

1916

# Report on cost finding prepared for the American Face Brick Association

Ernst & Ernst

American Face Brick Association

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# Report on Cost Finding

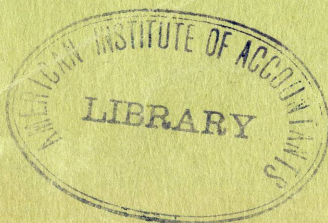
PREPARED FOR  
**The American Face  
Brick Association**



by  
**ERNST & ERNST**  
CERTIFIED PUBLIC ACCOUNTANTS  
PITTSBURGH

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# Report on Cost Finding

PREPARED FOR  
**The American Face  
Brick Association**



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**ERNST & ERNST**  
CERTIFIED PUBLIC ACCOUNTANTS  
PITTSBURGH

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ERNST & ERNST  
CHICAGO

March 8th, 1920.

Mr. R. D. T. Hollowell, Secretary-Treasurer,  
American Face Brick Association,  
Chicago.

Sir: - SUPPLEMENTAL REPORT ON COST FINDING -

In connection with the uniform outline prepared for your Association several years ago, we desire to suggest in the light of further development since that time the following changes and request that you issue a bulletin to the members covering the subject matter of this letter:

GOVERNMENT INCOME AND EXCESS PROFITS TAXES

At the time the system was originally devised the Government taxes were only a very nominal item and the system provided for the inclusion of the taxes in the Tax Account under the caption of "Fixed Charges."

As conditions have radically changed in connection with Government taxes and these taxes are not a deductible item in making up a report to the Government, the members of the Association should charge these taxes to their Government Tax Account, which, at the end of the year, should be closed directly into their Surplus Account and these taxes should not be considered a part of the manufacturing cost of your product.

PROMOTION EXPENSE

This expense is shown as Group No. 13, with accounts for Association Dues and Assessments and Convention Expense. We suggest that this Promotion Expense be eliminated as a group and that these two expenses be included as separate accounts in Group No. 3, under the heading of General Expense.

In this way, these items will be taken in and form a part of the actual manufacturing cost of the product, whereas the present plan of having a separate group of expenses these items are not included as part of the manufacturing cost.

REHANDLING EXPENSE -SUB-GROUP NO. 2

Sub-Group No. 2, including freight charges, packing and local delivery expenses we find is misunderstood and charges are being made incorrectly by a number of members.

According to the original outline, which we are not proposing to change, there should be charged to these accounts only the transportation expense which the brick manufacturer has to stand. All prepaid freight which the customer remits

for should be charged to the proper transportation account and this same account receive credit when the customer makes payment.

Assuring you we will be glad to furnish any further information you may desire in case our explanation is not entirely clear in regard to this matter, we are

Very truly yours,

(Signed)

E. H. Scull,

Manager System Staff.

EHS-FH

# Report on Cost Finding

PREPARED FOR

THE AMERICAN FACE BRICK  
ASSOCIATION



By

ERNST & ERNST  
CERTIFIED PUBLIC ACCOUNTANTS  
PITTSBURGH

THE AMERICAN FACE BRICK ASSOCIATION

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**ERNST & ERNST**

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Union Trust B'ld'g

CHICAGO  
1st Nat'l B'k B'ld'g

DETROIT  
Dime Bank B'ld'g

DALLAS  
Busch B'ld'g

**Cleveland**

November 29th, 1916.

Cost Committee and Members,  
The American Face Brick Association,  
Pittsburgh.

Gentlemen:—

Pursuant to your request, we have conferred individually with the several members of THE AMERICAN FACE BRICK ASSOCIATION, PITTSBURGH, to whom at the outset of our engagement with you we have been directed.

In rendering this service in accordance with your requirements as made known to us, we have directed our efforts with the purpose to acquire an intimate acquaintance with the various processes employed in the manufacture of face brick and with the physical conditions which exist generally in face brick manufacturing plants.

In this report we give consideration to the important details which enter into a cost finding and general accounting procedure applicable to the face brick industry and we submit for your consideration certain and definite recommendations which, if adopted, we believe will effect the accomplishment of the particular object which now is before The American Face Brick Association—the use by all members of uniform cost finding and accounting methods.

