

SUPPLEMENTARY
FOUNDATION INVESTIGATION REPORT
For

E.R.W. and Hwy. #27 Interchange,
Twp. of Etobicoke, County of York,
District #6 (Toronto),
W.P. 275-64-1 and W.P. 275-64-4
W.J. 65-P-104

INTRODUCTION:

Since the original foundation investigation report for the above mentioned interchange was prepared, we have received the preliminary plans for the individual structures involved which show the exact locations of each. We have reviewed these plans with respect to the available soil information, and as a result of this review, we arranged for more borings to be carried out in the field to obtain additional information.

Field work, laboratory work, and the preparation of the Record of Borehole sheets, for the additional borings, were undertaken by Dominion Soil Investigation Ltd. at our request and according to a program decided upon by us.

The following pages contain a description of the subsoil conditions prevailing at each structure location, together with our final recommendations for the structure foundations.

This report was prepared by Mr. A. Barsvary, Senior Foundation Engineer, under the general supervision of Mr. K. G. Selby, Supervising Foundation Engineer.

cont'd. /2 ...

STRUCTURE #23 - W.P. 32-66 -- W.J. 65-F-104 -

1. Soil Conditions:

Four sampled boreholes, numbered: 58, 59, 63 and 64, were placed at the site of the proposed structure. At the north side of the crossing some 7 ft. thick fine sand with some silt was found. Underlying the sand layer in boreholes #63 and 64, and right from ground elevation in boreholes #58 and 59, a very hard clayey silt (glacial till) deposit was observed. The till contains some gravel and boulders, extending down to el. 324 - 328 ft. Below this elevation, shale bedrock with limestone bands underlies the till. 5 - 7 ft. thickness of the bedrock was proved by diamond drilling. (Refer Drawing No. 65-F-104V.)

In boreholes #63 and 64, ground water level was observed at el. 354 - 356 ft. within the fine sand; in boreholes #58 and 59, the ground water lies between el. 341.5 - 343.5 ft.

2. Recommendations:

The preliminary design calls for a four-span structure with closed type abutments.

Spread footings are recommended for the abutments as well as for the piers, supported within the hard glacial till deposit.

The suggested elevations of the individual substructures, together with the elevations of the bedrock and the allowable bearing capacities, are listed as follows:

cont'd. /35...

Location	Elevation of (ft.)		Allowable Bearing Capacity (t.s.f.)
	Footing	Bedrock	
South Abutment	344.0	-	3.0
South Pier	329.5	324.0	4.0
Middle Pier	333.5	326.0	4.0
North Pier	333.0	328.0	4.0
North Abutment	346.0	-	4.0

Due to the cohesive nature of the clayey silt till, no "boiling" of the excavation floors is anticipated.

cont'd. /36 ...

[illegible]

Foundation Section,
Materials & Testing Div.,
Room 107, Wash. Bldg.

Journal of Management Inquiry 18(6)

Journal of Management Studies, 19(1), 67-80.

[illegible]

The test pits were recently dug at the locations of C.N. 415 and C.N. 416 of the above project. The purpose of the pits was to examine more closely than was possible during the foundation investigation, the nature of the glacial till over-burden which immediately overlies the shale and limestone bedrock.

The pits were inspected on January 17 and 18, 1967, together with an open cover trench on Contract No. 66-127, at which location weathered shale bedrock outcrops from the ground surface for some 6 to 8 feet down to the sand bedrock.

The two test pits confirmed the original findings of the foundation investigation.

A description of the weathered rock in the outer trench and of the glacial till overburden in the test pile, has been made by Mr. E. Hughes, Materials & Testing Geological Eng., for your information. It is attached to this memo.

12. L. G. G. G.

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

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1. C. Bailey,
SUPERVISING FERRATION MGR.
Torr.

100-443887-100

MEMORANDUM

To: Mr. B. R. Davis,
Bridge Engineer,
Bridge Division.
Attention: Mr. S. McCombie

From: Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

Date: October 17, 1966

Our File Ref.

In Reply To:

Subject:

FOUNDATION INVESTIGATION REPORT
For
Q.E.W. and Hwy. #27 Interchange,
Twp. of Etobicoke, County of York,
District #6 (Toronto)
W.J. 65-F-104 -- W.P. 33-65
W.P. 32-66

Enclosed, please find the results of our final
foundation investigations for Structures No's
1 (W.P. 33-65), and 23 (W.P. 32-66).

Please attach these to your copy(s) of
Foundation Report #65-F-104.

AGS/MdeF
Attach.

A. G. Stermac
A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

cc: Messrs. B. R. Davis (2)
H. A. Tregaskes
D. W. Parren
G. K. Hunter (2)
P. Allen
T. J. Kovich
W. S. Malinschyn
A. Gati

Foundations Office
Gen. Files

MEMORANDUM

To: Mr. A. G. Stermac,
Principal Foundation Engineer,
Room 107,
Lab. Building.

FROM: Bridge Division,
Downsview, Ontario.

DATE: September 15th, 1966.

