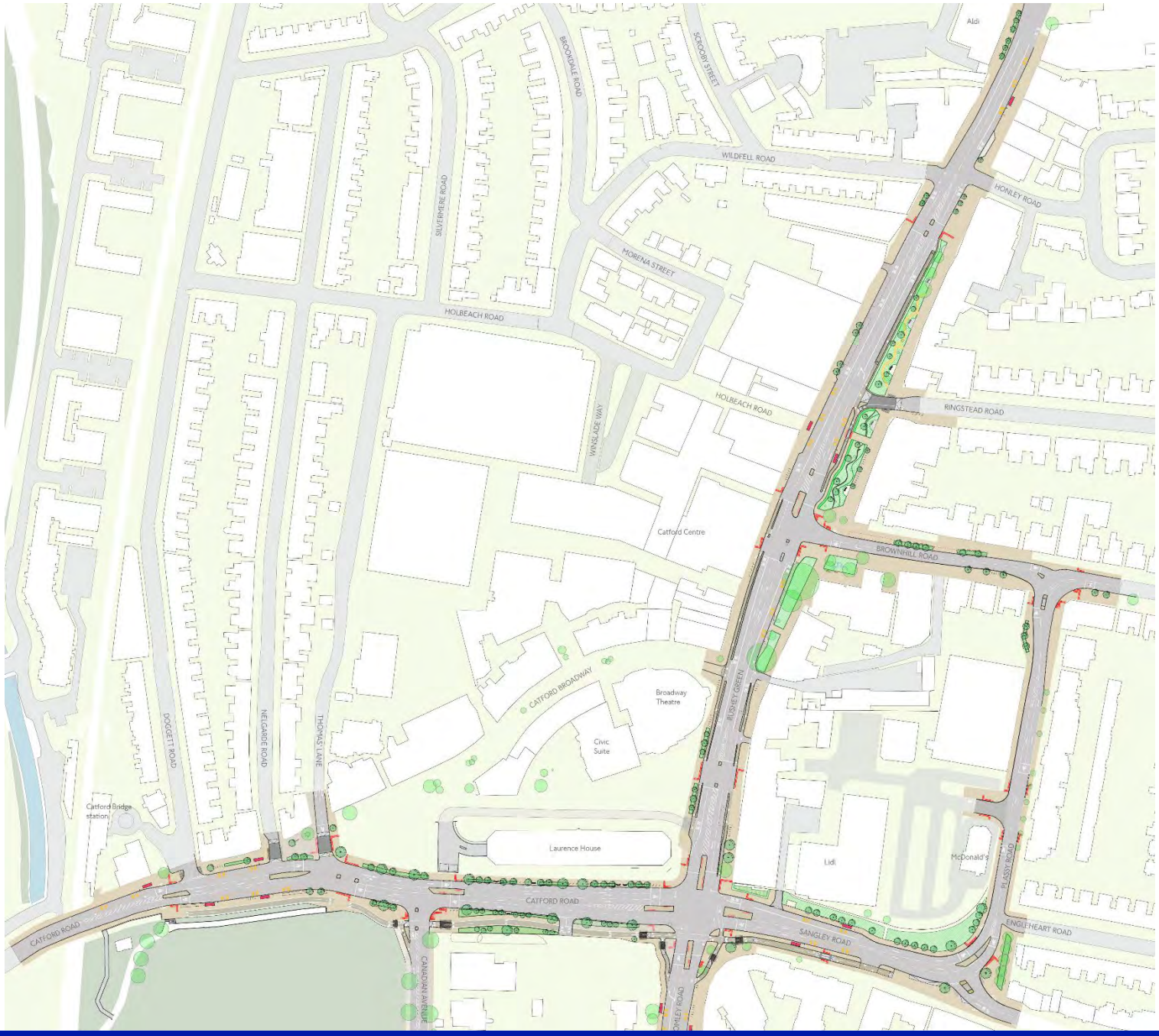

Town and Country Planning Act 1990

Catford Town Centre Highway Realignment

Drainage and SUDs Strategy

December 2023

MAYOR OF LONDON

TRANSPORT FOR LONDON

EVERY JOURNEY MATTERS

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Transport for London

Programme: Healthy Streets

Project: Catford Town Centre Highway Realignment

Drainage and SuDS Strategy

		Signature	Date
Prepared by	I confirm that professional skill and care has been used in the preparation of this deliverable and it meets the project requirements. I also confirm that this deliverable has been checked for accuracy and compliance by competent person(s) employing check process(es) commensurate with the level(s) of risk inherent to the assets and works. [redacted] Pumps and Drainage Engineer		
Checked by	[redacted] Senior Drainage Engineer		
Approved by	I approve this deliverable as the designated technical authority for the relevant engineering discipline and am accredited to sign off Sustainable Drainage Systems (SuDS) and/or Flood Risk Management (FRM) content. [redacted] Principal Engineering Leader (Pumps & Drainage)		
Accepted by	I accept this deliverable as the person accountable for its delivery and believe to the best of my knowledge that the above entities have undertaken and fulfilled their legal obligations as required with regard to this product. [redacted] Programme Manager		

Document History

Revision	Date	Summary of changes
01	27/10/2023	First Issue
01a	27/11/23	Minor revision including topographical survey in appendices
01b	15/12/23	Minor formatting revision

Table of Contents

1 Name of design organisation

Company: Transport for London

Design team: Pumps & Drainage

Contact Name: [redacted]

Email: [redacted]

2 Introduction

This Drainage Strategy has been prepared by Transport for London (TfL), in support of a planning application to the London Borough of Lewisham (LB Lewisham) for conversion of the A205 South Circular one-way gyratory system to two-way working within the Catford Town Centre and associated works.

The proposal involves realignment of the A205 approach to the town centre from the west to a new more southerly alignment, comprehensive highway and public realm improvements and replacement access to the St Dunstan's College Jubilee Ground sports fields.

The project will enable the LB Lewisham's vision for a green, accessible, vibrant town centre by making provision for the creation of new public spaces along the existing alignment of Catford Road east of Thomas Lane

2.1 Proposal

The main objective of the proposed scheme is the conversion of the gyratory into a bidirectional highway system. The extents of the scheme, shown in **Error! Reference source not found.**, stretch from Rushey Green's junction with Rosenthal Road in the north, to the existing gyratory which is comprised of Rushey Green, Brownhill Road and Sangley Road; including from Catford Bridge station in the west, down to a new alignment of Catford Road between Canadian Avenue and Bromley Road south of the London Borough of Lewisham (LBL) council offices Lawrence House, and new access facilities to St Dunstan's playing fields from near Canadian Avenue to the south.

In addition, the proposal seeks:

- Improved cycling conditions for cyclists,
- Promote sustainable travel – through cycling, walking and public transport – and contribute to a reduction in car dependency,
- Improvements to the public realm, the movement of motorised vehicles and buses within the site area.
- Urban Greening through tree planting and Sustainable Urban Drainage Systems.

The latest scheme proposal GA drawings can be found in the Planning Application as drawings *PJ569C-RSM-PLN-07-DR-TE-03-0001* to *PJ569C-RSM-PLN-07-DR-TE-03-0006.*

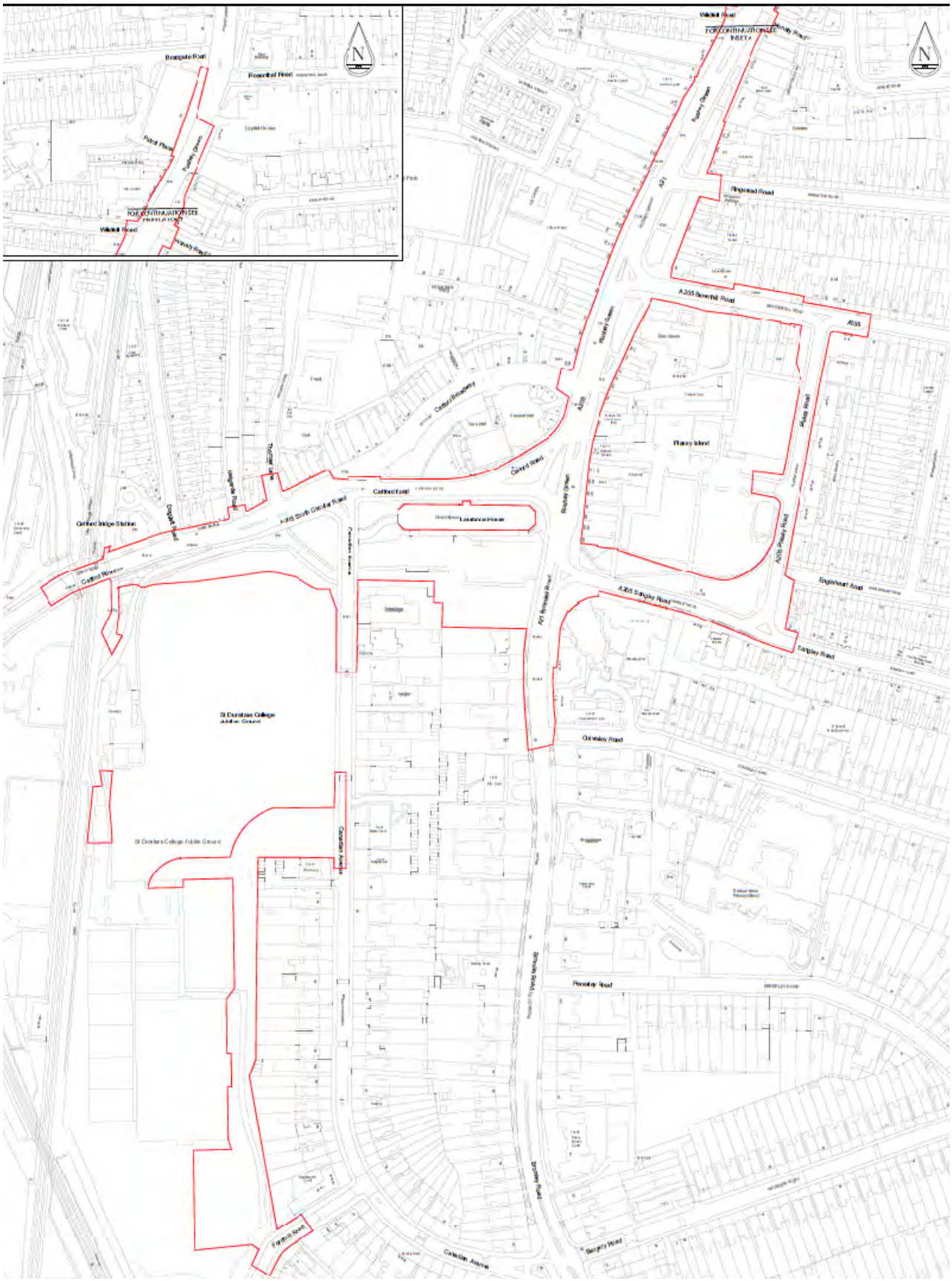


Figure 1 – Catford Town Centre Highway Realignment Scheme Extents

3 Applicant Details

The department funding or promoting the project is the Investment Delivery Planning.

Principal Sponsor: [redacted]

Address: 4th Floor, Palestra, 197 Blackfriars Road, London SE1 8NJ

Email: [redacted]

4 Description of the existing conditions

4.1 Existing drainage network and catchments

The site area is served by an existing surface water highway drainage system, but the network are not available yet, but it is likely to discharge into the Thames Water sewer network described below.

Extracts of the Thames Water sewer map were reviewed, and they consist mainly of combined sewers which discharge along Rushey Green to the north of the scheme towards Lewisham High Street. It is noted that sections of Brownhill Road, Sangley Road and Bromley Road first discharge into surface water sewers which in turn discharge into the wider network of combined sewers.

Topographical drawings of the scheme are shown in Appendix B and local site visits indicate that the scheme area along Catford Road from Catford Bridge in the west flows east towards the gyratory.

The ground profile of the existing gyratory areas of Brownhill Road, Sangley Road and Plassey Road and the scheme area within Canadian Avenue and Bromley Road appears to be approximately flat.

In areas throughout the scheme extent the TLRN highway, and TfL and LBL public realm areas form a wider combined catchment area; specifically with the new alignment of Catford Road and the handover of the existing Catford Road to LBL owned shared pedestrian area.

Information on the road drainage is not available at time of writing but it is assumed to be mostly gullies connected with 150mm dia. pipes to surface water sewers, 225mm to 400mm diameter, conveying water to the surface and combined sewers described above.

No known SuDS have been identified on site.

4.2 Existing condition of the drainage network

A drainage investigation has not been completed yet. This is due to be commissioned between November and December 2023.

No hydraulic modelling has been carried out to confirm whether the existing drainage provision is sufficient to comply with the DMRB design guidelines.

4.3 Existing geology

The below extracts are taken from the BGS website showing the superficial deposits and bedrock geology. These are used as an approximate guide for the geological conditions in the area but does not constitute an assessment by a geological discipline engineer. This will be carried out where necessary at concept design stage.

No groundwater level information or infiltration tests were made available at this stage of design.

Figures 1 and 2 show the scheme area is mostly *London Clay formation* with a discrete area of *Lambeth Group – Clay, silt, and gravel* adjacent to intersection of Bromley Road and Catford Road.

