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CONNECTION ASSESSMENT & APPROVAL PROCESS

SYSTEM IMPACT ASSESSMENT REPORT (2nd Addendum)

For the Contingency Plan to Allow the 230kV Switching Facilities at Lakeview SS to be By-passed.

CAA ID No. 2004-113

*Consistent Information Set Department, and
Long Term Forecasts & Assessments Department*

FINAL Version

Date: 23rd February 2005

2nd ADDENDUM TO THE SYSTEM IMPACT ASSESSMENT

For the Contingency Plan to Allow the 230kV Switching Facilities at Lakeview SS to be By-passed

1. Introduction

Hydro One is currently modifying the arrangement at Cooksville TS to establish a new 230kV busbar together with additional 230kV switching facilities. Once this work is complete, the four 230kV circuits from Applewood Junction to Lakeview SS will become idle and the 230kV Lakeview switchyard will be taken out-of-service.

Although all of the approved work is not scheduled to be completed until May 2006, some key components that would allow Hydro One to vacate the Lakeview switchyard are scheduled to be completed by 5th September 2005. OPG has notified Hydro One that the Powerhouse will no longer be staffed after that date and that the electrical and water services to the building will be terminated. Since the protective relaying, communications, monitoring and control facilities for the 230kV switchgear at Lakeview SS are all located within the Powerhouse, operation of the switchyard will not be possible after this date.

While Hydro One expects to complete all of the work required to allow them to vacate the switchyard by 5th September 2005, a contingency plan has been developed in case delays should occur.

2. Existing System Configuration

Diagram 1 shows the existing system configuration, with only two 230kV in-line circuit breakers at Cooksville TS and with the four 230kV circuits from Applewood Junction to the 230kV busbar at Lakeview SS. (For clarity, the individual breakers at Lakeview SS have not been shown.)

Microwave communication facilities presently exist between the following locations:

- Richview TS to Lakeview SS
- Manby TS to Lakeview SS
- Cooksville TS to Lakeview SS (Two)

3. Development Plan

Interim Stage (Diagram 2)

In the Interim Stage, the first two breakers are to be installed in the ring busbar at Cooksville, which is to be operated open, and the following changes are to be made to the configuration of the existing circuits:

- Circuit B16C is to be reconnected directly on to circuit L24CR, without the 230kV in-line breaker.
- Circuit B15C is to be terminated on to the new ring busbar, between the two new breakers.
- Circuit L23CK (which is to become K23C) is also to be terminated on to the new ring busbar, allowing the section between Applewood junction and Lakeview SS to be removed from service.

- Similarly, circuit L21K (which is to become K21C) is to be terminated on to the new ring busbar through a new 230kV cable, allowing the section between Applewood Junction and Lakeview SS to also be removed from service.
- The two pairs of step-down transformers are to be re-terminated on to their permanent positions on the ring busbar. However, without the intermediate breakers, all four units will effectively be connected to circuit K23C.
- New microwave communication facilities are to be installed between -
 - Richview TS & Cooksville TS, and
 - Manby TS & Cooksville TS.

This arrangement will allow the existing alternative connection between Richview TS and Manby West TS, via Lakeview SS, to be maintained (through circuits L24CR & L22K). In addition, the new connection between Manby East TS and Manby West TS, via Cooksville TS (through circuits K23C & K21C), will provide a comparable replacement for the existing connection via Lakeview SS.

Final Stage (Diagram 3)

This Diagram shows the configuration of the switchyard at Cooksville TS and of the 230kV circuits once all the work is complete.

At this point in the development, Cooksville TS will be fulfilling the same connectivity function that Lakeview SS is currently providing. The four 230kV circuits between Applewood Junction and Lakeview SS, together with the 230kV switchyard at Lakeview SS, can therefore be removed from service. In addition, without any active transmission facilities at Lakeview SS, the microwave communications between Cooksville TS and Lakeview SS and between Manby TS and Lakeview SS can also be disconnected.

It is also proposed to change the relay protection on the affected circuits from Distance to Differential, as shown in the Table below.

4. Contingency Plan

If delays should occur that prevent the final two circuits to Lakeview SS being idled by 5th September 2005, then Hydro One proposes to establish a temporary connection between these two circuits at Applewood Junction or at a suitable location on the existing right-of-way. This would allow the connections into the Lakeview switchyard to be severed while maintaining the alternative direct connection into Manby West TS from Richview TS.

