

17 MATERIAL ASSETS

17.1 INTRODUCTION

This chapter considers and assesses the potential impacts on the material assets of the surrounding area during the construction and operational phases of the proposed road project. The material assets that are considered include:-

- Major utilities; and
- Waste.

Potential impacts to land use and properties are addressed in **Chapter 7: Socio Economic and Community** and potential impacts to agricultural assets are addressed in **Chapter 8: Agriculture Land Uses**.

17.2 METHODOLOGY

17.2.1 Utilities

A number of utility providers have installations within the study area and these are summarised in **Table 17.1** below.

Table 17.1: Data Sources for Material Assets

Utility Provider	Data Source
Gas Network Ireland (GNI)	Consultations between Design Team and GNI
Electricity Supply – EirGrid, ESBI and ESB Networks	Consultations between Design Team and ESBI, EirGrid and ESB Networks
Water Supply/ Waste Water	Consultations between Design Team and Irish Water & Cork County Council
Eir	Consultations between Design Team and Eir
Vodafone	Consultations between Design Team and Vodafone
Meteor	Consultations between Design Team and Meteor
3	Consultations between Design Team and 3
Virgin Media	Consultations between Design Team and Virgin Media (formerly UPC)
enet	Consultations between Design Team and enet
Eir	Consultations between Design Team and Eir

Chapter 6: Non-Statutory Consultation outlines the level of consultation that was undertaken with the various service providers.

17.2.2 Waste

The assessment of the potential impact of the proposed M28 Road Project on the waste management environment has been undertaken in accordance with the general requirements of the “*Guidelines on the information to be Contained in the Environmental Impact Statement (Draft September 2015)*”, *Advice Notes for preparing Environmental Impact Statements (Draft September 2015)*, and the *Guidelines for the management of waste From National Roads Construction Projects (Revision 1, 12 November 2014)*. The characteristics of the impact which will be defined are the quality, significance and duration of the impact.

17.3 RECEIVING ENVIRONMENT

17.3.1 Existing Utilities

Utility providers that are known to have services within, or adjacent to, the footprint of the proposed road project include:-

- Gas – Gas Networks Ireland (Transmission and Distribution mains);
- Electricity Supply – EirGrid, ESBI and ESB Networks;
- Mains Water, Surface Water and Foul Sewers – Irish Water and Cork County Council; and
- Telecommunications – Eir, Vodafone, Meteor, 3, Virgin Media (formerly UPC); and enet.

Drawing Nos. UT0201-UT0207 in **Volume 5**, show approximate locations of known services. These drawings were prepared following liaison and meetings with the various service providers. In some instances topographical survey and site investigation data (slit trenches etc.) has been used to verify these locations.

17.3.2 Waste

The proposed M28 Road Project will require a variety of construction methodologies resulting in the generation of various waste streams. As outlined in **Chapter 3: Description of the Proposed Road Development**, the proposed M28 Road Project will run above and below current ground level and as a result cutting and filling will be required along the length of the route. The majority of the waste will be generated from the demolition works, excavation arisings and at the construction compound and Service Area. The potential wastes to be generated by the project and their potential for significant environmental impacts are discussed below in **Section 17.4.2**.

17.4 POTENTIAL IMPACTS

17.4.1 Utilities

17.4.1.1 Gas

Gas Networks Ireland (GNI) owns and operates distribution and transmission mains in the vicinity of the proposed M28 Road Project and has been discussed in detail with Gas Networks Ireland.

Distribution Mains

Table 17.2 below gives details of conflict locations between the proposed M28 Road Project and existing Gas Distribution mains.

Table 17.2: Conflicts with Gas Distribution Mains

Location	Chainage	Existing Apparatus
R610 Rochestown Road	0+550 (Mainline)	180mm 4bar
Maryborough Overbridge	1+560 (Mainline)	125mm 4bar
M28 mainline	9+230 (Mainline)	125mm 4bar
Proposed L6472 Shanbally to Raffeen Link Road	0+080 to 0+180	125mm 4bar
Proposed L2492 Shanbally Southern Link Road	0+000 to 0+080	125mm 4bar
Proposed IDA Link Road	0+080 to 0+270	180mm 4bar
Proposed R613 South Link Road	0+000 to 0+150	180mm 4bar
Barnahely Roundabout	N/A	180mm 4bar
Proposed R613 North Link Road	0+000 to 0+150	180mm 4bar
Proposed L6517 Loughbeg Road (North)	0+000 to 0+040	180mm PE-80 4bar
Proposed Loughbeg Roundabout	N/A	180mm PE-80 4bar
Proposed L6517 Loughbeg Road (South)	0+000 to 0+280	180mm PE-80 4bar
Proposed L2545 West Ringaskiddy Village Link Road	0+000 to 0+070	180mm PE-80 4bar
Proposed Ringaskiddy Roundabout	N/A	180mm PE-80 4bar
Proposed L2545 East Haulbowline Island Link Road	0+000 to 0+090	180mm PE-80 4bar

Transmission Mains

The Gas Transmission main is a 300 mm diameter pipe that supplies a number of pharmaceutical plants in Ringaskiddy. The proposed road project will be in conflict with this transmission main at a number of locations as listed in **Table 17.3** below.

Table 17.3: Conflicts with Gas Transmission Lines

Location	Chainage	Existing Apparatus
M28 Mainline	8+000	300mm ST 19bar
Proposed L6472 Shanbally to Raffeen Link Road	1+480	300mm ST 19bar
M28 Mainline (Barnahely to Loughbeg)	11+020	300mm ST 19bar
M28 Mainline (Barnahely to Loughbeg)	11+610 to 11+720	300mm ST 19bar
Proposed Loughbeg Roundabout	N/A	300mm ST 19bar
Proposed L6517 Loughbeg Road (South)	0+000 to 0+180	300mm ST 19bar

There are no utility services currently traversing the Service Area site. There is a gas pipeline along the southern boundary of the Port of Cork lands and the L-2545 (which also runs along the eastern side of the adjacent disused Ringaskiddy Logistics Centre).

17.4.1.2 Electricity Supply

The proposed road project will be in conflict with a number of overhead and underground ESB cables including LV, 10kV, 20kV, 38kV, 110kV and 220kV.

Extensive liaison has taken place with ESB Networks (LV, 10kV, 20kV and 38kV), EirGrid and ESBI (110kV & 220kV) during the course of the project, regarding existing services and future plans for the area.

Table 17.4 below lists locations of where LV & MV (excl. 38kV) overhead and underground cables are in conflict with the proposed M28 Road Project.

