:** 1:50
Plant: Dando 2000	**Ground Level:** 64.27 mOD	**Dates:** 16/03/2016 - 01/03/2016	**Driller:** BM **Logger:** DOM

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
								MADE GROUND - Brown clay fill		
0.50	B1									
						(1.80)				
1.00	B2									
1.00	D7									
1.00 - 1.45	SPT (S) N=22			N=22 (4,4/5,5,6,6)						
					62.47	1.80		Stiff greyish brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
2.00	B3									
2.00	D8									
2.00 - 2.45	SPT (S) N=40			N=40 (5,7/6,6,14,14)						
						(1.20)				
3.00	B4				61.27	3.00		Stiff grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
3.00 - 3.45	U11	3.00		Ublow=50 100%					▼	
						(1.00)				
4.00	B5				60.27	4.00		Very stiff grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
4.00	D9									
4.00 - 4.45	SPT (S) N=63			N=63 (7,13/13,14,14,22)						
						(1.40)				
5.00	B6									
5.00	D10									
5.00 - 5.45	SPT (S) N=71			N=71 (10,13/13,17,20,21)	58.87	5.40		End of borehole at 5.400m		

Remarks
Hand dug inspection pit from 0 to 1.20m

Water Added		Water Strike - General			
From (m)	To (m)	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
		3.30	3.30	10	3.30

Casing Details		Chiselling Details		
To (m)	Diam (mm)	From (m)	To (m)	Time (hh:mm)
		5.30	5.40	01:00

CAUSEWAY GEOTECH

Project No.: 16-0116	**Project Name:** Old Nangor Road Clondalkin	**Borehole No.:** BH07
Coordinates: 306434.79 E 231537.38 N	**Client:** Department of Education and Skills	Sheet 1 of 1
Method: Cable Percussion	**Client's Representative:** Tobin Consulting Engineers	**Scale:** 1:50
Plant: Dando 2000	**Ground Level:** 63.47 mOD	**Dates:** 18/03/2016 - 18/03/2016	**Driller:** BM
			Logger: DOM

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
0.50	B1					(1.00)		MADE GROUND - Brown clay fill		
1.00	B2				62.47	1.00		Brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
1.00	D4					(0.80)				
					61.67	1.80		End of borehole at 1.800m		
2.00	B3									
2.00	D5									

Remarks
Hand dug inspection pit from 0 to 1.20m

Refusal met on possible bedrock

Water Added		Water Strike - General			
From (m)	To (m)	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Casing Details		Chiselling Details		
To (m)	Diam (mm)	From (m)	To (m)	Time (hh:mm)
		1.80	2.00	01:00

CAUSEWAY GEOTECH

Project No.: 16-0116	**Project Name:** Old Nangor Road Clondalkin		**Borehole No.:** BH08
Coordinates: 306345.02 E 231408.34 N	**Client:** Department of Education and Skills		Sheet 1 of 1
Method: Cable Percussion	**Client's Representative:** Tobin Consulting Engineers		**Scale:** 1:50
Plant: Dando 2000	**Ground Level:** 64.68 mOD	**Dates:** 16/03/2016 - 16/03/2016	**Driller:** BM **Logger:** DOM

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
0.50	B1					(1.00)		MADE GROUND - Brown CLAY (Fill)		
1.00	B2				63.68	1.00				
1.00 - 1.45	SPT (S) N=5			N=5 (1,1/1,1,1,2)				MADE GROUND - Soft grey CLAY (Fill)		
1.20	D5					(1.00)				
2.00	B3				62.68	2.00		Stiff greyish brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse		
2.00	D6									
2.00	U7									
2.00 - 2.45	SPT (S) N=17			N=17 (2,3/4,4,4,5)		(1.20)				
3.00	B4									
3.00 - 3.15	SPT (S)			50 (12 for 75mm/50 for 75mm)	61.48	3.20		End of borehole at 3.200m		

Remarks
Hand dug inspection pit from 0 to 1.20m

Water Added		Water Strike - General			
From (m)	To (m)	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
		2.00	2.00	10	2.00

Casing Details		Chiselling Details		
To (m)	Diam (mm)	From (m)	To (m)	Time (hh:mm)
		3.10	3.20	01:00

Appendix C **Trial pit logs**

CAUSEWAY GEOTECH

Method: Trial Pitting	**Project No.:** 16-0116	**Project Name:** Old Nangor Road Clondalkin	**Trial Pit No.:** TP01
Plant: 8T Excavator	**Co-ordinates:** 306379.13 E, 231569.00 N	**Client:** Department of Education and Skills	Sheet 1 of 1
	Ground Level: 63.05 mOD	**Client's Representative:** Tobin Consulting Engineers	**Scale:** 1:25
	Date: 24/03/2016		**Driver:** BS
			Logger: DOM

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
				(0.30)		TOPSOIL	
			62.75	0.30		Stiff light brown silty sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse.	
0.50	B1			(0.90)			
			61.85	1.20		Stiff dark brown slightly sandy slightly gravelly CLAY with weathered rock and occasional cobbles and boulders. Sand is fine to coarse. Gravel is angular to subangular. Cobbles and boulders are rounded to subrounded.	
		Water seepage		(1.30)			▼
2.50	B2		60.55	2.50		End of trial pit at 2.500m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks

Refusal met on possible bedrock

Water Strikes:

Struck at (m):	Remarks:
2.30	Water seepage

Stability: Stable

Width:

Length:

CAUSEWAY GEOTECH

Project No.: 16-0116	**Project Name:** Old Nangor Road Clondalkin		**Trial Pit No.:** TP02
Co-ordinates: 306292.23 E 231471.14 N	**Client:** Department of Education and Skills		Sheet 1 of 1
Method: Trial Pitting	**Client's Representative:** Tobin Consulting Engineers		**Scale:** 1:25
Plant: 8T Excavator	**Ground Level:** 64.14 mOD	**Date:** 23/03/2016	**Driver:** BS
			Logger: DOM

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
				(0.20)		TOPSOIL	
			63.94	0.20			
				(0.30)		Stiff brown sandy gravelly CLAY with occasional cobbles. Sand is fine to coarse. Gravel is angular to subangular. Cobbles are rounded to subrounded	
			63.64	0.50			
0.60	B2					Stiff brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular.	
				(1.00)			
1.20	B1						
			62.64	1.50		End of trial pit at 1.500m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks

