Laboratory for Fire Safety

Evaluation of the fire resistance of solid timber floor constructions with Astro Lighting Ltd. downlights incorporated into a plasterboard ceiling

Assessment report

Report number C 2425-2E-RA-001 dated 14 April 2025

C 2425-2E-RA-001 I8326D30F / JORISVD

Laboratory for Fire Safety

Evaluation of the fire resistance of solid timber floor constructions with Astro Lighting Ltd. downlights incorporated into a plasterboard ceiling

Assessment report

Client	Astro Lighting Ltd River Way Harlow CM20 2GJ United Kingdom
Report number	C 2425-2E-RA-001
Date	14 April 2025
Reference	JvdV/TBr//C 2425-2E-RA-001
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kvk 12028033, all orders according to DNR 2011, member NLingenieurs, btw NL.004933837B01, ISO-9001:2015

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1 Introduction

Astro Lighting Ltd. has requested an assessment to determine whether the downlights, previously tested in I-joist, metal web joist, and solid timber joist wooden floor constructions (with fire test reports Y 2903-2E-RA-001, Y 2904-2E-RA-001 and Y3308-3E-BR, respectively), can achieve the same or better fire resistance when incorporated into a solid timber floor constructions built as described in fire test reports 20/21960-370 and 20/21960-371.

The assessment is where relevant focused on construction-specific principles and is therefore not valid for situations other than those described in this report.

On behalf of *Astro Lighting Ltd.*, fire resistance tests have previously been performed, the results of which, as well as the description of the tested constructions, have been outlined in the paragraphs below.

The present report is mainly drawn up in accordance with EN 15725:2023 'Extended application reports on the fire performance of construction products and building elements'.
For the preparation of this report, use was made of test reports provided by the client (*Astro Lighting Ltd.*) along with detailed drawings of the downlights.

This assessment has been drawn up in accordance with the guideline "Requirements for drawing up assessments – version 2022." as can be found on our website (in Dutch).

This assessment is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to the Peutz Laboratory for Fire Safety the assessment will be unconditionally withdrawn and the applicant will be notified in writing. This report is valid for 3 years. At the end of this period, the validity period can be extended if it is demonstrated that the composition of the materials and the construction have not changed, the direct field of application as described in the relevant standards have not been limited and no test results have become available that require adjustment of the conclusions in this report.

2 Data used

2.1 Standard used

Preparing this report, the applicable test standard EN 1365-2:2014 and its direct field of application were used. Regarding wooden floor constructions an Extended Application standard is not available.

2.2 Reports used

Various reports have been made available by the client for the purpose of this assessment, see Table 2.1 below.

t2.1 Documents made available

Laboratory	Client	Number and date of the test report	Method used
Applus+ Laboratories	Astro Lighting Ltd.	Test report 20/21960-370, dated March 26, 2020	EN 1365-2:2014
Applus+ Laboratories	Astro Lighting Ltd.	Classification report 20/21960-370-1, dated March 26, 2020	EN 13501-2:2016
Applus+ Laboratories	Astro Lighting Ltd.	Test report 20/21960-371, dated March 26, 2020	EN 1365-2:2014
Applus+ Laboratories	Astro Lighting Ltd.	Classification report 20/21960-371-1, dated March 26, 2020	EN 13501-2:2016
Peutz bv	Astro Lighting Ltd.	Test report Y 2903-2E-RA-001, January 8, 2024	EN 1365-2:2014
Peutz bv	Astro Lighting Ltd.	Test report Y 2904-2E-RA-001, January 10, 2024	EN 1365-2:2014
Peutz bv	Astro Lighting Ltd.	Test report Y 3308-3E-BR, December 16, 2024	EN 1363-1:2020

The client have confirmed that these are the most recent versions of the reports, that they have not been withdrawn and that the aforementioned reports may be used for the present assessment.
A brief description of the reports is given below.

For a complete description of the floor constructions and the incorporated downlights we refer to the test reports as given in Table 2.1.

2.2.1 Test report 20/21960-370 (Applus+ Laboratories)

This report describes the results of a fire resistance determination carried out on a loadbearing timber floor assembly, constructed as follows:

Dimensions floor joists:	solid timber joists and noggins (grade C16), 45 mm wide × 193 mm high, with span length of 4250 mm;
Centre-to-centre distance joists:	600 mm;
Density of the joists:	377 kg/m^3;
Loading on the deck:	90 kg/m^2;
Floor boards (deck):	22 mm chipboards, 600 mm wide, tongue and groove, screwed at 250 mm centres (screws Ø5.0 × 100 mm) and glued (D4 glue);
Ceiling boards:	Gyproc WallBoard, type A, 15 mm boards, dimensions 1200 mm × 2400 mm, screwed 280 mm centres along all joists, drywall screws Ø3.5 × 42 mm; joints taped and filled with joint filler;
Downlight types installed:	DL133-MNRA-1249040 in Ø86 mm, DL133-MNSA-1249043 in 86 × 86 mm, DL133-MNW-1249036 in Ø86 mm, DL133-TRRA-1248019 in Ø83 mm, DL133-TRSA-1248020 in 83 × 83 mm, SP149.00-1396017 in Ø83 mm, DL133-PHRA-1434003 in Ø83 mm, DL133-PHSA-1434004 in Ø86 mm, DL133-PHTA-1434008 in Ø83 mm;
Summarized test results:	Loadbearing capacity (R): 37 minutes, Integrity (E): 37 minutes, Insulation (I): 37 minutes;
Main cause of failure:	the test was discontinued after a period of 37 minutes at the request of the sponsor, none of the criteria failed at that moment.

2.2.2 Classification report 20/21960-370-1 (Applus+ Laboratories)

This report describes the classification of the floor assembly tested according to test report 20/21960-370.

2.2.3 Test report 20/21960-371 (Applus+ Laboratories)

This report describes the results of a fire resistance determination carried out on a loadbearing timber floor assembly, constructed as follows:

Dimensions floor joists:	solid timber joists and noggins (grade C16), 45 mm wide × 193 mm high, with span length of 4250 mm;
Centre-to-centre distance joists:	600 mm;
Density of the joists:	377 kg/m^3;
Loading on the deck:	70 kg/m^2;
Floor boards (deck):	22 mm chipboards, 600 mm wide, tongue and groove, screwed at 250 mm centres (screws Ø5.0 × 100 mm) and glued (D4 glue);
Ceiling boards:	3 layers of Gyproc FireLine, type F, 12.5 mm boards, dimensions 1200 mm × 2400 mm, screwed 280 mm centres along all joists, drywall screws Ø3.5 × 25 mm (first layer), Ø3.5 × 42 mm (second layer), Ø3.5 × 60 mm (third layer); joints (on the third layer) taped and filled with joint filler;
Downlight types installed:	DL133-MNRA-1249040 in Ø86 mm, DL133-MNSA-1249043 in 86 × 86 mm, DL133-MNW-1249037 in Ø86 mm, DL133-TRRA-1248019 in Ø83 mm, DL133-TRSA-1248020 in 83 × 83 mm, SP149.00-1396018 in Ø83 mm, DL133-PHRA-1434003 in Ø83 mm, DL133-PHSA-1434004 in Ø86 mm, DL133-PHTA-1434008 in Ø83 mm;
Summarized test results:	Loadbearing capacity (R): 104 minutes, Integrity (E): 104 minutes, Insulation (I): 104 minutes;
Main cause of failure:	the test was discontinued after a period of 104 minutes at the request of the sponsor, none of the criteria failed at that moment.

2.2.4 Classification report 20/21960-377-1 (Applus+ Laboratories)

This report describes the classification of the floor assembly tested according to test report 20/21960-371.

2.2.5 Test report Peutz Y 2903-2E-RA-001

This report describes the results of a fire resistance determination carried out on a loadbearing timber floor assembly, constructed as follows:

Dimensions floor joists:	Finnjoists, 45 mm wide × 220 mm high × 4150 mm span length, comprise two rectangular LVL flanges 45 mm × 36 mm connected to each other with 9 mm OSB board;
Centre-to-centre distance joists:	600 mm;
Density of the joists:	500 kg/m^3 (flange), 652 kg/m^3 (OSB board);
Loading on the deck:	110 kg/m^2;
Floor boards (deck):	chipboard 22 mm boards 600 mm wide, tongue and groove, glued and screwed ca. 600 mm centres, Ø4.2 × 45 mm screws;
Ceiling boards:	Gyproc Wallboard type A, 15 mm boards, dimensions 1200 mm × 2400 mm, screwed 230 mm centres along all joists, drywall screws Ø3.5 × 40 mm; joints taped with joint tape and filled with joint filler;
Downlight types installed:	1434007 in Ø62 mm, 1434002 in Ø70 mm, 1249038 in 86 × 86 mm, 1434008 in Ø79 mm, 1248017 in Ø79 mm, 1396036 in Ø79 mm, 1286096 in Ø79 mm, 1434004 in Ø83 mm, 1249036 in Ø86 mm, 1249034 in Ø86 mm, 1249040 in Ø86 mm, 1248019 in Ø79 mm;
Summarized test results:	Loadbearing capacity (R): 32 minutes, Integrity (E): 32 minutes (due to failing R), Insulation (I): 32 minutes (due to failing R);
Main cause of failure:	the test was discontinued after a period of 32 minutes, all criteria were failed at that moment. After 32 minutes the whole floor assembly collapsed.

2.2.6 Test report Peutz Y 2904-2E-RA-001

This report describes the results of a fire resistance determination carried out on a loadbearing timber floor assembly, constructed as follows:

Dimensions floor joists:	Wolf Systems joists, 72 mm wide × 219 mm high × 4150 mm span length, comprise two rectangular timber flanges 72 mm × 47 mm (w × h) connected to each other with WS metal webs; at midspan 35 mm × 97 mm strongback was mounted to each mid-column with 2no. 4.0 × 60 mm wood screws;
Centre-to-centre distance joists:	600 mm;
Density of the joists:	505 kg/m^3;
Loading on the deck:	133 kg/m^2;
Floor boards (deck):	chipboard 22 mm boards 600 mm wide, tongue and groove, glued and nailed ca. 200 mm centres, Ø4.0 × 60 mm screws;
Ceiling boards:	Gyproc Wallboard type A, 15 mm boards, dimensions 1200 mm × 2400 mm, screwed 150 mm centres along all joists, drywall screws Ø3.5 × 40 mm; joints taped with joint tape and filled with joint filler;
Downlight types installed:	1434007 in Ø62 mm, 1434002 in Ø70 mm, 1249038 in 86 × 86 mm, 1434008 in Ø79 mm, 1248017 in Ø79 mm, 1396036 in Ø79 mm, 1286096 in Ø79 mm, 1434004 in Ø83 mm, 1249036 in Ø86 mm, 1249034 in Ø86 mm, 1249040 in Ø86 mm, 1248019 in Ø79 mm;
Summarized test results:	Loadbearing capacity (R): 37 minutes, Integrity (E): 37 minutes, Insulation (I): 37 minutes;
Main cause of failure:	the test was discontinued after a period of 37 minutes, none of the criteria failed at that moment.

2.2.7 Test report Peutz Y 3308-3E-BR

This report describes the results of a fire resistance determination carried out on a loadbearing timber floor assembly, constructed as follows:

Dimensions floor joists:	Solid timber joists, 45 mm wide × 195 mm high × 1600 mm span length;
Centre-to-centre distance joists:	600 mm;
Loading on the deck:	110 kg/m^2;
Floor boards (deck):	chipboard 22 mm boards 600 mm wide, tongue and groove, glued and nailed ca. 200 mm centres, Ø4.0 × 60 mm screws;
Ceiling boards:	Gyproc Wallboard type A, 15 mm boards, dimensions 1200 mm wide, screwed 150 mm centres along all joists, drywall screws Ø3.5 × 40 mm; joints and heads of the screws filled with joint filler;
Downlight types installed:	1502001 (with Gen II LED module) in Ø83 mm, 1502001 (with Gen I LED module) in Ø83 mm, 1505001 (with Gen I LED module) in Ø79 mm, 1497001 (with Gen I LED module) in 86 × 86 mm, 1496001 (with Gen I LED module) in Ø86 mm;
Summarized test results:	Loadbearing capacity (R): 33 minutes, Integrity (E): 33 minutes, Insulation (I): 33 minutes;
Main cause of failure:	the test was discontinued after a period of 33 minutes, none of the criteria failed at that moment.

3 Description of the assessed constructions and requirements

3.1 Description of the assessed constructions

The assessed constructions are wooden floor constructions with solid timber joists, built as described in the test reports listed in Table 2.1 (see also Sections 2.2.1 and 2.2.3). *Astro Lighting Ltd.* downlights, as mentioned below, are incorporated into the plasterboard ceiling.

The following downlights can be incorporated in the floor constructions:

GU 10 Downlights:

1248xxx* : **1248017** (Ø79 mm)	1249xxx* : **1249034** (Ø86 mm)	1434xxx* : 1434001 (Ø70 mm)
1248019 (Ø79 mm)	1249035 (Ø86 mm)	**1434002** (Ø70 mm)
	1249036 (Ø86 mm)	1434003 (Ø83 mm)
1286xxx* : 1286095 (Ø79 mm)	1249037 (Ø86 mm)	**1434004** (Ø83 mm)
1286096 (Ø79 mm)	**1249038** (86 square)	**1434007** (Ø62 mm)
	1249039 (86 square)	**1434008** (Ø79 mm)
1396xxx* : **1396036** (Ø79 mm)	**1249040** (Ø86 mm)	
1396037 (Ø79 mm)	1249041 (Ø86 mm)	
	1249042 (86 square)	
	1249043 (86 square)	

'Pro' Downlights using Gen I LED Module:

Minima Pro Round Fixed – 1494xxx* (Ø86 mm)
Minima Pro Round Adjustable – 1495xxx* (Ø86 mm)
Minima Pro Round 25° - 1496xxx* (Ø86 mm)
Minima Pro Square Fixed – 1497xxx* (86 square)
Minima Pro Square Adjustable – 1498xxx* (86 square)
Pinhole Pro Round Fixed – 1499xxx* (Ø70 mm)
Pinhole Pro Round Adjustable – 1500xxx* (Ø83 mm)
Pinhole Pro Square Fixed – 1501xxx* (Ø70 mm)
Pinhole Pro Square Adjustable – 1502xxx* (Ø83 mm)
Pinhole Pro Round Flush Fixed – 1503xxx* (Ø62 mm)
Pinhole Pro Round Flush Adjustable – 1504xxx* (Ø79 mm)
Trimless Pro Round Fixed – 1505xxx* (Ø79 mm)
Trimless Pro Round Adjustable – 1506xxx* (Ø79 mm)

Drawings of the assessed floor constructions are given in Appendix 1 and 2, drawings of the downlights are given in Appendix 3.

3.2 Requirement

The assessed constructions requires a fire resistance of REI 30 and REI 90 in line with EN 13501-2:2023.

* 'xxx' represents a variant of the same product where the finish is different (*LED, Lens, and Filter (optional) for downlights using Gen I LED Module)*, but the size, weight, construction and materials remain the same as tested, and does not impact the fire-rating performance (for example, 1249034 represents a downlight with a white matte finish, whereas 1249035 signifies a black matte finish).
Downlights that underwent the fire test (see test reports mentioned in Chapter 2) are highlighted in bold font.

4 Assessment

4.1 General

Where relevant, the assessment focuses on construction-specific principles and therefore cannot be used in situations other than those described in this report.

Based on the fire resistance tests listed in Table 2.1, along with thorough information supplied by *Astro Lighting Ltd*., it will be assessed in the following paragraphs whether it is possible (or not) to achieve the same or better fire resistance by incorporating lighting fixtures from Section 3.1 in solid timber floor constructions as described in the test reports 20/21960-370 (dated March 26, 2020) and 20/21960-371 (dated March 26, 2020), see also Sections 2.2.1 and 2.2.3.

4.2 Metsä Wood floor construction with Astro Lighting Ltd. downlights

Astro Lighting Ltd. downlight types:

- 1248017
- 1248019
- 1434002
- 1434004
- 1434007
- 1434008
- 1249034
- 1249036
- 1249038
- 1249040
- 1286096
- 1396036

These lighting fixtures were tested in a floor construction using *Metsä Wood* joists, as documented in fire test report Y 2903-2E-RA-001. The applied load in this test was 110 kg/m^2. Based on observations during the fire test, no downlight was found to have fallen out of the opening in the plasterboard ceiling. The test achieved an REI 30 classification in accordance with EN 13501-2:2023.

4.3 Wolf Systems floor construction with Astro Lighting Ltd. downlights

Astro Lighting Ltd. downlight types:

- 1248017
- 1248019
- 1434002
- 1434004
- 1434007
- 1434008
- 1249034
- 1249036
- 1249038
- 1249040
- 1286096
- 1396036

These lighting fixtures were tested in a floor construction using *Wolf Systems* joists, as documented in fire test report Y 2904-2E-RA-001. The applied load in this test was 133 kg/m^2. Based on observations during the fire test, no downlight was found to have fallen out of the opening in the plasterboard ceiling. The test achieved an REI 30 classification in accordance with EN 13501-2:2023.

4.4 Small scale test with Astro Lighting Ltd. downlights

Astro Lighting Ltd. downlight types:

- 1502001 (with Gen II LED module)
- 1502001 (with Gen I LED module)
- 1505001 (with Gen I LED module)
- 1497001 (with Gen I LED module)
- 1496001 (with Gen I LED module)

In this small scale fire test, conducted in accordance with the most recent version of EN 1363-1, new versions of *Astro Lighting Ltd.* downlights were tested, incorporating new LED modules (Gen I and Gen II). A detailed description of the construction and downlights can be found in the report referenced in Table 2.1 (test report No. Y 3308-3E-BR, December 16, 2024).
Five downlights, four of which contained the LED Gen I module and one the LED Gen II module, were installed in 15 mm plasterboards (type A) in accordance with the manufacturer's instructions. They were positioned to best represent their practical installation, meaning that some were installed directly next to solid timber joists, in the middle between two joists, and directly over the joints between two plasterboards. The load applied during the test was 110 kg/m^2.
During the fire test, within the first minute, downlight 1502001, which contained the LED Gen II module, fell into the furnace. The remaining downlights, all of which contained the LED Gen I module, stayed in place until the 30 min. of the test. After the 30 min., the first piece of gypsum board dropped into the furnace, and within the next three minutes, several other pieces followed, along with the downlights. The test was stopped at 33 minutes, with none of the criteria having been exceeded by that point.

4.5 Solid timber floor constructions with Astro Lighting Ltd. downlights

4.5.1 Test report 20/21960-370 (Applus+ Laboratories)

Astro Lighting Ltd. downlight types:

DL133-MNRA-1249040,	DL133-TRRA-1248019,	DL133-PHRA-1434003,
DL133-MNSA-1249043,	DL133-TRSA-1248020,	DL133-PHSA-1434004,
DL133-MNW-1249036,	SP149.00-1396017,	DL133-PHTA-1434008;

In this 30-minute fire test, which used 45 × 193 mm (thick × deep) solid timber joists, nine different types of downlight types were tested. They were installed in openings of various sizes in 15 mm Type A plasterboard from British Gypsum.

According to the fire test report, the first piece of the plasterboard ceiling (containing three downlights) collapsed into the furnace after 27 minutes. The test was then continued for another 10 minutes before being terminated at the sponsor's request. At this point, none of the criteria (load-bearing capacity (R), integrity (E), or insulation (I)) had been met.

Given that the deflection at the end of the test was approximately 60 mm, which corresponds to around 30% of the maximum allowable deflection, and that the maximum temperatures on the test specimen did not exceed 80 °C, the test could likely have continued for a few more minutes.

Considering that solid timber joists have significantly higher strength than I-joists or metal web joists, incorporating downlights into a floor construction, as described in test report 20/21960-370, which were previously tested in fire tests Y 2903, Y 2904 and Y 3308 (see also Sections 2.2.5, 2.2.6 and 2.2.7), should not pose a problem in achieving an REI 30 classification according to EN13501-2.

4.5.2 Test report 20/21960-371 (Applus+ Laboratories)

Astro Lighting Ltd. downlight types:

DL133-MNRA-1249040,	DL133-TRRA-1248019,	DL133-PHRA-1434003,
DL133-MNSA-1249043,	DL133-TRSA-1248020,	DL133-PHSA-1434004,
DL133-MNW-1249037,	SP149.00-1396018,	DL133-PHTA-1434008;

In this 90-minute fire test, which used 45 × 193 mm (thick × deep) solid timber joists, nine different types of downlight types were tested. They were installed in openings of various sizes in a ceiling consisting of three 12.5 mm layers of British Gypsum Type F plasterboards.

According to the fire test report, the first piece of the plasterboard ceiling (the first exposed layer) fell into the furnace after 82 minutes. After 85 minutes of testing, another piece of the first layer of plasterboard fell into the furnace. After 95 minutes of testing, downlights DL133-TRSA-1248020 and SP149.00-1396018 fell into the furnace. The test was terminated at the sponsor's request after 104 minutes of testing. At this point, none of the criteria (load-bearing capacity (R), integrity (E), or insulation (I)) had been met.

