Laboratory for Fire Safety

Evaluation of the fire resistance of ITW and MiTek wooden floor constructions with Astro Lighting Ltd. downlights incorporated into a plasterboard ceiling

Assessment report

Report number C 2339-2E-RA-003 dated 21 January 2025

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Evaluation of the fire resistance of ITW and MiTek wooden 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 2339-2E-RA-003 (replaces report C 2339-2E-RA-002, dated 10 June 2024)
Date	21 January 2025
Reference	HL/TBr//C 2339-2E-RA-003
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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 already tested downlights in a *Wolf Systems* wooden floor construction (fire test report Y 2904-2E-RA-001) can achieve the same (or better) fire resistance (REI 30) when incorporated into *ITW* and *MiTek* floor constructions.

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 *ITW Construction Products* and *MiTek*, 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 of this report.

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.*), *ITW Construction Products* and *MiTek* 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contradictory evidence becomes available to the Peutz Laboratory for Fire Safety the assessment will be unconditionally withdrawn and the applicant will be notified in writing.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 and extended 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 Standards used

Preparing this report, the applicable test standard EN 1365-2:2014 and its direct application were used. Regarding wooden floor constructions an Extended Application standard is not available. For wooden beams EAD 130031-00-0304 can be used. EAD 130031-00-0304 only concerns lightweight composite wood-based beams (and columns), which can be used for floor constructions, but the guideline doesn't provide rules for floor constructions. That means in this report EAD 130031-00-0304 is only used for assessing the *ITW* and *MiTek* joists in the floor construction itself.

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
FIRES	MiTek Industries Ltd	Test report No FIRES-FR-103-18-AUNE Edition 2, October 21, 2020	EN 1365-2:2014
Peutz bv	ITW Construction Products	Test report No Y 2258-3E-RA-001, September 28, 2022	EN 1365-2:2014
Peutz bv	Astro Lighting Ltd.	Test report No Y 2904-2E-RA-001, January 10, 2024	EN 1365-2:2014
Peutz bv	Astro Lighting Ltd.	Test report No Y 3308-3-E-BR, December 16, 2024	EN 1363-1:2020

The clients 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 FIRES-FR-103-18-AUNE Edition 2

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

Dimensions floor joists:	Mitek Posi-Joists, 72 mm wide × 225 mm high × 4100 mm span length, comprise two rectangular timber flanges 72 mm × 47 mm (w × h) connected to each other with PS9 posi-strut webs; at midspan 47 mm × 97 mm strongback was mounted to each mid-column of Posi-Joists with Ø5.0 × 90 mm screws;
Centre-to-centre distance joists:	600 mm;
Density of the joists:	the density of the joists is not measured by the laboratory, the timber grade is given as TR26 instead. The timber grade is no European Standard, which means that the density of the used wood is uncertain. In the table of the current EN 338:2016, it is listed that C27 (same 5% density as TR26) has a mean density of 430 kg/m^3;
Loading on the deck:	153 kg/m^2;
Floor boards (deck):	chipboard 22 mm boards 600 mm wide, tongue and groove, screwed ca. 200 mm centres, screws Ø4.4 × 49 mm;
Ceiling boards:	Knauf plasterboard type A, 15 mm boards, dimensions 1200 mm × 2400 mm, screwed 150 mm centres along all joists, drywall screws Ø3.5 × 42 mm; joints taped and filled with joint filler;
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 at the request of the sponsor, none of the criteria failed at that moment.

2.2.2 Test report Peutz Y 2258-3E-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:	ITW SpaceJoists, 72 mm wide × 219 mm high × 4147 mm span length, comprise two rectangular timber flanges 72 mm × 47 mm (w × h) connected to each other with metal webs (SJ9) and TR26 white wood blocks; at midspan 47 mm × 97 mm strongback was mounted to each mid-column of SpaceJoist with 3no. 5.0 × 80 mm wood screws;
Centre-to-centre distance joists:	600 mm;
Density of the joists:	425 kg/m^3;
Loading on the deck:	153 kg/m^2;
Floor boards (deck):	chipboard 22 mm boards 600 mm wide, tongue and groove, glued and nailed ca. 150 mm centres, ring shank nails 3.1×63 mm;
Ceiling boards:	Gyproc Wallboard type A, 15 mm boards, dimensions 1200 mm × 2365 mm, screwed 150 mm centres along all joists, drywall screws Ø3.5 × 45 mm; joints taped with fibreglass tape and filled with joint filler;
Downlight types installed:	1 x BDXX1AXXXX in Ø78 mm, 2 x BDXX1FXXXX in Ø78 mm, 1 x BDXX0FXXXX in Ø68 mm, 1 x BDXX2FXXXX in Ø78 mm, 1 x BDXX2A3XXXX in Ø78 mm, 1 x BDXX3FXXXX in Ø68 mm, 1 x BDXX3AXXXX in Ø68 mm, 1 x BDXX4FXXXX in 2 x Ø68 mm, 1 x BDXX4AXXXX in 2 x Ø68 mm;
Summarized test results:	Loadbearing capacity (R): 36 minutes, Integrity (E): 36 minutes (due to failing R), Insulation (I): 36 minutes (due to failing R);
Main cause of failure:	the test was discontinued after a period of 36 minutes, all criteria were failed at that moment. After 36 minutes the whole floor assembly collapsed.

2.2.3 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.

2.2.4 Test report Peutz Y 3308-3E-RA

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 construction and requirements

3.1 Description of the assessed construction

The assessed constructions are wooden floor constructions, with Deep Space Joists (*ITW*) or Posi-Joists (*MiTek*) built as described in the test reports mentioned in Table 2.1, see also Section 2.2.1 and 2.2.2. Incorporated into the plasterboard ceiling are *Astro Lighting Ltd.* downlights as mentioned below.

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

Drawings of the floor constructions are given in Appendix 1 – 3, drawings of the downlights are given in Appendix 4. Appendix 5 contains drawings of the construction as well as the tested downlights from a small-scale test.

3.2 Requirement

The assessed constructions requires a fire resistance of REI 30 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 paragraphs 2.2.3 and 2.2.4) 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 (REI 30) by incorporating lighting fixtures from Section 3.1 in *Wolf Systems*, *ITW* and *MiTek* floor constructions.

4.2 ITW 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 load applied in this test was 133 kg/m^2. The fire test achieved an overrun time of 7 minutes, at which point none of the classification criteria (loadbearing capacity – R, integrity – E, insulation – I) were met. In the fire test where *ITW* joists were used for the floor construction, the applied load was slightly higher and equal to 153 kg/m^2. In this test, downlight fixtures were also tested, and the construction achieved an overrun time of 6 minutes (see also Section 2.2.2 of this report). Considering the result of the fire test, it can be concluded that by replacing the lighting fixtures used during the *ITW* fire test with those from *Astro Lighting Ltd.* (see Section 3.1), it is expected that the result will be at least 30 minutes on the REI performance criteria.

4.3 MiTek 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 load applied in this test was 133 kg/m^2. The fire test achieved an overrun time of 7 minutes, at which point none of the classification criteria (loadbearing capacity – R, integrity – E, insulation – I) were met. The test without lighting fixtures incorporated in the ceiling (test report number FIRES-FR-103-18-AUNE Edition 2) was stopped at the client's request after 33 minutes.

During this time, none of the classification criteria (R, E, or I) were exceeded. According to the test report (Y 2904-2E-RA-001, *Wolf Systems* floor construction with *Astro Lighting Ltd.* lighting fixtures incorporated in the ceiling), the first piece of gypsum board fell into the furnace after 28 minutes, and the rate of deflection was achieved after 30 minutes. In the test without lighting fixtures (*Mitek*), after 24 minutes, all gypsum boards are still attached to the joists. In theory, lighting fixtures can lead to additional heat above the ceiling due to openings created as a result of the disintegration of downlights. According to the test report Y 2904-2E-RA-001, lighting fixtures did not create an opening before 30 minutes of testing, therefore it is expected that the negative impact on the fire resistance of the *Mitek* floor construction is negligible.

4.4 Non-tested downlights

In addition to the tested lighting fixtures in the *Wolf Systems* floor construction, several similar lighting fixtures (see also Section 3.1) were not subjected to fire testing. The lighting fixtures in question are:

- 1434001
- 1434003
- 1249035
- 1249037
- 1249039
- 1249041
- 1249042 / 043
- 1286095
- 1396037

In this case assessed is whether the mentioned lighting fixtures can achieve the same or better fire resistance as when they were tested in the *Wolf Systems* floor construction. In the paragraphs before, the performance of the tested lighting fixtures in other floor constructions (*ITW* and *Mitek*) has already been assessed. Therefore, it can be assumed that the untested lighting fixtures can be applied in *ITW* and *Mitek* floor constructions, provided that the application of the lighting fixtures in the tested *Wolf Systems* floor construction would give a positive result.

4.4.1 1434001 downlight

This lighting fixture is very similar in construction to version 1434002, which has been tested. Its installation requires an identical opening in the plasterboard ceiling of 70 mm, and its weight is approximately 60 grams lighter than the tested downlight. The difference between these two products lies in the bezel, which in version 1434001 is round, whereas in the version subjected to fire testing (1434002), a square bezel was used. According to test report Y 2904-2E-RA-001, the tested downlight did not create an opening within the first 30 minutes of testing. Additionally, the bezel is not a significant component that influences the formation of potential gaps in the structure. Therefore, it is expected that any potential negative effect on the fire resistance of the floor constructions is negligible.

4.4.2 1434003 downlight

This lighting fixture is very similar in construction to version 1434004, which has been tested. Its installation requires an identical opening in the plasterboard ceiling of 83 mm, and its weight is approximately 22 grams lighter than the tested downlight. The difference between these two products lies in the bezel, which in version 1434003 is round, whereas in the version subjected to fire testing (1434004), a square bezel was used. According to test report Y 2904-2E-RA-001, the tested downlight did not create an opening within the first 30 minutes of testing. Additionally, the bezel is not a significant component that influences the formation of potential gaps in the structure. Therefore, it is expected that any potential negative effect on the fire resistance of the floor constructions is negligible.

4.4.3 1249042 / 043 downlight

This lighting fixture is very similar in construction to version 1249040, which has been tested. Its installation requires an opening in the plasterboard ceiling with dimensions of 86 × 86 mm (in version 1249040, it was a round opening with a diameter of 86 mm), and its weight is approximately 14 grams lighter than the tested downlight. The difference between these two products lies in the bezel, which in version 1249042 / 043 is square, whereas in the version subjected to fire testing (1249040), a round bezel was used. Concerning the double numbers (042 / 043), they serve solely to indicate the colour finish. According to test report Y 2904-2E-RA-001, the tested downlight did not create an opening within the first 30 minutes of testing. Additionally, the bezel is not a significant component that influences the formation of potential gaps in the structure. Therefore, it is expected that any potential negative effect on the fire resistance of the floor constructions is negligible.

4.4.4 1249035, 1249037, 1249039, 1249041, 1286095, 1396037 downlights

These numbers identify only different colour finishes of the versions that were used during the fire test, see test report number Y 2904-2E-RA-001 and also Chapter 3 of this report. Therefore, it is expected that any potential negative impact on the fire resistance of the ceiling constructions will be negligible.

4.5 Floor construction with new Astro Lighting Ltd. downlights

In this small scale fire test, which followed 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 3308-3-E-BR, December 16, 2024), as well as in Appendix 5.

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 1502xxx, 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.

This test demonstrated that the downlights with the LED Gen I module remained in place throughout the entire fire test. Considering this, it is expected that a full scale fire test conducted in accordance with EN 1365-2:2014 would achieve a result of at least 30 minutes for the REI performance criteria.

5 Field of application

Based on the fire resistance tests listed in Table 2.1, detailed information provided by the client (see Appendix 1-5), and the knowledge and experience gained by Peutz through numerous similar fire tests conducted over the years, it can be stated that floor constructions incorporating *Astro Lighting Ltd.* downlights (see also Chapter 4) are assessed for a fire resistance of at least REI 30 in line with the classification standard EN 13501-2:2023. The field of application is based on the direct field of application in accordance with the classification report of Peutz. The field of application is only valid for constructions similar to that described in the report. Any changes other than those mentioned below are not allowed.
Only downlights as given in Section 3.1 may be incorporated in the floor construction as given in the mentioned reports.

5.1 Construction element

Wolf Systems floor construction

The span of the floor construction is in principle limited to a maximum of 4150 mm, but may be increased under certain circumstances as written below.

The spacing of the joists may be decreased, or the depth and flange size of the joists increased, provided that the maximum moments and shear forces on the joists, considering the load applied in practise, are not greater than those tested, when calculated on the same basis in the fire condition.

The maximum load used in the calculations in the unchanged floor construction is 133 kg/m^2 for all downlights.

ITW floor construction

The span of the floor construction is in principle limited to a maximum of 4147 mm, but may be increased under certain circumstances as written below.

The spacing of the joists may be decreased, or the depth and flange size of the joists increased, provided that the maximum moments and shear forces on the joists, considering the load applied in practise, are not greater than those tested, when calculated on the same basis in the fire condition.

The maximum load used in the calculations in the unchanged floor construction is 153 kg/m^2 for all downlights.

MiTek floor construction

The span of the floor construction is in principle limited to a maximum of 4100 mm, but may be increased under certain circumstances as written below.

The spacing of the joists may be decreased, or the depth and flange size of the joists increased, provided that the maximum moments and shear forces on the joists, considering the load applied in practise, are not greater than those tested, when calculated on the same basis in the fire condition.

The maximum load used in the calculations in the unchanged floor construction is 153 kg/m^2 for all downlights.

5.2 Joists

Wolf Systems floor construction

The density of the joists shall be at least 505 kg/m^3.

ITW floor construction

The density of the joists shall be at least 425 kg/m^3.

MiTek floor construction

The density of the joists shall be at least 430 kg/m^3 (TR26 – timber strength class).

5.3 The dimension crosswise to the span direction

Wolf Systems, ITW and MiTek floor constructions

The dimension perpendicular to the span direction is unlimited provided that the spacing of the joists is not greater than 600 mm.

5.4 Downlights

Wolf Systems, ITW and MiTek floor constructions

The centre-to-centre distance between 2 random fittings shall be no less than 600 mm in the direction parallel to the joists and no less than than 600 mm in the direction perpendicular to the joists. Alternatively the downlights may be spaced closer than 600 mm perpendicular to the joists provided that the spacing is adjusted accordingly in the parallel direction such than the density of downlights per m^2 is no greater than one downlight per m^2 for the entire ceiling area.
The distance between the centre of a downlight and the joint of the gypsum board, as well as between the centre of a downlight and the centre of a joist, shall be no less than 100 mm. The diameter/ opening in the gypsum board for installing the downlight must not exceed those specified in Section 3.1.

5.5 Boards of the ceiling

Wolf Systems floor construction

The maximum size of boards of the ceiling is 2450 mm × 1250 mm, provided that the number of fixings per square meter remains at least the same as tested. The boards shall be of the type British Gypsum, Gyproc Wallboard, Type A, 15 mm.

ITW floor construction

The maximum size of boards of the ceiling is 2415 mm × 1250 mm, provided that the number of fixings per square meter remains at least the same as tested. The boards shall be of the type British Gypsum, Gyproc Wallboard, Type A, 15 mm.

MiTek floor construction

The maximum size of boards of the ceiling is 2450 mm × 1250 mm, provided that the number of fixings per square meter remains at least the same as tested. The boards shall be of the type Kanuf, Type A, 15 mm.

5.6 Cavity

Wolf Systems floor construction

The height of the cavity between the ceiling and the flooring may be increased but with a minimum joists height of 219 mm. No extra material may be added to that cavity other than needed for the incorporated downlights.

ITW floor construction

The height of the cavity between the ceiling and the flooring may be increased but with a minimum joists height of 219 mm. No extra material may be added to that cavity other than needed for the incorporated downlights.

MiTek floor construction

The height of the cavity between the ceiling and the flooring may be increased but with a minimum joists height of 225 mm. No extra material may be added to that cavity other than needed for the incorporated downlights.

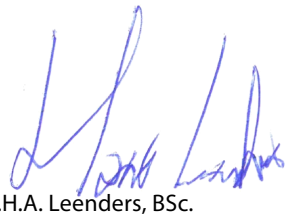
6 In conclusion

Based on the fire test reports listed in Table 2.1, the use of lighting fixtures in *Wolf Systems*, *ITW* and *Mitek* floor constructions is assessed for a fire resistance of REI 30 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).

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 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.

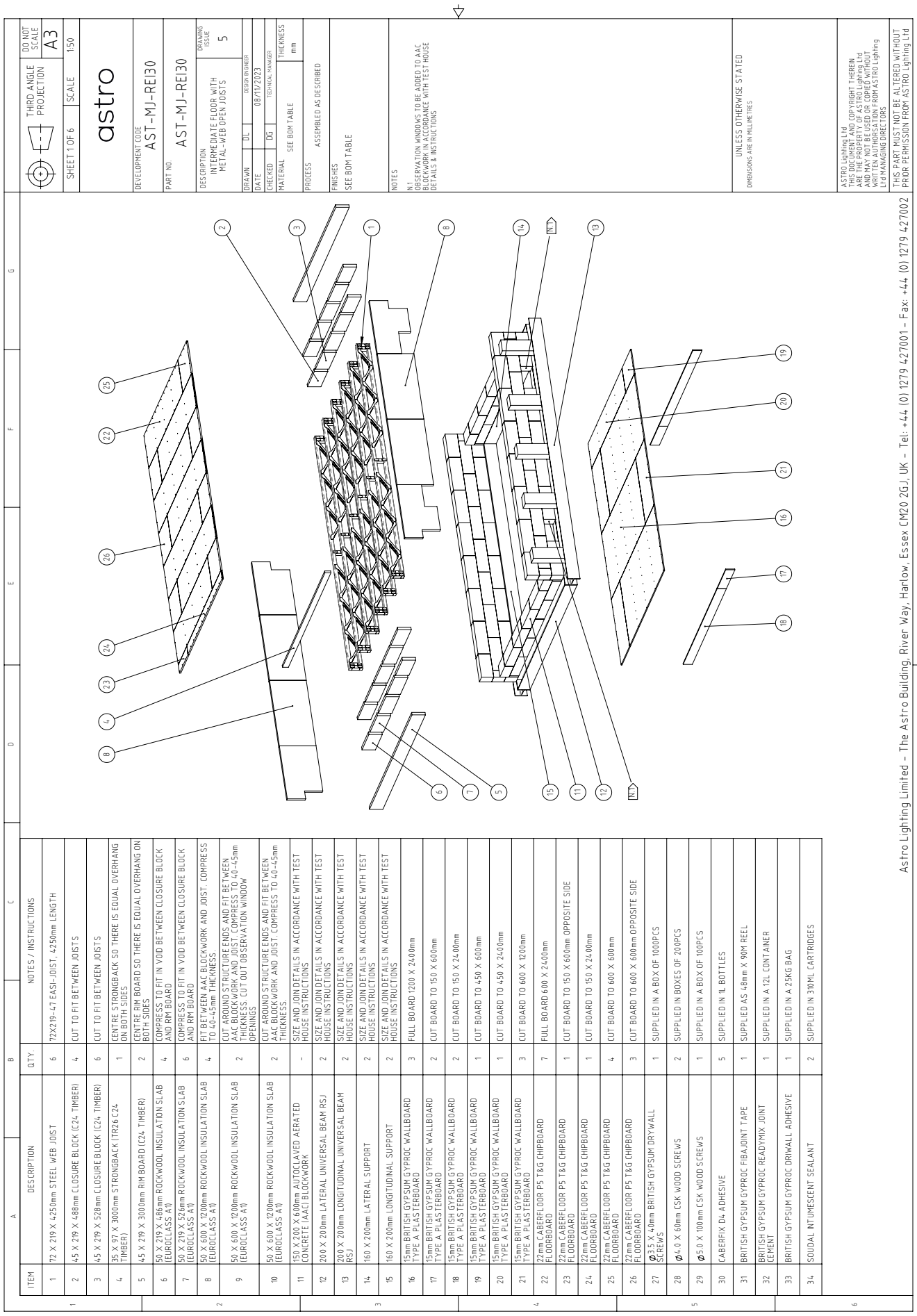
Haps,



H.H.A. Leenders, BSc.
Head of the Fire Laboratory

This report contains 17 pages and 5 Appendices.

