



GOVERNMENT OF BERMUDA
Ministry of Public Works and Environment

Annex K

Swing Bridge Replacement 2026

Geotechnical Information Summary

Rev P02

APPENDIX 5

GEOTECHNICAL REPORT - HIGHWAY STRUCTURE SUMMARY INFORMATION

**GEOTECHNICAL REPORT
HIGHWAY STRUCTURE SUMMARY INFORMATION**

STRUCTURE NAME Swing Bridge Replacement		OS Grid Reference 555412.16m E 141133.99m N			Reference/ comments																																																																																				
STRUCTURE TYPE 7-span bridge with main navigation channel		AIP Ref No 3502-RAM-SB-XX-RP-CB-30001																																																																																							
DESIGN LIFE 75 Years																																																																																									
RELEVANT TRIAL HOLES BH201, BH202, BH203, BH204, BH205, BH206, BH207 <i>(Report: Geotechnical Investigation for Two Bridges in Bermuda Islands: Longbird and St. George's Bridge, Final Report, October 2018)</i>																																																																																									
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PREVIOUS GROUND HISTORY									
The historic ground use adjacent to the site is that of an airport development found on reclaimed land but more locally, an existing bridge structure.									
Previous ground investigations have been undertaken on and around the site:									
<ul style="list-style-type: none"> • Geotechnical Investigation for proposed new apron and widening of existing taxiway LF Wade International Airport (2016) • Preliminary Geotechnical Assessment New Grotto Bay/Castle Harbour Crossing Bermuda (2007) • St George's Town Cut Project, Geotechnical Data Report (2015) 									
GROUNDWATER									
Groundwater was encountered on the southern (airport side) abutment location in TP203 and TP205 (On shore Test Pits dug to 3.5m)									
EARTH PRESSURE VALUE k_0^*	Coralline Deposits			Sand and Gravel		Silty Clays		Clayey Silts	
	0.48			0.44		0.64		0.64	
SOIL PARAMETERS									
Stratum	Bulk Density, γ (kN/m ³)	Undrained Shear Strength Parameters		Drained Shear Strength Parameters		UCS (MPa)	Hoek Brown		
		Undrained Shear Strength, c_u (kN/m ²)	Change with depth, z	Effective Angle of Shearing Resistance Φ' (°)	Drained cohesion (kN/m ²)		mb	a	s
Sand and Gravel	17.0			31	0				
Coralline Deposits	16.0			34	0				
Clayey Silt	19.0	50	0	21	0				
Silty Clay	19.0	50	21.4 kN/m ² /m depth	21	0				
Karst Limestone	24.8			48	247	16	1.6	0.50	0.01
Weathered Basalt	21.3			36	181	3.2	3.383	0.51	0.002
Unweathered Basalt	23.0			62	404	30	5.99	0.50	0.01

PILE DESIGN									
Structure Element	Founding Stratum	Founding Rock Head Level (mOAD)	Pile Cap Head Level (mOAD)	Pile Length (m)	Pile Toe Level (m AOD)	Pile Diameter (mm)	Ultimate Bearing Capacity (kN)	Pile Compressive Load (Tensile Load) (kN)	
Northern Abutment	Weathered Basalt	-25.7	-0.50	25.7	-26.2	900	22135	1100 (600)	0.5m rock socket
Pier 4	Weathered Basalt	-22.0	-2.04	20.5	-22.5	900	35102	1900 (500)	0.5m rock socket
Pier 3	Weathered Basalt	-24.3	-4.29	20.5	-24.8	900	35102	2400 (900)	0.5m rock socket
Nose Pier	Weathered Basalt	-21.6	-4.50	18.1	-22.6	900	27327	2400 (900)	1m rock socket
Lift Pier	Basalt	-27.8	-6.02	23.3	-29.3	900	33889	2900 (2200)	1.5m into Basalt
Pier 2	Basalt	-24.3	-6.50	19.3	-25.8	900	35582	2400 (900)	1.5m into Basalt
Pier 1	Weathered Basalt	-21.8	-2.85	20	-22.8	900	18620	1900 (500)	1m rock socket
Southern Abutment	Basalt	-22.5	0.26	23.3	-23.0	900	30135	1100 (600)	0.5m into Basalt
Pile type..... Steel Tube (Driven) Criteria for selecting pile toe level..... Strength/Stiffness of founding stratum Allowance for negative skin friction within design.....None									
SETTLEMENT									
Structural Element	Founding Level (m AOD)	Immediate Settlement (mm)			Total Settlement (mm)	Time for 90%	Settlement Remaining at Completion		
Not Applicable									
GROUND MOVEMENTS									

Associated Earthworks	Settlement due to Embankment loading	Heave due to Cutting Excavation	Subsidence Due to Mineral Extraction	Flowing Water	Other	
Cause of Movement	Not Applicable					
Maximum Movement (mm)						
Measures to Deal with Movement						