

Building 401 Redevelopment

Utilities Strategy (Unit 1)

Columbia Threadneedle Investments

Project reference: Building 401

Report Ref: 60663052-AEC-XX-XX-RP-C-00003

September 2021

Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
-	22/09/2021	First Draft		Vin Bamford	Technical Director

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1 Introduction

Columbia Threadneedle Investments (CTI) have commissioned AECOM to prepare a utilities strategy for a proposed logistics development on the site of Building 401 the former SkyChef Building in the global logistics area at Manchester Airport.

An outline masterplan for the site has been provided by RPS showing two new units however this report will only focus on Unit 1. Unit 1 comprises a 90,000sq ft warehouse building which is split into 3no integral units with individual integral office space. Office space is assumed to comprise 10% of the overall gross internal floor area (GIFA) for the purposes of this Utilities Strategy.

This initial assessment will be undertaken on the basis of demand for the building as a whole. A 5% uplift allowance will be made in the demand calculations with the assumption that there may be nominal increases for the individual units based on tenant requirements.

CTI have been assigned utilities capacity by MAG to be services from the existing MAG networks as part of the land sale agreement. An assessment will be made of expected demand against committed capacity.

2 Site Location

The site is bounded by the Avro Way to the north, Pinfold Lane to the east and Wilmslow Old Road to the south. The new DNATA facility sits to the east of the proposed site with the existing DNATA food facility to the west.



Figure 1 – Site Plan

3 Utilities Strategy

The following utilities strategy has been prepared on the basis of a maximum 90,000sqft of building footprint.

3.1 Demand Calculations

Demand calculations have been prepared in line with the CIBSE guidance assuming warehouse and office use with 10% of the overall footprint dedicated as office.

A 20% additional demand has been assumed within the power load for future EV charging requirements.

The following demand loads are estimated for the proposed Unit 1 development:

- Power = 700 kVA
- Gas = 65 m³/hr
- Water = 1.01 l/s peak
- Foul = 0.96 l/s peak

Loading calculations have been provided in Appendix A.4.

3.2 Power

The power supply is to be provided via the relocated Z sub-station which will be sited in the north east corner of the site. Z sub-station has to be relocated to allow the demolition of the existing building. A scheme has previously been agreed to relocate the substation along with the ring mains servicing it with MAG Utilities and Electricity North West.

Details of the proposed diversion scheme are provided in Appendix A.2. The scheme has been previously tendered and a price for all HV works has been provided by ENWL. Any electrical works associated with the HV elements of the diversion and new substation must be undertaken by ENWL as per the COMA agreement allowing ENWL to act as network operator for the Manchester Airport Group.

A 1MVA transformer will be provided in the new Z sub-station and this will provide the supply to the new facility.

On this basis, for Unit 1 it is recommended that CTI request an additional capacity of 700kVA from MAG which should be available from the proposed 1MVA transformer. It should be noted that a further 200kVA will be required for Unit 2, should this be implemented in the future.

Power will be taken from the MAG operated network and details for billing, metering and sub-metering will need to be agreed with MAG Utilities.

For the purposes of this report, it is assumed that the warehouse and offices will be provided with heating via gas fired heating systems. The market is currently moving away from gas fired heating to electric, via various heating systems such as Ground source heat pumps, air source heat pumps, etc. This is to align with the Net Zero carbon aspirations set out by the government. In the event that electric heating is to be considered in lieu of gas heating, then this will significantly increase the electrical load for the building.

3.3 Gas

Gas is to be provided to the development via Manchester Airports Prime 2 Gas Network. There is an existing supply to the 401 building via a valve gas house cited on the eastern boundary of the site adjacent to Pinfold Lane. As of the date of issue of this report it is understood that the supply to the existing building has been isolated in the valve house though this needs to be verified prior to commencement on site.

The proposed demand for the new unit 1 development is $65\text{m}^3/\text{hr}$ which is expected to be significantly less than the existing demand due to a change in use of the building. It is therefore anticipated that all downstream pipework from the valve house will need to be removed and replaced with a new supply pipe to the proposed building. Modifications may also be required to the existing valve house such as the installation of a governor to control pressures and output.

The location of the existing valve house is shown in the image below.

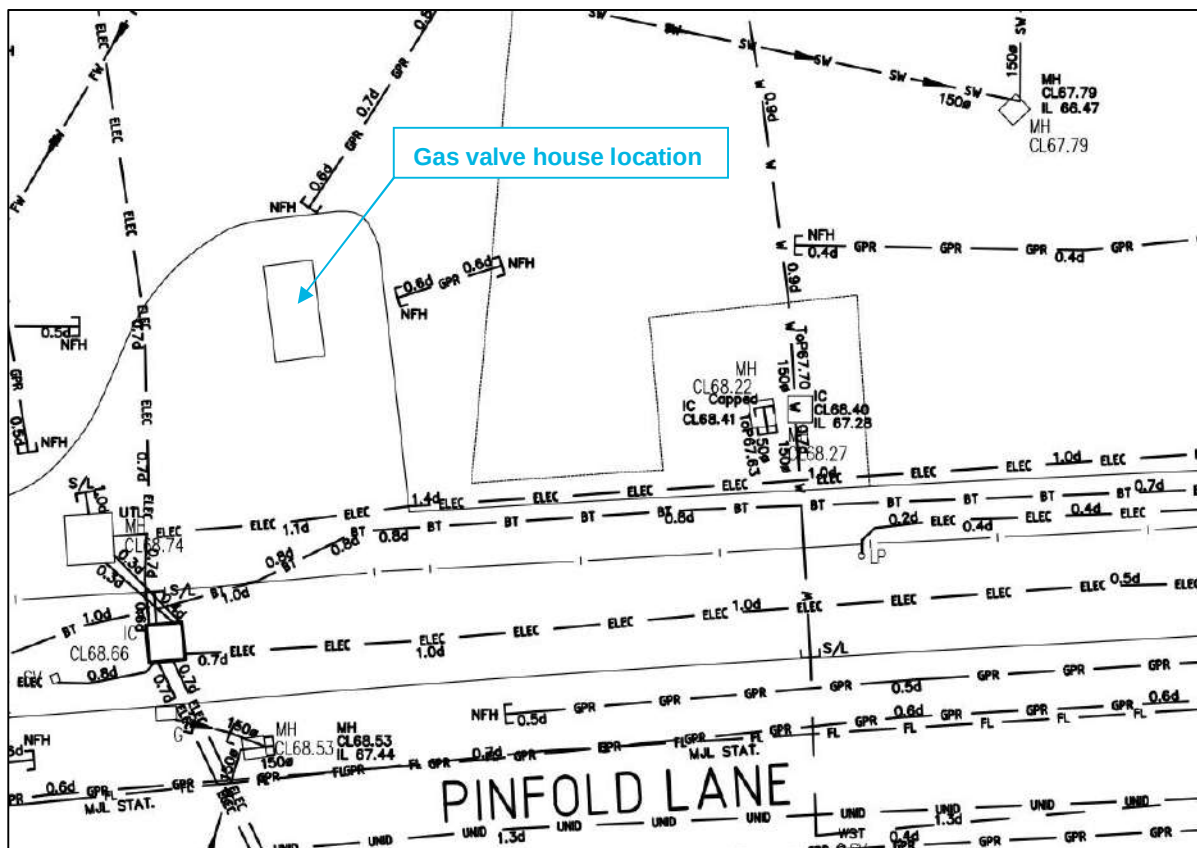


Figure 2 – Existing Gas House Location Plan

3.4 Water

An existing potable water supply is provided to the site via the MAG combined network in Pinfold Lane. The supply comes into the site on the eastern boundary with a valve chamber cited in the verge on the eastern boundary of the existing site. The location of the existing valve chamber is shown in the image below.

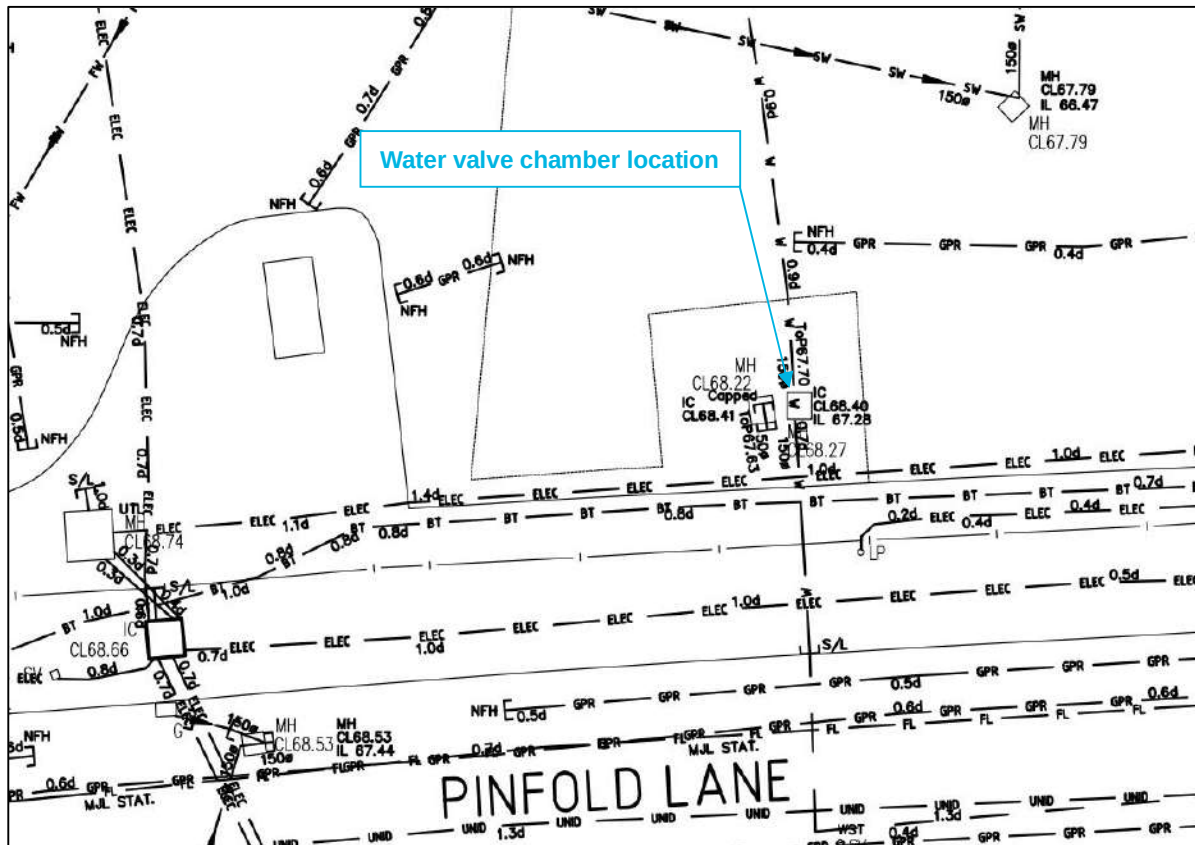


Figure 3 – Existing Water Supply Valve Location Plan

At the time of writing this report it is understood that the supply downstream of this valve chamber to the existing building has been isolated. It is envisaged that all pipework downstream of this valve chamber will be removed with the valve chamber retained. New supply pipework is to be installed off the existing valve to serve the proposed development.

The existing site is not currently serviced by fire hydrants. The existing building has internal hose reels for the purpose of firefighting. To meet current standards and the safeguarding requirements of the airport it is expected that new hydrant provision to the proposed development will likely be required. It is proposed that a new hydrant main is installed from the main distribution main in Avro Way. To meet the requirements of the MAG Asset standards this will need to be installed as a ring main connection with the main starting and terminating at the same distribution main in Avro Way.

A drawing showing the proposed water connection details is provided in Appendix A.1.

3.5 Comms

Comms provision will need to be provided via the BT network in Pinfold Lane. A pit and duct system is present within Pinfold Lane and the existing verge. A new connection will need to be installed from the proposed site pit and duct network to the BT network in Pinfold Lane. An application will need to be made to BT for the connection. It is anticipated that the applications will be made by the future tenants. Note that, depending on tenant requirements, it may be necessary to provide two diverse comms connections points into the site. This is to be confirmed later in the design stages.