Refusal met on possible bedrock

Water Strikes:	
Struck at (m):	Remarks:

Stability: Stable

Width:

Length:

CAUSEWAY GEOTECH

Project No.: 16-0116	**Project Name:** Old Nangor Road Clondalkin		**Trial Pit No.:** TP03
Co-ordinates: 306359.71 E 231517.18 N	**Client:** Department of Education and Skills		Sheet 1 of 1
Method: Trial Pitting	**Client's Representative:** Tobin Consulting Engineers		**Scale:** 1:25
Plant: 8T Excavator	**Ground Level:** 64.09 mOD	**Date:** 23/03/2016	**Driver:** BS / **Logger:** DOM

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
				(0.20)		TOPSOIL	
			63.89	0.20		Stiff brown sandy gravelly CLAY with cobbles. Sand is fine to coarse. Gravel is angular to subangular. Cobbles are subrounded to rounded.	
0.50	B1			(0.50)			
			63.39	0.70		Firm to stiff light brown silty very sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular.	
				(0.70)			
1.20	B2						
			62.69	1.40		Stiff to very stiff dark brown sandy gravelly CLAY with boulders. Sand is fine to coarse. Gravel is angular to subangular. Boulders are subrounded to rounded.	
				(1.60)			
2.50	B3						
			61.09	3.00		End of trial pit at 3.000m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks

Refusal met on possible bedrock

Water Strikes:

Struck at (m):	Remarks:

Stability: Stable

Width:

Length:

CAUSEWAY GEOTECH

Project No.: 16-0116	**Project Name:** Old Nangor Road Clondalkin		**Trial Pit No.:** TP04
Co-ordinates: 306426.18 E 231533.44 N	**Client:** Department of Education and Skills		Sheet 1 of 1
Method: Trial Pitting	**Client's Representative:** Tobin Consulting Engineers		**Scale:** 1:25
Plant: 8T Excavator	**Ground Level:** 63.40 mOD	**Date:** 24/03/2016	**Driver:** BS **Logger:** DOM

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
			63.30	(0.10) 0.10		TOPSOIL	
						MADE GROUND - Firm brown sandy gravelly CLAY with cobbles, paper, glass and red brick. Sand is fine to coarse. Gravel is angular to subangular. Cobbles are subrounded to rounded.	
0.50	B1			(0.80)			
			62.50	0.90		Stiff to firm brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to angular.	
				(0.60)			
1.50	B2		61.90	1.50		End of trial pit at 1.500m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks

Refusal met on possible bedrock

Water Strikes:	
Struck at (m):	Remarks:

Stability: Stable

Width:

Length:

CAUSEWAY GEOTECH

Project No.: 16-0116	**Project Name:** Old Nangor Road Clondalkin	**Trial Pit No.:** TP05
Co-ordinates: 306289.80 E 231387.72 N	**Client:** Department of Education and Skills	Sheet 1 of 1
Method: Trial Pitting	**Client's Representative:** Tobin Consulting Engineers	**Scale:** 1:25
Plant: 8T Excavator	**Ground Level:** 64.61 mOD	**Date:** 23/03/2016	**Driver:** BS / **Logger:** DOM

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
				(0.20)		TOPSOIL	
			64.41	0.20		MADE GROUND - Soft brown sandy silty gravelly CLAY with occasional red brick. Sand is fine to coarse. Gravel is angular to subangular	
				(0.40)			
0.60	B1		64.01	0.60		Stiff brown silty sandy gravelly CLAY with cobbles and boulders. Sand is fine to coarse. Gravel is subangular to angular. Cobbles and boulders are rounded to subrounded.	
				(0.60)			
1.20	B2		63.41	1.20		Stiff dark brown silty slightly sandy slightly gravelly CLAY with cobbles and very large boulders. Sand is fine to coarse. Gravel is angular to subangular. Cobbles are rounded to subrounded. Boulders are subrounded to rounded.	
				(2.00)			
3.00	B3						▼
			61.41	3.20		End of trial pit at 3.200m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks

Refusal met on possible bedrock

Water Strikes:

Struck at (m):	Remarks:
3.00	

Stability: Stable

Width:

Length:

CAUSEWAY GEOTECH

Project No.: 16-0116	**Project Name:** Old Nangor Road Clondalkin		**Trial Pit No.:** TP06
Co-ordinates: 306382.91 E 231432.73 N	**Client:** Department of Education and Skills		Sheet 1 of 1
Method: Trial Pitting	**Client's Representative:** Tobin Consulting Engineers		**Scale:** 1:25
Plant: 8T Excavator	**Ground Level:** 64.99 mOD	**Date:** 23/03/2016	**Driver:** BS **Logger:** DOM

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
				(0.20)		TOPSOIL	
			64.79	0.20		MADE GROUND - Soft to firm brown sandy gravelly CLAY with occasional paper glass and metal fill	
0.50	B1			(0.60)			
			64.19	0.80		Firm to stiff light brown silty sandy gravelly CLAY with occasional cobbles. Sand is fine to coarse. Gravel is angular to subangular. Cobbles are rounded to subrounded	
				(0.50)			
1.20	B2						
			63.69	1.30		Stiff brown sandy gravelly CLAY with boulders and weathered rock. Sand is fine to coarse. Gravel is angular to subangular. Boulders are subrounded to rounded.	
				(1.20)			
2.50	B3		62.49	2.50		End of trial pit at 2.500m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks

Refusal met on possible bedrock

Water Strikes:	
Struck at (m):	Remarks:

Stability: Stable

Width:

Length:

CAUSEWAY GEOTECH

Project No.: 16-0116	**Project Name:** Old Nangor Road Clondalkin		**Trial Pit No.:** TP07
Co-ordinates: 306493.45 E 231481.23 N	**Client:** Department of Education and Skills		Sheet 1 of 1
Method: Trial Pitting	**Client's Representative:** Tobin Consulting Engineers		**Scale:** 1:25
Plant: 8T Excavator	**Ground Level:** 64.59 mOD	**Date:** 24/03/2016	**Driver:** BS
			Logger: DOM

