ATKINS

Member of the SNC-Lavalin Group

Edinburgh Tram

Vibration and Ground-borne Noise Review

City of Edinburgh Council

11th March 2021

Notice

This document and its contents have been prepared and are intended solely as information for City of Edinburgh Council and use in relation to the noise and vibration that is expected to arise from completion of Phase 1a of the Edinburgh Trams system from York Place to Newhaven.

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Contents

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Executive Summary

This document sets out the scheme requirements for Edinburgh Trams York Place to Newhaven (ETYN) in relation to Noise & Vibration (N&V) and the Contractor proposals to achieve satisfactory compliance.

The Contractor, Sacyr Farrans Neopul (SFN), is responsible for the design and construction of these works and hence for ensuring that the works comply with the requirements set out in the Infrastructure and Systems Contract.

Atkins is acting as client technical advisor on behalf of the City of Edinburgh Council.

The Contractor for the vibration study is the SFN consortium, although the lead vibration consultant is employed by the Sener group.

This review considers the Contractor's final design submission including the "Positive Impact of Elastic Track Solutions as Effective Counter-measures against Ground-borne Noise Generated by Edinburgh Trams" Addendum.

1. Introduction

The Edinburgh Trams York Place to Newhaven (ETYN) project extents include 4.6km of twin track taking the existing route from York Place, in the city, to Newhaven.

ETYN has to comply with the Edinburgh Tram Act Lines One and Two - Noise and Vibration Policy of March 2006. This Policy statement sets out the approach to be adopted in mitigating noise from the operation of Edinburgh Tram. The Contractor is responsible for demonstrating that their design will meet the requirements set out in the Contract.

It should be noted that compliance with the Code of Construction Practice is required to control construction activities.

To date, the Contractor has produced trackwork reports ETYN-SEF-XXX-12-RP-H-0010, covering the Ocean Terminal to Newhaven section of the route, and ETYN-SEF-XXX-12-RP-H-0012, covering the York Place to Ocean Terminal section. Both reports include Appendix 2 “Vibration” which outlines the Contractor’s approach to addressing the project Noise & Vibration requirements. The Contractor’s design has been reviewed, and through design challenge and queries raised, the Contractor has presented a robust response and solution meeting the scheme requirements. Atkins are satisfied with the approach taken.

The issue of ground-borne noise has been raised and Atkins found that, notwithstanding the lack of a specific ground-borne noise criterion, the Contractor had in fact sought to control ground-noise within residential properties to no more than 40 dB(A) and had applied appropriate criteria for other types of sensitive buildings.

The Noise and Vibration Policy that applies to the scheme specifies no limit although it is understood that an informal ground-borne noise limit of 40 dB(A) for residential properties was applied to the existing Edinburgh tramway. This is the same value that is given in Table 1.1.1 in paragraph 1.1.2 of the report “Edinburgh Tram Network - Newhaven Road to Haymarket - Ground borne noise and vibration study” prepared by D2S International (dated 4 August 2009) for the existing section of the tramway. The report states that the criteria are based on “Rupert Taylor report “Noise and Vibration Stage 2 Report Sensitive Receptor Study” dated 19th March 2007”.

The criteria adopted by D2S are shown in the extract below:

Building	Level/Metric [dB $L_{Amax,S}$]
Residential buildings	40
Offices	40
Hotels	40
Theatres	25
Large Auditoria/Concert Halls	25
Studios	30
Churches	35
Courts, lecture theatres	35
Small Auditoria/halls	35
Schools Colleges	40
Hospitals, laboratories	40
Libraries	40

It should be noted that UKTram Ltd states in Section 5.3 of its document Best Practice Guidance Design and Specification for Minimum Noise and Vibration Impact, issued on 30 July 2007, that:

"*Although it is not always possible to measure ground-borne noise in the presence of airborne sound either from the tram or from general ambient background noise, unless specialised techniques are applied, it is recommended that the system shall be specified not to generate ground-borne noise within neighbouring properties, where it is measurable, greater than 40 dB(A) on a meter with "Slow" response for any individual tram pass-by event*."

Through review, Atkins found that the Contractor had followed a standard method of assessing vibration (US Federal Transit Administration's "Transit Noise and Vibration Impact Assessment Manual" of September 2018) and had proposed different types of track at various locations to mitigate the effects of vibration.

The supplier of trackwork solutions for vibration mitigation is Pandrol. Pandrol is a very well-established company in the field of track components and will be able to supply the vibration attenuation measures that the Contractor has specified. The Contractors trackwork design utilises various Pandrol products to apply a standard, soft and floating track solution to address where mitigation measures are required. In general terms, a standard track solution is applied where no additional mitigation is required, soft track where moderate and floating where a more significant solution is required.

The Pandrol offering, specifically their Q track system, is one which has been utilised the world over, including recently on the extension to the tram system in Blackpool. Appendix 5 includes the Pandrol Q Track embedded Rail datasheet.

2. Legal and Scheme Requirements

This section provides legal and scheme requirements in relation to vibration and ground-borne noise only. Airborne noise is not considered in this document.

2.1. Edinburgh Tram Lines One & Two – Noise and Vibration Policy

The Noise & Vibration Policy states that trackforms adjacent to sensitive receptor buildings will be designed using best practicable means to keep within the guideline levels of Vibration Dose Value (VDV) given in BS6472, 1992 (Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting) below which the probability of adverse comments is low:

- Day (0700-2300 hours) 0.2 $m/s^{1.75}$; and
- Night (2300-0700 hours) 0.13 $m/s^{1.75}$.

In addition, the Noise & Vibration Policy includes that the design of the tramway will include a Peak Particle Velocity (PPV) level no higher than 2mm/s at 2m from the rails.

The vibration peak particle velocity (PPV) should be compared with the recommendations given in British Standard BS 7385-2:1993 Evaluation and measurement for vibration in buildings — Part 2: Guide to damage levels from groundborne vibration which in section 7.4.1 states that:

"Some data …. suggests that the probability of damage tends towards zero at 12.5 mm/s peak component particle velocity."

Examination of the scheme drawings has shown that no residence is closer to the rails than 2m. Accordingly, the 2mm/s at 2m from the rails level specified in the Vibration Policy is considered to be conservative.

It should be noted that the Contractor is following BS 6472-1 2008 as the current version of this standard.

The following table shows the VDV limits that are specified in BS6472:1992.

Table 7 — Vibration dose values ($m/s^{1.75}$) above which various degrees of adverse comment may be expected in residential buildings

Place	Low probability of adverse comment	Adverse comment possible	Adverse comment probable
Residential buildings 16 h day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8 h night	0.13	0.26	0.51

The limits specified in BS6472-1 2008 are given in the following table:

Table 1 **Vibration dose value ranges which might result in various probabilities of adverse comment within residential buildings**

Place and time	Low probability of adverse comment $m \cdot s^{-1.75}$ 1)	Adverse comment possible $m \cdot s^{-1.75}$	Adverse comment probable $m \cdot s^{-1.75}$ 2)
Residential buildings 16 h day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8 h night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

With regard to the Edinburgh scheme, it may be seen from the above BS6472 extract that the Edinburgh Tram Vibration Policy daytime VDV guideline level of 0.2 $m/s^{1.75}$ corresponds with the lower daytime value for "Low probability of adverse comment" given above.

In instances where the VDV limit would otherwise be exceeded, the Contractor has adopted a specific trackform designed to reduce the impact of tram operations by attenuating vibration at source. The Contractor's application of attenuation and the prediction calculations are considered to satisfy the above requirements.

2.2. Ground Borne Noise

As is commonly the case for tramways, the Noise & Vibration Policy does not state limits for ground borne noise (GBN). The lack of a specific GBN criterion is not judged to be a problem in a scheme such as this, where there are no tunnels, as the airborne noise contribution would typically dominate the ground-borne noise.

Notwithstanding the above, Ground Borne Noise is not being ignored by the project with specific reference being included within the Edinburgh Tram Design Manual which states the following:

Noise

5.101

- *The construction of the trackslab must be designed to reduce ground- borne vibration or noise, particularly to adjacent properties.*
- *An acceptable balance must be reached between technical requirements for noise reduction and aesthetic requirements within sensitive areas of townscape, particularly in the WHS and conservation areas.*

The criteria specified for comparable project specifications are included in Appendix 1. The Policy's PPV vibration criterion and the noise criteria are all consistent with the relevant Standards and generally similar to the criteria specified for other tramway and railway projects.

The Contractor has confirmed that they are considering ground-borne noise within their design. This may be seen from inspection of the addendum which gives predicted ground-borne noise levels for the various properties, none of which, when rounded to the nearest decibel, exceeds 40 dB(A) at a residence.

Appendix 3, trackwork layouts, highlights the trackwork solution applied along the route. This includes correlation to the sensitive buildings noted in Appendix 4.

Appendix 4 includes the levels post analysis and mitigation measures included.

3. Review of Predictions

The Contractor has provided the output of their vibration analysis which supports the overall trackworks design. The Contractor has demonstrated that they have followed established process utilising acceptable limits.

3.1. Analysis Method

The Contractor has adopted a well-established Detailed Vibration Analysis method laid down in the US Federal Transit Administration (FTA) document Transit Noise and Vibration Impact Assessment Manual. The FTA document states that:

"The Detailed Vibration Analysis procedure is a comprehensive assessment method that produces the most accurate estimates of vibration impact for a proposed project and is often accomplished during the engineering phase of a project when there are sufficient data identifying potential adverse vibration impacts from the project."

As applied to the project, the procedure was essentially as follows:

- The vibration acceleration of a tram passing by on the existing tram track was measured for both ordinary track and for the case of a turnout (i.e. a set of points). This gave a source value for the vibration.
- At sample locations along the route of the proposed extension, a vibration source (a compactor) was used to induce vibration in the ground. At various distances from this vibration source, measurements were taken of the vibration acceleration to establish what attenuation occurred over distance.
- To obtain data on the transfer of vibration energy within the different parts of a property structure, the Contractor took measurements at various locations within 129 Leith Walk of vibration acceleration arising from an external source. It is understood that this property was chosen due to previous complaints raised from the residents and concerns that the trams passing by their property would give rise to high levels of vibration within it. The FTA method gives values for different types of building structure/foundations etc. The Contractor has applied a more sensible value based on the assessment of worst-case Edinburgh data rather than recommendations from the guidance.

The Contractors utilisation of this property, 129 Leith Walk, as a baseline is reasonable and can be seen as a worst-case example to support route wide analysis. Having regard to the fact that indicative values are available for internal noise transmission (e.g. such sources as the Association of Noise Consultants' "Red Book") and the general difficulty of undertaking any form of acoustic measurement in an occupied residence the 129 Leith Walk measurements are considered adequate. Additionally, the other site measurements, vibration acceleration and vibration source, complete by the Contractor are considered reasonable. The Contractor has completed the surveys in the best practicable terms establishing readings in a busy/built up city centre environment.

Two points should be noted. Firstly, for any given frequency (*f*) of vibration wave, the vibration acceleration (*a*) and the vibration velocity (*v*) are related by the following relationship:

$$a = 2\pi f v$$

A given vibration wave can be transformed into a combination of sine waves at various frequencies and it is necessary to do this to convert vibration acceleration into vibration velocity.

The second point to note is that there are essentially three paths by which vibration energy can be transferred through the earth (surface waves, two types of body waves) and each path has a different way of attenuating vibration energy over distance. Transmission of this energy at each material interface is attenuated in different ways and, in the case of transmission within a building, while the energy is attenuated at certain frequencies, at others it may be amplified because of resonance. Therefore, empirical methods are commonly used in industry to predict vibration levels and, wherever possible, these methods use data on the transmission of vibration energy that have been acquired on site.

3.2. Prediction Analysis

From inspection of sample material provided, it is clear that the Contractor has examined internal ground-borne noise levels in general accordance with the FTA prediction method. A similar prediction method is given in Chapter 13 of "Railway Noise and Vibration Mechanisms, Modelling and Means of Control" by Professor David Thompson (this chapter is stated to have been written by Chris Jones). This method treats the vibrating floor of a room as a noise radiator and makes certain assumptions of the room dimensions and absorption to obtain, by standard acoustic methods, an equation that relates the vibration velocity of the floor to the reverberant sound pressure level within the room. The latest guidance from the Association of Noise Consultants is that, although founded in theory, this equation gives conservative results. It is understood that the FTA prediction method gives values closer to those found in practice. A point was raised regarding the utilisation of vibration velocity formula required by the FTA. Rather than the normal value of 20 the Contractor utilised 30. This was queried and found to be conservative provided the tram speed was assumed to be at least 20 km/h under all circumstances. In this case, it was confirmed that the assumed speed of the tram is always 20 km/h or above which is also conservative. Additionally, The VDV calculations consider the maximum tram frequency of 16 trams per hour per direction which provide a conservative output assuming the maximum service despite actually being lower throughout the timetabled service.

Review of the Contractor analysis output concludes that the documented scheme limit requirements, those in the Noise and Vibration Policy, have been addressed sufficiently. Appendix 4 includes the analysis output demonstrating the Contractors adherence to the values set out.

Appendix 4 includes the route analysis output addressing the Vibration Dose Values required by the Noise and Vibration Policy.

Atkins review of the Contractor's work on vibration has shown that the Contractor is mindful of the criteria laid down in the Noise and Vibration Policy of 2006. As stated above, this Policy gives no criterion for ground-borne noise. However, Atkins has found that, notwithstanding the absence of a specific ground-borne noise criterion, the Contractor has taken steps to control ground-borne noise. Were only the vibration criteria considered, the attenuation measures specified would exceed those required to meet the vibration criteria alone.

Examination of sample predictions provided by the Contractor showed that ground-borne noise predictions had been made for the residential properties using the FTA method.

Although the Contractor has worked with an awareness of ground-borne noise as an issue and has not explicitly stated a criterion, in an Addendum document provided by the Contractor ("Positive Impact of Elastic Track Solutions as Effective Counter-measures against Ground-borne Noise Generated by Edinburgh Trams"), it is clear that within residential properties none of the predicted tram ground-borne noise levels exceeds 40 dB(A).

As may be seen from tables 1 and 2 in Appendix 1, not every tram or railway scheme has adopted a criterion for ground-borne noise and inspection of the values adopted by those schemes that have adopted a criterion shows that 40 dB(A) is a reasonable value. Atkins understands that this is in line with the operational sections of Edinburgh Tram, where no complaints have been received to date in relation to GBN. We therefore consider this to be a robust and proportionate limit for residential properties.

In relation to 129 Leith Walk, the analysis carried out is robust and the solution being constructed fully complies with the specification.

3.2.1. Specific analysis

3.2.1.1. Trackbounds with varying trackform

Atkins questioned the use of two different track forms, on either track bound, at various points along the route. The Contractor has provided demonstration that their analysis considered the specific Contract requirements, namely those within the Noise and Vibration Policy, and the established limits for ground borne noise. In these instances, the Contractor analysis demonstrated that the values are within acceptable limits. It is also expected that, despite no quantifiable example being available as acceptable limits had been maintained, the trench where the trackform is sited will provide attenuation benefits and support overall mitigation.

An example of this is at Edinburgh Playhouse where floating slab track had been specified for the nearer track and soft pad track for the further track. The Contractor responded with a comprehensive explanation of the calculation method, which followed the basic principle of vibrating floors acting as noise radiators. In this case, every horizontal surface in the main hall of the Playhouse has been considered as a sound radiator, appropriate adjustments being made for radiation efficiency. The absorption within the hall was calculated in the normal way by consideration of the areas and absorption coefficients of the various materials. As stated earlier, the prediction of vibration transmission through the ground and its transmission from the ground into the building and upwards is customarily approached empirically owing to the uncertainties involved. Atkins considers that the Contractor's approach has been entirely appropriate. Edinburgh Playhouse is discussed further in section 3.2.1.2.

Section 3.3.3, below, highlights the trackform mitigation measures applied for these works.

3.2.1.2. Edinburgh Playhouse

The tram route, from York Place to Newhaven, feature some more specific sensitive receivers which require greater control.

For some types of non-residential receptors (such as the Edinburgh Playhouse) lower limits would apply. This should be considered on a case-by-case basis and it is clear that the Contractor has done this. Inspection of the Contractor's prediction calculation for the Edinburgh Playhouse shows that the predicted level of ground-borne noise within the auditorium would be 5.2 dB(A) from the nearer track (to which floating slab track will be fitted) and 16.7 dB(A) from the further track (which will be fitted with soft pads). For comparison, the table below is extracted from the HS2 "London West Midlands Environmental Statement - November 2013 - Volume 5 | Technical Appendices Methodology, assumptions and assessment (route-wide) - (sV-001-000) Sound, noise and vibration" of November 2013 (Ref: ES 3.5.0.10):

Table 4: Ground-borne sound impact criteria for non-residential receptors (refer to SMR)

Category of building		Impact (screening) criterion L_{pASmax} [dB]	Potential effect
Code	Description		
G1	Large auditoria; and concert halls	25	Adverse 'A'
G2	Sound recording & broadcast studios; theatres, and small auditoria	30	Adverse 'A'
G3	Places of meeting for religious worship; courts; cinemas; lecture theatres; museums; and small auditoria or halls	35	Adverse 'A'
G4	Offices; schools; colleges, hospitals; hotels; and libraries	40	Adverse 'A'

It may be seen that the most stringent "Impact (screening) criterion L_{pASmax} (dB)", that for "Large auditoria; and concert halls", is some 8 dB higher than the 16.7 dB(A) predicted by the Contractor for the Edinburgh Playhouse. Various aspects of the Contractor's assumptions and calculations have been queried and the responses that have been received have been satisfactory.

In the Addendum previously referred to, additional explanation of the calculations was provided by the Contractor for sample properties. These showed the reasoning that had been followed when determining what track vibration attenuation measures to adopt. The latest version of the "Appendix 2 Vibration" includes predicted vibration accelerations and vibration dose values.

In conclusion, the Contractor applied their professional judgment in an appropriate way following a well-established prediction method and applying appropriate criteria.

3.3. Trackwork mitigation measures

Appendix 3 includes the layout plans highlighting where the varying trackforms have been applied throughout the route. These plans also include correlation to the receivers noted in Appendix 4.

Appendix 4 includes the analysis output highlighting where the varying trackforms have been applied to control noise levels which would exceed acceptability requirements.

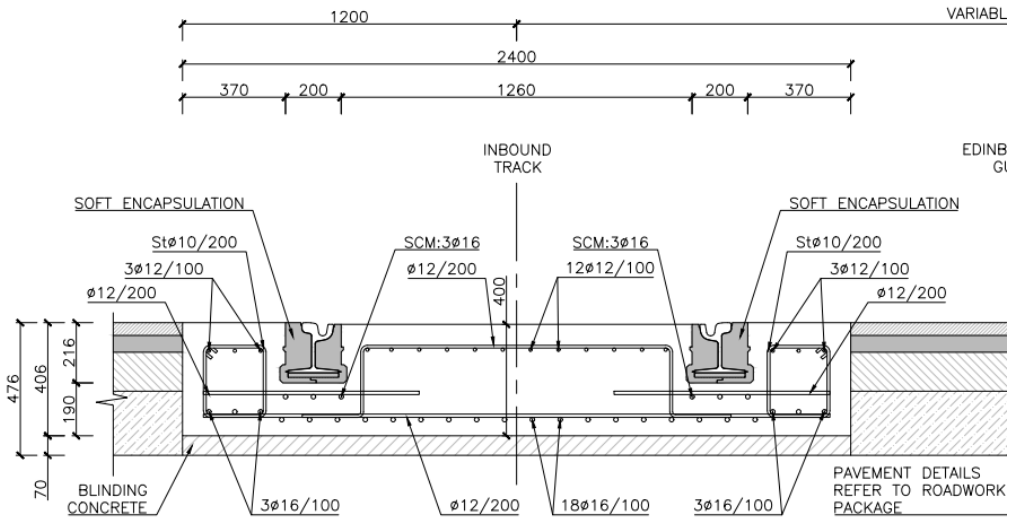
Maintenance of the system, including rolling stock, will assist with overall performance. Maintenance measures that assist in minimising vibration include eliminating track corrugations and other faults by grinding as well as maintaining rolling stock to ensure that, for example, wheel flats are eliminated. It is understood that, in making his recommendations, the Contractor has made allowance for temporary wheel defects (such as flats on the wheel tread) or excessive rail roughness. This makes the predictions more robust as further operational impact is considered.

3.3.1. Standard track

The standard trackform is the solution applied where no additional vibration abatement is required. This utilises the standard Pandrol Q Track products. The standard trackform is itself a resilient/ embedded rail, which provides a degree of vibration noise attenuation. The variants described below provide additional benefits to meet the requirements where necessary.

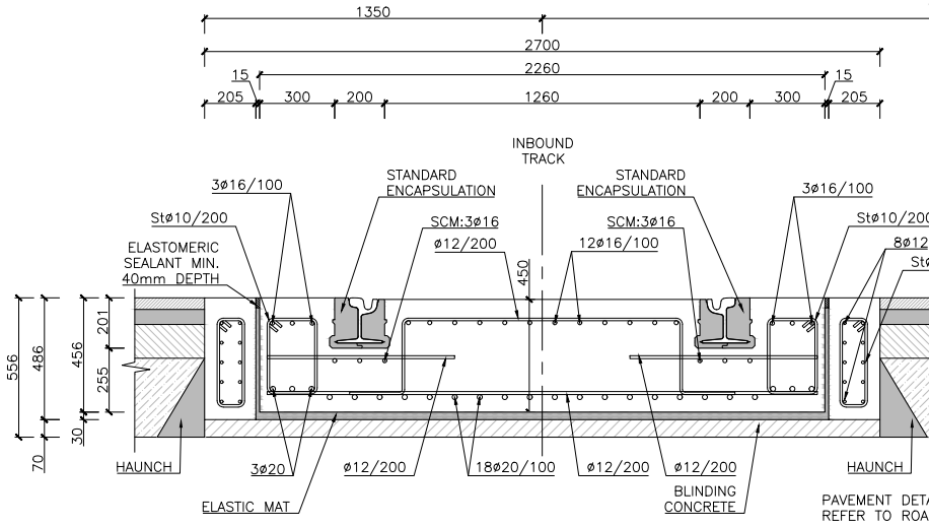
3.3.2. Soft track

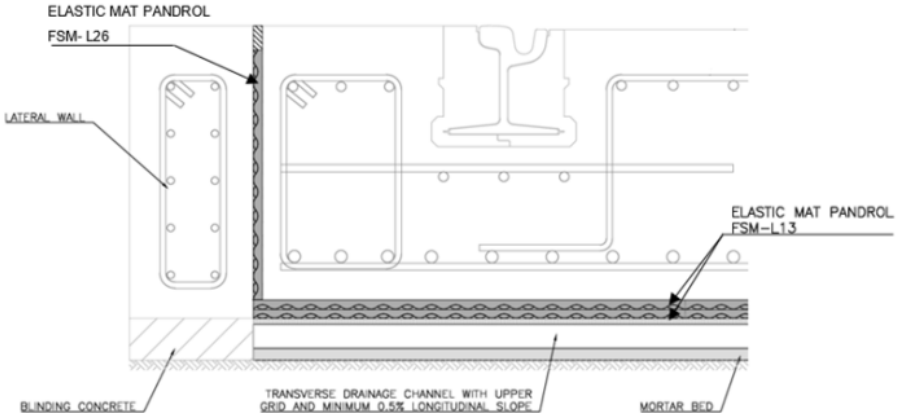
The soft pad design typically benefits noise mitigation by 7dB improvement from the standard trackform solution. Structurally, this is the same profile as a standard track section but features a soft pad included within the encapsulation which the rail sits. Example section below.