Very truly yours,

**ERNST & ERNST,**  
Certified Public Accountants.



# REPORT ON COST FINDING

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# THE AMERICAN FACE BRICK ASSOCIATION

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## INTRODUCTION

It has been made incumbent on us in pursuit of our engagement with you to create in the mind of each member of The American Face Brick Association, to whom we are directed, a definite understanding relative to the details of the general plan to which it has been recommended he adhere in arriving at the cost of his own product by cost finding methods uniform with those employed by all other members of the association. To accomplish successfully this purpose with the minimum expenditure of time granted to us, and to leave with each member for reference an exhibit definitely outlining the procedure to which he will adhere, is the occasion for the preparation of this report.

In consideration of the commendable degree of intelligence in the application of accounting principles which we have had occasion to recognize in the organizations of those members with whom we already have conferred, we express the opinion that the members of the association individually should experience little difficulty in making effective in their organizations the details of the plan as defined in the following pages of this report.

In preparing for presentation to the members of the association the outline discussed in the following pages of this report, we have retained foremost in mind the particular objective which it is your purpose to attain—the adoption by all members of The American Face Brick Association uniform cost finding methods by which may be obtained costs of production which will permit of uniform and intelligent comparison.

In order that this particular purpose might be placed within the range of successful accomplishment by the association members individually and collectively, we have determined that for the sake of a close adherence to the principle of uniformity our recommendations shall effect in certain details a deviation from the technicalities involved in the strictest application of cost finding procedure.

## REPORT ON COST FINDING

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### PRIMARY EXPENSE GROUPS

All expenses incident to the various operations and the various materials entering directly or indirectly into the production of Face Brick for cost finding purposes primarily may be considered in thirteen groups:

#### General Overhead Expenses

1. Office and Administrative Expense
2. Fixed Charges
3. General Expense
4. Power Generation Expense

#### Departmental Manufacturing Expenses

5. Shale or Clay Mining and Transportation Expense
6. Processing and Machining Expense
7. Drying Expense
8. Transferring and Setting Expense
9. Burning Expense
10. Sorting and Drawing Expense

#### Distribution Expenses

11. Rehandling Expense
12. Selling Expense
13. Promotion Expense

The thirteen primary expense groups as presented above are comprised within three grand expense divisions.

The General Overhead Expense division comprises all those expenses which are carried directly into the cost of manufacture without previous distribution among the various processing departments with exceptions as subsequently herein noted.

The Departmental Manufacturing Expense division comprises all those expenses which are incurred in processing the product in the various stages of manufacture and which are directly chargeable to these processes.

The Distribution Expense division comprises those expenses which do not enter into the cost of manufacture and which are incident to the sale and distribution of the finished product. These expenses necessarily are added to the cost of manufacture before the determination of the selling price.

### COAL MINING

Preliminary to a discussion of the expense items which enter into and comprise each of the Primary Expense Groups, our attention is directed to those manufacturing plants engaged in the face brick

## THE AMERICAN FACE BRICK ASSOCIATION

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### PRIMARY EXPENSE GROUPS

#### COAL MINING—Concluded

industry which are carrying on coal mining operations in conjunction with the production of brick.

Without discussion we recognize the fact that if one manufacturer in a certain locality has in his property an available coal supply which can be mined and delivered at the point of consumption at a low cost per ton and another manufacturer in the same locality is compelled to purchase coal in the open market and to pay therefor a high price in accordance with market conditions, the difference in these two cases in this fuel expense item will affect in some degree the cost of production in the same locality, although other conditions might be more nearly equal.

In all plants, therefore, where the entire coal supply or a part thereof is derived from deposits owned or worked by the manufacturer, the coal mining operations will be regarded as separate and distinct from the brick manufacturing enterprise. The coal mined out of the local deposits will be delivered and in effect sold by the coal mining enterprise to the brick manufacturing enterprise at a price determined in accordance with that which would be paid, on a contract basis, for the same grade if purchased in the open market in the same locality. This procedure, we believe, is in strict accordance with the purpose to have adopted by all members of the association the principles of uniform cost finding

It is not our purpose that a uniform price should be determined at which throughout the industry as a whole the coal mined by the manufacturers themselves should be charged into their brick manufacturing expense. This would be illogical and impracticable. Different prices should prevail in different localities depending upon varying market conditions, and these prices should include always a proper allowance for transportation charges which necessarily would be incurred if the coal were purchased in the open market.

If the conditions under which coal and shale or clay are taken out of the same property do not permit of a distinct division as between coal mining expenses and shale or clay mining expenses, it will be necessary that all expenses incident to the mining of coal and shale or clay be charged into the Shale or Clay Production Expense group. At the end of each accounting period a credit will be carried to an account in this group representing the nominal revenue derived from the coal mined and delivered at market price to the brick making enterprise. The amount of this credit will be deducted at the end of each accounting period from the total expenses charged in the period to the Shale or Clay Production Expense group leaving a balance in the group which will be chargeable to the production of shale or clay.

