Discipline Committee of the

Association of Professional Engineers of the Province of Prince Edward Island

Between

Association of Professional Engineers of the Province of Prince Edward Island ("Association")

And

Andrew Walsh ("Member")

DECISION

Appearances:

Gordon MacKay, KC, for the Association
Jacob Ezeard, for the Member Andrew Walsh, P.Eng.

Place and date of hearing	Charlottetown, PEI	September 25, 2024
	Charlottetown, PEI	November 25 – 27, 2024
Place and date of written decision	Charlottetown, PEI	February 13, 2025

DISCIPLINE COMMITTEE:
Hon. David H Jenkins, Chair
Marianne LeBlanc, P.Eng.
Kent Nicholson, P.Eng.
Dr. Amy Hsiao, FEC, P.Eng.
Adam MacKenzie, P.Eng.
Mark Sherren, FEC, P.Eng.

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Introduction

This is the decision of the Discipline Committee.

The Act Enforcement Committee ("AEC") investigated a complaint of professional misconduct and incompetence, and then referred the matter to the Discipline Committee.

The Discipline Committee conducted an oral hearing, pursuant to the ***Engineering Profession Act*** *("Act")*. The Association and the Member presented evidence and made submissions.

The Complaint

The AEC investigation was prompted by a complaint made to the Association by [redacted] (the "Complainant"). The hearing was commenced by the Act Enforcement Officer laying a complaint, as set out in the AEC's Notice of Hearing.

The Association alleges that the Member, while practising engineering in this Province, engaged in conduct that failed to maintain the standards of the practice of engineering as defined in the Act. The impugned conduct is alleged to have occurred in 2023 between March 1 and October 30 at the property of [redacted], located on the Fort Augustus Road [redacted]. The Notice of Hearing states these particulars of professional misconduct and incompetence:

<u>Professional Misconduct</u>

(i) Engaging in conduct contrary to Article 13 of the Bylaws and Code of Ethics of the Association, in that the Member failed to conduct his practice of engineering and relationship with his clients, the Complainant, in accordance with the Code of Ethics

section 14.4.11 thereof in that he undertook the design of a structural racking system to support solar panels on a ground mounted solar array located at the property of the Complainant which professional services he was not competent to perform by virtue of his training and experience.

Incompetence

(ii) The member displayed in his design of a racking system intended to support a ground mounted solar array at the property of the Complainant a lack of knowledge, skill, or judgment in the design of the said racking system of such an extent as to demonstrate unfitness to carry out the responsibilities of a professional engineer.

The Notice of Hearing further states that the purpose of the hearing is to determine whether the Member committed an act of professional misconduct defined under the Act and Bylaws and failed to comply with the Code of Ethics, and further whether this conduct constitutes incompetence with respect to the design and installation of a racking system for a ground mounted solar array at the property of the Complainant.

[redacted] testified on direct examination and cross- examination, and the complaint is in evidence. The categories of his complaint are:

1. Schedule was not followed;

2. Poor build (six components):

(i) the grade of the site was not factored properly when the engineering was carried out;
(ii) the aluminum horizontals were cut too short during the build;
(iii) the system is too low to the ground, there is not enough clearance, making it problematic for snow;
(iv) (stated to be the main concern), deflection of the horizontals, which is not compliant with building standards;
(v) electrical problems;
(vi) poor fit and finish:

3. The system, being underbuilt, is not strong enough to support its own weight;

4. It is not structurally sound;

5. It doesn't look straight and tidy; and

6. Piles are misaligned.

During its summation in the hearing, the Association confirmed it is not pursuing the particulars of the Complaint with respect to the schedule, the treatment of the client, or the matter of not stamping the engineering drawings, with the provision that any evidence regarding those matters remains in the record as context for Committee consideration of the categories of complaint that the Association is pursuing.

Scope of Discipline Committee inquiry

According to the Association, the Complaint involves professional misconduct and incompetence, regarding the design of the racking system for the solar array for [redacted]. The Association bases its case on the expectations of a professional engineer set out in the Act and in the Bylaws and Code of Ethics made under the Act. It advances [redacted] evidence that the solar panel array structure that the Member designed for him was essentially not fit for its purpose, was inadequately designed and poorly built, was not completed by the agreed schedule, and has already sustained visible structural damage as a consequence.

The Association asserts the evidence demonstrates both professional misconduct and incompetence in both design and implementation. The Association submits design and implementation are intertwined, both being within the rubric of engineering services. The Member held himself out as providing an engineering service that would provide the client/customer with the complete solar array ground structure project.

The Association refers to the definition of "professional engineering" in s.1(s) of the Act. Engineering services include: consultation; investigation; instruction; evaluation; planning; design; inspection; management; research; development; and implementation of engineering works and systems.

The Association submits that the professional misconduct in this case includes incompetence, and that in his design of the racking system that was to support a ground mounted solar array the Member displayed a lack of knowledge, skill or judgment.

The **Act** states at s.13(1) that members shall conduct themselves in accordance with the Code of Ethics for Engineers, and without restricting the meaning of professional misconduct, any breach of the Code of Ethics shall be deemed to be a form of professional misconduct.

Regarding standards of practice, the **Bylaws** under the Act state at s.13 that all members of the Association shall at all times conduct their practice of engineering, and their relationship with the public and clients in accordance with the Code of Ethics.

The **Code of Ethics** of the Association states at s.14.4.11: "*Engineers shall only take such work as they are competent to perform by virtue of their training and experience*".

The Association submits that by undertaking the design of a structural racking system to support solar panels on the ground mounted solar array, which professional services he was not competent to perform by virtue of his training and experience, the Member breached those provisions.

The Association submits that the Member's education and training was in mechanical engineering, not structural engineering. His experience did not include any other formal training, and none of the certificates and other evidence adduced relate to the design of a structural system. The Association further asserts that the Member did not follow his own engineering design that he developed in his "2020 drawing" (discussed subsequently) in his design and construction of the [redacted] solar array. The Association notes that the Member testified that 20-30 other projects are also not designed and constructed in accordance with his own design.

Overall, the Association alleges that the Member undertook work that he was not competent to perform; this is proven by how he performed that work; and he was not trained and did not have the requisite experience or mentorship to carry out this type of structural engineering.