3.3.3. Floating track

The floating design typically benefits noise mitigation by 15dB improvement from the standard trackform solution. This profile features a slightly different section as it includes for the floating mat which the trackform sits, with overlapping of the sides. The mat itself, is protected and held in place with concrete upstands. Example section and sample application photograph below.


1350
2700
2260
15
15
205
300
200
1260
200
300
205
INBOUND
TRACK
3ø16/100
STANDARD
ENCAPSULATION
STANDARD
ENCAPSULATION
3ø16/100
Stø10/200
SCM:3ø16
ø12/200
SCM:3ø16
12ø16/100
ELASTOMERIC
SEALANT MIN.
40mm DEPTH
450
556
486
456
201
255
30
70
HAUNCH
3ø20
ø12/200
18ø20/100
ø12/200
ø12/200
HAUNCH
ELASTIC MAT
BLINDING
CONCRETE


ELASTIC MAT PANDROL
FSM- L26
LATERAL WALL
ELASTIC MAT PANDROL
FSM–L13
BLINDING CONCRETE
TRANSVERSE DRAINAGE CHANNEL WITH UPPER
GRID AND MINIMUM 0.5% LONGITUDINAL SLOPE
MORTAR BED

4. Conclusion

The Noise & Vibration Policy's PPV vibration criterion and the noise criteria are all consistent with the relevant Standards and are generally similar to the criteria specified for other tramway and railway projects.

It is considered that the VDV criterion specified in the Noise and Vibration Policy of March 2006 has been applied in the development of this scheme.

Apart from the VDV criterion, the other vibration criterion and the noise criteria are consistent with the relevant Standards and are also considered to be in line with those used on other UK tramway and railway schemes.

The Contractor is following a well-established method for predicting the Nose & Vibration impact of the York Place to Newhaven Tram works.

The Contractor's design has been reviewed and is expected, through the application of the mitigation measures recommended in the form of varying trackform types, to satisfy requirements and regulations.

The varying attenuation measures proposed provide a more than reasonable level of mitigation to address the scheme requirements.

The Contractor has utilised a well-established supplier of trackwork components and there is confidence that the system will perform as intended.

Appendix 1:

Table 1: Various UK Projects' Criteria

Project	VDV Day (16 hour)	VDV Night (8 hour)	PPV	Ground Borne Noise
Edinburgh Tram Extension	*0.2 m/s$^{1.75}$*	*0.13 m/s$^{1.75}$*	*2 mm/s at 2m from the rails*	
Crossrail (Information Paper D10)	0.31 m/s$^{1.75}$ (In the Absence of Appreciable Existing Levels of Vibration)	0.18 m/s$^{1.75}$ (In the Absence of Appreciable Existing Levels of Vibration)		40 dB $L_{Amax,S}$ (based on JLE, HS1, Thameslink) See note Local authorities preference for 35 dB $L_{Amax,S}$ is stated.
Croydon	0.3 m/s$^{1.75}$	0.1 m/s$^{1.75}$		40 dB $L_{Amax,S}$
East West Rail	0.4 m/s$^{1.75}$	0.2 m/s$^{1.75}$		
HS2 LOAEL (Lowest Observed Adverse Effect Level)	0.2 m/s$^{1.75}$ (Indoors, centre of any GF dwelling room)	0.1 m/s$^{1.75}$ (Indoors, centre of any GF dwelling room)		35 dB $L_{Amax,S}$
HS2 SOAEL (Significant Observed Adverse Effect Level)	0.8 m/s$^{1.75}$ (Indoors, centre of any GF dwelling room)	0.4 m/s$^{1.75}$ (Indoors, centre of any GF dwelling room)		45 dB $L_{Amax,S}$
Manchester (GMPTE)	"BS6472 used to assess"	"BS6472 used to assess"		
Mersey (cancelled)	0.4 m/s$^{1.75}$	0.1 m/s$^{1.75}$		
Midland Metro (CENTRO)	0.4 m/s$^{1.75}$	0.13 m/s$^{1.75}$	As BS7385 (50 mm/s for reinforced buildings, 15 mm/s for unreinforced buildings)	
Nottingham	0.4 m/s$^{1.75}$	0.13 m/s$^{1.75}$ (0.1 m/s$^{1.75}$ for Line 1 only)		

Table 2: Various Countries' Criteria

Country	Daytime Vibration Exposure	Night- time Vibration Exposure	Vibration Event	Ground Borne Noise
Ireland (Railway Procurement Agency – LUAS)	0.4 $m/s^{1.75}$	0.13 $m/s^{1.75}$	1 mm/s at 6.5m from the track	
France				
Germany			Various – more stringent than UK	
USA - Federal Transit Agency			Various - RMS.	35 dB(A) sleep, 40 dB(A) daytime
Canada - Vancouver Canada Line			72 dBV frequent events ≈ 0.1mm/s (RMS assumed) 80 dBV infrequent events = 0.254mm/s RMS assumed (dB relative 1 microinch/s)	35 dB(A) frequent events 43 dB(A) infrequent events
Canada – Eglinton Crosstown LRT			0.1mm/s RMS for "Residences and buildings where people normally sleep"	35 dB(A)for "Residences and buildings where people normally sleep"
People's Republic of China			70 dB Daytime for "continuous steady-state vibration, shock vibration and random vibration" (add 10 dB for "shock vibration occurring several times a day"). 67 dB night-time (add 3 dBV for "shock vibration occurring several times a day". RMS assumed.	Structure-borne noise limits are set for the 31.5Hz, 63Hz, 125Hz and 250Hz octave bands.

Country	Daytime Vibration Exposure	Night- time Vibration Exposure	Vibration Event	Ground Borne Noise
South Australia			Seems similar to BS6472	Day, 40 dB L_{AMaxS} Night, 35 dB L_{AMaxS}
New South Wales				Development increases existing rail noise levels by 3 dB(A) or more **and** resulting rail noise levels exceed: Day (7AM-10PM) 40 dB, L_{AMaxS} Night (10PM-7AM) 35 dB, L_{AMaxS}
Victoria	Preferred 0.2m/s$^{1.75}$ Maximum 0.4m/s$^{1.75}$	Preferred 0.13m/s$^{1.75}$ Maximum 0.26m/s$^{1.75}$	similar to BS6472	

Appendix 2: Bibliography

Transit Noise and Vibration Impact Assessment Manual
FTA Report No. 0123
Federal Transit Administration
Prepared by John A. Volpe National Transportation Systems Centre
September 2018

Railway Noise and Vibration Mechanisms, Modelling and Means of Control
Professor David Thompson
Elsevier, First Edition 2009

Appendix 3: Trackwork layout plans

Do not scale from this drawing.

EDINBVRGH
THE CITY OF EDINBURGH COUNCIL

SFN
Sacyr • Farrans • Neopul

TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE

01 02 03 04 05 06 07

MELROSE DRIVE
CONTINUED ON SHEET 2
SANDPIPER DRIVE
SITE BOUNDARY
FAIRBAIRN
Annfield
PICARDY PLACE
TRAMSTOP NEWHAVEN L= 42.00 m
OUTBOUND TRACK
INBOUND TRACK
NEWHAVEN
JUST FUTURE
FOR TRACK SLAB SECTION AND RAIL FIXATION SEE DRAWING ETYN–SEF–XXX–12–DR–H–2170
END OF OUTBOUND TRACK CH 18+431.10
BUFFER STOP CH 18+424.60
EARTH PLATE ACCESS MANHOLE–3
END OF INBOUND TRACK CH 18+425.00
BUFFER STOP CH 18+418.50
GUARDRAIL
PROVISION FOR FUTURE NEW–S–I–E
KEEP CLEAR
BUS STOP
LOOK LEFT
LOOK RIGHT
CH 18+576.11
CH 18+576.37
CH 18+535.17
CH 18+535.20
CH 18+535.68
P06
P07

NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE).
2– VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN–SEF–18X–15–DR–Z–0201 TO ETYN–SEF–18X–15–DR–Z–0239.
3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- TRACK DRAINAGE
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- L.P. LOW POINT
- H.P. HIGH POINT
- GRADIENT
- GRASSCRETE DRAINAGE
- LOW SLOPE SECTIONS
- OLE POLE
- RAIL BOND
- TRACK BOND
- FLOATING SLAB DRAINAGE
- 00 SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- 00 SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- NO CROSS SLOPE SECTIONS
- VLD CONNECTION BOX
- P06

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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REF. NAME

35 SI EXISTING GROUND
100a TRACKWORKS LOSS OF RAIL BONDING
101b TRACKWORKS WATER AND DEBRIS INFILTRATION IN RAIL FIXATION
102a TRACKWORKS CONCRETE DEGRADATION
103a TRACKWORKS CONCRETE CRACKS
104 TRACKWORKS ROLLING STOCK INTERFACE
137 TRACK CIRCUIT FAILURE
139 FREEZING LEADING TO ACCIDENTS
140 FLOATING SLAB FAILURE
141 DRAINAGE FAILURE LEADING TO ACCIDENTS

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE.

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

Rev.	Date	Description	Drwn.	Chkd.	Appd.
P07	14/12/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P06	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	27/03/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION OCEAN TERMINAL – NEW HAVEN TRACKWORKS LAYOUT

Sheet 1 of 7

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 14/12/2020	Date: 14/12/2020	Date: 14/12/2020

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2000

Suitability:	Revision:
S3	P07

Do not scale from this drawing.

TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE

MELROSE DRIVE

CONTINUED ON SHEET 1

CONTINUED ON SHEET 3

02

03

TRAMSTOP NEWHAVEN
L= 42.00 m

OUTBOUND TRACK

INBOUND TRACK

PICARDY PLACE

NEWHAVEN

JUST FUTURE TRIS

SCISSORS CROSSOVER AT NEWHAVEN

NEW-SP-02
SPRING POINTS WITH PREFERRED POSITION

AXIS OF SIGNAL POLE AT 1830mm FROM TRACK AXIS. SIGNAL HEAD POSITIONED PARALLEL TO TRACK AXIS

CH 18+376.11
CH 18+364.33
CH 18+356.68
CH 18+353.70
CH 18+341.20
CH 18+329.82
CH 18+322.17
CH 18+317.32
CH 18+309.67
CH 18+305.54
CH 18+300.26
CH 18+297.89
CH 18+292.55
CH 18+239.60
CH 18+231.21
CH 18+223.67
CH 18+215.21

P07
P08
D-02
D-02A
D-03
D-04
NEW-TC05
NEW-TC06
NEW-TC02
NEW-TC03
NEW-TEC
NEW-TPC01
NEW-TRTS01
NEW-TRTS02
NEW-RI-01
NEW-RI-02
NEW-RI-03
VLD-03
VLD-04
VLD-06
VLD-07
NEW-PPI-01
NEW-PPI-02
NEW-PPI-03
NEW-PPI-04

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- TRACK DRAINAGE
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- L.P. LOW POINT
- H.P. HIGH POINT
- GRADIENT
- GRASSCRETE DRAINAGE
- LOW SLOPE SECTIONS
- OLE POLE
- RAIL BOND
- TRACK BOND
- FLOATING SLAB DRAINAGE
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- NO CROSS SLOPE SECTIONS
- VLD CONNECTION BOX

NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE).
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SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P08	22/02/2021	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P07	19/12/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	27/08/2020	FIRST ISSUE	UPL	IFG	LQB

EDINBVRGH
THE CITY OF EDINBURGH COUNCIL

SFN Sacyr • Farrans • Neopul

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION OCEAN TERMINAL – NEW HAVEN TRACKWORKS LAYOUT

Sheet 2 of 7

Scale at A1:	Status:
1:250	FOR COMMENTS AND REVIEW

Drawn:	Checked:	Approved:
UPL	AFLL	LQB
Date: 22/02/2021	Date: 22/02/2021	Date: 22/02/2021

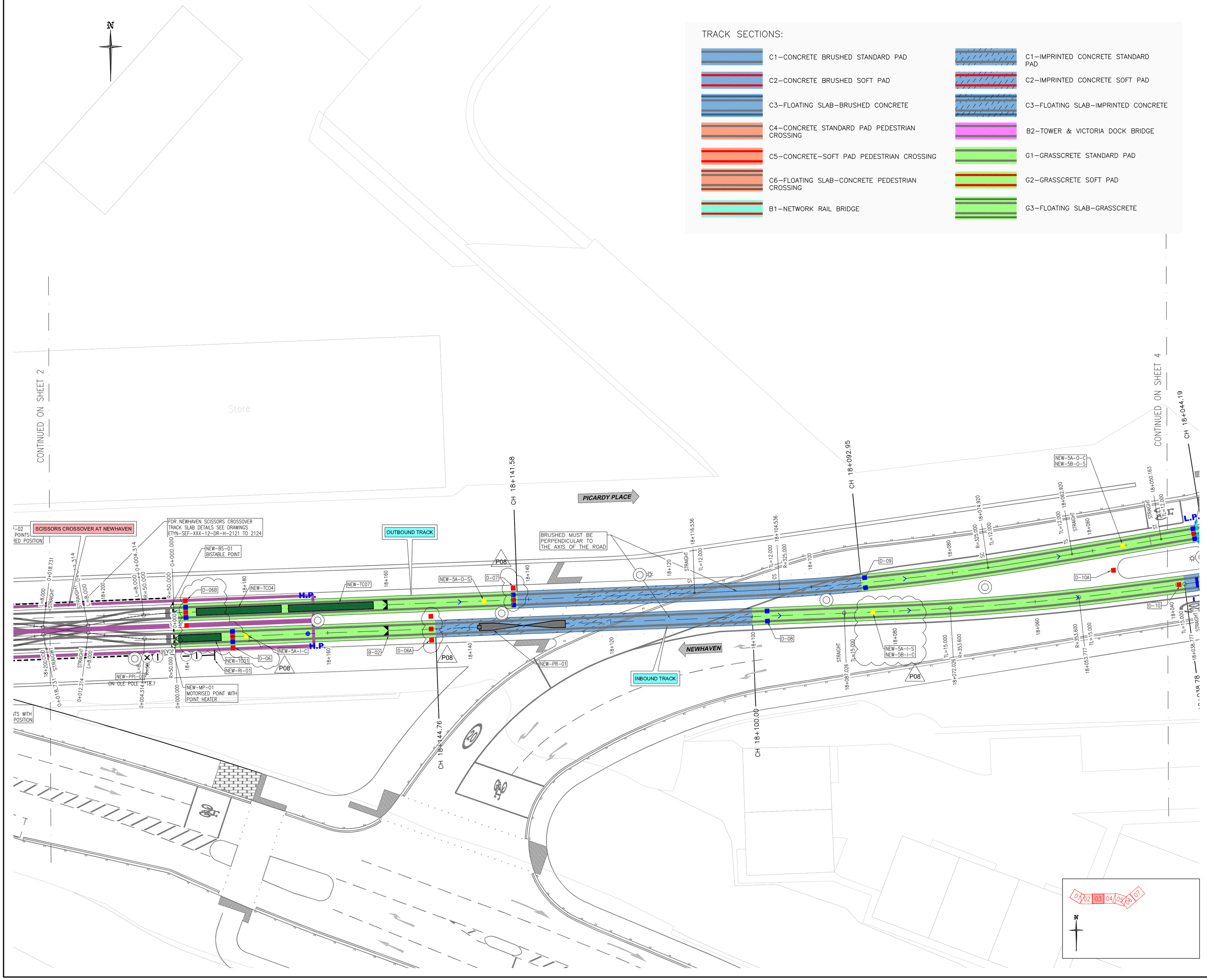
Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2001

Suitability:	Revision:
S3	P08

Do not scale from this drawing.

TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE



LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- FLOATING SLAB DRAINAGE
- L.P. LOW POINT
- H.P. HIGH POINT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRADIENT
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- GRASSCRETE DRAINAGE
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
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P08	22/02/2021	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P07	19/12/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	27/03/2020	FIRST ISSUE	UPL	IFG	LQB

EDINBVRGH
THE CITY OF EDINBURGH COUNCIL

SFN Sacyr • Farrans • Neopul

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION OCEAN TERMINAL – NEW HAVEN TRACKWORKS LAYOUT

Sheet 3 of 7

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 22/02/2021	Date: 22/02/2021	Date: 22/02/2021

Project	Originator	Volume	Location	Type	Role	Number
ETYN	SEF	XXX	12	DR	H	2002

Suitability:	Revision:
S3	P08

Do not scale from this drawing.

EDINBVRGH
THE CITY OF EDINBURGH COUNCIL

SFN
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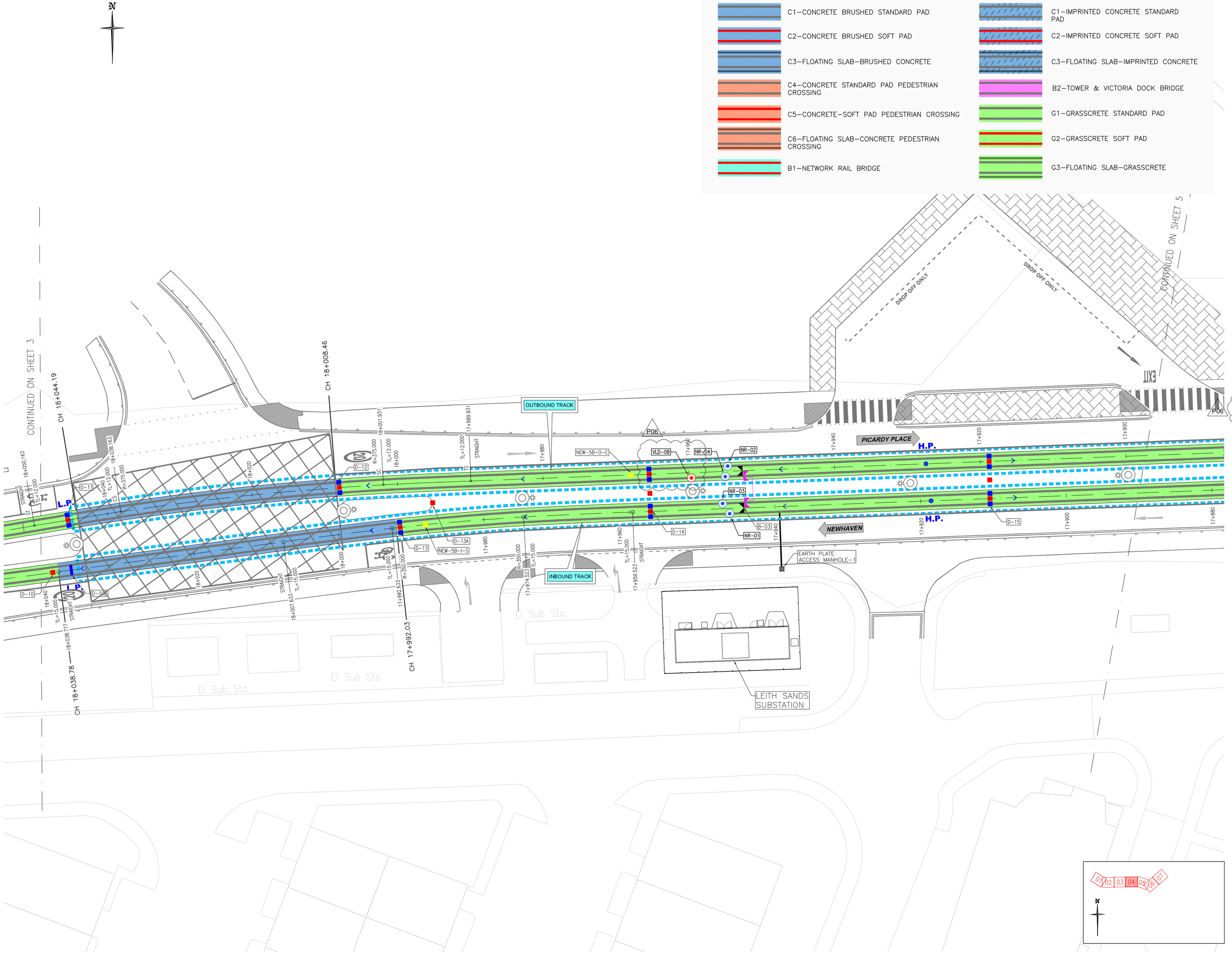
TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE



LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- TRACK DRAINAGE
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- L.P. LOW POINT
- H.P. HIGH POINT
- GRADIENT
- GRASSCRETE DRAINAGE
- LOW SLOPE SECTIONS
- OLE POLE
- RAIL BOND
- TRACK BOND
- FLOATING SLAB DRAINAGE
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- NO CROSS SLOPE SECTIONS
- VLD CONNECTION BOX
- P06

NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE).
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SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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137 TRACK CIRCUIT FAILURE
139 FREEZING LEADING TO ACCIDENTS
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141 DRAINAGE FAILURE LEADING TO ACCIDENTS

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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P06	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P05	16/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	07/03/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION OCEAN TERMINAL – NEW HAVEN TRACKWORKS LAYOUT

Sheet 4 of 7

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2003

Suitability:	Revision:
S3	P06

Do not scale from this drawing.

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THE CITY OF EDINBURGH COUNCIL

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TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
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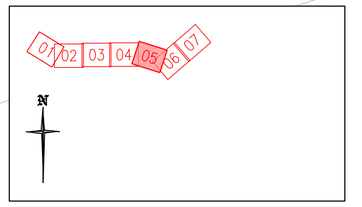

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- TRACK DRAINAGE
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- L.P. LOW POINT
- H.P. HIGH POINT
- GRADIENT
- GRASSCRETE DRAINAGE
- LOW SLOPE SECTIONS
- OLE POLE
- RAIL BOND
- TRACK BOND
- FLOATING SLAB DRAINAGE
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- NO CROSS SLOPE SECTIONS
- VLD CONNECTION BOX

NOTE:
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SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P07	26/01/2021	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P06	19/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	27/03/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION OCEAN TERMINAL – NEW HAVEN
TRACKWORKS LAYOUT

Sheet 5 of 7

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 26/01/2021	Date: 26/01/2021	Date: 26/01/2021

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2004

Suitability:	Revision:
S3	P07

Do not scale from this drawing.

