



North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

North Ayrshire Supplementary Street Design Guide

Appendix E – Street Lighting Requirements

Version 1: 2023



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1.1 Introduction

The role of street lighting within the street scene is to provide the overall background level of lighting required to encourage a better, safe environment for all public road and footway users, to ensure people and vehicles can see and be seen. Using lighting, where considered appropriate, to contribute to road safety is a statutory responsibility of the Roads Authority. Where it considers it appropriate to do so, under the provisions of the Roads (Scotland) Act 1984, the Roads Authority lighting service may also direct that lighting be installed in locations which will not subsequently be presented for adoption and/or maintenance by the Local Authority.

Energy consumption and carbon reduction requirements are an increasing priority in the national agenda and the UK has set challenging targets for reductions. Any decision on lighting provision must therefore follow strict national guidance on lighting hierarchy, local environmental considerations, appropriate light levels, night-time use of the location and include the assessment of glare or other light pollution emanating from all such installations, but particularly with respect to off-road lighting effects on the public road network. Careful lighting design is required to comply with all of these, sometimes competing, elements and it is important that competent design & verification is undertaken both on installations and improvements carried out by the Council but also ensuring proposed lighting installations associated with development and regeneration works achieve compliance through Planning & Construction Consent approval processes.

The provision of a lighting service is generally taken for granted as a basic service that the Local Authority should provide to its citizens and there are several benefits of providing an effective street lighting service including:

- To reduce night-time accidents.
- To reduce personal injury accidents.
- Assist emergency services to identify locations and shorten response times.
- Reduce the fear of crime.
- Promote sustainable transport & active travel (public transport, cycling and walking).
- Facilitate social inclusion & reduce isolation by providing freedom to use streets after dark.
- Support a 24-hour leisure economy, promoting economic development.
- Provide safe access to educational facilities supporting lifelong learning.

Achieving these benefits is linked to and supports the Council's corporate objectives and priority outcomes relating to Road Safety, community safety, social inclusion, quality of life and sustainability to ensure:

- North Ayrshire is well-connected with effective infrastructure.
- North Ayrshire is a sustainable environment.
- North Ayrshire is a vibrant welcoming and attractive environment.
- An efficient Council that maximises resources and provides value for money.

1.2 Design Parameters

In all cases the proposed lighting design will be within the current BS Street Lighting Standards.

Lighting designs should be based on the current versions of:

- BS 5489-1 - Code of Practice for the Design of Road Lighting (Part 1: Lighting of Roads and Public Amenity Areas) and the associated current BS EN 13201 Standards.
- BS 7671 - Requirements for Electrical Installations. IET Wiring Regulations.
- BS EN 12899 - Fixed, Vertical Road Traffic Signs - Part 1: Fixed Signs.
- BS EN 12464 - Outdoor Lighting.
- BS EN 40-3 - Lighting Columns. Design and Verification – Verification by testing.
- PD 6547 - Guidance on the use of BS EN 40.
- HSG 38 Lighting at Work.
- HSE GS6 Avoiding danger from overhead lines.
- ENA Engineering Recommendation G12 Issue 4 + Amendment 2 (March 2021)

It is the responsibility of the developer to ensure that adequate site measurement of road lighting performance is carried out and reported, prior to the end of the 12 month maintenance period. This should be carried out as per Technical Report 28 (TR28) from the Institute of Lighting Professionals (ILP) and ILP GN 3/16. Failure to submit this information may result in NAC carrying out these measurements with associated costs recharged to the developer.

Additionally, any lighting issues arising during the maintenance period should be resolved by the developer and where necessary verified by design revision (e.g. complaints from residents regarding obtrusive light or glare).

Lighting Levels

Lighting levels are recommended by British Standards based on the nature & usage of an area. This includes consideration of urban and rural, residential and town centre high amenity and allows for understanding the difference between the two in terms of night-time traffic & footfall.

Recommendations are based on the identification of Environmental Zones for exterior lighting within development plans.

| Type | Descriptor | Examples |
|------|---------------------------------|---|
| E1 | Intrinsically dark landscapes | Country Parks, areas of outstanding natural beauty. |
| E2 | Low district brightness area | Rural, small villages or relatively dark urban locations. |
| E3 | Medium district brightness area | Small town centres or urban locations. |
| E4 | High district brightness areas | Town/city centres with high night-time activity. |

These categories help determine the appropriate design level of light output, the limiting factors for light pollution or if lighting is required at all. Using the Scottish Government Urban/Rural Classification Guidance a lighting plan was developed that matched the appropriate lighting classes to areas in North Ayrshire and a lighting class matrix tailored to North Ayrshire was produced.

Table 1 – Lighting Matrix

| Lighting Matrix | | | | | |
|----------------------------------|--------------------|------|-----------------------------------|------------|----------------------------|
| Location | Area | Zone | Main User | Crime Risk | Design Class (White Light) |
| Urban Major Town Centre (Irvine) | High Amenity | E3 | Traffic, Pedestrians and Cyclists | High | P1 (P2) |
| Urban Town Centre | High Amenity | E3 | Traffic, Pedestrians and Cyclists | Moderate | P2 (P3) |
| Urban Town Centre | Distributor Road | E3 | Traffic and Cyclists | Low | M4 |
| Urban Town Centre | Link & Access Road | E3 | Traffic, Pedestrians and Cyclists | Moderate | P3 (P4) |
| Urban Town Centre | Link & Access Road | E3 | Traffic, Pedestrians and Cyclists | Low | P4 (P5) |
| Rural Village Centre | High Amenity | E2 | Traffic, Pedestrians and Cyclists | Moderate | P3(P4) |
| Rural Village Centre | High Amenity | E2 | Traffic, Pedestrians and Cyclists | Low | P4 |
| Rural Village | Distributor Road | E2 | Traffic and Cyclists | Low | M5 |
| Rural Village | Link & Access Road | E2 | Traffic, Pedestrians and Cyclists | Moderate | P4 |
| Rural Village | Link & Access Road | E2 | Traffic, Pedestrians and Cyclists | Low | P5 (P6) |
| Distributor | >40mph | E2 | Traffic | Low | M4 |
| Distributor | <40mph | E2 | Traffic | Low | M5 |
| Urban Towns | Industrial Areas | E3 | Traffic | Moderate | P4 (P5) |
| Rural Villages | Industrial Areas | E2 | Traffic | Moderate | P5 |
| Urban Town | Car Park | E3 | Traffic and Pedestrians | N/A | 10 Lux Uniformity 0.25 |
| Rural Village | Car Park | E2 | Traffic and Pedestrians | N/A | 10 Lux Uniformity 0.25 |

General Requirements

The following is a submission checklist of items required by the Roads Lighting Authority, before the lighting element of any construction consent can be formally assessed:

1. Adoptable areas/surfaces drawing showing extents of area to be assessed.
2. Designer risk assessment as per BS 5489-1:2020 (Design Strategy and Road Classification)
3. Layout drawing clearly showing:
 - A satisfactory scaled general lighting layout as well as at junctions and bends.
 - Any contiguous lighting.
 - Legend outlining satisfactory materials with a sufficient level of information provided.
 - Sufficient electrical information and cabling arrangements.
 - Details of proximity to other electrical apparatus which may impact the safe operation of the lighting system (EV charging points for example).
4. A corresponding lighting calculation report showing:
 - Sufficient photometry information.
 - Design classification (as per designer risk assessment).
 - Vertical illuminance calculation report (typically the façade of the property (or several) in closest proximity to any proposed lighting positions).
 - Separate conflict area design where applicable.

Additionally, it is the responsibility of the developer to take cognisance of any authorised signage (e.g. “Neighbourhood Watch”, “No Dog Fouling” signs etc) mounted on existing lighting columns. If these existing lighting columns are to be removed as part of the construction phase, the signage should be relocated on the nearest available adjacent lighting column and identified on the submitted consent design drawings, or NAC consulted where suitable appropriate adjacent alternative location is not clear.

Private Areas

There are many roads, footpaths, parking areas and service areas in North Ayrshire that are private and for which the Council has no direct responsibility. No new adoptable lighting will be provided on existing private roads and areas. All proposed new development under planning & construction consent review requires the developer to ensure that residents and owners engage private factoring to provide, manage & maintain any lighting that is considered appropriate under the terms of approval by the Authority. Evidence and details of factoring arrangements for lighting or other maintenance in communal or private locations within any proposed development will be provided by the Developer as part of the planning and consent process.

Designs in respect of private & communal areas, while subject to separate maintenance and operational arrangements, will be designed in accordance with the same criteria as adoptable lighting.

Design Competency

All lighting design for developments must be carried out by professional lighting & electrical design consultants who are able to show evidence of specific relevant design experience and qualifications. Lighting designers may work independently or as part of an overall design consultancy, however the developer should provide on request evidence of previous experience and competency for the lighting design consultant engaged.

This requirement ensures that any designer duties for health and safety under relevant lighting, electrical and construction legislation and regulations, should be satisfied by professional designers with competency for the function. Guidance on appropriate competency standards and qualifications can be found by referring to the Institution of Lighting Professionals website. Engaging competent designers will also help support a more streamlined construction consent approval process that encourages a ‘right first time’ approach, reducing costly delays and revisions for developers.

Alternatively, should developers wish, North Ayrshire Council can provide a quotation for design services for lighting. This will provide quality, expertise and highly skilled lighting technical and design services that can ensure designs are competent on a first-time basis and can facilitate and accelerate the design process and construction consent approval.

Urban

Under current legislation, the responsibility to provide street lighting within North Ayrshire is given to the Council as the statutory Local Roads Authority. Section 35, of the Roads (Scotland) Act 1984, (RSA 1984), sets out the powers and duties covered by this legislation. The act does not directly impose an obligation on the Council to provide street lighting. It does however require that the Council considers what lighting is appropriate in terms of road safety and accident reduction. Once street lighting has been provided, it is the Councils statutory duty to ensure that it remains functioning correctly and is inspected and maintained to a safe standard. Road types and night-time usage vary in nature according to location, traffic volume and access to amenities. Therefore, the level, type, design & maintenance requirements of lighting systems will also vary. Roads within speed-controlled areas, i.e. urban and residential areas, and their associated 30mph speed limits are established by the presence of a “system of lighting”, in accordance with the Road Traffic Regulation Act 1984. De-restricted areas are not normally lit, however areas with special requirements, such as roundabout conflict areas or identified accident black spots may be considered on their individual merit for a site-specific solution. On principal and distributor roads, where traffic speed and flows tend to be higher, vehicles dominate, and public lighting systems are designed to reflect this purpose. On residential streets and footpaths, where the pedestrian and cyclist are more frequent, the lighting system is designed appropriately around the

combined needs of all users that may be brought into conflict. In high night-time amenity areas and town centres where traffic & footfall is high and subject to high incidences of interaction and potential crime, lighting design of associated roads, footpaths and pedestrianised areas will be of a higher illumination class to reflect this. The maintenance and management of the public road lighting network is undertaken by Roads –Engineering Services: Lighting Section.

Rural and Islands

An intrinsic element of the design process is consultation, particularly with respect to requests for new lighting. It is also recognised that many locations in North Ayrshire are unique in terms of their natural beauty and attractiveness and that residents might have strong feelings about the provision of lighting. The Council, however, as Roads Authority has a statutory duty and legal obligation to consider road safety and the mitigating impact of lighting provision of the correct type to reflect the local environment and night-time use. Where advised by the local authority during the planning process, the Developer, or their design consultants, will be responsible for consultation with adjacent property owners and users to inform the lighting design proposals. The Arran Lighting Policy is available for guidance specific to developments on Arran. In some circumstances NAC Road Lighting will direct the completion of a suitable design but limit installation to underground ducting for future provision only as detailed in the Arran Lighting Policy.

Conservation Areas

The Council has designated several locations as Conservation areas, and these will be lit in accordance with the design output criteria relevant to the environmental zone and area use. However, additional consideration will be given to the selection of specialist amenity or heritage styled materials in these areas. Given the additional budgetary impact of specialist materials of this type and maintenance, as a rule these will be restricted to conservation areas.

Foot and Cycleways

Cycle routes shall be lit in accordance with the Institution of Lighting Professionals Technical Report No. 23 – Lighting of Cycle Tracks and shall respond to the Environmental Zone in which the route is located. The lighting of any cycle route should first be discussed with the Local Authorities Lighting Team.

Public lighting is part of the approach to a sustainable transport policy, helping to increase the use of the road and footpath network after dark.

The duties and responsibilities of specification, management and maintenance of cycle routes falls to Roads Services, either as the Roads Authority as in any other prospective public road or footway under the powers of the Roads (Scotland) Act 1984, or as maintaining service for non-public road asset network belonging to the Council, and as such responsibility for specification, adoption and future maintenance of any cycle path or lighting that the Roads Authority considers necessary, is as directed or designed by Roads Services.

As with any other public footway, there is no duty to provide lighting on any cycle route, however there is still a requirement to contribute to overall road safety and the Road lighting team will consider the appropriate provision of lighting subject to local circumstances.