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
				(0.20)		TOPSOIL	
			64.39	0.20		Stiff brown sandy slightly gravelly CLAY with occasional cobbles. Sand is fine to coarse. Gravel is angular to subangular fine to medium. Cobbles are rounded to subrounded.	
0.60	B1			(0.70)			
			63.69	0.90		Stiff to very stiff dark brown sandy gravelly CLAY with occasional cobbles and boulders. Sand is fine to coarse. Gravel is angular to subangular fine to medium. Cobbles and boulders are rounded to subrounded.	
				(1.30)			
2.00	B2						
			62.39	2.20		End of trial pit at 2.200m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks

Refusal met on possible bedrock

Water Strikes:	
Struck at (m):	Remarks:

Stability: Stable

Width:

Length:

Appendix D Infiltration test results

Project No.: 16-0116
Site: Old Nangor Road, Clondalkin
Test Location: IT02
Date

Causeway Geotech Ltd
Infiltration Test

Analysis using method as described in
BRE Digest 365 and
CIRIA Report C697-The SUDS Manual

	width (m)	length (m)
test pit top dimensions	1	1
test pit base dimensions		
test pit depth	1.5	m

infiltration rate (q) is very low

depth to groundwater before adding water (m) = Dry

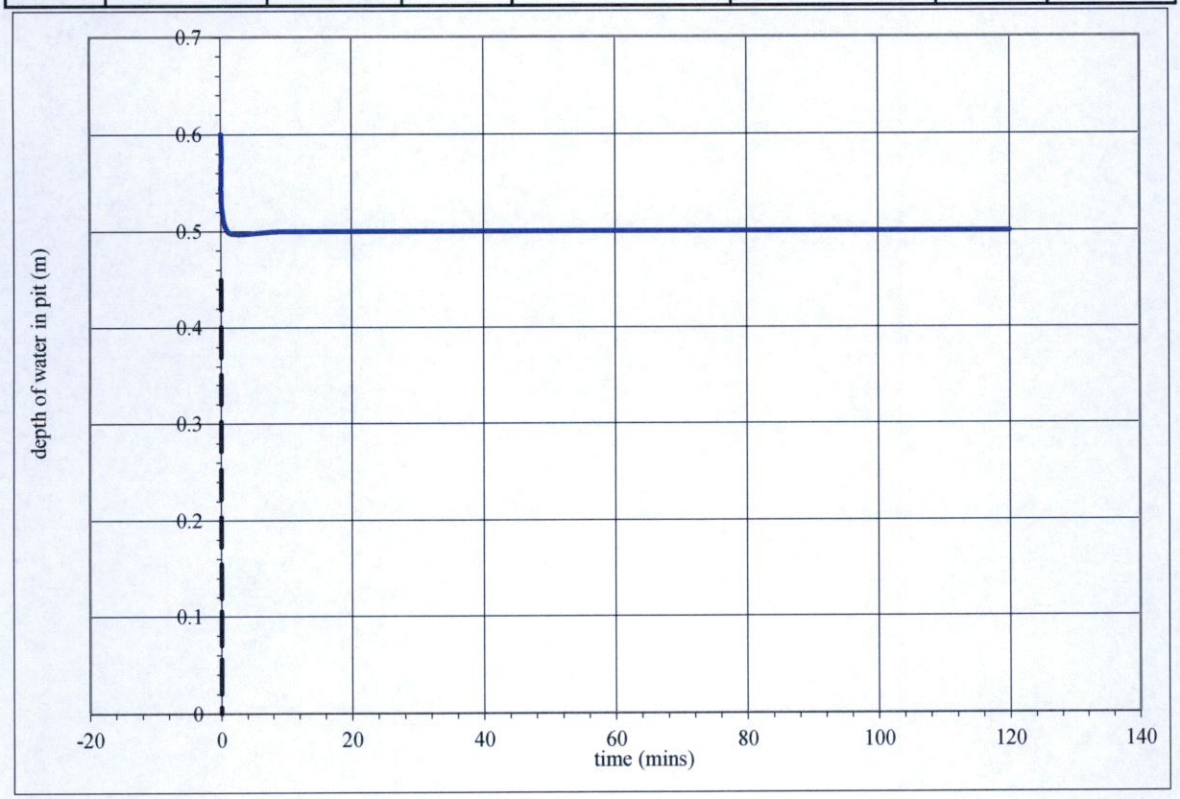
time (mins)	depth to water surface (m)	depth of water in pit (m)
0	0.9	0.6
1	1	0.5
10	1	0.5
60	1	0.5
120	1	0.5

From graph below:

test start - 75% depth at
0.45 m water depth
time is not determined

test end - 25% depth at
0.15 m water depth
time is not determined

time (mins)	depth to water surface (m)	depth of water in pit (m)	time elapsed (mins)	volume of water lost (m3)	Area of walls and base at 50% drop (m2)	q (m/min)	q (m/h)
	1.05	0.45					
	1.35	0.15		0.02	0.15		