The deflection at the end of the test was approximately 20 mm, which corresponds to around 10% of the maximum allowable deflection. Moreover, by the end of the 104 minute of the test, the two remaining layers of Type F plasterboards remained intact. This suggests a high probability that the test could have continued for a few more minutes.

Considering that solid timber joists have significantly higher strength than I-joists or metal web joists, incorporating downlights into a floor construction, as described in test report 20/21960-371, which were previously tested in fire tests Y 2903, Y 2904 and Y 3308 (see also Sections 2.2.5, 2.2.6 and 2.2.7), should not pose a problem in achieving an REI 90 classification according to EN13501-2.

5 In conclusion

Based on the fire test reports listed in Table 2.1, the use of lighting fixtures in solid timber floor constructions, as specified in test reports 20/21960-370 (REI 30) and 20/21960-371 (REI 90), has been assessed for fire resistance of REI 30 and REI 90 in accordance with the classification standard EN 13501-2:2023. The conclusion of this assessment is that all evaluated lighting fixtures in Section 3.1 are permissible in the aforementioned floor constructions (constructed according to the test reports listed in Table 2.1) with an expected fire resistance of 30 minutes (REI 30) and 90 minutes (REI 90).

The fire resistance of the considered modifications to the tested constructions can only be determined with absolute certainty on the basis of a fire resistance test in accordance with the European test standard EN 1365-2:2014. The conclusion of this assessment is that if the floor constructions as described in this report were subject to such tests we would expect a REI 30 and REI 90 fire classification.

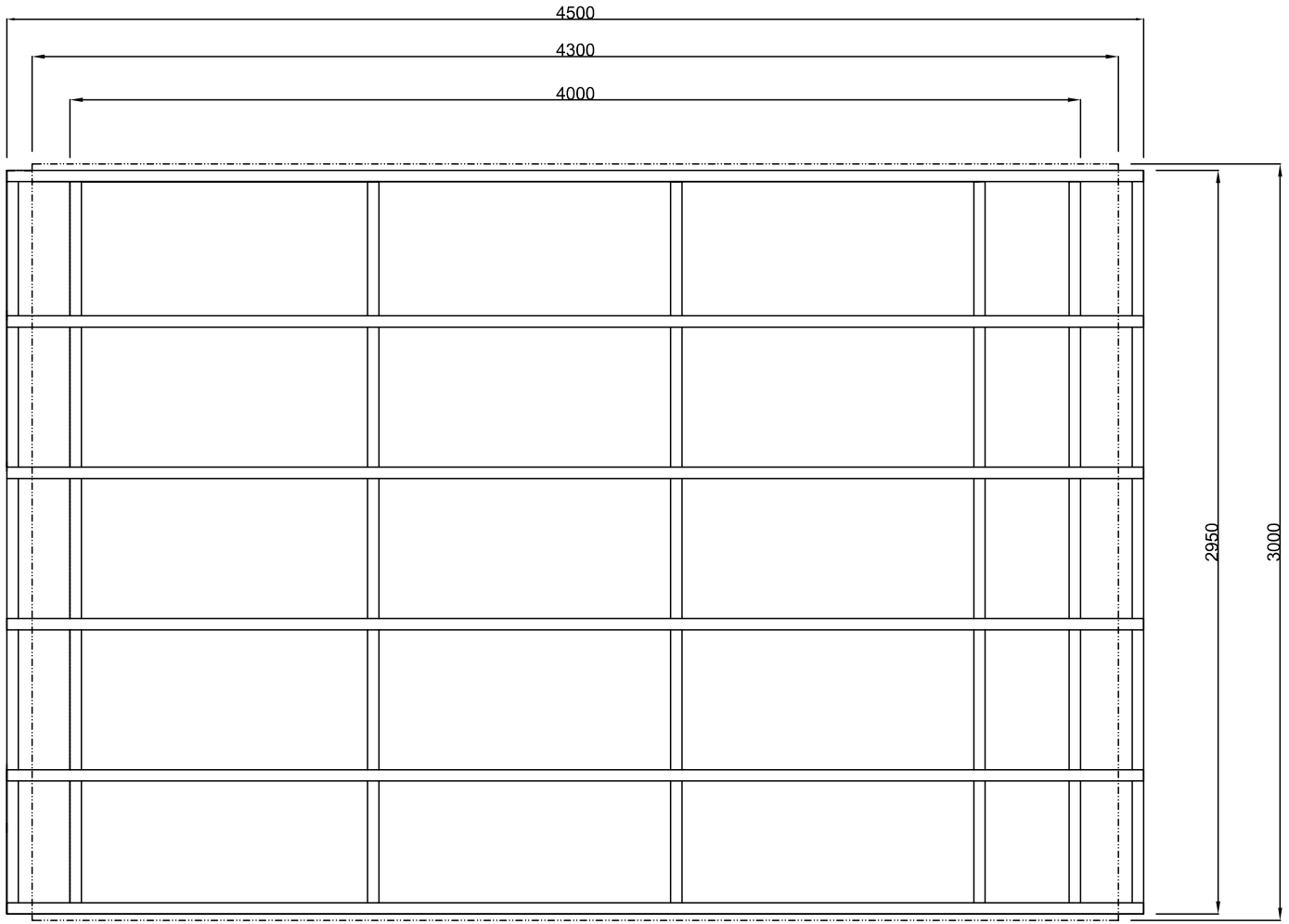
The assessment described in this report concerns equivalent solutions. The described equivalent solutions must be agreed with the competent authority in a timely manner.

Haps,

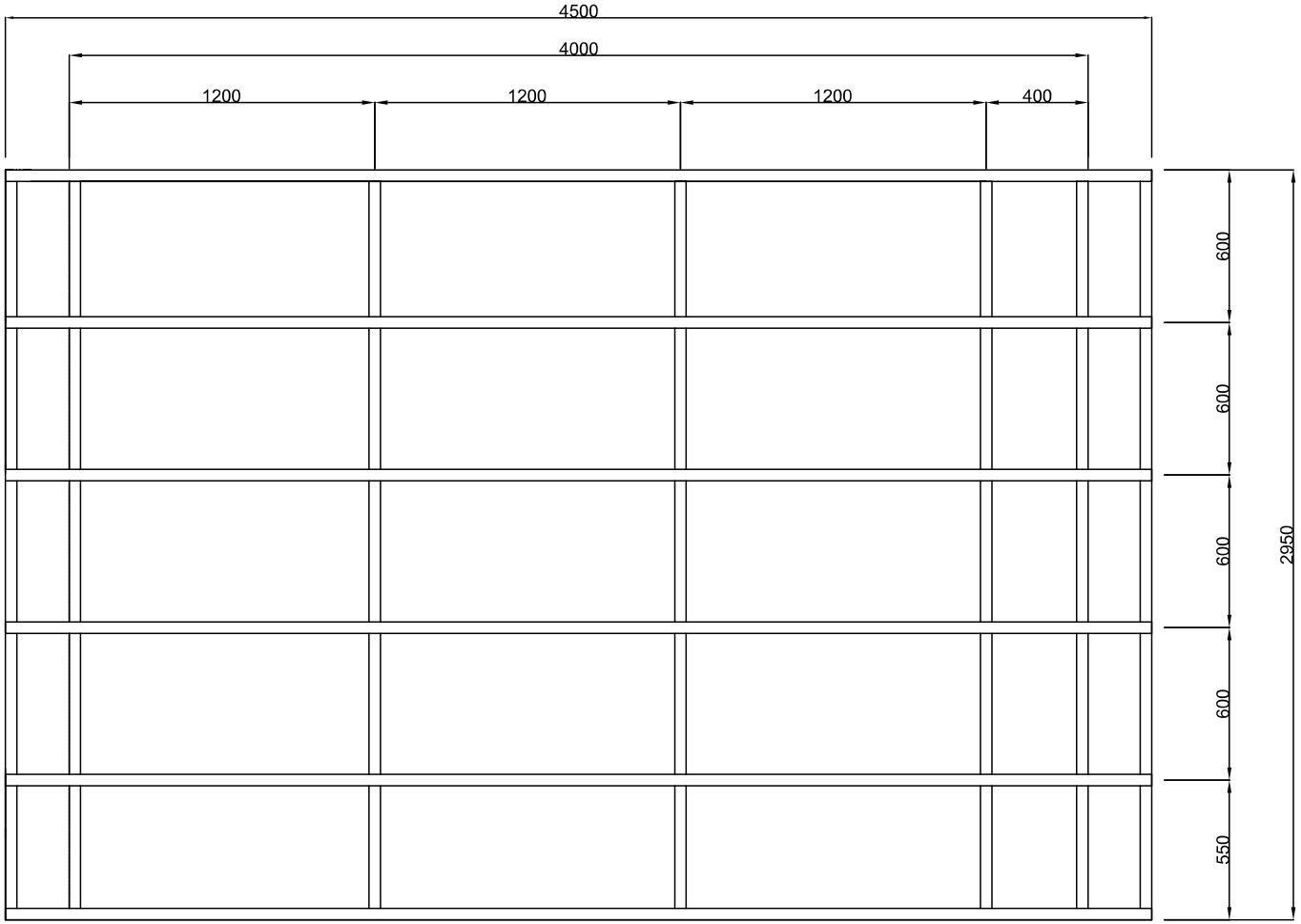
J. van der Vleuten, MSc.
Senior project manager

This report contains 15 pages and 3 Appendices.

Appendix 1 Floor construction 20/21960-370 (Applus+ Laboratories)

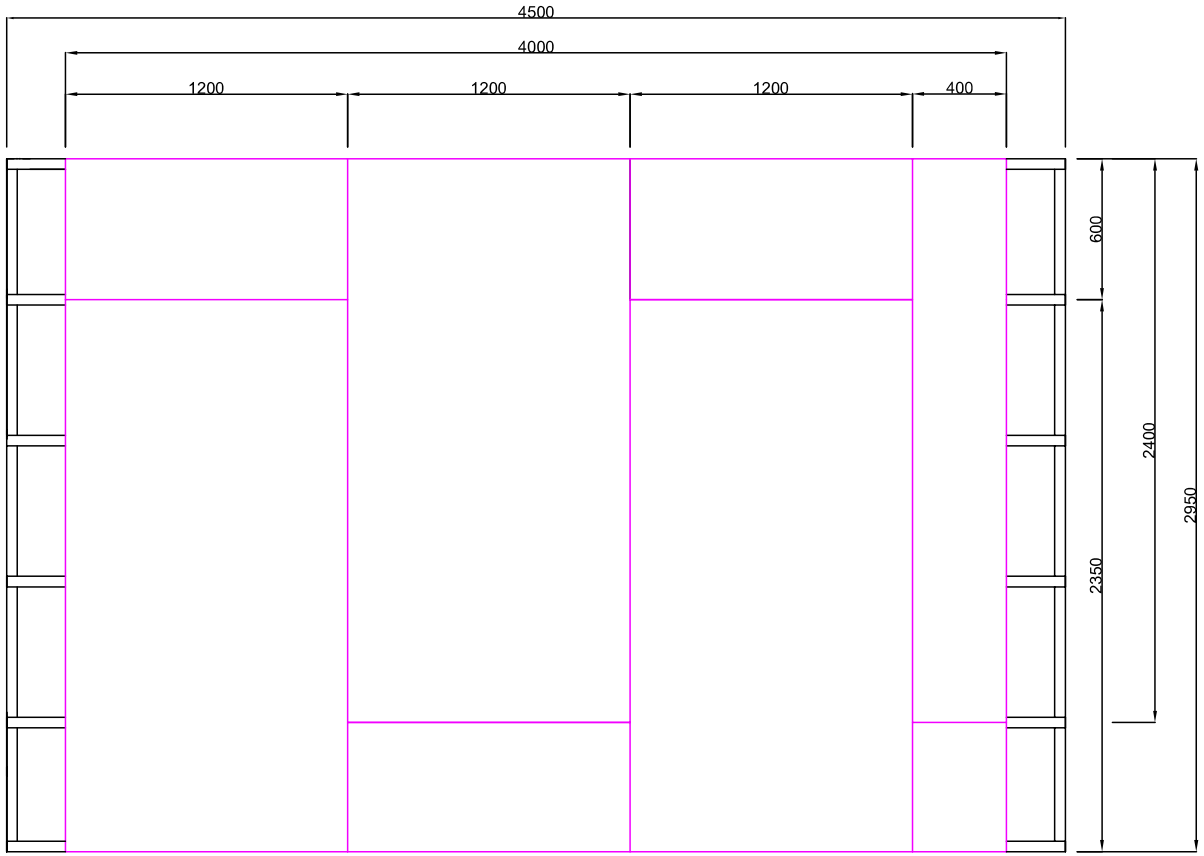


Appendix 1 Floor construction 20/21960-370 (Applus+ Laboratories)



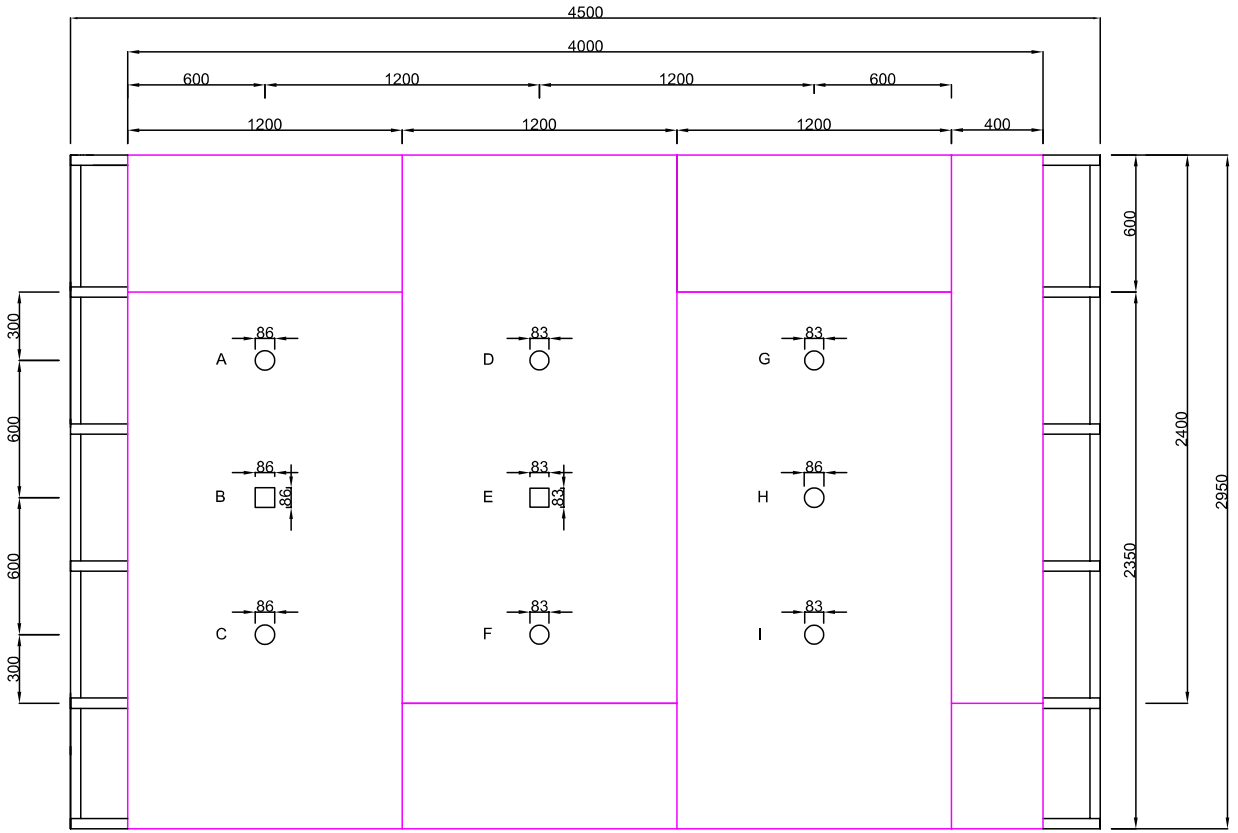
- Timber floor constructed using 193 mm deep by 45 mm thick C16 grade timber joists and noggins as per the specifications provided in British Gypsum White Book
- Timber joists positions at 600 mm centres
- Timber noggins at 1200 mm centres

Appendix 1 Floor construction 20/21960-370 (Applus+ Laboratories)



- Ceiling for 30 minute fire rated timber floor comprising a single layer of 15 mm thick Gyproc WallBoard as per the specifications provided in British Gypsum White Book
- Boards fixed using 32 mm long drywall screws at 280 mm centres
- Boards joints protected using British Gypsum joint filler and tape
- Screw fixed positions protected using British Gypsum joint filler

Appendix 1 Floor construction 20/21960-370 (Applus+ Laboratories)



- Specimen A - MINIMA Round Adjustable
- Specimen B - MINIMA Square Adjustable
- Specimen C - MINIMA Wall Wash
- Specimen D - Trimless Round Adjustable
- Specimen E - Trimless Square Adjustable
- Specimen F - Can 50 Trimless
- Specimen G - Pinhole Round Adjustable
- Specimen H - Pinhole Square Adjustable
- Specimen I - Pinhole Trimless Adjustable

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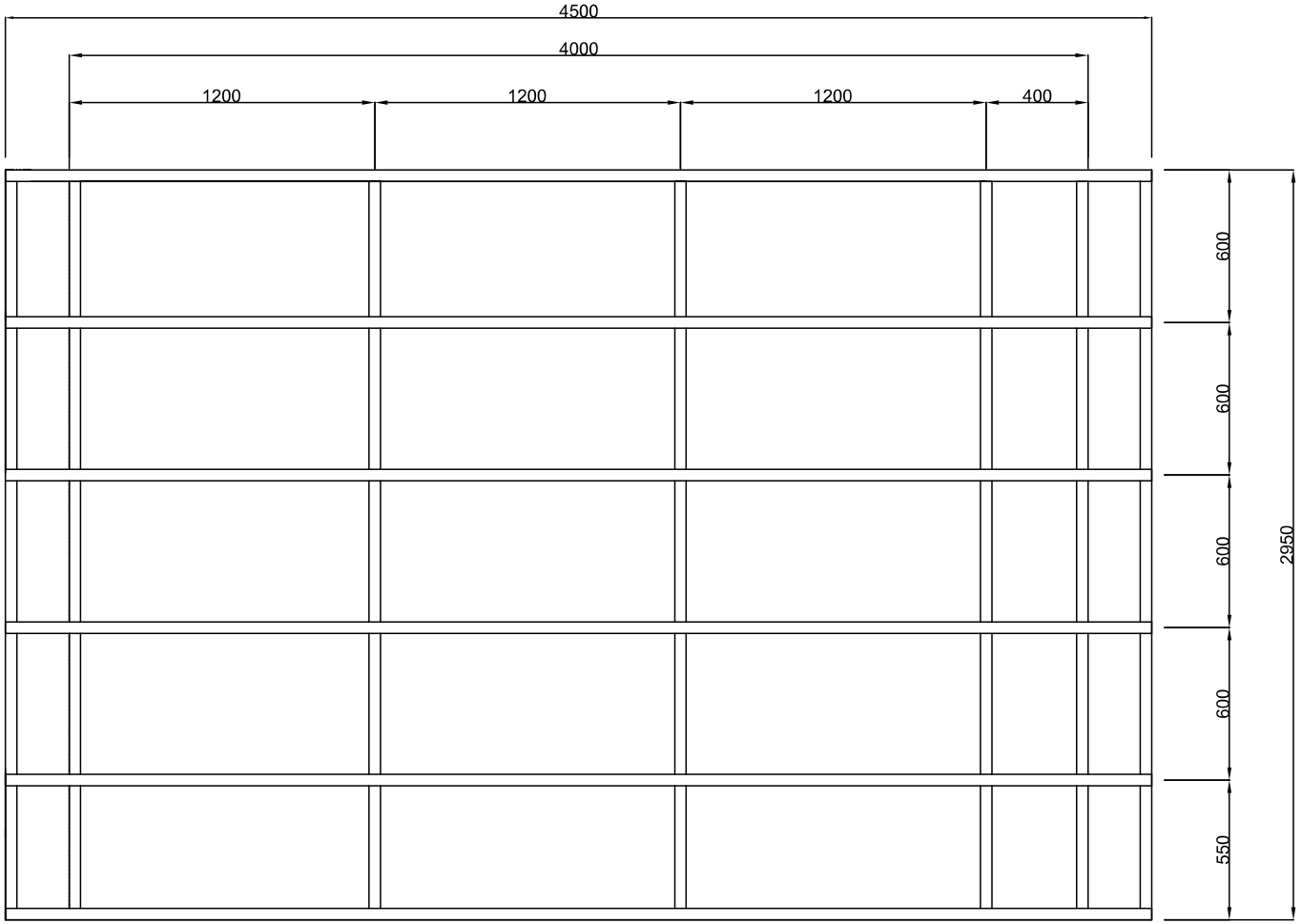
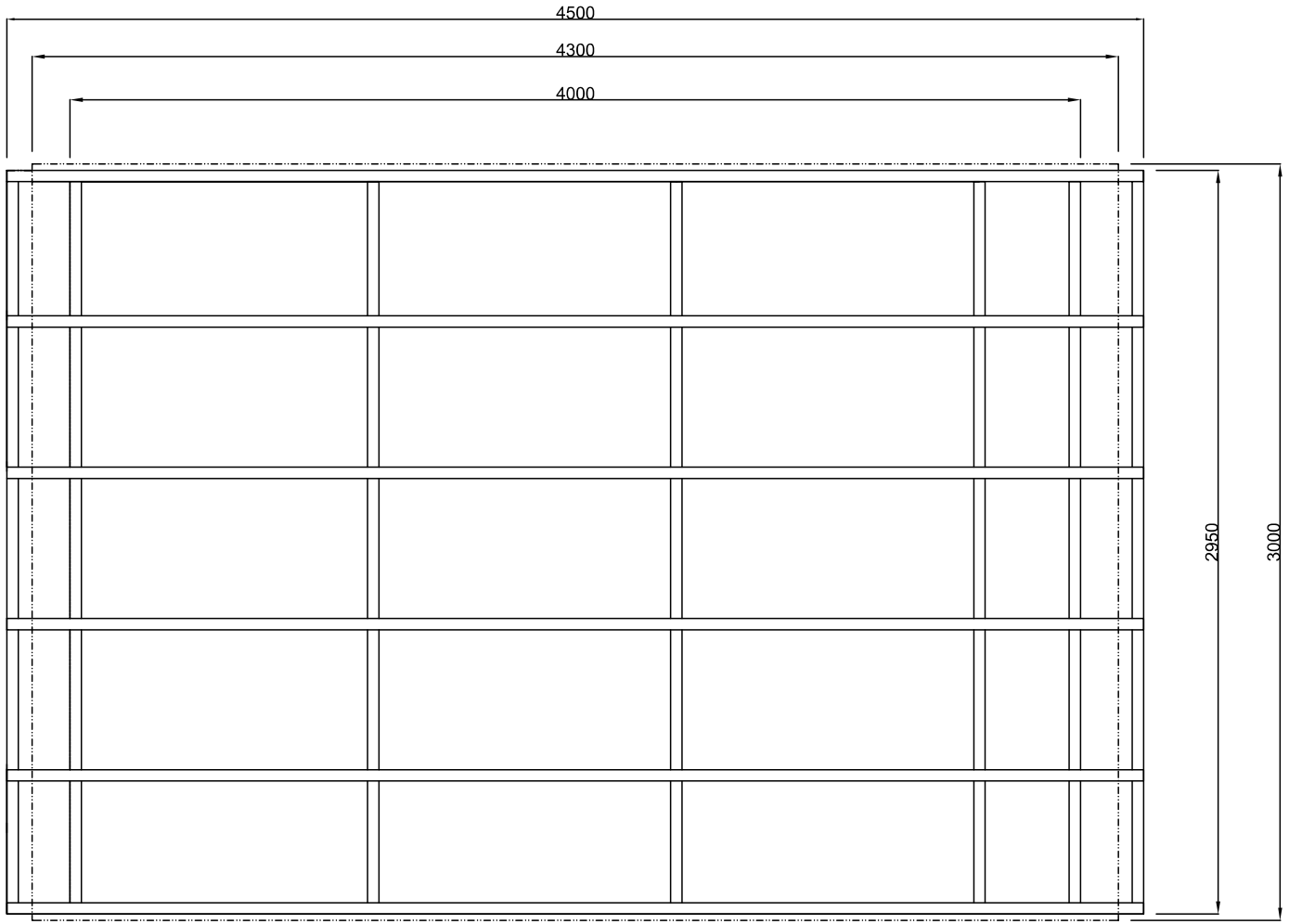
Appendix 2 Floor construction 20/21960-371 (Applus+ Laboratories)