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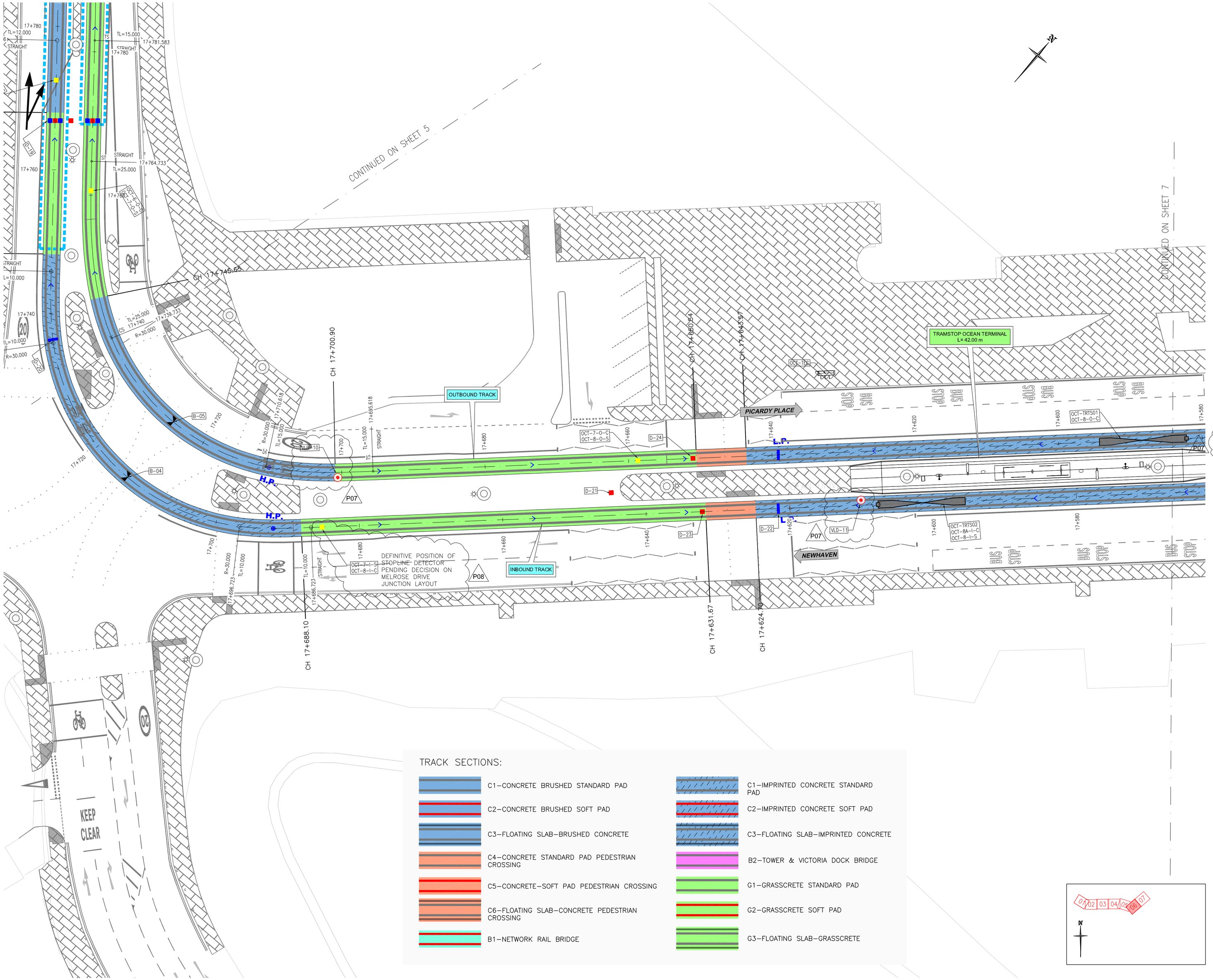

TRACK SECTIONS:

- C1—CONCRETE BRUSHED STANDARD PAD
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- C3—FLOATING SLAB—IMPRINTED CONCRETE
- B2—TOWER & VICTORIA DOCK BRIDGE
- G1—GRASSCRETE STANDARD PAD
- G2—GRASSCRETE SOFT PAD
- G3—FLOATING SLAB—GRASSCRETE

01/02 03 04/05 06 07

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
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- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX
- P07

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P08	14/12/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P07	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	27/03/2020	FIRST ISSUE	UPL	JFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION OCEAN TERMINAL – NEW HAVEN TRACKWORKS LAYOUT

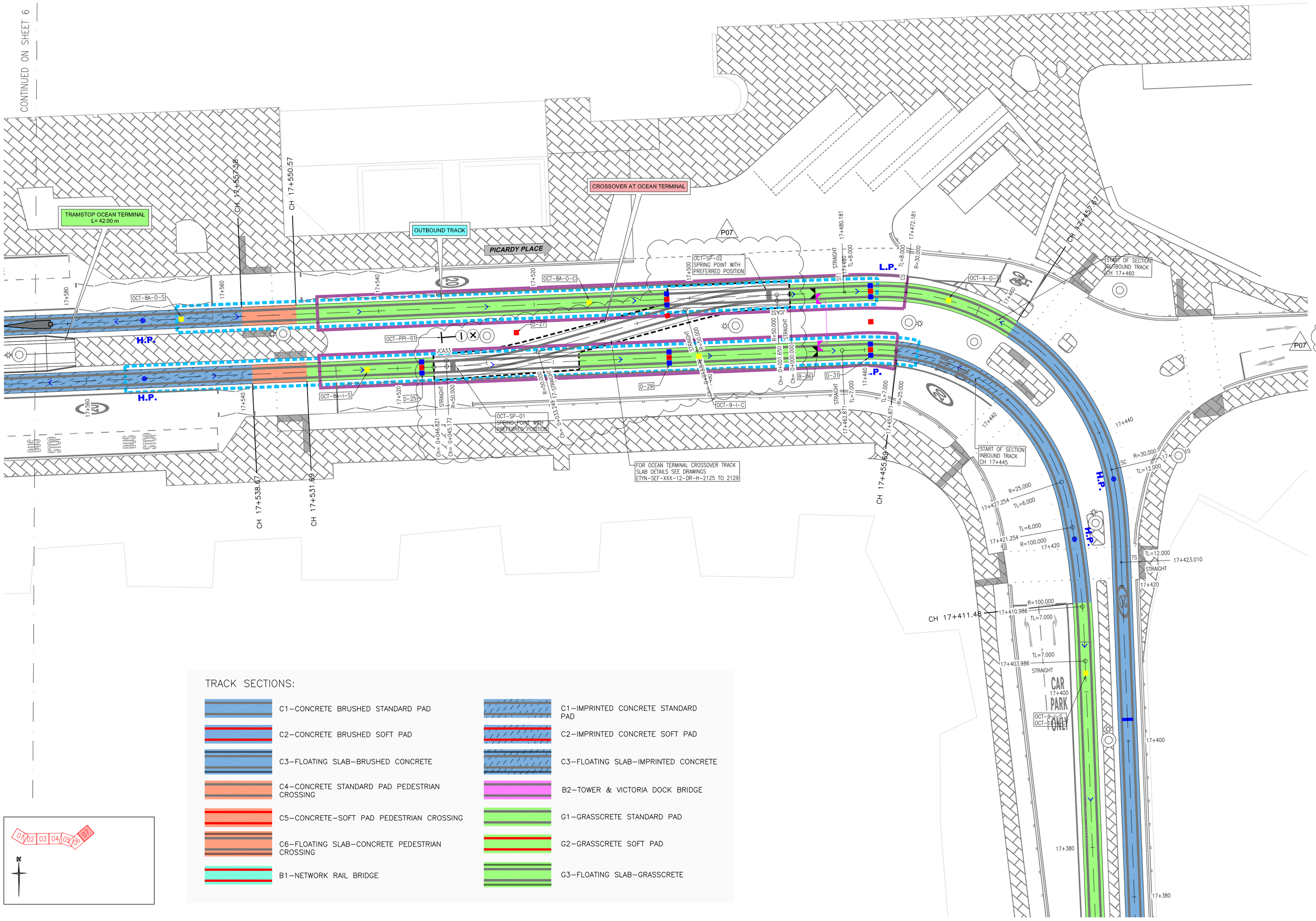
Sheet 6 of 7

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 14/12/2020	Date: 14/12/2020	Date: 14/12/2020

Project Originator Volume Location Type Role Number
ETYN-SEF-XXX-12-DR-H-2005

Suitability:	Revision:
S3	P08

CONTINUED ON SHEET 6



TRACK SECTIONS:

- C1—CONCRETE BRUSHED STANDARD PAD
- C2—CONCRETE BRUSHED SOFT PAD
- C3—FLOATING SLAB—BRUSHED CONCRETE
- C4—CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5—CONCRETE—SOFT PAD PEDESTRIAN CROSSING
- C6—FLOATING SLAB—CONCRETE PEDESTRIAN CROSSING
- B1—NETWORK RAIL BRIDGE
- C1—IMPRINTED CONCRETE STANDARD PAD
- C2—IMPRINTED CONCRETE SOFT PAD
- C3—FLOATING SLAB—IMPRINTED CONCRETE
- B2—TOWER & VICTORIA DOCK BRIDGE
- G1—GRASSCRETE STANDARD PAD
- G2—GRASSCRETE SOFT PAD
- G3—FLOATING SLAB—GRASSCRETE

Do not scale from this drawing.

EDINBVRGH
THE CITY OF EDINBURGH COUNCIL

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LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- FLOATING SLAB DRAINAGE
- L.P. LOW POINT
- H.P. HIGH POINT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRADIENT
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- GRASSCRETE DRAINAGE
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX
- P07

NOTE:
1- FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN-SEF-XXX-01-DR-Z-0020 (OLE PACKAGE).
2- VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN-SEF-18X-15-DR-Z-0201 TO ETYN-SEF-18X-15-DR-Z-0239.
3- PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISK AND INFORMATION.

IDENTIFIED RISK ARE NOTE IN ETYN-SEF-XXX-XX-HS-Z-001. RISK REGISTER. REFER TO RISK REGISTER FOR MITIGATION MEASURES. RISKS ASSOCIATE WITH THIS WORKS ELEMENT ARE AS FOLLOWS

REF. NAME

35 SI EXISTING GROUND
100a TRACKWORKS LOSS OF RAIL BONDING
101b TRACKWORKS WATER AND DEBRIS INFILTRATION IN RAIL FIXATION
102a TRACKWORKS CONCRETE DEGRADATION
103a TRACKWORKS CONCRETE CRACKS
104 TRACKWORKS ROLLING STOCK INTERFACE
137 TRACK CIRCUIT FAILURE
139 FREEZING LEADING TO ACCIDENTS
140 FLOATING SLAB FAILURE
141 DRAINAGE FAILURE LEADING TO ACCIDENTS

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE.

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

Rev.	Date	Description	Drwn.	Chkd.	Appd.
P07	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P06	16/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	27/03/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

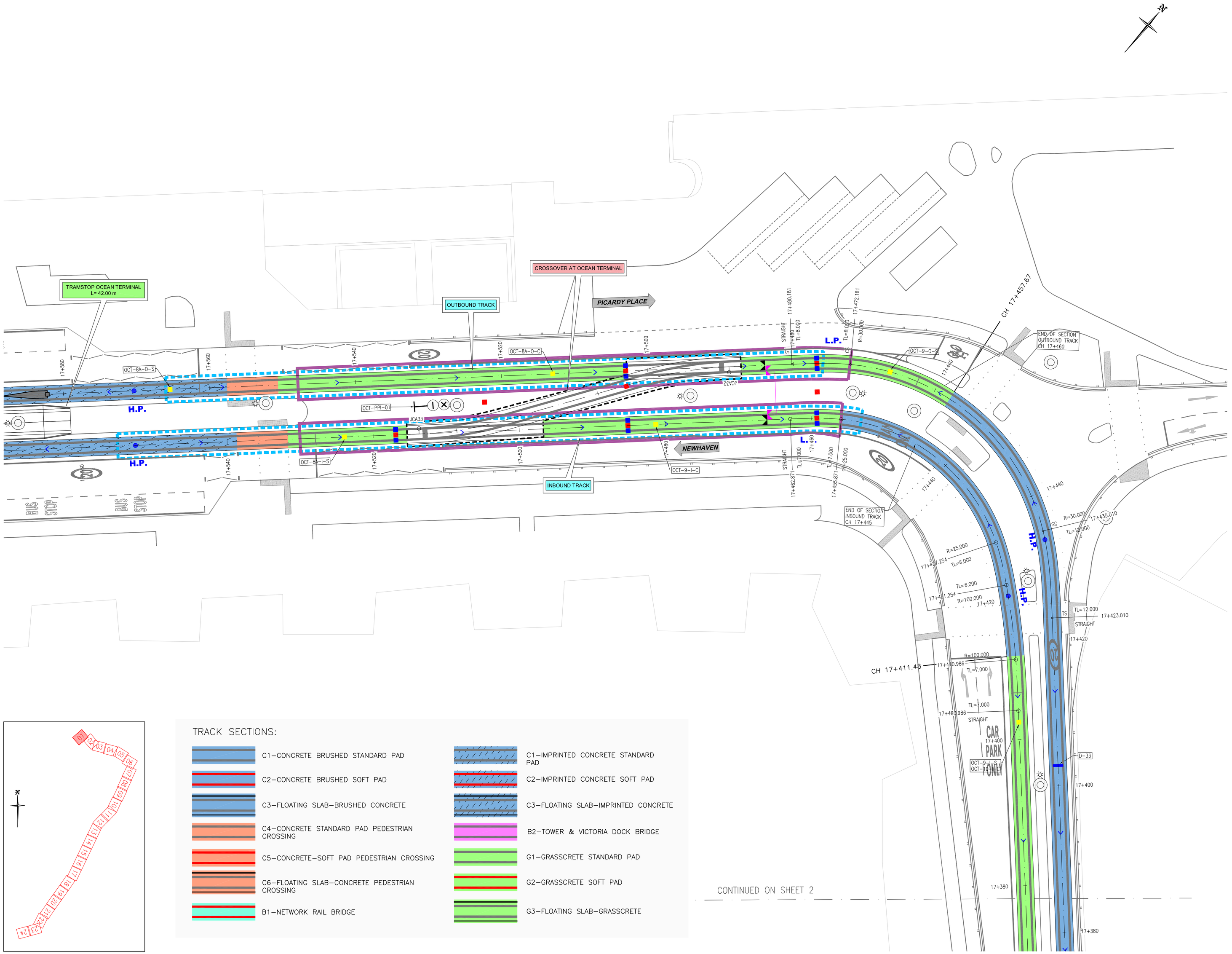
Drawing Title:
SECTION OCEAN TERMINAL – NEW HAVEN TRACKWORKS LAYOUT

Sheet 7 of 7

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project Originator Volume Location Type Role Number
ETYN-SEF-XXX-12-DR-H-2006

Suitability:	Revision:
S3	P07



TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE

Do not scale from this drawing.

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LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- H.P. HIGH POINT
- FLOATING SLAB DRAINAGE
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRASSCRETE DRAINAGE
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE).
2– VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN–SEF–18X–15–DR–Z–0201 TO ETYN–SEF–18X–15–DR–Z–0239.
3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

P05

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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REF.	NAME
35	SI EXISTING GROUND
76	SLAB OVER 275KV CABLES
82	RESTRICTED DEPTH (TOWER PLACE BRIDGE)
84	RESTRICTED DEPTH (VICTORIA QUAY BRIDGE)
100A	TRACKWORKS LOSS OF RAIL BONDING
101B	TRACKWORKS WATER AND DEBRIS INFILTRATION IN RAIL FIXATION
102A	TRACKWORKS CONCRETE DEGRADATION
103A	TRACKWORKS CONCRETE CRACKS
104	TRACKWORKS ROLLING STOCK INTERFACE
114	SPEN 275KV
139	FREEZING LEADING TO ACCIDENTS
140	FLOATING SLAB FAILURE
141	DRAINAGE FAILURE LEADING TO ACCIDENTS

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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P05	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P04	16/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL
TRACKWORKS LAYOUT

Sheet 1 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2500

Suitability:	Revision:
S3	P05

Do not scale from this drawing.

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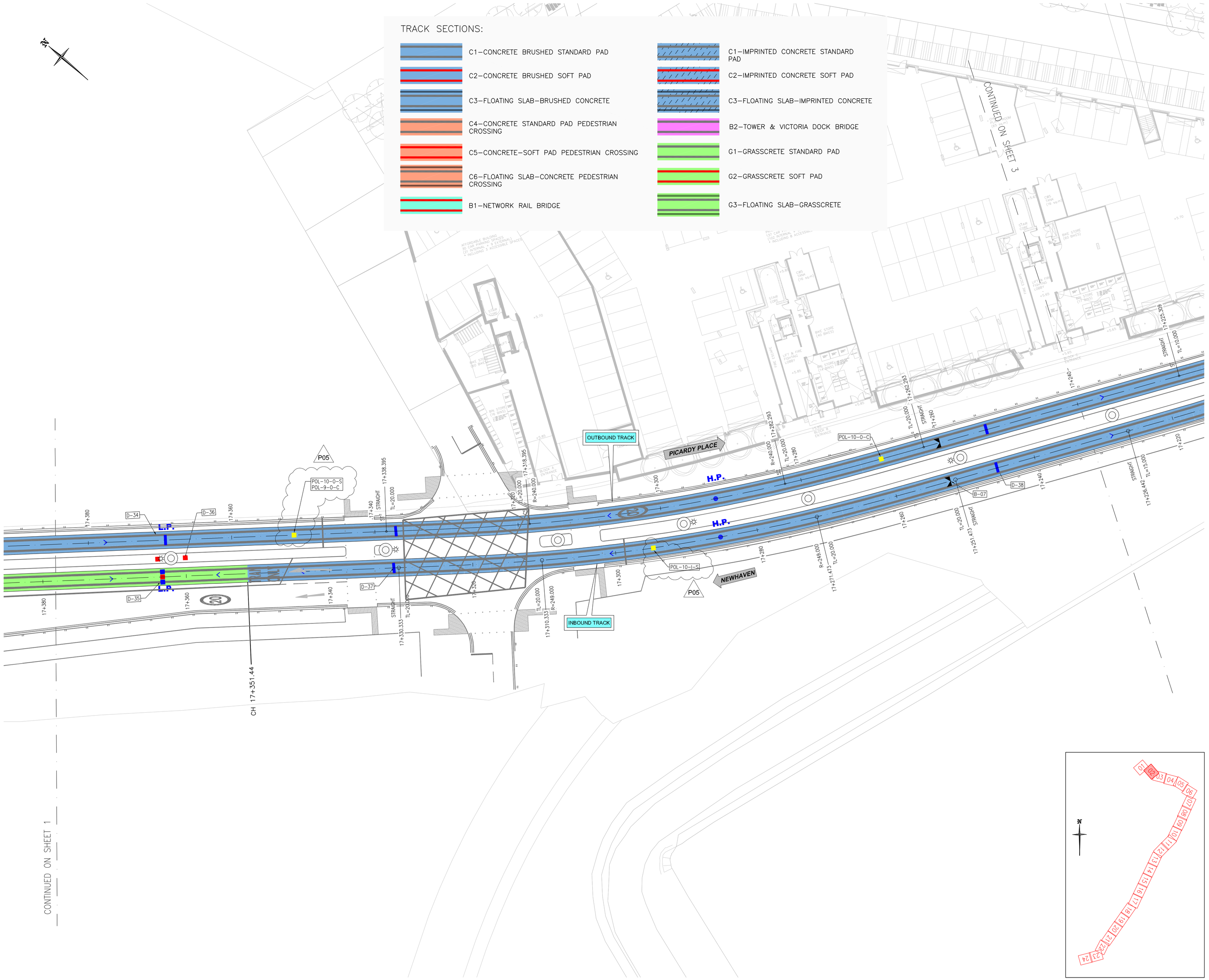
TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE



LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- H.P. HIGH POINT
- FLOATING SLAB DRAINAGE
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRASSCRETE DRAINAGE
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE).
2– VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN–SEF–18X–15–DR–Z–0201 TO ETYN–SEF–18X–15–DR–Z–0239.
3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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REF. NAME

35 SI EXISTING GROUND
76 SLAB OVER 275KV CABLES
82 RESTRICTED DEPTH (TOWER PLACE BRIDGE)
84 RESTRICTED DEPTH (VICTORIA QUAY BRIDGE)
100A TRACKWORKS LOSS OF RAIL BONDING
101B TRACKWORKS WATER AND DEBRIS INFILTRATION IN RAIL FIXATION
102A TRACKWORKS CONCRETE DEGRADATION
103A TRACKWORKS CONCRETE CRACKS
104 TRACKWORKS ROLLING STOCK INTERFACE
114 SPEN 275KV
139 FREEZING LEADING TO ACCIDENTS
140 FLOATING SLAB FAILURE
141 DRAINAGE FAILURE LEADING TO ACCIDENTS

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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P05	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P04	16/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	JFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 2 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2501

Suitability:	Revision:
S3	P05

Do not scale from this drawing.