Figures 4 and 5 show the scheme area is entirely *Kempton Park Gravel Member – Sand and Gravel*

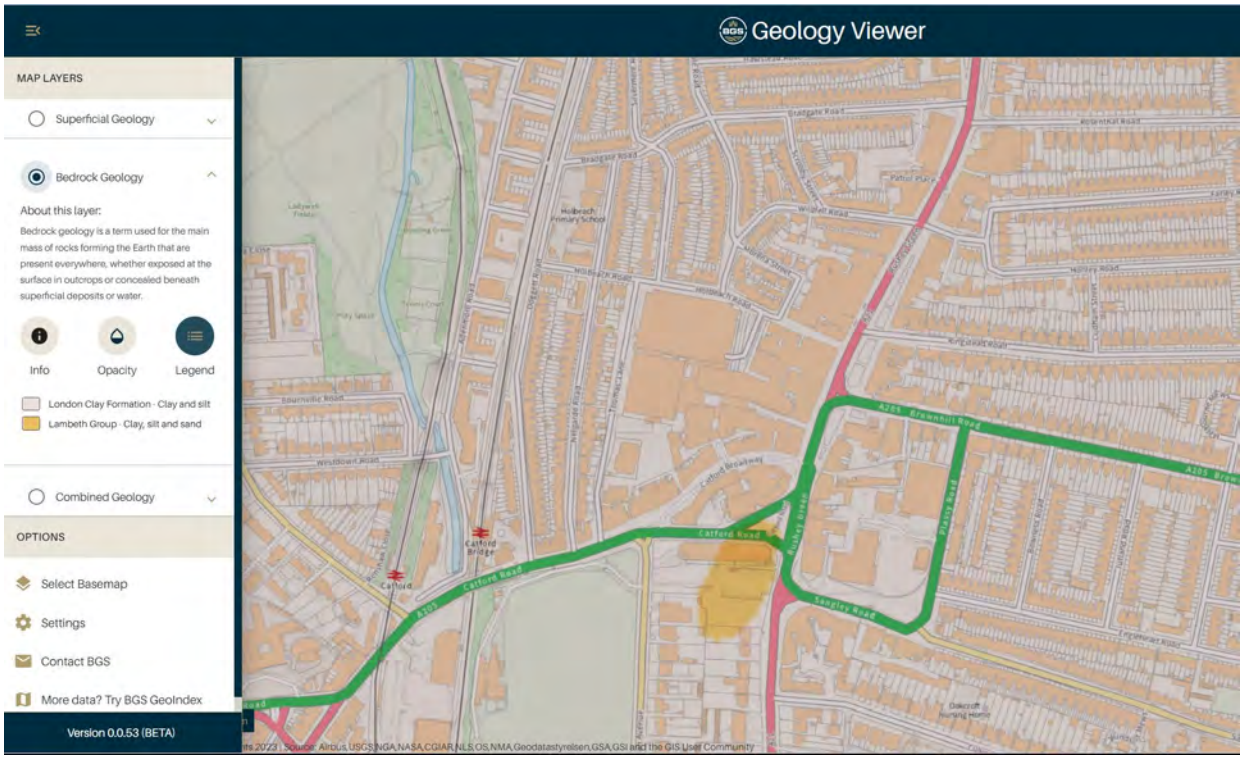


Figure 2 - BGS Bedrock Geology (1 of 2) (source: BGS website)

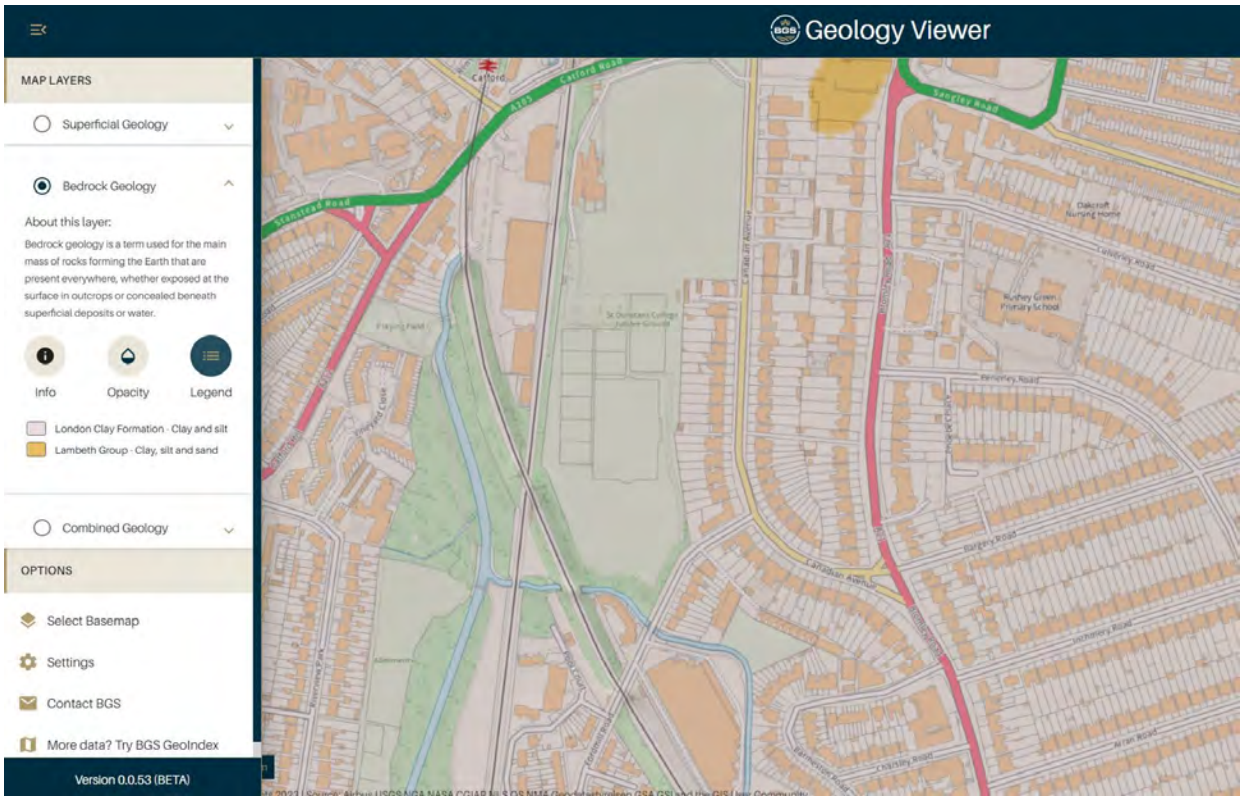


Figure 3 - BGS Bedrock Geology (2 of 2) (source: BGS website)

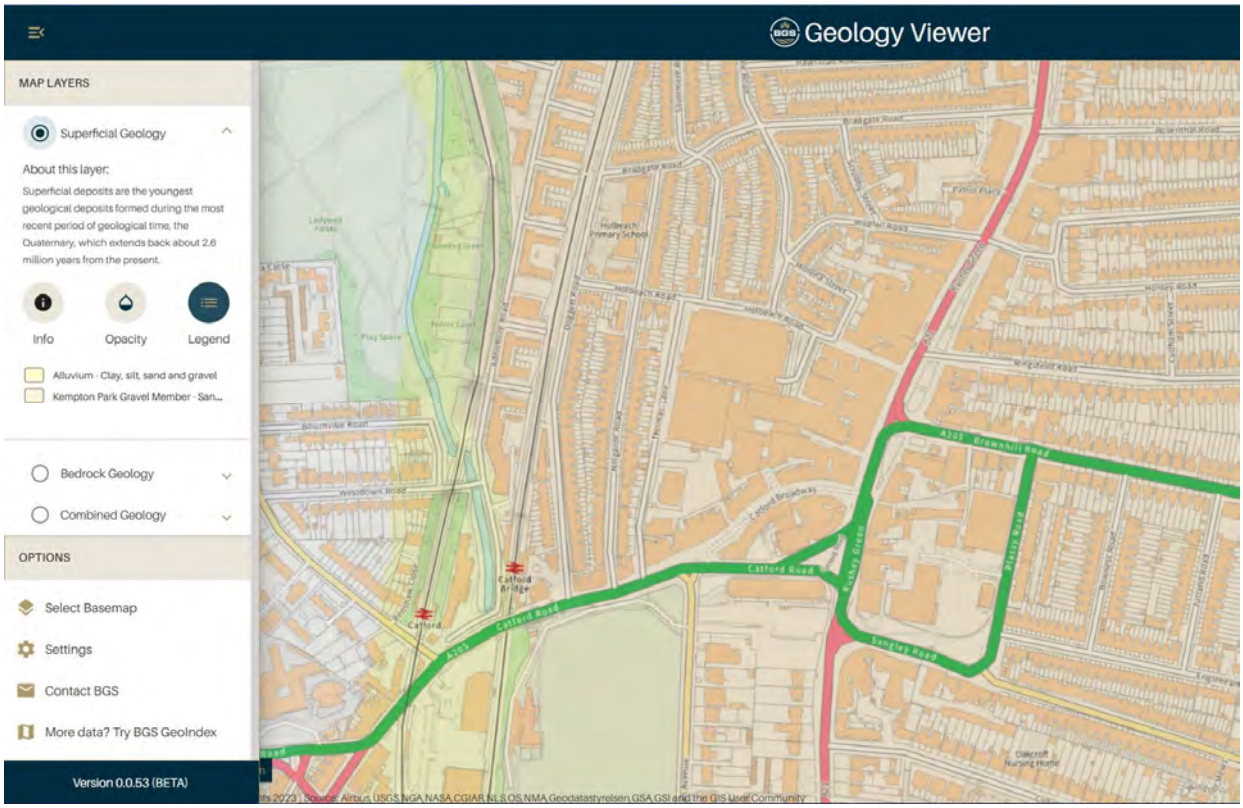


Figure 4 - BGS Superficial Geology (1 of 2) (source: BGS website)

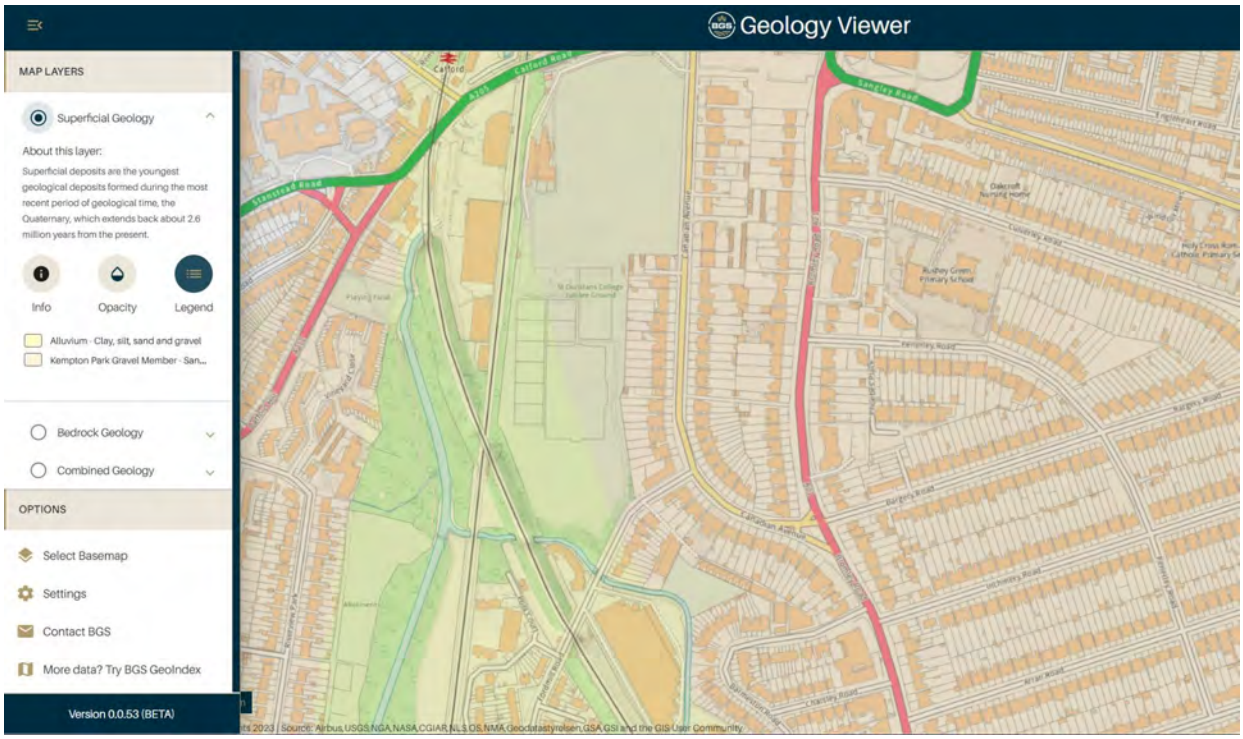


Figure 5 - BGS Superficial Geology (2 of 2) (source: BGS website)

5 Strategy & Mitigation

5.1 Strategy

The Mayor Transport Strategy requires that SuDS features are introduced in any new design. The objective of the strategy is that impermeable areas first drain into SuDS features rather than conventional drains and sewers. Drainage systems should be designed to attenuate the water runoff from impermeable areas before discharging into public sewers, while aiming for discharge flow rates to match greenfield run-off where possible.

The main objective of the proposed scheme is the conversion of the gyratory into a bidirectional highway system to improve the town centre environment for pedestrians and cyclists.

The intention of TfL is to offset the increase of impermeable surface by utilising cycle lanes as permeable surfaces and utilising their attenuation properties.

In areas where the pavement can be widened to improve the public realm or provide better physical separation between pedestrians, cyclists and vehicular traffic, opportunities for new green infrastructure (SuDS planters, raingardens, and SuDS tree pits) will be incorporated in the concept design to further offset permeable area loss.

Although no detailed modelling is available in this area, it appears that the various sewers in this area are partially at risk of surcharge and flood as seen in several locations on the surface flood risk modelling extract included in Appendix A, therefore SuDS attenuation features are to be considered high priority in order to provide betterment to the peak flows reaching the public sewers although flood risk reduction was not the primary objective on this scheme.

The concept design will:

- propose sufficiently sized rain gardens and tree pits, wherever compatible with the new layout within the scheme area;
- allow for water runoff from sufficiently sized catchments to be conveyed into the SuDS inlets; and where infiltration test results are sufficient to infiltrate into the surrounding ground (subject to checks into groundwater flooding records)
- introduce orifices to avoid the SuDS emptying too quickly and weirs to prevent the SuDS from being inundated.

Three types of SuDS will be proposed on this scheme:

- Rain gardens;
- Tree pits (in some cases combined with rain gardens)
- Shallow planted areas (similar to rain gardens but not provided with a drainage layer, they are allowed to be inundated and are drained by adjacent carriageway

To ensure the green/SuDS infrastructure proposals are feasible the buried utilities records and initial GPR have been reviewed at concept design to avoid the most obvious clashes. A more detailed assessment shall be carried out at detail design to identify services that will need to be protected as part of the new road and drainage design, and any proposed alterations communicated or agreed with the service owners.

The types of SuDS are explained in more detail here:

5.1.1 Permeable pavement

In order to provide freely draining pavements, permeable paving with interlocking tiles shall be used for the proposed build-outs and pavement where possible in line with the below considerations.

A typical system consists of interlocking tiles installed on top of a permeable bedding layer (the thickness dependent on manufacturer recommendations) which is in turn laid onto aggregate filter material of variable depths. A permeable or impermeable membrane is used to separate the aggregate from the undisturbed soil. The exact make-up of a permeable pavement will depend on many factors including structural and geological design, and the depth of existing utilities.

Permeable pavement materials should be specified to freely drain in excess of a 100-year storm event (300 mm/hr) when partially obstructed.

Other design considerations to be included in the detail design are:

- An impermeable membrane may be included at the interface between the undisturbed ground and the permeable sub-base, in particular if the highest expected water level is within 1 m of formation level, and if pollutants are present in the existing ground (refer to CIRIA Report C753 for more details);
- The permeable paved areas installed on impermeable ground will require an under-drain system;

- Slopes in excess of 5% will require additional design solutions, as described in CIRIA Report C753); typically, to avoid constructing volumes of permeable material that will not be available for attenuation, a strip of impermeable ground is left to hydraulically disconnect portions of SuDS where the difference of ground level exceeds 250mm.
- Inlets from carriageway into permeable pavement: proprietary plastic diffusers may be an acceptable solution, however perforated pipes connecting two consecutive kerb gully chambers or a kerb gully and a rodding eye may be an acceptable cost effective solution.

5.1.2 Rain gardens

Part of the SuDS implementations in this scheme shall consist of rain gardens where practicable. Rain gardens are bio-retention systems consisting of a landscaped depression that allow runoff to filter through the vegetation and underlying soil and may also pond temporarily on the surface once the soil becomes fully inundated.