3.6 Existing Utilities

The site is currently serviced by a full utilities network supplying both the existing 401 building along with external lighting and the Customer Transport Operations Centre (CTOC) which is cited on the southern portion of the site. The CTOC area has a number of prefabricated buildings including offices and welfare, garages and a bus wash facility. The CTOC site is also serviced by infrastructure such as fuel pumps and chemical tanks. A summary of all services serving the existing site is provided as follows:

Low Voltage (LV supplies)

The existing 401 building had low voltage supplies from an internal panel supplied from the existing HV transformer at Z Substation. This panel is now currently isolated with the tails cut externally at the transformer. The panel itself remains in the building and will need to be removed as part of the demolition.

The CTOC site is serviced via a LV panel that sits externally adjacent to the existing Z sub-station. The LV panel remains live fed off the remaining live transformer at Z sub-station. The following infrastructure is services within the CTOC site from the panel via an underground pit and duct system :

- Street lighting
- Modular welfare + office units to the west of the CTOC site
- Maintenance garage in south west corner of the site
- Karcher bush wash on the southern boundary in the centre of the CTOC site.
- Fuel pump and tank adjacent to Karcher Bus Wash
- Pumping station in south east corner of the site.

There is also an existing fuel pump and tank in the south east corner adjacent to the pumping station which is fed at LV via an offsite supply across Pinfold Lane emanating from airport I substation to the rear of the DNATA facility.

It is understood that all supplies will be disconnected and isolated by MAG prior to the relocation of the CTOC site. It is likely that below ground LV cables will remain within the pit and duct network upon vacant possession of the site. The works contractor should be aware of these and should allow for testing, spiking and removal of all cables as required to facilitate the proposed development.

The existing live external LV panel may be isolated and relocated by MAG however if it is retained it is recommended that this is relocated and resupplied from the new Z Sub-station to provide an LV supply to the site during the development works.

High Voltage (HV) electric

There is an existing network of HV ring mains around the perimeter of the site and within serving Z-sub-station. A detailed scheme for the diversion of these cables and location for proposed routes is provided in Appendix A.2.

Gas

An existing gas supply is present within the site from the Prime 2 network in Pinfold Lane as previously detailed. This is to be retained and amended as required to service the proposed development.

Gas mains on the airport's Prime 2 network also run in the verge along Avro Way immediately adjacent to the site. It is recommended that trial pits are undertaken to confirm the exact locations of these mains prior to any works commencing so as to ensure they are not affected by the proposed works. The proposed site entrance will cross these mains and all works must be agreed with MAG Utilities prior to commencement on site. Protection or diversion works may be required.

Water

The existing 401 building is serviced from the airport owned combined network in Pinfold Lane. This supply is to be retained and amended as required to service the new building.

The CTOC site is serviced via a connection from the United Utilities main in Wilmslow Old Road. It is expected that as part of the relocation works to be undertaken by MAG that this supply will be isolated and abandoned. It is likely that the water supply pipework will remain in the CTOC area at vacant possession. The works contractor must satisfy himself that isolation has occurred at the UU main on the boundary prior to removal of any below ground water infrastructure.

Comms

An existing comms supply is provided via the MAG network in Avro Way running along the western façade of the existing building to supply the office buildings within the CTOC site. It is anticipated that below ground cables will remain following vacant possession.

Drainage

Existing foul and surface water networks are present within the site serving the existing 401 building, external yard areas and the CTOC site. The existing surface water network outfalls to the north west of the site to the MAG network in Avro Way. The outfall pipe is to be retained and reused as the primary outfall for the proposed surface water network. All remaining surface water drainage within the site curtilage including all below ground pipes, manholes, gullies and linear drainage are to be removed or abandoned as required to facilitate the installation of new building foundations and to suit the proposed earthworks strategy. The existing outfall pipe to be retained is highlighted in the image below.

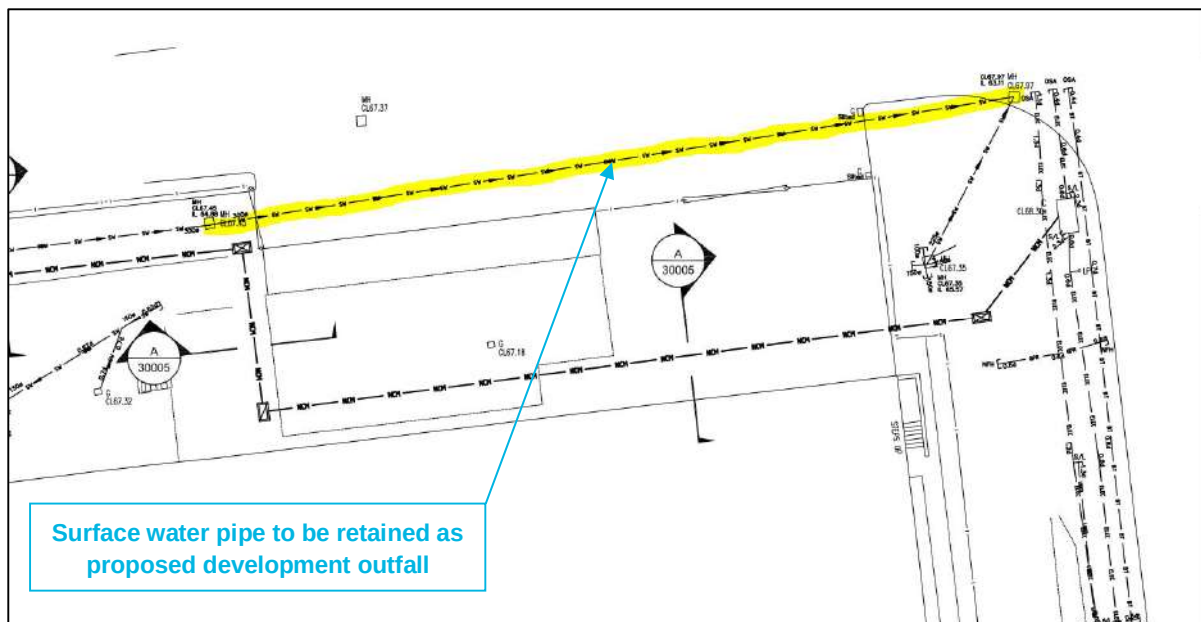


Figure 4 – Existing Surface Water Outfall Pipe

The existing foul network, including manholes, is to be removed or abandoned as required. The existing outfall is to a pumping station in the south east corner of the site. The pumping station should be retained if possible but may need to be relocated dependant on proximity to the proposed building and foundations. Should the pumping

The site plan shows the existing pumping station (highlighted in blue) and the proposed new pumping station (highlighted in green). The plan includes various infrastructure elements such as roads, buildings, and utility lines. Key features include:

- Existing Pumping Station:** Located in the upper left quadrant, indicated by a blue box and arrow.
- New Pumping Station:** Located in the lower right quadrant, indicated by a green box and arrow.
- Proposed Road:** A new road, labeled "Proposed Road", runs diagonally across the site.
- Utility Lines:** Various utility lines are shown, including water mains, sewer lines, and gas lines.
- Buildings and Structures:** Several buildings and structures are depicted, including a large building in the upper right and a smaller building in the lower left.
- Topography:** The plan shows the existing ground surface and proposed grading.

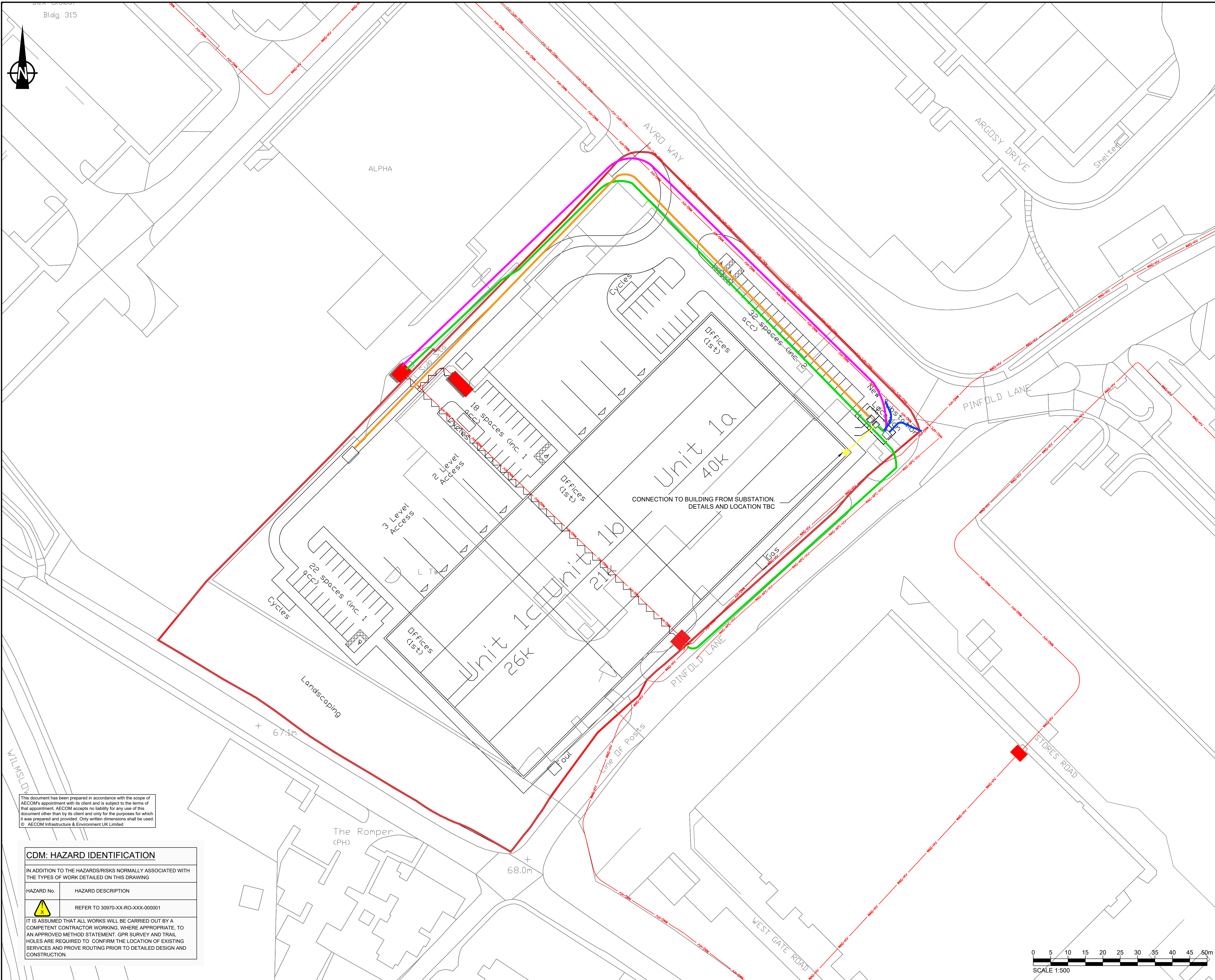
Figure 5 – Existing Foul Pumping Station

4 Proposed Drainage

Refer to AECOM drainage strategy document 60663052-AEC-XX-XX-RP-C-00001 for details of proposed foul and surface water drainage.