Table 17.4: Networks LV/MV Overhead and Underground Cables

Location on M28	Chainage	Existing Apparatus
N40 Northbound Merge	0+130	MV/LV UG Cable Network
Mainline	0+215	MV/LV UG Cable Network
Mainline (east)	0+250 to 0+350	MV/LV UG Cable Network
Mainline (west)	0+350 to 0+550	MV/LV UG Cable Network
Mainline and proposed Northbound M28 (West) Diverge	0+575 to 0+635	MV/LV UG Cable Network
Rochestown Road	N/A	MV/LV UG Cable Network
Mainline	1+380	MV Overhead Single & 3 Phase
Proposed Maryborough Hill Link Road	0+550 to 0+600	MV Overhead Single & 3 Phase
Proposed Maryborough Hill Link Road	0+460	MV/LV UG Cable Network
Proposed Maryborough Hill Link Road	0+052	MV Overhead Single & 3 Phase
Maryborough Hill	0+160	MV Overhead Single & 3 Phase
Maryborough Hill	0+000	MV Overhead Single & 3 Phase
Mainline	1+670	MV/LV UG Cable Network
Mainline	1+970 to 2+010	MV/LV UG Cable Network
Carr's Hill Northbound Merge	0+120	MV/LV UG Cable Network

Location on M28	Chainage	Existing Apparatus
Carr's Hill Northbound Merge	0+050 to 0+100	MV Overhead Single & 3 Phase
Stream Realignment, R609 tie-in (North South)	0+000 to 0+070	MV Overhead Single & 3 Phase
Stream Realignment, R609 tie-in (North South)	0+025, 0+050	MV Overhead Single & 3 Phase
Proposed Carr's Hill West Roundabout	N/A	MV Overhead Single & 3 Phase
Proposed Carr's Hill Southbound Diverge	0+130	MV/LV UG Cable Network
Proposed Carr's Hill Southbound Merge	0+050 to 0.100	MV Overhead Single & 3 Phase
Mainline	2+670	MV Overhead Single & 3 Phase
Mainline	4+650	MV Overhead Single & 3 Phase
Proposed Shannonpark Northbound Merge (East-West)	0+140 to 0+160 and 0+190	LV Overhead Single & 3 Phase
Proposed Shannonpark Northbound Merge (North-South)	0+190	LV Overhead Single & 3 Phase
Mainline	6+025 to 6+050	LV Overhead Single & 3 Phase
Proposed Shannonpark Southbound Diverge	0+280	LV Overhead Single & 3 Phase
Proposed Ballinrea Access Road	0+025 to 0.060	LV Overhead Single & 3 Phase
Proposed Shannonpark South Link Road	0+025 to 0+175	MV/LV UG Cable Network
Mainline	6+575	MV Overhead Single & 3 Phase
Mainline	7+150 to 7+180	MV Overhead Single & 3 Phase
Mainline	7+800	MV Overhead Single & 3 Phase
Mainline	9+225	LV Overhead Single & 3 Phase
Proposed Shanbally Southbound diverge	0+075	LV Overhead Single & 3 Phase
Proposed L6472 Shanbally to Raffeen Link Road	0+220	LV Overhead Single & 3 Phase
Proposed Shanbally Southbound diverge	0+225	MV Overhead Single & 3 Phase
Mainline	9+375	MV Overhead Single & 3 Phase
Proposed Shanbally Northbound merge	0+200	MV Overhead Single & 3 Phase
Proposed Shanbally North Link Road	0+275	LV Overhead Single & 3 Phase
Proposed IDA Link Road	0+150	MV/LV UG Cable Network
Proposed IDA Link Road	0+250	MV/LV UG Cable Network
Mainline	9+600 to 9+725	MV/LV UG Cable Network
Mainline	9+730	MV/LV UG Cable Network
Mainline	9+890	MV/LV UG Cable Network
Mainline	10+200 to 10+250	MV Overhead Single & 3 Phase
Mainline	10+250 to 10+300	MV Overhead Single & 3 Phase
Proposed Janssen Access Spur	0+000 to 0+060	MV/LV UG Cable Network
Proposed R613 North Link Road	0+50 to 0+100	MV/LV UG Cable Network
Proposed R613 North Link Road	0+040	MV Overhead Single & 3 Phase
Mainline	10+675 to 10+850	MV/LV UG Cable Network
Mainline	10+910	LV Overhead Single & 3 Phase
Mainline	10+910	MV Overhead Single & 3 Phase
Barnahely Roundabout	N/A	MV/LV UG Cable Network
Mainline (Barnahely to Loughbeg)	11+660	MV Overhead Single & 3 Phase
Mainline (Barnahely to Loughbeg)	11+880	MV/LV UG Cable Network
Mainline (Barnahely to Loughbeg)	11+750 to 11+770	MV Overhead Single & 3 Phase

Location on M28	Chainage	Existing Apparatus
Mainline (Barnahely to Loughbeg)	11+770 to 11+980	MV/LV UG Cable Network
Loughbeg Roundabout	N/A	MV Overhead Single & 3 Phase
Loughbeg Roundabout and Entrance to Ringport Business Park	N/A	MV/LV UG Cable Network
Upgrade of Local Road at Loughbeg	0+110	MV/LV UG Cable Network
Upgrade of Local Road at Loughbeg	0+110	MV/LV UG Overhead Single & 3 Phase
Mainline (Loughbeg to East of Ringaskiddy)	12+400	MV Overhead Single & 3 Phase
Proposed L2545 West Ringaskiddy Village Link Road	0+000 to 0+070	MV Overhead Single & 3 Phase
Ringaskiddy Roundabout	N/A	MV Overhead Single & 3 Phase
Proposed L2545 East Haulbowline Island Link Road	0+000 to 0+080	MV Overhead Single & 3 Phase

The proposed M28 Road Project is in conflict with 38kV overhead and underground cables at the locations listed in **Table 17.5** below.

Table 17.5: ESB OH/UG 38kV Cables

Location on M28	Chainage	Existing Apparatus
Mainline	9+600 to 9+650	UG 38kV
Proposed IDA Link Road	0+125	UG 38kV
Mainline	10+350 to 10+400	OH 38kV
Proposed R613 North Link Road	0+060	OH 38kV
Mainline	11+530 to 11+580	OH 38kV
Proposed Loughbeg Roundabout	N/A	OH 38kV

The proposed M28 Road Project is in conflict with 110kV overhead and underground cables at the locations listed in **Table 17.6** below.

Table 17.6: ESBI OH/UG 110kV Cables

Location on M28	Chainage	Existing Apparatus
M28 Mainline	4+450 to 4+500	OH 110kV
Proposed R611 Carrigaline Link Road	0+140	OH 110kV
M28 Mainline	7+220	OH 110kV
M28 Mainline	8+060	OH 110kV
Proposed L6472 Shanbally to Raffeen Link Road	1+380	OH 110kV
M28 Mainline	8+600 to 8+700	OH 110kV
M28 Mainline	8+700 to 8+750	OH 110kV (2 lines)
M28 Mainline	9+200 to 9+350	OH 110kV (2 lines)
M28 Mainline	9+400 to 9+500	OH 110kV
M28 Mainline	9+575	OH 110kV
Proposed Shanbally Northbound Merge	0+100 to 0+280	OH 110kV (2 lines)
Proposed Shanbally Northbound Merge	0+400	OH 110kV

Location on M28	Chainage	Existing Apparatus
Proposed Shanbally Southbound Diverge	0+100 to 0+170	OH 110kV
Proposed IDA Link Road	0+120	OH 110kV
M28 Mainline	10+300 to 10+350	OH 110kV (2 lines)
R613 North Link Road	0+080	OH 110kV (2 lines)
M28 Mainline	11+550 to 11+650	OH 110kV (2 lines)
L6517 Loughbeg Road (South)	0+040	OH 110kV (2 lines)

The proposed M28 Road Project is in conflict with 220kV overhead and underground cables at the locations listed in **Table 17.7** below.

Table 17.7: ESBI 220kV Cables

Location on N28	Chainage	Existing Apparatus
M28 Mainline	7+900	OH 220kV (double line)
M28 Mainline	7+950	UG 220kV
Proposed L2545 West Ringaskiddy Village Link Road	0+000 to 0+070	UG 220kV
Ringaskiddy Roundabout	N/A	UG 220kV
Proposed L2545 East Haulbowline Island Link Road	0+000 to 0+080	UG 220kV

There are no utility services currently traversing the Service Area site. There is a 220Kv underground cable running along the southern boundary of the Port of Cork lands with the L-2545 (which also runs along the eastern side of the adjacent disused Ringaskiddy Logistics Centre). There is also an underground ESB connection servicing the adjacent disused Ringaskiddy Logistics Centre.

