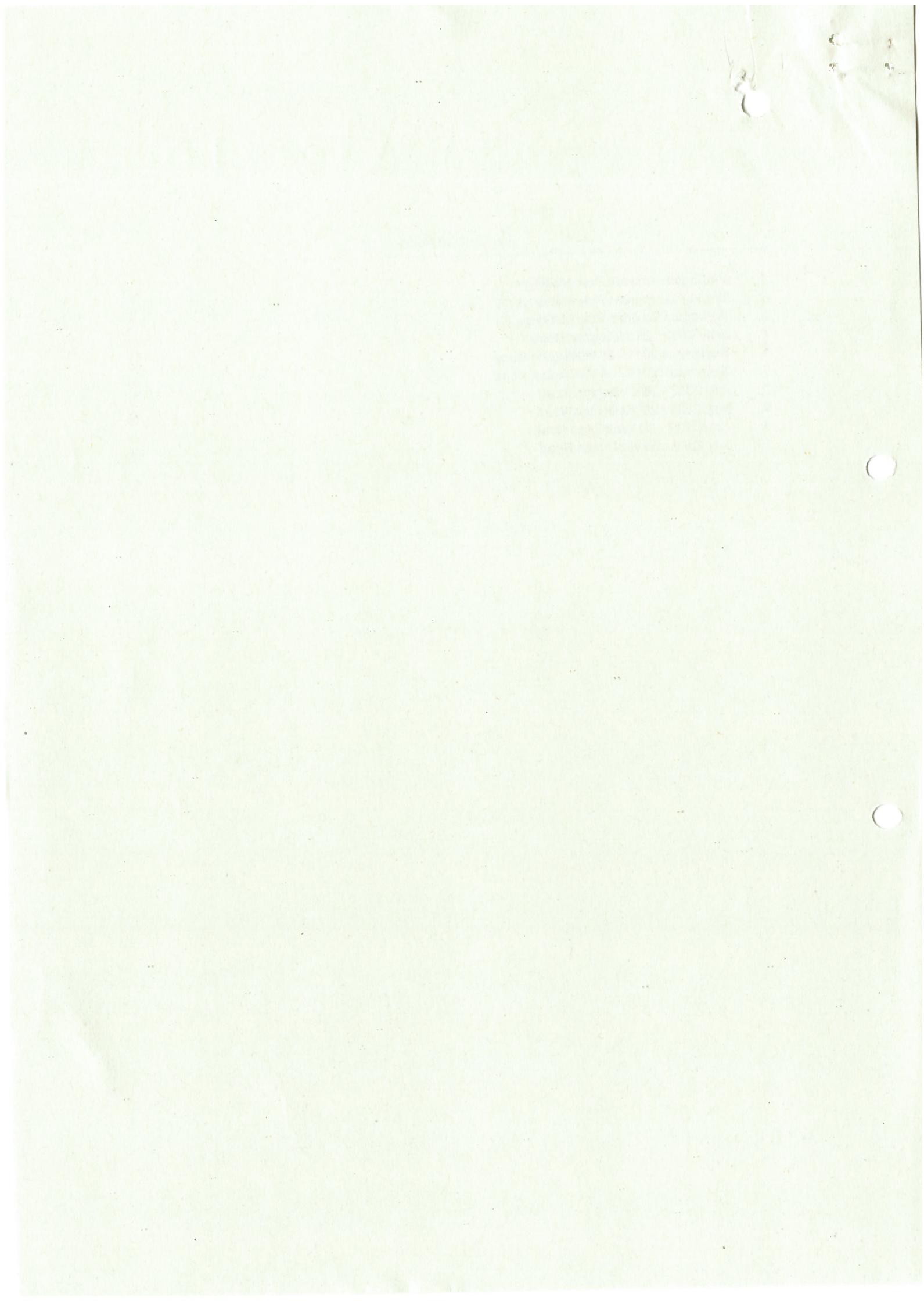
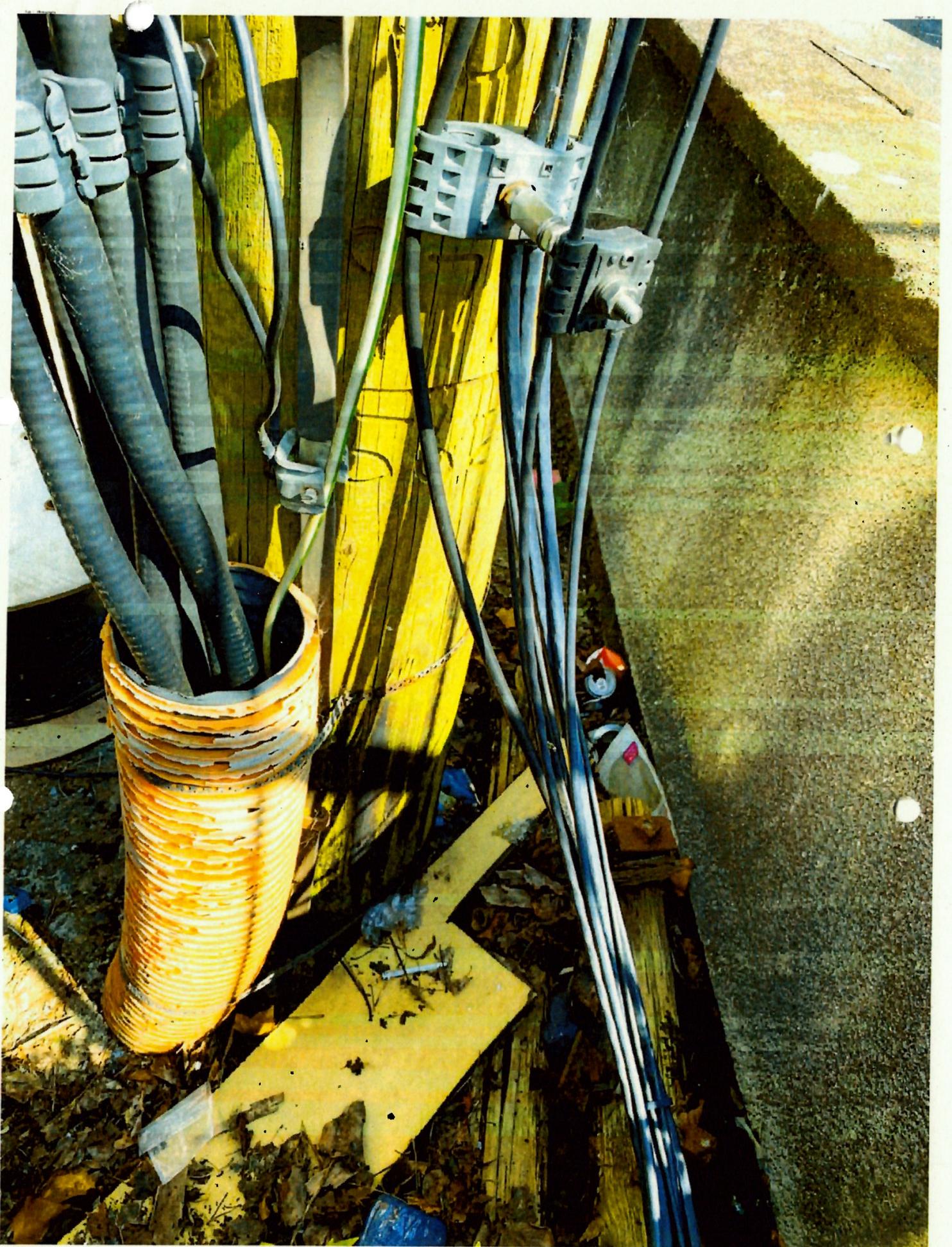
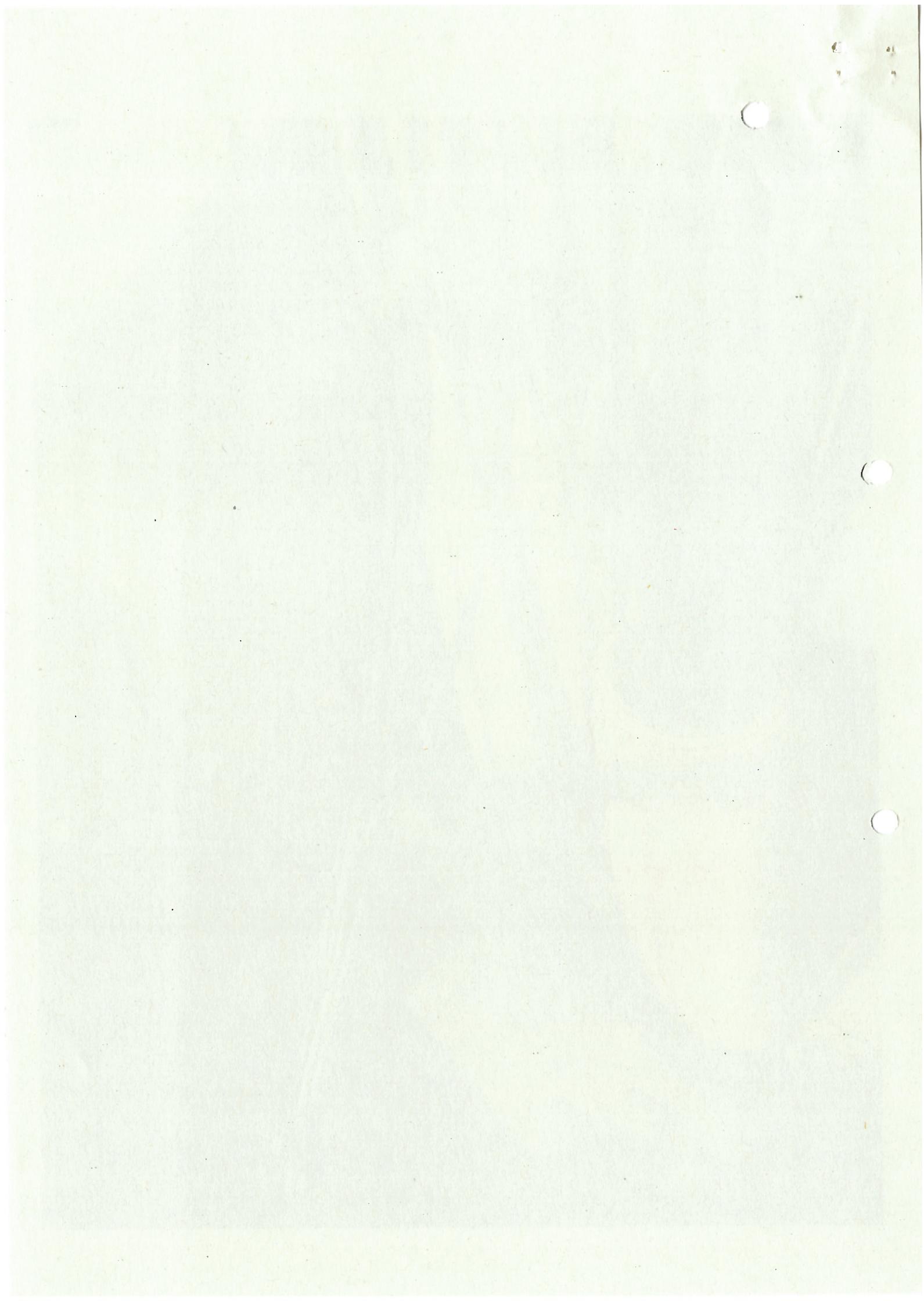


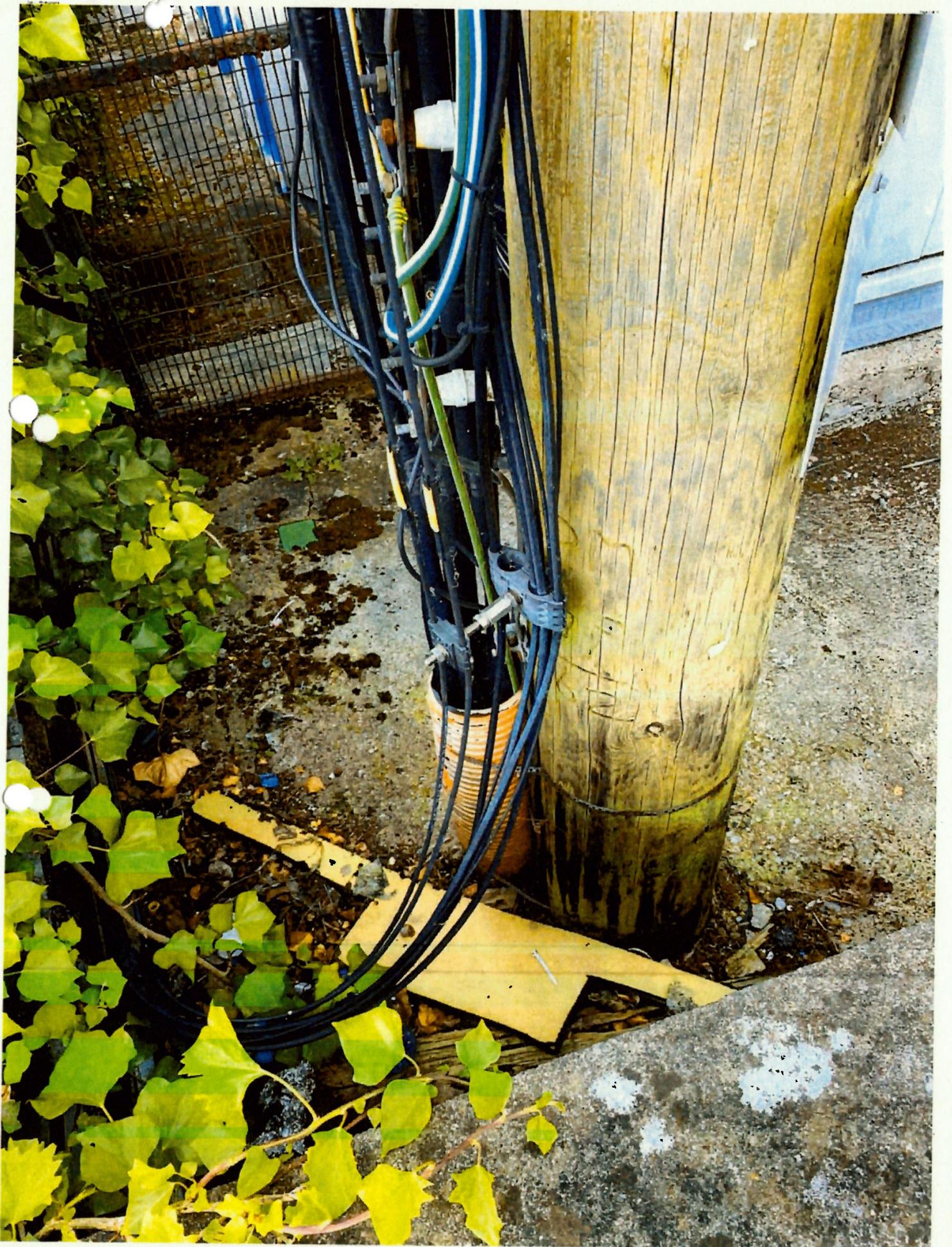
Table of Contents

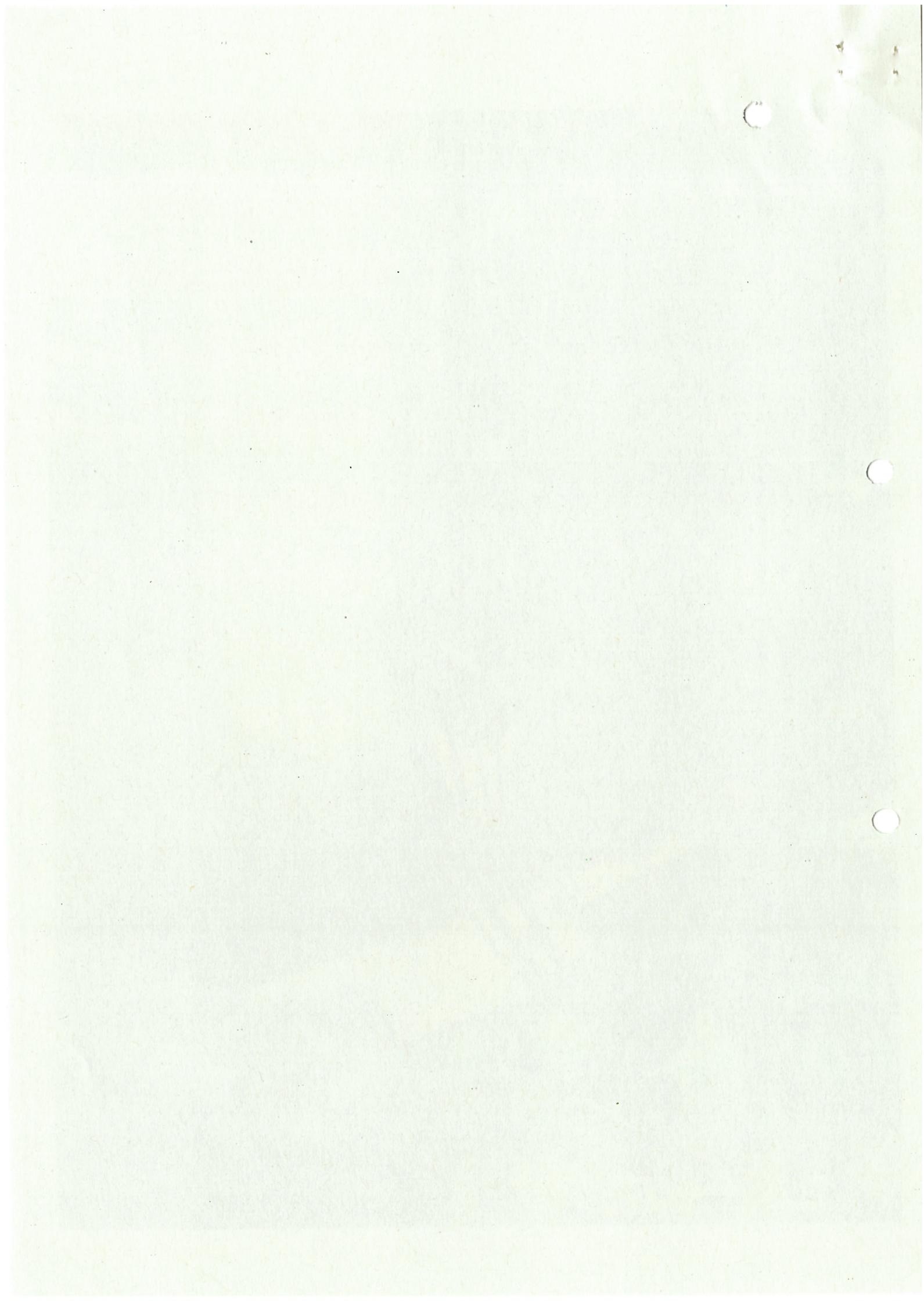
1.	Wellington Wooden Pole Markings (1)	1
2.	Wellington Wooden Pole Markings (2)	2
3.	Wellington Wooden Pole Markings (3)	3
4.	June 2009 - 26 Wellington Road	4
5.	September 2011 - 26 Wellington Road	5
6.	September 2014 - 26 Wellington Road	6
7.	July 2022 - 26 Wellington Road	7
8.	May 2024 - 26 Wellington Road	8
9.	June 2017 - 26 Wellington Road	9
10.	July 2019 - 26 Wellington Road	10



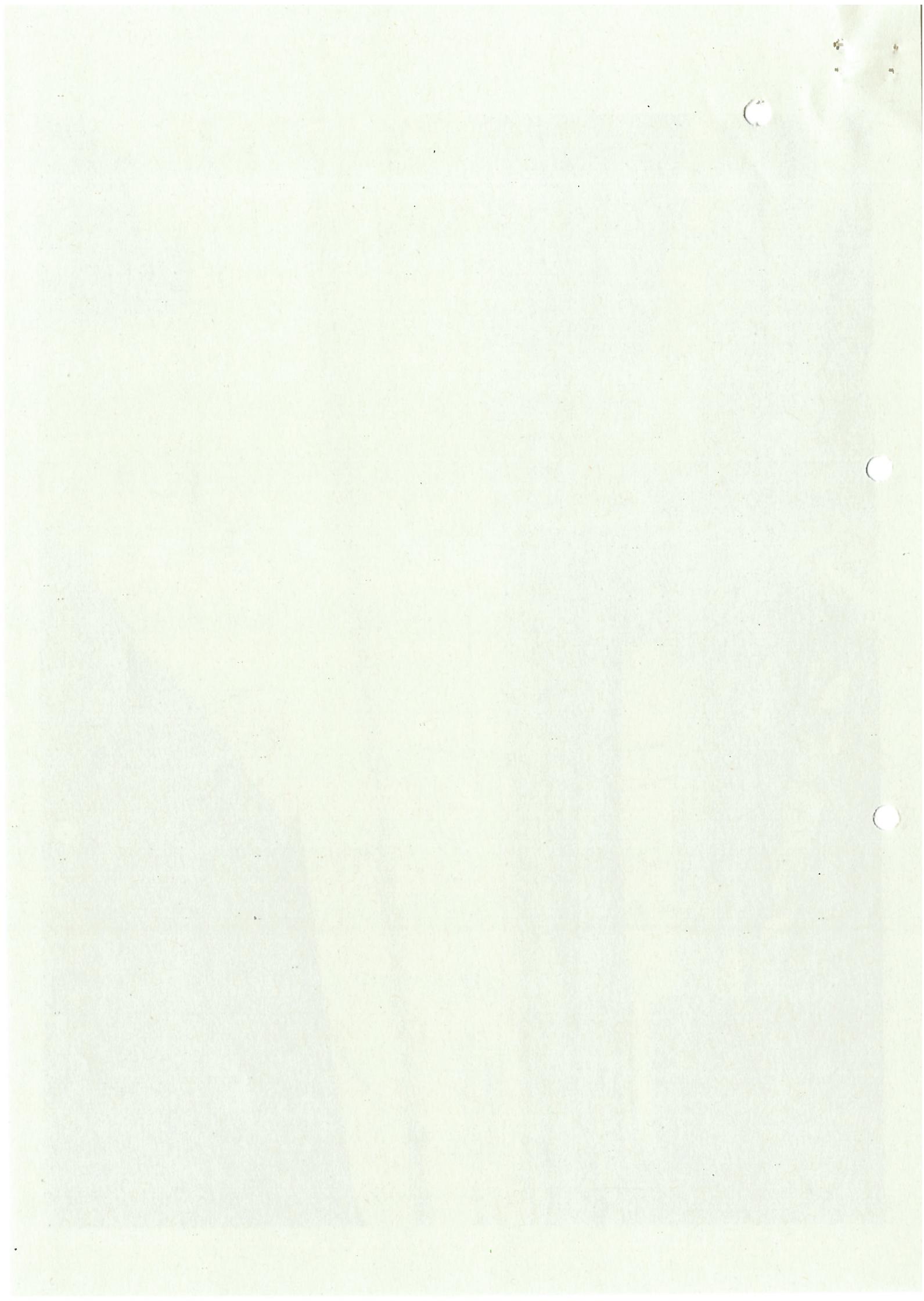






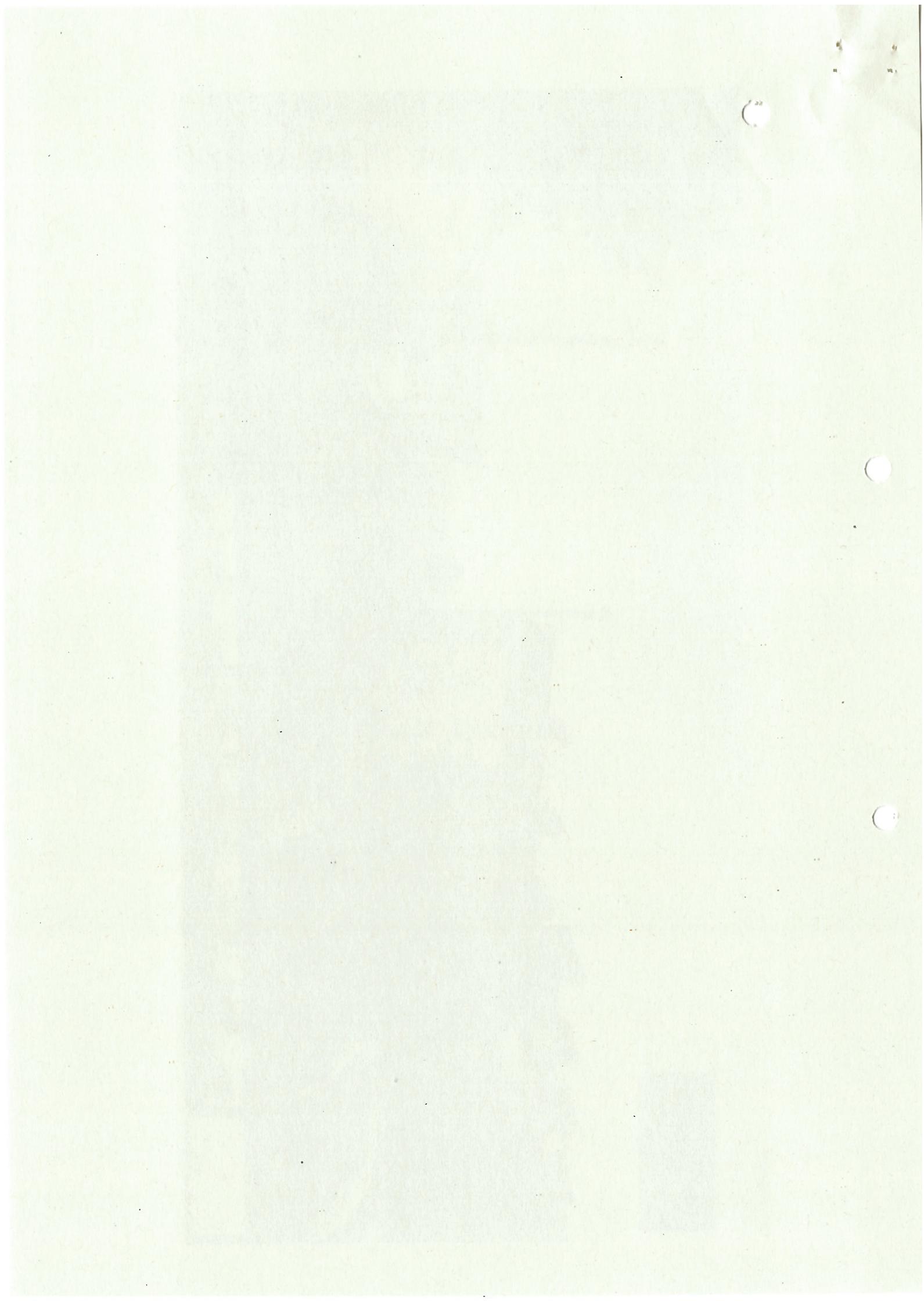






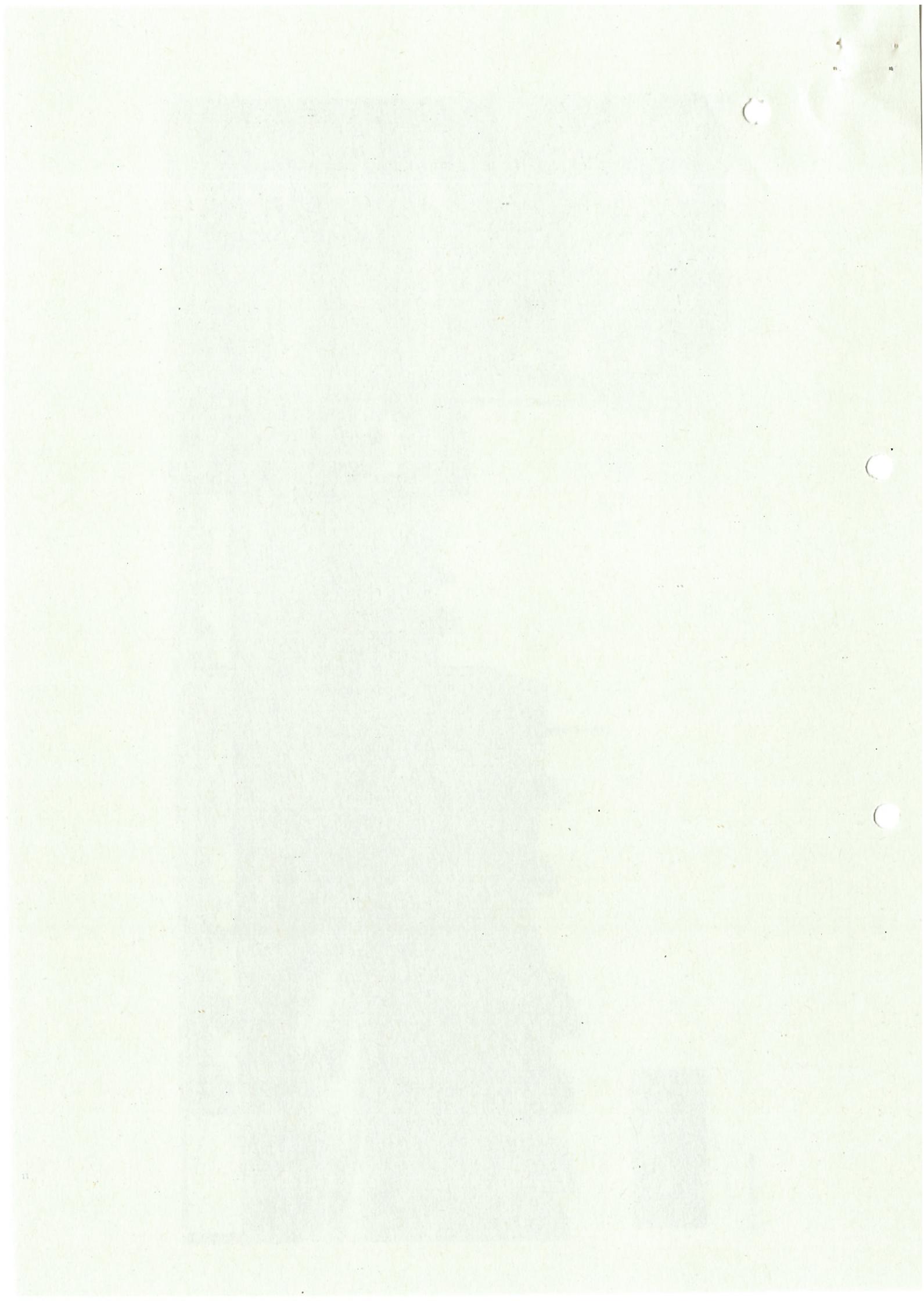
Tab 1 - Photographs



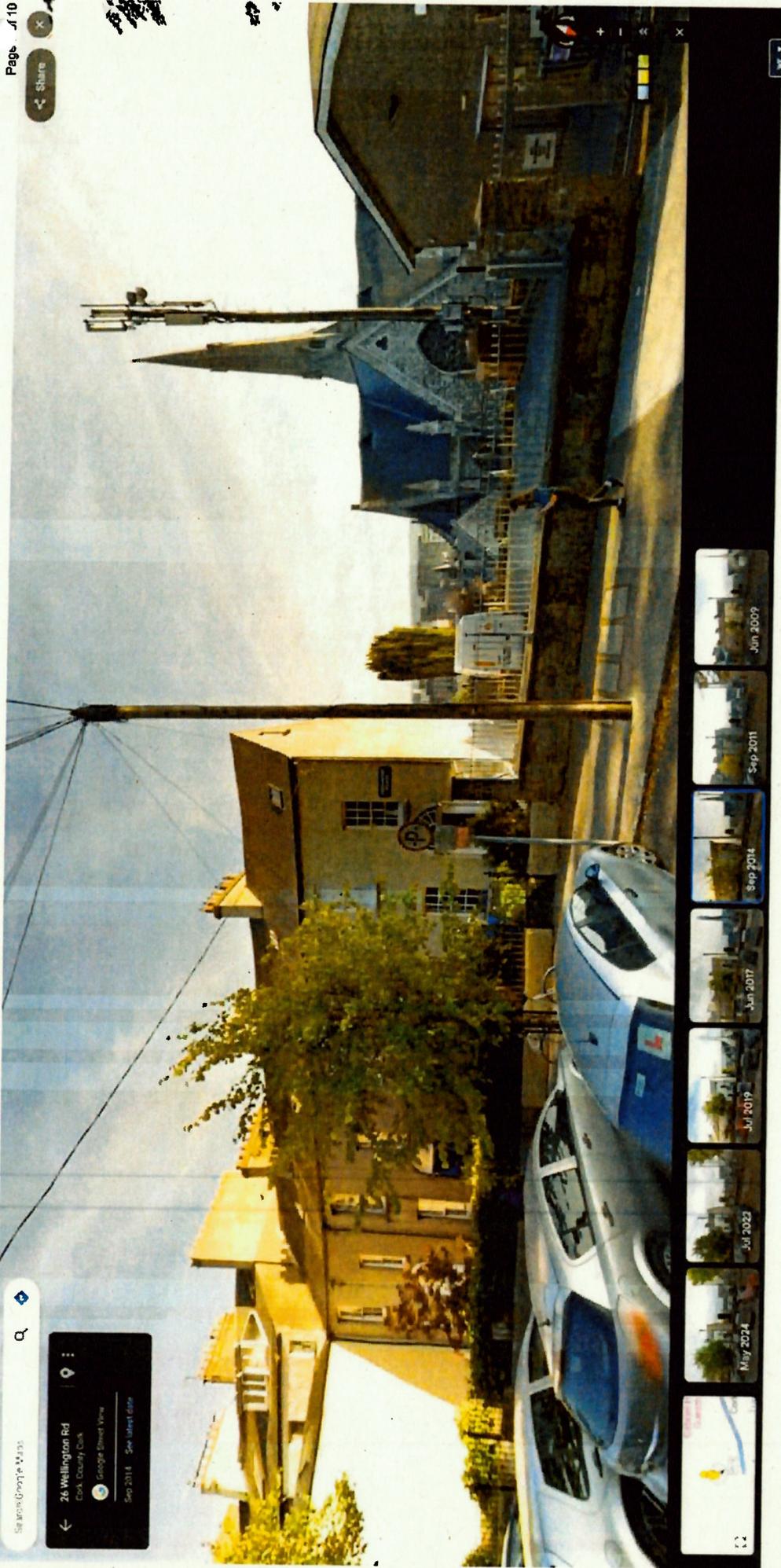


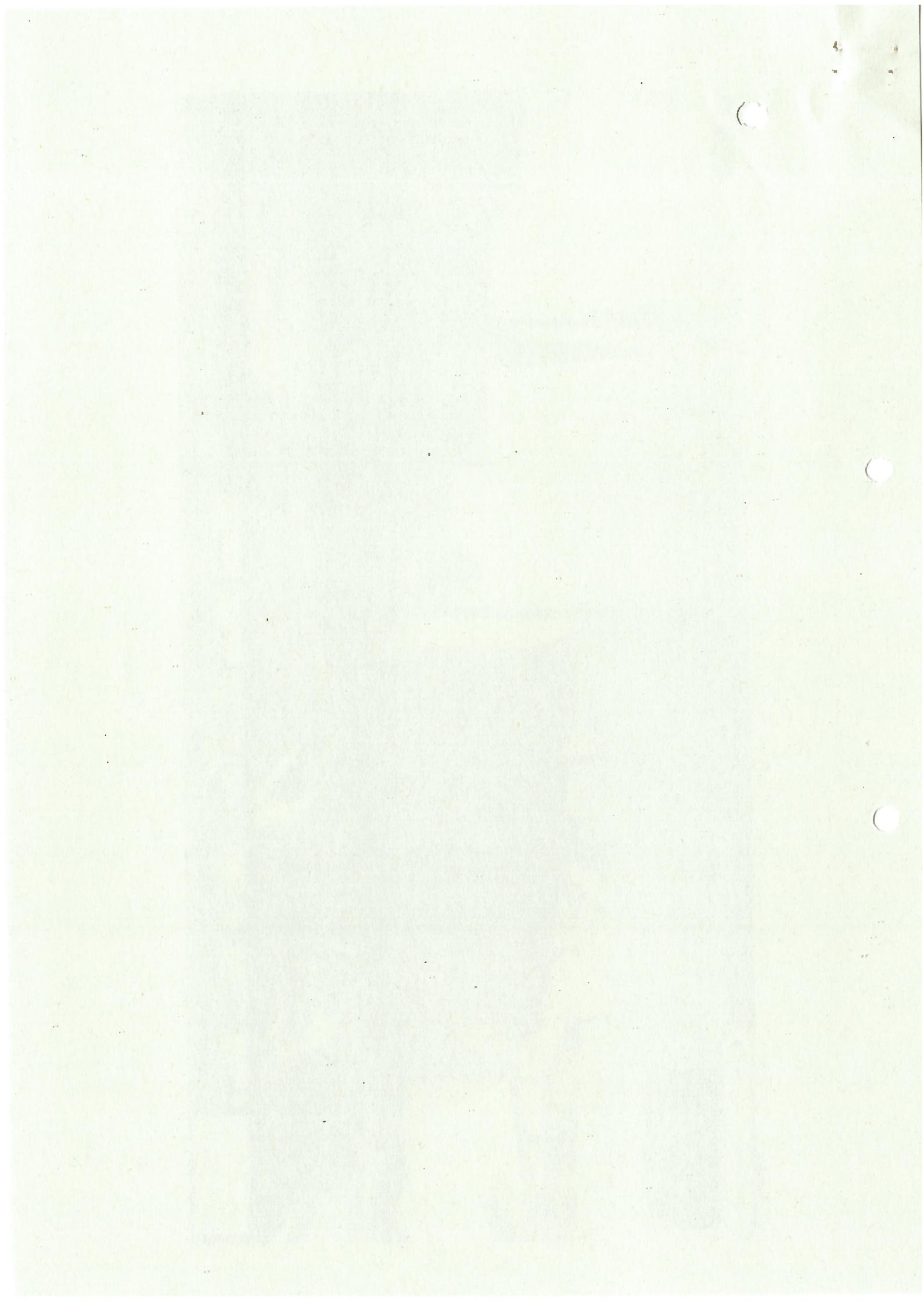
Tab 1 - Photographs





Tab 1 - Photographs

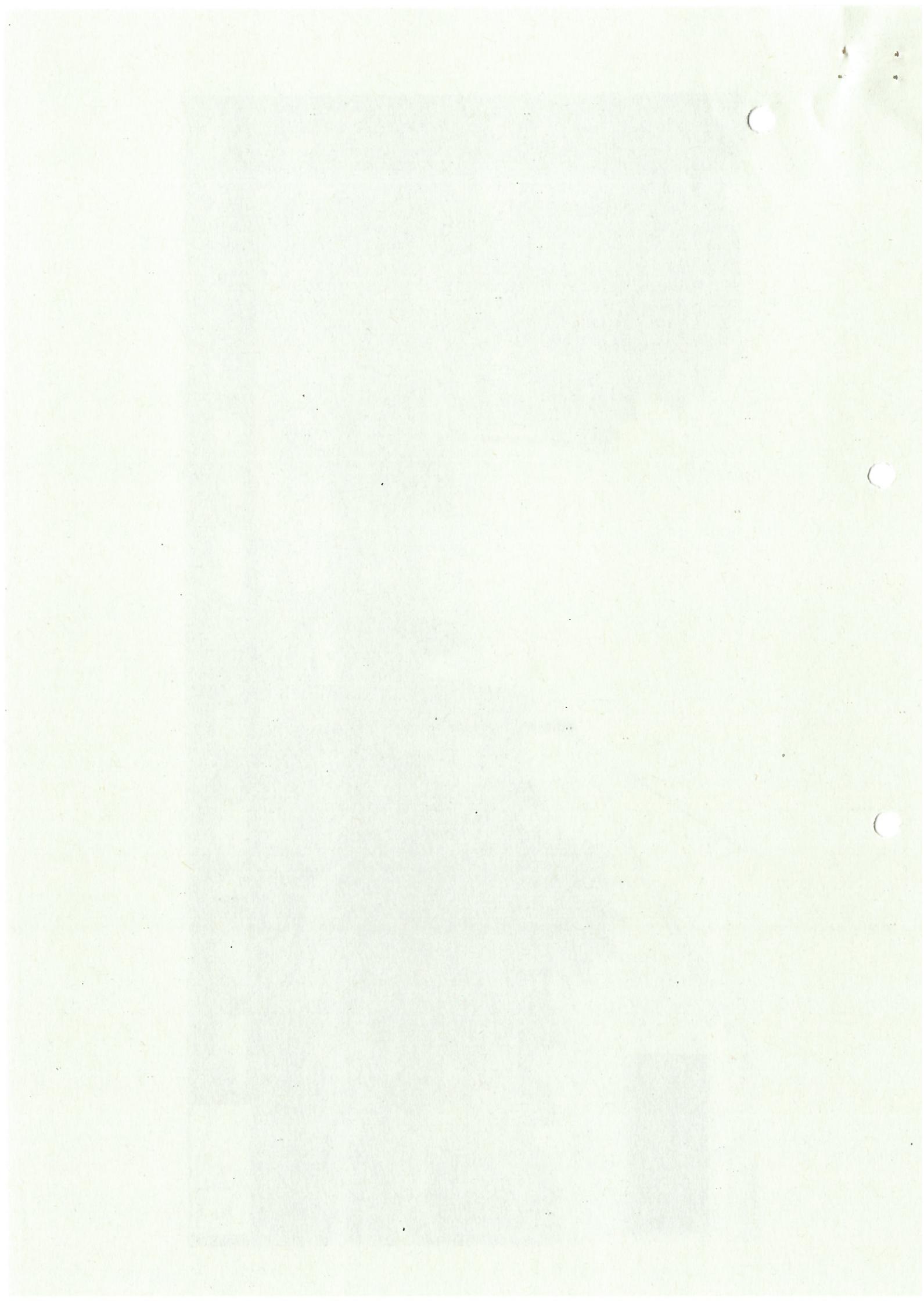






Tab 1 - Photographs



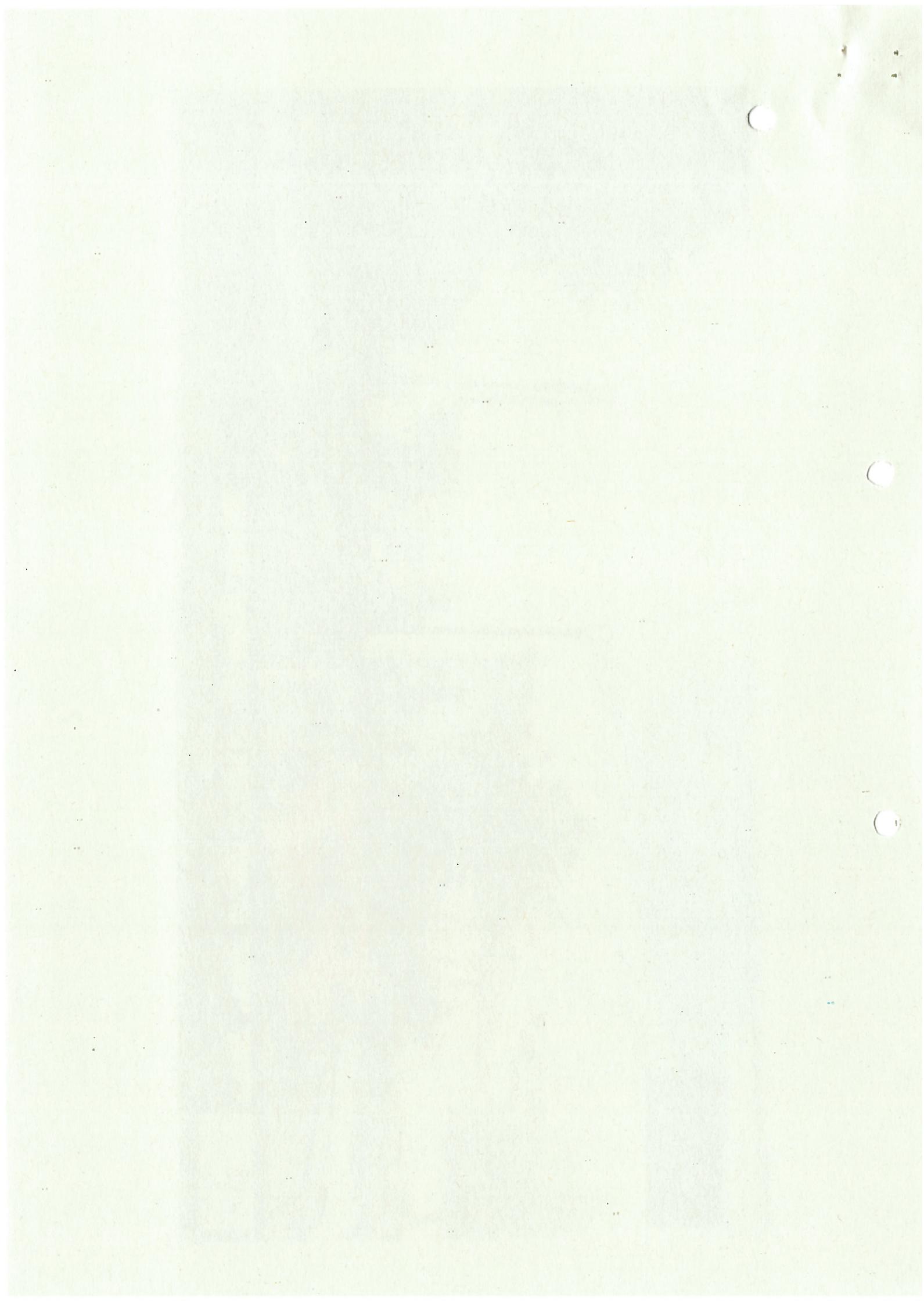


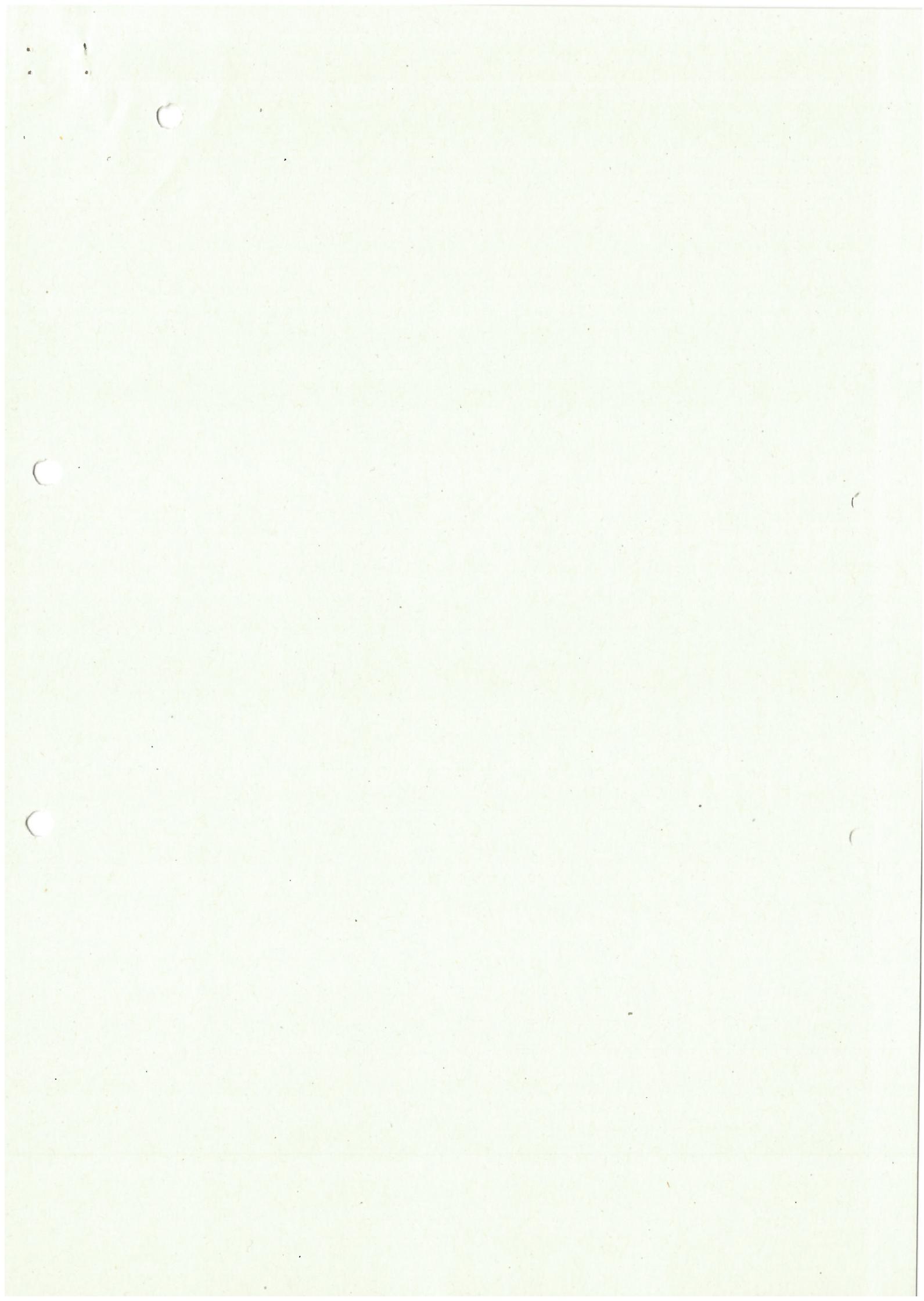
Tab 1 - Photographs

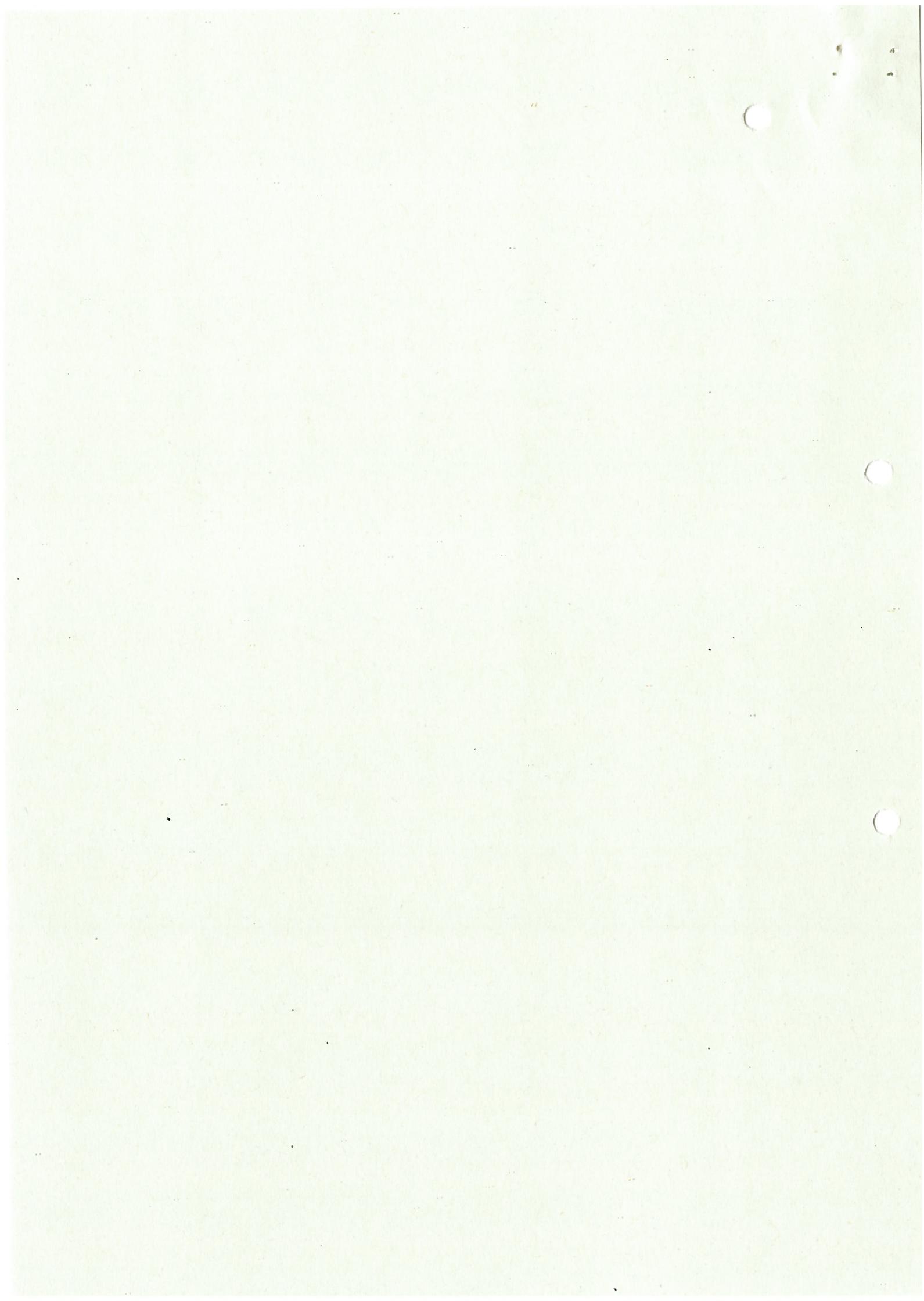


Tab 1 - Photographs











Vantage Towers Limited,
Mountainview,
Leopardstown,
Dublin 18,
Ireland.