Cycle routes which run adjacent to an unlit carriageway should not be lit as this can cause difficulties for drivers. Urban routes, particularly shared road routes, within speed-restricted zones will normally be considered for lighting. Off-carriageway tracks within otherwise lit built up areas, for example through parks or running tracks may not be well used after dark, even if lighting was provided. In these cases, determination of an appropriate cycle route should primarily identify suitable alternative routes utilising existing street lighting, while matching the desired line as closely as possible.

Where an off-carriageway track is being considered for lighting within an urban area, the factors that will be taken into account by the Roads Lighting service to determine suitability are based on guidance from Transport Scotland, the Department for Transport, Institution of Lighting Professionals and other national sources and include:

- Identification of possible existing alternative lit routes
- Responsibility and future adoptable status of the considered route-Environmental zone in terms of lighting design guidance (intrinsically dark, urbanised etc.)
- Existing night-time usage that shows evidence of high flows of non-motorised users
- Suitability for increased shared night-time use by cyclists, commuters, dog walkers, school children, other recreational users and for access to local amenities
- Linkage of urban access for higher volumes of commuting or access to centralised amenities
- Underground infrastructure provision for linkage to future development at a later stage-Availability of electricity supply
- Geographic considerations that may impact, e.g., presence of dense tree/vegetation likely to cause obstruction under the provisions of the Roads (Scotland) Act 1984.
- Scale of installation and impact of additional maintenance, particularly evidence of vandalism or anti-social behaviour-Impact of additional energy use and maintenance
- Effects of light pollution (inc. requiring evidence of consultation with local property owners if required)
- Impact on wildlife-Impact on carbon reduction commitment

Though it is not expected that routes outside built up areas and used primarily by cyclists for recreation would normally be lit, consideration will be given where there are specific road safety concerns such as crossings, subject to the availability of suitable electrical supply sources.

In accordance with current practice a full lighting impact consultation will be conducted with local residents, prior to finalising a route Option Appraisal. This will be specifically focused on determining the possible impact of additional lighting to identify any risks to the introduction

of lighting in respect of high profile, sensitive concerns relating to light trespass, glare & other light pollution, increased carbon emissions and energy use.

Once the decision has been made, by the Roads Lighting Authority, that a route should be lit, the preferred option will be developed in accordance with relevant lighting design guidance H & S and electrical legislation.

Underpasses, Subways and Tunnels

The following guidance and standards shall be referred to when considering lighting of underpasses, subways, and tunnels; BS5489-1:2020

- BS5489-2:2016
- PLG09 – Ensuring Visibility Within Short Tunnels
- CIE 88-204

Where switching between daytime and night-time levels has been identified, the designer will consult with North Ayrshire Council at the earliest convenience to agree upon an appropriate regime and switching method.

Pedestrian Crossings

Pedestrian Crossings shall be illuminated to the requirements of:

- ILP Technical Report No. 12 - Lighting of Pedestrian Crossings.
- BS 5489-1:2020.
- BS EN 13201 Part 2.

Design of Illuminated Traffic Signs

All traffic signage should be designed in compliance with the current version of the “The Traffic Signs Regulations and General Directions” (TSRDG) document. The TSRDG document places many relaxations on the number of signs and the illumination of traffic signs, by the means of external or internal lighting. Designers should take this into full consideration when specifying traffic signs within their proposal to ensure that proposals are compliant and reduce environmental impact; impact on streetscape access & clutter; and energy management associated with unnecessary (illuminated AND non-illuminated) signage.

1.3 Location

Footway

Lighting should illuminate both the carriageway, the footway and junctions, including any speed reduction features, to enable road users to see potential obstacles and each other after dark. The lighting design should ensure that shadows are avoided in streets where pedestrians may be vulnerable. Adequate lighting helps reduce crime and the fear of crime and can encourage increased pedestrian activity. Consideration should be given to

incorporating colour contrast bands on lighting columns and located at the back of the footway where possible.

Traffic Calming

Designers should pay special attention to the illumination of any proposed Traffic Calming measures. The Institute of Lighting Professionals’ “Technical Report 25 – Lighting for Traffic Calming Measures” document should be followed to ensure these features are illuminated adequately.

Verges

Lighting columns should be placed so that they do not impinge on available widths of footways in the interests of wheelchair users and people pushing prams or pose a hazard for blind or partially sighted people.

Service Strips

The width of a service strip will depend on the number and type of premises served. All domestic services (gas, electricity, lighting, water and telecoms) will normally be accommodated in a maximum 2 metres wide reservation, developers should discuss each development with Statutory Undertakers.

Lighting Obstructions

Under the provisions of the Roads (Scotland) Act 1984 the presence of dense tree/vegetation likely to cause obstruction should be considered and similarly with regards to the potential of the blocking of illumination on the roadway and footway. It is the designer’s responsibility to take cognisance of the landscape design e.g., placement of trees, walling etc. in relation to proposed lighting positions.

1.4 Self-Certification and Adoption

During the planning process, where it is determined by the Roads Authority that lighting should be provided, extended or improved, the developer submits lighting proposals, co-ordinated through Economic Regeneration, which are forwarded to Roads Lighting for review. Where the design is agreed to comply with the relevant lighting and electrical design requirements approval is granted, in writing.

Once approval is granted, the Road Lighting Authority reserves the right to review suitability of the design proposal to determine if it requires to be upgraded or redesigned at the developer’s expense in the following circumstances:

- If statutory legislative guidance, or NAC maintenance materials specification, is amended that affects the original proposals/approval.
- If the installation does not commence on site within 3 years of consent approval.
- If the development is not offered for adoption within 5 years of consent approval.

- At renewal of construction consent in all circumstances.

The developer may, at their own discretion, energise parts or whole of the network within their site prior to adoption and subject to compliance with all relevant safety, lighting and electrical legislation. The developer or their design consultant are responsible for the mitigation of any repairs, failures or complaints regarding light pollution arising from their design after energizing before final adoption by the Roads authority.

Lighting installations are not adopted, or part adopted, prior to the road being adopted and placed onto the public roads register. Lighting installations will be subject to the same monitoring, test, inspection and 12mth maintenance period in alignment with the adoptable road before being added to the Register of adopted roads and the Council's lighting asset inventory and maintenance regimes. 12mth maintenance period will begin upon satisfying a compliant final test and inspection on the lighting installation. All necessary access to site and equipment required to inspect prospectively adoptable plant will be provided by the developer, or their agents on-site, upon request by the Council's lighting inspectors.

Where a proposal requires alignment or integration with an existing lighting installation, for example a new junction arrangement, the Council will in certain circumstances, allow connection to the existing network utilising a Permit-to Work authorisation and the subsequent partial adoption of the lighting circuits involved, after a monitored test & inspection. The developer is responsible for all maintenance and cost of energy of their installation until the date of adoption and will require their own MPAN (Metering Point Administration Number) until the installation is formally added to the assets register and appropriate Council MPAN. The developer, or their agents, will provide written details on request of their selected DNO/IDNO and interim MPAN.

All necessary access to site and equipment required to inspect prospectively adoptable plant will be provided by the developer, or their agents on-site, upon request by the Council's lighting inspectors.

1.5 Specification

Lanterns

The proposed unit shall:

- Be compliant with all relevant EN standards and directives with a declaration of conformity to said standards and directives being available at the time of tender.
- Be constructed and tested in accordance with BS EN 60598-1.
- Have a canopy manufactured from Aluminium or other fully recyclable material.
- Finished in RAL7043 or similar approved to be confirmed at the time of order.
- Have an optical compartment sealed to IP66 in accordance with BS EN 60529 by a glass enclosure to ensure minimum lens degradation from long term environmental exposure.

- Have a Dali enabled LED driver compatible with the Philips City Touch CMS system.
- Be supplied with a factory fitted integral Philips City Touch OLC COM SR Node.
- Have a maximum body weight of no more than 10Kg.
- Be designed for Class 1 electrical protection in accordance with IEC 61140.
- Have all integral control gear / drivers mounted on a removable tray with plug and socket connections.
- Have all hinges, toggle catches, captive screws and nuts manufactured in stainless steel or other non-corrodible materials and a minimum of 2 stainless steel Allen fixing screws.
- Have tool-less access to serviceable parts with canopy held captive in open position.
- Have one-part sealing gaskets recessed to avoid damage during normal maintenance operations.
- Have an impact resistance of not less than IK08.
- Have a LED light source that can be replaced with the luminaire canopy in situ.
- Have a LED light source of 3000k for residential streets and 4000k for traffic routes, both must maintain chromaticity consistency of ≤ 5 SDCM throughout the guarantee period.
- Be approved for use under the Balancing and Settlement Code (BSC) Unmetered Supplies Arrangements and shall have all necessary UMSUG codes provided at the time of tender/ submission.
- Be supplied with a universal spigot to allow either 76mm post mount or 42mm side entry connection and without the need of additional accessories.
- Be guaranteed against failure for a period of 12 years (including all components & drivers)
- Incorporate a surge protection device rated to at no less than 10kV in common mode.
- Have a minimum CRI of 70 compliant with Ra8.
- Have a power factor of 0.9 or greater.
- Be fully compliant with the RoHS (2012) Regulations.
- Be fully compliant with the WEEE Regulations.
- Have a ULOR of equal to or less than 1%.
- Incorporate a surge protection device rated at no less than 10kV in common mode and 6kV in differential mode.



Figure 1,2 & 3 – Galvanised Finish Column Lighting with LED Lamps in Public Realm

Columns and Brackets

General Specification

The lighting column manufacturer shall be registered with and certified by either British Standards Institute Quality Assurance Services or Lloyds Register Quality Assurance Ltd for the manufacture, supply and verification of lighting columns under their Quality Assessment Schedule to BS 5750 part 2. An equivalent European Standard shall be acceptable.

Dimensions and Tolerances

Table 2 – Racket Type C (Web Type with 5o Uplift)

| Projection | Height | For use with |
|------------|-----------|--------------|
| 0.5m 0.6m | 7.4M 9.4M | 11.4M |
| 0.5m 0.6m | 7.4M 9.4M | 11.4M |

5,6m columns which have an integral bracket shall have a bracket projection 0.3 metres at a 15 degree angle. Bracket projections do not include the lantern spigot.

Materials and Welding Requirements

The columns, brackets and compartment doors shall meet the requirements of BS5649:EN40:, BD 26/99, and shall have a silicon content between approximately 0.12% and 0.3% or below 0.04%. The grade of steel used in the fabrication of the lighting column and brackets shall be hot rolled to BSEN10021 S355J2H.

Test certificates applicable to the grade of steel used shall be supplied on request.

Corrosion Protection for Steel Columns and Brackets

Columns shall be hot-dip galvanised as defined in BS 5649 Part 4, clause 4.1, the requirements of ISO 1459, ISO 1460 and ISO 1461 being applied.

The hot-dip galvanising shall be applied to areas A, B and C of the lighting column as defined in BS 5649 Part 4. In addition a coat of bitumen shall be applied to area B as defined in BS 5649 Part 4, clause 3 - excluding above ground level which shall be 100mm.

Lighting column brackets shall be galvanised as per the above requirements for columns, the hot-dip galvanising being applied to the interior and exterior surfaces of the column bracket. Foundation bolts and all steel fixings including doors, chains, locks and grub screws shall be approved stainless steel or be galvanised in accordance with the above.

Base Compartment and Cable Ways

The column base compartment and cable ways shall comply with the requirements of BS 5649 Part 5. The compartment door shall be protected against corrosion by hot-dip galvanising as specified above. A 3mm nominal diameter closed link stainless steel chain shall be fitted internally between the door and column (not to the backboard, earthing terminals or other removable points). The chain shall be sufficiently long to allow the door to rest freely on the ground with the column in its operational position.

The base compartment(s) shall be fitted with hardwood or other substantially non-hygroscopic material baseboards not less than 90mm wide and 15mm thick securely fixed internally to accommodate the fused cut out assemblies, control equipment, service cables etc.

See drawing sl/spec/cols 4 for dimensions of door and door access. The base compartment shall have a weatherproof access door fitted with a tamperproof and corrosion resistant lock.

The door arrangement shall be such that it can only be opened by releasing a single equilateral triangular headed (with 8mm diameter rounded corners) captive non-corrosive bolt fixing into a door locking bar. The lock face shall be circular in shape,

Doors shall be interchangeable for similar columns without adaptation. All column doors shall have rounded corners of 27mm minimum radius.

Interconnection of Column Shaft and Bracket

Bracket types must be interchangeable on lighting columns of 8m or 10m or 12m nominal height. Web shall be 6mm thick.

The diameter of all column shafts should be equal at the point of interconnection with brackets.

The assembly of lighting column shaft and bracket shall incorporate a mechanical locking system in addition to high tensile socket headed set screws.