The Member acknowledges the importance of maintaining the high standards of the profession required by the governing legislation. He asserts the focus should be on his qualifications to design the [redacted] solar array structure, that he is so qualified, and that the Association has not proven that he has taken on work that he is not competent to perform by virtue of his training and experience. He submits that the question for the Committee is whether his training and experience prepared him for this kind of project.

The Member asserts that the scope of the Discipline Committee jurisdiction is limited by the language in the Notice of Hearing to matters of design, and does not extend to matters of implementation; and that in any event the doctrine of procedural fairness limits the scope of inquiry to matters for which the Member received proper notice i.e. "design". The Member notes the complaint is cast in narrow terms, that the Association has cited "design" for review and scrutiny, and the Notice of Hearing, crafted by the AEC, does not give notice to the Member of a case to answer regarding the implementation aspect of the project, including any engineering work within the parameters of "implementation". Implementation is distinct from design, although there may be some overlap. Something can be designed without being installed, or installed that was designed elsewhere, but design and implementation are distinct functions. The Member submits the Committee

needs to stay within its bounds, and the bounds are formed from the precise wording of the Notice of Hearing.

The Discipline Committee accedes to the Member's submission that the scope of the Complaint to answer is "design", and we will discuss that now in the following sections.

- **Defining "Design"**

Engineering design is a structured process used by engineers to develop solutions to technical problems, or create systems, products, or structures that meet specific requirements and constraints and follows regulatory bodies, Provincial and Federal codes.

Design includes multiple phases of engineering, including but not limited to:

- Developing detailed specifications, schematics and models. Performing the technical analyses (i.e. stress; thermal; vibration; etc.) and simulations.

- Prototyping and testing, the model or prototype design needs to be validated, and performance tested against the requirements and refine the design as needed.

- Implementation and production, preparing manufacturing or construction plans and ensuring quality control and adherence to standards during production and fabrication. (If a Professional Engineer's scope of work only contains design and no construction/implementation, if engineering questions or concerns arise, it is the design engineer's responsibility and due diligence to respond and act accordingly on the items that arise – as the Professional Engineer takes responsibility for the design and its adherence to safety, functionality and applicable standards).

While installation is not a part of the engineering design per se, it is a vital component where the design is brought to life. The success of the installation often depends on the quality and thoroughness of the design and the collaboration between design engineers and installation teams, in this case, both were Mr. Walsh.

All instructions and specifications for the installation are a function of the engineering design and must be detailed enough to guide an installer without deviation or "guess work" in the instructions.

An engineering design package should be a complete package containing all the elements of a full engineering package that could be issued for construction. As well, it should be approved and stamped by a Professional Engineer. The practice of stamping is an essential

aspect of professional engineering, emphasizing the trust society places in engineers to protect public safety and welfare.

- **Procedural fairness**

We view this as a question of procedural fairness. The Act confers full jurisdiction upon the Discipline Committee to hear and decide complaints against members of professional misconduct and incompetence in their practice of engineering, which includes providing engineering services. However, due application of the doctrine of procedural fairness would confine the scope of the Discipline Committee inquiry to complaints regarding which the Member had adequate notice, being notice sufficient for him to know the case to answer and his peril by virtue of the complaint.

The allegation is that the Member failed to conduct his practice of engineering and his relationship with his client in accordance with the Code of Ethics section 14 .4.11, in that he undertook the “design” of a structural racking system that he was not competent to perform by virtue of his training and experience. The allegations of professional misconduct and incompetence as set out cite “design” – they do not say the Member professionally engineered a structure or racking system.

Respecting procedural fairness means that whenever a person's rights, privileges or interests are at stake in a legal proceeding, adjudicators have a duty to act fairly and within their confines. There is no process specifically under the Act for a member to seek clarification about the Notice of Hearing. Statutory construction suggests the legislative intention is for the Association to articulate the allegation to the Member fully, clearly and precisely so that the Member is capable of responding. Accordingly, beyond design, any other avenues of practising engineering fall outside the scope.

The Association's mandate to protect the public interest, which involves prosecuting and deterring acts of professional misconduct and incompetence, must remain in balance with the Member’s interests of being provided with a fair and transparent discipline process. Notice is an essential element. In this case, the preferred course is to apply the principle so as to hold the AEC to the allegations specified in the Notice, and to decline to permit additional allegations simply because the member may have a broad awareness of them or because they may be inferred from the particulars that were provided to him.

Decision-making process

The Association has the onus of proving a member is guilty of professional misconduct or is incompetent.

The applicable standard of proof is balance of probabilities. This is taken to import the requisite qualities of being based on evidence that is clear, cogent and convincing.

The referral of a complaint by AEC is not itself proof of professional misconduct or incompetence.

The Discipline Committee is to decide the case based only on the evidence in the hearing. The Association has the obligation of adducing all the evidence it considers to be relevant, and the Association advises it has done that. The Member presented evidence. It is for the Committee to find the facts from all the evidence, to find as a matter of fact whether the allegations set out in the Notice of Hearing have been proven on the requisite standard, such that there should be a finding of professional misconduct or incompetence.

Professional misconduct and incompetence are defined in the Act:

18. Professional Misconduct

(1) A member, licensee, engineer-in-training or a holder of a certificate of authorization may be found guilty of professional misconduct by the Discipline Committee if

(a) the member, licensee, engineer-in-training or a holder of a certificate of authorization has been found guilty of an offence which, in the opinion of the Committee, is relevant to suitability to engage in the practice of engineering; or

(b) the member, licensee, engineer-in-training or holder of a certificate of authorization has been guilty in the opinion of the Committee, of conduct that is not in the best interest of the public or tend to harm the standing of the Association.

Incompetence

(2) The Discipline Committee may find a member, licensee, or engineer-in-training incompetent if, in its opinion

(a) The member, licensee, or engineer-in-training has displayed in his professional activities a lack of knowledge, skill or judgment, or disregard for the welfare of the public of a nature or to an extent that demonstrates the member or licensee is unfit to carry out the responsibilities of a professional engineer; or

(b) [not relevant]

The Association submits that the conduct reaches the level of professional misconduct and incompetence because s.13 of the Act links to the Code of Ethics the requirement that a licensed engineer *"shall conduct themself in accordance with the code of ethics of engineers, and ... any breach of the code of ethics shall be deemed to be a form of professional misconduct"*.

