A) CONSTRUCTION

Claim 1

1.1 *A system for providing electrical power to a road vehicle*

A system Claim 1 is an independent apparatus claim to a system, i.e. a group of components that together perform a function.

for = suitable for but not limited to

providing electrical power to = supplying electricity to because this is the normal meaning

a road vehicle = a vehicle which travels along a roadway powered by an external source of electricity because this is the normal meaning of the words in the context of the patent. Examples include a trolley car which runs on wheels on a road or a tram which runs on tracks on a road (page 5, line 9).

1.2 *the system comprising at least a pair of gantries and an overhead cable supported by a carrier cable extending from the gantries at an elevated position*

the system comprising = it has the features that follow, and may also have other features

at least a pair of = two (or more) similar or corresponding items which operate together because this is the normal meaning of "pair"

gantries = structures which support the weight of an overhead cable above a road vehicle while providing a through-path for it because this is their purpose (page 5, lines 15-16 and 10-11).

and an overhead cable = a cable for carrying electricity which is held above and supplies electricity to road vehicles because this is its purpose (page 3, lines 7-10).

supported by a carrier cable = the overhead cable is held in place by a separate cable (e.g. via dropper wires) (page 3, line 19; page 5, lines 15-16).

extending from the gantries at an elevated position = the carrier cable is located between and attached to the gantries so that it is held above the path of the vehicle because this is the configuration described on page 5, lines 15-19.

1.3 *the gantries each having a support leg for engaging the ground either side of a road and a beam spanning the road between support legs*

The gantries have three functional components. Two are attached to the ground, one on either side of the road. Their purpose is to hold the third component in an elevated position above and across

the road, so that the traffic can pass between the first two components and beneath the third component (page 5, lines 10-11). The purpose of the third component is to support the weight of the carrier cable and OHE cable (page 5, line 14). The terms "leg" and "beam" construed purposively, mean any component that performs these functions respectively.

1.4 *the overhead cable being connected or connectable to a supply of electricity*

This covers two alternatives: a source of electrical power is electrically connected to the overhead cable, i.e. the power source is part of the claimed system; or the overhead cable is capable of being connected to the source of electrical power, but the power source is not part of the claimed system.

1.5 *a first end of the carrier cable being rigidly secured to a first of the gantries*

a first end of the carrier cable

Figure 2 and page 5, lines 15-21 describe an apparatus according to the invention including a gantry 3A to which the carrier cable is attached by a resilient biaser and an adjacent gantry 3B to which the carrier cable is attached by rigid arm supports. The carrier cable clearly does not terminate at these gantries. The term "a first end of the carrier cable" cannot mean a terminal end, otherwise the apparatus of Figure 2 would not be according to the invention. The purpose of the gantries is to support the carrier cable. Therefore "a first end" means the part of the carrier cable which is attached to the first gantry. It could be a terminal end or an intermediate point.

being rigidly secured = the carrier cable is directly and fixedly attached to the gantry, so that no relative movement can take place between them because this is the normal meaning of "rigidly secured", and because the only type of connection described in the patent is with the carrier cable being directly attached to the gantry by rigid support arms (page 5, line 18 and Figure 2).

to a first of the gantries = one of the pair of gantries in 1.2. The use of "first" and "second" is reversed in the description compared to 1.5 and 1.6. Which is "first" and which "second" does not matter as long as they operate together as a pair.

1.6 *a second end of the carrier cable being secured to the second gantry by a resilient biaser arranged to generate tension in the carrier cable*

a second end of the carrier cable = the part of the carrier cable which is adjacent and attached to the second gantry for the same reason as in 1.5.

being secured to the second gantry by a resilient biaser = attached to the second gantry (i.e. the other of the pair of gantries for same reason as in 1.5) so that the carrier cable is supported in its elevated position by the gantry and so that the gantry anchors one end of the resilient biaser because this is its purpose (page 5, lines 16-17). In Figure 2, the resilient biaser is directly attached to the cable and the gantry. However, indirect attachment (e.g. via another component between the resilient biaser and the gantry) would also achieve the purpose of supporting the cable, so direct attachment is not required.

resilient biaser = a device that generates an opposing force in response to a change in its length, e.g. a constant force coil spring or a helical spring, because this is its function (page 5, lines 24-30).

arranged to generate tension in the carrier cable = the combination of force on the carrier cable from the resilient biaser at one end and the rigid attachment to the gantry at the other end result in tension in the cable between them because this is the purpose (page 5, lines 20-21).

