

# **A very ordinary power: The evolution of the electrical substation in Pietermaritzburg, 1900-1960**

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## ***Abstract***

Pietermaritzburg is a city in KwaZulu-Natal, South Africa, characterised by a central core of late Victorian-era buildings. It was in this period that electrification arrived, bringing with it new challenges in the provision of infrastructure and its ancillary requirements. One such adjunct to electrification was the need to provide for structures to house transformers and substations and these had to be integrated into an already existing urban infrastructure. As primarily utilitarian buildings, they had a single function which was to house the mechanisms of electrical power. However, simultaneously, they had to exist as palatable pieces of architecture within an already largely constructed city-scape. This cogent awareness of built environment is reflected in the design of many of the substations, which are modest, constructed within the prevailing architectural style of the time, and as a result blend in entirely with the city fabric as it exists. They also tell the story of the arrival of one of the cornerstones of our modern existence, namely power, and elucidate its part in the creation of new areas of the city and the march of “progress” from the centre outwards.

**Keywords:** Electricity; Substations; Pietermaritzburg; Municipal buildings; Trams; Infrastructure.

## **Introduction**

Pietermaritzburg is the capital city of KwaZulu-Natal, inland of the port city of Durban on the eastern seaboard of South Africa. It was laid out at the end of the 1830s by Voortrekkers before being taken over by the British in 1843. The latter had a distinctly different approach towards urban settlement, in addition to which their architectural ethos was lodged firmly in the Victorian tradition. The original city was laid out in a grid fashion typical of Dutch settlement, maximising the gentle slope in order to provide water to all even through a system of furrows which ran alongside the long streets. This grid plan is relevant since it provided a rational structure for the later provision of

services such as piped water, sewage and electricity.<sup>1</sup>

Whilst this article will first focus to some degree on the provision of electrical power in the city, it will then also consider the means by which this power was housed, and the aesthetic and architectural mechanisms employed in order to accommodate the technology required in a functional yet modest fashion.

The early years of the city focused on the provision of the grand monuments reflecting the new civic power of the city and its position as the capital of the new Colony of Natal. Late Victorian Revivalism was deployed in buildings such as the old Law Courts<sup>2</sup> (now the Tatham Art Gallery) and the Pietermaritzburg City Hall<sup>3</sup> whilst others embodied a variety of Neo – Classically derived genres such as the Colonial Buildings,<sup>4</sup> the Post Office<sup>5</sup> and the Legislative Council Buildings.<sup>6</sup> Even though the architects of these buildings generally used local materials in constructing these monuments, they lost any sense of the architectural vernacular as the buildings reflected rather a status and power derived from an English architectural paradigm having responded to an expected pattern of civic architecture, rather than embracing the complexities of the new Colony. Thus, with the exception of the City Hall and the Law Courts constructed partly of the salmon brick that characterises the early buildings of the city, the overriding sense is one of the creation of generic buildings of power rather than a series of structures that reflected the more layered and complex social and political environment of the late 19<sup>th</sup> century.<sup>7</sup> Thus, British derived in both material and genre, they situated the city as part of the larger lattice which formed the Empire, creating a comfort that ignored, consciously or unconsciously, the complexities of the new colony from a social-cultural, political and environmental perspective. This firmly placed the stamp of England onto the architectural landscape, and the power associated with it.

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1 D Secadanari, *New map of the city of Pietermaritzburg, 1906* (This is found in Figure 1 in this article).

2 B Kearney, *Architecture in Natal 1824-1893* (Cape Town, Balkema, 1973), p. 32. Kearney notes this as being in the Renaissance Pavilion Style.

3 B Kearney, *Architecture in Natal 1824-1893...*, p. 55. The first city hall, a double story, was commenced in 1891 and was in a mixed style, referred to as both “free Renaissance” as well as a quaint blend of Tudor, Flemish and Florentine styles. After its destruction by fire in 1898, it was rebuilt with a third floor. The architect for both buildings was William Street Wilson.

4 D Robinson (ed.), *The buildings of Pietermaritzburg* (Pietermaritzburg City Council, Pietermaritzburg, 1986), p. 306. Described by the authors as “Late English Renaissance”.

5 D Robinson (ed.), *The buildings of Pietermaritzburg...*, p. 358. Described by the authors as “Second Empire Style”.

6 D Robinson (ed.), *The buildings of Pietermaritzburg...*, p. 360. Described by the authors as “Palladian style of the Renaissance Revival”.

7 B Kearney, *Architecture in Natal 1824-1893...*, p. 32.

At the same time that these monumental structures were being built, a lower level group of structures began to fill in the urban fabric, responding to the new technologies at the end of the nineteenth century. In many ways as crafted as the civic buildings, these electrical substations were a necessary component of the changing technological landscape which involved the provision of power across the city.

Having described the protracted process of the advent of electrical power in the city, this article will focus on the earlier electrical substations in Pietermaritzburg, many of which although seemingly utilitarian buildings, are very competent pieces of architecture blending quietly into their urban surroundings. Indeed, this aesthetic sense formed part of the “modus operandi” of their design and construction, particularly from the 1930s onwards. Furthermore, they are constructed in the prevailing architectural genres of the times, often reflecting cultural identity and, ironically, the struggle for power. They were also contentious pieces of infrastructure and a necessary evil – as much as people needed electricity, they also complained about the buildings, leading to a number of attempts by the Corporation to make them more palatable. This article will also discuss how these structures reflect the rapid suburbanisation of the early 20<sup>th</sup> century, describing the march of progress outwards from the city centre.<sup>8</sup>

## **Early electrical power supply and its challenges**

By September 1861, the Royal Observatory in Cape Town had initiated the use of electrical current. They achieved this by transmitting an impulse which travelled through the telegraph system to the time-ball mounted on a mast in the vicinity of Table Bay. At one o'clock sharp this current made the time-ball drop, providing an accurate, public signal for time.<sup>9</sup> This abstract concept of the generation of electricity as opposed to the logical provision of power provision through steam engines, for example, meant that early attempts at sourcing electrical power in the city of Pietermaritzburg were not always received with enthusiasm by the elders. The earliest archival record

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8 It must be noted that the Msunduzi Municipality, the current-day administrators of the city, are unable to provide information with regards to the provision of electricity and its infrastructure. For this reason, most of the sources quoted are archival.