**VANTAGE
TOWERS**



Date: 22/01/2024

Re: Declaration of Structural Design Failure
Site Ref: CK103 Wellington Rd. Exchange

To whom it concerns,

We hereby state that the proposed equipment installation as per client instruction relating to the above site, is not feasible. The structural integrity of the existing timber pole at Wellington Road Exchange is compromised.

The site has been visited and assessed by a structural engineer and the following conclusions/recommendations made:

Structural Engineer's Appraisal

An in person structural survey has been carried out prior to the proposed Vodafone upgrade. The existing timer pole is no longer standing plumb. This is likely due to subsidence of the soil around the base of the structure. For this reason, the structure has failed and cannot accommodate any further equipment and should be decommissioned and taken away. Due to the precarious location of the structure base which is very close to an old masonry retaining wall no delay should be taken in removing the existing structure. A fall of the structure will likely result in damage to the exchange building or potential fall into the car park area/street. This will also cause rubble to fall into the church car park due to collapse of a section of the retaining wall.

Yours sincerely,

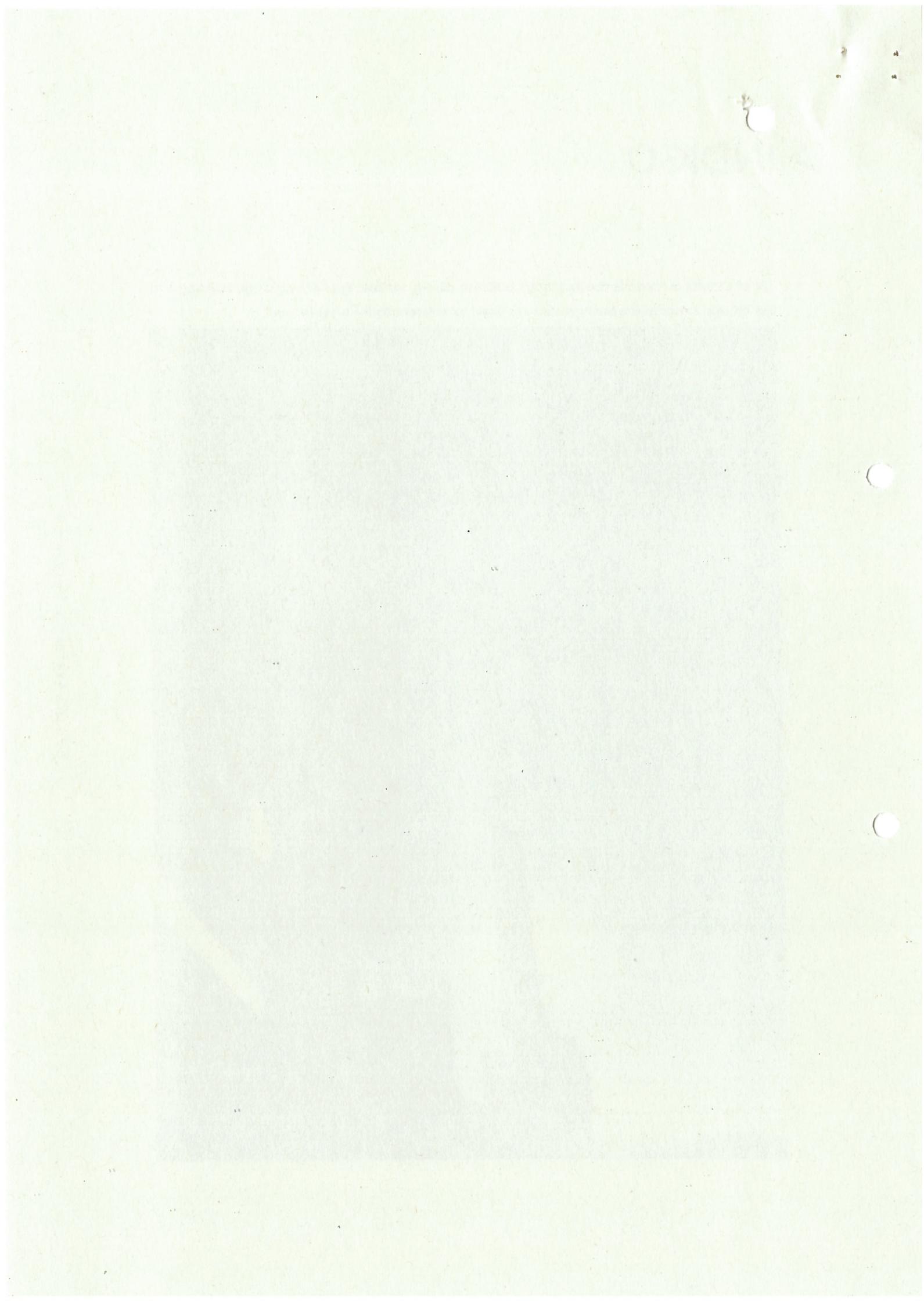
**Tadhg Ó
Loingsigh**

Digitally signed by Tadhg Ó Loingsigh
DN: CN=Tadhg Ó Loingsigh, O=Indigo Telecom Group, OU=Structural Engineer, E=tadhg.oloingsigh@indigotg.com, C=IE
Reason: I am the author of this document
Location:
Date: 2024.01.22 13:32:07Z00'00'
Foxit PDF Reader Version: 2023.3.0

Tadhg Ó Loingsigh B. Eng. (Hons) MIEI
Senior Structural Engineer

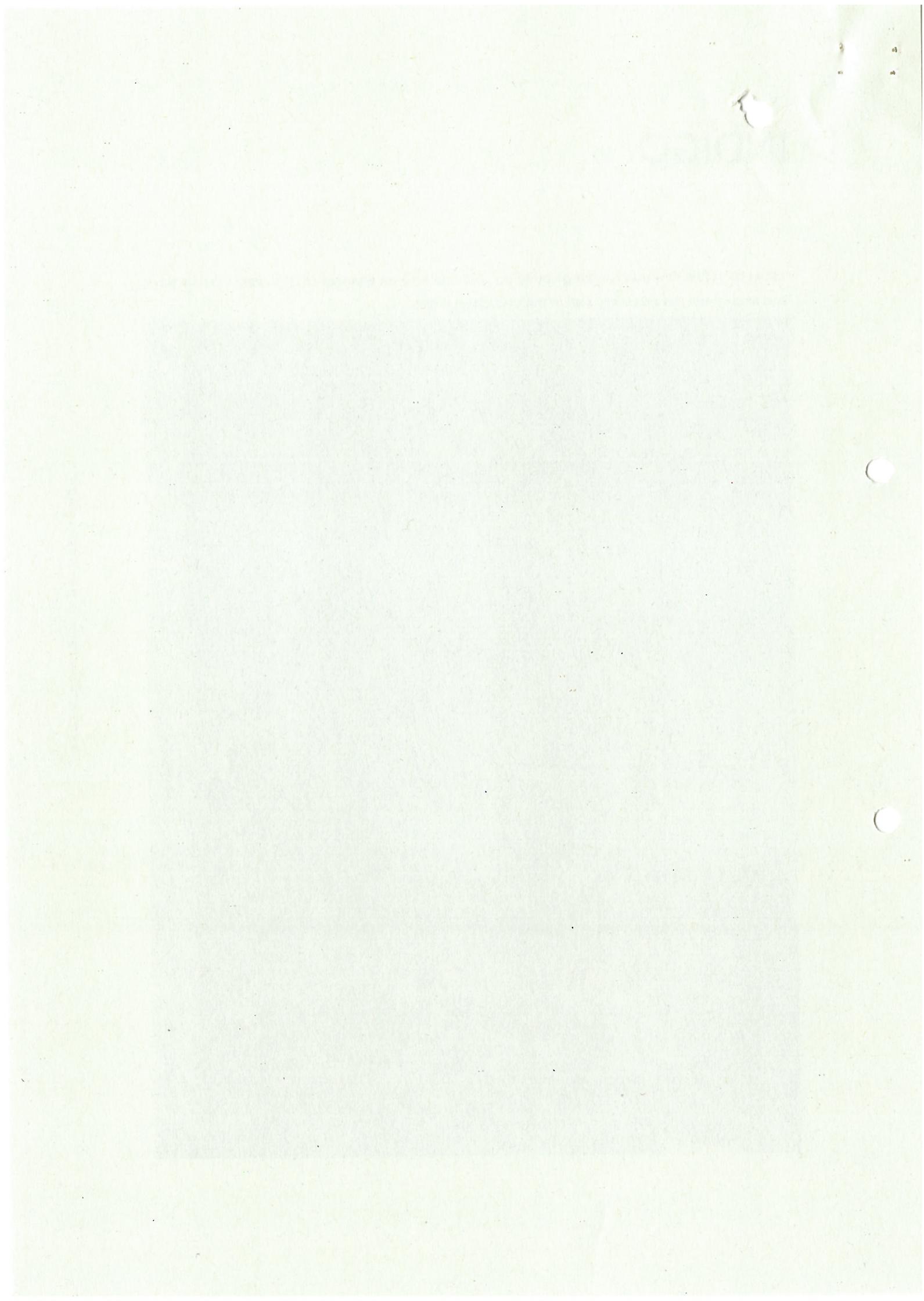
Tilt of structure towards the exchange building clearly visible. Wall of exchange building and the church tower in the background are used as references for what is level.





Tilt of structure towards exchange building. There is also an element of tilt towards the carpark and away from the retaining wall of the church grounds.



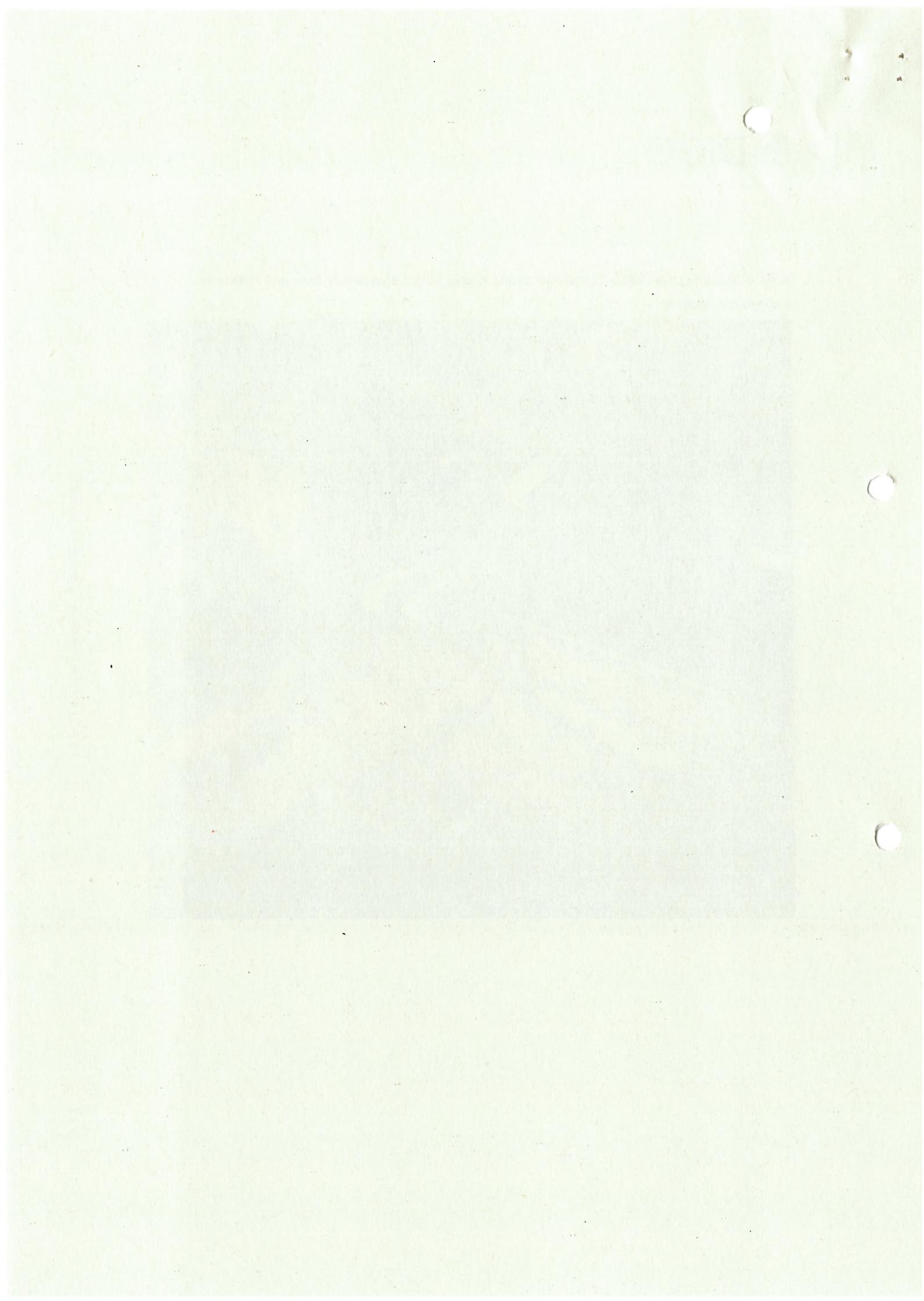


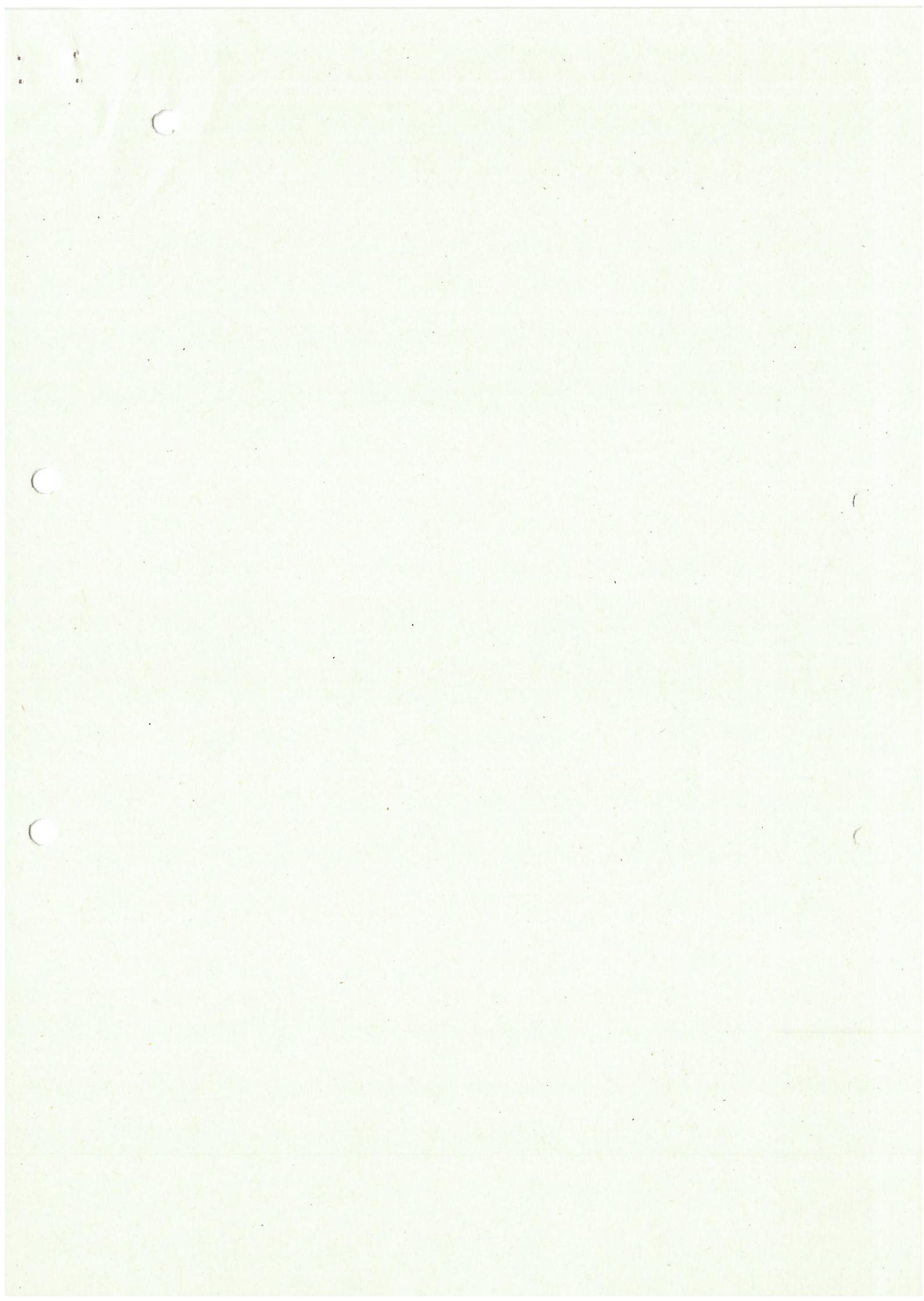
Tilt of structure to the right clearly visible at the base.

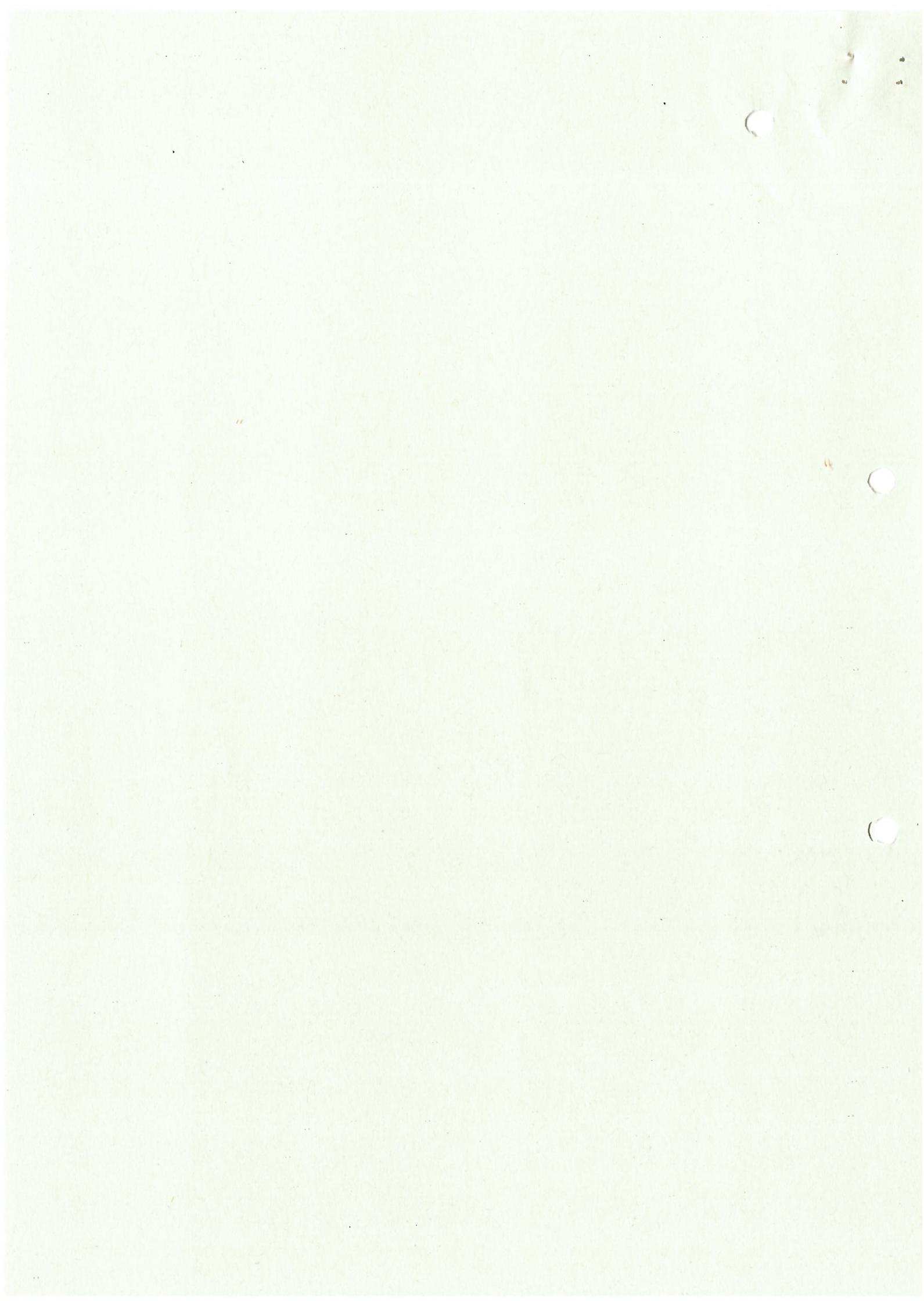


Area of retaining wall likely to fail and cause rubble to fall if structure fails and falls in the expected direction.





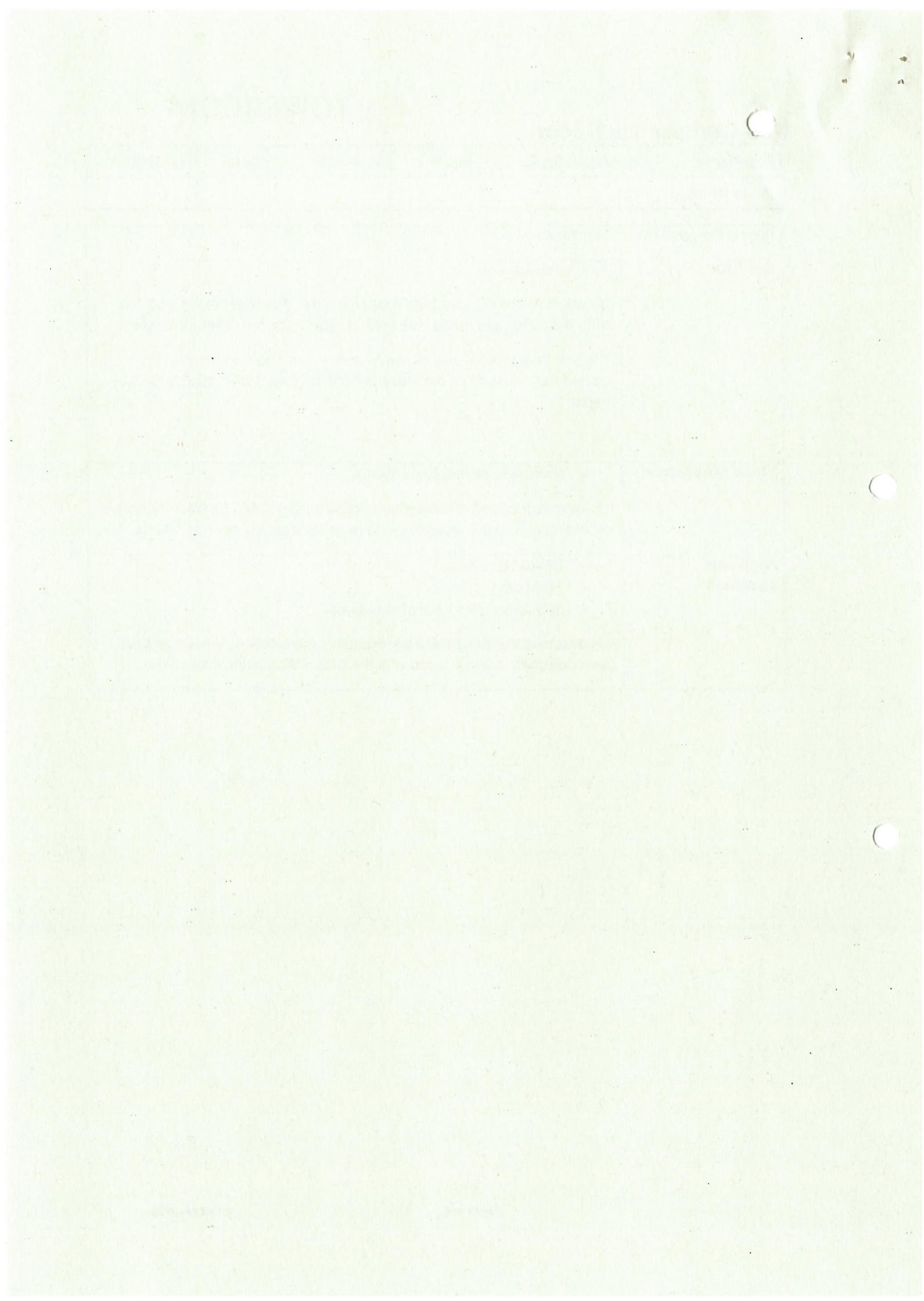




NCI-Compliance Report

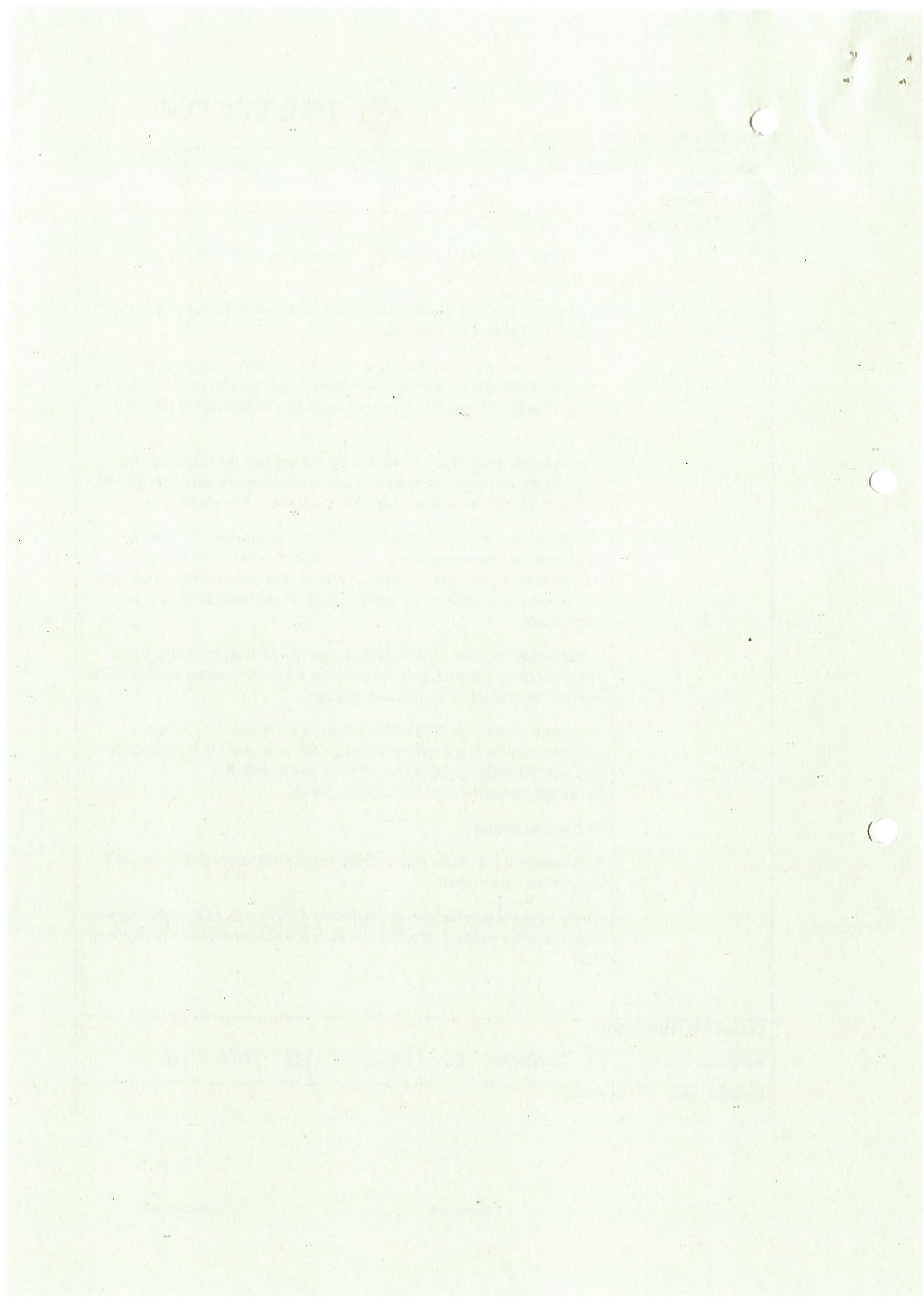
Site Name:	Wellington Road	Site ID:	TCK5225	Date:	13/03/2024
Issue Number	001				

Report Prepared by:	Seán Bradley
Site Type:	<ul style="list-style-type: none"> • Wooden Pole <p>On site is a 12m wooden pole supporting 4No. Panel antennas and 1No. 0.6m dish. 2No. panel antennas extend above the top of wooden pole.</p> <p>The pole is surrounded by concrete at its base. The wooden pole is located very close to an old masonry retaining wall that is approx. 4.0m in height.</p>
Year of Manufacture	<ul style="list-style-type: none"> • Unknown, possibly mid 1990's. <p>It is unknown as to the exact year of build as site safety file documents are not available, but it is understood to have been built in the mid 1990's.</p>
Applicable standards	<ul style="list-style-type: none"> • British Standards: • Eurocodes • See Appendix for list of standards <p>It is assumed the design and installation of the wooden pole would have been designed in accordance with the British Standards at this time.</p>



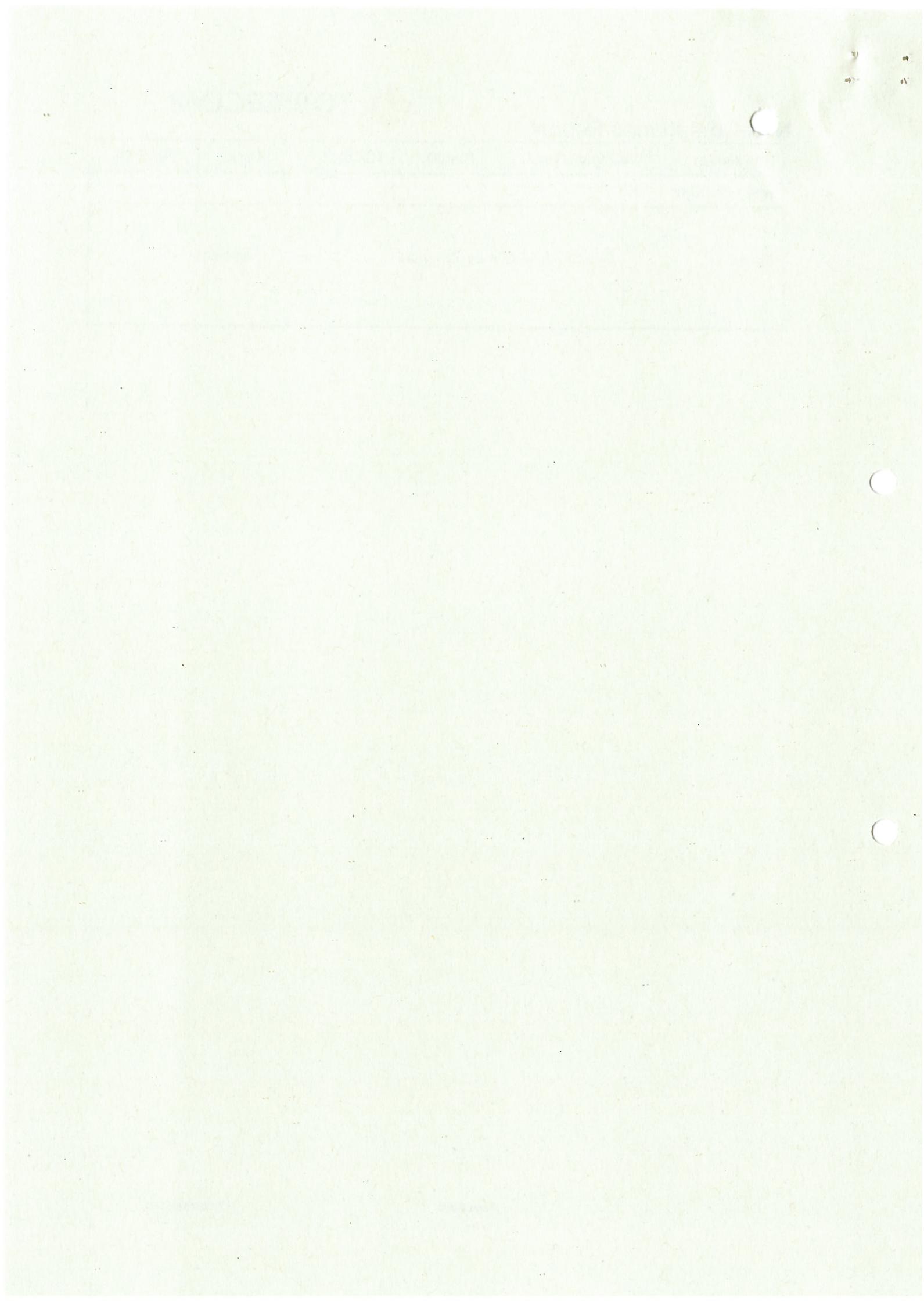
Non-Compliance Report

Site Name:	Wellington Road	Site ID:	TCK5225	Date:	13/03/2024
Issue Number	001				
Non-Compliance issue:	<ul style="list-style-type: none"> • Wooden Pole <p>The existing timber pole is leaning 450mm to the West and is therefore no longer standing vertical.</p> <p>In no longer standing plumb. This is likely due to subsidence of the soil around the base of the structure.</p> <p>A fall of the structure will likely result in damage to the exchange building or potential fall into the car park area/street. This will also cause rubble to fall into the church car park due to collapse of a section of the retaining wall.</p> <p>A Towercom report from 15/11/2010 did not indicate the power leaning. Photos from this report shows that Vodafone equipment was 4No. panels & 1No. 0.3m dish as well as 2No. RRU's approx. 2.8m height.</p> <p>The photos of the wooden pole in 05/03/2020 shows that the Vodafone equipment had been upgrade in the time period between 2010 & 2020. Additional steelwork was installed as well as 3No. larger panels than what was previously there. Also an additional RRU was installed at approx. 2.8m height.</p> <p>In this period between 2010 & 2020 it appears the pole started to lean. This most likely occurred as a result of the additional loading applied to the wooden pole following Vodafone's upgrade.</p> <p>A Vantage report from 22/01/2024 following a inspection by Indigo indicated that there is a structural design failure due to the leaning of the pole, ref. '2024-01-22_Vodafone_CK103_Wellington Rd. Exchange_Structural Cert Letter_FAIL_Rev0'</p> <p>Recommendation</p> <p>A replacement pole to be is to be installed in order to decommission and remove the existing pole.</p> <p>Ideally a new steel pole with appropriately designed foundation be installed adjacent to the existing pole as soon as is possible and before September 2024.</p>				
Documents / Information:					
Standards:	<input type="checkbox"/>	Guidelines	<input type="checkbox"/>	Drawings:	<input checked="" type="checkbox"/>
				Other:	<input checked="" type="checkbox"/>
Describe Other:	Photos				



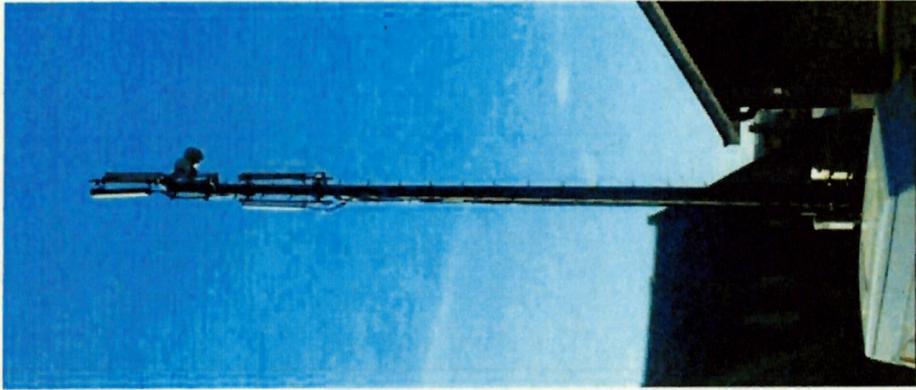
NCI-Compliance Report

Site Name:	Wellington Road	Site ID:	TCK5225	Date:	13/03/2024
Issue Number	001				
Signed:	Seán Bradley BE(Hons) CEng MIEI		Date:	13/03/2024	