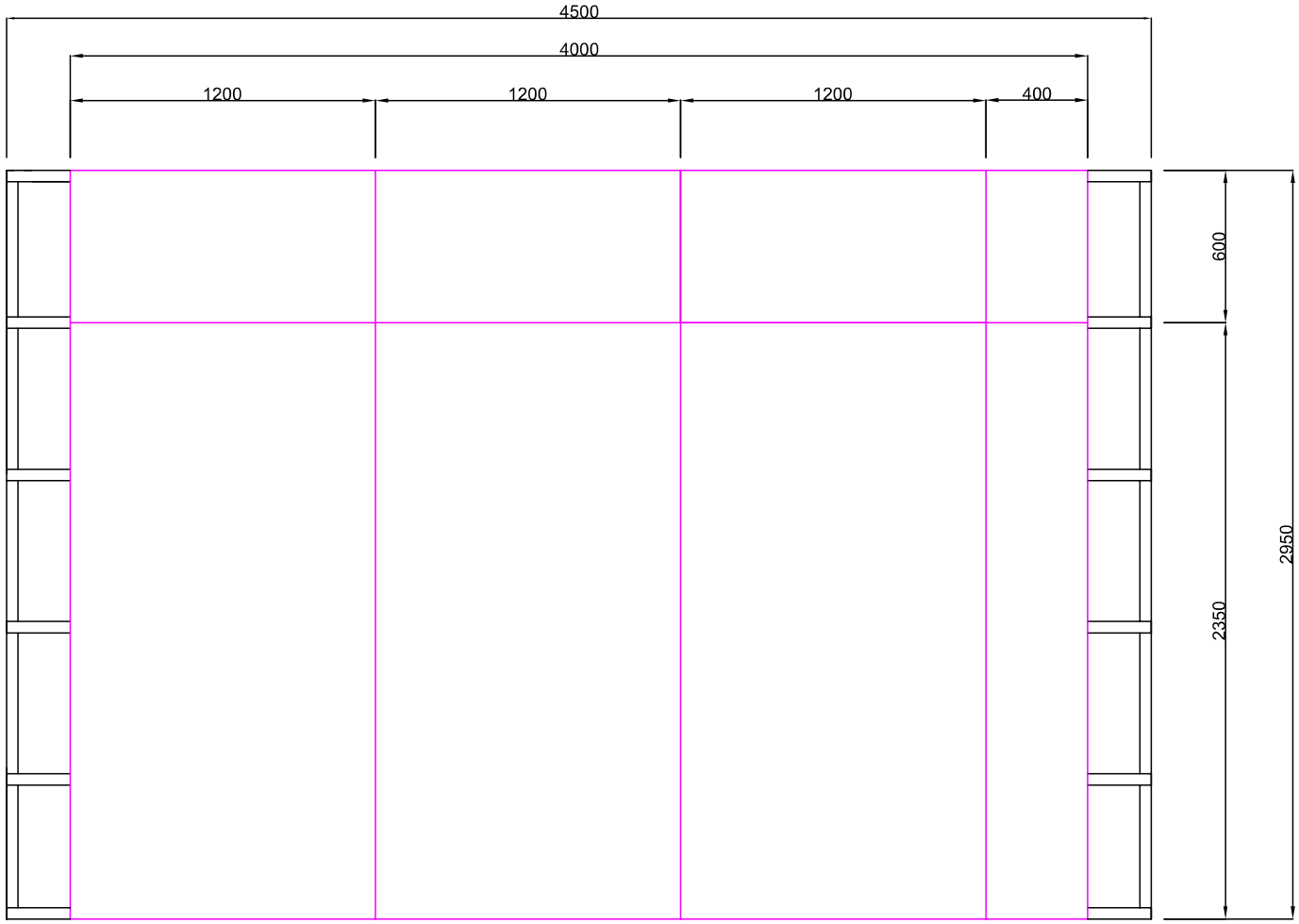


- Timber floor constructed using 193 mm deep by 45 mm thick C16 grade timber joists and noggins as per the specifications provided in British Gypsum White Book
- Timber joists positions at 600 mm centres
- Timber noggins at 1200 mm centres

Appendix 2 Floor construction 20/21960-371 (Applus+ Laboratories)

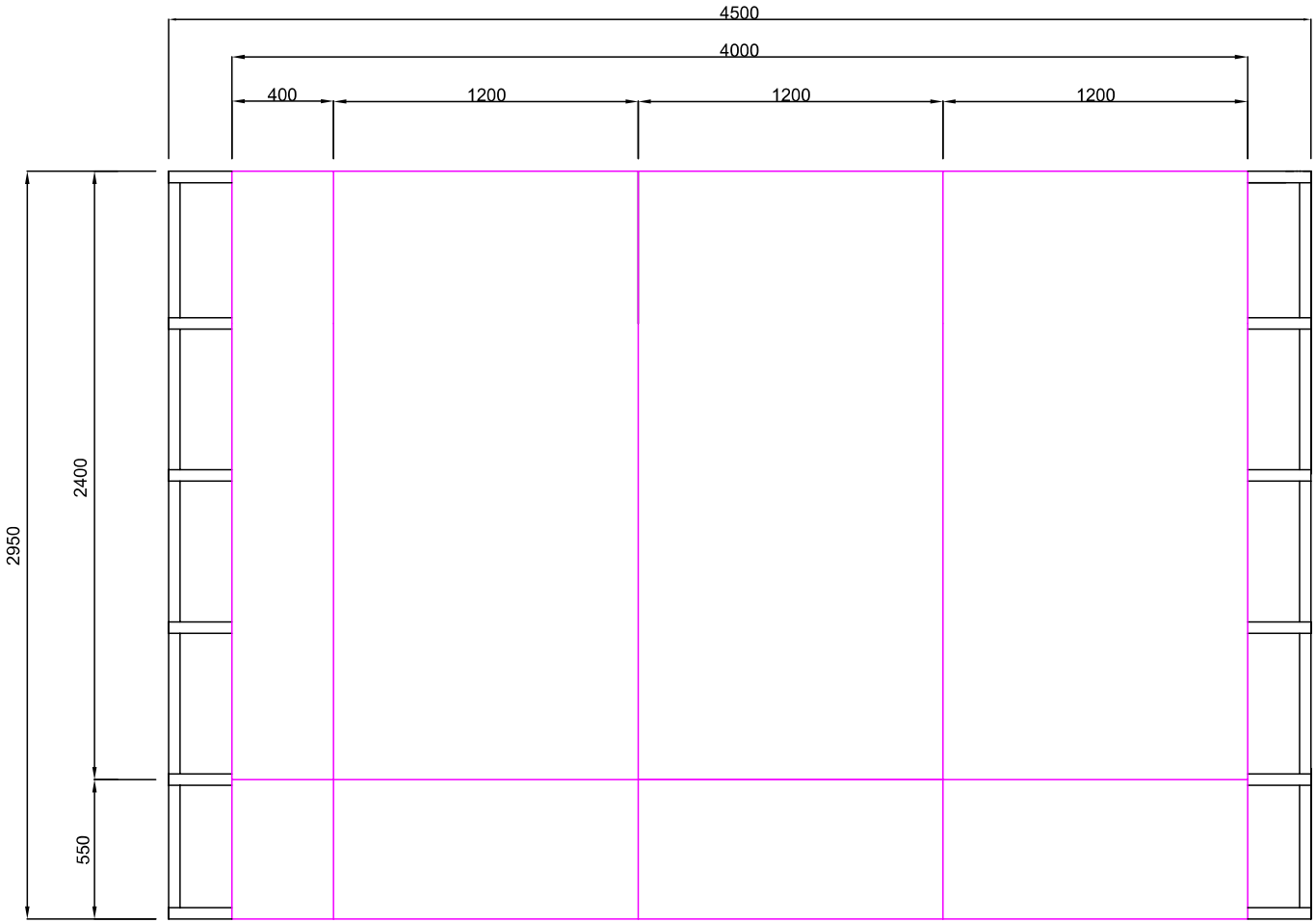


Appendix 2 Floor construction 20/21960-371 (Applus+ Laboratories)



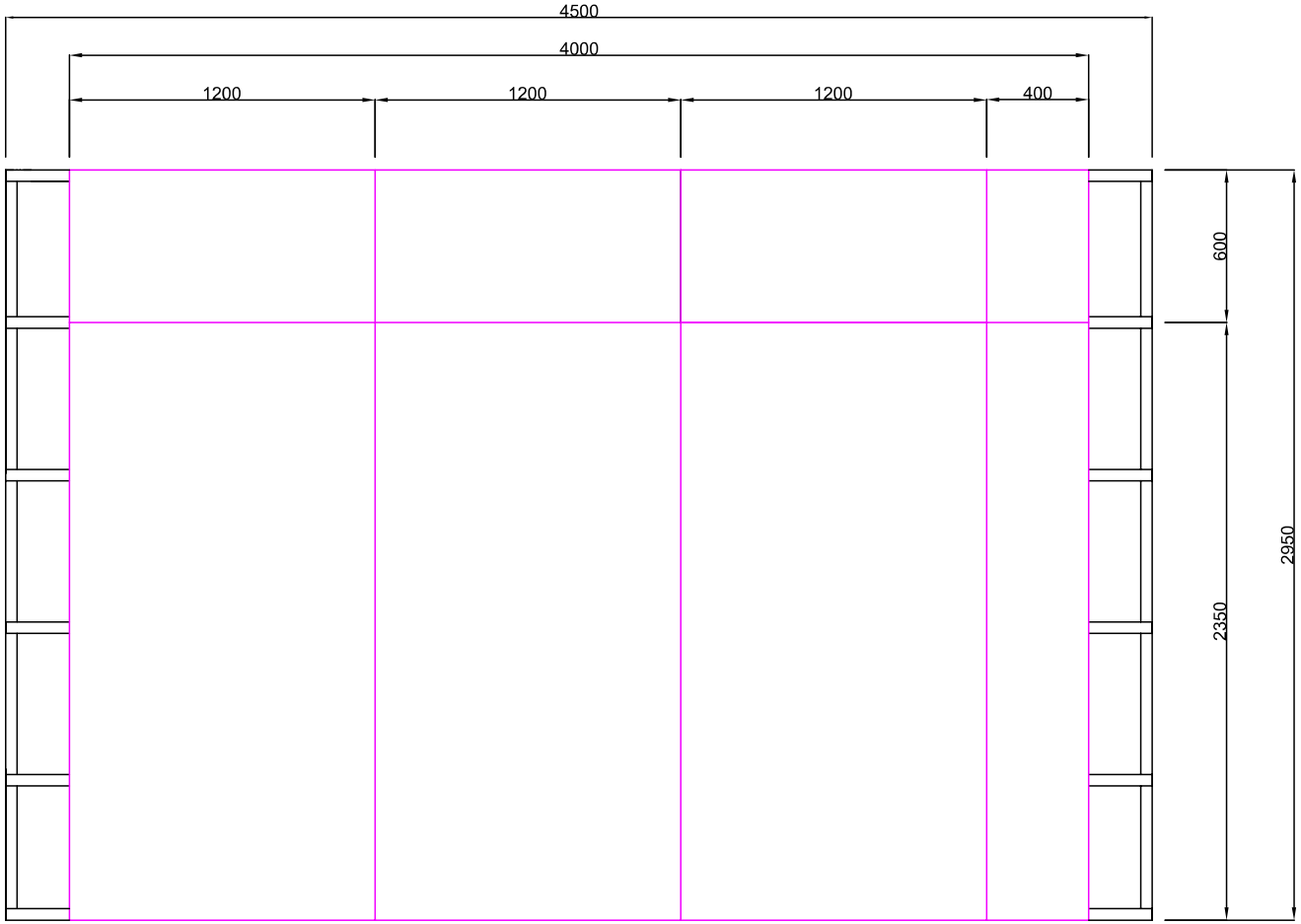
- Ceiling for 90 minute fire rated timber floor comprising 3no. layers of 12.5 mm thick Gyproc FireLine plasterboard as per the specifications provided in British Gypsum White Book
- First layer boards fixed using 25 mm long drywall screws at 280 mm centres

Appendix 2 Floor construction 20/21960-371 (Applus+ Laboratories)



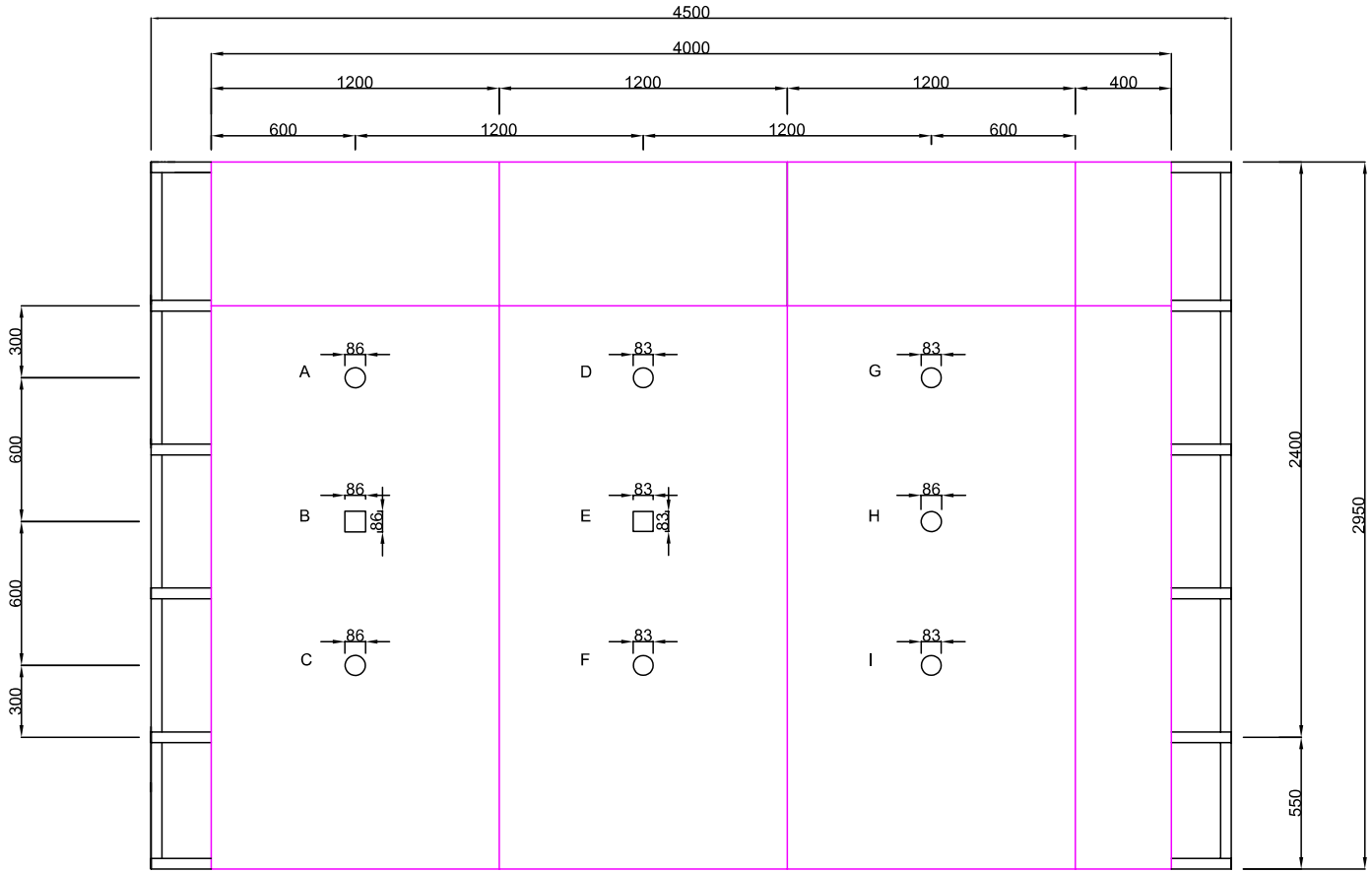
- Ceiling for 90 minute fire rated timber floor comprising 3no. layers of 12.5 mm thick Gyproc FireLine plasterboard as per the specifications provided in British Gypsum White Book
- Second layer boards fixed using 42 mm long drywall screws at 280 mm centres

Appendix 2 Floor construction 20/21960-371 (Applus+ Laboratories)



- Ceiling for 90 minute fire rated timber floor comprising 3no. layers of 12.5 mm thick Gyproc FireLine plasterboard as per the specifications provided in British Gypsum White Book
- Third layer boards fixed using 60 mm long drywall screws at 280 mm centres
- Boards joints protected using British Gypsum joint filler and tape
- Screw fixed positions protected using British Gypsum joint filler

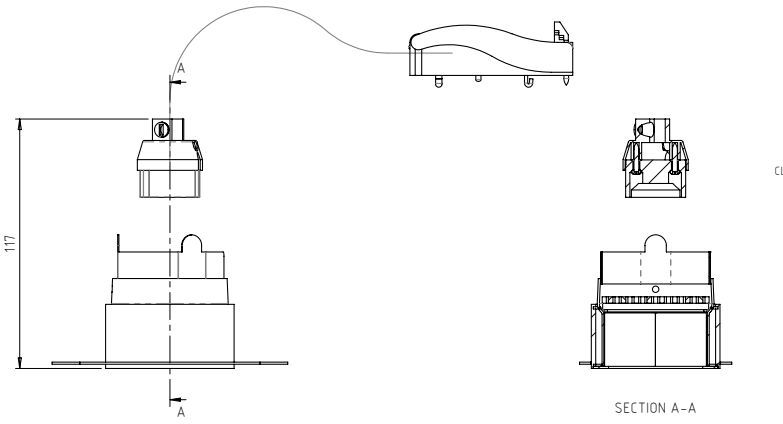
Appendix 2 Floor construction 20/21960-371 (Applus+ Laboratories)