9 D Gill, *A History and description of the Royal Observatory, Cape of Good Hope* (London, HMSO1913), p. cxiiiiv; S Solomon & Co, *The general directory and guide book to the Cape of Good Hope* (Saul Solomon & Co, Cape Town, 1870), p. 126.

discussing electricity in Pietermaritzburg dates from 13 November 1880, nearly a full two decades after the time-ball in Cape Town had been dropped using electrical current. A Mr Chadwick who held the post of “Sub Manager of Telegraphs” wrote to the Governor of Natal, Sir George Pomeroy Colley requesting for “necessary arrangements” to enable the time gun at Fort Napier to be fired by electricity routed along the telegraph lines from the Cape. The letter reads thus:<sup>10</sup>

Cape Mean time is distributed from the Observatory at Cape Town at 1.0pm which is at 47 mins and 37 secs past one on Natal time, and arrangements could easily be made for a current to be passed to the gun at Fort Napier if it would answer the purpose required to have it fired then instead of at 8.0am as at present. On receiving further instructions I will if desired procure an estimate of the cost of the necessary apparatus and of erecting a line from the Pmburg office to the Fort.

Another documented attempt at electrification is dated January 1887. George Ireland penned a missive to the Sessional Committee of the Natal Legislative Council saying:<sup>11</sup>

I should be pleased to undertake the lighting by Electricity of the large hall in which the meetings of the legislative Council are held during the remainder of the session using either arc or Incandescent lamps and a motor that would ensure a steady and reliable light. Perfect ventilation and absence of heat and smell would be the result.

To this, the dour, negative response: “The Sessional Committee sees no reason for making any change in the method of lighting the Council Chambers for this session”. It must be emphasised that at this time, interior lighting was carried out by means of oil lamps, which burnt hot creating heat, smoke and smell.

Active debate must have carried on behind closed doors, for another serious application was made five years later. This time it was an approach by the Mayor, His Worship R Mason, who was seeking support for the provision of electrical power for the city, rather than elements of it. In April 1892 he wrote to The Honourable Colonial Secretary asking for assistance in implementing electric power in Pietermaritzburg. He remarked that the proposed

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10 KwaZulu-Natal Provincial Archives Repository (NAB), Pietermaritzburg, Colonial Secretary's Office, CSO 778 Reference 1880/4381: Letter, Chadwick (Sub Manager of Telegraphs) / Sir George Colley (Governor of Natal), 13 November 1880.

11 NAB, Colonial Secretary's Office CSO, Vol. 114, Reference 1887/76: Letter George Ireland (Contractor) / Sessional Committee (Natal Legislative Council), January 1887.

electrification scheme was contrived by a Mr RL Cousens, Consulting Engineer, and that the power supply could either be steam-driven, implying a need for combustible fuels to drive the machinery, or water-power derived from a complicated system of piping from the Upper Umgeni Falls.<sup>12</sup> Mason was more successful: from this point, it took some time to implement public lighting and electrification in the city, since the access to a municipal power supply had to be legislated and thus the applications were subjected to the rigour of a full parliamentary approval process. In the meantime, however, lighting to the newly completed City Hall, was carried out in 1893. This was operated by a private company, Messrs Woodhouse and Rawson, who erected a generator behind the City Hall which provided electricity for the hall and charged the Corporation accordingly. Woodhouse and Rawson filed for insolvency in 1895, and the city bought their lighting plant.<sup>13</sup>

Once legislated, initiated and demonstrated it did not take long for electrical power to gain public favour in the city. The city fathers discovered that the generator provided enough power to electrify other buildings, and thus applications from property owners in the city centre were considered, including the Legislative Assembly and the Post Office. Electric lights fired by direct current were first demonstrated in the Market Building in 1896.<sup>14</sup> This big “switch on” of private power administered by Municipal officials took place on 1 April 1896. This initial electrification for street lighting particularly, was only implemented over a short distance along what was then known as Commercial Road, in the centre of the city. The days of the sputtering oil lamps were now officially over, although it would take some years before the complete change-over was thoroughly affected.

Power was generated by a temporary power station, a 30 kW alternator situated behind the City Hall.<sup>15</sup> Certainly, this structure is visible in the Secadanari Map of 1906,<sup>16</sup> showing the City Hall, substation and Market Building tightly grouped, and is also evident on the early aerial photographs in 1937. In addition, this temporary power station is frequently referred to in

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12 NAB, Colonial Secretary's Office CSO, Vol. 1424, Reference 1892/1920: Letter: R Mason (His Worship the Mayor of Pietermaritzburg) / The Honourable Colonial Secretary, April 1892. Also known as Howick Falls, this waterfall is some distance from the city.

13 E Meineke, *Municipal engineering in Pietermaritzburg – the first hundred years* (Pietermaritzburg, The Pietermaritzburg Corporation, 1983). p. 104.

14 J Ingram, *The story of an African city* (G Coester, Pietermaritzburg, 1898), p. 92

15 Lloyds Greater British Publishing Company, *Twentieth century impressions of Natal: Its people, commerce, industries, and resources* (Lloyds Greater British Publishing Company, Durban, 1906), p. 241.

16 D Secadanari, *New map of the city of Pietermaritzburg, 1906...*

archival records. Operating for over five decades after it was downgraded in 1898, it was decommissioned around 1949 and subsequently demolished.<sup>17</sup> Thus far, the author has failed to source any photographs of this building.

Figure 1: Annotated Secadanari Map, 1906. Note the Electrical Power Station as the dark spot to the left of the city (annotations Author 2014)



Source: D Secadanari, *New map of the city of Pietermaritzburg, 1906*.