A rain garden typically comprises the following features:

- **Vegetation:** it influences the performance of the system through direct uptake of pollutants and by facilitating physical and chemical processes in the soil that remove nutrients. Vegetation also prevents erosion of the surface soil layers and helps maintain the permeability of the filter medium.
- **Freeboard:** it provides potential water storage space, above the topsoil.
- **Planting medium:** this consists of a sand-based filter media, sufficiently permeable to allow water to pass through it, so that the rain garden does not become waterlogged. It also needs to contain sufficient organic material and plant nutrients to support the proposed vegetation. The recommended depth of filter medium is minimum 500mm for healthy growth of shrubs and herbaceous plants, however in small areas with constraints such as existing buried utilities, shallower topsoil of minimum 300mm depth may be acceptable.
- **Transition layer - coarse sand:** each raingarden should be provided with an intermediate layer of coarse sand between the filter medium and the drainage layer underneath.
- **Sub-base (drainage layer):** this layer collects water from the filter medium and infiltrates into the native soil underneath or allows water to reach the perforated under-drain easily.
- **Under-drain pipes and perforations:** the use of perforated pipes to drain the sub-base is essential where the native soil is impermeable and the rain garden serves a large catchment, to ensure that the rain garden can drain-down within a reasonably short time period to ensure that they do not become water-logged and have enough capacity available for the next storm event.
- **Under-drain - flow control:** The flow limitation provided for each SuDS should not depend on the number or diameter of the pipe perforations, but solely on the flow control provided at the outfall chamber, as this is where maintenance can easily be carried out without specialised equipment.
- **Under-drain pipe rodding:** All under-drain pipes shall be either provided with a dedicated rodding eye, or connect to the previous outfall chamber, where SuDS are

provided with multiple outfall locations, so that the pipes are accessible for rodding and jetting.

It should be noted that some rain garden may be crossed by existing utilities that may be shallower than the depth of the raingarden: in these instances, part of the raingarden may be built with a shallower depth, to retain the utilities in place and avoid utility diversion. However, it shall be ensured that the whole attenuation volume is slowly emptied within 24 h from the end of the storm event, either by infiltration or by an unobstructed path to the under-drain pipe.

All retention systems and each of their components should be detailed and specified in accordance with the standards, applicable design guidance and in particular with the CIRIA Report C753 (The SuDS Manual, chapter 18).

5.1.3 Tree pits

The design criteria for tree pits are similar to those of a rain garden, as they are both structures which rely on some water passing though the planting soil material, provide storage for storm water, and are provided of a form of under-drain and overflow to prevent soil being inundated for extended period of time.

For the design of tree pits the detail design shall consider the following key design criteria:

- Runoff area connected to each tree pit is suitable for the proposed trees (i.e. trees do not risk being over-watered);
- Soil volume is sufficient to support a healthy tree root growth;
- Determine where buried services clash with proposed tree pits;
- Determine the flow route for water from the catchment into the structure, and determine requirement for a dedicated under-drain and overflow system, or whether the tree pit is provided with an under-drain arrangement in common with other adjacent SuDS.
- Ensure that, where suitable, multiple tree pits are connected together to maximise the attenuation volume and allow for more tree root growth;
- Identify if there is a requirement for root protection system.

The potential for SuDS Tree Pits in this scheme are expected to be adjacent to proposed permeable paving SuDS, that will be provided with an under-drain system. Typically, a tree pit will be deeper than the permeable paving, however it is considered acceptable for the bottom part of the tree pit to be slowly drained into the underlying ground through the permeable geotextile, while the under-drain pipe should provide drainage from a depth of approximately 800mm from ground level, as illustrated in the typical detail drawings included in the concept design.

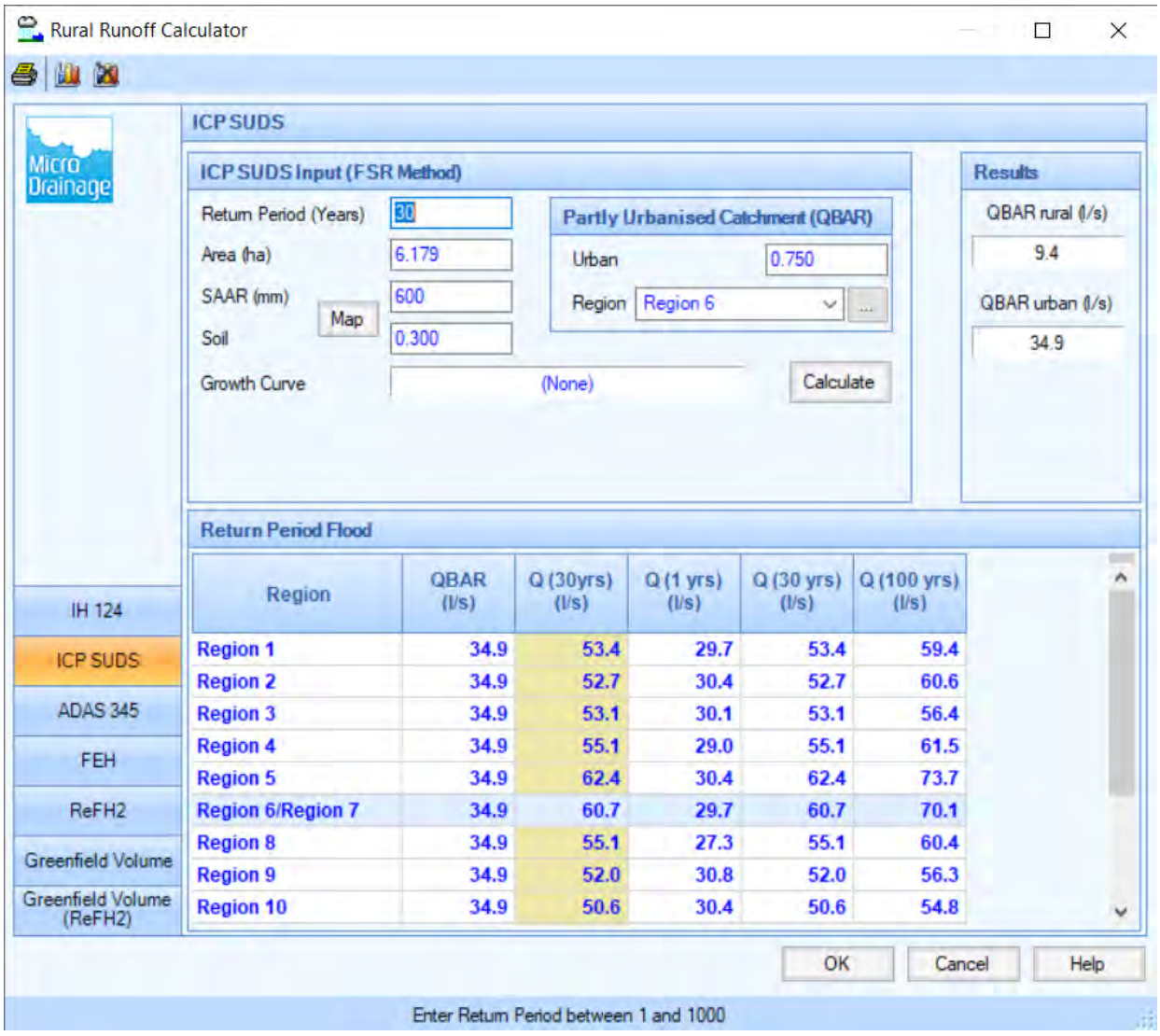
5.1.4 Inlets from carriageway into permeable pavement

Road or kerb gullies may be proposed specifically to collect water runoff from the carriageway, but at intervals determined by the detail design and distribute it into the surrounding permeable pavement using diffusers.

5.2 Climate Change Allowance

In accordance with the Environment Agency climate change allowance for peak rainfall in the London Management Catchment, a 40% allowance on rainfall shall be included within the design.

5.3 Greenfield run off rate calculation



Region	QBAR (l/s)	Q (30yrs) (l/s)	Q (1 yrs) (l/s)	Q (30 yrs) (l/s)	Q (100 yrs) (l/s)
Region 1	34.9	53.4	29.7	53.4	59.4
Region 2	34.9	52.7	30.4	52.7	60.6
Region 3	34.9	53.1	30.1	53.1	56.4
Region 4	34.9	55.1	29.0	55.1	61.5
Region 5	34.9	62.4	30.4	62.4	73.7
Region 6/Region 7	34.9	60.7	29.7	60.7	70.1
Region 8	34.9	55.1	27.3	55.1	60.4
Region 9	34.9	52.0	30.8	52.0	56.3
Region 10	34.9	50.6	30.4	50.6	54.8

Figure 6 - Greenfield Run off calculation

5.4 Lewisham SuDS proforma

1. Project & Site Details

Project / Site Name (including sub-catchment / stage / phase where appropriate)	Catford Gyratory Replacement
Address & post code	A205 between Catford Bridge, Canadian Avenue, Rushey Green South of j/w Rosenthal Road, Brownhill Road, Sangley Road
OS Grid ref. (Easting, Northing)	E
	N
LPA reference (if applicable)	
Brief description of proposed work	Conversion of existing highway gyratory into bidirectional highway and new cycle lanes and green infrastructure with relocation of existing Catford Road to south of council offices between Canadian Avenue and Bromley Road.
Total site Area	m^2
Total existing impervious area	m^2
Total proposed impervious area	m^2
Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	Yes. Zone 2 and 3
Existing drainage connection type and location	Multiple connections to Thames Water surface and combined sewers
Designer Name	Samuel Cox
Designer Position	Pumps and Drainage Engineer
Designer Company	Transport for London

2. Proposed Discharge Arrangements

2a. Infiltration Feasibility

Superficial geology classification	Kempton Park Gravel Member - Sand and gravel.
Bedrock geology classification	London Clay Formation - Clay and Silt & Lambeth Group - Clay, silt and Sand
Site infiltration rate	m/s
Depth to groundwater level	m below ground level
Is infiltration feasible?	Partial

2b. Drainage Hierarchy

	Feasible (Y/N)	*Proposed (Y/N)*
1 store rainwater for later use	N	N
2 use infiltration techniques, such as porous surfaces in non-clay areas	Y	Y
3 attenuate rainwater in ponds or open water features for gradual release	Y	Y
4 attenuate rainwater by storing in tanks or sealed water features for gradual release	Y	Y
5 discharge rainwater direct to a watercourse	Y	Y
6 discharge rainwater to a surface water sewer/drain	Y	Y
7 discharge rainwater to the combined sewer.	Y	Y

2c. Proposed Discharge Details

Proposed discharge location	see Sections 5.1 and 5.6
Has the owner/regulator of the discharge location been consulted?	No. Not required.

3. Drainage Strategy

3a. Discharge Rates & Required Storage

	Greenfield (GF) runoff rate (l/s)	*Existing discharge rate (l/s)*	*Required storage for GF rate (m^3)*	*Proposed discharge rate (l/s)*
Qbar	34.9			
1 in 1	29.7			
1 in 30	60.7			
1 in 100	70.1			
1 in 100 + CC				
Climate change allowance used		40%		
3b. Principal Method of Flow Control		Orifice plates or Vortex flow control		

3c. Proposed SuDS Measures

	Catchment area (m^2)	*Plan area (m^2)*	*Storage vol. (m^3)*
Rainwater harvesting	0		0
Infiltration systems	0		0
Green roofs	0	0	0
Blue roofs	0	0	0
Filter strips	0	0	0
Filter drains	0	0	0
Bioretention / tree pits	0	0	0
Pervious pavements	0	0	0
Swales	0	0	0
Basins/ponds	0	0	0
Attenuation tanks	0		0
Total	**0**	**0**	**0**

4. Supporting Information

4a. Discharge & Drainage Strategy	*Page/section of drainage report*
Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	This will be completed in the applicable areas at detailed design stage.
Drainage hierarchy (2b)	Section 5.6
Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Section 5.1
Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	See Sections 5.5 and 5.6
Proposed SuDS measures & specifications (3b)	See Sections 5.1 and 5.6
4b. Other Supporting Details	*Page/section of drainage report*
Detailed Development Layout	Provided at later stage.
Detailed drainage design drawings, including exceedance flow routes	Provided at later stage.
Detailed landscaping plans	Provided at later stage.
Maintenance strategy	Provided at later stage.
Demonstration of how the proposed SuDS measures improve:	See Section 5.5 for benefit details
a) water quality of the runoff?	
b) biodiversity?	
c) amenity?	

5.5 Design Peak Flow Rate

Table 1 - Outline Calculations for Planning

Approximate Total Area of site		Rainfall	Climate Change	Run-off coefficient	Flow Rate
Ha	m2	l/s/m2	-		l/s
6.1789	61789	0.0458*	1.4	1	2830

*1 in 100 year or 1% AEP 15 minute storm

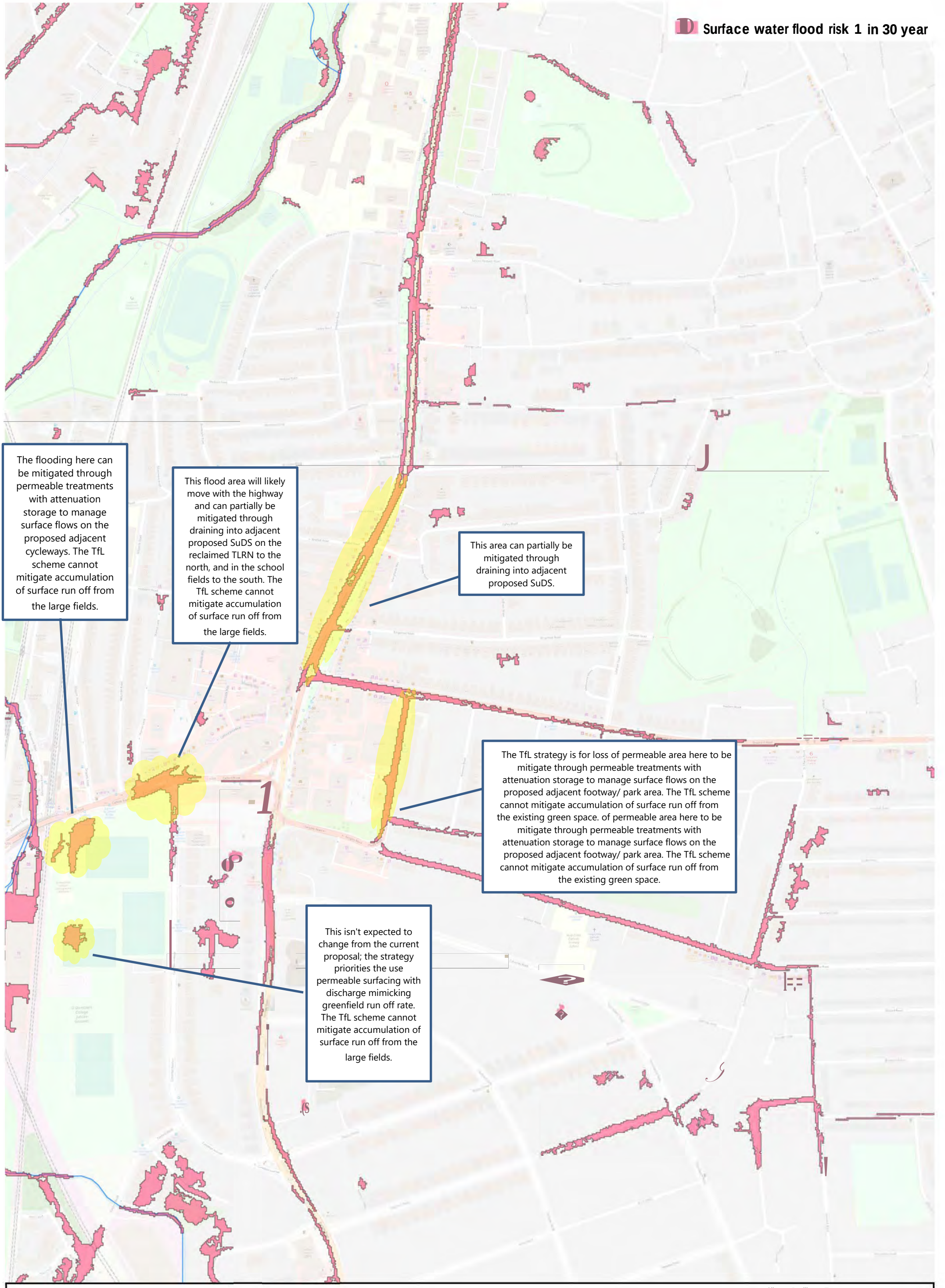
A run-off coefficient of 1 was used in Table 1 as a conservative approach even though an urban ratio of 0.75 was used for the QBAR calculation as this is a limitation of the Microdrainage Source Control ICP SuDS method.