Appendices

A.1 Utilities Strategy Drawings



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KEY

- | | |
|---|---|
|  | EXISTING SUB-STATION |
|  | EXISTING HV CABLE ROUTES |
|  | EXISTING HV CABLE ROUTE TO BE ABANDONED |
|  | REPOSITION OF RING F1 TO Z-Z |
|  | CONNECTIONS TO C4 AND FUEL FARM |
|  | REPOSITION OF RING Z-Z TO Z |
|  | PROPOSED LV CABLE |
|  | PROPOSED HV CONNECTION |
|  | SITE BOUNDARY |

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KEY

-  SITE BOUNDARY
-  EXISTING GAS MAIN
-  PROPOSED GAS MAIN
-  EXISTING GAS MAIN TO BE REMOVED

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P2	17/05/19	FOR ISSUE
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BUILDING 401
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SHEET NUMBER

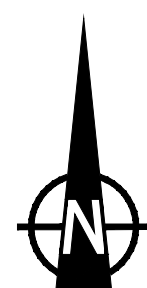
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KEY

-  SITE BOUNDARY
 EXISTING WATER MAIN
 PROPOSED HYDRANT MAIN
 PROPOSED WATER MAIN
 EXISTING WATER MAIN TO BE REMOVED

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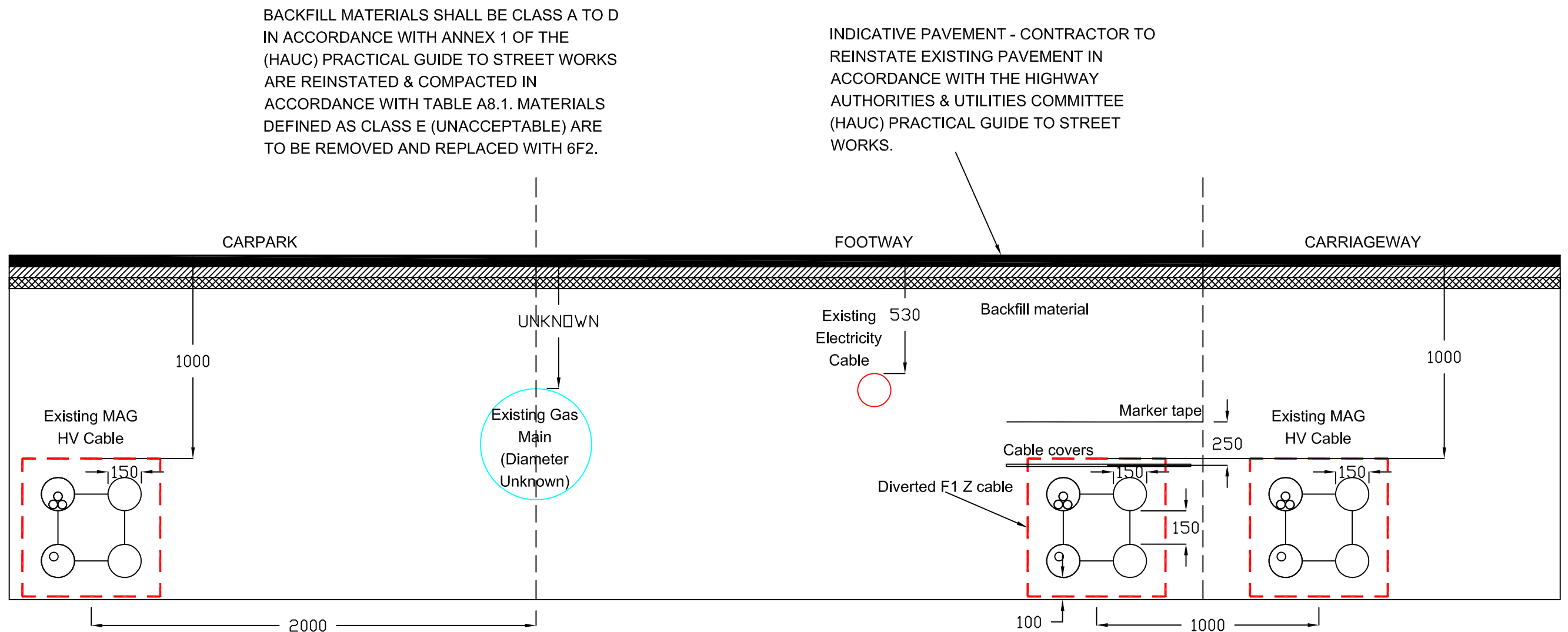
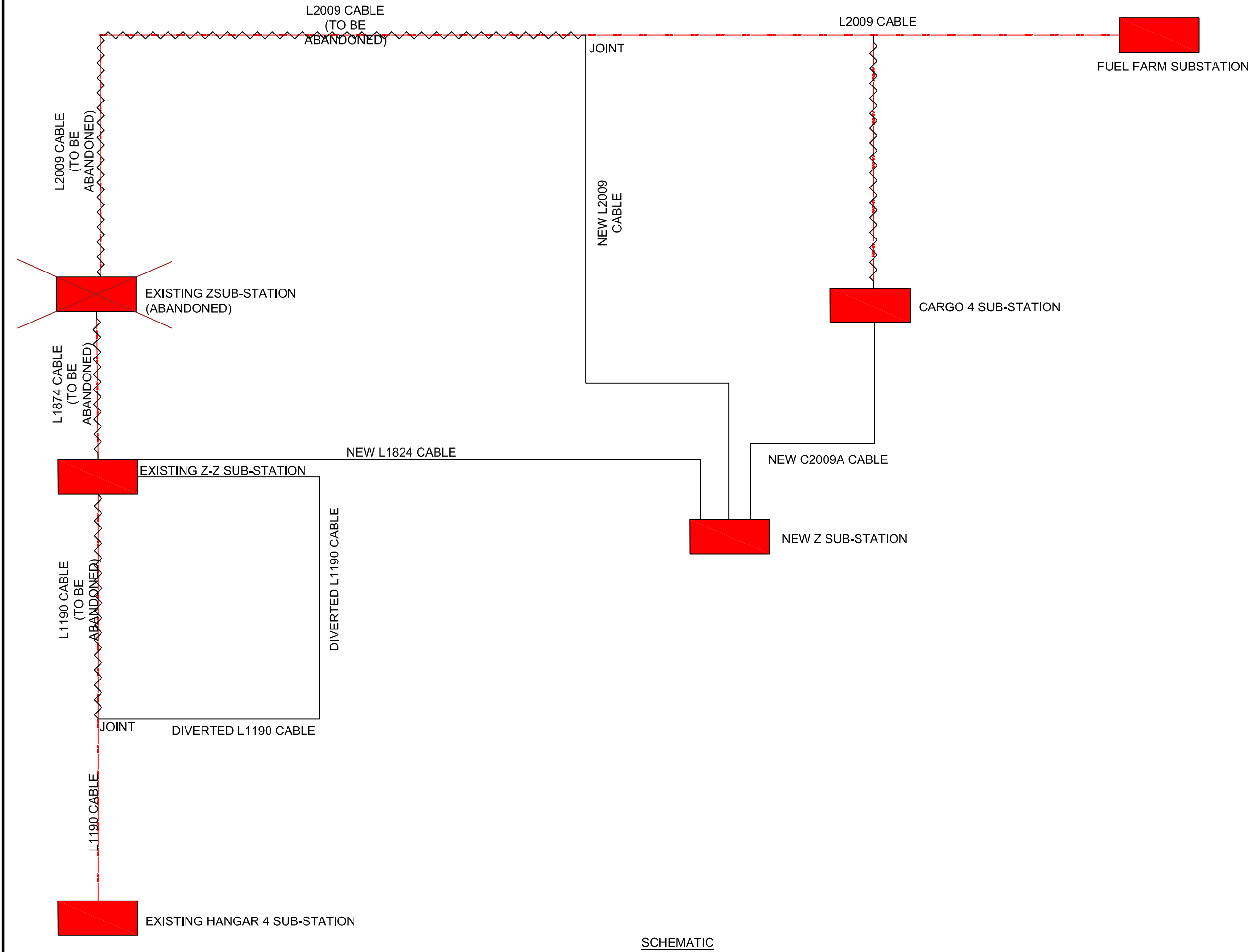
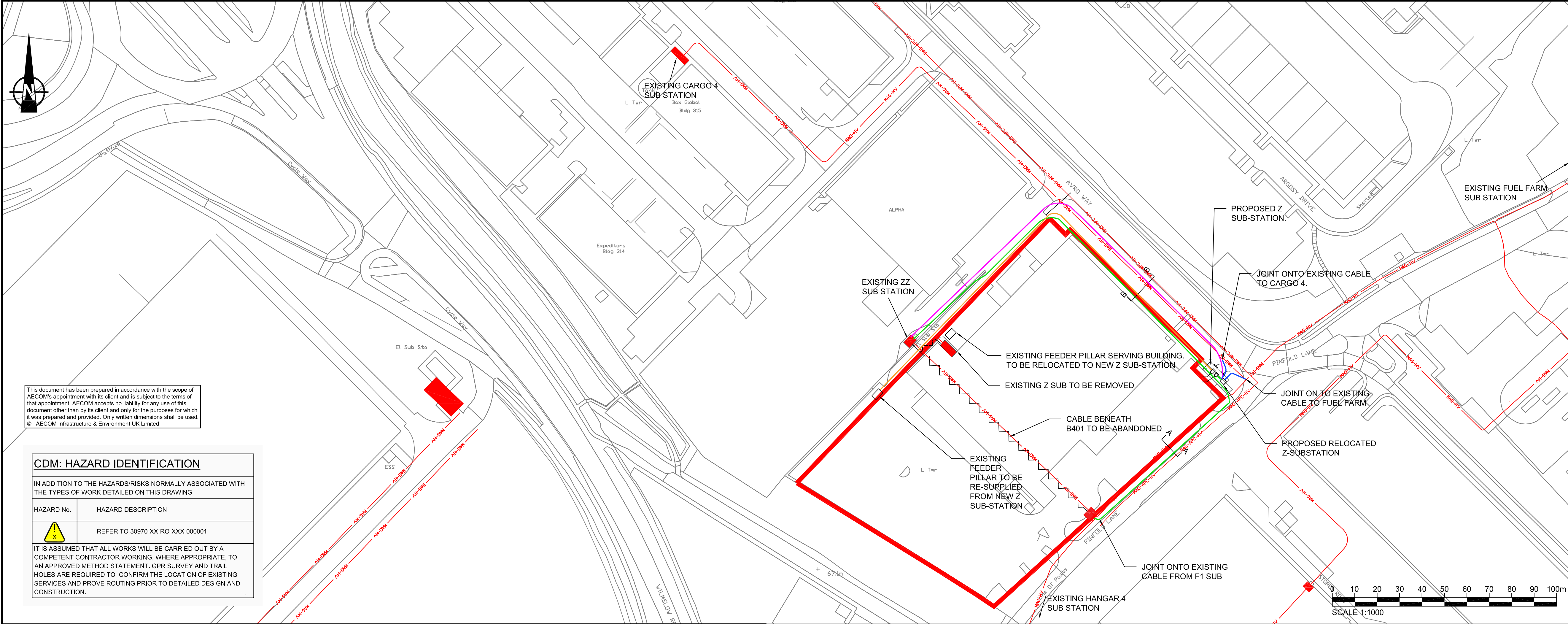
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INSET C

A.2 HV Diversion Drawings



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- EXISTING SUB-STATION
- EXISTING HV CABLE ROUTES
- EXISTING HV CABLE ROUTE TO BE ABANDONED
- REPOSITION OF RING F1 TO Z-Z
- CONNECTIONS TO C4 AND FUEL FARM
- REPOSITION OF RING Z-Z TO Z
- PROPOSED LV CABLE