Appendix E Indirect CBR test results

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Old Nangor Road Clondalkin

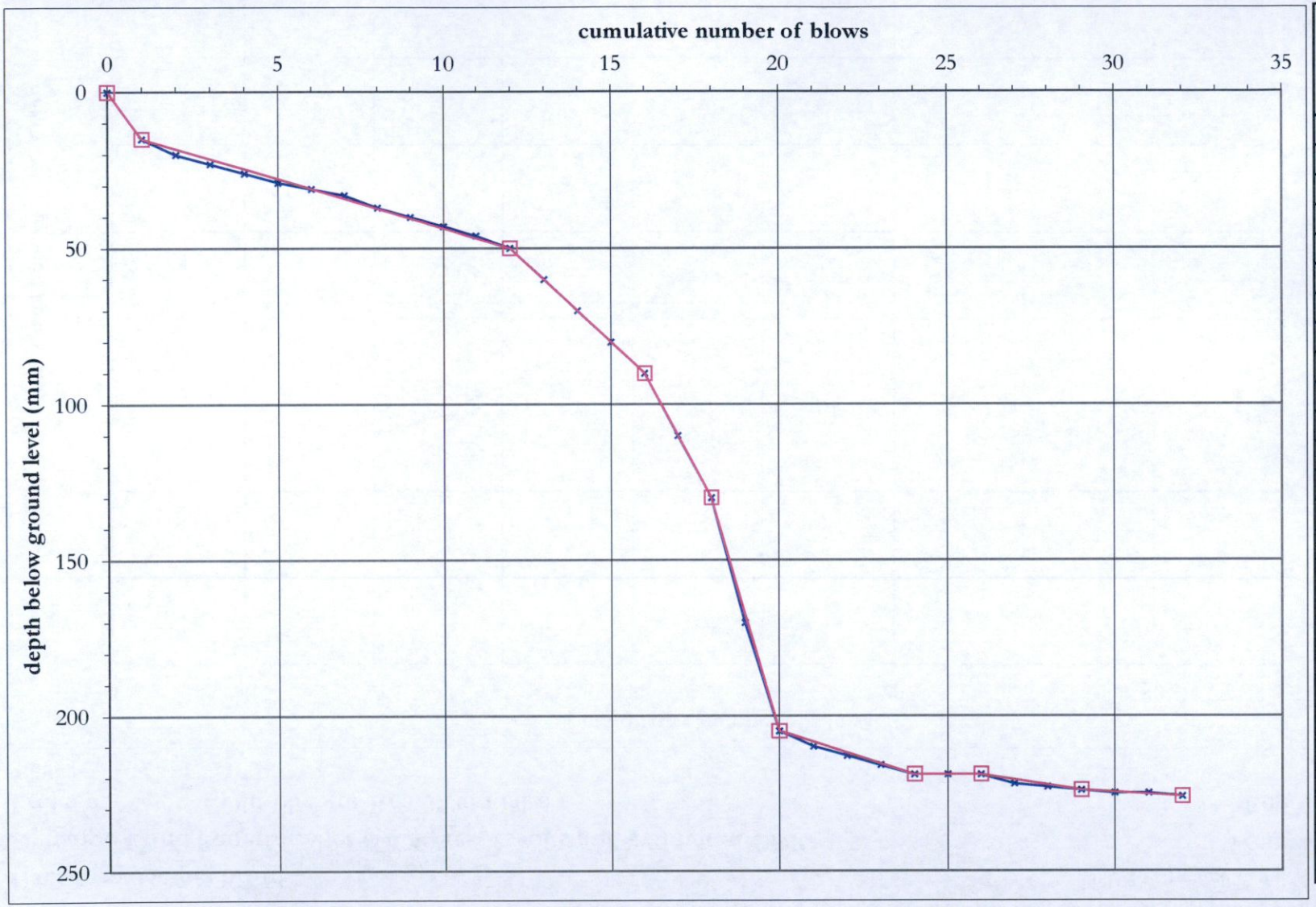
Test Number: DCP01

CBR estimated using Kleyn & Van Heerden (1983):

Log CBR = 2.632-1.28 Log (mm/blow)

Report No: 16-0116

Date: 24-Mar-16



depth from to (mm)	mm/blow	CBR (%)
0	15	13
15		
15	3.2	97
50		
50	10	22
90		
90	20	9.3
130		
130	38	4.1
205		
205	3.5	86
219		
219	0	#NUM!
219		
219	1.7	223
224		
224	0.7	720
226		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Old Nangor Road Clondalkin

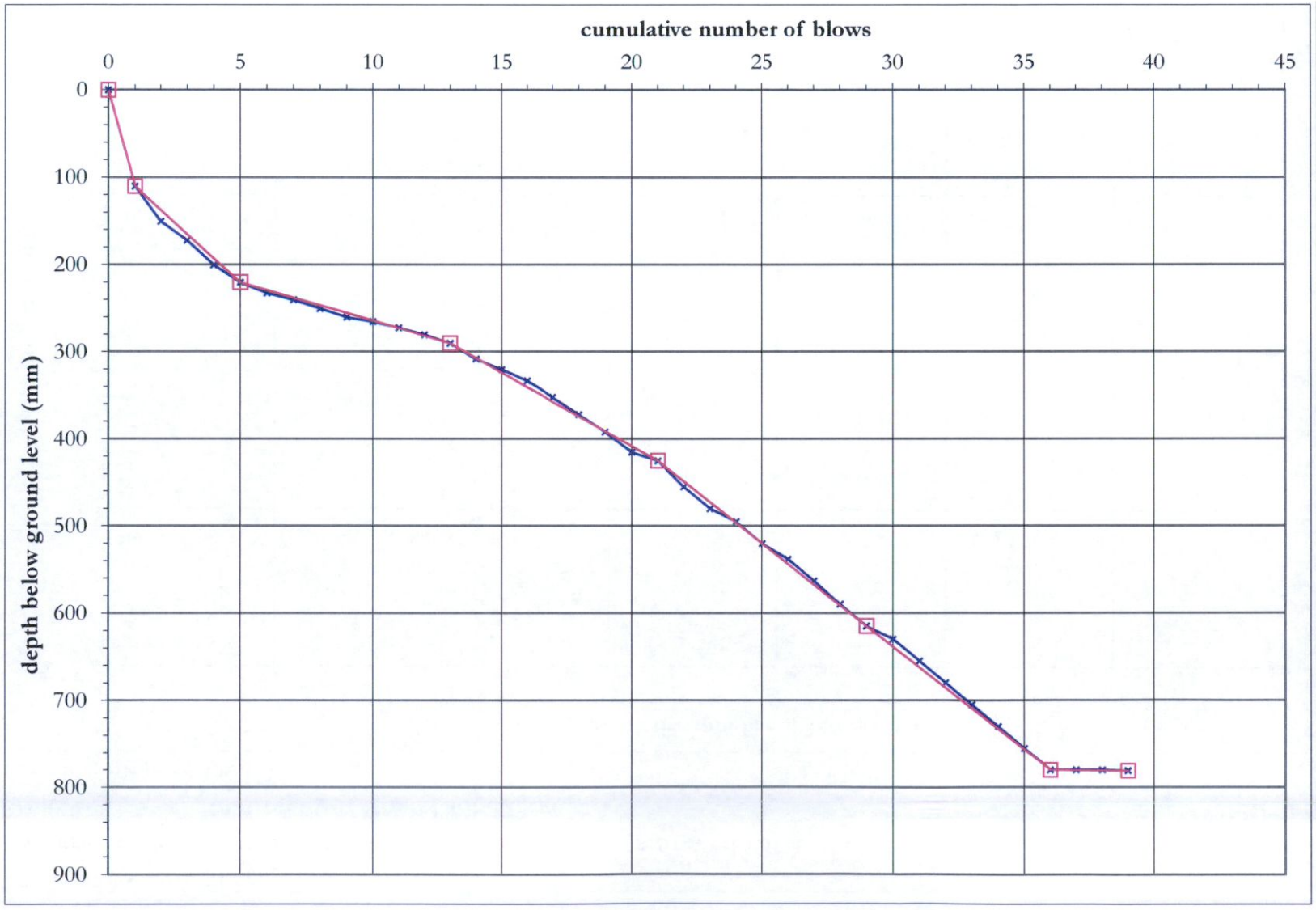
Test Number: DCP02

CBR estimated using Kleyn & Van Heerden (1983):