Claim 2

2.1 ***A system according to Claim 1***

The system has all of the features of claim 1, plus the following

2.2 ***wherein the cable has a core and a sheath***

Claim 1 has two cables: the OHE cable and the carrier cable. The cable in Claim 2 must be the OHE cable, since the patent describes an OHE cable having a core and a sheath (page 5, lines 41-46 and Figure 4), whereas there is no discussion of the structure of the carrier cable.

The core is the central part of the cable and the sheath is the outer part of the cable (apart from the side where it makes contact with the road vehicle) because this is the normal meaning of the words, and because the outer layer is described as a cover (page 4, line 27) or a coating (page 5, line 43).

2.3 ***the core being formed of a first material and the sheath being formed of a second material***

The core is made from an electrically conductive material because its purpose is to conduct electricity (page 5, line 42). The sheath is made from a different, protective material, because its purpose is to protect the core (page 5, line 43).

Claim 3

3.1 ***A system according to Claim 1***

The system has all of the features of claim 1, plus the following

3.2 ***wherein the resilient biaser is a spring***

The resilient biaser is any type of spring which applies a tensioning force to the cable as the cable expands and contracts, and thereby compensates for the change in the length of the cable because this is its purpose (page 4, lines 8-10), e.g. a constant force spring, a helical tension spring or a helical compression spring (page 4, lines 11-12).

Claim 4

4.1 ***A system according to Claim 3***

The system has all of the features of claim 3 and claim 1, plus the following

4.2 ***wherein the resilient biaser is secured to the gantries via a flexible connector***

The use of "gantries" is an error, since claim 1 on which claim 4 depends requires that the resilient biaser is secured to the (singular) second gantry. Thus "gantries" should be read as "second gantry".

The resilient biaser (the spring) is in a housing that is connected to the gantry via a ball and socket joint (page 5, lines 31-40). Thus "secured to" does not require direct connection between the resilient biaser and the gantry.

The purpose of the flexible connector is to allow pivoting motion between the biaser and the gantry (page 4, lines 17-19). There is an error on line 19: clearly "relative motion between the biaser and the cable" should be "relative motion between the biaser and the gantry" in view of the earlier part of this sentence. "Relative motion" must refer to pivoting motion because the flexible connector may be a ball and socket joint (and not translational motion along the direction of the cable which would counteract the effect of the spring in tensioning the cable). So flexible connector = an element which connects the biaser to the gantry while allowing pivoting motion.

4.3 ***and is rigidly secured to a first end of the carrier cable***

Claim 1 on which claim 4 depends requires that the resilient biaser is secured to the second end of the carrier cable. Thus "first end" in 4.3 should be "second end".

Rigidly secured = the resilient biaser is connected to the second end of the carrier cable so that no relative movement is possible between them, because this is the normal meaning and is described on page 4, line 17 and Figure 3C.

Claim 5

5.1 ***A cable for carrying electricity particularly in an overhead power system***

A cable = a thick wire because this is the normal meaning in this context

for carrying electricity = suitable for conducting electricity

*particularly in an overhead power system: '*particularly" is not limiting, so the cable is not necessarily suitable for an overhead power system.

5.2 ***the cable comprising a core and a sheath*****,**

The core is the central part of the cable and the sheath is the outer part of the cable (apart from the side where it makes contact with the road vehicle) because this is the normal meaning of the words, and because the outer layer is described as a cover (page 4, line 27) or a coating (page 5, line 43).