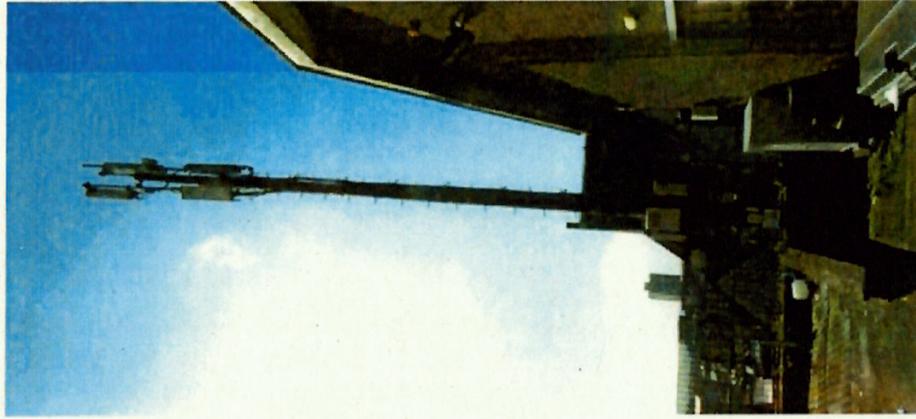


Non-Compliance Report

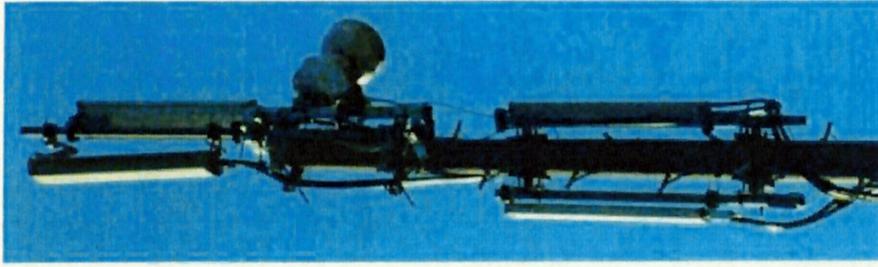
2.0 Appendix: Site Elevation Photos



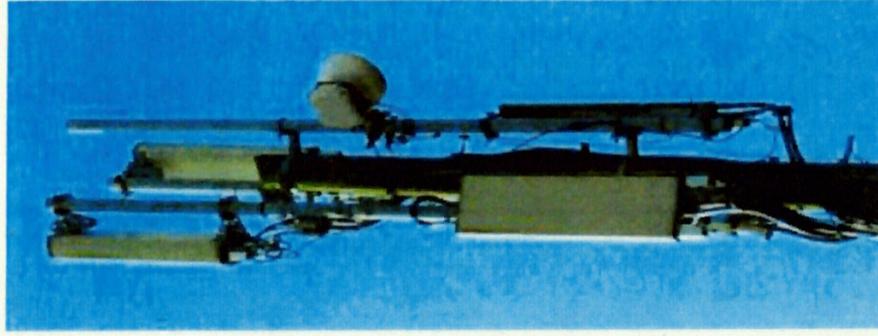
Elevation 15/11/2010



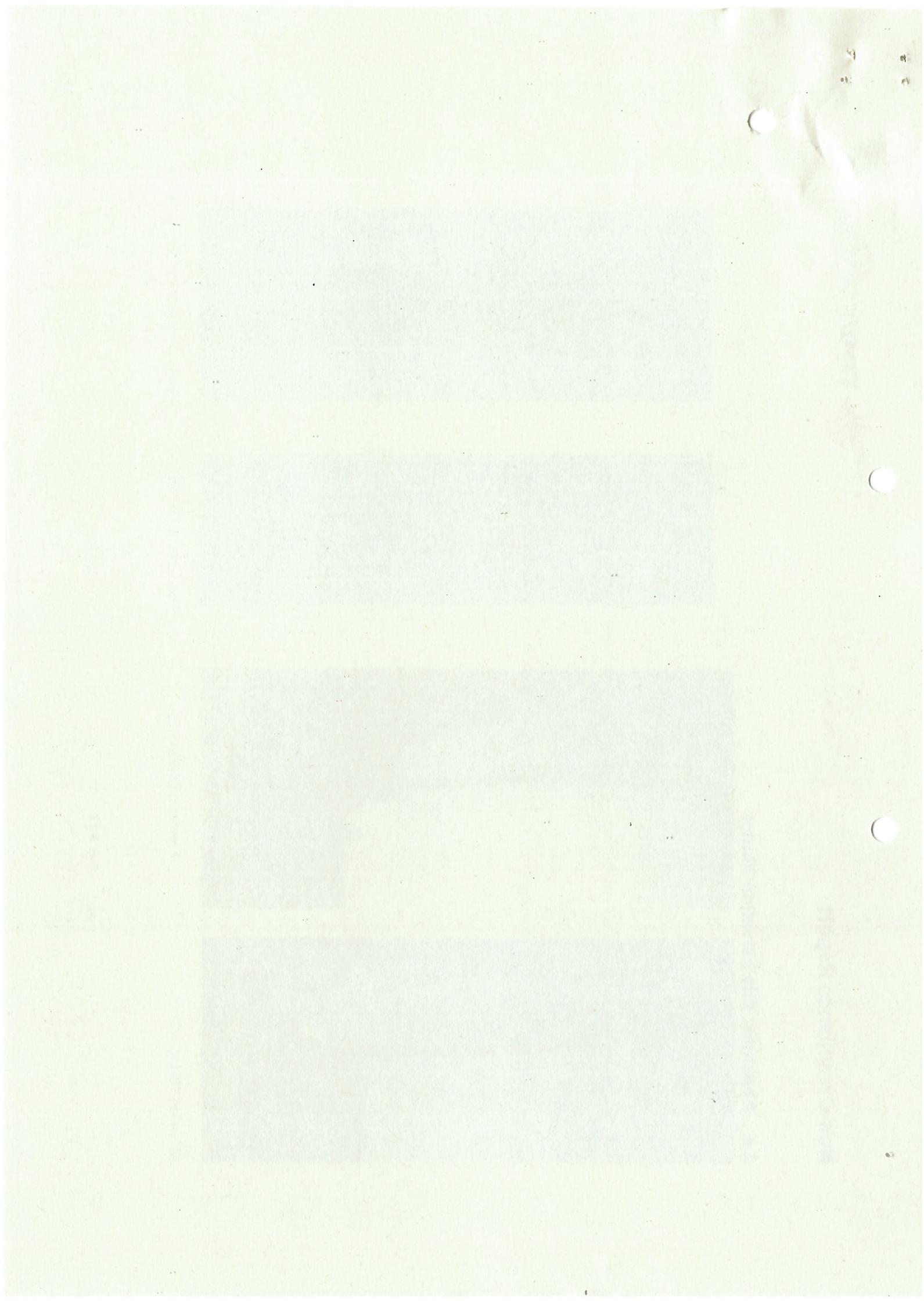
Elevation 05/03/2020



Equipment 15/11/2010

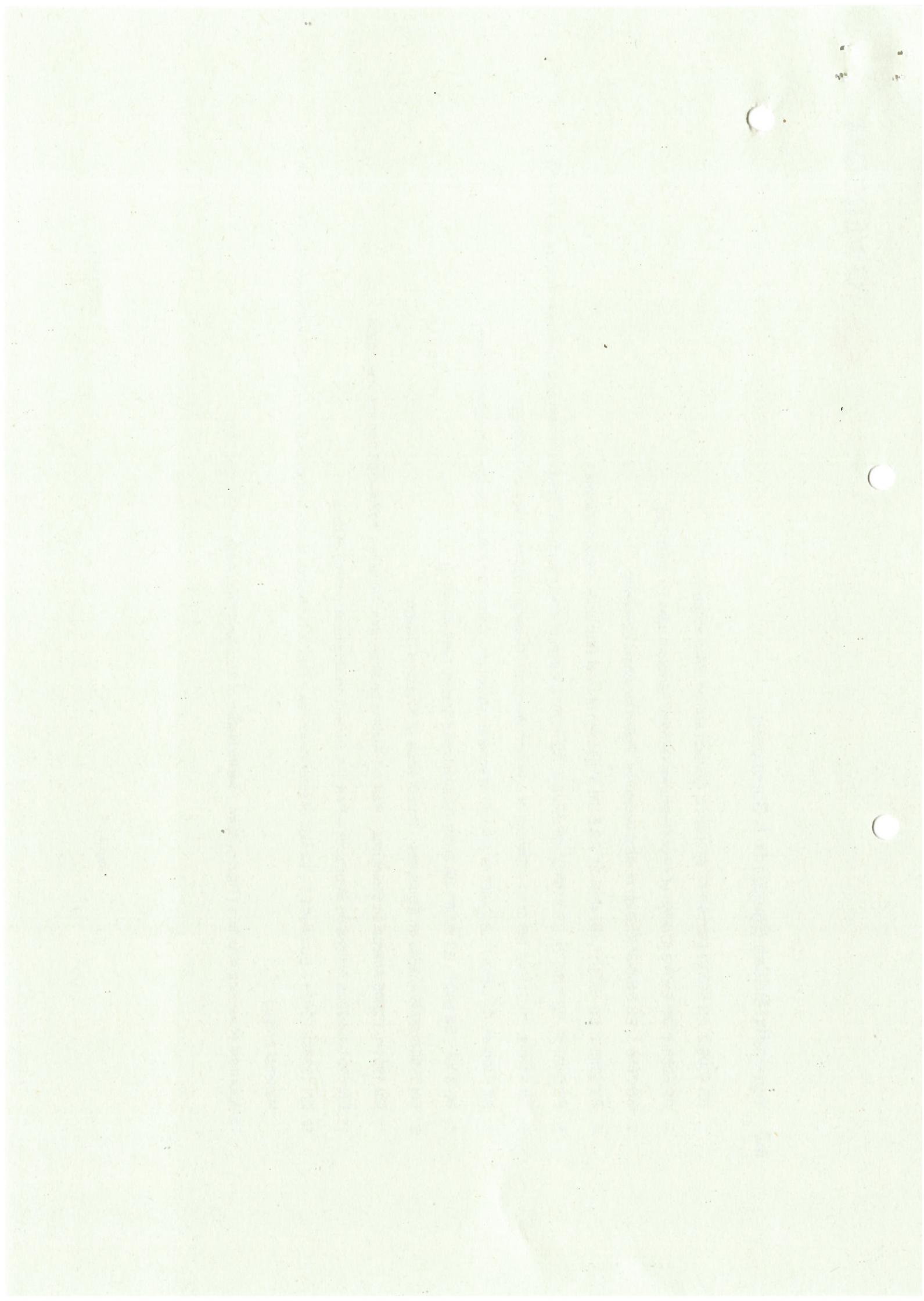


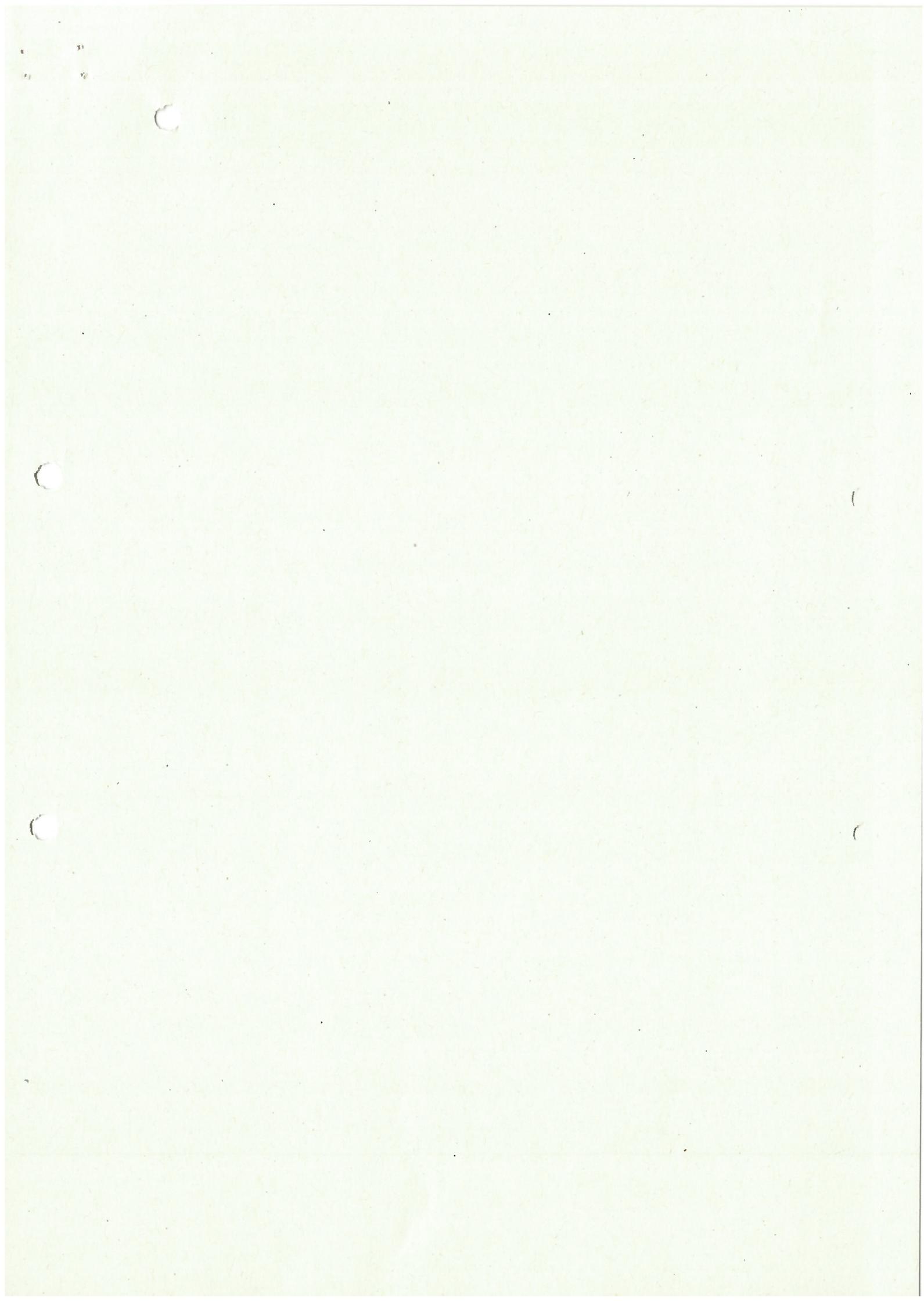
Equipment 05/03/2020

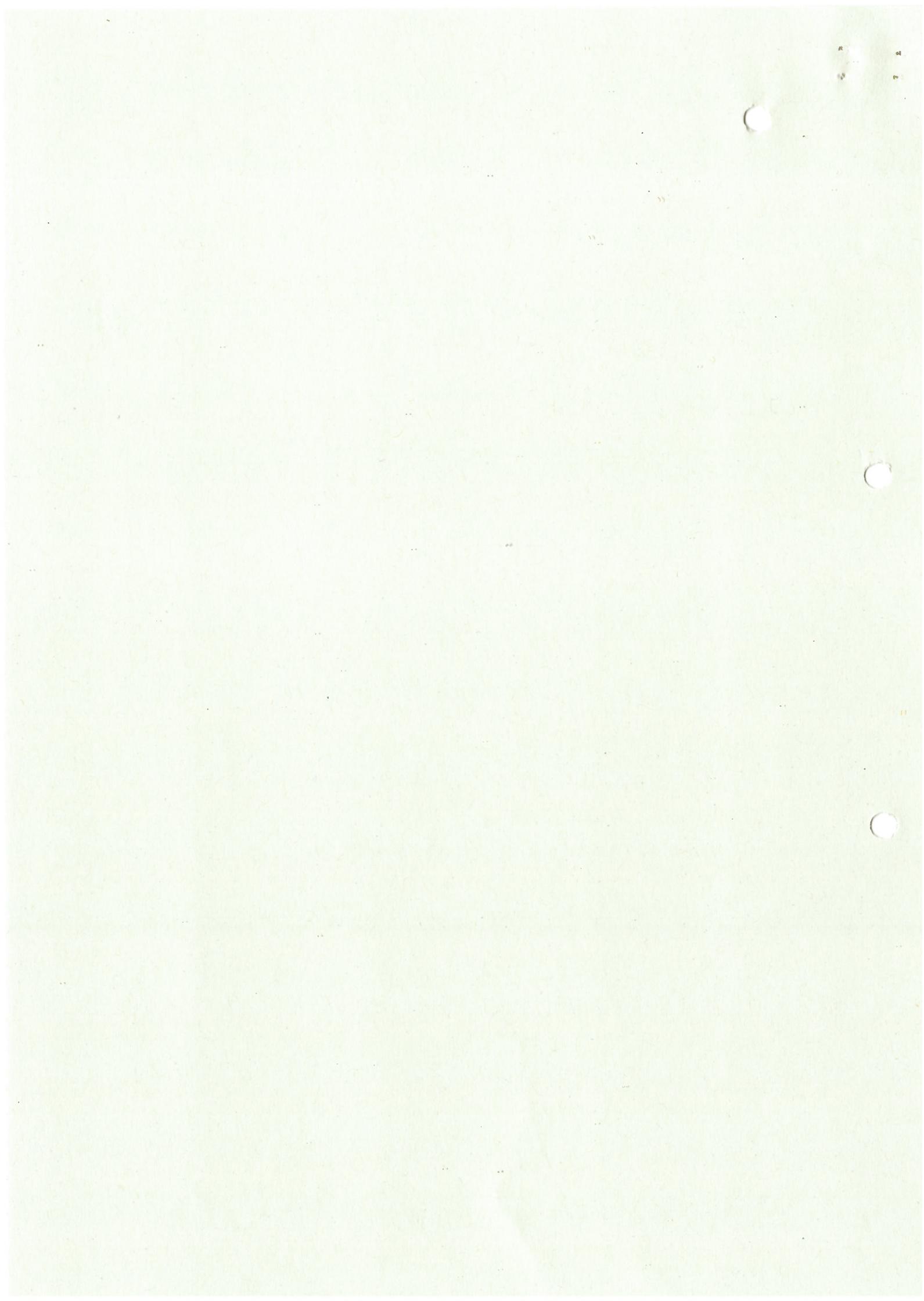


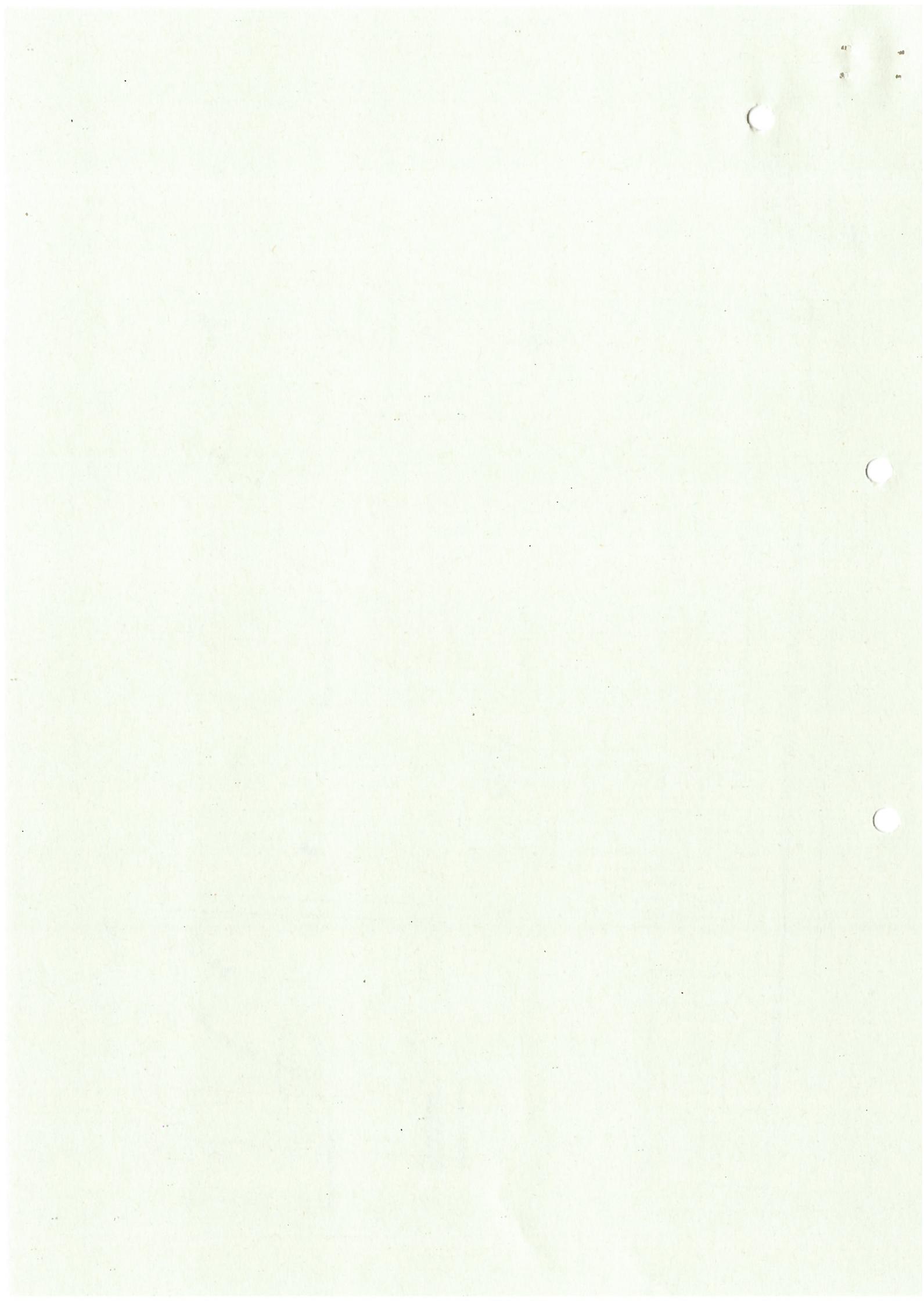
4.0 Appendix: British Standards & Eurocodes

1. BS 6399-2, BS 5400-2 [Actions on structures. General actions. Wind actions]
2. BS 5950-1, BS 5400-3 [Design of steel structures. General rules and rules for buildings]
3. BS 5950-1, BS 5400-3* [Design of steel structures. Plated structural elements]
4. BS 5950-1, BS 4604-1*, BS 4604-2*, BS 5400-3* [Design of steel structures. Design of joints.]
5. BS 8100-1*, BS 8100-2*, BS 8100-3*, BS 8100-4, BS 4076* [Design of steel structures. Towers, masts and chimneys. Towers and masts]
6. BS 8110-1, BS 8110-2, BS 8110-3 [Design of concrete structures. General rules and rules for buildings]
7. BS 5400-4*, BS 5400-7*, BS 5400-8* [Design of concrete structures. Concrete bridges. Design and detailing rules]
8. BS 8002*, BS 8004*, BS 8006*, BS 8081* [Geotechnical design. General rules.]
9. EN 1990-0:2005 Actions on Structures – Part 0: Basis of Structural Design
10. EN 1991-1-1:2005 Actions on Structures – Part 1-1 Actions on structures: Densities, self-weight and imposed loads
11. EN 1991-1-4:2005 Actions on Structures – Part 1-4: Actions on structures – Wind actions
12. EN 1993-3-1:2006 – Eurocode 3 – Design of steel structures – Part 3-1: Towers, masts and chimneys – Towers and masts (including Irish National Annex)
13. Appraisal of existing structure (Third edition), The Institution of Structural Engineers, 18 October 2010







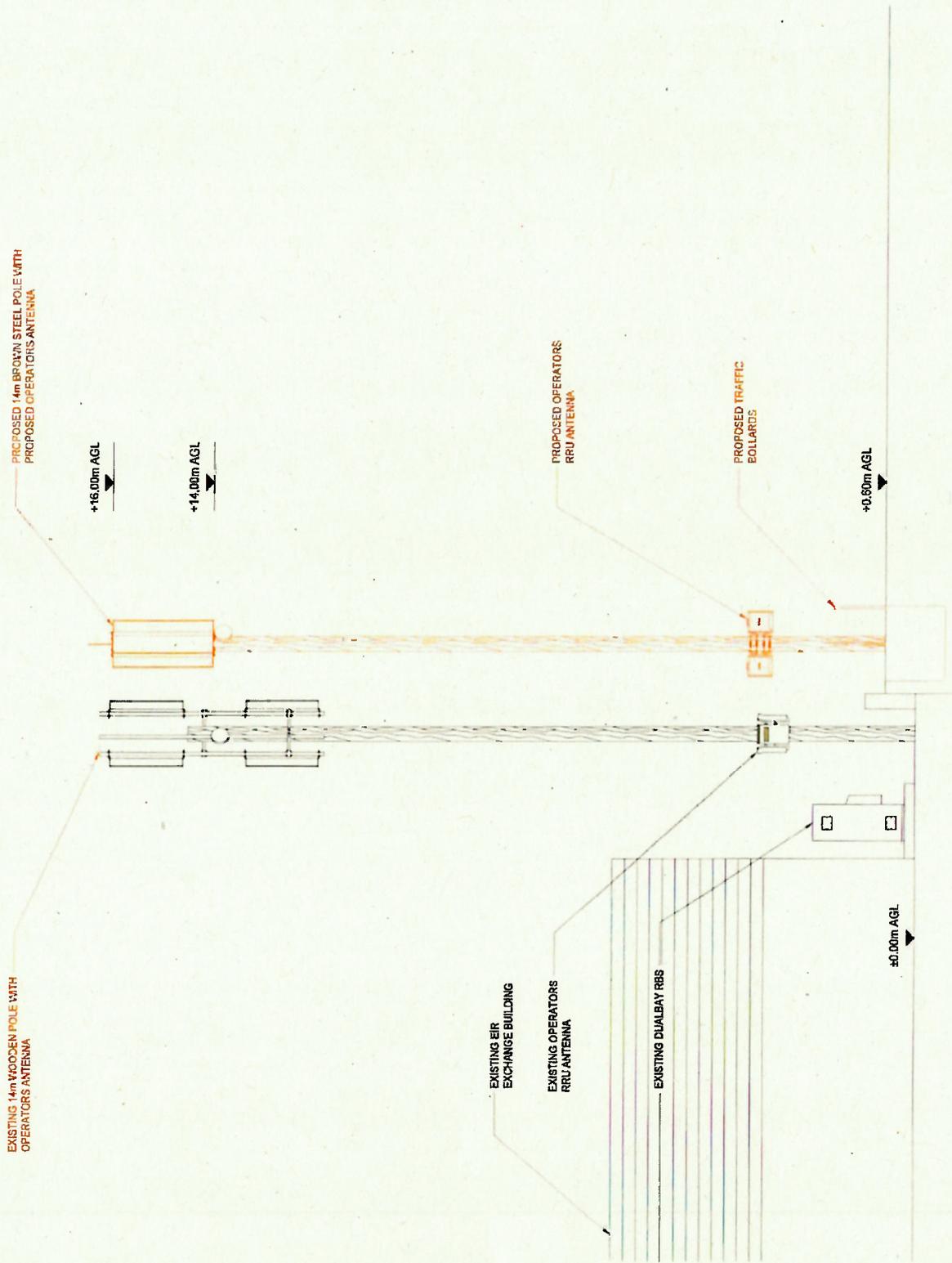


Notes
 1. Do not scale. Measurements are indicative only.
 2. All dimensions are in millimeters unless noted otherwise.
 3. Assume all site details are existing unless otherwise specified.

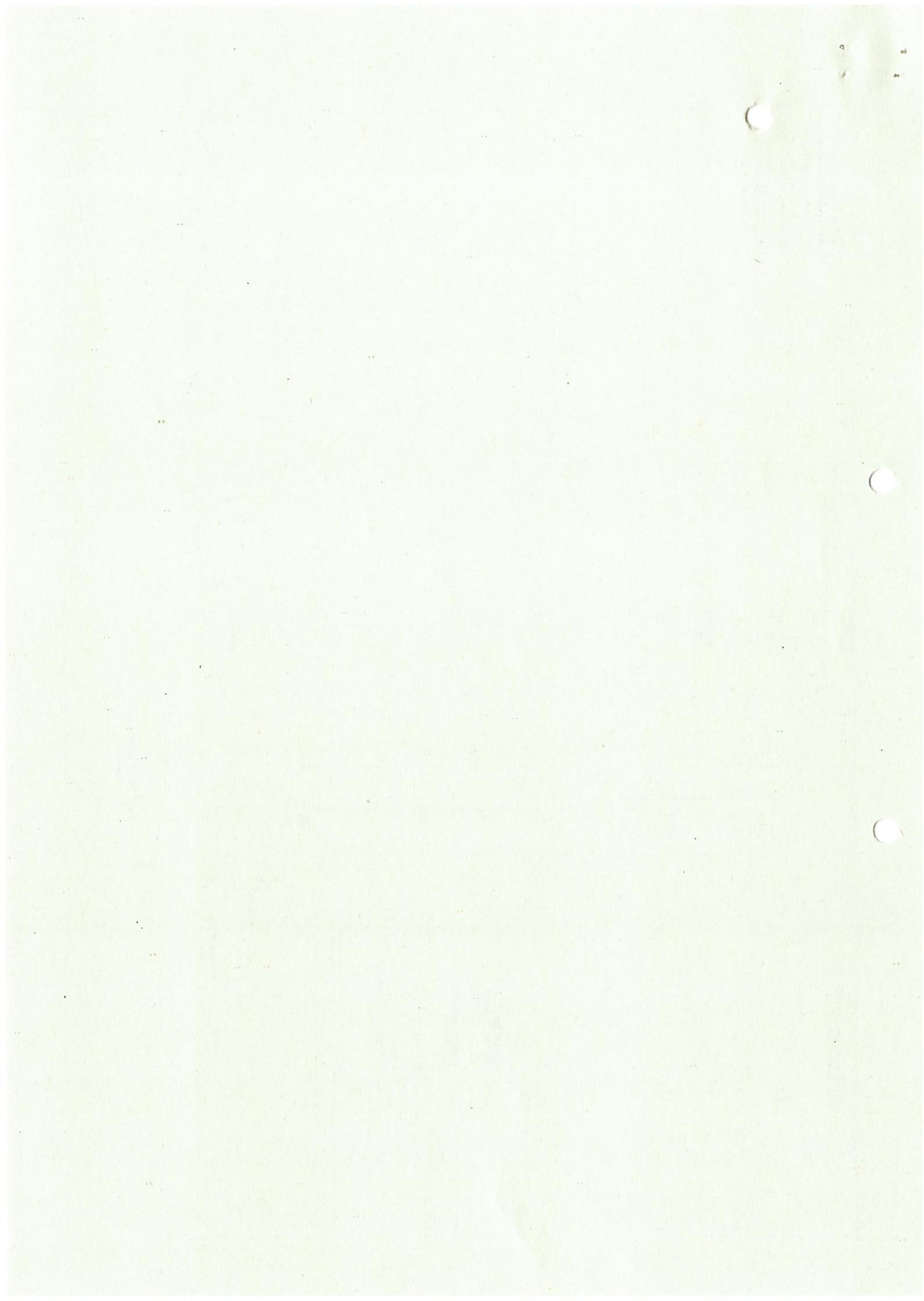
Existing Structure Details
 Type: Wooden Pole Height: 14m
 Proposed Structure Details
 Type: Brown Steel Pole Height: 14m

01	Proposal	25.04.24	DNV	63
Rev	Description	Date	Drawn By	Checked By

Site ID: TCKS225
 Site Name: Wellington Road Ctr. Cor
 Title: Site Evaluation
 Scale: As Shown
 AD Print: Sheet No. 02
 Dwg No: TCKS225-TC-01



SOUTH ELEVATION
 SCALE 1:80



Wooden Pole Inspection Checklist

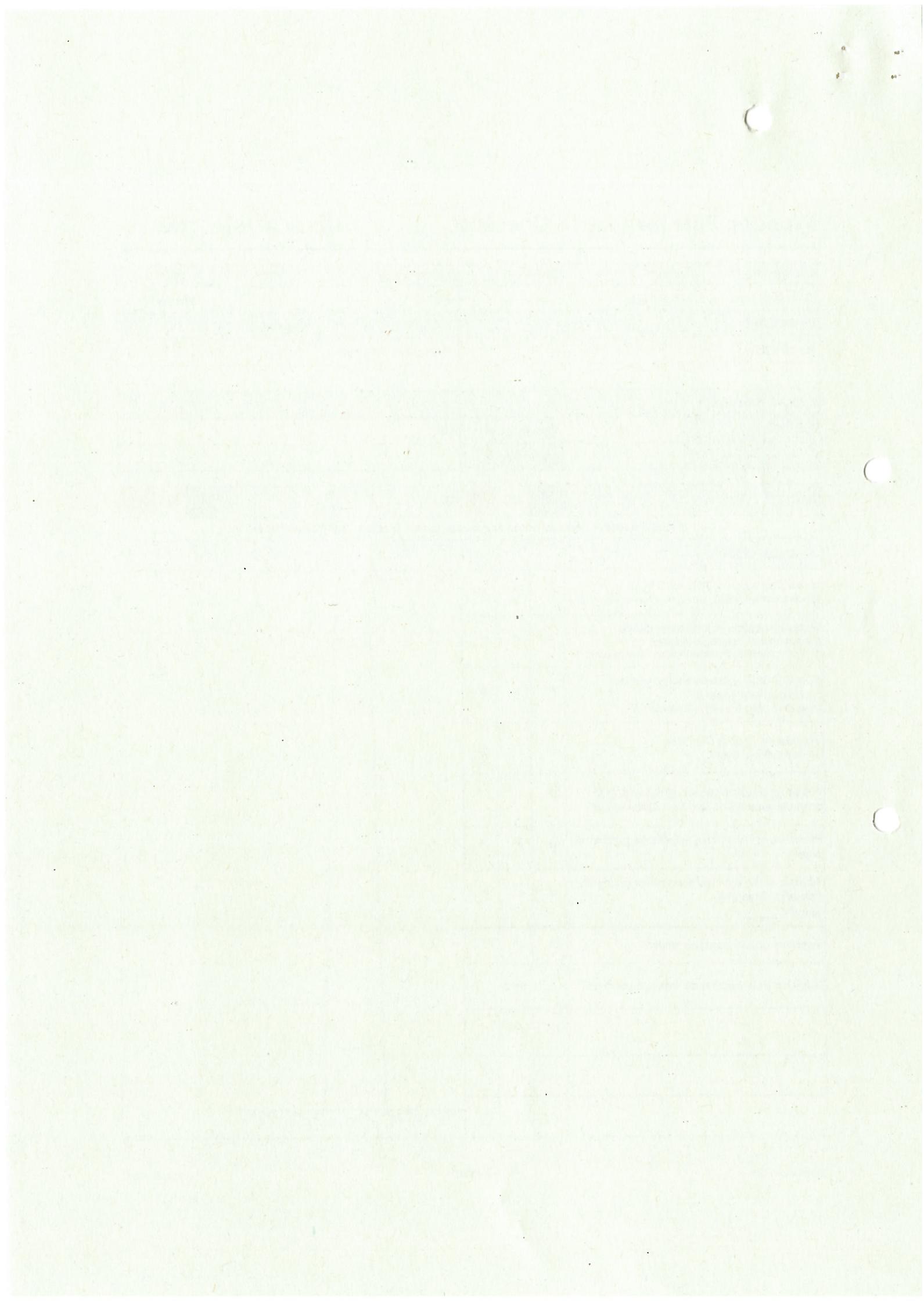


Site Name	Site ID	SAF #	Inspection Type	Date
Wellington road	TCK5225		Ground	09/05/2024
On site crew:			Position	
Tom Sexton			Construction Manager	
Wooden Pole details				
Height (m)	15	Base Width (m)	320	
		Top Width (m)		

Task	OK	N/A	Issue	Task	OK	N/A	Issue
<i>Asset Inspection (issues found will be logged as Trouble Tickets on Radix)</i>							

Structure Inspection

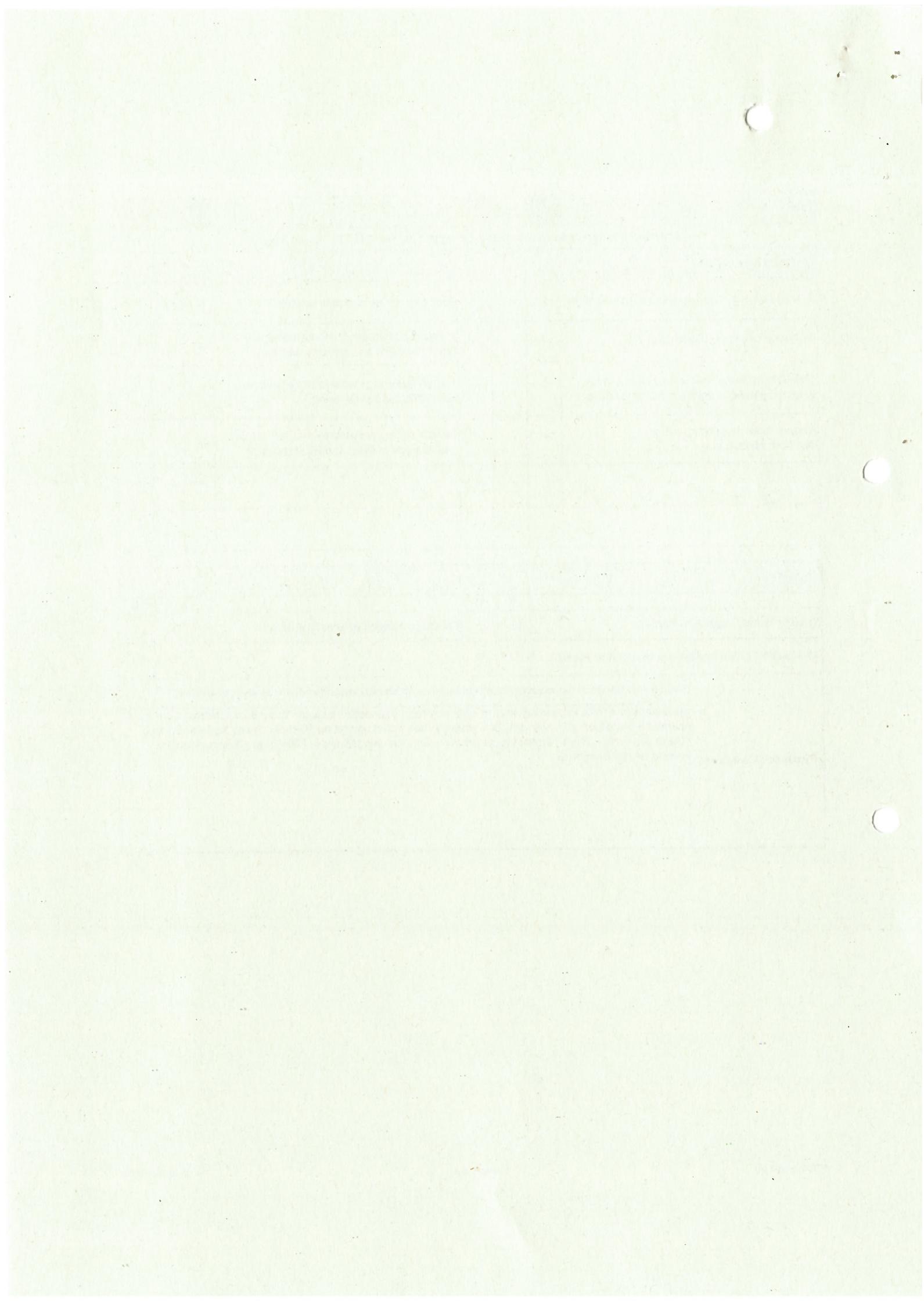
Task	OK	N/A	Issue	Task
Visual inspection of Pole for Cracks (Record location, length, width and depth on drawing)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Wooden Pole Diagram:
Visual inspection of Pole damage/rot (Record location, severity on drawing) (Hammer test for Indication of Rot can also be used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Pole Stability, vertical standing with no excessive lean or bend. (If an issue, state severity or incline/bend)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Foundation Type & Condition (Record drainage type)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are all operators steelwork and equipment properly secure and free from deformation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Presence of Ivy or other vegetation growing on pole?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Access: Is there a clear form of accessing the pole and equipment Identify: _____	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Inventory on site matches Radix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Height of Pole depth mark from ground level.	900			
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

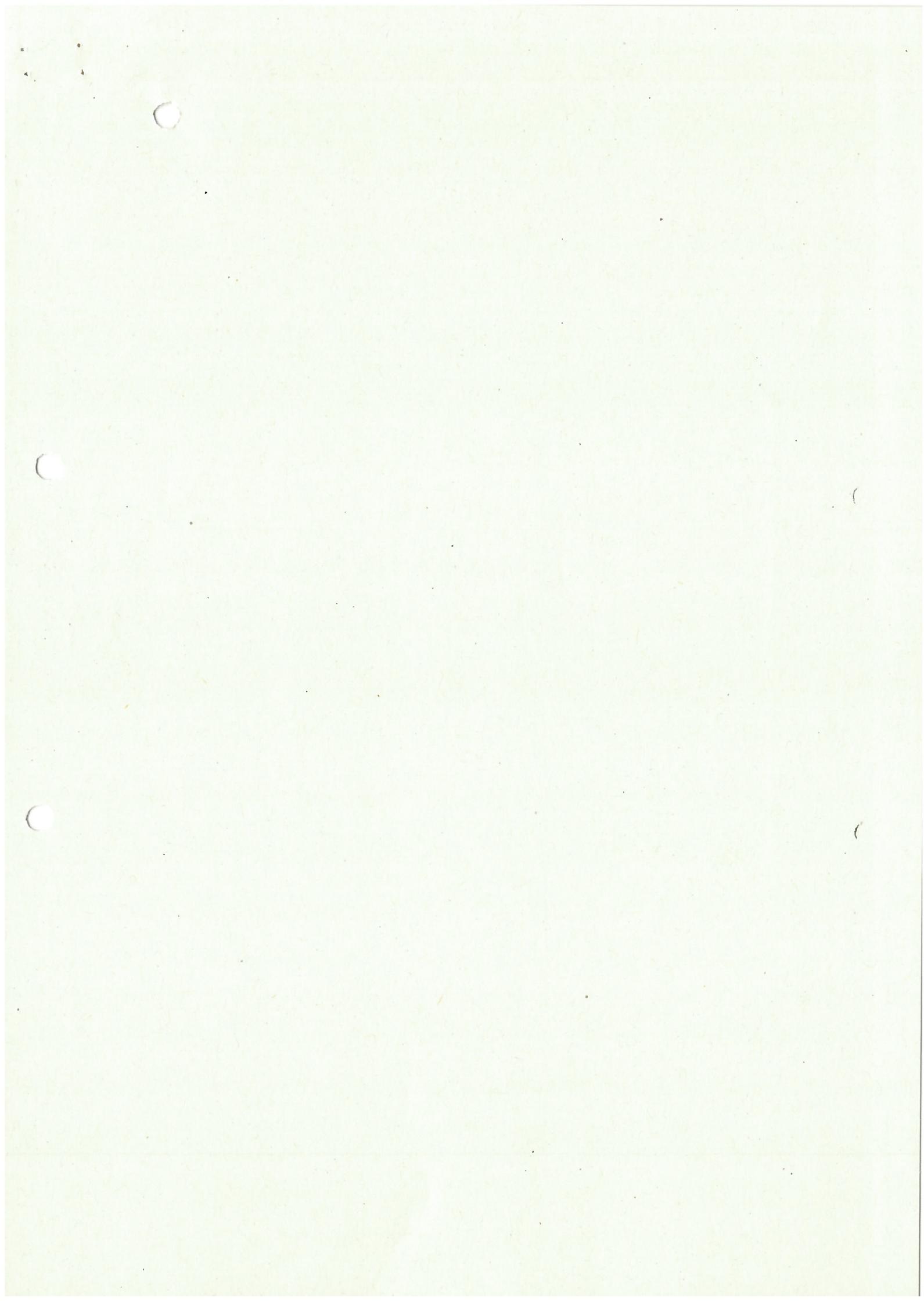


Task	OK	N/A	Issue	Task	OK	N/A	Issue
<i>Asset Inspection (issues found will be logged as Trouble Tickets on Radix)</i>							
Site Photos (upload onto LAN)							
Elevations	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ground Photos	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Task	OK	N/A	Issue	Task	OK	N/A	Issue
Asset Inspection (issues found will be logged as Trouble Tickets on Radix)							
Site area Inspection							
Signage on site - appropriate to likely hazards	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Earthing - fence and gate earthed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Condition of compound fencing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Outdoor customer ground equipment in good condition and properly earthed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall condition of site area (tidiness over grown vegetation, slip/trip & bio hazards etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Are all Towercom locks in working order? (use CRC 2-26 to oil locks)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Access route (in good condition, free from obstruction)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Feeder cables properly secured @ 1m C/C with the use of MKD and REM clamps?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Signoff					
	Y	N		Y	N
Trouble Tickets logged on Radix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Climbdown Date captured on Radix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
All Trouble Tickets reviewed & updated on Radix?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
Evaluation Comments:	Note: Mandatory field for observations during inspection i.e. Monitor [Supplementary files to be attached to report]				
	As before The Pole is Leaning around 450mm West. Foundation appears to be in concrete and from last inspection no signs of movement. 2no antennas are poled up and no Phenols above these antennas. There are 1mm - 2mm - 3mm vertical cracks visible around 200mm to 300mm to 400mm in length maybe longer further up.				







Our Ref: GH/Rp/P24116+ attachments (*.pdf)

10th September, 2024

Messrs. TOWERCOM
Usher House,
Main Street,
Dundrum,
Dublin 14.

Re: Steel pole, Wellington Rd. (TCK5225), Ground investigation, Report

Introduction

In August, 2024, Towercom, commissioned Priority Geotechnical (PGL), to carry out a ground investigation at the location of a proposed 14m steel pole, located at Eir exchange Wellington Rd., Cork City, E567999, N572327.

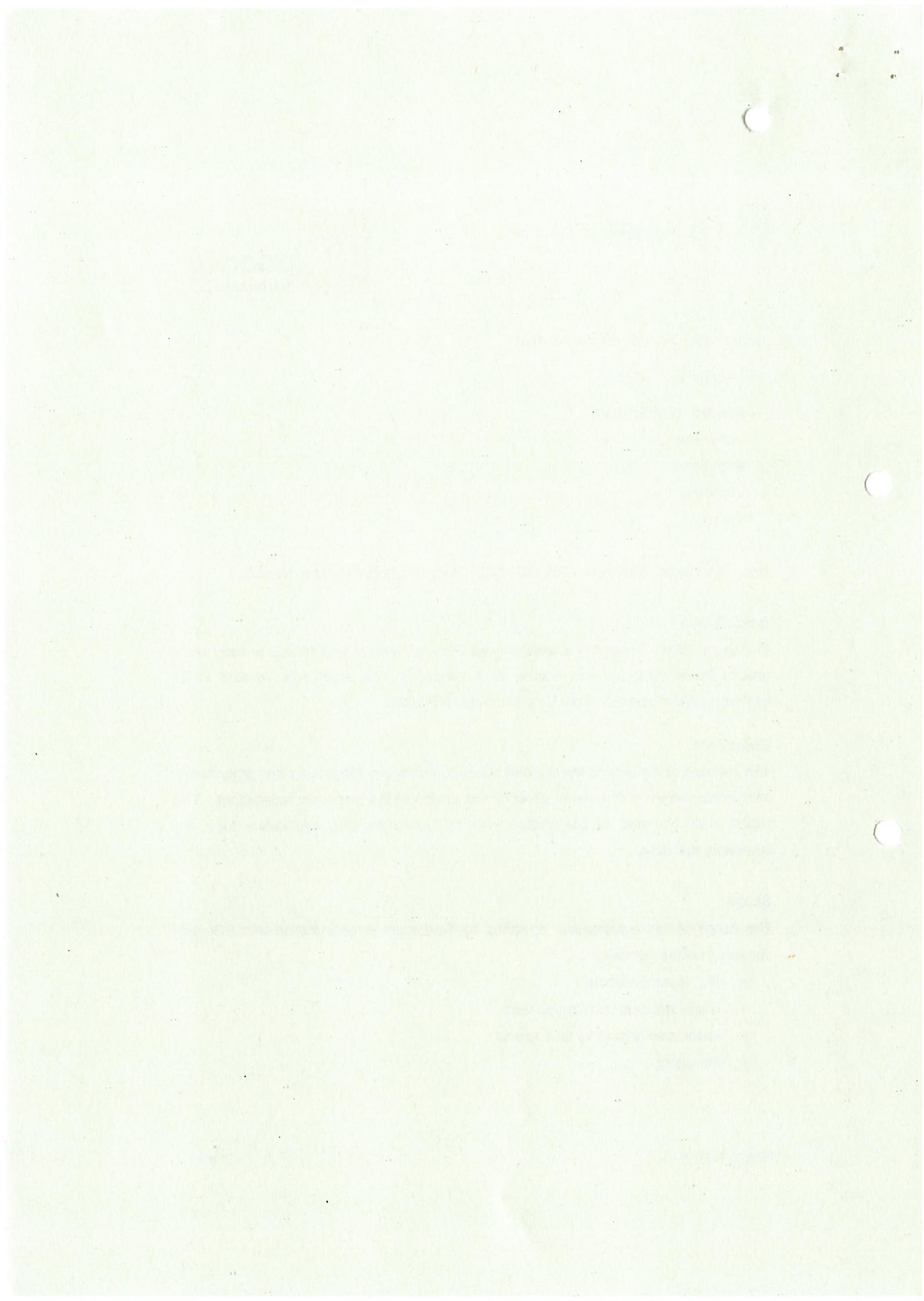
Objectives

The purpose of the ground investigations was to determine the ground and groundwater conditions present at the site to allow for the design of the monopole foundations. This report shall be read in conjunction with the accompanying exploratory logs and laboratory test data.

Scope

The scope of the investigation, specified by Towercom in consultation with PGL and comprised of the following;

- 1Nr. rotary borehole;
- *In situ* standard penetration tests;
- Associated laboratory testing and
- Reporting.



Site Works

The investigation was carried out in accordance with, Eurocode 7- Geotechnical Design Part 2, ground investigation and testing (BS EN 1997-2: 2007) and the relevant British Standards BS5930, 1999. The fieldworks at the proposed mast structure were carried out on the 26th August, 2024.

Rotary borehole

A single (1) rotary borehole was bored to a depth 6.7m below existing ground level (bgl) using PGL's Baretta T44, rotary rig. The records accompany this report and are discussed herein.

Location	Depth, m bgl
RC01	6.7

Sampling

A total of 1.5lin.m of rock core was recovered in the exploratory hole in accordance with Geotechnical Investigation and Sampling – Sampling Methods and Groundwater Measurements (EN ISO 22475-1:2006).

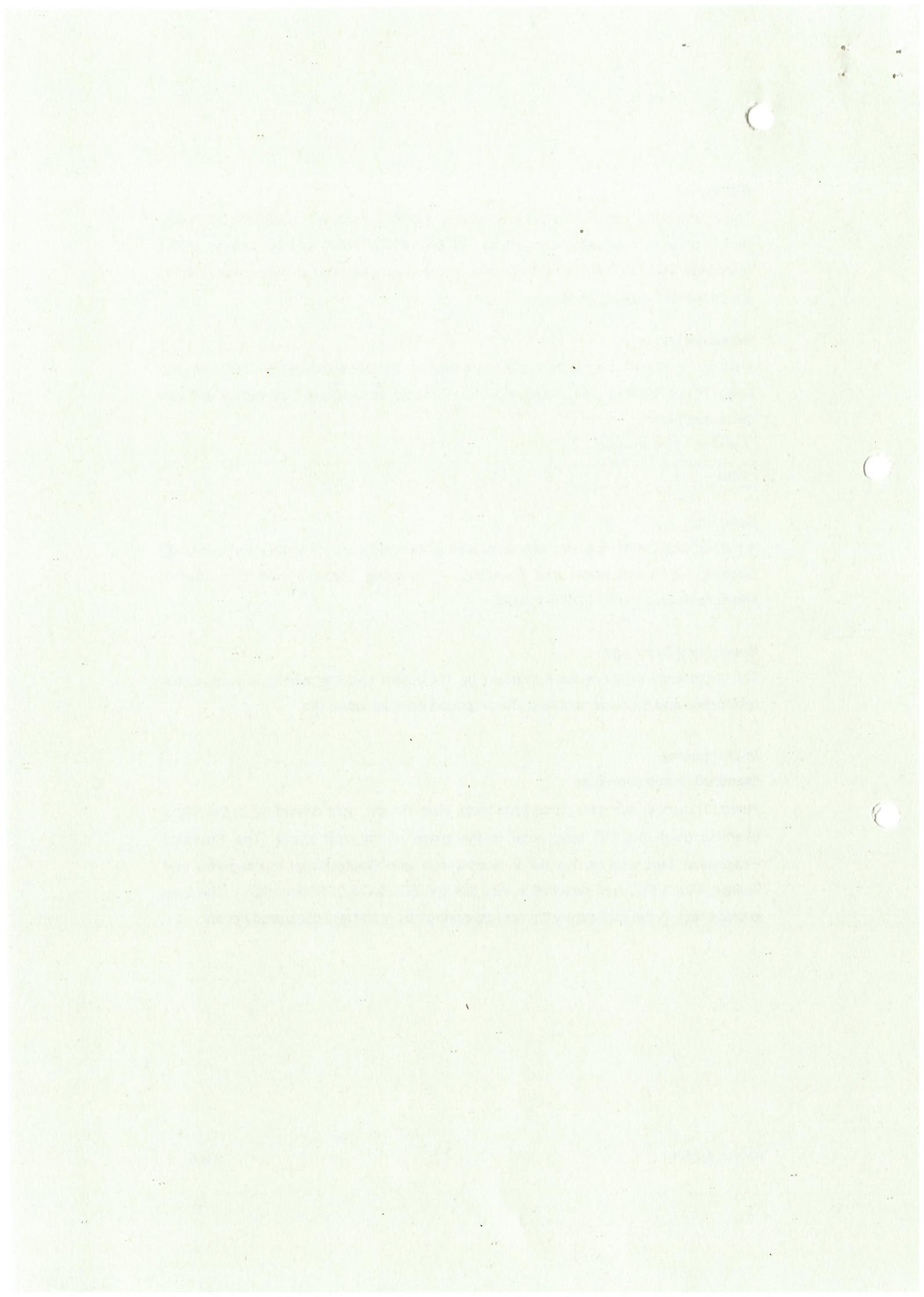
Survey and Drawings

The exploratory locations were selected by Towercom and are subject to work space restrictions and available access to the proposed mast structure site.

***In-situ* testing**

Standard penetration test

Three (3) number standard penetration tests, N_{SPT} values, were carried out in the rotary borehole using the 60° solid cone in the place of the split spoon. The Standard Penetration Test was carried out in accordance with Geotechnical Investigation and Testing, Part 3 Standard penetration test, BS EN ISO 22476-3:2005+A1:2011. The data is presented on the exploratory log accompanying this report and discussed herein.



Laboratory testing

All samples were transported to Priority Geotechnical's laboratory in Midleton, Co. Cork examined, logged and prepared for scheduled testing. Laboratory testing was scheduled by PGL on behalf of Towercom. Testing was carried out by PGL in accordance with BS1377 (1990), Methods of test for soils for civil engineering purposes and the ISRM suggested methods for rock characterisation, testing and monitoring. Chemical analysis was undertaken by Eurofins Chemtest Ltd. (UK) on behalf of PGL. The laboratory test results were presented herein. A summary of tests undertaken were detailed as follows;

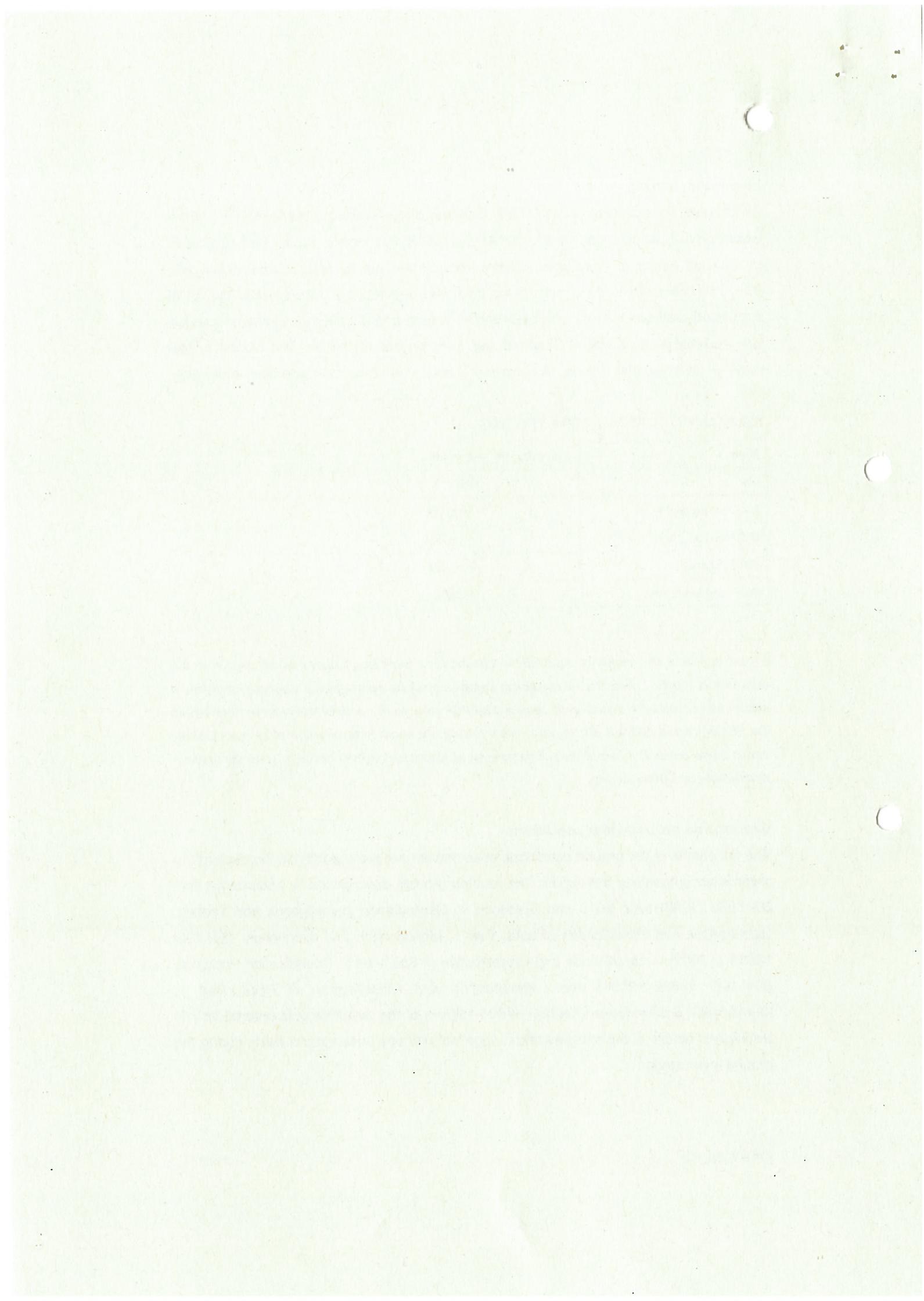
SUMMARY OF LABORATORY TESTING

Type	Quantity, Nr.	Remarks
pH	1	8.7
Sulphate content SO ₄	1	<0.010g/l
Sulphate SO ₄ , (acid soluble)	1	<0.010%
Total Sulphate	1	<0.010%
Point load index, I _{p50}	1	4.3MPa

Please note that all sample/ cores shall be retained for a period no longer than 28 days from the date of this report. Thereafter all remaining samples shall be appropriately disposed of unless a written instruction to the contrary is received by PGL prior to the date of this reporting and within the 28 day period outlined above. Laboratory testing will result in a reduction of sample quantity and in some cases the use of the full sample mass. Samples already tested may not be suitable or available for further testing.

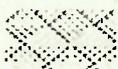
Ground and groundwater conditions

The full details of the ground conditions encountered are provided for on the exploratory records accompanying this report. The records provide descriptions, in accordance with BS 5930 (1999) +A2: 2010 and Eurocode 7, Geotechnical Investigation and Testing, Identification and classification of soils, Part 1, Identification and description (EN ISO 14688-1: 2002), – Identification and Classification of Soil, Part 2: Classification Principles (EN ISO 14688-2:2004) and Identification and Classification of Rock, Part 1: Identification & Description (EN ISO 14689-1:2004) of the materials encountered, *in situ* testing and details of the samples taken, together with any observations made during the ground investigation.



GRAVEL with Cobble content was described to a depth of 4.9m below existing ground level (bgl); below this, 4.9m bgl, medium strong SANDSTONE was encountered.

Details of the groundwater encountered are presented on the relevant exploratory logs attached herein. Groundwater conditions observed in the excavations are those appertaining to the period of the investigation. The groundwater regime should be assessed from standpipe well installations, where available. The exploratory boreholes were backfilled with arisings. No groundwater monitoring standpipes were constructed.



ARISINGS Backfill

No groundwater was encountered during the period of fieldworks. Seasonal fluctuations may occur.

SUMMARY OF GROUNDWATER ENCOUNTERED

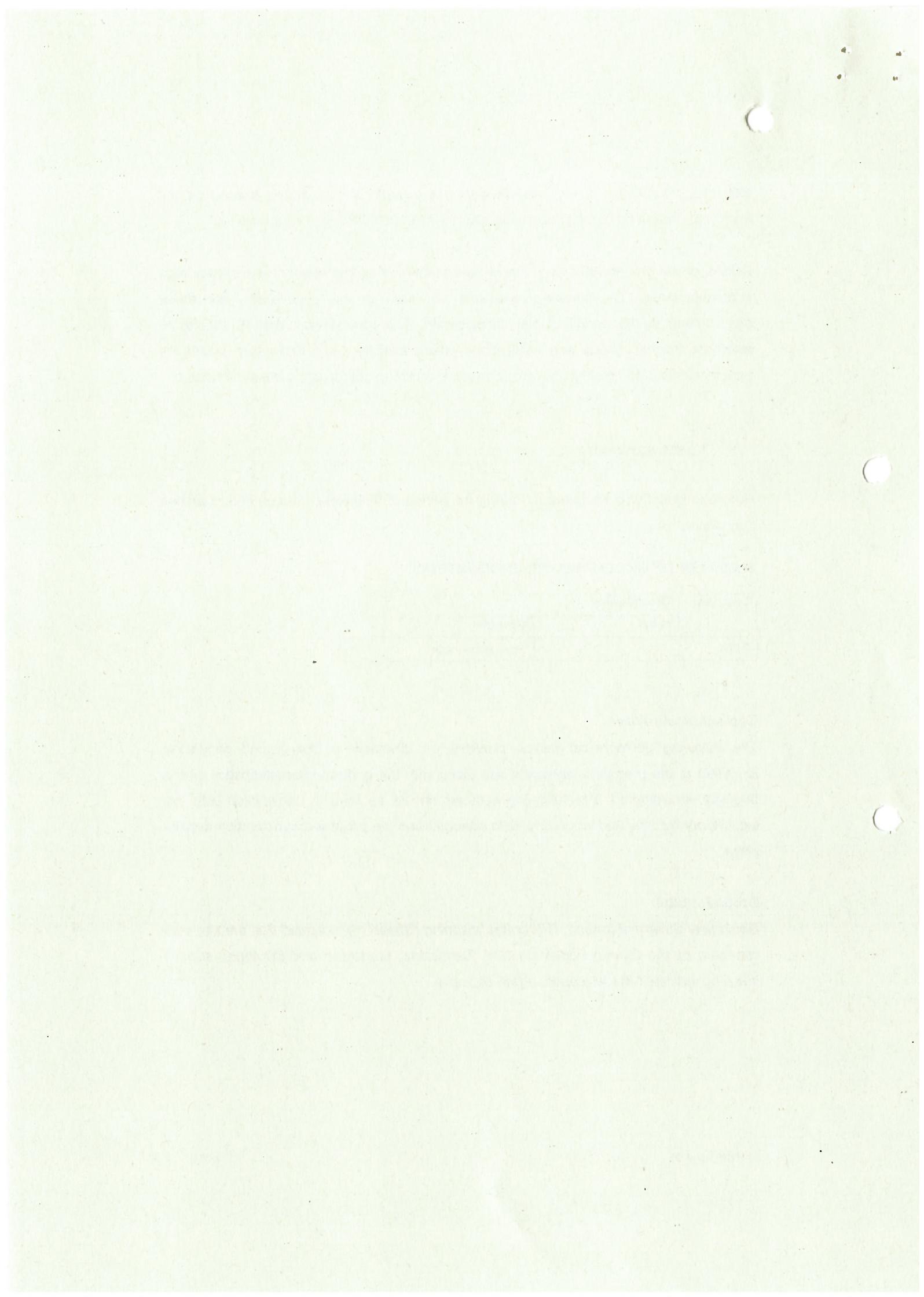
Location	Groundwater	
	m bgl	Remarks
RC01	-	None encountered.

