

56-F-209C

HWY #17 &

CYRVILLE RD.

77 685
(C O P Y)

REPORT ON FOUNDATION INVESTIGATION

AT

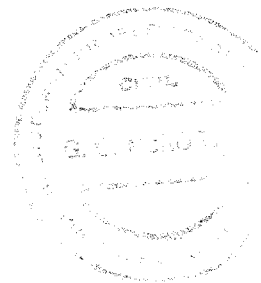
CYRVILLE ROAD AND HIGHWAY 17 ALTERNATIVE

EAST OF OTTAWA

TO

DeLEUW CATHER & COMPANY OF CANADA LIMITED

JAN. 6, 1956
Report No. 214



McROSTIE & ASSOCIATES
CONSULTING ENGINEERS
OTTAWA CANADA

BA 685

MCROSTIE & ASSOCIATES

CONSULTING ENGINEERS

OTTAWA 1

CANADA

393 BELL STREET
TELEPHONE CE. 2-5334

FOUNDATION INVESTIGATION AT CYRVILLE ROAD

1. FIELD WORK

Three boreholes were made at the site in the locations shown on plate one. These were chosen as the most representative of the eight locations shown on Drawing No. 1-C17-SKI. Standard penetration tests were performed in the boreholes and rock was diamond drilled and cores recovered. Approximately ten feet of drilling was done in each hole since large concentrated loads are to be supported and the quality of rock is low.

Groundwater levels were observed in all holes.

2. OBSERVATIONS

The soil layers are somewhat variable but in general consist of glacial till to a depth of ten to twenty-three feet, the till exists in several densities, ranging from very dense to loose, and in hole 3 a thin layer of sand is interbedded at seven to nine feet. Underneath the till is soft shale rock which is considerably weathered and broken. The bedding is thin, one-half inch to three inches, and is slightly inclined in hole 3. The geological explanation for rock in this condition is that at the time of the glaciers, the frost penetrated to great depths and the softest shale layers were disturbed by frost action. This explanation also is advanced for the presence of shale fragments in the soil mass above the parent rock.

Water levels were approximately four feet below surface, but can be expected to be at or near the surface in wet seasons, and lower in dry seasons.

3. DESIGN RECOMMENDATIONS

If the structures will have approximately the same slope as the existing ground, which seems reasonable, the soil properties are best referred to depths from

surface. If not, then values can be supplied referring to a uniform elevation.

Soil Strengths

Above 10 feet -	2,000 pounds per square foot
10 ft. to 17 ft. -	4,000 pounds per square foot, but groundwater control required.
Below 17 feet -	6,000 pounds per square foot and not affected by groundwater flow.

These values are based on the lowest average strengths encountered for each soil horizon at the site. Higher values for individual points might be confirmed if the cost of further investigation is justified.

Soil Consolidation - since the till is predominantly granular in its properties, slow settlement by consolidation is not a factor here. Settlements due to applied load would take place during the placing of the dead load and would not increase with time.