5.3 ***the core being formed of a relatively conductive material and the sheath being formed from an elastic material***

The purpose of the core is to conduct electricity, so the core is made from a material which is a good electrical conductor. The claim does not say what the conductivity is relative to; however, the context (specifying the type of materials in the core and sheath) implies that it is relative to the sheath material. The sheath is made from an elastic, i.e. resilient, material, e.g. rubber, because its purpose is to withstand clamping forces when in use (page 5, lines 44-46).

5.4 ***the core having a cross section which is not circular*****.**

The conventional cable O (Figure 1C) is said to have a substantially circular cross-section, but is shown as having two recesses in the upper half (rebates A1, A2). Since this is acknowledged prior art, it cannot be intended to fall within the term not "not circular". The purpose of the non-circular cross-section is to provide a flat surface which contacts the electrical contact on the road vehicle (page 5, line 46-47). Examples of possible non-circular cross-sections are square, pentagonal and hexagonal (Figure 4). A cross-section which is not circular means a cross-section which is generally flat in the

region where it which contacts the electrical contact on the road vehicle (i.e. the lower side), because this is in accordance with the purpose and it excludes the conventional cable with recesses.

B) INFRINGEMENT

Claim 1

1.1 Present

The system shown on page 12 has an overhead electricity cable (OHE - see page 3, line 8) which provides electrical power to a tram, which is a type of road vehicle. See also page 11, lines 2 -5.

1.2 Present

Page 12 shows the OHE cable supported by a carrier cable above a tram. The carrier cable is held in an elevated position above the tram and road by suspension cables between buildings.
Adjacent suspension cables are a pair because they are similar items (both have the same structure) and they operate together (to support the length of cable).
The suspension cables and buildings together support the weight of an overhead cable above a road vehicle while providing a through-path for it, and therefore are gantries as construed above.
The OHE cable is held above a tram and supplies electricity to it.
The OHE cable is supported by the separate carrier cable.
The carrier cable is held above the road by and between adjacent suspension cables.
NB the gantries at the termini cannot be a pair, because they are at each end of the line with numerous other gantries between them, so that they cannot be said to operate separately.

1.3 Present

The buildings rest on to the ground, one on either side of the road on which the road vehicle travels and hold the suspension cable in an elevated position above and across the road, so that the traffic can pass between the buildings and beneath the suspension cable. The suspension cable supports the weight of the carrier cable and OHE cable. The buildings and suspension cable are therefore support legs and a beam respectively, as construed above.

1.4 Present

The OHE cable is connected at the terminal gantries to a supply of electricity (page 11, line 30-31).

1.5 Tentatively present

Each point at which the carrier cable contacts the suspension cable is an “end” as construed above.
The figures on page 12 show the carrier cable attached to each suspension cable; it appears to be a direct, fixed connection, so that no relative movement is possible between them (this should be confirmed by inspection).

1.6 Not Present

As 1.5: the carrier cable is attached to the suspension cable at each gantry but it appears to be a fixed connection where the two cables meet, i.e. it is not secured by a resilient biaser.

Claim 1 is not infringed on a normal construction, because feature 1.6 is not present. However, claim 1 is infringed by equivalence. The variant is immaterial because the three Actavis questions are satisfied:

1. Connecting the carrier cable to the gantry beam (the suspension cable) and connecting the gantry beam (suspension cable) to a gantry leg (the building) via a resilient biaser at each end achieves substantially the same result as the invention (generating tension in the carrier cable) in substantially the same way (using a resilient biaser attached to a fixed part of the gantry).
2. It is obvious to the skilled person that it does so because it is apparent that the springs would generate tension in the carrier cable when the suspension cable is pulled slightly away from perpendicular to the buildings.
3. There is nothing in the patent that suggests to the skilled person that the patentee intended strict compliance resilient biaser being between the carrier cable and the gantry, instead of being between two parts of the gantry". There is very little discussion of this feature apart from the structure shown in Figure 2 and described on page 5, lines 16-17, so the skilled person would not consider it to be particularly important.

Claim 1 is not infringed on a normal construction, because feature 1.6 is not present. Claim 1 is also not infringed by equivalence. The variant is not immaterial because the first Actavis question is not satisfied.