The mechanical locking system on the column shaft shall comprise of four 16mm by 25mm deep slots 90 degrees apart located at the top of the column to allow the bracket to be

General

- Door keys shall be provided on the basis of 1 per 10 columns.
- Welded watersheds shall be provided above the column door openings.
- Have an external identification number painted in black on a white background. The numbers shall be 75mm high
- Locking Mechanism shall be greased before dispatch.
- Columns shall have door openings arranged so that when the column is in the erected position an operative facing the door opening will also normally be facing oncoming traffic.
- The cable way shall be located at the front of the column and situated directly beneath the door
- All columns and brackets shall carry a unique identification mark which indicates the name of the manufacturer, year of production, and other information, to enable details of the column and bracket to be determined by a unique design code reference number relating to the appropriate Column and Bracket Data sheet.

The unique reference number shall not be used for any other design of column or bracket.

The column identification mark shall be permanent, legible, clearly visible and be:

- On a permanent fixed label.
- Hard stamped.
- Formed in the material of the column on an external face only.

It shall be located either within the base compartment or, except in the case of hard stamping, immediately above or below the door. It shall not be located on the door.

The bracket identification mark shall be in the form of detachable label supplied fixed to the bracket. This label shall be moved from its temporary position and fixed on erection to a suitably provided hole next to the label on the column. Cable ties are not an acceptable means of attaching identification labels.

- Each column shaft shall have a base compartment large enough to offer easy access to the control equipment. A weatherproof door giving protection to IP42 BS EN 60529 shall be provided for each opening and shall be interchangeable between columns of the same mounting height.
- There shall be no sharp edges within the columns or bracket arms which could cause damage to electrical cables either during installation or whilst in service. An anti-chafe ring shall be welded where cables change direction from the horizontal to vertical within the bracket arm.
- Columns and brackets shall carry a unique identification mark which indicates the name of the manufacturer, the year of production and other design information to enable details of.

Column Planting Depth

Column foundations used in the design were in accordance with Chapter 8 of the Department of Transport standard BD26/92. 8.5.14.10 DESIGN LOADS: The required design loads need to be assessed by the supplier, based on luminaire size and a winding loading factor of K3, but a length of 150mm positioned above the cable entry. The external dimensions should be adhered to unless a variation has been agreed in writing between the Supervising Officer and Contractor.

Verification of Structure by Testing

The structure of lighting columns shall also be verified by testing by the manufacturer and a third party approved by the Council.

Guarantee

All lighting columns and brackets shall be manufactured from steel which meets the requirements of BSEN40. Columns should be of tubular steel design and shall be manufactured from specified grade of steel to give a minimum design life of 25 years.

Mid-Hinged Raise and Lower Columns

- Columns shall be as galvanized tubular steel columns above with the following exceptions
- Column shall be suitable for operation without a specialist tool.
- Columns must have a discrete internal locking mechanism which has the capability of being internally locked
- Columns to be hinged using a stainless-steel hinge and pin with a suitable with no maintenance dry lubricated bush.
- Column shaft to be profiled to ensure the overlap section of the shaft fits neatly in position ensuring the circular section of tubular steel design and shall be manufactured from specified grade of steel to give a minimum design life of 25 years. The gap between where both shaft profiles meet shall not exceed 3mm, to reduce ability for digital ingress and injury.
- Column should be supplied prewired within suitable flexible conduit provided.
- Columns shall be the mid hinged counter balanced type designed such that the fitted lantern provides the counterbalance.

Electrical Supply

Feeder Pillars

- Be manufactured in 3mm thick sheet steel hot dipped galvanised after construction or 2.5mm thick stainless steel, minimum grade 3CR12 or similar throughout, including door and back panels, have degrees of protection IP54 reducing to IP 42 where single ventilator is fitted. It shall comprise two sections, a cabinet (above ground level) of dimensions no greater than 1010mm high x 606mm wide x 288mm deep and a root (below ground level) bolted together or it may be plinth mounted bolted to a concrete foundation. Object impacts at 20 joule. IK10 must be achieved as per EN50102.

- Have a colour finish to (RAL7031 – blue grey or RAL7000) which has been applied by the manufacturer immediately after production.
- Be of adequate size to house lighting distribution units panel(s), incoming and outgoing cables, Electricity Supply Authority service cables and apparatus.
- Have a baseboard (890mm x 525mm) manufactured from substantially non hygroscopic material to mount electrical equipment. A clearly marked position shall be indicated for the Supply Authority Cable Head. This position will not encroach upon the position for the siting of the Distribution panel.
- House such suitable electrical equipment as is described in the specification. 107 Volume 2 Numbered Appendices 3G Roads Minor Works Rev 1 October 2018 Framework Contract (PS/18/04).
- House distribution panels as specified in Appendix 0/2.
- Have a main earth terminal comprising a brass screwed stud M8 x 30mm long complete with 2 No. brass hexagon nuts and plain brass washers at a readily accessible position within the cabinet section of the pillar.
- Have an external identification number painted in black on a white background. The numbers shall be 75mm high.
- Labelling shall be provided to enable ready identification of all protective, switching and isolating devices and all outgoing circuit terminals, with warning notices regarding isolation, and the presence of voltage, appropriately positioned.
- A suitable anti-condensation heater shall be provided within the unit. The rating of this unit will not be greater than 15W. Resistors used as heaters will not be accepted
- Will be provided with sets of all keys and tools required for access supplied by the Contractor
- Lighting circuits shall operate as group control.
- The double pole switch isolator and contactor, shall be suitable for use in switching discharge lighting loads up to 63A.
- Contactors shall be silent in operation and shall be of the electromagnetically operated electrically maintained type with arc control devices and neutral link. The contactor shall be rated with an AC 3 utilisation Category and also have readily replaceable contacts. Auxiliary coil circuits shall be separately fused and suitable for operation at 230V 50Hz.
- Internal wiring between the Scottish Power cut-out, the contactor and outgoing fuses shall be single core PVC insulated the PVC sheathed 300/500 volt grade at least 16mm² unless otherwise specified, and comply with BS 6004:2012.

Mini Feeder Pillar

- The pillar shall be manufactured in two sections, a cabinet (above ground) c/w a root (300mm below ground level) and single door. The pillar shall be constructed of 3mm sheet steel (hot dip galvanised to BS EN 1461).
- The pillar shall be manufactured to prevent ingress of dust and water sprayed from all directions. Minimum rating of IP54 as per EN6059 MUST be achieved. It must also be able to withstand an impact of an object weighing 5kg on a flat surface no greater than 40cm across. Object impacts at 20 joule. IK10 must be achieved as per EN50102 · A distribution

cut out shall be fixed to a hardwood backboard no less than 18mm thick and coated with water repellent (minimum size- 585mm high x 155mm width). Unit to be mounted at least 65mm from the top of the backboard. Outline position to be marked (using permanent marker) centrally at the bottom of the backboard for the main Electricity Supply Authority service cut out.

- The paint finish will be in accordance with BS4800 and painted Aircraft Grey (BS693 RAL693) which is a power coated application.
- The pillar MUST have M8 x 32mm long earth bonding studs fitted and located with ease of installation in mind, on both the door and pillar housing. The earth terminal shall be brass and supplied with one full nut, two half nuts and two washers (all brass)
- All electrical bonding and labelling must be completed to the current edition of BS7671
- Earthing
- The location of earth electrodes is described in Appendix 14/2 and shown on the Construction drawings.
- Details of the earth electrodes are shown on Drawing Number SL/SPEC/27/A.
- The earthing of the installation shall comply with the current edition of BS 7671 and ENA ER G12.
- The Contractor shall ensure that throughout the installation all metallic parts other than the current carrying conductors are bonded to form a continuous path by way of the armouring to the Distribution Network Operator earth connection.
- An earth electrode is required at the last or penultimate lighting column on each separate cable run where there are more than three lighting columns.
- The earth continuity conductor between the cut-out and earth rod shall be a copper conductor of at least 16mm² tri-rated PVC insulated or sheathed coloured green and yellow.
- Traffic Signs
- Sign Lanterns.
- The luminaire shall have an LED light source with sufficient output to provide illumination to the required levels.
- The luminaire shall have electronic control gear.
- The luminaire shall have flat glass.
- The luminaire shall have a facility for fixing miniature Photo Electric Cells as required.
- The luminaire shall have a maximum wattage of 6 watts.
- External sign lanterns shall comply with the current edition of BS EN 12899-1:2007.
- The lantern shall have an IP65 rating as per BS EN 60529:1992+A2:2013.
- Lanterns shall be suitable for mounting either by bracket on 76-114mm dia. column shaft and 76mm post top mounting.
- The body shall be constructed of die cast aluminium, with the lantern and bracket being of ridged one-piece construction to provide for no rotational displacement in service.
- All circuit components should be on a plugged tray which can be removed without disturbing the supply cabling.

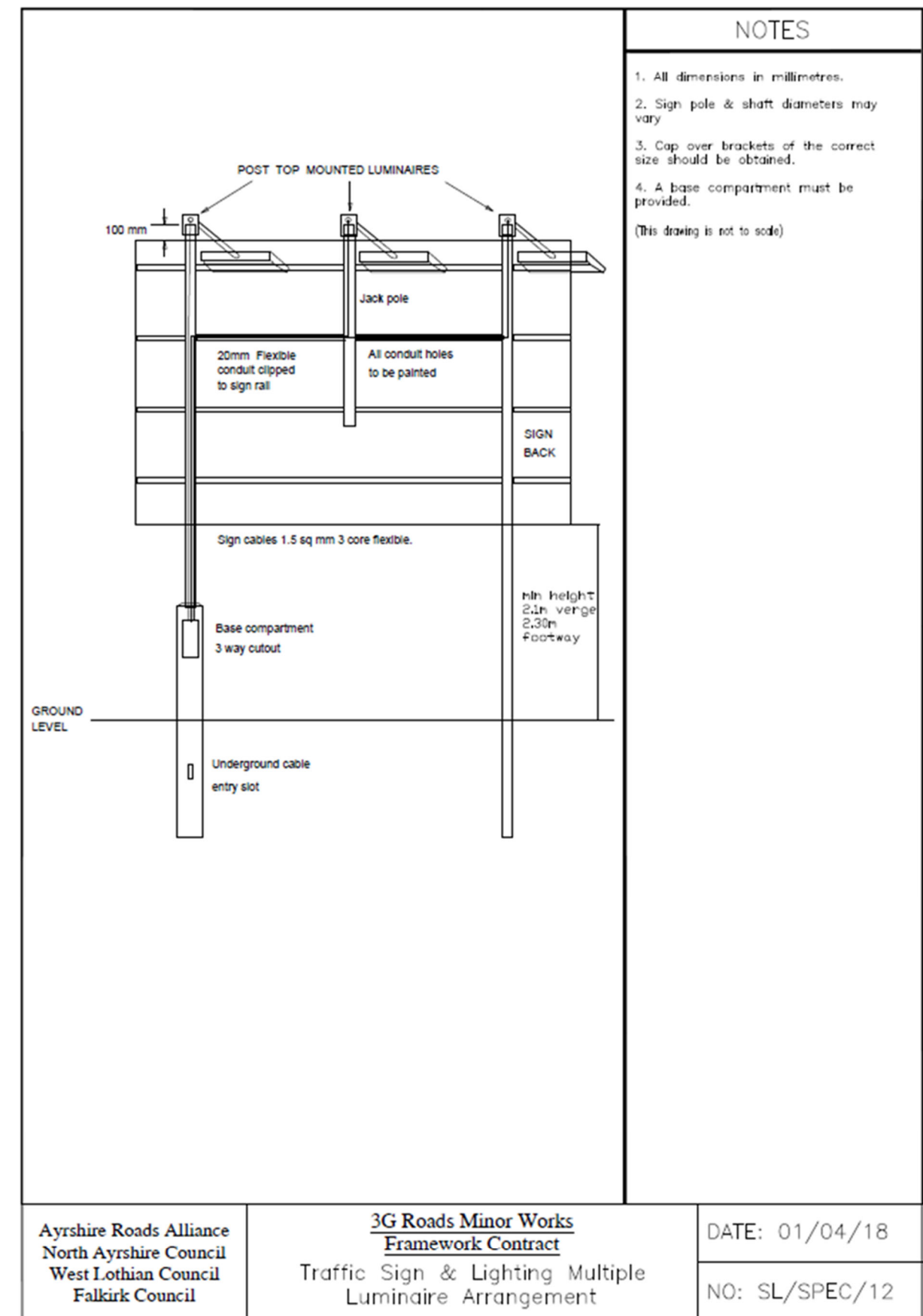
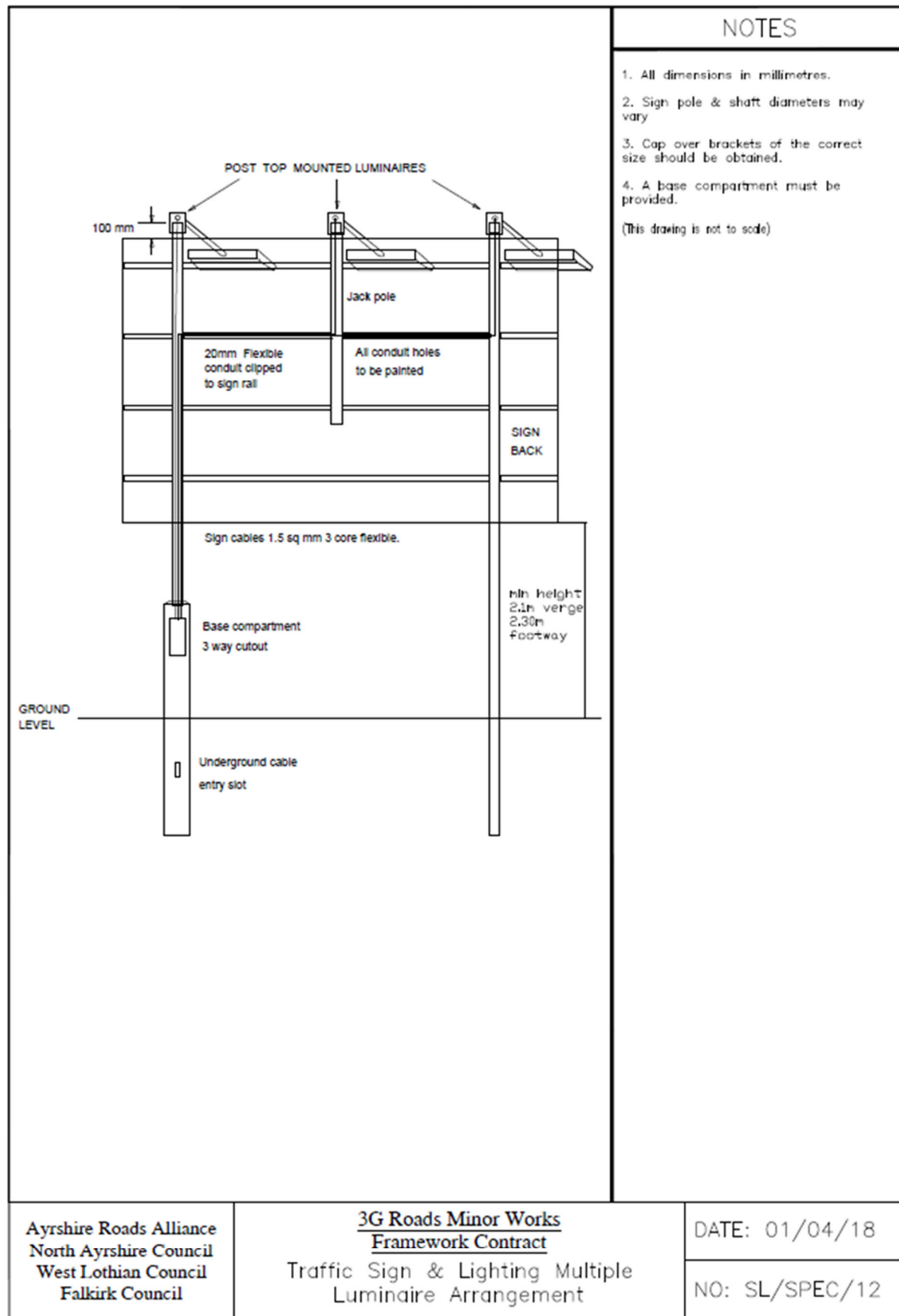
- Provision for fixing miniature Photo Electric Cells will be available as required.

