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MULTIDISCIPLINARY CONSULTING ENGINEERS

FACILITIES FOR CHARGING ELECTRIC VEHICLES

Adamstown Station District Centre - Block ACD

PROJECT NO. Q067

August 2023

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NOTICE

OCSC Job No.: Q067	Project Code	Originator Code	Zone Code	Level Code	File Type	Role Type	Number Series	Status/ Suitability Code	Revision
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EV Charging

PROJECT NO. Q067

INDEX **PAGE NO.**

INTRODUCTION.....5

PROPOSED DEVELOPMENT.....6

EV CHARGING SYSTEM OVERVIEW.....8

CONCLUSION.....4

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INTRODUCTION

The intention of this report is to identify the Electric Vehicle Charging associated with the design, construction, ongoing management and maintenance of the proposed Adamstown Station District Centre Block ACD development located at Adamstown, Co. Dublin.

The Electric Vehicle (EV) charging aspects of the proposed development will comply with IS 10101:2020. As part of the development's efforts to futureproof the EV charging system in Adamstown, the infrastructure will be designed to allow for 100% EV charging while 10% of the operating system will be installed on site. This equates to 23No. chargers 9No. Spaces will be within Block A car park and 14No. will be on street between block ACD.

The proposed Zaptech Vehicle Charging system will comprise of demountable chargers, flat cabling, connections, pedestals along with associated containment and bracketry where required. The system works on a phase balancing basis thus it will have a much lower MIC required for the charging of vehicles.

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PROPOSED DEVELOPMENT

The proposed development comprises the construction of Block ACD of the Adamstown Station District Centre. The proposed development consists of 436 No. apartments over 3 residential blocks.