Connecting the carrier cable to the gantry beam (the suspension cable) and connecting the gantry beam (suspension cable) to a gantry leg (the building) via a resilient biaser at each end does not generate tension in the carrier cable in substantially the same way. The springs can only generate tension in the suspension cable. Since the suspension cable is perpendicular to the carrier cable, expansion / contraction of the carrier cable cannot be counteracted by the springs.

<u>Claim 2</u>

2.1 Present as above for claim 1

2.2 Present: page 11, lines 36-37 describes a coated cable which is square and advantageous over conventional cables. It must be an OHE cable (not a carrier cable) because the Plan View on page 12 shows a square OHE cable and a circular carrier cable.

2.3 Present: it is implicit that the core and sheath are formed of different materials, since otherwise, there would be no point in having a coating.

The additional features are present, so claim 2 is infringed / not infringed by dependency on claim 1.

Claim 3

3.1 Present as above for claim 1

3.2 Present: the resilient biaser is a spring (page 11, line 33 and figure on page 13).

The additional features are present so claim 3 is infringed / not infringed for the same reason as claim 1.

Claim 4

4.1 Present as above for claim 3

4.2 Present

The resilient biasers (springs) which secure most of the suspension cables to the buildings have a flexible connector (universal connection - page 11, lines 22-24 and Figure on page 13).

4.3 Not present

The springs are connected to the carrier cable by the suspension cable, and so are not rigidly secured to the carrier cable.

Feature 4.2 is present but 4.3 is not present, so claim 4 is not infringed on a normal construction. However, having the resilient biaser between the leg and beam of the gantry is equivalent to having it between the beam and the carrier cable (see claim 1). Since the connection between the suspension cable and the carrier cable appears to be rigid (see 1.5), claim 4 is infringed by equivalents for the same reasons as claim 1.

Feature 4.3 is not an immaterial variant for the same reasons as claim 1, so claim 4 is not infringed by equivalents.

Claim 5

5.1 Present

Page 11, lines 36 describes a coated, square cable. It must be an OHE cable (not a carrier cable) because the Plan View on page 12 shows a square OHE cable and a circular carrier cable.

5.2 Present

It is implicit that a coated cable has a core (the part inside the coating) and a sheath (the coating).

5.3 Not known

The core of an OHE cable must be electrically conductive. There is no information on the nature of the coating, so it is not known whether or not it is elastic.

5.4 Present: the cable is square (page 11, line 36, Plan View on page 12).

Conclusion: claim 5 is infringed if the coating material is elastic. This should be investigated.

C) NOVELTY

There are three prior art documents:

- the acknowledged background to the patent on page 3, lines 4 – 32; page 4, line 35 to page 5, line 7; and Figures 1A – 1D of doc A.
- doc C - published in January 2010, before the priority date of the patent (14 July 2015)
- doc D - published in October 1980, also before the priority date of the patent.

The background of doc A discusses both power systems and cables so is relevant for all claims.
Doc C is only concerned with cables, so is only relevant for the novelty of claim 5.
Doc D is only concerned with power systems, so is only relevant for the novelty of claims 1 – 4.

Document A

Claim 1

1.1 Present

The system provides electrical power to a train. It has weights for tensioning the cable (page 3, line 26) which are potentially hazardous when installed on roadways (page 3, line 37); however, this hazard could in principle be overcome (e.g. by a failsafe mechanism of some type) so it does not make the system unsuitable for road vehicles.

1.2 Not present

The system (Figure 1A) has pylons (P), an overhead cable (O) supported by a carrier cable (C) which is located between the pylons. The pylons support the weight of the cables above the track. Adjacent pylons are a pair because they are similar items which operate together to support the cable between them.
However, the pylons are not gantries, because the vehicle does not travel through them, i.e. there is no through-path.

1.3 Not present

The pylons only have one leg and thus do not engage the ground on either side of the track.

1.4 Present

Cable O is connected to a supply of electricity (page 3, line 29-30; also transformer T in Figure 1D).

