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TO: Director, Preliminary Plan Review Bureau

ENGINEERING INSTRUCTION

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

MODIFIED BY EI 87-034 EFFECTIVE 3/3/1988; EI 89-027 EFFECTIVE 9/27/1989 SUPERSEDED BY EB 98-045 EFFECTIVE 12/1/1998

SUBJECT: Betterment Data Procedure

Subject Code: 7.20-1

Distribution: [A] Main Office [C] Regions [ ] Special

Code: EI 75-13

Date: 2/3/75

Supersedes:

APPROVED: Roger H. Edwards
Deputy Chief Engineer, Facilities Design Subdivision

The purpose of this instruction is to establish basic guidelines for betterment computations and cost data used as input to the computer Engineers Estimate Handling System (Program HE71500) by regional design and subsequently to the Contract Accounting System. Presently, betterments are introduced into the Contract Accounting System via orders-on-contract, after contract award, utilizing exception codes and base prices.

As of May 1, 1975 the above betterments procedure can no longer be used due to the implementation of the revised computer Contract Accounting System. The revised procedure detailed below will eliminate orders-on-contract, provide for the assignment of fiscal and engineering shares in lieu of exception codes and base prices, and allow betterment data to be entered into the EEHS prior to P.S.&E. submission and contract award.

The following procedure shall be used to separate betterment cost data at the time of regional input to the Engineers Estimate Handling System.

A. Establish a separate engineering share for items and quantities to be paid 100% by each betterment requestor(s), and a separate engineering share for the corresponding participating items and quantities for each betterment. (See Exhibit Nos. 1 & 2)

B. Items added solely for the betterment shall be included in the 100% betterment requestor(s) share. (See Exibit No. 3)

C. When an increase in item quantity is necessary for a betterment, the increased quantity shall be included in the betterment requestor(s) share; the replacement "in-kind" quantity shall be shown in the participating share. (The in-kind quantity is the quantity that would have been necessary to construct a system comparable to the existing system being replaced). (See Exhibit No. 3)

D. If an improved or betterment item (e.g. increased pipe size) is to be substituted for an in-kind replacement item, quantities of the improved item must be apportioned between the betterment requestor(s) and participating in-kind engineering shares on the basis of estimated item price ratios. (See Exhibit No. 3)

E. "Overhead" items, such as Basic Maintenance and Protection of Traffic, Survey and Stakeout, Engineer's Office, Mobilization, etc., must be included in the Betterment Engineering shares if the total betterment cost is of sufficient magnitude to warrant participation.

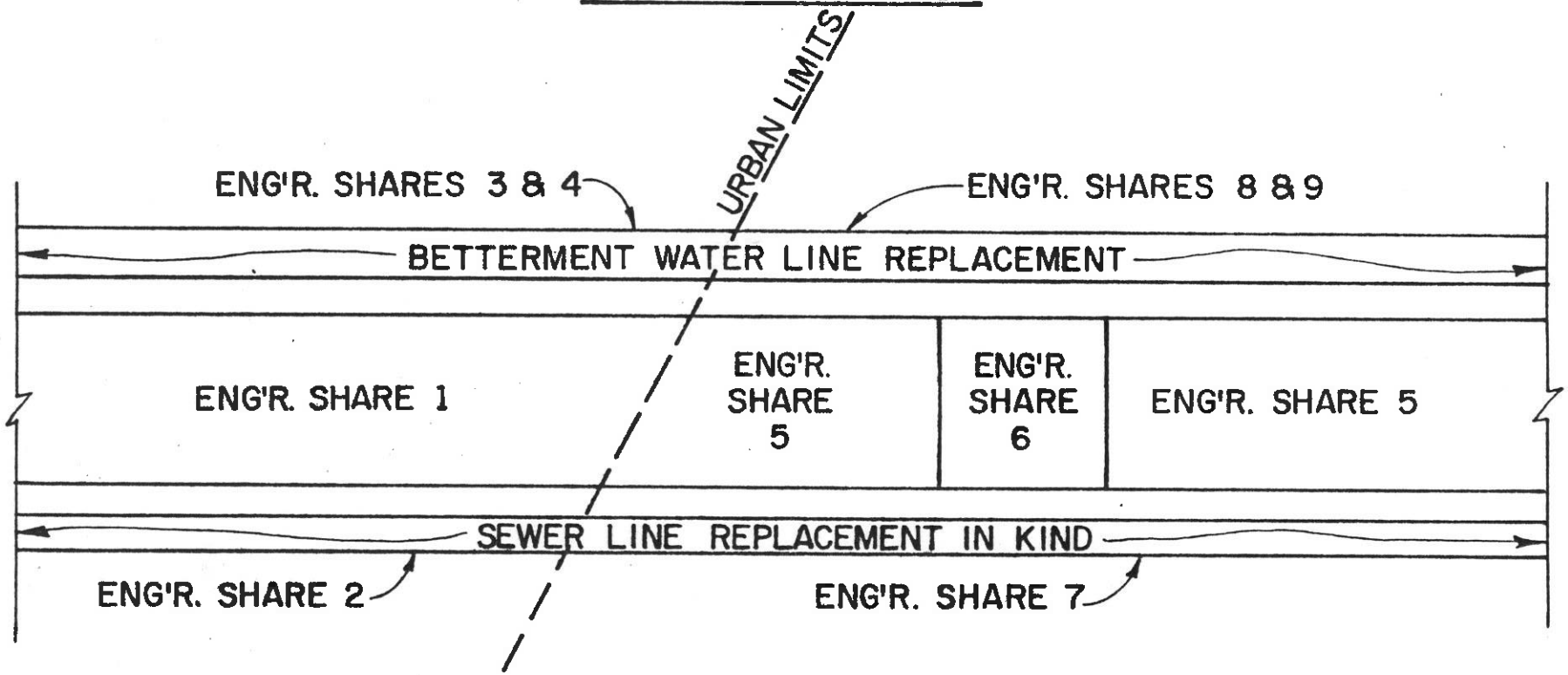
The quantity ratio and/or cost ratio between the participating betterment share and the 100% betterment requestor's share shall be calculated as shown on Exhibit 3.