Diagram 4 shows the proposed arrangement of the temporary connection. Although this has been shown close to Applewood Junction, where circuits B15C & B16C are presently tapped on to circuits L23CK & L24CR respectively, this connection could be made at any convenient location between Applewood Junction and the entry of circuits L24CR & L22K into Lakeview SS.

In addition, to accommodate the change in the terminal stations of this new combined circuit, Hydro One is proposing to install temporary differential protection on the Manby West terminal of circuit L22K so that it will be compatible with the permanent differential protection that is to be installed on the Richview and Cooksville terminals of circuit L24CR. Once circuit L22K is twinned with circuit K21C, this temporary protection will become redundant.

<i>Relay Protection</i>			<i>Circuit</i>
			<i>L22K & L24CR</i>
Existing	Distance Protection	'A' Group	Schweitzer SEL-321 relays
		'B' Group	GCX or KD relays
			<i>R24C, K23C & K21C + B15C & B16C</i>
Final	Differential Protection		GE L90 or Schweitzer SEL-311L
			<i>L24CR/L22K (R24C & K21C)</i>
Contingency	Differential Protection	At Richview & Cooksville TSs	GE L90 or Schweitzer SEL-311L
		At Manby West TS	Temporary Differential Protection

5. Conclusions

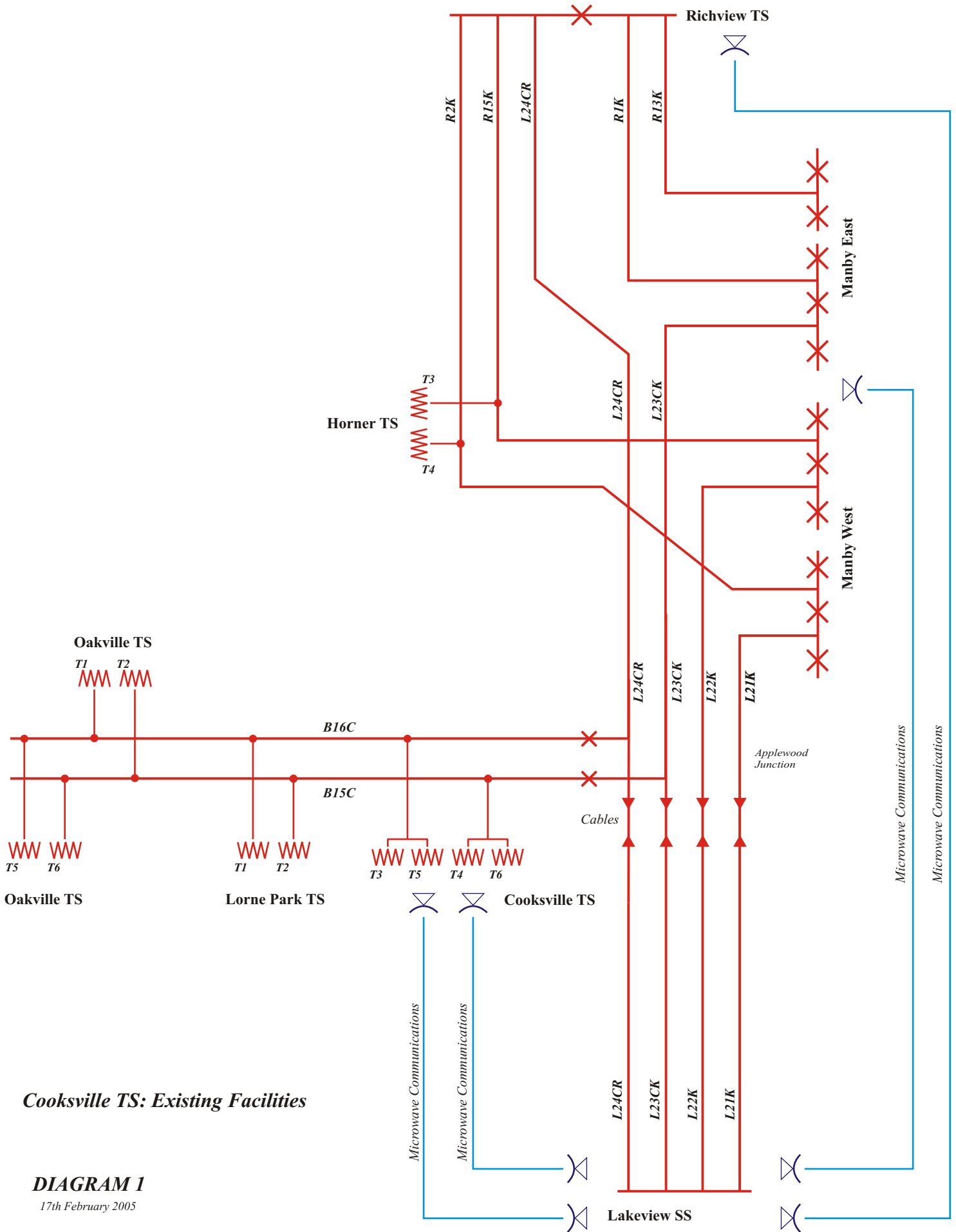
The proposed contingency plan will only be implemented if Hydro One determines that they will be unable to complete all of the work required to take the Lakeview 230kV busbar out-of-service on, or before, 5th September 2005.