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P3	21.06.19	FOR TENDER
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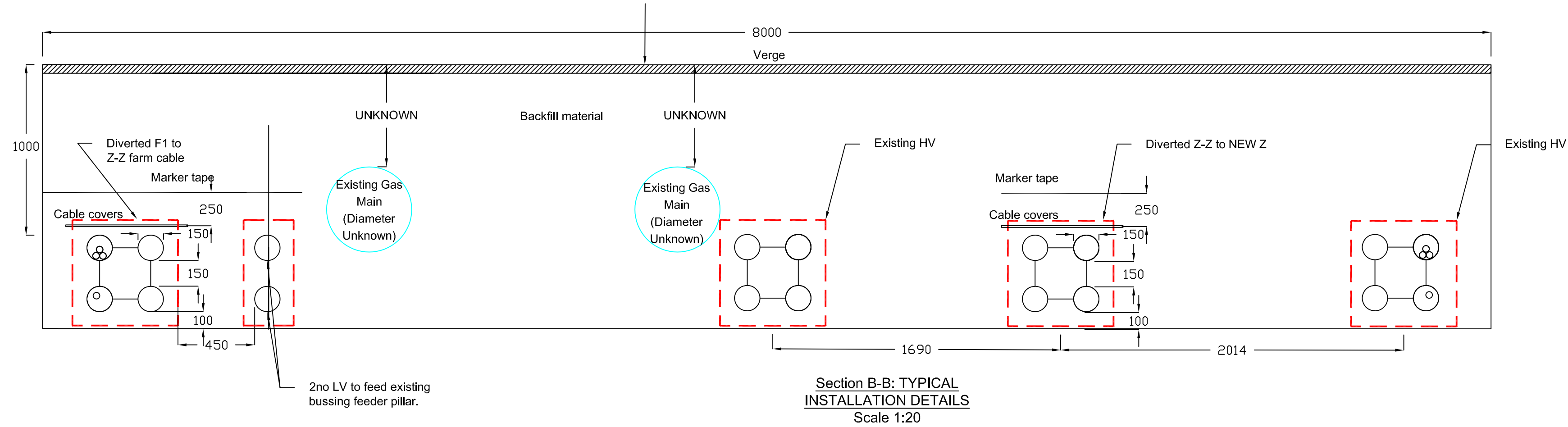
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BUILDING 401
HV DIVERSIONS AND
ABANDONMENTS STRATEGY
SHEET 1 OF 2

60582825-MAN-B401-001

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ISSUE/REVISION

I/R	DATE	DESCRIPTION
P4	15.07.19	FOR TENDER
P3	21.06.19	FOR TENDER
P2	17.05.19	FOR INFORMATION

PROJECT NUMBER

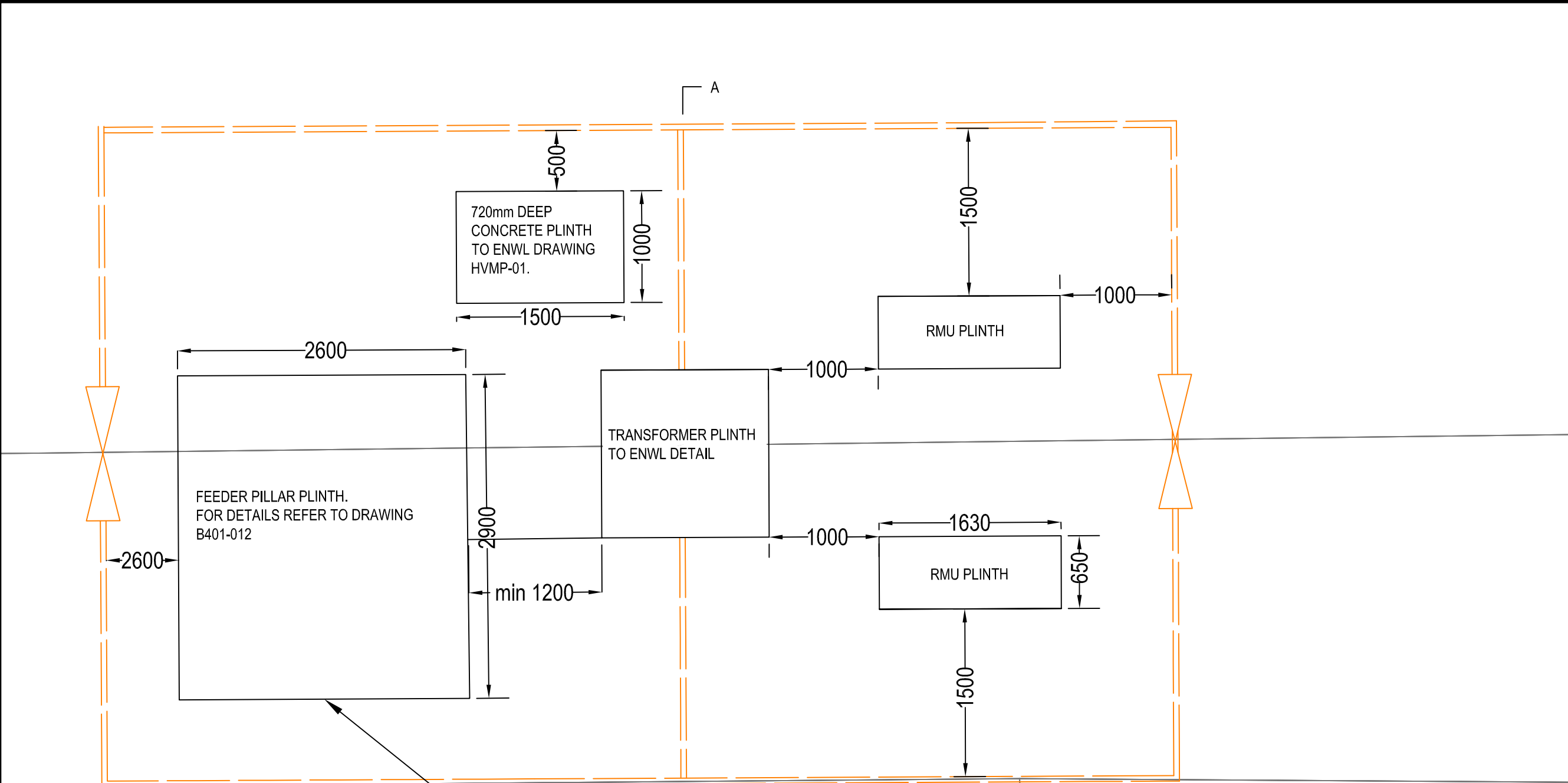
60552028

SHEET TITLE

BUILDING 401
HV DIVERSIONS AND
ABANDONMENTS STRATEGY
SHEET 2 OF 2

SHEET NUMBER

60582825-MAN-B401-002



CDM: HAZARD IDENTIFICATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING

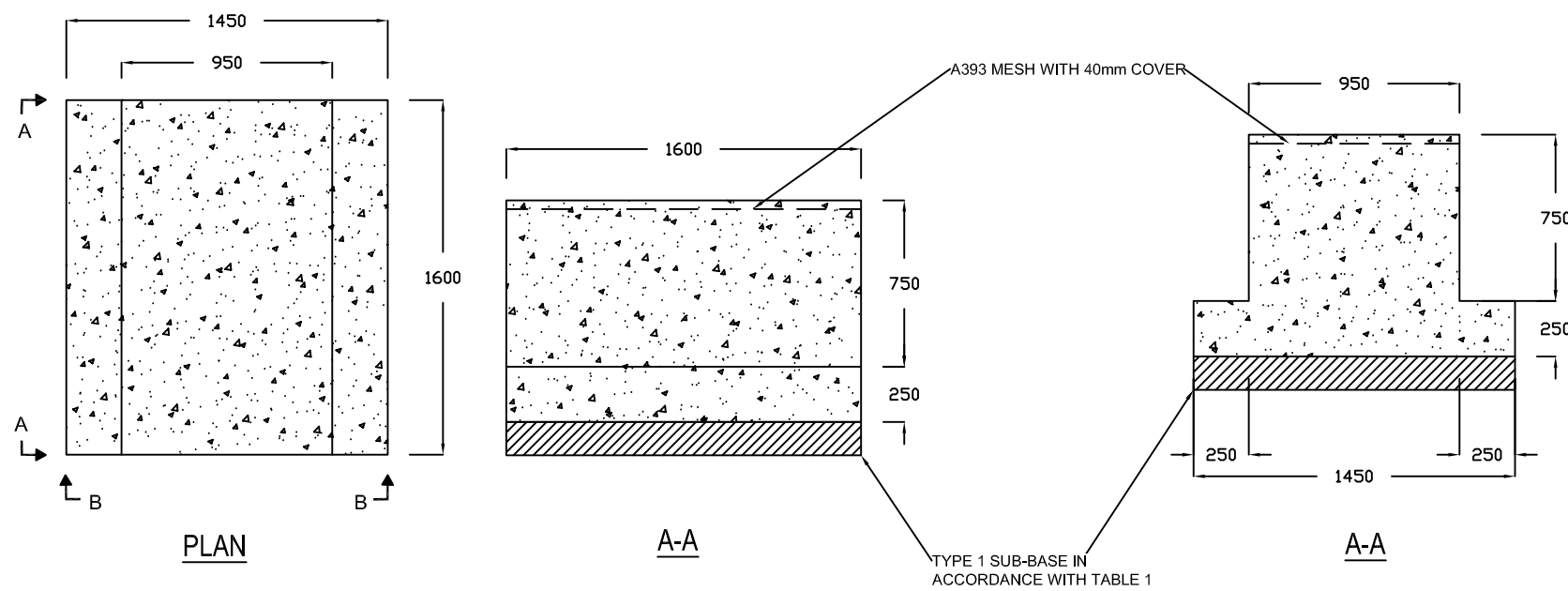
HAZARD No.	HAZARD DESCRIPTION
------------	--------------------

1	REFER TO 30970-XX-RO-XXX-000001
---	---------------------------------

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

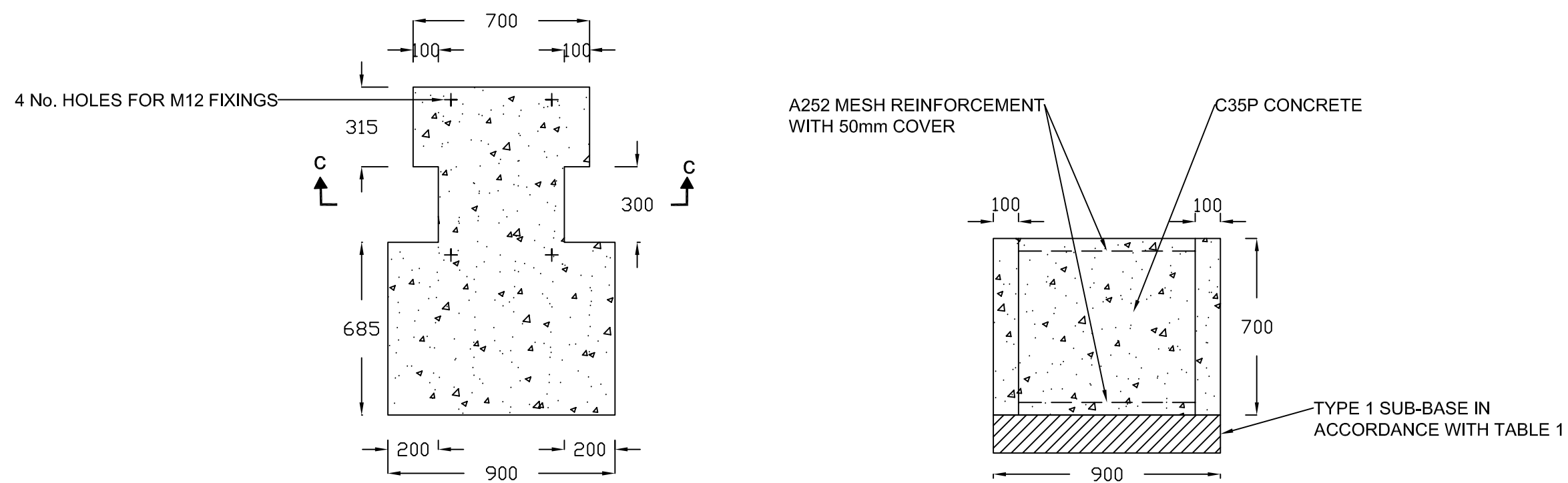
FOR BASE SLAB DETAILS REFER TO DWG 60582825-MAN-B401-012