There are two overhead 110kV lines in the vicinity of the proposed Shanbally Interchange. Of the two, the single phase line is located slightly closer to Shanbally Village. A diversion of this line is required. It is proposed to remove two existing pole sets and a tower, which will be replaced with a new pole set and two new towers. A diversion of the double circuit line is also required, which will result in the removal of four towers. In order to facilitate this diversion six new towers will be required. The line of the proposed diversion can be seen on drawing No **DG0210** in **Volume 5**.

The potential impacts associated with these modifications have been assessed in the relevant environmental chapters.

17.4.1.3 Water, Surface Water and Foul Sewers

Watermains

A number of conflicts have been established between the proposed M28 Road Project and existing watermains, surface water and foul sewers. Of particular concern are conflicts with the 1,200mm Cork Harbour & City Watermain which occur at 3 locations, i.e., Carr's Hill Interchange, Shanbally Interchange and the R613 at Barnahely. There are a number of conflicts at each of these locations as follows (**Table 17.8**):-

Table 17.8: Conflicts with 1200mm Cork Harbour & City Watermain

Location	Chainage	Existing Apparatus
M28 Mainline @ proposed Carr's Hill Interchange	2+600 to 2+750	1,200mm Cork Harbour & City Watermain
Proposed Shanbally Southbound Diverge	0+280	1,200mm Cork Harbour & City Watermain
M28 Mainline @ proposed Shanbally Interchange	9+425	1,200mm Cork Harbour & City Watermain
Proposed Shanbally Northbound Merge	0+230	1,200mm Cork Harbour & City Watermain
Proposed L6472 West Link Road @ Barnahely	0+140	1,200mm Cork Harbour & City Watermain
Barnahely Roundabout	N/A	1,200mm Cork Harbour & City Watermain
Proposed R613 North Link Road	0+000 to 0+100	1,200mm Cork Harbour & City Watermain
Proposed Janssen Biologics Access Spur	0+050	1,200mm Cork Harbour & City Watermain

During the course of the design phase completed to date a number of trial holes were excavated at Shanbally and Barnahely to establish the line and level of the main. These trial holes were excavated under the supervision of Cork County Council personnel and to their requirements. Each of these conflicts has been discussed in detail with relevant personnel in Cork County Council.

Other Watermain Conflicts

In addition to the conflicts with the 1,200mm Cork Harbour & City watermain there are a number of conflicts with other watermain of various sizes. These conflicts are listed below in **Table 17.9**.

Table 17.9: Other Watermain Conflicts

Location	Chainage	Existing Apparatus
M28 Mainline	1+250 to 1+300	250mm AC
Intersects L2470 Maryborough Hill (South of Bridge)	1+570	250mm AC
Intersects L2470 Maryborough Hill (North of Bridge) where the proposed Maryborough Hill Link Road intersects Maryborough Hill	1+570	100mm
M28 Mainline	2+090	450mm DI
Proposed Carr's Hill Northbound Merge	0+025	450mm DI
Maryborough Hill Link Road	0+025	450mm DI
Proposed Carr's Hill Southbound Diverge	0+240	450mm DI
Proposed Carr's Hill South Roundabout	N/A	450mm DI 200mm DI
Proposed Carr's Hill Northbound Diverge	0+150	150mm AC
Proposed Carr's Hill Southbound Merge	0+110 to 0+150	150mm AC
Proposed Carr's Hill South Link Road	0+050 to 0+100	450mm DI 200mm DI 150mm AC
M28 Mainline	3+210	175 AC

Location	Chainage	Existing Apparatus
M28 Mainline (Board of Works Underbridge)	3+350	250mm DI
M28 Mainline	4+800 to 4+850	100mm
M28 Mainline	6+025	2 x 150mm AC
Shannonpark Southbound Diverge	0+275	2 x 150mm AC
Shannonpark Northbound Merge	0+200	2 x 150mm AC
Proposed Ballinrea Access Road	0+050 to 0+100	450mm
Proposed R611 Carrigaline Link Road	0+000 to 0+180	450mm
Proposed Shannonpark South Link Road	0+125	450mm
M28 Mainline (Rock Road Underbridge)	6+930	150mm
Proposed Shanbally Southbound Diverge	0+075	150mm and 100mm AC
M28 Mainline	9+230	150mm and 100mm AC
Proposed Shanbally Northbound Merge	0+050	150mm and 100mm AC
L6472 Shanbally to Raffeen Link Road	0+190	150mm
Proposed Barnahely Roundabout	N/A	100mm AC
M28 Mainline	10+900 to 10+950	100mm AC
Proposed L6472 West Link	0+000 to 0+040	100mm AC
Proposed L6472 West Link	0+300	100mm AC
Proposed Loughbeg Roundabout	N/A	300mm AC
Proposed L6517 Loughbeg Road (South)	0+000 to 0+270	300mm AC
Proposed L6517 Loughbeg Road (North)	0+000 to 0+050	300mm AC
Proposed Ringaskiddy Roundabout	N/A	450mm
Proposed L2545 West Ringaskiddy Village Link Road	0+000 to 0+070	450mm
Proposed L2545 East Haulbowline Island Link Road	0+000 to 0+090	450mm

Conflicts with Storm Sewers

In addition to the conflicts with watermains there are a number of conflicts with the existing storm sewer network. These conflicts are listed below in **Table 17.10**.

Table 17.10: Conflicts with Storm Sewers

Location	Chainage	Existing Apparatus
R610 Rochestown Road Underbridge	0+550	Storm
M28 Mainline	0+600 to 2+050	Storm
M28 Mainline	1+230	Stream Diversion
L2470 Maryborough Road Overbridge	1+570	Storm
Proposed Carr's Hill Interchange	Various Locations	Storm
Proposed Barnahely Roundabout	N/A	Storm
Proposed R613 South Link Road	0+000 to 0+150	Storm
Proposed R613 North Link Road	0+000 to 0+140	Storm

Conflicts with Foul Sewers

There are a number of conflicts with the existing foul sewer network. These conflicts are listed below in **Table 17.11**.

Table 17.11: Conflicts with Foul Sewers

Location	Chainage	Existing Apparatus
M28 Mainline	1+250	FS 300mm
M28 Mainline	1+440 to 1+460	FS 300mm
Proposed Shanbally Southbound Diverge	0+075	FS 225 mm
M28 Mainline	9+230	FS 225 mm
Proposed Shanbally Northbound Merge	0+050	FS 225 mm
Proposed L6474 Shanbally to Raffeen Link Road	0+190	FS 225 mm
Mainline – Barnahely to Loughbeg	10+950	FS 225mm
Mainline – Barnahely to Loughbeg	10+950 to 11+150	FS (IDA)

There are no utility or water services currently traversing the Service Area site. Along the L2545 and adjacent to the boundary of the Port of Cork lands, there is a watermain and a network of storm water and foul sewer pipes which are to the west of the development site.