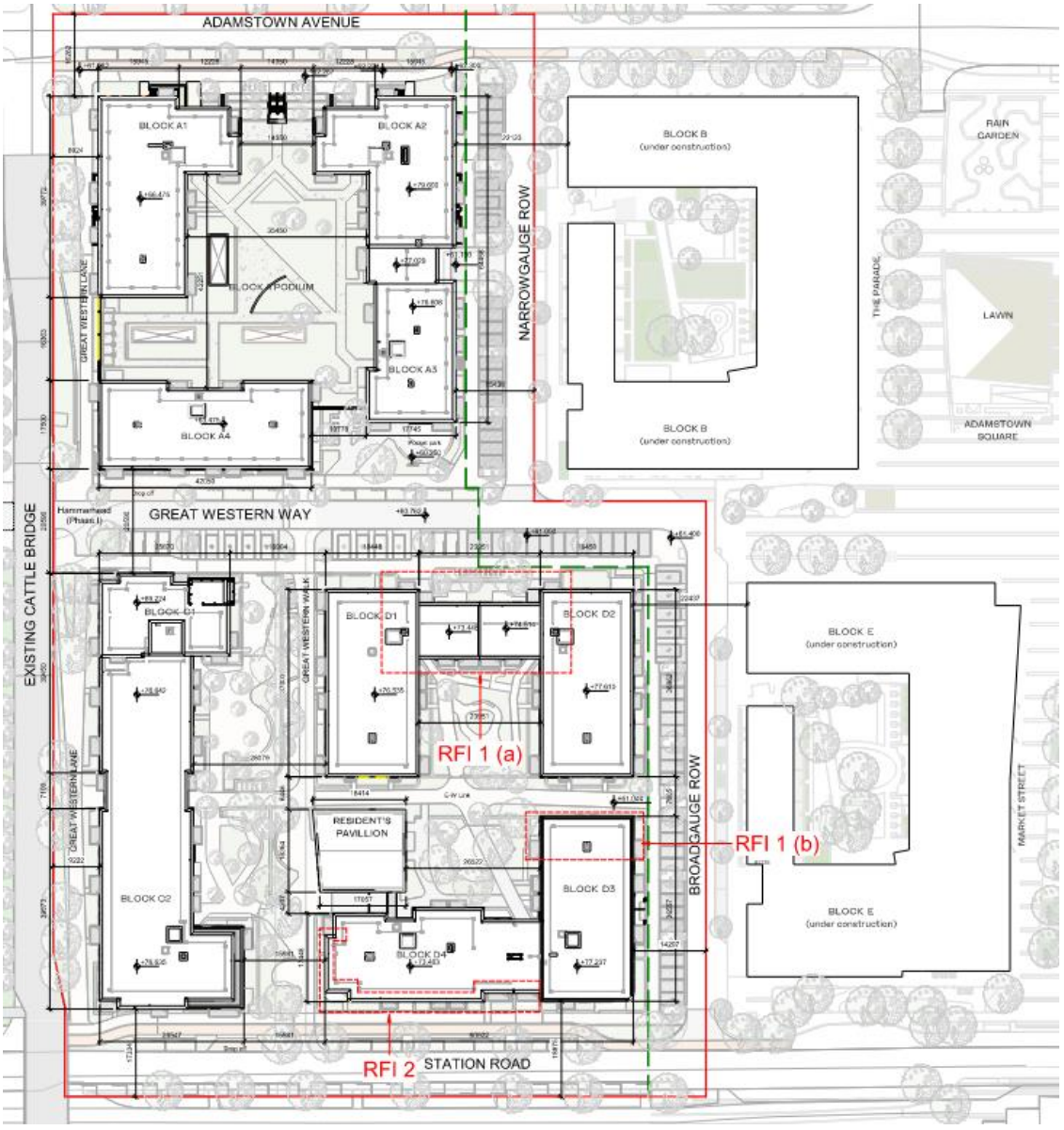

Figure 1 – Proposed Site Plan

The Block ACD development will be provided with a total of 223 No car parking spaces. The table below shows the car parking split throughout the ACD site.

CARPARKING (*)					
	Podium	On street	MSCP	Subtotal	Ratio
Block A	62	10	-	**72**	50.0%
Block C	-	2	61	**63**	50.8%
Block D	26	43	15	**84**	50.0%
Visitor	-	4	-	**4**	1.8%
Total	88	59	76	**223**	**51.1%**

(*) Refer to Atkins drawings and report. Disabled carpark 5% / Electric vehicle 10%, included in totals

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Figure 2 – Proposed Parking Plan

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EV CHARGING SYSTEM OVERVIEW

(INTERNAL)

The proposed Zaptec Pro EV chargers allow for the connection of up to 30 No. EV chargers to a single 63A supply. This allows for maximum flexibility in this modular system whilst minimising MIC through the use of the dynamic load and phase balancing system.

The chargers are connected via Woertz 3 phase flat cabling which can be clipped direct to the car park soffit/wall or installed on the suspended cable containment installed within the car park. Proprietary tap offs will be installed at each charging point within the car park. Future EV chargers can be connected to the existing charger circuits up to a maximum of 30 No. chargers per circuit.

The Zaptec Pro chargers communicate with each other and the Zaptec portal via a Wi-Fi connection. The portal is a free tool and can be used for maintenance reports, billing and status information
Each charging point can be wall, column or kiosk mounted. Where ground column, or kiosk mounts are selected, it is recommended that crash barriers are installed.