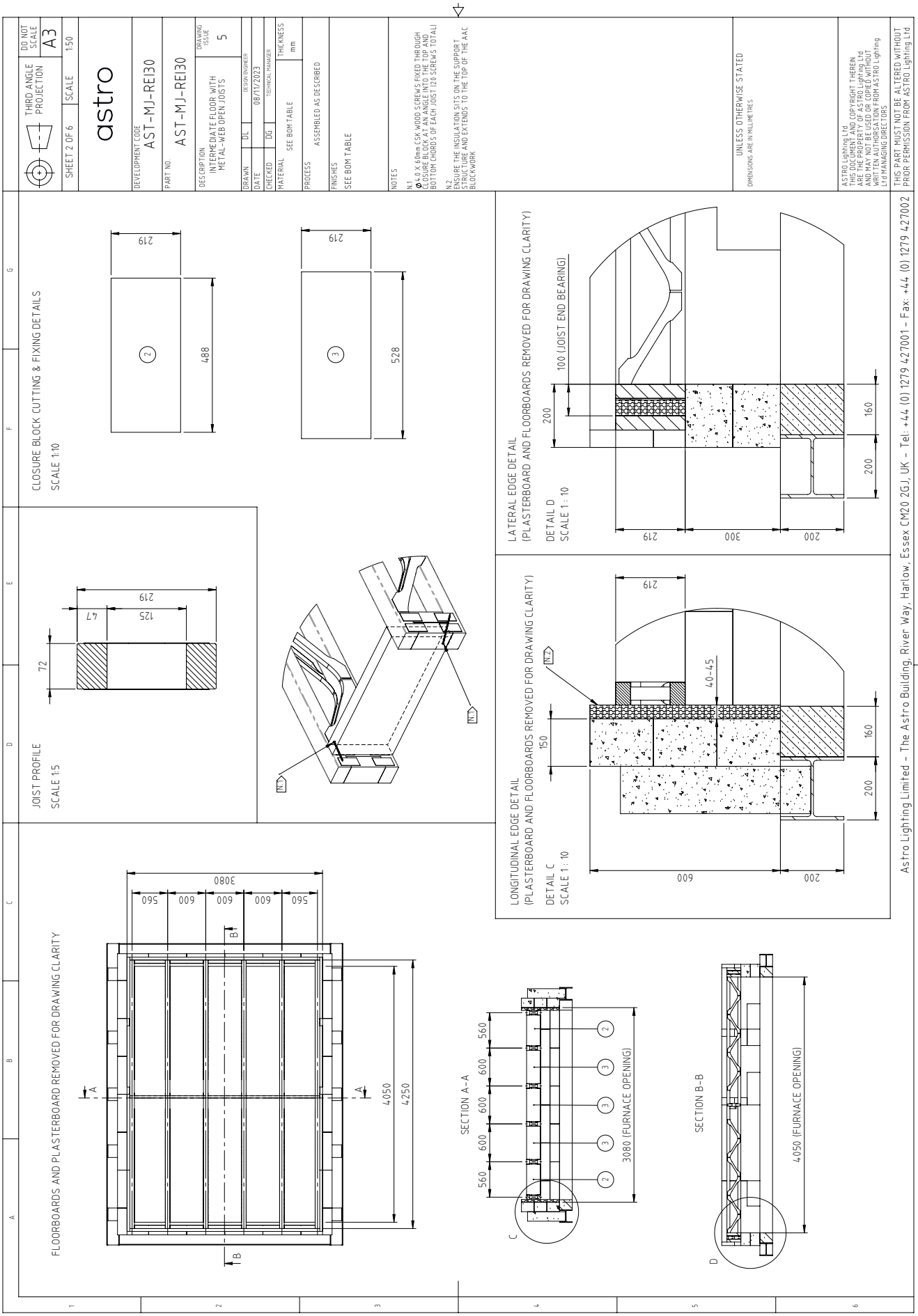
Appendix 1 Floor construction Y 2904-2E-RA-001 (PEUTZ BV)



ITEM	DESCRIPTION	QTY	NOTES / INSTRUCTIONS
1	72 X 219 X 4250mm STEEL WEB JOIST	6	72X219-47 EASI-JOIST, 4250mm LENGTH
2	45 X 219 X 488mm CLOSURE BLOCK (C24 TIMBER)	4	CUT TO FIT BETWEEN JOISTS
3	45 X 219 X 528mm CLOSURE BLOCK (C24 TIMBER)	6	CUT TO FIT BETWEEN JOISTS
4	35 X 97 X 3000mm STRONGBACK (TR26 C24 TIMBER)	1	CENTRE STRONGBACK SO THERE IS EQUAL OVERHANG ON BOTH SIDES
5	45 X 219 X 3000mm RIM BOARD (C24 TIMBER)	2	CENTRE RIM BOARD SO THERE IS EQUAL OVERHANG ON BOTH SIDES
6	50 X 219 X 486mm ROCKWOOL INSULATION SLAB (EUROCLASS A1)	4	COMPRESS TO FIT IN VOID BETWEEN CLOSURE BLOCK AND RIM BOARD
7	50 X 219 X 526mm ROCKWOOL INSULATION SLAB (EUROCLASS A1)	6	COMPRESS TO FIT IN VOID BETWEEN CLOSURE BLOCK AND RIM BOARD
8	50 X 600 X 1200mm ROCKWOOL INSULATION SLAB (EUROCLASS A1)	4	FIT BETWEEN AAC BLOCKWORK AND JOIST. COMPRESS TO 40-45mm THICKNESS
9	50 X 600 X 1200mm ROCKWOOL INSULATION SLAB (EUROCLASS A1)	2	CUT AROUND STRUCTURE ENDS AND FIT BETWEEN AAC BLOCKWORK AND JOIST. COMPRESS TO 40-45mm THICKNESS. CUT OUT OBSERVATION WINDOW OPENINGS
10	50 X 600 X 1200mm ROCKWOOL INSULATION SLAB (EUROCLASS A1)	2	CUT AROUND STRUCTURE ENDS AND FIT BETWEEN AAC BLOCKWORK AND JOIST. COMPRESS TO 40-45mm THICKNESS
11	150 X 200 X 600mm AUTOCLAVED AERATED CONCRETE (AAC) BLOCKWORK	-	SIZE AND JOIN DETAILS IN ACCORDANCE WITH TEST HOUSE INSTRUCTIONS
12	200 X 200mm LATERAL UNIVERSAL BEAM RSJ	2	SIZE AND JOIN DETAILS IN ACCORDANCE WITH TEST HOUSE INSTRUCTIONS
13	200 X 200mm LONGITUDINAL UNIVERSAL BEAM RSJ	2	SIZE AND JOIN DETAILS IN ACCORDANCE WITH TEST HOUSE INSTRUCTIONS
14	160 X 200mm LATERAL SUPPORT	2	SIZE AND JOIN DETAILS IN ACCORDANCE WITH TEST HOUSE INSTRUCTIONS
15	160 X 200mm LONGITUDINAL SUPPORT	2	SIZE AND JOIN DETAILS IN ACCORDANCE WITH TEST HOUSE INSTRUCTIONS
16	15mm BRITISH GYPSUM GYPROC WALLBOARD TYPE A PLASTERBOARD	3	FULL BOARD 1200 X 2400mm
17	15mm BRITISH GYPSUM GYPROC WALLBOARD TYPE A PLASTERBOARD	2	CUT BOARD TO 150 X 600mm
18	15mm BRITISH GYPSUM GYPROC WALLBOARD TYPE A PLASTERBOARD	2	CUT BOARD TO 150 X 2400mm
19	15mm BRITISH GYPSUM GYPROC WALLBOARD TYPE A PLASTERBOARD	1	CUT BOARD TO 450 X 600mm
20	15mm BRITISH GYPSUM GYPROC WALLBOARD TYPE A PLASTERBOARD	1	CUT BOARD TO 450 X 2400mm
21	15mm BRITISH GYPSUM GYPROC WALLBOARD TYPE A PLASTERBOARD	3	CUT BOARD TO 600 X 1200mm
22	22mm CABERFLOOR P5 T&G CHIPBOARD FLOORBOARD	7	FULL BOARD 600 X 2400mm
23	22mm CABERFLOOR P5 T&G CHIPBOARD FLOORBOARD	1	CUT BOARD TO 150 X 600mm OPPOSITE SIDE
24	22mm CABERFLOOR P5 T&G CHIPBOARD FLOORBOARD	1	CUT BOARD TO 150 X 2400mm
25	22mm CABERFLOOR P5 T&G CHIPBOARD FLOORBOARD	4	CUT BOARD TO 600 X 600mm
26	22mm CABERFLOOR P5 T&G CHIPBOARD FLOORBOARD	3	CUT BOARD TO 600 X 600mm OPPOSITE SIDE
27	Ø3.5 X 40mm BRITISH GYPSUM DRYWALL SCREWS	1	SUPPLIED IN A BOX OF 1000PCS
28	Ø4.0 X 60mm CSK WOOD SCREWS	2	SUPPLIED IN BOXES OF 200PCS
29	Ø5.0 X 100mm CSK WOOD SCREWS	1	SUPPLIED IN A BOX OF 100PCS
30	CABERFIX D4 ADHESIVE	5	SUPPLIED IN 1L BOTTLES
31	BRITISH GYPSUM GYPROC FIBA JOINT TAPE	1	SUPPLIED AS 48mm X 90M REEL
32	BRITISH GYPSUM GYPROC READYMIX JOINT CEMENT	1	SUPPLIED IN A 12L CONTAINER
33	BRITISH GYPSUM GYPROC DRIWALL ADHESIVE	1	SUPPLIED IN A 25KG BAG
34	SOUDAL INTUMESCENT SEALANT	2	SUPPLIED IN 310ML CARTRIDGES

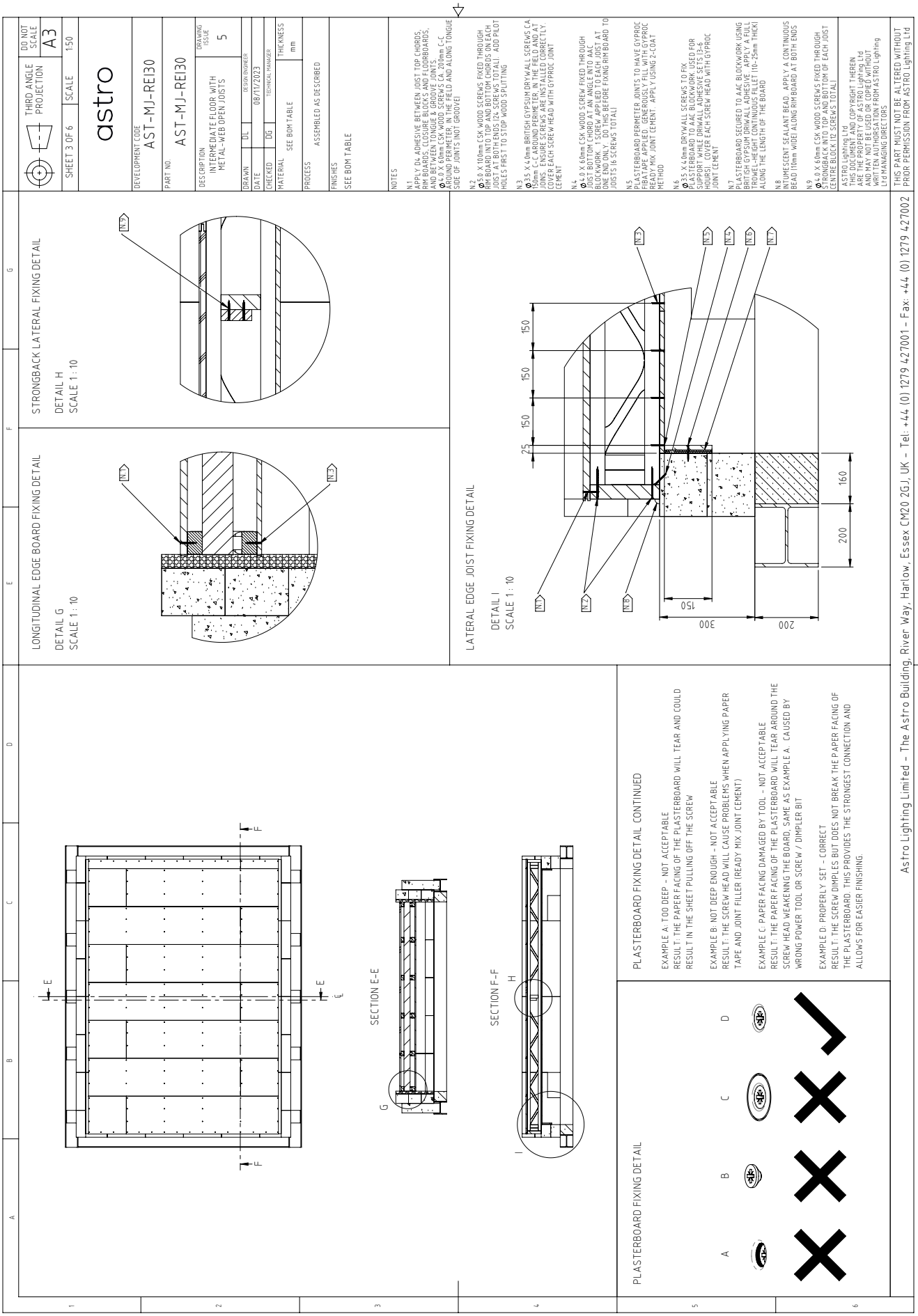
C 2339-2E-RA-003 999867.2BC/ HARML

Appendix 1 Floor construction Y 2904-2E-RA-001 (PEUTZ BV)



C 2339-2E-RA-003 999872BC/ HARWL

Appendix 1 Floor construction Y 2904-2E-RA-001 (PEUTZ BV)



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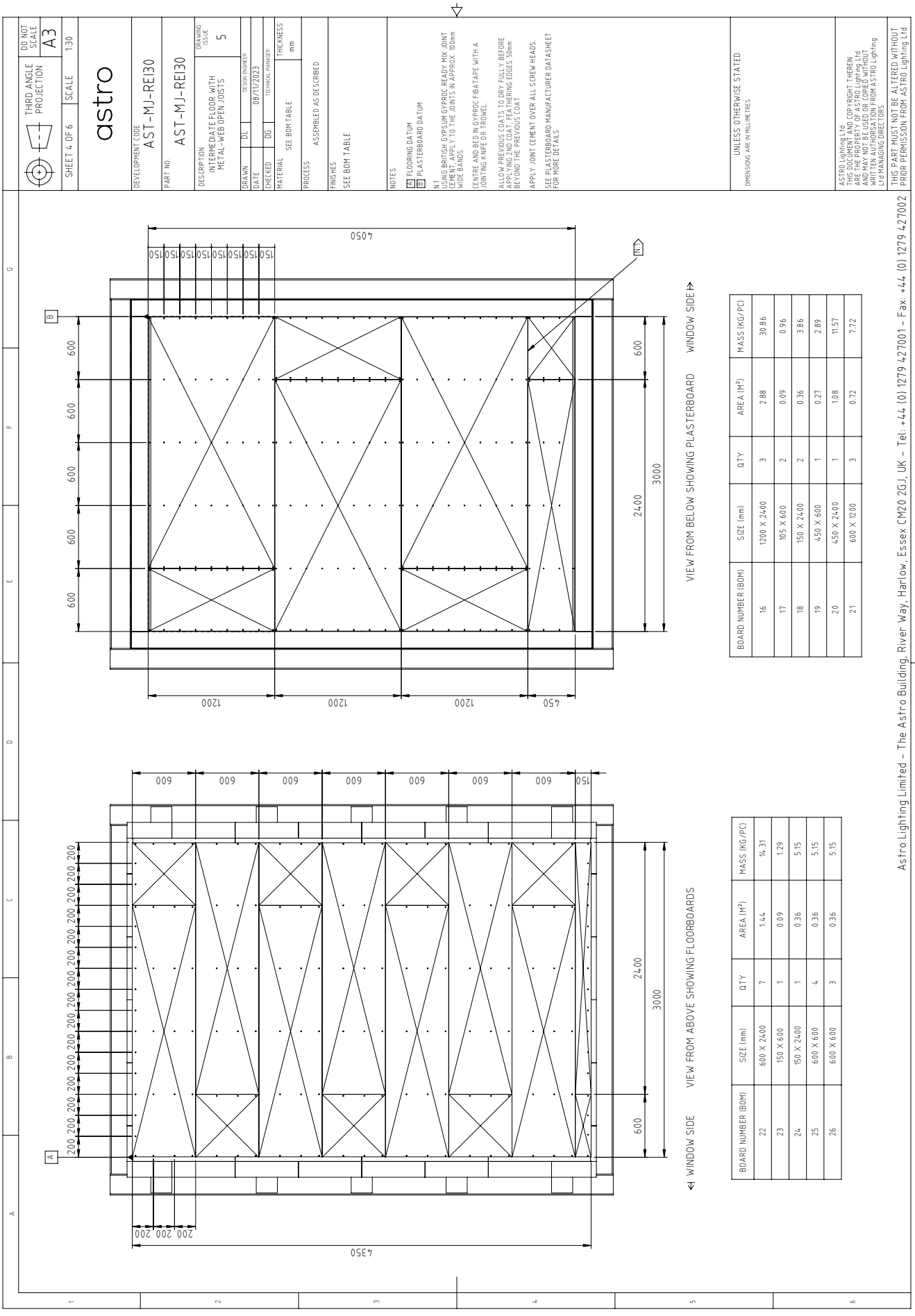
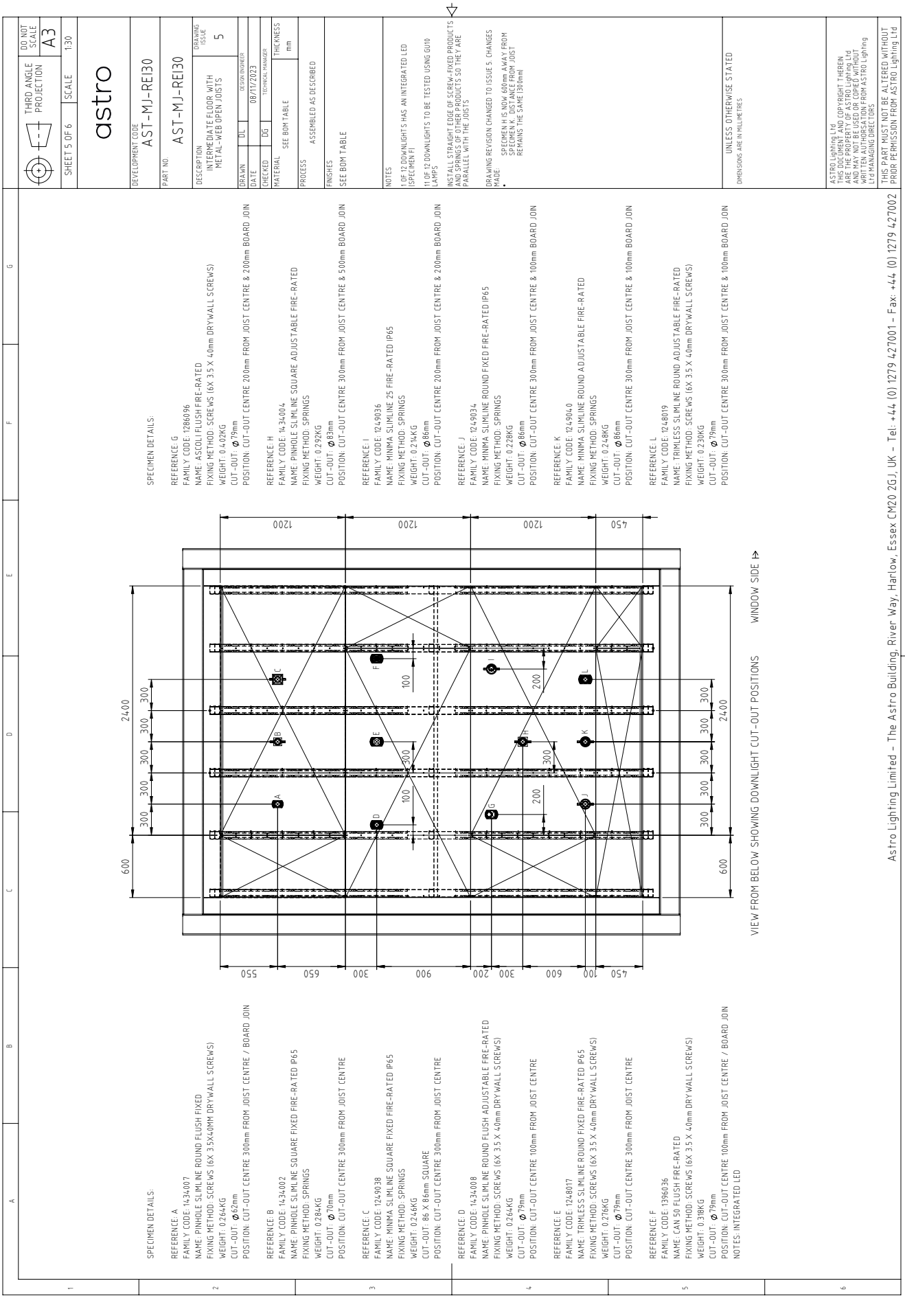
Appendix 1 Floor construction Y 2904-2E-RA-001 (PEUTZ BV)