Its replacement, the new Municipal Power Station was situated at the top end of town. This complex was completed in 1898 and power was generated using a steam system employing massive boilers. Particularly notable was the brick smoke stack, which by the time of its' dismantling in 1931, was deemed quite "pitted", leading the Town Council to allocate £50 for its demolition.<sup>18</sup> Its presence in the city was highly rated: The Natal Almanac of 1899 shows the new "Electric Power Station" on its in-text map and declares that:<sup>19</sup>

Electric lighting was introduced on an experimental scale, but the demand for the illuminant having become large, increased plant has been ordered, and an electric station has been built. It is intended to expend some 40 000 to 50 000 pounds on the public and private lighting of the city.

On 1 July 1898<sup>20</sup> power was switched over to the new municipal electricity supply, made available with the completion of the Municipal Power Station situated at the top end of the city, close to the railway station.

<sup>17</sup> Pietermaritzburg Corporation, *Pietermaritzburg Corporation yearbook 1948-1949* (Pietermaritzburg, Pietermaritzburg Corporation, 1949), p. 81.

<sup>18</sup> NAB, Pietermaritzburg Corporation Files 3/PMB, Vol. 4/3/54, Reference 111/1931: Repairs to Power Station.

<sup>19</sup> AC Braby, *Natal Almanac and Directory, 1899* (Durban, AC Braby 1898), p. 833.

<sup>20</sup> Significantly, the notorious fire which razed the Pietermaritzburg City Hall on 12 July 1898 started at the rear of the building, the façade closest to the original Power Station. The cause of the fire is still unknown, and it is perhaps relevant that the fire occurred 12 days after switch over to the new Municipal Power Station.

Figure 2: Pietermaritzburg Power Station (KwaZulu-Natal Archives Repository)



Source: *KwaZulu - Natal Archives Repository also J Laband and R Haswell (eds.), Pietermaritzburg 1838 – 1938. A new portrait of an African city* (Shuter & Shooter, Pietermaritzburg, 1988), p. 144.

This was a much more substantial structure than its diminutive predecessor situated in the centre of town, and was purpose built for the generation of electricity. A reasonably restrained building in the late Victorian style, it followed the by now established Pietermaritzburg vernacular of soft salmon brick and corrugated sheeting roofs.<sup>21</sup> This new power station allowed for greatly extended and simultaneously intensified electrification through the city: Joseph Ingram commented of Scott's Theatre buildings in 1898 that,<sup>22</sup> "The building is lighted by 600 incandescent lights... The electrical installation having been carried out by Messers. Siemens brothers of London". By this time, the "accoutrements" of electrical supply were also locally available. Ingram refers to Messers. Collins and Munro, the proprietors of a department store in the city who had an unrivalled Electrical department in 1898, saying that,<sup>23</sup> "Appliances for the utilization of electric energy, based on the latest advances, are to be seen on every hand, and the firm can undertake works in connection with the installation of electric plant for power or lighting purposes". By 1904 electrical power was an integral part of the city. Pietermaritzburg had a fledgling electric tram system and certainly by then most government and official buildings were lit by electricity. The statistics for the year note that the "Electric Light Department supplied current to 91 arc lamps, 1,710 street

21 A Duigan, "Pietermaritzburg red brick: Then and now". J Laband and R Haswell (eds.), *Pietermaritzburg 1838 – 1938. A new portrait of an African city* (Shuter & Shooter, Pietermaritzburg, 1988), p. 265.

22 J Ingram, *The story of an African city* (G Coester, Pietermaritzburg, 1898), p. 92.

23 J Ingram, *The story of an African city* (G Coester, Pietermaritzburg, 1898), p. 173.

lamps, and 29393 incandescent lamps, there being 940 private consumers connected to the system”.<sup>24</sup> The historian Alan Hattersley in *Portrait of a City* notes that:<sup>25</sup>

Though electricity gave brilliant illumination to the main streets, there still remained in use at the beginning of that year some fifty old-fashioned oil lamps ... on 2<sup>nd</sup> November 1904, electric trams began running ... Pietermaritzburg was the first inland town to install an electric tram service, its council, guided by the progressive WJ O’Brien, believing that trams would make possible sale of hundreds of acres of undeveloped Town lands. Scottsville was not the only suburb to owe its initial progress to the trams. Prestbury ... went ahead once the line to the gardens was opened.

Figure 3: “A new type of tram”<sup>26</sup>



Source: Lloyds Greater British Publishing Company, *Twentieth century impressions of Natal...*, p. 240.

The stated objective in the quotation above, of expanding the city, releasing town lands for sale and populating the proposed suburbs was thus inextricably connected to the provision of electricity for running trams, allowing residents of the city reasonably easy access to areas of interest such as the racecourse and the new suburb of Scottsville, as well as the Botanical Gardens and the Royal Agricultural Showgrounds<sup>27</sup>. Therefore, the tramlines and their routes were initially the vector for establishing electrical substations and laying electrical conduit across the city. There was also a vital economic perspective:

<sup>24</sup> Lloyds Greater British Publishing Company, *Twentieth century impressions of Natal: Its people, commerce, industries, and resources* (Durban, Lloyds Greater British Publishing Company, 1906), p. 241.

<sup>25</sup> A Hattersley, *Portrait of a city* (Shuter and Shooter, Pietermaritzburg, 1951), p. 105.

<sup>26</sup> Lloyds Greater British Publishing Company, *Twentieth century impressions of Natal...*, p. 240.

<sup>27</sup> Lloyds Greater British Publishing Company, *Twentieth century impressions of Natal...*, p. 225. The tramline extension to the Botanic Gardens, Prestbury and Zwaartkop was opened on 3 March 1905.



the intention was that revenue received from the tramways would be fed back into the system and assist in extending the electrification of the city, reinforcing the interdependence between power supply and expansionism. Symbolically, and also practically, the tram sheds were part and parcel of the Power Station itself, situated adjacent to the railway lines at the upper end of town.