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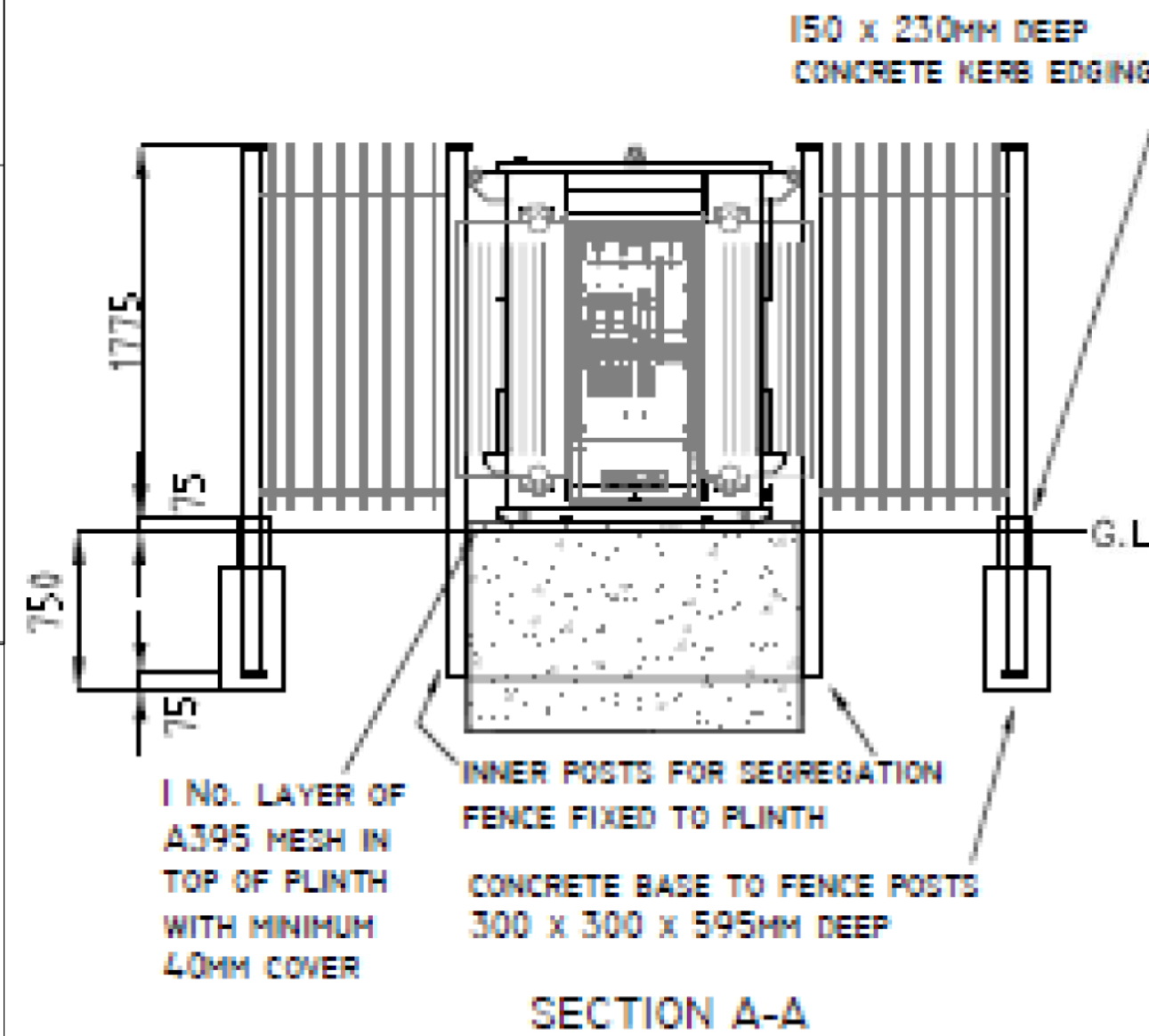
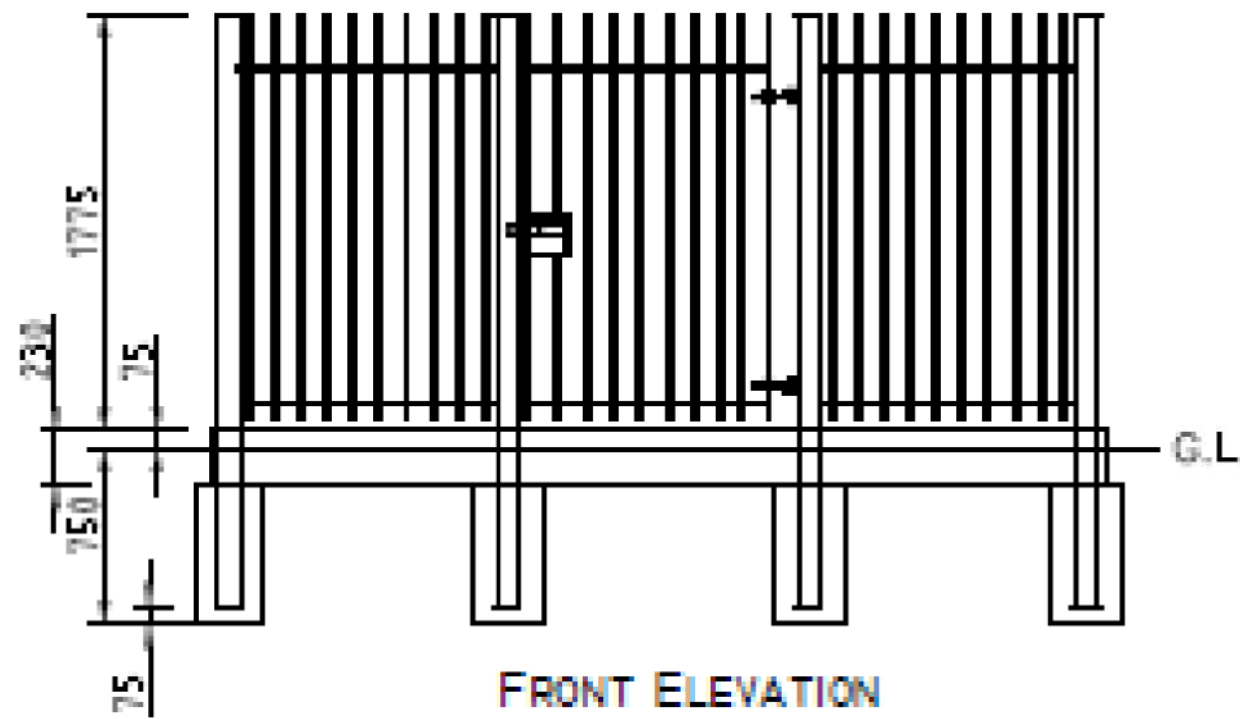


CBR	>5%	<5%	<4%	<3%	<2%	<1%
Sub-Base (mm)	150mm*	165mm	210mm	270mm	365mm	450mm **

STANDARD TRANSFORMER PLINTH DETAILS



RING MAIN UNIT PLINTH



WARNING
GAS AND HV IN CLOSE PROXIMITY TO PROPOSED COMPOUND REFER TO SERVICES DRAWING

WARNING
CONTRACTOR IS TO VERIFY PROPOSED LAYOUT AND DETAILS WITH ENWL

NOTES:

Fencing

Fencing to be galvanised palisade type to a minimum height of 1.8mtrs. all sides to be detachable with the posts concreted in the ground.

Gates

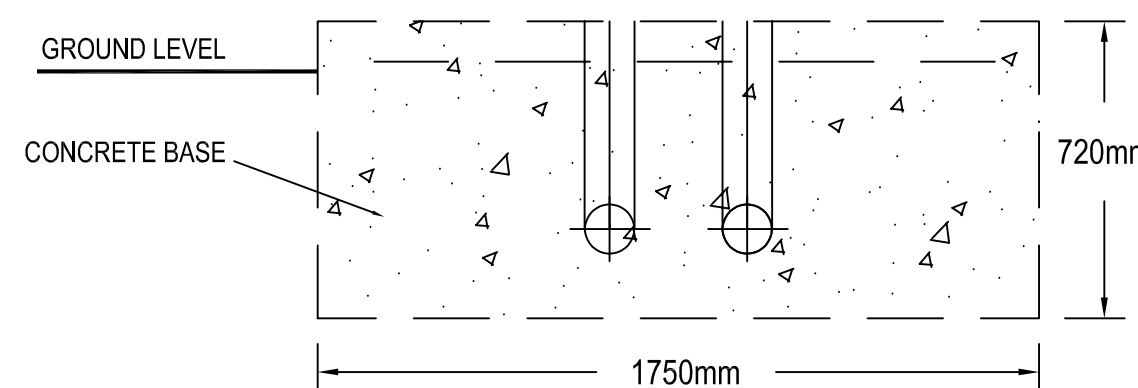
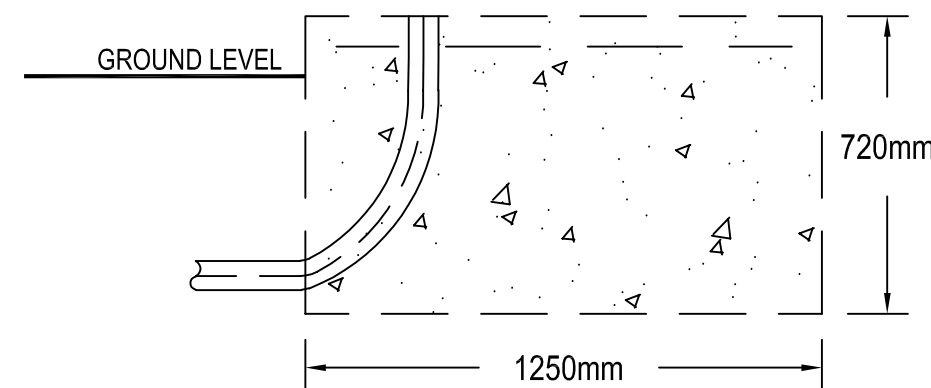
Gates must be hinged outwards & fitted with sliding bars to accept electricity north west standard padlocks. The gates to be fitted with long handled drop bolts with provision to hold the gates in the open position.

Compound:

Area within the substation compound and 1m all around the fencing should be flat & level. Remove topsoil and all other vegetation matter within compound. Contractor to backfill compound after casting of plinth and ring beam to leave a maximum drop in level of 400mm to avoid issues associated with working at height and deep excavations. After cables are installed backfill and blind the area with coarse sand & finish with 75mm layer of 20mm stone chippings. Top of chippings to be 50mm below transformer plinth base, concrete kerb edgings are to be installed around the perimeter to hold in chippings.

Plinth:

Plinths to stand 50mm proud of surrounding levels. Mass concrete base to be 1:2:4 mix of ordinary portland cement 30N/mm, (28days) 1000mm deep. 1 No. Layer of A395 Mesh in top of plinth with minimum 40mm cover. 20mm aggregate shall be placed & compacted within adequate form-work to ensure that the surfaces are true to plane with level fair face trowel finish. No drilling to take place within 28days of casting. No percussion drills to be used. Only rotary drills. Do not over-tighten bolts.



STANDARD METER HOUSING PLINTH DETAILS

AECOM

PROJECT

B401 DEMOLITION MANCHESTER AIRPORT

CLIENT



CONSULTANT

AECOM Manchester
Bridgewater House, Whitworth Street,
Manchester, M1 6LT
0161 907 3500 tel 0161 907 3599 fax
www.aecom.com

KEY

NOTES

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- IF RECEIVED ELECTRONICALLY, IT IS THE RECIPIENT'S RESPONSIBILITY TO PRINT TO THE CORRECT SCALE. ONLY WRITTEN DIMENSIONS SHALL BE USED.
- ORIENTATION AND DETAILS OF HV EQUIPMENT ARE TO BE CONFIRMED BY ENWL.
- DETAILS OF GRP ENCLOSURE ARE TO BE PROVIDED TO ENWL BY THE CONTRACTOR FOR APPROVAL.