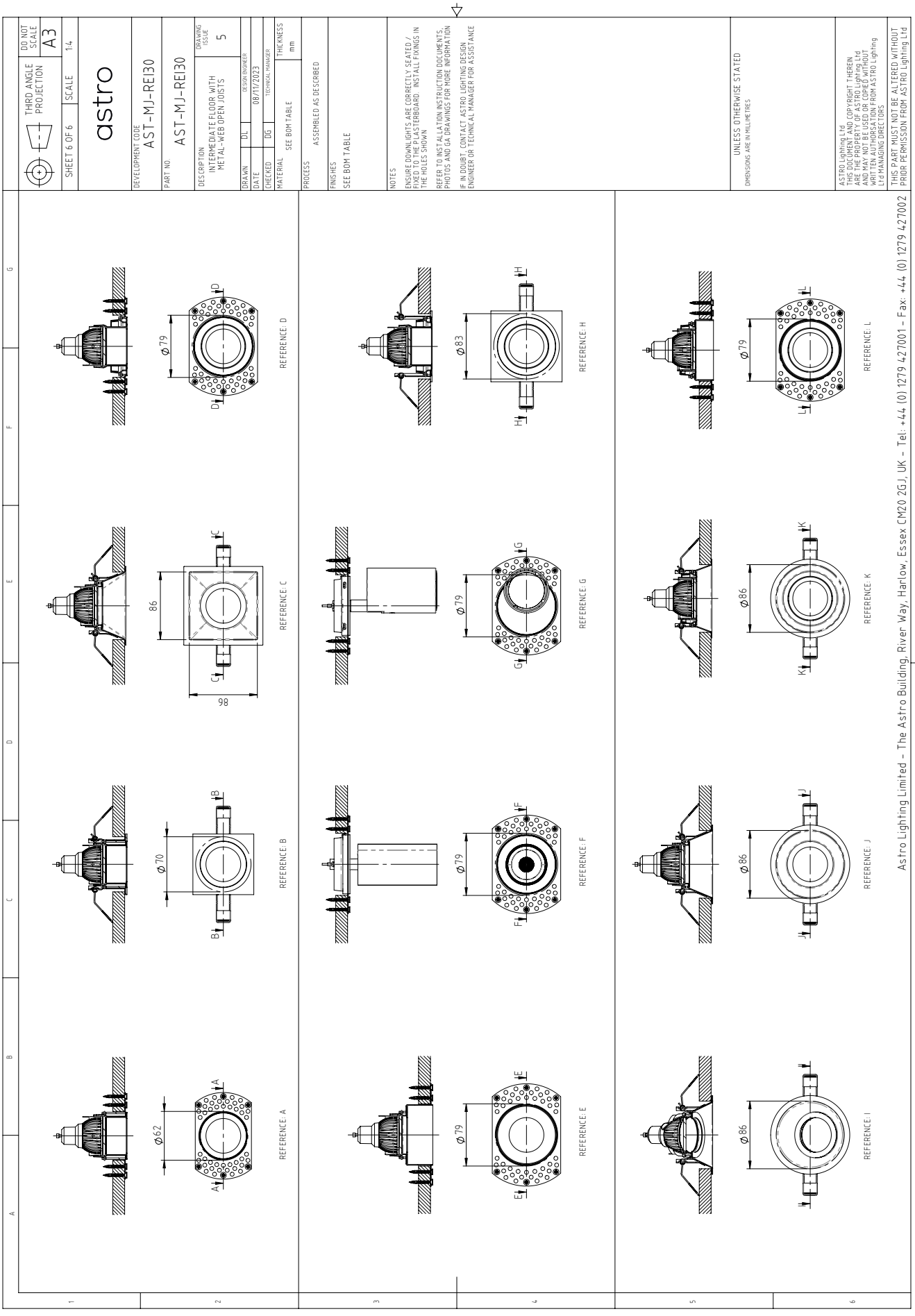


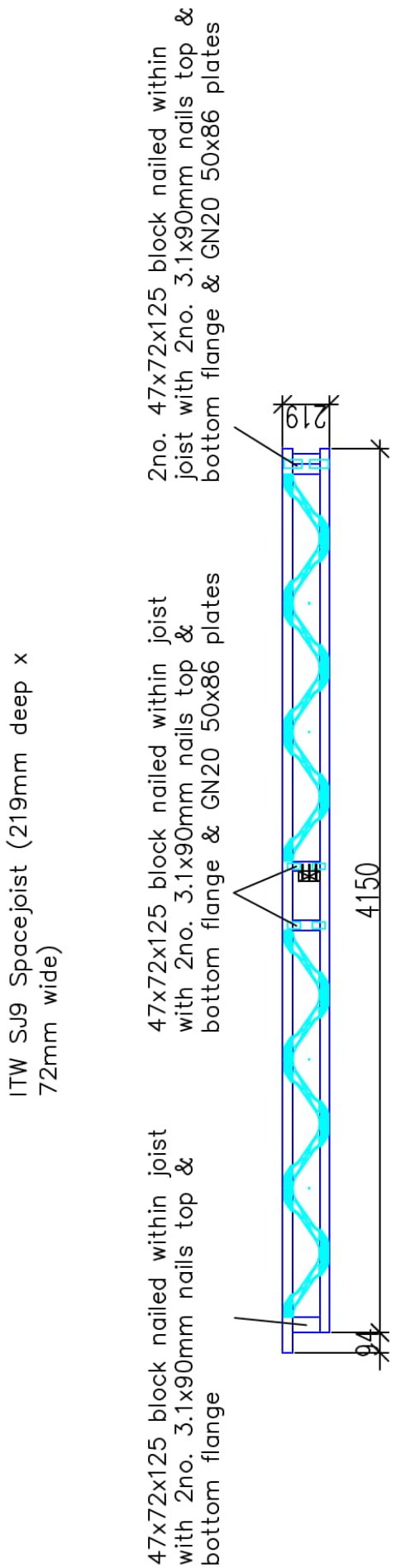
C 2339-2E-RA-003 999872BC/ HARWL

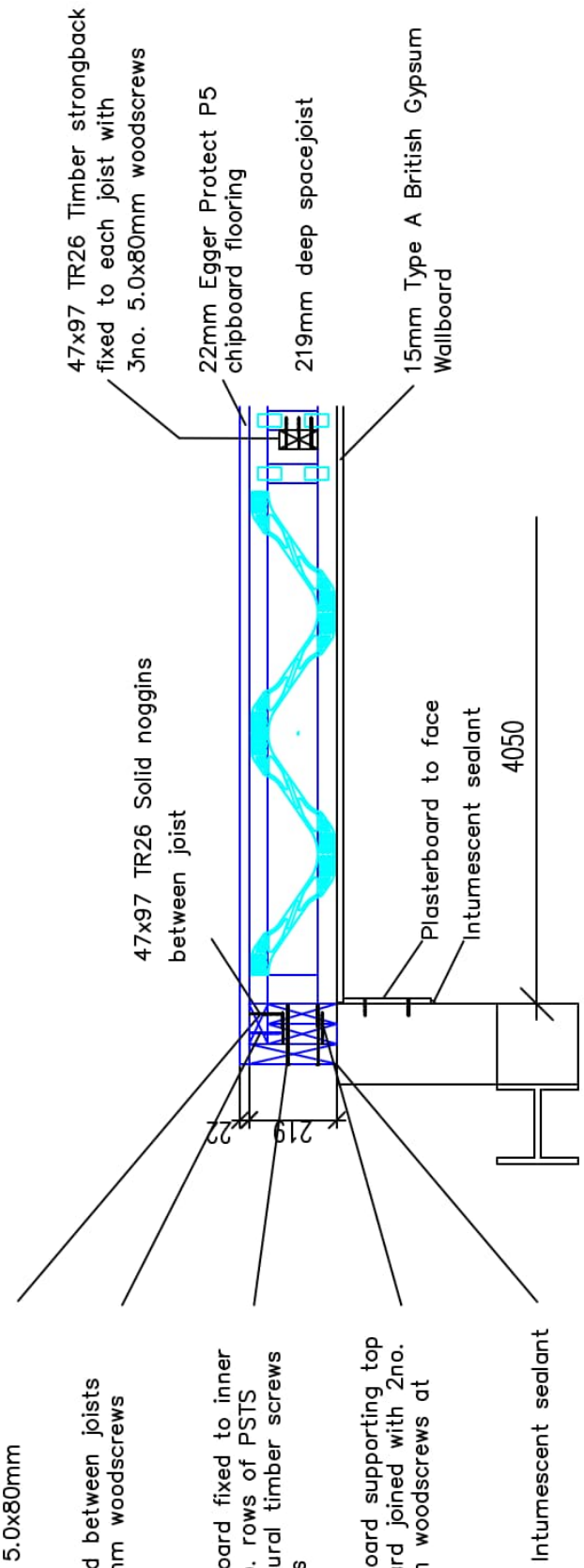
Appendix 1 Floor construction Y 2904-2E-RA-001 (PEUTZ BV)

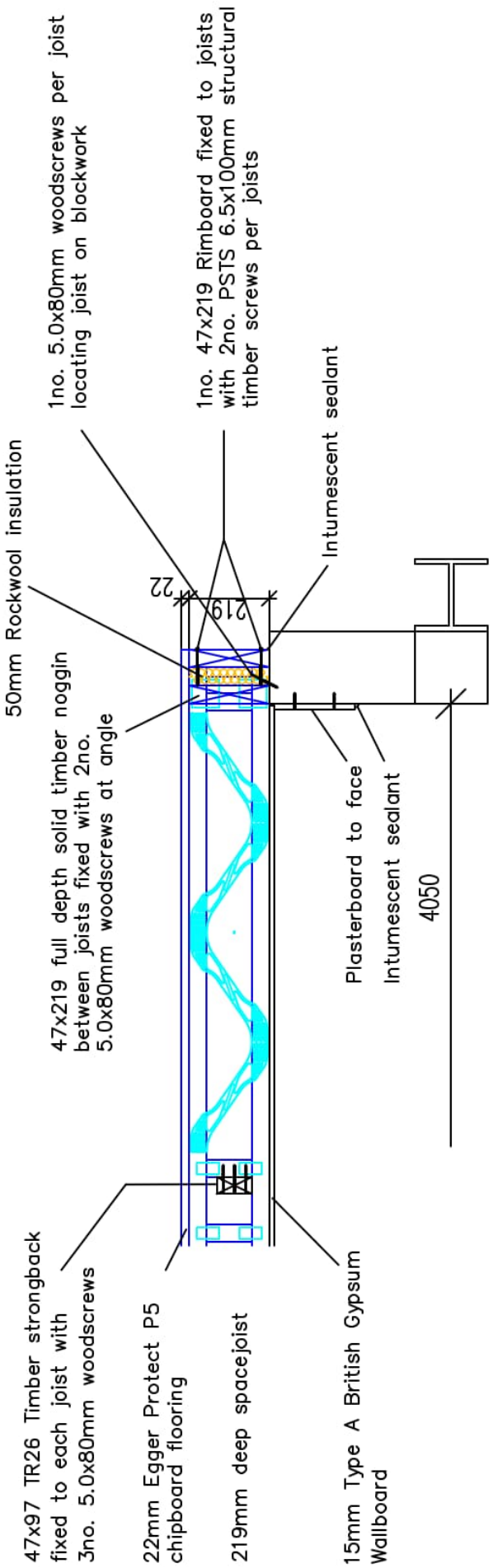


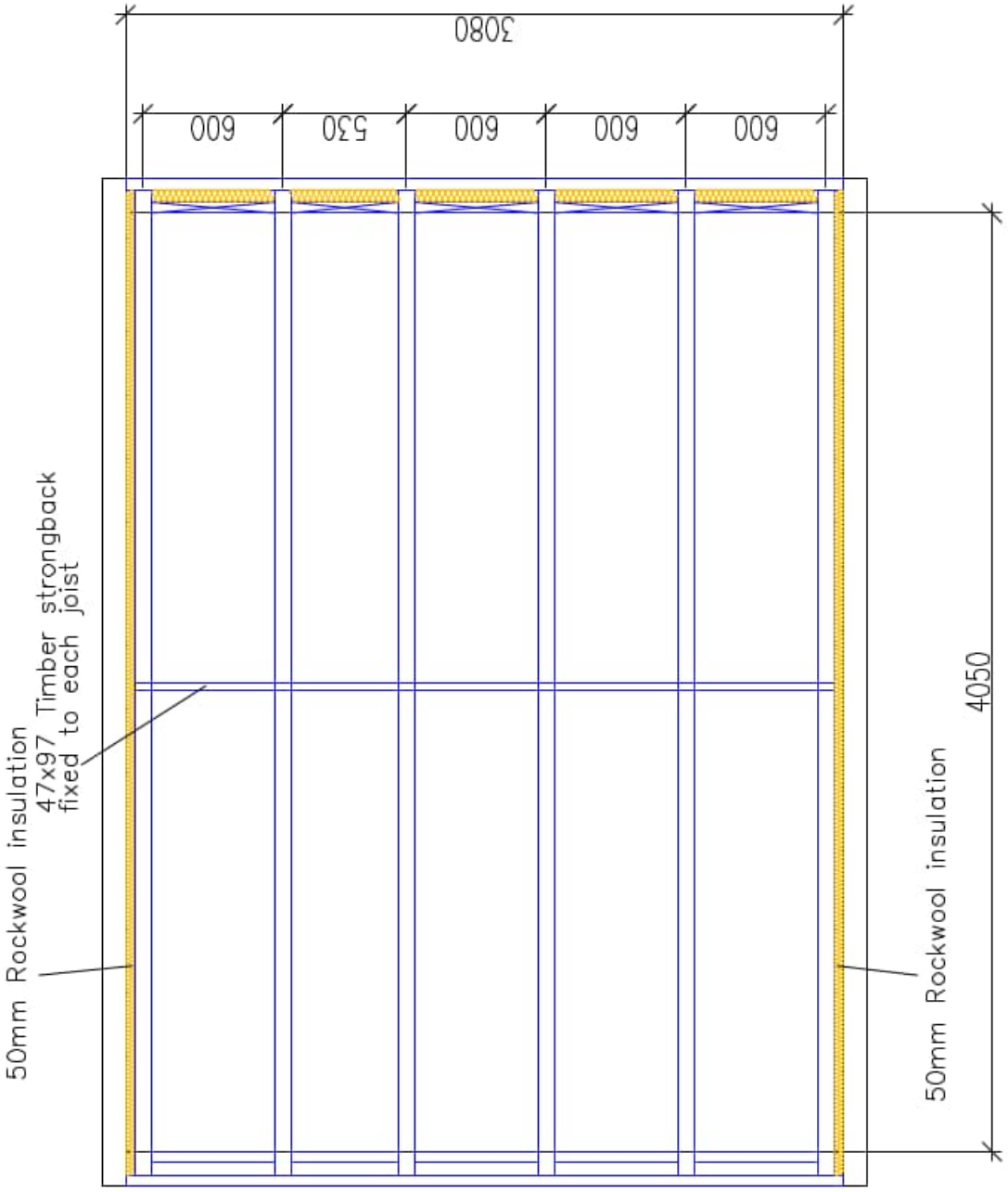
Appendix 1 Floor construction Y 2904-2E-RA-001 (PEUTZ BV)

