GAGNON ENGINEERING, INC.

GORHAM, MAINE

Project: CANAL LANDING BUILDINGS
Subject: ALLOWABLE FOUNDATION GROUND PRESSURES
Item: Design Calculations

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REV Date: Feb. 07, 2019

Purpose: Determine allowable ground pressures under footings
a) top of Compact Gravel
b) top of native ground

Conditions & Assumptions:

Existing Soils & Proposed Backfills are described in Geotechnical Reports by S.W. Cole Engineering titled "Geotechnical Engineering Services, Proposed Buildings C & D" August 11, 2015 and "Explorations & Geotechnical Engineering Services, Proposed Portland Yacht Services Expansion" May 8, 2018.

Foundation Plan: GEI Plan entitled "Canal Landing Work Building Foundation" dated 012519

Existing Subgrade soil, below elevation 8.0' is granular with a friction angle of 28 degree or better, with density of at least 115 pcf .
Added fill is 34 degree 125 pcf gravel. Ground water is maintained at or below elevation 7.0'

Ground Pressures Dissipate Rapidly below elevation 7.0'
Reference: "Soils in Construction" by Schroeder et al 5th Ed. Table 11.2

General Equation: $q_{uallow} := \frac{0.4 \cdot \gamma \cdot B_f \cdot N_\gamma + \gamma \cdot D_f \cdot N_q}{FS}$ Soils in Constrution, Eq. 11-4, (Note: Variables are defined below)

Top of Compact Gravel Allowable Bearing:

$\gamma_{34} := 0.125 \frac{kip}{ft^3}$ $B_f := 2\ ft$ $N_\gamma := 36$ $D_{34} := 3\ ft$ $N_q := 36$ $FS := 2.5$

$$q_{uallow34} := \frac{0.4 \cdot \gamma_{34} \cdot B_f \cdot N_\gamma + \gamma_{34} \cdot D_{34} \cdot N_q}{FS} = 6.84\ ksf \quad > 4.0\ ksf \ \therefore\ OK$$

Top of Native Ground Allowable Bearing (Proof-Rolled):

$\gamma_{28} := 0.115 \frac{kip}{ft^3}$ $B_f := 2\ ft$ $N_\gamma := 15.7$ $D_{28} := 4\ ft$ $N_q := 17.8$ $FS := 2.5$

$$q_{uallow28} := \frac{0.4 \cdot \gamma_{28} \cdot B_f \cdot N_\gamma + \gamma_{28} \cdot D_{28} \cdot N_q}{FS} = 3.85\ ksf \quad > 2.0\ ksf \ \therefore\ OK$$