1.5 Present

The part of the carrier cable which is attached to the end of the beam (e.g. of the pylon with the transformer T in Figure 1D) is a first end as construed above. The carrier cable is shown as being attached to the arm of the pylon, but it is not stated whether this is rigid or not. Clearly tension could be maintained by having a weight on one pylon and either another weight or a fixed attachment at the next pylon. Page 5, lines 6-7 state that weights may be present at successive or periodic pylons, i.e. they do not have to be present at every pylon. Therefore it is implicit that at some pylons there is a fixed, immovable attachment i.e. an anchor point at some pylons.

1.6 Not present

The carrier cable has a second end (shown in Figure 1D), but there is no resilient biaser – instead the carrier cable is tensioned by the weights W (page 5, lines 6 – 7, Figure 1D).

Features 1.2, 1.3 and 1.6 are not present, so claim 1 is novel.

Claim 2

2.1 Not present as above for claim 1

2.2 Present: a traditional OHE cable has a copper core and may be coated, at least on the non-contact side (page 3, lines 30 – 31).

2.3 Present: the protective cover is implicitly a different material from the copper core.

The additional features are present; claim 2 is novel by its dependency on claim 1.

Claim 3

3.1 Not present as above for claim 1

3.2 Not present: there is no resilient biaser (see 1.6), in particular no spring.

Claim 3 is novel both by dependency on claim 1 and because the additional feature is not present.

Claim 4

4.1 Not present as above for claim 3

4.2 Not present

There is no resilient biaser or gantry (see 1.6). The weights & pulley (which perform the same function) appear to be rigidly connected to the pylons. There is no disclosure of a connection that would allow pivoting motion between the biaser and gantry.

4.3 Not present

The weights appear to be rigidly secured to the carrier cable, but there is no resilient biaser (see 1.6).

Claim 4 is novel both by dependency on claim 3 and because the additional features are not present.

Claim 5

5.1 Present: page 3, lines 30-31 describe a traditional OHE cable for use in overhead power systems.

5.2 Present: the cable has a copper core and may be coated (at least on the non-contact side) by a protective cover, i.e. a sheath.

5.3 Not present

Copper is a good electrical conductor (page 3, line 16). However, there is no information on the nature of the protective coating material, so it is not known whether or not it is elastic. The nature of the coating material in traditional OHE cable should be checked with the client.

5.4 Not present

The cable cross-section is shown in Figure 1C. It is circular, apart from two recesses (rebates A1, A2) on the upper side. It has a circular shape on the lower side where the cable makes contact with the vehicle, i.e. it is not generally flat in the contact region. Therefore the core has a cross section which is circular, according to the above construction.

Feature 5.4 is not present (and 5.3 may also not be present), so claim 5 is novel.

Document C

Claim 5

5.1 Present

The figures on page 14 show a thin thread which conducts electricity. Lines 26-27 state that this approach could also be used for thicker gauge materials for heavier duty work. Therefore Doc C discloses a cable for carrying electricity. There is no mention of an overhead power system; however, this is an optional, non-limiting feature.

5.2 Present

The cable has a core and a sheath (the coating) – Figures on page 14.

5.3 Not present

The core is an electrically conductive material (page 14, lines 10 – 12).

The coating is an insulating polymer (page 14, line 12 & figures). However, it is not stated whether or not this is elastic (not all polymers are elastic). Therefore this feature is not disclosed.

5.4 Present

The cable cross-section is rectangular (figure on page 14).

Feature 5.3 is not present, so claim 5 is novel.

Document D

Claim 1

1.1 Present

The system provides electrical power to a train (page 15, lines 14 – 17). It has weights for tensioning the cable (Figure on page 16) which are potentially hazardous when installed on roadways (page 3, line 37); however, this hazard could be overcome (e.g. by a failsafe mechanism of some type) so it does not make the system unsuitable for road vehicles. Page 15, line 27 mentions urban rail installations, which could include trams, and certainly suggests that the system is suitable for road vehicles.