Log CBR = 2.632-1.28 Log (mm/blow)

Report No: 16-0116

Date: 24-Mar-16



depth from to (mm)	mm/blow	CBR (%)
0	110	1
110		
110	28	6.2
220		
220	8.8	27
290		
290	17	12
425		
425	24	7.4
615		
615	24	7.5
780		
780	0.3	1749
781		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Old Nangor Road Clondalkin

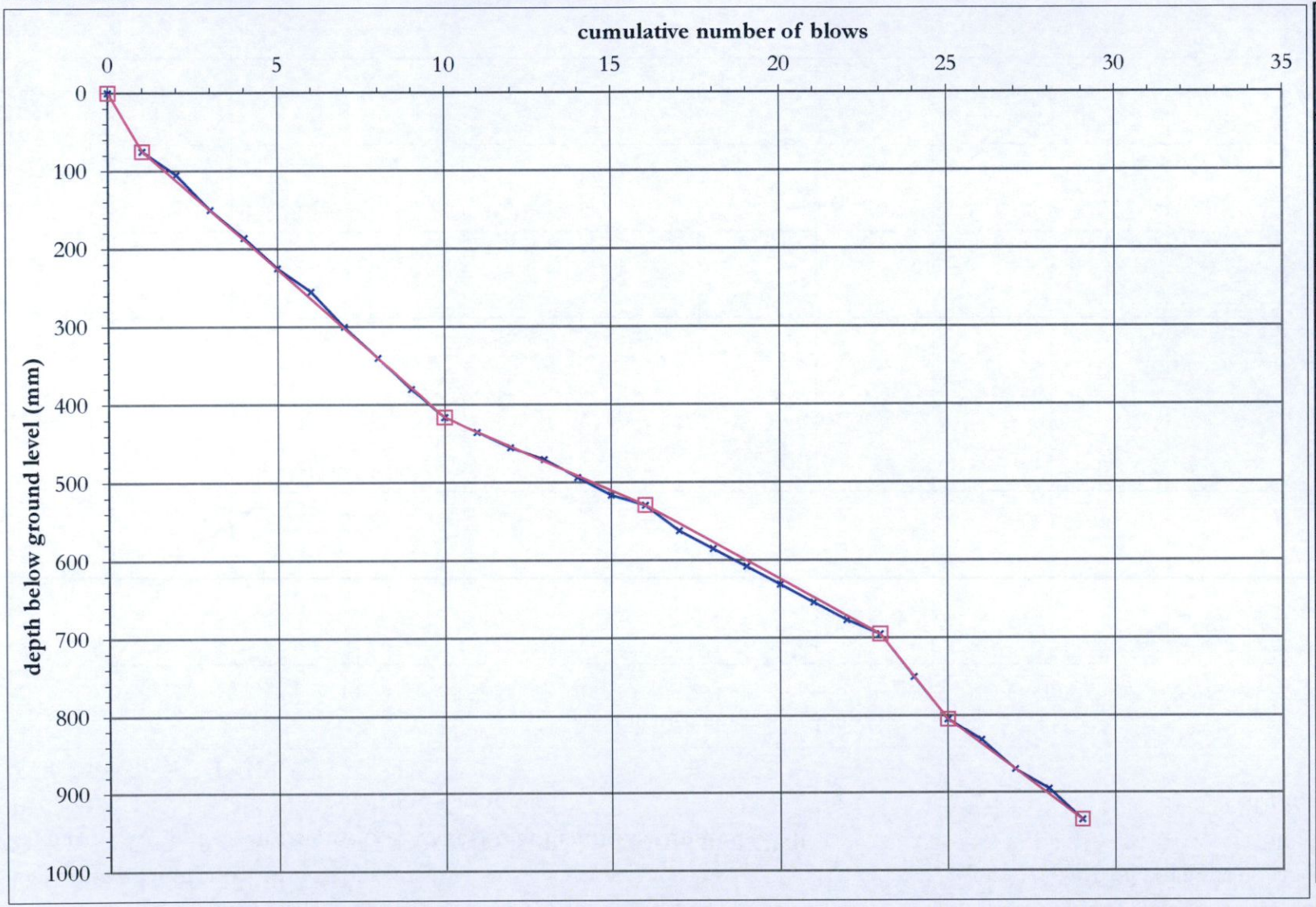
Test Number: DCP03

CBR estimated using Kleyn & Van Heerden (1983):

Log CBR = 2.632-1.28 Log (mm/blow)

Report No: 16-0116

Date: 24-Mar-16



depth from to (mm)	mm/blow	CBR (%)
0	75	1.7
75		
75	38	4.1
416		
416	19	10
529		
529	24	7.4
695		
695	55	2.5
805		
805	33	5
935		