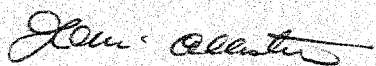
OUR FILE REF.

IN REPLY TO:

SUBJECT: W.P. #32-66, Bridge No. 23,
C.E.W. and Hwy. #27 Interchange,
District #6.

Herewith one print of our drawing D-5964-P1
for your approval and comments.

RNC/cew
Encl.


J. C. McAllister,
for W. S. Melinyshyn,
Regional Bridge Location Engineer.

Mr. C. S. Grebaki,
Bridge Design Engineer,
Bridge Division,
Admin. Bldg.

Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

October 5, 1966

Bridge No. 1 (W.P. 33-65) and
Bridge No. 23 (W.P. 32-66) --
Q.E.W. & Hwy. #27 Interchange.

In response to your verbal request regarding the foundation recommendations for Bridges No. 1 and 23, Q.E.W. and Hwy. #27 Interchange, we wish to advise you that the reports will be issued most probably by the end of next week. However, to enable you to proceed with your design work, we are listing below, the recommended footing elevations and corresponding allowable bearing capacities.

Bridge No. 1 (W.P. 33-65) -

	<u>Ftg. Elev.</u>	<u>Rock Elev.</u>	<u>Allow. B.C. (t.s.f.)</u>
West Abutment	358.0	347.0 - 348.0	3.0
Pier No. 1	345.0	345.0	10.0
Pier No. 2	343.5	344.0	10.0
Pier No. 3	345.0	346.0 - 347.0	10.0
East Abutment	358.0	347.5	3.0

Provisions should be made for rock concrete to be placed in case the bedrock surface is found to be uneven, or some portions to be excavated because it is weathered.

Mr. C. S. Grebski,
Bridge Design Engr.,
Bridge Div., Admin. Bldg.

- 2 -

October 5, 1966

Bridge No. 23 (W.P. 32-66) -

	<u>Ftg. Elev.</u>	<u>Rock Elev.</u>	<u>Allow. B.C. (t.s.f.)</u>
South Abutment	344.0	334 (below)	3.0
Pier No. 1	329.5	325.0	4.0
Pier No. 2	333.5	328.5	4.0
Pier No. 3	333.5	328.5	4.0
North Abutment	346.0	340 (below)	4.0

We think that this information will be adequate for your further design work. However, should you have any additional questions that you would like to discuss, please feel free to contact this Office.

AGS/MieP

M. Devata
for A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

cc: Foundations Office ✓
Gen. Files

MEMORANDUM

To: Mr. A. G. Sternac,
Principal Foundation Engineer,
Room 107, Lab. Building.

FROM: Bridge Division,
Downsview, Ontario

Attention: Mr. K. Selby

DATE: August 10, 1966

One File Ref.

IN REPLY TO:

SUBJECT: W.P. 174-66-2, Bridge No. 22
W.P. 32-66, Bridge No. 23,
Q.E.W. and No. 27 Interchange,
District 6

Attached is one print of a 1" = 40' plan as you requested for the above crossings; showing the approximate location of footings and a suggested bore hole layout.

Elevation of the ramp W-Ev. over Q.E.W. will be at approximate elev. 358 ± at sta. 450 + 00.

This information is preliminary, however the geometrics are now available and the layout as shown should not differ much from the final design.

JCMCA/pr
Attach.

cc. A. Crowley
R. Strain

J. C. McAllister
J. C. McAllister,
for W. S. Melnyshyn,
Regional Bridge Location
Engineer.

GEOTECHNICAL DATA SHEET FOR BOREHOLE . 58 .

OUR REFERENCE NO. 6-5-39

W.J. 66-F-47

CLIENT: D.H.O.

PROJECT: Q.E.W. & HWY. No 27 INTERCHANGE

LOCATION: 175,900 N ; 207,155 E

DATUM ELEVATION: G.S.C.

METHOD OF BORING: AUGERING & CORING

DIAMETER OF BOREHOLE: 4"

ENCLOSURE NO.

DATE: JUNE 28 3, 1966

W.P. 275-64-4

ELEVATION ft.	DEPTH ft.	STRATIFICATION DESCRIPTION	STRATIFICATION SYMBOL	SAMPLES			PENETRATION RESISTANCE blows per foot				CONSISTENCY water content %				REMARKS
				NUMBER	TYPE	N or Advancement of Sampler	2,0	4,0	6,0	8,0	100	PL	W	LI	
354.7	0	GROUND SURFACE													
		4" GRAVEL FILL													
		Reddish Brown													
		FINE SAND													
352.2	2.5														
350.0	5	Hard to very Hard		1	S.S.	29									
		Grey													
		CLAYEY SILT													
		with some													
345.0	10	embedded Gravel		2	S.S.	66									
		(Glacial TILL)													
340.0	15			3	S.S.	93									
		(boulders)		3A	R.C.										
335.0	20	frequent boulders		4	S.S.	75/6"									
		below el. 335 ft.		5	R.C.										
330.0	25			5A	R.C.										
				6	S.S.	79									
325.0	30			7	S.S.	25/1"									
				7A	R.C.										
324.2	30.5			8	S.S.	77/5"									
		Dark Grey SHALE		9	R.C.										
		with bands of			53%										
320.0	35	Hard LIMESTONE		10	R.C.										
					50%										
317.2	37.5	END OF BOREHOLE													
315.0	40														

W.L. EL. 343.4
JUNE 6. 1966.