17.4.1.4 Telecommunications

Eir

Consultation with Eir has been ongoing during the design phase of the project. A number of conflicts have been identified between the proposed M28 Road Project and existing Eir infrastructure. These conflicts occur at the following locations: Rochestown Road/Clarke’s Hill, Rochestown Link Road Underbridge (S2, BR0201, Drawings in **Volume 5**), Maryborough Overbridge (S3, BR0303 & BR0304 Drawings in Volume 5), R611 at Shannonpark Interchange, L6472 (Raffeen Road), Shanbally Interchange, Barnahely Roundabout, R613 and Ringaskiddy Roundabout. These conflicts are listed in **Table 17.12**.

Table 17.12: Conflicts with Eir

Location	Chainage	Existing Apparatus
M28 Mainline Southbound between Bloomfield and Rochestown Interchange	0+000 to 0+350	UG Fibre Optic Cable
Rochestown Southbound Diverge Slip Road	0+260 to 0+380	UG Fibre Optic Cable
Proposed Rochestown Link Road Underbridge (East-West)	0+550	UG Fibre Optic Cable and Copper Cable
Maryborough Underbridge	0+000 to 0+255	UG Fibre Optic Cable and Copper Cable
Proposed Carr’s Hill Interchange	Various Locations	O/H wiring
Proposed Shannonpark Central Link Road	0+000 to 0+140	U/G Fibre Optic Cable and Copper Cable

Location	Chainage	Existing Apparatus
Proposed Shannonpark North Roundabout	N/A	U/G Fibre Optic Cable and Copper Cable
Proposed Shannonpark South Roundabout	N/A	U/G Fibre Optic Cable and Copper Cable
Proposed R611 Carrigaline Link Road	0+150 to 0+300	U/G Fibre Optic Cable and Copper Cable
Proposed Shannonpark North Link Road	0+000 to 0+145	U/G Fibre Optic Cable and Copper Cable
Proposed Shannonpark South Link Road	0+000 to 0+225	U/G Copper Cable
Proposed Ballinrea Access Road	0+000 to 0+100	U/G Copper Cable
Proposed Shanbally Road Underbridge	9+230	U/G Copper Cable
Proposed Barnahely Roundabout	N/A	U/G Copper Cable
Proposed R613 North Link Road	0+000 to 0+220	U/G Copper Cable
Proposed R613 South Link Road	0+000 to 0+150	U/G Copper Cable
Proposed L6472 West Link Road	0+000 to 0+151	U/G Copper Cable
Proposed Janssen Access Road	0+045 to 0+060	U/G Copper Cable
Mainline – Barnahely to Loughbeg	11+930	U/G Copper Cable
Proposed Loughbeg Roundabout	N/A	U/G Copper Cable
Proposed L6517 Loughbeg Road North	0+000 to 0+050	U/G Copper Cable
Proposed L6517 Loughbeg Road South	0+000 to 0+280	U/G Copper Cable
Access Road 12	0+000 to 0+046	U/G Copper Cable
Proposed Ringaskiddy Roundabout	N/A	U/G Fibre Optic and Copper Cable
Proposed L2545 West Ringaskiddy Village Link Road	0+000 to 0+067	U/G Fibre Optic and Copper Cable
Proposed L2545 East Haulbowline Island Link Road	0+000 to 0+095	U/G Fibre Optic and Copper Cable

Vodafone/3/Meteor/UPC

3, Meteor and Virgin Media (formerly UPC) do not have any services within the vicinity of the proposed M28 Road Project.

There is an existing Vodafone mast (Site ID: CK146) located in the vicinity of the proposed Carr's Hill Interchange. A meeting has been held with Vodafone on site and the mast can be retained at its current location.

enet

There are a number of conflicts with the enet network and they are listed below in **Table 17.13**.

Table 17.13: Conflicts with enet

Location	Chainage	Existing Apparatus
Proposed IDA Link Road	0+075 to 0+300	enet Duct
Proposed R613 South Link Road	0+000 to 0+150	enet Duct
Proposed R613 North Link Road	0+100 to 0+140	enet Duct
Mainline – Barnahely to Loughbeg	10+970	enet Duct
Loughbeg Roundabout	N/A	enet Duct
Proposed L6517 Loughbeg Road (North)	0+000 to 0+050	enet Duct
Proposed L6517 Loughbeg Road (South)	0+000 to 0+275	enet Duct
Proposed Ringaskiddy Roundabout	N/A	enet Duct
Proposed L2545 West Ringaskiddy Link Road	0+000 to 0+070	enet Duct
Proposed L2545 East Haulbowline Link Road	0+000 to 0+090	enet Duct

17.4.2 Waste

General construction and demolition waste arisings including, but not limited to, wood, packaging, metals, plastics, bricks, blocks, canteen waste, hazardous wastes (e.g. oils, paints, and adhesives), arisings generated from site clearance works and residual wastes will be generated during the construction phase. While it is difficult at this stage to predict exact volume of the wastes arisings expected to be generated by the proposed M28 Road Project, estimates of the waste materials and volumes likely to be generated and the potential for significant environmental impacts are outlined below.

17.4.2.1 Excavated Material

Given the nature of the project and the construction methodologies outlined in **Chapter 3: Description of the Proposed Road Development**, it is anticipated that the main waste types generated during the construction phase of the project will be excavation materials generated from the cut works required along the main line of the route as well as clay, soil, stone and concrete from other excavations such as in structural foundations at bridges, slip roads and side roads, etc. Material will also be excavated for the creation of a wetland as outlined in the Habitat and Species Management Plan (Appendix 12B).

The construction of the road element of the project will require approximately 2.2 million m³ of fill material. It is anticipated that approximately 1.15 million m³ of reusable material will be excavated from the cuttings for the project. This means that there will be a deficit of material required to construct the project, including the project requirements for higher quality rock material of the order of 1.05 million m³. It is anticipated that where possible the majority of this material will be obtained from Raffeen Quarry under its current planning permission.

The advantages of utilising the reserves in Raffeen Quarry maximises the sustainable reuse of materials available close to the site, minimising carbon footprint, noise and air emissions associated with transport and adheres to the principles outlined in the Southern Region Waste Management Plan 2015-2021 in terms of making better use of resources.

The preferred option for the management of waste arisings is re-use on site, where possible. However there is an element of cut material that is likely to be considered unsuitable for reuse on-site. It is estimated that 200,500m³ of surplus cut material will need to be managed off-site. The preferred off-site option for this material is recovery at a licenced soil recovery site where it is envisaged that this material will be used as backfill¹ material. At the Service Area site there will be approximately 22,300m³ of excavated material that will need to be managed appropriately through disposal or recovery, as appropriate. At this stage, it is assumed that this material will not be suitable for reuse on site and will require transport off site.

It is estimated that approximately 21,000m³ of excavated material from Raffeen Quarry will be generated in order to create the wetland habitat area. At this stage, it is assumed that this material will be suitable for re-use on site as fill material.

By reusing excavation material from the proposed cuttings where possible and sourcing the remaining material from the quarry situated adjacent to the proposed M28 Road Project the impact from excavations is considered to be slight negative in the absence of mitigation.

17.4.2.2 Demolished Structures

Mixed demolition wastes will arise on the project mainly from the demolition of the existing overbridge and properties at Maryborough Hill and Shanbally, the demolition of the existing deck cantilever and parapet on the western side of the existing bridge at Carr's Hill and the removal of the existing merge at Maryborough Hill.

It is estimated that approximately 210m³ of waste materials will be generated from the demolition of the identified properties. Approximately 120m³ of waste materials will be generated from the demolition of the property at Maryborough Hill and approximately 90m³ will be generated from the demolition of the property at Shanbally. Concrete / masonry will account for the vast majority of this demolition waste. It is envisaged that the majority of this material, an estimated 175m³, will comprise concrete and stone and will be suitable for reuse on site as fill materials. The remaining material, approximately 35m³, will require transfer off site to an authorised waste facility for appropriate waste treatment.