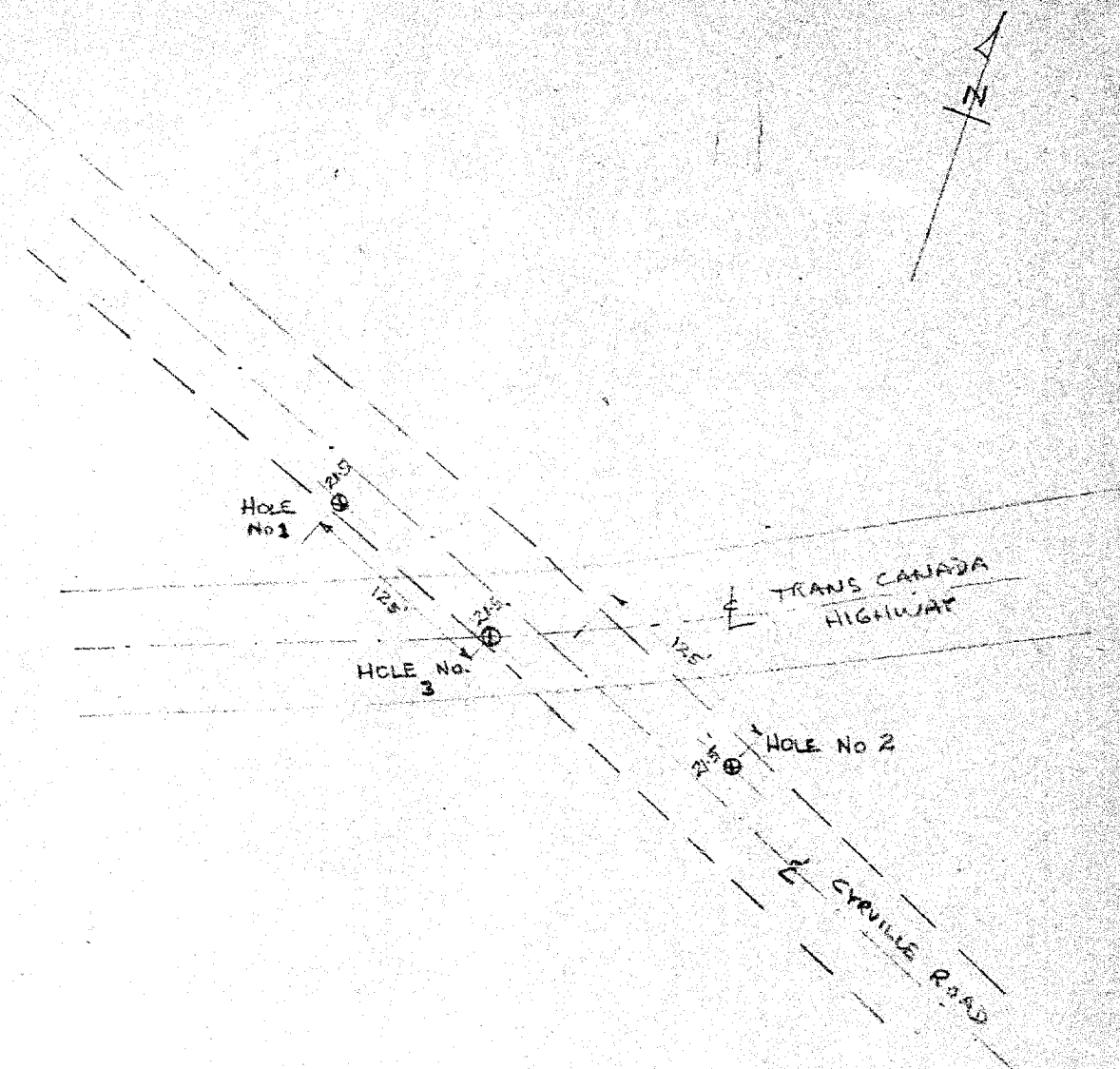
4. CONSTRUCTION PRECAUTIONS

The glacial till in the upper soil layers at this site could gradually lose strength due to groundwater seepage during the time of construction. The depth below groundwater levels has an important effect and hence the season at which excavations would be made should be considered. If it was necessary to excavate at seasons of high groundwater levels (groundwater near the surface) and if the excavations were made fifteen feet deep, then softening of the excavation bottom would very likely occur unless the groundwater had been lowered or controlled by wellpoints or deep cutoff ditches.

On the other hand, if the excavations were only ten feet deep, and were made during the dry season (groundwater likely eight feet or more below surface) then no problem would exist.

3.

One possible method of proceeding in this situation is to obtain unit prices for groundwater control methods such as excavation for groundwater cutoff ditches or drains, and have the control used at the discretion of the engineering supervisory staff.



SEE DWG No 1-C17-SK 1.

G. C. McROSTIE
CONSULTING CIVIL ENGINEERS

BOREHOLE LOCATIONS
 CYRVILLE RD AT NO 17 ALT
 EAST OF OTTAWA

SCALE 100' = 1"

PLATE 1

● 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840.

G. C. McROSTIE
CONSULTING CIVIL ENGINEERS
OTTAWA CANADA

SOIL PROFILE AND SUMMARY
OF LABORATORY TESTS

CYRVILLE ROAD AT
HIGHWAY 17 ALTERNATIVE
EAST OF OTTAWA

ELEVATION OF GROUND SURFACE (ZERO DEPTH) 232.7

HOLE NO.

REMARKS

2

BORINGS BY McROSTIE TESTING BY _____ DATE NOV. 28/55

UNCONFINED COMPRESSIVE STRENGTH	STANDARD PENETRATION BLOWS/FT.	SAMPLE NUMBER	DESCRIPTION OF SOIL	DEPTH IN FEET	ELEVATION	PENETRATION TEST			
					LB. HAMMER	NO CASING		
KIPS/FT. ²						INCH DROP	INCH DIA. ROD	BLOWS PER FOOT	
			GROUND SURFACE						
			SOIL	0	232.7				
				2					
	13	1 $\frac{X}{X}$	MEDIUM DENSE FINE GRAVEL 4.0	4					
	6	2 $\frac{X}{X}$	LOOSE TILL	6					
	10	3 $\frac{X}{X}$		8					
	23	4 $\frac{X}{X}$		10	222.7				
	59	Lost	DEDIUM	12					
	For 6"		DENSE	14					
	17	Lost	TILL	16					
	For 6"			18					
	97	5 $\frac{X}{X}$	19.5 DENSE TILL	20	212.7				
			22.9	22					
			WESTHERED	24					
			AND	26					
			BROKEN						
			SOFT						
			SHALE	28					
			(Drilled) 28.5						
			SOFT SHALE DRILLED	30	202.7				
			TO 37.8' DEPTH						
						% WATER CONTENT			
						PLATE			
						3			

G. C. McROSTIE
CONSULTING CIVIL ENGINEERS
OTTAWA CANADA

SOIL PROFILE AND SUMMARY
 OF LABORATORY TESTS

CYRVILLE ROAD AT
 HIGHWAY 17 ALTERNATIVE
 EAST OF OTTAWA

ELEVATION OF GROUND SURFACE (ZERO DEPTH) 234.2
 REMARKS

HOLE NO.

3

BORINGS BY McROSTIE TESTING BY DATE DEC. 13/55

UNCONFINED COMPRESSIVE STRENGTH KIPS/FT ²	STANDARD PENETRATION BLOWS/FT.	SAMPLE NUMBER	DESCRIPTION OF SOIL	DEPTH IN FEET	ELEVATION	PENETRATION TEST			
						LB. HAMMER	NO CASING	INCH DROP	INCH DIA. ROD
			GROUND SURFACE						BLOWS PER FOOT
			SOIL	0	234.2				
				2					
	46	1 X	DENSE	4					
			TILL						
	57	2 X	WITH	6					
			WEATHERED SHALE						
			FRAGMENTS						
	30	3 X	MEDIUM DENSE	8					
			SAND						
	35	4 X	DENSE	10	224.2				
			TILL	12					
	104	5 X		14					
	70	6 X		16					
For 6"			WEATHERED	18					
			AND BROKEN						
			SOFT SHALE						
			(drilled)	20	214.2				
			SOFT	22					
			SHALE	24					
			DRILLED	26					
			(Core Recovery 90%)						
				27.5					
			BOTTOM OF HOLE	28					
				30	204.2				
						% WATER CONTENT		PLATE	
								14	