Causeway Geotech Ltd

Dynamic Cone Penetrometer (DCP) test results and estimated CBR

Project: Old Nangor Road Clondalkin

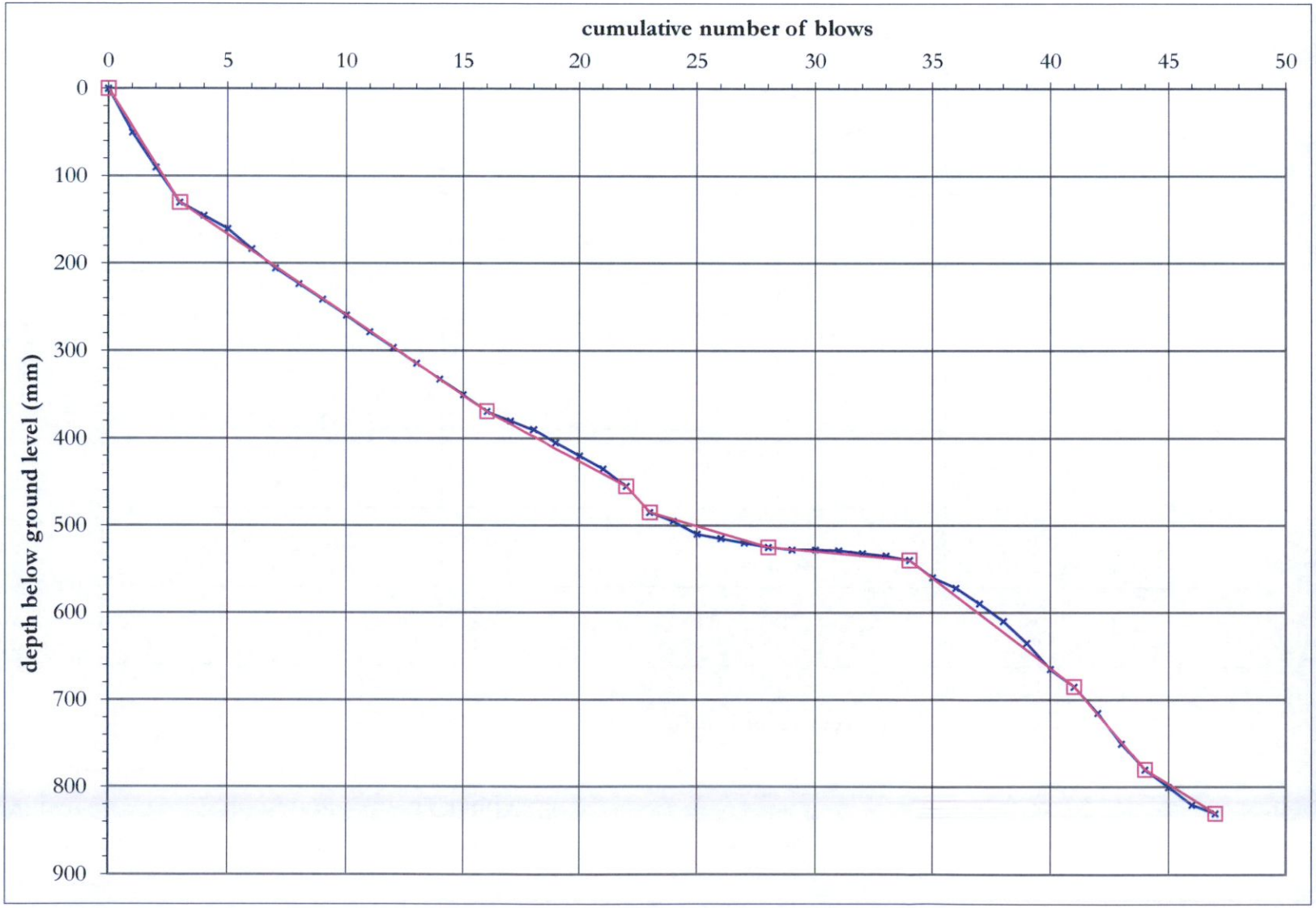
Test Number: DCP04

CBR estimated using Kleyn & Van Heerden (1983):

Log CBR = 2.632-1.28 Log (mm/blow)

Report No: 16-0116

Date: 24-Mar-16



depth from to (mm)	mm/blow	CBR (%)
0	43	3.4
130		
130	18	10
369		
369	14	14
455		
455	30	5.5
485		
485	8	30
525		
525	2.5	133
540		
540	21	8.9
685		
685	32	5.1
780		
780	0.1	15622
830		

Appendix H – Road Safety Audit

Road Safety Audit Report

RSA Audit Comments Sheet

Tel: +353 4493 42518 | Email: info@ors.ie

Client	Revision	Date	Compiled	Checked	Approved
Department of Education & Skills	A	05/12/16	ND	SG	DMC
Marlborough Street, Dublin 1 D01 RC96					

Stage 1/2 Road Safety Audit

Proposed school's development at Clondalkin, Co. Dublin
December 5th 2016

1 Introduction

ORS were appointed by the Department of Education and Skills to carry out a stage 1/2 Road Safety Audit on the Old Nangor Road, Clondalkin, Co Dublin. ORS identified 10 problems as part of this Road safety audit and made recommendation to the designers based on our findings. ORS are satisfied with the designer's response on these recorded problems.

The identification of the abovementioned problems was the first stage of the Road Safety Audit process. The problems identified following this audit and associated recommendations are listed and described in Section 3.1 of this report. Tobin Consulting Engineers took on board the recommendations put forward by ORS in relation to all 10 issues. The proposed roads design and layouts were updated accordingly and we are now satisfied that all 10 problems have been completely resolved."

This report documents the findings of a stage 1/2 Road Safety Audit carried out with respect to the proposal by The Department of Education and Skills to construct a shared educational campus consisting of 2 number 500 pupil capacity schools which are to be accommodated on the same site as an existing post primary school on the Old Nangor Road, Clondalkin, Co. Dublin.

The audit was carried out in the offices of ORS on the 06th December 2016. The audit team visited the site on 12th December 2016.

The audit team comprised of the following people:

Team Leader:
David McCormack BEng (Hons), Dip Eng, CEng, MIEI

Team Member:
Shane Gill BEng (Hons), CEng, MIEI

Team Member:
Adam Price BEng (Hons), MIEI

During the site visit the weather was overcast but dry. The road surface was damp and traffic levels were observed to be moderate but consistent with typical daily flows.

The audit team reviewed the following drawing which was provided by Tobin Consulting Engineers.

- Site layout plan

Documents/information not supplied:
A. Collision Data,
B. Speed Count Data

The terms of reference / procedure for the Audit were as per the relevant sections of the ***National Roads Authority (NRA) Design Manual for Road and Bridges (DMRB) HD 19/15***. The audit

examined only those issues within the design relating to the road safety implications of the scheme, and has therefore not examined or verified the compliance of the designs to any other criteria. The Road Safety Audit should not be treated as a design check.

The problems identified and described in this report are considered by the Audit Team to require action to improve the safety of the scheme and minimise accident occurrence.

All comments, references and recommendations in this safety audit are in respect of the site visit and review of information supplied by Tobin Consulting Engineers. Please refer to attached photographs in Appendix B for descriptions and illustrations of the problems and recommendations outlined in this Road Safety Audit.

2 Description of Proposed Scheme

The proposal put forward by the Department of Education and Skills is to construct a shared educational campus consisting of 2 number 500 pupil capacity schools which are to be accommodated on the same site as an existing post primary school on the Old Nangor Road, Clondalkin, Co. Dublin.

Figure 2.1 below details the existing school site in the context of the surrounding area.