The existing overbridge at Maryborough Hill has a deck area of 465m². The decking has a general depth of 1.2m it is therefore considered that approximately 558m³ of reinforced concrete will need to be demolished. In addition there are two piers that need demolishing which include approximately 275m³ of reinforced concrete. It is envisaged that the majority of this material will be suitable for reuse on site.

17.4.2.3 Pile Arisings

Soil arisings will be generated from pile bores to be used for bridge structures. The majority of the excavated material will be soils, but the pile arising will also contain sands, gravels and cementitious materials. It is expected that bored pile arisings will total approximately 2,520 m³.

¹ Backfilling is a recovery operation where suitable waste is used for reclamation purposes in excavated areas or for engineering purposes in landscaping and where the waste is a substitute for non-waste materials. Commission Decision of 18 November 2011 (2011/753/EU) establishing rules and calculation methods for verifying compliance with the targets set in Article 11(2) of Directive 2008/98/EC of the European Parliament and of the Council (notified under document C(2011) 8165)

The pile arisings may be contaminated with cementitious materials and without management of this waste stream on site, the impact significance of pile arising, in the absence of mitigation, is therefore assessed as moderate negative due to the potential to cause pollution of the surrounding environment.

17.4.2.4 Surplus Materials

Surplus material and wastage may occur where material supply exceeds material demand. Surplus materials and wastes could arise from existing site materials such as concrete from demolition or excavations of materials from earthworks which cannot be reused in the proposed development. Materials brought to site but not fully utilised for their original purpose or stored incorrectly can result in waste such as damaged products, off cuts and surplus products.

For surplus materials and waste, the potential environmental effects would be primarily associated with production, movement and transport, processing and recovery or disposal of the wastes at appropriately authorised waste facilities with a waste licence, waste permit or certificate of registration. On this basis, in the absence of mitigation, the impact significance of surplus material is assessed as slight.

17.4.2.5 Made Ground

The disturbance or storage of the made ground during construction can lead to the release of chemical pollutants into the air, ground or water through remobilisation of contaminants. No significant land contamination has been identified within the study area following desk based and site investigation. In the event that previously unidentified contamination is found during the construction works, the proposed management/mitigation measures in **Section 17.5.2** below will be applied.

Due to the potential of remobilised unidentified contaminants to pollute the environment, the impact significance of made ground is therefore assessed as moderate, in the absence of mitigation.

17.4.2.6 Preliminary/Design Stage Phase

As outlined in **Section 11.4.1**, isolated and minor amounts of waste material were generated during the preliminary ground investigations in BH1012A and TP2001. This material will be removed off-site to a suitably licensed facility.

There is potential for the fill material to contain contaminated material. In 1995 the area adjacent to the site of the proposed Service Area was a green field site. Between 2000 and 2005 this area was used as a car storage area. The fill material comprises limestone quarry fill underlain by sand with occasional shells (Port of Cork Strategic development Study – Glover Site Investigations Ltd 2006). In 2011, the Marine Energy Centre analysed soil samples (at a location immediately south of Paddy's Point) for metals, hydrocarbons and polycyclic aromatic hydrocarbons (PAHs) contaminants' and reported that the contaminant levels were low. The fill material will be subject to appropriate chemical testing to assess its contamination potential and determine an appropriate waste treatment route if this is necessary. The treatment or removal of potentially contaminated material will have a positive impact on soils by removing a potential source of contamination. This is considered a moderately positive impact of permanent duration.

17.4.2.7 Waste Management

Where waste materials are not stored, handled, transported or managed (recovered or disposed of) correctly and where sewage associated with temporary site toilets is not managed appropriately (i.e. collected, treated and disposed or recovered appropriately), there is the potential for the pollution of air, soil, groundwater and/or surface waters to occur. For example, such instances could occur by locating unmanaged stockpiles of wastes too close to watercourses or drainage networks.

On this basis, in absence of management or mitigation without waste management plans on site, the impact of waste management is assessed as moderate due to the potential to cause pollution of the surrounding environment.

17.4.2.8 Operation Phase

The main potential impacts from the operational phase of the proposed road project will arise from road and constructed wetland/attenuation pond maintenance, landscape maintenance, maintenance of the Service Area, and waste generated through littering. The predicted characteristics of the impacts resulting from the operation of the road are considered negligible due to the expected low volume of maintenance wastes. It is envisaged that a high proportion of this material will be green, biodegradable wastes in nature.

17.5 MITIGATION MEASURES

17.5.1 Utilities

17.5.1.1 Gas Distribution

Each of these conflicts has been discussed in detail with relevant personnel in Gas Networks Ireland. The following was agreed.

Ch. 0+550m Bloomfield

There is a distribution line along the R610 Rochestown Road, at the location where the M28 mainline crosses this regional road. A potential conflict could occur with the construction of the bridge abutments for the proposed Rochestown Link Road Underbridge. The design drawings of the bridge structure will be forwarded to Gas Networks Ireland for comment.

Ch. 1+560m Maryborough Overbridge

There is a distribution line along the bridge where Maryborough Hill goes over the M28. This bridge shall be replaced and widened as part of this scheme. It is proposed to initially demolish a section of the bridge (which will not impact on the current operation and alignment of the distribution line) and then permanently divert the distribution line into this new section of the Maryborough Overbridge.

Ch. 9+230 M28 mainline

The new M28 mainline carriageway crosses a 125mm 4bar distribution main. The proposed road project will be in 2m of fill at this point. A protection slab, to GNI specification, will be placed over the pipe and isolation valves inserted on either side of road.

Ch. 0+080 to 0+180 - L6472 Shanbally to Raffeen Link Road and Ch. 0+000 to 0+080 L2492 Shanbally Southern Link Road

It is proposed to provide additional protection when these sections of the L6472 and L2492 are getting upgraded by slabbing over the distribution pipe.

Ch. 0+080 to 0+270 IDA Link Road

The new IDA Link Road crosses a 180mm 4bar distribution line. It is proposed to divert this line outside the boundary of the earthworks associated with this project.

Ch. 0+000 to 0+150 - Proposed R613 South Link Road, Ch. 0+000 to 0+150 - Proposed R613 North Link Road, Barnahely Roundabout

The proposed Barnahely Roundabout and associated link roads runs over a 180mm 4bar distribution line. In order to protect the existing pipe slabbing must be provided over the distribution pipe and/or divert them outside the road.

Ch. 0+000 to 0+040 L6517 Loughbeg Road (North), Ch. 0+000 to 0+280 L6517 Loughbeg Road (South), Proposed Loughbeg Roundabout

The new Loughbeg Roundabout and associated link roads crosses a 180mm PE-80 4bar distribution line. A diversion solution has been agreed with GNI.

Ch. 0+000 to 0+070 L2545 West Ringaskiddy Village Link Road, Ch. 0+000 to 0+090 L2545 East Haulbowline Island Link Road, Proposed Ringaskiddy Roundabout

The new Ringaskiddy Roundabout and associated link roads crosses a 180mm PE-80 4bar distribution line. A 3m offset would be the scale of the diversion.

It is likely that resolution of these conflicts will be undertaken as part of the *'main construction'* contract rather than as an *'advance works'* contract.

17.5.1.2 Gas Transmission

Each of these conflicts has been discussed in detail with relevant personnel in Gas Networks Ireland. The following was agreed.