## REPORT ON COST FINDING

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### EXPENSE DISTRIBUTION

In the discussion of the various details which are peculiar to each of the thirteen expense groups, it is of first importance that we acquire and definitely fix in mind a clear conception of the exact limits within which each group properly is confined.

We recognize the fact that while similar processes of manufacture are employed in the various plants represented in the national association of face brick manufacturers, these plants differ widely as to the magnitude of their operations and the requirements relative to the details of the cost of production in which the operators have interest.

The extent to which the costs of production will be analyzed by means of maintaining separate and distinct accounts therefor in the ledger and in the subsidiary books of record will be determined by the operators in accordance with their individual requirements. It is of importance only that all manufacturers interested in the adoption of uniform cost finding methods in the face brick industry shall adhere strictly to the practice of segregating all expenses incurred in the operation of their respective plants into the proper expense groups uniformly maintained and that the quantities of finished and semi-finished products produced within an accounting period shall be determined by uniform methods of procedure.

The order of sequence in which the different primary expense groups are presented and discussed in the following pages of this report is in accordance with the arrangement in which they will be carried into the Summary Cost Statement which subsequently herein we recommend for uniform adoption. In this arrangement we have anticipated also a practical method of procedure in arriving at the cost value of product in process of manufacture at the end of each accounting period.

The items appearing under each of the following main captions represent the accounts which we recommend be maintained in the ledger to comprise the various expense groups. It is the intention that the number of accounts maintained in each primary expense group shall be increased or reduced in accordance with the particular requirements in each face brick plant for analysis of cost finding data. This may be minute in detail requiring a number of accounts in addition to those recommended in this report or it may be summarized to the extent of requiring only one account to represent each expense group or sub-group. The results which we seek ultimately to attain in the adoption of a uniform cost finding procedure in no way is affected by the number of accounts maintained in each expense group or sub-group if all other important principles presented in this discussion are strictly observed.

# THE AMERICAN FACE BRICK ASSOCIATION

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## EXPENSE DISTRIBUTION

It is our purpose that all expenses incurred within an accounting period and chargeable to the cost of production in that period shall be set up in the books of account and record in such manner that there may be taken therefrom at the termination of the period all data necessary to the computation of complete costs.

It is our purpose also that all manufacturing plants represented in The American Face Brick Association shall determine their costs of production at the end of prescribed and definitely fixed periods of time termed "accounting periods." The period of time embraced within an accounting period is governed by the date on which the pay period ends in each plant. If the end of the pay period coincides with the end of the calendar month, the accounting period will embrace the calendar month. If the pay period is terminated at the end of a week or two weeks, the accounting period will embrace four weeks and the fiscal year will be divided into thirteen accounting periods.

### (1) OFFICE AND ADMINISTRATIVE EXPENSE

- Executive Salaries
- Clerical Salaries
- Office Stationery and Supplies
- Telephone, Telegraph and Postage
- Office Rent
- Legal Expense
- Undistributed Expense

The accounts comprising this group are in themselves sufficiently explanatory of the nature of the expenses which properly will be charged thereto.

### (2) FIXED CHARGES

- Insurance
- Interest on Investment
- Interest on Finished Stock Inventory
- Taxes
- Depreciation of Plant and Equipment

The proper handling of Fixed Charges in the books of account in accordance with the accounting procedure herein prescribed requires that additional accounts in connection therewith be maintained as follows:

- Unexpired Insurance
- Interest Income
- Accrued Taxes
- Allowance for Depreciation of Plant and Equipment

Fixed Charges are those expenses which in total are applicable to an entire fiscal period and which are chargeable into the operat-

## REPORT ON COST FINDING

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### EXPENSE DISTRIBUTION

#### (2) FIXED CHARGES—Continued.

ing expenses in each accounting period usually in equal and in fixed amounts.

Insurance premiums when paid will be charged to the Unexpired Insurance account. The total amount of insurance expense applicable to an entire fiscal period will be divided into equal portions in accordance with the number of accounting periods into which the fiscal year is divided. In each accounting period an equal portion of the insurance expense will be charged into the Insurance account and a corresponding credit will be carried to the Unexpired Insurance account.