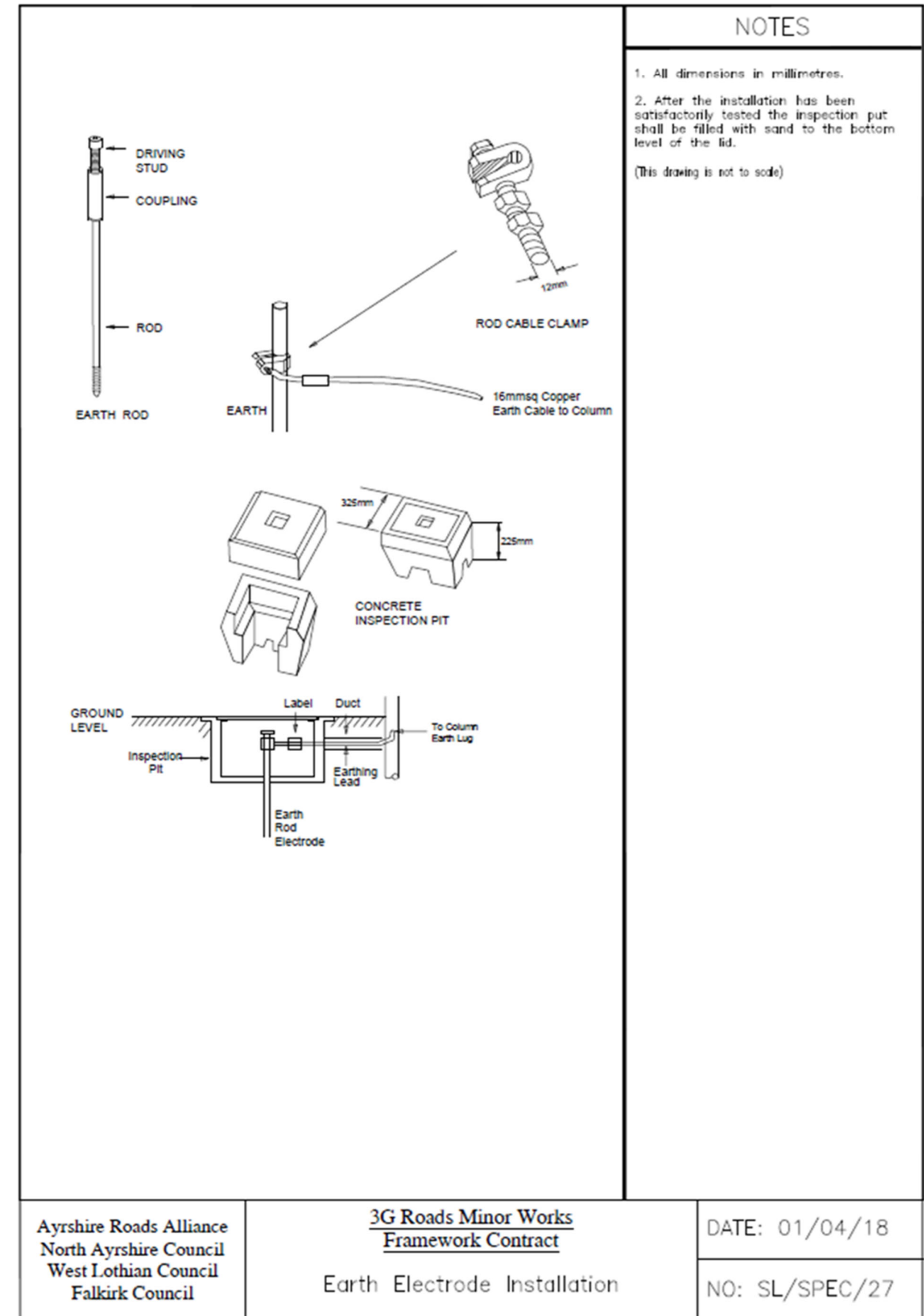
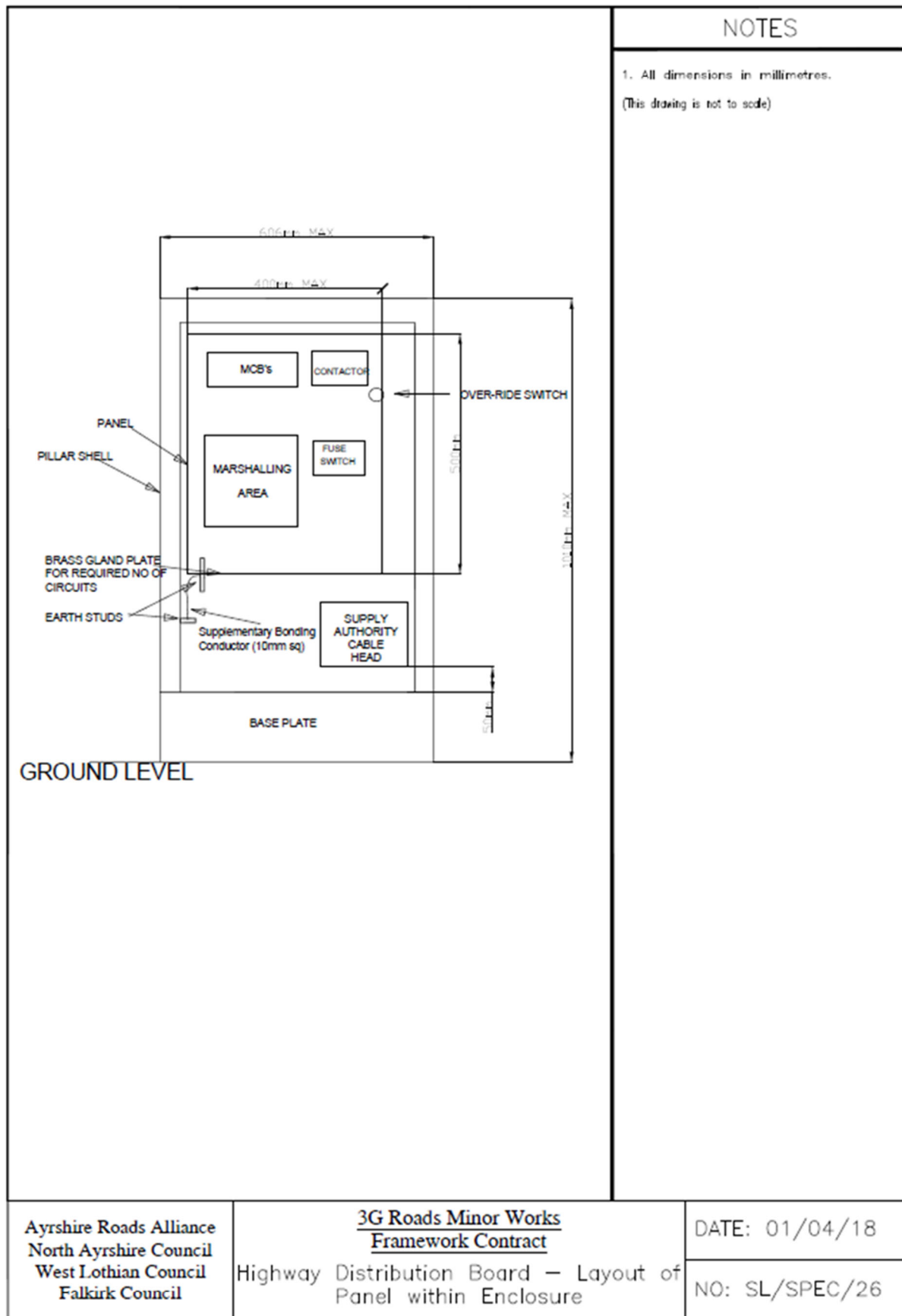
Illuminated Bollard – LED Type