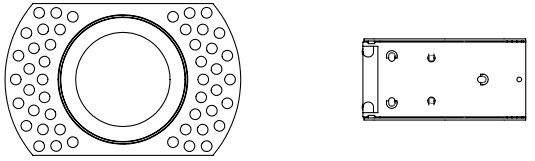
- Specimen A - MINIMA Round Adjustable
- Specimen B - MINIMA Square Adjustable
- Specimen C - MINIMA Wall Wash
- Specimen D - Trimless Round Adjustable
- Specimen E - Trimless Square Adjustable
- Specimen F - Can 50 Trimless
- Specimen G - Pinhole Round Adjustable
- Specimen H - Pinhole Square Adjustable
- Specimen I - Pinhole Trimless Adjustable

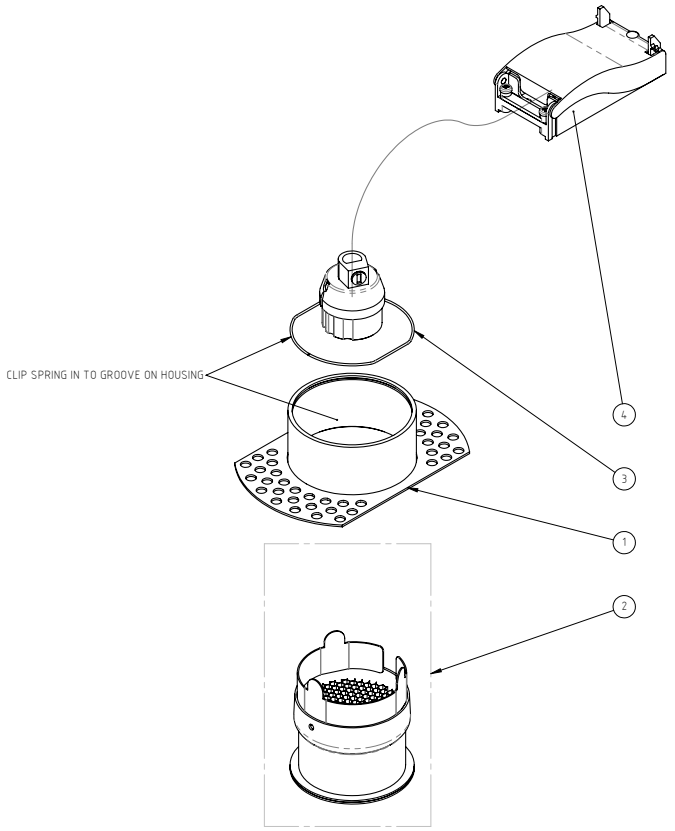
C 2425-2E-RA-001 I8336D30F / JORISVD

Item No.	Description	QTY.	Part Number	Revision	Process	Material	Finish
1	Body Pinhole Trimless	1	DL133.01-PHT	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Pinhole	1	DL133.A-PH	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Lamp Bezel Spring	1	DL133.02	2	Formed	Spring Steel	Nickel Plated
4	Lampholder and Terminal Block Subassembly	1	DL133.B	1	See Part Drawings	See Part Drawings	



SECTION A-A





THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 1 | SCALE 1:2

astro

DEVELOPMENT CODE: DL133

PART NO.: DL133-PHT

DESCRIPTION: Pinhole Trimless | DRAWING ISSUE: C0-002504

DRAWN: RD (SENIOR DESIGN ENGINEER)

DATE: 06/08/2020

CHECKED: XX ([POSITION])

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS: See Part Drawings

FINISHES: See Product Specifications

NOTES:
[CRITICAL /关键]
GLASS MUST CONFORM TO GLASS MATERIAL
NOTE DETAILED ON DL133.04 PART DRAWING

Component Surface Quality:
A = A Surface
B = B Surface
C = C Surface

UNLESS OTHERWISE STATED

DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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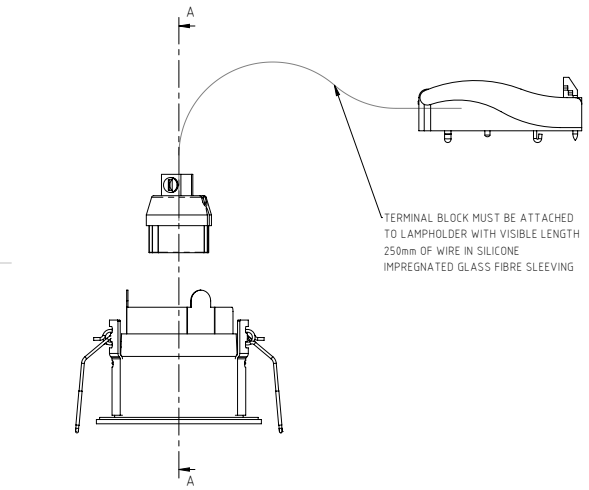
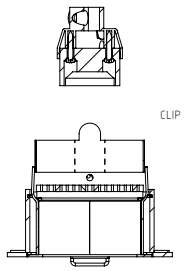
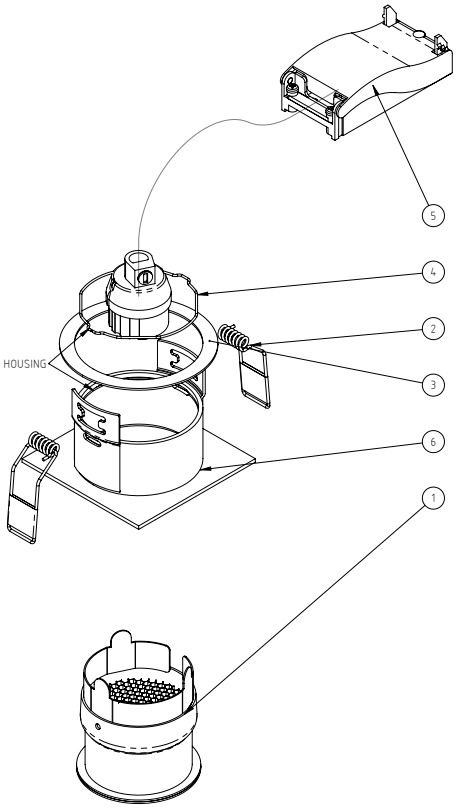
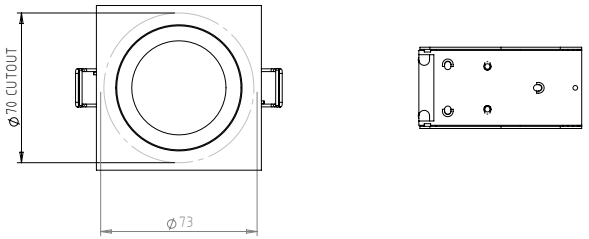
Appendix 3 Astro Lighting Ltd. downlights

Item No.	Description	Q.TY.	Part Number	Revision	Process	Material	Finish
1	Lamp Bezel Subassembly Pinhole	1	DL133.A-PH	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Fixing Spring	2	DL133.05	2	Formed	Spring Steel Ø1.3mm	Nickel Plated
3	Flange Seal Pinhole	1	DL133.16-PH	1	Stamped	Silicone Shore A 50	Natural Clear
4	Lamp Bezel Spring	1	DL133.02	CO-003058	Formed	Spring Steel	Nickel Plated
5	Lampholder and Terminal Block Subassembly	1	DL133.B	1	See Part Drawings	See Part Drawings	
6	Body Pinhole Square	1	DL133.01-PHS	CO-006338	See Part Drawings	See Part Drawings	See Product Specifications









THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 1 | SCALE 1:2

astro

DEVELOPMENT CODE: DL133

PART NO.: DL133-PHS

DESCRIPTION: Pinhole Square | DRAWING ISSUE: CO-006338

DRAWN	RD	DESIGN ENGINEER
DATE	21/01/2022	
CHECKED	RJS	PRODUCT ENGINEERING MANAGER

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS: See Part Drawings

FINISHES: See Product Specifications

NOTES
[CRITICAL /关键]
GLASS MUST CONFORM TO GLASS MATERIAL NOTE DETAILED ON DL133.04 PART DRAWING
[CRITICAL /关键]
FIXING SPRINGS MUST NOT OBSTRUCT OR CONTACT BEZEL SURFACE

Mark critical notes, dimensions and details with: [CRITICAL /关键]

UNLESS OTHERWISE STATED
DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

All dimensions are to finished parts
所有尺寸均指金表面处理后最终部件尺寸

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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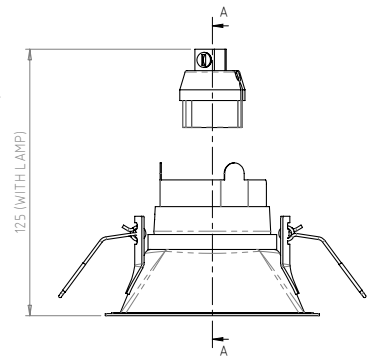
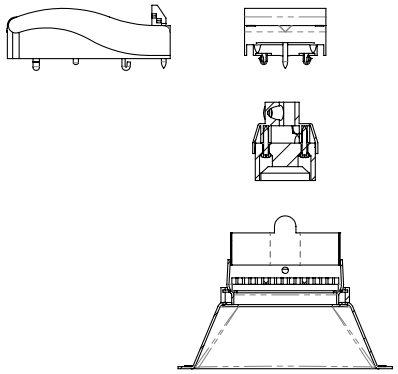
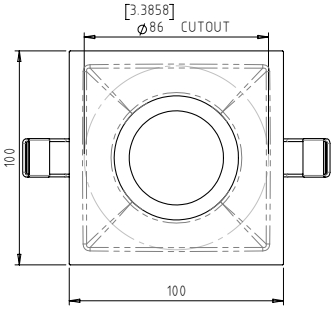
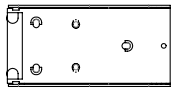
Item No.	Description	DL133-MNS Minima Square/ QTY.	Part Number	Revision	Process	Material	Finish
1	Body Minima Square	1	DL133.01-MNS	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Minima	1	DL133.A-MIN	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Fixing Spring	2	DL133.05	2	Formed	Spring Steel Ø1.3mm	Nickel Plated
4	Flange Seal Minima Square	1	DL133.16-MNS	1	Stamped	Silicone Shore A 50	Natural Clear
5	Lamp Bezel Spring	1	DL133.02	2	Formed	Spring Steel	Nickel Plated
6	Lampholder and Terminal Block Subassembly	1	DL133.B	1	See Part Drawings	See Part Drawings	

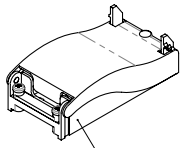


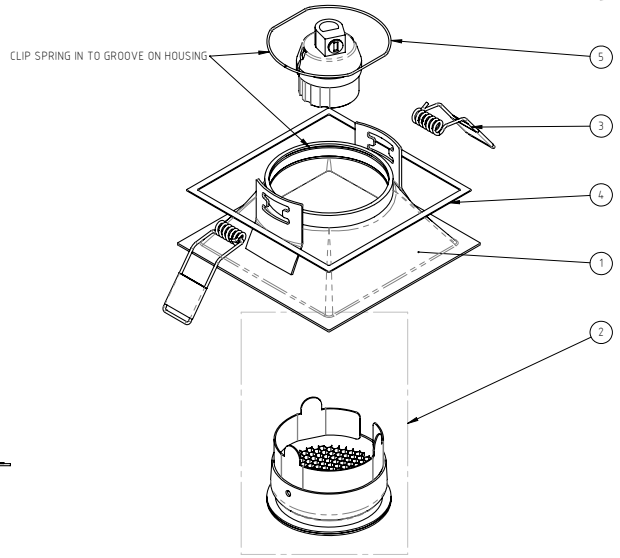


SECTION A-A









THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 1 | SCALE 1:2

astro

DEVELOPMENT CODE: DL133

PART NO.: DL133-MNS

DESCRIPTION: Minima Square

DRAWING ISSUE: CO-002497

DRAWN	RD	SENIOR DESIGN ENGINEER
DATE	06/11/2020	
CHECKED	XX	[POSITION]

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS: See Part Drawings

FINISHES: See Product Specifications

NOTES
[CRITICAL /关键]
GLASS MUST CONFORM TO GLASS MATERIAL
NOTE DETAILED ON DL133.04 PART DRAWING

Component Surface Quality:
A = A Surface
B = B Surface
C = C Surface

UNLESS OTHERWISE STATED
DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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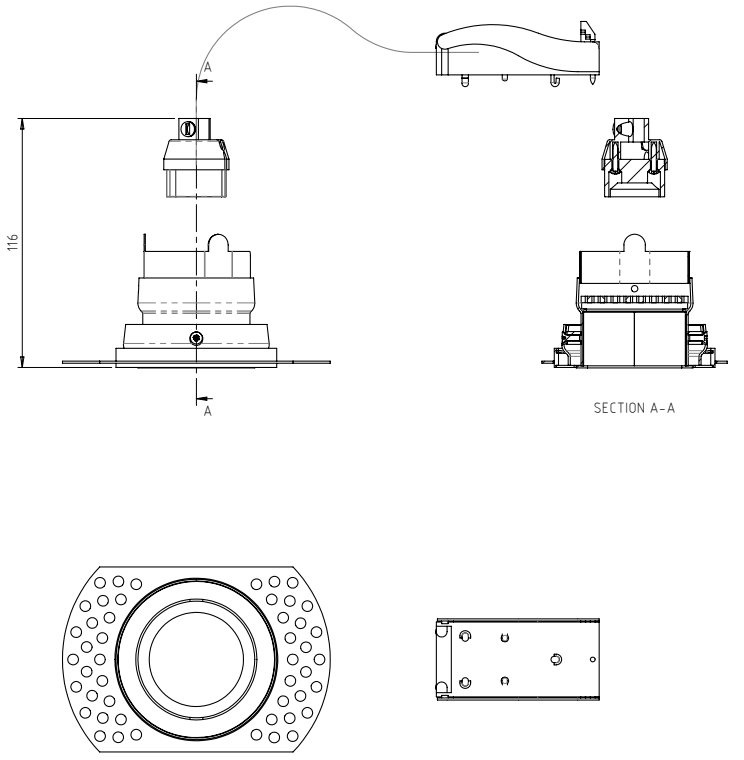
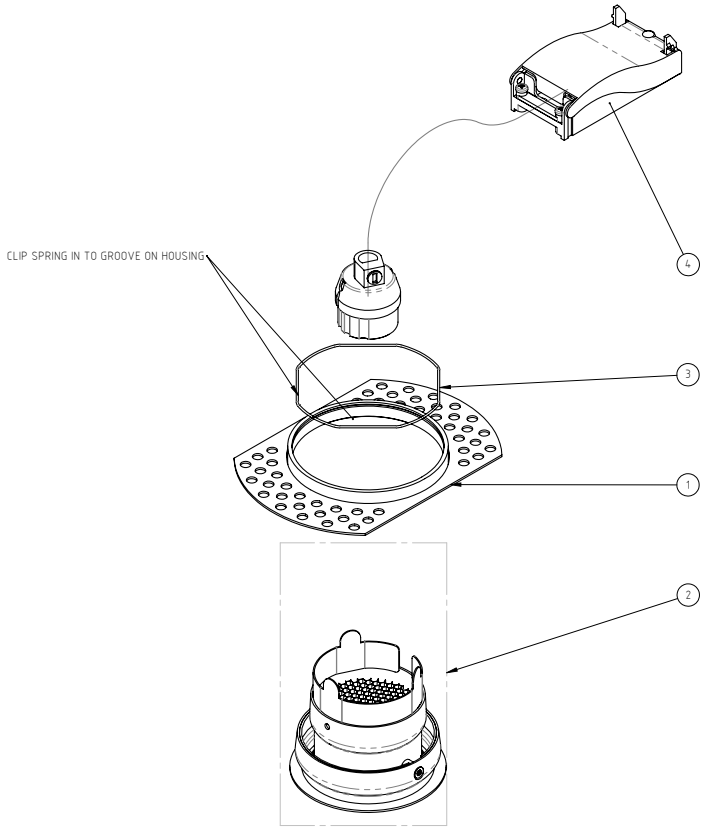
Item No.	Description	QTY.	Part Number	Revision	Process	Material	Finish
1	Body Pinhole Trimless Adjustable	1	DL133.01-PHTA	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Pinhole Adjustable	1	DL133.A-PHA	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Lamp Bezel Spring Pinhole Adjustable	1	DL133.02-PHA	2	Formed	Spring Steel	Nickel Plated
4	Lampholder and Terminal Block Subassembly	1	DL133.B	1	See Part Drawings	See Part Drawings	





THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 1 | SCALE 1:2

astro

DEVELOPMENT CODE: DL133

PART NO.: DL133-PHTA

DESCRIPTION: Pinhole Trimless Adjustable | DRAWING ISSUE: C0-002504

DRAWN	RD	SENIOR DESIGN ENGINEER
DATE	06/08/2020	
CHECKED	XX	[POSITION]

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS: See Part Drawings

FINISHES: See Product Specifications

NOTES
[CRITICAL /关键]
GLASS MUST CONFORM TO GLASS MATERIAL
NOTE DETAILED ON DL133.04 PART DRAWING

Component Surface Quality:
A = A Surface
B = B Surface
C = C Surface

UNLESS OTHERWISE STATED

DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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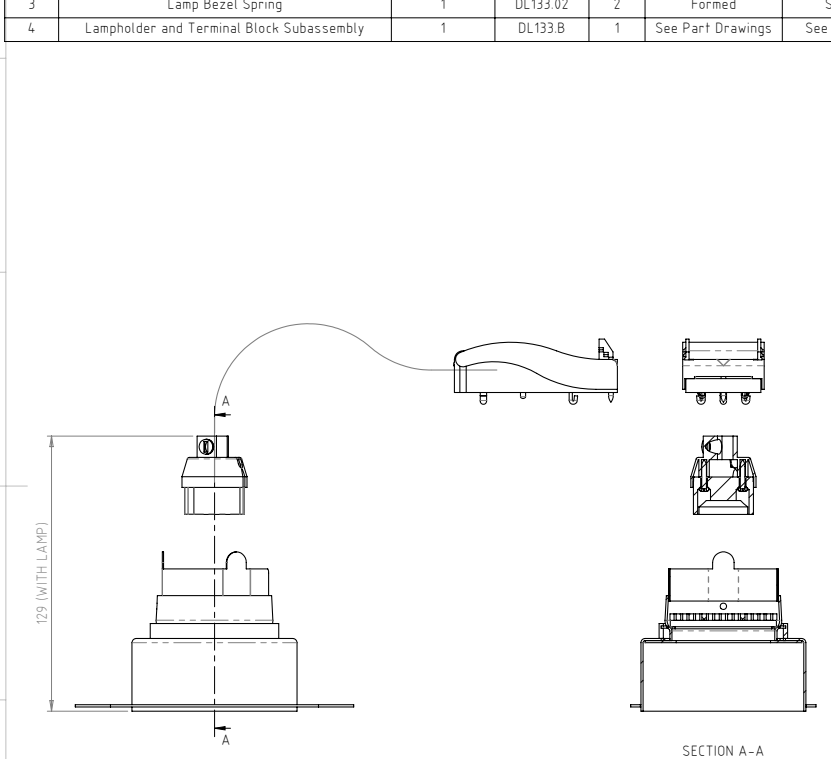
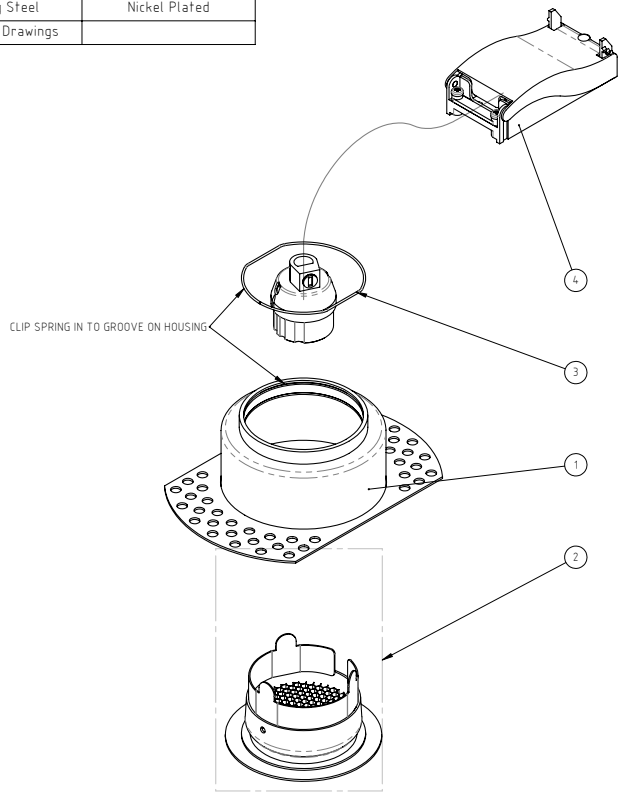
Item No.	Description	DL133-TRR Trimless Round/QTY.	Part Number	Revision	Process	Material	Finish
1	Body Trimless Round	1	DL133.01-TRR	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Trimless Round	1	DL133.A-TRR	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Lamp Bezel Spring	1	DL133.02	2	Formed	Spring Steel	Nickel Plated
4	Lampholder and Terminal Block Subassembly	1	DL133.B	1	See Part Drawings	See Part Drawings	





THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 1 | SCALE 1:2

astro

DEVELOPMENT CODE: DL133

PART NO.: DL133-TRR

DESCRIPTION: Trimless Round

DRAWING ISSUE: CO-002497

DRAWN	RD	SENIOR DESIGN ENGINEER
DATE	06/11/2020	
CHECKED	XX	[POSITION]

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS: See Part Drawings

FINISHES: See Product Specifications

NOTES
[CRITICAL /关键]
GLASS MUST CONFORM TO GLASS MATERIAL
NOTE DETAILED ON DL133.04 PART DRAWING

Component Surface Quality:
A = A Surface
B = B Surface
C = C Surface

UNLESS OTHERWISE STATED
DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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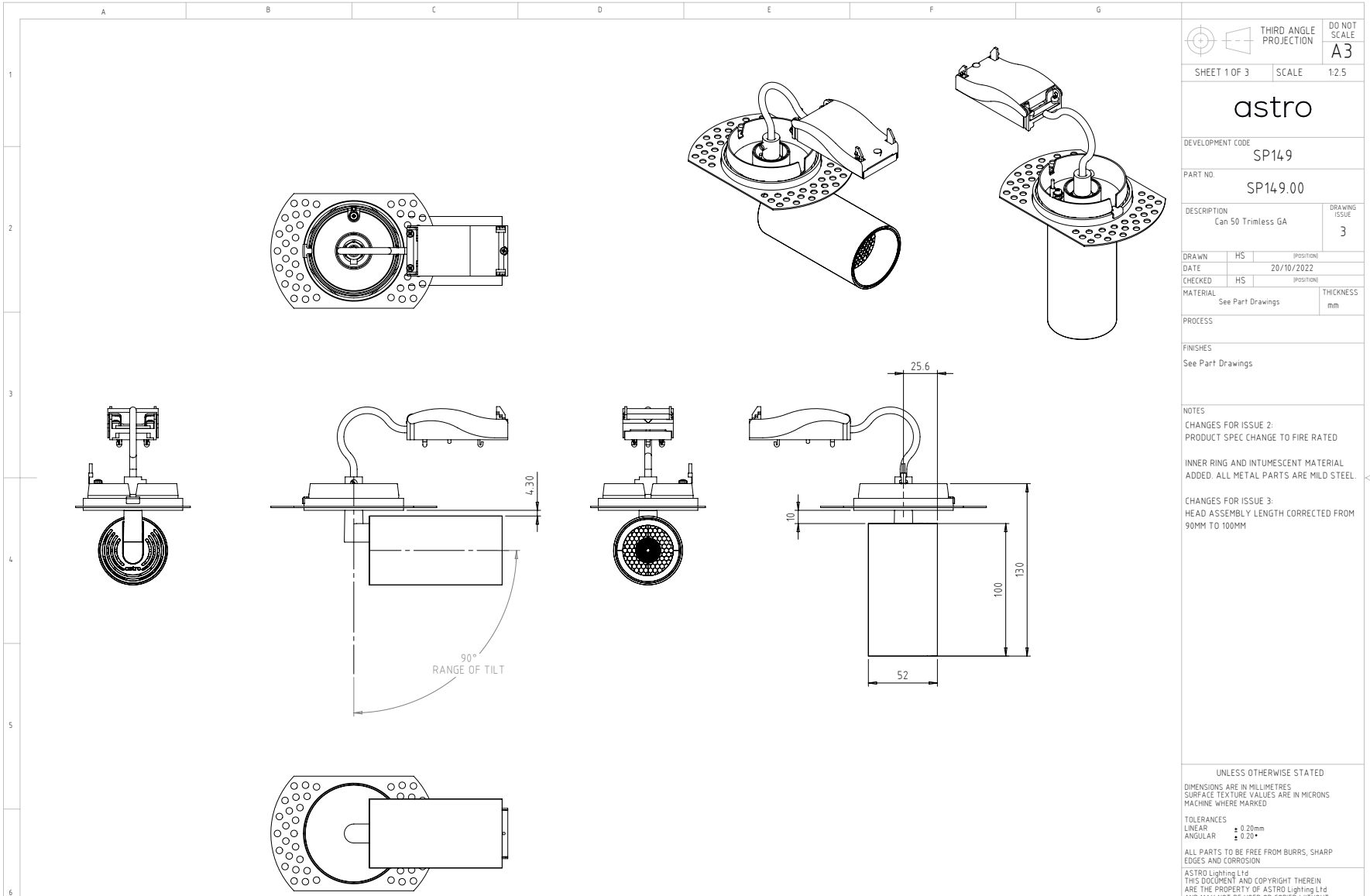

THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 3 | SCALE 1:2.5

astro

DEVELOPMENT CODE: SP149

PART NO.: SP149.00

DESCRIPTION: Can 50 Trimless GA | DRAWING ISSUE: 3

DRAWN	HS	[POSITION]
DATE	20/10/2022	
CHECKED	HS	[POSITION]

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS

FINISHES: See Part Drawings

NOTES

CHANGES FOR ISSUE 2:
PRODUCT SPEC CHANGE TO FIRE RATED

INNER RING AND INTUMESCENT MATERIAL ADDED. ALL METAL PARTS ARE MILD STEEL.

CHANGES FOR ISSUE 3:
HEAD ASSEMBLY LENGTH CORRECTED FROM 90MM TO 100MM

UNLESS OTHERWISE STATED

DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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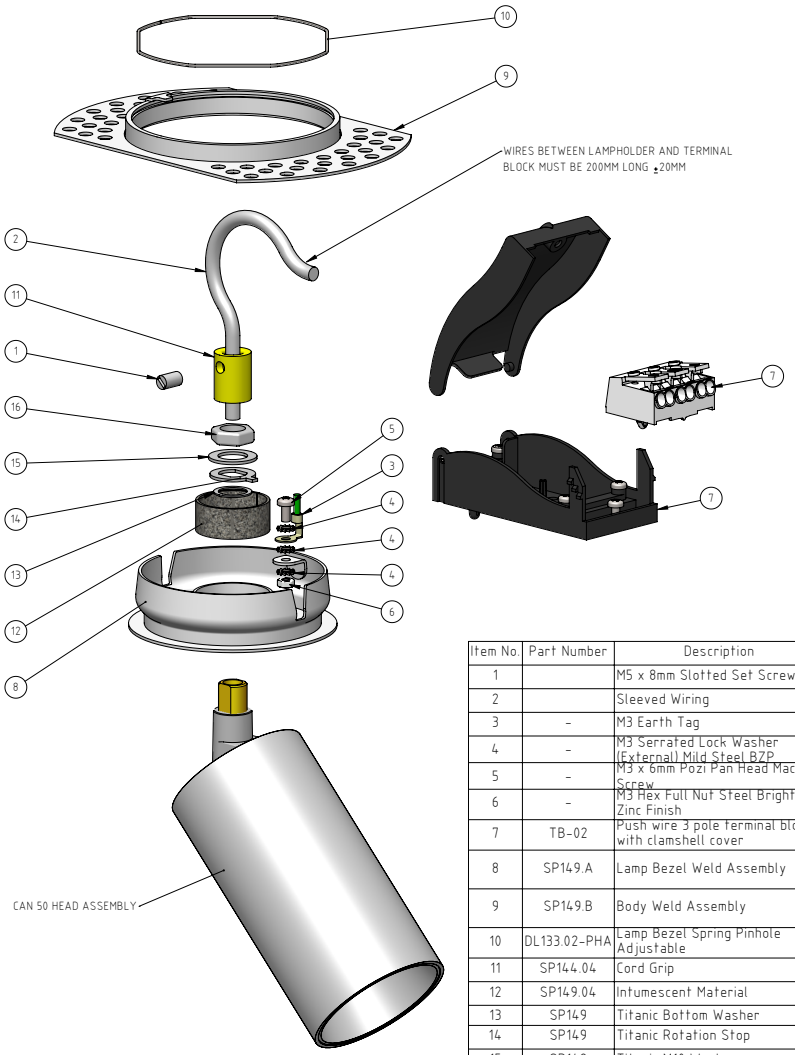
C 2425-2E-RA-001 (8336D30F) JORISVD



Item No.	Part Number	Description	Q.TY.	Revision	Process	Material	Finish
1		M5 x 8mm Slotted Set Screw	1			Nylon	
2		Sleeved Wiring	1			See Product Specification	See Product Specification
3	-	M3 Earth Tag	1	-	Sourced from market	Brass	Natural
4	-	M3 Serrated Lock Washer (External) Mild Steel BZP	3	-	Market Sourced	Mild Steel	BZP
5	-	M3 x 6mm Pozi Pan Head Machine Screw	1	-	Market Sourced	Mild Steel	BZP Clear Passivated
6	-	M3 Hex Full Nut Steel Bright Zinc Finish	1	-	Market Sourced	Steel	Bright Zinc
7	TB-02	Push wire 3 pole terminal block with clamshell cover	1	-	Sourced from market	Various	Black
8	SP149.A	Lamp Bezel Weld Assembly	1	2	Fabricated	Mild Steel	FS000086 - Indoor - Matt White - Wet Spray - Matt Smooth
9	SP149.B	Body Weld Assembly	1	1	See Part Drawings	See Part Drawings	FS000095 - Indoor - Zinc Plate + EPC Matt Smooth - RAL9003 -
10	DL133.02-PHA	Lamp Bezel Spring Pinhole Adjustable	1	2	Formed	Spring Steel	Nickel Plated
11	SP144.04	Cord Grip	1	1	Machined	Nylon	Natural
12	SP149.04	Intumescent Material	1	1	Stamped	TBC	Natural
13	SP149	Titanic Bottom Washer	1				
14	SP149	Titanic Rotation Stop	1				
15	SP149	Titanic M10 Washer	1				
16	SP149	Titanic M10 Nut	1				

THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 2 OF 3 | SCALE 2:3

astro

DEVELOPMENT CODE: SP149

PART NO.: SP149.00

DESCRIPTION: Can 50 Trimless GA | DRAWING ISSUE: 3

DRAWN: HS [POSITION]

DATE: 20/10/2022

CHECKED: HS [POSITION]

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS

FINISHES: See Part Drawings

NOTES

UNLESS OTHERWISE STATED

DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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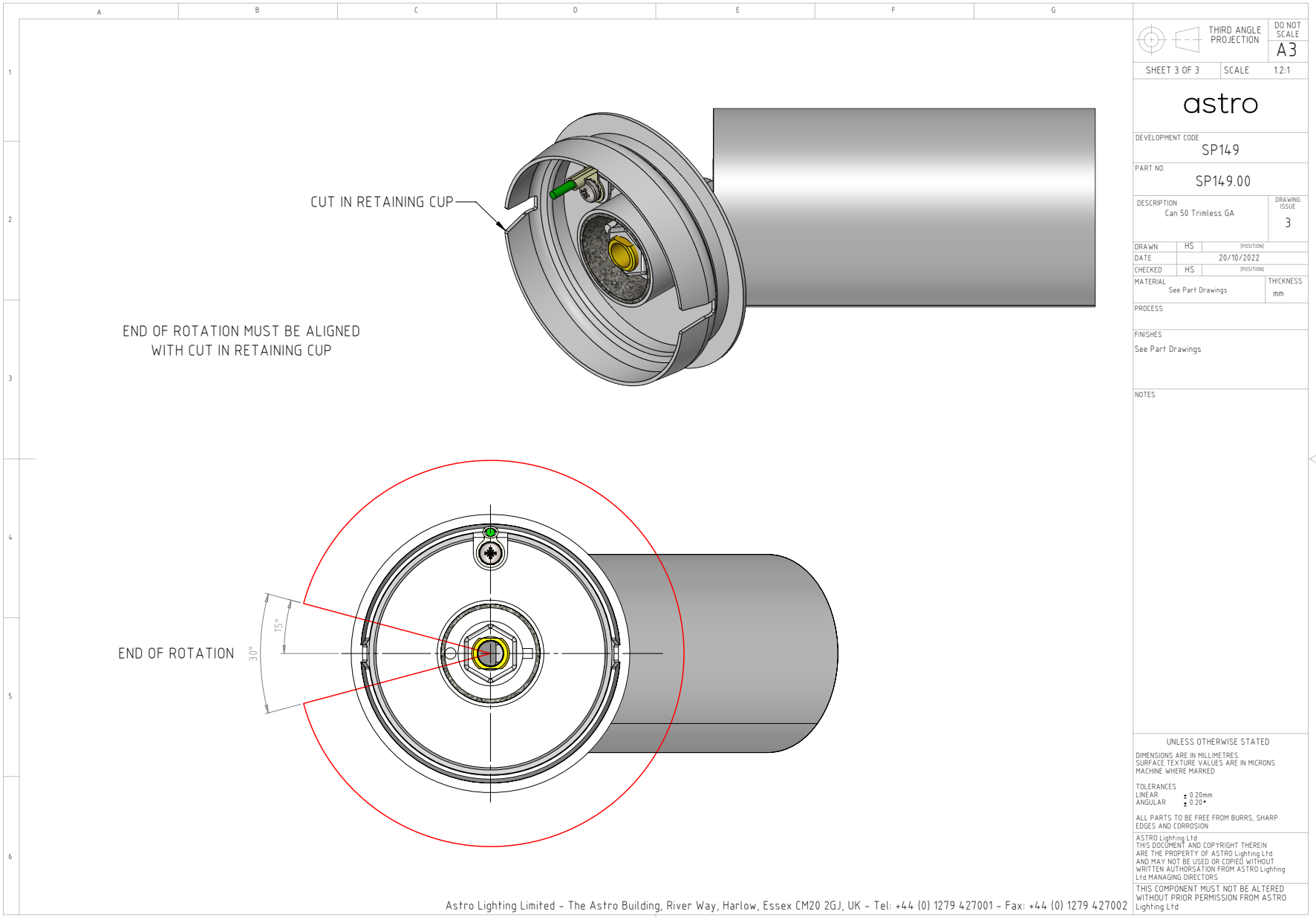
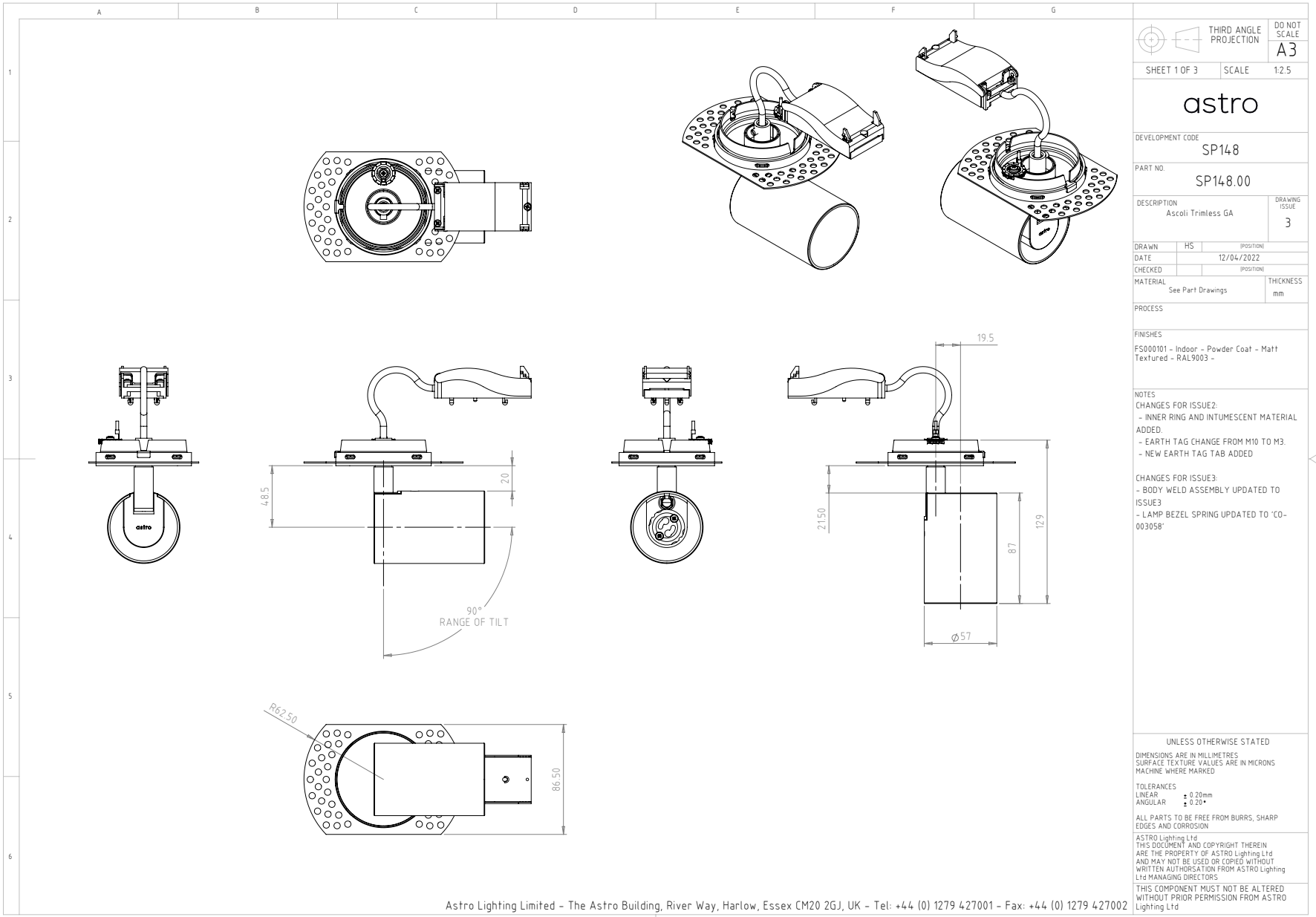
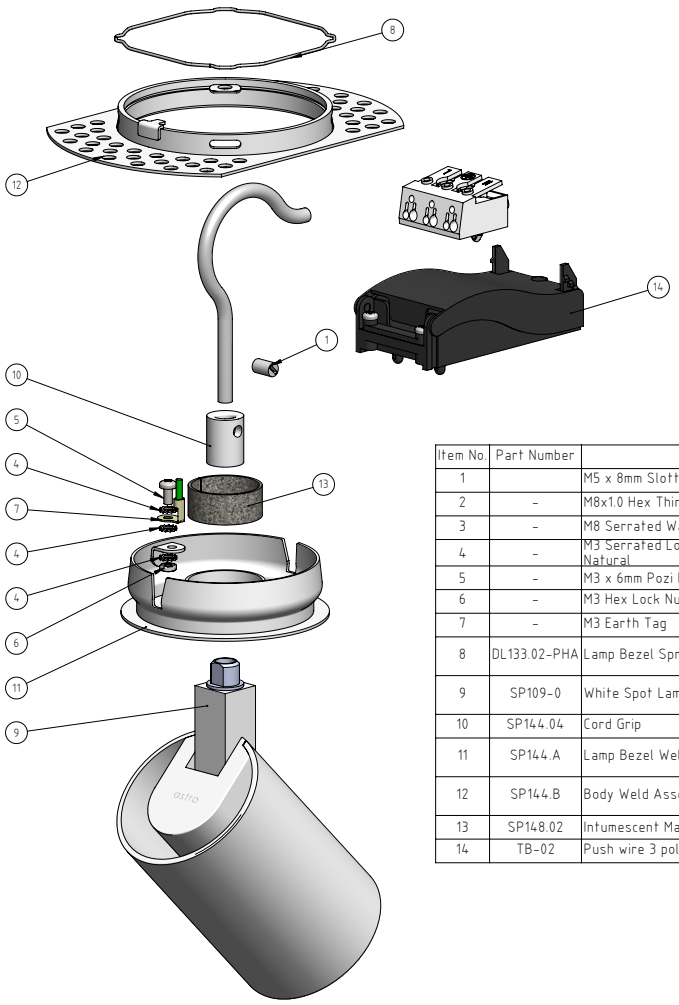


C 2425-2E-RA-001 (8339D30F) / JORISVD

Appendix 3 Astro Lighting Ltd. downlights



C 2425-2E-RA-001 (8336D30F) / JORISVD



Item No.	Part Number	Description	QTY.	Revision	Material	Finish
1		M5 x 8mm Slotted Set Screw	1		Nylon	
2	-	M8x1.0 Hex Thin Nut Steel Bright Zinc Finish	1	-	Steel	Bright Zinc
3	-	M8 Serrated Washer (Internal)	1	-	Mild Steel	Bright Nickel
4	-	M3 Serrated Lock Washer (External) Stainless Steel Natural	3	-	Stainless Steel	Natural
5	-	M3 x 6mm Pozi Pan Head Machine Screw	1	-	Mild Steel	BZP Clear Passivated
6	-	M3 Hex Lock Nut Steel Bright Zinc Finish	1	-	Steel	Bright Zinc
7	-	M3 Earth Tag	1	-	Brass	Natural
8	DL133.02-PHA	Lamp Bezel Spring Pinhole Adjustable	1	3	Spring Steel	Nickel Plated
9	SP109-0	White Spot Lamp Assembly	1	1	See Part Drawings	FS000108 - Indoor - Zinc Plate + EPC Matt Textured - RAL9003
10	SP144.04	Cord Grip	1	1	Nylon	Natural
11	SP144.A	Lamp Bezel Weld Assembly	1	3	Mild Steel	FS000101 - Indoor - Powder Coat - Matt Textured - RAL9003 -
12	SP144.B	Body Weld Assembly	1	3	See Part Drawings	FS000108 - Indoor - Zinc Plate + EPC Matt Textured - RAL9003
13	SP148.02	Intumescent Material	1	1	TBC	Natural
14	TB-02	Push wire 3 pole terminal block with clamshell cover	1	-	Various	Black

THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 2 OF 3 | SCALE 1:1.5

astro

DEVELOPMENT CODE: SP148

PART NO.: SP148.00

DESCRIPTION: Ascoli Trimless GA | DRAWING ISSUE: 3

DRAWN: HS [POSITION]

DATE: 12/04/2022

CHECKED: [POSITION]

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS

FINISHES

FS000101 - Indoor - Powder Coat - Matt Textured - RAL9003 -

NOTES

CHANGES FOR ISSUE2:
- INNER RING AND INTUMESCENT MATERIAL ADDED.
- EARTH TAG CHANGE FROM M10 TO M3.
- NEW EARTH TAG TAB ADDED

CHANGES FOR ISSUE3:
- BODY WELD ASSEMBLY UPDATED TO ISSUE3
- LAMP BEZEL SPRING UPDATED TO 'CO-003058'

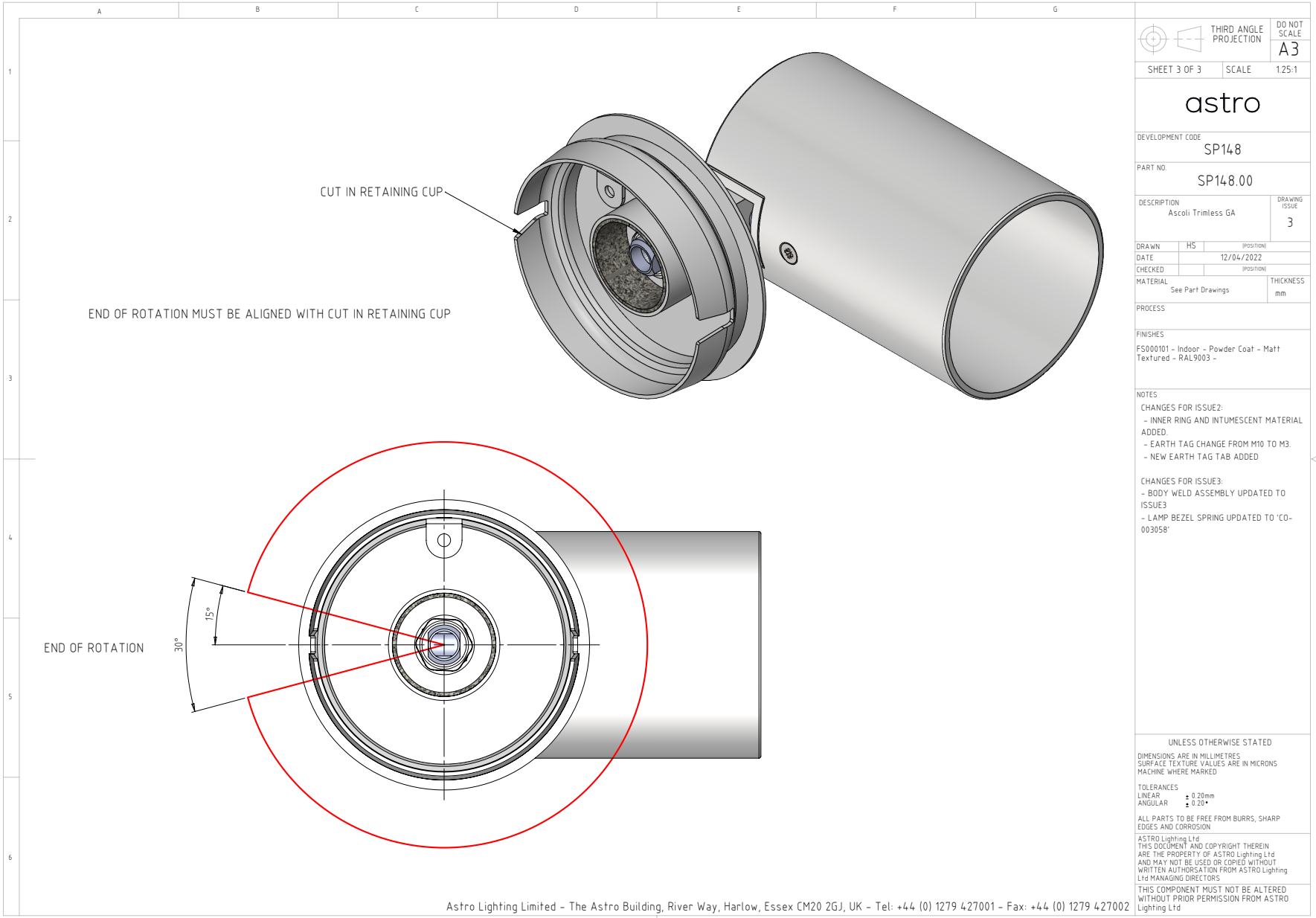
UNLESS OTHERWISE STATED

DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

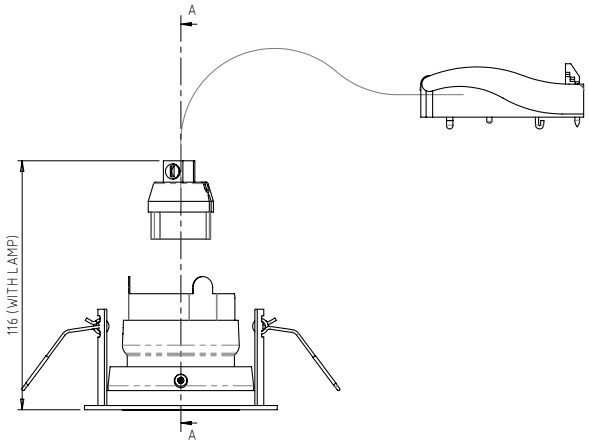
ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

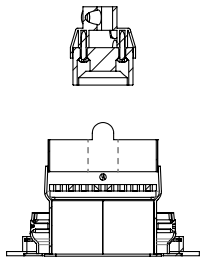
Astro Lighting Limited - The Astro Building, River Way, Harlow, Essex CM20 2GJ, UK - Tel: +44 (0) 1279 427001 - Fax: +44 (0) 1279 427002



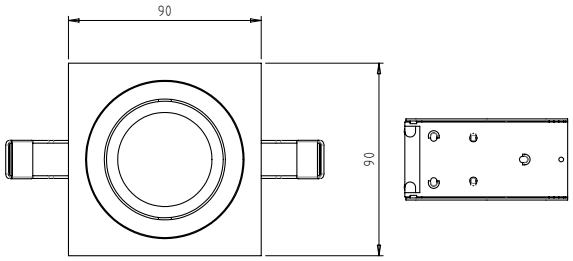
C 2425-2E-RA-001 (8339D30F) JORISVD

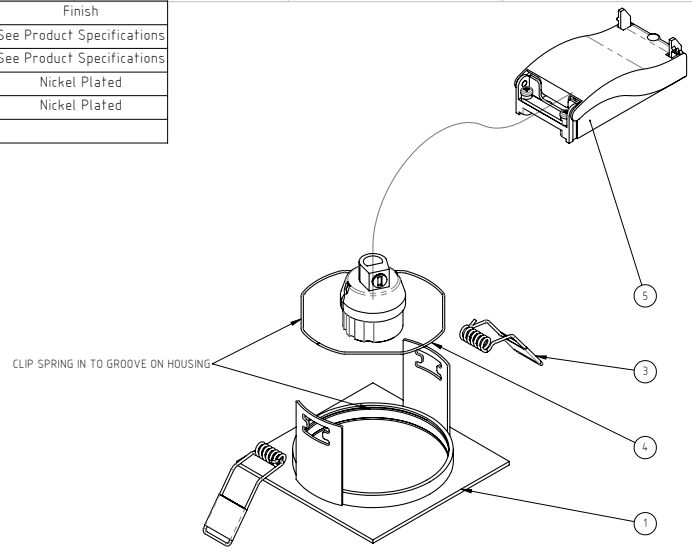
Item No.	Description	Q.TY.	Part Number	Revision	Process	Material	Finish
1	Body Pinhole Square Adjustable	1	DL133.01-PHSA	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Pinhole Adjustable	1	DL133.A-PHA	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Fixing Spring	2	DL133.05	2	Formed	Spring Steel Ø1.3mm	Nickel Plated
4	Lamp Bezel Spring Pinhole Adjustable	1	DL133.02-PHA	2	Formed	Spring Steel	Nickel Plated
5	Lampholder and Terminal Block Subassembly	1	DL133.B	1	See Part Drawings	See Part Drawings	





SECTION A-A





THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 1 | SCALE 1:2

astro

DEVELOPMENT CODE: DL133

PART NO.: DL133-PHSA

DESCRIPTION: Pinhole Square Adjustable

DRAWING ISSUE: C0-002504

DRAWN	RD	SENIOR DESIGN ENGINEER
DATE	06/08/2020	
CHECKED	XX	[POSITION]

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS: See Part Drawings

FINISHES: See Product Specifications

NOTES

[CRITICAL /关键]

GLASS MUST CONFORM TO GLASS MATERIAL

NOTE DETAILED ON DL133.04 PART DRAWING

Component Surface Quality:

A = A Surface

B = B Surface

C = C Surface

UNLESS OTHERWISE STATED

DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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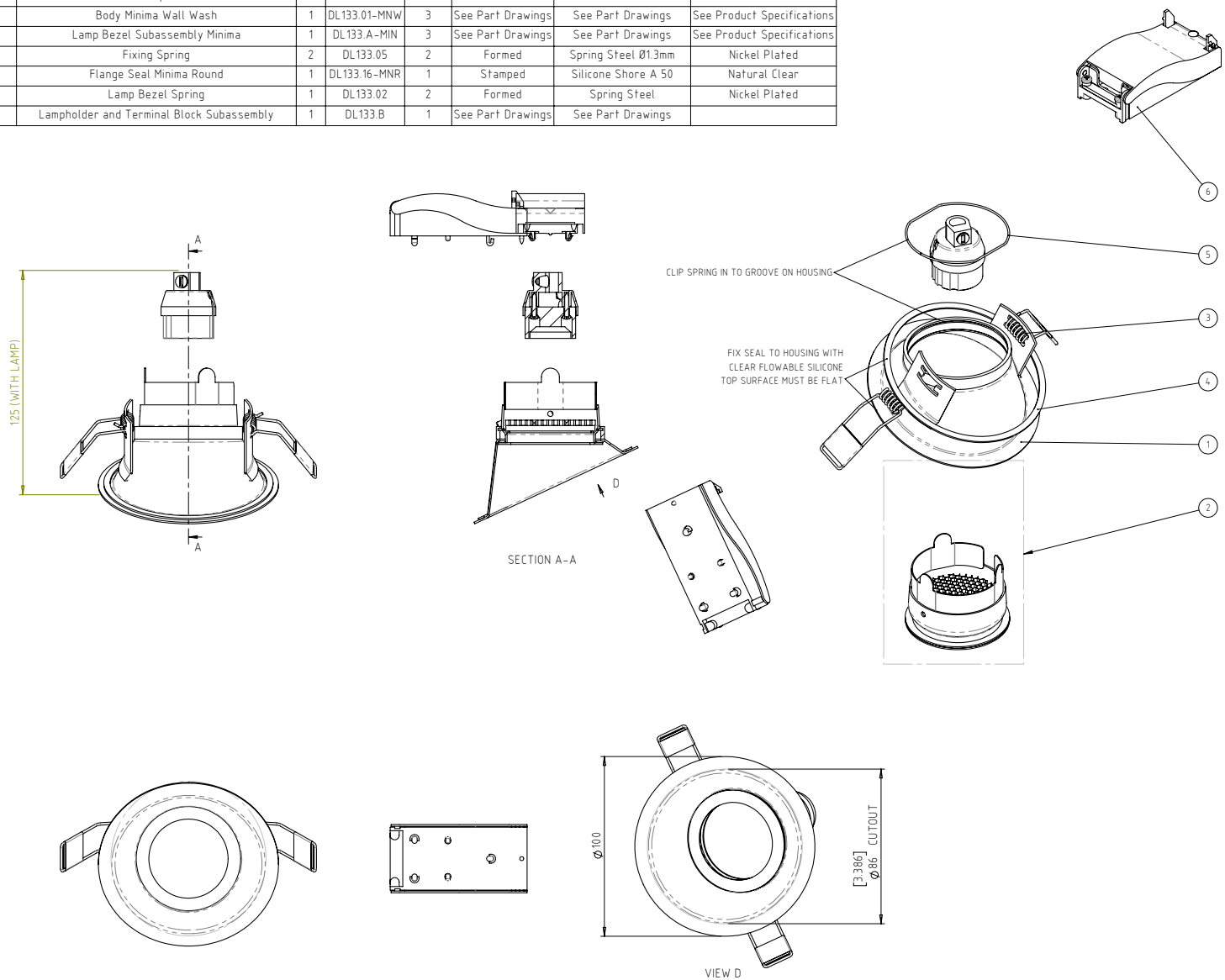
Item No.	Description	QTY.	Part Number	Revision	Process	Material	Finish
1	Body Minima Wall Wash	1	DL133.01-MNW	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Minima	1	DL133.A-MIN	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Fixing Spring	2	DL133.05	2	Formed	Spring Steel Ø1.3mm	Nickel Plated
4	Flange Seal Minima Round	1	DL133.16-MNR	1	Stamped	Silicone Shore A 50	Natural Clear
5	Lamp Bezel Spring	1	DL133.02	2	Formed	Spring Steel	Nickel Plated
6	Lampholder and Terminal Block Subassembly	1	DL133.B	1	See Part Drawings	See Part Drawings	



THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 1 | SCALE 1:2

astro

DEVELOPMENT CODE: DL133

PART NO.: DL133-MNW

DESCRIPTION: Minima Wall Wash

DRAWING ISSUE: C0-002497

DRAWN	RD	SENIOR DESIGN ENGINEER
DATE	06/11/2020	
CHECKED	XX	[POSITION]

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS: See Part Drawings

FINISHES: See Product Specifications

NOTES
[CRITICAL /关键]
GLASS MUST CONFORM TO GLASS MATERIAL
NOTE DETAILED ON DL133.04 PART DRAWING

Component Surface Quality:
A = A Surface
B = B Surface
C = C Surface

UNLESS OTHERWISE STATED
DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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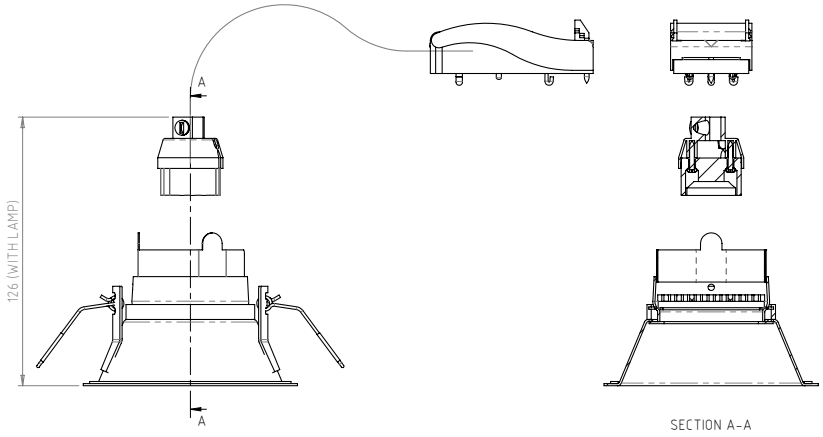
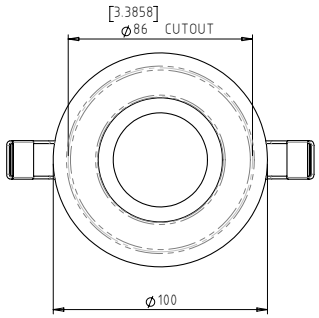
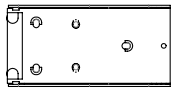
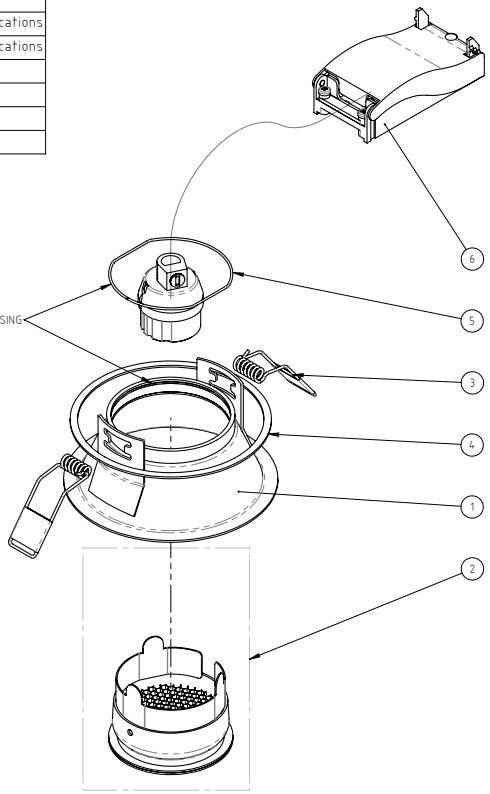
Item No.	Description	Q.T.Y.	Part Number	Revision	Process	Material	Finish
1	Body Minima Round	1	DL133.01-MNR	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Minima	1	DL133.A-MIN	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Fixing Spring	2	DL133.05	2	Formed	Spring Steel Ø1.3mm	Nickel Plated
4	Flange Seal Minima Round	1	DL133.16-MNR	1	Stamped	Silicone Shore A 50	Natural Clear
5	Lamp Bezel Spring	1	DL133.02	2	Formed	Spring Steel	Nickel Plated
6	Lampholder and Terminal Block Subassembly	1	DL133.B	1	See Part Drawings	See Part Drawings	



SECTION A-A







THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 1 | SCALE 1:2

astro

DEVELOPMENT CODE: DL133

PART NO.: DL133-MNR

DESCRIPTION: Minima Round | DRAWING ISSUE: CO-002497

DRAWN	RD	SENIOR DESIGN ENGINEER
DATE	06/11/2020	
CHECKED	XX	[POSITION]

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS: See Part Drawings

FINISHES: See Product Specifications

NOTES:
[CRITICAL /关键]
GLASS MUST CONFORM TO GLASS MATERIAL
NOTE DETAILED ON DL133.04 PART DRAWING

Component Surface Quality:
A = A Surface
B = B Surface
C = C Surface

UNLESS OTHERWISE STATED
DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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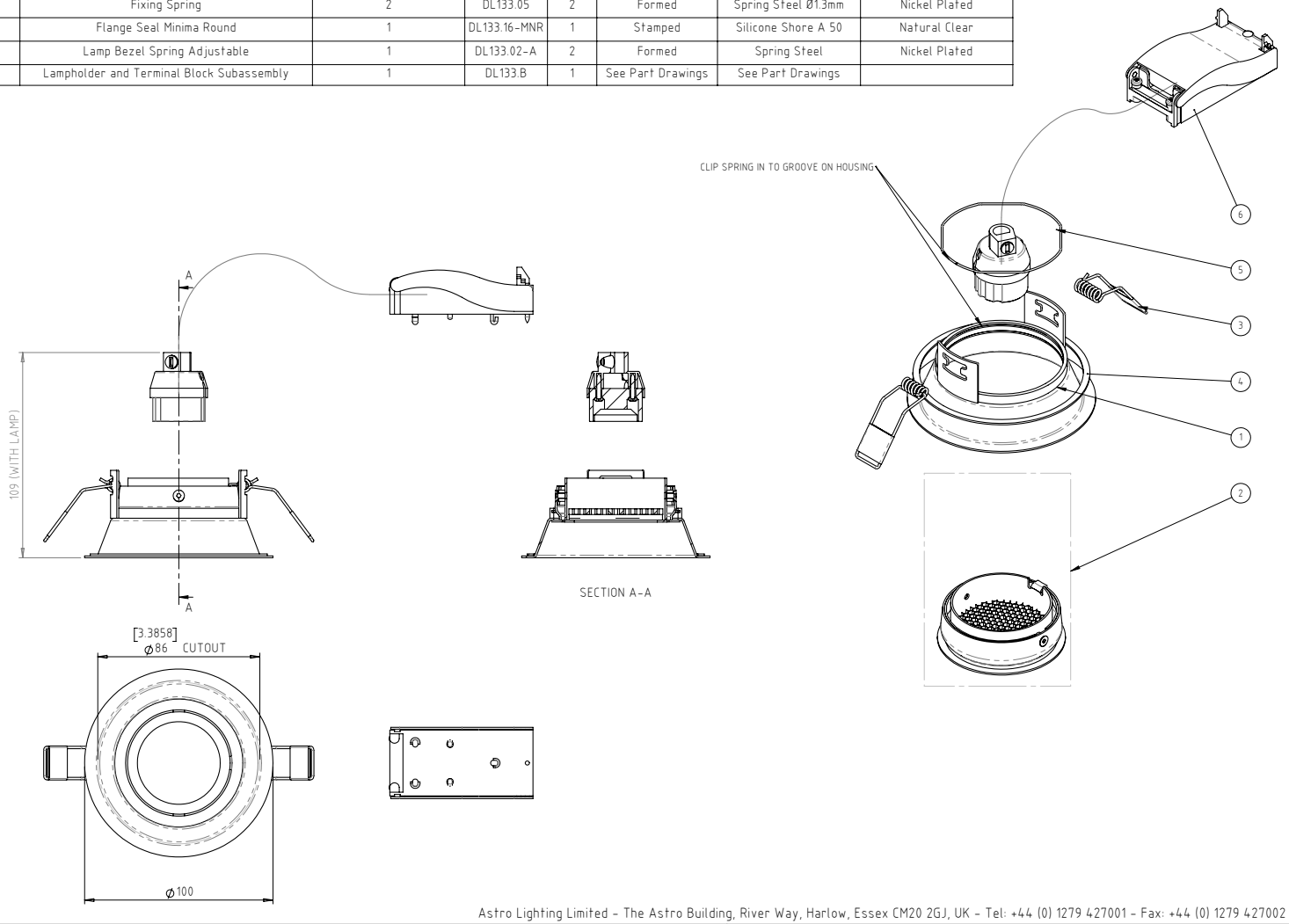
Item No.	Description	DL133-MNRA Minima Round Adjustable/QTY.	Part Number	Revision	Process	Material	Finish
1	Body Minima Round Adjustable	1	DL133.01-MNRA	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Adjustable	1	DL133.A-A	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Fixing Spring	2	DL133.05	2	Formed	Spring Steel Ø1.3mm	Nickel Plated
4	Flange Seal Minima Round	1	DL133.16-MNR	1	Stamped	Silicone Shore A 50	Natural Clear
5	Lamp Bezel Spring Adjustable	1	DL133.02-A	2	Formed	Spring Steel	Nickel Plated
6	Lampholder and Terminal Block Subassembly	1	DL133.B	1	See Part Drawings	See Part Drawings	



THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 1 | SCALE 1:2

astro

DEVELOPMENT CODE: DL133

PART NO.: DL133-MNRA

DESCRIPTION: Minima Round Adjustable | DRAWING ISSUE: C0-002497

DRAWN: RD (SENIOR DESIGN ENGINEER)

DATE: 06/11/2020

CHECKED: XX ([POSITION])

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS: See Part Drawings

FINISHES: See Product Specifications

NOTES:
[CRITICAL /关键]
GLASS MUST CONFORM TO GLASS MATERIAL
NOTE DETAILED ON DL133.04 PART DRAWING

Component Surface Quality:
A = A Surface
B = B Surface
C = C Surface

UNLESS OTHERWISE STATED

DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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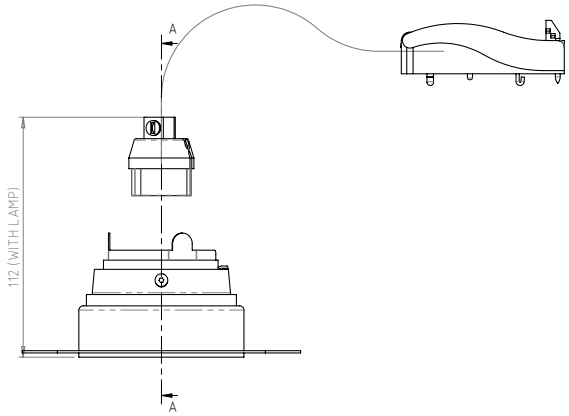
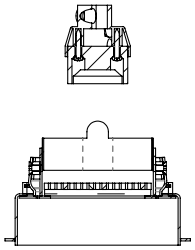
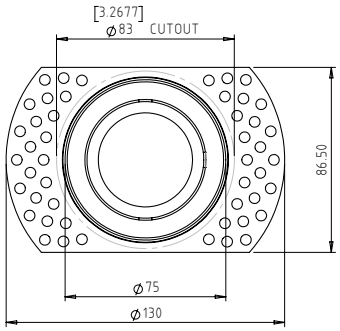
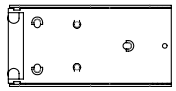
Item No.	Description	DL133-TRRA Trimless Round Adjustable/QTY.	Part Number	Revision	Process	Material	Finish
1	Body Trimless Round Adjustable	1	DL133.01-TRRA	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Trimless Adjustable	1	DL133.A-TRA	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Lamp Bezel Spring Adjustable	1	DL133.02-A	2	Formed	Spring Steel	Nickel Plated
4	Lampholder and Terminal Block Subassembly	1	DL133.B	1	See Part Drawings	See Part Drawings	

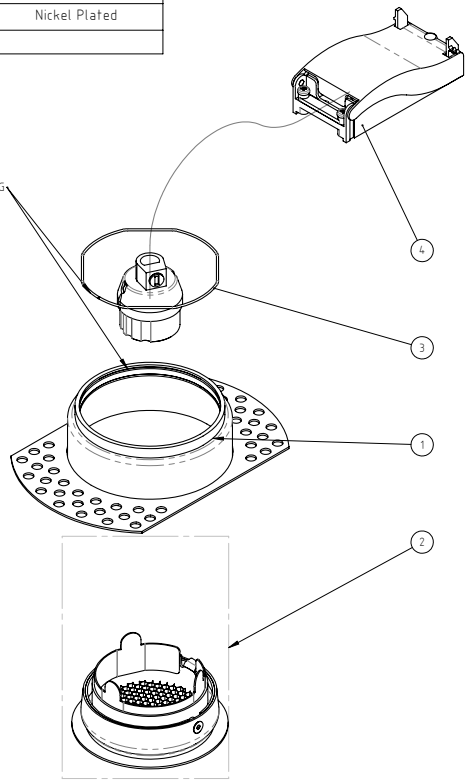




SECTION A-A







THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 1 | SCALE 1:2

astro

DEVELOPMENT CODE: DL133

PART NO.: DL133-TRRA

DESCRIPTION: Trimless Round Adjustable | DRAWING ISSUE: C0-002497

DRAWN	RD	SENIOR DESIGN ENGINEER
DATE	06/11/2020	
CHECKED	XX	[POSITION]

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS: See Part Drawings

FINISHES: See Product Specifications

NOTES
[CRITICAL /关键]
GLASS MUST CONFORM TO GLASS MATERIAL
NOTE DETAILED ON DL133.04 PART DRAWING

Component Surface Quality:
A = A Surface
B = B Surface
C = C Surface

UNLESS OTHERWISE STATED
DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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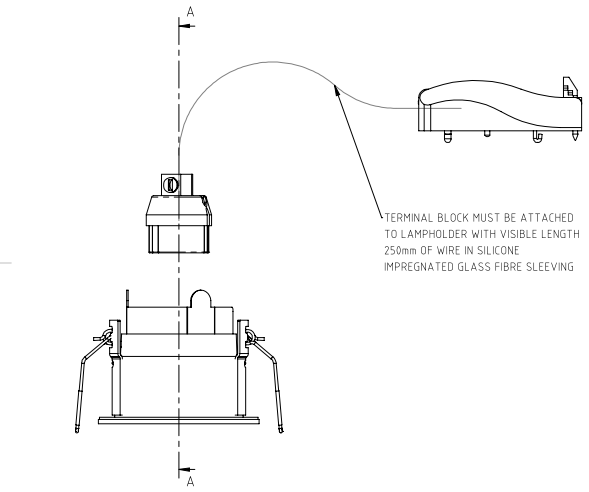
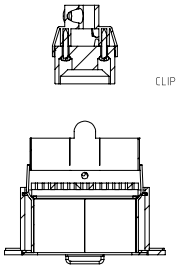
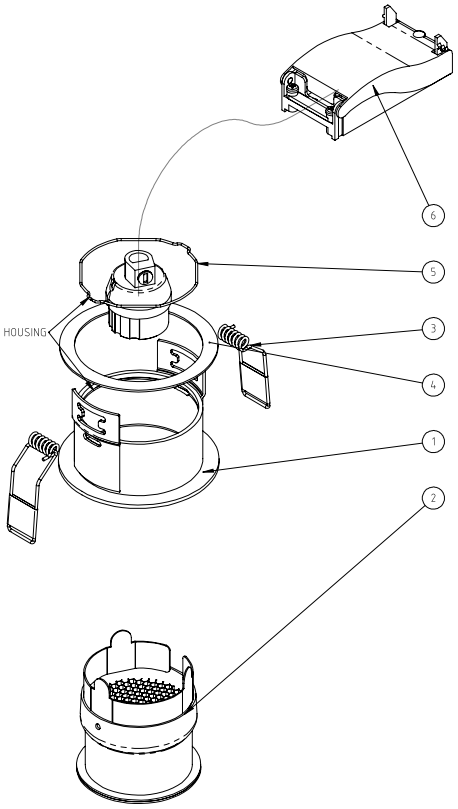
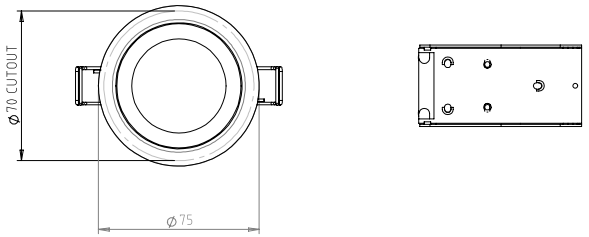
Appendix 3 Astro Lighting Ltd. downlights

Item No.	Description	Q.T.Y.	Part Number	Revision	Process	Material	Finish
1	Body Pinhole Round	1	DL133.01-PHR	CO-006338	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Pinhole	1	DL133.A-PH	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Fixing Spring	2	DL133.05	2	Formed	Spring Steel Ø1.3mm	Nickel Plated
4	Flange Seal Pinhole	1	DL133.16-PH	1	Stamped	Silicone Shore A 50	Natural Clear
5	Lamp Bezel Spring	1	DL133.02	CO-003058	Formed	Spring Steel	Nickel Plated
6	Lampholder and Terminal Block Subassembly	1	DL133.B	1	See Part Drawings	See Part Drawings	









THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 1 | SCALE 1:2

astro

DEVELOPMENT CODE: DL133

PART NO.: DL133-PHR

DESCRIPTION: Pinhole Round (1434001) | DRAWING ISSUE: CO-006338

DRAWN: RD | DESIGN ENGINEER

DATE: 21/01/2022

CHECKED: RJS | PRODUCT ENGINEERING MANAGER

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS: See Part Drawings

FINISHES: See Product Specifications

NOTES
[CRITICAL /关键]
GLASS MUST CONFORM TO GLASS MATERIAL NOTE DETAILED ON DL133.04 PART DRAWING
[CRITICAL /关键]
FIXING SPRINGS MUST NOT OBSTRUCT OR CONTACT BEZEL SURFACE

Mark critical notes, dimensions and details with: [CRITICAL /关键]

UNLESS OTHERWISE STATED
DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

All dimensions are to finished parts.
所有尺寸均指含表面处理后最终部件尺寸

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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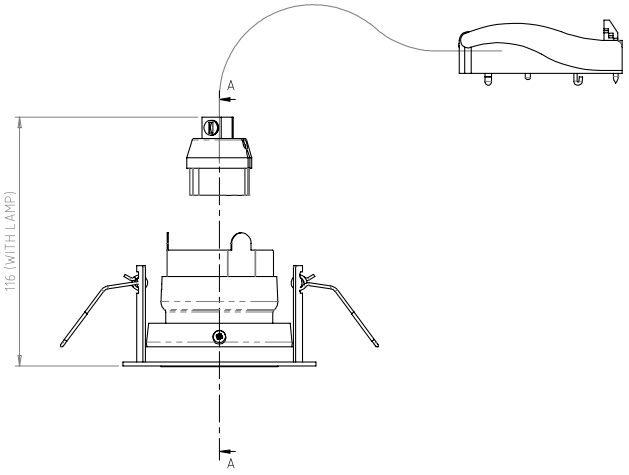
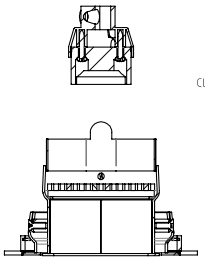
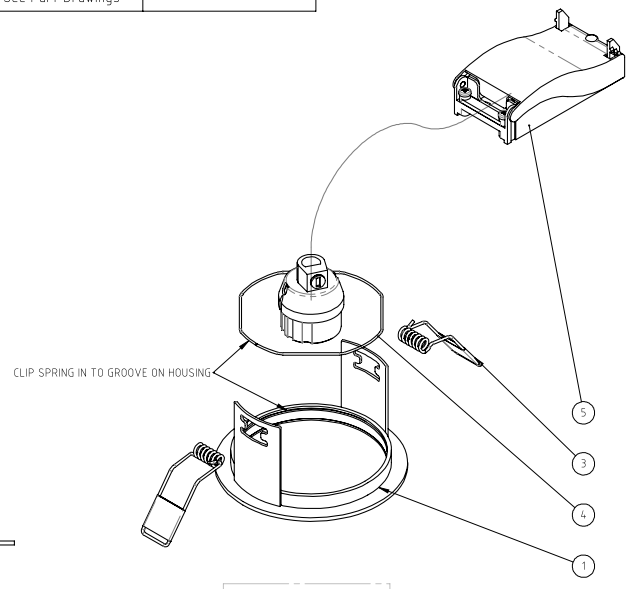
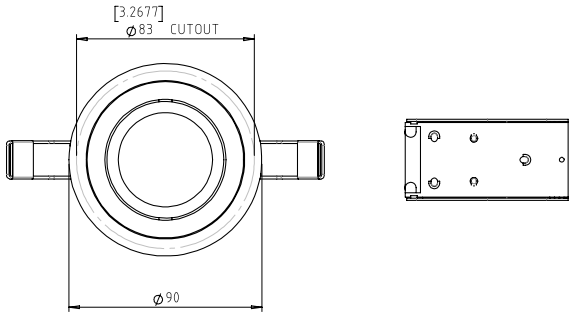
Item No.	Description	DL133-PHRA Pinhole Round Adjustable/QTY.	Part Number	Revision	Process	Material	Finish
1	Body Pinhole Round Adjustable	1	DL133.01-PHRA	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Pinhole Adjustable	1	DL133.A-PHA	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Fixing Spring	2	DL133.05	2	Formed	Spring Steel Ø1.3mm	Nickel Plated
4	Lamp Bezel Spring Pinhole Adjustable	1	DL133.02-PHA	2	Formed	Spring Steel	Nickel Plated
5	Lampholder and Terminal Block Subassembly	1	DL133.B	1	See Part Drawings	See Part Drawings	





SECTION A-A





THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 1 | SCALE 1:2

astro

DEVELOPMENT CODE: DL133

PART NO.: DL133-PHRA

DESCRIPTION: Pinhole Round Adjustable (1434003)

DRAWING ISSUE: C0-002504

DRAWN	RD	SENIOR DESIGN ENGINEER
DATE	06/11/2020	
CHECKED	XX	(POSITION)

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS: See Part Drawings

FINISHES: See Product Specifications

NOTES:
[CRITICAL /关键]
GLASS MUST CONFORM TO GLASS MATERIAL
NOTE DETAILED ON DL133.04 PART DRAWING

Component Surface Quality:
A = A Surface
B = B Surface
C = C Surface

UNLESS OTHERWISE STATED
DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

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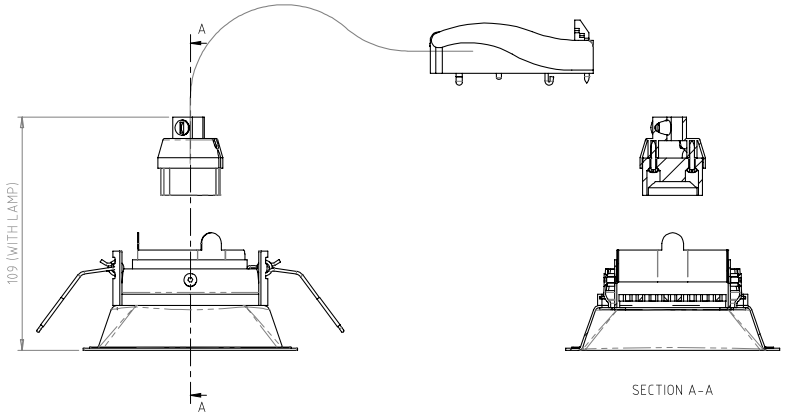
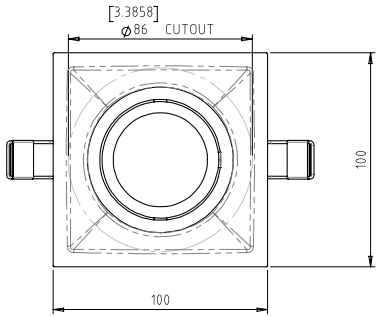
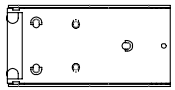
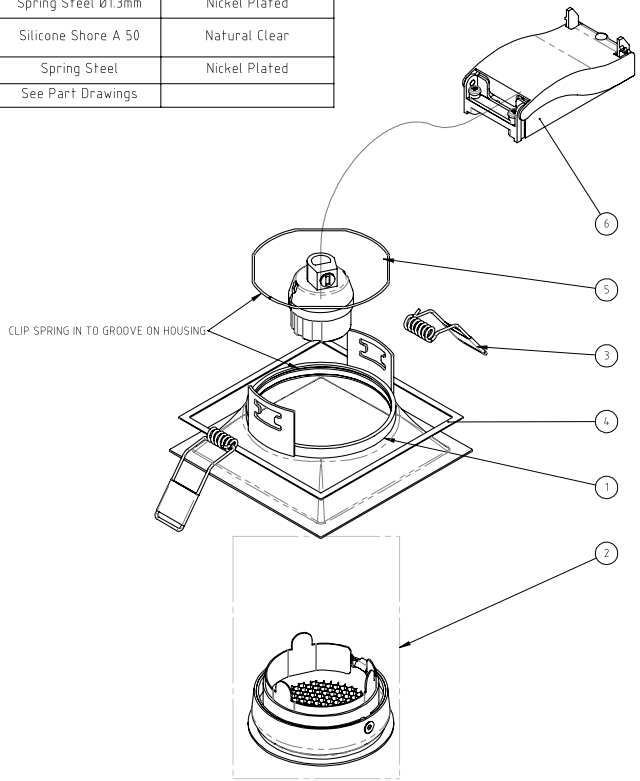
Item No.	Description	DL133-MNSA Minima Square Adjustable/QTY.	Part Number	Revision	Process	Material	Finish
1	Body Minima Square Adjustable	1	DL133.01-MNSA	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Adjustable	1	DL133.A-A	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Fixing Spring	2	DL133.05	2	Formed	Spring Steel Ø1.3mm	Nickel Plated
4	Flange Seal Minima Square	1	DL133.16-MNS	1	Stamped	Silicone Shore A 50	Natural Clear
5	Lamp Bezel Spring Adjustable	1	DL133.02-A	2	Formed	Spring Steel	Nickel Plated
6	Lampholder and Terminal Block Subassembly	1	DL133.B	1	See Part Drawings	See Part Drawings	



SECTION A-A







THIRD ANGLE PROJECTION | DO NOT SCALE | A3

SHEET 1 OF 1 | SCALE 1:2

astro

DEVELOPMENT CODE: DL133

PART NO.: DL133-MNSA

DESCRIPTION: Minima Square Adjustable (1249042)

DRAWING ISSUE: C0-002497

DRAWN	RD	SENIOR DESIGN ENGINEER
DATE	06/11/2020	
CHECKED	XX	(POSITION)

MATERIAL: See Part Drawings | THICKNESS: mm

PROCESS: See Part Drawings

FINISHES: See Product Specifications

NOTES:
[CRITICAL /关键]
GLASS MUST CONFORM TO GLASS MATERIAL
NOTE DETAILED ON DL133.04 PART DRAWING

Component Surface Quality:
A = A Surface
B = B Surface
C = C Surface

UNLESS OTHERWISE STATED

DIMENSIONS ARE IN MILLIMETRES
SURFACE TEXTURE VALUES ARE IN MICRONS
MACHINE WHERE MARKED

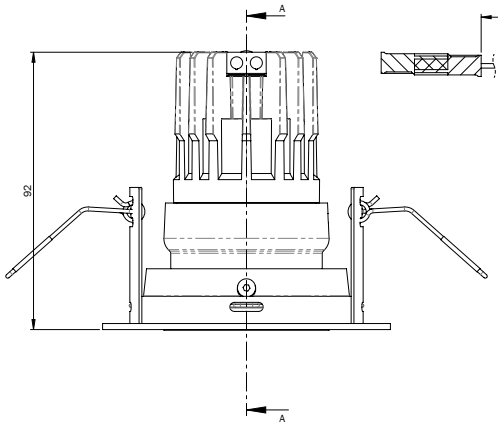
TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°