Geotechnical review

The following geotechnical review provides an overview of the ground conditions identified at the proposed monopole site along with the general characterisation of the deposits encountered. The following sections should be read in conjunction with the exploratory records and laboratory data attached and the proposed construction details/ plans.

Ground model

Geological Survey of Ireland, GSI online mapping (Sheet 25) indicated that the site was underlain by the Gyleen Formation (GY, Sandstone, Mudstone and Siltstone); subsoil mapping indicated Made ground, urban deposits.



The current ground model such that; medium dense (NsPT 20 and 21) GRAVEL with Cobble content was described to a depth of 4.9m bgl. Below 4.9m medium strong, moderately weathered, CIII, fair SANDSTONE was encountered. No groundwater was encountered during the period of fieldworks.

Location	Depth to rock		Groundwater		Superficial deposits	Solid Geology
	m bgl	mOD Malin	m bgl	mOD Malin		
RC01	4.9	-	-	-	Made ground coarse deposits GRAVEL with Cobble content	SANDSTONE (GY)

The following non-exhaustive geotechnical risk have been identified:

- Cobble and Boulder particles/ obstructions;

The site is characterised by geotechnical category GC-2.

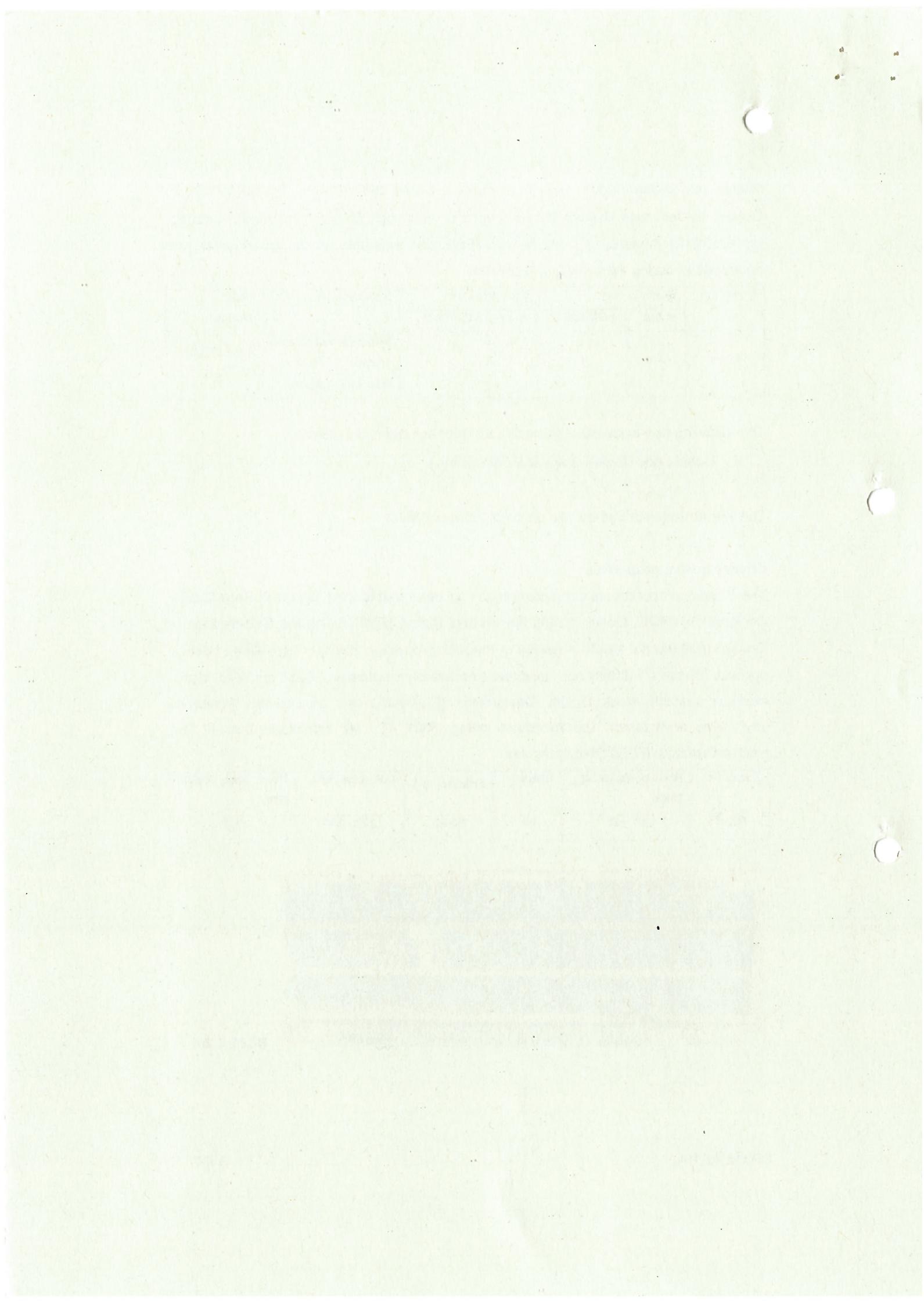
Characteristic properties

The Sandstone rockmass characterization has been established using the Rock Quality Designation, (RQD, Deere, 1964), Rock Mass Rating (RMR) using the Geo-mechanics System (Bieniawski, 1989). A review of the rock properties, strength (I_{s50} MPa), fracture spacing (60mm - 140mm) and condition (moderately weathered, rough surfaces, close-medium spaced), Rock Quality Designation (RQD10%) and groundwater (assumed 'dry'); was undertaken. The rockmass rating, RMR 41 - 46 indicating Class III fair, medium strong LIMESTONE rockmass.

Location	Rock mass rating, RMR	Class	Friction, ϕ^0	Cohesion, kPa	Point load index, MPa
RC01	41 - 46	III	25-28	200 - 230	4.3



RC01, 5.2m



Foundations

Proposed structure; 14m steel pole, approx. 2.0m x 2.0m sq. base.

A suitable bearing strata is identified 1.5m bgl within the medium dense GRAVEL deposits. A presumed bearing resistance of 200kN/m² (kPa) to 600kPa is expected (BS8004, Code of practice for foundations, 1986).

Table 1.1 Presumed bearing values (BS 8004, Table 1)

Category	Types of rocks and soils	Presumed allowable bearing value		Remarks
		kN/m ² *	kgf/cm ² ; tonf/ft ²	
Rocks	Strong igneous and gneissic rocks in sound condition	10 000	100	These values are based on the assumption that the foundations are taken down to unweathered rock. For weak, weathered and broken rock, see 2.2.2.3.1.12
	Strong limestones and strong sandstones	4000	40	
	Schists and slates	3000	30	
	Strong shales, strong mudstones and strong siltstones	2000	20	
Non-cohesive soils	Dense gravel, or dense sand and gravel	>600	>6	Width of foundation not less than 1 m. Groundwater level assumed to be a depth not less than below the base of the foundation. For effect of relative density and groundwater level, see 2.2.2.3.2
	Medium dense gravel, or medium dense sand and gravel	<200 to 600	<2 to 6	
	Loose gravel, or loose sand and gravel	<200	<2	
	Compact sand	>300	>3	
	Medium dense sand	100 to 300	1 to 3	
	Loose sand	<100	<1	
		Value depending on degree of looseness		
Cohesive soils	Very stiff boulder clays and hard clays	300 to 600	3 to 6	Group 3 is susceptible to long-term consolidation settlement (see 2.1.2.3.3). For consistencies of clays, see table 5
	Stiff clays	150 to 300	1.5 to 3	
	Firm clays	75 to 150	0.75 to 1.5	
	Soft clays and silts	<75	<0.75	
Very soft clays and silts		Not applicable		
Peat and organic soils		Not applicable		See 2.2.2.3.4
Made ground or fill		Not applicable		See 2.2.2.3.5

* 107.25 kN/m² = 1.094 kgf/cm² = 1 tonf/ft²

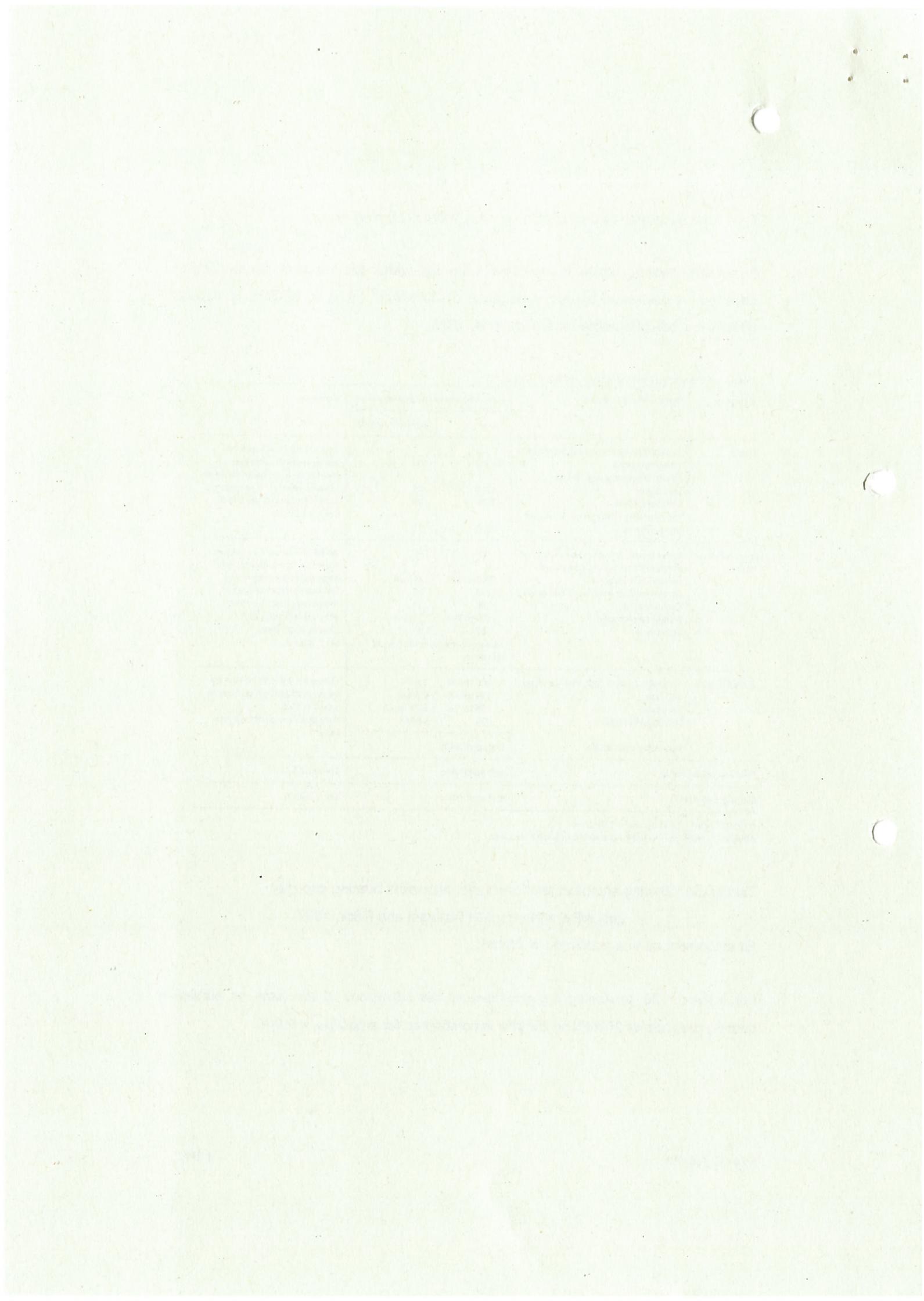
All references within this table refer to the original document

Taking the following empirical relationship for allowable bearing capacity;

$$Q_{all} \text{ (kPa)} = N_{SPT} \times 10 \text{ (Terzaghi and Peck, 1967)}$$

for settlement up to a maximum of 25mm.

For a $N_{SPT} = 20$, assuming the groundwater has influenced *in situ* tests, an allowable bearing pressure of 200kPa to 250kPa is considered for a pad $B_{sq} = 2.0m$.



For a design, friction 35°, an allowing for a partial factor of safety 1.25; an ultimate bearing resistance of 1046kPa have been determined for B= 2.0m sq pad foundation bearing on the medium dense GRAVEL deposits B= 1.5m (Terzaghi, 1947). There is adequate resistance to shear failure for shallow foundations. A basic settlement analysis based on compression index I_c and N_{SPT} (20) yielded settlement 0.042mm/kPa.

For N_{SPT} 20, an allowable bearing resistance of **250kPa** is recommended for an isolated pad foundation up to 2.0m square, at depth 1.5m bgl, for predicted settlement 11mm.

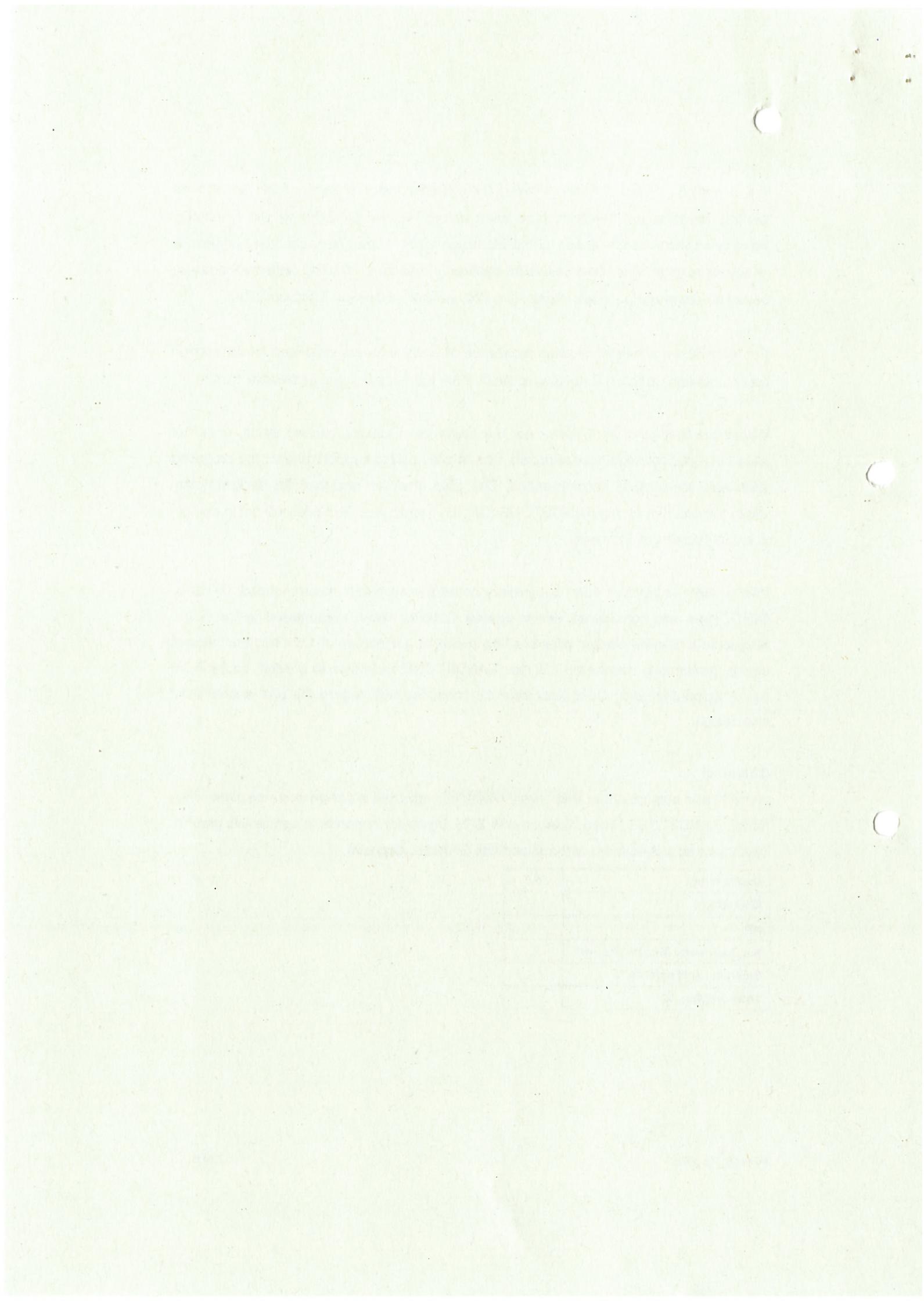
Where the restricted work space nor the depth to a suitable bearing strata, does not allow for a pad foundation or adequate size, a piled pad to support/ anchor the proposed steel pole structure is recommended. The piles shall be designed for socket friction within the medium strong SANDSTONE (CIII, GY) rockmass. The piles will act in tension to resist overturning moments.

With a depth to bedrock 4.9m bgl a rotary bored pile system is recommended; DTHH or ODEX piles are considered where coarse Cobbles were encountered below 5.1m. Subject to a detailed design, piles shall be socketed a minimum of 1.5m into the medium strong, moderately weathered CIII, fair SANDSTONE rockmass to a depth below 7.0m bgl. A Specialist Piling Contractor shall be consulted with regard the pile/ anchor form and design.

Chemical

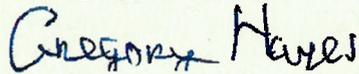
pH (8.7) and sulphate data (<0.010g/l <0.010%) indicated a design sulphate class **DS-1** for the SANDSTONE, in accordance with BRE Digest for concrete in aggressive ground. There was no assessment of the superficial GRAVEL deposits.

Depth, m bgl	5.5
Moisture, %	—
pH	—
Sulphate water soluble SO_4 , g/l	—
Sulphate, acid soluble, %	—
Total Sulphur, %	—



Should there be any queries in relation to the data collected or subsequent analysis please do not hesitate to contact our office.

Yours sincerely,
For Priority Geotechnical,



**Greg Hayes BE MEngSc CEng MIEI
Geotechnical Specialist**

This report has been prepared for the Employer, Towercom and their Representative(s) as outline, herein. The information provided should not be used by Third Parties without their prior written permission and notification to PGL or possible Third Party liabilities.

Decisions made relating to the design process shall be the responsibility of the Designer. PGL shall be notified of any deviations from the proposed or intended construction relating to the tendered and agreed scope of works, herein.

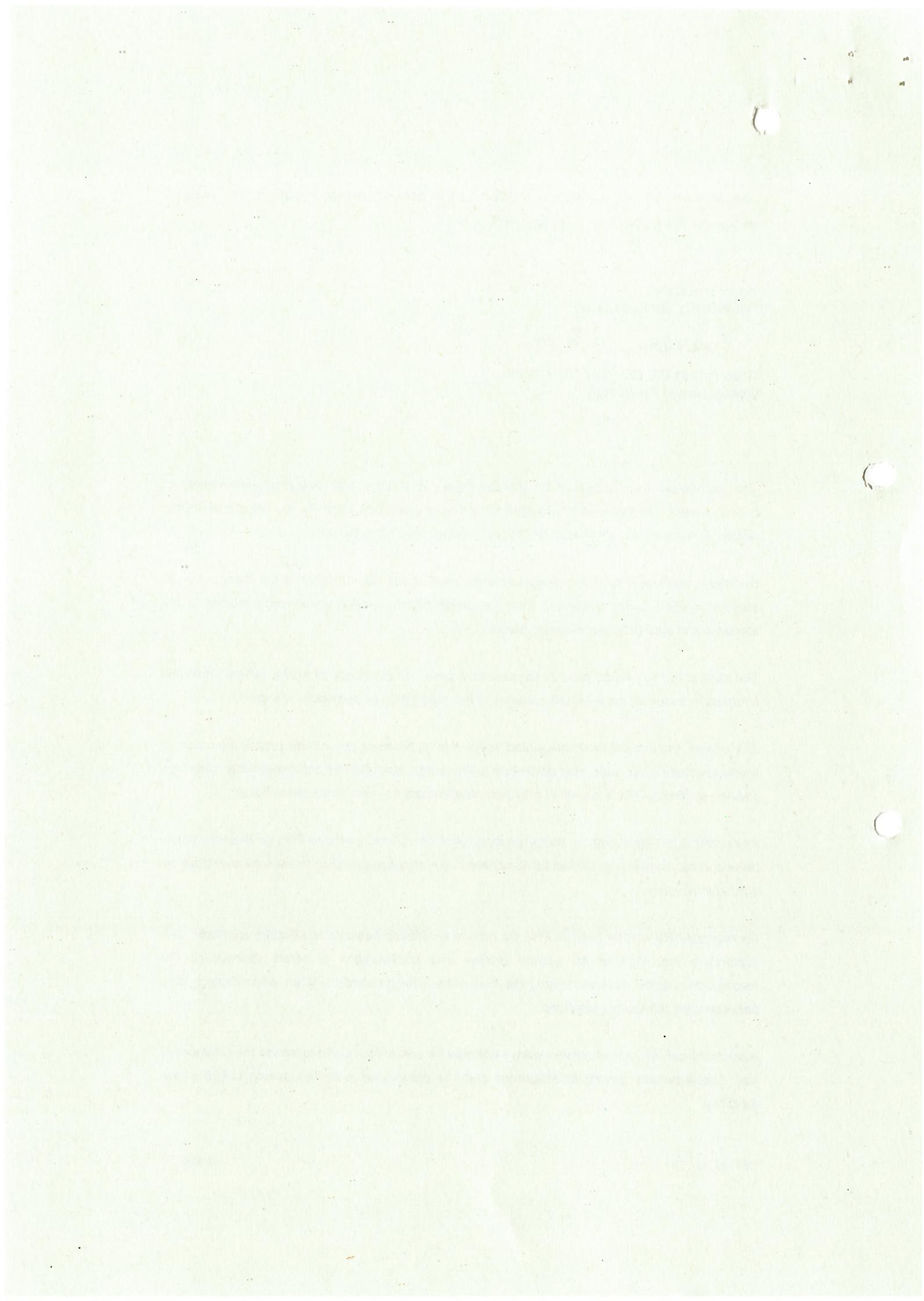
The contents of this report have been presented based on the scope of works. Where additional information becomes available the contents of this report may be subject to change.

The design recommendations presented within this report shall rely on the proper execution of works at construction stage. Any deviations to the design, specification and construction drawings shall be notified to PGL where they may potentially impact the recommendation herein.

Any conflicts arising during the design process shall be communicated to PGL so their impact on the report recommendations shall be considered. Fee structures relating to such reviews shall be agreed in advance.

No responsibility can be held by PGL for ground conditions between exploratory locations. The exploratory logs provide for ground profiles and configuration of strata relevant to the investigation depths achieved during the fieldworks. Caution shall be taken when extrapolating between such exploratory locations.

A geotechnical risk register of unresolved risk may be presented herein to inform the Designer of risk. Supplementary ground investigations shall be considered to further reduce risk(s) where identified.



KEY TO SYMBOLS ON EXPLORATORY HOLE RECORDS

All linear dimensions are in metres or millimetres

DESCRIPTIONS

** Drillers Description
Friable Easily crumbled

SAMPLES

U() Undisturbed 102mm diameter sample, () denotes number of blows to drive sampler
U()F, U()P F- not recovered, P-partially recovered
U38 Undisturbed 38mm diameter sample
P(F), (P) Piston sample - disturbed
B Bulk sample - disturbed
D Jar Sample - disturbed
W Water Sample
CBR California Bearing Ratio mould sample
ES Chemical Sample for Contamination Analysis
SPTLS Standard Penetration Test 5 lump sample from split sampler

CORE RECOVERY AND ROCK QUALITY

TCR Total Core Recovery (% of Core Run)
SCR Solid Core Recovery (length of core having at least one full diameter as % of core run)
RQD Rock Quality Designation (length of solid core greater than 100mm as % of core run)
Where there is insufficient space for the TCR, SCR and RQD, the results may be found in the remarks column
IF Fracture Spacing in mm (Minimum/Average/Maximum) NI - non intact, NR - no recovery
AZCL Assumed Zone of Core Loss
NI Non intact

GROUNDWATER

▽ Groundwater strike
▼ Groundwater level after standing period
Date/Water Date of shift (day/month)/Depth to water at end of previous shift shown above the date and depth to water at beginning of shift given below the date

INSITU TESTING

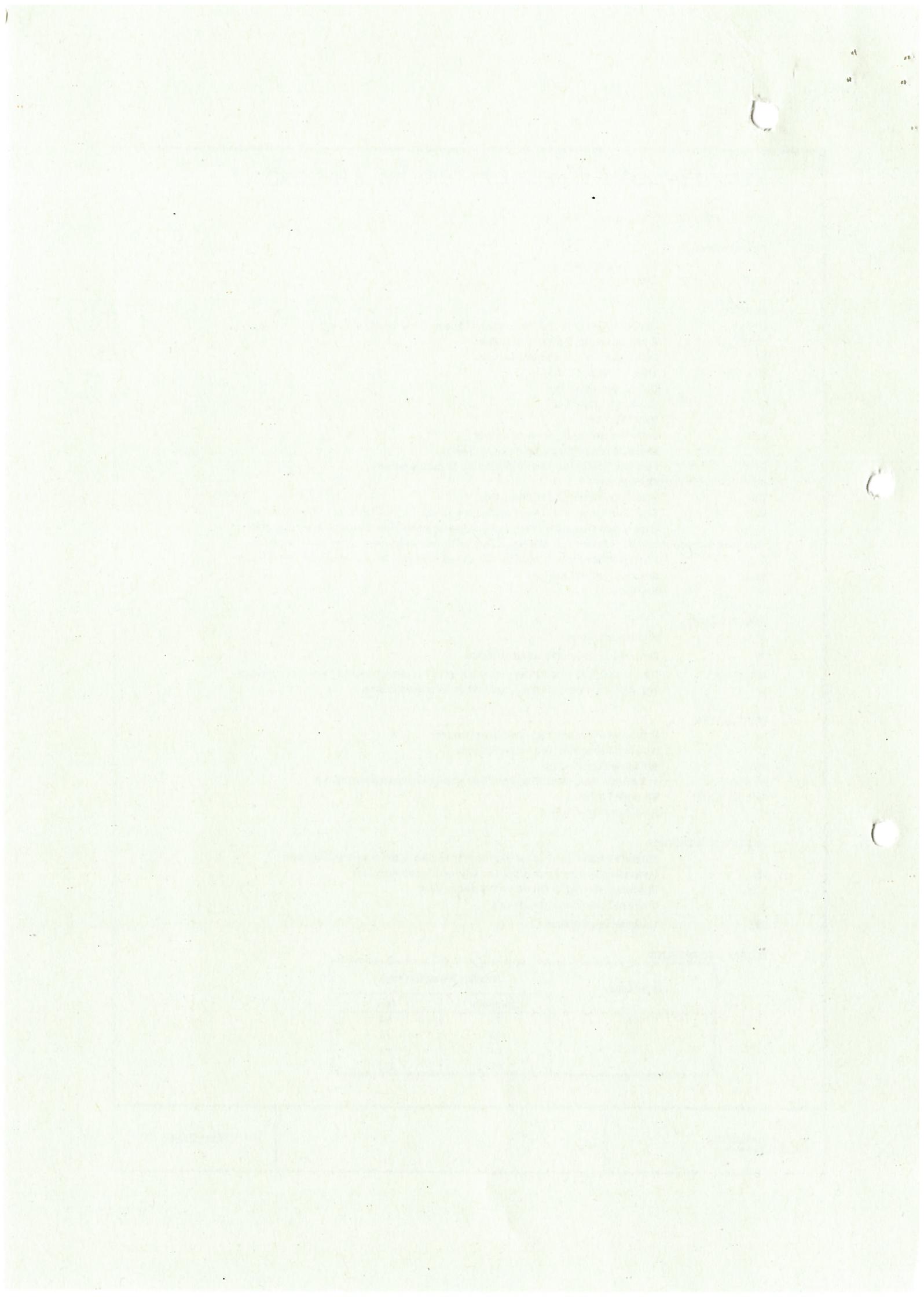
S Standard Penetration Test - split barrel sampler
C Standard Penetration Test - solid 60° cone
SW Self Weight Penetration
Ivp, HVp (R) In Situ Vane Test, Hand Vane Test (R) demonstrates remoulded strength
K(F), (C), (R), (P) Permeability Test
HP Hand Penetrometer Test

MEASURED PROPERTIES

N Standard Penetration Test - blows required to drive 300mm after seating drive
x/y Denotes x blows for y mm within the Standard Penetration Test
x*/y Denotes x blows for y mm within the seating drive
c_u Undrained Shear Strength (kN/m²)
CBR California Bearing Ratio

ROTARY DRILLING SIZES

Index Letter	Nominal Diameter (mm)	
	Borehole	Core
N	75	54
H	99	76
P	120	92
S	146	113





Priority Geotechnical Ltd.
Tel: 021 4631600
www.prioritygeotechnical.ie

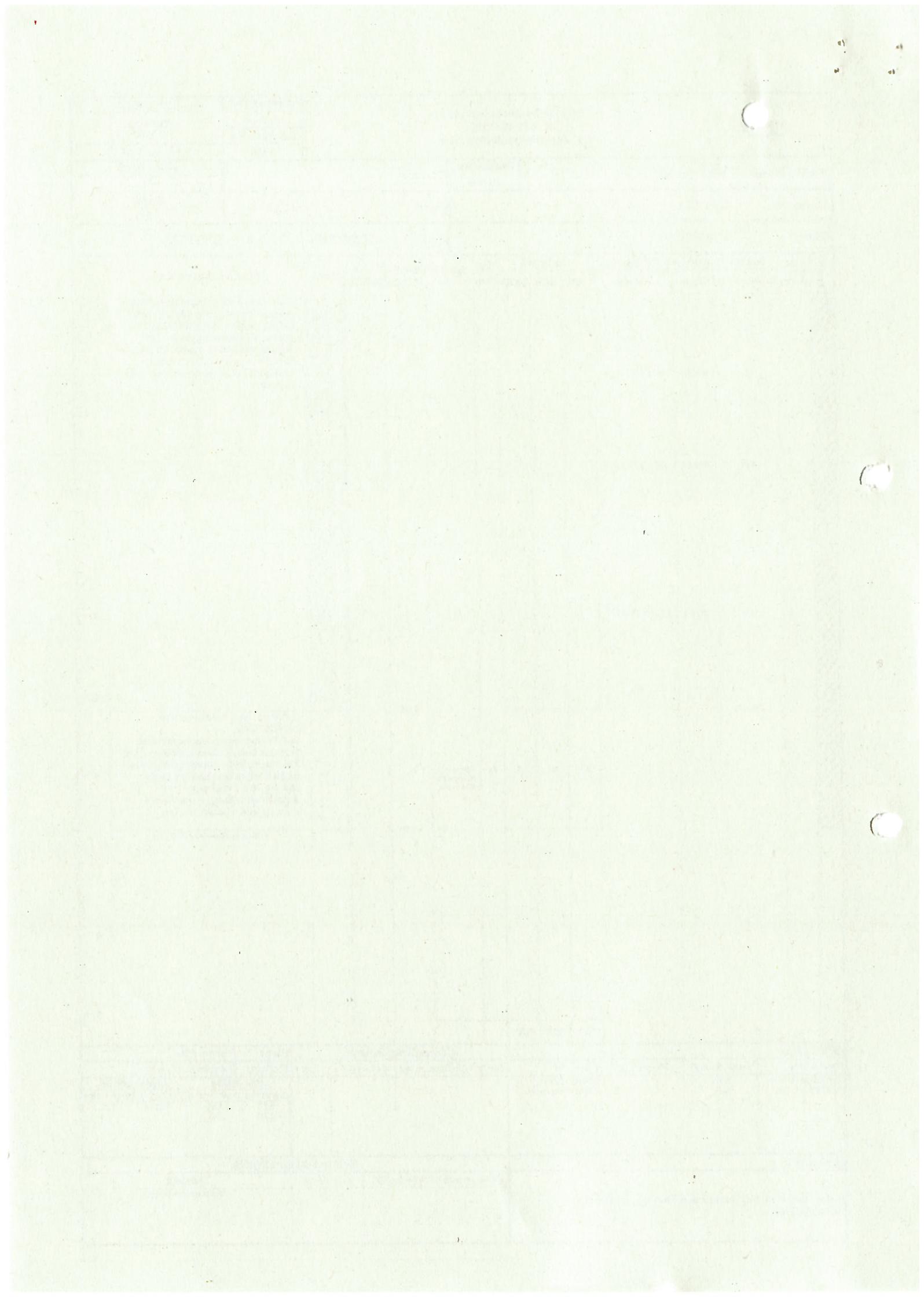
Drilled By	Location
LM & LG	RC01
Logged By	
MM	Sheet 1 of 1

Project Name	Wellington Rd.	Project No.	P24116	Co-ords	
Location	Cork City	Level	m OD	Hole Type	RC
Client	TOWERCOM	Date	26/08/2024		Scale
			26/08/2024		1:50

Backfill	Water Strike (m bgl)	Sampling and In-Situ Testing			Coring %			FI/Run	Spacing (mm)	Depth (m bgl)	Level (mOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results	TCR	SCR	RQD							
		1.00	SPT(C)	N=21 (5.8/6.4/5.6)										1
		2.15	SPT(C)	N=21 (3.1/7.5/5.4)										2
		4.00	SPT(C)	N=20 (3.7/4.8/3.5)										3
		5.20 - 6.70								5.20			5	
					100	29	9	20	30mm min 140mm max 60mm avg	6.70				6
													End of Borehole at 6.700m	7
														8
														9

Shift Data				Chiselling Details				Plant	Soilmec PSM																
Date & Time	Depth (m bgl)	Water (m bgl)	Remarks	Top (m bgl)	Base (m bgl)	Duration (hh:mm)	Tool	Method	Compressed air mist																
26/08/2024 08:00	0.00		Start of shift.																						
26/08/2024 18:00	6.70		End of borehole.																						
								<table border="1"> <thead> <tr> <th colspan="2">Hole Details</th> <th colspan="2">Casing Details</th> </tr> <tr> <th>Depth (m)</th> <th>Diameter (mm)</th> <th>Depth (m)</th> <th>Diameter (mm)</th> </tr> </thead> <tbody> <tr> <td>5.20</td> <td>131</td> <td>5.20</td> <td>131</td> </tr> <tr> <td>6.70</td> <td>76</td> <td></td> <td></td> </tr> </tbody> </table>		Hole Details		Casing Details		Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	5.20	131	5.20	131	6.70	76		
Hole Details		Casing Details																							
Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)																						
5.20	131	5.20	131																						
6.70	76																								

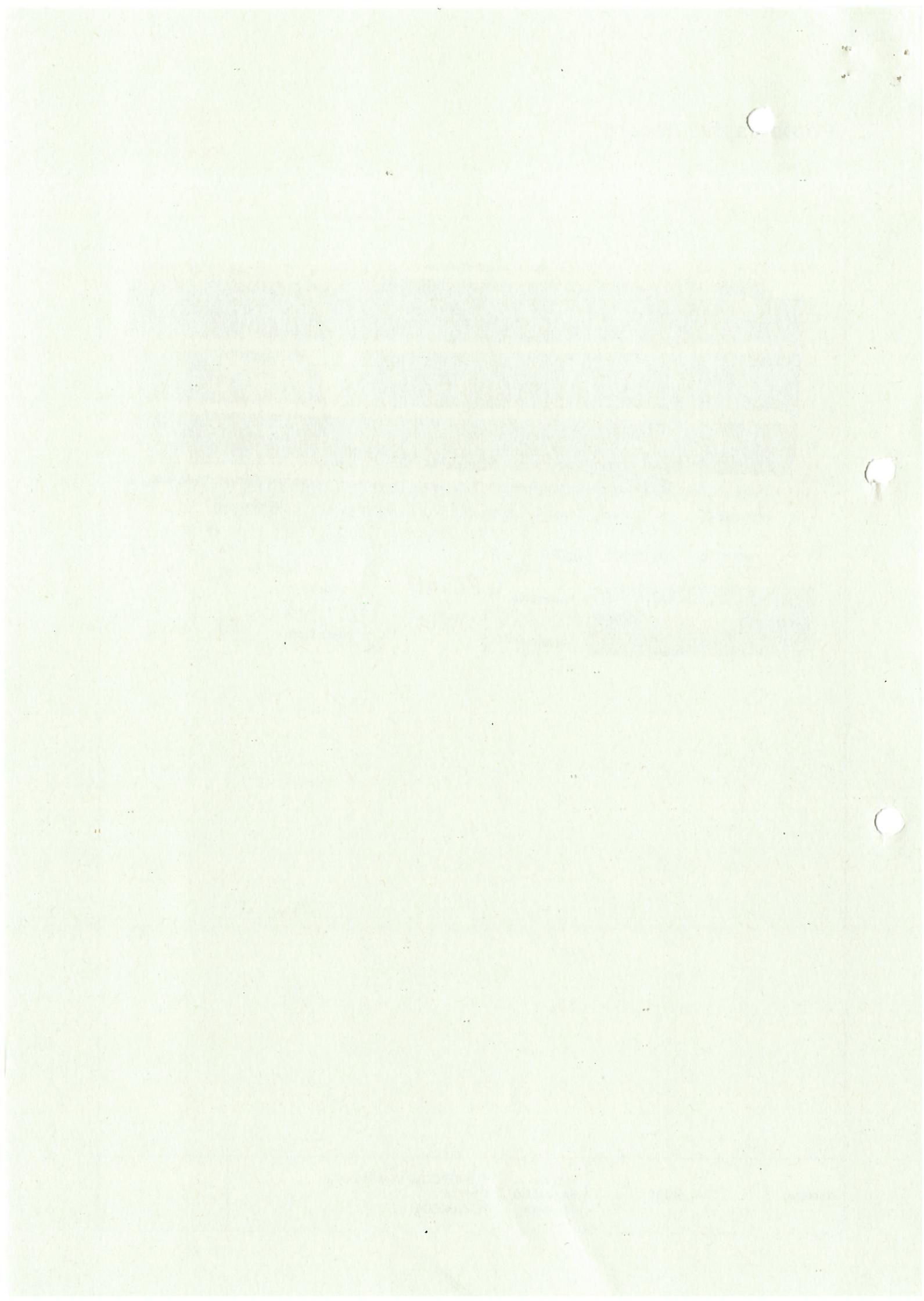
Remarks	Groundwater Details			
	Strike (m bgl)	Rose (m bgl)	After (Mins)	Remarks
Rotary borehole terminated at 6.70m bgl, in bedrock, SANDSTONE.				None encountered.



Photographic Record



Number: RC01	Project TOWERCOM, Wellington Rd Project No P24116 Engineer TOWERCOM	
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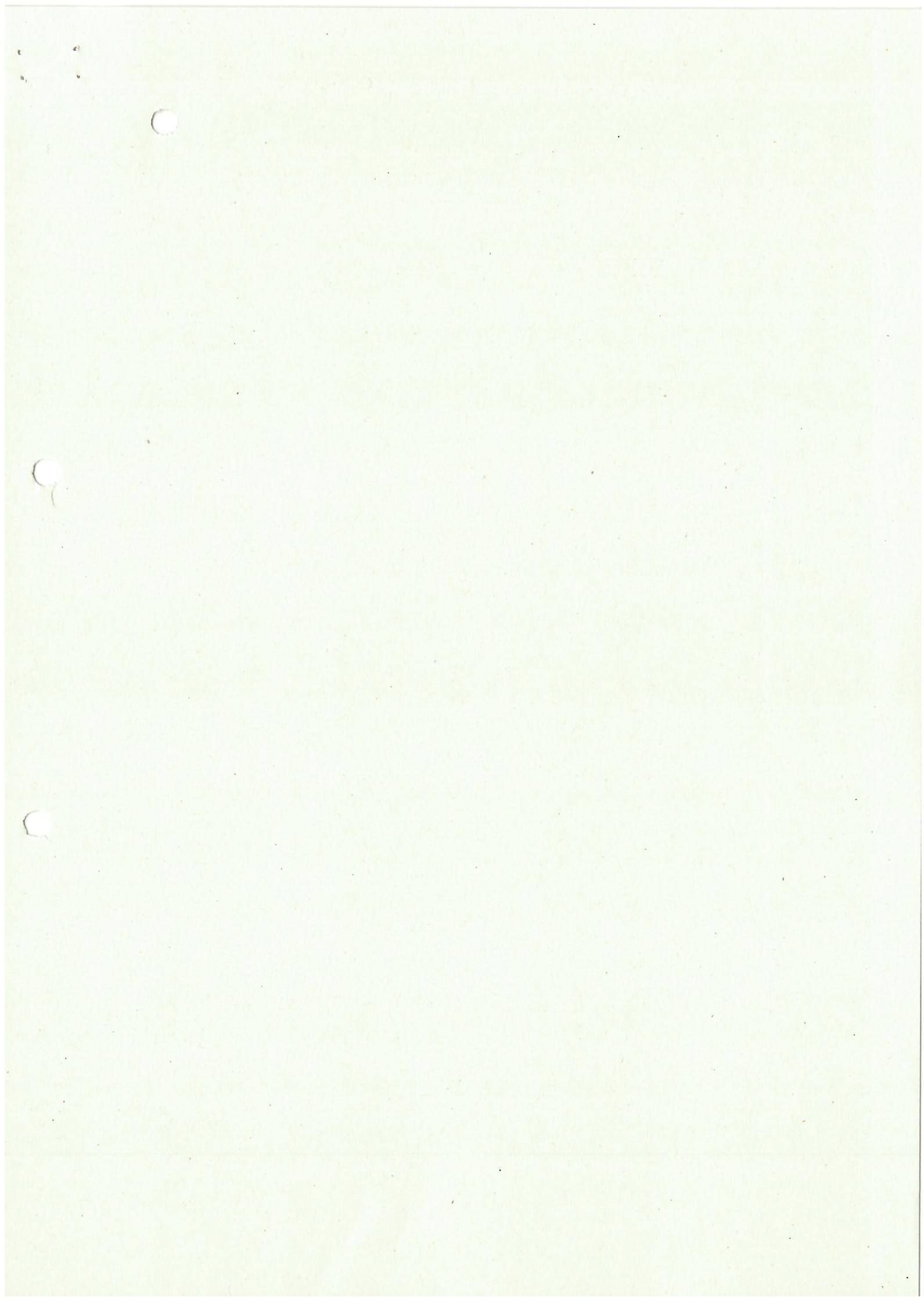


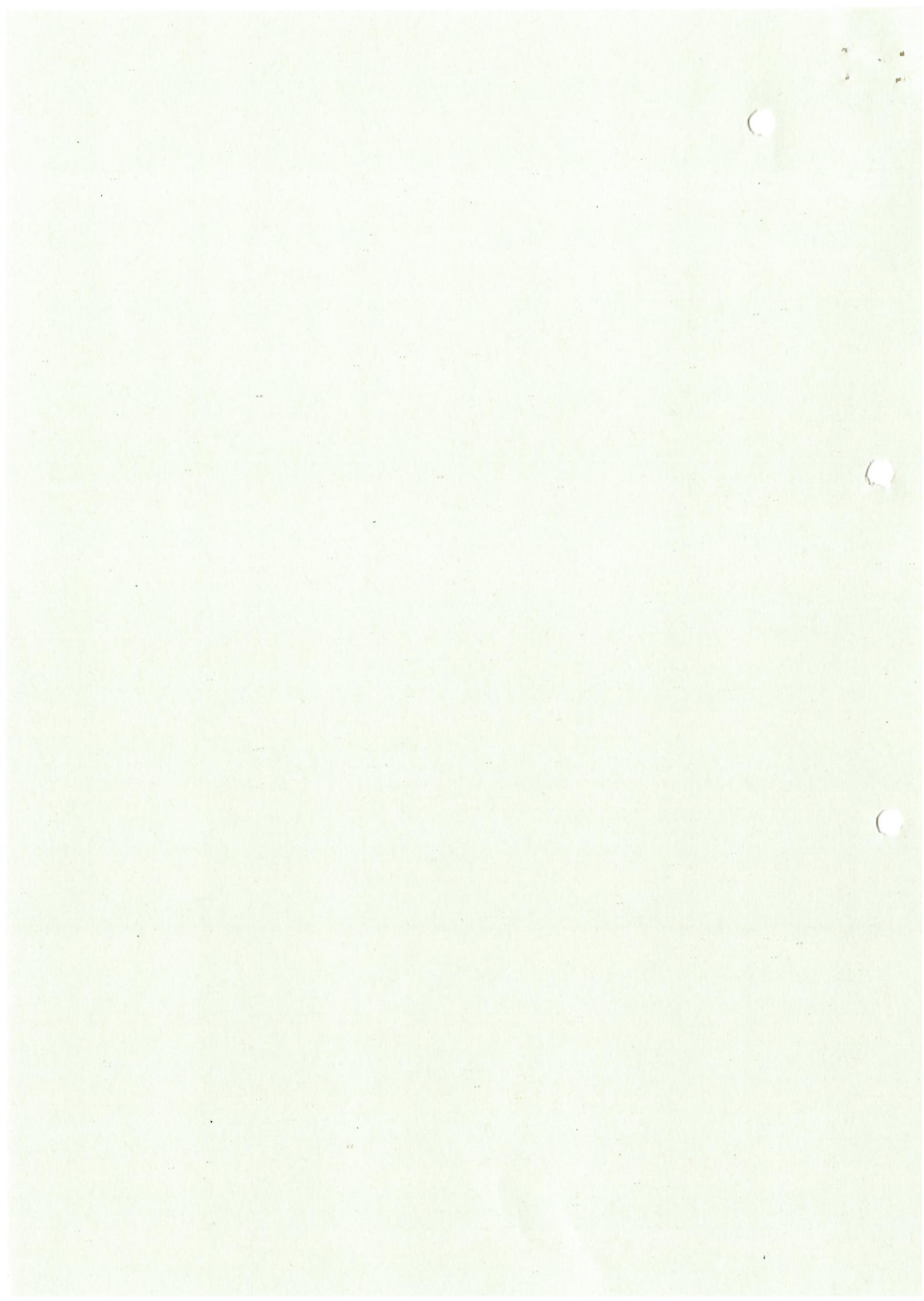
KEY TO SYMBOLS - LABORATORY TEST RESULT

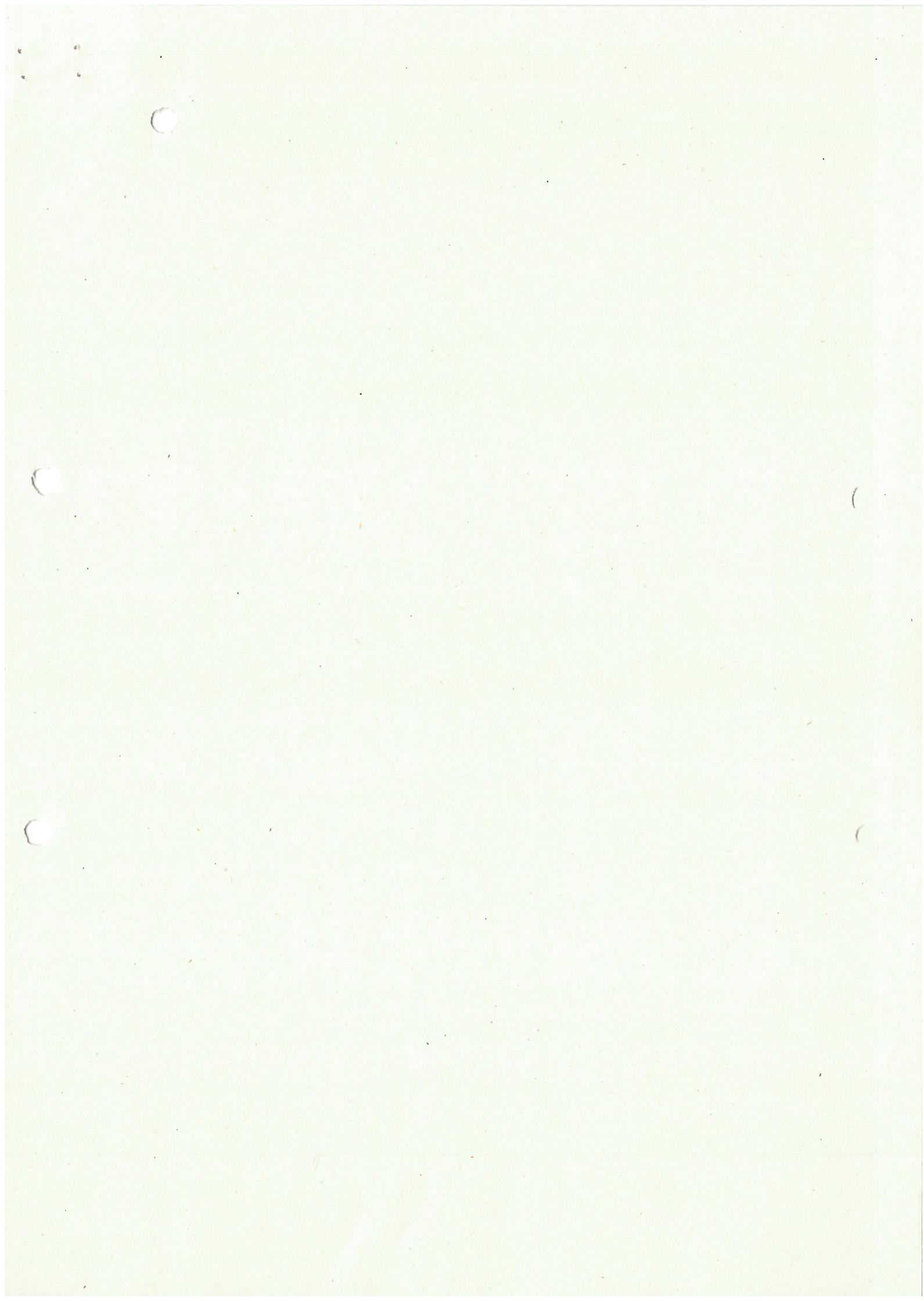
U	Undisturbed Sample	
P	Piston Sample	
TWS	Thin Wall Sample	
B	Bulk Sample - Disturbed	
D	Jar Sample - Disturbed	
W	Water Sample	
pH	Acidity/Alkalinity Index	
SO ₃	% - Total Sulphate Content (acid soluble)	
SO ₃	g/ltr - Water Soluble Sulphate (Water or 2:1 Aqueous Soil Extract)	
+	Calcareous Reaction	
Cl	Chloride Content	
PI	Plasticity Index	
<425	% of material in sample passing 425 micron sieve	
LL	Liquid Limit	
PL	Plastic Limit	
MC	Water Content	
NP	Non Plastic	
Y _b	Bulk Density	
Y _d	Dry Density	
P _s	Particle Density	
U/D	Undrained/Drained Triaxial	
U/C	Unconsolidated/Consolidated Triaxial	
T/M	Single Stage/Multistage Triaxial	
100/38	Sample Diameter (mm)	
REM	Remoulded Triaxial Test Specimen	
TST	Triaxial Suction Test	
V	Vane Test	
DSB	Drained Shear Box	
RSB	Residual Shear Box	
RS	Ring Shear	
σ ₃	Cell Pressure	
σ ₁ -σ ₃	Deviator Stress	
c	Cohesion	
c _e	Effective Cohesion Intercept	
φ	Angle of Shearing Resistance - Degrees	
φ _e	Effective Angle of Shearing Resistance	
ε _f	Strain at Failure	
*	Failed under 1 st Load	
**	Failed under 2 nd Load	
#	Unstable	
##	Excessive Strain	
p _o	Effective Overburden Pressure	
m _v	Coefficient of Volume Decrease	
c _v	Coefficient of Consolidation	
Opt	Optimum	
Nat	Natural	
Std	Standard Compaction - 2.5kg Rammer	(1 CBR)
Hvy	Heavy Compaction - 4.5kg Rammer	(5 CBR)
Vib	Vibratory Compaction	
CBR	California Bearing Ratio	
Sat m.c.	Saturation Moisture Content	
MCV	Moisture Condition Value	