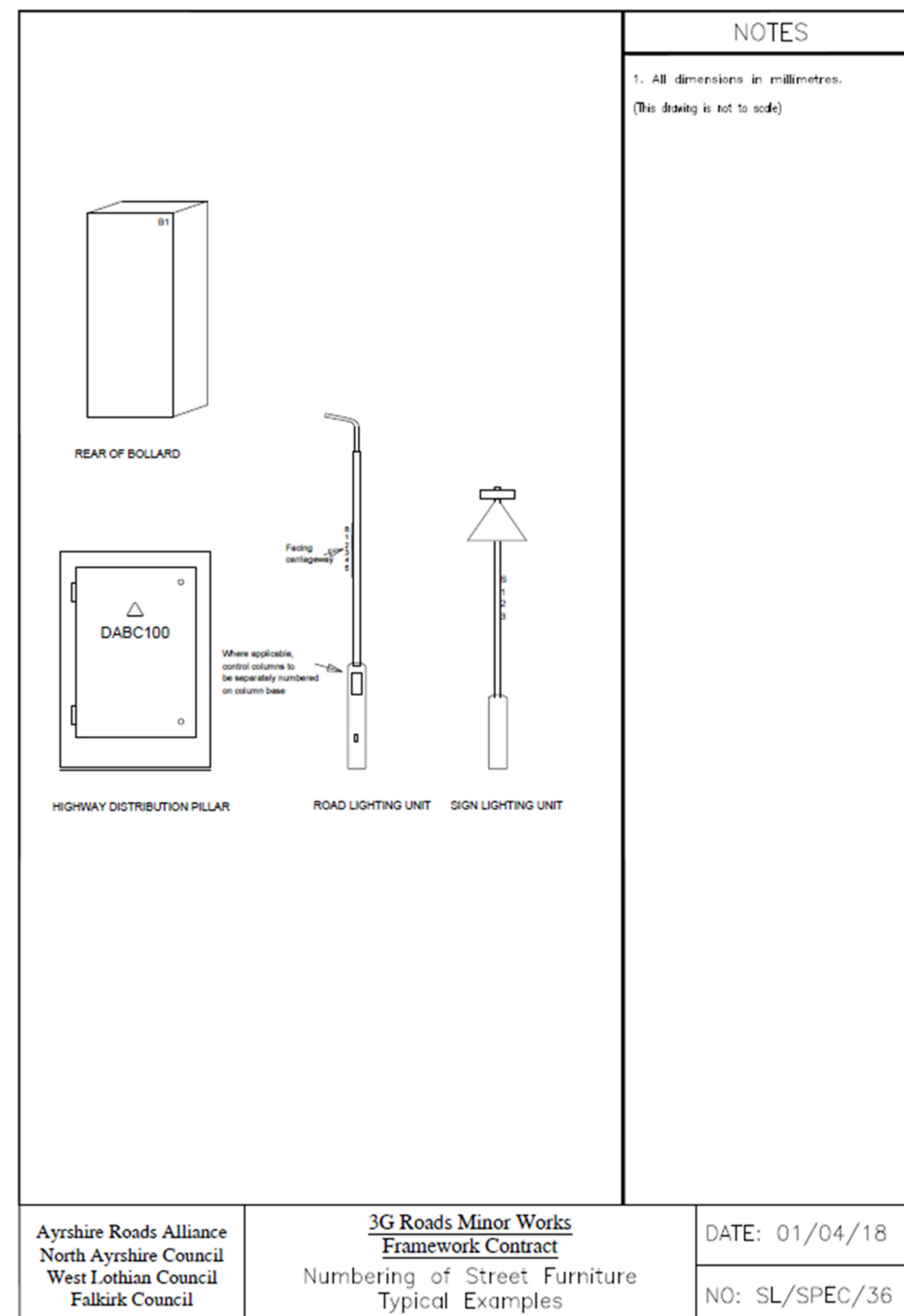
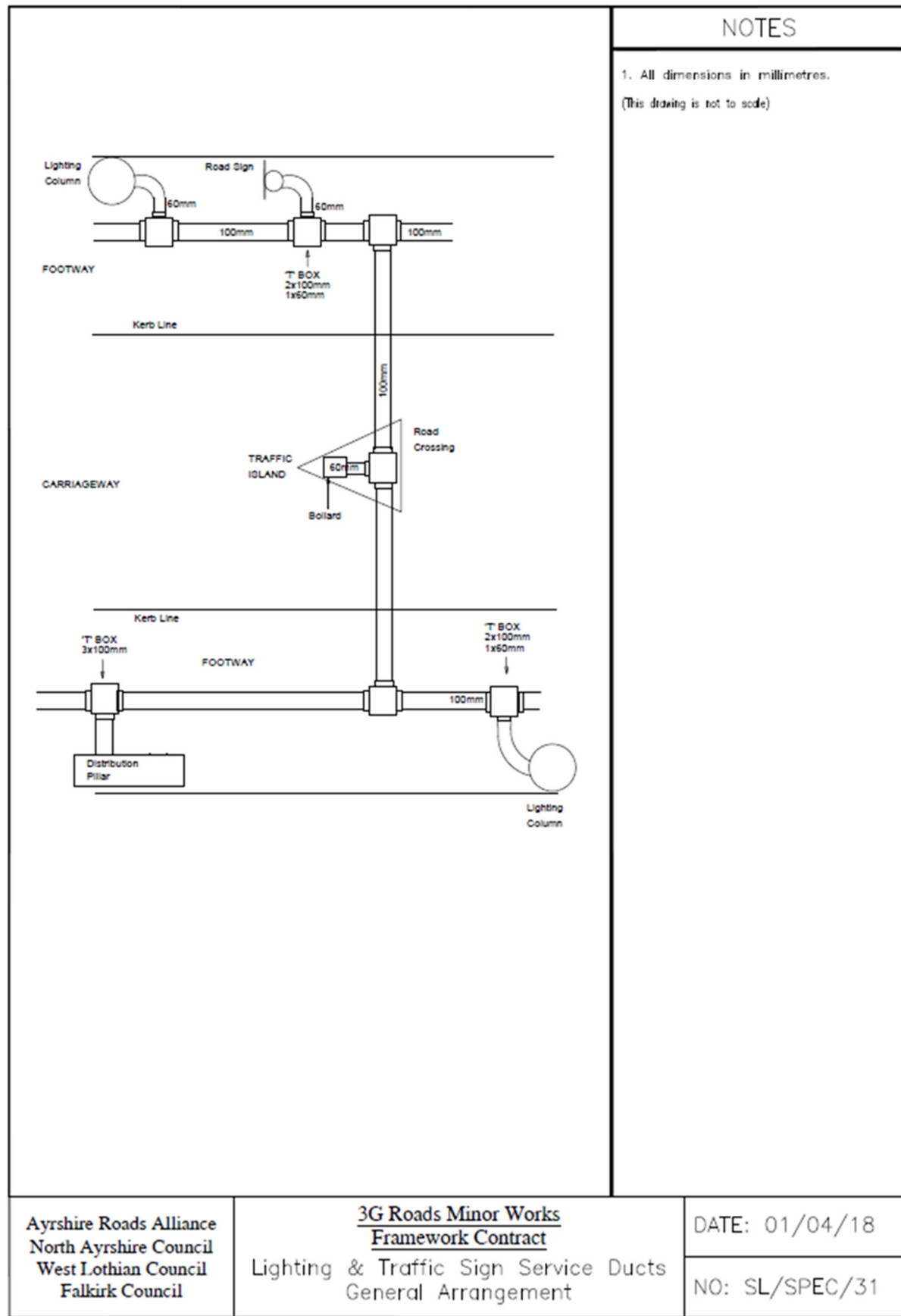
- Bollard base lights shall be suitable for positioning in the ground with cable termination box and light source being below ground level.
- The whole unit shall have a minimum ingress protection of IP67 as specified in the current edition of BS EN 60529. All gaskets shall be one part recessed to avoid damage in service. All bolts for the fixing of the bollard shall not penetrate the box internally.
- The bollard shell is to be fitted over the bollard base light unit and secured by using bolts.
- The unit shall be constructed in die cast aluminum. The hinge and lock should be of stainless-steel moving parts.
- The unit shall be fitted with two lead in glands approximately 50mm in length suitable for 6mm² 3 core armour cable. A heat-shrink seal must be fitted between the bollard and the outer cable sheath.
- The unit shall have a LED light source with a maximum running wattage of 18 watts.
- The circuit components shall be on a plugged removable gear tray which can be easily removed without disturbing the supply cabling.
- The light unit lens shall be made from 5mm polycarbonate which can be easily replaceable.
- The unit shall be suitable for accepting a Type 2, cut-out.
- Bollard tops shall be manufactured in a one piece moulding from tough UV stabilised flexible polymer with integral graphics.
- Bollard tops to suit 270mm dia and 600mm dia sign face as required with the graphics outlined in black for improved definition.
- Bollard tops shall be finished in anti-grime finish.
- The photometric performance of the bollard shall, when illuminated from below, provide the illumination levels with uniformity required by BS 8442:2015.
- The light unit lens shall be made from 5mm polycarbonate

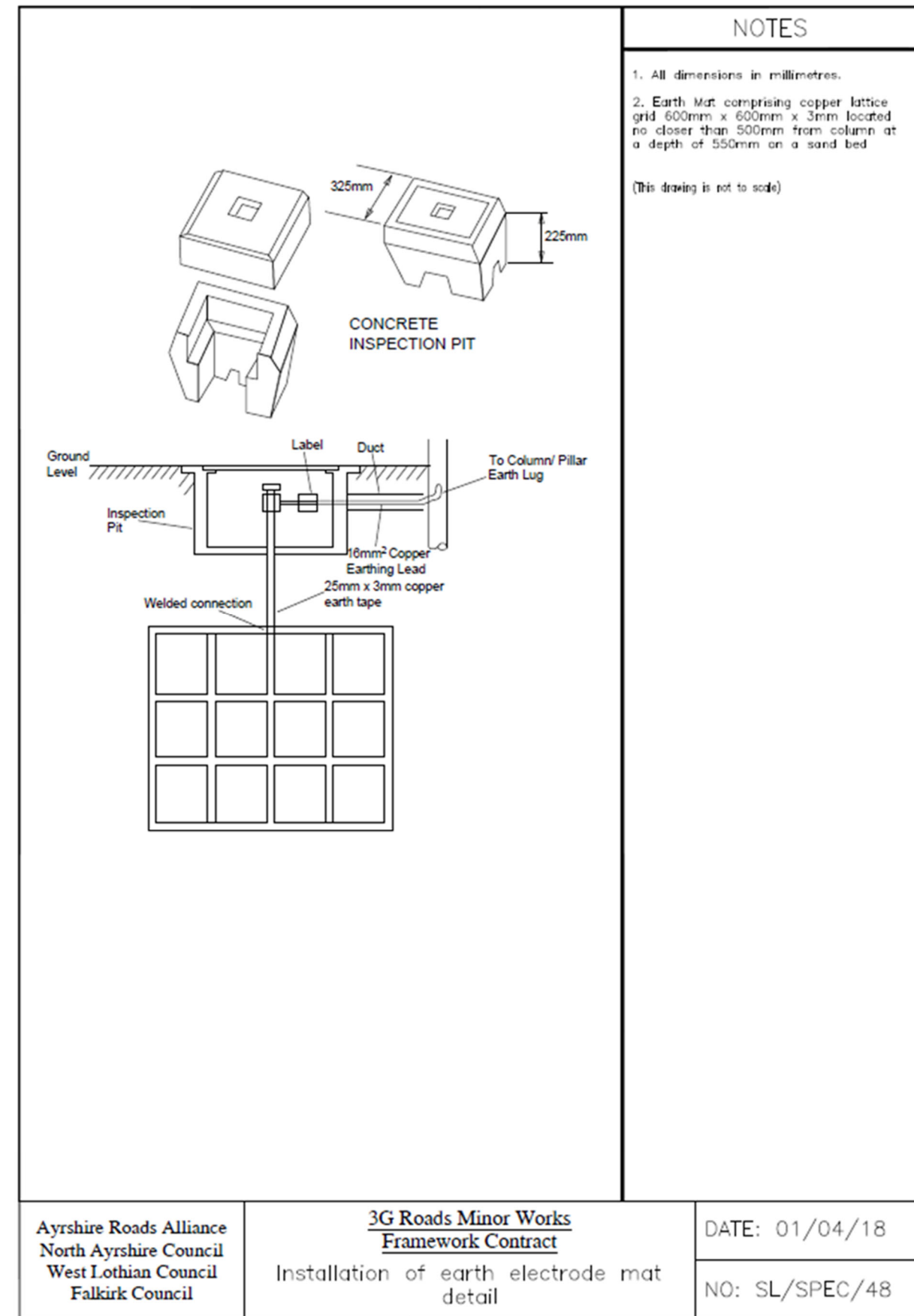
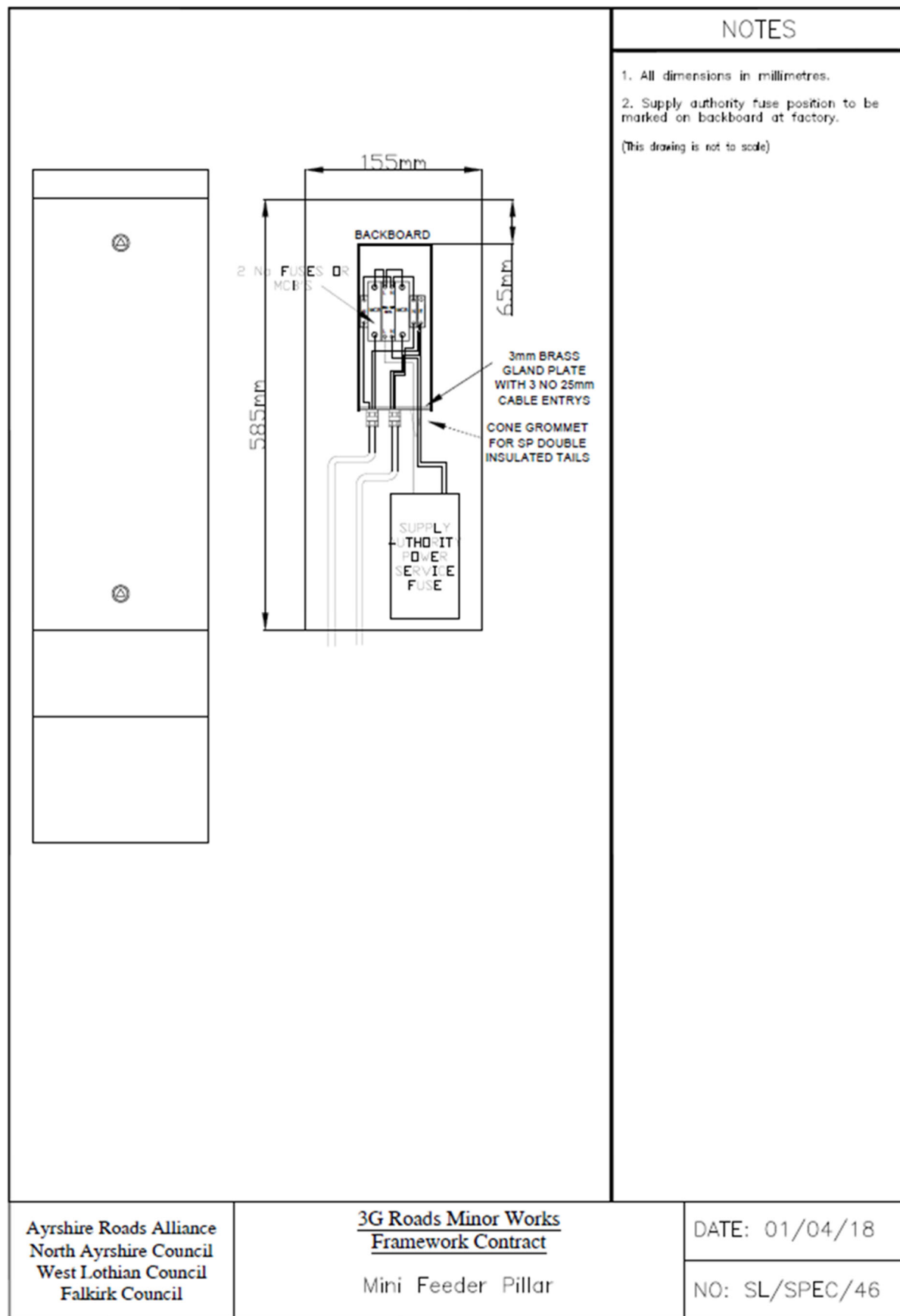
Drawings