The question as to whether or not interest on the amount of capital invested in the fixed assets of a business enterprise should be considered as a proper charge to the cost of production or as an element of profit is one which has been made the subject of extended discussion. It is not our purpose to present in this report further argument in this connection. Having before us, however, the particular ends which it is your purpose to accomplish by the adoption of a uniform plan of cost finding in the paving brick industry, we assume the position that this item should be considered a proper charge to the cost of manufacture in connection with face brick.

In accordance with the determination to include in manufacturing cost practically every item of expense incurred in the operation of a brick manufacturing enterprise it follows that interest on bonded indebtedness will be considered as properly chargeable into the cost of production. In order that all concerns interested and operating in accordance with a uniform system of cost finding may be placed on a uniform and equitable basis in the handling of interest charges, it seems to us imperative that interest computed on the total amount of capital invested in the fixed assets of each plant should be included in the various items of expense chargeable to manufacturing cost. It is understood that the fixed assets to which we have reference shall comprise the investment in plant, real estate, buildings, machinery and equipment at the depreciated book value as represented in the books of account at the beginning of each fiscal period. An equal portion of the total amount of this interest charge for the fiscal period will be debited at the end of each accounting period to the Interest on Investment account and a corresponding credit will be made to the Interest Income account.

We have observed that it is a common practice among face brick manufacturers to negotiate bank loans which are variable in amount from time to time and among different plants in those periods during which conditions of trade make it necessary that a large

## THE AMERICAN FACE BRICK ASSOCIATION

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### EXPENSE DISTRIBUTION

#### (2) FIXED CHARGES—Continued

quantity of finished product be carried in stock. The amount of the loans negotiated by the individual concerns is governed largely by their financial status and the extent of their operations and is not always in proportion to the inventory of finished product. Instead, therefore, of following the usual procedure in accordance with which interest charges on current loans would be carried into manufacturing expense, it is our purpose that interest will be computed on the cost valuation of the average monthly inventory of finished brick. The amount of the interest computed on this basis will be charged at the end of each accounting period to the Interest on Finished Stock Inventory account and a credit will be made to the Interest Income account.

Interest on bonded indebtedness when paid will be charged to Interest Income account.

Taxes, in accordance with the time at which they are made payable in most states, necessarily are treated as an accrued expense. The total amount of taxes expense chargeable into operations in a fiscal period will be estimated in accordance with the amount paid in the previous tax period and in each accounting period an equal portion thereof will be credited to Accrued Taxes account and a charge in the same amount will be carried to the Taxes account.

It is our opinion that in any practical cost finding procedure as applied to the face brick industry no condition arises which makes necessary a distribution of fixed charges into the operating expenses of the various manufacturing departments.

In accordance with the plan of cost finding which we present to you, it is our purpose that no distribution of fixed charges will be made except in the item of depreciation. We recommend that depreciation expense primarily be divided into two divisions—Depreciation of Kilns and Depreciation of Plant and Equipment. The former item will be discussed in connection with the Burning Expense group.

For the purpose of arriving at rates of depreciation applicable to plant and equipment other than kilns it will be necessary that all items of equipment be divided into distinct groups according to the physical conditions peculiar to each plant and separate rates of depreciation determined in connection with each group. On the basis of the cost valuation or the appraised valuation of each group and the prescribed rates of depreciation, the total amount of the annual depreciation expense will be determined. In each accounting period an equal portion of the annual charge will be debited to the Depreciation of Plant and Equipment account and a corresponding credit

## REPORT ON COST FINDING

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### EXPENSE DISTRIBUTION

#### (2) FIXED CHARGES—Continued

will be carried to the Allowance for Depreciation of Plant and Equipment account.

The factors governing in the determination of rates applicable to depreciation of plant and equipment depend upon conditions existing in and peculiar to each plant and for that reason the rates adopted for use in connection with the various face brick manufacturing plants will be at variance in the different plants and should be fixed in accordance with experience and manufacturing conditions.

It should be clearly understood at this point that in all cases where old or obsolete items of equipment such as buildings, engines, boilers, motors, locomotives, horses or mules are replaced the asset account in which they are carried in the ledger should be credited at the book value and a corresponding charge made to the Allowance for Depreciation of Plant account. All expenses incurred in replacing such items of equipment should be charged to the asset account affected. By this method of accounting any increase or decrease in the book assets resulting from these replacements will be adjusted in the books of account.

In this connection it is necessary that a systematic plan of handling repair and maintenance items also be pursued.