5.6 Key Assumptions

- The existing highway drainage network of gullies is split into sections each with a connection into the Thames Water sewer network therefore the calculated greenfield run off rate is an approximation for the discharge across the multiple existing connections within the whole scheme area, and a minimum rate will be used for l/s will be determined by the detail designer in accordance with the maintainable limitations of specific flow control devices.
- The existing discharge rate from the whole catchment is approximated for the purposes of this strategy; this will be lower for the individual catchments identified later in the design process.
- The specific SuDs elements to be implemented throughout the scheme area or the volume of attenuation storage required to achieve greenfield run-off rate has not been calculated on a site wide basis will be laid out in more detail at the full concept design stage.
- In areas throughout the scheme extent the TLRN highway and TfL and LBL public realm areas are part of a wider combined catchment. Coordination of the design of the two schemes will be carried out to ensure the system works together.

6 Appendix A

- Surface water flood risk Catford



DATE: 05/10/23
AUTHOR: M. Gayle
JOB No:

High Surface Water Flood Risk Map for Catford

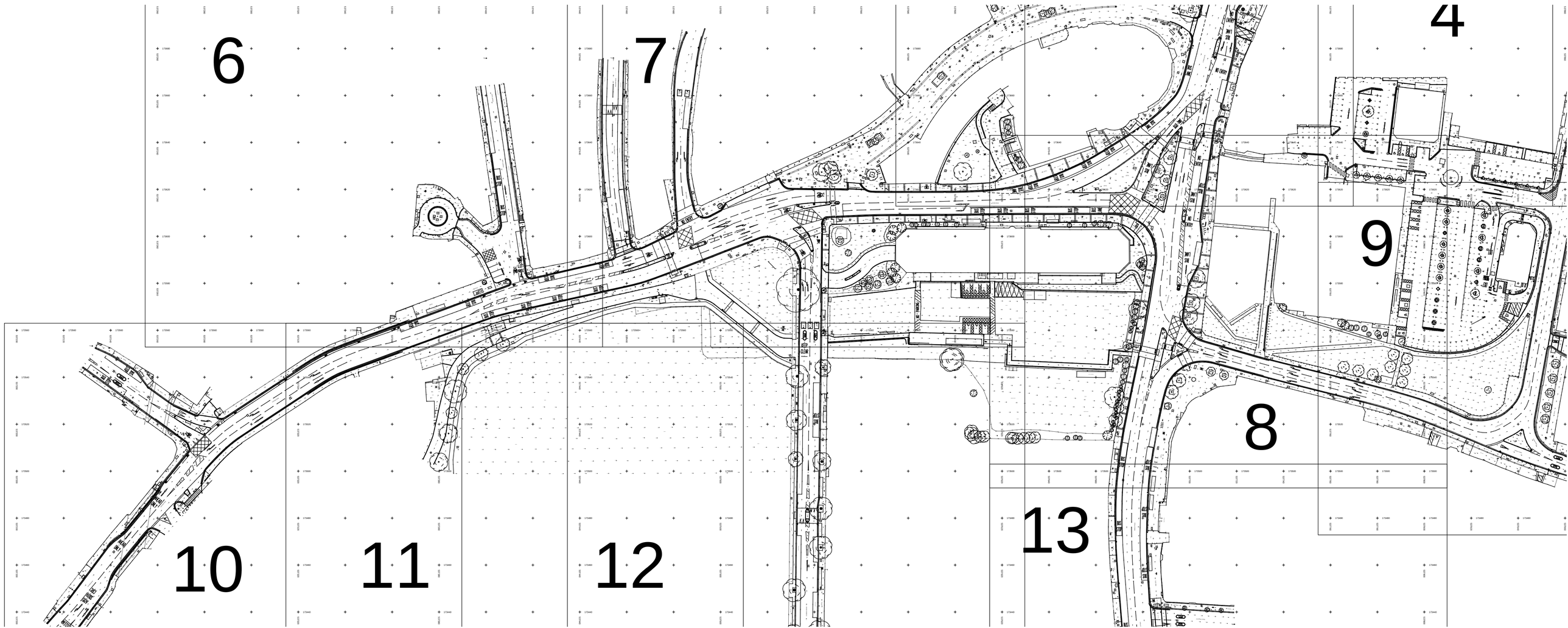
Climate Resilience Team
Lewisham Town Hall
Laurence House
Catford SE6 4RU

Tel: 02083146542

Lewisham

7 Appendix B

- Site Topographical Survey Drawings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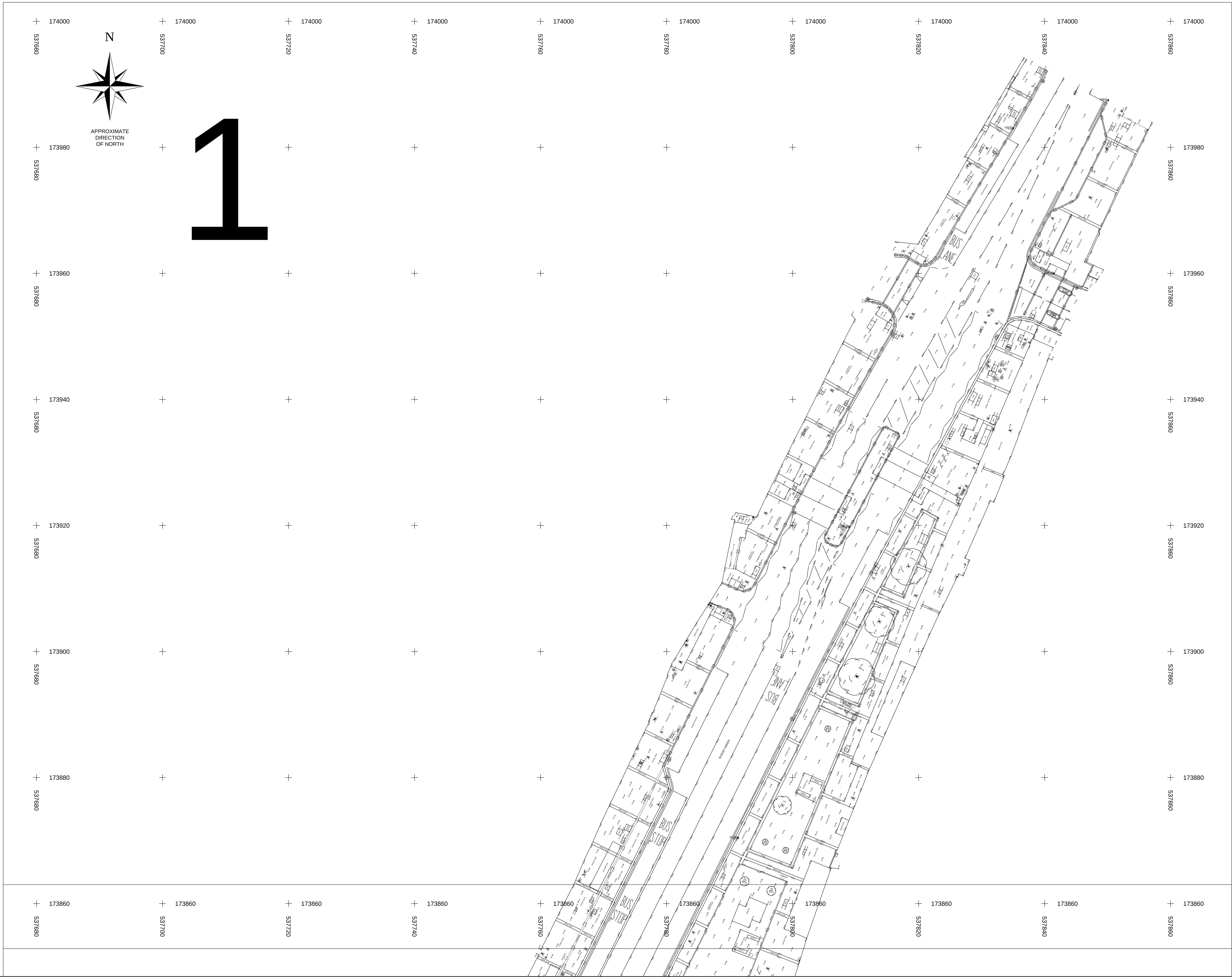

Standard Abbreviations (where applicable):

Building Survey		Land Survey	
AB	AIR BRICK	BOL	BOLLARD
ACU	AIR CONDITIONING UNIT	BOL IL	BOLLARD ILLUMINATED
AH	ACCESS HATCH	BB	BELISHA BEACON
AP	ACCESS PANEL	BT	B.T. COVER
AV	AIR VALVE	CAM	CAMERA
BH	BEAM HT	CATV	CABLE TV COVER
BR	BOILER	CL	COVER LEVEL
BSL	BEAM SOFFIT LEVEL	EB	ELECTRIC BOX
CB	CUPBOARD	ELEC	ELECTRIC COVER
CC	CEILING CHANGE	EP	ELECTRIC POLE
CIH	CLEAR INTERNAL HT	ER	EARTH ROD
C-A	CILL TO APEX HT	FH	FIRE HYDRANT
C-H	CILL TO HEAD HT	FP	FLAG POLE
C-S	CILL TO SPRING HT	FW	FOUL WATER
DB	DOOR BASE HT	GU	GULLY
DH	DOOR HEAD HT	GV	GAS VALVE
DR	DRAIN	IC	INSPECTION COVER
EXF	EXTRACTOR FAN	IL	INVERT LEVEL
FA	FIRE ALARM	LP	LAMP POST
F-A	FLOOR TO APEX HT	MH	MANHOLE
F-C	FLOOR TO CILL HT	MKR	MARKER POST
F-H	FLOOR TO HEAD HT	P	POST
F-S	FLOOR TO SPRING HT	PM	PARKING METER
FL	FLOOR LEVEL	PI	PIPE
GEA	GROSS EXTERNAL AREA	P&T	POST OFFICE AND TELE.
GIA	GROSS INTERNAL AREA	RO	RODDING EYE
GU	GULLY	RS	ROAD SIGN
HT	HEATER	RWP	RAIN WATER PIPE
HW	HOT WATER TANK	SA	SITE AREA
NIA	NET INTERNAL AREA	SL	SOFFIT LEVEL
NTS	NOT TO SCALE	SP	SIGN POST
RAD	RADIATOR	SV	STOP VALVE
RE	RECESS HEAD HEIGHT	SVP	SOIL VENT PIPE
RFV	RAISED FLOOR VOID	SW	STORM WATER
RL	ROOF LIGHT	TF	TOP OF FENCE
RSH	ROLLER SHUTTER	TP	TELEGRAPH POLE
RWP	RAIN WATER PIPE	TSIC	TRAFFIC SIGNALS IC
SVP	SOIL VENT PIPE	TS	TRAFFIC SIGNALS
V	VENT	TW	TOP OF WALL
WA	WARDROBE	TW	TOP OF WALL
		UTL	UNABLE TO LOCATE
		UTR	UNABLE TO RAISE
		VP	VENT PIPE
		WIC	WATER COVER
		WM	WATER METER
		WT	WATER TAP
		WV	WATER VALVE

Symbols (where applicable):

Direction of sloping ceiling

FL 10.00	3.00	3.00
FLOOR LEVEL RELATIVE TO DATUM	FLOOR TO STRUCTURAL CEILING HT	FLOOR TO SUSPENDED CEILING HT

Notes:

The Survey has been computed on an Ordnance Survey (OS) National Grid using GPS and related to OSTN15(GB) and OSGM15(GB).

The survey grid is orientated to Grid North with a scale factor of 1.000.

All Levels are in meters and relate to an OS Datum established by GPS using OSGM15(GB).

Station 1 Value 17.142m

All survey control must be checked and verified before any use.

All direction arrows indicate UP unless otherwise stated.

Drainage pipe sizes (where shown) have been gauged from the surface (for safety reasons) and should be regarded as approximate only. All dimensions and connections should be checked and verified prior to starting work.

Visible features in the vicinity of any boundaries, as shown on this survey, may not represent the extent of legally conveyed ownership.

Whilst every effort has been made to determine wall materials, no guarantee is given. Materials should be regarded as assumed unless verified by a qualified third party.

Internal walls measurements are taken to the wall finishes at approx. 1m above the floor level. The wall is assumed to be vertical.