The Betterment Worksheets (Exhibit No. 3) shall be included with the P.S. & E. submission. They shall be in the format as shown and in a neat and workmanlike manner. Since this method relies on the establishment of separate corresponding shares for betterment costs, it can be implemented in the Engineers Estimate Handling System at the regional design level.

An early implementation of these procedures will minimize the number of contracts with exception codes and base prices that will have to be converted prior to implementing the revised computer Contract Accounting System.

MT:LF:BS

EXHIBIT NO. 1



ENG'R. SHARE NO.	DESCRIPTION
1	ROADWAY - URBAN
2	UTILITY - URBAN
3	PARTICIPATING BETTERMENT - URBAN
4	100% BETTERMENT REQUESTOR - URBAN
5	ROADWAY - RURAL
6	BRIDGE #1 - RURAL
7	UTILITY - RURAL
8	PARTICIPATING BETTERMENT - RURAL
9	100% BETTERMENT REQUESTOR - RURAL

EXHIBIT NO. 2

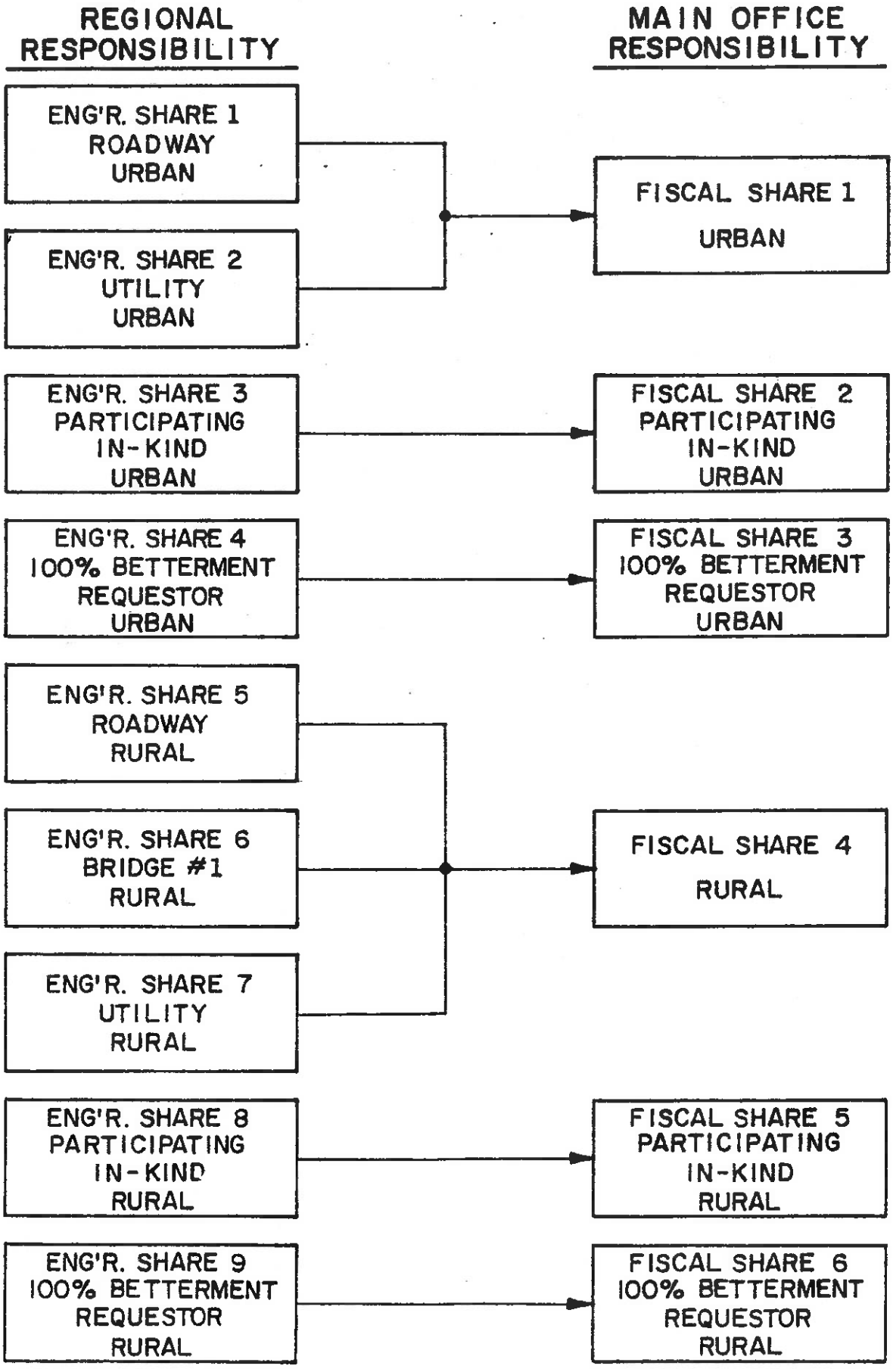

REGIONAL RESPONSIBILITY
MAIN OFFICE RESPONSIBILITY
ENG'R. SHARE 1 ROADWAY URBAN
ENG'R. SHARE 2 UTILITY URBAN
FISCAL SHARE 1 URBAN
ENG'R. SHARE 3 PARTICIPATING IN-KIND URBAN
FISCAL SHARE 2 PARTICIPATING IN-KIND URBAN
ENG'R. SHARE 4 100% BETTERMENT REQUESTOR URBAN
FISCAL SHARE 3 100% BETTERMENT REQUESTOR URBAN
ENG'R. SHARE 5 ROADWAY RURAL
ENG'R. SHARE 6 BRIDGE #1 RURAL