The Association seeks to connect professional misconduct with incompetence. Section18(1)(b) of the Act states: *"the member ... has been guilty, in the opinion of the committee, of conduct that is not in the best interests of the public or tends to harm the standing of the Association."* The Member held himself out as a professional engineer as part of his marketing plan to attract clients such as the Complainant. The Member designed something available in the marketplace and to members of the public that has failed. It tends to lend harm to the Association when an engineer conducts himself that way. Section 18(2) (a) provides that a member may be found incompetent if, in the Committee's opinion, the Member has displayed in his professional activities a lack of knowledge, skill or judgment, or disregard for the welfare of the public of a nature or to an extent that it demonstrates the member is unfit to carry out the responsibilities of a professional engineer. The Association submits this wasn't a one-off case – that the Member used the same system -- with 3 mm aluminum in 20-30 foot lengths -- in other installations across the Island.

The previously mentioned statutory provisions in the Act, Bylaws and Code of Ethics provide contextual assistance for interpretation and application of these defined terms. Since this is the first complaint to have reached the Discipline Committee decision stage in this province, there are no local precedents. Canadian case law regarding self-regulated professions is of general, although limited, assistance. In broad terms, the case law instructs the Committee that every mistake or act constituting negligence does not necessarily amount to professional misconduct or a demonstration of incompetence. It is a question of degree as to whether a mistake or mistakes made by a professional will be of such significance as to constitute misconduct or incompetence. Whether the error is one-off or a shown to be a pattern may be of significance, especially in assessing for incompetence. The standards of a profession are an important benchmark, and a departure from those standards must be so significant that it constitutes professional negligence. (See: ***The Regulation of Professions in Canada***, James T. Casey, K.C., Carswell, at 13.7; and ***Barrington v The Institute of Chartered Accountants of Ontario***, 2011 ONCA 409 at para.122; Keith R. Hamilton, ***Self-governing Professions***, Canada Law Book, Cap.11).

The Committee has turned its mind to the appropriate test, considered the issues raised and the key evidence adduced by the parties, applied its expertise (relying on only the evidence adduced in the hearing), and seeks to articulate the path to its conclusions.

Evidence on the questions in issue

1. Training and experience

- **Jim Landrigan**

Mr. Landrigan is Executive Director and Registrar of the governing body Engineers PEI. He obtained his professional engineering designation in 1981, and has had a successful career in electrical engineering.

The Registrar administers the qualification process for new engineers and continuing qualifications. The Association actively promotes familiarity by members with the Code of Ethics. Touchstones include: 1) required acknowledgment on the application form; 2) engineer-in-training acknowledgement of the requirement to work within their area of competence; 3) Register makes presentations; 4) all members need to maintain an ongoing awareness of self-regulation; 5) candidates for designation are expected to know these requirements.

There are different kinds of engineering. Mechanical is not the same as structural. Design of the ground-mounted frame structure, in this case, falls within the scope of civil engineering. On Mr. Walsh's application, the field of “mechanical” is checked, “civil” is not. It is possible for an engineer to expand their qualifications. Engineers agree they will only take on work that they are qualified for based on their experience and training. If an engineer works outside their formal education area of expertise and gets into trouble, the engineer has an onus of proving their competence to do this kind of work.

PEI is the only jurisdiction that interviews engineers-in-training who are applying to become a Professional Engineer. The Member was interviewed at that time he received his professional designation. In the year 2021, the Member was beginning to practise outside his certification. During the qualifications interview, a discussion occurred regarding working within one’s capabilities. The Code of Ethics, s.14.4.1 requires an engineer to take on only such work as they are competent to perform by virtue of their training and experience. It is because engineers can work outside their designation, successfully, that the Association has this self-regulation process. At the forefront, it is up to the engineer to determine whether they are competent.

- **Andrew Walsh**

Andrew Walsh testified and adduced documentary evidence of his professional qualification, training and experience. He graduated in mechanical engineering in 2017. He had experience as a practicing engineer prior to becoming a professional engineer.

The design in tab 4, page 145 (subsequently referred to as the "2020 drawing") is the document that was used for the design of the structure on the [redacted] property, and also for 20-30 previous structures. The creation of a structure like this one is the practice of engineering.

Mr. Walsh canvassed his logs to demonstrate his experience in structural design, and he provided this extensive documentation for Committee review.

He explained how he came into the business of supplying ground-mounted solar powered systems following his development of a system for himself on his own rural property. He indicated that he took short courses in cube installer training, Canadian Solar Institute, and off-grid solar training. He successfully completed his national professional practice exam in February 2020, and received his professional designation on June 11, 2021.

Mr. Walsh acknowledged awareness of the limitation stated in section 14.4.1 of the Code of Ethics, and of the concomitant burden resting with the professional engineer. He expressed confidence, absolute confidence, in his competence to design these structures, and that he had all necessary training and experience. He advised that, *"Given all the things that I've done, all these structural elements, all these things that I've built, I feel extremely competent to design a solar frame or light structural work. I know solar just as well as I know the structural members. I used a very sophisticated tool that's very expensive and I know every square millimetre of how that frame reacts because I've literally had that computer do a million calculations over this frame. I know where every weak point is, where every strong point is, where stresses and strains, all three basic stresses throughout the entire thing, every joint, so, frankly, I feel a little insulted that I'm kind of here."* When asked if there was anything else he would like to share in relation to his training, he advised *"I think all my work experience speaks for itself in this matter. I would never take on a project that I wasn't comfortable doing. That is completely irresponsible."*

He advised his objective for this kind of work has been to benefit the local economy by keeping the money on the Island. He developed the frame design in 2019, and published it in 2020. That was the basis design for all 20-30 racking frames he has sold. All of these systems stem from the original 2020 drawing.

When asked, he responded: guaranteed he would have done a wind load analysis. There are several solar frames across the Island today that serve as physical proof that his calculations work, and they do work. Regarding system height, the system is kept low to avoid torque, and this reduces the risk of overturn and provides better strength. Although shoveling snow is a valid concern.

2. The work

- [redacted]

[redacted] made the Complaint, which is in evidence. He saw the Member's advertisement on Facebook. Mr. Walsh was to be the designer, installer, everything, and he billed himself out as an engineer who did all those applications. [redacted] specified his requirements of a safe and strong system. The written contract could not be found, and was not in evidence.