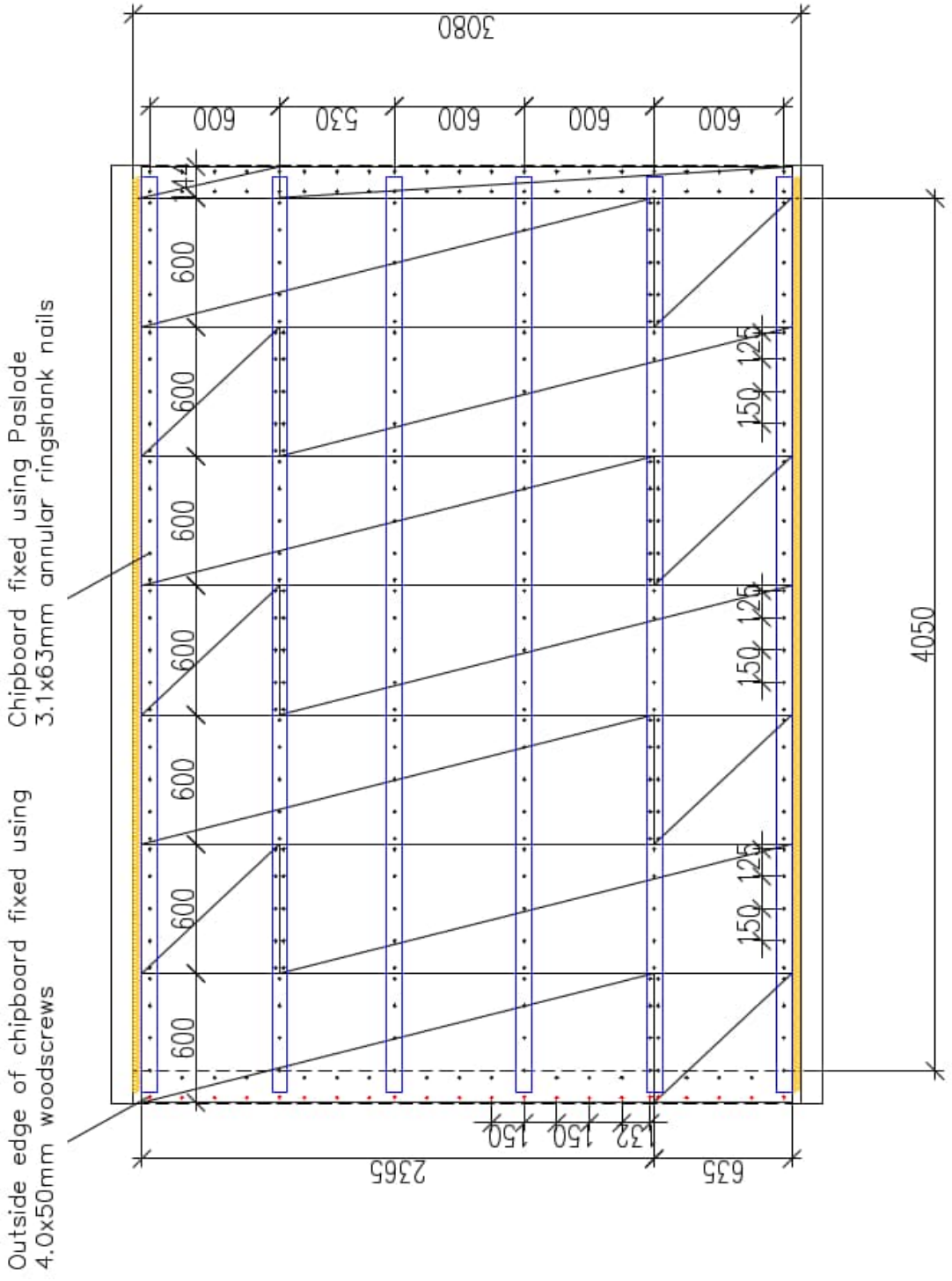


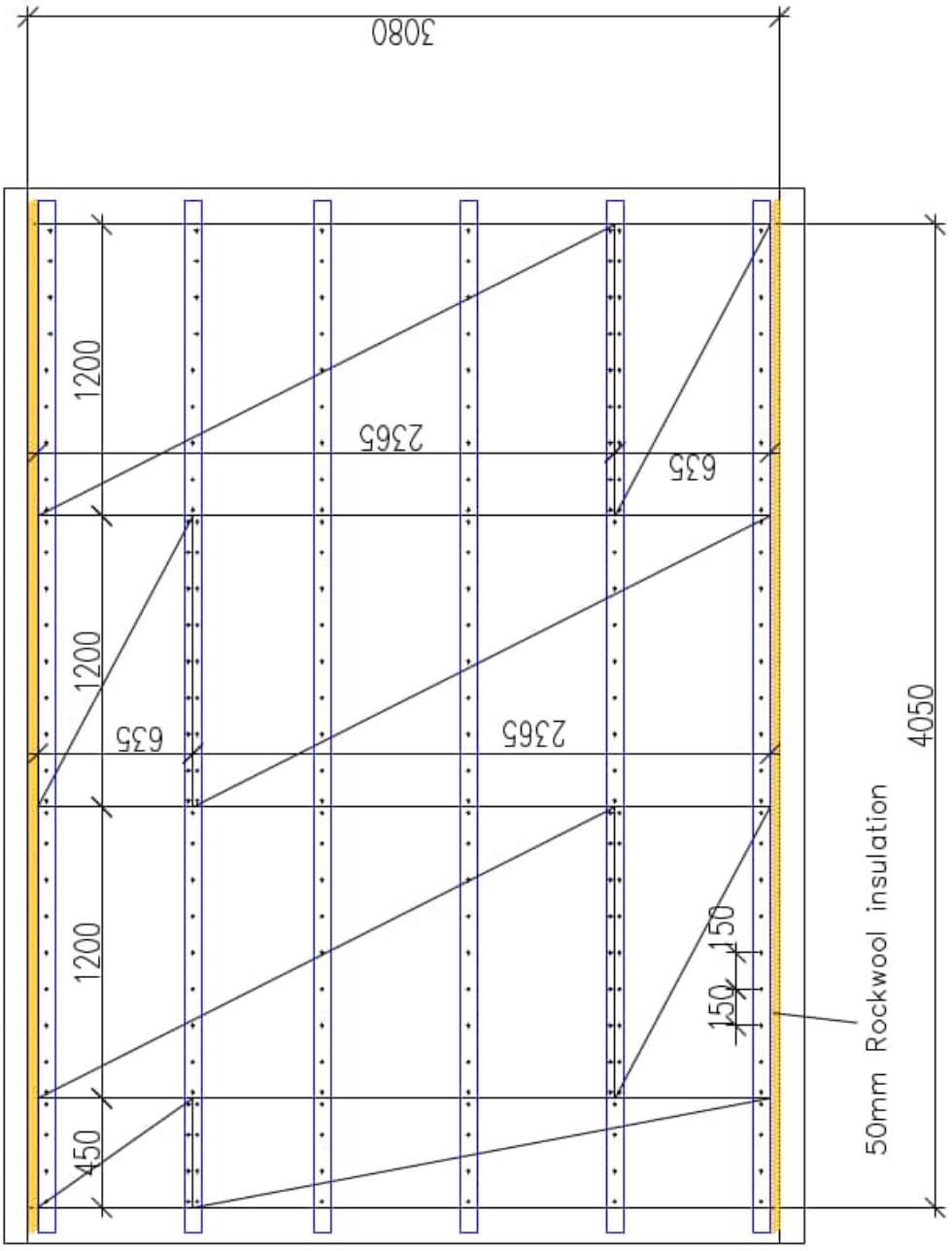


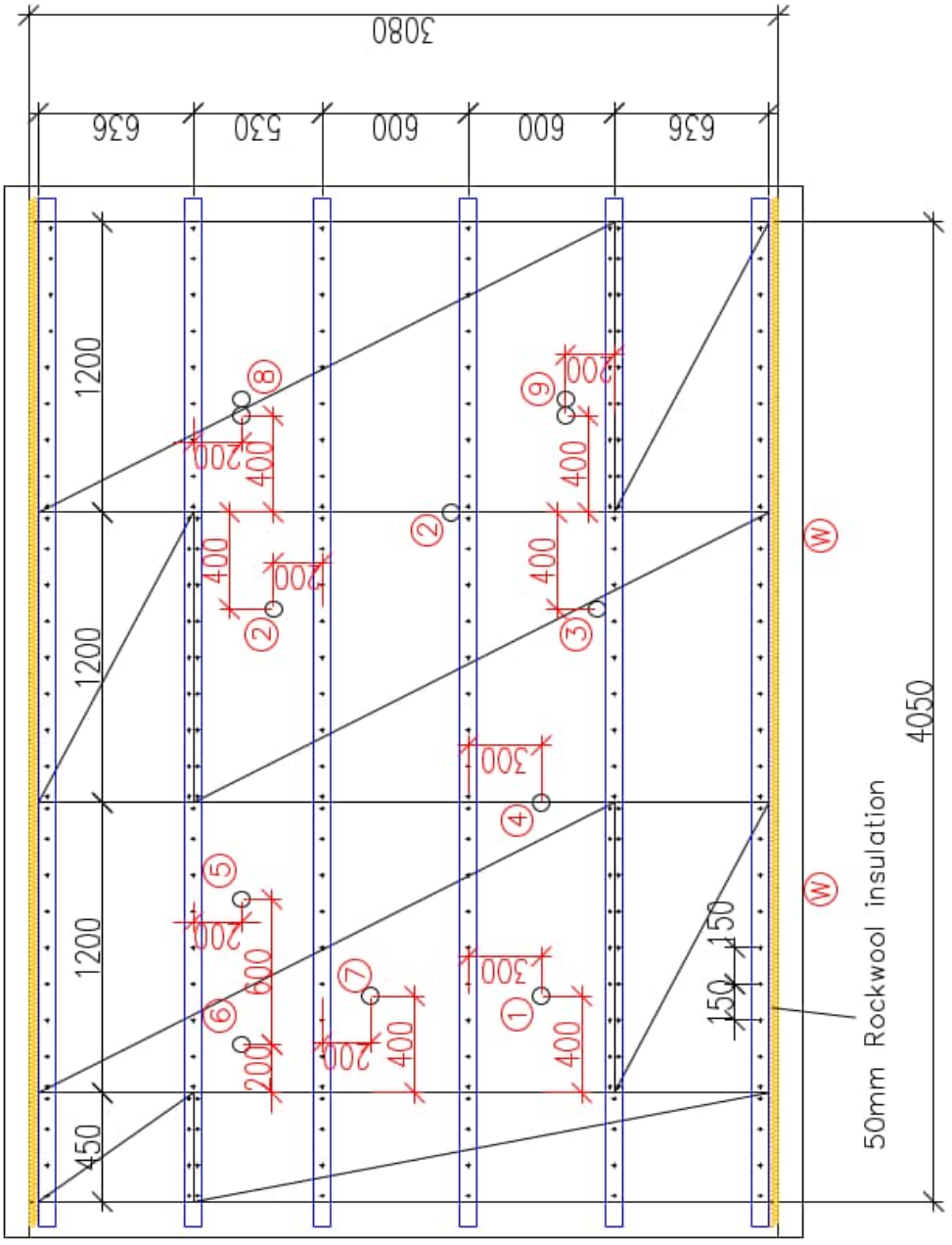


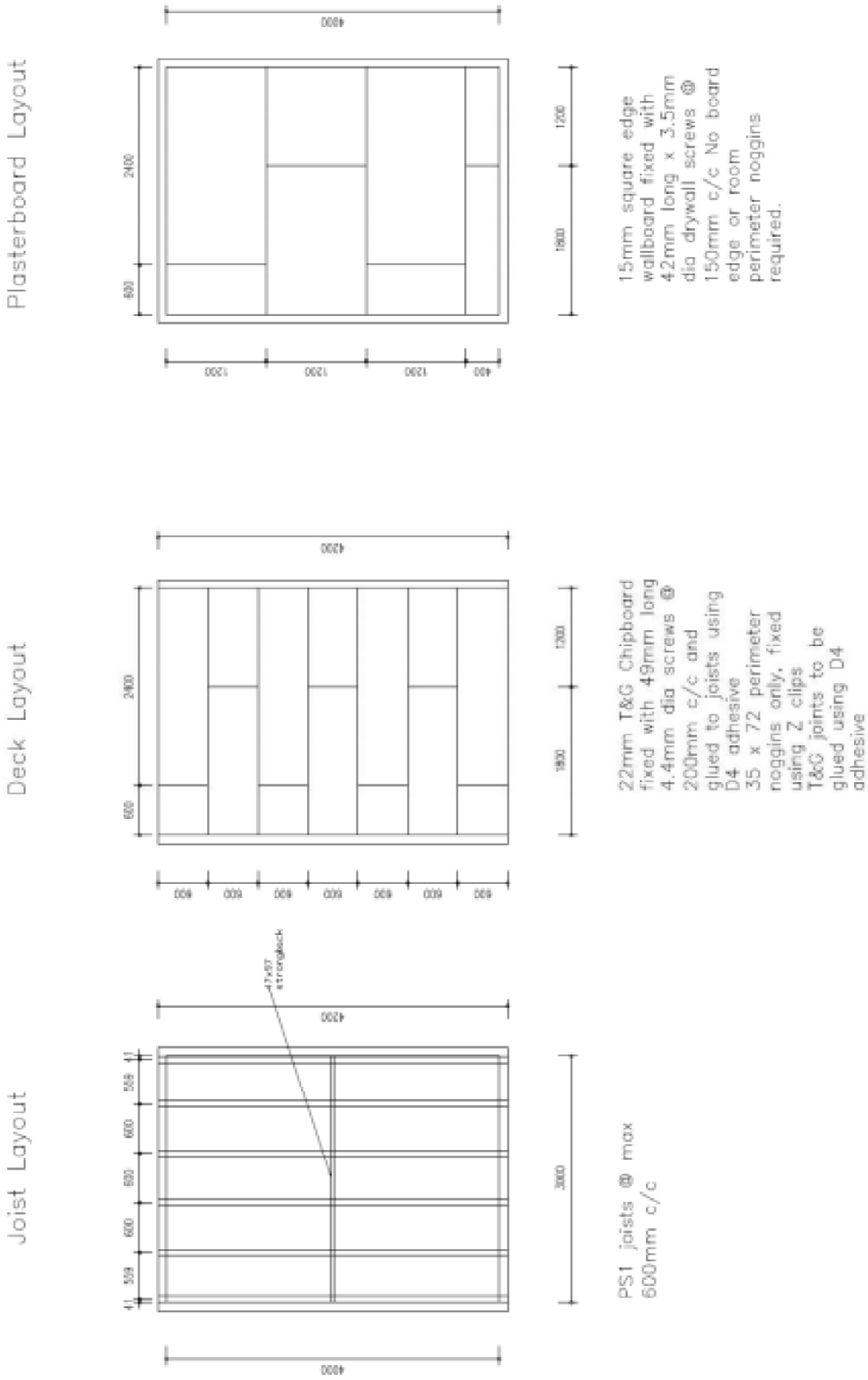






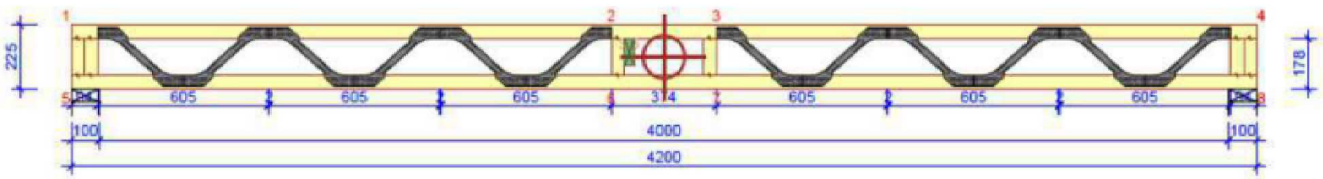






PS1 - 1 no.

BRACINGS ACCORDING TO TIMBER TABLE AND STABILITY OF THE TRUSS SYSTEM SHALL BE DESIGNED SEPARATELY
⊠ INDICATES BRACING



POSI STRUT SIZE: PS-9

TIMBER THICKNESS 72 mm

JOINT FROM - TO	DEPTH mm	GRADE	BRACING mm/no.
1-4	72	TR26	Sheeting
5-8	72	TR26	Sheeting
1-5	72	TR26	None
1-5	72	TR26	
4-8	72	TR26	None
4-8	72	TR26	
2-6	72	TR26	None
3-7	72	TR26	None

LOADS (kN/m²)

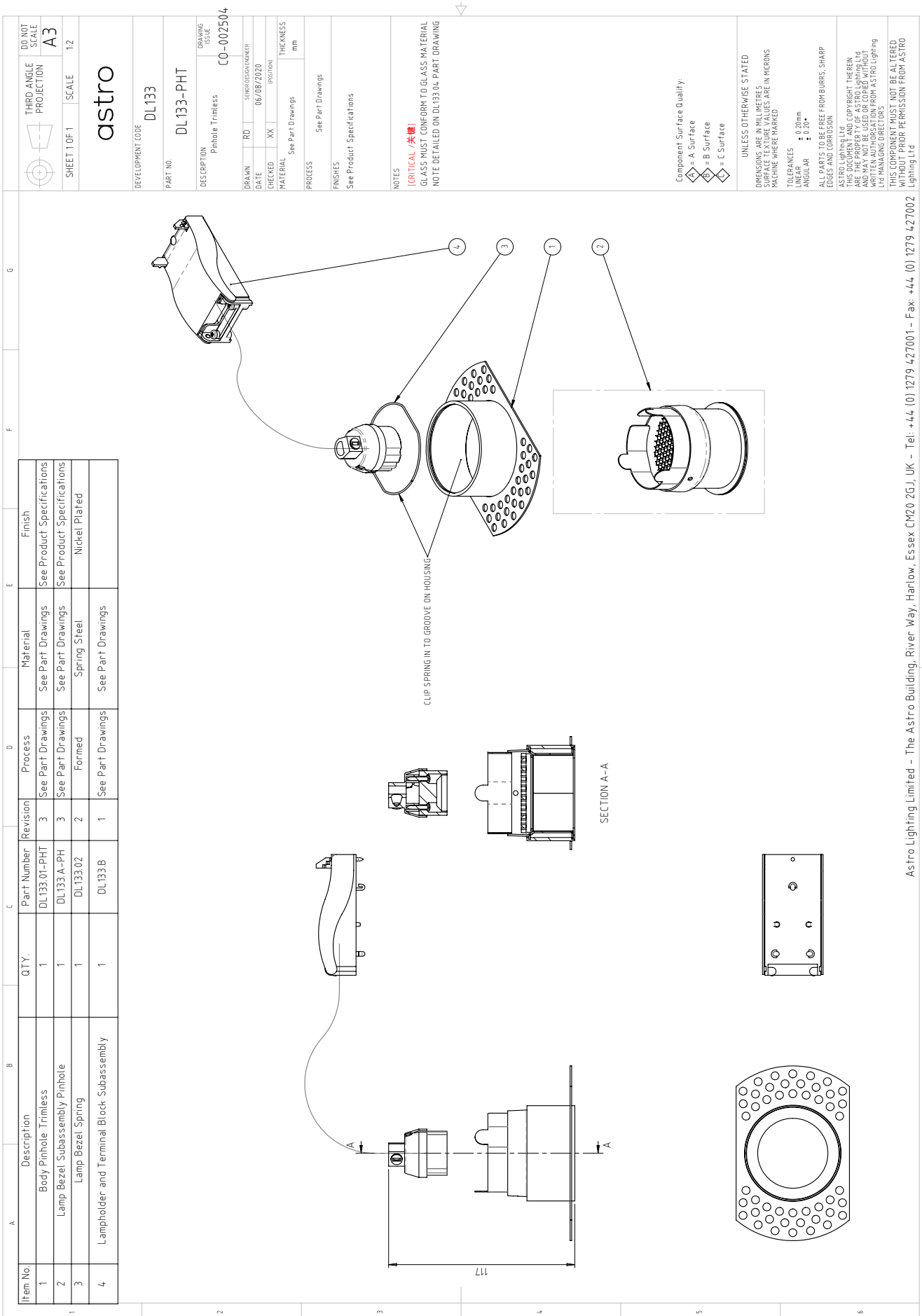
LIVE LOAD INSIDE ROOM:	1.500
DEAD LOAD ON ATTIC FLOOR:	0.250
DEAD LOAD ON CEILING:	0.250

GENERAL SETTINGS

TIMBER THICKNESS (mm):	72
TRUSS WEIGHT (kg/ply):	19
TRUSS CENTRES (mm):	600
LOADSHARING FACTOR:	1.1
BUILDING CATEGORY:	Domestic
SERVICE CLASS:	2 = 65% <= RH < 85%
BRACING: SEE TIMBER TABLE	

GENERAL DIRECTIONS

THE STRUCTURE HAS BEEN CALCULATED USING COMPUTER PROGRAM "PAMIR",
MiTek UK - GTh2 - LICENSE: 10130
DESIGN CODE: EN 1995-1-1:2004 + A2:2014 + UK-NA + PD6693-1:2012
FULL DESIGN RESULTS AS PER CALC. PRINTOUT



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	

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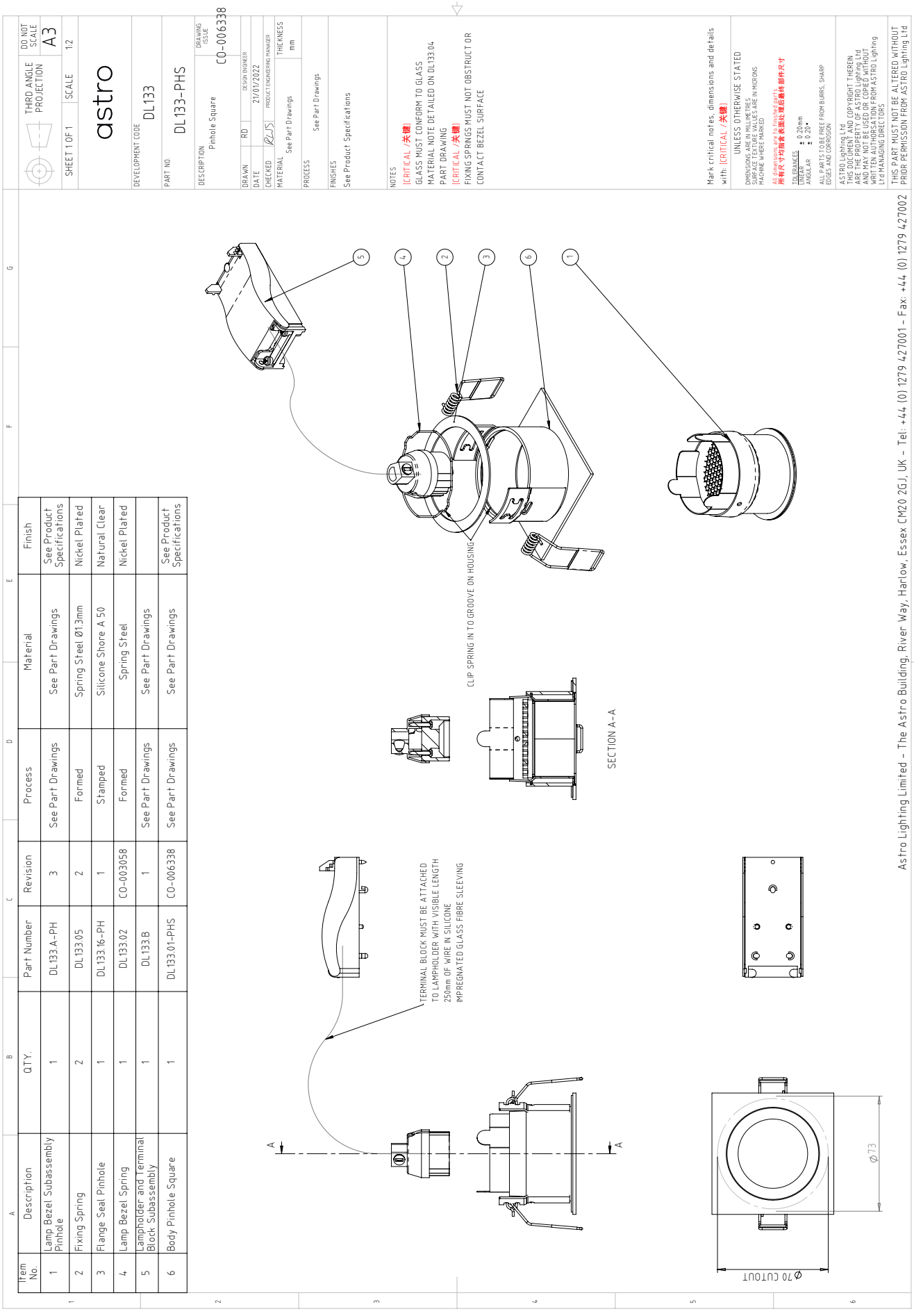

Item No.	Description	QTY.	Part Number	Revision	Process	Material	Finish
1	Lamp Bezel Subassembly Pinhole	1	DL133.A-PH	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Fixing Spring	2	DL133.05	2	Formed	Spring Steel Ø1.3mm	Nickel Plated
3	Flange Seal Pinhole	1	DL133.16-PH	1	Stamped	Silicone 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