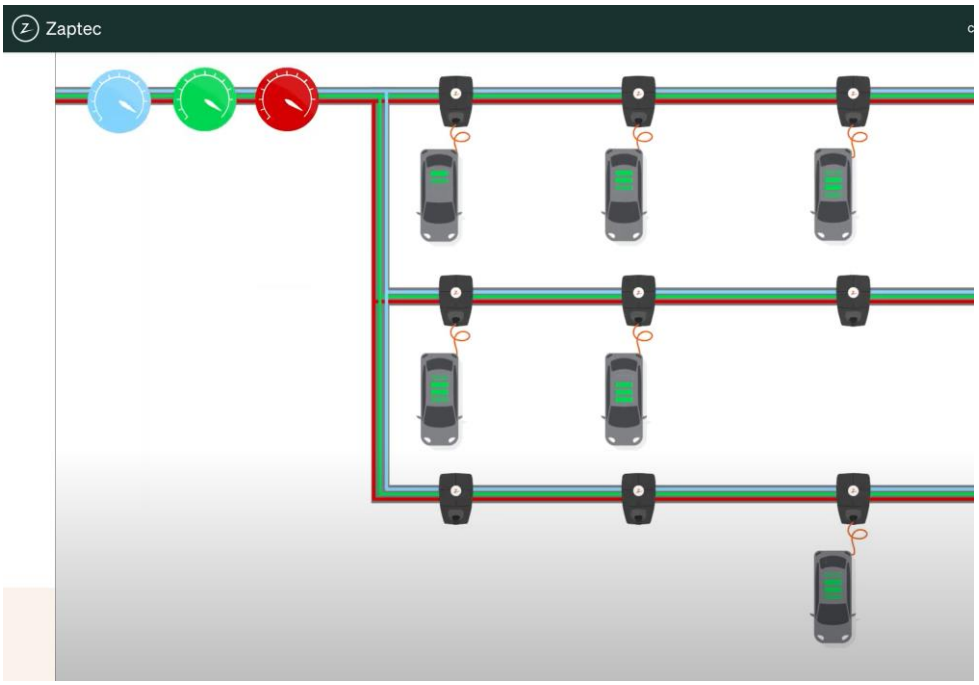

Figure 3 – Zaptec Pro Modular EV Connections

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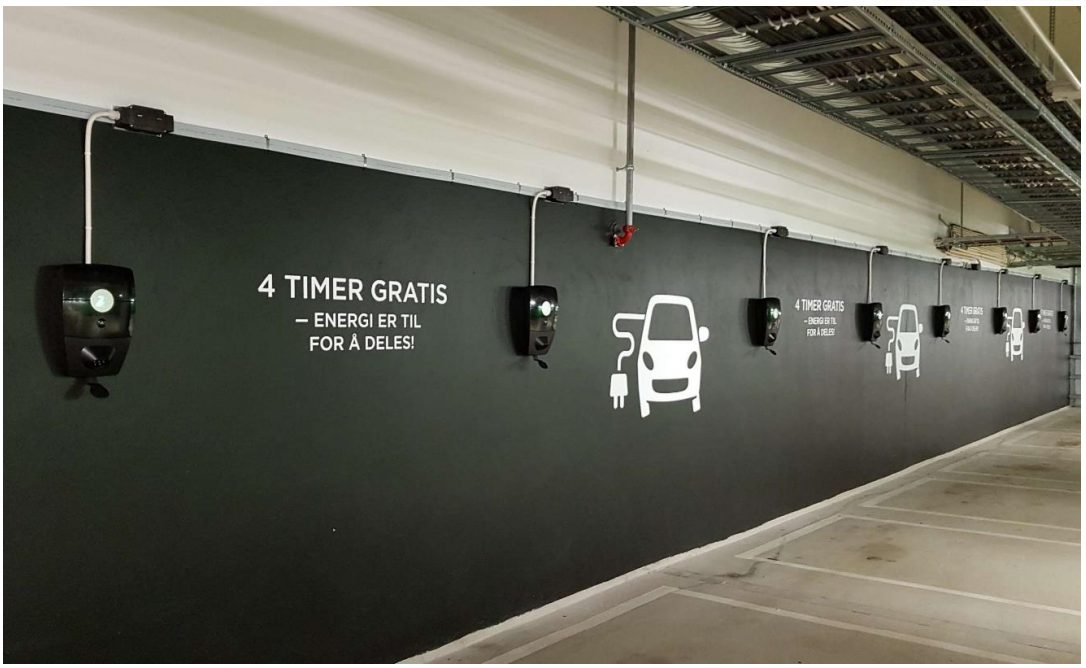