As to the complaint of poor build, he complained that Mr. Walsh did not properly set the orientation of the site slope; the horizontal panels were short, being 10 feet, one 1/2 inches instead of 10 foot, 3 inches, with the external panels barely hanging on to the end. When he brought to Mr. Walsh's attention that it did not look right, Mr. Walsh responded that 'we're' going to have to address that in the future. [redacted] says the material used in the framing was insufficient, being unable to support itself, and failed as a result. As an illustration, he showed a video of the effect of wind on the solar panels. This appeared to show the aluminum frame at the point of connection to one of the middle screw pile supports that was oscillating vertically. He wondered how many repetitions the panels could take, this created uncertainty for him given an intended 20-year lifespan. [redacted] believed that since the engineer and installer was the same person, it should have been clear to Mr. Walsh how to deal with deflection.On cross-examination, [redacted] advised that he measured a 2-inch deflection in the solar panels. In response, Mr. Walsh told him he was not qualified to make the assessment, and so he filed a complaint with the Association.

The Complainant also raised concerns about the coiled electrical wiring, stating that Mr. Walsh was causing them to kink as it was unrolled. In an effort to ameliorate the installation, Mr. Walsh came up with a solution that involved 2 x 2 tubes. The disagreement between the parties centered around who was responsible for paying for these additional costs. This led to the exchange of threatening letters from lawyers. [redacted] stance was that he would pay if the system was fixed, but not otherwise.

- **Andrew Walsh**

On February 26th, the AEC notified the Member of the Complaint and asked him to respond. Mr. Walsh responded on February 28th. The response is in evidence. In summary:

- The substantive report is preceded by an observation that the Complainant suffers from severe anxiety, and if he cannot get his way, he becomes irrational and confrontational, which led to incidents and complaints.
- The design is based on frame system designed in 2019. A prototype was made. A lot of testing was carried out to make sure it was structurally sound before he started installing them for anyone. The same design has been used for several years, and this is served well through the experience of some of the most ferocious storms in PEI's history. The Member created the design and stands behind it as proven.
- The report contains the plans, drawings and structural simulation, including the Autodesk calculations, for the frame in question. The report includes technical details and attempts to address the various complaints.
- The complaint about schedule is a bit surprising, as the timeline for the project went well, all things considered.
- Foundation and soil compaction: the soil was compacted before installation of the screw piles. Hand compaction was used to compress the soil. Settlement of the screws was verified by checking and measuring the deflection under the impact testing after installation (as per manufacturer's recommended installation instructions). Specifications noted and technical report included.
- Bearing surfaces: [redacted] is partially correct, in that the design was made so that two cross members could be created from exactly one length, by cutting the members at 45° at the end. Specification of the surface area of contact is sufficient; the joint does not affect the force of friction holding it together. Using the material more effectively in that way saved the client approximately $2,800.
- System height: The array was intentionally kept low to reduce torque, enhancing its resilience during storms. This design choice does come with a trade-off for snow removal, as most clients don't clear snow from the panels. Also, it is often noted that solar energy collection is minimal during the winter months. Snow load and deflection: the Code does not specify as to flexion; it focuses more on strength, stability, durability, fatigue and serviceability. Best practice was followed, allowing for 1/2 inch of deflection. Simulations were performed and show that the deflection at the point in question should be 1/8 inch, within the permitted range.
- Electrical: The wire used was suitable, consisting of insulated woven wire covered with a sheathing, followed by a thermoplastic covering around all the wires. This was

then protected by a layer of spiral steel, with an additional thermoplastic layer enclosing it. The method of wire installation was also appropriate.

- Client relations: Under the standard contract applied in this case, the client is required to approve the drawings for the location, frame design, and inverter placement. Any changes must be agreed upon in writing. Additionally, the Member provides a warranty on all work performed and assumes full responsibility in the unlikely event of any issues. In this case, the client sought additional services at the Member's expense, requested a refund, and rejected the resolution offers made.

Mr. Walsh produced a report: ***Technical Report: Structural Integrity of Solar Frame-Post-Hurricane Fiona,*** undated [index tab 9 – titled structural integrity report from Andrew Walsh on July 16th]. His purpose was to *"prove beyond reasonable doubt"* that the solar frame under investigation is well designed for PEI's climate. The report documents and analyzes the real-world performance of a frame comparable structure at Goose River, which was subjected to extreme conditions during hurricane Fiona. The report contains some documentation of the frame performance. The Walsh report concludes the solar frame at Goose River demonstrated exceptional performance and resilience in the face of PEI's harshest weather conditions. The inspection reported that the frame remained structurally sound, with no significant damage or displacement, confirming the robustness of the design. Public safety is paramount in all design decisions. The frame is designed with a deliberate point of failure to reduce damage and enhance safety during extreme wind conditions. The report concludes that there is clear evidence that the solar frame is a reliable choice, has proven its ability to withstand significant snowfall and resist corrosion in a coastal environment. Regular maintenance, such as updating protective coatings on screw piles, will ensure its longevity and continued performance. The report concludes that it provides clear evidence that the solar frame is a reliable and safe choice for solar installations in extreme climates, capable of and enduring the worst storms and winters PEI has to offer.

- **Kerry Taylor**

Kerry Taylor, FEC, P.Eng. is Chair of the AEC. He received his accreditation 40 years ago as civil engineer and has worked most of his career in design engineering and project management. Structural is one of the main parts of civil engineering. The AEC screens complaints to determine whether the complaint is warranted as a real complaint to answer for breach of ethics or of management services. The core idea is that professional engineers are held to a higher standard, ensuring that the public can trust the engineering work to be carried out with professionalism and expertise.

The AEC reviewed the Member's response in detail. In their view, the response contained very little site- specific information; the EMS documents were not site specific, appearing to be technical information out of a sales package; the drawings did not meet the Association standards - were not sealed, were dated before Mr. Walsh was accredited, and before Mr. Walsh was retained for this project.

The Member was responsible for the engineering drawing and the installation.

Taylor found the Member's comments on the health and disposition of the client concerning.

Taylor went to see the property and met with the Complainant. From his site visitation and windshield observation of other structures, Taylor referred to the structure as *"flimsy"* compared to others. He could see deflection.

AEC looks for ways to resolve complaint issues. In this case, its view was the Member was working outside his area of expertise. The AEC determined that an independent engineering assessment was required to provide an opinion on whether the solar installation provided by the Member met applicable design principles, codes and standards that should be followed by a professional engineer. These include but are not limited to structural, site planning and electrical. The AEC retained Coles Associates consulting engineers to provide an independent report.