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LAND & MEASURED BUILDING SURVEYS
AMU Surveys Ltd
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5 Wadsworth Road,
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020 8338 1219
www.amusurveys.co.uk
info@amusurveys.co.uk

Client: TRANSPORT FOR LONDON

Project: CATFORD TOWN CENTRE CATFORD, LONDON

Drawing Title: EXISTING TOPOGRAPHICAL SURVEY

Date:	Scale:	Surveyor:	Drawn:	Checked:
29/10/2018	1:200@A0	AU/WW/TD	GS	AU

Job No:	Drawing No:	Sheet No:	Rev:
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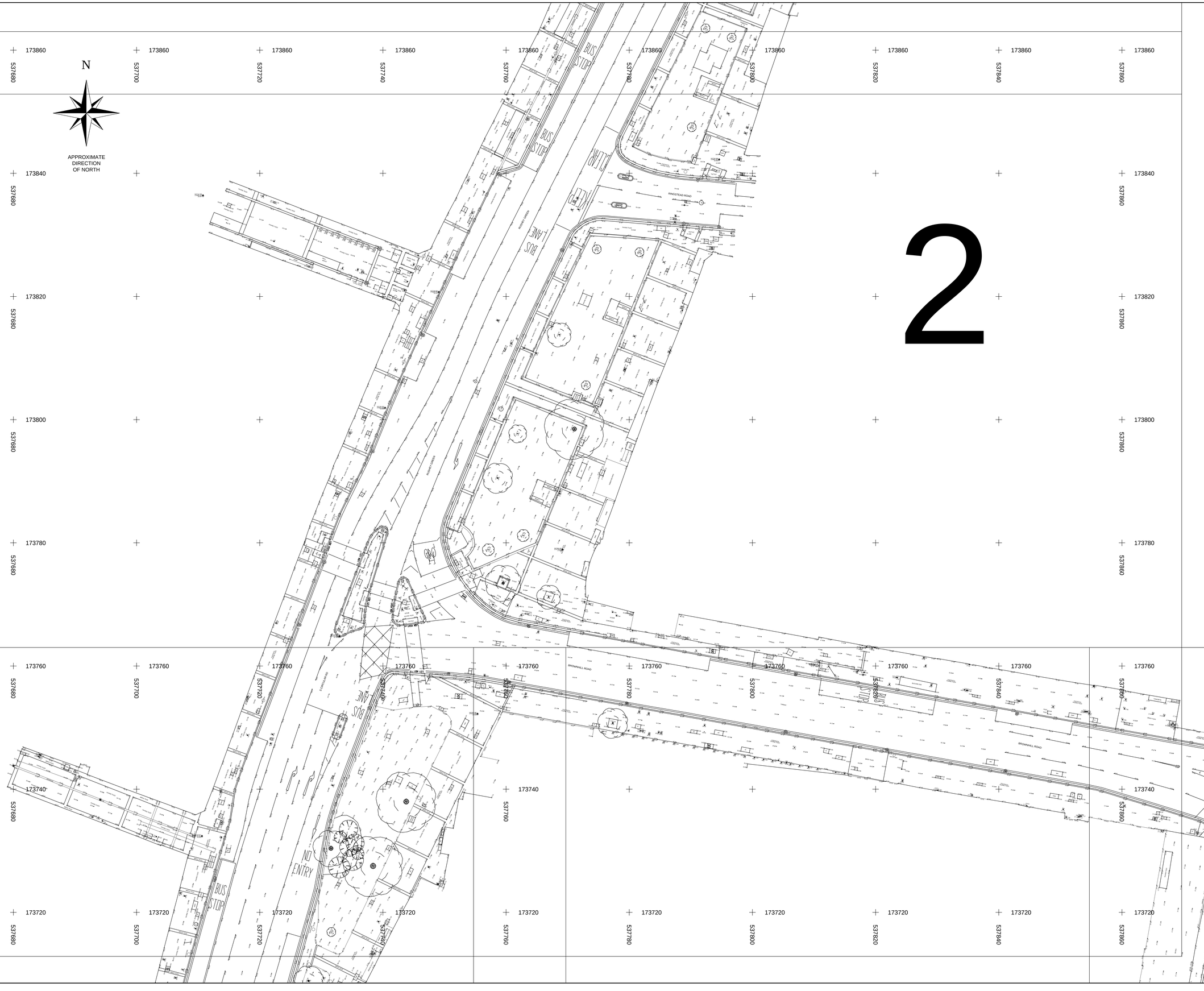

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AV	AIR VALVE	CAM	CAMERA
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BSL	BEAM SOFFIT LEVEL	EB	ELECTRIC BOX
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C-A	CILL TO APEX HT	FH	FIRE HYDRANT
C-H	CILL TO HEAD HT	FP	FLAG POLE
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DB	DOOR BASE HT	GU	GULLY
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Symbols (where applicable):

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FL 10.00 — FLOOR LEVEL RELATIVE TO DATUM

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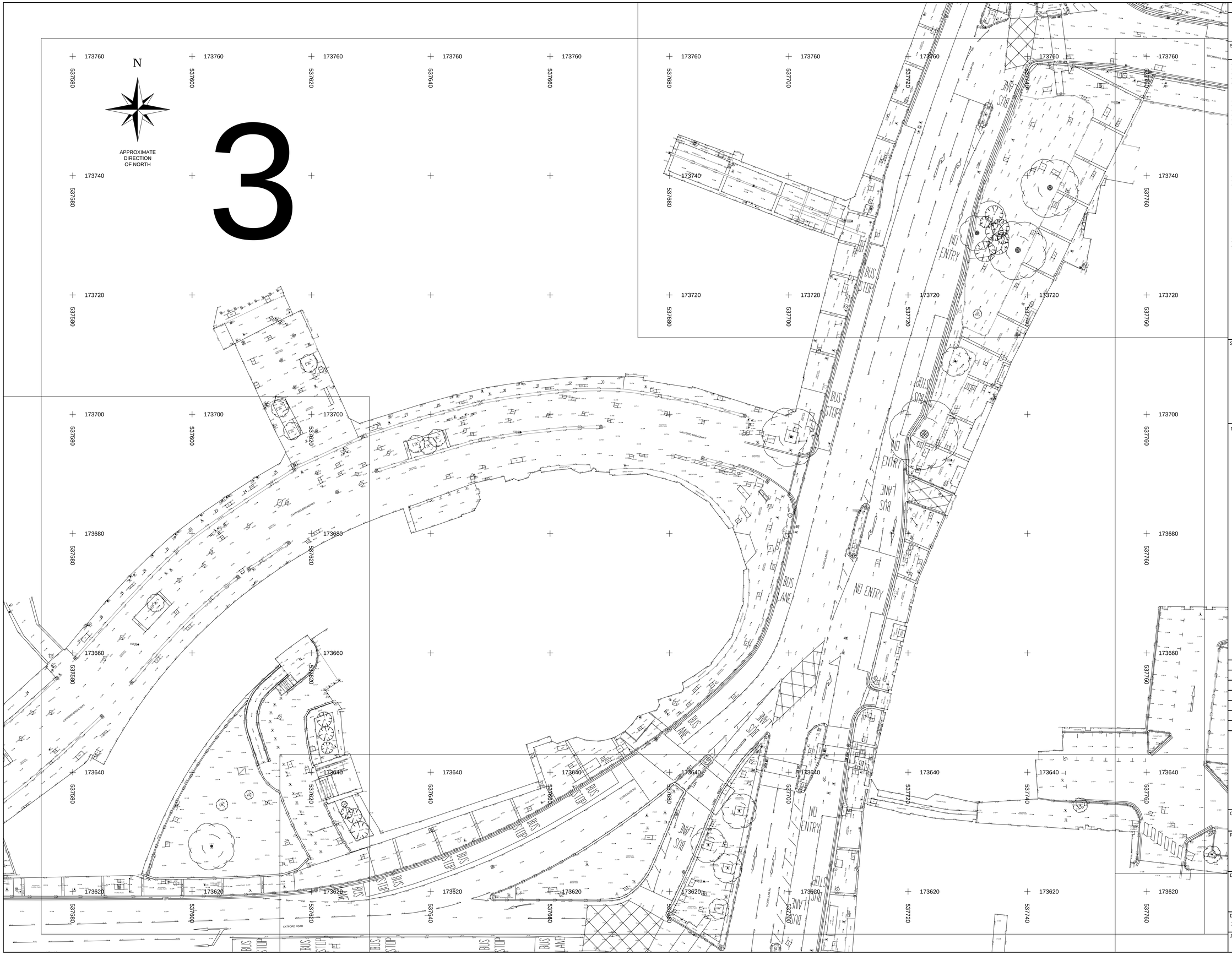

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Symbols (where applicable):

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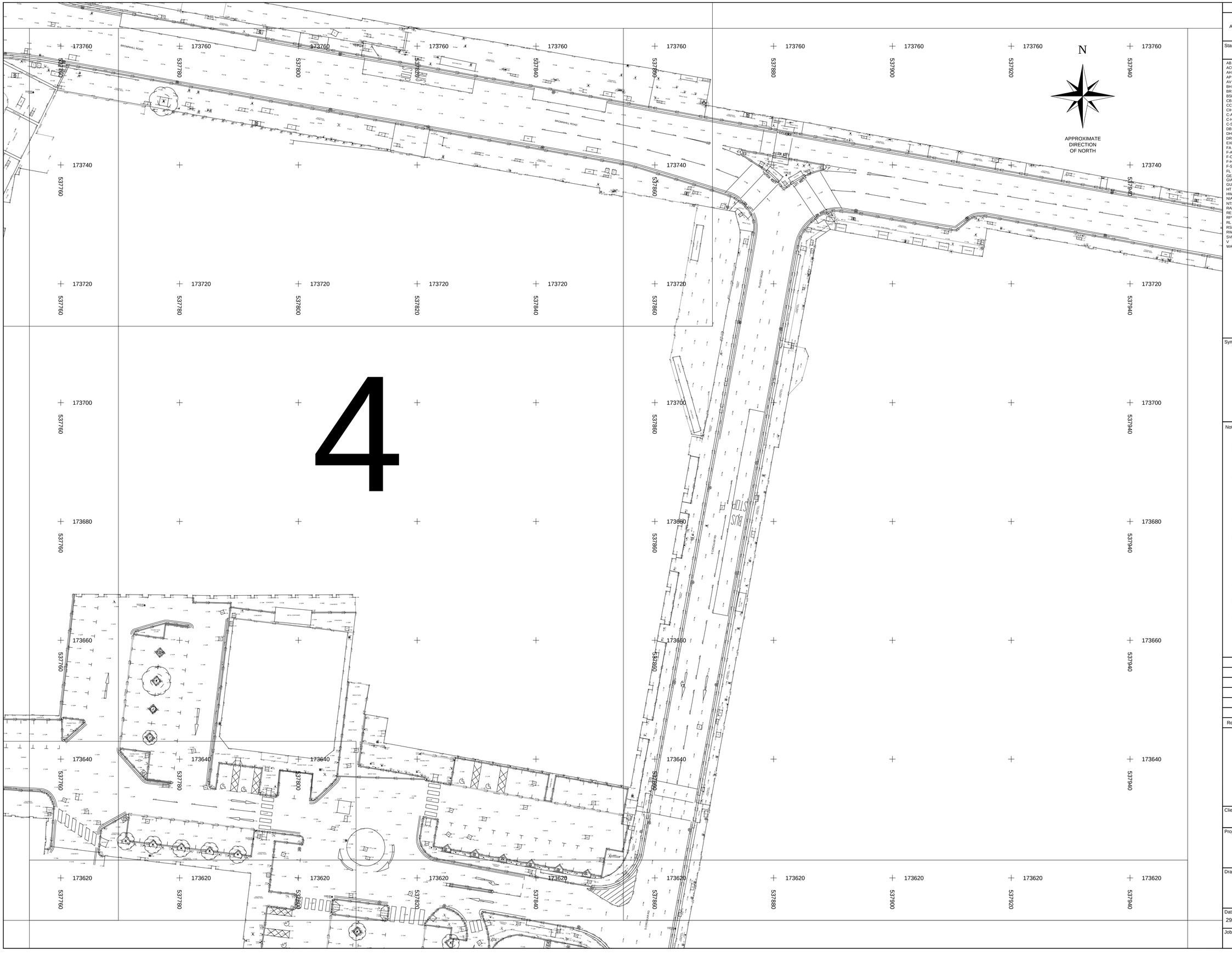

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Symbols (where applicable):

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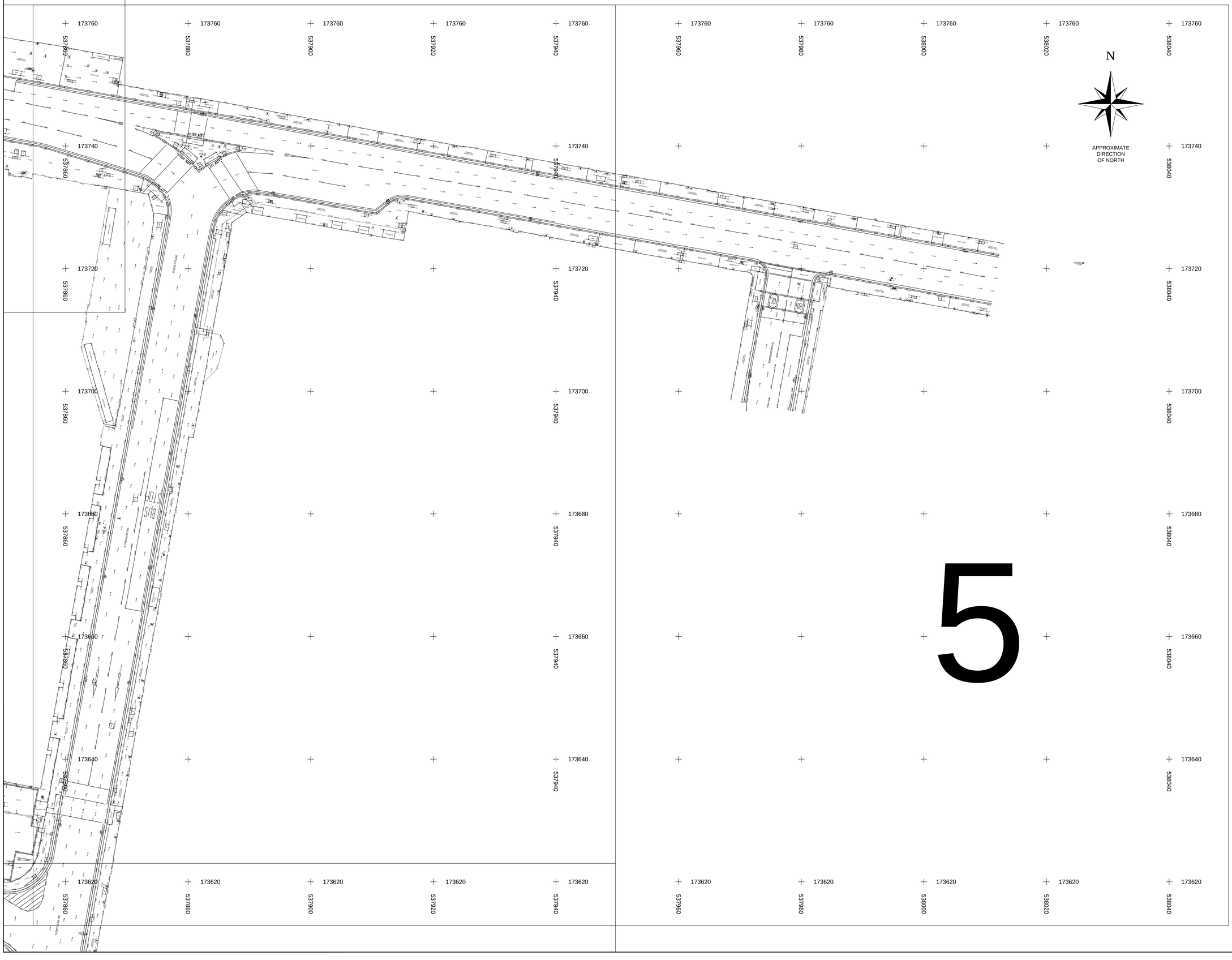