In accordance with the general scheme of accounts recommended for your adoption repair and maintenance accounts will be maintained in certain primary expense groups. It is recommended that memorandum accounts corresponding with these repair and maintenance accounts be carried in a section of the ledger separate from the regular ledger accounts or in a subsidiary record.

All repair and maintenance expenses incurred in an accounting period will be distributed among the repair and maintenance memorandum accounts according to the accounts properly affected and the total of these expenses for the period will be charged to the Repair and Maintenance Suspense account created for this purpose. To determine the amount to be charged in each accounting period to each of the various repair and maintenance accounts maintained, the total net amount of the charges made to each memorandum account in the twelve months' period immediately preceding the accounting period under consideration will be divided by the net machine production in the corresponding twelve months' period expressed in units of one thousand brick. The result will represent the charge per unit of production for repairs and maintenance. A separate charge per unit necessarily will be determined for each repair and maintenance account at the end of each accounting period. The product obtained by multiplying the different charges per unit of pro-



## THE AMERICAN FACE BRICK ASSOCIATION

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### EXPENSE DISTRIBUTION

#### (2) FIXED CHARGES—Continued

duction by the net machine production in the accounting period under consideration will represent the charge for repairs and maintenance of equipment applicable to the period. The amount of each charge thus determined will be carried to the repair and maintenance account properly affected and the total of all these separate charges applicable to the period will be credited to the Repair and Maintenance Suspense account. It readily is observed that by the use of this method in accounting the charges in each accounting period carried into the various repair and maintenance accounts are kept more nearly in proportion to the production in each period and great fluctuations in these expense items in successive periods are eliminated. These results have a tendency to keep more nearly uniform the costs of manufacture in successive accounting periods.

#### (3) GENERAL EXPENSE

- Superintendence and Factory Clerical
- General Plant Labor
- Stable Expense
- Repairs to Buildings
- Undistributed Freight (Incoming)

Operating expenses which in accordance with this outline of expense distribution are not properly chargeable into any other primary expense group will be carried into the General Expense group.

All expenses incurred in the maintenance of a plant stable will be charged into the Stable Expense account. These expenses in addition to those representing feed, bedding, shoeing and harness repairs will include also wages paid to drivers. In those plants where one or more of the horses or mules maintained in the plant stable are employed in hauling fuel to and cinders or refuse away from kilns in addition to other hauling, a proportionate amount of the total stable expense for the accounting period will be charged to the Kiln Hauling account in the Burning Expense group and credited to the Stable Expense account. So also if horses or mules maintained in the plant stable are employed in connection with the clay mine, shale bank, or in transportation of the raw material, a proportionate charge will be made to the Shale or Clay Mining and Transportation Expense group. If, however, a separate stable is maintained in connection with the mining operations, a separate account therefor will be credited in the expense group affected.

General labor employed about the plant in miscellaneous capacities which, because of the nature thereof, is impossible of accurate distribution will be charged to the General Yard Labor ac-

## REPORT ON COST FINDING

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### EXPENSE DISTRIBUTION

#### (3) GENERAL EXPENSE—Continued

count. Labor expended in small repairs to miscellaneous machinery and equipment likewise will be charged to this account or to a Machine Shop account if a machine shop is maintained in the plant.

#### (4) POWER GENERATION EXPENSE

- Labor
- Fuel
- Purchased Electric Service
- Repairs to Power Plant Equipment
- Lubricants and Supplies

We have observed that it frequently is the practice to use electric power in transferring the dried brick from dryers to kilns, in the operation of machinery used in the clay mine or in the shale bank, and in the transportation of the raw material from clay mine or shale bank to stock piles, crusher, or dry pans.

Whether this power is generated at the plant or is purchased from outside sources, it is our purpose that a portion of the power generation expense or of the cost of purchased power will be charged into the Transferring and Setting Expense group and the Shale or Clay Mining and Transportation Expense group in accordance with the power consumed in these manufacturing operations. It is not the intention that a further distribution of power expense will be made to other expense groups. A complete distribution of power expense, if attempted, necessarily must be made on a basis in most plants arbitrarily chosen and, therefore, inaccurate and unsatisfactory in greater or less degree. The particular purposes which we have before us in a uniform cost finding procedure do not require that a distribution of this item of expense be made beyond the point recommended in this paragraph.

It is to be noted also that a charge will not be made to drying expense for the power consumed in the operation of the fans in those plants where the "waste heat" method is used nor for the steam consumed in those plants which have a steam dryer in use. These elements of power expense will remain in the Power Generation Expense group and a further distribution thereof will not be made. That part of the total power expense incurred in an accounting period which is charged to other expense groups in accordance with the exceptions noted in the preceding paragraph will be credited to a Power Distribution account created for this purpose. At the end of the fiscal period, all expense accounts maintained in the Power Generation Expense group will be closed into the Power Distribution account and the debit balance then remaining therein will represent the amount of undistributed power expense.