Figure 4 – Zaptec Pro Wall Mount Installation

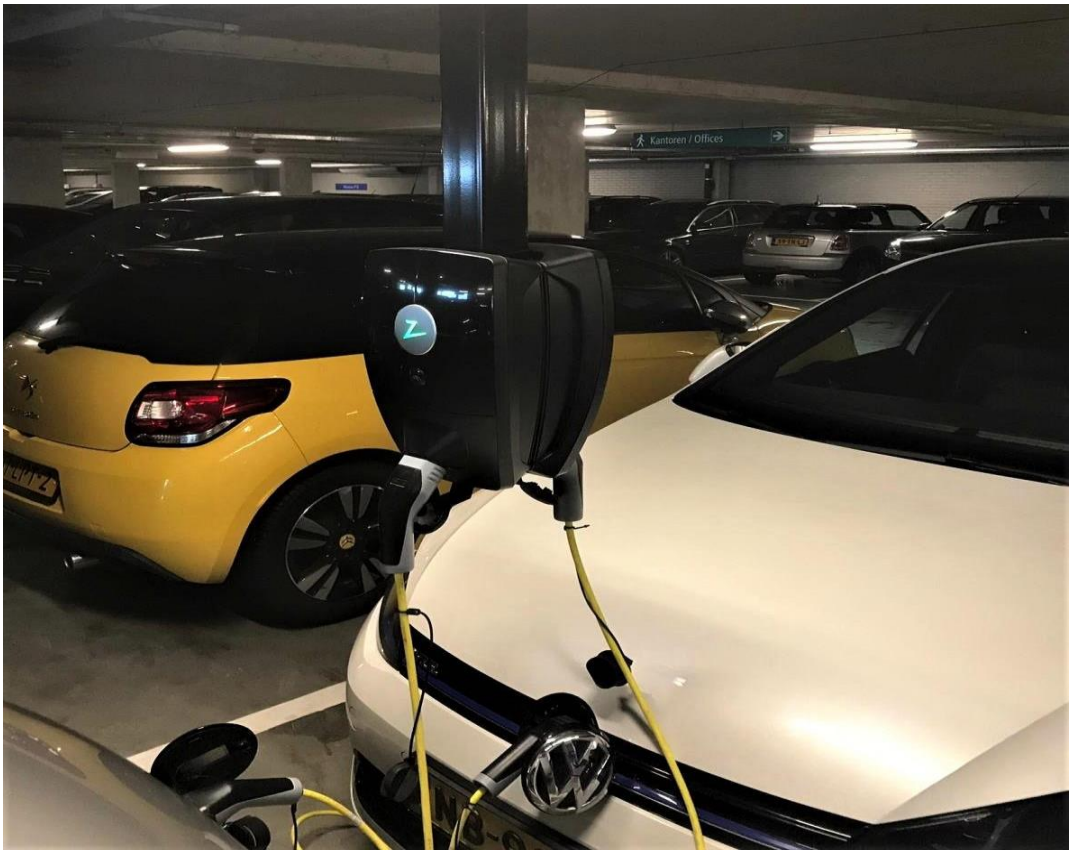

Figure 5 – Zaptec Pro Soffit Column Mount Installation

–30°C to +50°C

Technical Specifications - ZAPTEC Pro

ZAPTEC Pro is an alternating current wall or column-mounted charging station in accordance with IEC 61851-1, EVSE mode 3.

Dimensions and weight
H: 392 mm W: 258 mm D: 112 mm
Weight: approx. 5 kg (including backplate)

Installation circuit
Max. 63A serial fuse on installation circuit for charging stations.

Backplate connection box
Cable cross section 2.5–10 mm^2
Cable diameter 10–20mm^2

Installation network, Voltages
TN, IT and TT
230VAC ±10%
400VAC ±10%

Max. current and charging output
7.36kW* at 32A/1-phase
22kW* at 32A/3-phase (applicable to TN networks only)
5W at standby

Fuses
Built-in 3 x 40A fuses type C

Charging point
EC 62196-2 Type 2 Female with integrated self-closing cover

Earth fault protection
Built-in type B RCD
Calibration and a self-test are carried out before the start of every charging cycle. RCD can be automatically reset by disconnecting from the charging connector.

Integrated Power Meter
MID tested and calibrated (EN.50470).

Theft protection
The front cover of the ZAPTEC Pro can only be opened using a special tool. The charging cable can be locked permanently to the charging station.

Load balancing
Together with other ZAPTEC Pro charging stations, available power in the installation will be distributed automatically between the devices and phases.

Phase balancing
The charging station will dynamically select any single phase or 3-phase in a system with other ZAPTEC Pro charging stations, depending on the available power.

Communications interface and cloud connection/network
4G LTE-M1 (subscription required)
Wi-Fi 2.4 GHz, IEEE 802.11 b/g/n (channels 1-11)
Powerline (PLC) – HomePlug Green PHY®, 10 Mbit/s

Identification and configuration
Bluetooth Low Energy (BLE 4.1)
RFID/NFC reader – Mifare Classic, Type A
PLC for vehicle interface for future services as defined by ISO15118

Standards and approvals
CE compliance in accordance with the Radio Equipment Directive 2014/53/EU and ROHS Directive 2011/65/EU, and compliance with IEC 61851-1 (TUV SÜD) and IEC 61851-22

Temperature range
–30°C to +50°C

Degree of protection
IP54, indoor and outdoor use
IK10 impact protection
UL94 5VB flammability rating
UV resistant

Electrical protection
Protection class II (4kV AC and 6kV impulse, insulation)
Overvoltage category III (4kV)

Integration services
Third-party integration alternatives (API, Webhooks)
OCPP 1.6J
Message subscription

*32A is available but may be restricted by the condition of the vehicle's battery and temperature increases at the charging station.