ENG'R. SHARE 7 UTILITY RURAL
FISCAL SHARE 4 RURAL
ENG'R. SHARE 8 PARTICIPATING IN-KIND RURAL
FISCAL SHARE 5 PARTICIPATING IN-KIND RURAL
ENG'R. SHARE 9 100% BETTERMENT REQUESTOR RURAL
FISCAL SHARE 6 100% BETTERMENT REQUESTOR RURAL

Exhibit No. 3

(Example for Urban Portion Only)

BETTERMENT WORKSHEET

ITEM	"IN-KIND" QUANTITY	BETTERMENT QUANTITY	EST. PRICE	100% REQUESTOR'S		PARTICIPATING "IN-KIND"		ESTIMATE	
				ENGR. SH. QTY.	QTY. RATIO	ENGR. SH. QTY.	QTY. RATIO	REQUESTOR'S COST (NON-PART.)	"IN-KIND" COST (PART.)
03660.14 Hydrant	-	1 EA.	$350	1 EA.	1.00	-	-	$ 350.00	-
203.07 Select Fill	430 cy.	507 cy.	$2	77 cy.	.15	430 cy.	.85	$ 154.00	$ 860.00
206.02 Excavation	987 cy.	1,063 cy.	$3	76 cy.	.07	987 cy.	.93	$ 228.00	$ 2,961.00
15628.05 Sheeting	10,258 SF.	10,778 SF.	$.30	520 SF.	.05	10,258 SF.	.95	$ 156.00	$ 3,077.40
02660.1712 8" Valve	1 EA.	-	$200						
* 02660.1725 12" Valve	-	1 EA.	$300	.33 EA.	.33	.67 EA.	.67	$ 99.00	$ 201.00
603.9515 8" Pipe	1,410 LF.		$11						
** 603.9525 12" Pipe		1,465 LF.	$16	496 LF.	.34	969 LF.	.66	$7,936.00	$15,504.00
						Totals		$8,923.00	$22,603.40
						Total Betterment Cost		$31,525.40***	

Quantities determined by following computations:

Price Ratio x In-kind Quantity = Participating Share Quantity

* 200/300 x 1 = .67 Ea.