## THE AMERICAN FACE BRICK ASSOCIATION

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### EXPENSE DISTRIBUTION

#### (4) POWER GENERATION EXPENSE—Continued

It should be understood also that no distribution will be made of electric current consumed for lighting purposes whether generated in the plant or purchased from outside sources. Likewise no distribution will be made of steam used for heating purposes in plant offices or in other buildings.

#### (5) SHALE OR CLAY MINING AND TRANSPORTATION EXPENSE

- Mine Labor
- Power Expense
- Explosives and Supplies
- Mine Equipment Repairs
- Haulage (Within Mine)
- Tramway Maintenance
- Tramcar Repairs
- Royalty or Depletion

The items of expense distribution embraced within the Clay or Shale Production Expense group are illustrative of those which we recommend be maintained in connection with the general accounts and cost records.

This group embraces all expense items incident to the mining or gathering of fire clay or shale and the transportation and preparation thereof up to the point where it is delivered at the Dry Pan. It begins, therefore, with the initial expense in the mining operations and terminates with the delivery of the partially prepared raw material at the Dry Pan. By whatever means, mechanical or hand labor, the clay or shale is conveyed from stock pile into Pan, the expense incurred therein is properly chargeable into the Processing and Machining Group.

In reference to this particular group of expenses, it has been brought to our attention that the manufacturer in a number of cases desires to arrive at the Mining Cost per ton of clay or shale mined. This we have found is true most frequently in those operations where the raw material is obtained from fire clay deposits. To arrive at this cost it is necessary only that we set up within this main group a sub-group into which will be carried all expenses incident to the mining of the clay and the transportation thereof to the Crusher. This sub-group, therefore, ends with the delivery of the clay at the Crusher and does not include the crushing operation. The total of all mining expenses incurred up to this point, and constituting a sub-total in the main group, divided by the total tonnage of clay mined and dumped will produce a result representing the Mining Cost per ton of clay.

## REPORT ON COST FINDING

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### EXPENSE DISTRIBUTION

#### (5) SHALE OR CLAY MINING AND TRANSPORTATION EXPENSE—Continued

We have observed that in certain plants for purposes of economy in operation or for "weathering" a greater tonnage of shale or clay is mined and stocked in a given period than is consumed in the processes of manufacture in the same period. In order, therefore, that we may determine accurately the expense chargeable to the green brick produced in an accounting period, it will be necessary that we arrive at a cost per ton of shale or clay at the point where it is delivered into storage in all those plants which pursue the practice of carrying the raw material in stock in advance of immediate requirements. If, however, the shale or clay carried in stock does not amount to more than one or two days' supply no attention thereto will be given insofar as the cost finding procedure is concerned.

The total amount of the expenses incurred in an accounting period in the mining and transportation of the raw material down to the storage bins divided by the total tonnage carried into storage in the same period will give us the cost per ton of the shale or clay in storage.

The consumption of shale or clay per thousand green brick produced will be determined by careful test in each plant where this factor is required and this factor having been determined accurately will be maintained as a standard in connection with that plant. The consumption of raw material per thousand green brick produced will vary, of course, in different plants in accordance with the texture of the shale or clay mined.

The factor representing the weight of shale or clay required to produce one thousand green brick multiplied by the total quantity of green brick machined in an accounting period will give us the total tonnage of raw material consumed. The cost per ton of raw material in storage multiplied by the total tonnage consumed will produce an amount which will represent the total cost of the shale or clay consumed in the total quantity of green brick made in the given period. This amount will be charged to Shale or Clay Used account and credited to the Shale or Clay Inventory account. All expenses incurred in a period in the mining and transportation of the raw material down to the storage bin will be charged at the end of the period into the Shale or Clay Inventory account. The debit balance then remaining in this account at the close of each accounting period will represent the cost value of the shale or clay in storage.