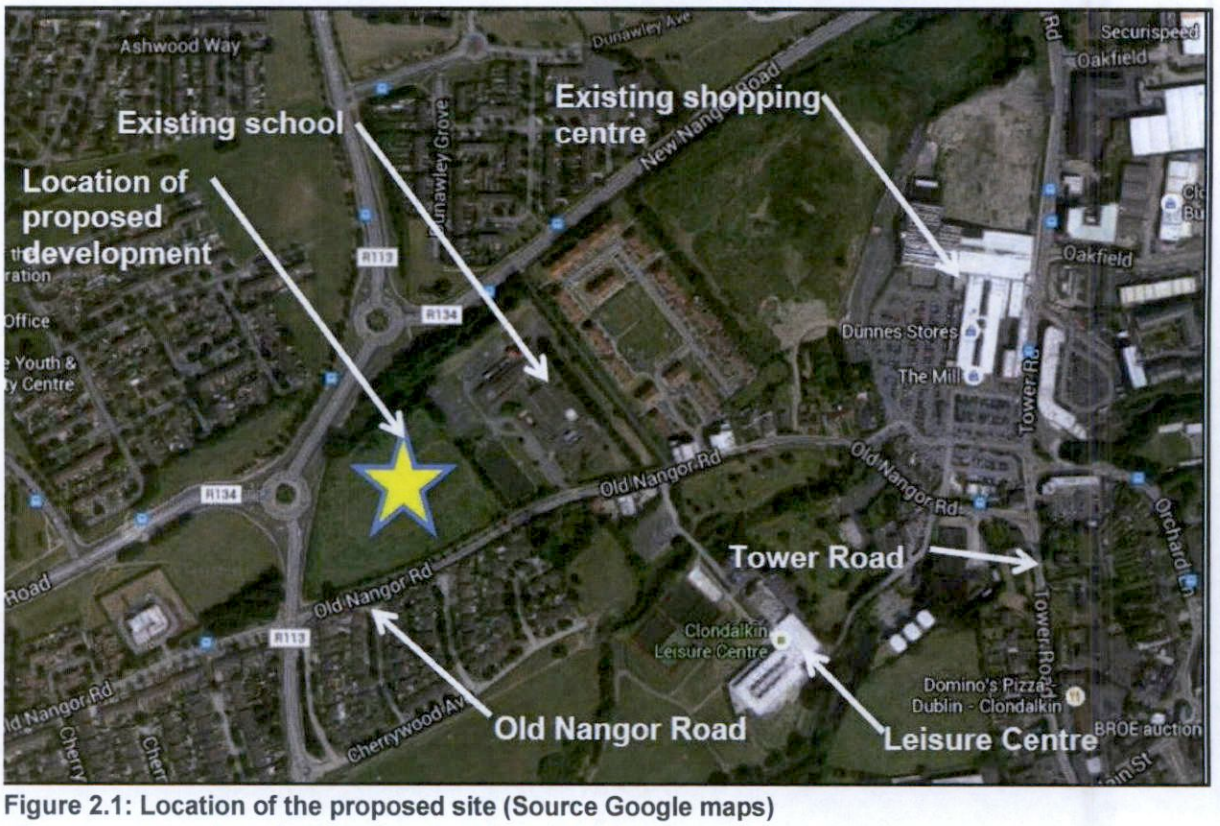


Figure 2.1: Location of the proposed site (Source Google maps)

3 Issues Raised from the Road Safety Audit

The following are problems and recommendations to address the safety issues associated with the proposals. The recommendations are proposed to the designers of the scheme to reduce any safety risks associated with it.

3.1 Potential Problems Identified

Problem No.1
Location: Internal Layout of proposed school campus

The audit team have noted that the proposed plans provided do not have any directional, information signage or road markings included to provide the necessary information to road and vulnerable road users as how to use the internal road network. There are obvious safety risks associated with a lack of internal information associated with the infrastructural network resulting in possible collisions, risks to pedestrians and confusion for all during peak times.

Recommendation No.1

It is recommended that the design team review their plans and provide details relating to the internal road network. It is recommended that the design team review the DMURS (Design Manual for Urban Roads and Streets) and the Traffic Signs Manual for guidance and details.

Problem No.2
Location: Internal Layout of proposed school campus

The audit team note that it is not clear from the plans provided as to the extent of set down and parking areas along the internal road network. There are potential safety risks if motorists do not understand the set down areas provided resulting in possible collisions with pedestrians and other vehicles.

Recommendation No.2

It is recommended that the design team review and update their plans to fully detail the extent of set down and parking areas provided along the internal link road within the campus.

Problem No.3
Location: Internal Layout of proposed school campus

The audit team have concerns regarding the proposed tight 90-degree internal bends within the campus. It is unclear from the plans provided if buses, emergency vehicles etc. will be able to safely navigate the layout, especially if vehicles are parked either side of the one way road.

Recommendation No.3

It is recommended that the design team carry out an Autotrack analysis of the internal road network to ensure that all intended vehicles can safely access the internal road layout.

Problem No.4
Location: Internal Layout of proposed school campus

It is noted that there are 3 areas designated for parking. It is unclear as to how these spaces are distributed for staff, parents and visitors. There is a potential safety risk of excess vehicular movements on site if insufficient information is provided for motorists entering the site who are unaware that there are additional car parking areas beyond the set down areas.

Recommendation No.4

It is recommended that clear concise information signage is provided for motorists entering the site to ensure that they are aware of the parking area distributed throughout the school campus.

Problem No.5
Location: External Road Frontage to school

The audit team have observed from the site visit that there is wide set down areas along the school frontage adjacent to the public road for vehicles. From the plans provided there is no detail shown as to the treatment of this area. There is a potential serious safety risk if these areas are continued to be used and the designed internal campus is not utilised resulting in continuing peak time congestion and increased safety risk for pedestrians in the area.

Recommendation No.5

It is recommended that the design team consider the proposed treatment for the existing set down area in front of the existing school.

Problem No.6
Location: Dimensions of internal school roadway

The audit team have noted from the plans provided that there are no details relating to the geometry of the internal road way and its width to accommodate traffic. There is a potential safety risk if the roadway is too wide or has no road markings for one-way traffic which could lead to unauthorised parking resulting in an increased safety risk.

Recommendation No.6

It is recommended that the design team provide more information for the internal road network to include all geometry, road signage and markings to ensure that road users use the proposed one-way system as safely intended.