The Coles Associates investigation included a review of the complaint and associated documentation, the information provided by the Member, and a review by an independent engineering assessment of the solar array structure. On July 22nd, the AEC made a decision by which they determined that during March 2024 the Member was actively maintaining a social media presence indicating he was an engineer and associated with Walsh Consulting and Drafting and was actively involved in the design and installation of solar arrays; and also that the Member's response to the Complaint did not include the stamped drawing but did include a lengthy response about the durability of his solar installations and warranty, etc. as well as selected design calculations. The conclusions and recommendations contained in the independent report indicate a number of deficiencies in the design and construction of the solar array provided by Mr. Walsh.

At this point, the AEC recommended to Council that the Complaint be referred to the discipline committee.

- **Nazmi Lawen**

Nazmi Lawen, FEC, M.A.Sc., P.Eng., PE, IntPE is a principal and director of civil and structural engineering with Coles Associates. The AEC retained Lawen to provide an independent report regarding the Complaint. Lawen was accepted as an expert, to provide

opinion evidence on structural design. He produced a report on July 11th. Later, the Member challenged the calculations that provided the basis for this report. As a result, Lawen made corrections and produced a revised/substitute report within the hearing.

The scope of the assessment was to inspect the as-built solar array, record its layout and supporting structural components, review site conditions, review applicable codes and standards and other relevant information, to allow for an opinion on the adequacy of the system.

Lawen testified that forensic engineering involves looking for the cause of a failure in structural design; and that he has carried out 400 - 500 assignments over time, including approximately six assessments of ground mounted solar arrays; and as required for integrity, this report is independent.

Lawen visited the site, met with [redacted] conducted research and wrote a report. Both the initial and revised reports are in evidence. Lawen referred to the National Building Code of Canada (2015 revision). He took measurements and put his results into a computer model.

In Lawen's opinion, confirmation that the solar array was installed per the original design drawings and specifications (either by the designer themselves or by using a delegate) is typically part of the design process. In this instance, the Member held himself out as providing both design and installation services. In his opinion, once a Professional Engineer involves himself, he is responsible – 100% - for the design.

In his initial report, Lawen advised:

- Several members failed, and there was deflection;
- On deflection, Lawen was surprised that the members in the racks were relatively smaller than those typically seen in the field. Nevertheless, he continued his calculations with an open mind;
- Client complained about vibration that could be observed even on a calm day;
- Client complained of non-compliance. The minimum dimensions were not compliant; as well as the engineer would be required to inspect and certify compliance with the National Building Code;
- After installation was completed, [redacted] became concerned about the adequacy of the design and construction of the racking structural components including the foundation;
- Lawen's computer modelling revealed that the aluminum members forming the solar panel racking system do not meet the strength or slenderness requirements to support the array at this location.

Walsh's intervention (tab 15) highlighted several issues, including inaccurate dimensions in structural calculations, lack of original design documents, misinterpretation of installation requirements, and problems with the conclusions and recommendations. According to Mr. Walsh, the report contained multiple factual errors, speculative conclusions, and inaccurate and incorrect assumptions, failure to account for critical factors such as proper material grades and joint offsets, which led to flawed structural analysis. Mr. Walsh submits these issues render the conclusions and recommendations unreliable.

Lawen's revised report (tab 20) does not contain a new set of catalogued conclusions and recommendations. In his evidence he explained that he performed further calculations using the revised measurements. Although fewer members were then shown as "failure", in his opinion the overall system still failed. He maintained his conclusions regarding racking, foundation, vibration, proximity of the solar panels to ground level. He recommended:

1) All components of the racking system should be removed and replaced with larger sections that have a higher capacity to withstand weather-resistant design loads. The racking system and foundation should be designed to meet the specific conditions of the subject site;

2) All helical piles should be removed and replaced. The piles should be driven into in-situ soil or well compacted fill. The piles should be field-tested to ensure they are capable of resisting design upward, downward, and lateral forces.

Lawen had never seen a solar array so close to the ground. The concern is snow sliding off the smooth surface. The apparent solution is to keep the solar panels at least 2 feet above ground, which also allows for the wind tolerance.

He found the vibration is excessive. In his opinion, this could be related to the small size of the aluminum racking system, which lacks sufficient strength. This can lead to wind-based system failure.

Following the revised calculations and report, Lawen maintained his opinion that it is fair to say this solar array system is not properly designed. The structure is not designed to withstand the environmental conditions and loadings at the site.

- **Casey Polonio**

Casey Polonio, P.Eng. obtained his professional engineering designation as a mechanical engineer in 2021. He provided an independent report: **Engineering report on a solar panel**

frame in Atlantic Canada. The report is in the evidence, and Mr. Polonio testified. He was accepted as qualified to give opinion evidence in structural engineering.

Mr. Polonio received a copy of the 2020 drawing from the Member and created a digital twin. He did not carry out a site visit. The National Building Code ensures structures are built to be safe. His opinion was that the design overall was what a reasonable or competent engineer would design, depending on environmental factors – wind, snow, and those things that are recommended from a customer point of view. Design is for strength.

With assistance on simulations from Darrell Young, P.Eng., Polonio produced the digital twin 3D model and analyzed the model using professional civil and structural software. His investigation refers to and incorporates the National Building Code of Canada. The Code provisions for wind and snow loads are particularly crucial for Charlottetown and area due to coastal location which exposes the Island to strong winds year-round and significant snowfall in winter. The Code regional specificity ensures that structures are designed to withstand the unique combination of these loads throughout the year and provides a safety margin for extreme weather events that may exceed average conditions.

His report contains technical analysis of load conditions, combined load analysis and material properties in cross-sections, and deflection analysis. In his opinion, based on his analysis from the model drawing, the frame is structurally sound in design, but there are a few recommendations that could further address aesthetics and challenges during construction. These include: 1) increasing the size of the aluminum tube (increasing cross-sectional area, for increased strength; 2) adding additional diagonal bracing to improve load distribution. 3) recommending periodic maintenance and inspections.

On cross-examination, Mr. Polonio acknowledged that in preparing his independent report he assumed that the framing shown in the 2020 drawing model was used. Upon Association counsel informing him that it had been established in the hearing evidence that although the 2020 drawing indicated member thickness of 6.35 mm, the actual thickness of installed members are 3 mm, Mr. Polonio indicated that such a reduction in thickness of the members would be significant. He added that this would obviously make a big difference because thinner material is typically not as strong. As to the 45° cut and bolt, Mr. Polonio accounted for a firm and rigid connection. Although it's preferable to be farther from the edge, this width is adequate to prevent ripping and tearing, as there is still enough material beneath the washer.