Importantly, as the economic success of electrification in Pietermaritzburg was directly dependent on its spread throughout the city the need to popularise electrification within the city to normal inner city households was a priority, made more viable through the “Assisted Wiring Scheme”. This was a system in which the city would sign a contract with a householder for the provision of basic electricity, which would be paid back to the city after a three year period.<sup>28</sup> Together with this, was a series of lectures and demonstrations held at the Royal Agricultural Showgrounds in order to popularise the power source for greater distribution throughout the city.<sup>29</sup>

Thus it was that besides the original power station started by Woodhouse and Rawson behind the City Hall, now downgraded to a substation, a small number of others existed located along the tram lines in order to boost their electrical supply. These substations were comparatively substantial, constructed out of brick and mortar, and all boasting a parapet wall to at least three façades. The earliest appears to have been that located in Prestbury, allowing for public transit by tram to the Botanical Gardens. The second, at Scottsville, provided public access to the Scottsville racetrack and a third, located on the lower half of Boshoff Street, allowed for easy transit to the Royal Agricultural Showgrounds.<sup>30</sup> The vehicle of access to amenity for the people of Pietermaritzburg was thus facilitated through the generation of electrical power.

Whilst physical vestiges of early electrification exist around the city, few records of the actual substation buildings are recorded in archival material prior to the late 1920s. The early ones constructed to facilitate the tramlines are described, as is the first power station behind the City Hall, but the

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28 Pietermaritzburg Corporation, *Pietermaritzburg Corporation Yearbook 1909-1910* (Pietermaritzburg Corporation, Pietermaritzburg 1910), p. 22.

29 Pietermaritzburg Corporation, *Pietermaritzburg Corporation Yearbook 1910-1911* (Pietermaritzburg Corporation, Pietermaritzburg 1910), p. 21.

30 T Wills, “From rickshaws to minibus taxis”, J Laband and R Haswell (eds.), *Pietermaritzburg 1838-1938. A new portrait of an African city* (Shuter & Shooter, Pietermaritzburg, 1988), p. 138. The trams were not as popular as originally thought, and by the end of 1936 they had ceased to exist.

Corporation Yearbooks are reasonably silent on the provision of buildings housing electrical infrastructure. The early years of the twentieth century were not prosperous in the city, and this lack of financial resources could, to some extent explain this silence. In addition, many of the minor substations are described as being constructed of wood-and-iron, and these were gradually replaced as the electrical supply systems were extended and became more permanent. Thus, apart from the aforementioned examples constructed of brick and mortar, the early substations being constructed of prefabricated materials means that little record remains of them today.

Despite its youth and the fanfare of its construction, this Power Station soon had to increase its output.

By 1910, pressure on the Corporation for power provision came from a number of angles. The Pietermaritzburg Corporation Yearbook recorded that “The Government approached the Corporation with a view to the latter supplying current to the Railway Department, instead of that Department generating current at the Railway Power Station.”<sup>31</sup> This commitment was not isolated. The expanding city meant that the pressure for electrical current was constantly increasing. A year later the Corporation was anxiously considering upgrading: the need for a more “modern” plant was articulated “to deal with the increasing load and the necessity for cheaper production”.<sup>32</sup> This was in the light of the realisation that:<sup>33</sup>

The connecting up to the supply mains of the Methuen Barracks and the Railway Workshops, which will materially increase the output of the Station; and more particularly the adoption by Council of the “Assisted Wiring Scheme” whereby householders may have their premises wired on the instalment system

Whilst there is still little mention of the construction of substations to house this expanded power network, it is plausible that the large substation on the corner of West and Pietermaritz Streets (ca 1920) was constructed in this period, being positioned at the top end of the city and reasonably close to the main power station.<sup>34</sup>

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31 Pietermaritzburg Corporation, *Pietermaritzburg Corporation Yearbook 1909-1910...*, p. 21. This relationship with the railways lasted until the mid-1920s when, ironically, the railways became the vehicle for the distribution of ESCOM electricity.

32 Pietermaritzburg Corporation. *Pietermaritzburg Corporation Yearbook 1910-1911...*, p. 47.

33 Pietermaritzburg Corporation. *Pietermaritzburg Corporation Yearbook 1910-1911...*, p. 22.

34 D Robinson (ed.), *The buildings of Pietermaritzburg* (Pietermaritzburg City Council, Pietermaritzburg, 1986), p. 231.

Rapid electrification of other cities in the Union led to the establishment of the Electricity Supply Commission (ESCOM) in early March 1923.<sup>35</sup> Its purpose was to remove the generation of electricity from Municipal responsibility and “maintaining electricity supply undertakings on a regional basis. Electricity was to be supplied efficiently, cheaply and abundantly to government departments, railways and harbours, local authorities and industry”. One of ESCOM’s first responsibilities in Natal was to assume responsibility for the newly established electrified rail link between Glencoe and Pietermaritzburg. This had been established by the Railway Administration and electricity generated by the coal-powered regional power station at Colenso. At the time of its construction, this was the second largest rail electrification scheme in the world.

In 1926 the first electric train entered Pietermaritzburg amidst great ceremony,<sup>36</sup> running on the electrified overhead lines that were to become the vector for electrical distribution, providing electricity to regions along the route. The first ESCOM power generated in such fashion entered the city system on 17 June 1927.<sup>37</sup> This massive power upgrade led to five new substations being constructed. A prominent example of this period is the Alexandra Swimming Baths substation, completed in 1926-1927, facilitating the intensified development in the eastern suburbs. This change over also determined the need for the Pietermaritzburg Corporation to convert its power supply from an unstable Direct Current (DC) supply, to the Alternating Current (AC) supply that was now being provided by ESCOM. This in itself was a massive logistical undertaking, involving the replacement of all cables, both underground and elevated. Around this time, the Electrical Department bemoaned the event of a fire in No 5 substation on May 6 1929, caused by defective switchgear. This conflagration interrupted the tramways and “certain power consumers” for 10 minutes,<sup>38</sup> an event for which the Municipal authorities were palpably embarrassed.