Problem No.7
Location: Entrances to School entrance and exit

The audit team are unsure as to the proposed treatment of the main school entrance and exit. It is unclear if gates will be provided and if so, how they will operate. There is a significant safety risk if gates are not designed to safely be held open and if they will block the entrance for vehicles trying to enter the site if they are shut. This could lead to vehicles stopping halfway onto the public carriageway awaiting the gates to open which could result in potential collisions.

Recommendation No.7

It is recommended that the design team confirm the main entrance and exit treatments for the school sites.

Problem No.8
Location: Internal Trafficked Route

The audit team are unsure as to the extent of public lighting to be provided within the site. It is likely that the school's amenities could be used in the evenings and after dark and there is a potential safety risk if public lighting throughout the pedestrian and trafficked routes are not provided.

Recommendation No.8

It is recommended that the design team confirm if public lighting will be provided throughout the proposed campus.

Problem No.9
Location: Pedestrian Routes to access school campus

The audit team note the proposed pedestrian routes to serve the school. There is a potential safety risk for users of these routes if they do not contain the normal design criteria for pathways and pedestrian links. There is no information in relation to the gradients, lighting, tactile paving, dropped kerb crossing areas or surface treatment for these routes. There is a serious safety risk to their use if they are not designed in accordance with best practice. It is also unclear as to the treatment of the main pedestrian routes along the main site frontage. It is not clear if pedestrian footpaths are to be provided at the main vehicular entrances.

Recommendation No.9

It is recommended that the design team review their approach to the pedestrian linkages to service the campus and ensure they confirm to all best practice design criteria and guidance available. Pedestrian desire lines should also be considered in the proposed design.

Problem No.10
Location: Internal Campus Road

The audit team note that while the main internal road system is designed for one-way traffic, there are a number of spur roads serving car parks and there is also an area to the rear of the existing school that will be two-way. It is unclear on the plans provided as to the information and road geometry available to ensure that two-way movements are possible and what measures will be provided to ensure that vehicles do not attempt to travel back along the one-way system in the wrong direction resulting in an increased safety risk.

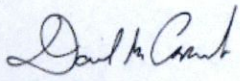
Recommendation No.10

It is recommended that the design team review their internal road layout provided and ensure that the internal road markings and signage is correctly provided to prevent any confusion on site.

4 Audit Team Statement

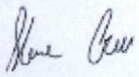
We certify that we have examined the drawings listed in Appendix A and examined the site by means of a site visit. This examination has been carried out with the sole purpose of identifying any features of the design that could be removed or modified to improve the safety of the scheme. The problems that we have identified have been noted in the report, together with suggestions for improvement, which we recommend should be studied for implementation.

Audit Team Leader: David McCormack: BEng (Hons), Dip Eng, CEng, MIEI
ORS

Signed: 

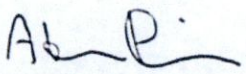
Date: 05th December 2016

Audit Team Member: Shane Gill: BEng (Hons), CEng, MIEI
ORS

Signed: 

Date: 05th December 2016

Audit Team Member: Adam Price: BEng (Hons), MIEI
ORS

Signed: 

Date: 05th December 2016

Appendix A – Inspected Documentation

1. Site Layout Plan

Appendix B – Photographs

Photograph 1 – View from existing school access looking towards the R113

Photograph 2 – R113 approach to the school access from the Old Nangor Road

Photograph 3 – Existing road markings at the school access

Photograph 4 – Existing parking facilities on Old Nangor Road at school access

Photograph 5 – Existing gated school access

Appendix C – Designer Response Form

ORS

Road Safety Audit Feedback Form

Job: Clondalkin School

Stage of Audit: 1/2

Completion Date of Audit: November 2016

Note: Please fill out relevant information below

Problem Point In Safety Audit Report	Problem Accepted (Yes/No)	Recommendation Accepted (Yes/No)	Alternative Option (Describe)	Alternative Option Accepted by Auditors (Yes/No)
P1	Yes	Yes		
P2	Yes	Yes		
P3	Yes	Yes		
P4	Yes	Yes		
P5	Yes	Yes		
P6	Yes	Yes		
P7	Yes	Yes		
P8	Yes	Yes		
P9	Yes	Yes		
P10	Yes	Yes		

NB: Alternatively, the designer may compose a formal letter outlining in detail their responses and alternative solutions (if any) to the problems outlined by the audit team.

Signed: ..... **Design Team Leader**

Date: 03/02/17

Please complete and return to safety auditor.

Safety Audit Signed Off ..... **Audit Team Leader**

Date: 03/02/2017

ORS

Road Safety Audit Feedback Form

Job: Clondalkin School

Stage of Audit: 1/2

Completion Date of Audit: November 2016

Note: Please fill out relevant information below

Problem Point In Safety Audit Report	Problem Accepted (Yes/No)	Recommendation Accepted (Yes/No)	Alternative Option (Describe)	Alternative Option Accepted by Auditors (Yes/No)
P1	Yes	Yes		
P2	Yes	Yes		
P3	Yes	Yes		
P4	Yes	Yes		
P5	Yes	Yes		
P6	Yes	Yes		
P7	Yes	Yes		
P8	Yes	Yes		
P9	Yes	Yes		
P10	Yes	Yes		

NB: Alternatively, the designer may compose a formal letter outlining in detail their responses and alternative solutions (if any) to the problems outlined by the audit team.

Signed: Audrey Mallon **Design Team Leader**

Date: 03/02/17

Please complete and return to safety auditor.

Safety Audit Signed Off David McCourt **Audit Team Leader**

Date: 03/02/2017

Fairgreen House
Fairgreen Road
Galway
H91 AXK8
Tel: + 353 (0)91
565211
Email: info@tobin.ie

Block 10-4,
Blanchardstown Corporate
Park
Dublin
D15 X98N
Tel: + 353 (0)1 8030401
Email: info@tobin.ie

Market Square
Castlebar
Mayo
F23 Y427
Tel: +353 (0)94 9021401
Email: info@tobin.ie

Ducart Suite
Castletroy Commercial Campus
Limerick
V94 Y6FD
Tel: +353 (0)61 574 413
Email: info@tobin.ie

The Gateway Building,
Floor 3, Northwest Business Park,
Collooney,
Sligo
F91W40H
Email: info@tobin.ie