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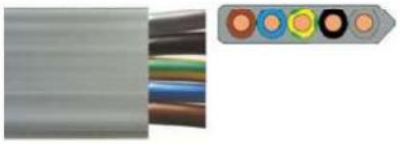
woertz

Flat cable 5G16 HF grey

Article number: 49606

Images



Description

Flat cable Woertz 5x16mm2 FR/LS0H light grey 3LNPE

Features

Eldas number:	**113299680**
Base Unit:	**meter**
availability:	**Available from stock**
EAN Code:	**7611718241529**
group:	**170000**
Packing:	**1**
country of origin:	**CH**
Customs number:	**8544.6092**
Construction:	**5x16 mm²**
Dimensions WxH:	**48,5x11,3 mm**
Cable type:	**halogen free flat cable**
International designation:	**N1Z1Z1H2-K**
Reaction to fire classification:	**B2ca s1 d0 a1**
Fire behavior:	**Cable with non-critical behavior**
Cross section:	**16 mm²**
Copper conductor:	**bare copper, stranded flexible CL5 EN60228**
Conductor resistance:	**1.21 ohm**
cores insulation:	**Flame retardant polyolefin**
Cores colors:	**gray, black, green / yellow, blue, brown**
Sheat insulation:	**Flame retardant polyolefin**
Sheath color:	**light grey**
Min bending radius:	**6xH**
Operating Temperature:	**-25 bis +90 °C**
Installation temperature min.:	**5 °C**
Halogen free acc. to:	**IEC/EN60754-1/2**
Minimal smoke emision acc. to:	**IEC/EN 60034-2**
Fire load:	**2.63 kWh/m**
Flame retardant to:	**IEC/EN60332-1-2**
Low fire propagation acc. To:	**IEC/EN 60332-3-24**
Copper weight:	**768 g**
Weight:	**1300 g**

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The below is information in regard to the Zatpec Pro portal and load management system.

ZAPTEC Portal is the administrator tool for the ZAPTEC charging system (Cloud solution), which is a virtual installation of the electrical installation. All installation owners today have free "basic" functionality in the ZAPTEC Portal, which is included in the purchase of ZAPTEC charging stations. This includes:

- Authentication (User Control via App / RFID / NFC)
- Real-time monitoring of the charging system (including automatic email notification if a charge fault and/or loss of communication occurs)
- Charge History
- Charge consumption report (Per charging station, user and at RFID / NFC level)
- Administration of user control and access

All dynamic load and phase balancing is performed by ZAPTEC Portal, which reflects a digital installation from the electrical installation of the ZAPTEC charging system. Where the ZAPTEC charging stations themselves distribute all available power based on which charging stations are being used. The difference between a traditional charging station and a ZAPTEC charging station is the unique load and phase balancing functions that allows the charging system to utilize all phase combinations when charging on both TN 400V and IT 230V power grids.

ZAPTEC APM (Automatic Power Management) is an option-based add-on service that enables the ZAPTEC charging system to dynamically regulate up / down available energy, based on the actual power consumption of the building mass per phase. This prevents one / more un-even loads as a result of high consumption in the building mass, while at the same time electric charging is carried.

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(EXTERNAL)

To comply with the table below EV chargers will be supplied and installed across the site as part of the proposed development.

CARPARKING (*)					
	Podium	On street	MSCP	Subtotal	Ratio
Block A	62	10	-	**72**	50.0%
Block C	-	2	61	**63**	50.8%
Block D	26	43	15	**84**	50.0%
Visitor	-	4	-	**4**	1.8%
Total	88	59	76	**223**	**51.1%**

(*) Refer to Atkins drawings and report. Disabled carpark 5% / Electric vehicle 10%, included in totals

The final installation of which manufacturer is yet to be decided but the space numbers and positions will remain the same.

The EV chargers are designed to charge 2no. vehicles from the one EVC unit. It's proposed to install a twin unit 2 x 7.5 kW in locations shown on the attached drawings.