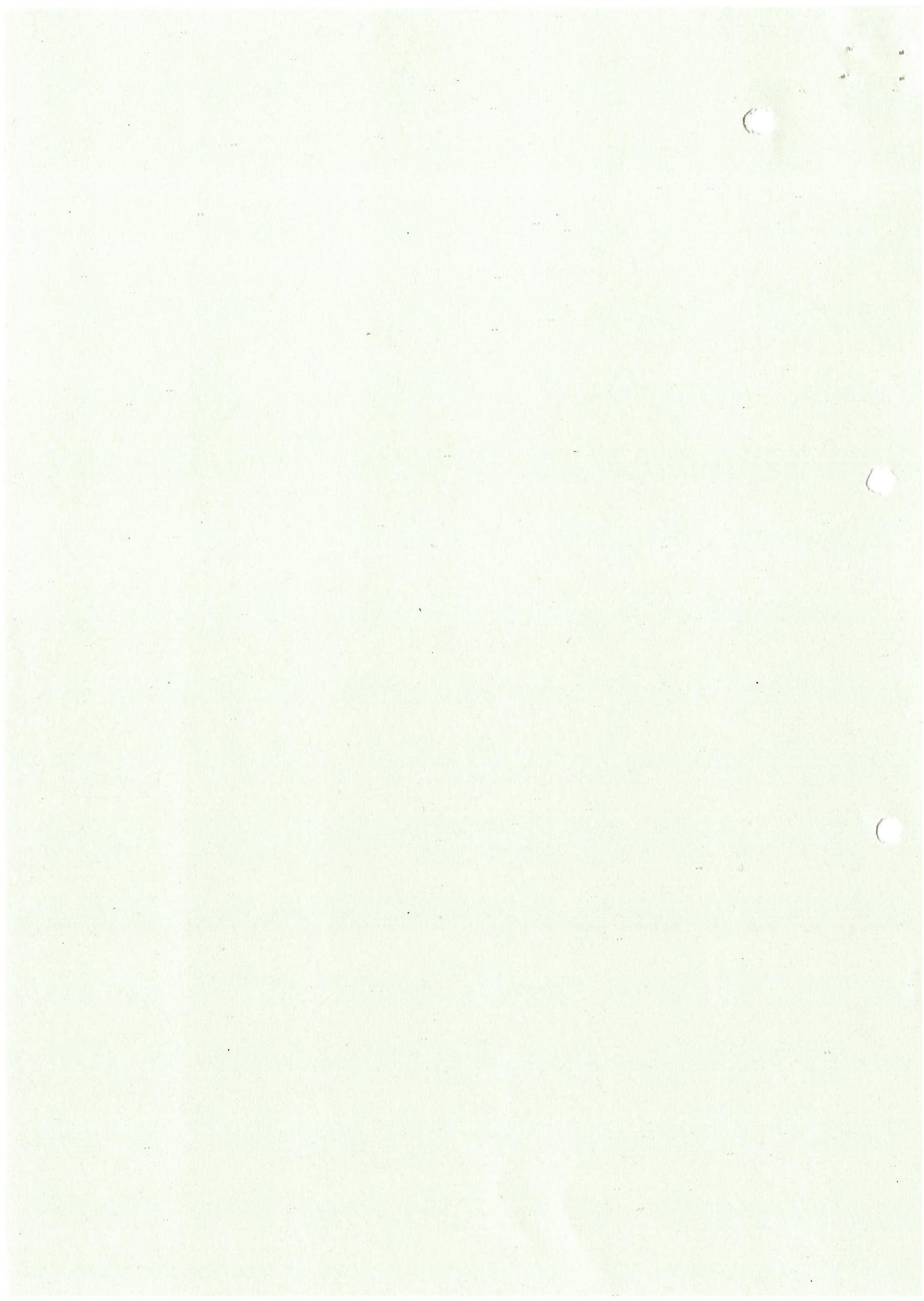
Key sheet













TOWERCON

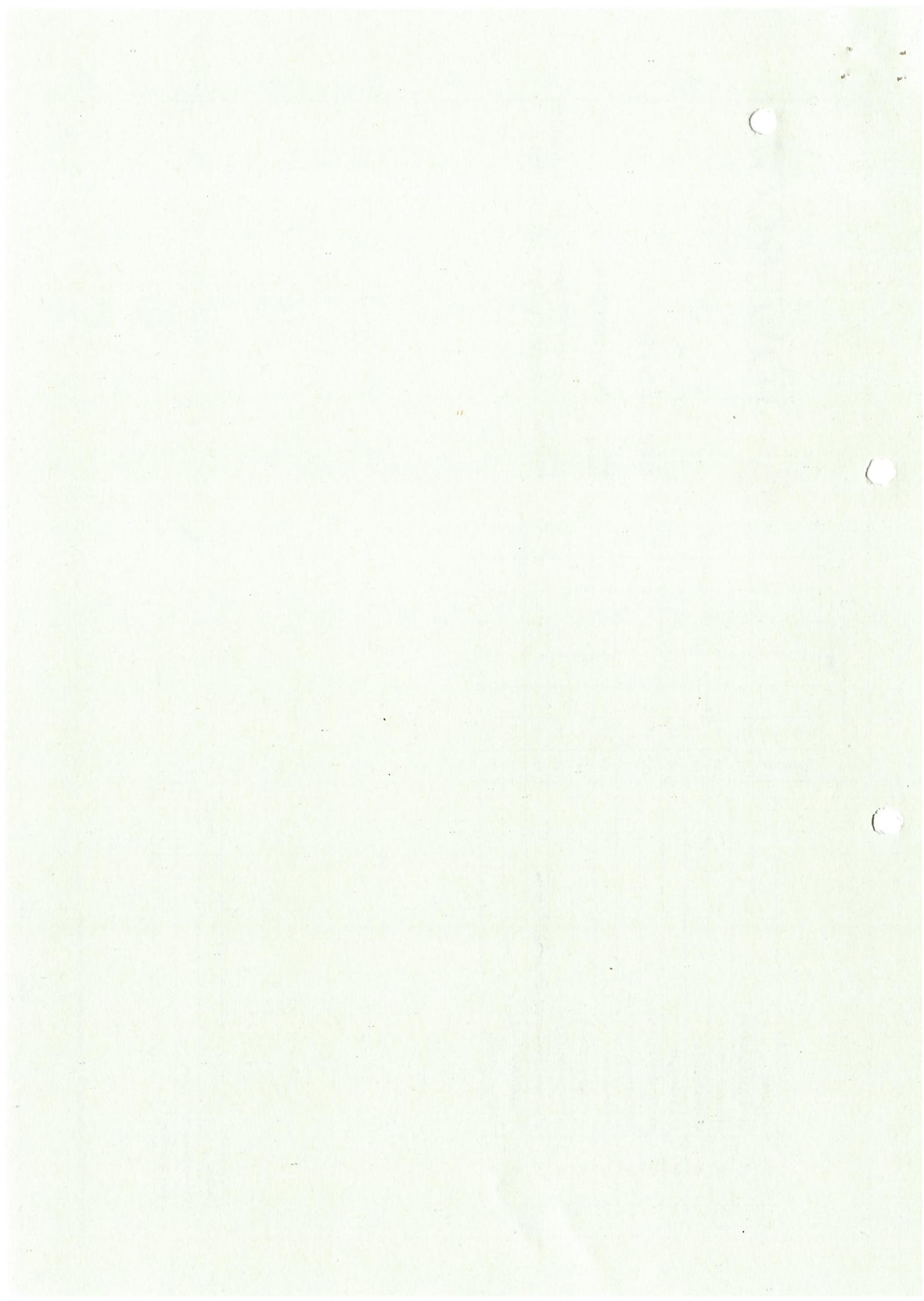
Site ID: TCK5225

Site Name: Wellington Road

Site Address: OpenEir Wellington Rd Exchange
Victorian Quarter, Cork, T23 N5K7

Sheet No.	Drawing title	Date of Issue			
		24.09.2024	08.10.2024		
01	CONSTRUCTION NOTES	1.0	2.0		
02	SITE LAYOUT PLAN	1.0	2.0		
03	COMPOUND PLAN	1.0	2.0		
04	SITE ELEVATION	1.0	2.0		
05	DELMEC MONOPOLE DETAILS	1.0	2.0		
06	GROUND EQUIPMENT PLAN	1.0	2.0		
07	EARTHING PLAN	1.0	2.0		
08	EARTHING SCHEMATIC	1.0	2.0		
09	SAFETY SIGNAGE PLAN	1.0	2.0		
10	STRUCTURE ORIENTATION AND SETTING OUT DETAIL	1.0	2.0		
11	FOUNDATION DETAILS	1.0	2.0		
12	"CROZIER DRAWING"	1.0	2.0		

Purpose	Revision
Detailed Design - Initial Design	1.0
Minor Amendment	2.0



1.0 GENERAL NOTES

- 1.1 Do not scale from this drawing, use figured dimensions only.
- 1.2 All dimensions on site to be confirmed by contractor prior to construction/fabrication. Any deviations from dimensions shown to be brought immediately to designers' attention.
- 1.3 All dimensions in mm unless noted otherwise.
- 1.4 The contractors shall be responsible for confirming dimensions and levels on site prior to the commencement of construction or fabrication.
- 1.5 The contractor shall be responsible for setting out the project on site.
- 1.6 The contractor shall be responsible for the stability and integrity of existing structure and ground profile within and adjacent to the works, from the date of taking possession of the site until practical completion of the works. The contractor shall be responsible for the design, installation and maintenance of all necessary temporary works to comply with this requirement.
- 1.7 The contractor shall ensure that tolerance are integrated and co-ordinated throughout the works to ensure the efficient implementation of the works.
- 1.8 Where the existing weatherproof envelope is pierced to implement the works, the contractor shall be responsible for ensuring that ingress of water does not occur during the construction period.
- 1.9 Preparation, handling and application of the proprietary products shall be all in accordance with the recommendations of the product manufacturer, health and safety legislation and the specification and details of the engineers. Where contradictions occur between these requirements, references should be made to the engineer for resolution.
- 1.10 Where specific proprietary products are referenced and equal product approved by the engineer may be substituted, unless noted otherwise.
- 1.11 If in doubt ask.

2.0 STRUCTURAL STEEL

- 2.1 All proposed structural steelwork shall be grade S275/S355 to BS EN 10025 and steel section to EN 10923.
- 2.2 All structural steelwork shall be galvanized to BS EN ISO 1461:2009
- 2.3 Ordinary bolts shall be 8.8 to BS 4190:2014.
- 2.4 All bolted connections shall have washers, thin hex-nut and structural nuts.
- 2.5 All external ordinary bolts shall be hot dip galvanized to BS 7371-5:1993+1:2011 unless noted otherwise.
- 2.6 All steelwork fabrication and erection shall be to Execution Class 2 as defined and conforming to BS EN 1090-2 Standard.
- 2.7 Welding shall be carried out in accordance with ISO 3884-3.
- 2.8 Steel subcategories shall be in accordance with national structural steelwork specification for building construction.
- 2.9 U-bolts shall be minimum grade 4, spun galvanized.

3.0 GROUNDWORKS/TOWERS/DUCTS

- 3.1 Geotechnical information to be supplied in accordance with EN 1967-2 section 6.
- 3.2 All soft spots are to be backfilled with either blinding concrete or well compacted granular fill.
- 3.3 The tower supplier shall supply the tower support hold down bolt templates to be cast into the foundation in accordance with tower supplier's specification and tolerances.
- 3.4 The upper surface of the tower foundation shall be provided with a slight fall (<1:100) from centre of the foundation to outside edges.
- 3.5 The tower base excavation to formation level shall be inspected by a qualified civil engineer. The approval of the excavation to be documented in the Safety File.
- 3.6 Minimum period of 14 days between casing tower base and installation of tower.
- 3.7 All ducts shall be smooth wall UPVC ducts, with draw cord. All ducts are to be provided with slow radius bends at all changes in directions.
- 3.8 Ducts cast in concrete shall be adjusted locally to avoid tower support sub-ducts.
- 3.9 All ducts shall be sealed with expanded foam after cable installation.
- 3.10 All buried ends of ducts to be marked at ground level with permanent markers.
- 3.11 Splice feeder ducts to be capped 25mm below ground level and covered with concrete.
- 3.12 Compound finish, sloped topsoil and existing surfacing to formation level. Excavate all soil and backfill with compaction of 80% granular fill, treat formation with weed killer and lay terram 11500 geotextile membrane or equal approved, lay min. 200mm compacted cl. 304 stone above.

4.0 CONCRETE NOTES

- 4.1 All mass and reinforced concrete shall be grade C38/45 to EN 206 with 20mm nominal aggregate size, minimum cement content of 330kg/m³ and a maximum water: cement ratio of 0.6.
- 4.2 All blinding concrete shall be grade C12/15 in accordance with EN 206 with minimum cement content of 270kg/m³ and a maximum water: cement ratio of 0.6.
- 4.3 Unless noted otherwise all reinforcement shall be
 - (a) high yield (fy=460 N/mm²) type 2 deformed bar reinforcement to BS4449
 - (b) mild steel (fy=250 N/mm²) plain round reinforcement bar to BS 4449
 - (c) welded steel mesh reinforcement to EN 10080
 - (d) screedcast and dimensioned to EN 8668.
- 4.4 Minimum concrete cover to formed or prepared surfaces to be 40mm unless noted otherwise.
- 4.5 Concrete to each base to be placed in one continuous pour.
- 4.6 Formed finishes to be basic finish/plain smooth finish.
- 4.7 Worked finishes to be tamped finish/brushed finish/steel floated finish.
- 4.8 Contractor to provide suitable chairs to support top mat reinforcement.
- 4.9 A set of three 100 or 150mm cubes from each concrete pour shall be prepared, cured and tested in accordance with EN 12390. One cube shall be tested at 7 days and the remaining two at 28 days.
- 4.10 If included in the engineer's scope the contractor shall notify the engineer to allow for inspection of all formations prior to concreting. Reasonable notice it to be given to allow any inspection to be carried out.

5.0 FASTENERS & CONNECTIONS - STEEL TO CONCRETE OR MASONRY

- 5.1 The preferred method of existing structural fixing into solid concrete or masonry walls shall be through-bolt fixing unless specified otherwise. Where the through-bolt fixing cannot be achieved resin anchors fixing should be utilized upon consultation with engineer.
- 5.2 All resin anchors into solid concrete shall be Hilti HIT HY200 resin injection system with HAS-R stainless steel anchors components, or similar approved, unless noted otherwise.
- 5.3 All resin anchors into solid brickwork or other solid masonry shall be Hilti HIT HY200 resin injection system with HAS-R stainless steel anchors components, or similar approved, unless noted otherwise.
- 5.4 Axial pull out test is required on existing bolt/pull out force to 5.0kN UNC.
- 5.5 Anchors shall be tested in accordance with the HSA code of practice for the design and installation of anchors.
- 5.6 The testing rate of anchors shall be 5 No. fixings or 2.5% of the total no. of fixings of each size and type, whichever gives the greater number. For situations where there are less than 5 No. anchors of any type or size then all anchors shall be tested. Where the project specification deviate from this testing frequency, the project specifications shall take priority.

Notes

1. All dimensions are in millimetres unless notes otherwise
2. All measurements to be as defined at PCA
3. All works to be in accordance with relevant EN/CEN/UK standard health, safety and CDM regulations
4. Specification of the works to be to the appropriate British Standard unless otherwise stated
5. All components to be specified to EN ISO 1461
6. All steelwork to be painted with a minimum of two coats of anti-rust paint to BS 6841:2007
7. The stability of the work during construction shall be maintained throughout the construction
8. All structural steelwork shall be protected against corrosion in accordance with BS EN 10902
9. The drawing is to be used in conjunction with relevant project specifications and manufacturer's guidelines

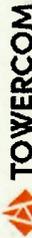
Coordinates

Uppercase A cross
Longitude 4 26 27.8
Latitude 51 50 27.1

Proposed Structure Data

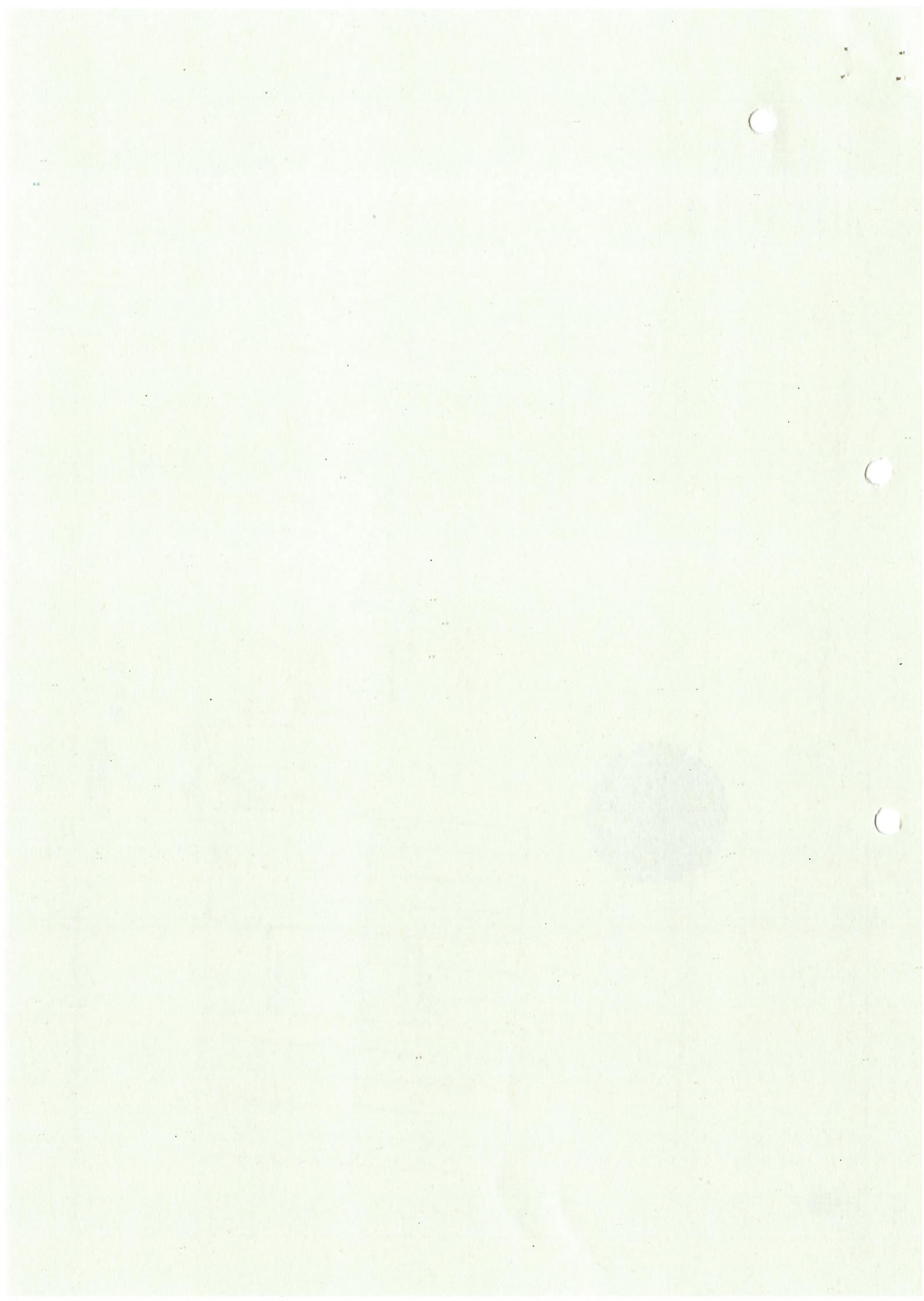
1. No. of storeys: 1

1:1	Scale	1:1
1:2	Scale	1:2
1:5	Scale	1:5
1:10	Scale	1:10
1:20	Scale	1:20
1:50	Scale	1:50
1:100	Scale	1:100

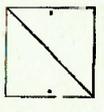


Client Name		Towercom Ltd	
Client Address		Walsingham Rd Cherry Hill, Walsingham Rd Walsingham, Norfolk, UK	
Title		Construction Notes	
Scale	1:100	File No	1001
Drawn	J. Smith	Checked	J. Smith
Date	10/10/2014	Issue	1.0

6. This drawing is the property of Towercom Ltd and shall not be copied, reused or reproduced without their consent.



- NOTES**
1. ALL DUCTS SHALL BE SMOOTH WALL UPVC DUCT WITH DRAW CORD INSTALLED.
 2. ALL DUCTS TO BE SEALED WITH EXPANDED FOAM AFTER DRAW CORD INSTALLATION.



NOTE

A: Antenna And Dishes To Be Planted To Match Tower Pole and Aux Equipment (RAL8014 - Sepia Brown)

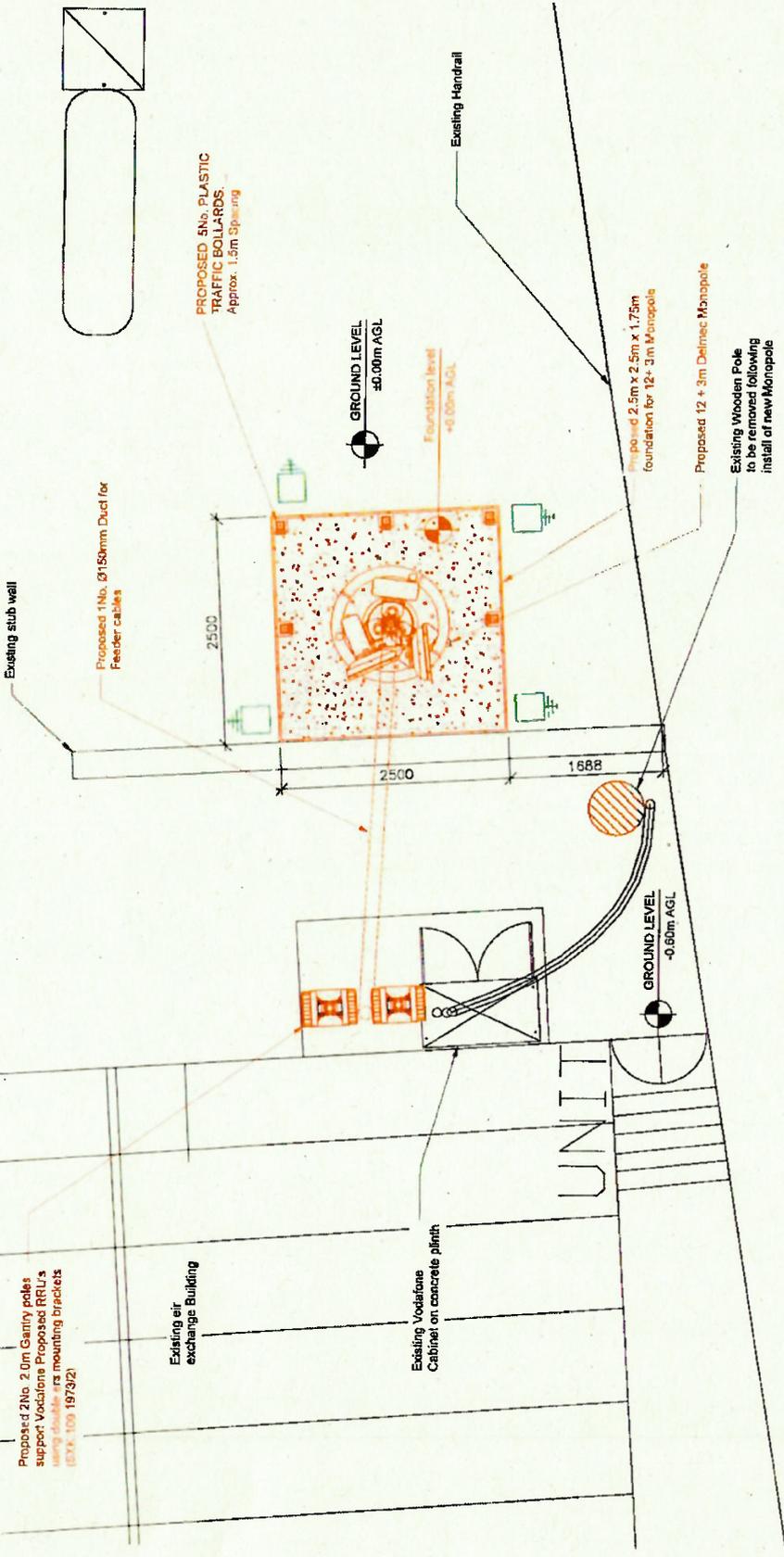
Proposed 2No. 2.0m Gantry poles support Vodafone Proposed RRU's using dishes - ra mounting brackets (GX 100 19/32)

Existing air exchange Building

Existing Vodafone Cabinet on concrete plinth

UNIT

TARMAC AREA



GROUND LEVEL
-4.00m AGL

Compound Plan
SCALE 1:50

Notes

1. All dimensions are in millimeters unless notes otherwise.
2. All measurements to be completed at 100%.
3. All work to be completed in accordance with the relevant standards and codes of practice.
4. The location of the work to be done is shown by the site plan and/or photographs of the site or other information provided to the contractor.
5. All work to be done in accordance with the relevant standards and codes of practice.
6. All work to be done in accordance with the relevant standards and codes of practice.
7. The contractor is to ensure that all work is completed in accordance with the relevant standards and codes of practice.
8. The contractor is to ensure that all work is completed in accordance with the relevant standards and codes of practice.
9. The contractor is to ensure that all work is completed in accordance with the relevant standards and codes of practice.
10. The contractor is to ensure that all work is completed in accordance with the relevant standards and codes of practice.

Coordinates

Zone	50	Access	
Latitude	11 45 57.1	Latitude	11 45 57.1
Longitude	148 52 57.9	Longitude	148 52 57.9

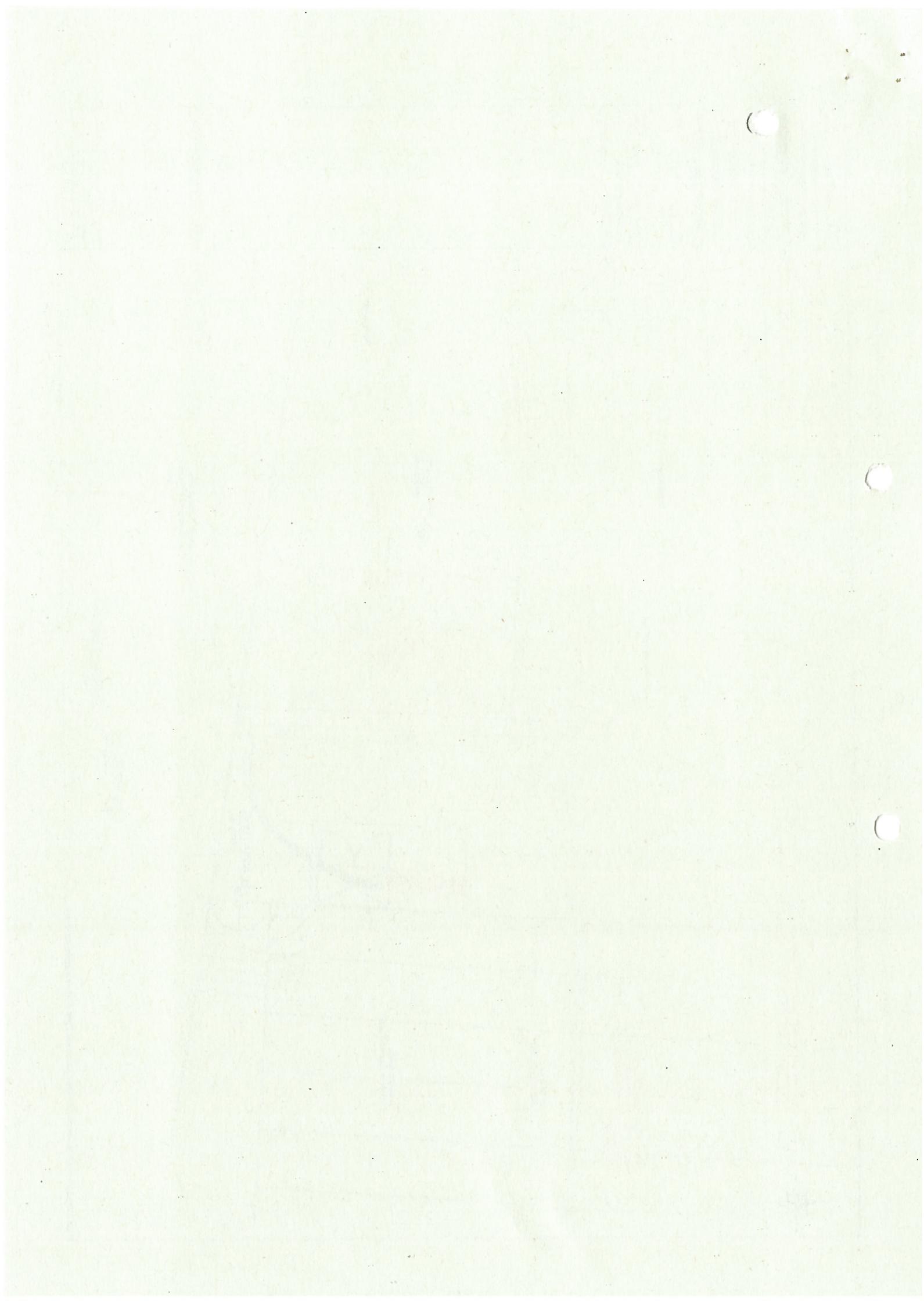
Proposed Structure Details

Type	Monopole	Height	12+3m
------	----------	--------	-------

Rev	1.0	Issue	Final Design
Rev	2.0	Issue	Final Design
Rev	3.0	Issue	Final Design



Towercom Ltd
17 27 Wellington Rd
Wellington, New Zealand
Phone: 04 474 1000
Fax: 04 474 1001
Email: sales@towercom.co.nz

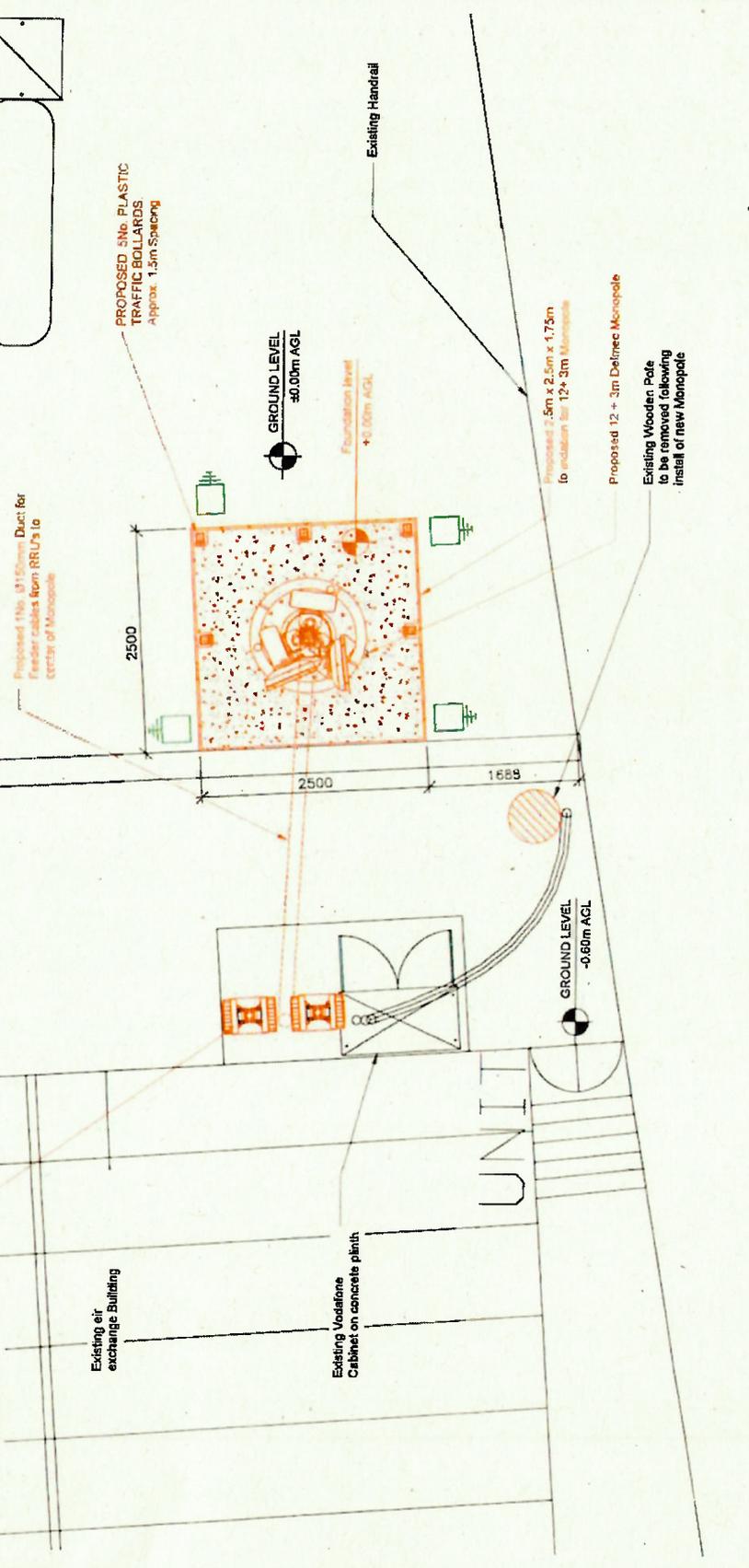
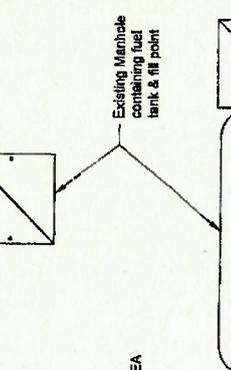


- NOTES**
- All dimensions are in millimeters unless noted otherwise.
 - All measurements to be confirmed as per IFCN.
 - All works to be in accordance with relevant local current health, safety and design legislation.
 - Responsibility of the works to be in accordance with relevant standards where no such standards exist.
 - All components to be delivered to EN ISO 9001:2015.
 - All materials to be delivered to EN ISO 14001:2015.
 - The quality of the work during construction phases is to be in accordance with the requirements of the contract.
 - All structural work must comply with the relevant standards in accordance with BS EN 1992-1-1:2004 (Eurocode 2).
 - This drawing is to be read in conjunction with relevant contract documents and manufacturer's guidelines.

Coordinates
 Site: A00155
 Latitude: 51.92377
 Longitude: -4.82378
 UTM Easting: 467104

Proposed Structure Details
 Type: Monopole
 Height: 11.8m

- NOTES**
- ALL DUCTS SHALL BE SMOOTH WALL UPVC DUCT WITH DRAW CORD INSTALLED.
 - ALL DUCTS TO BE SEALED WITH EXPANDED FOAM AFTER DRAW CORD INSTALLATION



- NOTE**
- All Antenna And Dishes To Be Painted To Match Brown Pole and Aux Equipment (RAL8014 - Super Brown)
- Proposed 2No. 2.0m Gannity poles Support Vodafone Proposed RRU's using double end mounting brackets (SVA 109 19732)

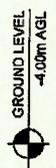
TOWERCOM

17 Wellington Rd
 Waterloocree, Co. Wick
 Ireland

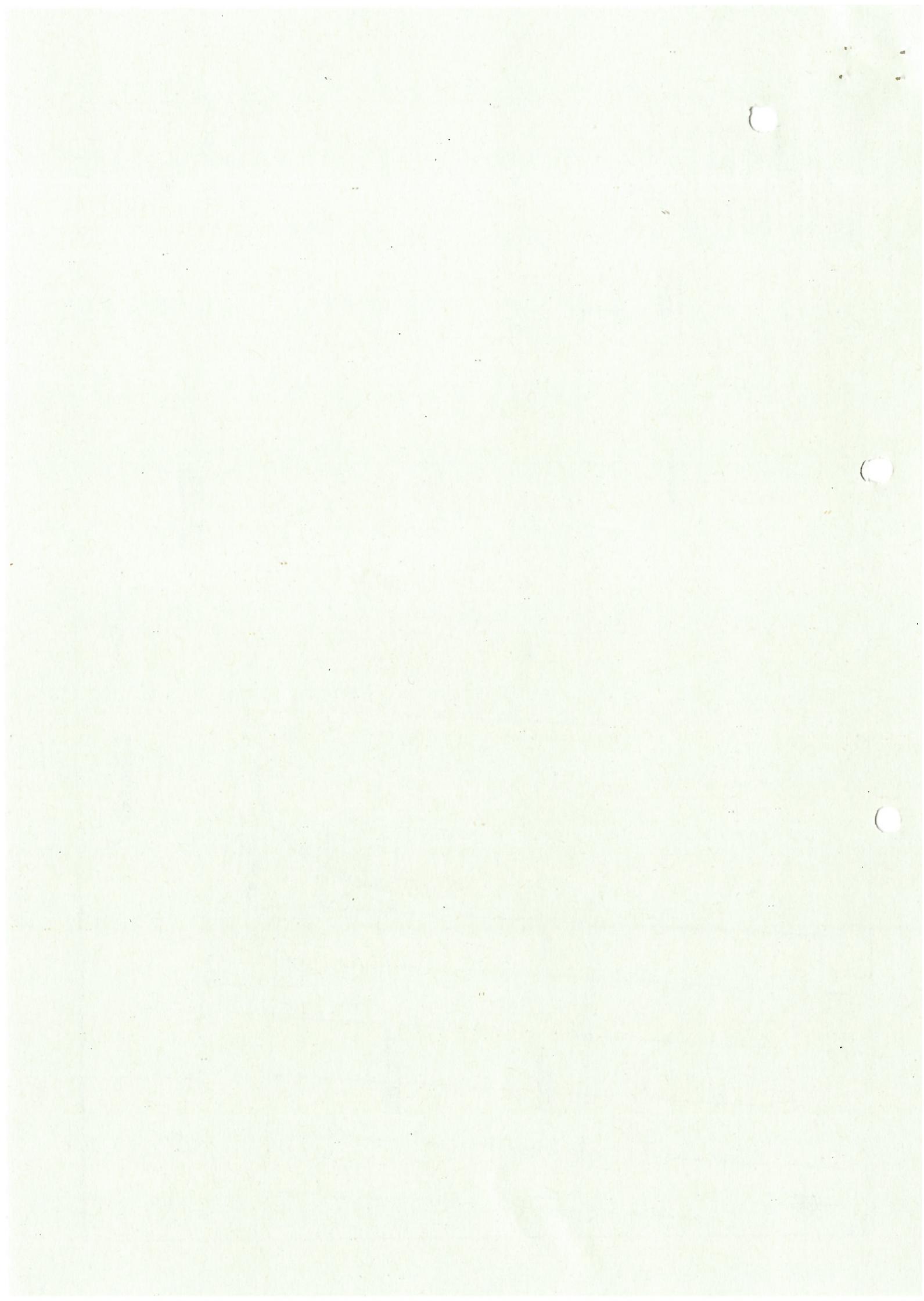
Project No: TOWERCOM_001_001_0

Scale: 1:50

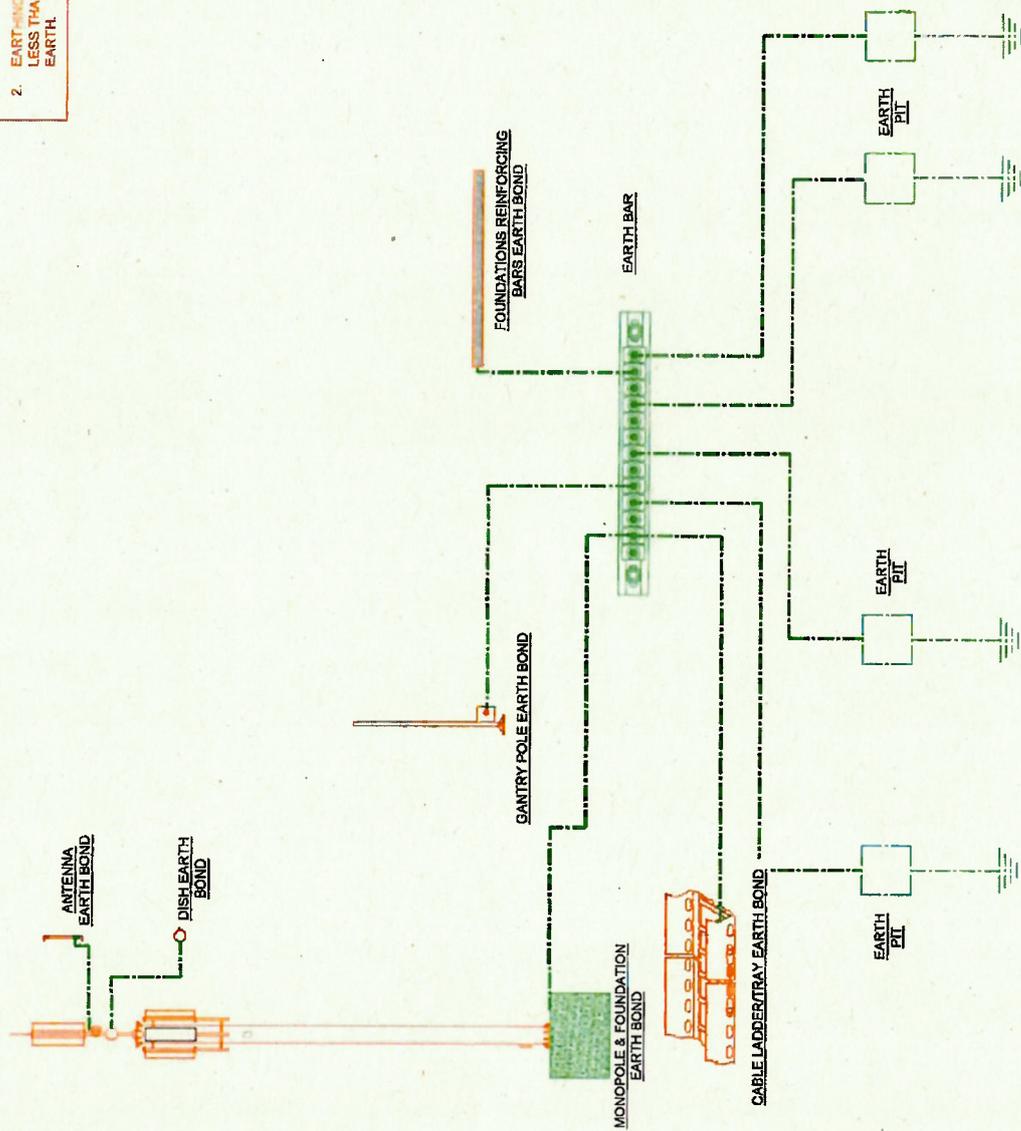
Ground Equipment Plan
 SCALE 1:50



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NOTE
AFTER INSTALLATION NEW EARTHING TO BE TESTED AND CERTIFIED BY A QUALIFIED PERSON.
 1. EARTHING TO BE TESTED TO ATTAIN LESS THAN 10 Ohms IMPEDANCE TO EARTH.



Earthing Schematic
 NTS

- Notes**
1. All dimensions are in millimeters unless otherwise stated.
 2. All materials to be confirmed as per the specification.
 3. All work to be done in accordance with relevant and current standards.
 4. Specification of materials to be used in the construction of the structure shall be in accordance with the relevant standards.
 5. All components to be galvanneal to EN 10346 (min. 99.9% Zn).
 6. All bolts to be specified to EN 10901 (min. 8.8).
 7. The subject of the design shall be the responsibility of the contractor.
 8. All structural steelwork must carry CE marking in accordance with BS EN 10353-1 (substructure steel).
 9. This drawing is to be used in conjunction with relevant technical documents and the structure's specifications.