It is expected that a decision to proceed with the contingency plan will need to be made during July or August 2005 to provide adequate time to complete the work required.

Since the contingency plan will provide the same connectivity as the final stage of the development plan, it will have no adverse impact on the IESO-controlled grid.

6. Notification of Approval

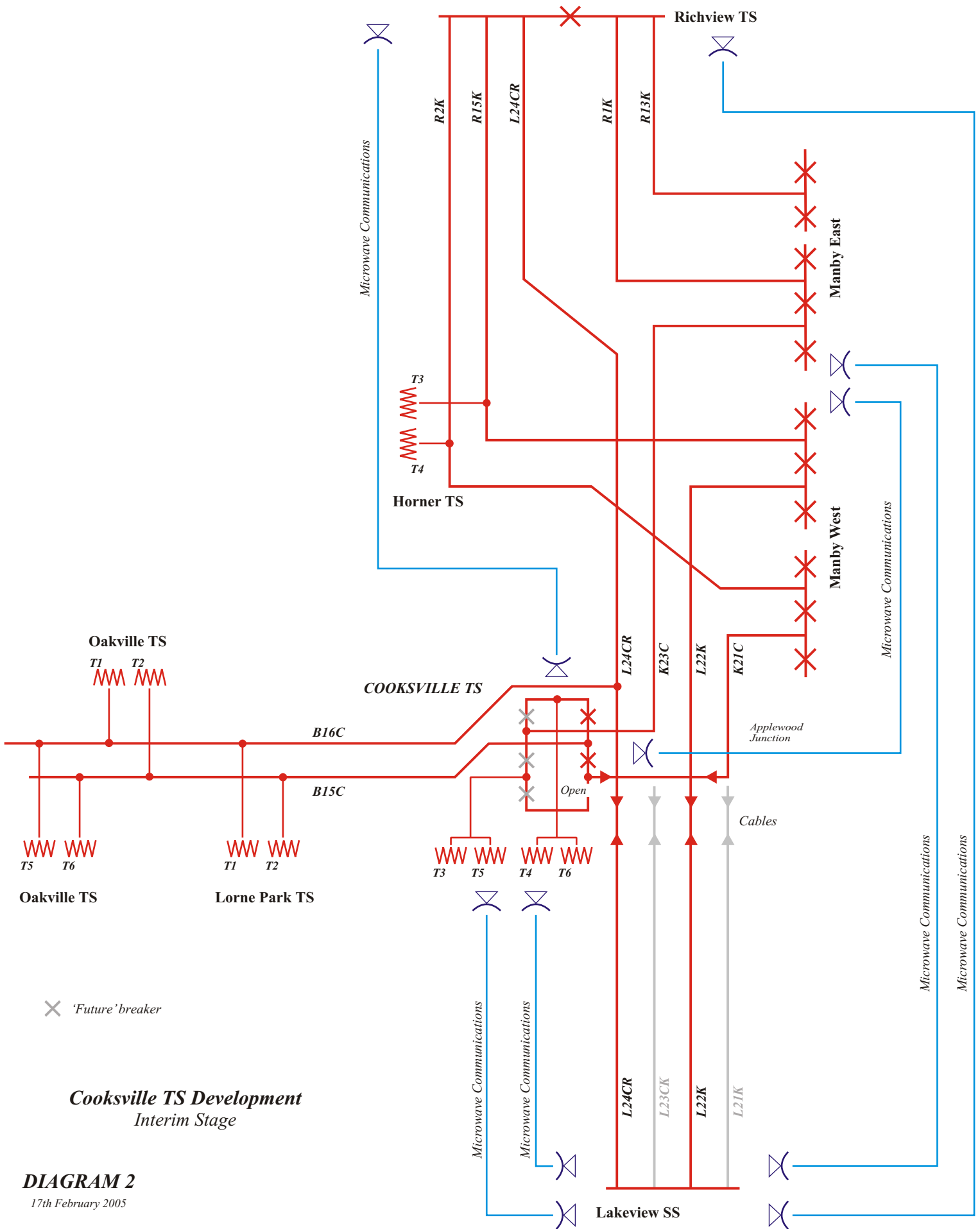
The IESO has determined that the proposed Contingency Plan will have no adverse effect on the IESO-controlled grid, and it is therefore recommended that an amended *Notification of Approval to Connect* should be issued for this Project.