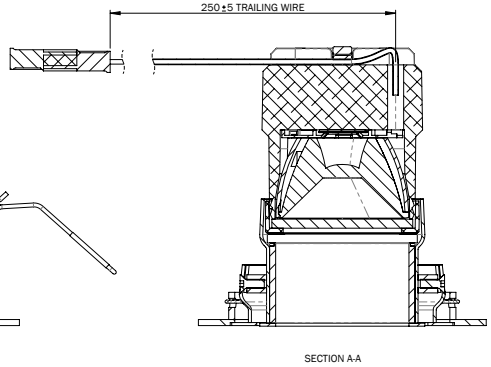
ALL PARTS TO BE FREE FROM BURRS, SHARP EDGES AND CORROSION

Astro Lighting Limited - The Astro Building, River Way, Harlow, Essex CM20 2GJ, UK - Tel: +44 (0) 1279 427001 - Fax: +44 (0) 1279 427002

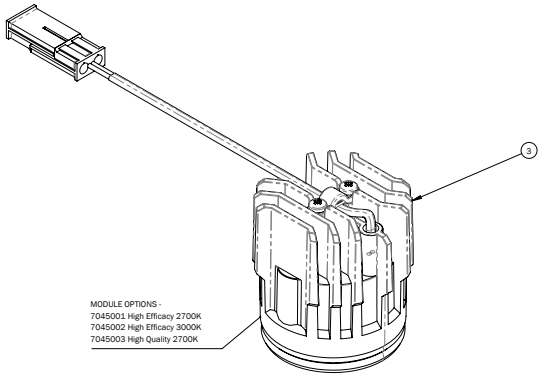
Item No.	Description	QTY.	Part Number	Revision	Process	Material	Finish
1	Pinhole Square Adjustable LED Body	1	DL133.SA02.v11.rB	B	Assembly	See product specification	See product specification
2	Glare Guard	1	DL133.PT13.v02.rA	A	See product specification	See product specification	See product specification
3	LED Module	1	ATB18.SA01.CE.v01.rB	B	Assembly	See Subassembly Drawings	See Subassembly Drawings
4	Lens	1	See Product Specification	A	Market Sourced	See Product Specification	See product specification

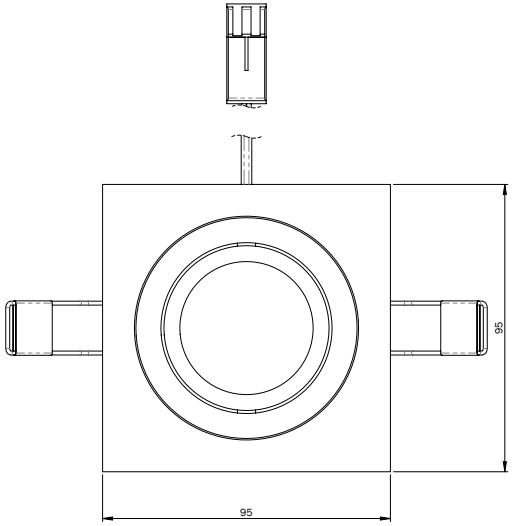
REVISIONS				
ZONE	REV.	DESCRIPTION	CHANGE ORDER REFERENCE	DATE
	B	DRAWING ORDER RESTRUCTURED	-	29/10/2024
H5	C	LARGER BODY SIZE IMPLEMENTED	-	12/11/2024

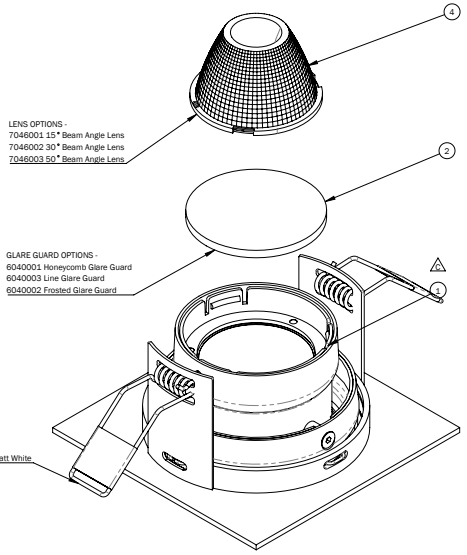




SECTION A-A







ASSEMBLY DRAWING

THIRD ANGLE PROJECTION

SHEET: 1 / 1
A2
SCALE: 1:1
UNITS: mm
DO NOT SCALE

ITEM STATUS	Development (unreleased)
DESIGN ENGINEER	Jake Chamberlin
DEVELOPMENT CODE	DL133
ITEM NUMBER	DL133.GA11.CE.rC
DESCRIPTION	Pinhole Square Adjustable LED
DRAWING ISSUE NUMBER	01
DRAWN BY	Jake Chamberlin
CHECKED BY	David Locke
DRAWING ISSUE DATE	16/12/2024

GENERAL NOTES

SEE PRODUCT SPECIFICATIONS FOR MARKET SOURCED COMPONENT DETAILS.

NOTES

Product Development Code
Item Category (PT, SA, or GA)
Item Category Number
EX001.PT01.A.v01.rA
Certification (GAs only) (CE, CE, UL, JIS)
Form Factor (parts only) (A, B, C, ...)
Design Variant
Revision

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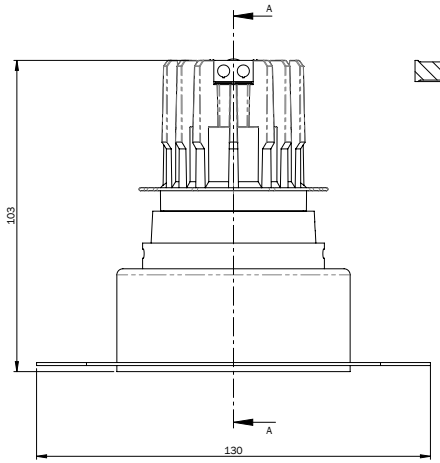
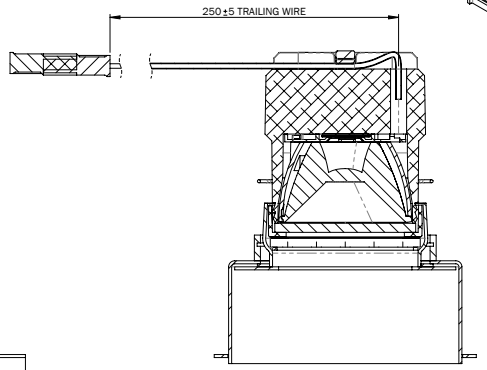
C 2425-2E-RA-001 |8339D30F| JORISVD

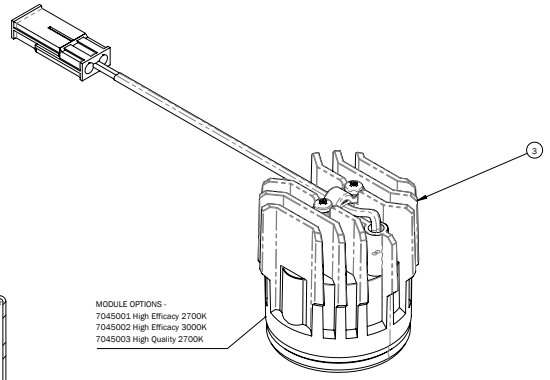
Item No.	Description	QTY.	Part Number	Revision	Process	Material	Finish
1	Trimless Round LED Body	1	DL133.SA02.v06.rA	A	Assembly	See product specification	See product specification
2	Glare Guard	1	DL133.PT13.v02.rA	A	See product specification	See product specificaion	See product specification
3	LED Module	1	ATB18.SA01.CE.v01.rB	B	Assembly	See Subassembly Drawings	See Subassembly Drawings
4	Lens	1	See Product Specification	A	Market Sourced	See Product Specification	See product specification

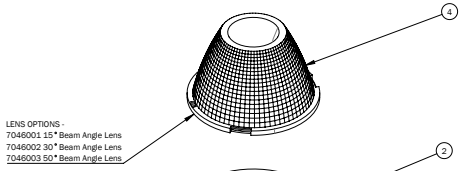
REVISIONS				
ZONE	REV.	DESCRIPTION	CHANGE ORDER REFERENCE	DATE
	B	DRAWING ORDER RESTRUCTURED	-	29/10/2024

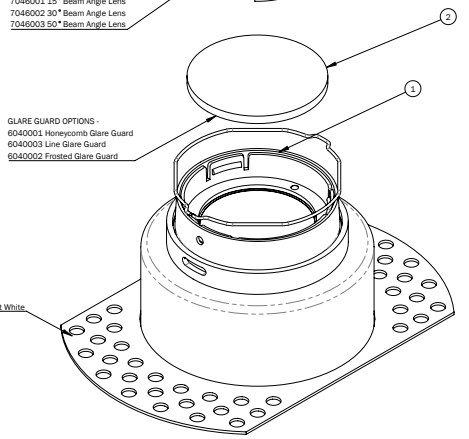


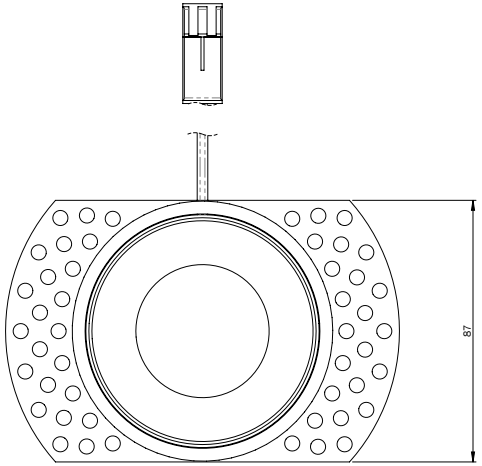


SECTION A-A









ASSEMBLY DRAWING

THIRD ANGLE PROJECTION

SHEET: 1 / 1
A2
SCALE: 1:1
UNITS: mm
DO NOT SCALE

ITEM STATUS	Development (unreleased)
DESIGN ENGINEER	Jake Chamberlin
DEVELOPMENT CODE	DL133
ITEM NUMBER	DL133.GA06.CE.v01.rB
DESCRIPTION	Trimless Round Fixed LED
DRAWING ISSUE NUMBER	01
DRAWN BY	Jake Chamberlin
CHECKED BY	David Locke
DRAWING ISSUE DATE	12/12/2024

GENERAL NOTES

SEE PRODUCT SPECIFICATIONS FOR MARKET SOURCED COMPONENT DETAILS.

NOTES

Product Development Code
Item Category (PT, SA, or GA)
Item Category Number
EX001.PT01.A.v01.rA
Certification (GAs only) (CE, CE, UL, JIS)
Form Factor (parts only) (A, B, C, ...)
Design Variant
Revision

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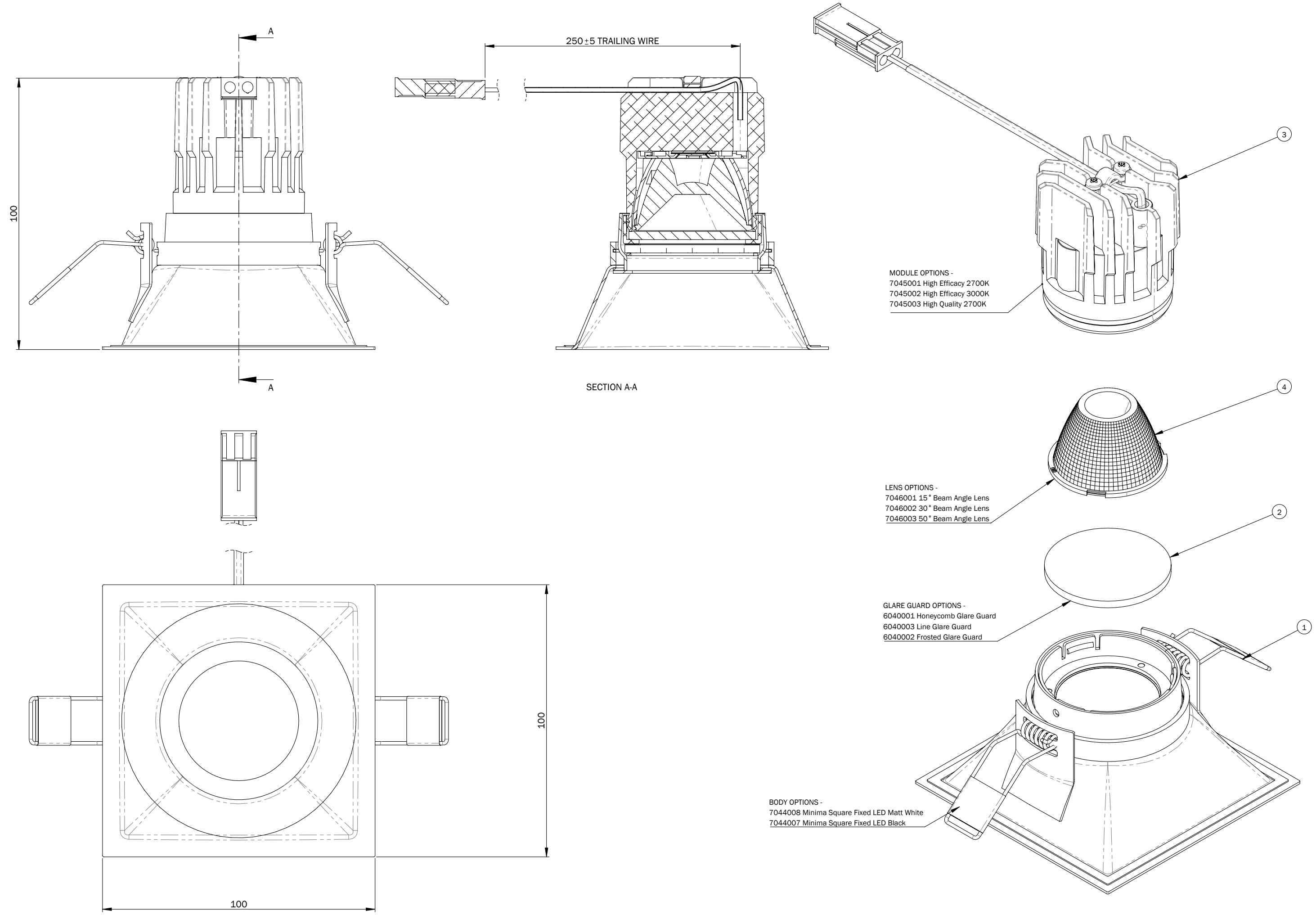
Appendix 3 Astro Lighting Ltd. downlights

Item No.	Description	QTY.	Part Number	Revision	Process	Material	Finish
1	Minima Square Fixed Body	1	DL133.SA02.v03.rA	A	Assembly	See Product Specification	See Product Specification
2	Glare Guard	1	DL133.PT13.v02.rA	A	See product specification	See product specification	See product specification
3	LED Module	1	ATB18.SA01.CE.v01.rB	B	Assembly	See Subassembly Drawings	See Subassembly Drawings
4	Lens	1	See Product Specification	A	Market Sourced	See Product Specification	See product specification

REVISIONS				
ZONE	REV.	DESCRIPTION	CHANGE ORDER REFERENCE	DATE
	B	DRAWING ORDER RESTRUCTURED	-	29/10/2024



ASSEMBLY DRAWING

THIRD ANGLE PROJECTION

SHEET:	1 / 1
	A2
SCALE:	1:1
UNITS:	mm
	DO NOT SCALE

ITEM STATUS	Development (unreleased)
DESIGN ENGINEER	Jake Chamberlin
DEVELOPMENT CODE	DL133
ITEM NUMBER	DL133.GA03.CE.v01.rB
DESCRIPTION	Minima Square Fixed LED
DRAWING ISSUE NUMBER	01
DRAWN BY	Jake Chamberlin
CHECKED BY	David Locke
DRAWING ISSUE DATE	12/12/2024

GENERAL NOTES

SEE PRODUCT SPECIFICATIONS FOR MARKET SOURCED COMPONENT DETAILS.

NOTES

EX001.PT01.A.v01.rA

- Product Development Code
- Item Category (PT, SA, or GA)
- Item Category Number
- Certification (GAs only) (IEC, CE, UL, JIS)
- Form Factor (parts only) (A, B, C, ...)
- Design Variant
- Revision

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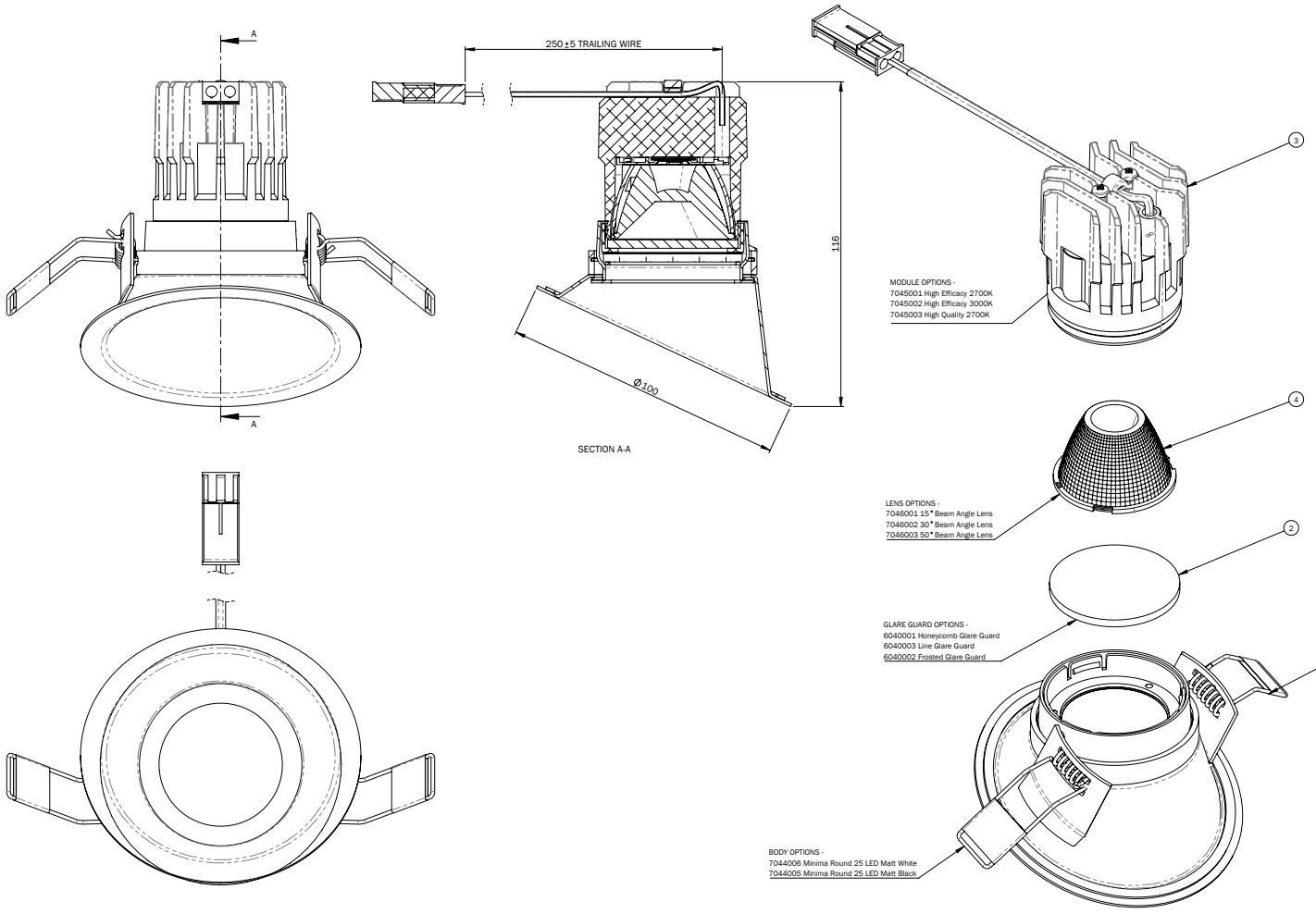
Item No.	Description	QTY.	Part Number	Revision	Process	Material	Finish
1	Minima Round 25 Body	1	DL133.SA02.v05.rA	A	Assembly	See product specification	See product specification
2	Glare Guard	1	DL133.PT13.v02.rA	A	See product specification	See product specificaion	See product specification
3	LED Module	1	ATB18.SA01.CE.v01.rB	B	Assembly	See Subassembly Drawings	See Subassembly Drawings
4	Lens	1	See Product Specification	A	Market Sourced	See Product Specification	See product specification

REVISIONS				
ZONE	REV.	DESCRIPTION	CHANGE ORDER REFERENCE	DATE
	B	DRAWING ORDER RESTRUCTURED	-	29/10/2024



ASSEMBLY DRAWING

THIRD ANGLE PROJECTION

SHEET: 1 / 1
A2
SCALE: 1:1
UNITS: mm
DO NOT SCALE

ITEM STATUS	Development (unreleased)
DESIGN ENGINEER	Jake Chamberlin
DEVELOPMENT CODE	DL133
ITEM NUMBER	DL133.GA05.CE.v01.rB
DESCRIPTION	Minima Round 25 LED
DRAWING ISSUE NUMBER	01
DRAWN BY	Jake Chamberlin
CHECKED BY	David Locke
DRAWING ISSUE DATE	12/12/2024

GENERAL NOTES

SEE PRODUCT SPECIFICATIONS FOR MARKET SOURCED COMPONENT DETAILS.

NOTES

Product Development Code
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