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LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- FLOATING SLAB DRAINAGE
- H.P. HIGH POINT
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRASSCRETE DRAINAGE
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- LOW SLOPE SECTIONS
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- VLD CONNECTION BOX

NOTE:
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2– VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN–SEF–18X–15–DR–Z–0201 TO ETYN–SEF–18X–15–DR–Z–0239.
3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

P05

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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REF.	NAME
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104	TRACKWORKS ROLLING STOCK INTERFACE
114	SPEN 275KV
139	FREEZING LEADING TO ACCIDENTS
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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P05	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P04	16/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

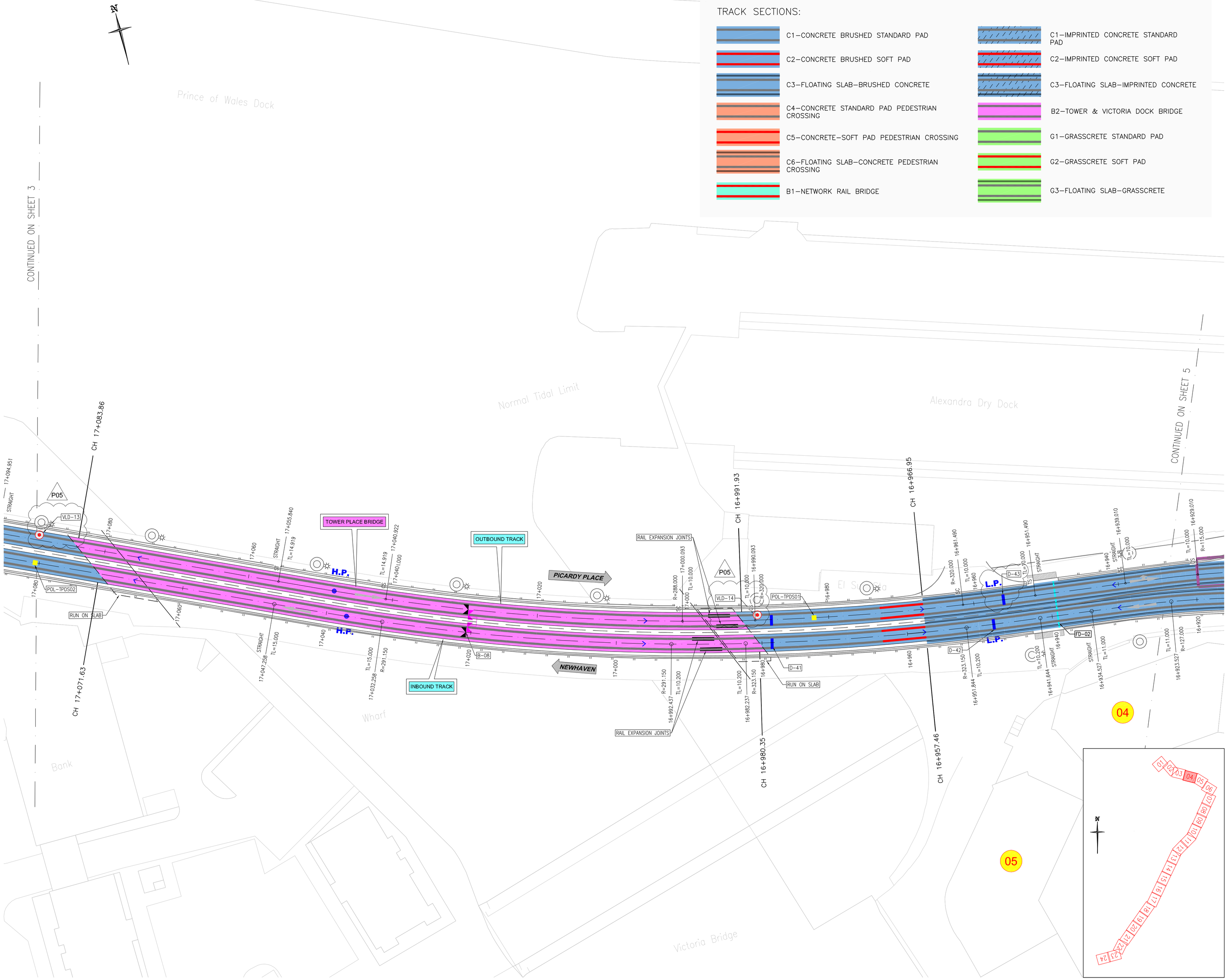
Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 3 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project	Originator	Volume	Location	Type	Role	Number
ETYN	SEF	XXX	12	DR	H	2502

Suitability:	Revision:
S3	P05



Do not scale from this drawing.

EDINBVRGH
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LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- FLOATING SLAB DRAINAGE
- H.P. HIGH POINT
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- GRADIENT
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- GRASSCRETE DRAINAGE
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE). P05
2– VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN–SEF–18X–15–DR–Z–0201 TO ETYN–SEF–18X–15–DR–Z–0239.
3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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P05	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P04	16/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/09/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 4 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project	Originator	Volume	Location	Type	Role	Number
ETYN	SEF	XXX	12	DR	H	2503

Suitability:	Revision:
S3	P05

Do not scale from this drawing.

EDINBVRGH
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TRACK SECTIONS:

- C1—CONCRETE BRUSHED STANDARD PAD
- C2—CONCRETE BRUSHED SOFT PAD
- C3—FLOATING SLAB—BRUSHED CONCRETE
- C4—CONCRETE STANDARD PAD PEDESTRIAN CROSSING
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- C1—IMPRINTED CONCRETE STANDARD PAD
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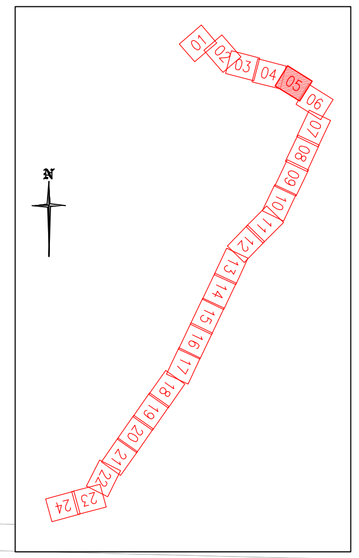

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- H.P. HIGH POINT
- FLOATING SLAB DRAINAGE
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- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
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- LOW SLOPE SECTIONS
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- OLE POLE
- VLD CONNECTION BOX

NOTE:
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2— VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN—SEF—18X—15—DR—Z—0201 TO ETYN—SEF—18X—15—DR—Z—0239.
3— PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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REF.	NAME
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103A	TRACKWORKS CONCRETE CRACKS
104	TRACKWORKS ROLLING STOCK INTERFACE
114	SPEN 275KV
139	FREEZING LEADING TO ACCIDENTS
140	FLOATING SLAB FAILURE
141	DRAINAGE FAILURE LEADING TO ACCIDENTS

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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P06	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P05	28/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL
TRACKWORKS LAYOUT

Sheet 5 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project Originator Volume Location Type Role Number
ETYN—SEF—XXX—12—DR—H—2504

Suitability:	Revision:
S3	P06

Do not scale from this drawing.

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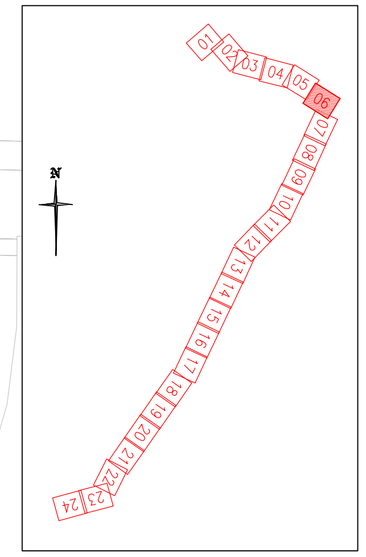

TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- H.P. HIGH POINT
- FLOATING SLAB DRAINAGE
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRASSCRETE DRAINAGE
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE).
2– VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN–SEF–18X–15–DR–Z–0201 TO ETYN–SEF–18X–15–DR–Z–0239.
3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISK AND INFORMATION.

IDENTIFIED RISK ARE NOTE IN ETYN–SEF–XXX–XX–HS–Z–001. RISK REGISTER. REFER TO RISK REGISTER FOR MITIGATION MEASURES. RISKS ASSOCIATE WITH THIS WORKS ELEMENT ARE AS FOLLOWS

REF.	NAME
35	SI EXISTING GROUND
76	SLAB OVER 275KV CABLES
82	RESTRICTED DEPTH (TOWER PLACE BRIDGE)
84	RESTRICTED DEPTH (VICTORIA QUAY BRIDGE)
100A	TRACKWORKS LOSS OF RAIL BONDING
101B	TRACKWORKS WATER AND DEBRIS INFILTRATION IN RAIL FIXATION
102A	TRACKWORKS CONCRETE DEGRADATION
103A	TRACKWORKS CONCRETE CRACKS
104	TRACKWORKS ROLLING STOCK INTERFACE
114	SPEN 275KV
139	FREEZING LEADING TO ACCIDENTS
140	FLOATING SLAB FAILURE
141	DRAINAGE FAILURE LEADING TO ACCIDENTS

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE.

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

Rev.	Date	Description	Drwn.	Chkd.	Appd.
P08	26/01/2021	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P07	14/12/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 6 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 26/01/2021	Date: 26/01/2021	Date: 26/01/2021

Project	Originator	Volume	Location	Type	Role	Number
ETYN	SEF	XXX	12	DR	H	2505

Suitability:	Revision:
S3	P08

Do not scale from this drawing.

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THE CITY OF EDINBURGH COUNCIL

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TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- TRACK DRAINAGE
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- L.P. LOW POINT
- H.P. HIGH POINT
- GRADIENT
- GRASSCRETE DRAINAGE
- LOW SLOPE SECTIONS
- OLE POLE
- RAIL BOND
- TRACK BOND
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- FLOATING SLAB DRAINAGE
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- NO CROSS SLOPE SECTIONS
- VLD CONNECTION BOX

NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE). P05
2– VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN–SEF–18X–15–DR–Z–0201 TO ETYN–SEF–18X–15–DR–Z–0239.
3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISK AND INFORMATION.

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REF. NAME

35 SI EXISTING GROUND
76 SLAB OVER 275KV CABLES
82 RESTRICTED DEPTH (TOWER PLACE BRIDGE)
84 RESTRICTED DEPTH (VICTORIA QUAY BRIDGE)
100A TRACKWORKS LOSS OF RAIL BONDING
101B TRACKWORKS WATER AND DEBRIS INFILTRATION IN RAIL FIXATION
102A TRACKWORKS CONCRETE DEGRADATION
103A TRACKWORKS CONCRETE CRACKS
104 TRACKWORKS ROLLING STOCK INTERFACE
114 SPEN 275kV
139 FREEZING LEADING TO ACCIDENTS
140 FLOATING SLAB FAILURE
141 DRAINAGE FAILURE LEADING TO ACCIDENTS

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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P05	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P04	16/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

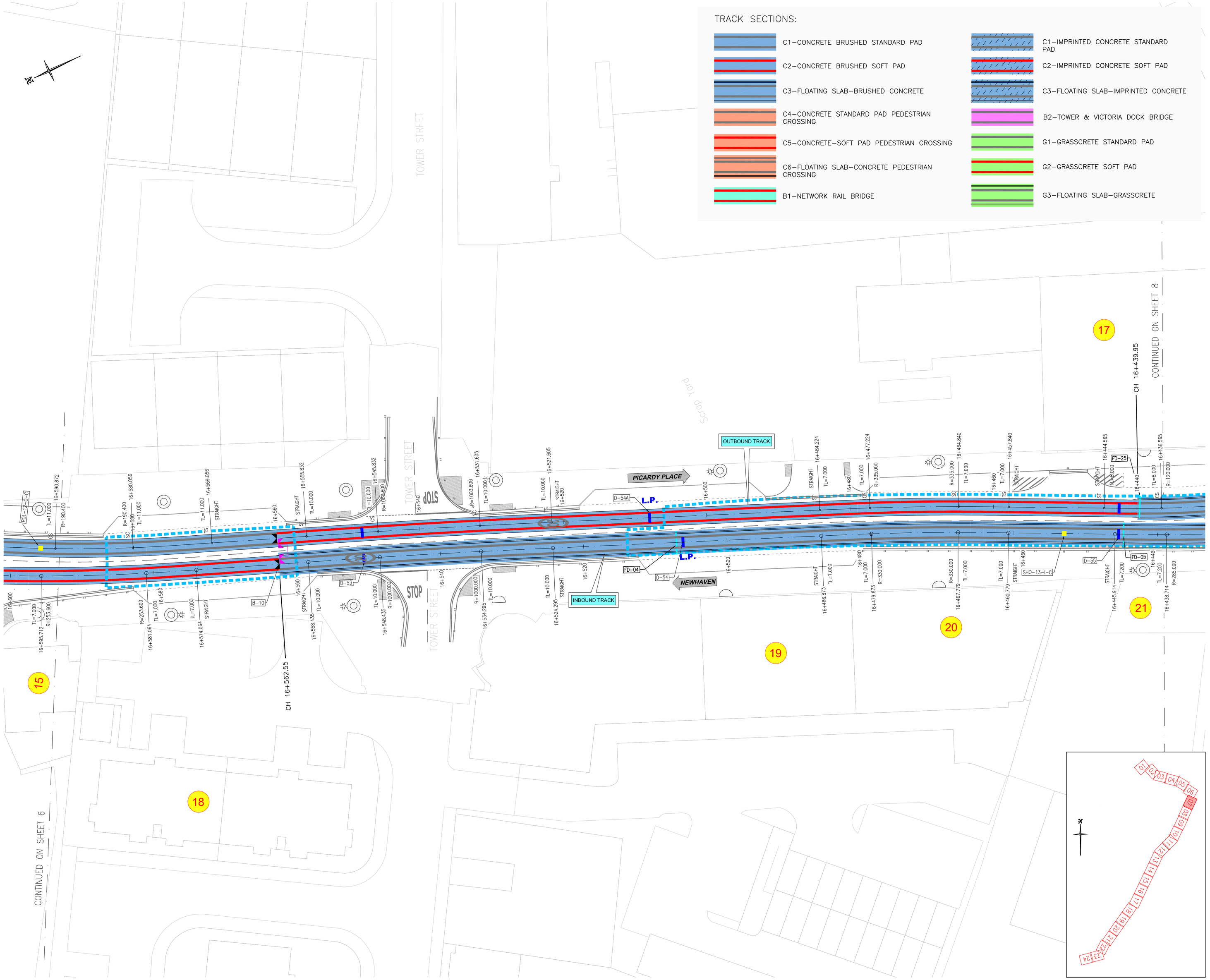
Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 7 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2506

Suitability:	Revision:
S3	P05



Do not scale from this drawing.

TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE

CONTINUED ON SHEET 7

CONTINUED ON SHEET 9

CH 16+439.95

BALTIC STREET

ASSEMBLY

THE SHORE TRAMSTOP
L= 42.00 m

PICARDY PLACE

OUTBOUND TRACK

INBOUND TRACK

NEWHAVEN

Leith Assembly Rooms

Burns' Monument

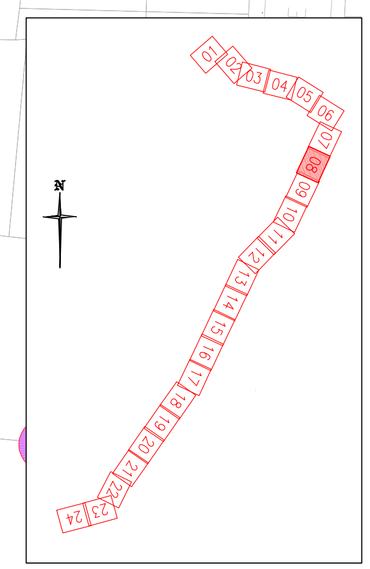
BERNARD STREET

BUS STOP

STOP

Bell's Court

22 23 24 25 21 26 27 28 29 30 31 01 02



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LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- FLOATING SLAB DRAINAGE
- H.P. HIGH POINT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRADIENT
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- GRASSCRETE DRAINAGE
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE). P05
2– VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN–SEF–18X–15–DR–Z–0201 TO ETYN–SEF–18X–15–DR–Z–0239.
3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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104	TRACKWORKS ROLLING STOCK INTERFACE
114	SPEN 275KV
139	FREEZING LEADING TO ACCIDENTS
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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P05	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P04	16/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL
TRACKWORKS LAYOUT

Sheet 8 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project	Originator	Volume	Location	Type	Role	Number
ETYN	SEF	XXX	12	DR	H	2507

Suitability:	Revision:
S3	P05

Do not scale from this drawing.

EDINBVRGH
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LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- FLOATING SLAB DRAINAGE
- H.P. HIGH POINT
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRASSCRETE DRAINAGE
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
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2– VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN–SEF–18X–15–DR–Z–0201 TO ETYN–SEF–18X–15–DR–Z–0239.
3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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102A TRACKWORKS CONCRETE DEGRADATION
103A TRACKWORKS CONCRETE CRACKS
104 TRACKWORKS ROLLING STOCK INTERFACE
114 SPEN 275KV
139 FREEZING LEADING TO ACCIDENTS
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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P07	14/12/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P06	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

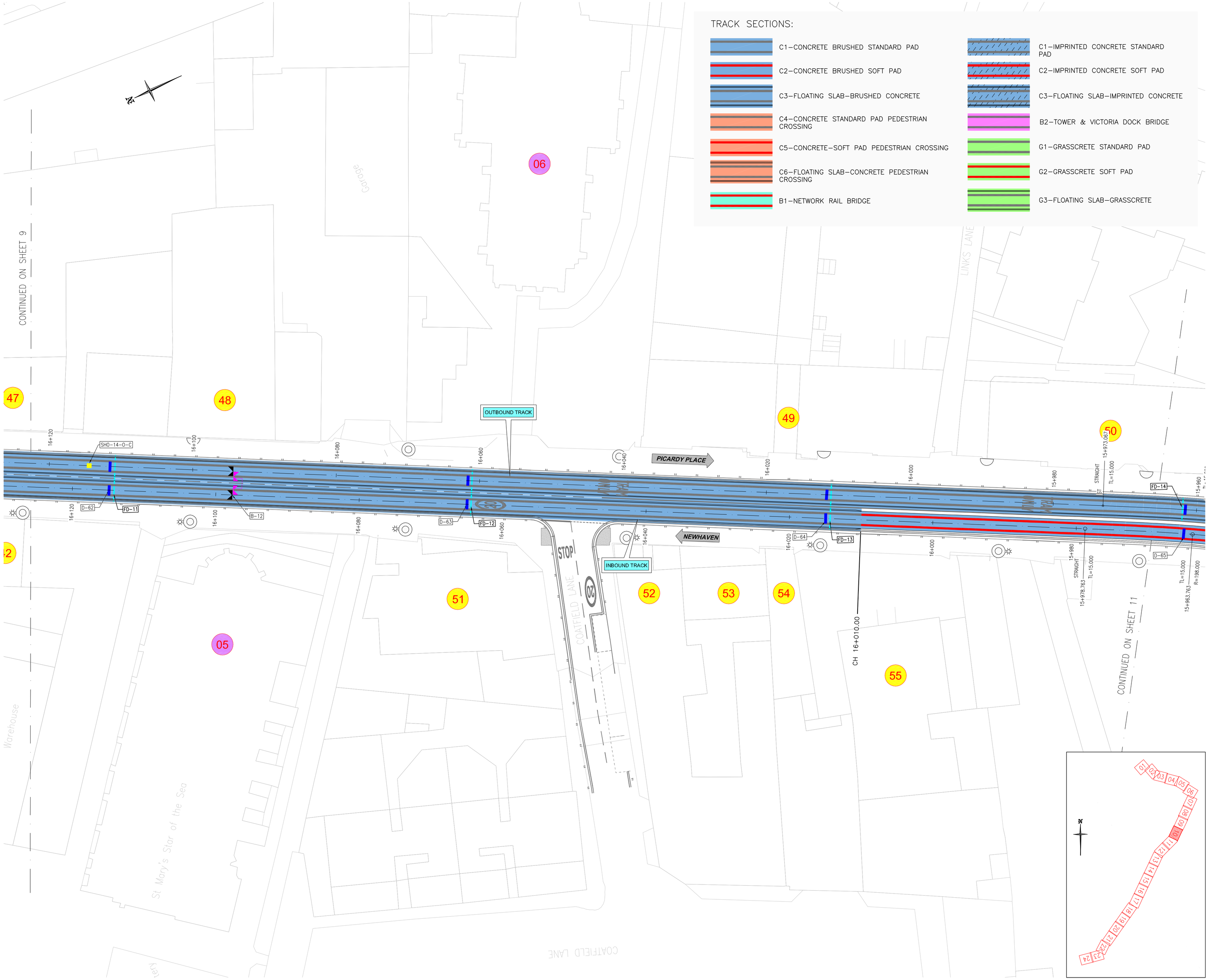
Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 9 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 14/12/2020	Date: 14/12/2020	Date: 14/12/2020

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2508

Suitability:	Revision:
S3	P07



Do not scale from this drawing.

EDINBVRGH
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LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- FLOATING SLAB DRAINAGE
- H.P. HIGH POINT
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
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- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
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P05

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P05	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P04	16/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

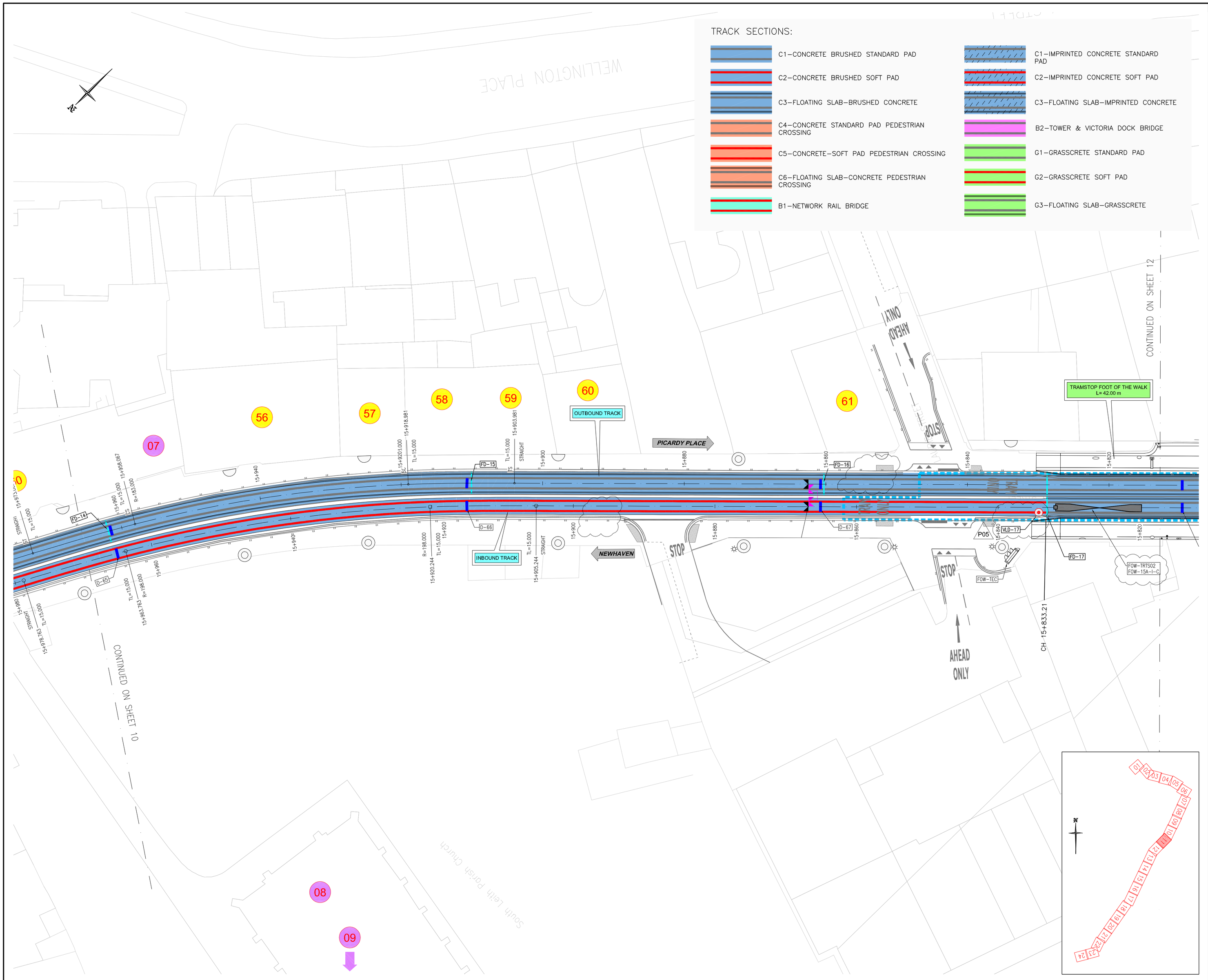
Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 10 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2509

Suitability:	Revision:
S3	P05



Do not scale from this drawing.