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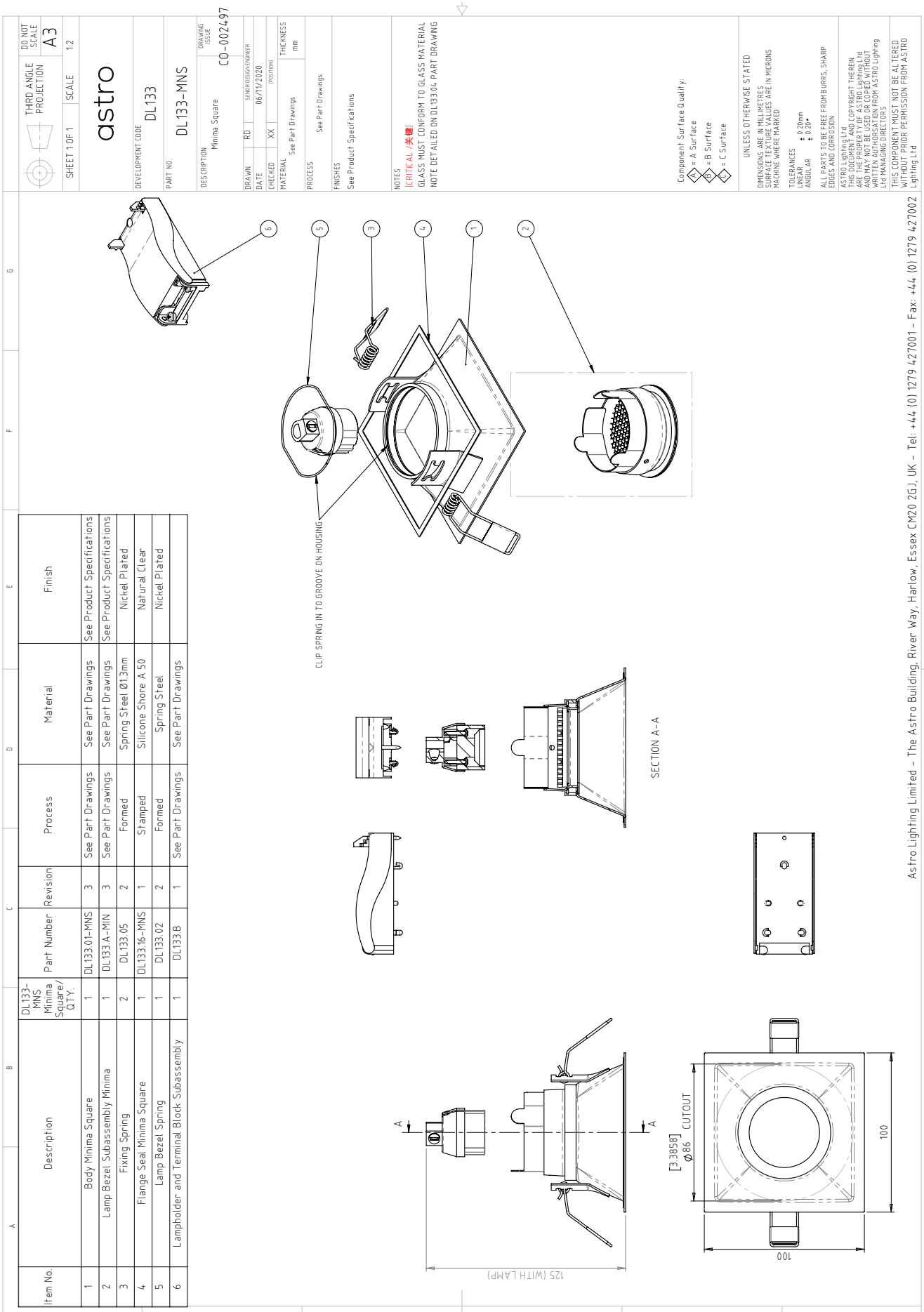
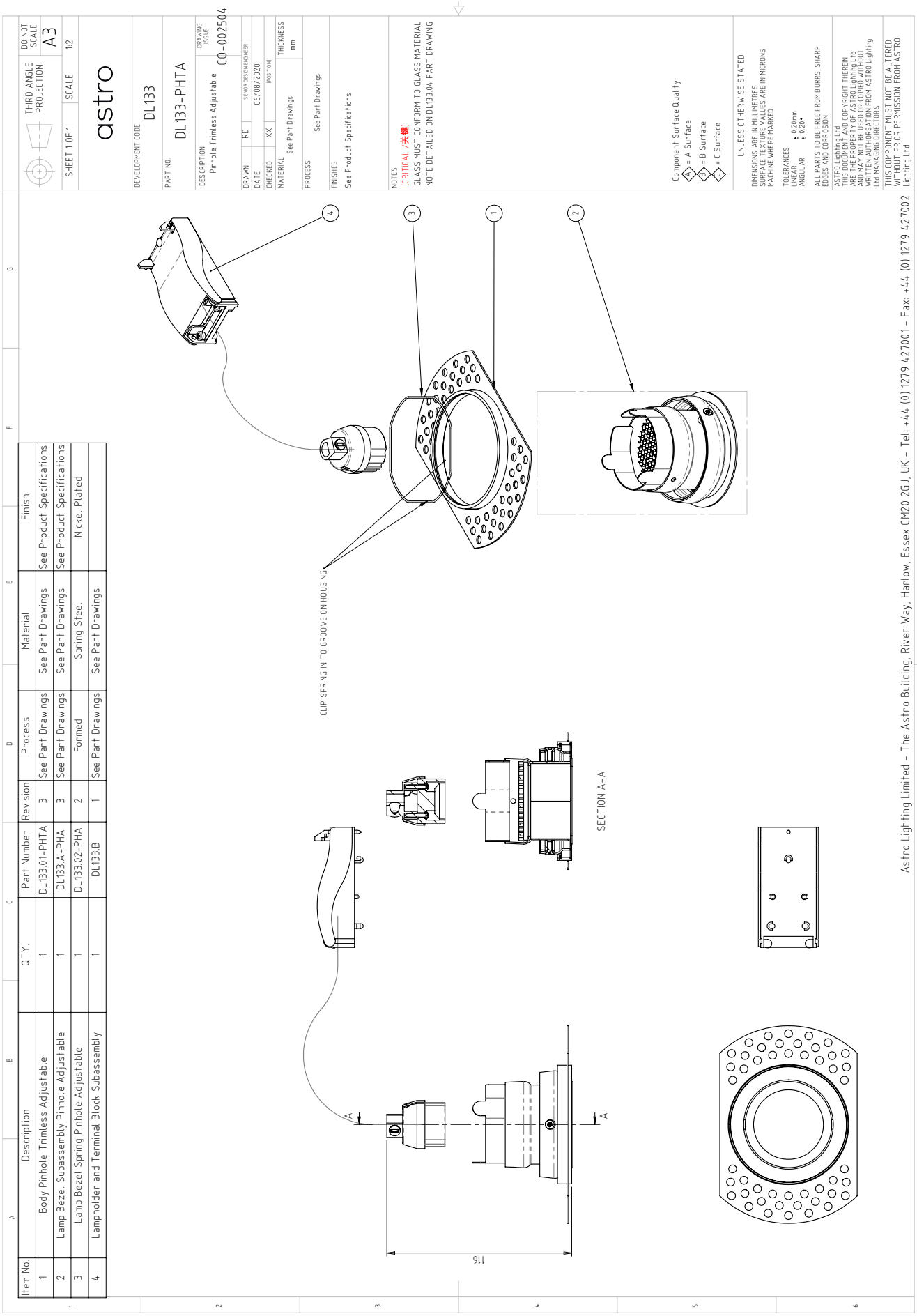
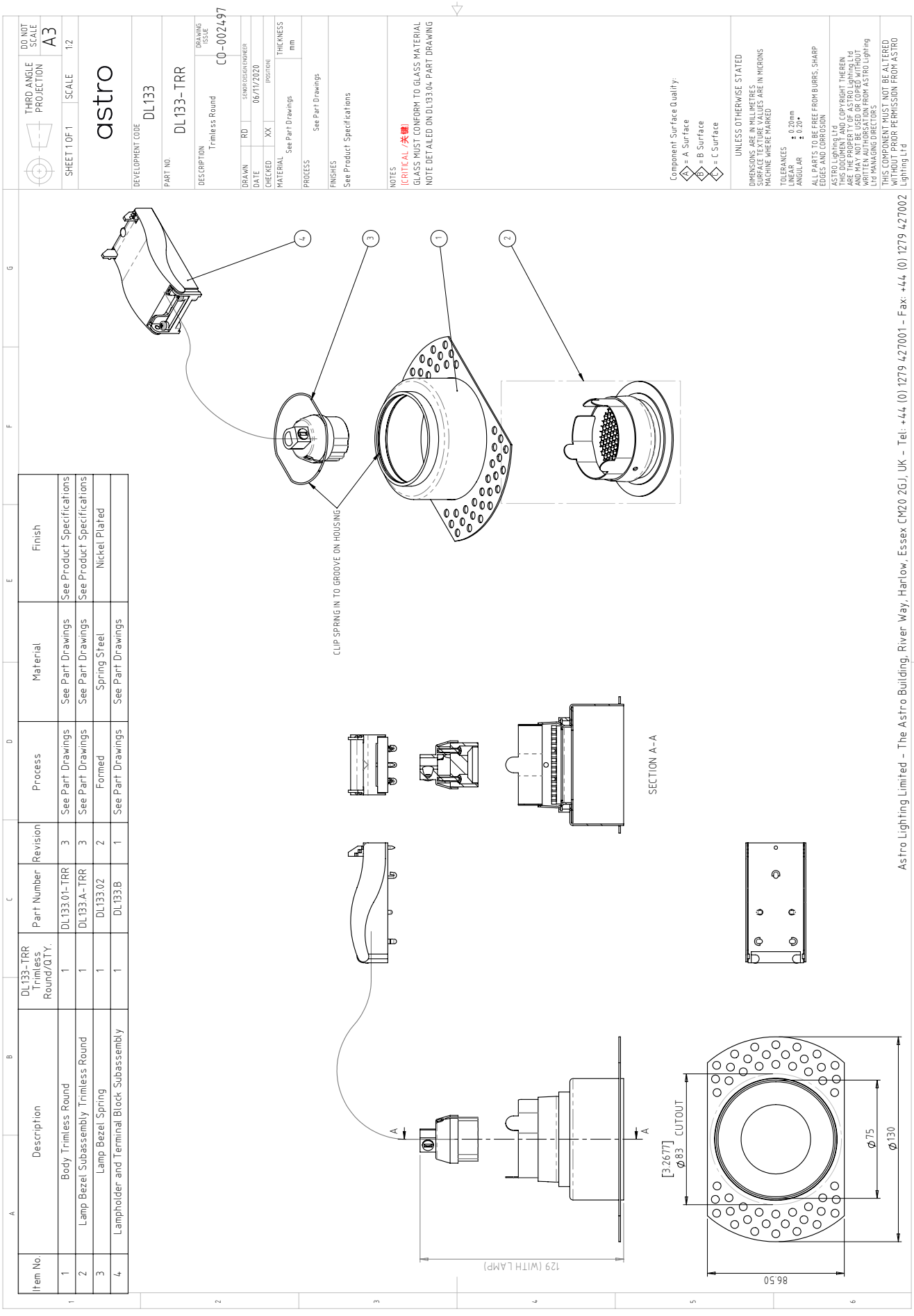


Item No.	Description	DL133-MNS Minima Square/ QTY.	Part Number	Revision	Process	Material	Finish
1	Body Minima Square	1	DL133.01-MNS	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Minima	1	DL133.A-MIN	3	See Part Drawings	See Part Drawings	See Product Specifications
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	



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	



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	

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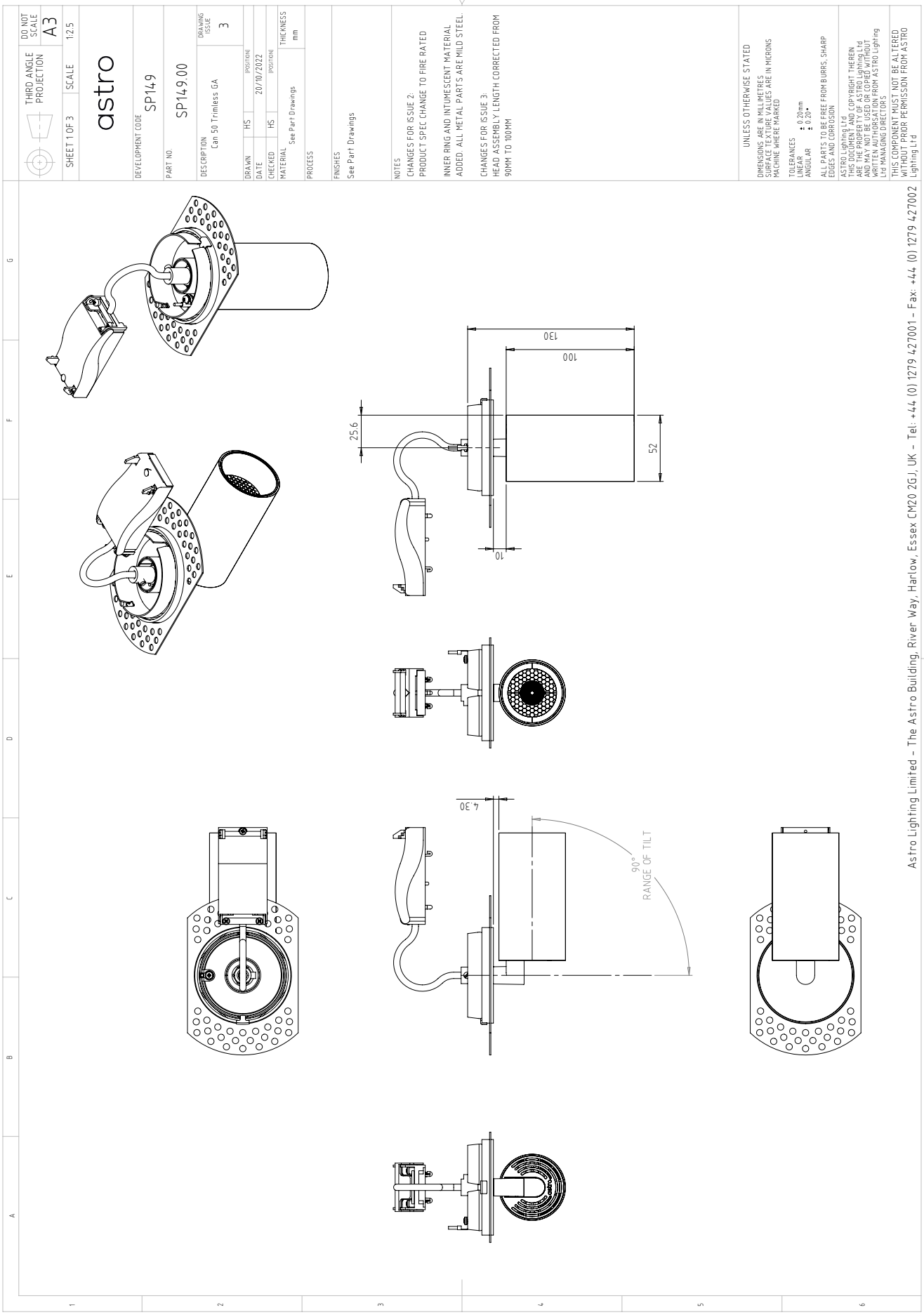
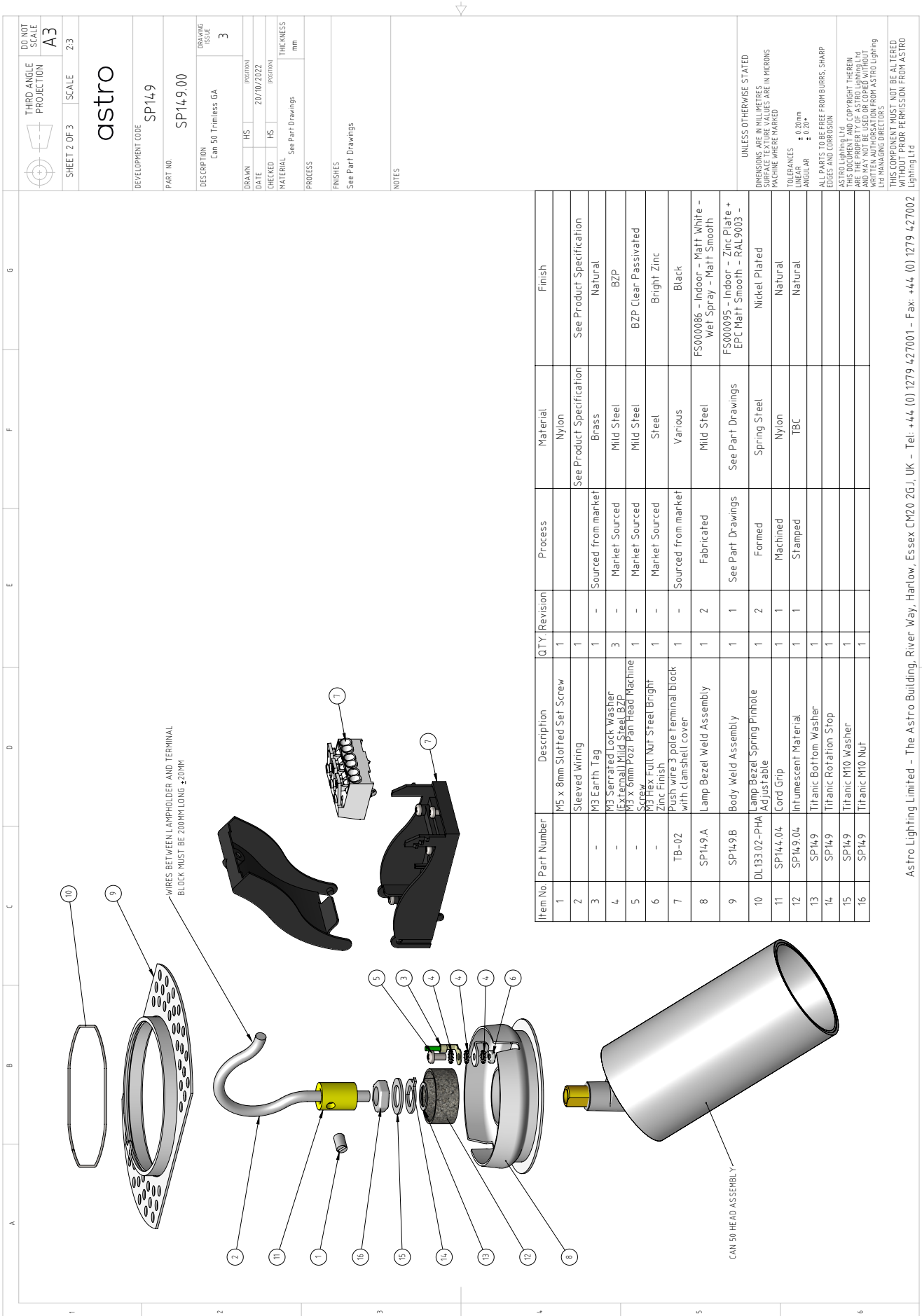
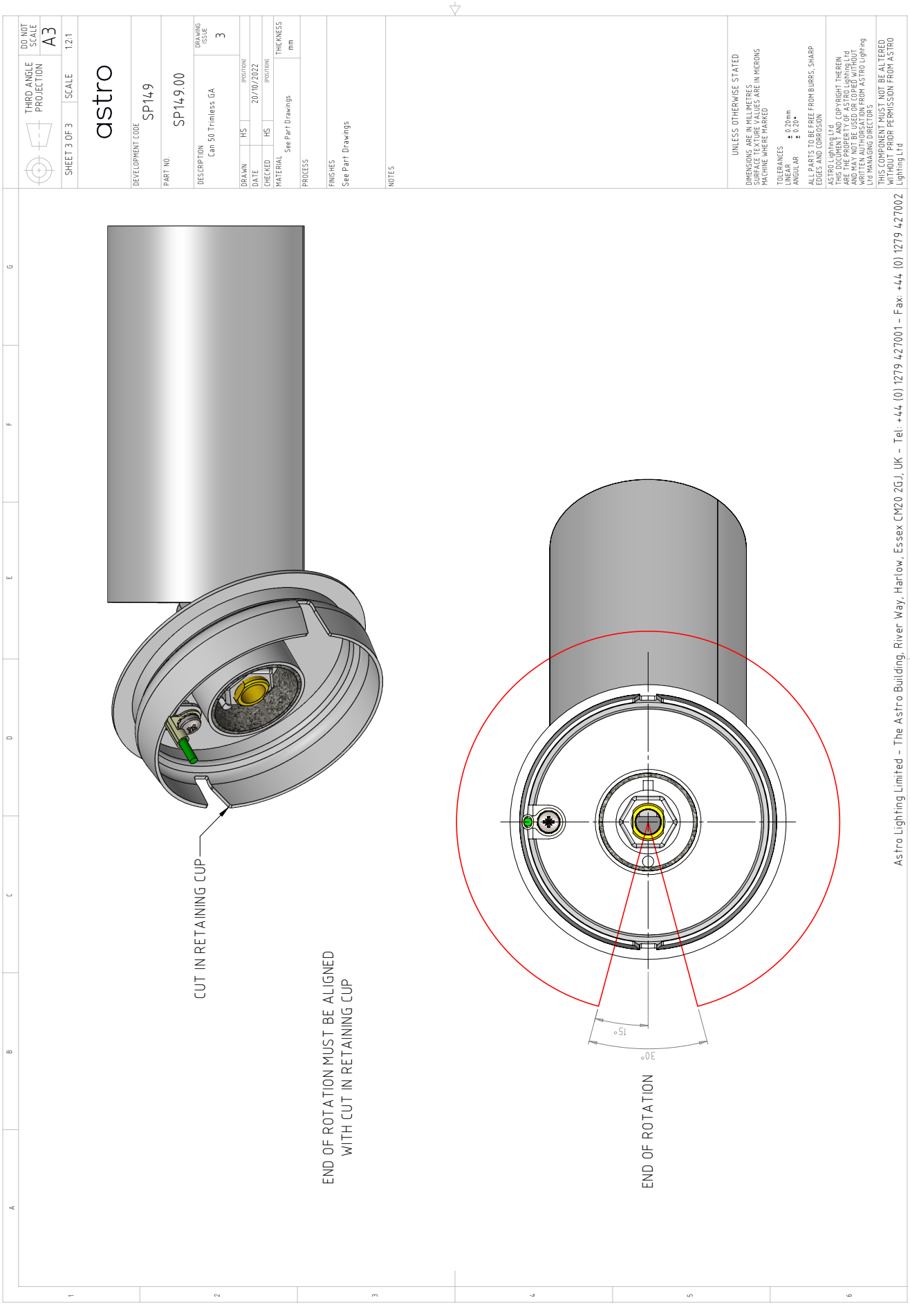