The units can be fitted with a smart meter in order to meter the electricity used for charging in accordance with calibration law.

Figure 6 Proposed options for twin EVC unit.

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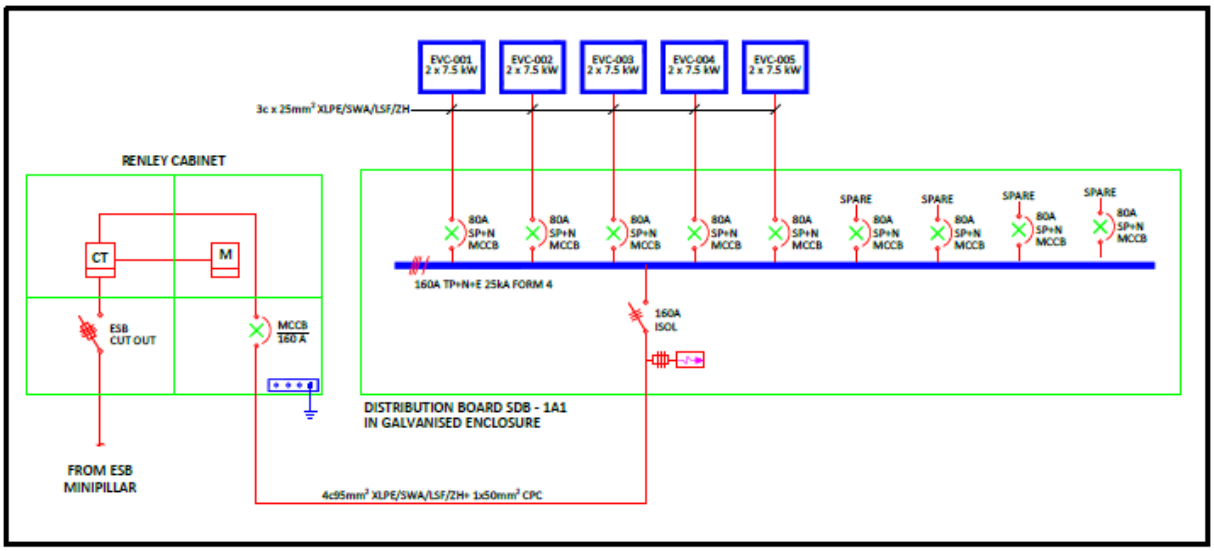
Power supply for the EV charges will be taken from an ESB mini pillar. The ESB mini pillar will in turn feed a Renley cabinet that will house ESB cut-out fuses, ESB meter and the customer breaker. The Renley cab will in turn feed sub-distribution board SDB which in turn can power up to 9no. double EV charging units (18 parking spaces). Refer below for in depth schematic:



TYPICAL ELV SCHEMATIC
SCALE N.T.S.

To optimise energy usage and vehicle charging time a Dynamic Load Balancing (DLB) system can be installed within each group of EVCs (units fed from same ESB supply).

Dynamic Load Balancing allows for the optimising of available power to EV charging infrastructure. All EV's receive maximum power until the number of charging sessions reaches the available power supply. As additional EV's are added the available power is equally distributed amongst all EV's within the group. As charging sessions end spare capacity is redistributed among remaining EV's.

The final installation may use different software for DLB aiming to achieve the same result.
All wiring will be designed in accordance with ETCI National Rules for Electrical Installations ET101:2008.