EDINBVRGH
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LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
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- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
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- H.P. HIGH POINT
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- NO CROSS SLOPE SECTIONS
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- VLD CONNECTION BOX

NOTE:
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SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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141 DRAINAGE FAILURE LEADING TO ACCIDENTS

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE.

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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P05	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P04	16/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 11 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project	Originator	Volume	Location	Type	Role	Number
ETYN	SEF	XXX	12	DR	H	2510

Suitability:	Revision:
S3	P05

Do not scale from this drawing.

EDINBVRGH
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LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- H.P. HIGH POINT
- FLOATING SLAB DRAINAGE
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRASSCRETE DRAINAGE
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE).
2– VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN–SEF–18X–15–DR–Z–0201 TO ETYN–SEF–18X–15–DR–Z–0239.
3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

P05

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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IDENTIFIED RISK ARE NOTE IN ETYN–SEF–XXX–XX–HS–Z–001. RISK REGISTER. REFER TO RISK REGISTER FOR MITIGATION MEASURES. RISKS ASSOCIATE WITH THIS WORKS ELEMENT ARE AS FOLLOWS

REF.	NAME
35	SI EXISTING GROUND
76	SLAB OVER 275KV CABLES
82	RESTRICTED DEPTH (TOWER PLACE BRIDGE)
84	RESTRICTED DEPTH (VICTORIA QUAY BRIDGE)
100A	TRACKWORKS LOSS OF RAIL BONDING
101B	TRACKWORKS WATER AND DEBRIS INFILTRATION IN RAIL FIXATION
102A	TRACKWORKS CONCRETE DEGRADATION
103A	TRACKWORKS CONCRETE CRACKS
104	TRACKWORKS ROLLING STOCK INTERFACE
114	SPEN 275KV
139	FREEZING LEADING TO ACCIDENTS
140	FLOATING SLAB FAILURE
141	DRAINAGE FAILURE LEADING TO ACCIDENTS

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE.

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

Rev.	Date	Description	Drwn.	Chkd.	Appd.
P06	16/02/2021	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P05	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 12 of 24

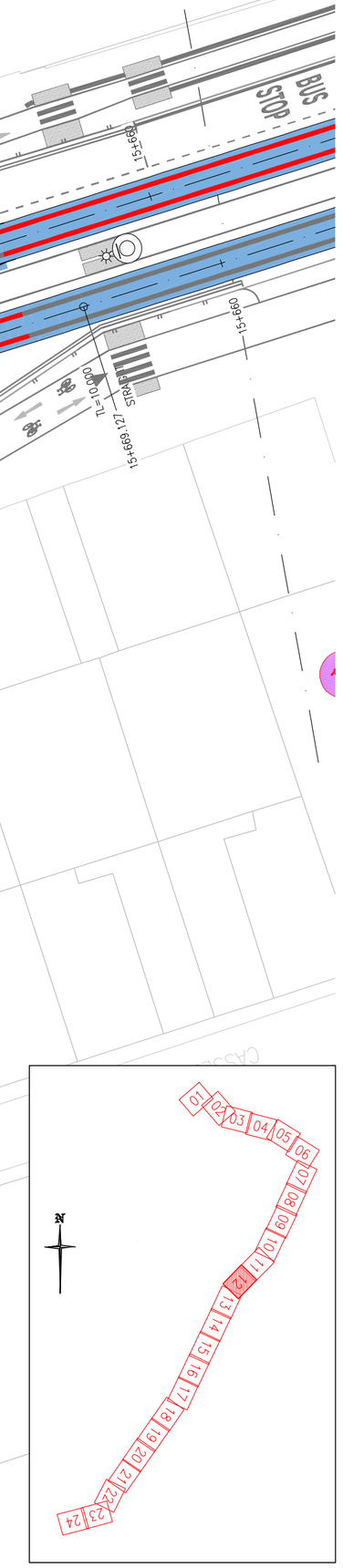
Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 16/02/2021	Date: 16/02/2021	Date: 16/02/2021

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2511

Suitability:	Revision:
S3	P06

TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE



Do not scale from this drawing.

TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE

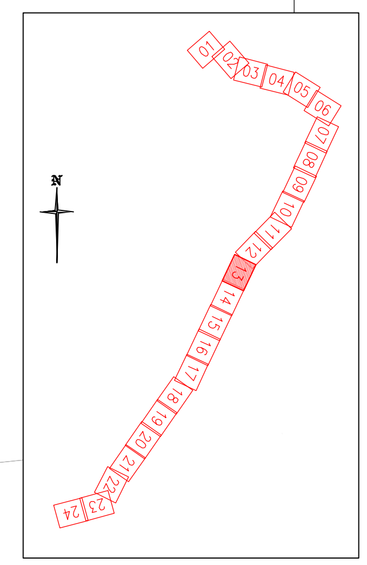
CONTINUED ON SHEET 12
CONTINUED ON SHEET 14

CROWN STREET
TURN LEFT
BANKS
STOP
MANDERSTON STREET
PICARDY PLACE
OUTBOUND TRACK
INBOUND TRACK
NEWHAVEN
SGN 500 ø GAS MAIN
BUS STOP
STOP
TURN LEFT
CASSELBANK STREET
Surgery
Church
Hall
Hall

64 69 70 71 72 73 74 75 76 77 78 79 10 11

P05 P06 FOW-16-O-S FOW-16-O-C FOW-16-I-C FOW-16-I-S B-14 D-72 D-73 D-74

15+660 15+640 15+620 15+600 15+580 15+560 15+540 15+520 15+500



NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE).
2– VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN–SEF–18X–15–DR–Z–0201 TO ETYN–SEF–18X–15–DR–Z–0239.
3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- TRACK DRAINAGE
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- L.P. LOW POINT
- H.P. HIGH POINT
- GRADIENT
- GRASSCRETE DRAINAGE
- LOW SLOPE SECTIONS
- OLE POLE
- RAIL BOND
- TRACK BOND
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- FLOATING SLAB DRAINAGE
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- NO CROSS SLOPE SECTIONS
- VLD CONNECTION BOX

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISK AND INFORMATION.

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REF. NAME

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76 SLAB OVER 275KV CABLES
82 RESTRICTED DEPTH (TOWER PLACE BRIDGE)
84 RESTRICTED DEPTH (VICTORIA QUAY BRIDGE)
100A TRACKWORKS LOSS OF RAIL BONDING
101B TRACKWORKS WATER AND DEBRIS INFILTRATION IN RAIL FIXATION
102A TRACKWORKS CONCRETE DEGRADATION
103A TRACKWORKS CONCRETE CRACKS
104 TRACKWORKS ROLLING STOCK INTERFACE
114 SPEN 275KV
139 FREEZING LEADING TO ACCIDENTS
140 FLOATING SLAB FAILURE
141 DRAINAGE FAILURE LEADING TO ACCIDENTS

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE.

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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P06	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P05	28/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

EDINBVRGH
THE CITY OF EDINBURGH COUNCIL

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SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

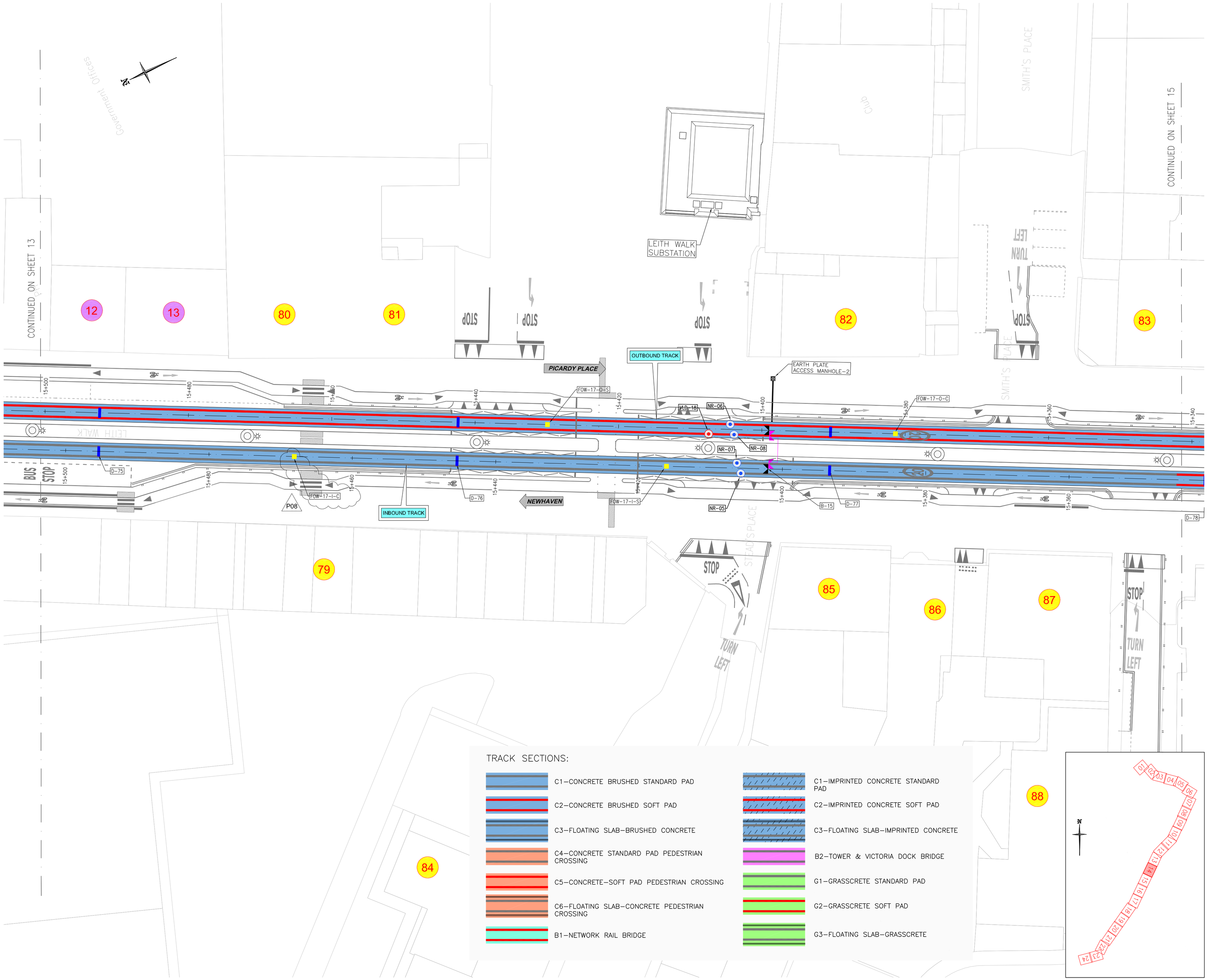
Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 13 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2512

Suitability:	Revision:
S3	P06



Do not scale from this drawing.

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LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- FLOATING SLAB DRAINAGE
- H.P. HIGH POINT
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRASSCRETE DRAINAGE
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
1— FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN—SEF—XXX—01—DR—Z—0020 (OLE PACKAGE).
2— VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN—SEF—18X—15—DR—Z—0201 TO ETYN—SEF—18X—15—DR—Z—0239.
3— PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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Rev.	Date	Description	Drwn.	Chkd.	Appd.
P08	14/12/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P07	26/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 14 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 14/12/2020	Date: 14/12/2020	Date: 14/12/2020

Project Originator Volume Location Type Role Number
ETYN—SEF—XXX—12—DR—H—2513

Suitability:	Revision:
S3	P08

Do not scale from this drawing.

EDINBVRGH
THE CITY OF EDINBURGH COUNCIL

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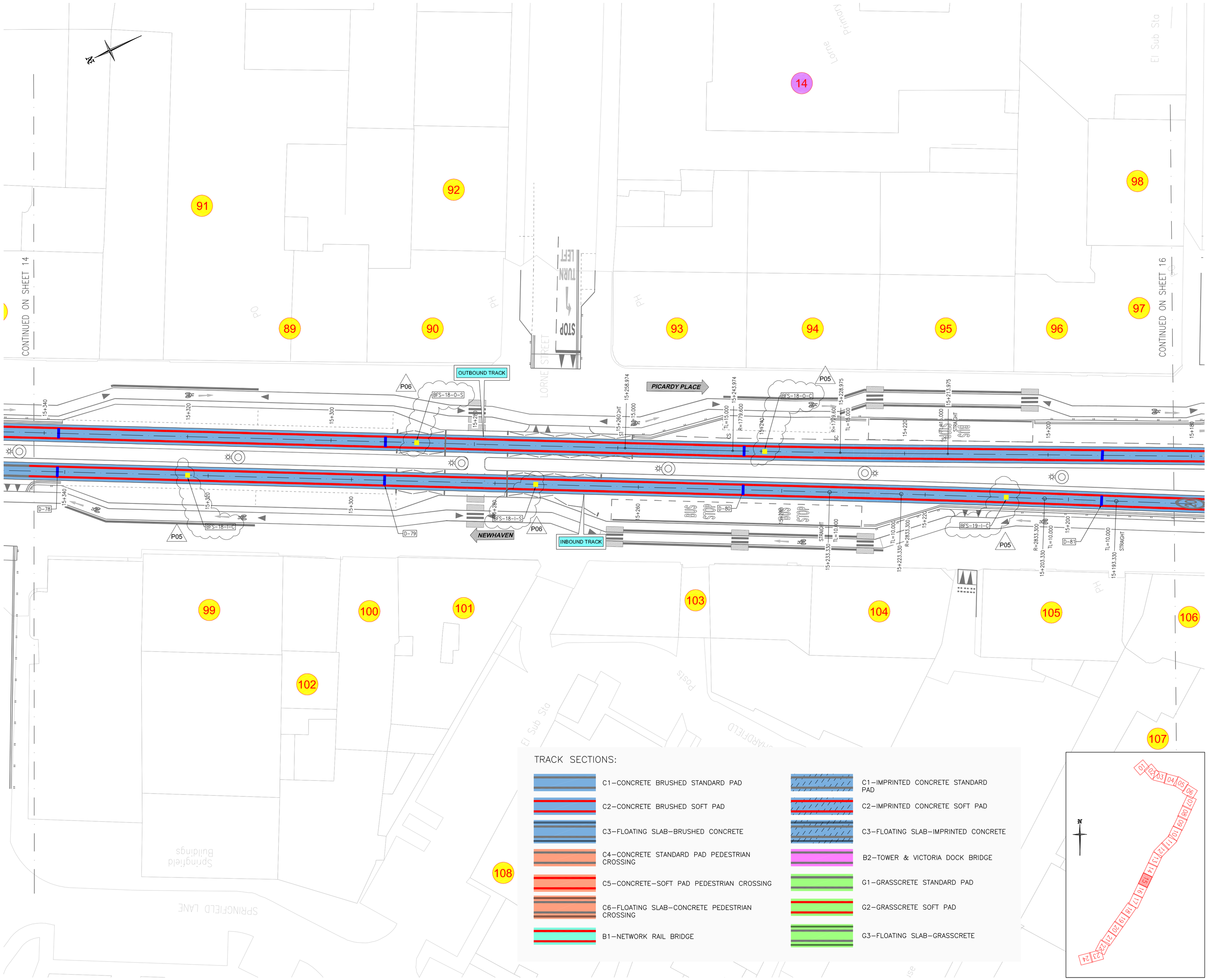

TRACK SECTIONS:

- C1—CONCRETE BRUSHED STANDARD PAD
- C2—CONCRETE BRUSHED SOFT PAD
- C3—FLOATING SLAB—BRUSHED CONCRETE
- C4—CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5—CONCRETE—SOFT PAD PEDESTRIAN CROSSING
- C6—FLOATING SLAB—CONCRETE PEDESTRIAN CROSSING
- B1—NETWORK RAIL BRIDGE
- C1—IMPRINTED CONCRETE STANDARD PAD
- C2—IMPRINTED CONCRETE SOFT PAD
- C3—FLOATING SLAB—IMPRINTED CONCRETE
- B2—TOWER & VICTORIA DOCK BRIDGE
- G1—GRASSCRETE STANDARD PAD
- G2—GRASSCRETE SOFT PAD
- G3—FLOATING SLAB—GRASSCRETE

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- FLOATING SLAB DRAINAGE
- H.P. HIGH POINT
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRASSCRETE DRAINAGE
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- VLD CONNECTION BOX

NOTE:
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SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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103A	TRACKWORKS CONCRETE CRACKS
104	TRACKWORKS ROLLING STOCK INTERFACE
114	SPEN 275KV
139	FREEZING LEADING TO ACCIDENTS
140	FLOATING SLAB FAILURE
141	DRAINAGE FAILURE LEADING TO ACCIDENTS

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P06	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P05	28/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 15 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project Originator Volume Location Type Role Number

ETYN—SEF—XXX—12—DR—H—2514

Suitability:	Revision:
S3	P06

Do not scale from this drawing.

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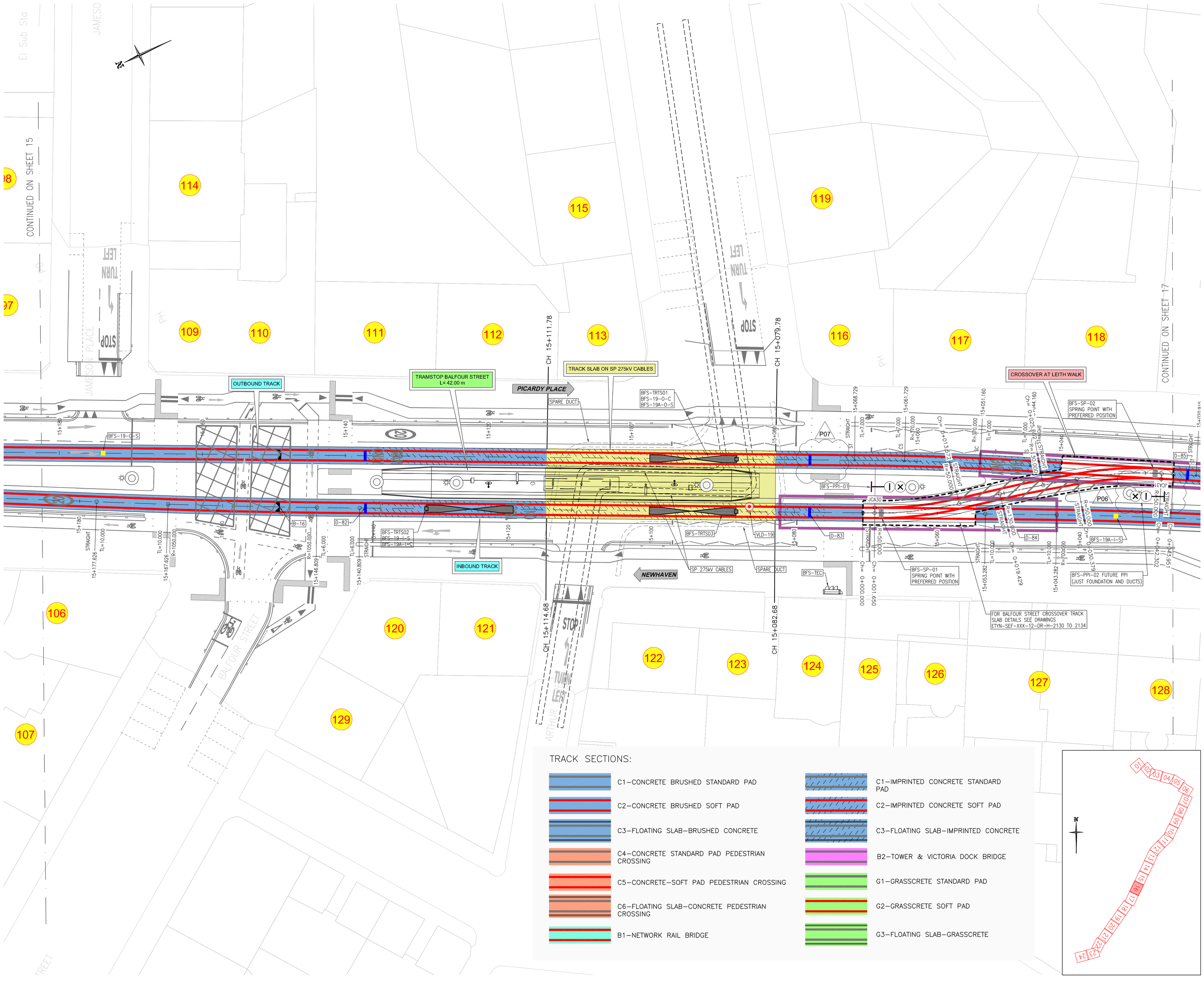

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- H.P. HIGH POINT
- FLOATING SLAB DRAINAGE
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRASSCRETE DRAINAGE
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
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3- PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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TRACK SECTIONS:

- C1-CONCRETE BRUSHED STANDARD PAD
- C1-IMPRINTED CONCRETE STANDARD PAD
- C2-CONCRETE BRUSHED SOFT PAD
- C2-IMPRINTED CONCRETE SOFT PAD
- C3-FLOATING SLAB-BRUSHED CONCRETE
- C3-FLOATING SLAB-IMPRINTED CONCRETE
- C4-CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- B2-TOWER & VICTORIA DOCK BRIDGE
- C5-CONCRETE-SOFT PAD PEDESTRIAN CROSSING
- G1-GRASSCRETE STANDARD PAD
- C6-FLOATING SLAB-CONCRETE PEDESTRIAN CROSSING
- G2-GRASSCRETE SOFT PAD
- B1-NETWORK RAIL BRIDGE
- G3-FLOATING SLAB-GRASSCRETE

Rev.	Date	Description	Drwn.	Chkd.	Appd.
P07	26/01/2021	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P06	14/12/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

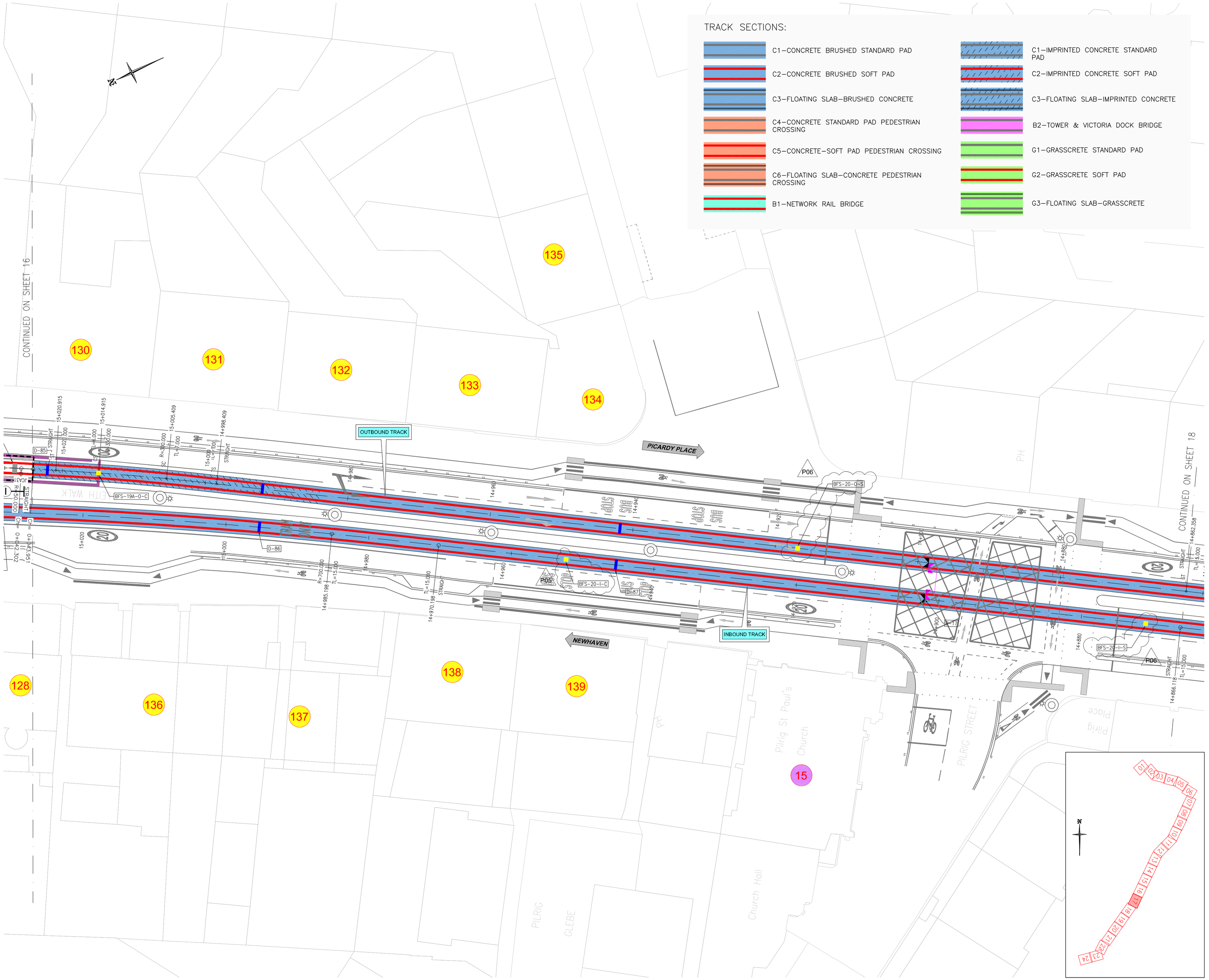
Drawing Title:
SECTION YORK PLACE - OCEAN TERMINAL
TRACKWORKS LAYOUT

Sheet 16 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 26/01/2021	Date: 26/01/2021	Date: 26/01/2021

Project	Originator	Volume	Location	Type	Role	Number
ETYN	SEF	XXX	12	DR	H	2515

Suitability:	Revision:
S3	P07



Do not scale from this drawing.