5

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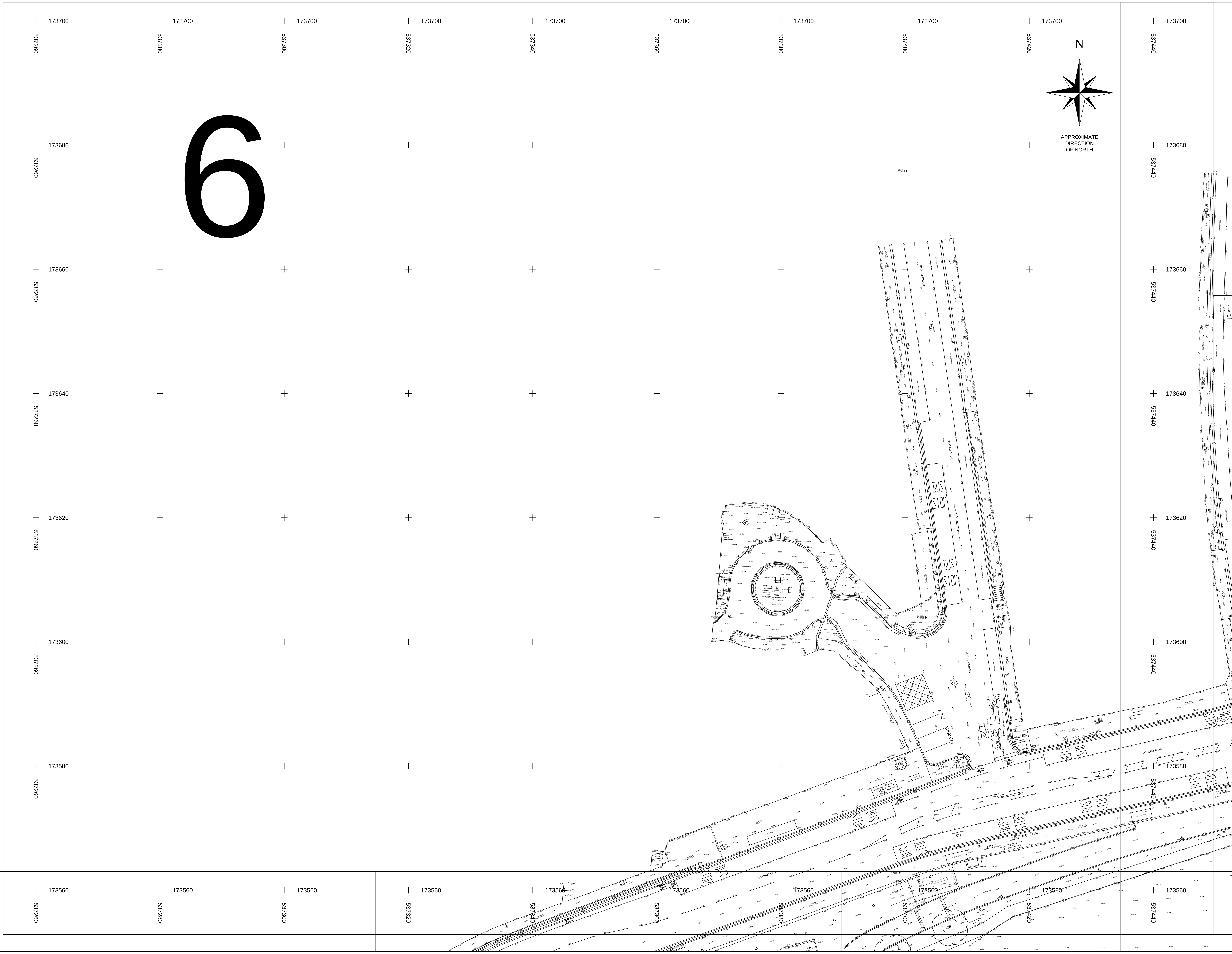

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Symbols (where applicable):

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FL 10.00	3.00	3.00
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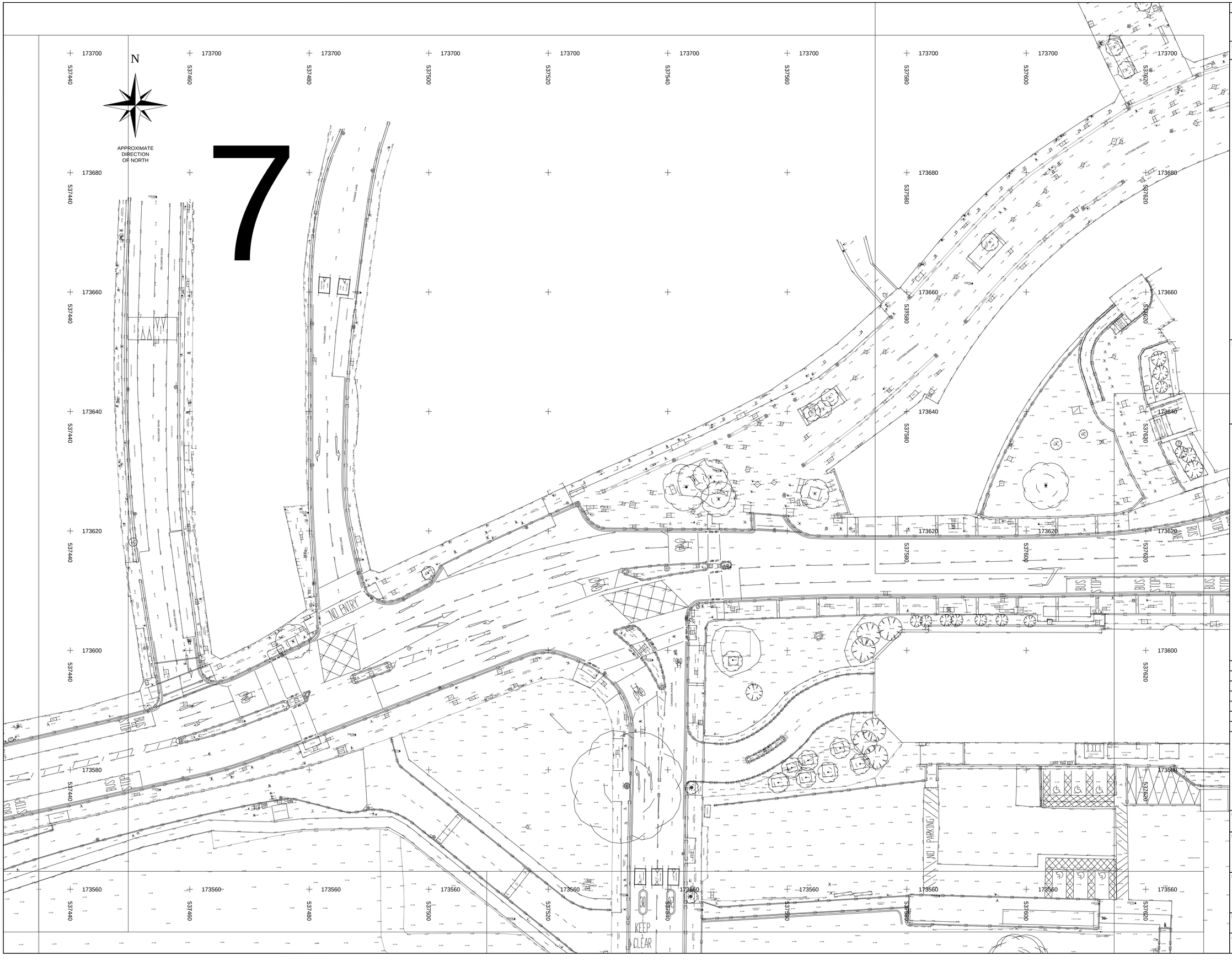

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DR	DRAIN	IC	INSPECTION COVER
EXF	EXTRACTOR FAN	IL	INVERT LEVEL
FA	FIRE ALARM	LP	LAMP POST
F-A	FLOOR TO APEX HT	MH	MANHOLE
F-C	FLOOR TO CILL HT	MKR	MARKER POST
F-H	FLOOR TO HEAD HT	P	POST
F-S	FLOOR TO SPRING HT	PM	PARKING METER
FL	FLOOR LEVEL	PI	PIPE
GEA	GROSS EXTERNAL AREA	P&T	POST OFFICE AND TELE.
GIA	GROSS INTERNAL AREA	RO	RODDING EYE
GU	GULLY	RS	ROAD SIGN
HT	HEATER	RWP	RAIN WATER PIPE
HW	HOT WATER TANK	SA	SITE AREA
NIA	NET INTERNAL AREA	SL	SOFFIT LEVEL
NTS	NOT TO SCALE	SP	SIGN POST
RAD	RADIATOR	SV	STOP VALVE
RE	RECESS HEAD HEIGHT	SVP	SOIL VENT PIPE
RFV	RAISED FLOOR VOID	SW	STORM WATER
RL	ROOF LIGHT	TF	TOP OF FENCE
RSH	ROLLER SHUTTER	TP	TELEGRAPH POLE
RWP	RAIN WATER PIPE	TSIC	TRAFFIC SIGNALS IC
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V	VENT	TW	TOP OF WALL
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Symbols (where applicable):

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29/10/2018	1:200@A0	AU/WW/TD	GS	AU

Job No:	Drawing No:	Sheet No:	Rev:
18014	18014-07	07 OF 19	

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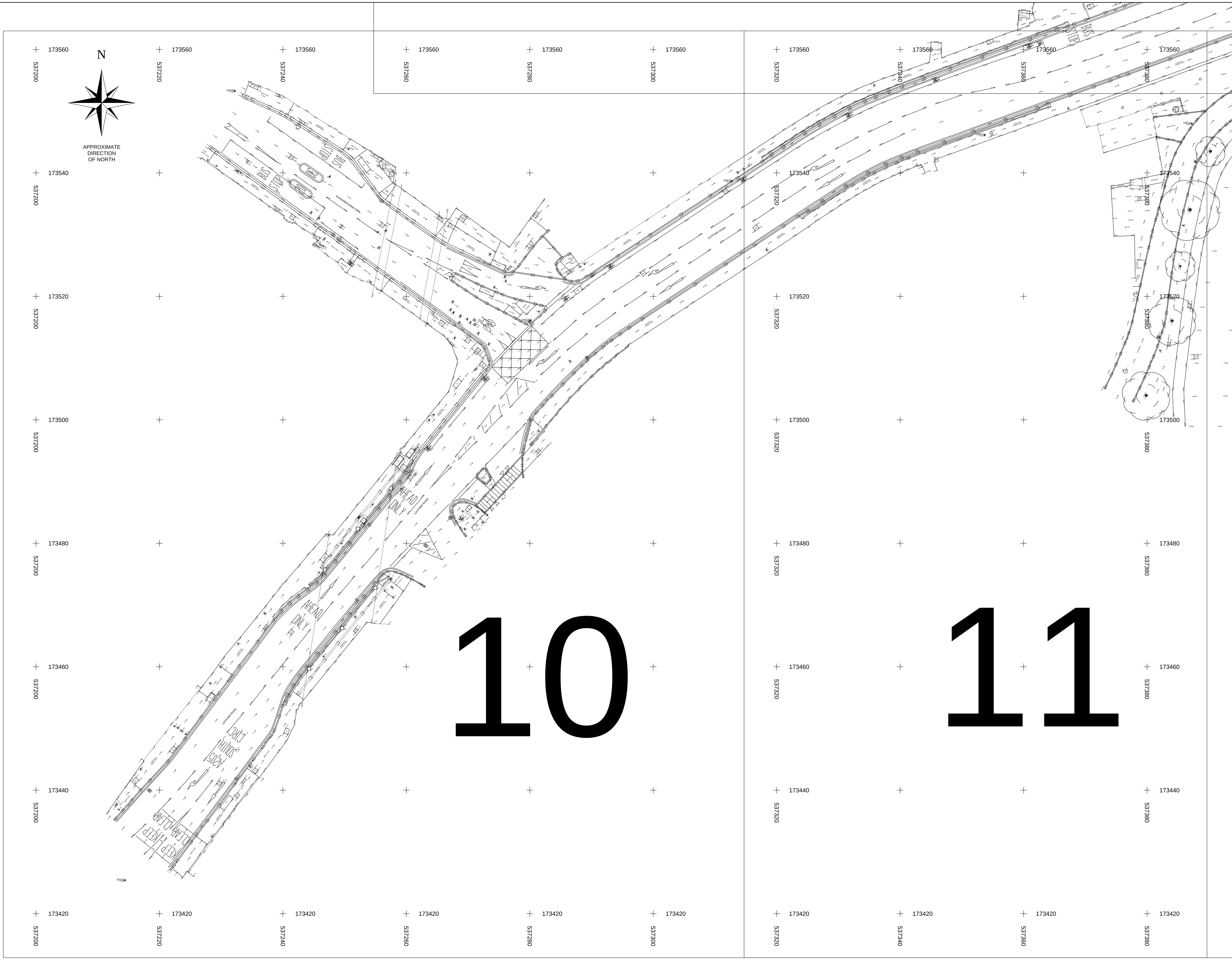

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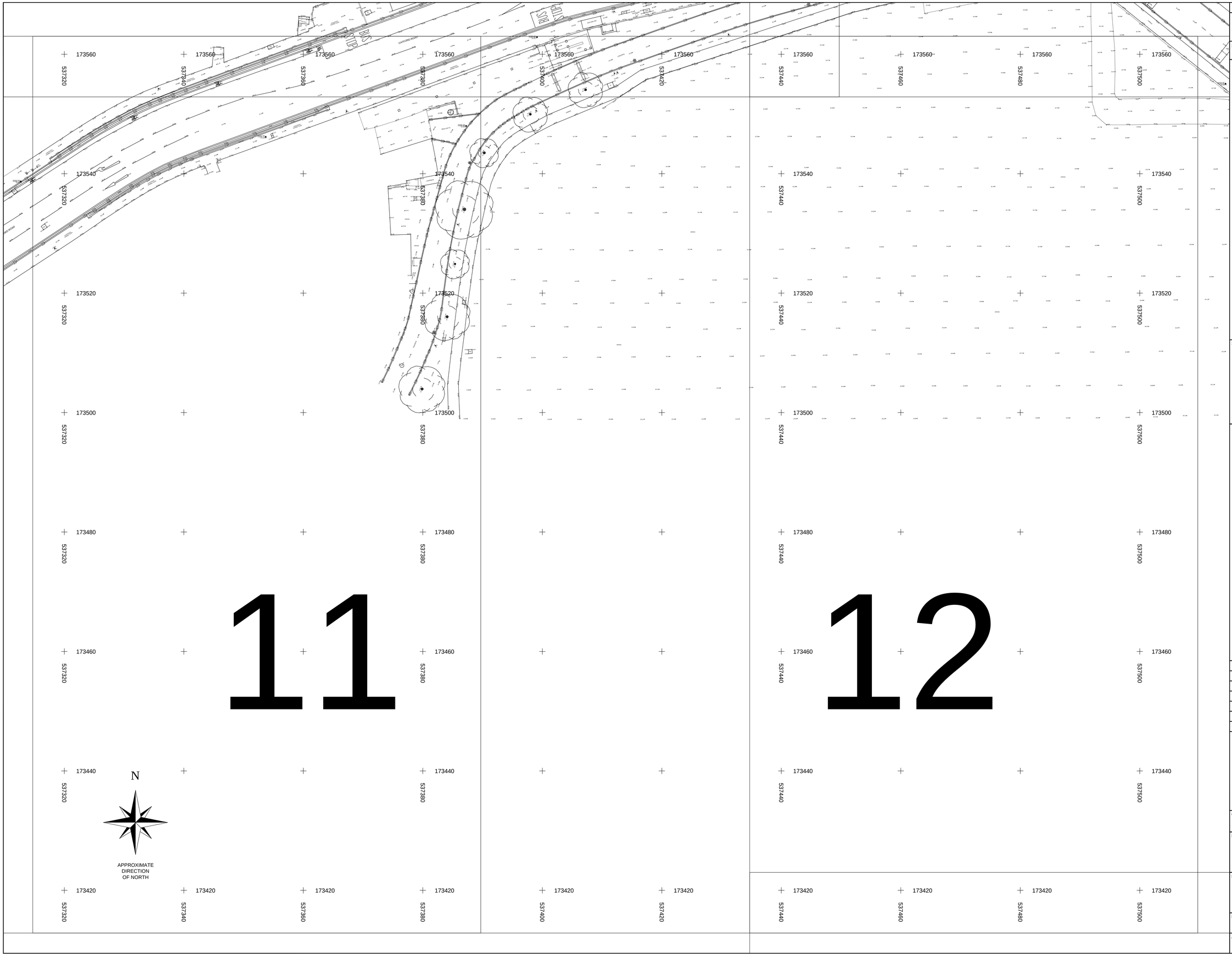