Electrical distribution as a national imperative removed the responsibility from Corporations to provide their own electricity. This resulted in the

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35 This was facilitated by the Electricity Act no 42 of 1922.

36 Pietermaritzburg Corporation, *Pietermaritzburg Corporation Yearbook 1925-1926* (Pietermaritzburg Corporation, Pietermaritzburg 1910), p. 39.

37 Pietermaritzburg Corporation, *Pietermaritzburg Corporation Yearbook 1927-1928* (Pietermaritzburg Corporation, Pietermaritzburg 1910), p. 86.

38 NAB, Pietermaritzburg Corporation Files 3/PMB, Vol. 4/3/37, Reference 471/1929: Note also a similar incident in 1945 in which “The whole city supply was interrupted for eight minutes on 10<sup>th</sup> December 1945, due to a fault on the ESC supply equipment” (Pietermaritzburg Corporation, *Pietermaritzburg Corporation Yearbook 1945-1946...*, p. 102.

decommissioning of most of the old municipal power stations. Thus, by the end of the 1920s the Pietermaritzburg Power station was no longer operational, and all of the plant had been sold to private bidders.<sup>39</sup> By February 1931 the building had begun to fall into disrepair, prompting the Pietermaritzburg Corporation to allocate a budget of £220 for its repair. The roofing needed to be replaced in areas, as well as valley gutters and repairs to the brickwork of the main building. For a time it was used by the railways. However, perhaps its peripheral position in the Townlands and its scale rendered it difficult to let. The Corporation attempted to find appropriate occupants, but the yearbooks bemoan the fact that the building remained largely empty. However, despite the loss of its original purpose, the building continues to stand today. Not long after this, the trams too ceased to run: their original scope of operations had been reduced and they did not prove very viable as transport for the city residents.

Whilst the aforementioned “Assisted Wiring Scheme” formed a fundamental part in the development and popularisation of electrification in the city, a means by which people were made aware of its dangers was also being formulated, namely the branding intended to signify “beware”. One of the earlier examples, known colloquially as the “Running Man” depicts a spiky individual with a pointed hat. This was replaced by the distinctly Modernist example from the late 1950s with the characteristic “lightning bolt” as a mutually understood signal of danger.<sup>40</sup>

Figure 4: Running man



Source: D Whelan, 2012.

<sup>39</sup> NAB, Pietermaritzburg Corporation Files 3/PMB, Vol. 4/3/80, Reference 248/1932: Re: Erection of buildings by Electricity Department.

<sup>40</sup> All attempts to garner information from the Electrical Department in this regard came to naught. This information is due to feedback from a public talk on the subject given for Heritage Month September 2012, at which lively discussion noted that the “Running Man” was a precursor to the “lightning bolt”.

## **Considering substation buildings as artefacts of power provision**

Thus, in order to contextualise the architecture of the electrical substations in Pietermaritzburg, it is important to position it within a highly contested political situation at the time. Natal Colony and Pietermaritzburg, in particular, occupied an unenviable position. As noted, Natal was fervently British, to the point that as an entity they voted against the incorporation of the Colony into Union in 1910. However, as a subsequent seat of provincial authority after Union, Pietermaritzburg had an inescapable Afrikaner population. Furthermore, from 1918 resurgence in Afrikaner nationalism had been exacerbated by the schism created by South Africa's participation in what was seen as "England's war".<sup>41</sup> This tension was in conflict with the overbearing and quintessential Englishness and this conflict could be said to be reflected in the architecture.

The early substations were undeniably and understandably late Victorian and Edwardian structures. There are not many left in original form: those from 1905-1906, the parapet walled structures at Zwartkops/Botanic Gardens, the lower end of Boshoff Street and Durban Road (now Alan Paton Road) in the suburb of Scottsville, are early extant examples. Although they are modest and pared down structures, they are nevertheless finely detailed, all with a delicate eyebrow of projecting decorative brickwork over the entrance. The Boshoff Street example has an elegant frieze made up of quarry tiles placed at a 45° angle, and windows carefully treated with a full soffit and cill. There are also regular plaster bands through the brickwork, emphasizing horizontality. Architectural plans for these structures have not yet been found, should they exist.<sup>42</sup>

From the Corporation yearbooks,<sup>43</sup> it appears that the competence for the design of these structures was not initially located in the Corporation Engineers Department, but rather in the section that dealt with the provision of electricity. The erection of the more prominent civic structures and other large scale projects was more organized as they were more visible, thus forming the political face of the city. This meant that the Corporation Engineers had

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41 P Thompson, *The British Civic culture of Natal, South Africa 1902-1961* (Pietermaritzburg, Brevitas, 1999), p. 30.

42 Any primary documentary information on substations has been sourced solely from archival material. The lack of institutional knowledge as well as an ineffective plans referencing system at the Msunduzi Municipality means that the city has apparently no plans for these buildings.

43 Perhaps the most useful Corporation data, these collections of annual reports of the different departments within the city structure are vital sources of information in being able to understand the workings of the city from a variety of different aspects.

a large responsibility in their design and implementation, as those responsible for the creation of a coherent architectural environment that projected the vision of the city fathers.

Whilst it is plausible that they were designed by technicians within the Electricity Department, the actual identity of the “architect” is not at this point known, nor the means by which the construction process was carried out. Given their general similarity of scale and material, it is obvious they were designed within a specific responsive framework that allowed for careful consideration of the design guidelines. At the same time, looking at the aesthetic response of the Boshoff Street Substation, that in Sweetwaters Road, and the corner building in Durban Road (Alan Paton) these diminutive buildings that comprise the early electrical substations differed according to site and requirement.

However, the architectural response of these structures is purely instinctive: precedent did not exist in the city for housing this new form of technology. Certainly, in their “pattern” response, it is suspected that the design and construction was purely paradigmatic: this approach meant that these buildings automatically fitted in with their surroundings and blended in with their context, making them silent participants in the city-scape.