THE CITY OF EDINBURGH COUNCIL

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LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
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- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE).
2– VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN–SEF–18X–15–DR–Z–0201 TO ETYN–SEF–18X–15–DR–Z–0239.
3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISK AND INFORMATION.

IDENTIFIED RISK ARE NOTE IN ETYN–SEF–XXX–XX–HS–Z–001. RISK REGISTER. REFER TO RISK REGISTER FOR MITIGATION MEASURES. RISKS ASSOCIATE WITH THIS WORKS ELEMENT ARE AS FOLLOWS

REF. NAME

35 SI EXISTING GROUND
76 SLAB OVER 275KV CABLES
82 RESTRICTED DEPTH (TOWER PLACE BRIDGE)
84 RESTRICTED DEPTH (VICTORIA QUAY BRIDGE)
100A TRACKWORKS LOSS OF RAIL BONDING
101B TRACKWORKS WATER AND DEBRIS INFILTRATION IN RAIL FIXATION
102A TRACKWORKS CONCRETE DEGRADATION
103A TRACKWORKS CONCRETE CRACKS
104 TRACKWORKS ROLLING STOCK INTERFACE
114 SPEN 275KV
139 FREEZING LEADING TO ACCIDENTS
140 FLOATING SLAB FAILURE
141 DRAINAGE FAILURE LEADING TO ACCIDENTS

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE.

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

Rev.	Date	Description	Drwn.	Chkd.	Appd.
P06	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P05	28/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:

EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:

SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 17 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project Originator Volume Location Type Role Number

ETYN–SEF–XXX–12–DR–H–2516

Suitability:	Revision:
S3	P06

Do not scale from this drawing.

TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE

PICARDY PLACE

OUTBOUND TRACK

INBOUND TRACK

NEWHAVEN

Bank

Cirington Place

Albert Place

MIDDLEFIELD

CONTINUED ON SHEET 19

CONTINUED ON SHEET 17

STOP!

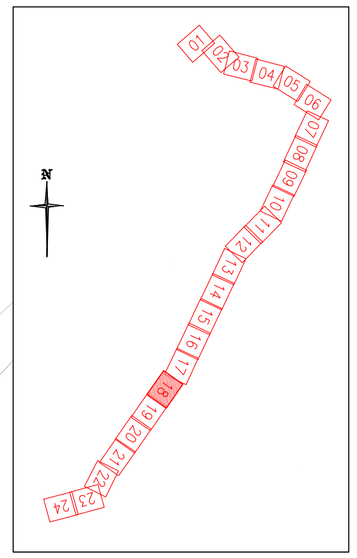
TURN LEFT

P05 P06 MDR-21-O-C MDR-21-O-S MDR-21-I-C MDR-21-I-S D-88 D-89 D-90 BF-420-O-C

STRAIGHT TL=15.000 R=1500.000 TS SC CS

14+862.358 14+847.358 14+866.118 14+851.118 14+719.426 14+704.426 14+723.187 14+708.187

14+800 14+820 14+840 14+860 14+780 14+760 14+740 14+720 14+700



LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- FLOATING SLAB DRAINAGE
- H.P. HIGH POINT
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRASSCRETE DRAINAGE
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
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SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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103A	TRACKWORKS CONCRETE CRACKS
104	TRACKWORKS ROLLING STOCK INTERFACE
114	SPEN 275KV
139	FREEZING LEADING TO ACCIDENTS
140	FLOATING SLAB FAILURE
141	DRAINAGE FAILURE LEADING TO ACCIDENTS

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P06	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P05	28/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 18 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2517

Suitability: S3
Revision: P06

Do not scale from this drawing.

TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE

CONTINUED ON SHEET 18

CONTINUED ON SHEET 20

NETWORK RAIL BRIDGE

OUTBOUND TRACK

INBOUND TRACK

PICARDY PLACE

NEWHAVEN

RUN ON SLAB

BUS STOP

STOP

CH 14+669.70

CH 14+649.72

CH 14+672.84

CH 14+652.88

P07

P06

140

16

D-91

B-18

D-92

MDR-22-I-C

D-93

MDR-22-D-S

MDR-22-I-S

MDR-23-I-C

D-94

SHRUB PLACE LANE

MCDONALD ROAD

Albert Place

Croall Place

Bonk

Brunswick

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- TRACK DRAINAGE
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- L.P. LOW POINT
- H.P. HIGH POINT
- GRADIENT
- GRASSCRETE DRAINAGE
- LOW SLOPE SECTIONS
- OLE POLE
- RAIL BOND
- TRACK BOND
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- FLOATING SLAB DRAINAGE
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- NO CROSS SLOPE SECTIONS
- VLD CONNECTION BOX

NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE).
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SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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114 SPEN 275KV
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140 FLOATING SLAB FAILURE
141 DRAINAGE FAILURE LEADING TO ACCIDENTS

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P07	26/01/2021	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P06	14/12/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	JFG	LQB

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 19 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 26/01/2021	Date: 26/01/2021	Date: 26/01/2021

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2518

Suitability:	Revision:
S3	P07

Do not scale from this drawing.

TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE

CONTINUED ON SHEET 19

CONTINUED ON SHEET 21

TRAMSTOP MC DONALD ROAD
L= 42.00 m

PICARDY PLACE

OUTBOUND TRACK

INBOUND TRACK

NEWHAVEN

MDR-TRTS01
MDR-23-O-C
MDR-23A-O-S

MDR-TRTS02
MDR-23-I-S
MDR-23A-I-C

MDR-22-O-C
MDR-23-O-S

MDR-TEC

MDR-23A-O-C

MDR-23A-I-S

MDR-24-I-C

VLD-20

P07

P06

D-94

D-95

D-96

D-97

B-19

Elm Row

Haddington Place

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- FLOATING SLAB DRAINAGE
- H.P. HIGH POINT
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRASSCRETE DRAINAGE
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
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3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

P06

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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103A TRACKWORKS CONCRETE CRACKS
104 TRACKWORKS ROLLING STOCK INTERFACE
114 SPEN 275KV
139 FREEZING LEADING TO ACCIDENTS
140 FLOATING SLAB FAILURE
141 DRAINAGE FAILURE LEADING TO ACCIDENTS

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE.

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P07	26/01/2021	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P06	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL
TRACKWORKS LAYOUT

Sheet 20 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 26/01/2021	Date: 26/01/2021	Date: 26/01/2021

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2519

Suitability:	Revision:
S3	P07

17

Do not scale from this drawing.

TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
- C6–FLOATING SLAB–CONCRETE PEDESTRIAN CROSSING
- B1–NETWORK RAIL BRIDGE
- C1–IMPRINTED CONCRETE STANDARD PAD
- C2–IMPRINTED CONCRETE SOFT PAD
- C3–FLOATING SLAB–IMPRINTED CONCRETE
- B2–TOWER & VICTORIA DOCK BRIDGE
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE

CONTINUED ON SHEET 20

CONTINUED ON SHEET 22

PICARDY PLACE

OUTBOUND TRACK

INBOUND TRACK

NEWHAVEN

ANNANDALE STREET

Elm Row

Haddington Place

Gayfield Place

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- TRACK DRAINAGE
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- L.P. LOW POINT
- H.P. HIGH POINT
- GRADIENT
- GRASSCRETE DRAINAGE
- LOW SLOPE SECTIONS
- OLE POLE
- RAIL BOND
- TRACK BOND
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- FLOATING SLAB DRAINAGE
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- NO CROSS SLOPE SECTIONS
- VLD CONNECTION BOX

NOTE:
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SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

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P04	16/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

EDINBVRGH
THE CITY OF EDINBURGH COUNCIL

SFN Sacyr • Farrans • Neopul

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

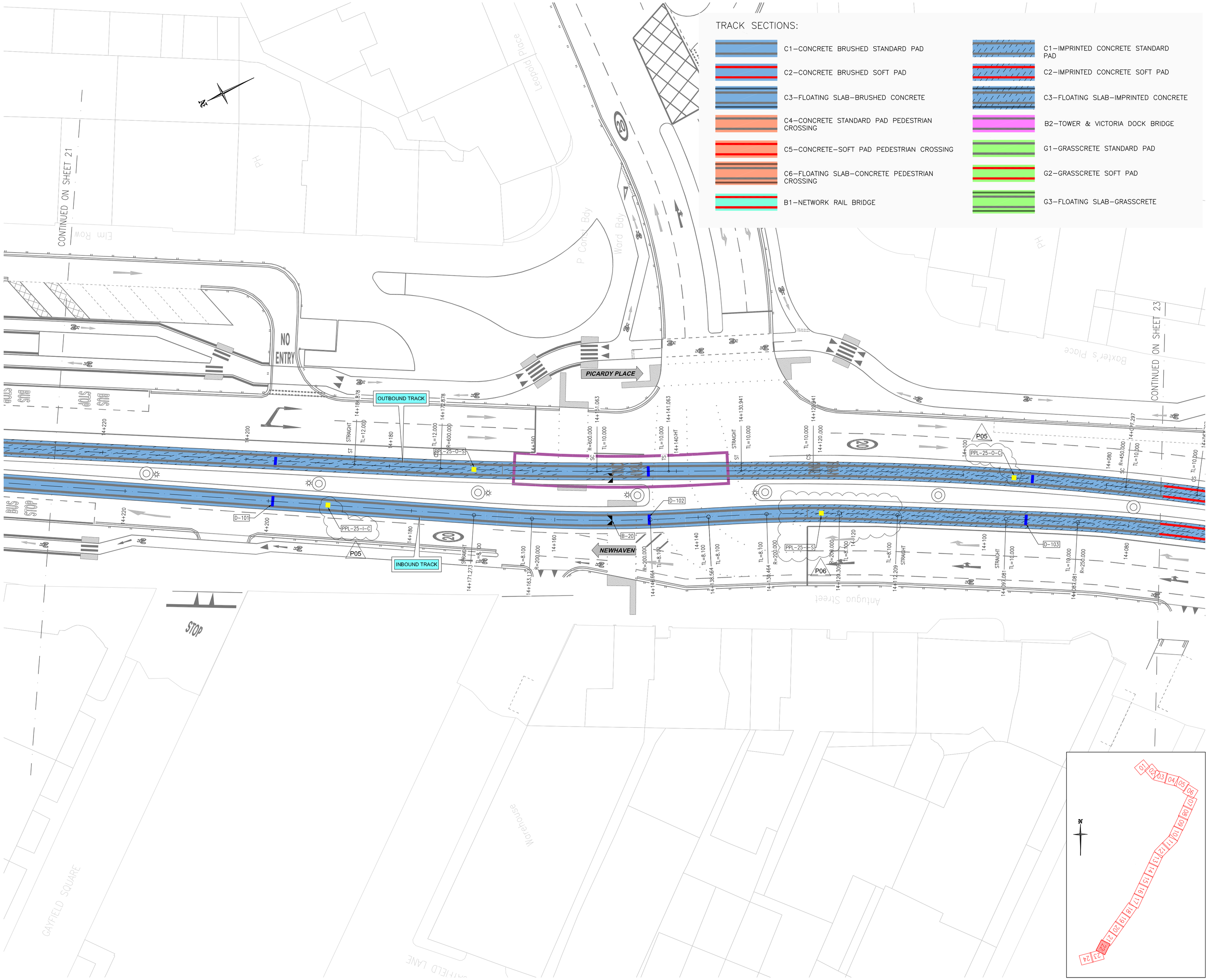
Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL
TRACKWORKS LAYOUT

Sheet 21 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2520

Suitability:	Revision:
S3	P05



Do not scale from this drawing.

EDINBVRGH
THE CITY OF EDINBURGH COUNCIL

SFN
Sacyr • Farrans • Neopul

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
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- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

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SENER FAIRHURST

Project Title:
EDINBURGH TRAM
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TRACKWORKS LAYOUT

Sheet 22 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 07/01/2021	Date: 07/01/2021	Date: 07/01/2021

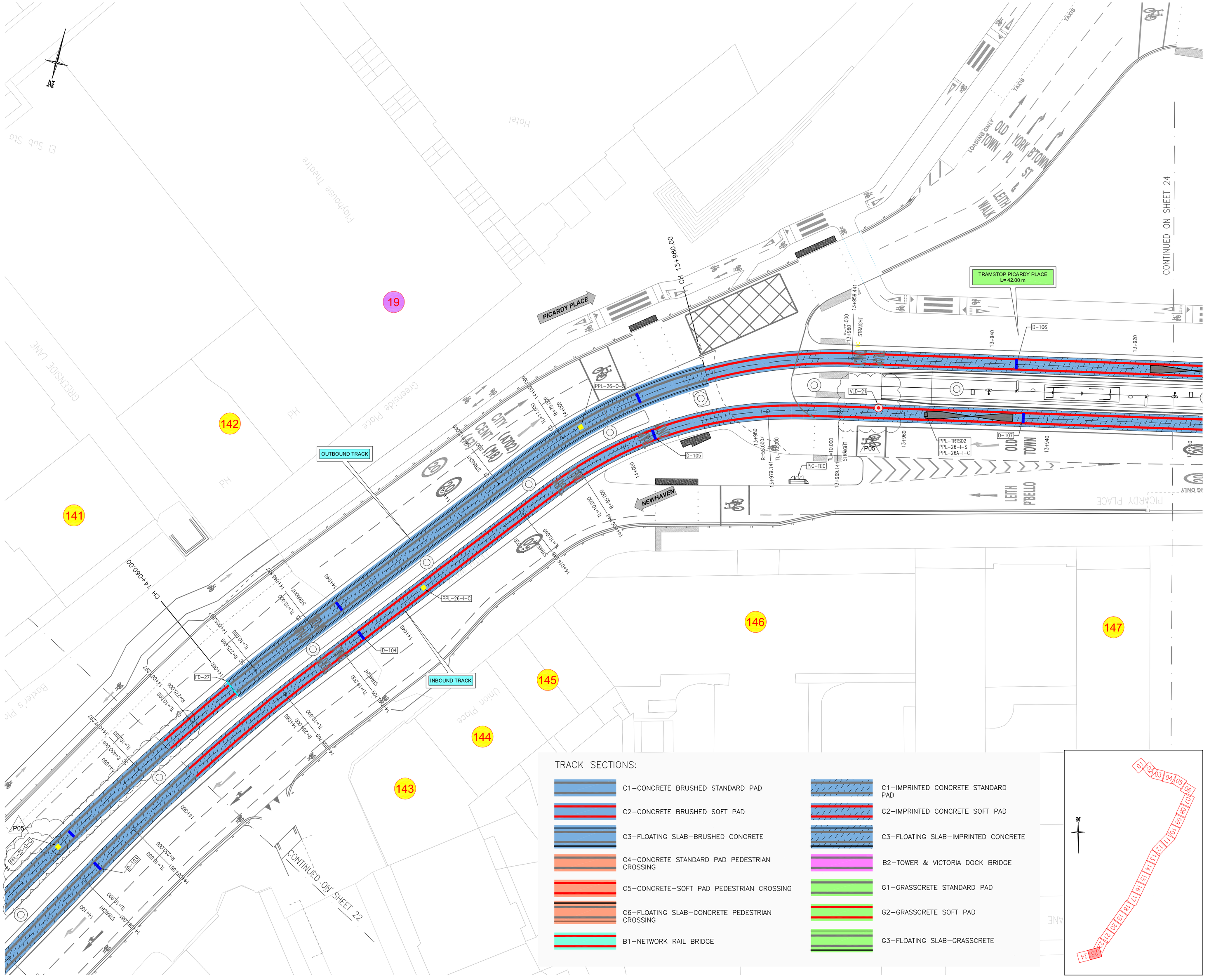
Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2521

Suitability:	Revision:
S3	P06

Do not scale from this drawing.

EDINBVRGH
THE CITY OF EDINBURGH COUNCIL

SFN
Sacyr • Farrans • Neopul



TRACK SECTIONS:

- C1—CONCRETE BRUSHED STANDARD PAD
- C2—CONCRETE BRUSHED SOFT PAD
- C3—FLOATING SLAB—BRUSHED CONCRETE
- C4—CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5—CONCRETE—SOFT PAD PEDESTRIAN CROSSING
- C6—FLOATING SLAB—CONCRETE PEDESTRIAN CROSSING
- B1—NETWORK RAIL BRIDGE
- C1—IMPRINTED CONCRETE STANDARD PAD
- C2—IMPRINTED CONCRETE SOFT PAD
- C3—FLOATING SLAB—IMPRINTED CONCRETE
- B2—TOWER & VICTORIA DOCK BRIDGE
- G1—GRASSCRETE STANDARD PAD
- G2—GRASSCRETE SOFT PAD
- G3—FLOATING SLAB—GRASSCRETE

LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- H.P. HIGH POINT
- FLOATING SLAB DRAINAGE
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRASSCRETE DRAINAGE
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
1— FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN—SEF—XXX—01—DR—Z—0020 (OLE PACKAGE).
2— VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN—SEF—18X—15—DR—Z—0201 TO ETYN—SEF—18X—15—DR—Z—0239.
3— PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISK AND INFORMATION.

IDENTIFIED RISK ARE NOTE IN ETYN—SEF—XXX—XX—HS—Z—001. RISK REGISTER. REFER TO RISK REGISTER FOR MITIGATION MEASURES. RISKS ASSOCIATE WITH THIS WORKS ELEMENT ARE AS FOLLOWS

REF.	NAME
35	SI EXISTING GROUND
76	SLAB OVER 275KV CABLES
82	RESTRICTED DEPTH (TOWER PLACE BRIDGE)
84	RESTRICTED DEPTH (VICTORIA QUAY BRIDGE)
100A	TRACKWORKS LOSS OF RAIL BONDING
101B	TRACKWORKS WATER AND DEBRIS INFILTRATION IN RAIL FIXATION
102A	TRACKWORKS CONCRETE DEGRADATION
103A	TRACKWORKS CONCRETE CRACKS
104	TRACKWORKS ROLLING STOCK INTERFACE
114	SPEN 275KV
139	FREEZING LEADING TO ACCIDENTS
140	FLOATING SLAB FAILURE
141	DRAINAGE FAILURE LEADING TO ACCIDENTS

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE.

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

Rev.	Date	Description	Drwn.	Chkd.	Appd.
P05	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P04	16/10/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL
TRACKWORKS LAYOUT

Sheet 23 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 18/11/2020	Date: 18/11/2020	Date: 18/11/2020

Project Originator Volume Location Type Role Number
ETYN—SEF—XXX—12—DR—H—2522

Suitability:	Revision:
S3	P05

Do not scale from this drawing.

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LEGEND:

- IMU LOOP
- TRACK CIRCUIT
- IMU ANTENNA
- RAIL BOND
- TRACK DRAINAGE
- TRACK BOND
- FLANGEWAY DRAIN
- NEGATIVE RETURN CONNECTION BOX
- CONECTION TO STRAY CURRENTE COLLECTOR SYSTEM OF PHASE 1
- L.P. LOW POINT
- H.P. HIGH POINT
- FLOATING SLAB DRAINAGE
- GRADIENT
- SENSITIVE BUILDINGS (SINGULAR BUILDINGS)
- GRASSCRETE DRAINAGE
- SENSITIVE BUILDINGS (RESIDENTIAL BUILDINGS)
- LOW SLOPE SECTIONS
- NO CROSS SLOPE SECTIONS
- OLE POLE
- VLD CONNECTION BOX

NOTE:
1– FOR CONNECTION DETAILS OF RAIL BONDS, SEE DRAWING: ETYN–SEF–XXX–01–DR–Z–0020 (OLE PACKAGE).
2– VLD CONNECTION BOXES ARE TO BE PLACED ACCORDING TO THE FINAL LOCATION OF VLD PRESENTED IN DRAWINGS ETYN–SEF–18X–15–DR–Z–0201 TO ETYN–SEF–18X–15–DR–Z–0239.
3– PEDESTRIAN CROSSINGS SHALL BE FINISHED WITH BRUSHED CONCRETE.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISK AND INFORMATION.

