Figure 2

Earthwork Computations

The following computations are used to determine if there is excess cut material that must be wasted or that insufficient material is available in the cuts to complete the fills, necessitating the use of borrow. The formula is applicable to projects that include both earth and rock excavation.

General Formula

$$(C - R) - [1.15(F - F_R)] - (F_R - 1.30R)$$

where:

C	=	Total Excavation (Earth and Rock)
R	=	Solid Rock Excavation
F	=	Total Fill (Earth and Rock)
F_R(Rock Fill)	=	1.30R when F>1.30 R (The ususal case)
	=	F when F<1.30R (Unusual case)
Fill compaction factor	=	1.15 (shrinkage)
Fractured rock factor	=	1.30 (swell)

Case I

Usual case: More fill than rock on project.

$F > 1.30R \setminus F_R = 1.30$

General formula: $(C - R) - [1.15(F - F_R)] - (F_R - 1.30R)$

Substitute 1.30R for F_R: $(C - R) - [1.15(F - 1.30R)] - (1.30R - 1.30R)$
$C - R - 1.15F + 1.495R - 0$

Case I Formula: **$C + 0.495R - 1.15F$**

Case II

Unusual Case: More fractured rock than fill on project.

$F < 1.30R \setminus F_R = F$

General formula: $(C - R) - [1.15(F - F_R)] - (F_R - 1.30R)$

Substitute F for F_R: $(C - R) - [1.15(F - F)] - (F - 1.30R)$
$C - R - F + 1.30R$

Case II Formula: **$C + 0.30R - F$**

Note: The formula to be used is governed by Project Totals, not by individual balance totals.