1.2 Present

The system has gantries and overhead cables suspended from carrier cables (page 15, lines 16 – 17). Implicitly, the adjacent gantries operate together support the weight of the cables which extend between them above the track, and hence are a pair.

1.3 Present

The structure of the gantries is not discussed; however gantries implicitly have two legs which engage the ground and a beam, since line 16 distinguishes gantries and pylons.

1.4 Present

Trains receive electrical power from the overhead cable (page 15, lines 17-18), so it must be connected / connectable to a supply of electricity.

1.5 Not present

There is no information about this. Tension could be maintained by having a spring at one end of the carrier cable and either another spring or a fixed attachment at the next pylon. Therefore, this feature is not implicitly present.

1.6 Not present

The second end of the carrier cable is attached to a spring located in a curved track and held in place by retaining tangs; the track is welded to the gantry (page 15, line 38; page 16 lines 1-3 and figure). The gantry thus supports the carrier cable by means of the spring which is held in the track. However, the end of the resilient biaser is anchored by the weight, not the gantry.

A spring is a type of resilient biaser according to the patent (page 4, line 8). The spring is said to provide resilience to environmental changes, such as in hot climates (page 15, lines 40-42), i.e. changes in the length of the cable (page 15, lines 25 – 26), which appears mean that it (together with the weights) will generate tension in the carrier cable.

Features 1.5 and 1.6 are not present, so claim 1 is novel.

Claim 2

2.1 Not present as above for claim 1

2.2 Not present: there is no information on the structure of the cable.

2.3 Not present: there is no information on the structure of the cable.

Claim 2 is novel both by dependency on claim 1 and because the additional features are not present.

Claim 3

3.1 Not present as above for claim 1

3.2 Present: the resilient biaser is a spring (page 15, line 38 and Figure 1.6).

The additional feature of claim 3 is disclosed; claim 3 is novel by dependency on claim 1.

Claim 4

4.1 Not present as above for claim 3.

4.2 Not present

The spring is located in a curved track and held there by retaining tangs; the track is welded to the gantry (page 15, line 38; page 16 lines 1-3 and figure). As construed above, "secured to … by" does not require the resilient biaser to be directly attached to the gantry, so the curved track does secure the spring to the gantry. However, the curved track does not allow the spring to pivot relative to the gantry, so it is not a flexible connector.

4.3 Not present

There is no information in Doc D about how the spring is secured to the carrier cable.

Claim 4 is novel both by dependency on claim 3 and because the additional features are not present.

D) INVENTIVE STEP

Apply the Pozzoli/Windsurfer approach:

The skilled person for claims 1-4 is a tram/trolley bus engineer interested in in-town electrification.

The common general knowledge is electrification systems for trams and railways, as set out in the background section of the patent (page 3, lines 4 – 32, Figure 1A – 1D).

Claim 1

The inventive concept is tensioning the cables in a more effective (page 4, lines 8-10) and/or safe (page 5, lines 20-22) manner than by using weights.

The state of the art is document D. The differences over this are:

- the first end of the carrier cable is rigidly secured to a first gantry
- the second end of the carrier cable is secured to the gantry

Although doc D does not implicitly disclose that the first end of the carrier cable is rigidly attached to a first gantry, it would be obvious to the skilled person to do so in order to provide an anchor point. Since doc D page 15, lines 40-41 state that the spring itself provides resilience to environmental changes, it would be obvious to attach the spring to the gantry so that the gantry itself provides the anchor instead of the weight. Therefore this difference would also be obvious to the skilled person.

Thus the differences are all steps which do not require any degree of invention and which would have been obvious to the skilled person. Therefore claim 1 lacks an inventive step.

Claim 2

Cables having a core and a sheath are part of the CGK (doc A, page 3, lines 30 – 31). Consequently, claim 2 lacks inventive step over doc D in view of the CGK.

Claim 3

The additional feature of claim 3 is disclosed in doc D. Therefore claim 3 lacks inventive step over doc D in view of the CGK for the same reasons as claim 1.

Claim 4

The inventive concept is to allow relative motion between the resilient biaser and the gantry to accommodate wind loads etc. on the cable.