Mainline Ch. 8+000m

This conflict occurs adjacent to the L6472 local road immediately east of Raffeen Quarry. The vertical alignment at this location is on an embankment. A suitable slab can be placed over the transmission main at its current location. This slab would be placed under the supervision of GNI and to their specification. This may be done as part of an *'advance works'* contract.

Ch. 1+480m L6472 Shanbally to Raffeen Link Road

This conflict occurs on the proposed L6472 Shanbally to Raffeen Link Road. The vertical alignment at this location is at-grade. A suitable slab will be placed over the transmission main at its current location. This slab shall be placed under the supervision of GNI and to their specification.

Mainline Ch. 11+020m

Vertical alignment at this location is in fill. A suitable slab will be placed over the transmission main at its current location. This slab will be placed under the supervision of GNI and to their specification. This may be done as part of an *'advance works'* contract.

Mainline Ch. 11+610m to 11+720

Vertical alignment at this location is at-grade. A suitable slab can be placed over the transmission main at its current location. This slab would be placed under the supervision of GNI and to their specification. This may be done as part of an *'advance works'* contract.

Loughbeg Roundabout

The 300mm transmission main runs across the southern part of the proposed Loughbeg Roundabout. The roundabout will be slightly in cut where this conflict occurs. A permanent diversion of the main will be required and a design solution has been prepared by Gas Networks Ireland. Any land necessary to accommodate this diversion will be included in the land acquisition for the project. The diversion may be completed as part of an *'advance works'* contract.

L6517 Loughbeg Road

A 100mm transmission supply runs adjacent to the existing L6517 Loughbeg Road, on the eastern side. It is proposed that this local road, to the south of the Loughbeg Roundabout, will be upgraded as part of the proposed M28 Road Project. The existing vertical alignment is poor and is to be lowered to facilitate a compliant northbound approach to the Loughbeg Roundabout. A significant cut will be required (in excess of 5m in places) in order to provide the necessary vertical gradient. A couple of design solutions were considered by GNI as follows:-

1. Permanently divert the main over a distance of 250m approx. Any land necessary to accommodate this diversion would be included in the land acquisition for the project and the diversion would be completed as part of an *'advance works'* contract.

2. Construct a retaining wall on the eastern side of the upgraded L6517 Loughbeg Road. This could enable the existing 100mm transmission main to remain in-situ. This retaining wall would be up to 5m in height in places and extend for approximately 200m. This retaining wall could be constructed as part of the main contract or as part of an '*advance works*' contract. Any land necessary to accommodate the construction of this retaining wall will be included in the land acquisition for the project.

Having considered the 2 options, GNI have a preference for Option 1.

17.5.1.3 Electricity Supply

Conflicts with the LV & MV (excl. 38kV) network have been discussed with ESB Networks and resolution will be by way of diversion. Details of conflict resolution will be discussed in greater detail during the detailed design phase of the project. It is likely that resolution of these conflicts will be undertaken as part of the '*main construction*' contract rather than as an '*advance works*' contract.

There are six conflict points with 38kV overhead and underground cables. Each conflict location was discussed as an individual identity with ESB network. For the existing underground locations the general resolution is to provide a new underground ducting and cable route through the proposed road project and divert the existing cable. For the overhead lines, the general resolution is to provide new sets of poles outside of the proposed road project to carry the existing overhead wires. At Loughbeg Roundabout it is proposed to provide a new underground ducting and cable route through the new scheme and retire a section of the existing overhead line. A new 12m mast will need to be constructed at the point where the new UG cable transfers back to an OH line. It is likely that resolution of these 38kV conflicts will be undertaken as part of the '*main construction*' contract rather than as an '*advance works*' contract. Any land necessary to accommodate these diversions will be included in the land acquisition for the project.

The proposed M28 Road Project passes in close proximity to the existing Raffeen 220kV substation, which is the major transmission node for the South Cork area east of Cork Harbour. This is why it has such a quantity of circuits connected to the substation, at both 110 and 220kV.

The technical term for the intrusion of a planned development with an existing circuit is a '*conflict*'. This simply means something that needs to be resolved, rather than in its more literal sense. ESB Networks have a dedicated Conflicts Section, and the resolution of '*conflicts*' is an established practice, occurring by way of localised re-design or diversion.

'Conflicts' with the existing 110kV network have been discussed with EirGrid and ESBI. The 110 kV network comprises overhead conductors, supported on double-wood polesets along straights, with lattice steel structures (known as "angle towers") where the circuit alignment changes direction. Where resolution is necessary it is proposed by way of localised diversion, or by raising existing polesets/towers in immediate proximity to the planned road corridor in order to ensure adequate separation distance between the overhead conductors and ground levels (known as "vertical clearance"). At some locations the existing towers can be retained at their current location and the proposed road will pass underneath. Where the vertical clearance is available no works will be required. Where the line will need to be raised between towers to ensure adequate vertical clearance, 'ice loading' will be taken into account - [this is, a greater sag on the conductors due to the additional weight of ice].

The following ‘conflict’ resolution has been agreed with EirGrid and ESBI, and is proposed in this application: (note: poleset no.’s refer to numbers on internal EirGrid/ESBI mapping system):

- Approximate Chainage 4,450m – a new poleset no. 16A, with a maximum height of 23m, is to be erected at the land take line. Poleset no. 17 is to be relocated to the land take line, approximately 38m from its current location, and increased by approximately 2-3m in height from its current height of 21m. Poleset no. 16 is to remain unchanged;
- Approximate Chainage 7,230m – poleset no. 7 to be increased by approximately 2-3m in height from its current height of 16m;
- Approximate Chainage 8,080m – poleset no. 34 to be increased by approximately 1-2m height from its current height of 17m;
- Approximate Chainage 8,500m – due to the excessive span length across the planned road corridor re-locate poleset no. 3 by 15m to the land take line and poleset no. 4 by 48m to the land take line. Maximum height of both polesets will be 23 metres.
- Single phase line at Shanbally – A local diversion consisting of 2 towers and 1, possibly 2, polesets is required on this line 110kV line at Shanbally; refer to drawing No DG0210 in Volume 5;
- Double Circuit line at Shanbally – Diversion required, refer to drawing No DG0210 in Volume 5; and
- Approximate Chainage 11,550m to 11,700m – 1 no. existing tower to be replaced at its current location and increased in height by approximately 2-3m from its existing height of 13m.

The 220 kV network comprises overhead conductors, supported entirely on lattice steel towers. ‘Conflicts’ with the 220kV network have been discussed with EirGrid and ESBI. This concerns both an underground cable circuit, and an overhead line circuit. Conflicts with the underground 220kV cable circuit occur at mainline Ch. 7,950m and at Ringaskiddy Roundabout. It is proposed that a suitable protection slab will be placed over the circuit at its current location – there is no alteration to the existing alignment of this circuit. This slab will be placed under the supervision of ESBI and to their specification.

The only ‘conflict’ with the existing overhead 220kV circuit occurs at mainline Ch. 7+900m. The existing towers can be retained at their current location and the proposed scheme will pass underneath.

Subject to the statutory approval process, and consistent with established practice in this regard, the detailed design of these identified ‘conflict’ resolutions will be developed subject to statutory approval for the proposed development. Any detailed design will not diverge to any material extent from that which is proposed above, and which is proposed in this application, and which is subject to environmental assessment under EIA.

It is envisaged that resolution of 110kV and 220kV conflicts will be undertaken as part of an ‘advance works’ contract, where necessary.