Figure 5: Prestbury Substation



Source: D Whelan, 2012.

Figure 6: Boshoff Street Substation



Source: D Whelan, 2012.

Given the dearth of extant examples between the turn of the century buildings described above and those constructed after the First World War, in addition to very limited descriptions of substation buildings in the Corporation Yearbooks in intervening years, it is not surprising that a switch to a more defined Union period style with undertones of the Pietermaritzburg “style” appears around 1920. The authors of *Buildings of Pietermaritzburg*<sup>44</sup> (1986) describe what is known as the Pietermaritz Street Substation, as a “Single storey sub-station with tiled roof: face brick plinth and plastered brick walls ... plaster ornamented porthole windows and face brick quoins: roof ridge ventilator”. The description for the main substation on Victoria Road may just as well read the same, but its description notes “quarry tile quoins, stipple dash plastered walls and porthole windows”.

The aforementioned Alexandra Swimming baths substation, constructed after the switch to ESCOM power in 1927, is similar, although more elaborate, with quizzical neoclassical eyebrows and an axial ovate window placed above the main entrance. These three structures are confident in their built fabric, yet form so much part of it that they are neither offensive nor outstanding. As major substations at the time, which in some cases have subsequently bowed to development pressure, they describe the practical limits of the city of Pietermaritzburg and the slow expansion of the suburbs between 1920 and

<sup>44</sup> D Robinson (ed.), *The buildings of Pietermaritzburg...*, p. 231.

1930. The toolkits of the Edwardian architectural style exist, although in a more restrained form. Cape Dutch Revival markers typical of Union Period buildings are not evident, although porthole windows and the unrestrained use of teak for fenestration and “louvre” are employed. Rather, these buildings display a modest derivation of brick and tile domestic architecture of the city at the time and represent a suture of what was occurring in the greater architectural domain but still locating the buildings firmly in the city of Pietermaritzburg.

Plans of these later buildings too have not, as yet, been found in the official Municipal records, although some have been located in the Pietermaritzburg Corporation files at the Provincial Archives Repository. This was, perhaps, no accident: remonstrations in the early 1930s point to the recalcitrance of the Electricity Department in providing plans of their buildings for assessment.<sup>45</sup>

It is understood that the Electricity Department from time to time erects Transformer Chambers in various parts of the Borough, plans for which are not submitted to the Plans Sub Committee for approval, and for which no Water Building fees are paid.

Some of their designs are attributed to EB White. He had started working as a draughtsman around 1919<sup>46</sup> and the buildings constructed during this period have a particular aesthetic stamp. At this point, the Electrical Department were carrying out their infrastructure implementation in-house. Only towards the 1950s did the design and tender process become part of the competence of the Corporation Engineering Department. As a technical draughtsman in the Electrical Department, White would have had little aesthetic training, and thus most likely would have resorted to pattern derived from early 20<sup>th</sup> century sources; hence the utilisation of materials employed in Union Period fashion, together with the innate classicism of Roman brickwork, symmetry and arrangement of the façade.

Indeed, the Pietermaritzburg Corporation Yearbooks are silent about the employees working within the Electrical Department. In 1908, the Electricity Department Revenue account names Munro, as Electricity Department Engineer, a Clerk, CL Hurst, a typist, CM Waters, an (unnamed) apprentice,

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45 NAB, Pietermaritzburg Corporation Files 3/PMB, Vol. 4/3/24, Reference 1084/1928: Sale of plant at Power Station.

46 Prior to White's tenure at the Pietermaritzburg Corporation, the post had been vacant for some time. NAB, Pietermaritzburg Corporation Files 3/PMB, Vol. 4/3/4, Reference 223 / 1928: Retirement of EB White, Electric Department.



an Accountant, HF Hurst, Bookkeeper ED Gooding, and Meter readers WH Walters and H Beale.<sup>47</sup> There is not much change in later versions, and the early 1930s *Yearbooks* have little to say about a person who appears in retrospect, to have been a valuable member of the Electricity Department's staff component.

Thus, perhaps because of White's input, and despite the gradual stamp of Afrikanerdom becoming more prevalent in the rest of the Union, Pietermaritzburg Corporation's version of Union Period architecture remained quintessentially English, its vernacular origins retaining the stamp of the Victorian with elements of the Union period, without embracing a Cape Dutch Revival aesthetic common to other areas.

Figure 7: Victoria / West Street Substation ca 1926, perhaps designed by EB White



Source: D Whelan, 2012.

At the beginning of the 1930s a greater pressure for electricity was put on the city's resources. At the same time as the main Power Station was decommissioned and threatened for demolition, a number of other substations in emergent suburbs were being constructed. These follow the Union Period aesthetic trend, with expansive and detailed specifications issued to the tenderers, all of which were local firms. Roofs were of Marseilles tiles, reflecting the suburban aesthetic trends of the time. The use of teak was predominant, instructions as to preferred brick suppliers firmly articulated, the treatment of bricks before

<sup>47</sup> Pietermaritzburg Corporation, *Pietermaritzburg Corporation Yearbook 1908-1909* (Pietermaritzburg Corporation, Pietermaritzburg, 1909), p. 44.

laying, and great emphasis placed on the quality and proportion of mixes.<sup>48</sup>

Figure 8: HE White's Longmarket Girl's School Transformer station – 1931



Source: D Whelan, 2012.

### **The substation as markers of an expanding city**

Substations which were constructed in this period exist in the newer suburbs: Clarendon has a couple of examples such as “by the Bishops Residence” in which previously, electrical needs had been serviced by wood and iron buildings. On the crest of this hill is another from this period, built to service the needs of the Tuberculosis Sanatorium, quaintly referred to as the “Christmas Stamp Preventorium”.<sup>49</sup> This generation of substations serviced the expansion of Clarendon and Wembley, as well as the electrification of Mountain Rise, an older suburb but peripheral to the main city.