VERTICAL SCALE: 1 IN. TO 5 FT.

DOMINION SOIL INVESTIGATION LIMITED

MADE: D. A. M. CHD.

OUR REFERENCE NO. 6-5-39

W. J. 66 - F - 47

COUNT: D. H. O.

PROJECT: Q. E. W. & HWY. NO. 27 INTERCHANGE

LOCATION: 175,730 N; 207.100 E

DATUM ELEVATION G.S.C.

METHOD OF BORING AUGERING

DIAMETER OF BOREHOLE 4 "

DATE JUNE 4, 1966

W. P. 275 - 64 - 4

ENCLOSURE NO

[illegible]

GEOTECHNICAL DATA SHEET FOR BOREHOLE . 6.3 .

OUR REFERENCE NO. 6-5-39

W.J. 66-F-47

CLIENT: D.H.O.

PROJECT: Q.E.W. & HWY. No 27

LOCATION 176,155 N ; 207,155 E

DATUM ELEVATION: G.S.C.

METHOD OF BORING: WASHBORING

DIAMETER OF BOREHOLE 2 3/8"

DATE: JUNE 3 - 6, 1966

W. P. 275 - 64 - 4

ENCLOSURE NO.

ELEVATION ft	DEPTH ft	STRATIFICATION DESCRIPTION	STRATIFICATION SYMBOL	SAMPLES			PENETRATION RESISTANCE blows per foot				CONSISTENCY water content %				REMARKS
				NUMBER	TYPE	2- or Advancement of Sampler	2.0	4.0	6.0	8.0	10.0	PL	W	LI	
361.0	0	GROUND SURFACE													
360.0		3" TOPSOIL													
		Generally Dense to Compact Brown													
	5	FINE SAND													
355.0		with some SILT		1	S.S.	42									
352.0	9	Hard to very Hard													
350.0	10	Grey		2	S.S.	41									
		CLAYEY SILT													
	15	with some													
345.0		embedded gravel		3	S.S.	60									
		(Glacial TILL)													
	20	(boulder)		4	S.S.	100/0"									
340.0				5	R.C.										No Penetration
				6	S.S.	80/6"									
	25			7	R.C.										
335.0				8	S.S.	75/6"									
				9	R.C.										
	28.9			10	S.S.	60/4"									
332.1	30	Alternate Layers of		11	R.C.										
330.0		CLAYEY SILT		12	S.S.	100/4"									
		and SHALE		13	R.C.	50%									
328.0	33			14	S.S.	100/0"									No Penetration
	35	Dark Grey													
325.0		SHALE BEDROCK		15	R.C.	60%									
323.0	38.0	END OF BOREHOLE													
	40														
320.0															

W.L. EL. 354.0'
JUNE 6, 1966.

No Penetration

No Penetration

VERTICAL SCALE: 1 IN. TO 5 FT.

DOMINION SOIL INVESTIGATION LIMITED

MADE: D.A.M. CHD.

GEOTECHNICAL DATA SHEET FOR BOREHOLE . . 64 . .

OUR REFERENCE NO. 6 - 5 - 39

W. J. 66 - F - 47

CLIENT: D. H. O.

PROJECT: Q. E. W. & HWY. No 27 INTERCHANGE

LOCATION: 176,225 N ; 207,033 E

DATUM ELEVATION: G. S. C.

METHOD OF BORING WASHBORING

DIAMETER OF BOREHOLE 2 3/8"

DATE: JUNE 6 & 7, 1966

W. P. 275 - 64 - 4

ENCLOSURE NO.

ELEVATION ft	DEPTH ft	STRATIFICATION DESCRIPTION	STRATIFICATION SYMBOL	SAMPLES			PENETRATION RESISTANCE				CONSISTENCY water content % Pl W LI 10 20 30 40	REMARKS
				NUMBER	TYPE	N- or Advancement of Sampler	blows per foot 2,0 4,0 6,0 8,0 100 SHEAR STRENGTH lbs/sq ft					
361.1	0	GROUND SURFACE										
360.0		12" SANDY TOPSOIL Compact to Dense Brown										
355.0	5	FINE SAND with some SILT		1	S.S.	43						
354.1	7	Hard to Very Hard Grey		2	S.S.	46						
350.0	10	CLAYEY SILT with some embedded GRAVEL		3	S.S.	58						
		(GLACIAL TILL)		4	S.S.	38						
345.0	15	(boulder)		5	S.S.	68/10"						
340.0	20			6	R.C.							
339.6	21.5	END OF BOREHOLE		7	S.S.	95						

W.L. 356.0 Ft.
JUNE 8, 1966.
Sa. 82% ; Si 18%