In response to waves in the panels, they bend without breaking. His recommendation regarding aesthetics in the 2020 drawing suggests that while the system will not fail, it may not have the most visually appealing appearance.

Discussion, analysis and findings

- **Structural design**

The engineering plan on which the solar array ground structure is based is the document produced by the Member, shown at Tab 4 page 145, "***Walsh Consulting and Drafting ... Engineering/Structural, Structural Overview ... 2020*** (the "2020 Drawing"). The built structure is shown in the video produced by [redacted] that shows the solar array vibrating in the wind (with a cat in the picture).

The Member testified as to how he generated the design for the structure, in the 2020 drawing, and for the built structure. He explained the design in the 2020 drawing is not what he actually uses. Variations between the 2020 drawing and the built structure include 1) the tubular framing material being cut on a 45° angle and bolted through one side only of the square aluminum tubing, and 2) tubing thickness of 3 mm in width as opposed to 6.35 mm shown on the 2020 drawing.

The Member testified that he has designed and installed 20-30 rack structures across the Island that are based on the 2020 drawing. He defends the propriety of his work based on the fact that the Complainant has made the only complaint to the Association.

Lawen and Polonio were both accepted as experts qualified to give opinion evidence on structural design.

The independent engineering report and opinion evidence of Nazmi Lawen, FEC, P.Eng. holds that the design of the racking system and structure is deficient. In his opinion, it was improperly designed and built, failed in its modeling to withstand the loads that it would be subjected to, did not meet allowable strength and slenderness and the diameter-distance ratio, and did not meet edge distance requirements specified in the applicable standards of the ***National Building Code***.

Lawen also questioned whether the foundation was properly installed, but he did not have an opportunity to inspect the foundation installation. He did not mechanically record the vibration, although upon witnessing [redacted] push on the structure the structure appeared to him to be undersized. The primary factor being rocking frame members with inherently low stiffness causing excessive vibration. In his opinion, this could result in a complete collapse of the racking system. He also believes that the proximity of the panels to the ground is unsuitable.

The expert witness called by the Member, Casey Polonio, P.Eng. viewed the structure shown in the 2020 drawing upon which the design of the structure was based; however, he did not view the structure's *"as-built drawing"*. For his opinion, he assumed that 6.35 mm thick tubing was used instead of the 3 mm tubing (which the [redacted] structure was actually constructed from). He concluded that while the racking system and structure in the 2020 drawing were structurally sound, he would have approached it differently for both aesthetics and strength. He also provided several recommendations.

Kerry Taylor, FEC, P.Eng. visited the site, met with the Complainant, and observed the built structure during the AEC investigation. He described it as flimsy compared to installations around the Island (comparators viewed from a car window) and appearing to have been not robustly made. His evidence is qualified by his acknowledgment that his conclusion was to a significant extent influenced by the Lawen independent engineering report that was later shown by the Member to have been compromised by calculation errors. The Discipline Committee's assessment of Taylor's evidence overall is that it remains substantially reliable.

We find that the structure as built is burdened by problems stemming from design. The Complainant's concerns and observations regarding deficiencies are corroborated by evidence of both expert witnesses and Mr. Taylor.

The evidence demonstrates to us that the built structure is already failing; deflection on the panels is evident. In Lawen's opinion, this could lead to problems with the solar panels, such as cracking, microcracking, reduction in efficiency, and perhaps the total failure of the solar panels to be able to generate electricity.

We also note these related concerns raised in the evidence:

- the bolted connections were not constructed as per the design. The 20-foot-long members were cut at 45º angle. This was done to maximize use of the 20-foot length. The result is that the fastener connects on only one side rather than both sides of the member.
- the member had a lay person, with no identifiable qualifications, "approve" his engineering drawing; this practice is unacceptable and unprofessional.

In our assessment, the evidence clearly supports the above findings. The solar array racking structure is compromised by material deficiencies that are directly traceable to the engineering design. We have outlined the specifics of these issues. Ultimately, the system has failed.

- **Potential for conflict of interest**

The Committee observes that the range of service that the Member provides to the public may be a contributing factor to potential conflict of interest. Engineering design and sales and installation are distinct functions. While it is permissible to offer all the services, offering them in tandem in this instance may introduce a misalignment of interests.

The By-Laws and Code of Ethics for the Association state in s14.4.10 that, *"Engineers will promptly disclose to clients or employers any interest in a business which may compete with or affect the business of the client or employer. They will not allow an interest in any business to affect their decisions regarding engineering work for which they are employed, or which they may be called upon to perform."*

In the scenario before the Discipline Committee, a Professional Engineer, the Member, is providing both the design services for the ground mounted solar panel array and also the installation services as installation contractor for the same solar panel array.

This sets up the scenario contemplated by s.14.4.10 because a situation where the responsibilities and obligations of the Member as a Professional Engineer to, "*..not allow an interest in any business to affect their decisions regarding engineering work for which they are employed, or which they may be called upon to perform"* can potentially lead to a conflict of interest because his financial interests with respect to his business may cause him to make different decisions then he might otherwise, acting solely as a Professional Engineer. It is Mr. Walsh's financial interest in the project as the business owner that potentially puts him in this conflict-of-interest position.

- Design decisions impacted by personal financial interest

A number of design decisions made on this project were questioned by both expert witnesses, Nazmi Lawen, FEC, P.Eng. commissioned by the AEC to review the Member's design, and Casey Polonio, P.Eng. commissioned by the Member.

Regarding the rackings, Mr. Lawen noted in his report (Tab 8, Page 20) these deficiencies:

2. *All the beams supporting the solar array (Aluminum HSS 1 ½" x 1 ½" x ¼") failed for all load combinations between 1.28 and 5.28 as a multiplier of allowable.*
3. *All rails and bracing sections (Aluminum HSS 1 ½" x 1 ½" x ¼") do not meet minimum allowable strength and slenderness ratio.*
4. *All bolted connections do not meet the minimum edge distance requirements as specified in applicable standards.*

This report was subsequently revised in Tab 20 and fewer aluminum members in fact failed, but Mr. Lawen stood by his assessment that poor engineering decisions were made that affected the final product and its fit for purpose.