** 11/16 x 1410 = 969 L.F.

Betterment Quantity minus Participating Share Quantity = Betterment Requestor Share Quantity

* 1 - .67 = .33 Ea.

** 1465 - 969 = 496 L.F.

*** $\frac{22,603}{31,525}$ = 71% = Participating Percentage of each "overhead" item

$\frac{8,923}{31,525}$ = 29% = Betterment Requestor percentage of each "overhead" item

File

MEMORANDUM
DEPARTMENT OF TRANSPORTATION

DATE March 17, 1975

SUBJECT BETTERMENT DATA PROCEDURE - E.I. 75-13

FROM M. Tegza, Final Plan Review Bureau, Rm. 410, Bldg. 5 MT

TO All Regional Directors

cc J. Sternbach, Constr. Subdiv., Rm. 423, Bldg. 5
R. N. Kamp, Struct. Des. & Constr. Subdiv., 6th Flr., Bldg. 5
W. Christman, Design Bur., Rm. 510, Bldg. 7A
J. R. Stellato, Waterways Maint. Subdivision, Rm. 216, Bldg. 5
R. Radliff, Preliminary Plan Review Bureau, Rm. 408, Bldg. 5
A. Kenyon, Preliminary Plan Review Bureau, Rm. 408, Bldg. 5

Recently, Region 8 questioned this office on how Instruction 75-13 applied to the contributory flow method detailed in Instruction 70-33 and page 8-83 paragraph 8.06 of the Highway Design Manual.

The only purpose of Instruction 75-13 is to establish the method of dividing the total quantities necessary for a betterment into 2 separate shares, one share paid for entirely by the requestor of the betterment, the other share paid for entirely by the State and/or FHWA. This 2 share concept will work for either the "additional cost basis" betterment (the example shown in Instruction 75-13) or the "contributory flow" betterment (see example below). The ratio of responsibility arrived at by either betterment method is applied to the total quantities for the betterment, resulting in 2 separate but related engineering shares which are input to the Engineer's Estimate Handling System.

The following is an example of how to arrive at the 2 separate engineering shares for a "contributory flow" type betterment using Formula 1 of Instruction 70-33:

STORM SEWER

ITEM	QUANTITY	ESTIMATED PRICE	TOTAL COST
203.07	39.1 CY	$11.00	$ 430.10
206.02	36.9 CY	12.00	442.80
603.0515	110 LF	10.00	1,100.00
			$1,972.90

CONTRIBUTORY FLOW FACTORS

CITY	=	3.4
STATE	=	1.0
TOTAL		4.4

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MAR 17 1975
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Using Formula 1 of Instruction 70-33 (flow factor ratio applied to <u>total cost</u>), computations would be as follows:

City Share = 3.4/4.4 = 77% x $1972.90 = $1519.13
State Share = 1.0/4.4 = 23% x $1972.90 = 453.77

Using the E.I. 75-13 method (flow factor ratio applied to <u>total quantity</u>), computations would be as follows using Formula 1:

City Share = 3.4/4.4 = 77% of each quantity
State Share = 1.0/4.4 = 23% of each quantity

ITEM	Quantity InKind	Quantity Requestor	Estimated Price	Cost Inkind	Cost Requestor
203.07	9	30.1	$11.00	$ 99.00	$ 331.10
206.02	8.48	28.42	12.00	101.76	341.04
603.0515	25.3	84.7	10.00	253.00	847.00
				$453.76 (STATE)	$1,519.14 (CITY)

In both cases above, the cost to each participant computes to the same amount. However, using Instruction 75-13 methods of establishing 2 separate shares, the <u>Quantities</u> for each share are input into the Engineer's Estimate Handling System by your office. This will set the amount of participation prior to letting and facilitate use in the revised Contract Accounting System.

Formula 2 of Instruction 70-33 would be applied in the same manner except the ratio for apportionment of quantities to each share would be based on total system costs rather than amounts of contributory flow.

The Federal Highway Administration has approved Instruction 75-13. The Highway Design Manual (Page 21-30, Item 4) will be updated to incorporate the 2 share concept for betterments. Page 8-83, paragraph 8.06 will <u>not</u> change.

We trust this will clarify the situation.

MT:LJF:FS