Item No.	Part Number	Description	QTY.	Revision	Process	Material	Finish
1						Nylon	
2		M5 x 8mm Slotted Set Screw	1			See Product Specification	See Product Specification
3	-	Sleeved Wiring	1	-	Sourced from market	Brass	Natural
4	-	M3 Earth Tag	3	-	Market Sourced	Mild Steel	BZP
5	-	M3 Serrated Lock Washer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


THIRD ANGLE PROJECTION
DO NOT SCALE
A3
SHEET 3 OF 3
SCALE
1:2:1
astro
DEVELOPMENT CODE
SP149
PART NO
SP149.00
DESCRIPTION
Can 50 Trimless GA
DRAWING ISSUE
3
DRAWN
HS
DATE
20/10/2022
CHECKED
HS
MATERIAL
See Part Drawings
THICKNESS
mm
PROCESS
FINISHES
See Part Drawings
NOTES
UNLESS OTHERWISE STATED
DIMENSIONS ARE IN MILLIMETRES
SURFACE FINISH VALUES ARE IN MICRONS
MACHINE WHERE MARKED
TOLERANCES
LINEAR ± 0.20mm
ANGULAR ± 0.20°
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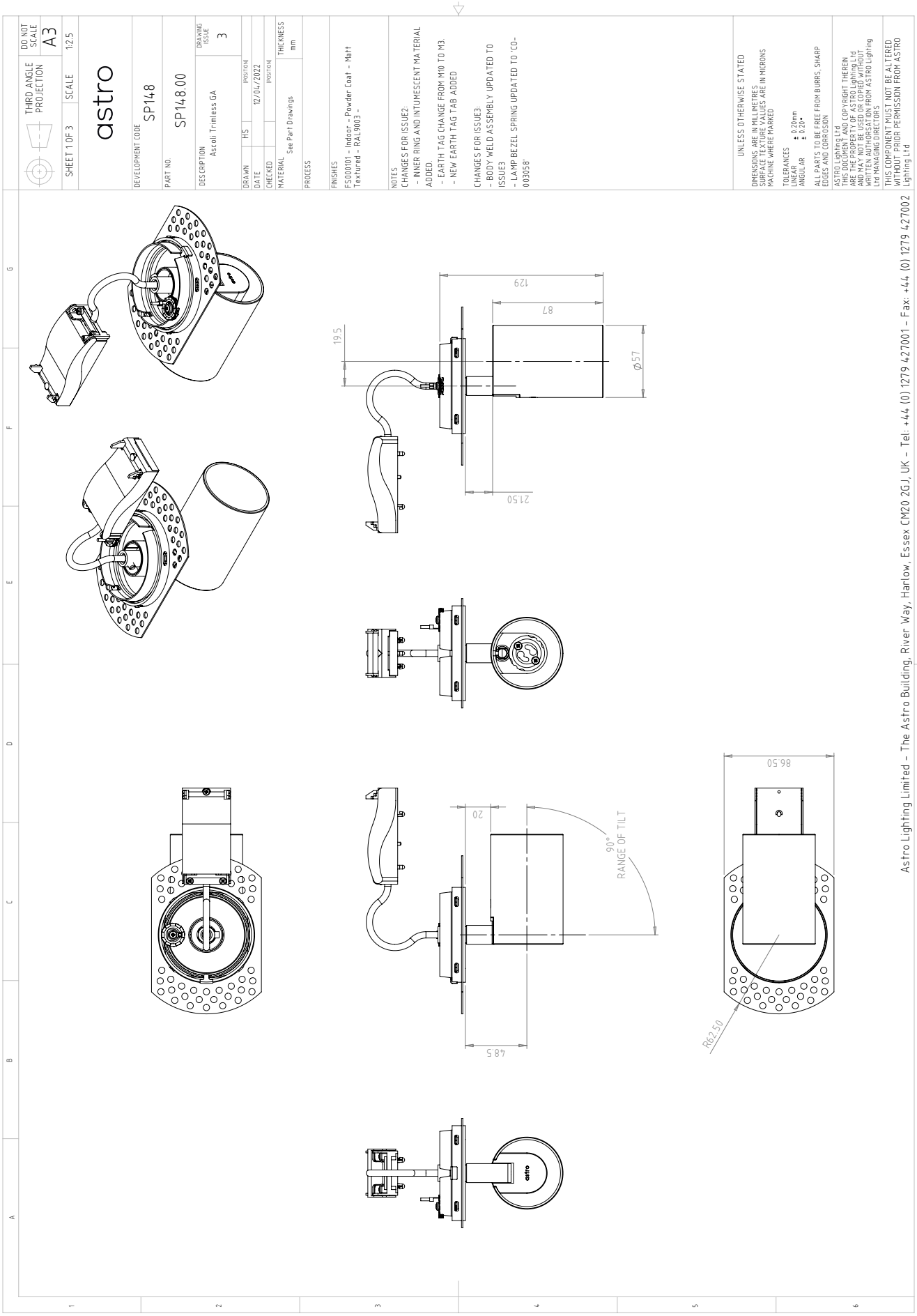

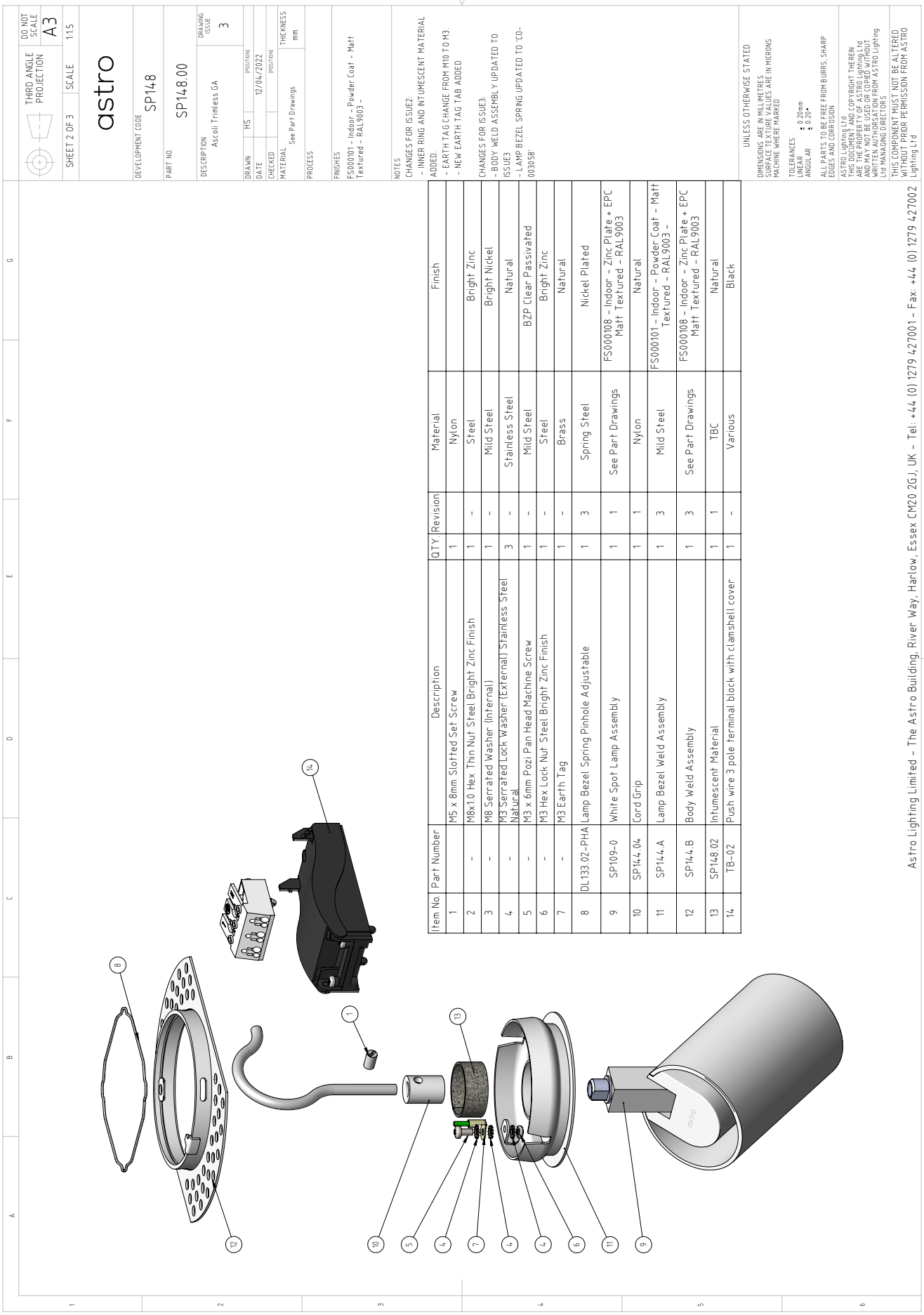

Item No.	Part Number	Description	QTY.	Revision	Material	Finish
1		M5 x 8mm Slotted Set Screw	1		Nylon	
2	-	M8x1.0 Hex Thin Nut Steel Bright Zinc Finish	1	-	Steel	Bright Zinc
3	-	M8 Serrated Washer (Internal)	1	-	Mild Steel	Bright Nickel
4	-	M3 Serrated Lock Washer (External) Stainless Steel Natural	3	-	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

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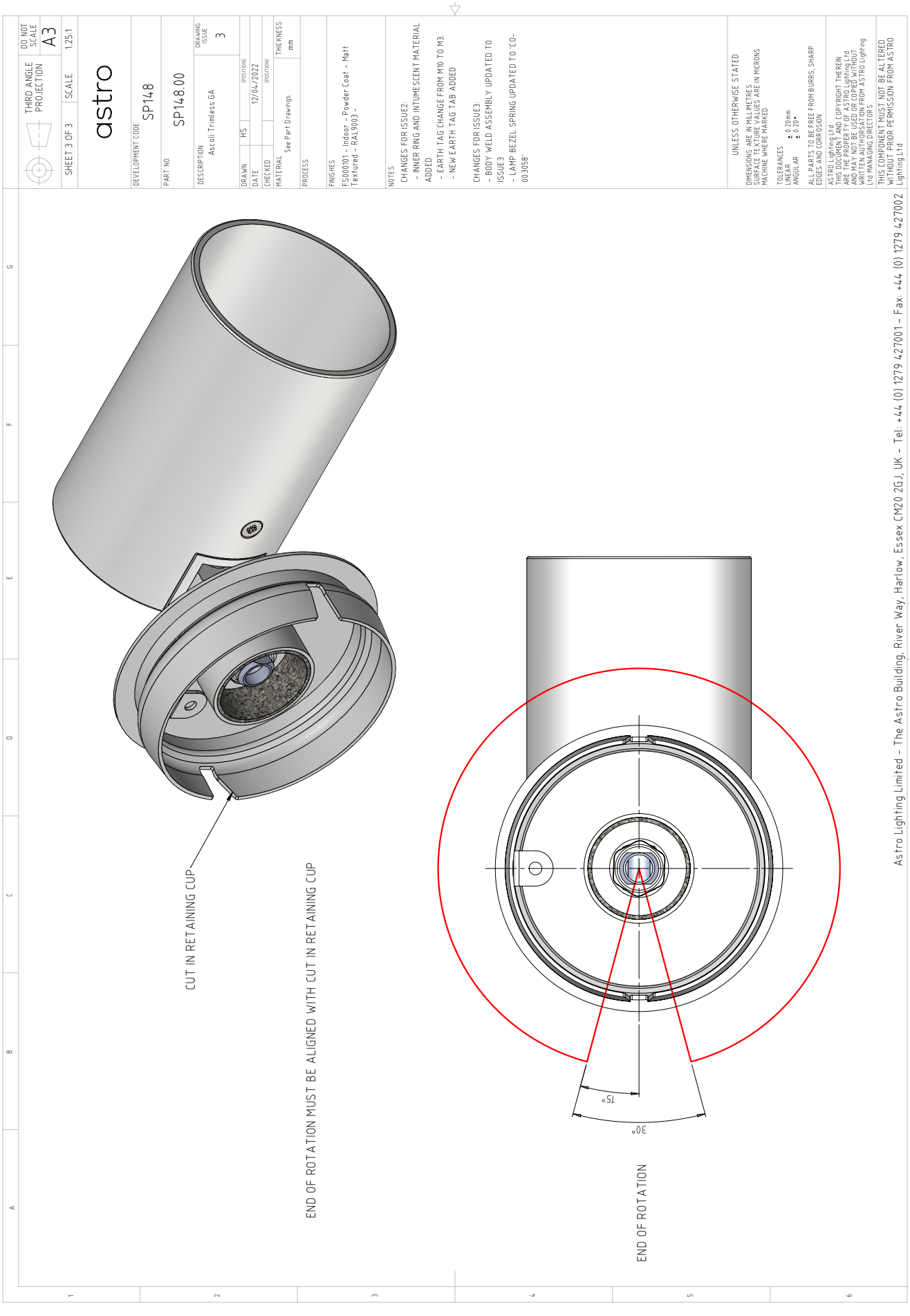

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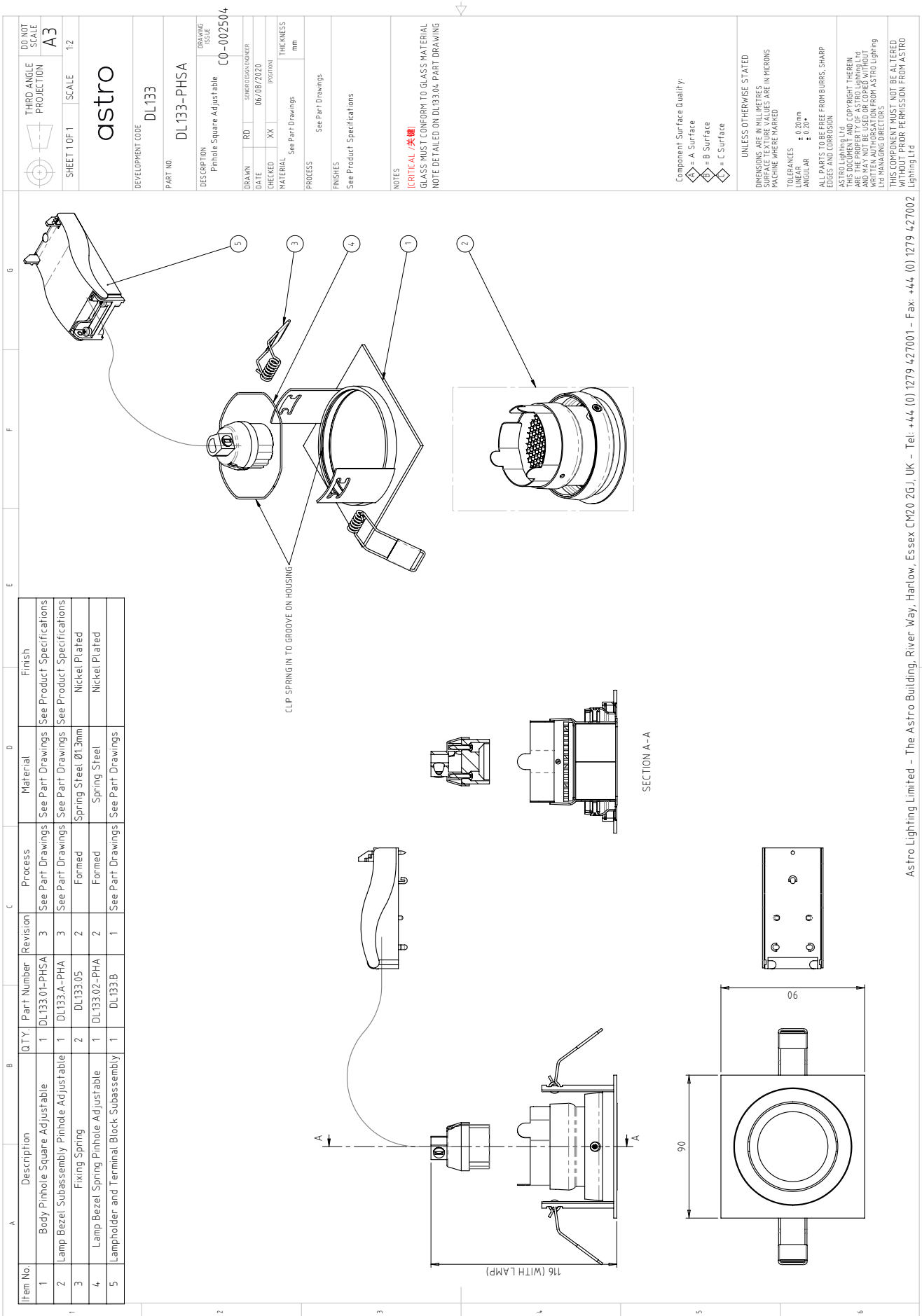
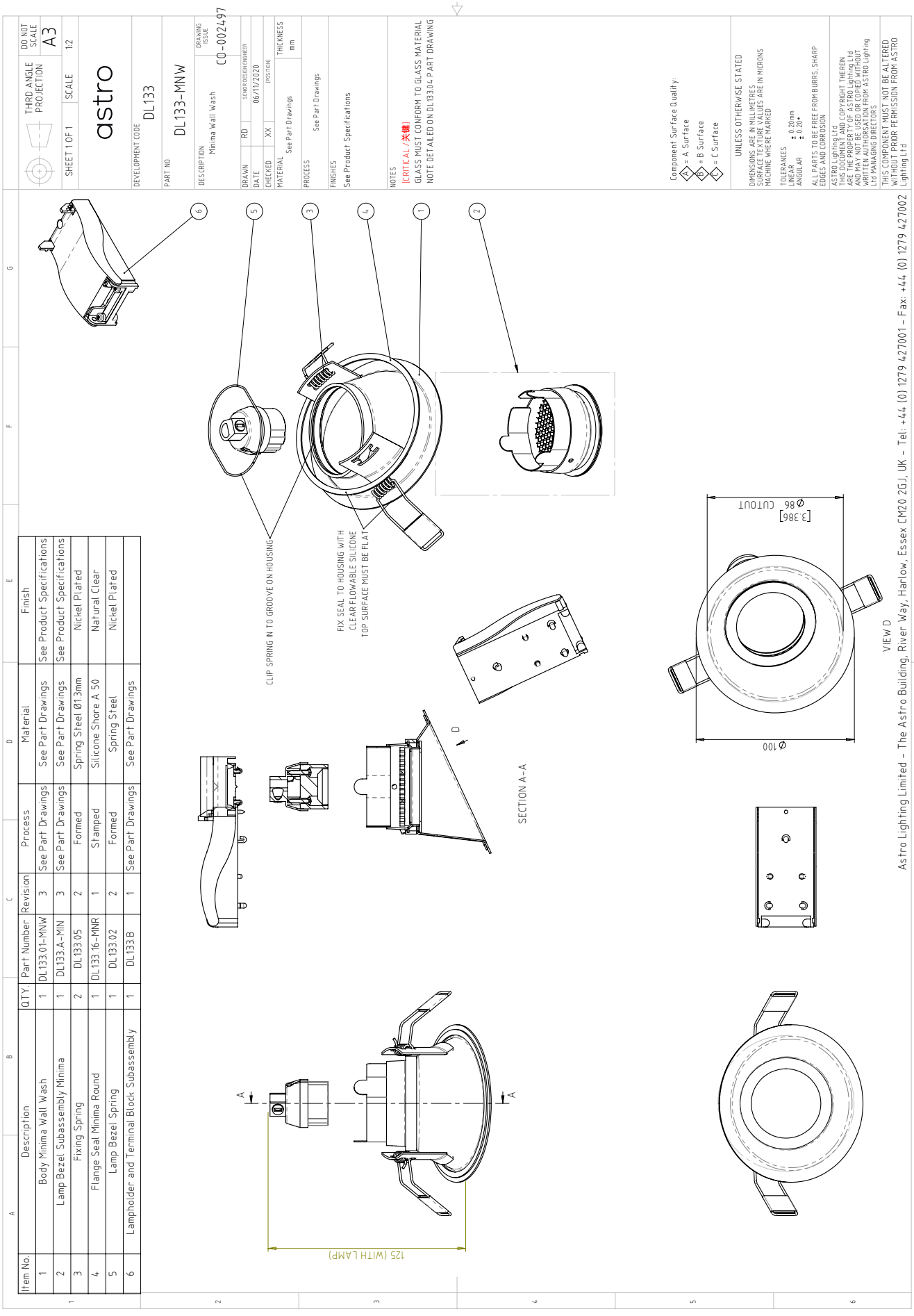
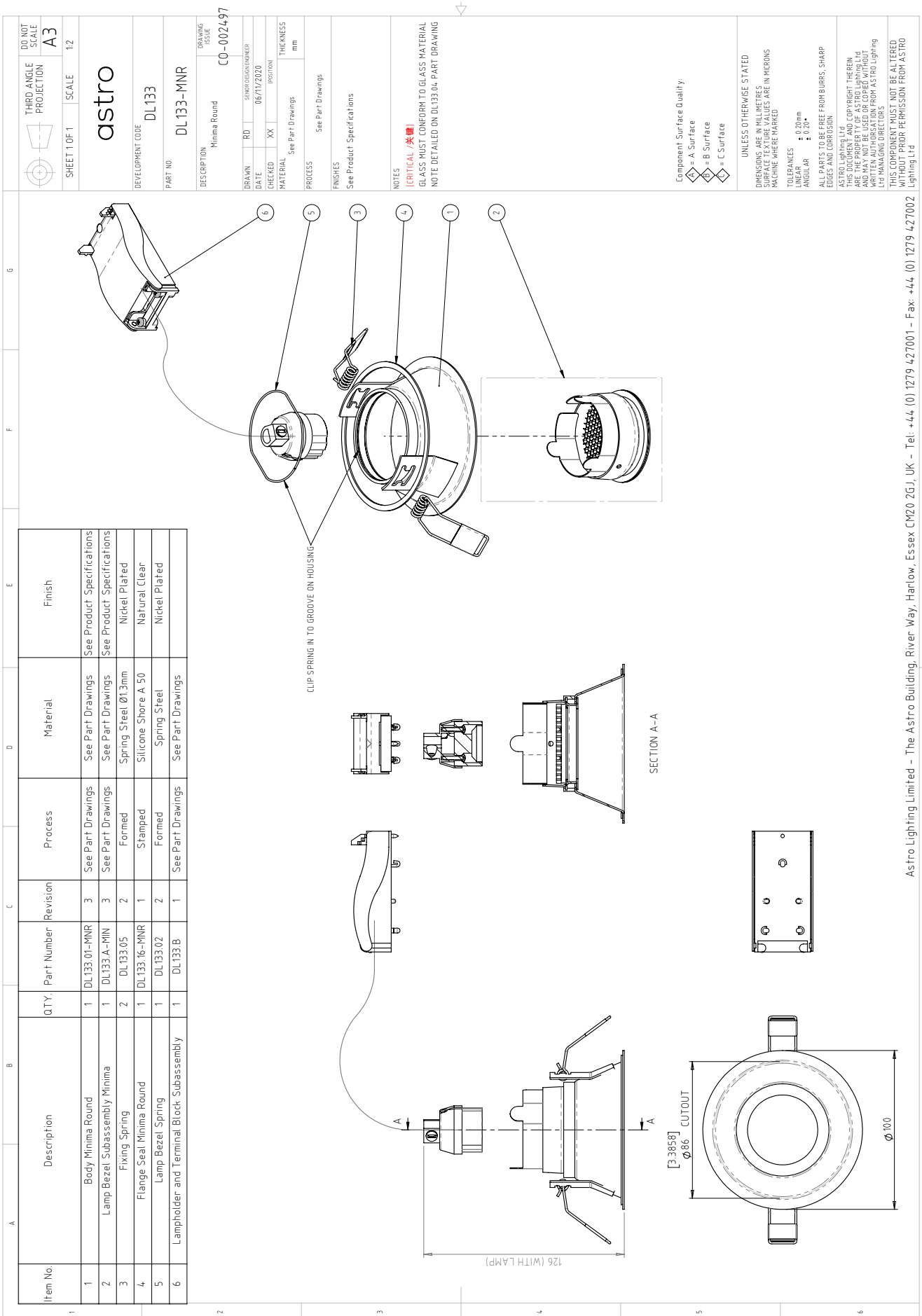