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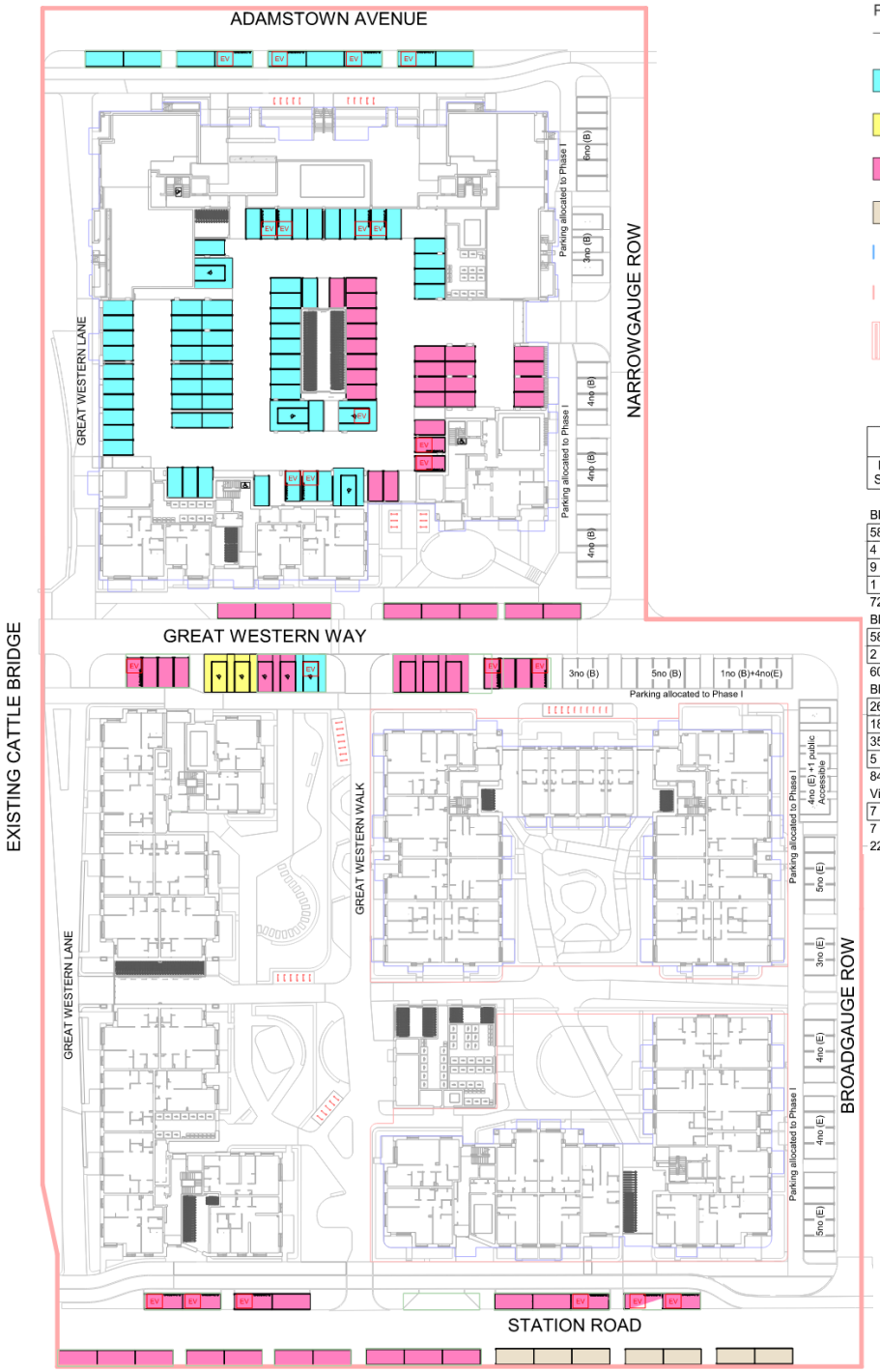
CONCLUSION

By using Zaptech Car charging approach within Block ACD it will allow for charging of 10% of the of EV chargers for the ACD development. We will be using a more energy efficient cutting edge technology. As the design team for the Adamstown Station District Centre -Block ACD development located at Adamstown, Co. Dublin we believe this is the best solution for both efficiency of extension of the system and usability of the system.



Parking Legend:

- Block A Parking
- Block C Parking
- Block D Parking
- Visitor Parking
- Public Sheffield Bike Parking
- Private Sheffield Bike Parking
- Private Double Stack Bike Parking
- EV Charging Space

PROPOSED CAR PARKING ALLOCATION by block

No. of Spaces	Parking Description	Assigned to	Location	Charging Station: Y/N
Block A				
58	Standard parking	Block A	Block A podium	
4	Universal Access	Block A	Block A podium	
9	On street parking	Block A	On street	
1	Universal Access	Block A	On street	Yes
72				
Block C				
58	Standard parking	Block C	Block F MSCP	
2	Universal Access	Block C	On street	Yes
60				
Block D				
26	Standard parking	Block D	Block A podium	
18	Standard parking	Block D	Block F MSCP	No
35	On street parking	Block D	On street	
5	Universal Access	Block D	On street	Yes
84				
Visitor				
7	On street parking	Visitor	On street	No
7				
223				