LOCATION PLAN



ISSUE/REVISION

P3	15.07.19	FOR TENDER
P2	21.06.19	FOR TENDER
P1	02.04.19	FOR INFORMATION
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60552028

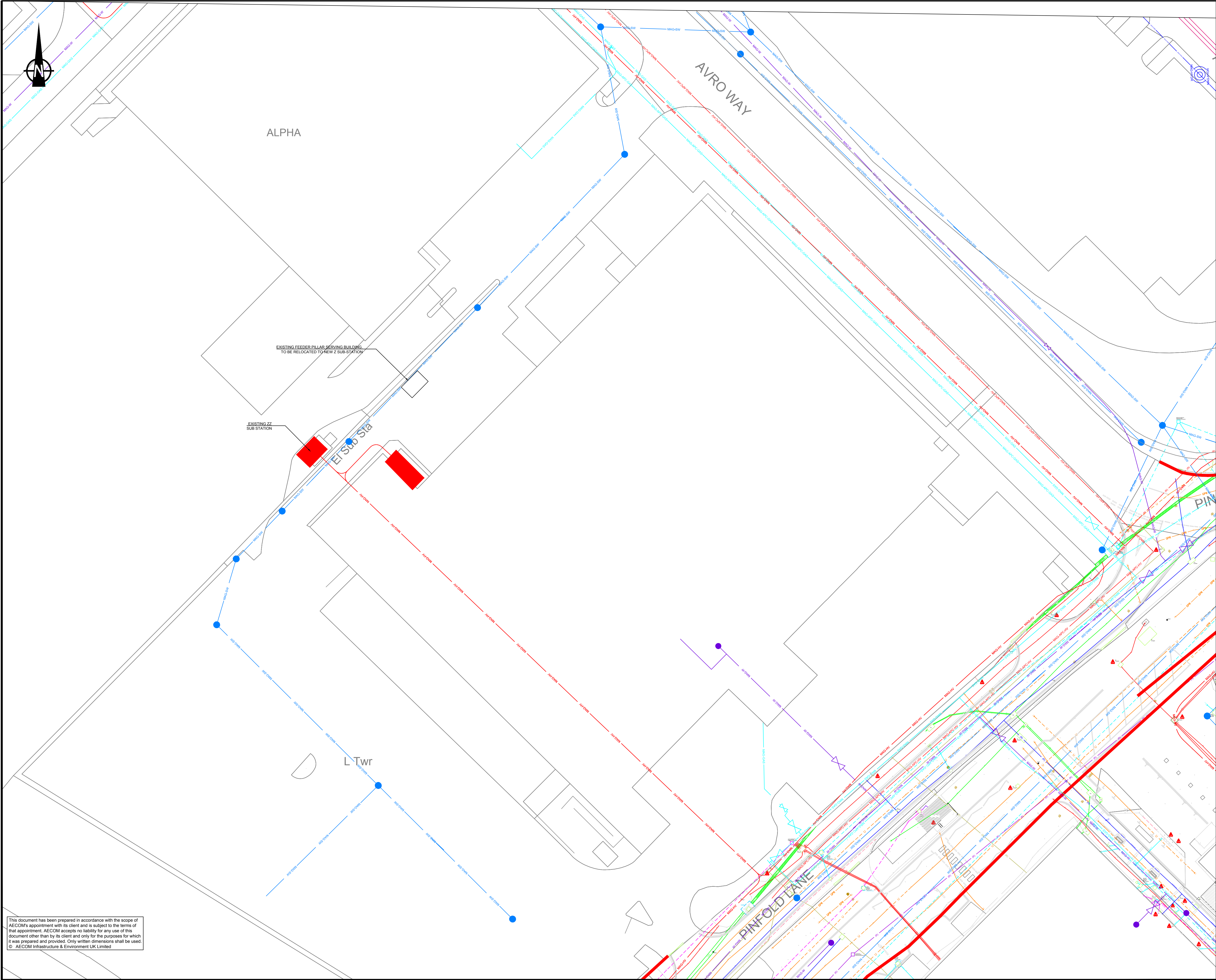
SHEET TITLE

BUILDING 401 DEMOLITION
NEW Z SUB-STATION

SHEET NUMBER

60582825-MAN-B401-003

A.3 Existing Combined Services Drawings



AECOM

PROJECT

B401 DEMOLITION
MANCHESTER
AIRPORT

CLIENT



CONSULTANT

AECOM Manchester
Bridgewater House, Whitworth Street,
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0161 907 3500 tel 0161 907 3599 fax
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KEY

- EXISTING MAG HV
- EXISTING GAS MAIN
- EXISTING MAG SURFACE WATER
- EXISTING ELECTRIC CABLE (ADIEN)
- EXISTING GAS MAIN
- UNKNOWN TRACE (ADIEN)
- EXISTING SURFACE WATER (ADIEN)
- EXISTING TELECOMS (ADIEN)
- EXISTING GAS MAIN (ADIEN)
- EXISTING WATER MAIN

NOTES

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ISSUE/REVISION

T2	15.07.2019	FOR TENDER
T1	26.06.2019	FOR TENDER
P2	17.05.2019	FOR ISSUE
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60552028

SHEET TITLE

BUILDING 401
EXISTING SERVICES

SHEET NUMBER

60582825-MAN-B401-005

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PROJECT

Manchester Airport
Transformation
Programme

CLIENT

MANCHESTER
AIRPORTS GROUP

4th Floor
Olympic House
Manchester Airport
M90 1QX

CONSULTANT

AECOM Infrastructure & Environment UK Ltd
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Fax: +44 (0)1925 858 769
www.aecom.com

NOTES

1. Do not scale from this drawing.
2. All levels are in metres AOD unless stated otherwise.
3. Locations of existing United Utilities water supply pipe currently unknown.
4. Flow rates determined in accordance with BS EN 12056 - 2 : 2000 and BS EN 752:2008

ISSUE/REVISION

1	17/02/2017	AWS2 Application
VR	DATE	DESCRIPTION

APPROVALS

Drawn By	Signed
Jake Humphreys	
Checked By	Signed
Kevin Sellars	
Approved By	Signed
TBC	

SCALE

Not to Scale @ A0

PROJECT NUMBER

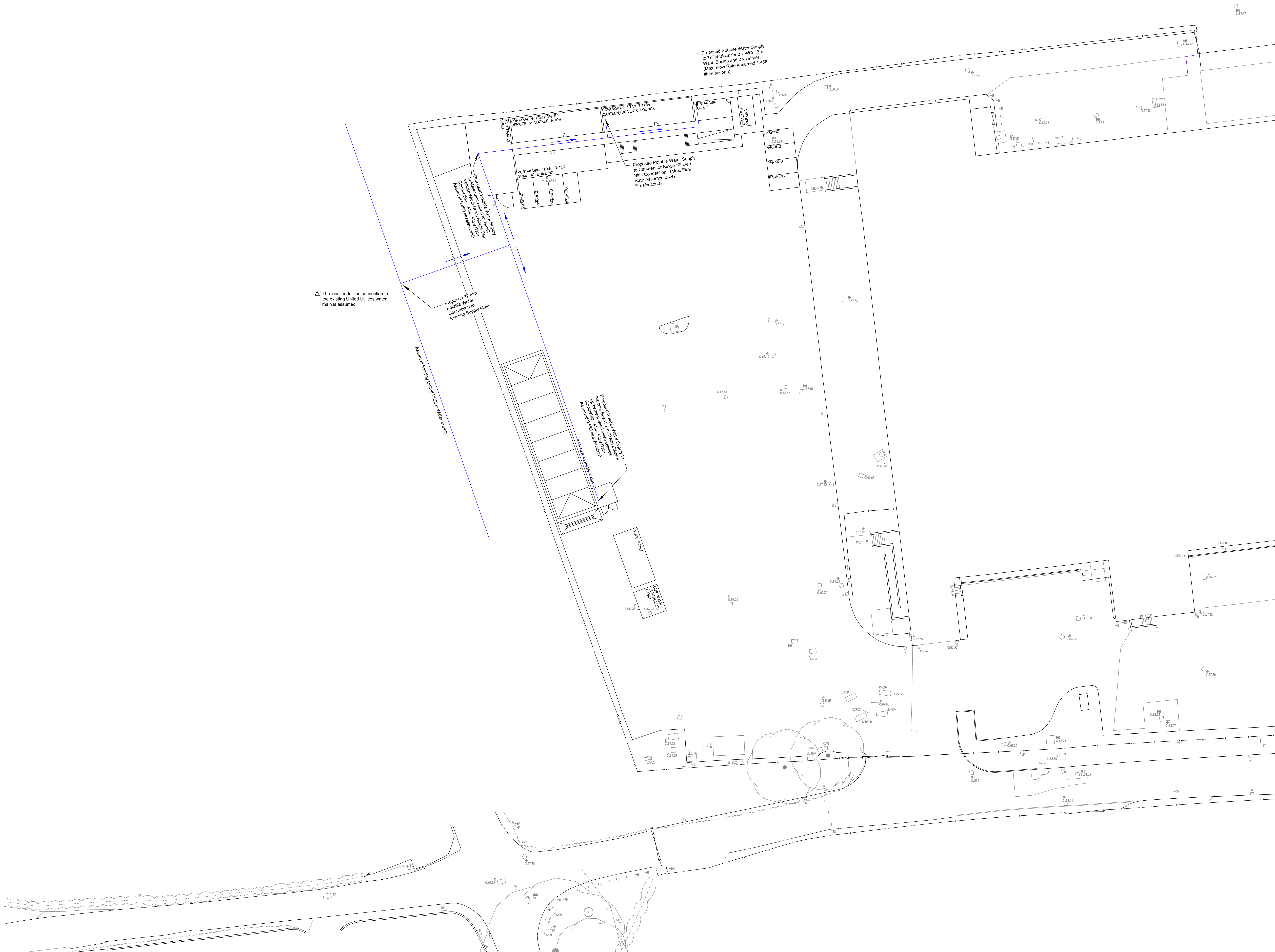
60XXXXXX

SHEET TITLE

PP14 Landside Bussing Relocation
Scheme -
Proposed Potable Water Layout

SHEET NUMBER

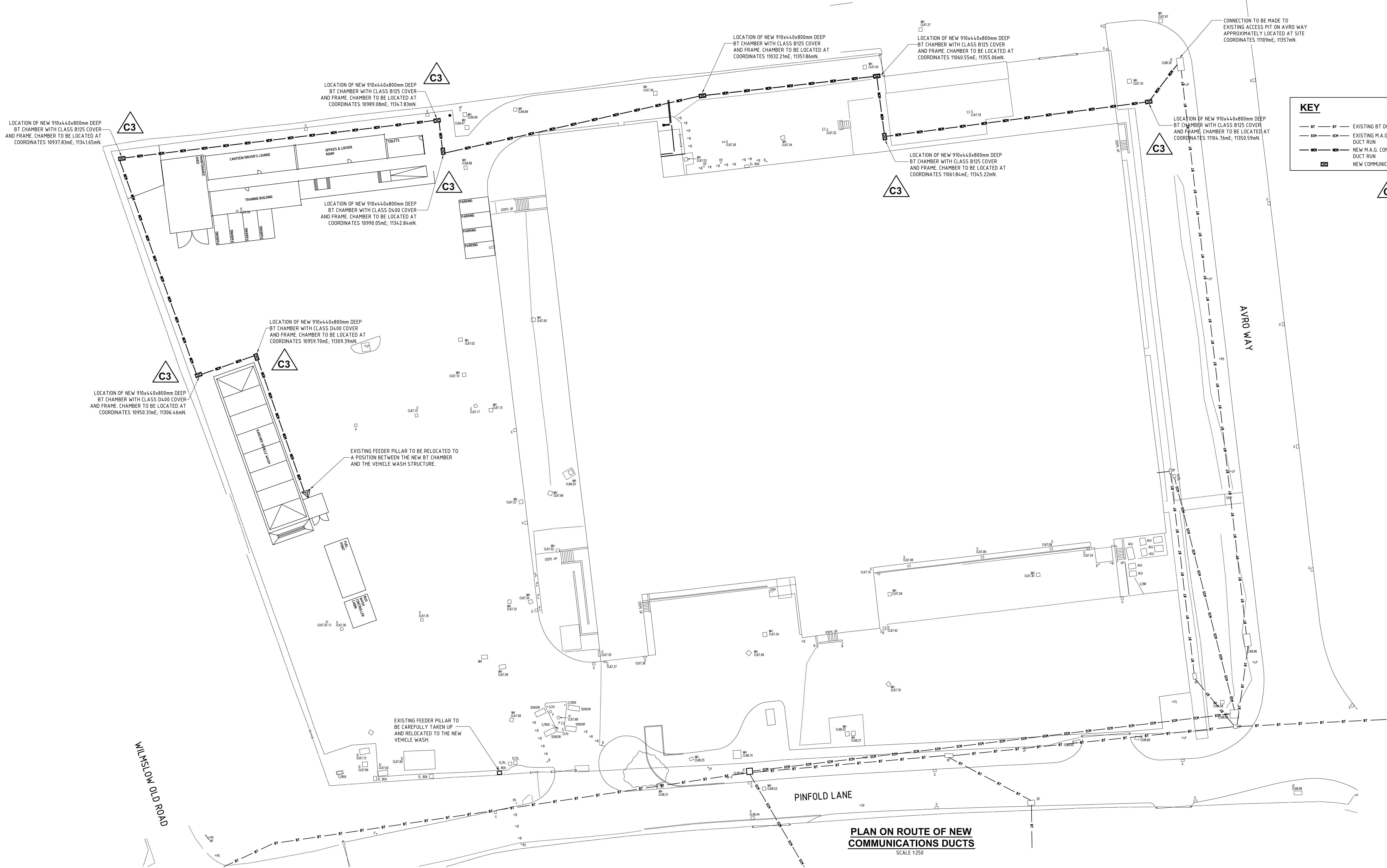
60XXXXXX-ACM-00-XX-DR-C-1002



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NO	DATE	DESCRIPTION
C3	22/03/2017	CONSTRUCTION ISSUE
C2	16/03/2017	CONSTRUCTION ISSUE
C1	10/03/2017	CONSTRUCTION ISSUE
VR	DATE	DESCRIPTION