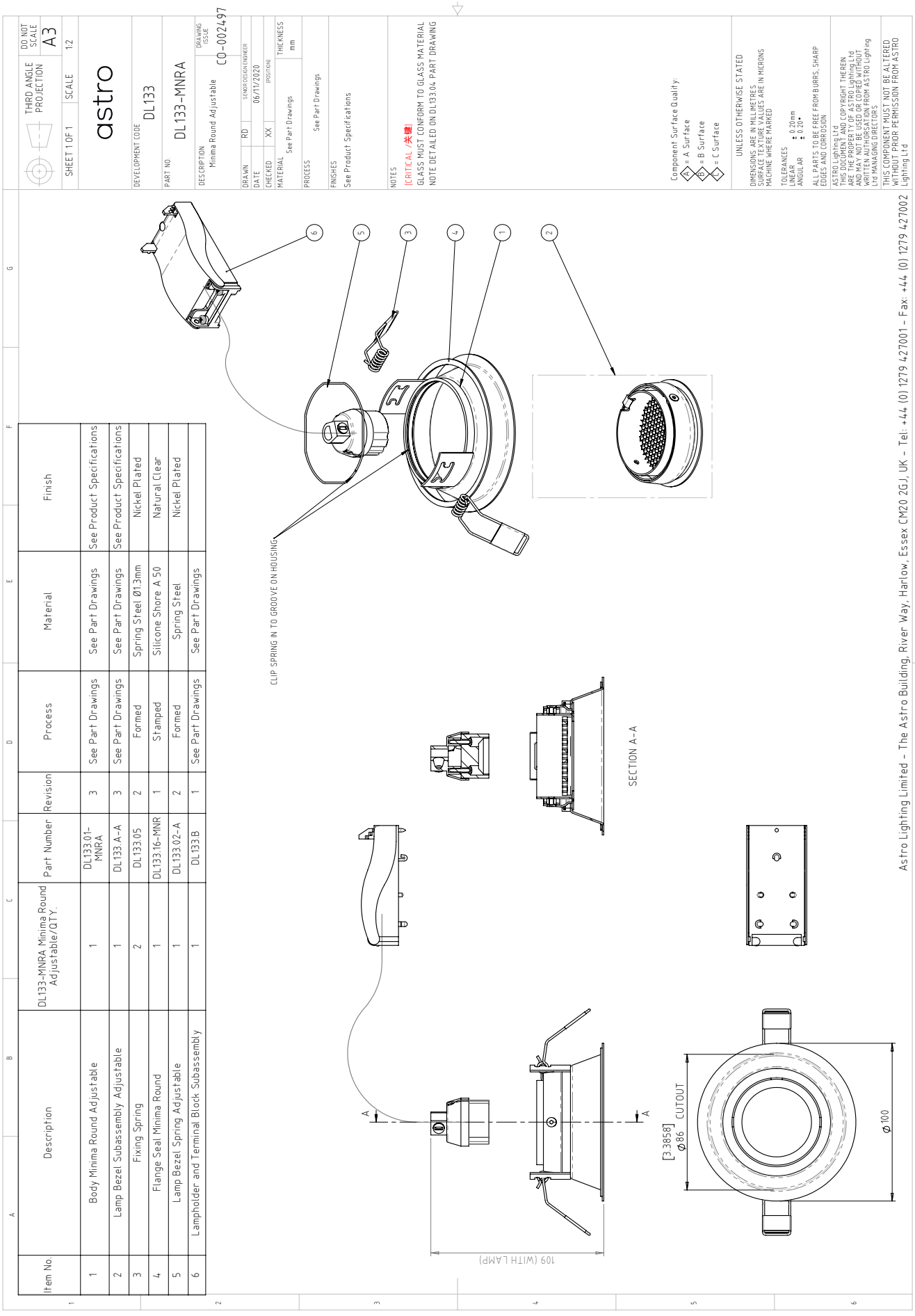
Item No.	Description	QTY.	Part Number	Revision	Process	Material	Finish
1	Body Pinhole Square Adjustable	1	DL133.01-PHSA	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Pinhole Adjustable	1	DL133.A-PHA	3	See Part Drawings	See Part Drawings	See Product Specifications
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	



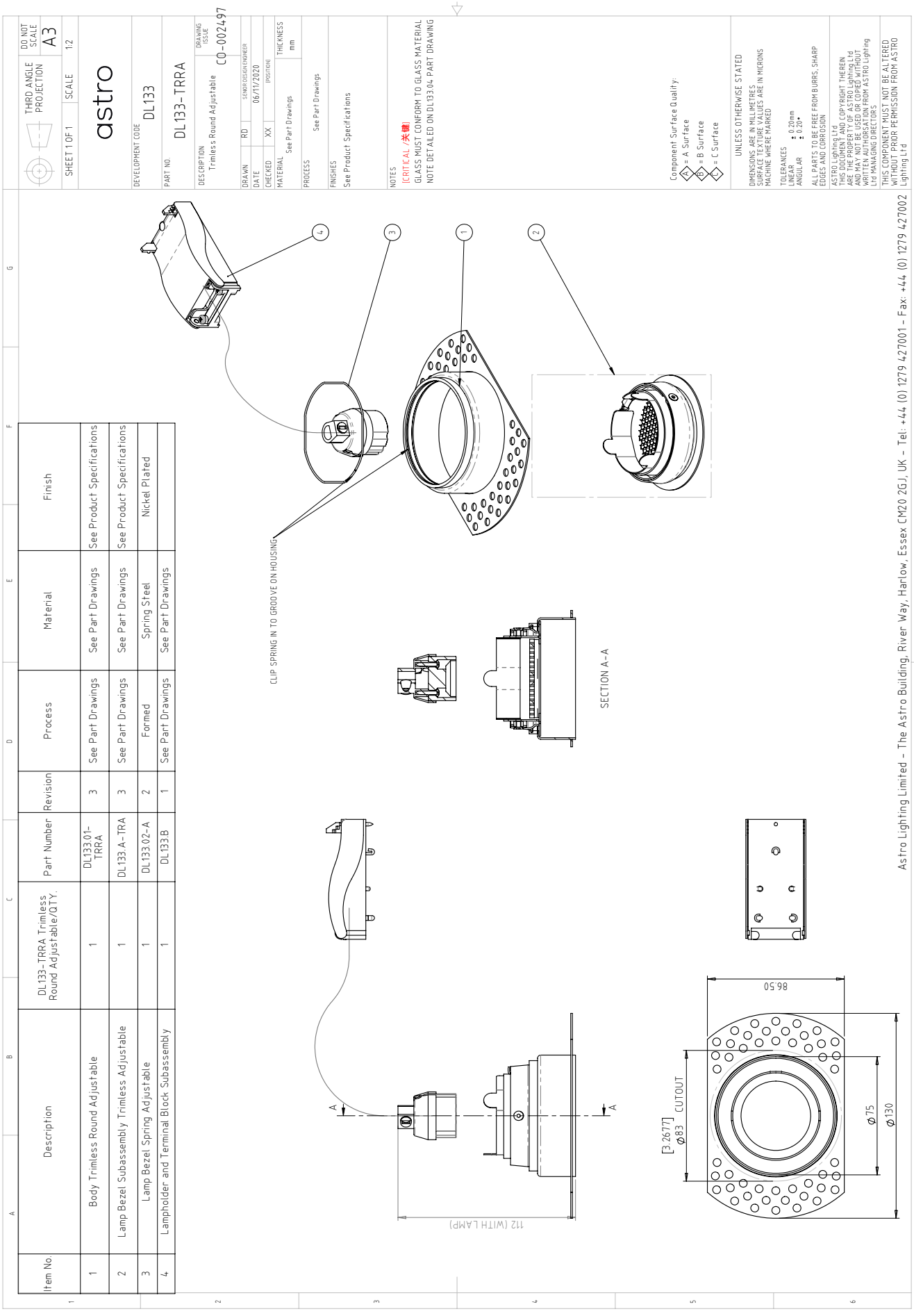
Item No.	Description	QTY.	Part Number	Revision	Process	Material	Finish
1	Body Minima Wall Wash	1	DL133.01-MNW	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Minima	1	DL133.A-MIN	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Fixing Spring	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	



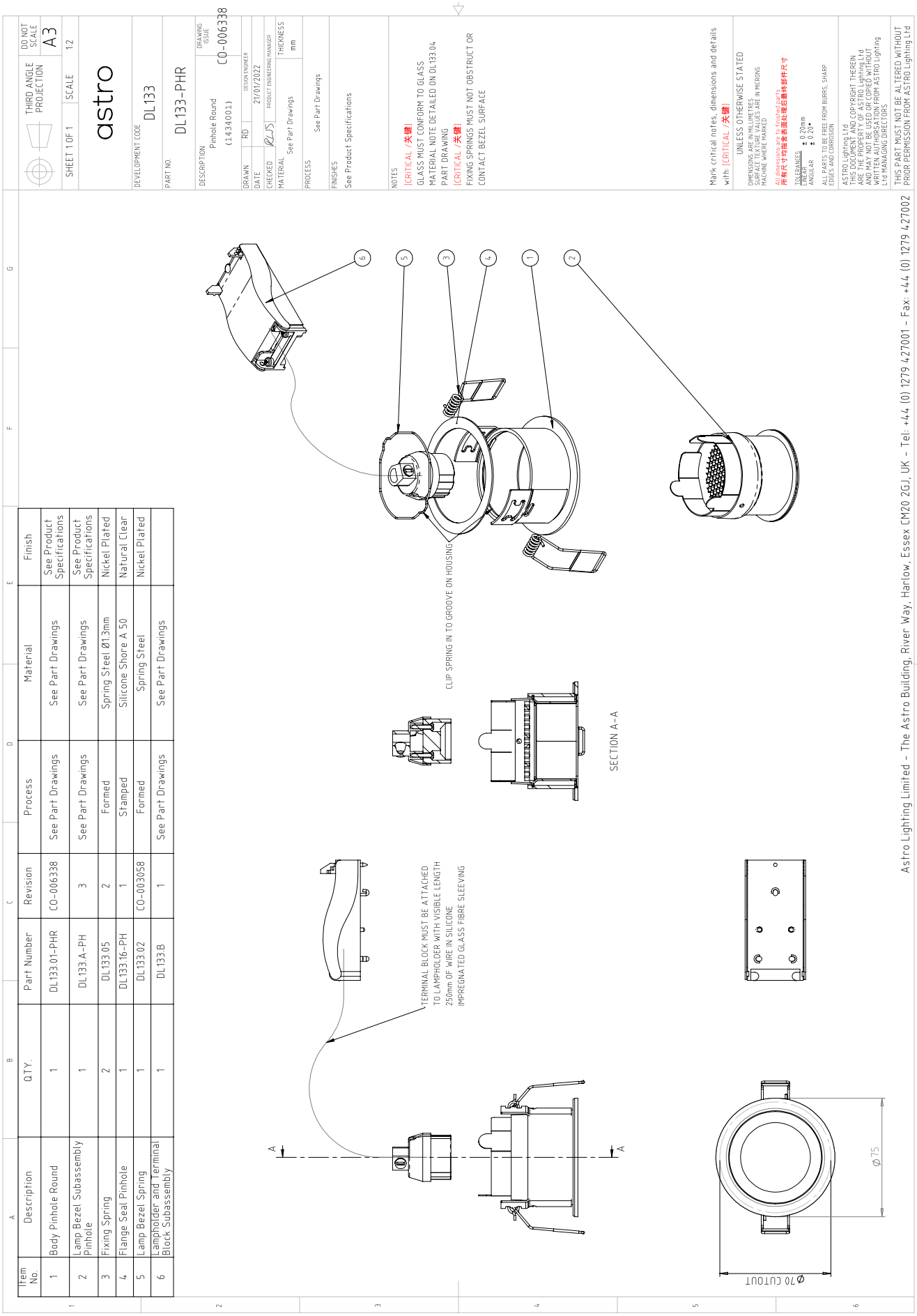
Item No.	Description	QTY.	Part Number	Revision	Process	Material	Finish
1	Body Minima Round	1	DL133.01-MNR	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Minima	1	DL133.A-MIN	3	See Part Drawings	See Part Drawings	See Product Specifications
3	Fixing Spring	2	DL133.05	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	

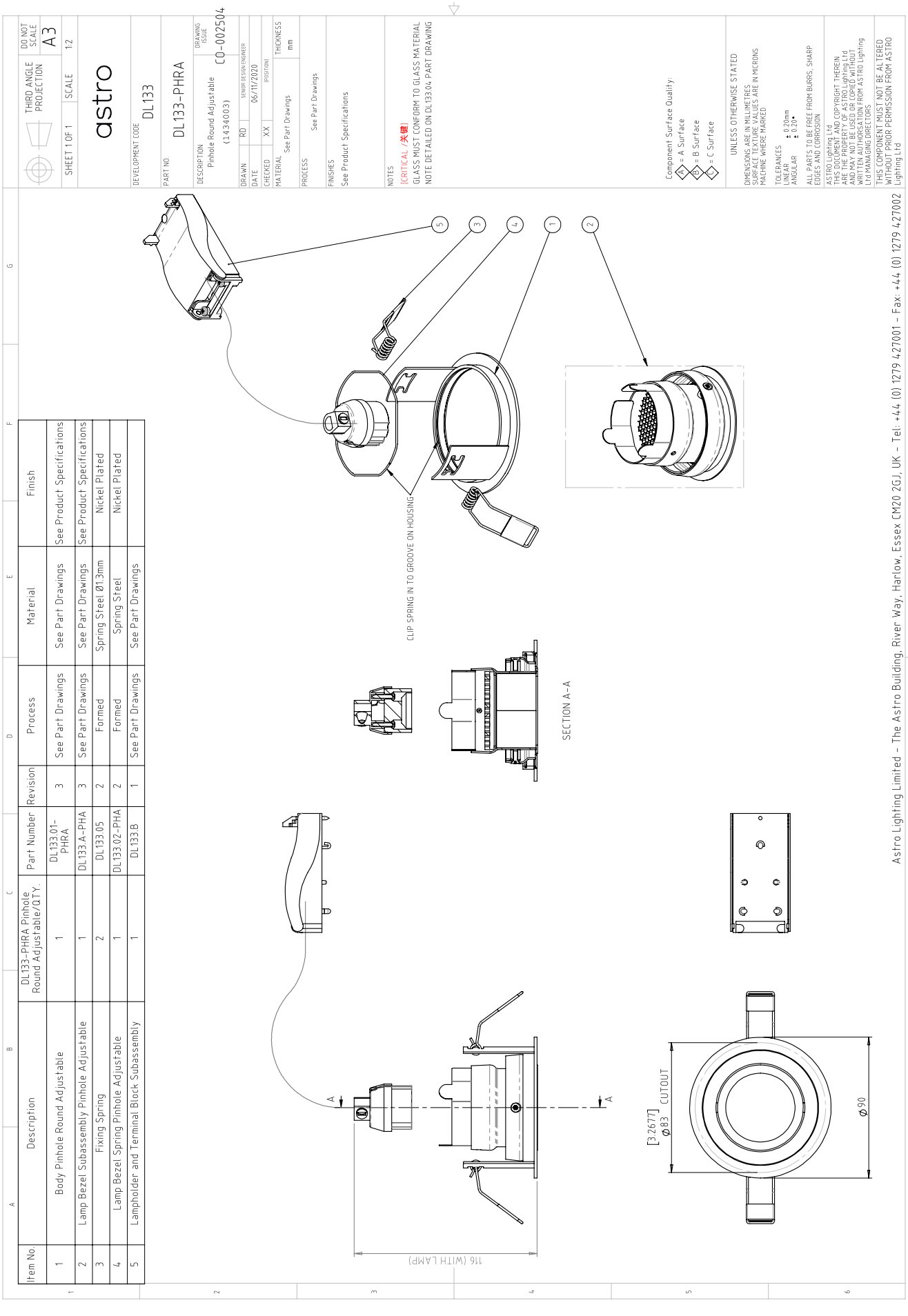


Item No.	Description	DL133-MNRA Minima Round Adjustable/QTY.	Part Number	Revision	Process	Material	Finish
1	Body Minima Round Adjustable	1	DL133.01-MNRA	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Adjustable	1	DL133.A-A	3	See Part Drawings	See Part Drawings	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	