Mr. Polonio recommended in his report (Tab 13, Page 7) that:

- *Redesign for double shear and 2 bolts in each member being attached. The current twisted plate and fastener arrangement for the braces is likely to result in a pinned sort of connection, rather than being a rigid connection as intended.*

- *The bolted connections that pass completely through two frames are well designed. That aside, the connection points that do not fully crossover or overlap should have been constructed as per the design, where the contact patch between members is not compromised.*

The design decision to cut the 20-foot lengths of aluminum structural tubing at 45-degree angles at each end resulted in very little area of contact between bolted members, and also resulted in bolt holes not meeting minimum edge distance requirements per Sections 16.2.3.9 and 16.2.3.10 of CSA S157-17 Aluminum Member Design, but in doing so, Mr. Walsh saved money on the quantity of aluminum tubing required to be purchased. This decision either resulted in Mr. Walsh being able to offer a less expensive installation for [redacted] or in Mr. Walsh being able to make a larger profit margin (or smaller loss) on the project by reducing his out-of-pocket materials costs.

Likewise, a decision to choose 3 mm think aluminum structural tubing versus 6 mm thick aluminum structural tubing also reduced costs for Mr. Walsh on the project. However, the 3 mm thick aluminum structural tubing was found to fail on both strength and deflection requirements by Mr. Lawen's revised model (Tab 20). Also, Mr. Polonio acknowledged in his oral testimony that the strength and deflection requirements of NBCC and CSA S157-17 within his model would also have failed if 3 mm thick tubing (as was installed on [redacted] solar array) had been used in his model.

➢ **Foundation design & geotechnical design considerations**

There were decisions made regarding the foundation design of the solar panel array frame that reflect poor engineering judgment. The location for the solar frame was selected in an area where the ground was not substantially level. [redacted] offered to bring in some "soil" to build-up the ground at one end of the proposed installation location to provide a level pad. [redacted] testified that he provided the soil and built-up a 3- to 4-foot-thick layer of soil that he compacted by running his tractor wheels back and forth over the soil. [redacted] indicated that there was no compaction test performed on the soil after it had been installed.

Proper practice would have involved seeking advice from an engineer who had competence in geotechnical design and implementation, who would have provided advice on such things as: proper design/composition of structural fill material; proper specification of structural fill in defined lift thicknesses with compaction between each lift with vibratory roller; choice of proper compaction testing methods and required results; and proper design depth of helical anchor design.

The drawing in Tab 4 (Page 14) shows that the Pylex screw piles were only 50 inches long (4 feet-2 inches). We also know that the poorly compacted soil that these screw piles were installed into was 3 to 4 feet thick at one end of the solar array frame; so that the piles would have very little insertion into the in-situ (or undisturbed) soil. Finally, having the design such that the screw piles installed with the majority of their length in mounded soil that did not incorporate any styrofoam insulation board and was soil that was exposed to freezing temperatures on four sides, would likely have exposed the screw piles to frost heave issues.

Instead, it can be inferred that money was saved on the project by not acquiring proper geotechnical design help and by allowing [redacted] (who did not know any better) to supply the soil and install it with improper installation methods. [redacted] having installed the soil does not discharge Mr. Walsh's obligation as a Professional Engineer to ensure that the design of the foundation/soil/piles was properly done and that the soils would support the solar frame designed by Mr. Walsh.

- **Training and experience**

The evidence of Executive Director Landrigan in relation to adequacy of training and experience is essentially that the first stage of assessing one's competence comes from the engineer personally. If an engineer feels competent to perform the task, the Act allows the engineer to expand beyond their educational discipline, in this case mechanical engineering to structural engineering. Landrigan testified to relevant factors the Association would consider important in assessing whether one can become competent in a discipline in which they perhaps weren't initially formally trained. Landrigan gave four specific factors: experience, professional development and training, additional courses or training after graduation, and the quality of previous projects in the expanded field of discipline.

The Member testified about his successful admission to the Association and his more than nine years of experience designing structures, using finite element analysis, and working on a variety of projects, including conveyors, walkways, and hot dog hydraulic dumpers. His experience spans multiple companies, such as Charlottetown Metal Products, Eastern Fabricators, Advanced Extraction Systems, and his own practice. The Member spoke to having 20 to 30 complaint-free systems similar to the solar system in question operating across the Island, including his own off-grid system for four years

In all the Member's experience designing structures presented, only the experience designing and installing solar systems involved geotechnical considerations, however the Member did not indicate any mentorship or training during this period. This led the Committee to discern the Member had little expertise in this particular field.

The Member was initially trained in mechanical engineering and not formally trained in structural engineering. He used his designation to advertise and market his expertise and to differentiate himself from others who might be involved in supplying solar array systems to the public.

As to professional misconduct, we cannot accept counsel's submission that by virtue of training and experience the Member was competent to undertake the design of the racking system. The Association has demonstrated the contrary.

- **Further observations**

The Committee is concerned by an apparent lack of introspection by the Member. In the face of compelling evidence of material problems with the structure that originated with the engineering design, the Member continued to maintain the proprietary of the design; and offered that he is insulted that his peers in the AEC referred the Complaint to the Discipline Committee. He surmised that absent of the faulty Lawen independent engineering report, the AEC would not have referred the Complaint to the Committee. Fortunately, the Member identified this issue and Lawen provided a revised report based on correct calculations and testified in direct and cross-examination. The Committee would not, and need not, speculate whether the AEC would have pursued the Complaint with the revised and corrected Lawen report on hand.

Substandard work for clients erodes public confidence in the engineering profession by undermining trust in the quality and reliability of engineering services. When projects are poorly executed, whether through faulty design, inadequate materials, or negligent construction, it can lead to safety risks, financial losses, and failures that directly impact the public and clients. As these failures become more visible, the perception of Engineering as a competent and responsible field is compromised. Over time, this can result in a broader loss of credibility and confidence in engineers' ability to safeguard public welfare and deliver projects that meet necessary standards. Public trust is essential for the continued success and integrity of the profession.

Engineers must review their design work to ensure it meets safety, performance, and reliability standards. This includes verifying calculations, cross-checking assumptions, and ensuring materials and methods are appropriate for the project. Engineers must also account for external factors, like environmental conditions, that could impact performance.