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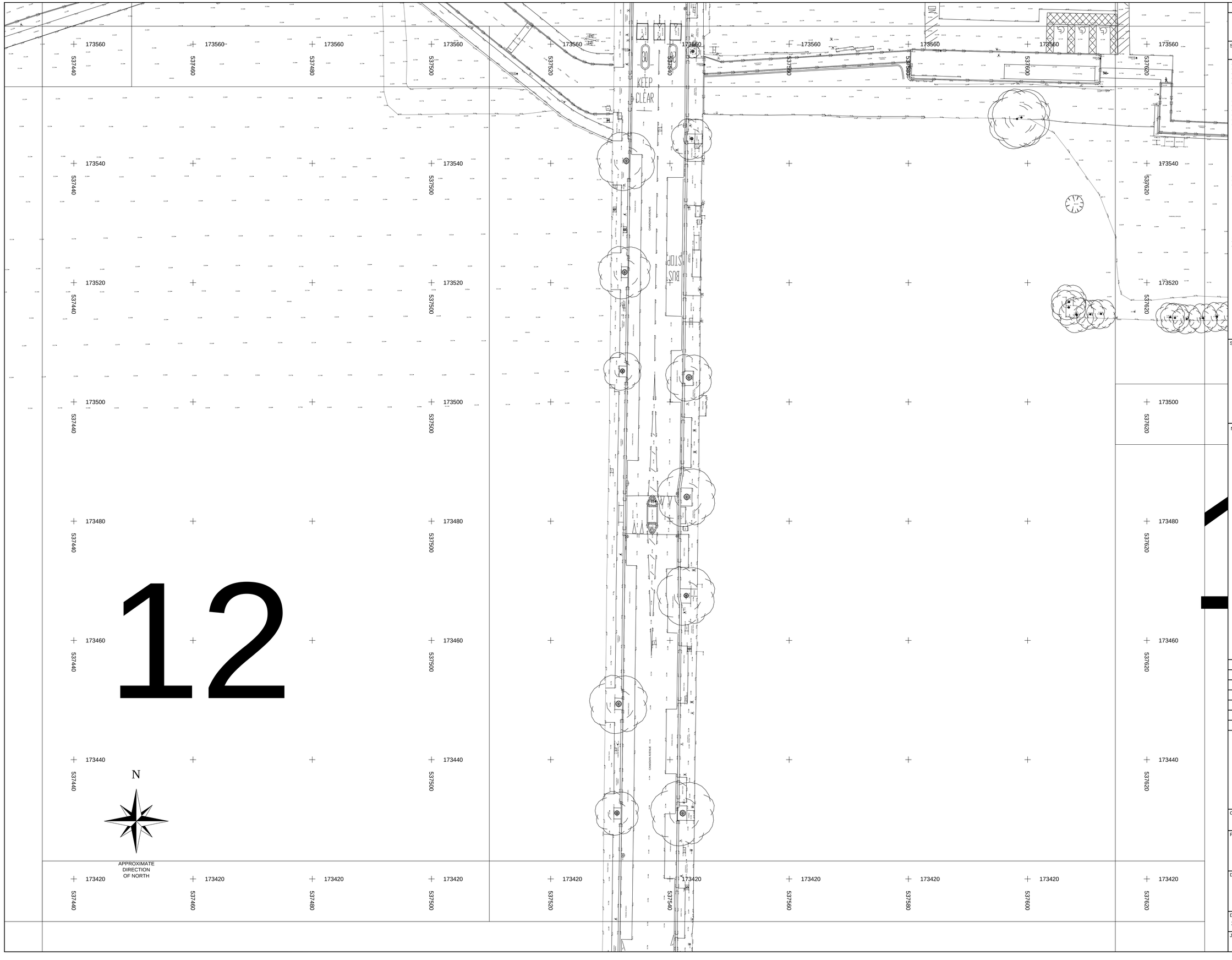

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Project:
CATFORD TOWN CENTRE
CATFORD, LONDON

Drawing Title:
EXISTING
TOPOGRAPHICAL SURVEY

Date:	Scale:	Surveyor:	Drawn:	Checked:
29/10/2018	1:200@A0	AU/WW/TD	GS	AU

Job No:	Drawing No:	Sheet No:	Rev:
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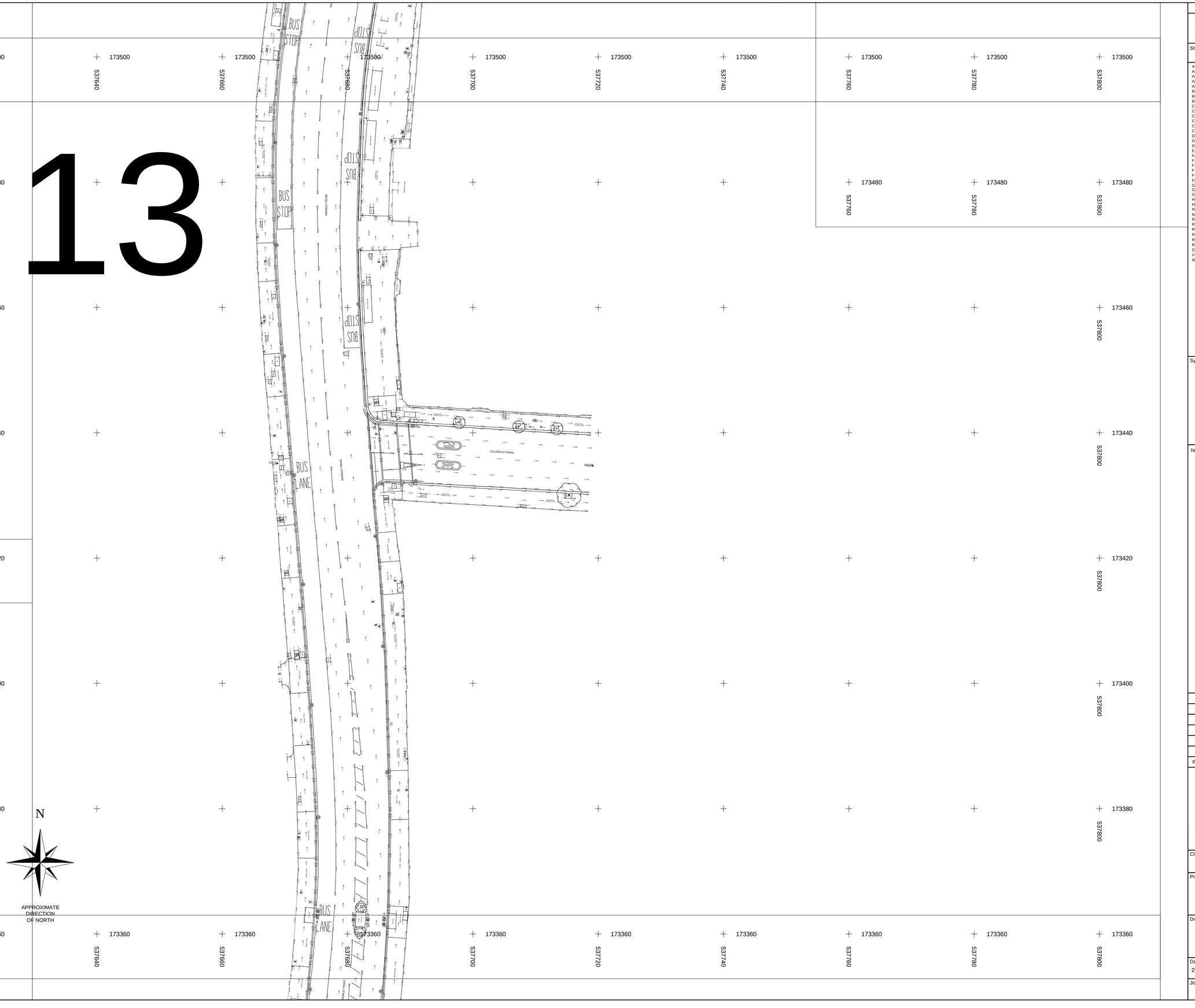

Standard Abbreviations (where applicable):

Building Survey		Land Survey	
AB	AIR BRICK	BOL	BOLLARD
ACU	AIR CONDITIONING UNIT	BOL IL	BOLLARD ILLUMINATED
AH	ACCESS HATCH	BB	BELISHA BEACON
AP	ACCESS PANEL	BT	B.T. COVER
AV	AIR VALVE	CAM	CAMERA
BH	BEAM HT	CATV	CABLE TV COVER
BR	BOILER	CL	COVER LEVEL
BSL	BEAM SOFFIT LEVEL	EB	ELECTRIC BOX
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CC	CEILING CHANGE	EP	ELECTRIC POLE
CIH	CLEAR INTERNAL HT	ER	EARTH ROD
C-A	CILL TO APEX HT	FH	FIRE HYDRANT
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Symbols (where applicable):

Direction of sloping ceiling

FL 10.00 — FLOOR LEVEL RELATIVE TO DATUM

3.00 — FLOOR TO STRUCTURAL CEILING HT

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Notes:

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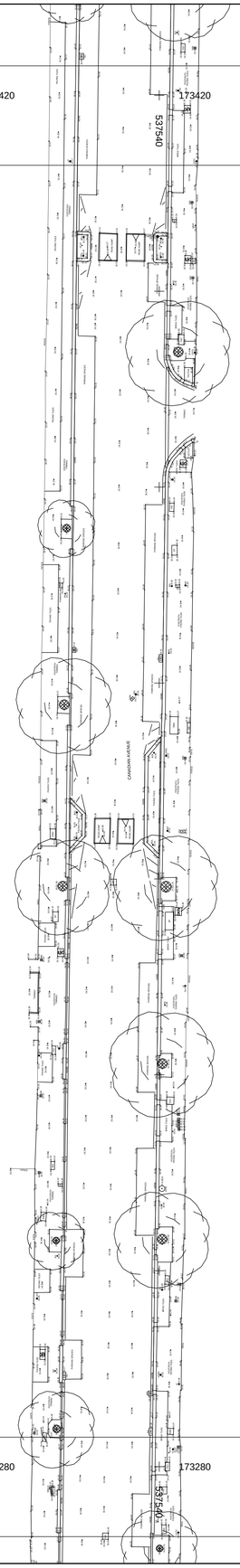

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APPROXIMATE DIRECTION OF NORTH

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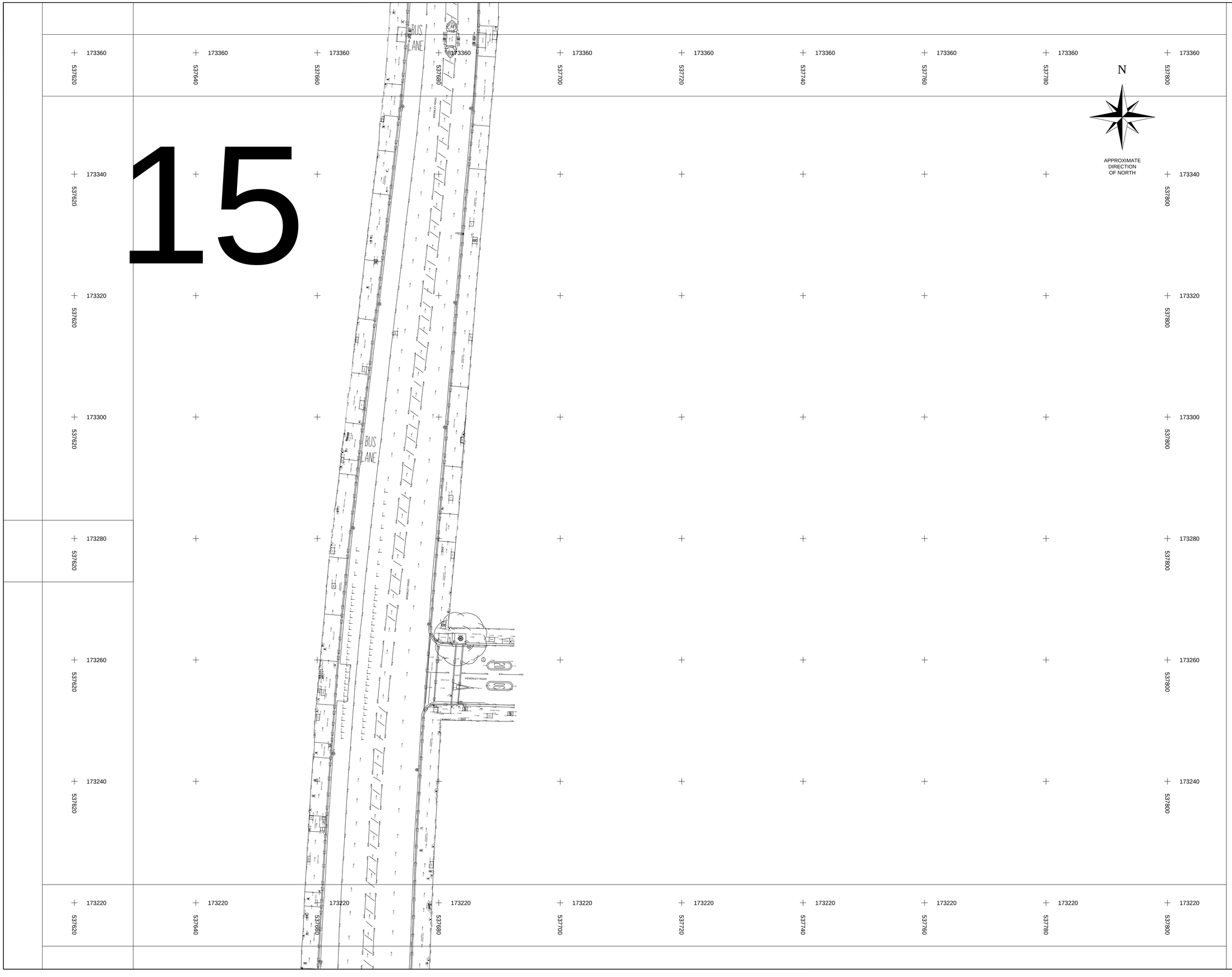