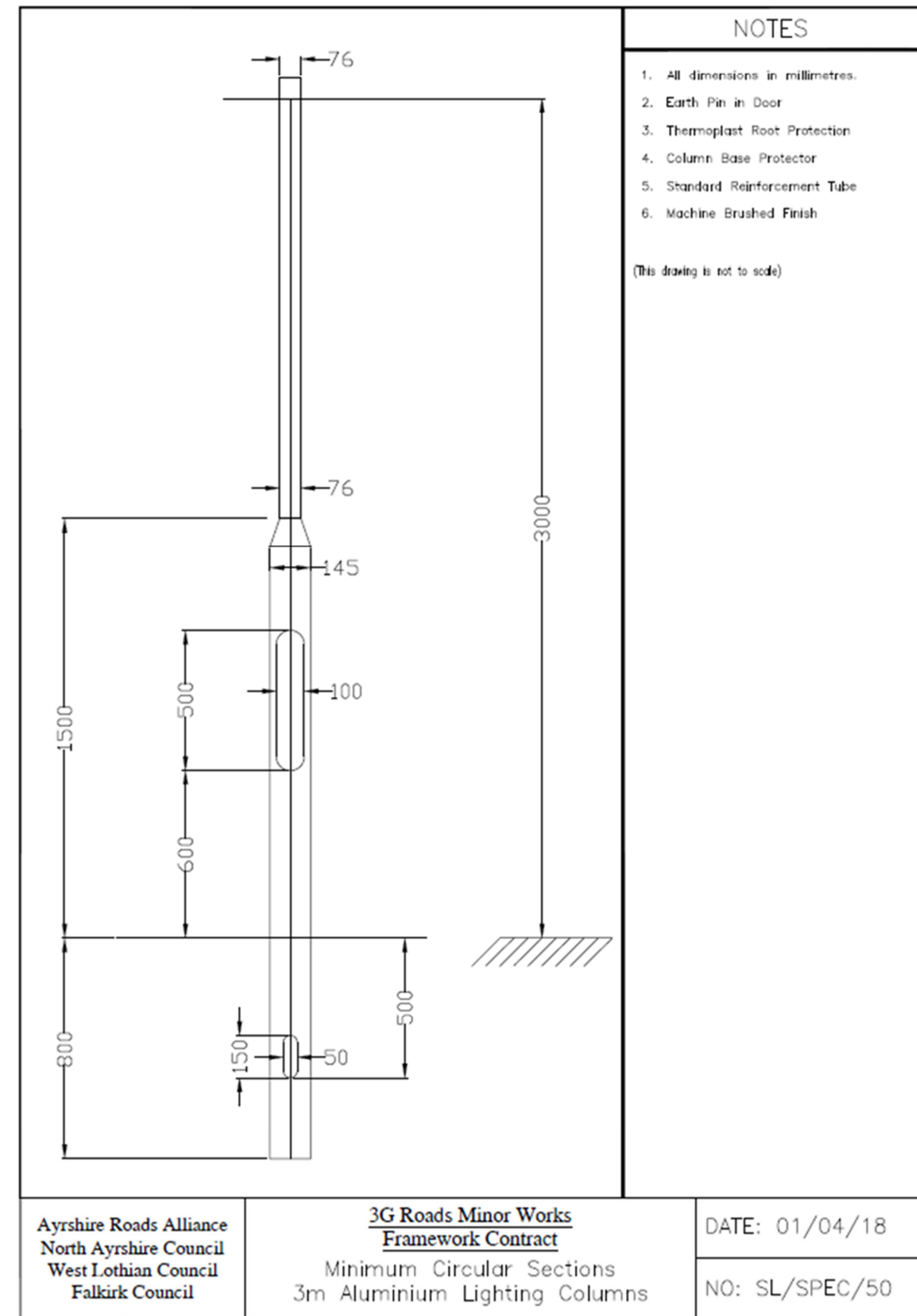
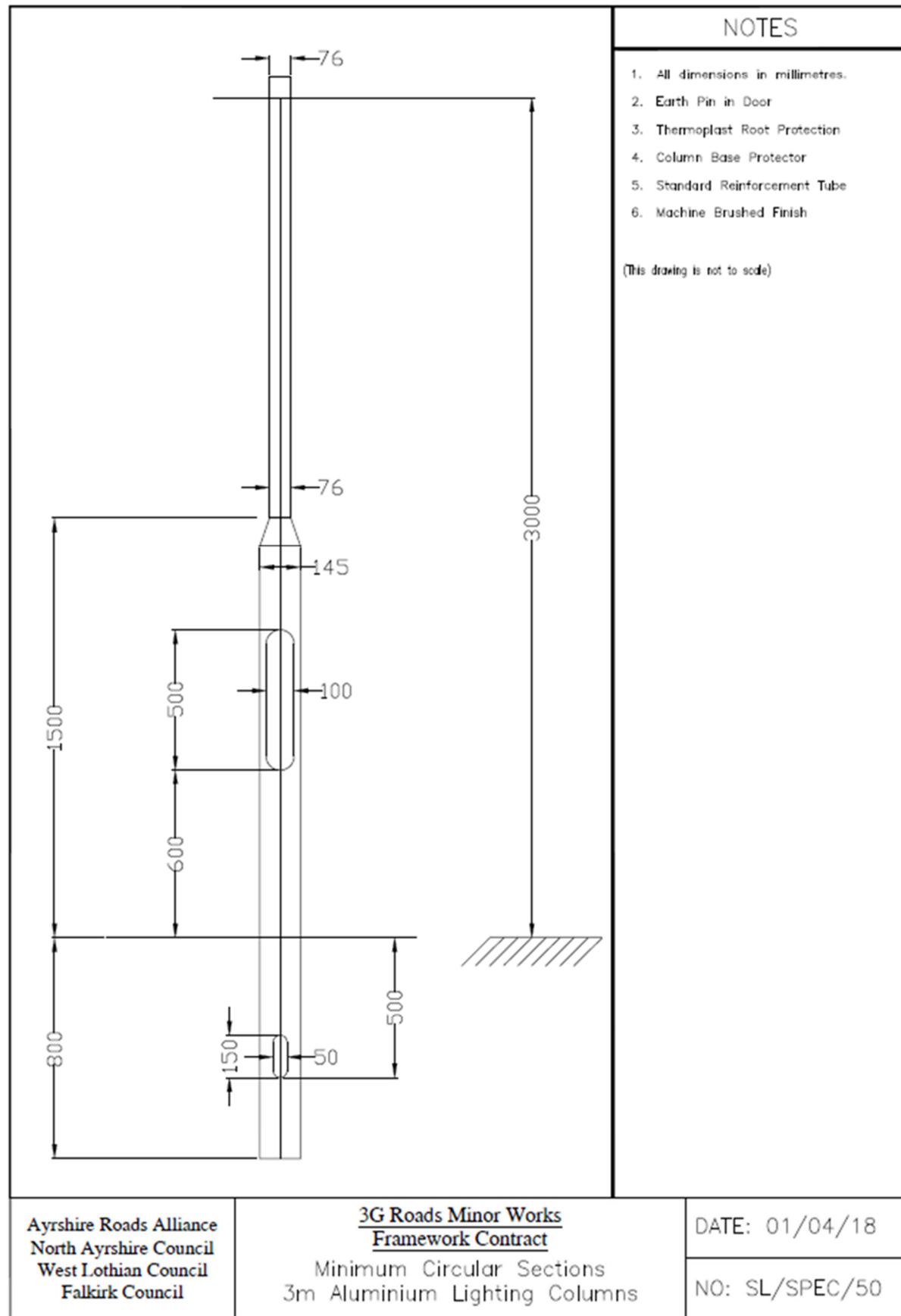
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|--|--|--|--|
| | | <p style="text-align: center;">NOTES</p> <p>1. All dimensions in millimetres. (This drawing is not to scale)</p> | |
| | | <p>Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council</p> | <p style="text-align: center;"><u>3G Roads Minor Works</u> <u>Framework Contract</u></p> <p>Traffic Sign & Luminaire Sign Column with Base Compartment</p> |