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REF.	NAME
35	SI EXISTING GROUND
76	SLAB OVER 275KV CABLES
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104	TRACKWORKS ROLLING STOCK INTERFACE
114	SPEN 275KV
139	FREEZING LEADING TO ACCIDENTS
140	FLOATING SLAB FAILURE
141	DRAINAGE FAILURE LEADING TO ACCIDENTS

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE.

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

Rev.	Date	Description	Drwn.	Chkd.	Appd.
P06	26/01/2021	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P05	18/11/2020	MDU COMMENTS INCLUDED	UPL	AFLL	LQB
P01	17/04/2020	FIRST ISSUE	UPL	IFG	LQB

SENER FAIRHURST

Project Title:
EDINBURGH TRAM
YORK PLACE TO NEWHAVEN
TRACKWORKS

Drawing Title:
SECTION YORK PLACE – OCEAN TERMINAL TRACKWORKS LAYOUT

Sheet 24 of 24

Scale at A1:	Status:	
1:250	FOR COMMENTS AND REVIEW	
Drawn: UPL	Checked: AFLL	Approved: LQB
Date: 26/01/2021	Date: 26/01/2021	Date: 26/01/2021

Project Originator Volume Location Type Role Number
ETYN–SEF–XXX–12–DR–H–2523

Suitability: S3
Revision: P06

TRAMSTOP PICARDY PLACE
L= 42.00 m

PPL–TRTS01
PPL–26–0–C
PPL–26A–0–S

6M. TRACK SLAB CENTERED ON EXISTING MANHOLE
CONTRACTION JOINT 1 IN CHAINAGE 13+859.089
CONTRACTION JOINT 2 IN CHAINAGE 13+865.089

OUTBOUND TRACK

EXISTING MANHOLE IN CHAINAGE 13+862.089

INBOUND TRACK

PPL–26A–0–C

PPL–26A–I–S

H.P.

P05

P06

B–21

D–108

D–109

AHEAD ONLY

NEWHAVEN

TRAM ONLY

BUS STOP

EXISTING TRTS AT THIS LOCATION TO BE MAINTAINED

TIE–IN OUTBOUND
CH 13+763.00

TIE–IN INBOUND
CH 13+838.00

THIS DETECTOR TO BE REPLACED IN THE SAME POSITION AS PART OF THE CONSTRUCTION WORKS

POINTS CONTROL CABINET

CONTINUED ON SHEET 23

TRACK SECTIONS:

- C1–CONCRETE BRUSHED STANDARD PAD
- C2–CONCRETE BRUSHED SOFT PAD
- C3–FLOATING SLAB–BRUSHED CONCRETE
- C4–CONCRETE STANDARD PAD PEDESTRIAN CROSSING
- C5–CONCRETE–SOFT PAD PEDESTRIAN CROSSING
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- C3–FLOATING SLAB–IMPRINTED CONCRETE
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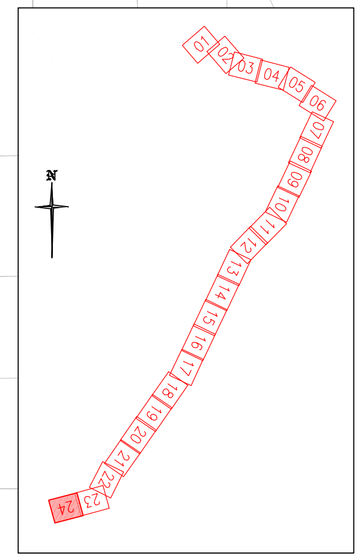
- G1–GRASSCRETE STANDARD PAD
- G2–GRASSCRETE SOFT PAD
- G3–FLOATING SLAB–GRASSCRETE



Appendix 4 – Structure borne noise levels

Structure-borne assessment

Receptor	Description	Chainage	Side	Distance (m)	Use	StrBne (near track dBA,)	far StrBne (ther track dBA,)
1	Residential buildings	18+370	Outbound	5	Residential	4.6	3.6
2	Residential buildings	18+340	Outbound	5	Residential	5.6	4.4
3	Residential buildings	18+320	Inbound	17	Residential	3.7	2.9
4	Residential building	16+925	Inbound	5	Residential	31.7	22.2
5	Residential building	16+951	Inbound	19	Residential	14.7	11.1
6	Services "GAC Services UK" + Residential building	16+910	Inbound	5	Residential + services	31.9	21.4
7	Residential building	16+890	Inbound	6	Residential	29.9	17.2
8	Residential building	16+880	Inbound	26	Residential	0.8	1.2
9	Residential building	16+800	Outbound	31	Residential	3.1	1.9
10	Business establishments + residential buildings	16+830	Inbound	6	Residential + services	30.1	17.8
11	Residential building	16+786	Inbound	11	Residential	19.2	10.5
12	Residential building	16+700	Inbound	10	Residential	23.2	23.9
13	Residential building	16+740	Outbound	11	Residential	20.7	21.6
14	Residential building	16+626	Inbound	12	Residential	29.3	29.3
15	Residential building	16+595	Inbound	8	Residential	37.6	35.3
16	Residential building	16+720	Inbound	33	Residential	4.3	2.7
17	Offices	16+436	Outbound	7	Services	29.7	21.6
18	Residential building	16+574	Inbound	27	Residential	7.4	18.8
19	"Post Office" + residential building	16+524	Inbound	6	Residential + services	31.1	31.9
20	Residential building	16+486	Inbound	6	Residential	31.2	32.1
21	Agency "IHJ Collection Ltd" + residential building	16+438	Inbound	5	Residential + services	32.3	24.4
22	Residential building	16+416	Outbound	6	Residential	31.3	23.3
23	Hotel "Wallace's Arthouse Scotland" + Denholm Assoc.	16+360	Outbound	5	Services	32.7	24.8
24	Residential building	16+307	Outbound	5	Residential	32.4	25.2
25	Residential building	16+289	Outbound	6	Residential	31.4	24.1
26	Residential building	16+428	Inbound	5	Services	32.3	24.4
27	Residential building	16+360	Inbound	5	Residential	32.4	24.8
28	Coffee "Printworks" + residential building	16+340	Inbound	5	Residential + services	32.4	25.0

Receptor	Description	Chainage	Side	Distance (m)	Use	StrBne (near track dBA,)	far StrBne (ther track dBA,)
29	Bar & kitchen "Rocksalt" + residential building	16+309	Inbound	14	Residential + services	20.2	15.3
30	Bar "Port O'Leith" + residential building	16+283	Inbound	15	Residential + services	19.4	14.8
31	Residential building	16+283	Inbound	26	Residential	10.3	7.4
32	"GPO Cae & Rooms Leith"	16+267	Outbound	7	Services	30.1	23.0
33	Residential building	16+260	Outbound	7	Residential	30.1	23.0
34	Residential building	16+267	Outbound	32	Residential	7.0	5.2
35	Residential building	16+260	Outbound	23	Residential	12.6	9.2
36	Residential building	16+260	Inbound	10	Residential	25.7	19.6
37	"Campbell Stafford Lettings" + residential building	16+240	Inbound	9	Residential + services	27.3	20.9
38	Residential building	16+220	Inbound	9	Residential	27.4	21.1
39	Residential building	16+215	Inbound	9	Residential	27.4	21.1
40	Architect "Konishi Gaffney" + residential building	16+203	Inbound	9	Residential + services	27.4	21.2
41	Residentials buildings	16+147	Inbound	5	Residential	32.6	26.1
42	Business establishments + residential buildings	16+120	Inbound	5	Residential + services	32.6	26.3
43	Residential building	16+199	Outbound	5	Residential	32.5	25.8
44	Restaurant "The Compass" + residential building	16+158	Outbound	5	Services	32.6	26.1
45	Residential building	16+158	Outbound	14	Residential	21.7	17.1
46	Residential building	16+143	Outbound	5	Residential	32.6	26.1
47	Residential building	16+120	Outbound	5	Residential	32.6	26.3
48	Film production "LS Production" + residential building	16+100	Outbound	5	Residential + services	32.6	26.4
49	Residential building	16+020	Outbound	5	Residential	32.7	26.9
50	Residential building	15+973	Outbound	5	Residential	32.7	36.6
51	Housing Assoc. Port of Leith	16+060	Inbound	5	Services	32.6	26.6
52	Residential building	16+040	Inbound	6	Residential	31.8	25.9

Receptor	Description	Chainage	Side	Distance (m)	Use	StrBne (near track dBA,)	far StrBne (ther track dBA,)
53	Residential building	16+030	Inbound	6	Residential	31.8	25.9
54	Residential building	16+020	Inbound	5	Residential	32.9	27.1
55	Residential building	16+000	Inbound	12	Residential	34.3	20.6
56	Residential building	15+940	Outbound	5	Residential	32.7	36.4
57	Residential building	15+920	Outbound	5	Residential	32.7	36.2
58	Residential building	15+910	Outbound	5	Residential	32.7	36.2
59	Residential building	15+904	Outbound	5	Residential	32.7	36.2
60	Residential building	15+900	Outbound	5	Residential	32.7	36.1
61	Bar "Smoke & Mirrors" + residential building	15+860	Outbound	5	Residential + services	32.7	36.0
62	Business establishments	15+766	Outbound	5	Services	32.6	24.6
63	Business establishments + residential buildings	15+744	Outbound	5	Residential + services	32.6	24.3
64	Bar "Mermaid Fish Bar" + residential building	15+660	Outbound	8	Residential + services	39.1	39.3
65	Residential building	15+779	Inbound	15	Residential + services	17.8	13.2
66	Business establishments + residential buildings	15+756	Inbound	30	Residential + services	10.0	8.1
67	Business establishments + residential buildings	15+739	Inbound	15	Residential + services	17.2	12.6
68	Business establishments + residential buildings	15+701	Inbound	10	Residential + services	36.0	16.8
69	Business establishments + residential buildings	15+650	Outbound	8	Residential + services	39.1	39.4
70	Business establishments + residential buildings	15+630	Outbound	8	Residential + services	39.1	39.4
71	"Papa John's Pizza" + residential buildings	15+610	Outbound	8	Residential + services	39.0	39.2
72	Business establishments + residential buildings	15+590	Outbound	8	Residential + services	38.9	38.8
73	Coffee "Praline" + residential building	15+580	Outbound	8	Residential + services	38.8	38.7

Receptor	Description	Chainage	Side	Distance (m)	Use	StrBne (near track dBA,)	far StrBne (ther track dBA,)
74	Business establishments + residential buildings	15+520	Outbound	8	Residential + services	38.5	38.0
75	Business establishments + residential buildings	15+610	Inbound	14	Residential + services	38.1	27.1
76	Residential building	15+610	Inbound	28	Residential	30.0	21.6
77	Business establishments + residential buildings	15+590	Inbound	13	Residential + services	38.8	27.0
78	Business establishments + residential buildings	15+570	Inbound	13	Residential + services	38.5	26.4
79	Business establishments + residential buildings	15+500	Inbound	13	Residential + services	38.0	24.7
80	Residential building	15+470	Outbound	7	Residential	40.2	39.5
81	Residential building	15+450	Outbound	7	Residential	40.1	39.6
82	Business establishments + residential buildings	15+390	Outbound	9	Residential + services	36.7	37.4
83	Business establishments + residential buildings	15+340	Outbound	9	Residential + services	36.9	30.1
84	Residential building	15+440	Inbound	40	Residential	20.3	12.4
85	Business establishments + residential buildings	15+390	Inbound	15	Residential + services	36.0	22.2
86	Business establishments + residential buildings	15+380	Inbound	17	Residential + services	33.7	20.3
87	Business establishments + residential buildings	15+360	Inbound	15	Residential + services	36.5	22.5
88	Residential building	15+360	Inbound	31	Residential	20.6	11.8
89	Business establishments + residential buildings	15+310	Outbound	9	Residential + services	37.1	30.8
90	Business establishments + residential buildings	15+290	Outbound	9	Residential + services	37.2	31.3

Receptor	Description	Chainage	Side	Distance (m)	Use	StrBne (near track dBA,)	far StrBne (ther track dBA,)
91	Residential building	15+320	Outbound	20	Residential	23.2	17.2
92	Residential building	15+290	Outbound	25	Residential	17.0	12.0
93	Business establishments + residential buildings	15+255	Outbound	10	Residential + services	36.2	30.8
94	Business establishments + residential buildings	15+236	Outbound	10	Residential + services	36.1	30.6
95	Business establishments + residential buildings	15+221	Outbound	10	Residential + services	36.0	30.5
96	Business establishments + residential buildings	15+200	Outbound	10	Residential + services	35.8	30.3
97	Business establishments + residential buildings	15+190	Outbound	10	Residential + services	35.7	30.3
98	Residential building	15+190	Outbound	28	Residential	13.6	10.4
99	Business establishments + residential buildings	15+320	Inbound	9	Services	37.0	30.5
100	Services building	15+300	Inbound	9	Services	37.2	31.0
101	Business establishments + residential buildings	15+280	Inbound	9	Residential + services	37.3	31.6
102	Residential building	15+305	Inbound	22	Residential	20.9	14.9
103	Business establishments + residential building	15+250	Inbound	9	Residential + services	37.3	31.8
104	Business establishments + residential building	15+220	Inbound	9	Residential + services	37.1	31.6
105	Business establishments + residential building	15+203	Inbound	9	Residential + services	37.0	31.5
106	Business establishments + residential building	15+190	Inbound	9	Residential + services	37.0	31.4
107	Residential building	15+180	Inbound	21	Residential	22.7	15.9
108	Residentials buildings	15+260	Outbound	30	Residential	11.5	9.0

Receptor	Description	Chainage	Side	Distance (m)	Use	StrBne (near track dBA,)	far StrBne (ther track dBA,)
109	Business establishments + residential building	15+160	Outbound	10	Residential + services	35.5	30.0
110	Business establishments + residential building	15+150	Outbound	10	Residential + services	35.5	30.0
111	Business establishments + residential building	15+140	Outbound	10	Residential + services	35.4	29.9
112	Business establishments + residential building	15+120	Outbound	10	Residential + services	35.3	29.7
113	Business establishments + residential building	15+120	Outbound	10	Residential + services	35.3	29.7
114	Residential building	15+160	Outbound	28	Residential	13.8	10.7
115	Residential building	15+120	Outbound	25	Residential	17.3	12.6
116	Restaurant "La Casa - Leith" + residential building	15+068	Outbound	9	Residential + services	36.3	30.5
117	Business establishments + residential building	15+051	Outbound	9	Residential + services	36.2	30.3
118	Business establishments + residential building	15+030	Outbound	9	Residential + services	36.1	30.2
119	Residential building	15+068	Outbound	26	Residential	16.4	12.5
120	Business establishments + residential building	15+130	Inbound	9	Residential + services	36.6	30.9
121	Business establishments + residential building	15+120	Inbound	9	Residential + services	36.6	30.8
122	Business establishments + residential building	15+100	Inbound	10	Residential + services	35.2	29.6
123	Business establishments + residential building	15+090	Inbound	10	Residential + services	35.1	29.5
124	Residential building	15+080	Inbound	11	Residential	33.8	28.4

Receptor	Description	Chainage	Side	Distance (m)	Use	StrBne (near track dBA,)	far StrBne (ther track dBA,)
125	Business establishments + residential building	15+070	Inbound	11	Residential + services	33.8	28.3
126	Business establishments + residential building	15+060	Inbound	11	Residential + services	33.7	28.2
127	Residential building	15+043	Inbound	11	Residential	33.6	28.1
128	Residential building	15+030	Inbound	11	Residential	33.5	28.0
129	Business establishments + residential building	15+146	Inbound	20	Residential + services	23.9	17.2
130	Pizza "La Favorita" + residential building	15+020	Outbound	10	Residential + services	34.7	29.1
131	Business establishments + residential building	15+000	Outbound	10	Residential + services	34.6	28.9
132	Business establishments + residential building	14+980	Outbound	10	Residential + services	34.4	28.8
133	Fast Food "Greggs" + residential building	14+960	Outbound	10	Residential + services	34.3	28.7
134	Business establishments + residential building	14+950	Outbound	10	Residential + services	34.3	28.6
135	Residential building	14+950	Outbound	28	Residential	15.3	12.9
136	Business establishments + residential building	15+010	Inbound	10	Residential + services	34.6	29.0
137	Business establishments + residential building	14+985	Inbound	10	Residential + services	34.5	28.8
138	Business establishments + residential building	14+970	Inbound	8	Residential + services	37.3	30.8
139	Business establishments + residential building	14+950	Inbound	8	Residential + services	37.2	30.7
140	Business establishments + residential buildings	14+660	Outbound	10	Residential + services	32.9	27.2

Receptor	Description	Chainage	Side	Distance (m)	Use	StrBne (near track dBA,)	far StrBne (ther track dBA,)
141	Hotel "Courtyard Edinburgh"	14+060	Outbound	17	Residential	13.8	24.2
142	Business establishments + residential building	14+040	Outbound	16	Residential + services	14.9	24.7
143	Business establishments + residential building	14+050	Inbound	12	Residential + services	33.6	13.8
144	Business establishments + residential building	14+040	Inbound	12	Residential + services	33.4	13.8
145	Restaurant "Giulianos" + residential building	14+030	Inbound	12	Residential + services	33.2	13.9
146	Hotel "Holiday Inn Express Edinburgh City Centre"	13+980	Inbound	12	Residential	32.4	27.1
147	Car rental "Hertz" +residential building	13+930	Inbound	17	Residential + services	26.5	22.6
148	Bank "Bank of Scotland" + residential building	13+905	Inbound	15	Residential + services	28.1	23.9
149	Hotel "The wine House Hotel 1821"	13+890	Inbound	15	Residential	28.0	23.8
150	Business establishments + residential building	13+886	Inbound	16	Residential + services	27.0	23.0
151	Restaurant "The Conan Doyle" + residential building	13+850	Outbound	8	Residential + services	36.8	30.0
152	Residential building	13+835	Outbound	10	Residential	33.7	27.9
153	Hotel "Indigo Edinburgh" + residential building	13+810	Outbound	10	Residential	33.7	27.9
154	Restaurant "Turquoise Thistle" + Hotel "Indigo"	13+795	Outbound	10	Residential + services	33.7	27.9
155	Residential building	13+785	Outbound	10	Residential	33.7	27.9
156	Hotel "Premier Inn Edinburgh City Centre"	13+780	Inbound	19	Residential	24.5	20.8

Receptor	Description	Chainage	Side	Distance (m)	Use	StrBne (near track dBA,)	far StrBne (ther track dBA,)
1	Leith Podiatry.	16+360	Inbound	34	Cultural	5.7	4.1
2	Kagyu-Samye-Dzong Buddhist temple.	16+360	Inbound	40	Cultural	3.9	3.1
3	Red Roof Studios.	16+290	Inbound	40	Cultural	4.3	3.6
4	Mackenzie School of English.	16+220	Outbound	11	Cultural	24.6	19.0
5	St Mary Star of the Sea church.	16+100	Inbound	6	Cultural	31.7	25.4
6	Saint James Scottish Episcopal Church.	16+060	Outbound	24	Cultural	13.9	10.0
7	Hair Transplant Edinburgh Dr. Panno.	15+958	Outbound	5	Cultural	32.9	36.7
8	South Leith Parish Church Hall.	15+940	Inbound	40	Cultural	25.9	5.6
9	Trinity House Maritime Museum.	15+940	Inbound	40	Cultural	25.9	5.6
10	South Leith Baptist Church.	15+660	Inbound	25	Cultural	31.3	22.9
11	Destiny Church Edinburgh.	15+630	Inbound	40	Cultural	27.3	20.9
12	MagiKats (Maths & English Tutoring)	15+490	Outbound	7	Cultural	40.2	39.4
13	The Edinburgh Remakery (education).	15+480	Outbound	7	Cultural	40.2	39.4
14	Lorne Primary School.	15+235	Outbound	40	Cultural	7.8	6.4
15	Pilrig St Paul's Church of Scotland.	14+920	Inbound	10	Cultural	34.1	28.4
16	McDonald Road Library.	14+558	Inbound	10	Cultural	32.7	27.0
17	Bellevue Medical Centre.	14+430	Inbound	40	Cultural	22.3	21.5
18	Edinburgh Christadelphian church.	14+271	Inbound	40	Cultural	21.7	20.4
19	Edinburgh Playhouse (concerts)	14+010	Outbound	18	Cultural	13.1	22.8
20	St Mary's Catholic Cathedral.	13+850	Outbound	30	Cultural	17.0	14.7
21	St Paul & St George church.	13+850	Inbound	10	Cultural	33.7	27.9

Trackform application

TRACK TYPE		Ch Outbound		Length (m)	Sensitive Receptors
INBOUND	OUTBOUND	Begin	End		
Soft Pad	Soft Pad	13763	13980	217	147 to 156, S20, S21
Soft Pad	Floating Slab	13980	14060	80	141 to 146, S19
Soft Pad	Soft Pad	14060	14072	12	
Standard Pad	Standard Pad	14072	14500	428	S17, S18 (both far)
Soft Pad	Soft Pad	14500	14600	100	S16, S17
Standard Pad	Standard Pad	14600	14650	50	
Soft Pad	Soft Pad	14650	14670	20	140
Standard Pad	Standard Pad	14670	14850	180	
Soft Pad	Soft Pad	14850	15340	490	89,90,92 to 99, 100 to 139, S14, S15
Standard Pad	Soft Pad	15340	15670	330	64,69 to 88,91, S10 to S13
Soft Pad	Floating Slab	15670	15727	57	68
Floating Slab	Floating Slab	15727	15833	106	62,63,65 to 67
Soft Pad	Floating Slab	15833	16010	177	50,55 to 61, S7 to S9
Floating Slab	Floating Slab	16010	16440	430	17,21 to 54, S1 to S6
Floating Slab	Soft Pad	16440	16560	120	19,20
Soft Pad	Standard Pad	16560	16620	60	15,18
Soft Pad	Soft Pad	16620	16636	16	14
Floating Slab	Soft Pad	16636	16705	69	12
Floating Slab	Floating Slab	16705	16728	23	12,13
Soft Pad	Floating Slab	16728	16761	33	13,16
Floating Slab	Floating Slab	16761	16967	206	4 to 11
Soft Pad	Soft Pad	16967	16973	6	
Standard Pad	Standard Pad	16973	17460	487	
Standard Pad	Standard Pad	17460	18295	835	
Soft Pad	Soft Pad	18295	18301	6	
Floating Slab	Floating Slab	18301	18424	123	1 to 3