17.5.1.4 Water, Surface Water and Foul Sewers

Of particular concern are conflicts with the 1,200mm Cork Harbour & City Watermain which occur at 3 locations, i.e., south of the Carr's Hill Interchange, Shanbally Interchange and the R613 at Barnahely. During the course of the design work completed to date a number of trial holes were excavated at Shanbally and Barnahely to establish the line and level of the main. These trial holes were excavated under the supervision of Cork County Council personnel and to their requirements. Each of these conflicts has been discussed in detail with relevant personnel in Cork Harbour & City Water Supply Scheme.

M28 Mainline at Carr's Hill Interchange

The M28 mainline will cross the 1200mm watermain on an embankment that is up to 10m high in places. The watermain will remain in-situ and the mainline will be 'bridged' over it for the length of the conflict. The structure will be of sufficient size to facilitate access to the main for routine maintenance or in the event of an emergency. Further discussions will be required during the detailed design phase of the project to decide if this structure will be constructed as part of an 'advance works' contract or as part of the 'main construction' contract.

M28 Southbound Diverge at Shanbally Interchange

The M28 southbound diverge at Shanbally Interchange will cross the 1,200mm watermain at-grade. A trial hole was excavated at this location to establish the line and level of the watermain. Following receipt of the trial hole logs, further discussions took place with those responsible for the Cork Harbour & City Water Supply Scheme. It has been agreed to leave the watermain in-situ and use a reinforced concrete slab to protect it at the point of conflict. This slab will be constructed as part of an 'advance works' contract or as part of the 'main construction' contract.

M28 Mainline at Shanbally Interchange

The M28 mainline at Shanbally Interchange will cross the 1,200mm watermain on an embankment that is approx. 3m high. The watermain is to remain in-situ and a reinforced concrete slab will be used to protect the watermain at the point of conflict. Further discussions will be required during the detailed design phase of the project to decide if this slab will be constructed as part of an 'advance works' contract or as part of the 'main construction' contract.

M28 Northbound Merge at Shanbally Interchange

The M28 northbound merge at Shanbally Interchange will cross the 1,200mm watermain on an embankment that is approx. 3m high. A trial hole was recently excavated at this location to establish the line and level of the watermain. Following receipt of the trial hole logs, further discussions are now required with those responsible for the Cork Harbour & City Water Supply Scheme to establish if a diversion may be required. The preference would be to leave the watermain in-situ and use a reinforced concrete slab to protect it at the point of conflict. This slab will be constructed as part of an 'advance works' contract or as part of the 'main construction' contract.

Proposed L6472 West Link Road at Barnahely

The proposed L6472 West Link is a realigned section of the existing L6472 Local Road to the south of the proposed Barnahely Roundabout. This link road crosses over the 1200mm Harbour & City watermain more or less at-grade. The main is located in agricultural land just inside the western roadside boundary of the R613. The 1,200mm watermain will remain in-situ and further consultation will be required during detailed design to agree how it is to be protected during the '*main construction*' contract.

Barnahely Roundabout at Barnahely

The Barnahely Roundabout will be constructed primarily within the agricultural lands located to the west of the R613. The roundabout will be located on top of the 1,200mm Harbour & City watermain and the circulatory carriageway will cross the watermain at 2 locations. The roundabout will be slightly in fill and the watermain will remain in-situ. Further consultation will be required during the detailed design phase to agree how it is to be protected during the '*main construction*' contract.

Proposed R613 North Link Road at Barnahely

The 1,200mm watermain is located inside the western roadside boundary of the R613 from the Barnahely Roundabout as far as the existing N28 at the western Port entrance. A 100m approx. length of the proposed R613 upgrade will be in conflict with the 1,200mm watermain. The R613 will be slightly in cut over the length of the conflict and the watermain will remain in-situ. Further consultation will be required during the detailed design phase to agree how it will be protected during the '*main construction*' contract.

Proposed Janssen Biologics Access Spur at Barnahely

The proposed Janssen Biologics Access Spur is an improved section of the existing access road to Janssen Biologics from the R613 just north of the proposed Barnahely Roundabout. The current access road crosses over the 1,200mm Harbour & City watermain close to its junction with the R613.

The 1,200mm watermain will remain in-situ and further consultation will be required during detailed design to agree how it will be protected during the '*main construction*' contract.

In addition to the conflicts with the 1,200mm Cork Harbour & City watermain, there are a number of conflicts with other watermain of various sizes. Resolution measures in relation to these conflicts have been discussed with Irish Water/Cork County Council. Further discussion will take place during the detailed design stage of the Contract.

Storm and Foul Sewer Network

There are a number of conflicts with the existing storm and foul sewer network. Resolution measures in relation to these conflicts will be discussed with Irish Water/Cork County Council during the detailed design stage of the Contract.

17.5.1.5 Telecommunications

When dealing with conflict resolution the cost will largely depend on the type of cable in question. Copper and fibre optic are the two main cable types with the latter being the more expensive. When crossing Eir services with a new road embankment, the current standard procedure will be followed, where an access chambers will be introduced on either side of the road. Consultation with Eir personnel will continue during the detailed design and construction phases.

All diversion, etc., for Eircom infrastructure will be included in the '*main construction*' contract. Any works carried out during the construction phase will be in compliance with Eircom standards and specifications. Ducting will be provided by Eir with the Contractor laying the ducting and undertaking associated ancillary works such as access chambers, etc.

There is an existing Vodafone mast (Site ID: CK146) located in the vicinity of the proposed Carr's Hill Interchange. A meeting has been held with Vodafone on site and the mast can be retained at its current location.

It is proposed to provide enet diversion ducting at the conflict locations on the proposed IDA Link Road and the R613.

Between Barnahely and Loughbeg the mainline is on an embankment at the location of the point of conflict with the enet ducting. The preference would be to leave the enet cables in place and use a reinforced concrete slab to protect it at the point of conflict. This slab will be constructed as part of an '*advance works*' contract or as part of the '*main construction*' contract.

The proposed L6517 Loughbeg Road will be in cut over the length of the conflict which will require a diversion of the existing enet ducting. The proposal for this permanent diversion will be finalised during the detailed design stage in consultation with enet.

17.5.2 Waste Mitigation Measures

Waste management will incorporate the principles of the Waste Hierarchy.

The management of all waste associated with the proposed M28 Road Project must take cognisance of the policies and actions outlined in the Southern Region Waste Management Plan 2015-2021. The Southern Region Waste Management Plan 2015-2021 sets a target of 70% reuse, recycling and materials recovery rate of non-soil and stone construction and demolition waste to be achieved by 2020. It will be a requirement of the Contractor to achieve this target during the construction stage.

17.5.2.1 Excavated Materials

Excavated material on site will be managed in accordance with the requirements of the Waste Management Act 1996 (as amended). The Contractor will be required to ensure that the facility, to which any excavated material which requires transfer off-site is brought to, is authorised in accordance with Waste Management Legislation. The Contractor, as holder of the waste, will be responsible under the Waste Management Act for ensuring that all statutory obligations are met. All waste activities at the site will be subject to best practice waste handling procedures (i.e. source segregation, storage and collection). Material will be re-used where possible.

At a minimum the Contractor shall ensure:-

- That any waste haulier employed by the contractor is authorised by a waste collection permit or is exempt from such a requirement;
- That any disposal or recovery facility to be used for the management of waste arising from the proposed M28 Road Project is subject to the appropriate authorisation under the Waste Management Acts or any other legislation, as necessary;
- That the terms and conditions of the authorisations of the waste haulier and next destination waste facility allow for acceptance of the waste in question (i.e. allow the facility to accept the specific EWC/LoW type of waste); and
- That these authorisations will not expire within the lifetime of the project.