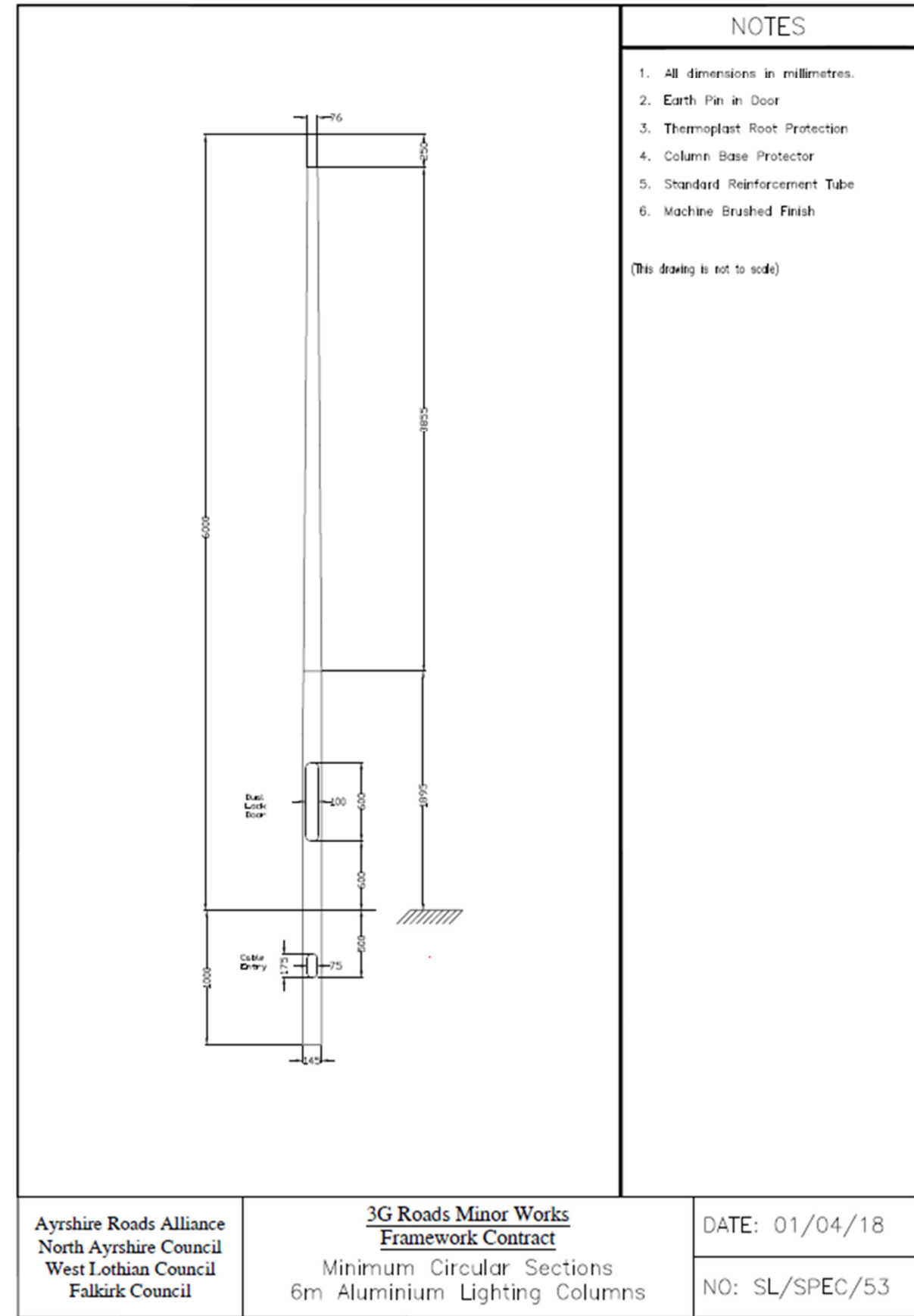
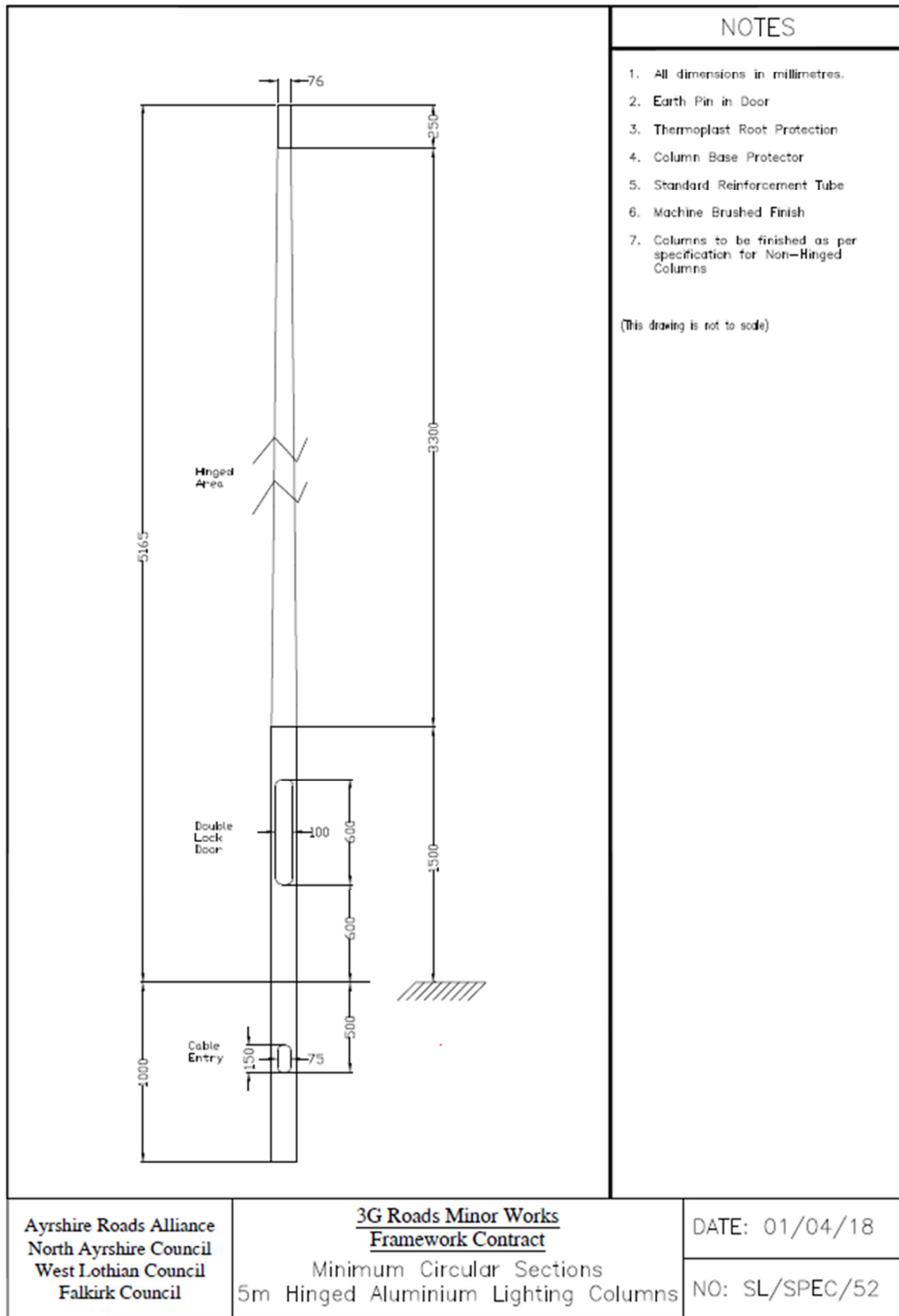


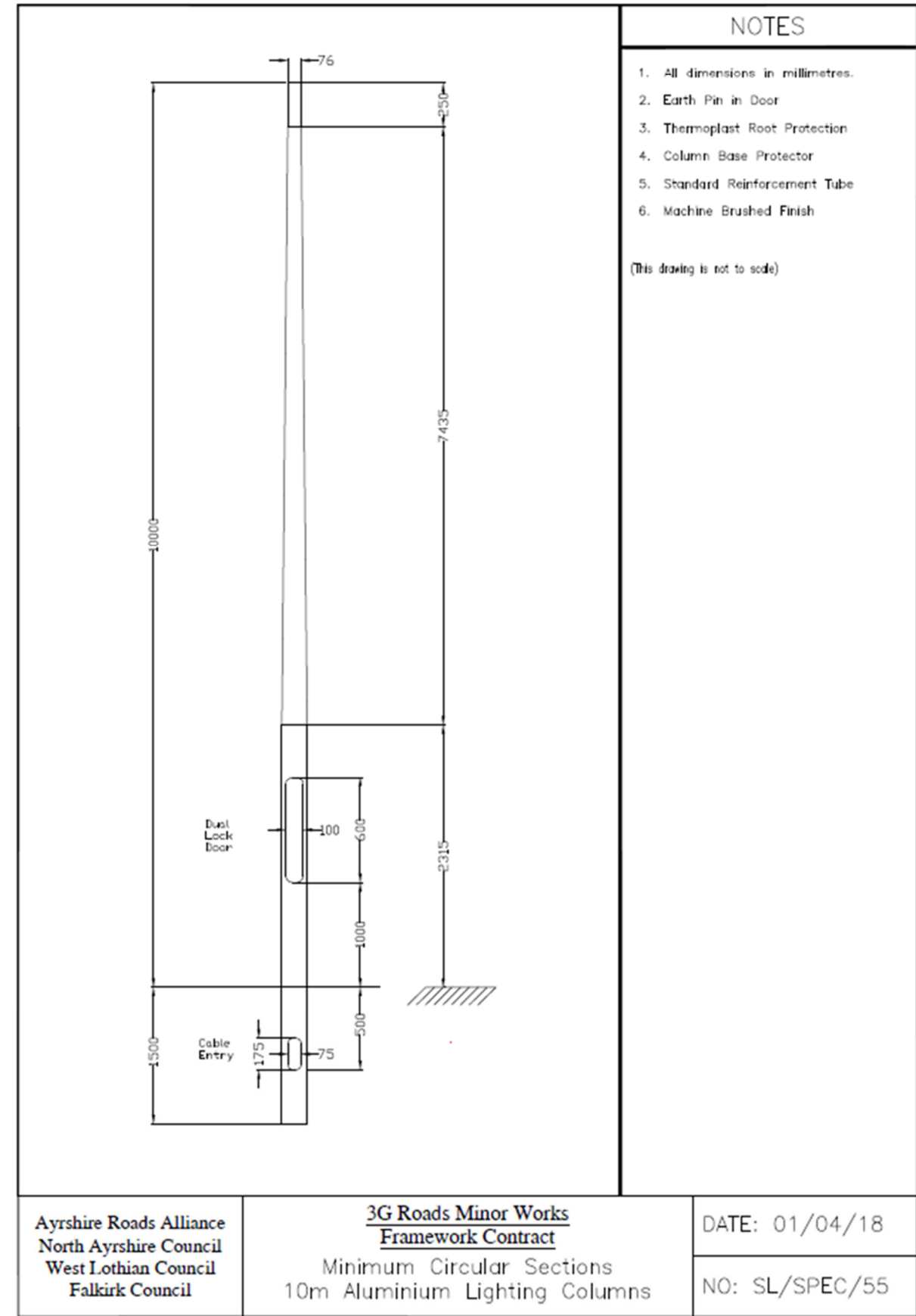
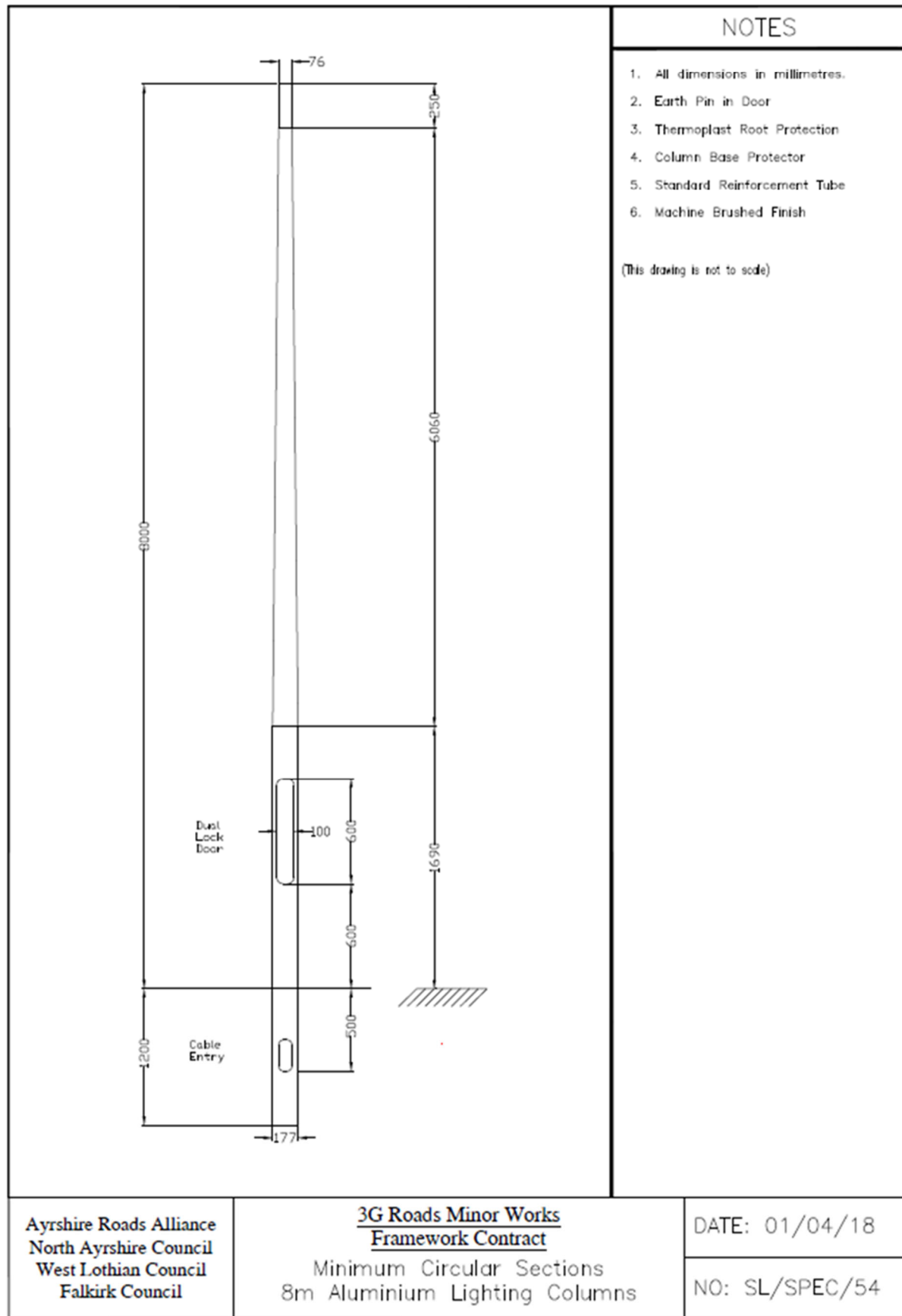