Drawn By	Jake Humphreys
Checked By	Kevin Sellars
Approved By	Vin Bamford



PLAN ON ROUTE OF NEW
COMMUNICATIONS DUCTS
SCALE 1:250

EXCAVATED SURFACING TO BE MADE GOOD IN
LINE WITH HAUL SPECIFICATION METHOD A,
APPENDIX A3.3. LAYERS ARE TO BE AS FOLLOWS:
• SURFACE: 40mm HRA 35/14 Surf 40/60 des.
• BINDER: 60mm HRA 50/20 F bin 40/60
• BASE: 90mm HRA 50/20 F bin 40/60

COVER AND FRAME TO BE
BEDDED ON TYPE (i) MORTAR
AS DESIGNATED IN MORTAR
TABLE 1 OF BS 5628.

CARRIAGEWAY NO.4 (CLASS D400) FRAME AND COVER TO BE SET ON A
MORTAR BED AND FITTED SQUARELY TO BOX STRUCTURE TO HIGHWAY
AGENCY DOCUMENT STANDARDS HA104. BT ITEM CODE 057246 FRAME &
COVER CARRIAGEWAY 4E. BT ITEM CODE 057250 FRAME & COVER
CARRIAGEWAY 4E. LOCKABLE LIFTING KEYS FOR THIS COVER CAN BE
PURCHASED FROM: TW ENGINEERING, ANGULAR HOUSE, EAGLE ROAD,
QUARRY HILL INDUSTRIAL PARK, ILKESTON, DERBYSHIRE DE7 4RB. TEL:
0115 932 3223 - DESCRIPTION: LIFTER MANHOLE COVER 4B.

EXISTING MACADAM
CARRIAGEWAY SURFACING

BACKFILL TO BE NOT TYPE 1 MATERIAL
COMPACTED IN LAYERS OF 150mm MAX.

VOIDS AROUND THE DUCTS ARE TO BE FILLED
WITH EXPANDABLE FOAM AND SEALED TO
INTERNAL AND EXTERNAL FACES WITH 20mm
THICK OF POLYURETHANE SEALANT MATERIAL.

WHERE THE DUCT ENTERS THE CHAMBER THE DUCT
SHALL ENTER FLUSH WITH THE WALL. DUCT MUST NOT
ENTER THROUGH CORNERS AND BE NO LESS THAN 75mm
FROM THE SIDE WALL. DUCT TO ENTER WALL 600 mm
MINIMUM DEPTHS FROM TOP OF FRAME. DUCT TO CLEAR
BASE BY 100mm MINIMUM.

910x440x800mm DEEP BT APPROVED
PRE-CAST CONCRETE CHAMBER BOX WITH
INTEGRAL METAL BRACKETS AND STEP IRON

100mm THK LAYER OF WELL
COMPACTED NOT TYPE 1 MATERIAL
AS FOUNDATION TO NEW CHAMBER.

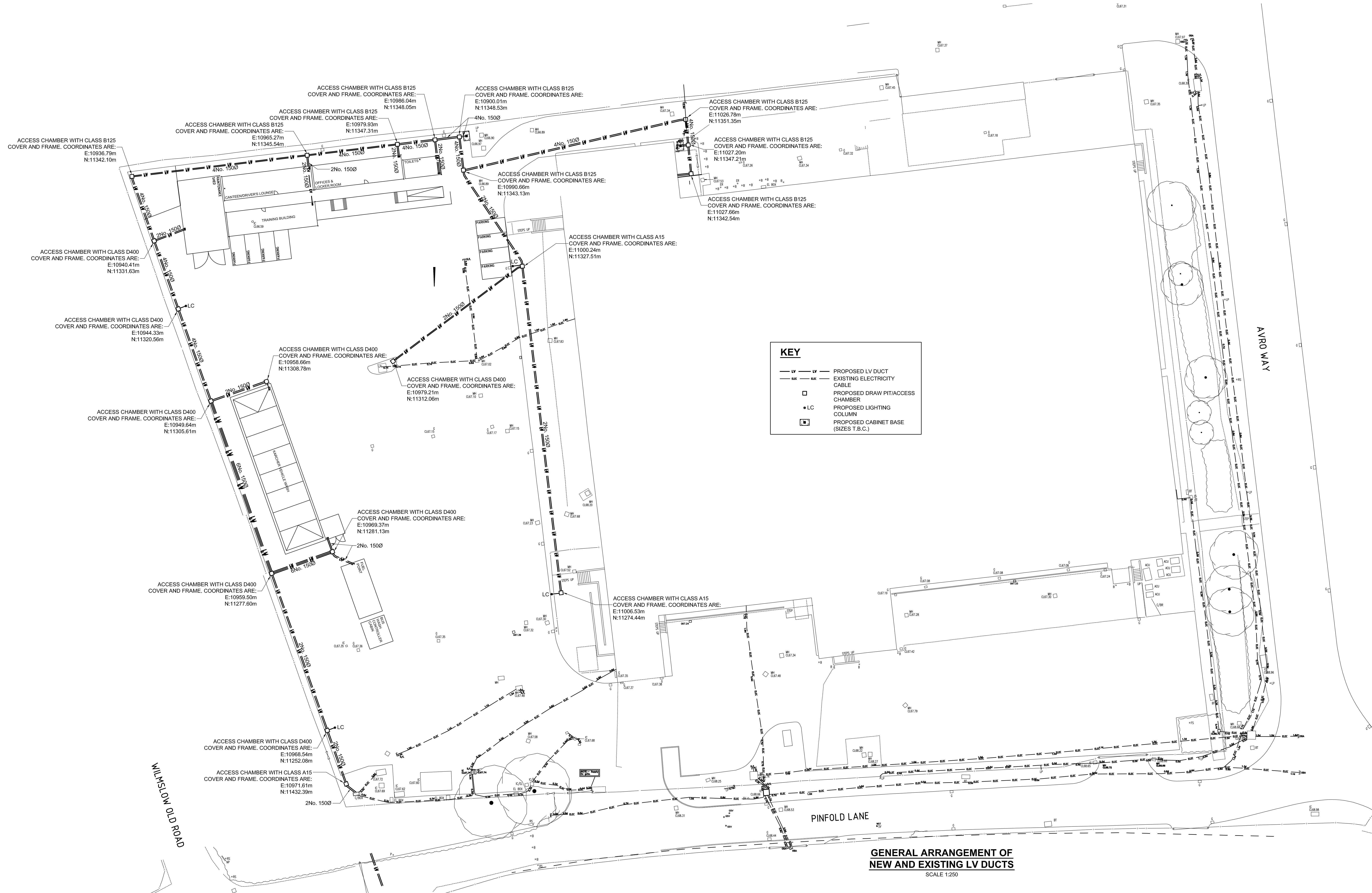
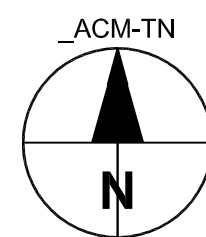
50mm THK LAYER OF
BLINDING SAND

CONCRETE TO BE GRADE 32/40 TO BS EN 206 WITH A SINGLE
LAYER OF A393 GRADE MESH AT 70mm COVER FROM THE TOP
OF THE SLAB. CEMENT TO BE PORTLAND CEMENT TO BS 12.

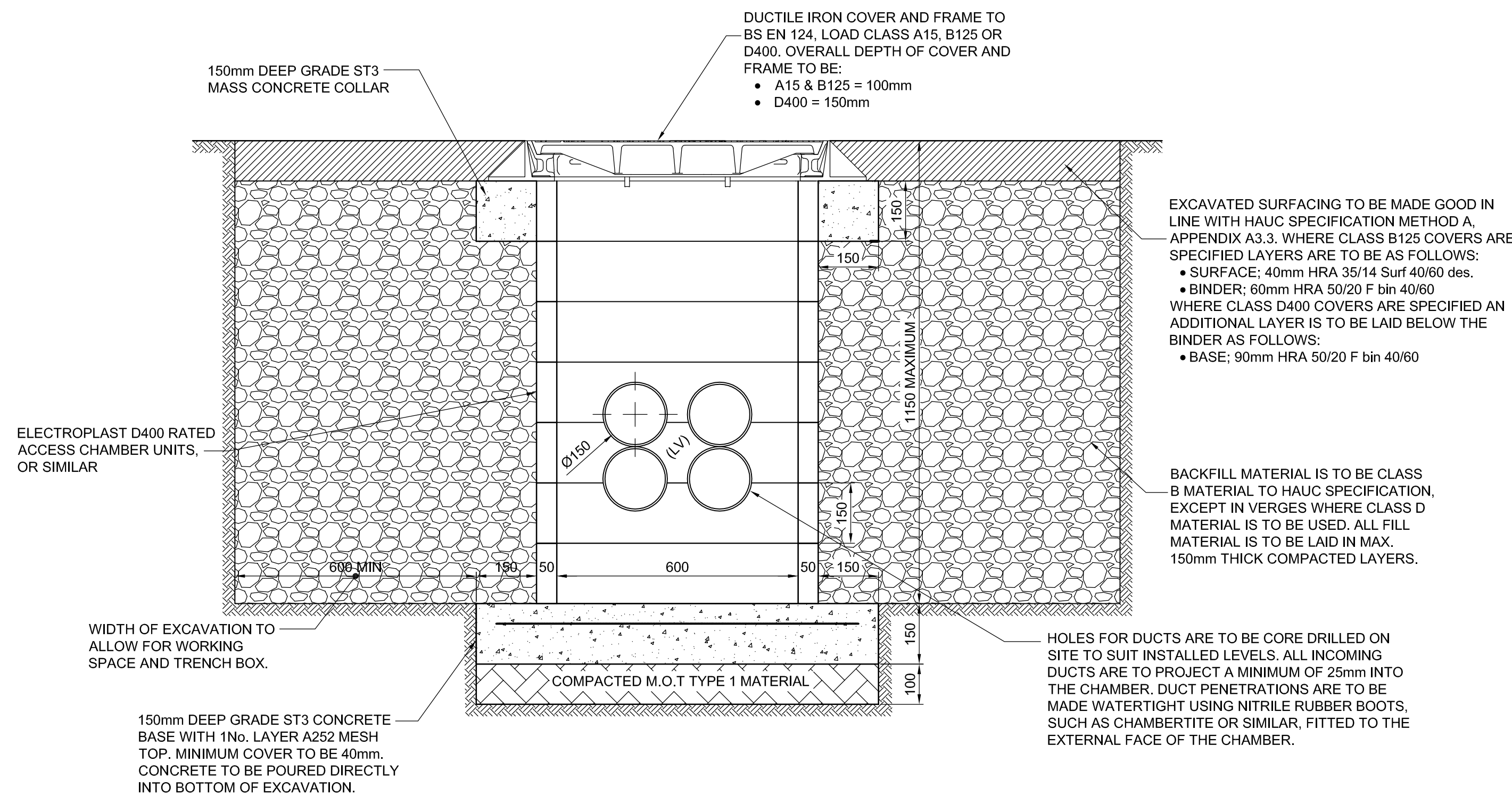
TYPICAL CROSS SECTION THROUGH
NEW BT ACCESS BOX
SCALE 1:10