In those plants where the stripping operations are carried on only during certain months of the year or where these operations are carried on far in advance of the mining operations all expenses incurred in the stripping operations will be charged to a Stripping

## THE AMERICAN FACE BRICK ASSOCIATION

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### EXPENSE DISTRIBUTION

#### (5) SHALE OR CLAY MINING AND TRANSPORTATION EXPENSE—Continued

Suspense account. If the raw material is carried into storage, a stripping charge per ton of shale mined will be set up. This fixed charge will be determined by dividing the total stripping expense by the estimated tonnage of shale uncovered. This factor multiplied by the total tonnage of shale delivered into storage during an accounting period will give us the amount of stripping expense properly chargeable into the cost of shale mined in the period. If the raw material is not carried into storage we may set up a stripping charge per ton of shale mined or per thousand green brick machined. The stripping expense determined on either one of the bases mentioned and properly chargeable into the cost of production in a given period will be charged at the end of each period to the Stripping Expense account maintained in the Shale Mining and Transportation Expense group and credited to the Stripping Suspense account. The balance in this account then will always represent a deferred charge.

Due consideration should be given to the expense item in this group representing charges for Royalty paid on the clay or shale mined and charges for depletion of clay or shale deposits. The Royalty charge is in all cases fixed and predetermined and is treated in the same manner as any other item properly chargeable to the cost of producing clay and shale. In all those cases where the manufacturer owns the clay deposits from which he obtains his raw material a proper depletion charge per ton of clay mined should be carried into this expense group. This is correct procedure from the accounting viewpoint and necessary in accordance with the principle of uniformity in cost finding. Theoretically the depletion charge is based on the available supply of the clay deposits in the property owned and the number of years during which it may be mined to the point of exhaustion. The fixed charge for depletion necessarily would be different in connection with different properties and in accordance with varying conditions. It is our opinion that we should depart here from the usual accounting procedure to the extent which would permit each group of manufacturers operating in the various territories to determine upon a fixed charge for depletion of clay deposits. This standard rate, we believe, should be determined not by each manufacturer individually but by each group of manufacturers. From the practical standpoint, we believe this method of procedure would be productive of the most satisfactory results in the handling of this expense item, which if recognized at all usually is determined arbitrarily.

The proper accounting of Royalty or Depletion charges necessi-

## REPORT ON COST FINDING

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### EXPENSE DISTRIBUTION

#### (5) SHALE OR CLAY MINING AND TRANSPORTATION EXPENSE—Concluded

tates that there be maintained in the scheme of general accounts a Royalty or a Clay Depletion account and a Royalty Suspense or a Clay Depletion Suspense account. At the end of the accounting period, the charge for the Royalty paid or for the Depletion allowance will be carried to the Royalty or the Clay Depletion expense account and a corresponding credit will be carried to the proper Suspense account.

The rates applicable to royalty expense and shale or clay depletion expense may be determined in the same manner as has been recommended in connection with the determination of rates for stripping expense charges.

#### (6) PROCESSING AND MACHINING EXPENSE

Machine Room Labor  
Machine Room Repairs  
Column Oil and Supplies

The items shown under the above caption represent the expense distribution which we recommend be maintained to comprise the Processing and Machining Expense group.

Into this group will be carried all expenses incurred in the processing of the clay or shale through Dry Pan, Screen, and Pug Mill; the machining of the green brick, and the hacking of the same onto the dryer cars. This group, therefore, begins at the Dry Pan and ends with the delivery of the green brick on cars into the Dryer.

We have observed in the various plants in which we have made investigations that the allowance made for lost and spoiled product between the point at which the green brick are hacked onto the transfer cars and the point at which they are set in the Kilns varies in the different plants from 2 per cent to 8 per cent. It is our opinion that the existing differences in the nature of the raw material and the character of the semi-finished product does not warrant so great a margin between the minimum and the maximum rates of discount which we have found in use. We readily recognize the fact that the use of a standard rate of discount throughout the industry would prove to be unsatisfactory, impracticable and not in accordance with existing conditions. We believe, however, that the association as a whole should exercise an earnest effort toward having each of its members conduct a series of thorough tests with the purpose of establishing rates of discount in production which would be less at variance than those now in use. This is of prime importance for the reason that this rate of discount is one of the factors which directly determine the cost of production.

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## EXPENSE DISTRIBUTION

### (7) DRYING EXPENSE

Fuel  
Dryer Equipment Repairs

The distribution of operating expenses into definite groups purposely has been arranged so that a comparatively small amount of expense will fall within this primary group. The reason for this procedure will be developed subsequently in our discussion relative to the valuation of finished product and product in process of manufacture.

If labor is employed in connection with the dryers exclusively for the purpose of drawing the cars therefrom onto the "stubs," this expense will be carried into the Transferring and Setting group and will not be charged to drying expense.

