

Stage 2 LRT Parkway Tunnel Construction

Mary-Ellen Gleeson Program Manager- RCP City of Ottawa

Bruno Pigeon Construction Manager - KEV Kiewit



November 21, 2024

Future O-Train Network



Future O-Train Network



Future O-Train Network





CUT AND COVER SEGMENT

Parkway Tunnel – Fall 2020



CUT & COVER METHODOLOGY



1. Existing Conditions



4. Excavate "CUT" and Install additional support



2. Relocate Traffic & Walkways



5. Construct Concrete Structure



7. Reinstate to Original





3. Install Support-of-Excavation



6. Remove Supports and Install "COVER" to grade



			P	ARKWAY			
	Station	Zone	Start	South Botton Slab (Sec D)	tion Length	SOIL SOE	ROCK SOE
		1	64.287	64.450	163	Soldier Piles	-
CUI & COVER PARKVAI SUES		2	64.450	64.545	95	Soldier Piles	-
		3	64.545	64.623	78	Soldier Piles	-
		4	64.623	64.833	210	Soldier Piles	Rock Bolts
		5	64.833	64.975	142	Soldier Piles	Rock Bolts
	New Orchard	d 6a	64.975	65.020	45	Soldier Piles	Rock Bolts
	New Orchard	d 6b	65.020	65.153	133	Soldier Piles	Rock Bolts
		7	65.153	65.337	184	Soldier Piles	Rock Bolts
		8a	65.337	65.445	108	Soldier Piles	Rock Bolts
		8b	65.445	65.555	110	Soldier Piles	Rock Bolts
		9	65.555	65.796	241	Soldier Piles	Rock Bolts
	Cleary	10	65.796	65.996	200	Soldier Piles	Rock Bolts
		11	65.996	66.020	24	Secant with Struts and Walers or CBS	P -
		12	66.020	66.117	97	Soldier Piles	-
		13a	66.117	66.227	110	Secant with Struts and Walers or CBS	P -
		13b	66.227	66.346	119	Slurry Wall (CBSP)	Rock Bolts
0000 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019 0019		13c	66.346	66.929	583	Slurry Wall (CBSP)	Rock Bolts
		13d	66.929	67.079	150	Slurry Wall (CBSP)	Rock Bolts
		13e	67.079	67.259	180	Slurry Wall (CBSP)	Rock Bolts
	8 8 8 8	19.85 to	8 81		2972		5 5 F
		- 66 - 6	•		- <u>-</u>		00
							9-04
							60
					- 8		1 56
	2 3 4 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 5 8 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	and Contraction of the 52
	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2						48
			1 855 1 865				44
			. 85				40
	Contraction Contraction			CONTRACTOR NO	4		36
64+287 64+623 64+833 64+975 65+153 65+337 65+445 65+555 65+796 65+996			11-2				32
28	FORMATION BR		17				28
24	Water level drawdown shull net be permitted 66+100 66+200	66	s+300 6	Drawdown shall be Tented to a maximum 66+400 66+500 66+600	n of tim at an outward distance of Xon leve 66+700	66+800 66+900 67+003 67+100	67+200 24
66+020	66+117 66	+227	66+346			66+929 67+079	67+260