Coordinates

Site: ACCESS

Latitude: 51.02171 Longitude: -4.85378

Latitude: 51.82274 Longitude: -4.85374

Proposed Structure Details

Type: Monopole Height: 12 x 3m

2D	Myra Andrews	06/10/2024
3D	Checked/Design/Model/Design	24/10/2024
REV	01	2024/10/24



Towercom Site ID: T246225

Site Name: ACCESS

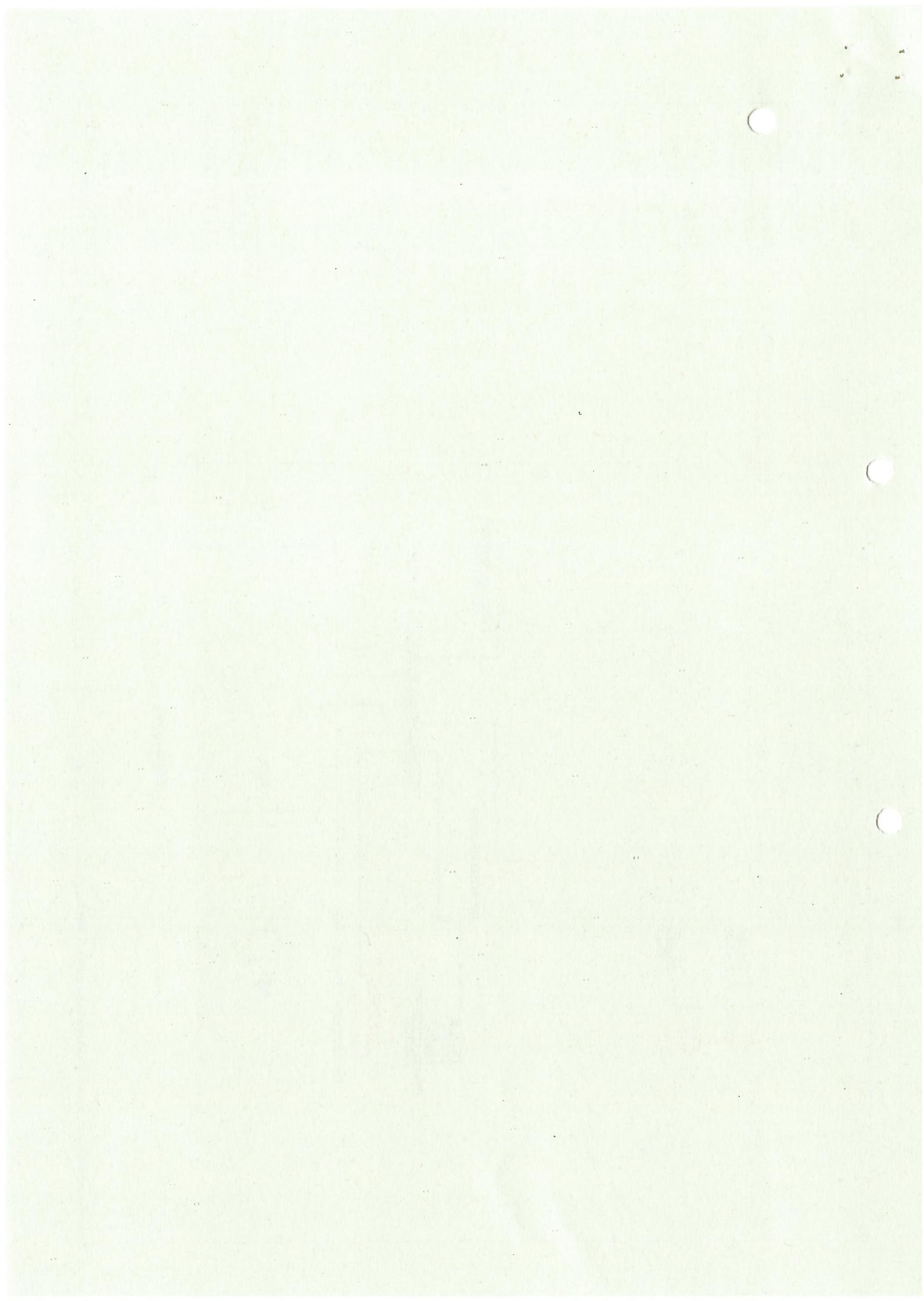
Address: 17, 27 Malpas Rd, Yarnham, Norfolk, NR23 1AD

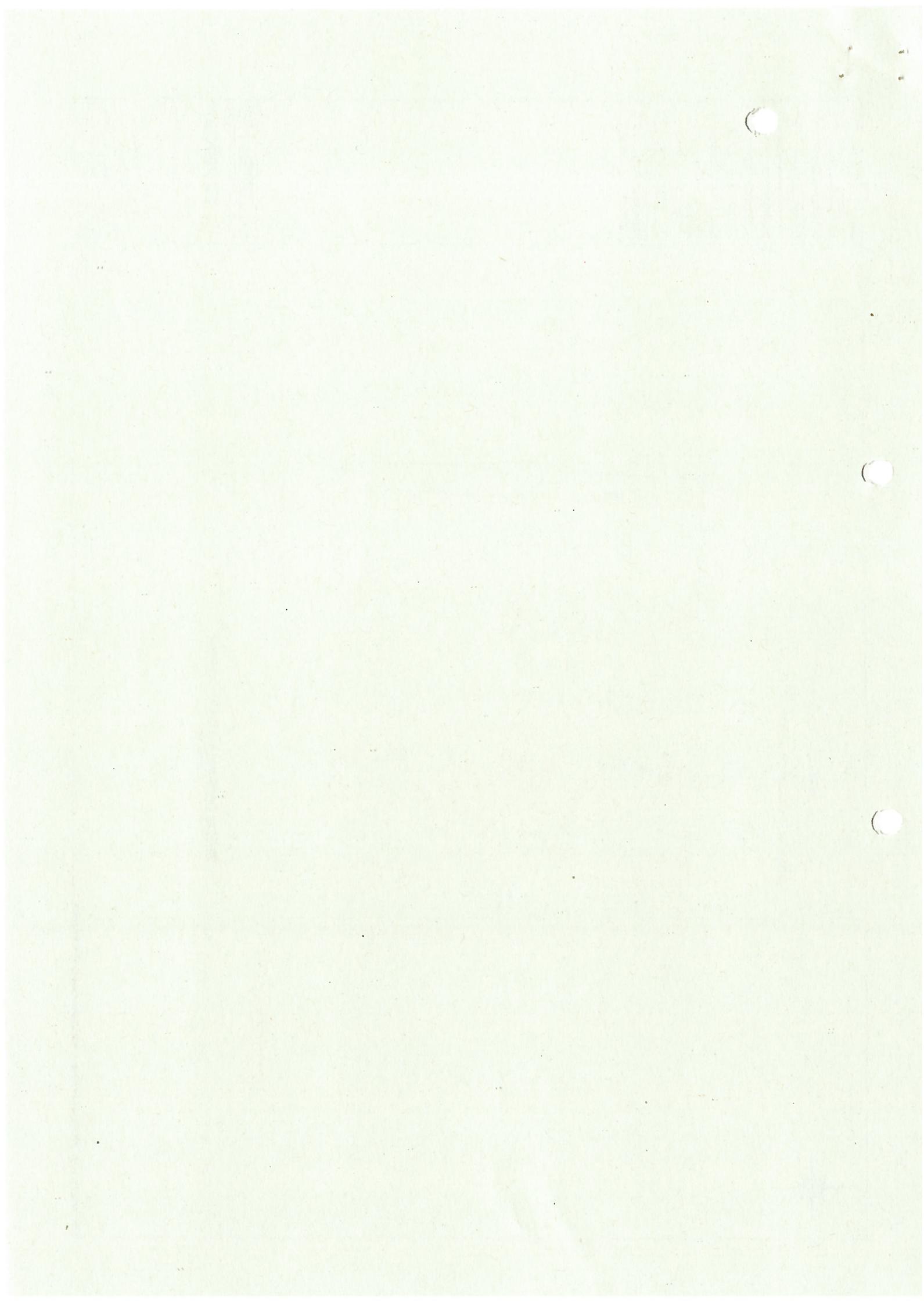
Title: Earthing Schematic

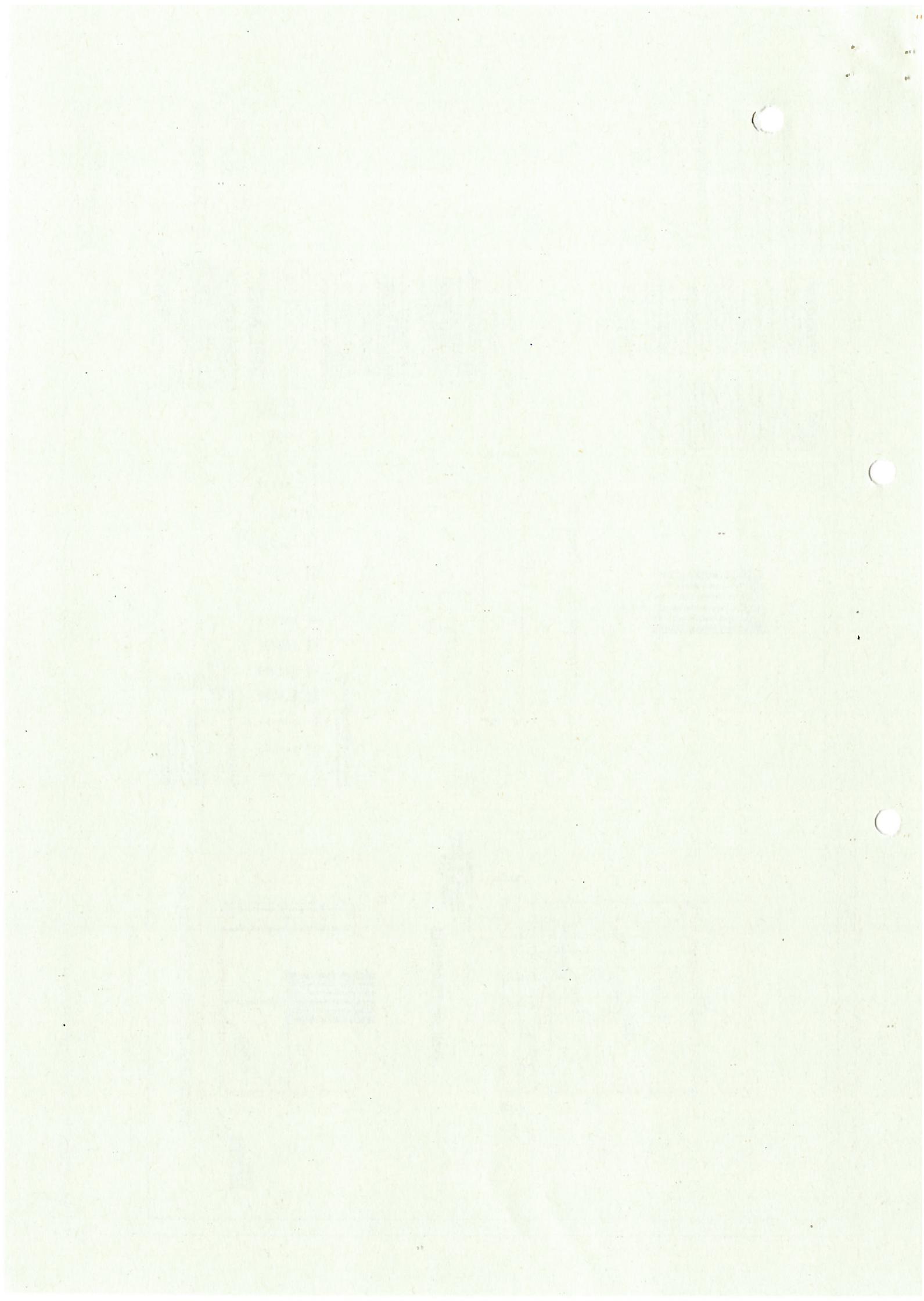
Scale: As shown

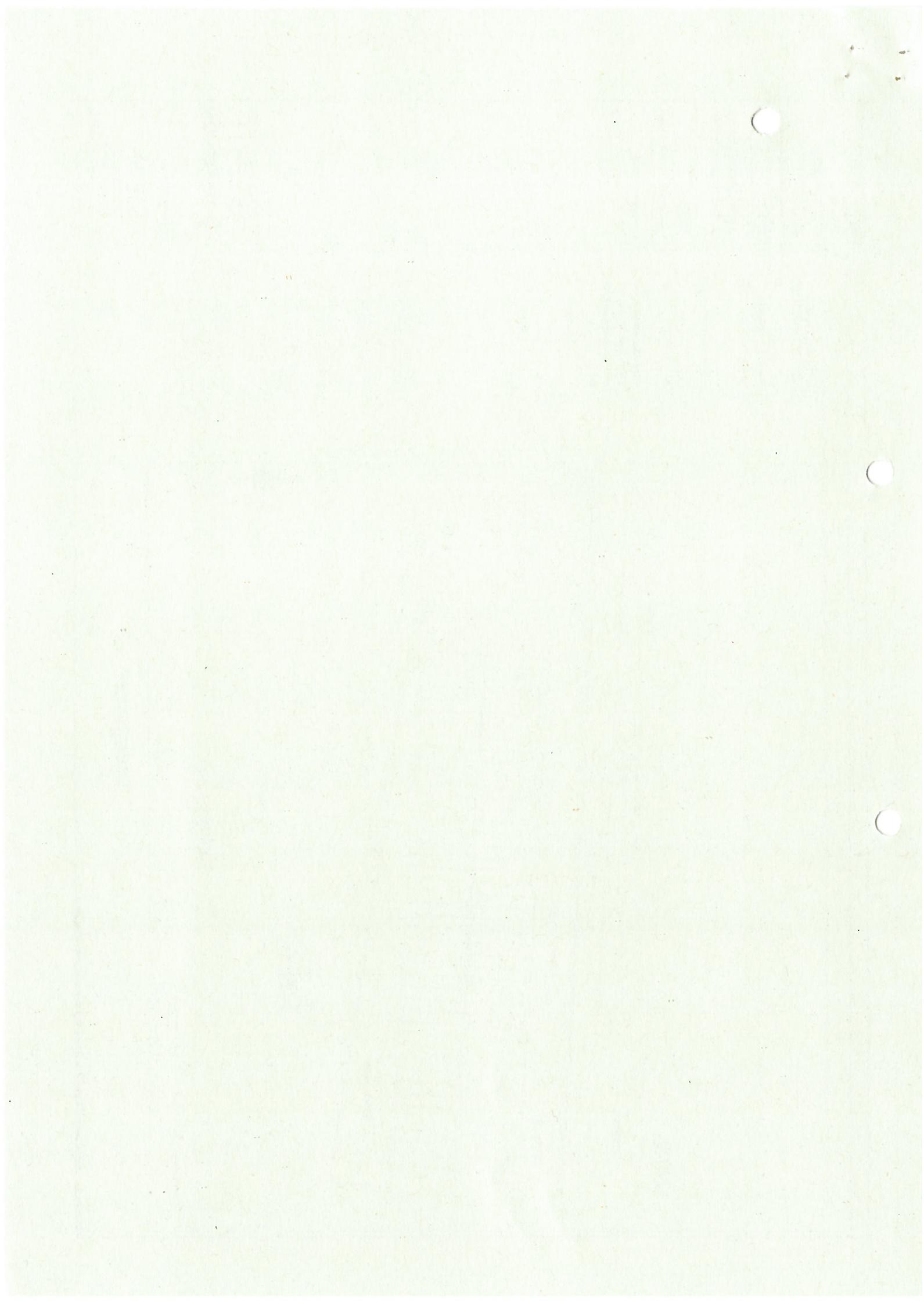
Drawn by: [blank]

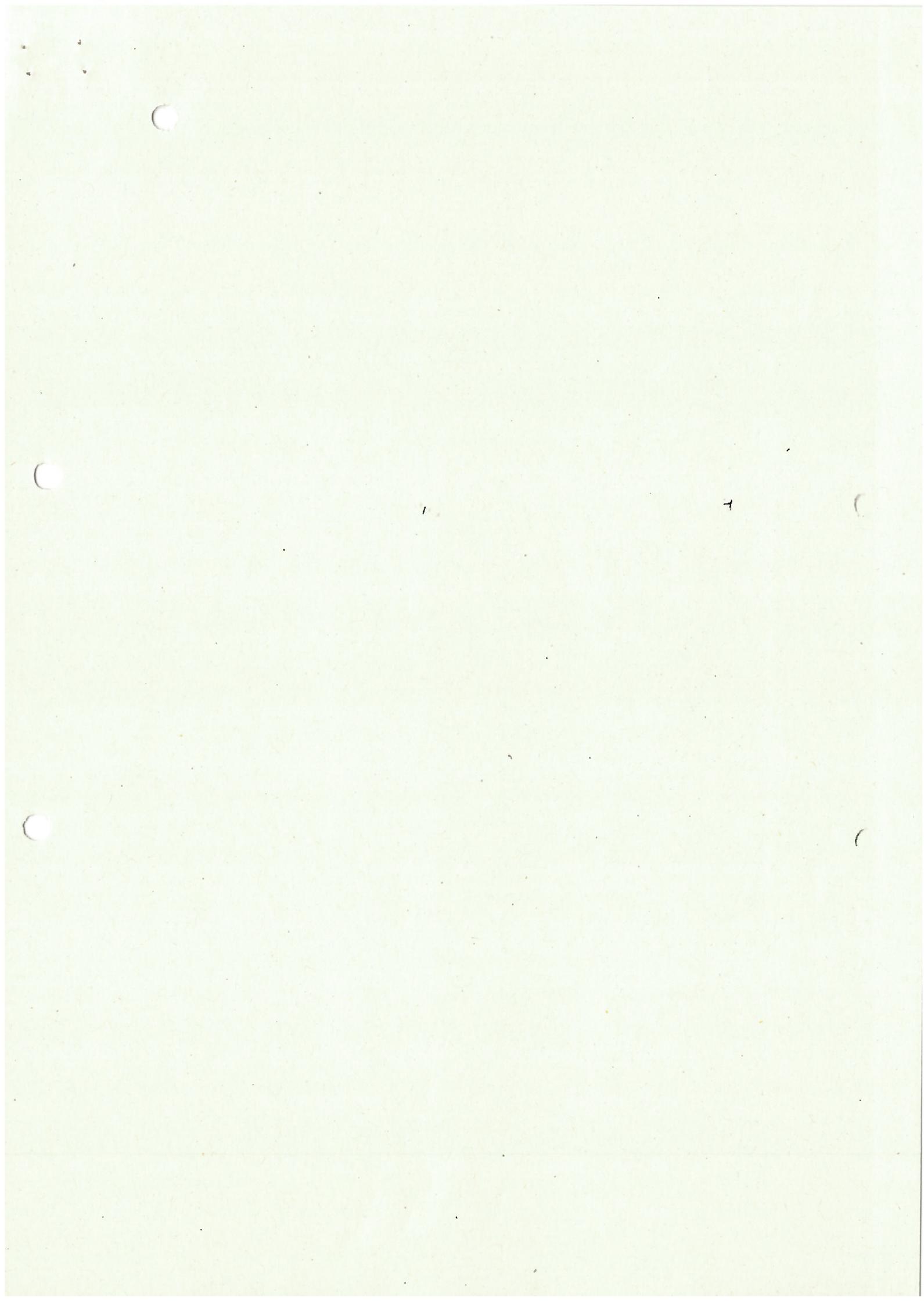
Day No: T246225_Doc_001/0

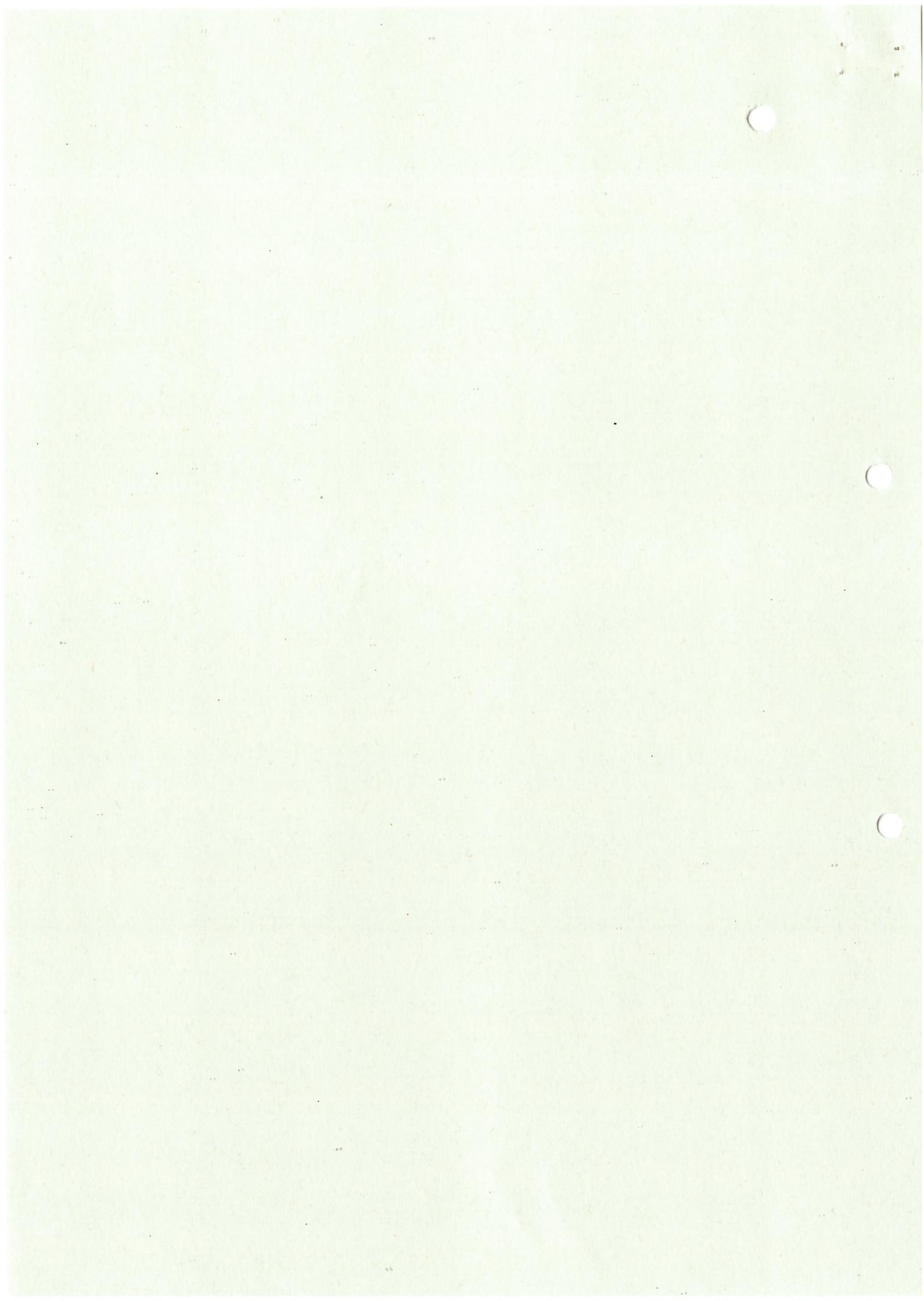












Design and Construction Safety and Health Plan

Site: Bundoran

Site ID: TDL7310

Address: Open Eir Wellington Rd Exchange

17, 27 Wellington Rd, Victorian Quarter, Cork, T23 N5K7

	Name & Job Description	Date	Revision
Preliminary:	Sean Bradley	30/09/2024	1.0
Construction:	Bogdan Paicu	10/10/2024	1.0
Approved By:	Claire O'Brien	10/10/2024	1.0

PREAMBLE

1. The following is the generic template for use in the preparation of the Health and Safety Plan for UTS projects. The Safety and Health Plan should be edited appropriately for the site in hand.
2. This Safety and Health Plan template is designed to be completed by the PSDP on a preliminary basis and further developed by the PSCS for the construction stage.
3. This template must be saved to the appropriate project folder
4. For Part 2:
 - Text in the lefthand column of the table should not be amended, though additional headings may be added if necessary
 - Project information should be inserted in the right-hand columns accordingly by the PSDP and PSCS
4. This Plan should be completed in accordance with the section 4 and 10.1 of TC245 Design and Construction Management Process.



Indicates to be completed by Project Supervisor Design Process



Indicates to be completed by Project Supervisor Construction Stage

Project Supervisor Design Process

 Towercom.

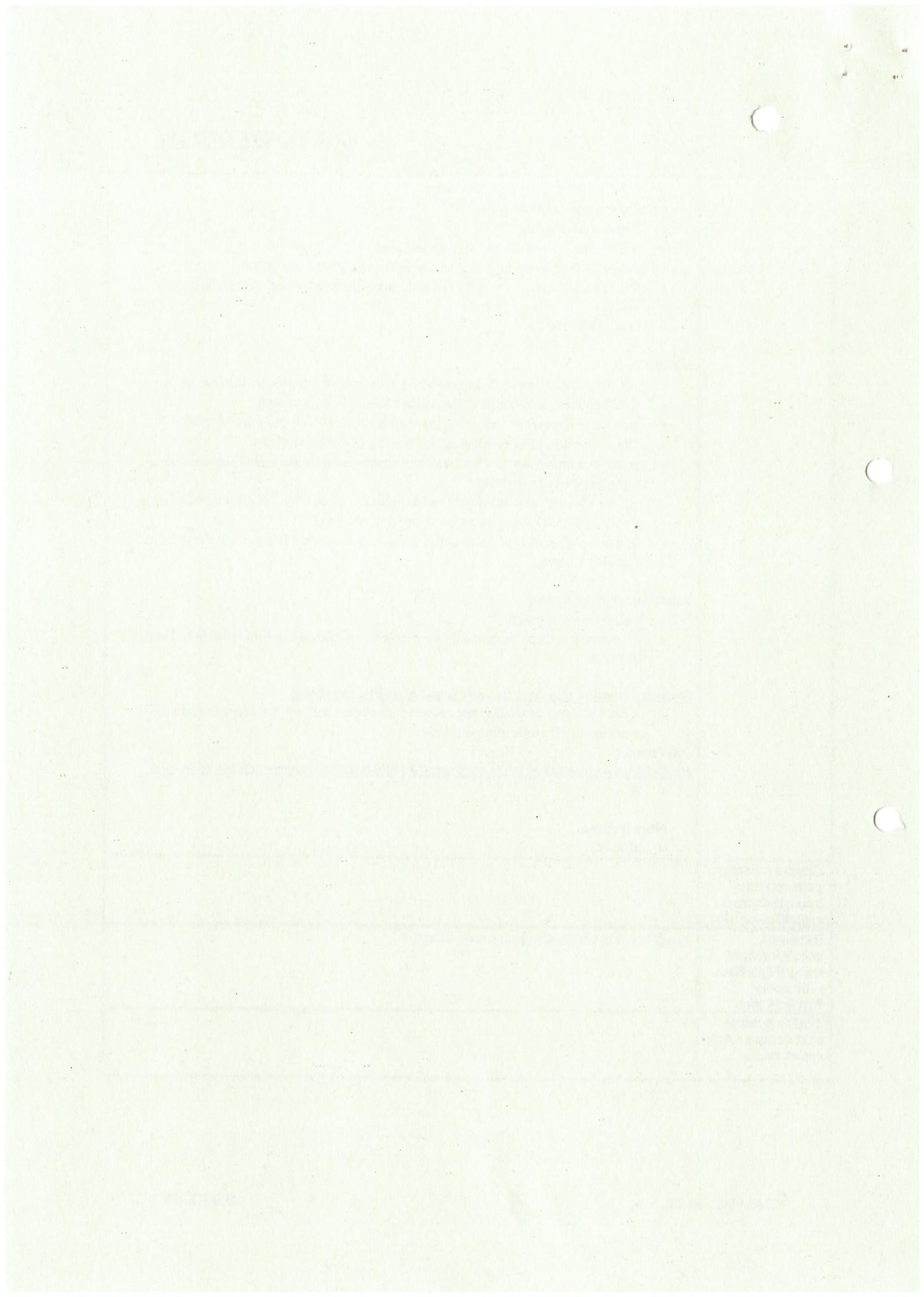
Project Supervisor Construction Stage

 Towercom

Part 1: Project Info (completed by PSDP) 

Duty holders: (include name, address, and contact details)	Client	Towercom
	Designer(s)	Towercom, Delmec LTD.
	Project Supervisor for Design Process (PSDP)	Towercom
	PSDP Contact Person / Details	Sean Bradley
	Project Supervisor Construction Stage (PSCS)	Tom Sexton
	PSCS Contact Person / Details	tsexton@towercom.ie 086 829 5568
	H&S Co-ordinator (where appointed)	Bogdan Paicu
Scope of works:	<p><u>Summary of works</u></p> <p>Supply and install 12 + 3m Monopole c/w foundation. 2No. 2m high gantry poles & rails for Vodafone's RRU's. 1No. 150mm dia duct for feeder cables & 5No traffic bollards surrounding foundation.</p> <p><u>Scope of works</u></p> <p><u>Site Preparation</u></p> <ul style="list-style-type: none"> • Scan the foundation & plinth area for the foundation to identify any UG services. Mark up any services found by the scan. • Install protective red PVC safety goalposts around existing overhead wires as required. • Secure the site using temporary fencing. • Complete pre-works Dilapidation Survey, photos & video of the adjoining Eir building. • Earth cable found during LUGS to be confirmed on site to be dead by openeir. Of earth cable is not dead then it is to be relocated around the proposed foundation. • Installation of Vibration, noise & dust monitors on site prior to works. <p><u>Civil/Structural</u></p> <ul style="list-style-type: none"> • Excavate the Site. • Unstable trench sides to be temporary supported as required • Install min. 50mm stone/lean-mix concrete from solid ground to underside of new foundation. • Install 150mm duct for feeder cables through foundation. • Install rebar as per schedule outlined in the design drawing • Install Monopole holding down bolt template for 12 +3m Delmec Monopole. <ul style="list-style-type: none"> ○ Ensure orientation of the Tower is as per the Construction Drawing • 1st fix lightning protection tape to be installed and tied to rebar 	

	<ul style="list-style-type: none"> • Erect formwork for new foundation. • Pour concrete for foundation • Remove Shuttering • 2nd fix Lightning Protection to be installed • Traffic bollard to be installed on the new Monopole foundation • Site area and access route to be landscaped back to its original condition, i.e. Tarmac • Clean and Tidy Site <p>Monopole</p> <ul style="list-style-type: none"> • Ensure the delivery of proposed 12 +3m Delmec Monopole as per the design specifications. Monopole to be painted RAL8014 dark brown • Install the operators' mounting steelwork to the Monopole prior to erection. • 1No. Cluster Pole to be installed on the top of the Monopole. • Install the proposed 12 +3m Delmec Monopole on to the holding down bolt template and secure bolts. <ul style="list-style-type: none"> ○ Ensure orientation of the Monopole is as per the Construction Drawing • Install operator gantry poles for support of the RRU's. • Operator cable gantry poles and ladders to be installed & cross-bonded to the new earthing system. <p>Safety Signage & Security</p> <ul style="list-style-type: none"> • Install safety signage. • No signage is to be installed on Eir property i.e. the compound fencing or on the building. <p><u>Electrical (some works may be completed at a different stage)</u></p> <ul style="list-style-type: none"> • <i>A full CAT scan of the ducting route to be carried out, for the identification and mark-up of all underground utilities</i> <p>ESB Power: <u>[Note ESB power solution to be confirmed by ESB prior to commencement of works]</u></p> <ul style="list-style-type: none"> • N/A <p>Fibre ducting:</p> <ul style="list-style-type: none"> • N/A.
Clients existing undertakings and other work activities on site	
Relevant adjoining land uses (High Risk – Schools, Public Areas	Neighbouring residential properties adjacent
Traffic System and access / Any restrictions	



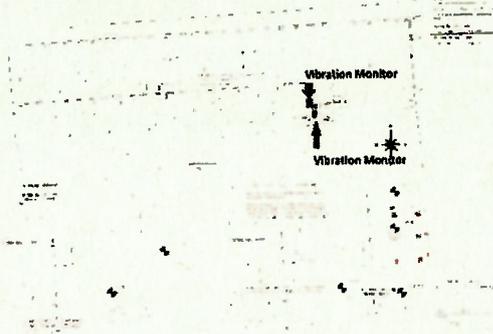
Environmental restrictions/ Planning Conditions:	Monopole to be painted RAL8014 dark brown
Other site Restrictions / Activities	
Security Arrangements	
Intended Commencement Date	November 2024
Duration of Project (include basis on which this is established):	5-6 weeks

Sequence / Phasing of works :
(Include Dates)

The works are to be carried out in 2 stages. Civils' November- December 2024. Second stage, Monopole lift December 2024.

Vibration monitoring- (works completed)
See Appendix 5 -

2No vibration monitor will be placed, one outside on boundary wall, and one inside as per below markup dw.



Vibration monitors will be installed as per above mark up dw by NVM operator first day before works commencing.

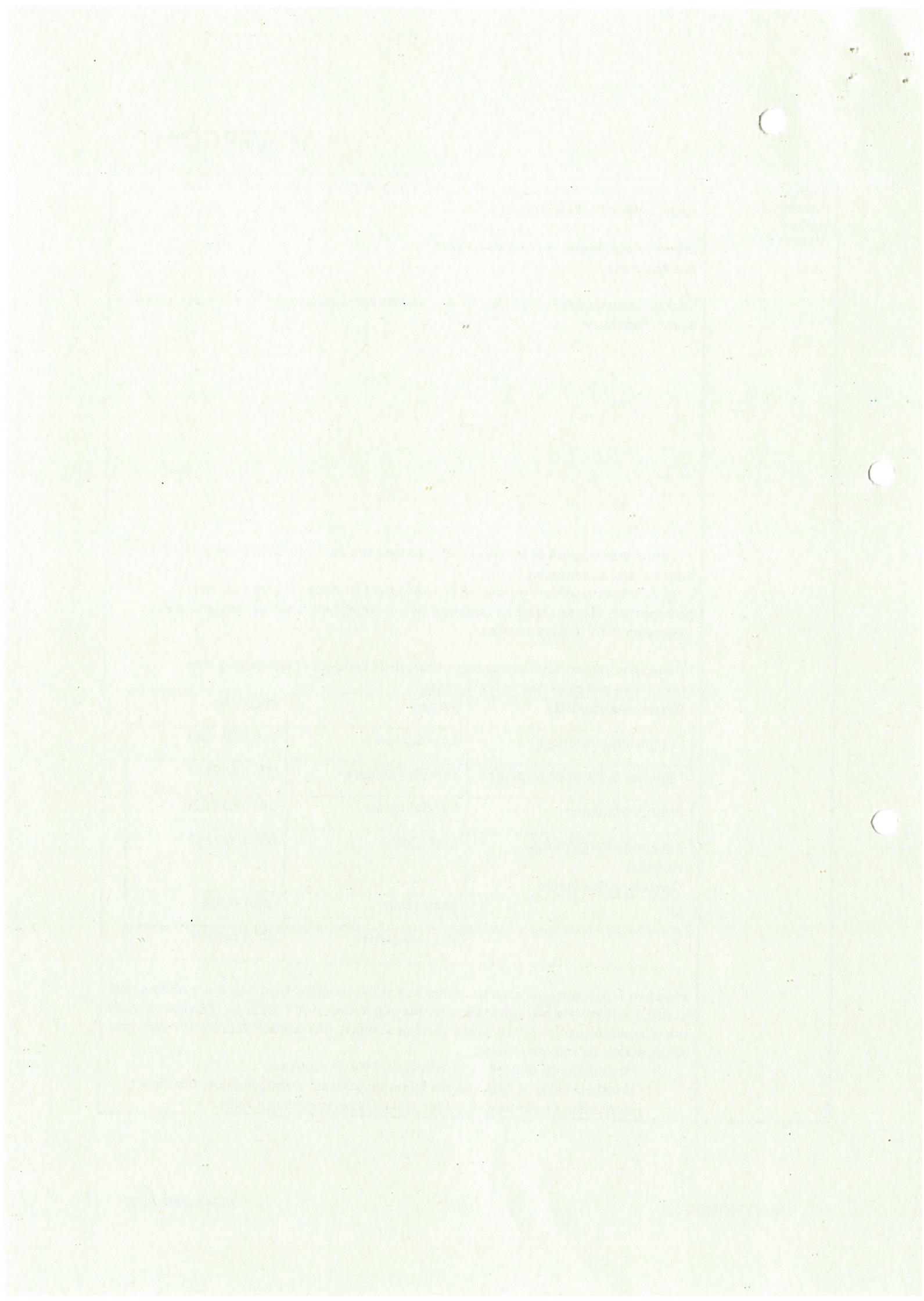
Once monitors have been installed a test will be performed to ensure monitors performance. This test will be completed each morning before works commencing by Towercom PICW present on site.

In case of vibration values exceeding set threshold limits (see table below), then notifications will be sent to below contacts:

Responsibility/Title	Name	Phone No.
Construction Manager	Tom Sexton	086 829 5568
Facilities & Services Manager	Tommy Galligan	085 1865123
Project Manager	Pat Gallagher	087 763 8226
Kavanagh Mansfield & Partners Consulting Engineers	Niall Clarke	087 6887251
eir	Pearse Daly	0851743751
eir	Kieran Delaney	0851743751

Vibration Measurements shall be conducted at the specified locations, the monitors shall be fitted with tri-axial sensors to allow for the monitoring of PPV levels and frequency-based analysis and calculation of VDV levels (human comfort). All recorded data shall be uploaded automatically for remote viewing.

- Measurements of Peak Particle Velocity (PPV) in mm/sec.
- Threshold values – based on the following guidance documentation, the alert notification threshold shall be set at the following guidance limits:



<i>Alert Level</i>	<i>Allowable vibration (in terms of peak particle velocity - PPV) at the closest part of sensitive property to the source of vibration independent of frequency</i>
<i>Amber</i>	8mm/s
<i>Red</i>	11mm/s

- The vibration monitor shall transmit text alerts should vibrations exceed set threshold values.
- Alert level:
 - Amber 8 mm/s (review works level)
 - Red 11mm/s (stop works level)

Stage 1 – Civil Works

Day 1

- Step 1: Complete pre-works Dilapidation Survey - photos & video record.
- Step 2: Install Harris security fence and safety signage around the working area. Ensure access for eir personnel will be kept free at all the time.
- Step 3: Existing Service Drawings to be checked. See Appendix 1. Detailed Design to be checked for details of other underground and overhead services. See Appendix 2.
- Step 4: Works Area to be scanned to confirm the if any underground services are present in accordance with **Locating Underground Services Procedure**. See Appendix 3: **TC234 Locating Underground Services**. **Permit to dig** to be completed prior to any digging. See Appendix 4: **TC236 Permit to Dig**.

Day 2 & 3

- Step 1: Install exclusion zone, Goal Posts and signage
- Step 2: Hand dig excavation for locating underground services.
- Step 3: Excavation of foundation base to the required depth, as per the Detailed Design drawing, using 3tonne excavator.
- Dispose of excavated material off-site using accredited waste disposal company. Waste disposal vehicles to be loaded directly on the site. Spotter to be in place. Driveway to be kept clean and tidy at all times.

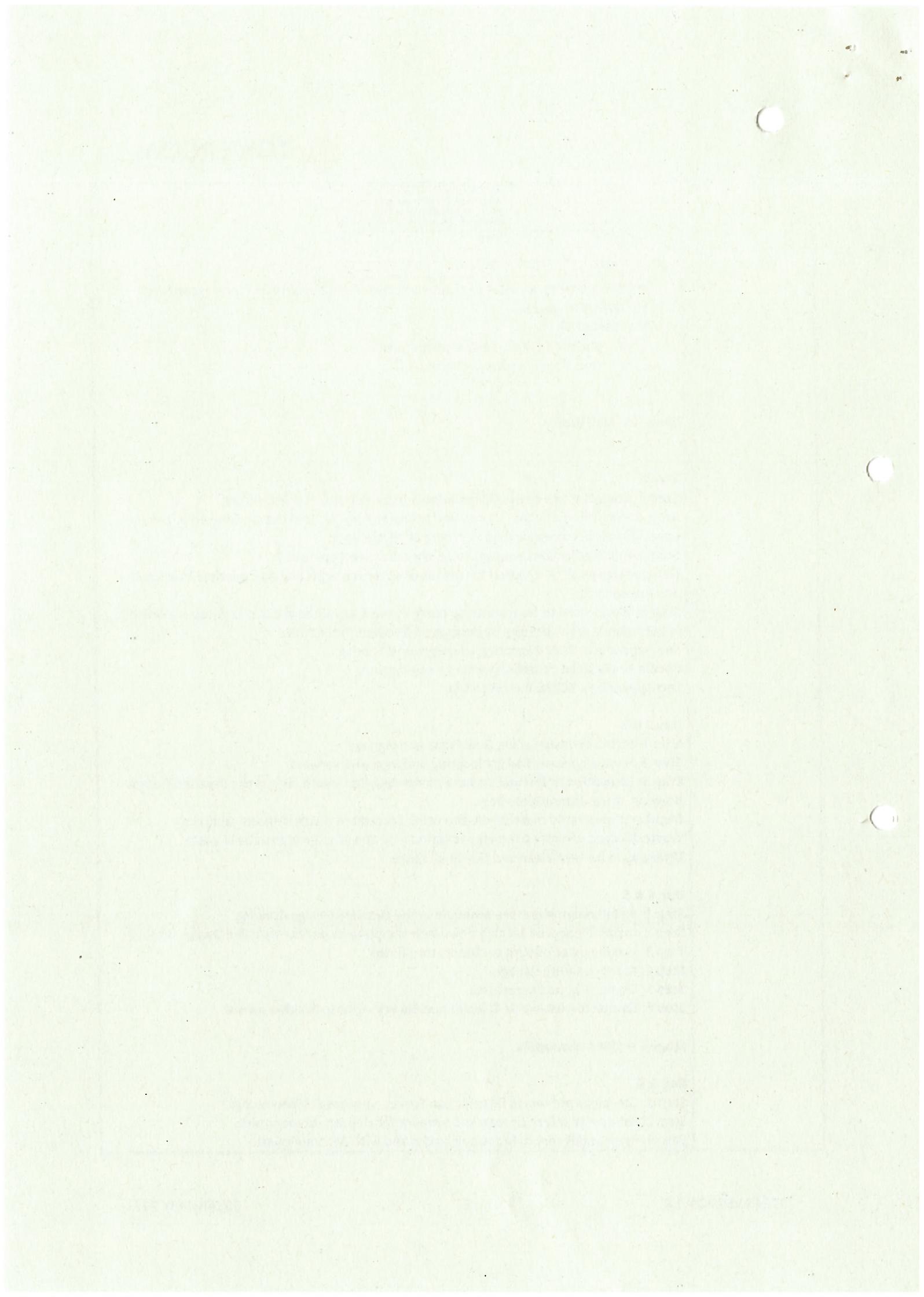
Day 4 & 5

- Step 1: Install rebar as per the schedule in the Detailed Design drawing.
- Step 2: Install Monopole holding down bolt template as per the Detailed Design drawing.
- Step 3: Install power ducting and operator plinths.
- Step 4: Remove safety signage.
- Step 5: Clean, tidy, and secure site.
- Step 6: Complete post-works Dilapidation Survey – photo & video record.

Stage 2 – Stand Monopole

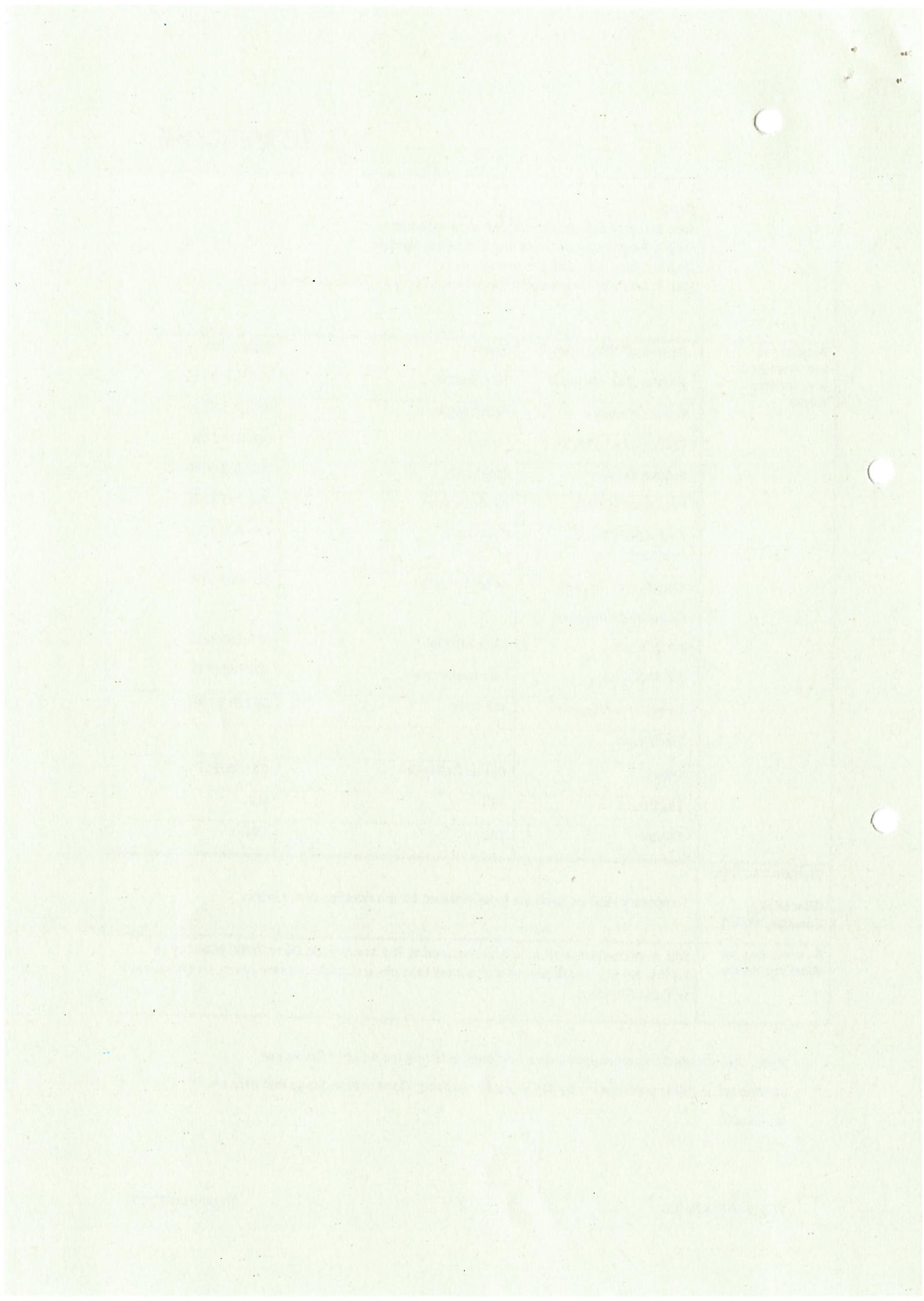
Day 1 &

- Step 1: Complete pre-works Dilapidation Survey - photos & video record.
- Step 2: Set up site safety signage and prepare for delivery of monopole.
- Step 3: Receive delivery of Monopole and stand with 25tonne crane.



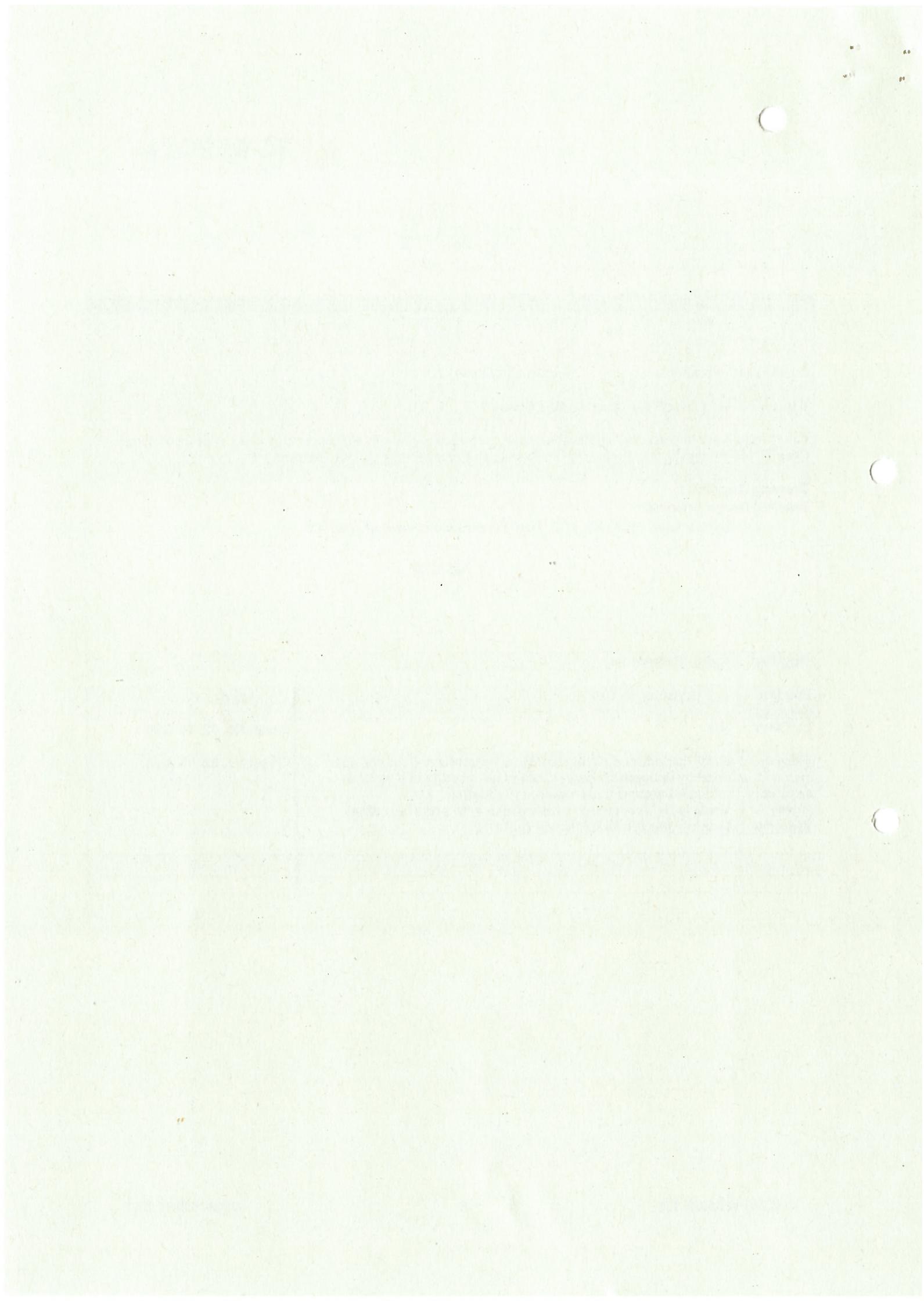
	Day 2 Step 1: Install operator gantry, poles, and ladders. Step 2: Remove security fencing and safety signage. Step 3: Clean, tidy, and secure site. Step 4: Complete post-works Dilapidation Survey – photo & video record.		
Personnel involved in the project/site works	Responsibility/Title	Name	Phone No.
	Construction Manager	Tom Sexton	086 829 5568
	Project Manager	Pat Gallagher	087 763 8226
	PICW (Tower Erection)	Kevin Lally	086 823 1090
	Rescue Climber	Kevin Lally	086 823 1090
	First Aider (Civils)	Pat Gallagher	087 763 8226
	First Aider (Tower Erection)	Kevin Lally	086 823 1090
	Operatives / Riggers	Kevin Gallagher	087 963 5470
	Operatives / Riggers		
	PICW (Civils)	Mick Mogan	087 2514080
	PICW (Civils)	Damien Byrene	0877687792
	Operatives / Riggers	Joe Kelly	087 823 1988
	Electrician		
	Other	Daniel Gallagher	0873695471
Electrician	N/A	N/A	
Others	TBC	TBC	
Welfare Facilities (Electricity, Sewage, water)	Temporary Welfare facilities to be installed for the duration of the works.		
Restrictions on Working Hours	Site development works shall be confined to the hours of 08:00 to 18:00 Monday to Friday . No site development works shall take place outside of these hours, or on Sundays or Public Holidays.		

Note: The intended commencement date and completion period advised above are provisional, pending confirmation by the Project Supervisor Construction Stage that they are practicable



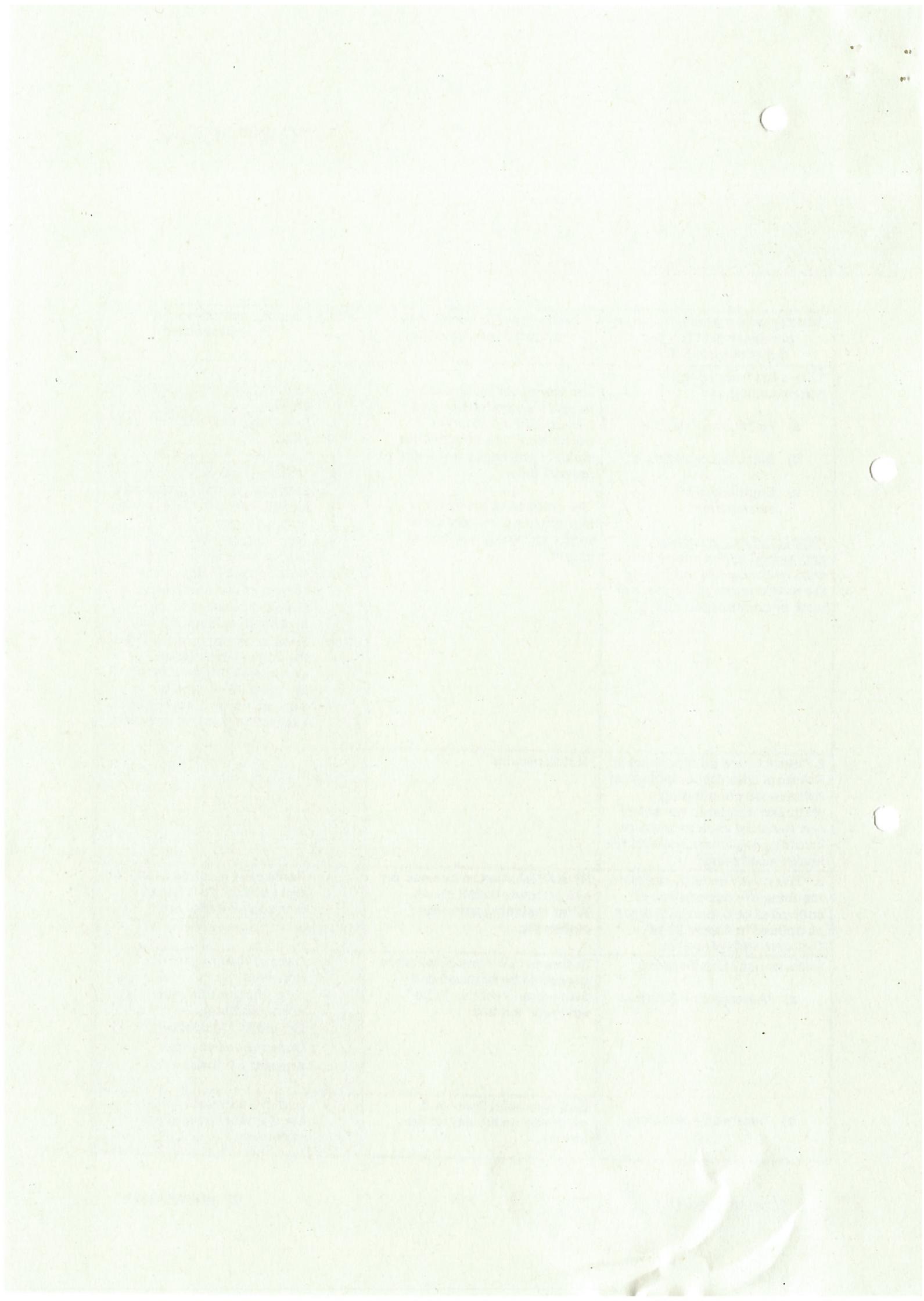
Part 1 Contd.: Project Info (completed by PSDP)

Is there an existing Safety File, site survey or other safety related records?		
<input type="checkbox"/> Yes	<input type="checkbox"/> No	
If yes, what part affects the Design Safety? <i>A</i>		
If yes, what part affects the Construction Safety?		
If no records are in place, then an assessment / site survey of on-site hazards may need to be undertaken. (See TC165 Design Survey Form / TC198 Towercom Survey Report & Risk Assessment)		
Drawing Register: Detailed Design Drawing: <ul style="list-style-type: none"> • Wellington Road - TCK5225_UTS_Dev_Construction Drawings_Rev 2.0 <p style="text-align: center;"><u>Drawings</u></p>		
Dwg No:	Safety Reference:	
Existing services	Location on Site	Dwg No.
LV OHW	N/A	Sheet No. 02, 03 & 04
Existing inground services (power & telecoms)	Earth cable found during LUGS to be confirmed on site to be dead by openeir. Of earth cable is not dead then it is to be relocated around the proposed foundation There is UG fuel tank in parking area with possible cables running into the air exchange building.	Sheet No. 02, 03 & 04.