C3

TRENCH DETAILS MOVED TO DRAWING 60537992-ACM-00-00-DR-C-30005

GENERAL ARRANGEMENT OF
NEW AND EXISTING LV DUCTS

SCALE 1:250

TYPICAL SECTION
THROUGH DRAW PIT

SCALE 1:10

ISSUE/REVISION

IR	DATE	DESCRIPTION
C1	23/03/2017	CONSTRUCTION ISSUE

APPROVALS

Drawn By	Kevin Sellers
Checked By	Jake Humphreys
Approved By	Marin Ellis

SCALE

1:250 @ A0

PROJECT NUMBER

60537992

SHEET TITLE

PP14 Landside Bussing Relocation
Scheme -
LV Ducts G.A. & Details

SHEET NUMBER

60537992-ACM-00-00-DR-C-30003

1. All work is to be undertaken in accordance with the Specification for Highway Works, BS EN 1610, and all contract drawings.
2. All dimensions are in millimetres. All levels, chainage and co-ordinates are in metres unless otherwise stated.
3. All contractors shall be responsible for the correct setting out of the works on site.
4. Copyright of this drawing is vested in AECOM and it must not be copied or reproduced without written consent. Figured dimensions only are to be taken from this drawing, do not scale off this drawing... if in doubt ask.
5. The position of all existing service routes has been taken from the 'Survey and Engineering Projects' drawing S13680.
6. At manholes all connections shall have level soffits unless noted otherwise in the manhole schedule.
7. All pipes are to be vitrified clay with flexible joints in accordance with BS EN 205 and CESW clause 2.132. Strength classes are as follows:
1000 & 1500 = FN40
8. All drains are to be laid with a class S bed and surround generally. Drains beneath the highway with less than 1.2m cover to soffit, or under footpaths with less than 0.9m cover, should be laid with a class Z concrete bed and surround.
9. All in situ concrete to be used below ground to pipes and manholes should be grade ST4 to suit sulphate conditions. All in situ concrete to be used below ground for linear drainage systems is to be as specified by the system manufacturer.
10. On completion of the works all surface water drains shall be CCTV surveyed.
11. Locations and levels of connections to existing sewers are to be checked on site by the contractor prior to commencing works. Anomalies are to be reported to the Engineer immediately.
12. Forecourt separators are to be Condor, Klargester, or similar approved, and are to be Class 1 with level alarm and shall be compliant with BS EN 858-1 and the Environment Agency's PP253. Washdown separators are to be Condor, Klargester, or similar approved and shall be Class 2.
13. Include for provision of all ducting required to provide supply and allow communication systems to interceptors.
14. All pipes are to be laid invert to invert unless indicated otherwise on the manhole schedule dwg 60537992-ACM-00-00-DR-C-30000.
15. All new linear drainage channels are to be ACO RoadDrain 200, or similar approved. Outlets from the linear drainage systems shall be via sump units manufactured specifically for the drainage units being installed. All units shall be able to withstand Class D400 loading minimum and shall be installed in line with the manufacturers details.
16. This drawing is to be read in conjunction with the following drawings:-
60537992-ACM-00-00-DR-C-30008
60537992-ACM-00-00-DR-C-30009
17. This layout has been designed in accordance with Jacobs Documents
MAN205-JAC-Z-0000-XXX-DC-SP-906-001 | F,
MAN200-JAC-D-0000-XXX-DC-SP-800-001 | A and Approved Document H.
18. An allowance for climate change of 10% has been used in accordance with Jacobs Document
MAN200-JAC-D-0000-XXX-DC-SP-800-001 | A
19. The design is based on no flooding of the building or neighbouring plots during a 100 year return period.
20. RWP positions are taken from Portakabin latest drawings.

ISSUE/REVISION

NO	DATE	DESCRIPTION
C1	31/03/2017	CONSTRUCTION ISSUE
1/R	DATE	DESCRIPTION

APPROVALS

Drawn By	Kevin Sellers
Checked By	Jake Humphreys
Approved By	Marin Ellis

SCALE

1:200 @ A0

PROJECT NUMBER

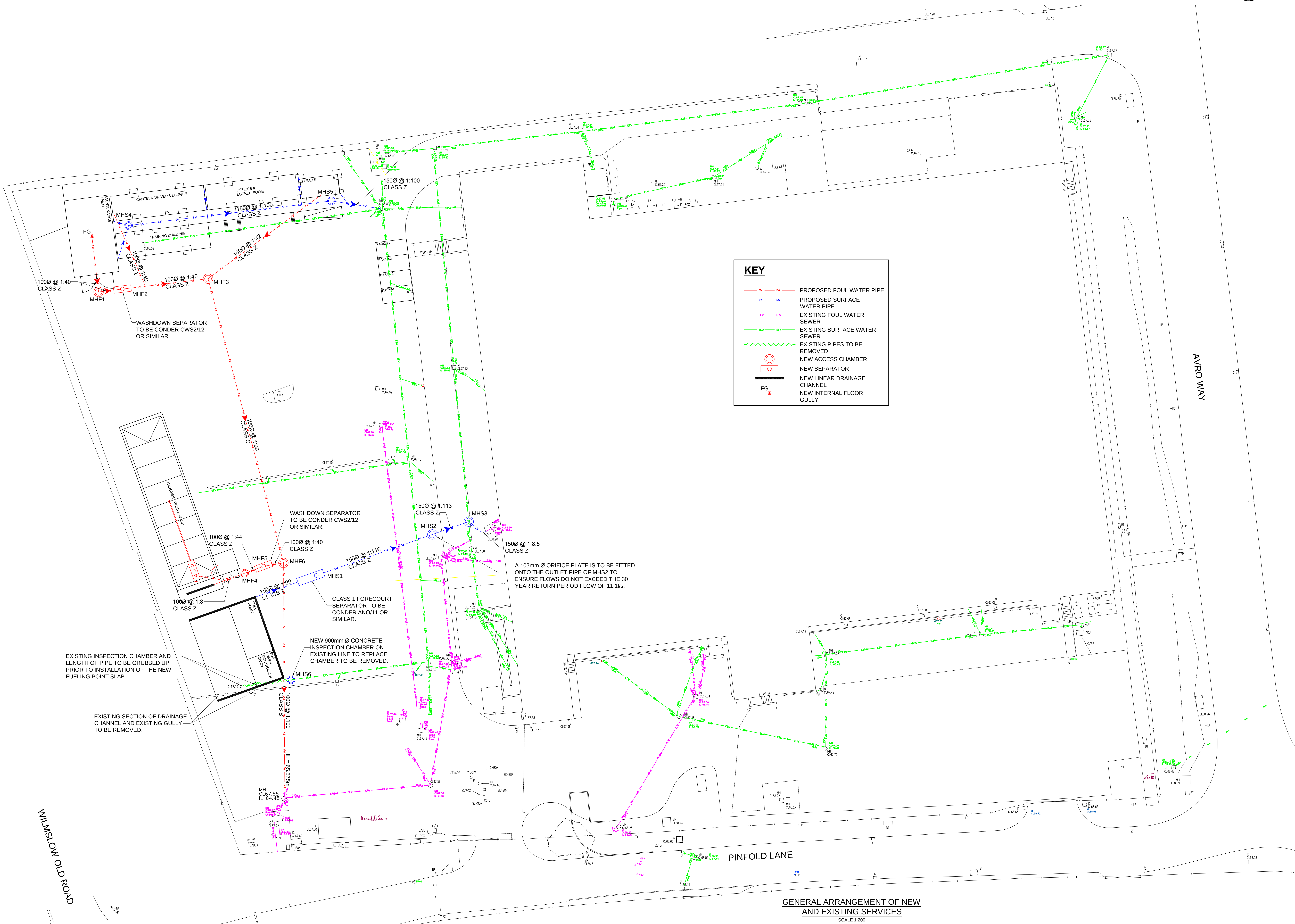
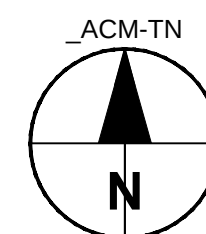
60537992

SHEET TITLE

PP14 Landside Bussing Relocation
Scheme -
Drainage General Arrangement

SHEET NUMBER

60537992-ACM-00-00-DR-C-30007

GENERAL ARRANGEMENT OF NEW
AND EXISTING SERVICES

SCALE 1:200

A.4 Loading Calculations

Project: Building 401 - 60663052

Electrical Load Estimate Schedule - Unit 1a 1b and 1c

				Connected Load		Max demand Load			
Item	Floor Area (m ²)	W/m ²	Total Power (Watts)	Total Power (kW)	Total Power (kVA)	Diversity Factor	Total Power (kVA)	Total Power (A/phase)	
<u>Warehouse</u>									
Lighting	7650	3	22950	23	24	0.9	22	31	
Small Power	7650	3.5	26775	27	30	1.0	30	43	
Client Fit out Loads	7650	35	267750	268	298	1.0	298	429	
				317	351		349	504	<u>Total load for Warehouse</u>
<u>Office Area - Ground Floor</u>									
Lighting	850	10	8500	9	9	0.9	8	12	
Small Power	850	25	21250	21	24	1.0	24	34	
Fire Alarm	850	2.5	2125	2	2	1.0	2	3	
				32	35		34	49	<u>Total load for Offices</u>
<u>Mechanical Building services</u>									
Assume gas heating and Gas water heating				125	136		104	150	
				125	136		104	150	<u>Total load for Mech plant (gas heating)</u>
<u>Totals</u>				475 kW	523 kW		487	703	
Plus Electric Vehicle charging							585 kVA		
Add Spare Capacity at 20%							701 kVA		

Initial Gas load calc

		AREA m2	GAS		
Building Ref	Category	m ²	Estimated Total (kW)	Gas Load (m ³ /hr)	Gas Load (kW)
Building 401 Unit 1	Office	850	85	8	85
	Warehouse	7,650	612	57	614
	Totals		697	65	700

Project: **MAG - Building 401**

Aecom Manchester
1 New York Street
Manchester
M1 4HD, UK
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STATUS	REV A
--------	-------

[illegible]

SCHEDULE	DES'R	SL
	DATE	14/09/2021
SHEET No 01 of 01	CHK'D	LG
	DATE	14/09/2021

Notes

Initial estimates based on w/m2 as below for various types of building
Includes for gas heating of the warehouse, query to note that some tenants may want to leave the warehouse unheated, tbc
Includes for gas to serve the offices, query to note that these may be served by VRF or renewables to lower the gas load, tbc
Excludes any additional process gas requirements from the fit out, tbc
m2 floor areas taken from electrical calc sheet dated 14/09/21

Gas Estimates Used

Advanced Manufacturing	80	w per m2
Hotel	8.4	kw per key (190w/m2)
MSCP	0	w per m2
Office	100	w per m2
Residential	6	kw per dwelling
Retail	100	w per m2
Warehouse	80	w per m2

*30W/m2 added to offices rule of thumb as initial design margin, subject to confirmation of U values and DHWS loading

Extract from BISRIA Rules of thumb 5th Edition

Table 18: Heating loads for different types of building (W/m^2 gross internal area, unless otherwise stated)

Description	Rule of thumb	Comments	Ref
	Heating load (W/m ² GIA)	Please refer to the glossary for a definition of gross internal area	61
Educational buildings	87		
Industrial buildings	80		
Offices	70		
Residential buildings	60		
Retail buildings	100		