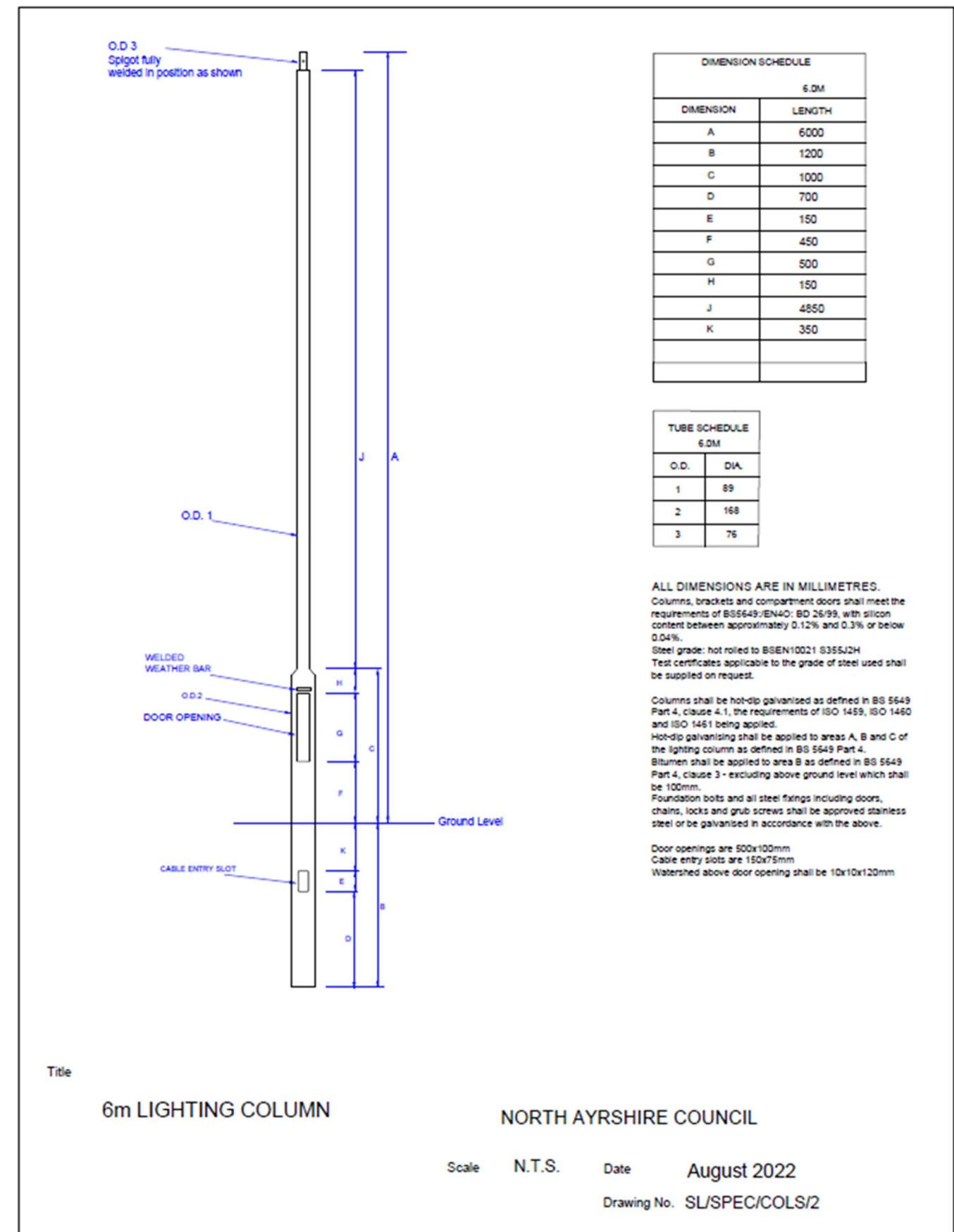
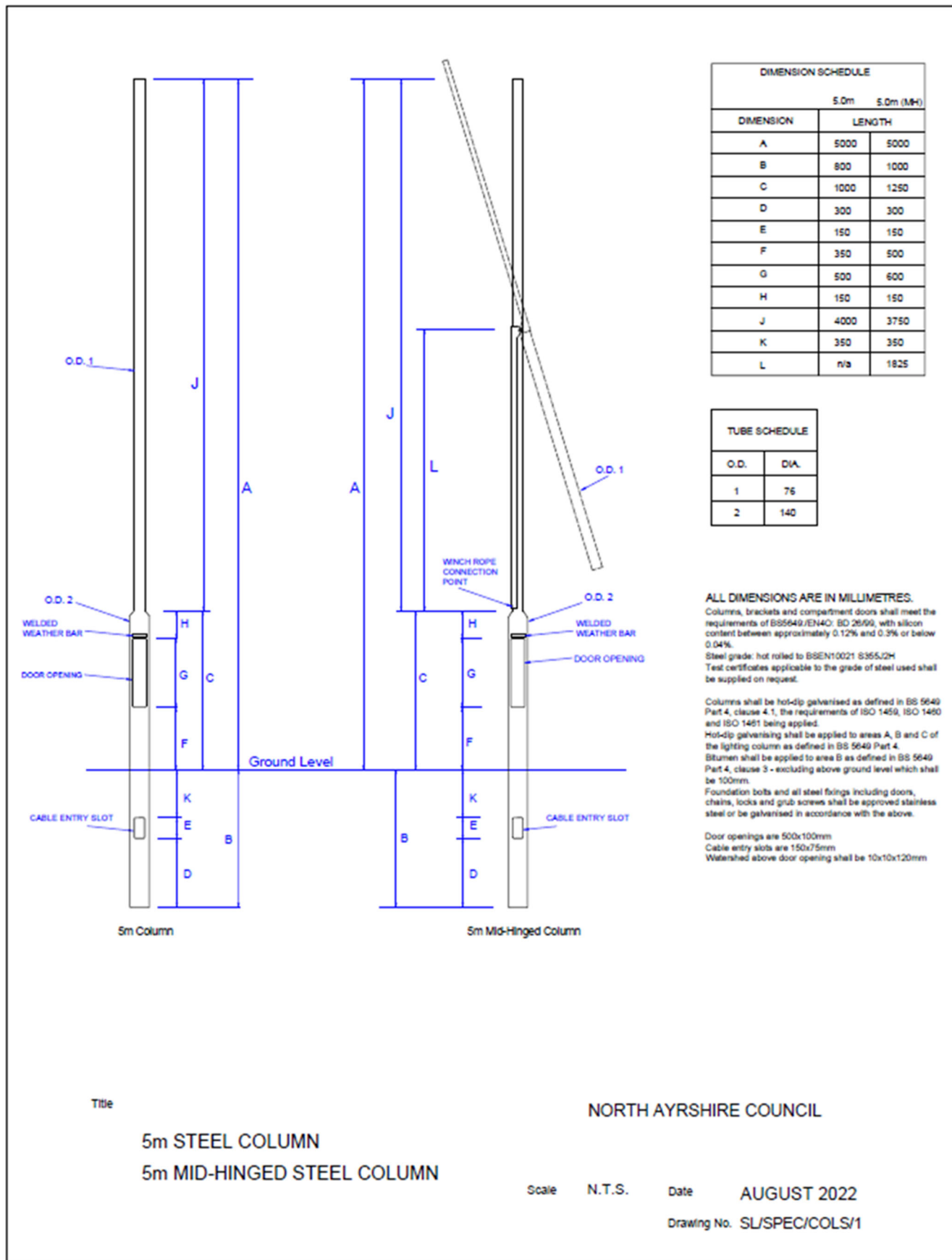










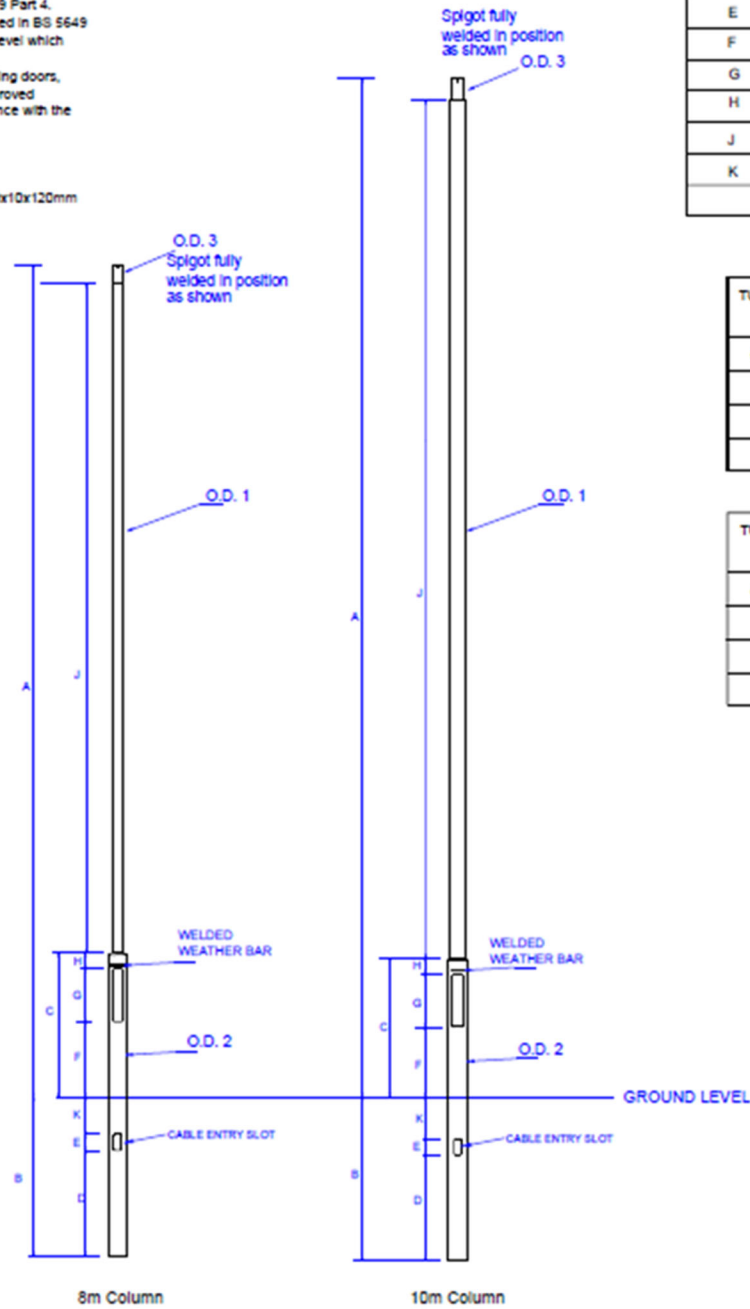


ALL DIMENSIONS ARE IN MILLIMETRES.
Columns, brackets and compartment doors shall meet the requirements of BS5649:EN40: BD 26/99, with silicon content between approximately 0.12% and 0.3% or below 0.04%.
Steel grade: hot rolled to BSEN10021 S355J2H
Test certificates applicable to the grade of steel used shall be supplied on request.

Columns shall be hot-dip galvanised as defined in BS 5649 Part 4, clause 4.1, the requirements of ISO 1459, ISO 1460 and ISO 1461 being applied.
Hot-dip galvanising shall be applied to areas A, B and C of the lighting column as defined in BS 5649 Part 4.
Bitumen shall be applied to area B as defined in BS 5649 Part 4, clause 3 - excluding above ground level which shall be 100mm.

Foundation bolts and all steel fixings including doors, chains, locks and grub screws shall be approved stainless steel or be galvanised in accordance with the above.

Door openings are 500x100mm
Cable entry slots are 150x75mm
Watershed above door opening shall be 10x10x120mm



| DIMENSION SCHEDULE | | |
|--------------------|--------|-------|
| DIMENSION | LENGTH | |
| | 8.0M | 10.0M |
| A | 8000 | 10000 |
| B | 1500 | 1500 |
| C | 1250 | 1250 |
| D | 1000 | 1000 |
| E | 150 | 150 |
| F | 600 | 500 |
| G | 500 | 500 |
| H | 150 | 150 |
| J | 6450 | 8400 |
| K | 350 | 350 |

| TUBE SCHEDULE 8.0M | |
|--------------------|------|
| O.D. | DIA. |
| 1 | 114 |
| 2 | 168 |
| 3 | 101 |

| TUBE SCHEDULE 10.0M | |
|---------------------|------|
| O.D. | DIA. |
| 1 | 139 |
| 2 | 193 |
| 3 | 127 |

Title
8m STEEL LIGHTING COLUMN
10m STEEL LIGHTING COLUMN

NORTH AYRSHIRE COUNCIL
Scale N.T.S. Date August 2022
Drawing No. SL/SPEC/COLS/3

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| DIMENSION | LENGTH | |
| | 8.0M | 10.0M |
| A | 8000 | 10000 |
| B | 1500 | 1500 |
| C | 1250 | 1250 |
| D | 1000 | 1000 |
| E | 150 | 150 |
| F | 600 | 500 |
| G | 500 | 500 |
| H | 150 | 150 |
| J | 6450 | 8400 |
| K | 350 | 350 |

| TUBE SCHEDULE 8.0M | |
|--------------------|------|
| O.D. | DIA. |
| 1 | 114 |
| 2 | 168 |
| 3 | 101 |

| TUBE SCHEDULE 10.0M | |
|---------------------|------|
| O.D. | DIA. |
| 1 | 139 |
| 2 | 193 |
| 3 | 127 |