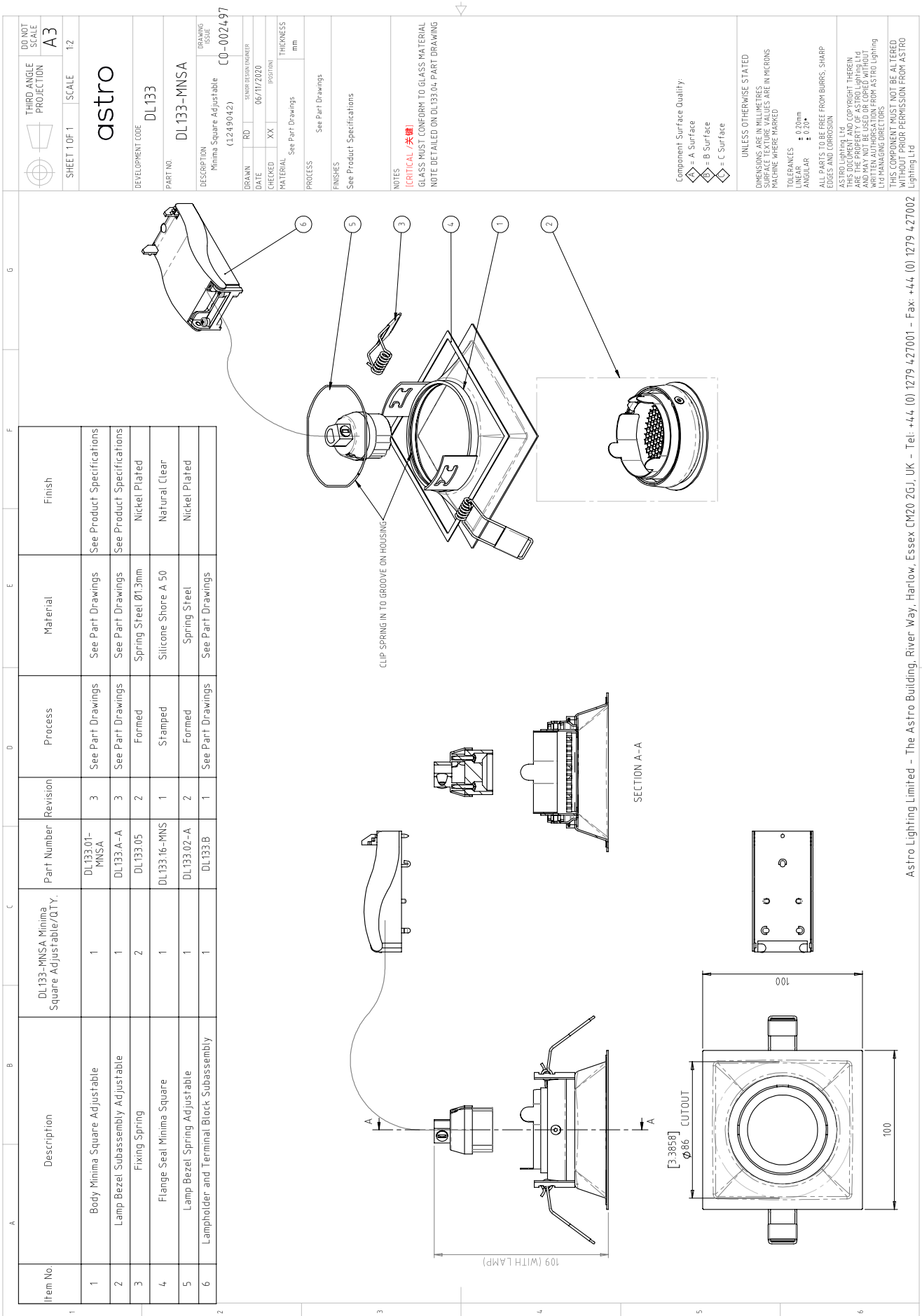


Item No.	Description	DL133-TRRA Trimless Round Adjustable/QTY.	Part Number	Revision	Process	Material	Finish
1	Body Trimless Round Adjustable	1	DL133.01-TRRA	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Trimless Adjustable	1	DL133.A-TRA	3	See Part Drawings	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	



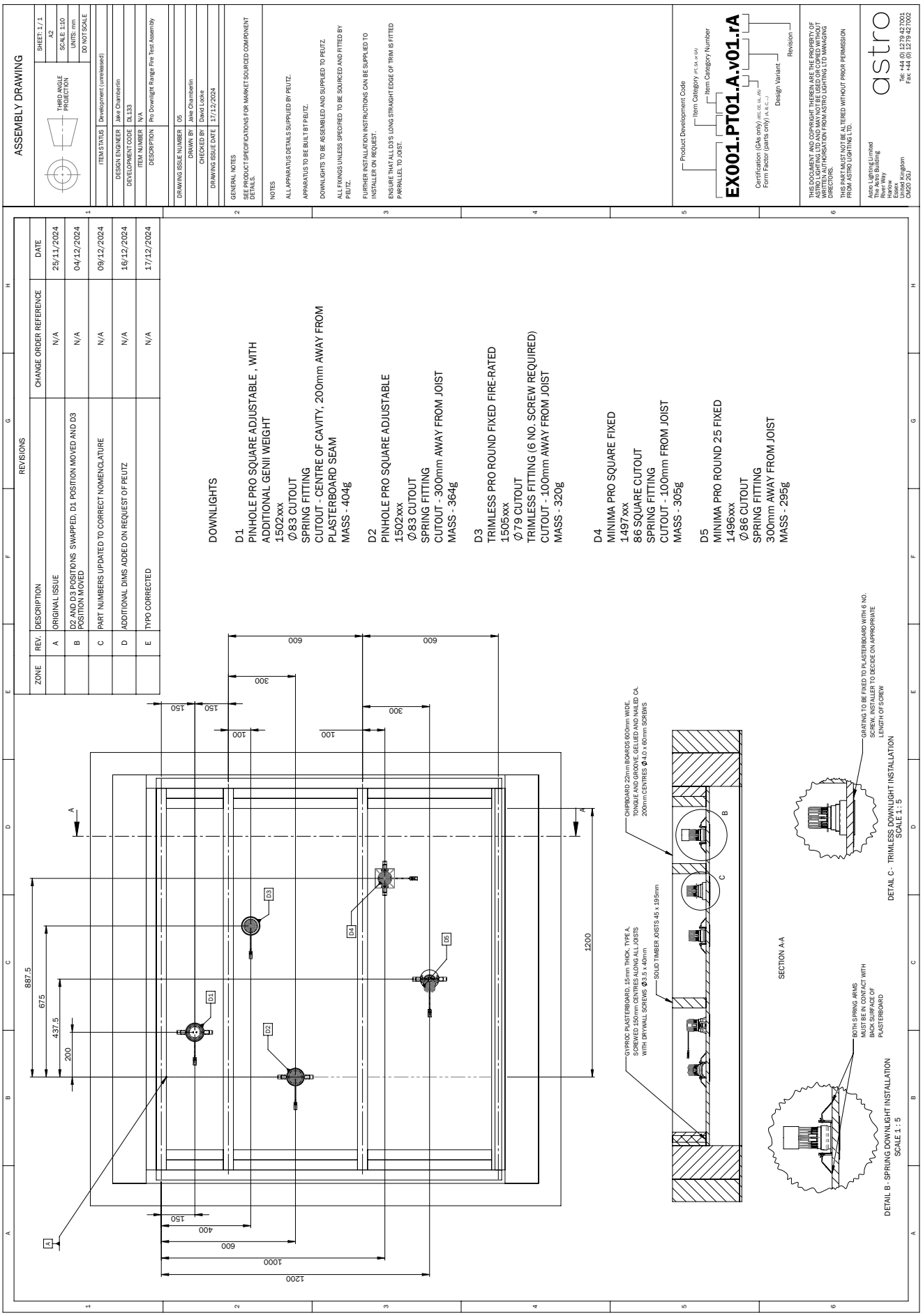


Item No.	Description	DL133-PHRA Pinhole Round Adjustable/QTY.	Part Number	Revision	Process	Material	Finish
1	Body Pinhole Round Adjustable	1	DL133.01-PHRA	3	See Part Drawings	See Part Drawings	See Product Specifications
2	Lamp Bezel Subassembly Pinhole Adjustable	1	DL133.A-PHA	3	See Part Drawings	See 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	



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	

Appendix 5 Floor construction Y 3308-3E-RA (PEUTZ BV)



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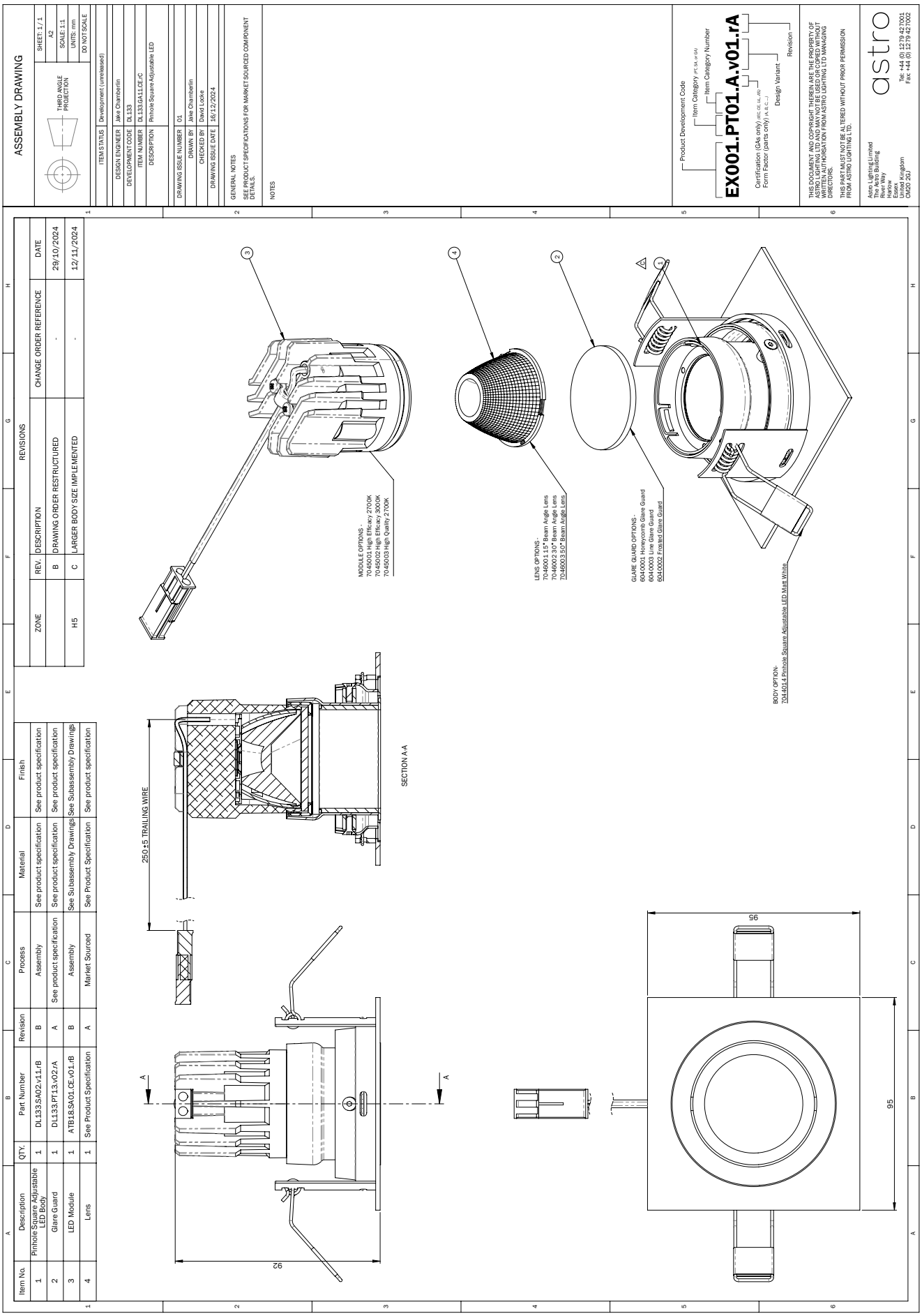
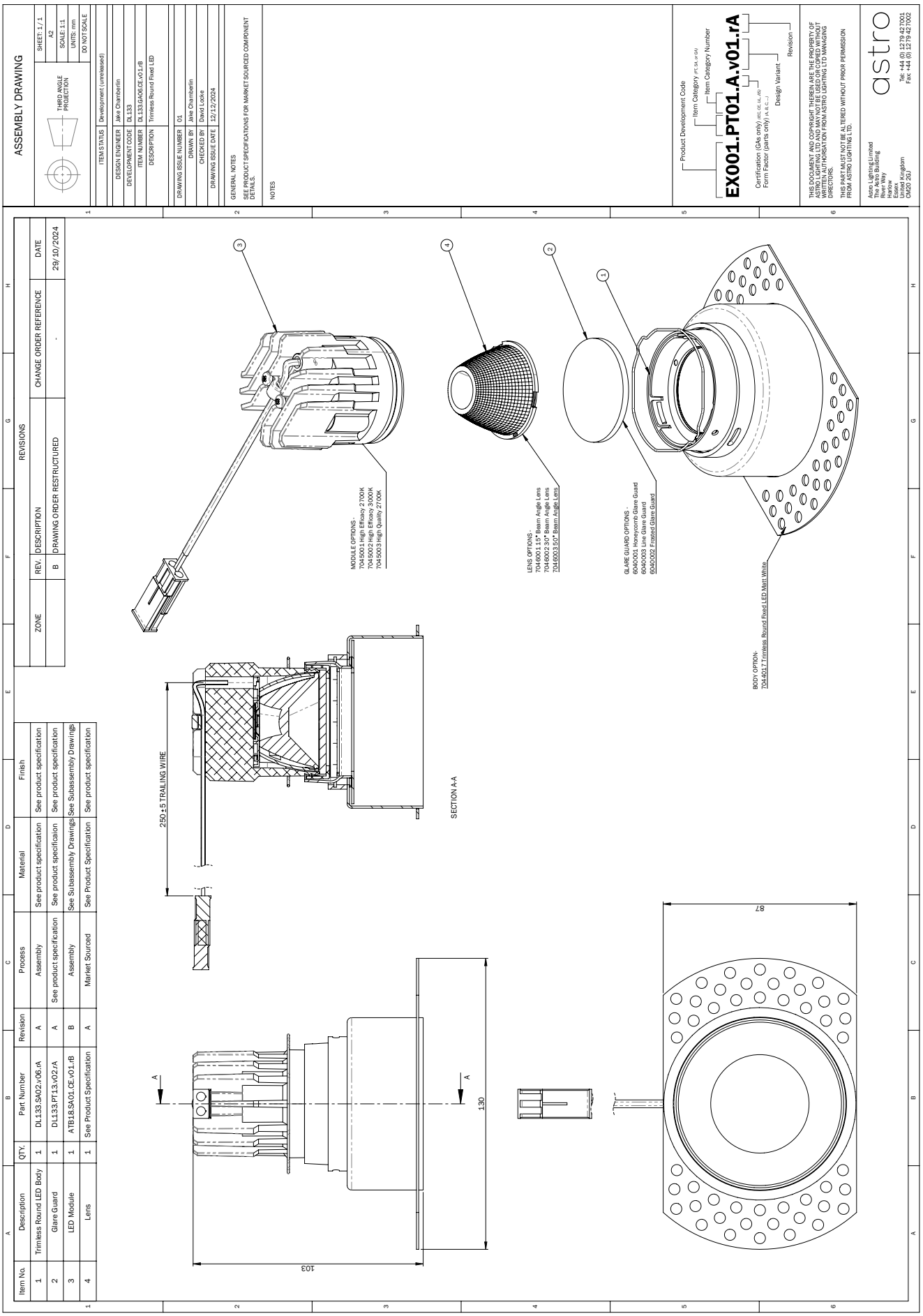
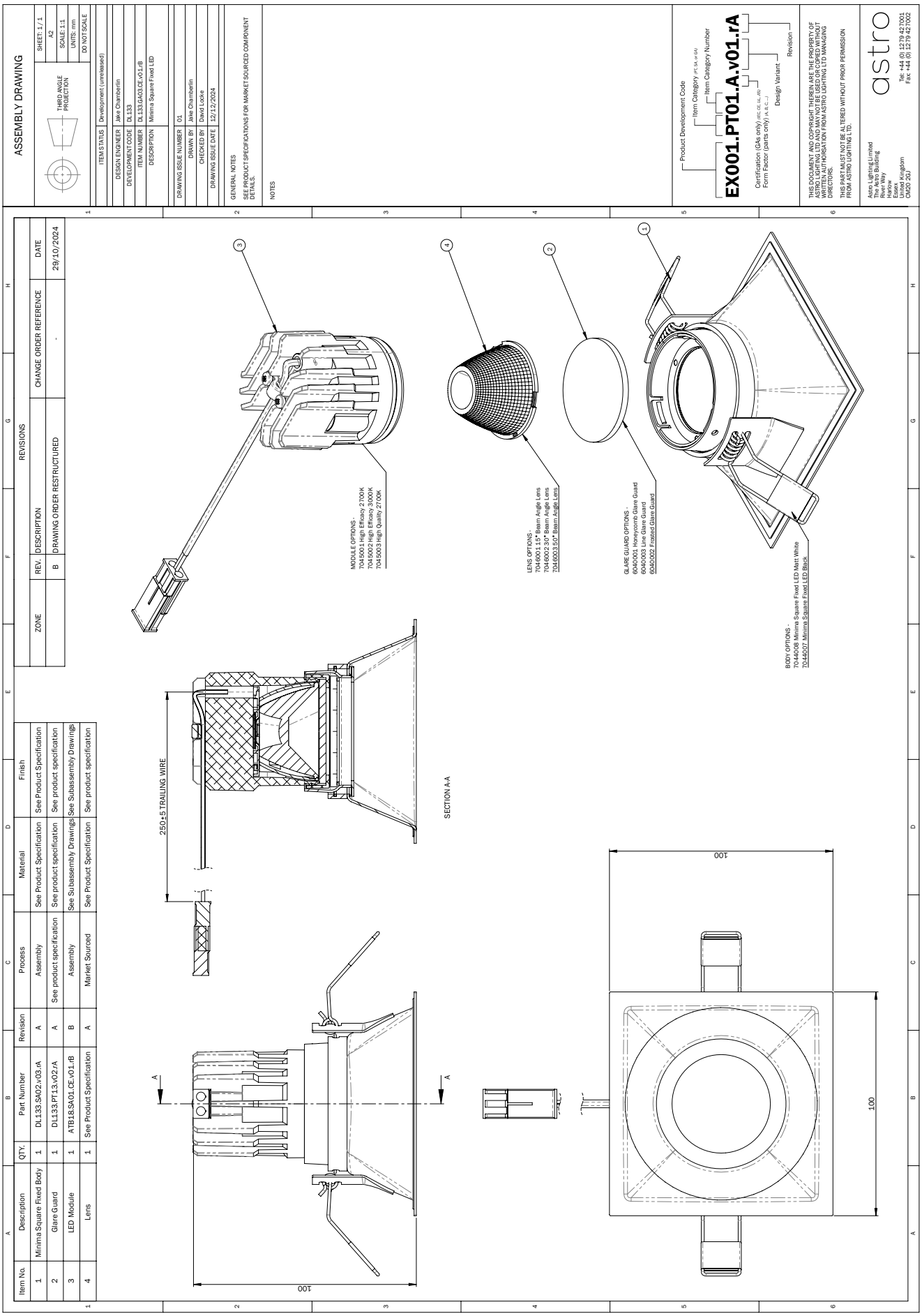




Item No.	Description	QTY.	Part Number	Revision	Process	Material	Finish
1	Trimless Round LED Body	1	DL133.SA02.v06.rA	A	Assembly	See product specification	See product specification
2	Glare Guard	1	DL133.PT13.v02.rA	A	See product specification	See product specification	See product specification
3	LED Module	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



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

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