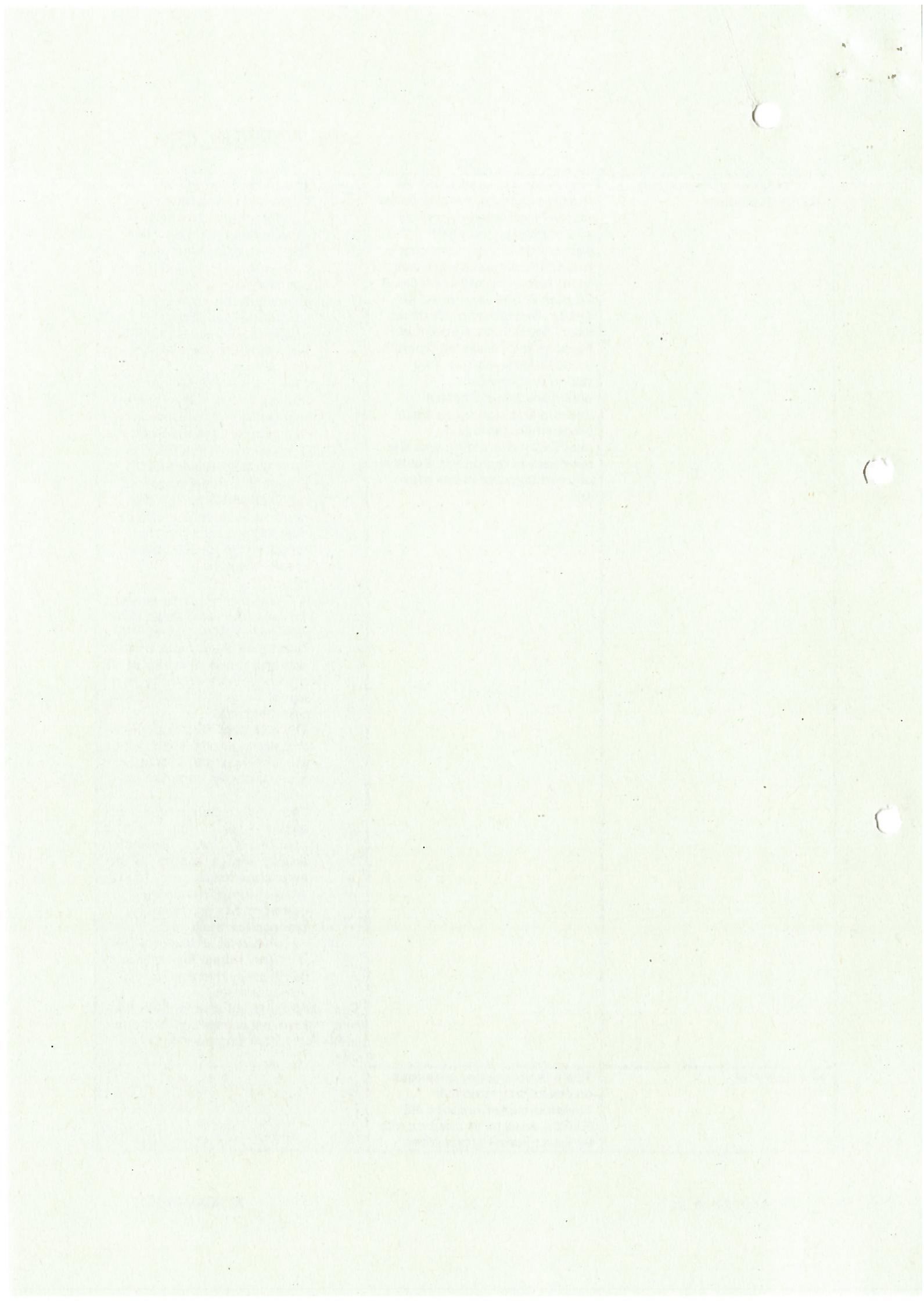
Part 2: Particular Risks (completed by PSDP and PSCS)

Identify works which involve a particular risk: (As per Schedule 1 of SI504)	PSDP – specify where in the project the risks will arise: 	PSCS – specify control measures to be implemented: 
<p>1. Does the work put the persons at risk of:</p> <p>a) Falling from Heights</p> <p>b) Burial under earthfalls</p> <p>c) Engulfment in swampland</p> <p>(Where the risk is particularly aggravated by the nature of the work or processes used or by the environment at the place of work or construction site”)</p>	<p>The Monopole foundation requires an excavation of a 2.5m x 2.5m x 1.75m. The excavation to be checked for stability and edges protected to prevent falls.</p> <p>The erection of the 12+3m Monopole will require crane works and some working at height.</p>	<ul style="list-style-type: none"> • Identify risks and complete JSSP. • Set up exclusion zone in work area. • Complete Permit to Dig • CSCS trained operator to scan the ground. Location of identify services to be marked on the ground • Only toothless bucket to be use for mechanical digging. • No mechanical dig within 500mm of live services. • Exposed services to be protected and highlighted. • Spoil to be stored away from the edge of excavation. Location for storing the spoil to be identified on site • Safe access and egress into excavation must be provided.
<p>2. “Work which puts persons at risk from chemical or biological substances constituting a particular danger to the safety and health of such persons or involving legal requirements for health monitoring”</p>	<p>Not applicable</p>	
<p>3. “Work with ionising radiation requiring the designation of controlled or supervised areas as defined in Article 20 of Directive 96/29/Euratom</p>	<p>RF NARDA Alert to be used on site by tower install crews. When installing antennas / dishes etc.</p>	<ul style="list-style-type: none"> • Narda alert must be available and used for duration of Monopole installation
<p>4. Works near Live Services</p> <p>a) Underground Services</p>	<p>Before excavations commence ground to be scanned and discovered services to be sprayed / marked.</p>	<ul style="list-style-type: none"> • Consult existing service drawings • Scan the ground using CAT scan and Genny. • Ensure TC234 Locating Underground Services procedure is followed.
<p>b) Overhead Powerlines</p>	<p>ESB overhead lines were observed on the day of the survey.</p>	<ul style="list-style-type: none"> • Install Goal post and signage for overhead powerlines protection



5. Works exposing persons to risk of drowning	Not applicable	
6. Work on wells, underground earthwork and tunnels	Not applicable	
7. Work carried out by divers at work, having a system of air supply	Not applicable	
8. Worked carried out in caisson with a compressed air atmosphere	Not applicable	
9. Work involving the use of explosives	Not applicable	
10. Work involving the assembly or dismantling of heavy prefabricated components	Erection of lattice tower requires assembly of tower sections	<ul style="list-style-type: none"> • Delivery of Monopole by approved sub-contractor. • Only trained operators will undertake the task.
11. Other Risks		
11.1 Risk of Covid-19 infection	Travelling to site, interacting with members of the public & colleagues on site. Use PPE, Surgical face mask, wash hands frequently. 70% Alcohol hand sanitizer to be used.	<ul style="list-style-type: none"> • Try to avoid places where you cannot keep 2 metres apart from other people, wear face covering if this is not possible
11.2. Risk of collision with Plant/Machinery/Vehicles on site- or other	Risk Assessment to be carried out on site (SSWP to be completed). Keep emergency escape routes clear at all times. Appropriate PPE to be provided and must be used correctly. Good housekeeping to be maintained at all times.	<ul style="list-style-type: none"> • All plant operatives will be competent and will have the appropriate CSCS training • No site Personnel or Plant/machinery will cross the roped areas as set out by the PICW • Only certified Items of plant / machinery will be allowed on this site • A certified banksman will be on site at all times to aid plant operator • SWL will be adhered to at all times • All equipment used for lifting with the excavator must be certified and Banksman required for attaching load. • Fire Extinguisher & First aid kit will be available on site • Excavated area to be CAT before work begins • Plant to be inspected and GA2 to be completed by operator before work commencing.

11.3. Work involving Lifting (Crane Operation)	<p>Any crane being used will be hired from an authorised dealer and only operated by trained and certified competent personnel. The manufacturer's instructions must be adhered to for operation of the crane . A lift plan & GA1 form must be onsite. Banksman must direct crane operations. Appointed Persons to oversee lift Operate on solid level ground. Two radios required for communication. Physical barriers and signage to be in place where there is a possibility interaction with the members of the public. Beware of overhead cables and slew area.</p>	<ul style="list-style-type: none"> • Exclusion zone will be installed in work area. • The Site Supervisor will ensure that the crane has a thorough examination certificate(every 12 months – form GA 1) • The Site Supervisor will ensure that the lifting appliance has been inspected within the previous 7 days – form GA 2) • The Site Supervisor will ensure that the weekly inspections of the automatic safe working load Indicator is carried out – forms GA 2/ GA 3 • The Site Supervisor shall ensure that all lifting gear is supplied with a current test certificates(every 6 months) - note lifting gear includes ropes, slings, chains, block crabs, shackles, • taken. • A Banksman must be present for all Lifts and must hold relevant CSCS ticket. The Banksman must be in contact with the crane operator at all time of the lift either by hand signal or two way communication • The Site Supervisor will check that lifting appliances such as gin wheels, pulley blocks, etc. are correctly erected and used. • The Site Supervisor will ensure that all lifting appliances are inspected weekly and a record of the inspection made. • Where a proposed lifting operation has not been planned for, the Site Supervisor shall seek advice from the Project Manager and put in place the required arrangements. <p>The Site Supervisor shall ensure that only trained and competent persons are involved in lifting operations on site.</p>
11.4 EMF / RF	<p>There is no existing antennas on / near the proposed Towercom development. RF NARDA Alert to be used on site by tower install crews when</p>	



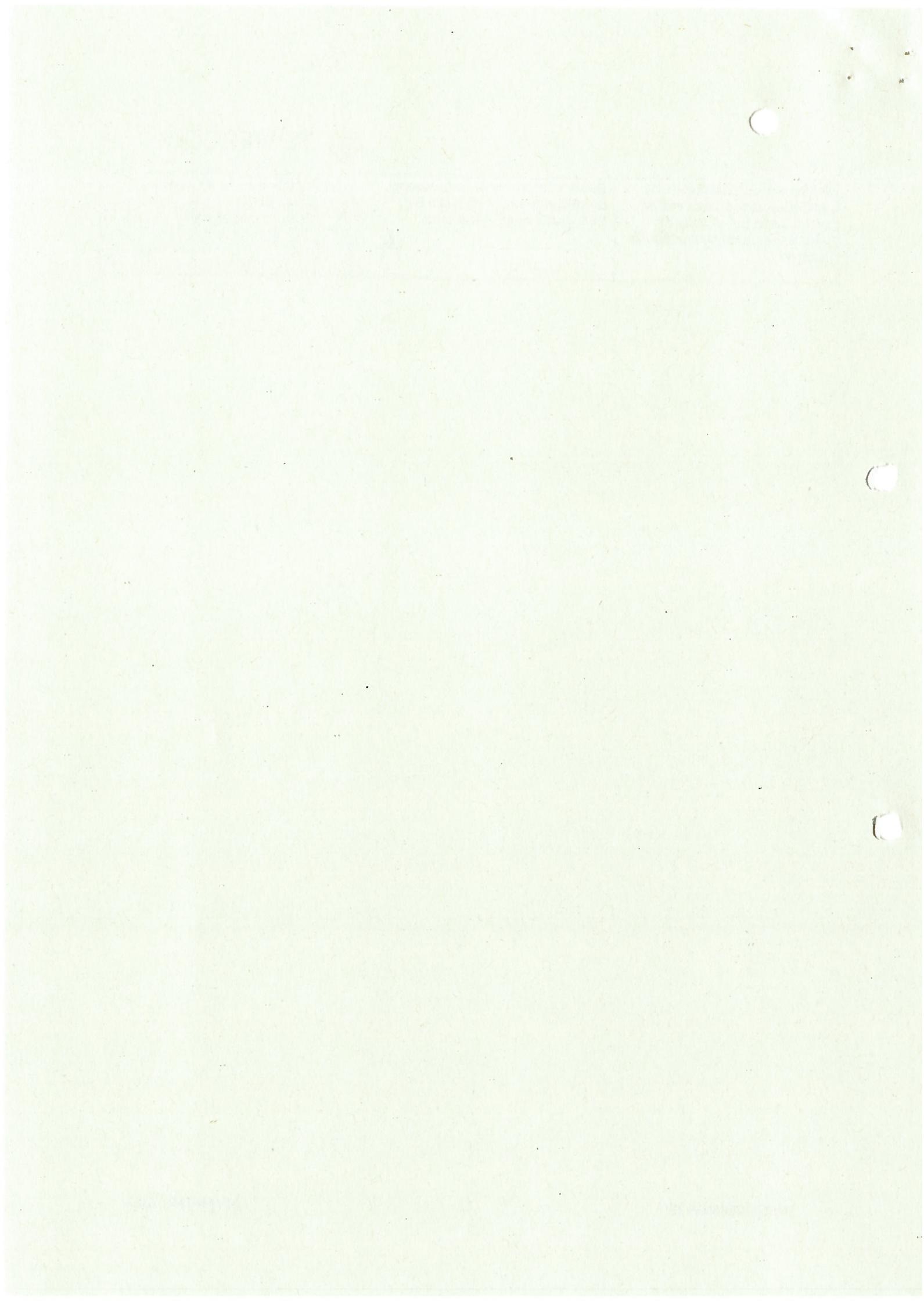
	active works are being carried out.	
11.5 Piling	Not applicable	
11.6 Works involving use of Equipment / Hand-tools	Training of operatives. Use suitable tools for job. All tools to be maintained in good working. Use PPE. Sharp edges covered when not in use. Take Ergonomic features into account when purchasing new tools.	<ul style="list-style-type: none"> • Fire extinguisher on site in the Site Office. No Smoking when operating or re-fuelling abrasive wheels • Only operatives trained in the use of Abrasive wheels may operate such equipment • Ensure correct blade type used for the works • Loose clothing, ties, coat sleeves are easily drawn into a revolving wheel and should not be worn. • To minimise the risk of bursting, abrasive wheels should always be run within the specified maximum rotation speed. Never remove any Guards that are in place • Only 110kv rated electrical hand tools to be used on site • All electrical equipment must be PAT tested. • Ensure hands kept clear when hitting ducting into place.
11.7 Manual Handling	Manual handling training carried out by all operatives. Use mechanical aids provided. Use two or more men for heavy/awkward loads. Correct lifting techniques. Heavy items placed at ground level or level where lifting is assisted. Also work area to be kept tidy.	<ul style="list-style-type: none"> • Manual Handling Training completed by all site personnel • Use mechanical means where possible and practicable for unloading equipment. • When lifting manually heavier/awkward loads 2 people should take the weight and carry to location.
11.8 Other(s) <u>Excavations:</u>	Locate and mark underground services in line with HSA 'Code of Practice for Avoiding Danger from Underground Services'. Fence off excavations. Ensure necessary equipment is available prior to start of work. Use correct support systems. Ensure personnel never enter unsupported excavations. Check & record inspections daily in 'Record Inspection book' if excavation is deeper than 1.25m. Store materials away from excavation. Staff Training, Wear Correct PPE.	<ul style="list-style-type: none"> • Identify risks and complete JSSP. • Set up exclusion zone in work area. • Complete Permit to Dig • CSCS trained operator to scan the ground. Location of identify services to be marked on the ground • Only toothless bucket to be use for mechanical digging. • No mechanical dig within 500mm of live services. • Exposed services to be protected and highlighted.

		<ul style="list-style-type: none">• Spoil to be stored away from the edge of excavation. Location for storing the spoil to be identified on site• Safe access and egress into excavation must be provided.
--	--	---

Part 3: Principles of prevention (completed by PSDP and PSCS)

	PSDP Conclusions drawn by PSDP and designers taking account of principles of prevention:	PSCS Construction controls identified:
1. Keeping the construction site in good order and in a satisfactory state of cleanliness	A good housekeeping culture. Appropriate & designated storage areas. Keep walkways/traffic route clear	<ul style="list-style-type: none"> • Access to air personnel must be kept clear at all the time. • Everyone on site must adhere to clean as you go policy.
2. Choosing the location of workstations, bearing in mind how access to them is obtained, and determining routes or areas for the passage and movement of equipment.	Plan all operations prior to commencement of works. Maintain site tidiness. Remove waste on a regular basis. Stacking areas designated & maintained. Correct signing & guarding. All materials guarded, covered or locked up. Regular Audits.	<ul style="list-style-type: none"> • All operatives must hold safe pass and Manual Handling for accessing the site. • CSCS cards required for undertaking specific tasks • Materials storage area to be identified on site, extra care to be considered for keeping the access free. • Audits to be carried by Safety Rep
3. The conditions under which various materials are handled		<ul style="list-style-type: none"> • Ensure PPE is worn when working on site.
4. The conditions under which the dangerous materials used are removed.		N/A
5. The storage and disposal or removal of waste and spoil/debris	To be removed promptly from the site during construction to maintain access to the exchange building	<ul style="list-style-type: none"> • Dispose of excavated material off-site using accredited waste disposal company.
6. The adaptation, based on progress made on the construction site, of the actual time to be allocated for the various types of work or work stages		<ul style="list-style-type: none"> • Extra time and care to be allocated for high risk activities such as Excavations, Crane Lift.
7. Co-operation between employers and self-employed persons		<ul style="list-style-type: none"> • Good cooperation required between operatives and Supervisor on site.

8. Interaction with industrial activities at the place within which or in the vicinity of which the construction site is located	Beware of the traffic movements of ESB vehicles within the Eir / ESB yard / compound area. 	<ul style="list-style-type: none">• Access/egress to be kept free for eir personnel/visitors.
---	--	---



Part 4: Site Rules (completed by PSCS)

Project Supervisor Construction Stage	
Safety rules for the execution of the construction work:	<ul style="list-style-type: none">• Only authorised personnel allowed on site• Safe Pass and Manual Handling training required for access to the site• Prior to starting the task all relevant safety paperwork must be briefed to crew and signed by everybody involved• Keep the site tidy "clean as you go"
This Plan must be brought to the attention of all contractors and other relevant persons who may be affected by it.	

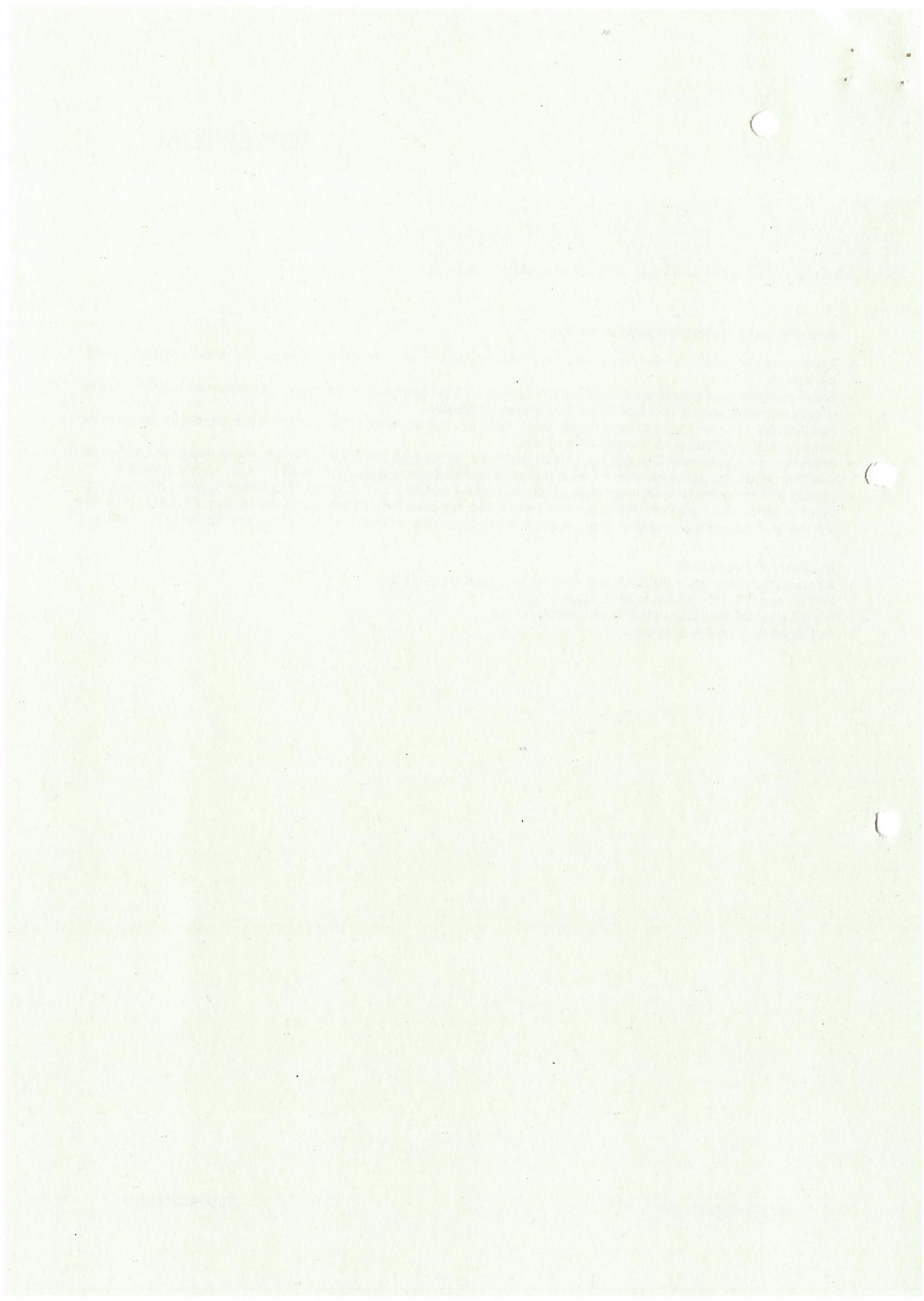
Part 5: Environmental aspects (completed by
PSCS)

Environment aspects for everyone on site

- Comply with all relevant environmental legislation avoiding prosecutions for the contravention of environmental law and regulations.
- Raise environmental awareness throughout the Towercom Site Management Team and sub-contractor group by means of regular Environmental Tool Box Talks and Awareness sessions.
- Achieve zero pollution incidents (emergency spills, noise / nuisance, water contamination, waste storage / management issues) whilst maintaining an operational work site.
- Implement the waste hierarchy: eliminate waste where we can; reduce the waste we create; reuse materials until we can't use them again; recycle waste where reasonably practicable; and only dispose of waste if we are unable to recycle.
- Identify and recognise all designated sites (Sites of Special Scientific Interest, Areas of Otstanding Natural Beauty etc), listed buildings and protected flora, fauna and wildlife that may potentially be affected by Towercom activities. Towercom will instigate appropriate mitigation measures to ensure adequate protection and that minimum disturbance is caused.

Environmental controls.

- All plant equipment when are not in use must sit on a plant nappy / drip tray
- Spill kit and Fire extinguisher to be in place on site.
- No refueling will take place within 30m of water course.
- Fuel must be stored in Jerry cans.



Part 6: Emergency Details (completed by PSCS)

First Aid

	On-site First Aider:	TBC
	First Aid Box Location:	To be identified
	Local Hospital:	See RAMS
	Local Doctor	See RAMS

Emergency Contacts

	An Garda Síochána:	112/999
	Local Authority: Cork County Council	
	HSE	1850 241850
	Gas Networks Ireland:	1850 205050
	ESB Services:	1850 372999
	Health and Safety Authority:	1890 289389
	Towercom Head Office:	
	Towercom EHS Manager:	086 7702880

Appendix 1 - Existing Services

Appendix 1 Irish



Appendix 1 Irish



Appendix 1 Gas



Appendix 1 ESB



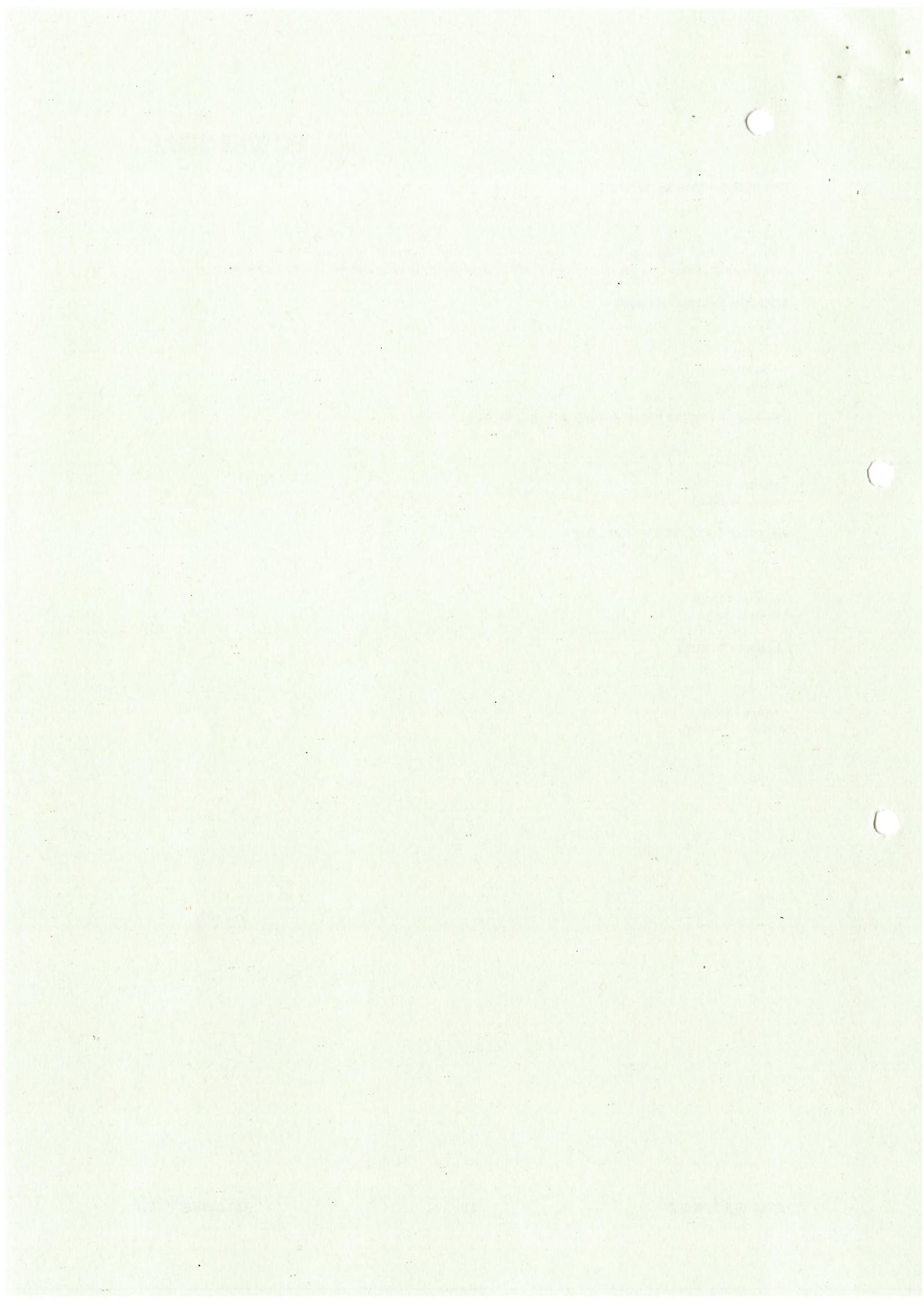
Appendix 1 Eir

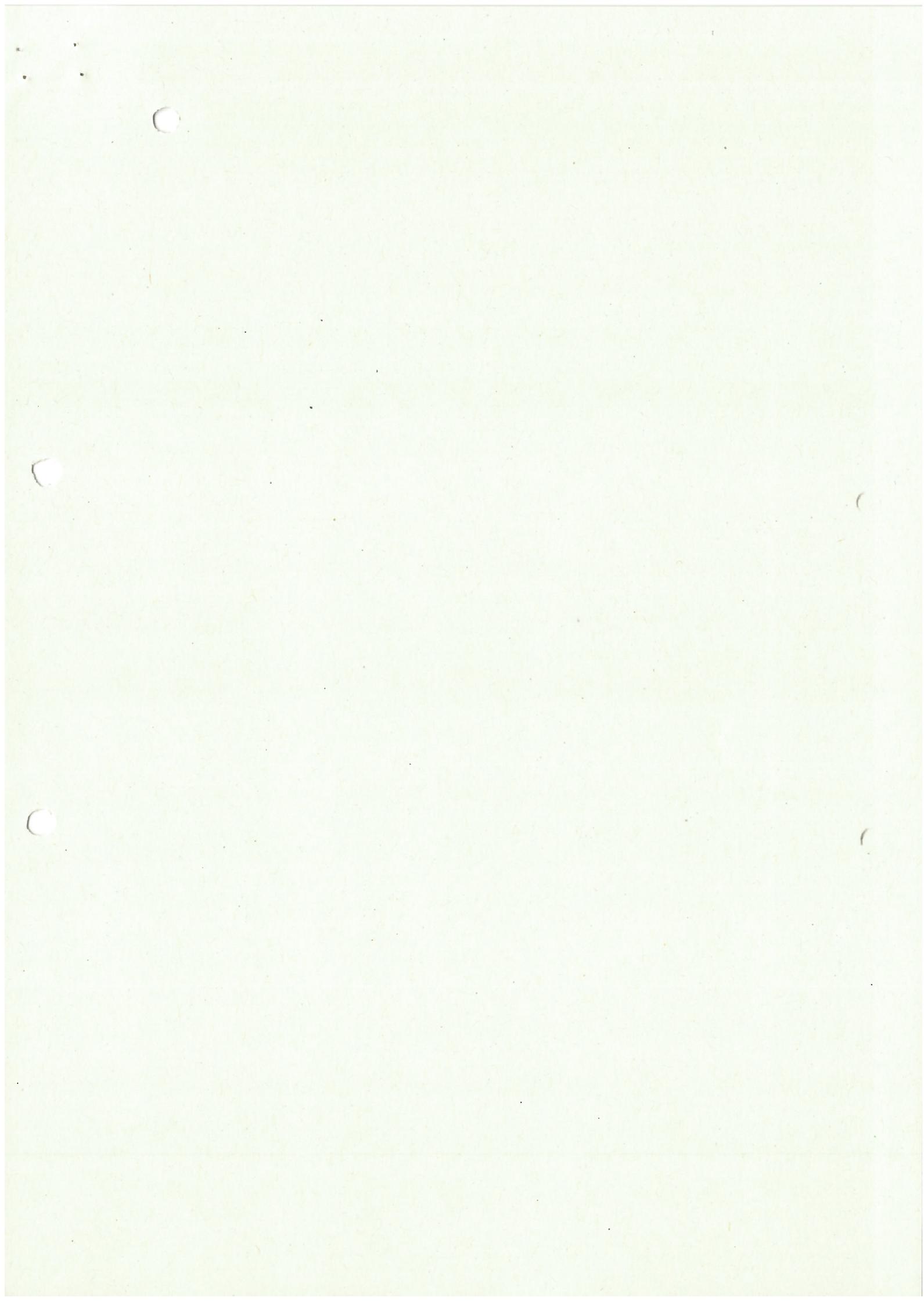


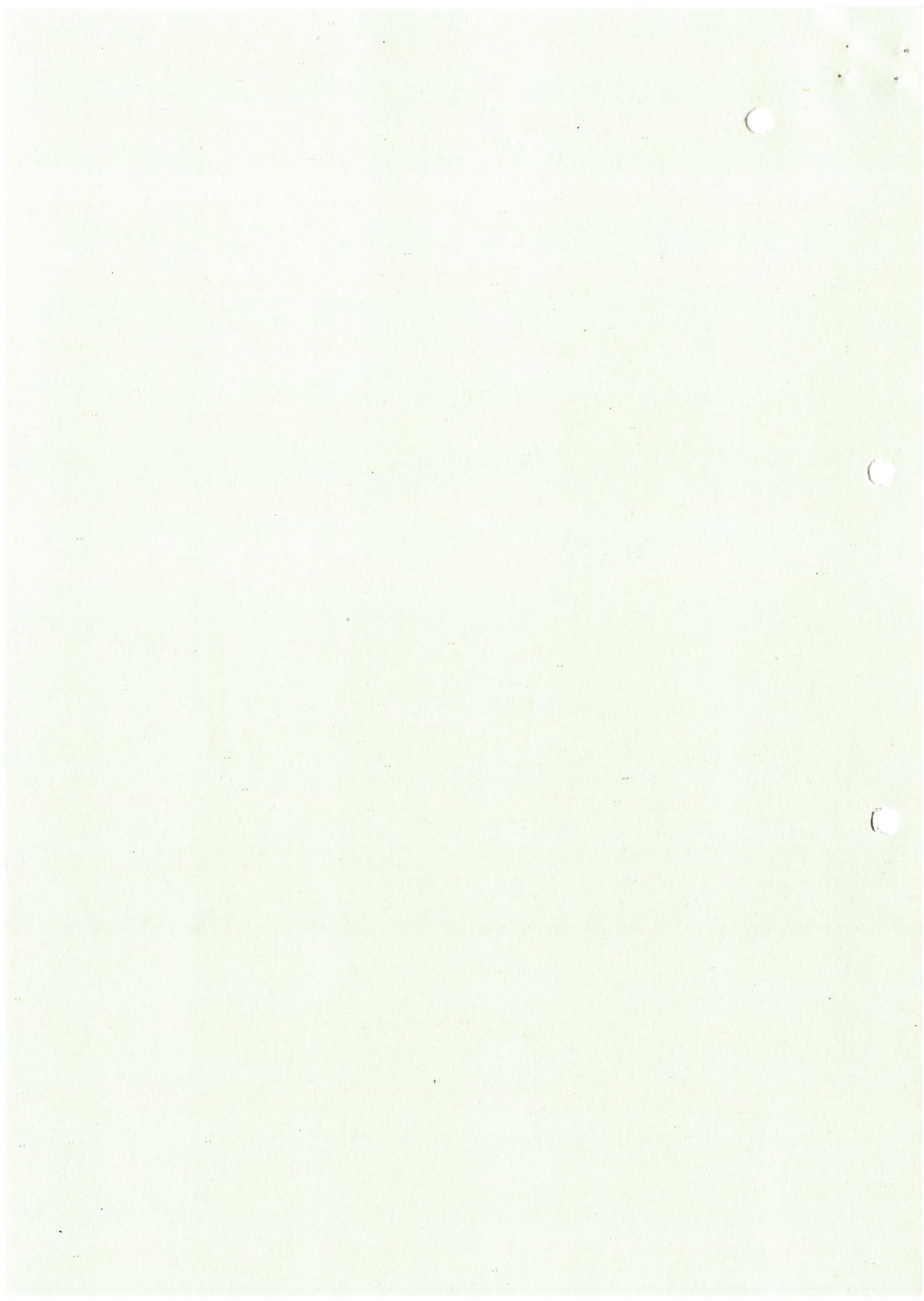
Appendix 1 Irish

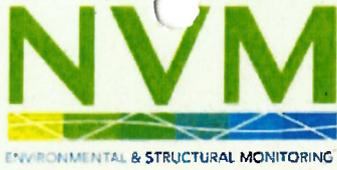
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Appendix 2 - Detailed DesignAppendix 2
Wellington Road - TC**Appendix 3 - TC234 Locating Underground Services**Appendix 3 TC234
Locating Underground**Appendix 4 – TC236 Permit to Dig**Appendix 4 TC236
Permit to Dig.pdf**Appendix 5- NVM**Appendix 5 NVM
RAMS-24-137 Wellinc









Unit 13, Boyne Business Park,
Termon Abbey,
Drogheda, Co. Louth.
A92 R625

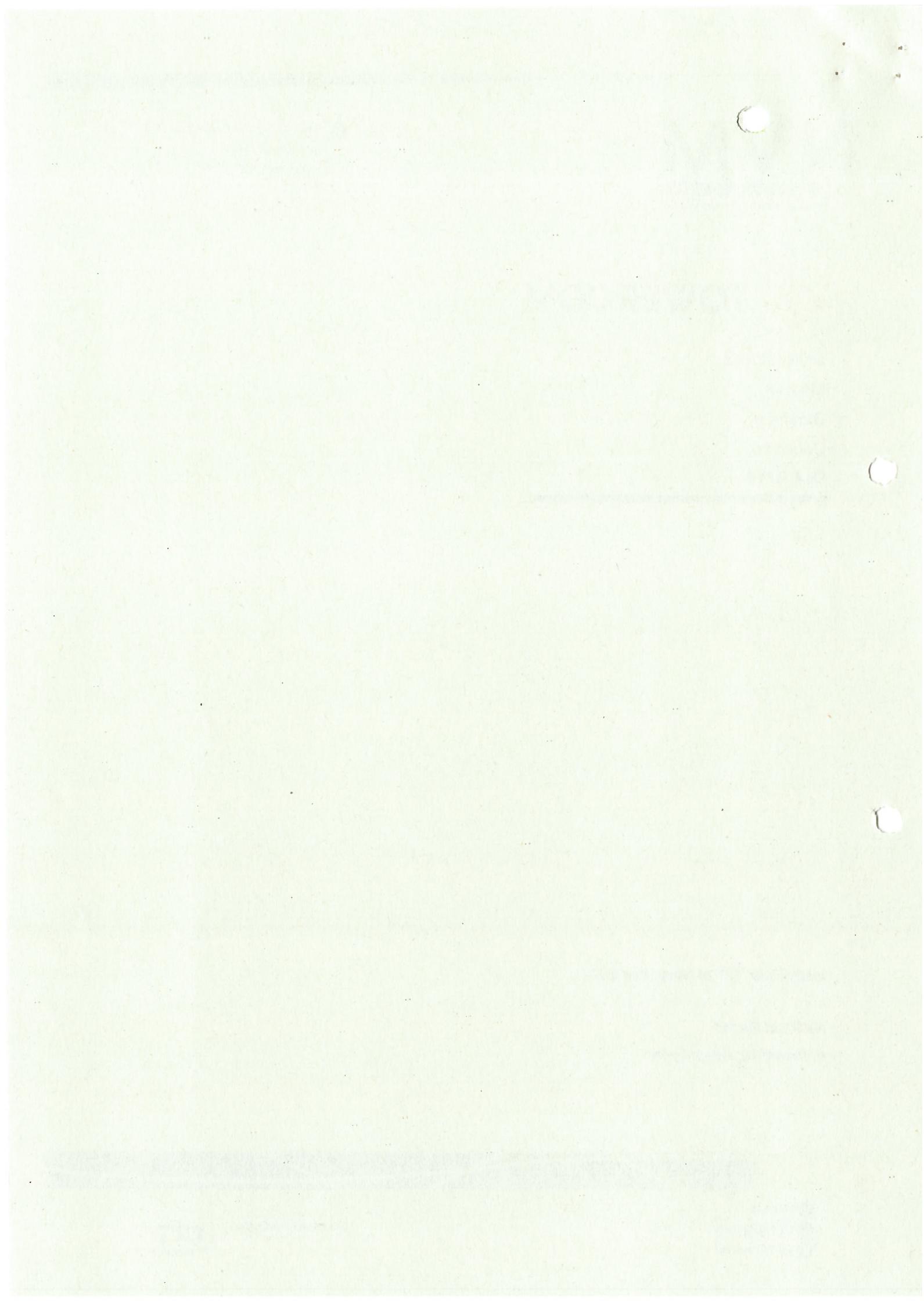


Usher House,
Main St,
Dundrum,
Dublin 14,
D14 N7Y8

Issue Date: 12th of November 2024

NVM Ltd Report

Authored by: Adam Lyons

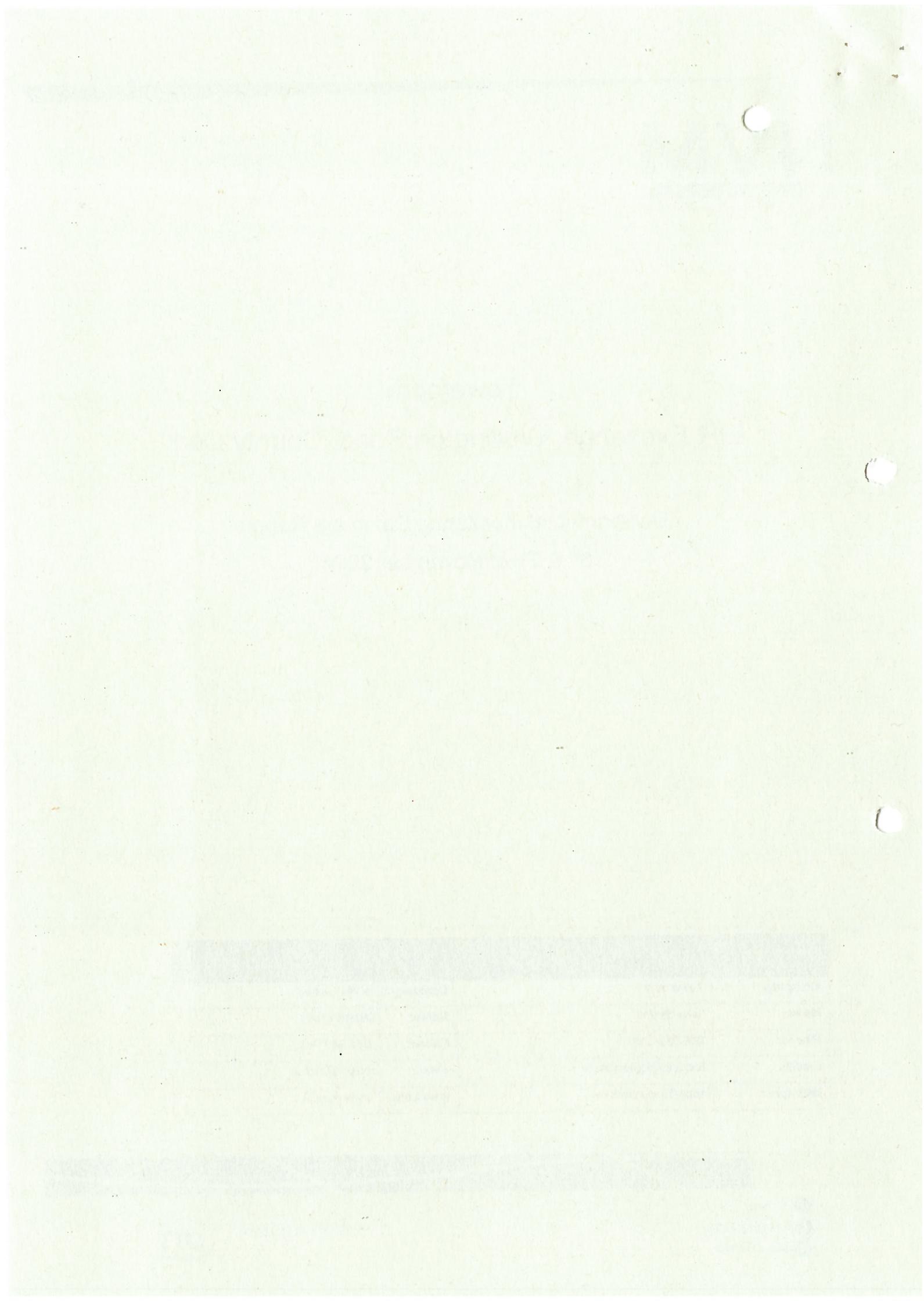


Towercom

EIR Exchange, Wellington Road, County Cork

Environmental Monitoring Summary Report 6th & 7th of November 2024

<i>Prepared For:</i>		<i>Prepared By:</i>	
Company:	<i>Towercom</i>	Company:	<i>NVM Limited</i>
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Executive Summary

NVM limited were tasked by Towercom Contracts with the installation and setup of unattended environmental noise and vibration monitoring instrumentation for scheduled works at the Wellington Road Eir Exchange.

The works involved remedial works to the existing Eir exchange site and the enabling works for the installation of a modified telecom communication mast.

In line with previous projects , the monitoring instrumentation were in place during the works schedule. The following report outlines the measurement values collected during the works which were completed on the 6th and 7th of November 2024 at Wellington Road, Cork.

The findings show recorded hourly LAeq noise levels measurements to be in the range of 52dB to 78dB.

With the exemption of the setup trial test limits during the installation the recorded vibration levels during the works were below 0.4 mm/s PPV.

The monitoring devices were removed by the Towercom personnel at the end of the monitoring period.

Report Check	Authored by	Reviewed by
	Adam Lyons	
Signed	<i>Adam Lyons</i>	
Date	12/11/2024	

Disclaimer:

This report has been prepared for the exclusive use of our client and unless otherwise agreed in writing by NVM Limited, no other party may use, make use of it, or rely on the contents of this report. This report has been compiled using the resources agreed with the client and in accordance with the scope of work agreed with the client. This is a technical report and may require sign off or review from the engineering consultants employed for this project. Certain aspects of the monitoring may vary or change during the project term due to certain issues outside of NVM Limited control ex: site conditions, extreme weather etc. NVM accepts no responsibility for any documents or information supplied by NVM or others and no legal liability arising from the use by others of opinions or data contained in this report. It is expressly stated that no independent verification of any documents or information supplied by others has been made. NVM Limited has used reasonable skill, care and diligence in compiling this report. No part of this report may be copied or reproduced, by any means, without prior written consent of NVM.

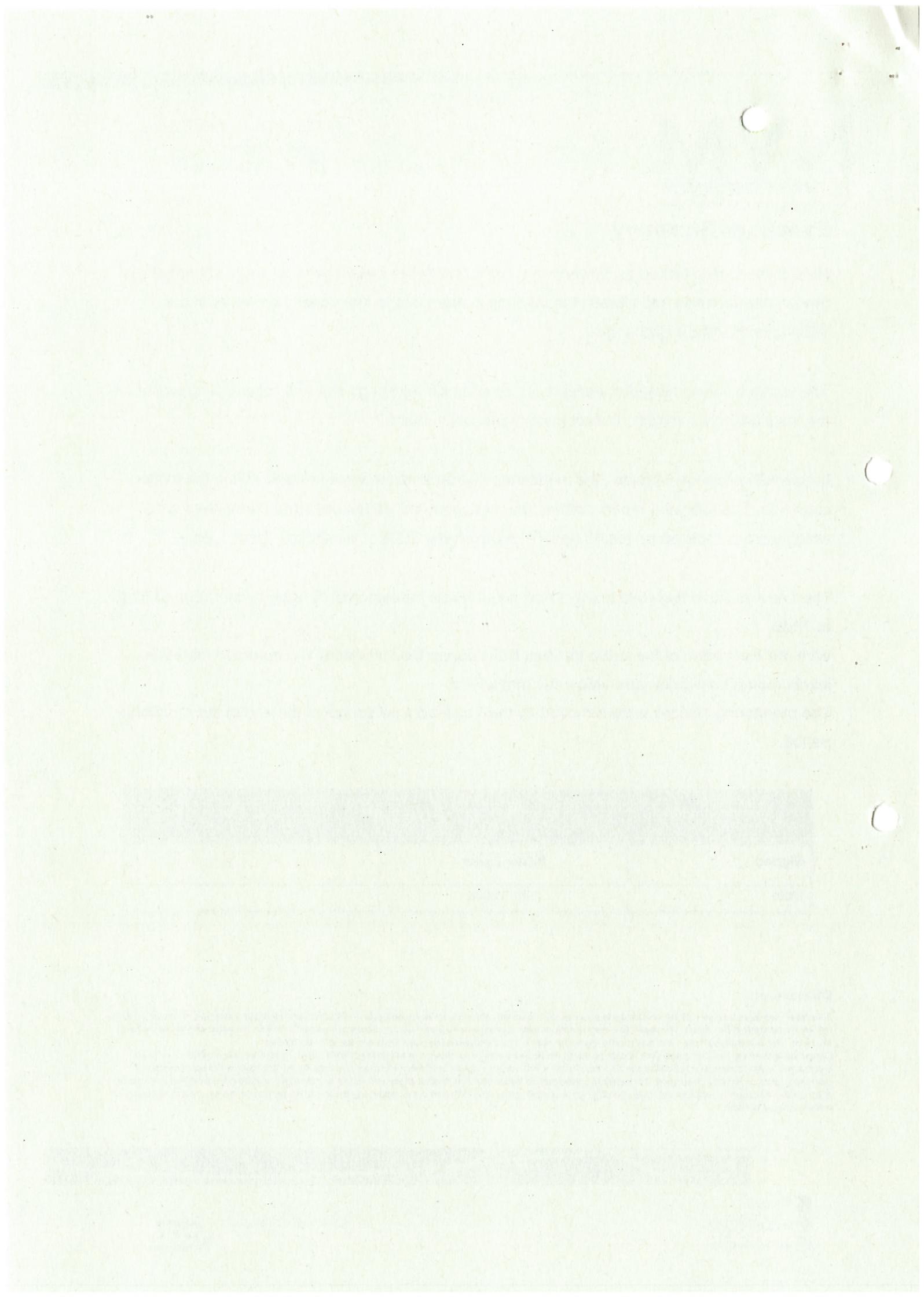


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1. Introduction

At the request of Towercom, NVM were requested to setup and install monitoring devices for the continuous measurement of environmental noise and vibration levels associated with their enabling works project at EIR Exchange, Wellington Road, Cork.

The project includes all associated enabling works for the installation of new communication mast at the EIR Exchange building on Wellington Road, County Cork.

The project is part of a larger nationwide scheme which is upgrading exchange buildings and communication masts for the EIR group.

2. Standards and Limits

Recommendations for standards and guidance were provided by the project consultancy group Kavanagh Mansfield & Partners Consulting Engineers.

A checklist for each site installation is provided to ensure the devices are setup to the agreed monitoring values for each site.

General terms and details of monitoring standards in relation to environmental noise and vibration monitoring include.

