MEMO / NOTE DE SERVICE

To / Destinataire	Mayor and Members of Council	File/N° de fichier: 09-2023
From / Expéditeur	Director, Rail Construction Program Transit Services Department	
Subject / Objet	Stage 2 Confederation Line Project - Support Oversight Appointments	Date : April 18, 2023

The following memorandum provides Mayor and Council with information regarding appointments to the Stage 2 Confederation Line Project extensions in the east and west of the city to support the delivery and startup of the project, and provides additional information in advance of the technical briefing scheduled for April 19, 2023 at 2 p.m. A previous iteration of this memorandum (also attached for reference) provided details on the oversight appointments on the Stage 2 Trillium Line extension.

As a starting point, it is worth noting that there are significant differences between the startup of a new rail line, such as in Stage 1 of the Confederation Line, and the work to extend an operational railway as with the Stage 2 project. For a new startup, testing activities are completed in a closed environment and the work is generally isolated from end users. For an extension project, the work can be completed in a closed environment to begin with but, eventually, requires integration and testing of the interfaces between the new sections and the existing section. The availability of existing infrastructure and vehicles helps to simplify testing of some elements of an extension project but also creates additional complexities at the boundary between the new infrastructure and the existing infrastructure. The various oversight roles described below have been organized to match the complexity of the Stage 2 program.

These appointments address Recommendation #28 from the Ottawa Light Rail Public Inquiry related to oversight, systems integration, and independent certification of the new rail lines.

Stage 2 Systems Integration

As noted in previous updates to Council, the Stage 2 Confederation Line Project Agreement (PA) adopts lessons learned from Stage 1 and uses a different strategy for dealing with systems integration and verification of project requirements.

The Confederation Line PA requires that East West Connectors (EWC) undertake a robust approach to systems engineering and integration activities based on a systems engineering approach defined by European Standards EN 50126 and ISO/IEC/IEEE 15288:2015 standards.

These standards establish a defined framework for the implementation of systems engineering and integration activities within project life cycle stages. Simply put, the framework defines what systems engineering and integration activities need to take place during each project phase using a regimented engineering management approach. This process ensures that the necessary interfaces and interactions between the different project components, including infrastructure, facilities, subsystems, software, operations, and maintenance, have been identified and engineered to function together as a holistic system. The application of these standards will support these interdependent systems coming together to form a safe and reliable transit service.

To assist with these activities, the City and EWC have jointly engaged a System Integration Verifier (SIV) who will assist the parties in confirming the system integration requirements as between the City's work on the Transit Operations Control Centre and the connections to field equipment provided by EWC. The SIV is a third-party independent function that provides verification services to both the City and EWC as part of the Stage 2 systems integration works. The role of the SIV is to monitor critical system implementation and integration milestones and certify that the testing has validated their successful implementation.

The Stage 2 SIV contract has been awarded to **Ingerop**, an international French multi-disciplinary engineering firm, with over 2,300 employees and 50 branches worldwide. Areas of specialization cover transport systems integration, signaling and CBTC, catenary and other railway systems. Ingerop has been involved with LRT and Metro projects worldwide, including Line 15-SouthGrand Paris (France) Metro, Line 18 GrandParis Metro, T9 Paris tramway, Line 1and 3 Lima Metro (Perú), L3 Seville Metro (Spain), Granada LRT (Spain), Málaga Metro (Spain), Zaragoza LRT (Spain), Madrid ML1, ML2 and ML3LRT projects (Spain), Medellín tramway (Colombia) and Line 1 Mexico DB (Mexico).

The Stage 2 Confederation Line Project Agreement also requires that KEV (Kiewit, Eurovia, and Vinci) undertake a vigorous system safety assurance process to certify that all elements of the new expanded system are safe prior to the start of revenue operations. KEV's system safety and assurance process is guided by European Standards EN 50126 which defines Reliability, Availability, Maintainability and Safety (RAMS) activities during each project phase. This iterative approach to system safety and assurance – leading to a Safety Case compliant with the European Standard EN 50129 - ensures that KEV is regularly reviewing, defining, and improving upon its safety tasks during each project phase. These standards establish a defined framework for the implementation of systems integration activities within project life cycle stages. Simply put, the framework defines what systems integration activities need to take place during each project phase using a regimented project management approach. As part of the Project Agreement, KEV is required to provide a Systems Integration Manager with at least 15 years' experience in this area to manage this scope.

Stage 2 Independent Oversight

The City is overseeing all aspects of the safety certification process through a joint team of City staff, external specialist consultants, and an independent safety auditor. The auditor will confirm that KEV's approach to system safety and assurance is sound, and that it has fulfilled compliance with all safety requirements throughout each project phase. The City has engaged SENER Inc. as the safety auditor, an international engineering and technology firm with wide experience in safety auditing and acceptance services. SENER is a certified Railway Independent Safety Auditor (ISA) that has provided ISA services throughout the world, including metro line 9 to the Barcelona International Airport (Spain), the Zapopan to Guadalajara and Tlaquepaque LRT system (Mexico), and the Lusail LRT Tramway (Qatar).

As is the standard model for this type of project, an Independent Certifier (IC) has been engaged to actively review the progress of works on site and authorize payments for works completed. The IC assigned to the Stage 2 Confederation Line Project, AW Hooker, is actively reviewing project progress and certifying payments as part of their services to the Project. The IC's role is bound by the Project Agreement and the City can rely on their services for completion of the contractual requirements.

In addition to the Project Agreement requirements outlined above, a variety of independent regulatory bodies, including the City's Building Code Services, the Technical Standards & Safety Authority (TSSA), and Ottawa Fire Services play an important role in ensuring that station and systems elements meet pertinent code requirements.

Overall Stage 1 – Stage 2 Extension Integration

The works and oversight described are in relation to the infrastructure being delivered by EWC only. In order to provide a complete view of the expanded Confederation Line, it is important to outline the various inputs that are required for vehicles, systems, infrastructure, operations and maintenance and how they are verified and validated as a complete unit.

- RTG provided an expansion to the Stage 1 Belfast Yard for additional storage and additional maintenance capability and RTG is providing an additional 38 Alstom Citadis vehicles as part of the Stage 2 Fleet Expansion including the safety certification for the individual vehicles;
- EWC is designing and constructing the expanded Confederation Line, and will safety certify the delivery of their works which includes the Thales safety case for the integrated Stage 1 and Stage 2 train control system;
- The City's Rail Construction Program team is providing an expansion and upgrade of key communication systems (SCADA, CCTV, PIS/PA, etc.) at the Transit Operations Control Centre (TOCC) to be able to support the expanded systems;
- RTG through their subcontractor RTM will be mobilizing and preparing to provide expanded maintenance services; and,

- The City's Transit Services team will be mobilizing and preparing to provide expanded operational services.

SENER, as Independent Safety Auditor, will provide a safety audit of the complete, expanded system on behalf of the City to ensure that the integrated solution meets the safety requirements.

Moreover, the coordination and integration of various scopes of work will be demonstrated as an integrated system through the Trial Running period. The Trial Running period, in the context of a system extension, is an EWC contractual requirement to test and exercise the respective System Infrastructure, including all subsystems, that comprise the relevant works, operating personnel and operating procedures to demonstrate the East Works and West Works can reliably implement passenger service without interruptions. Further details on the Trial Running process for the Confederation Line will be provided in 2024 and the full definition of Trial Running is provided in Schedule 14 listed on the City of Ottawa's Routine Disclosure webpage.

Should you have any questions about the information provided in this memo, please do not hesitate to contact me at extension 52718.

Original signed by
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