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<sup>48</sup> NAB Pietermaritzburg Corporation, Files 3/PMB 4/4/2/270 TC 104/6, Proposal to upgrade the Mayors Walk substation (temporarily housed in a wood and iron structure).

<sup>49</sup> Pietermaritzburg Corporation, *Pietermaritzburg Corporation Yearbook 1935-1936* (Pietermaritzburg, Pietermaritzburg Corporation, 1936), p. 17. Also NAB, Pietermaritzburg Corporation Files 3/PMB, Vol. 4/3/185, Reference 1058/1935: Supply of electricity to Children's Preventorium, Roberts Road.

Figure 9: East Street substation and associated public toilets, late 1930s



Source: D Whelan, 2013.

Growth was not only restricted to the then predominantly “white” suburbs. Electricity was extended south to Edendale in the 1920s. Moreover, the supply and maintenance of power was also considered a priority at the time of the construction of Pietermaritzburg Native Village, nowadays called Sobantu. In October 1926 there is mention of the setting out of Sobantu: providing water, having the site surveyed and the “streets and buildings pegged off” and the intention to “Erect not more than four experimental buildings of the type approved.” To add to this domestic infrastructure, on November 9 1927 the Corporation records note that:<sup>50</sup>

The Electricity and Transportation Committee recommended that the Electricity Supply Fund bear the whole cost of the high tension and transformer equipment, laying all the low tension distributing mains inside the Native Village, installing wiring and lamps in the houses and maintaining the installations, including lamp replacements, at a fixed charge of 3/- per month for every dwelling connected.

The expansion of the city continued unabated. In June 1929 heated discussion centred on a proposal to extend electrical supply to a 6½ mile radius from the

<sup>50</sup> NAB, Pietermaritzburg Corporation Files 3/PMB, Reference 4/3/67, Vol. 767/1927: Extension of electric light to Native Village.

city hall, including the area around Hilton Road. This would then include newly incorporated areas such as Mason's Mill and Plessislaer.<sup>51</sup> This debate was interrogating the jurisdiction within which Pietermaritzburg Corporation could practicably supply electrical current. Despite this extension of services, outlying areas were still clamouring for electrification until the middle of the 1940s.

The aesthetics of the buildings were simplified after White left the Department. Certainly, in 1931 he was still working at the Corporation, having signed off a characteristic version of his work at the Longmarket Girls School. But by the early 1940s the buildings were more streamlined and less detailed. The more substantial substation in Mayors Walk which replaced an earlier wood and iron example after 1941 has little of the whimsical ornamentation typical of HE White's buildings: it is reduced to an invisible functionary of conventional masonry construction with rough-cast plaster, under Marseilles tile roof, with a simple face brick plinth separated from a white-painted upper wall by a projecting string course.

Details as to designers of such buildings through the 1940s are scant. Certainly, towards the 1950s, the responsibility for the design of the substations appears to have been assumed by the Pietermaritzburg City Engineers Department. Indeed, some of the Modernist examples from the late 1940s onwards are among the most well-designed, yet modest structures in the city. Many of these flirted with variant options, of including store rooms, or doubling up as bus shelters. None of these really worked, thus, after some experimentation, the purpose of providing a straightforward functioning structure became the core requirement.

Throughout Pietermaritzburg, a small flotilla of quietly competent, well-executed face brick structures with strongly raked pointing are testimony to an engagement with design and architectural modernity. Simple boxes with impossibly thin concrete flat roofs, and employing elements of Modernist design such as "brise-soleil", vertical fins, are possibly attributed to the design leadership of Noel, an Architect and RIBA member who headed up the City Engineers Department from the 1950s through to the 1960s. Each example is individual and, after a brief flirtation with variety, they emerge not as pattern structures, but rather respond to their context and site. By now, the buildings

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51 NAB, Pietermaritzburg Corporation Files 3/PMB, Vol. 4/3/38, Reference 567/1929: Extension of electricity supply area.

have become patterns in themselves: they have precedent and in themselves create precedent.

Figure 10: Substation – Sweetwaters Road, possibly designed by Noel



Source: D Whelan, 2012.

However, it is tragic that few substations after this period have reacted to site in such an engaged manner. Most are unapologetically un-designed, have little architectural merit, and diverge from the quiet competence that characterised the substations from early on. These examples have become the worst fears of suburban dwellers – public eyesores.

### **An inevitable and enduring covering of foliage...**

Despite the simple structures of the 1950s and early 1960s, throughout most of the Modernist era, the Pietermaritzburg Council records note opposition, especially in the suburbs, to these “new-fangled” buildings. Of a proposed substation at the intersection of Woodhouse and Riverton Roads in Scottsville in 1943, CR Halle, the Acting City Electrical Engineer and Transport Manager received a motivation from his department that it would be at the junction of the two roads and would be covered with a rockery and planted. It was stressed that “It will NOT be an eyesore”.<sup>52</sup> Today, ironically, the original idea of planting has been inadvertently carried out in full force,

<sup>52</sup> NAB, Pietermaritzburg Corporation Files 3/PM, Vol. 4/4/2/270, Reference 104/12: Electricity Supply - Substations General.

as most of these buildings are covered with invasive Cat's Claw (*Macfadyena unguis-cati*) creeper, a declared invader.

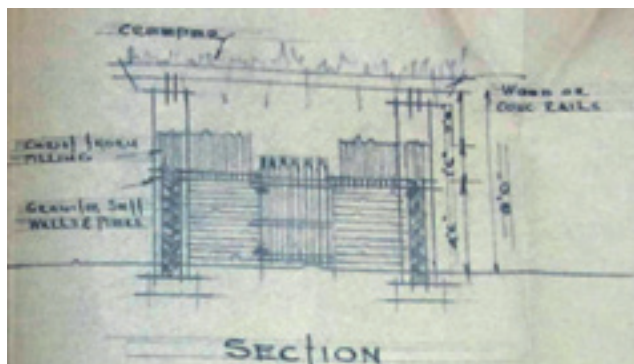
Blending with the landscape was priority, and this is perhaps one of the reasons, besides the certainty of Cat's Claw creeper, that these buildings are so invisible in the urban landscape. In the 1950s, the aesthetics of the Uplands Road Substation was called into question. The Assistant Electrical Engineer and Transport Manager reported that:<sup>53</sup>

The surrounding architecture is of several contrasting styles, Mr Biggs' house having a thatched roof. The design of the substation building...is undoubtedly in contrast to Mr. Biggs' house, but the two buildings are separated by trees and cannot be viewed together.