The further differences is that the spring is secured to the gantries via a flexible connector, whereas in doc D the spring is secured to the gantry by the curved track and held there by retaining tangs; the track is welded to the gantry (page 15, line 38; page 16 lines 1-3 and figure). This connection does not allow the spring to pivot relative to the gantry, so it is not a flexible connector.
Also, there is no information in doc D about how the spring is connected to the carrier cable.

Since there is no suggestion in doc D or the CGK to use a flexible connector, it would not have been obvious to the skilled person to do so. Therefore claim 4 is inventive.

Claim 5

The skilled person for claim 5 is an electrical engineer interested in in-town electrification.

The CGK is traditional OHE cables, described in the background of doc A (page 3, lines 30 – 32, fig 1C).

The priority document was drafted by the client (page 2, line 12). The priority claim should be checked: if it is valid then the relevant date for assessing the state of the art is the priority date (14/7/15); if not then it is filing date (14/7/16). The reference to doc C in Tram Electrification Monthly in January 2016 (page 2, lines 35 – 37) makes doc C part of the CGK if the priority claim is not valid.

The inventive concept is a cable that is better able to withstand clamping forces in use and which provides better engagement with the contact point on the road vehicle, and hence lower electrical losses and wear on the contact point (page 4, lines 21 – 27).

The state of the art is the traditional cable shown in Fig 1C. Doc A (page 3, lines 30-31) mentions that cables may be coated but does not discuss the material. The differences are:

- the cable has a sheath formed from an elastic material;
- the cable has a cross-section which is not circular in the region in which it makes contact with the road vehicle.

The nature of the coating material in traditional OHE cable should be checked with the client, to confirm that the elastic coating material is a differentiating feature.

As discussed above, doc C is only CGK if the priority claim is not valid. If doc C is not CGK, the skilled person would not consider doc C because doc C relates to threads, which are different from cables. Doc C mentions (page 14, lines 26-27) that the approach might be applied to thicker gauge materials for heavier duty work, but there is no indication of what “thicker gauge” and “heavier duty” could be. Since there is no clear pointer to cables, such as OHE cables, this statement does not provide an

incentive for the skilled person to consider doc C. Doc C discloses threads that have a non-circular cross-section, but there is no suggestion that this would be relevant for OHE cables.

In any case, even if the skilled person did consider doc C, the only teaching about the nature of the coating material is that it should be electrically insulating and not be too resistant to bending (page 14, lines 12 -13). There is no mention of an elastic material.

Consequently, it would not be obvious for the skilled person to use an elastic material. Therefore claim 5 is inventive.

E) SUFFICIENCY

The client states it has only been possible to produce a constant force coil spring with the necessary strength for an electrification system in the past few months (page 2, lines 16 to 20). This raises the question of whether claim 1 was enabled across its entire scope at the filing date (two years previously). Need to discuss with client why suitable constant force coil springs have only recently become available, in particular whether it was a matter routine work. If not, the claims would likely be insufficient.

F) AMENDMENT

The minor errors noted above in claim 4 and on page 4 should be corrected:

- 4.2: “secured to the gantries” should be “secured to the second gantry”
- 4.3: “secured to a first end of the carrier cable” should be “secured to the second end of the carrier cable”
- Page 4, line 19: “relative motion between the biaser and the cable” should be “relative motion between the biaser and the gantry”

Claim 1 lacks inventive step, and therefore should be amended to make it inventive, whilst still covering Me2’s system. One possible amendment is to introduce the features of claim 4, if it is confirmed that claim 4 is infringed.

OR: Claim 1 lacks inventive step, and therefore should be amended to make it valid, even though it does not cover Me2’s system. One possible amendment is to introduce the features of claim 4.

An alternative amendment would be to specify that the resilient biaser is housed in a housing, based on page 4, line 15 and page 5, line 32. This would cover the Me2 system, since the spring is housed in a plastic housing (figure on page 13). It would likely be inventive because there is no suggestion in the CGK or doc D of the spring being inside the housing.