2.1. Environmental Noise

- BS 5228-1: 2009 +A1: 2014: Code of practice for noise and vibration control on construction and open sites – Part 1 – Noise,
- ISO 1996-1:2016 “Acoustics – Description, measurement and assessment of environmental noise Part 1: Basic Quantities and assessment Procedures”. This document defines the basic quantities to be used for the description of noise in community Environments and describes basic assessment procedures.

Glossary.

Explanation on abbreviations and measurement parameters used in this report:

- **LAeq** is the equivalent continuous sound level. It is an averaging mechanism used to describe and compare fluctuating noise in terms of a single noise level over the sample period.

The "**A**" suffix denotes the fact that the sound levels have been "**A-weighted**" in order to account for the non-linear nature of human hearing.

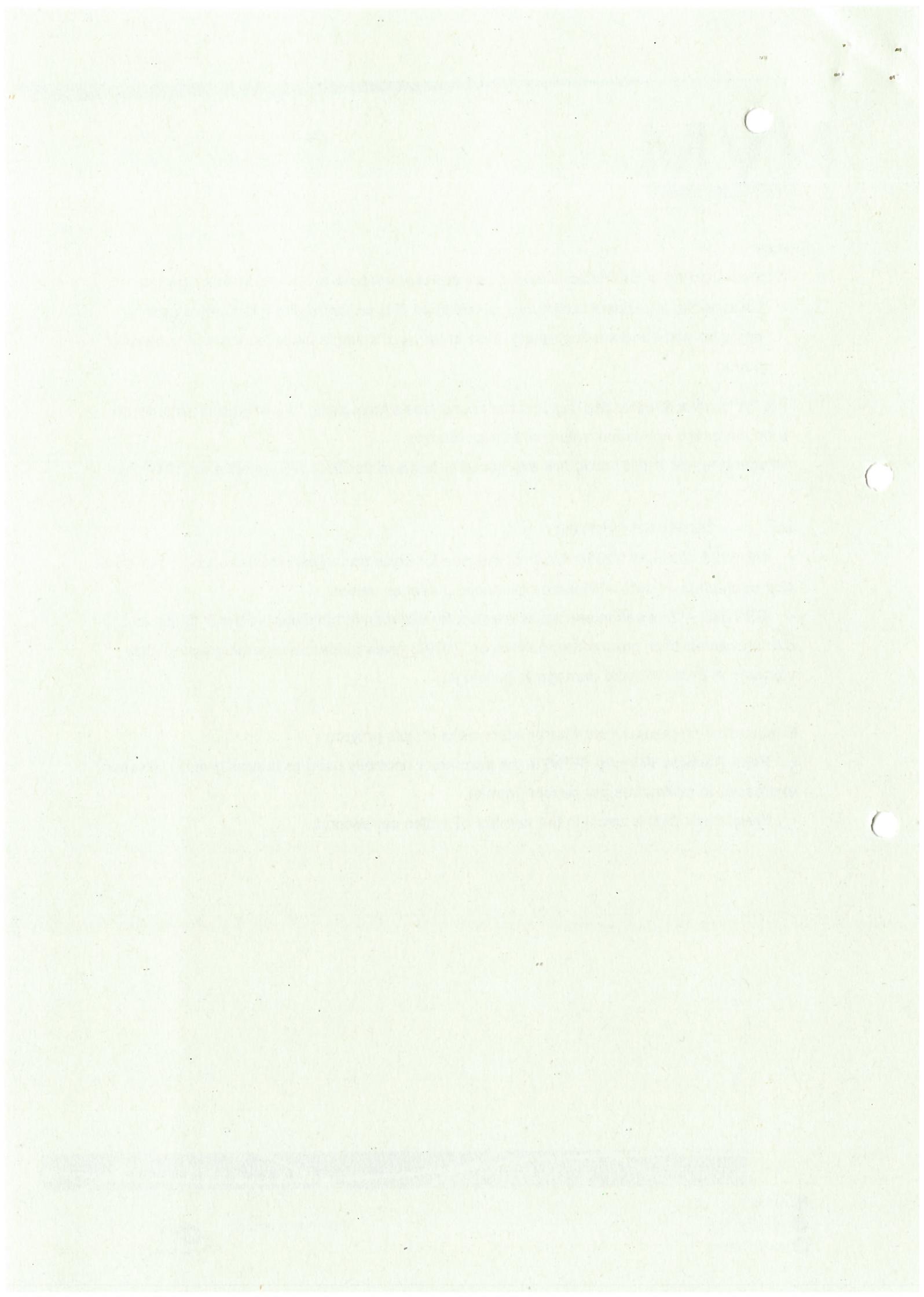
All sound levels in this report are expressed in terms of decibels (dB) relative to 2×10^{-5} Pa.

2.2. Structural Vibration

- BS 5228: 2009 +A1 2014: Code of practice for noise and vibration control on construction and open sites – Part 2 – Vibration produces guidance values.
- BS 7385 – "Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground-borne vibration" (1993) gives guidance regarding acceptable vibration in order to avoid damage to buildings.

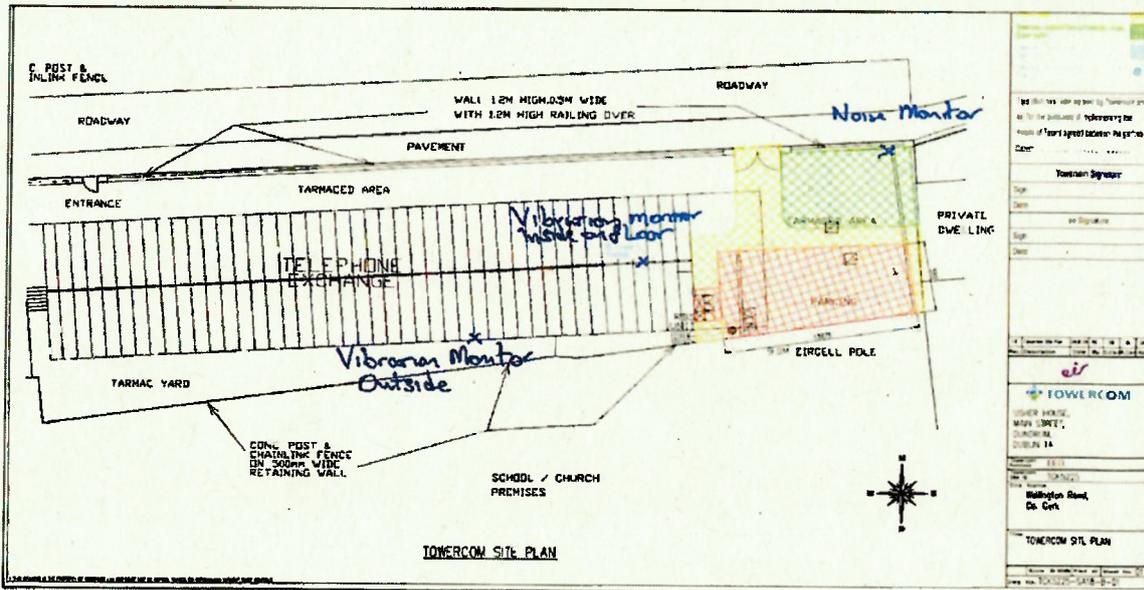
Explanation on measurement parameters used on this project:

- **Peak Particle Velocity (PPV)** is the parameter normally used to assess ground vibration expressed in millimetres per second (mm/s).
- **Frequency (Hz)** is equal to the number of cycles per second.



3. Monitoring Locations and Instrumentation

A site map and details of monitoring locations and instrumentation are included in Appendix 1 of this report. The below image is an overview of the site location and the general position of the instrumentation.



3.1 Monitoring Results Summary

3.2. Environmental Noise

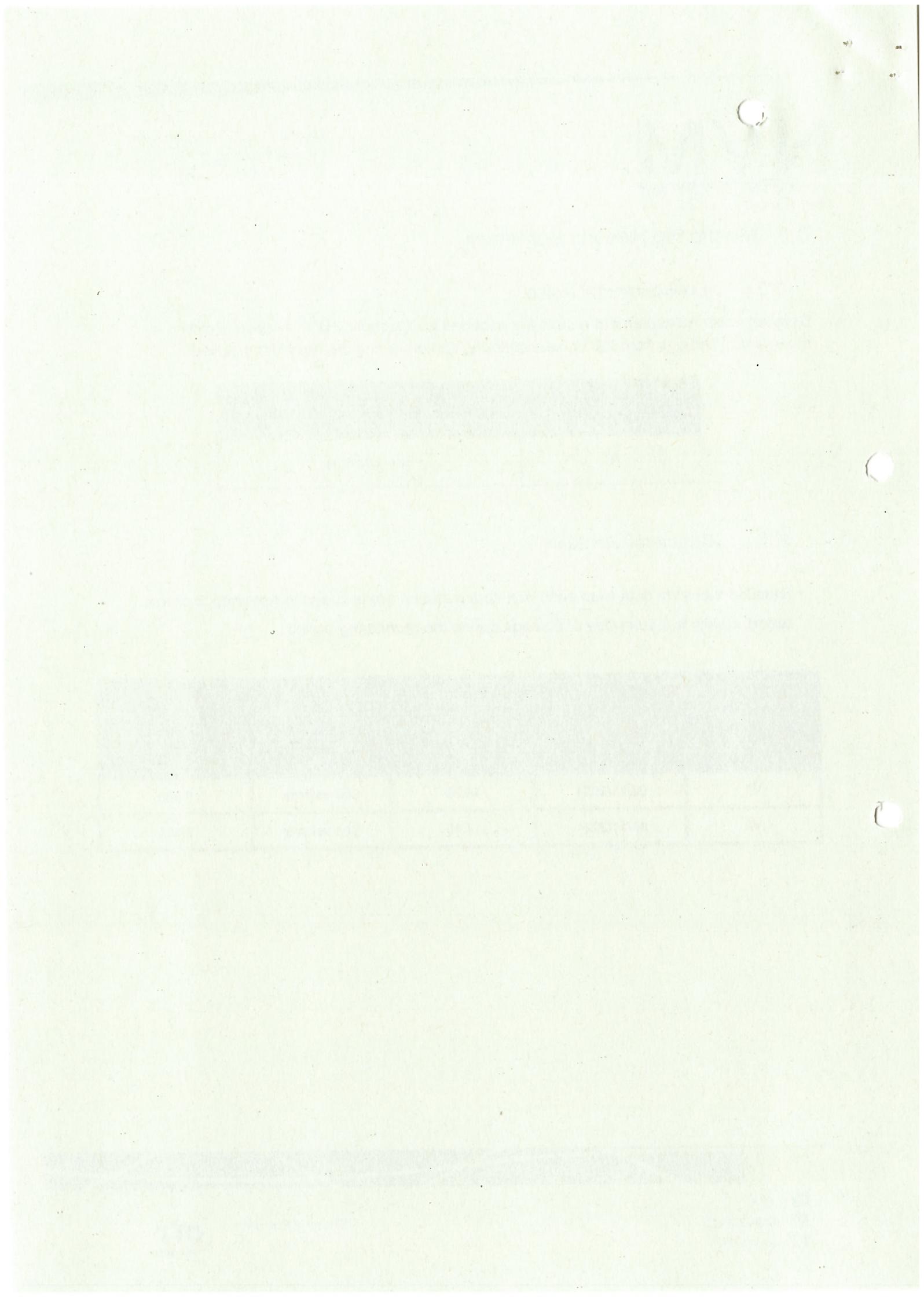
Detailed noise measurement results are included in Appendix 2 of this report. Below is a summary of findings from the noise monitoring station during the monitoring period.

Location	Measured Noise Levels (dB re. 2x10 ⁻⁵ Pa) Hourly Ave LAeq Range (dB)
N1	52 – 78 dB(A)

3.3. Structural Vibration

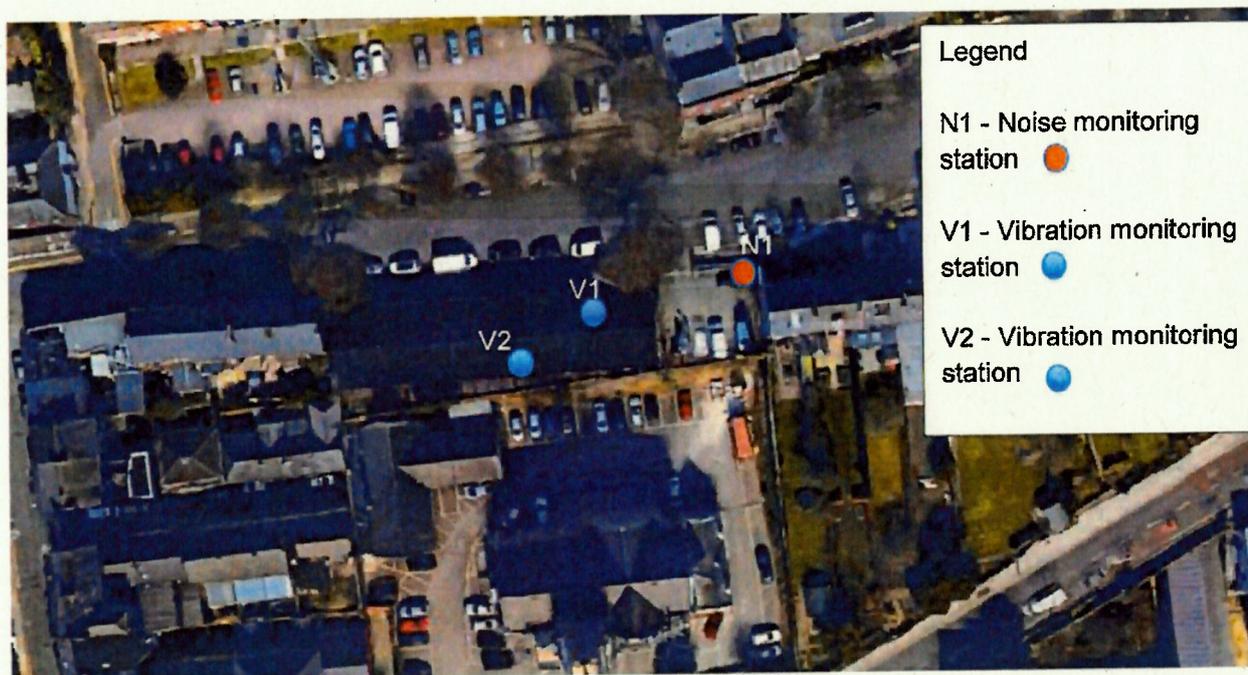
Detailed Vibration data from each monitoring station are included in Appendix 3 of this report. Below is a summary of findings during the monitoring period.

PPV mm/s - Daily Vibration Levels (Outside of Daily Notification Test events)				
Location	Date	Time	Channel	Velocity (mm/s) PPV
V1	06/11/2024	14:30	Ch2 velocity	0.368
V2	06/11/2024	14:45	Ch3 velocity	0.320



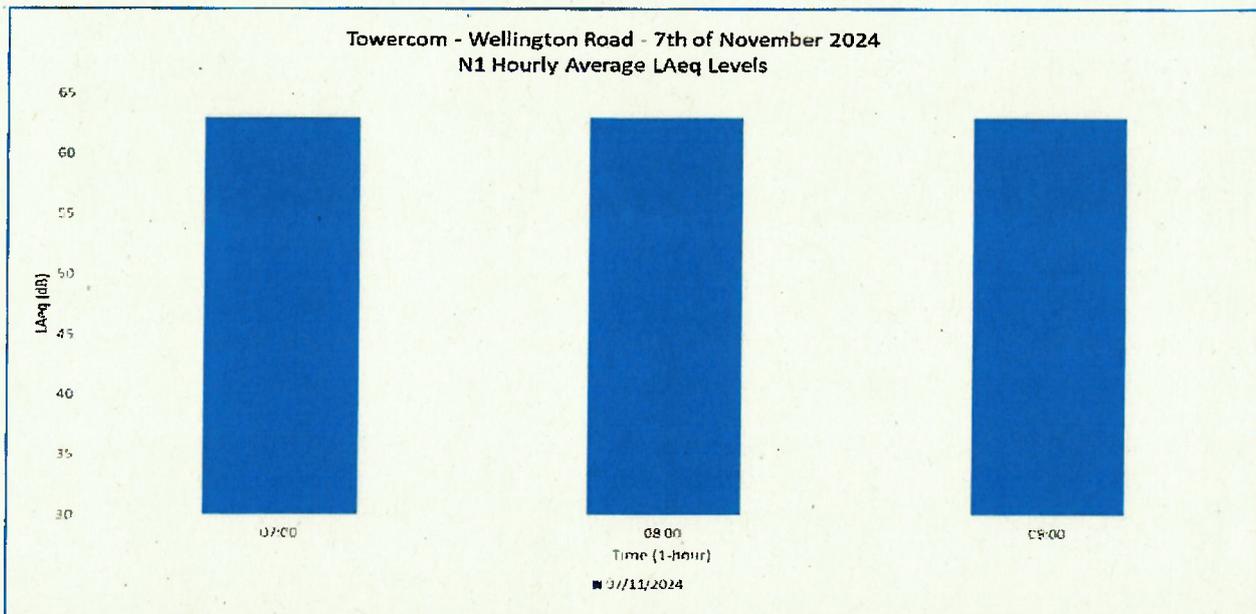
Appendix 1 Monitoring Locations

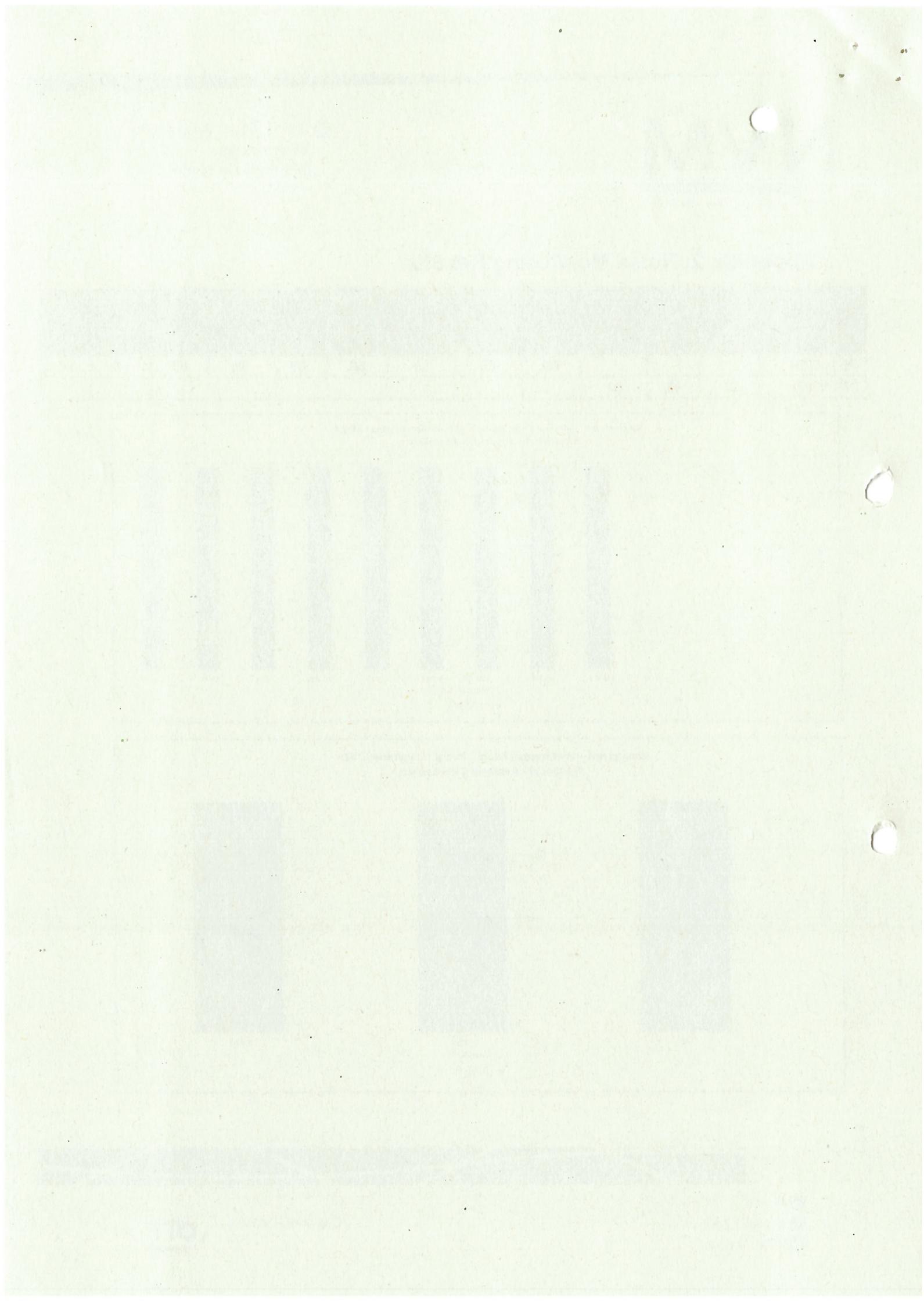
Location Details		Instrument Details		
Location Ref	Location Description	Model	Serial No.	Date Installed
N1	Boundary of Private Dwelling	EM2030	00592	6 th of Nov. 2024
V1	Internal of EIR Exchange	AVA Trace M80	12100	
V2	External of EIR Exchange		12516	



Appendix 2: Noise Monitoring Results

N1 – EIR Exchange, Wellington Road, Cork												
Hourly Average LAeq Levels dB (A)												
Date	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
06/11/2024				68	68	68	68	68	68	68	68	68
07/11/2024	63	63	63									

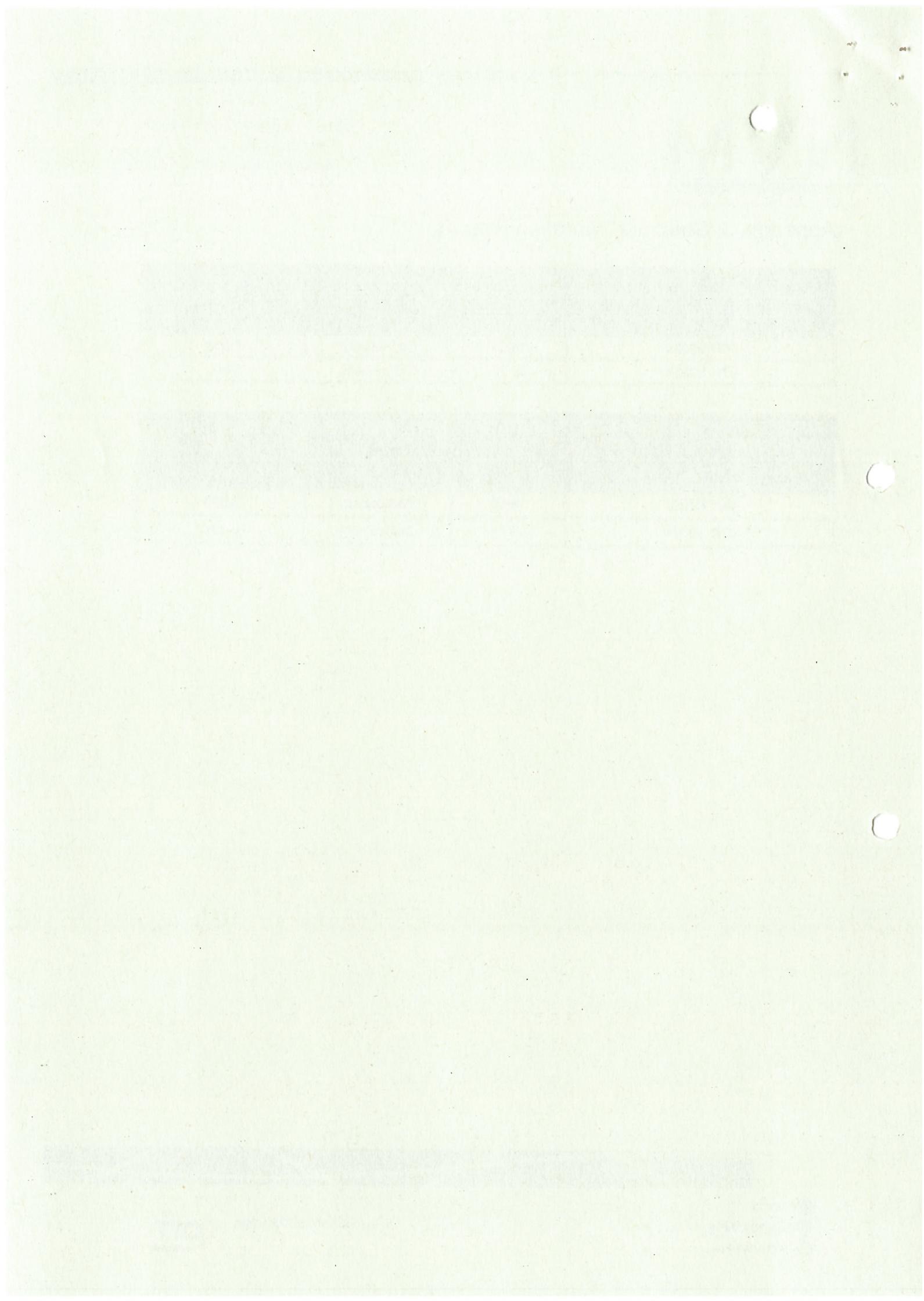




Appendix 3: Structural Vibration Results

EIR Exchange, Wellinton Road, Cork - Daily Maximum Vibration Levels			
Date	V1		
	Time	Channel	Velocity PPV (mm/s)
06/11/2024	14:30	Ch2 velocity	0.368
07/11/2024	09:24	Ch2 velocity	0.360

EIR Exchange, Wellinton Road, Cork - Daily Maximum Vibration Levels			
Date	V2		
	Time	Channel	Velocity PPV (mm/s)
06/11/2024	14:45	Ch3 velocity	0.320
07/11/2024	00:15	Ch2 velocity	0.304

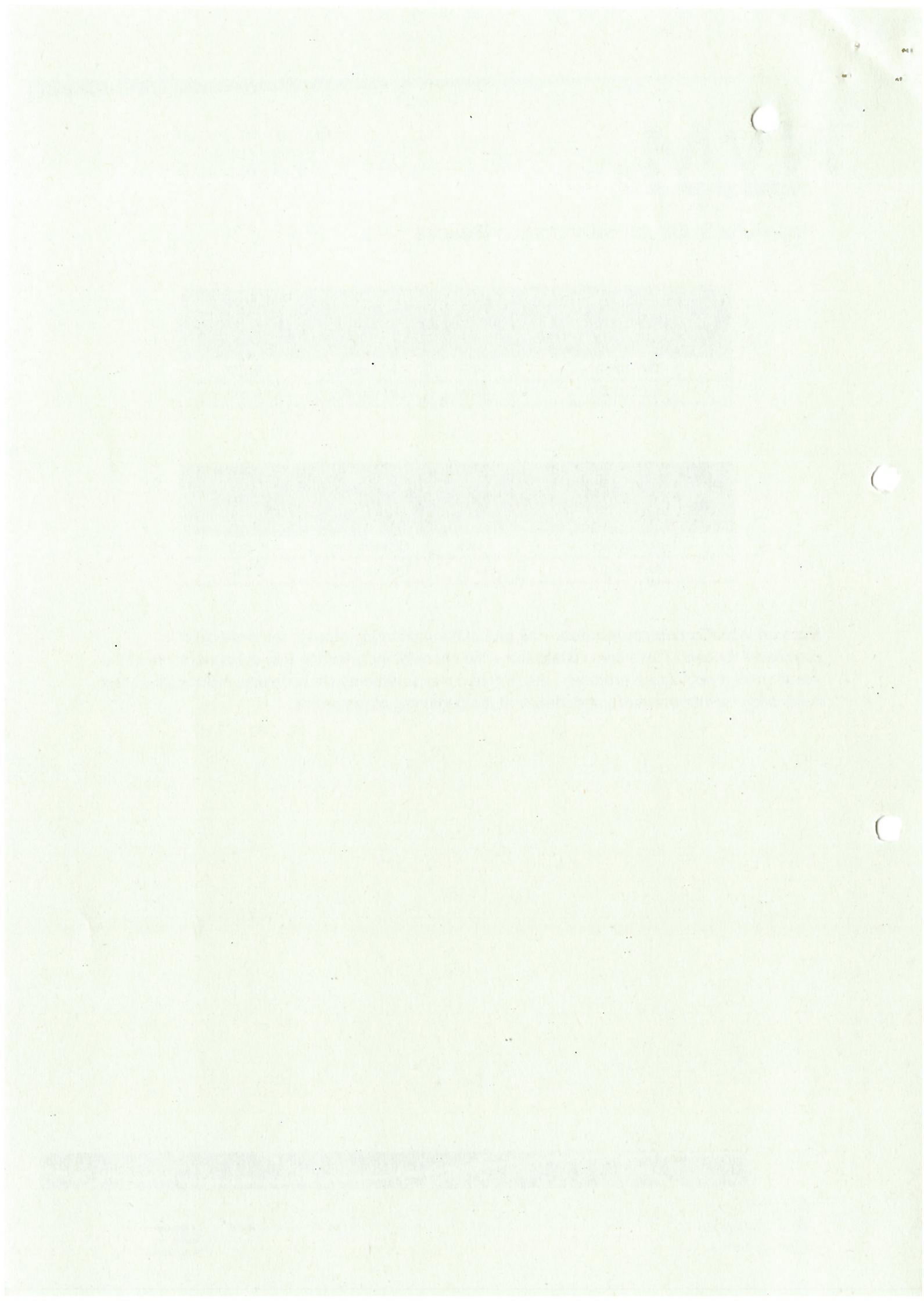


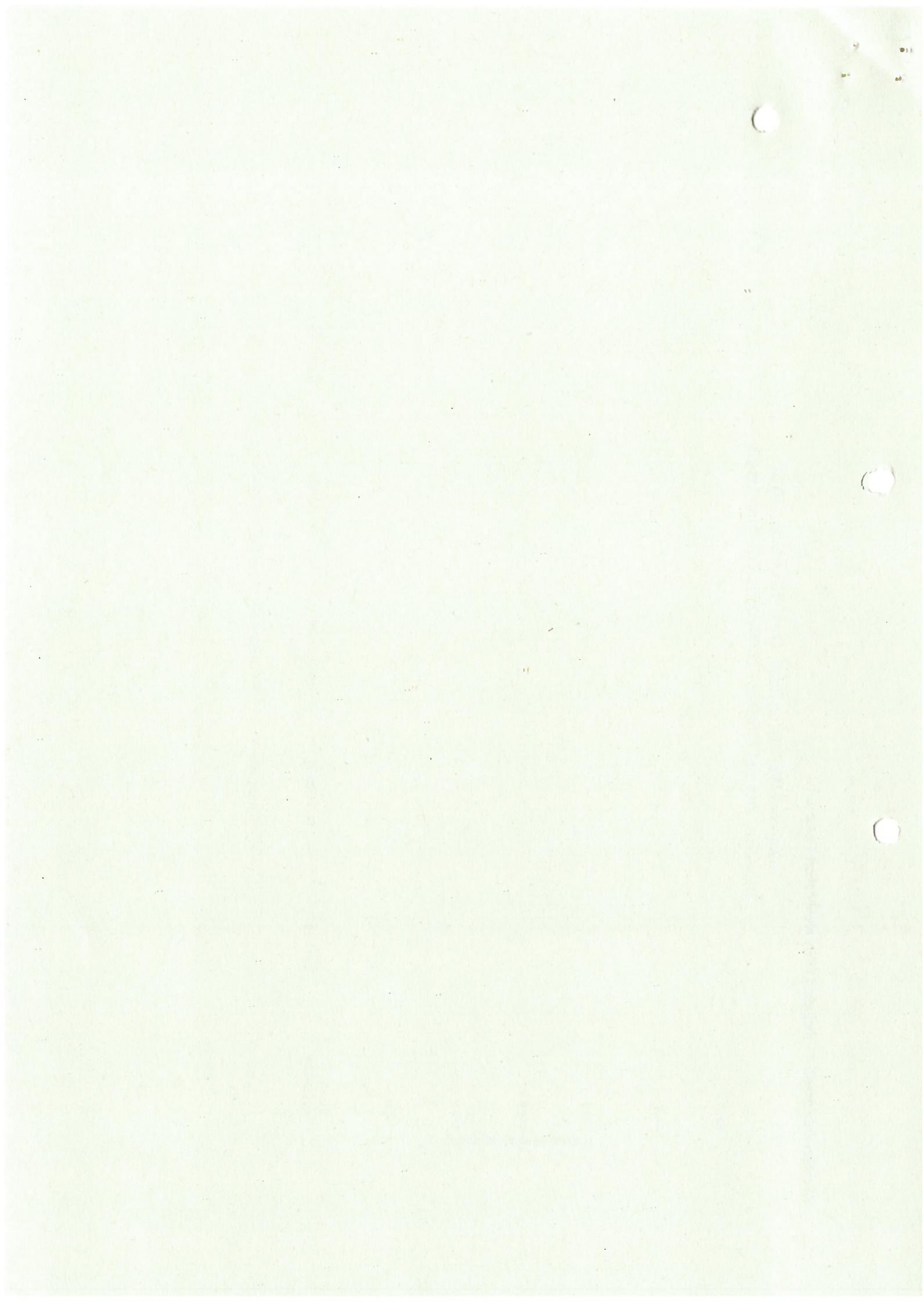
Appendix 3: Structural Vibration Results

EIR Exchange, Wellington Road, Cork - Daily Maximum Vibration Levels			
Date	V1		
	Time	Channel	Velocity (mm/s)
06/11/2024	14:30	Ch2 velocity	0.368
07/11/2024	09:24	Ch2 velocity	0.360

EIR Exchange, Wellington Road, Cork - Daily Maximum Vibration Levels			
Date	V2		
	Time	Channel	Velocity (mm/s)
06/11/2024	14:45	Ch3 velocity	0.320
07/11/2024	00:15	Ch2 velocity	0.304

Note on vibration measurements – as part of the monitoring procedures a checklist is completed for each Towercom installation – the checklist includes the test measurements of the vibration alert notification protocol – the graphed measurements shown below include these test notification events which are undertaken at the beginning of the project.

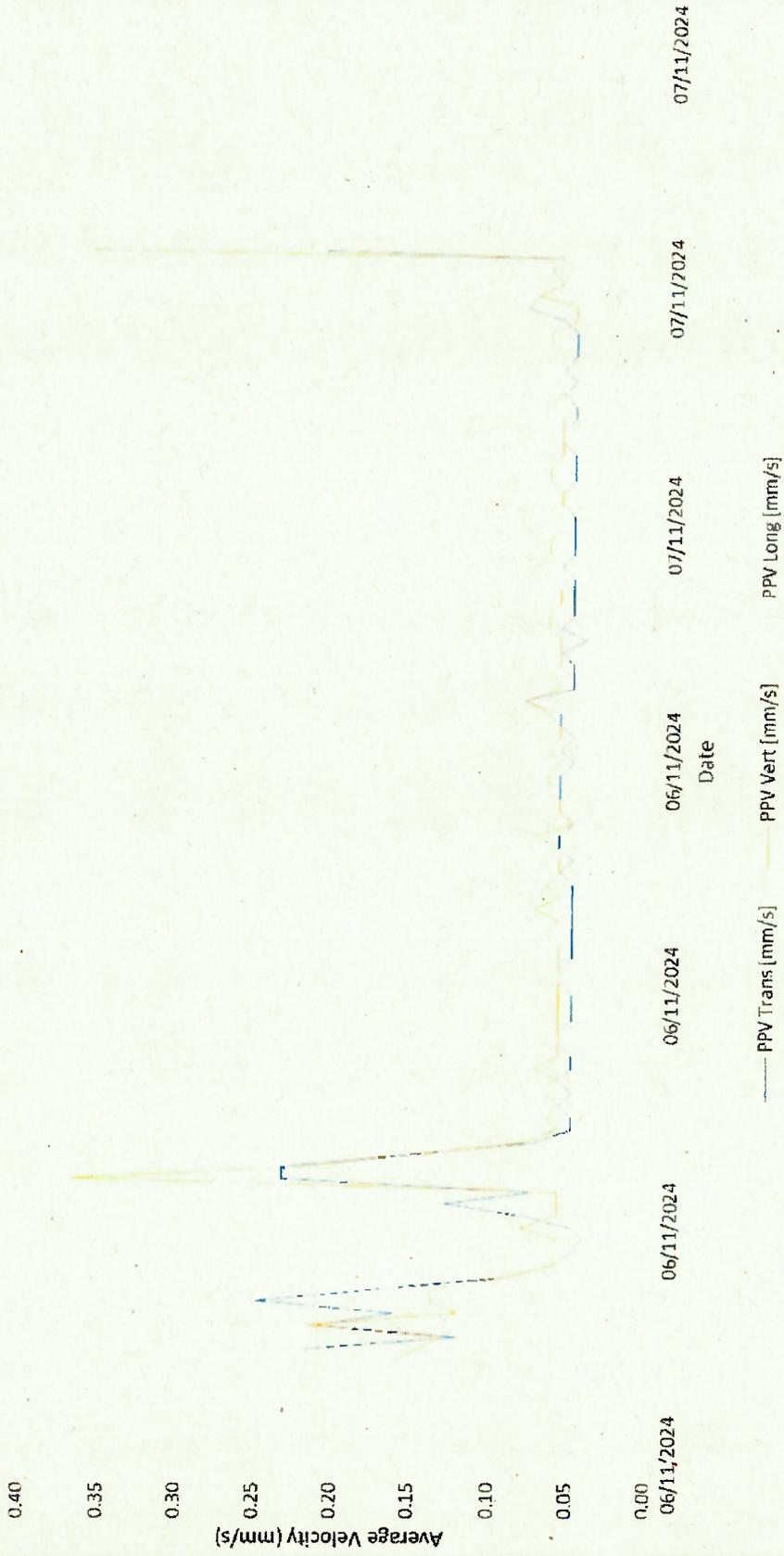


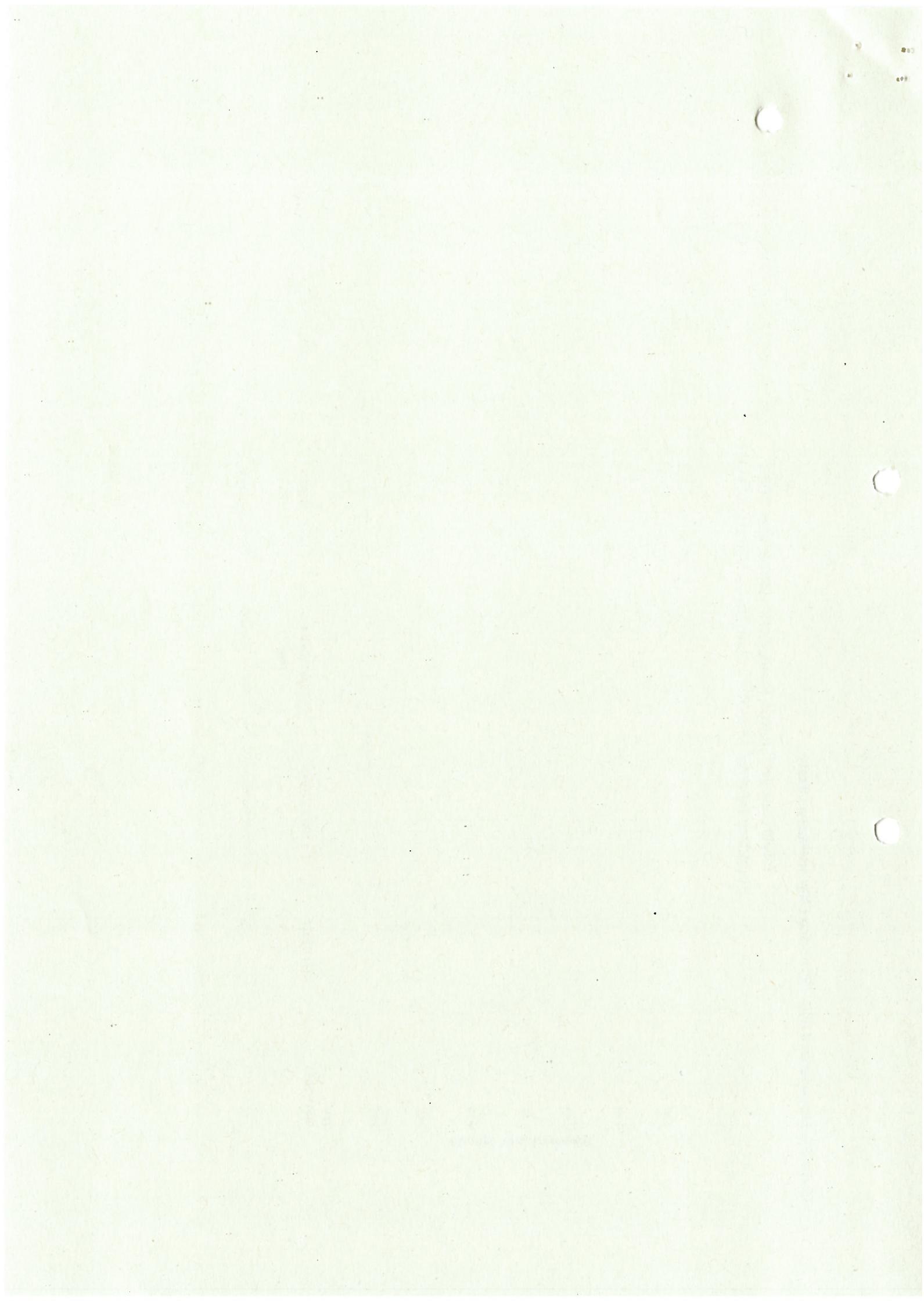


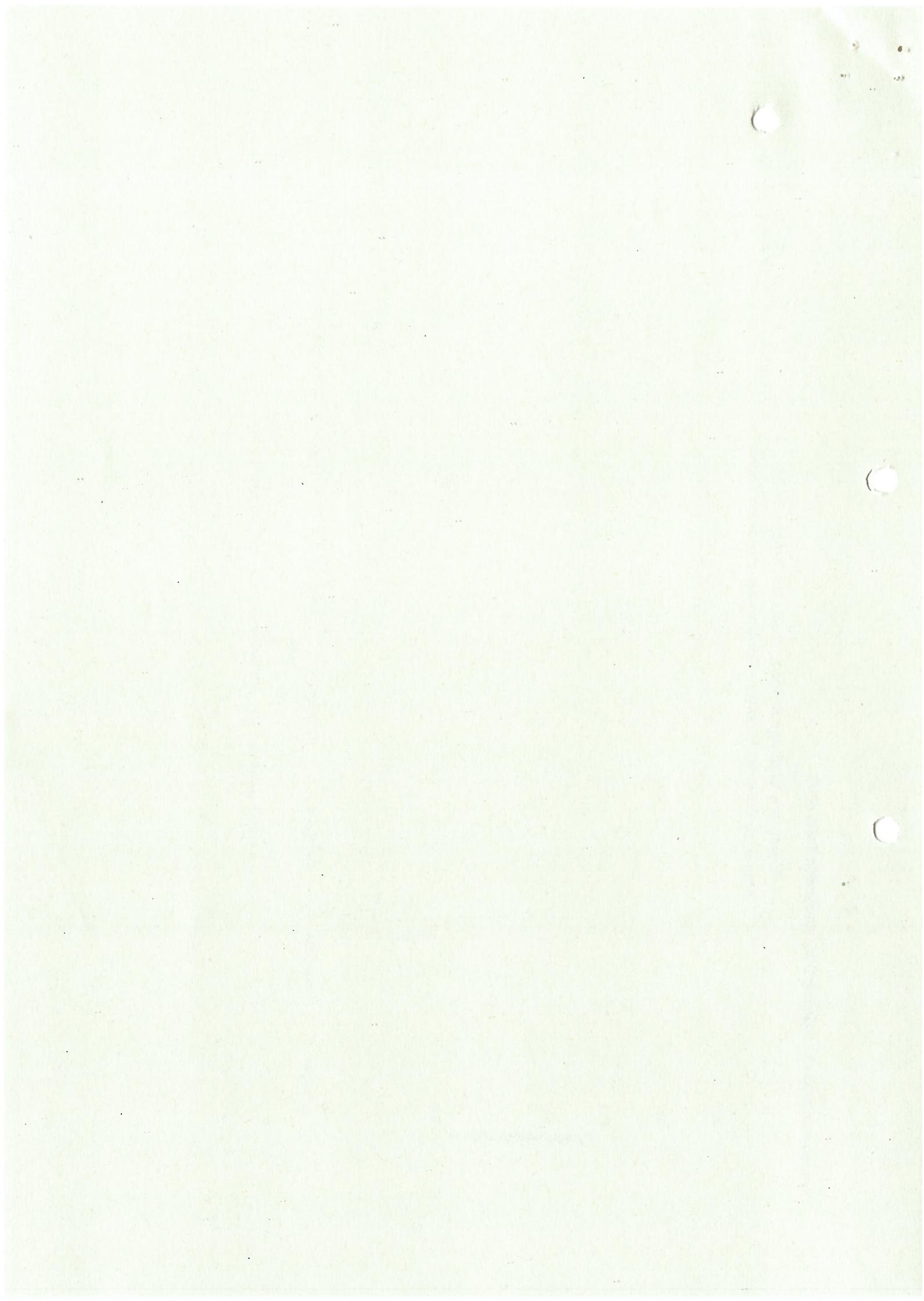
Graph 2 - Measurement data - Excluding Daily Notification Tests

Towercom Wellington Road, Cork - November 2024
Boundary Internal Monitor - Continuous Vibration Levels

V1



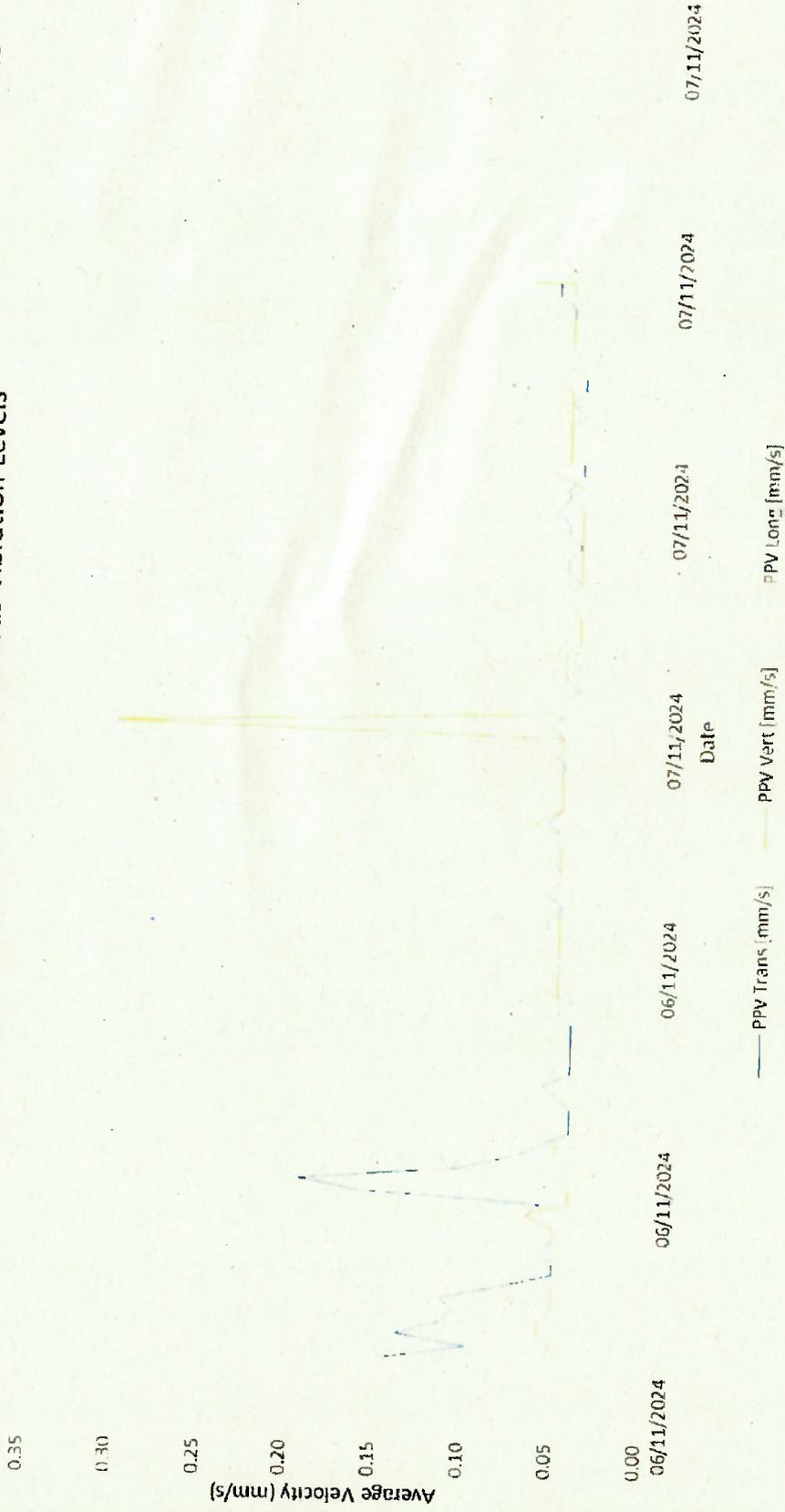




Graph 4 - Measurement data - Excluding Daily Notification Tests

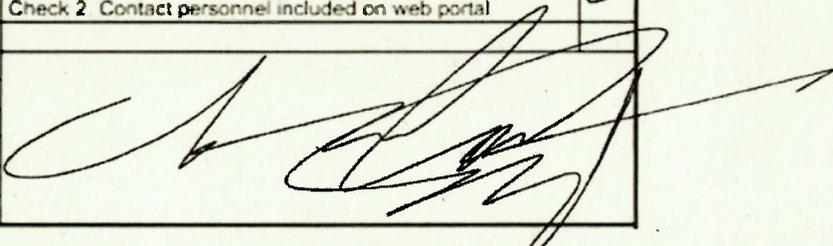
Towercom Wellington Road, Cork - November 2024
Boundary External Monitor - Continuous Vibration Levels

V2





Appendix 4: Towercom Check List

 TOWERCOM	To be completed and provided for all Towercom installations
TOWERCOM CHECKLIST	
Monitoring Location:	Wellington Road, Cork
Name:	Charlie Smyth
Devices:	AvaTrace M80 & EM2030
Serial no:	00592, 12100 & 12516
Actions:	<i>Please tick when completed</i>
	Report to be provided in excel -graphical and tabular data set
	Web portal completed
	Monitors labelled clearly (internal / external)
	Access provided to designated personnel
	Photos taken of site setup
	Ensure limits set on devices
	Battery check on devices
	Test text sent
	Check 2 Contact personnel included on web portal
Signed	
NVM Representative	

Contacts to be included on web portal every time they are setup.

Tom Sexton
Niall Clarko
Tommy Galligan
Pearse Daly
Pat Gallagher

NOTE: ALL PERSONNEL

Please ensure that the devices are turned off prior to being removed from site given the text alert setting on each device.