VDV assessment

Chain.	Dist.Left (m)	VDV_Day ($m/s^{1.75}$)	VDV_Night ($m/s^{1.75}$)	Accel. (mm/s^2)	Dist.Right (m)	VDV_Day ($m/s^{1.75}$)	VDV_Night ($m/s^{1.75}$)	Accel. (mm/s^2)
13580	10	0.09	0.07	9.57	10	0.09	0.07	9.57
13600	10	0.09	0.07	9.57	10	0.09	0.07	9.57
13620	10	0.09	0.07	9.57	10	0.09	0.07	9.57
13640	10	0.09	0.07	9.57	10	0.09	0.07	9.57
13660	10	0.09	0.07	9.57	10	0.09	0.07	9.57
13680	10	0.09	0.07	9.57	10	0.09	0.07	9.57
13700	10	0.09	0.07	9.57	10	0.09	0.07	9.57
13720	10	0.09	0.07	9.57	10	0.09	0.07	9.57
13740	10	0.09	0.07	9.57	10	0.09	0.07	9.57
13+760	10	0.09	0.07	9.57	10	0.09	0.07	9.57
13+780	10	0.09	0.07	9.57	10	0.09	0.07	9.57
13+800	10	0.09	0.07	9.57	10	0.09	0.07	9.57
13+820	10	0.09	0.07	9.57	10	0.09	0.07	9.57
13+840	15	0.08	0.06	7.96	10	0.09	0.07	9.57
13+860	20	0.06	0.05	6.38	50	0.02	0.01	2.03
13+880	20	0.06	0.05	6.38	50	0.02	0.01	2.03
13+900	20	0.05	0.04	5.37	50	0.02	0.01	1.99
13+920	20	0.04	0.03	4.53	50	0.02	0.01	1.96
13+940	20	0.04	0.03	3.84	50	0.02	0.01	1.95
13+960	20	0.03	0.02	3.27	50	0.02	0.01	1.96
13+980	20	0.03	0.02	2.80	50	0.02	0.01	1.98
14+000	15	0.03	0.02	3.43	20	0.02	0.02	2.41
14+020	10	0.06	0.05	6.29	20	0.02	0.02	2.09
14+040	10	0.06	0.04	5.97	20	0.02	0.01	1.83
14+060	10	0.06	0.04	5.80	25	0.02	0.01	1.73
14+080	10	0.06	0.04	5.91	25	0.02	0.01	1.77
14+100	15	0.03	0.02	2.76	25	0.02	0.01	1.81
14+120	15	0.03	0.02	2.87	30	0.02	0.02	2.13
14+140	15	0.03	0.02	2.98	50	0.02	0.01	1.97
14+160	15	0.03	0.02	3.09	30	0.02	0.02	2.11
14+180	50	0.02	0.01	1.86	30	0.02	0.02	2.10
14+200	50	0.02	0.01	1.81	30	0.02	0.02	2.10
14+220	15	0.03	0.02	3.48	30	0.02	0.02	2.09
14+240	15	0.04	0.03	3.63	30	0.02	0.01	2.09
14+260	15	0.04	0.03	3.78	30	0.02	0.01	2.08
14+280	15	0.04	0.03	3.94	30	0.02	0.01	2.08
14+300	15	0.04	0.03	4.11	20	0.03	0.02	2.83
14+320	20	0.03	0.02	2.97	10	0.07	0.05	7.38
14+340	20	0.03	0.02	3.10	10	0.07	0.05	7.53
14+360	15	0.05	0.03	4.66	10	0.08	0.06	7.68
14+380	15	0.05	0.03	4.87	10	0.08	0.06	7.84
14+400	15	0.05	0.04	5.08	10	0.08	0.06	7.99
14+420	15	0.05	0.04	5.31	10	0.08	0.06	8.16
14+440	15	0.05	0.04	5.55	10	0.08	0.06	8.33
14+460	15	0.06	0.04	5.80	10	0.08	0.06	8.50
14+480	15	0.06	0.04	6.07	10	0.09	0.06	8.67
14+500	50	0.01	0.01	1.32	10	0.09	0.06	8.86
14+520	50	0.01	0.01	1.30	50	0.01	0.01	1.30
14+540	50	0.01	0.01	1.29	40	0.02	0.01	1.59
14+560	15	0.07	0.05	7.27	10	0.09	0.07	9.43
14+580	50	0.01	0.01	1.24	50	0.01	0.01	1.24
14+600	10	0.09	0.07	9.52	10	0.09	0.07	9.52
14+620	10	0.09	0.07	9.55	10	0.09	0.07	9.55
14+640	50	0.01	0.01	1.11	10	0.09	0.07	9.57
14+660	50	0.01	0.01	1.08	10	0.09	0.07	9.59
14+680	50	0.01	0.01	1.04	10	0.09	0.07	9.61
14+700	50	0.01	0.01	1.01	10	0.09	0.07	9.63
14+720	50	0.01	0.01	0.97	10	0.10	0.07	9.66
14+740	30	0.02	0.01	2.08	10	0.10	0.07	9.68
14+760	30	0.02	0.01	2.07	10	0.10	0.07	9.71
14+780	30	0.02	0.01	2.07	10	0.10	0.07	9.74
14+800	30	0.02	0.01	2.06	10	0.10	0.07	9.76
14+820	25	0.03	0.02	3.31	10	0.10	0.07	9.79
14+840	25	0.03	0.02	3.31	10	0.10	0.07	9.82
14+860	10	0.10	0.07	9.85	10	0.10	0.07	9.85
14+880	25	0.03	0.02	3.33	10	0.10	0.07	9.88
14+900	50	0.01	0.01	0.72	10	0.10	0.07	9.91
14+920	10	0.10	0.07	9.95	10	0.10	0.07	9.95

Chain.	Dist.Left (m)	VDV_Day ($m/s^{1.75}$)	VDV_Night ($m/s^{1.75}$)	Accel. (mm/s^2)	Dist.Right (m)	VDV_Day ($m/s^{1.75}$)	VDV_Night ($m/s^{1.75}$)	Accel. (mm/s^2)
14+940	10	0.10	0.07	9.98	10	0.10	0.07	9.98
14+960	10	0.10	0.07	10.02	10	0.10	0.07	10.02
14+980	10	0.10	0.07	10.05	10	0.10	0.07	10.05
15+000	10	0.10	0.07	10.09	10	0.10	0.07	10.09
15+020	20	0.05	0.04	5.56	10	0.10	0.07	10.13
15+040	20	0.05	0.04	5.57	10	0.10	0.07	10.17
15+060	15	0.08	0.06	7.84	10	0.10	0.07	10.21
15+080	10	0.10	0.07	10.25	10	0.10	0.07	10.25
15+100	10	0.10	0.07	10.29	10	0.10	0.07	10.29
15+120	10	0.10	0.07	10.34	10	0.10	0.07	10.34
15+140	10	0.10	0.07	10.38	10	0.10	0.07	10.38
15+160	10	0.10	0.07	10.43	10	0.10	0.07	10.43
15+180	10	0.10	0.08	10.48	10	0.10	0.08	10.48
15+200	10	0.10	0.08	10.53	10	0.10	0.08	10.53
15+220	10	0.10	0.08	10.58	10	0.10	0.08	10.58
15+240	10	0.10	0.08	10.63	10	0.10	0.08	10.63
15+260	10	0.11	0.08	10.69	10	0.11	0.08	10.69
15+280	10	0.10	0.08	10.54	10	0.10	0.08	10.54
15+300	10	0.10	0.07	10.29	10	0.10	0.07	10.29
15+320	10	0.10	0.07	10.05	10	0.10	0.07	10.05
15+340	10	0.10	0.07	9.82	10	0.10	0.07	9.82
15+360	10	0.09	0.07	9.61	10	0.09	0.07	9.61
15+380	10	0.09	0.07	9.42	10	0.09	0.07	9.42
15+400	10	0.09	0.07	9.24	10	0.09	0.07	9.24
15+420	10	0.09	0.07	9.06	5	0.14	0.11	14.68
15+440	10	0.09	0.06	8.90	5	0.15	0.11	14.76
15+460	10	0.09	0.06	8.75	5	0.15	0.11	14.84
15+480	10	0.08	0.06	8.61	5	0.15	0.11	14.92
15+500	10	0.08	0.06	8.48	5	0.15	0.11	15.00
15+520	10	0.08	0.06	8.35	5	0.15	0.11	15.09
15+540	10	0.08	0.06	8.23	5	0.15	0.11	15.18
15+560	10	0.08	0.06	8.12	5	0.15	0.11	15.27
15+580	10	0.08	0.06	8.01	5	0.15	0.11	15.35
15+600	10	0.08	0.06	7.90	5	0.15	0.11	15.45
15+620	20	0.04	0.03	4.03	5	0.15	0.11	15.54
15+640	20	0.04	0.03	4.02	5	0.15	0.11	15.54
15+660	20	0.04	0.03	4.01	5	0.15	0.11	15.54
15+680	20	0.04	0.03	4.00	5	0.15	0.11	15.54
15+700	25	0.04	0.03	4.41	5	0.15	0.11	15.54
15+720	20	0.04	0.03	4.00	5	0.15	0.11	15.55
15+740	25	0.04	0.03	4.34	5	0.15	0.11	15.55
15+760	30	0.05	0.04	4.97	5	0.15	0.11	15.55
15+780	5	0.15	0.11	15.56	5	0.15	0.11	15.56
15+800	0	0.15	0.11	15.56	5	0.15	0.11	15.56
15+820	0	0.15	0.11	15.56	5	0.15	0.11	15.56
15+840	40	0.05	0.04	5.03	5	0.15	0.11	15.57
15+860	50	0.05	0.04	5.29	5	0.15	0.11	15.57
15+880	50	0.06	0.04	5.73	5	0.15	0.11	15.58
15+900	50	0.06	0.04	6.18	5	0.15	0.11	15.58
15+920	50	0.07	0.05	6.64	5	0.15	0.11	15.59
15+940	40	0.06	0.04	5.97	5	0.15	0.11	15.59
15+960	50	0.08	0.05	7.62	5	0.15	0.11	15.60
15+980	50	0.08	0.06	8.14	5	0.15	0.11	15.61
16+000	15	0.06	0.04	6.27	5	0.15	0.11	15.55
16+020	5	0.15	0.11	15.49	5	0.15	0.11	15.49
16+040	10	0.09	0.07	9.51	5	0.15	0.11	15.43
16+060	5	0.15	0.11	15.38	5	0.15	0.11	15.38
16+080	5	0.15	0.11	15.32	5	0.15	0.11	15.32
16+100	5	0.15	0.11	15.26	5	0.15	0.11	15.26
16+120	5	0.15	0.11	15.21	5	0.15	0.11	15.21
16+140	5	0.15	0.11	15.15	5	0.15	0.11	15.15
16+160	5	0.15	0.11	15.09	5	0.15	0.11	15.09
16+180	10	0.09	0.06	8.89	5	0.15	0.11	15.04
16+200	10	0.09	0.06	8.80	5	0.15	0.11	14.98
16+220	10	0.09	0.06	8.72	5	0.15	0.11	14.93
16+240	10	0.09	0.06	8.64	5	0.15	0.11	14.87
16+260	10	0.08	0.06	8.56	5	0.15	0.11	14.82
16+280	10	0.08	0.06	8.48	5	0.15	0.11	14.76

Chain.	Dist.Left (m)	VDV_Day ($m/s^{1.75}$)	VDV_Night ($m/s^{1.75}$)	Accel. (mm/s^2)	Dist.Right (m)	VDV_Day ($m/s^{1.75}$)	VDV_Night ($m/s^{1.75}$)	Accel. (mm/s^2)
16+300	10	0.08	0.06	8.40	5	0.15	0.11	14.71
16+320	5	0.14	0.11	14.66	5	0.14	0.11	14.66
16+340	5	0.14	0.10	14.60	5	0.14	0.10	14.60
16+360	5	0.14	0.10	14.55	5	0.14	0.10	14.55
16+380	10	0.08	0.06	8.09	5	0.14	0.10	14.50
16+400	10	0.08	0.06	8.02	5	0.14	0.10	14.44
16+420	5	0.14	0.10	14.39	5	0.14	0.10	14.39
16+440	10	0.08	0.06	7.87	5	0.14	0.10	14.34
16+460	10	0.08	0.06	7.80	15	0.05	0.03	4.84
16+480	10	0.08	0.06	7.73	30	0.04	0.03	4.01
16+500	10	0.08	0.05	7.66	30	0.04	0.03	3.98
16+520	10	0.07	0.05	7.59	30	0.04	0.03	3.95
16+540	30	0.04	0.03	3.92	10	0.07	0.05	7.52
16+560	30	0.04	0.03	3.89	10	0.07	0.05	7.45
16+580	30	0.04	0.03	3.86	10	0.07	0.05	7.38
16+600	30	0.04	0.03	3.83	50	0.05	0.04	4.93
16+620	30	0.04	0.03	3.80	50	0.05	0.03	4.85
16+640	30	0.04	0.03	3.77	50	0.05	0.03	4.77
16+660	10	0.07	0.05	7.12	10	0.07	0.05	7.12
16+680	10	0.07	0.05	7.06	50	0.05	0.03	4.61
16+700	10	0.07	0.05	7.00	50	0.04	0.03	4.53
16+720	40	0.04	0.03	4.11	50	0.04	0.03	4.46
16+740	40	0.04	0.03	3.95	50	0.04	0.03	4.21
16+760	40	0.04	0.03	3.73	50	0.04	0.03	3.87
16+780	10	0.06	0.04	6.18	50	0.04	0.03	3.55
16+800	10	0.06	0.04	5.93	50	0.03	0.02	3.25
16+820	10	0.06	0.04	5.69	50	0.03	0.02	2.98
16+840	10	0.05	0.04	5.46	50	0.03	0.02	2.72
16+860	10	0.05	0.04	5.25	50	0.02	0.02	2.47
16+880	10	0.05	0.04	5.04	50	0.02	0.02	2.25
16+900	10	0.06	0.04	5.82	50	0.02	0.01	1.70
16+920	5	0.13	0.10	13.43	50	0.01	0.01	1.27
16+940	5	0.14	0.10	14.32	50	0.01	0.01	0.93
16+960	5	0.15	0.11	15.30	5	0.15	0.11	15.30
16+980	50	0.01	0.01	0.70	50	0.01	0.01	0.70
17+000	50	0.01	0.01	0.75	50	0.01	0.01	0.75
17+020	50	0.01	0.01	0.80	50	0.01	0.01	0.80
17+040	30	0.02	0.02	2.29	50	0.01	0.01	0.85
17+060	20	0.04	0.03	4.37	50	0.01	0.01	0.91
17+080	10	0.10	0.07	9.82	50	0.01	0.01	0.97
17+100	10	0.10	0.07	9.77	50	0.01	0.01	1.03
17+120	50	0.01	0.01	1.09	50	0.01	0.01	1.09
17+140	50	0.01	0.01	1.16	50	0.01	0.01	1.16
17+160	50	0.01	0.01	1.23	50	0.01	0.01	1.23
17+180	50	0.01	0.01	1.30	50	0.01	0.01	1.30
17+200	50	0.01	0.01	1.38	50	0.01	0.01	1.38
17+220	50	0.01	0.01	1.46	50	0.01	0.01	1.46
17+240	50	0.02	0.01	1.54	50	0.02	0.01	1.54
17+260	50	0.02	0.01	1.63	50	0.02	0.01	1.63
17+280	50	0.02	0.01	1.73	50	0.02	0.01	1.73
17+300	10	0.09	0.07	9.41	50	0.02	0.01	1.83
17+320	10	0.09	0.07	9.39	50	0.02	0.01	1.93
17+340	10	0.09	0.07	9.36	50	0.02	0.01	2.04
17+360	10	0.09	0.07	9.34	50	0.02	0.02	2.16
17+380	10	0.09	0.07	9.32	50	0.02	0.02	2.28
17+400	10	0.09	0.07	9.30	50	0.02	0.02	2.40
17+420	10	0.09	0.07	9.28	30	0.04	0.03	3.99
17+440	20	0.06	0.05	6.32	50	0.03	0.02	2.68
17+460	20	0.06	0.05	6.46	40	0.03	0.02	3.41
17+480	20	0.07	0.05	6.61	30	0.04	0.03	4.40
17+500	20	0.07	0.05	6.76	20	0.07	0.05	6.76
17+520	20	0.07	0.05	6.91	20	0.07	0.05	6.91
17+540	20	0.07	0.05	7.07	20	0.07	0.05	7.07
17+560	50	0.04	0.03	3.70	20	0.07	0.05	7.24
17+580	50	0.04	0.03	3.90	20	0.07	0.05	7.41
17+600	50	0.04	0.03	4.12	20	0.07	0.05	7.58
17+620	50	0.04	0.03	4.34	20	0.08	0.06	7.77
17+640	50	0.05	0.03	4.58	30	0.06	0.04	5.77

Chain.	Dist.Left (m)	VDV_Day ($m/s^{1.75}$)	VDV_Night ($m/s^{1.75}$)	Accel. (mm/s^2)	Dist.Right (m)	VDV_Day ($m/s^{1.75}$)	VDV_Night ($m/s^{1.75}$)	Accel. (mm/s^2)
17+660	50	0.05	0.03	4.83	30	0.06	0.04	5.97
17+680	50	0.05	0.04	5.09	30	0.06	0.04	6.19
17+700	50	0.05	0.04	5.37	30	0.06	0.05	6.41
17+720	40	0.06	0.04	5.93	25	0.08	0.06	7.78
17+740	40	0.06	0.04	6.20	20	0.09	0.06	8.99
17+760	40	0.06	0.04	6.20	10	0.09	0.07	9.15
17+780	30	0.07	0.05	6.88	10	0.09	0.07	9.15
17+800	25	0.08	0.06	8.03	10	0.09	0.07	9.15
17+820	20	0.09	0.06	8.99	30	0.07	0.05	6.88
17+840	25	0.08	0.06	8.03	20	0.09	0.06	8.99
17+860	30	0.07	0.05	6.88	10	0.09	0.07	9.15
17+880	40	0.06	0.04	6.20	20	0.09	0.06	8.99
17+900	40	0.06	0.04	6.20	50	0.06	0.04	5.98
17+920	40	0.06	0.04	6.20	50	0.06	0.04	5.98
17+940	40	0.06	0.04	6.20	50	0.06	0.04	5.98
17+960	40	0.06	0.04	6.20	50	0.06	0.04	5.98
17+980	40	0.06	0.04	6.20	50	0.06	0.04	5.98
18+000	40	0.06	0.04	6.20	50	0.06	0.04	5.98
18+020	35	0.06	0.05	6.31	50	0.06	0.04	5.98
18+040	30	0.07	0.05	6.88	50	0.06	0.04	5.98
18+060	30	0.07	0.05	6.88	50	0.06	0.04	5.98
18+080	20	0.09	0.06	8.99	50	0.06	0.04	5.98
18+100	15	0.09	0.06	8.91	50	0.06	0.04	5.98
18+120	20	0.09	0.06	8.99	50	0.06	0.04	5.98
18+140	50	0.06	0.04	5.98	25	0.08	0.06	8.03
18+160	50	0.06	0.04	5.98	15	0.09	0.06	8.91
18+180	50	0.06	0.04	5.98	15	0.09	0.06	8.91
18+200	50	0.06	0.04	5.98	15	0.09	0.06	8.91
18+220	50	0.06	0.04	5.98	15	0.09	0.06	8.91
18+240	50	0.06	0.04	5.98	25	0.08	0.06	8.03
18+260	20	0.09	0.06	8.99	40	0.06	0.04	6.20
18+280	20	0.09	0.06	8.99	50	0.06	0.04	5.98
18+300	20	0.09	0.06	8.99	50	0.06	0.04	5.98
18+320	20	0.09	0.06	8.99	25	0.08	0.06	8.03
18+340	25	0.08	0.06	8.03	5	0.12	0.09	12.30
18+360	30	0.07	0.05	6.88	5	0.12	0.09	12.30
18+380	35	0.06	0.05	6.31	5	0.12	0.09	12.30
18+400	40	0.06	0.04	6.20	5	0.12	0.09	12.30
18+420	45	0.06	0.04	6.09	5	0.12	0.09	12.30
18+440	50	0.06	0.04	5.98	5	0.12	0.09	12.30
18+460	50	0.06	0.04	5.98	5	0.12	0.09	12.30
18+480	50	0.06	0.04	5.98	50	0.06	0.04	5.98
18+500	50	0.06	0.04	5.98	50	0.06	0.04	5.98

Table x: Vibration levels predicted for each chainage at both sides of the line, in the hypothesis of standard track installed everywhere.

Appendix 5 – Pandrol QTrack System Data Sheet

PANDROL CDM TRACK

Sustaining the way

PANDROL QTRACK® EMBEDDED RAIL SYSTEM FOR LRT

SYSTEM DATA SHEET

PANDROL

CDM TRACK

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PANDROL QTRACK® EMBEDDED RAIL SYSTEM

FOR LRT

The PANDROL QTrack® is a continuously supported and fastened embedded ballastless track system, where the rail is completely encapsulated by elastic prefabricated resin bonded rubber profiles with a unique shape and adapted stiffness characteristics.

DESIGN

PANDROL QTrack® - SP:
1-2 dBv mitigation

PANDROL QTrack® - HP:
3-5 dBv mitigation

PANDROL QTrack® - XP:
8-12 dBv mitigation

INSTALLATION

SPAIN

Visit www.pandrolcdmtrack.com for more information about the PANDROL QTrack® system

INSTALLATION AND FEATURES

- The PANDROL QTrack® system utilizes a top-down installation method, which can be performed by three different techniques:
  - PANDROL QTrack®-JIG: The rails are encapsulated on site and then levelled and aligned by means of specially made installation QT JIGs
  - PANDROL QTrack®-BEAM: Rails are delivered to site already encapsulated and embedded in a pre-cast, even curved, concrete beam
  - PANDROL QTrack®-SLAB: The entire track, also in curve, is integrated within a reinforced concrete slab provided with a road finishing layer and accommodating drainage elements, electrical boxes, etc.
- The system, when installed in concrete, provides support to all sides of the rail and allows stringent vertical and lateral support criteria to be met, and at the same time offers vibratory and electrical decoupling from its surroundings
- The PANDROL QTrack®-S&C system provides customized full elastic encapsulation of switches and crossings in prefabricated RR elements

BENEFITS

- Tuneable stiffness to achieve the required attenuation levels
- An installation rate of up to 144 lmst/day/work-group is feasible, making PANDROL QTrack® the quickest, easiest and most cost effective system available on the market
- Rail corrugation is controlled due to homogeneous stiffness of the track which results in less grinding activities (reducing maintenance and increasing track longevity) and lower vibration emissions due to better track quality

SPECIFICATION

Applications	Plain line track, stations, depots, tunnels, turnouts, levelled crossings…
Materials	Resin bonded rubber (RR family)
Rail compatibility	All vignola and grooved rails
Versions (stiffness levels)	SP: Standard Performance HP: High Performance XP: eXtra high Performance
Mechanical and electrical performance	Total compliance with EN 13481-5 for rail fastenings
Stray current insulation	From 0,4 to 500 Ω·km thanks to QT ELEC ad hoc solution
Rail replaceability	S: Standard encapsulation = Possible, but cut in the surrounding concrete is necessary R: Replaceable encapsulation = Possible via a cut in the rubber profiles
Installation	JIG, BEAM, SLAB

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