Realising that a thatched roof was not an option, the consequent recommendation was that "I suggest that the rather severe outline of the substation be relieved by rustic effects and creepers".

These somewhat random decisions were not isolated. In September 1952, the Electricity and Transportation Committee challenged the electrical engineer for a design solution that could be applied at appropriate times to soften the effect of the substation buildings. A rather rustic design drawing shows the solution for open-type substations with granite setts and pergolas added. Costing only £150 this was a generic solution to the problem which could be applied in the next residential setting.

Figure 11: A verdant version of the substation<sup>54</sup>



Source: KZN Archives Repository.

<sup>53</sup> NAB, Pietermaritzburg Corporation Files 3/PMB, Vol. 4/4/1/46, Reference TC82/18(1): Contract No. CE18 of 1955, Substation, Uplands Road.

<sup>54</sup> NAB, Pietermaritzburg Corporation Files 3/PMB 4/4/2/62 102/30: Centenary Road proposed substation.

This was not necessarily an issue that was restricted to the Modernist buildings. An archival file recommends that the:<sup>55</sup>

... existing lights on the Durban Road Substation be removed; further, that a suitable creeper be planted round the building by the Parks Department, in consultation with the City Electrical Engineer; attention to be given to the creeper by residents in the vicinity.

Specification of planting was also focussed in the general planning of the larger transformer stations. In January 1956, CF Halle requested the Town Clerk for funding for planting the new Woodburn substation with “lawns and hedges”. The Director of Parks had recommended *Pyracantha augustifolia* for the hedges, buffalo grass for the lawns, and if not available, dwarf *Paspalum*.<sup>56</sup>

Finally, disguise was not always verdant. The first substation at Woodhouse and Riverton Roads appears to have been “semi-submerged” and a fully underground version was constructed at the corner of Centenary and Roberts in August 1941. Seemingly these two variants have disappeared: shortly after its construction, records note that a new substation was needed in Centenary Road, since the submerged one had reached capacity. Known as the “De Villiers Drive” substation, concern about the aesthetics was raised, and it was suggested that the harsh lines could be mitigated with the addition of stone setts which were lying unused in the Municipal Stores. This has resulted in what is a uniquely dressed substation in the city, almost reminiscent of a Herbert Baker tradition.

Figure 12: Centenary Road Substation, ca 1952 (Author 2012)



Source: D Whelan, 2012.

55 NAB, Pietermaritzburg Corporation Files 3/PMB, Vol. 4/3/38, Reference 567/1929: Extension of electricity supply area.

56 NAB, Pietermaritzburg Corporation Files 3/PMB, Vol. 4/3/1, Reference 197 409/1936: Electricity sub-station in Durban Road.

Ultimately, by the time of the construction of the Melville Road substation in August 1962 the light tread on the surroundings was fully noted: the private individual selling the site to the Corporation made it,<sup>57</sup> “A condition on the use of this site would be that the architecture of the sub-station should blend in with the architecture of surrounding buildings”.

The stylistic approaches of the architecture of the substations, firmly entrenched by their designers, are a silent marker of the spread of urbanisation in the city, as well as the means by which electrification was extended from a central point, gradually being available in a much larger radius beyond its original mandate. In addition, the layers of the different provisions of electrical power also have significance: early suburbs have cast iron boxes which channelled the early direct current power from the substation to recipient households, in addition to substations of different periods and thus architectural styles responding to the different requirements as the electrical needs of the city spread.

Remnants of some of these exist, forgotten elements of the early city. However, they remain as layers of past endeavour, in which the triumphs of electrification were part of a brave, new world.

## **Conclusion**

The Pietermaritzburg Corporation adopted its new electrical systems without having any preconceived idea as to how to house the technology. The answer was simple: make them like any other building in the city, and employ the architectural language and patterning systems which entail the construction of a swimming bath, a house, or a magistrate’s court. This meant that the early designers such as HE White relied on these guidelines in the implementation of appropriate housing for the technology, and explains why these older buildings fit so quietly into the extant cityscape. Even with the rapid spread of electrification in the 1930s to suburbs and outlying areas, the buildings continued in a contemporary aesthetic employing the Union Period toolkit. Relatively far flung areas such as Mountain Rise and Chase Valley have examples of this type. Also, substations were necessary ancillary requirements for the provision of large projects, such as the ‘Christmas Stamp Preventorium(1935) and the Gardens Social Housing project in 1939,

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<sup>57</sup> NAB, Pietermaritzburg Corporation Files 3/PMB, Vol. 4/4/2/62, Reference 102/30: Melville Road Substation.



spurring electrical support in the area and extending the network to greater parts of the city.

They rapidly became pariahs, particularly so with some of the “new-fangled” Modernist examples. New materials were employed in different ways that did not necessarily agree with the visual habits of the Pietermaritzburg residents. They remained largely as experimental structures until the 1960s, when a resigned design approach tackled their requirements in a functional but elegant manner.

Despite the rancour which the construction of many of these substation structures attracted, their conception, design and implementation have added another layer of architectural history to the city. Most of the time they quietly fit in with the extant architectural fabric, deriving their idiom from catalogue pattern in the light of the lack of built precedent. Despite also the seeming lack of input by trained architectural personnel, the early electrical substations in Pietermaritzburg not only display a competence and modesty, but also tell the story about the expansion and development of the city outwards from its inner core.