SOE Type	Type Soldier Piles											Slurry Wall (CBSP)								
Dewatering Type	Sump & Pump	Sump & Pump	Sump & Pump	Sump & Pump	Sump & Pump	Sump & Pump	Sump & Pump	Sump & Pump	Sump & Pump	Sump & Pump	Well Points/Eductors inside Excavation Trench	1200-	dal Paradostra nati Ecolution Terrot	and Parts Educes inside Departure Terral	And Franks Eductory reads Encanalizer Transf.	Well Points/Eductors inside Excavation Trench	Sump & Pump	Sump & Pump		
Dewasering Equipment Type	KTZ 47.5 @ 15m	KTZ 47.5 @ 15m	KTZ 47.5 @ 15m	KTZ 47.5 @ 15m	KTZ 33.7 @ 50m	KTZ 33.7 @ 50m	KTZ 33.7 傻 50m	KTZ 33.7 @ 50m	KTZ 33.7 @ 50m	KTZ 33.7 @ 50m	Well Point + Pump @100m	227 ***	Marchael - Korg Britter	Well Point + Pump @100m	Wel Point + Pump @100m	Well Point + Pump @100m	Well Point + Pump @100m	Well Point + Pump @100m		
Devatoring Equipment Speci	50/60Hz, 7.5kW	50/60Hz, 7.5kW	50/60Hz 7.5KW	50/60Hz, 7.5kW	50/60Hz, 3.7kW	50/60Hz, 3.7kW	50/60Hz, 3.7kW	50/60Hz, 3.7kW	50/60Hz, 3.7kW	50/60Hz, 3.7kW	50HP, 575V, 3PH, 60A		50HP, 575V, 3PH, KA	50HP, 575V, 3PH, 60A	50HP, 575V, 3PH, 60A	50HP, 575V, 3PH, 60A	50HP, 575V, 3PH, 60A	50HP, 575V, 3PH, 60A		
Equipment Type	90 Ton RT Tadano + CAT 349	90 Ten RT Tadano + CAT 349F	90 Ton RT Tadano + CAT 349F	Gantry Crane + CAT 349F	90 Ton RT Tadano + CAT 349F	Tower Crane + CAT 349F	90 Ton RT Tadano+ CAT 349F	Gantry Crane + CAT 349F	90 RT Tadano + CAT 349F	90 RT Tacano + CAT 349F	Tower Crane + CAT 349F	-92	60 Ton RT Talero + CAT 368	60 Ton HT Tadavo + CAT 368	60 Tan RT Talano + CAT 368F	60 Ton RT Tadano + CAT 349F	60 Ton RT Tadano + CAT 349F	60 Ton RT Tadano + CAT 349F		
Equipment Access	North	North	North	North	South	North +South	North	North + South	South	South (65+506 to 65+600) North (65+600 to 65+746)	North + South	N+S	North	North	North (66+187 to to 66+200) South (66+200 to 66+295)	South	South	South		
Clare Power Requirements				460V, 3PH, 60Hz				460V, 3PH, 60Hz												
PBS	808:30 Mar 21 to 13 May 21 Excavation: 19 Apr 21 to 02 Jun 21 Structure: 14 May 21 to 31 Apr 21 Backlill: 01-8ep 21 to 20 Sep 21 Backlill: 01-8ep 21 to 20 Sep 21	502 25-Min-2210 15-Min-22 903 Excavation 12-Miny-2210 15-Jun-22 0ex Structure 15-Jun-22 to 12-Sep-22 5ex BackNII 06-Sep-22 to 20-Sep-22 5ex	E 20-May 21 to 20-Apr 21 meters: 10-May 21to 26-Jun 21 etwar 30-Jun 11 to 20-Oo 21 will 21-Oo 21to 01-May 21	50E 20 Dec 21 % 09 May 22 Discussion: 23-Mar 22 to 15-Jun 22 Structure (100% Travelet) 10 May 22 to 16 Apr 23 Backlit, 25-Jan 23 to 15 May 23	50E & Excertion: 25 Jun 20 to 33 Hov 20 Structure (Conventional System): 16 Oct-20 to 29 Jun 2 Baddit: 09-Jun-21 to 67-Jul-21	SOE & Excavation: 14-Jul-20 to 23-Nov-20 Structure (Conventionel): 38-Jun-21 to 29-Oct-21	SOE & Excavation: 15-Jun 29 to 05-00-20 Enceture (SV): Conventional System): 24-Aug-20 to 14-Dec-20 Enceture (SV): Traveller System): 16-Dec-20 to 17-May-21 Becklit: 22-Apr-21 to 22-May-21	SEE Economics ID-an-2110 (6-an-21 Souther Conventional: 36-an-2110 (2-200-21) Beefft: 25-05-2110 (2-400-21)	CR & Excension: 14Oes:21 to 24 Feb:22 Incluse Sciencetional: 01-Marc 22 to 26-bit-22 addit: 07-bit-22 to 04-bit-22	SOE & Exclamation: 29-Sep 20 to 01-Apr-21 Structure (80% Traveline System): 23-Non-20 to 10-May-21 Structure (34% Conventional System): 11-May-21 to 13-Aug-21 Back/III: 18-Aug-21 to 24-Sep 21	SOE: 25-Sep-20 to 17-Nov-20 Excavation: 19-Nov-20 to 27-Apr-21 Structure: 25-Jun-21 to 18-Feb-22	2580	NOL 11 April 10 10 April Instantin 20 April 10 April Instantin 20 April 10 April Baselin 10 April 10 April 10 Baselin 10 April 10 April 10	900: 05-04-21 to 05-5ep-21 Extension: 09-5ep-21 to 12-Asiv-21 Structure 15-Nov-21 to 24-3ex-22 Recentli 01-Mar-32 to 21-Apr-32	SOE 20 Aug 20 to 16 Bits 20 Excession: 24 Geg-22 to 25 Nov-20 Brocker (Transfer): 64 Mar-21 to 15 Agr-21 Backlit H-Agr-21 to 25 May-21	NOL REPORT LEMENT 11 (FEBURE 11) (FEBURE 1	5000, 589-349-28 to 27 Aug 21 Encountion: 52 Feb 22 to 25 May 22 Structure: 28-May 22 to 69-34-22 ReadMit: 56-34/22 to 26 Aug 22	604: 09-866 20 to 23-466 20 Discoverson: 10-569-20 to 25-469-20 Biolechers 13-466-21 to 25-469-21 Biolechers 13-466-21 to 25-469-21 Biolechi 01-469-21 to 25-469-21**		
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6 - New Orchard Station	Zone 7	Zone 8a	Zone 8b	Zone 9	Zone 10 - Cleary Station	2010	Zone 12	Zone 13a	Zone 13b	Zone 13c	Zone 13d	Zone 13e		







Utility Interactions

- 1200 mm backbone watermain
- Sequence change
- Operational considerations
- Schedule considerations









DESIGN CONSIDERATIONS

- Permanent dewatering
- Control of water
- Waterproofing system



DRAINED VS UNDRAINED SECTIONS FANS 64+96 JET FAN NIC STA 66+888. STA 67+259.715 UMIT OF PARKV TEMPORARY R.O.W PERMANENT R.O.W. CUT-AND-COVER GUIDEWAY (UNDRAINED EAST PORTAL SIR JOHN A. MACDONALD PARKWAY CLEARY NEW ORCHARD STATION CUT-AND-COV CUT-AND-COVER GUIDEWAY (UND RICHMON RICHMOND RI YRON AVE 1200 1201 CROSS PA STA 66+86(CROSS PA STA 66+66(CROSS F STA 66+4 JET FANS STA 65+78 SUMP PIT STA 64+91

No waterproofing below the Invert slab on drained sections

DRAINED VS UNDRAINED SECTIONS















5461

195

9/- J



ZONE 12 – CLEARY/RICHMOND



WEST NEPEAN COLLECTOR

- 1500 mm Combined Sewer 1954
- Design considerations
- Construction considerations
 - Unloading
 - Work methodology
 - Monitoring



ZONE 12 – WNC CROSSING















QUESTIONS?