Claim 1 should be amended to address the insufficiency issue by specifying that the resilient biaser is a helical spring, based on page 4, lines 11-12. This would still cover the Me2 system which has a helical spring (figure on page 13).

As noted above, claim 5 is likely novel over traditional OHE cables described in doc A, but this is subject to checking whether the coating for traditional OHE cables is an elastic material. If so, claim 5 could be amended to specify that the core is rectangular (based on page 6, line 9 and figure 4C) or that the contact point is a flat surface (based on page 5, line 47). These amendments provide novelty over traditional OHE cables, which are generally circular (Figure 1C). While these shapes are disclosed in doc C, the amended claim would be inventive because there is no suggestion in doc C of the benefits that they provide in OHE systems (page 6, lines 1 – 11). These amendments would still cover the Me2 system which has a square cable (page 11, line 36).

G) ADVICE

Claims 1 to 4 are infringed. Claim 5 may well be infringed; further information is required to confirm.

Claims 1 to 5 are novel. Claims 1 to 3 are invalid for lack of inventive step, but claims 4 and 5 are inventive. Claim 1 can be amended (see above) to restore validity whilst still being infringed.

OR: Claims 1 to 4 are not infringed. However, claim 5 may well be infringed; further information is required to confirm.

Claims 1 to 5 are novel. Claims 1 to 3 are invalid for lack of inventive step, but claims 4 and 5 are inventive. Claim 1 can be amended (see above) to restore validity, but will still not be infringed.

It is important for the client to prevent Me2 from selling their system to Mains Town so immediate action is required. It is especially important to stop Me2 from offering their system for other upcoming contracts, many of which will be significantly larger (page 2, lines 38-40).

The patent is in force (renewal fees are not yet due since it was filed less than 4 years ago) so the client can enforce it against Me2. As noted above, the patent should be amended so that it is valid.

In view of the urgency, the client should sue Me2 seeking an interim injunction to prevent them from installing their system in Mains Town, with an application to amend the patent under s75. (Amendment under s27 is not appropriate since Me2 would be able to oppose the amendment and delay infringement proceedings).

OR: In view of the urgency, the client should sue Me2 for infringement of claim 5 seeking an interim injunction to prevent them from installing their system with square cables in Mains Town, with an application to amend the patent under s75. (Amendment under s27 is not appropriate since Me2 would be able to oppose the amendment and delay infringement proceedings).

Whether the court will grant an interim injunction depends on the balance of convenience, in particular whether damages would be an adequate remedy or not. A single installation of Me2's system in Mains Town would likely be adequately compensated by damages. However, the ability of

Me2 to tender for upcoming contracts could result in substantial lost sales for the client, for which damages might not be an adequate remedy.

Following a successful infringement action, the client would be able to obtain a final injunction which would prevent Me2 from offering their system thereafter. The client would also be able to obtain damages or an account of profits for previous sales, including Me2's sale to Mains Town if this cannot be prevented by an interim injunction.

OR: Following a successful infringement action, the client would be able to obtain a final injunction which would prevent Me2 from offering their system with square cables thereafter. The client would also be able to obtain damages or an account of profits for previous sales, including Me2's sale to Mains Town if this cannot be prevented by an interim injunction.

Whilst it would be possible to offer a license to Me2, this would not achieve the client's objectives of preventing Me2 from offering their system to Mains Town and in upcoming contracts.

Me2 intend to start a claim for threats (s70) resulting from the client's letters to Me2 and Mains Town (page 2, lines 30-34). The client's letter to Me2 is not actionable since they are manufacturers of the system, and likely also manufacturers or importers of the cable (this should be checked).

Mains Town is not a manufacturer or importer, so the client's letter to Mains Town could be an actionable threat. Me2 would be an aggrieved person if they suffer a loss as a result of the client's letter to Mains Town, in particular if Mains Town withdraw the award of the contract. Thus, the threat is actionable by Me2. However, since claims 4 and 5 are valid and likely infringed, the threat is likely to be justified in which case the client would not be liable.

We should check whether Cables n Threads have any patents that could cover the cable of claim 5.