Waste arisings generated will only be treated at facilities that are authorised to carry out the appropriate waste treatment activity for the specific waste stream. Records of all waste movements and associated documentation shall be maintained on-site such as waste facility authorisation number, expiry date, class of waste accepted, weighbridge records, treatment methods for each waste stream accepted i.e., backfilling, crushing, screening, etc.

Where waste generated is not reusable on-site, samples will be taken and waste acceptance criteria (WAC) laboratory testing will be undertaken on the excavated material. The results of the laboratory testing will be used to determine whether a waste is inert, non-hazardous or hazardous. Authorised waste facilities will be contacted to establish what their waste acceptance criteria requirements are. The excavated waste from the proposed development will be compared with the facility waste acceptance criteria, and sent to the waste facilities which are authorised to accept the material in line with the waste acceptance criteria. Where practical, the closest suitable facilities to the proposed development will be selected to reduce impacts associated with vehicle movement such as air emissions.

Stockpile areas will be identified and created by the Contractor for the storage of materials in line with the requirements as set out in **Section 3.12.1.4** and **17.5.2.4**.

The Contractor(s) will store, handle and transport demolition material arising in accordance with best practice guidelines and the Waste Management Act 1996 (as amended). As per **Section 17.5.2.1** above, waste arisings that cannot be re-used will be sampled, tested and disposed of, to a licensed waste management facility.

17.5.2.2 Pile Arisings

The Contractor(s) will be required to store, handle and transport pile arising in accordance with best practice guidelines and the Waste Management Act 1996 (as amended). As per **Section 17.5.2.1** above, waste arisings will be sampled, tested and treated at an appropriately authorised waste management facility.

17.5.2.3 Surplus Materials

Any surplus material generated by excavation of cuttings, which cannot be used for landscaping or as fill for road embankments, as per **Section 17.5.2.1** above, will be sampled, tested and treated at an appropriately authorised waste management facility.

17.5.2.4 Made Ground Management

If contaminated soils are encountered during the construction works, further investigation, testing and risk assessments will be undertaken to determine whether the soils require further treatment to make them suitable for reuse or whether they need to be disposed of to a licensed waste facility off-site.

Materials identified (as per **Section 17.5.2.1**) as not being suitable for reuse or treatment (disposal or recovery) due to contamination levels will require to be suitably managed at a licensed hazardous waste facility. Any such material will be managed in accordance with waste management legislation and the following:-

- Topsoil stripping over large areas in advance of main excavation works will not be permitted. It will be restricted to the minimum required for efficient earthworks operations;
- Soil excavation will be targeted and stockpiling will be managed in order to avoid cross-contamination of reusable soil with contaminated material;
- All hazardous waste material generated will be covered at all times by appropriate material such as high density polyethylene (HDPE) to minimise possible washout or wind blow of contamination;
- All stockpiles will be clearly labelled to enable proper and safe handling, transportation and storage of the waste;
- Runoff from a stockpile will be collected via a shallow toe drain, located outside the silt fence, which will discharge to a settlement pond which will be designed to have a retention time of at least 5 hours. Sediment build-up will be removed at regular intervals by manual means only and will be disposed of treated at an appropriately authorised waste management facility;
- Stockpiles of non-granular materials shall be limited in height to not more than 2m;
- Each construction area will be top-soiled as soon as practicable thus limiting both the amount and the length of time for which materials have to be stockpiled;
- Topsoil stripping in proximity to any watercourses will be undertaken in dry weather conditions and all stockpiles will be located greater than 100m from a watercourse. Stockpiles within 200m of a watercourse will be covered;
- If unidentified asbestos is encountered during construction, specialist asbestos contractors will be engaged to arrange appropriate removal, testing and disposal to a licensed facility;
- Waste Records will be maintained in relation to all waste materials generated on site including; stockpile locations, volumes, origins and additional testing undertaken; and
- A C1 form will be required for the movement of any hazardous waste within Ireland and Trans-frontier shipment (TFS) of waste is subject to control procedures under EU and National Legislation and guidance, such as Waste Management Transfrontier Shipment of Waste Regulations, 2007.

17.5.2.5 Waste Management

The off-site handling of waste generated is subject to the required statutory authorisations under the Waste Management Acts and the principles of the Waste Hierarchy.

An Outline Project Construction and Demolition Waste Management Plan (refer to **Appendix 17A**) has been prepared for the provision of waste management for the construction phase of the proposed M28 Road Project having regard to the following guidance documents on the management and minimisation of construction and demolition waste:-

- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (Department of Environment Heritage and Local Government, July 2006);
- CIRIA document 133 Waste Minimisation in Construction; and
- TII guidelines including Guidelines for the Management of Waste from National Roads Construction Projects (Revision 1, 12 November 2014).

Quantities of materials presented in this chapter and the C&D Waste Management Plan are indicative and are subject to detailed design and should not be taken as definitive. The C&D Waste Management Plan will be updated by the Contractor at the detailed design stage and at the implementation phase of the mitigation.

The Plan shall be incorporated into the Environmental Operating Plan (EOP). The project C&D Waste Management Plan shall include:-

- Analysis of the waste arising/material surpluses;
- Specific waste management objectives for the project;
- Methods proposed for the prevention, reuse and recycling of wastes;
- Material handling procedures; and
- Proposals for education and a workforce and plan dissemination programme.

In order to prevent and minimize the generation of wastes, the Contractor will be required to ensure that raw materials are ordered so that the timing of the delivery, the quantity delivered and the storage is not conducive to the creation of unnecessary waste. The Contractor will be required to develop a programme in conjunction with the material suppliers showing the estimated delivery dates and quantities for each specific material associated with each element of work. By following a "just in time" approach this improves cash flow, utilises storage space better, reduces potential losses to theft and accidental damage as well as making the site safer.

The location of the site compound has been selected to ensure that sewage from temporary toilets can be discharged to the existing sewerage network in the area.

17.5.3 Operational Phase

Management of wastes arising during the operational phase of the proposed road project will be the responsibility of the council or contractors appointed by the maintaining Authority to provide waste management and landscaping services.

Waste silts and Hydrocarbons/oily waters collecting onsite drainage interceptors will be managed by specialists contractors as and when required. The specialist contractors will be appointed to clean out the interceptors and ensure the waste material is sent to a suitable licensed facility for treatment and/or disposal.

The Service Area will provide adequate waste storage facilities to allow the appropriate segregation and storage of waste.

Any waste water generated at the Service Area from toilets etc. will discharge to the existing wastewater sewer located within the existing L-2545 adjacent to the site.

17.6 RESIDUAL IMPACTS

The residual impacts associated with waste mitigation measure are considered to be slight to imperceptible.

The residual impacts associated with utilities mitigation measure are considered to be negligible.

17.7 MONITORING

The Contractor shall develop a record keeping system that will ensure that details of all arisings, movement and treatment of C&D waste are recorded. All materials being transferred from the site, whether for recycling, recovery or disposal, shall be subject to a documented tracking system which can be verified and validated (refer to the Outline C&D Waste Management Plan in **Appendix 17A** for further details).

Further investigations into services will be necessary during the detailed design stage. Methods such as ground penetrating radar (GPR) and silt trenching in the verge areas can be used to verify or locate existing services.