Reviewing work prevents errors that could lead to failures, safety hazards, or financial losses on the project. Engineers must also ensure compliance with codes, regulations, and

industry best practices. Their design responsibility extends to overseeing implementation during construction and ensuring ongoing maintenance and functionality.

An engineer's responsibility to review their work extends beyond the design phase. They must be diligent in overseeing the implementation of their design during construction or installation, so as to make adjustments as necessary to address unforeseen challenges. This feedback loop (with quality control checks) ensures that the installation was completed in accordance with the original intent of the design and is an integral and important step in the design process, without which the general public can be exposed to unnecessary safety risks.

This duty protects public health, safety, and welfare. Inadequate review can result in harm, negative financial impacts, and damage to the engineering profession's reputation. Continuous vigilance is crucial for delivering safe, effective solutions.

In our opinion, the actions of the Member in designing the faulty structure is an offence that is relevant to suitability to engage in that aspect or field of the practice of engineering. It is also our opinion that this conduct is not in the best interest of the public.

Given the Member's limited training and experience in structural design, our intervention is necessary to protect the welfare of the public.

As to incompetence, in our interpretation of s.18(2)(a) of the Act, we view the purpose of maintaining a fair balance between the objectives of protecting the welfare of the public and the professional status of the engineer would be to require proof of *"lack of knowledge, skill or judgment" "to an extent that demonstrates the member is unfit to carry out the responsibilities of a professional engineer"*. The engineering design of the racking system does show a lack of knowledge, skill or judgment. However, in our opinion the nature or extent is not of sufficient degree to demonstrate the Member is unfit to carry out the responsibilities of a professional engineer. It is a question of degree as to whether a mistake made by a professional will be of such significance as to constitute incompetence. The evidence does not reveal a pattern of faulty designs, habitual carelessness, intentional disregard for safety or of clients' interests, a significant absence of requisite experience, or a prolonged history of poor designs due to poor knowledge or judgement.

The AEC acknowledges proportionality should apply. The Member is not a "villain", and this complaint process has been difficult for him, as it would be for any professional called before his peers to defend his actions and competence or breach of a code of ethics. Nonetheless, the Association urges that the evidence shows that the Member was familiar

with the Act, Bylaws and Code of Ethics. When a professional engineer breaches those duties and his practice falls short of the prescribed standards of practice, the member has to respond and react as a professional. An effective discipline process is required as part of fulfillment of the Association's efforts to ensure the public is protected.

Conclusion

- Professional misconduct

The Committee unanimously finds that the Member is guilty of professional misconduct as set out in the Notice of Hearing and defined in s. 18 (1)(b) of the Act.

In the opinion of the Committee, the Member has carried out conduct that is not in the best interest of the public. The Association has proven on the requisite standard of the balance of probabilities that the Member has taken on work, namely design of the solar array structural racking system to support solar panels on a ground mounted solar array on the [redacted] property, that he is not competent to perform by virtue of his training and experience.

The Association has a duty to regulate the engineering profession in this Province. This duty includes informing the public of the proficiency and competency of professional engineers in the practice of professional engineering. All members of the Association have a corresponding duty at all times to conduct their practice of engineering, including their relationship with members of the public and clients, in accordance with the Code of Ethics, which requires engineers to only take on such work as they are competent to perform by virtue of their training and experience.

- Incompetence

The majority of the Committee finds, and thus the decision of the Committee is, that the Association’s allegation of incompetence, as set out in the Notice of Hearing and in s. 18(2)(a) of the Act, is not proven. While lack of requisite competence is an ingredient of the Committee finding of professional misconduct above, and while the Member has displayed in his professional activities a lack of knowledge, skill or judgment, or disregard for the welfare of the public, in our opinion the demonstrated lack of knowledge, skill or judgment is not of a sufficient degree or extent to reach the threshold of demonstrating the Member is unfit to carry out the responsibilities of a professional engineer. Accordingly, the Committee dismisses the charge of incompetence.

Penalties for professional misconduct

Having found the Member guilty of professional misconduct, the Committee orders the following penalties, with the approach to facilitate remediation and improvement such that the member, Andrew Walsh, continues the development and growth of his technical experience, skills, knowledge, proficiencies and professionalism.

As such, the penalties include all of the following:

1. Per Engineering Act s.20 (2) (d), completion of the following self-directed short courses offered free online by the *Engineers and Geoscientists of British Columbia Knowledge Centre* (or equivalent as approved by the Act Enforcement Committee or President), by April 30, 2025:

1. Ethics in Practice: Reviewing the Work of Another Professional
2. Introduction to Digital Seals and Electronic Document Authentication
3. Direct Supervision
4. Professional Practice Guidelines: Peer Review

And at least three of the following self-directed short courses offered free online:

1. Professional Practice Guidelines: Mechanical Engineering Services for Building Projects
2. Professional Practice Guidelines: Engineering Services for Temporary Structures: Formwork, Falsework, and Reshore
3. Professional Practice Guidelines: Geotechnical Engineering Services for Building Projects
4. Professional Practice Guidelines: Designing Guards for Building Projects

2. The Association values innovation within the engineering profession and recognizes its importance in advancing the field, and encourages Mr. Walsh to continue practising engineering and contributing his innovative ideas. However, to ensure high standards of safety and quality, and help maintain integrity and ensure all designs meet the necessary technical and regulatory standards, the Committee requires that his works and designs undergo the following peer review process before being issued for construction.

Per the Engineering Act s.20 (2) (e) (i), the Member is restricted to engaging in the practice of engineering only under the personal supervision (peer review) and direction (mentorship) of a currently licensed member, with the designation of Professional Engineer (P. Eng.), for a period of two years. This mentor will not be appointed by Engineers PEI. Mr. Walsh will be responsible to find and engage the supervising member.

The member Mr. Walsh selects will be contingent on approval from Engineers PEI, by the Registrar.

3. Per the Engineering Act s.20 (2) (e) (iii), the Member shall submit to periodic inspections by the Act Enforcement Committee or its designate, of all documents, records and work in connection with his practice of engineering as the AEC may request every six (6) months, for a period of two years.

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Signed by the Discipline Committee this 13th of February 2025.

DocuSigned by:
Dr. Amy Hsiao, FEC, P.Eng.

Kent Nicholson, P.Eng.

Signed by:
Marianne LeBlanc, P.Eng.

Signed by:
Mark Sherren, FEC, P.Eng.

DocuSigned by:
Adam MacKenzie, P.Eng.

Hon. David H Jenkins