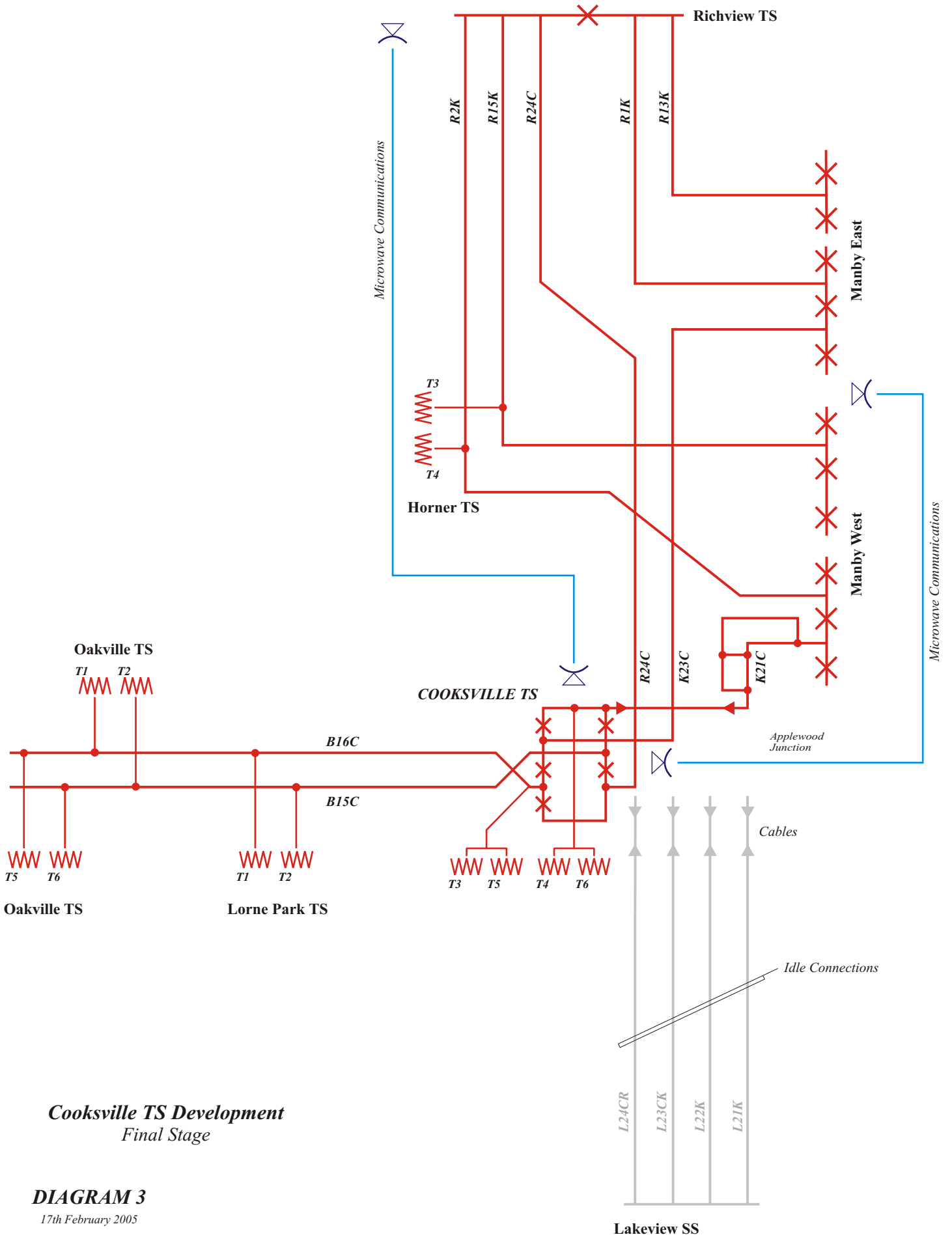


Cooksville TS: Existing Facilities

DIAGRAM 1

17th February 2005

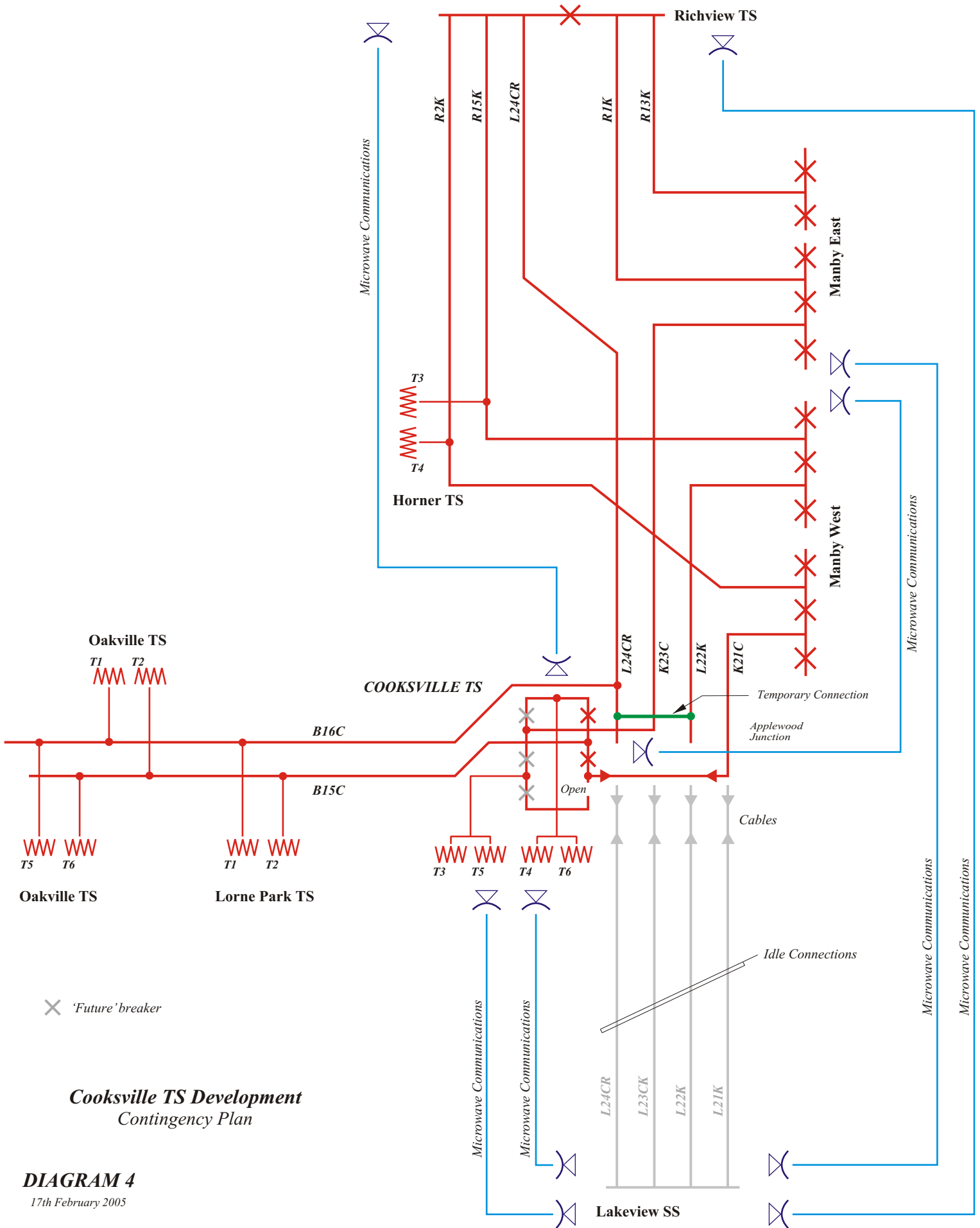




Cooksville TS Development
Final Stage

DIAGRAM 3

17th February 2005



**Cooksville TS Development
Contingency Plan**

DIAGRAM 4

17th February 2005