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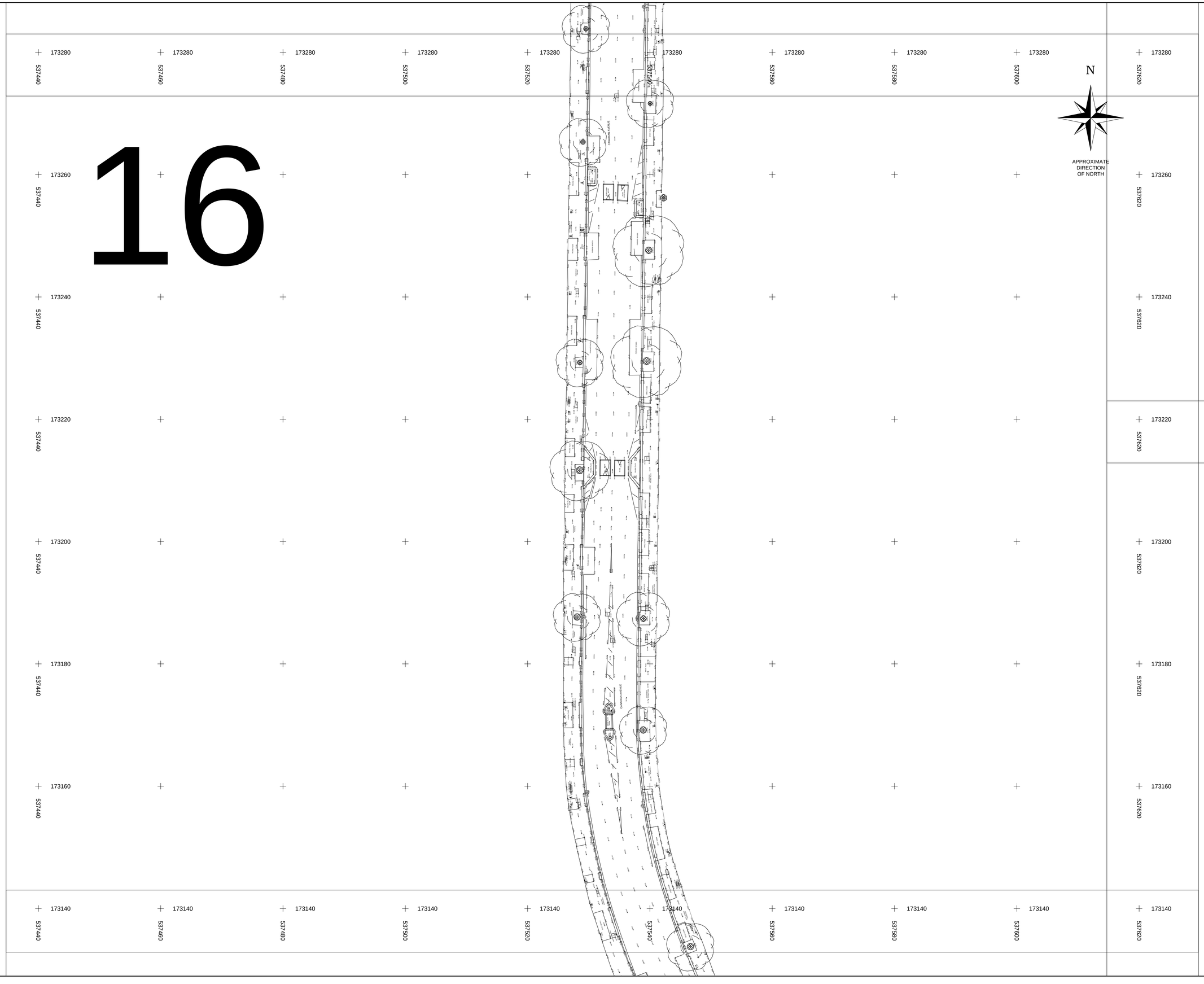

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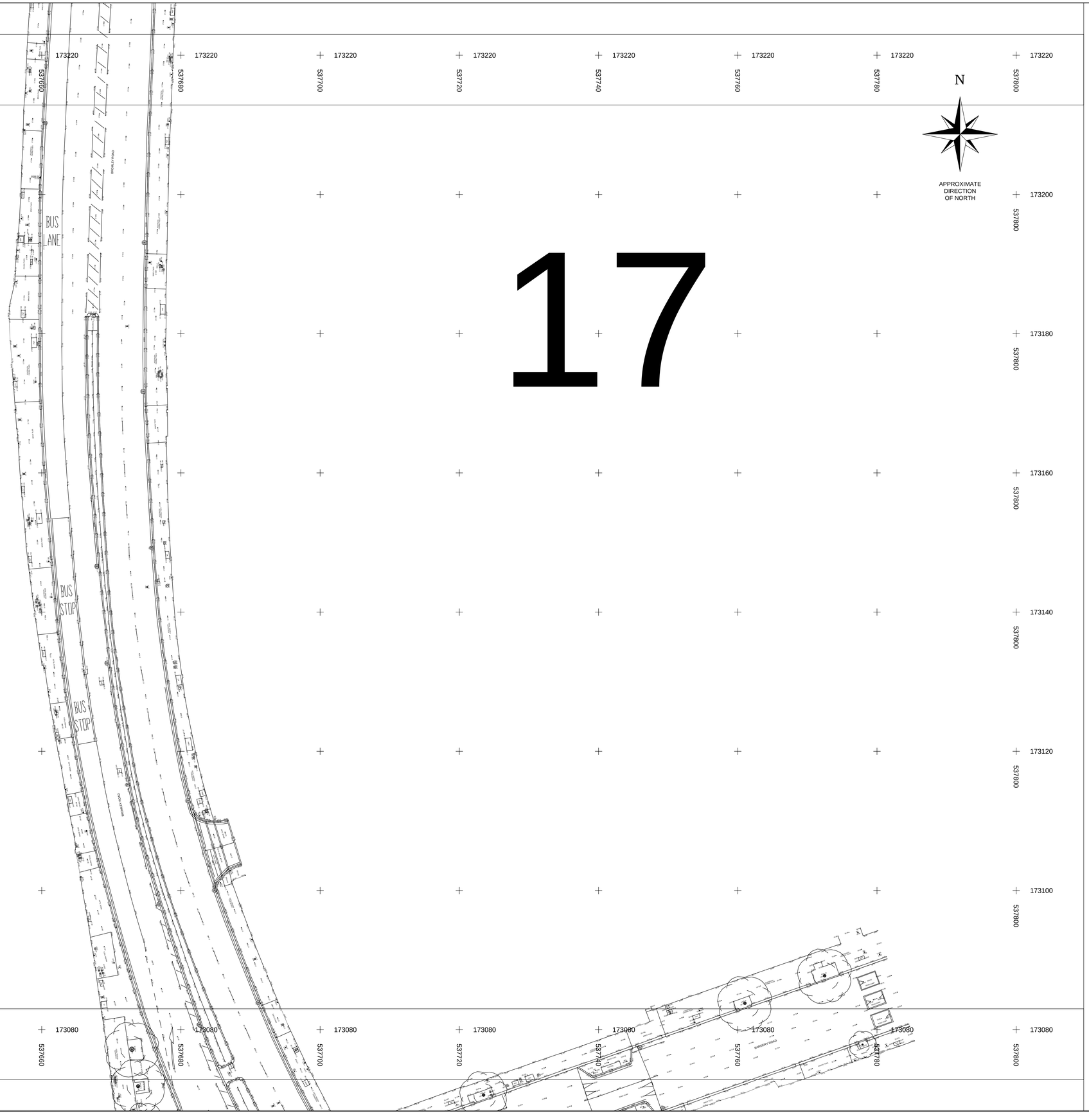

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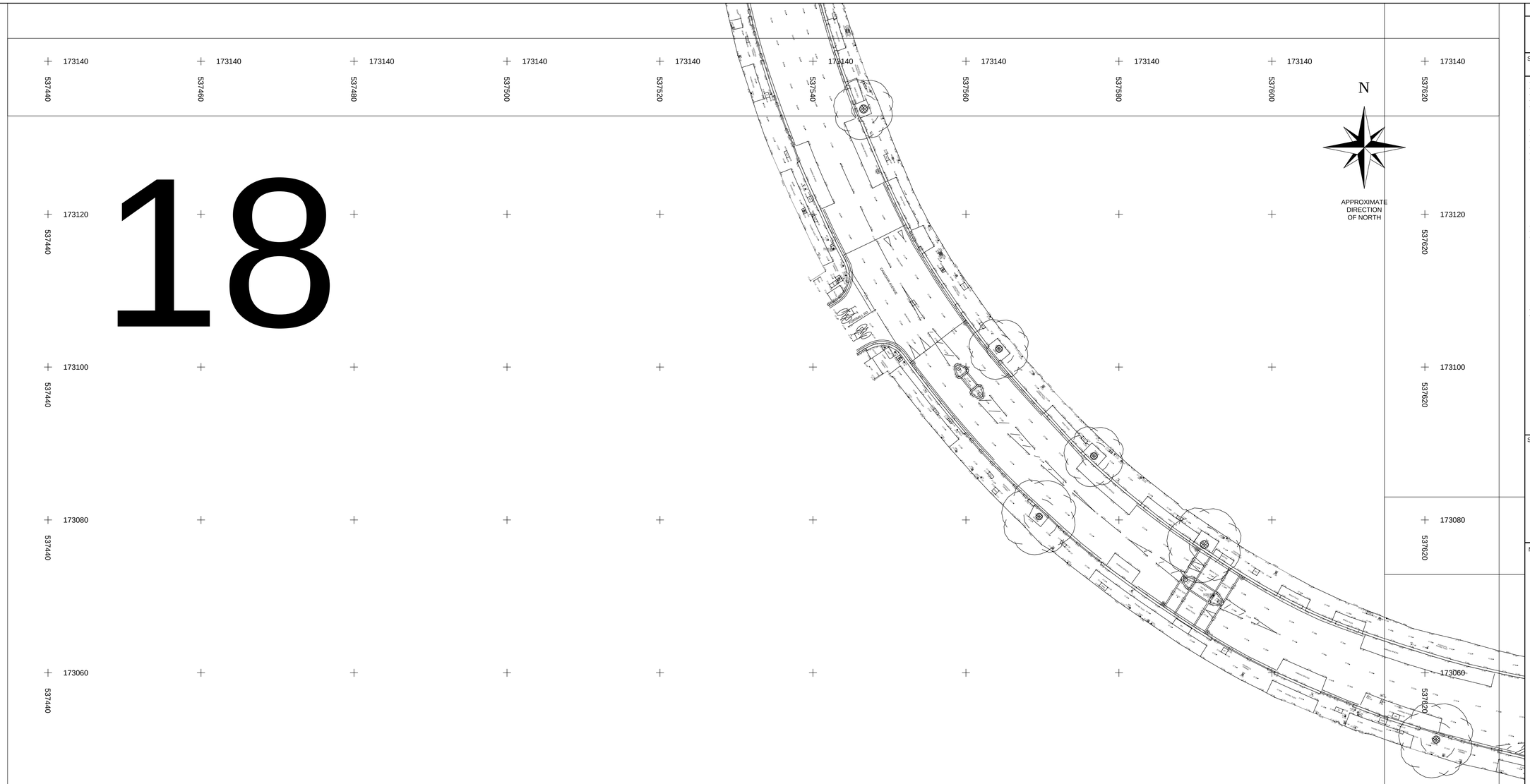

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FL	FLOOR LEVEL	PI	PIPE
GEA	GROSS EXTERNAL AREA	P&T	POST OFFICE AND TELE.
GIA	GROSS INTERNAL AREA	RO	RODDING EYE
GU	GULLY	RS	ROAD SIGN
HT	HEATER	RWP	RAIN WATER PIPE
HW	HOT WATER TANK	SA	SITE AREA
NIA	NET INTERNAL AREA	SL	SOFFIT LEVEL
NTS	NOT TO SCALE	SP	SIGN POST
RAD	RADIATOR	SV	STOP VALVE
RE	RECESS HEAD HEIGHT	SVP	SOIL VENT PIPE
RFV	RAISED FLOOR VOID	SW	STORM WATER
RL	ROOF LIGHT	TF	TOP OF FENCE
RSH	ROLLER SHUTTER	TP	TELEGRAPH POLE
RWP	RAIN WATER PIPE	TSIC	TRAFFIC SIGNALS IC
SVP	SOIL VENT PIPE	TS	TRAFFIC SIGNALS
V	VENT	TW	TOP OF WALL
WA	WARDROBE	TW	TOP OF WALL
		UTL	UNABLE TO LOCATE
		UTR	UNABLE TO RAISE
		VP	VENT PIPE
		WC	WATER COVER
		WM	WATER METER
		WT	WATER TAP
		WV	WATER VALVE

Symbols (where applicable):

Direction of sloping ceiling

FL 10.00 — FLOOR LEVEL RELATIVE TO DATUM

3.00 — FLOOR TO STRUCTURAL CEILING HT

3.00 — FLOOR TO SUSPENDED CEILING HT

Notes:

The Survey has been computed on an Ordnance Survey (OS) National Grid using GPS and related to OSTN15(GB) and OSGM15(GB).

The survey grid is orientated to Grid North with a scale factor of 1.000.

All Levels are in meters and relate to an OS Datum established by GPS using OSGM15(GB).

Station 1 Value 17.142m

All survey control must be checked and verified before any use.

All direction arrows indicate UP unless otherwise stated.

Drainage pipe sizes (where shown) have been gauged from the surface (for safety reasons) and should be regarded as approximate only. All dimensions and connections should be checked and verified prior to starting work.

Visible features in the vicinity of any boundaries, as shown on this survey, may not represent the extent of legally conveyed ownership.

Whilst every effort has been made to determine wall materials, no guarantee is given. Materials should be regarded as assumed unless verified by a qualified third party.

Internal walls measurements are taken to the wall finishes at approx. 1m above the floor level. The wall is assumed to be vertical.

If some of the features at the time of survey are obstructed or not visible, they may not have been surveyed.

Do not scale from this drawing.

Rev	Date	By	Description

LAND & MEASURED BUILDING SURVEYS

AMU Surveys Ltd

Sabichi House,
5 Wadsworth Road,
Perivale UB6 7JD,

020 8338 1219
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Client:
TRANSPORT FOR LONDON

Project:
CATFORD TOWN CENTRE
CATFORD, LONDON

Drawing Title:
EXISTING
TOPOGRAPHICAL SURVEY

Date:	Scale:	Surveyor:	Drawn:	Checked:
29/10/2018	1:200@A0	AU/WW/TD	GS	AU

Job No:	Drawing No:	Sheet No:	Rev:
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Standard Abbreviations (where applicable):

Building Survey		Land Survey	
AB	AIR BRICK	BOL	BOLLARD
ACU	AIR CONDITIONING UNIT	BOL IL	BOLLARD ILLUMINATED
AH	ACCESS HATCH	BB	BELISHA BEACON
AP	ACCESS PANEL	BT	B.T. COVER
AV	AIR VALVE	CAM	CAMERA
BH	BEAM HT	CATV	CABLE TV COVER
BR	BOILER	CL	COVER LEVEL
BSL	BEAM SOFFIT LEVEL	EB	ELECTRIC BOX
CB	CUPBOARD	ELEC	ELECTRIC COVER
CC	CEILING CHANGE	EP	ELECTRIC POLE
CIH	CLEAR INTERNAL HT	ER	EARTH ROD
C-A	CILL TO APEX HT	FH	FIRE HYDRANT
C-H	CILL TO HEAD HT	FP	FLAG POLE
C-S	CILL TO SPRING HT	FW	FOUL WATER
DB	DOOR BASE HT	GU	GULLY
DH	DOOR HEAD HT	GV	GAS VALVE
DR	DRAIN	IC	INSPECTION COVER
EXF	EXTRACTOR FAN	IL	INVERT LEVEL
FA	FIRE ALARM	LP	LAMP POST
F-A	FLOOR TO APEX HT	MH	MANHOLE
F-C	FLOOR TO CILL HT	MKR	MARKER POST
F-H	FLOOR TO HEAD HT	P	POST
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