In those plants where the dryers are operated by the "direct heat" method, the coal or gas consumed and the labor expended in firing the dryers will be made a direct charge to drying expense. Where the "waste heat" method is used and in those plants where live or exhaust steam is used in connection with the dryers, no charge will be made thereto for the power consumed. This expense will be allowed to remain in the Power Generation Expense group.

### (8) TRANSFERRING AND SETTING EXPENSE

Labor  
Power  
Sand Used  
Transfer Equipment Repairs

The expenses chargeable into this group begin with the drawing of the brick from the dryers and end with the brick set in the Kilns preparatory to burning.

Pursuant to the fact that in certain plants hand power is employed in transferring the dried product from dryers to Kilns and in other plants electric power, it becomes necessary that we carry into this group a charge for the power consumed in those plants which use electric power in transferring. This procedure is necessary in order that all plants may be placed on a uniform cost finding basis in the handling of this expense group.

### (9) BURNING

Kiln Labor  
Kiln Fuel  
Kiln Hauling  
Kiln Repairs  
Kiln Depreciation

Kiln Labor account will comprise all labor expense incident to the operation of the Kilns. The labor expense incurred in removing

## REPORT ON COST FINDING

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### EXPENSE DISTRIBUTION

#### (9) BURNING—Concluded

bats, sand and other refuse from Kilns may be charged to the Kiln Labor account or to the Kiln Hauling account in accordance with the explanation previously given under the General Expense group

The accounting procedure as applied to the handling of all expenses incident to Kiln repairs will be the same as that previously explained in our discussion under Fixed Charges in connection with the accounting of general plant repairs to which your attention is referred. In each accounting period a fixed charge for Kiln repairs will be determined which will be carried to the Kiln Repairs account. The corresponding credit will be carried to the Kiln Repairs Suspense account. The Kiln repair expenses actually incurred in the accounting period will be charged to the Kiln Repairs Suspense account.

A rate for depreciation of Kilns will be determined in each plant independent of all other plants. It is necessary that this rate be determined independently in each plant for the reason that it will be based on conditions which will be greatly at variance in different plants. It is our opinion, based on the information which we have acquired in pursuit of our investigations, that this rate under various conditions should be fixed between a minimum of seven per cent and a maximum of ten per cent per annum. In those plants where two or more different types of kilns are in use separate and distinct rates of depreciation should be established in connection with each type of kiln.

For purposes of cost finding the burning period will cover the elapsed time between the hour at which the fires are started in a kiln and the hour at which the flame is off and, therefore, it will include the "water smoking" period and all the various stages of the burning process.

The labor expense incident to putting up the "wickets" in kilns preparatory to burning and removing the same after the burning process has been completed and preparatory to drawing the kiln will be charged into the Burning Expense group.

#### (10) SORTING AND DRAWING EXPENSE

##### Drawing Labor

The expenses embraced within this group begin with the drawing of the burned product from the kilns and end with the delivery of the same into finished stock or onto cars where the cars are loaded direct from the kilns.

All operating expenses which properly are chargeable into the manufacturing cost of the face brick product are complete with the inclusion of those expenses which comprise the Sorting and Drawing



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### EXPENSE DISTRIBUTION

#### (10) SORTING AND DRAWING EXPENSE—Concluded

group. It is the intention, in other words, that in accordance with the cost finding procedure recommended in this report the manufacturing cost of the finished product will be determined at the point of delivery into finished stock or onto cars loaded direct from the kilns. Additional expenses incurred subsequent to this point and incident to the shipping and the distribution of the product will be handled as additional items of cost which must be taken into consideration prior to the determination of the selling price of first grade product.

#### (11) REHANDLING EXPENSE

##### Sub-Group I

Rehandling Labor  
Straw Used

##### Sub-Group II

Freight Charges (outgoing)  
Local Delivery Expense

Rehandling expense primarily is divided into two separate and distinct sub-groups. Sub-Group I comprises that expense which is chargeable to all shipments local and foreign and shipments F. O. B. plant or F. O. B. destination. Sub-Group II comprises those items of expense which are applicable only to those shipments in connection with which the manufacturer in accordance with the terms of sale assumes the freight charges or local delivery expense.

The expense chargeable into Sub-Group I of this primary group includes that which is incurred in the resorting of the product in finished stock and in the rehandling of the same from the finished stock piles to cars preparatory to shipment.

This group of expenses is not included in the manufacturing cost of the finished product. The rehandling expense, applicable to an accounting period, per unit of product shipped is treated as a supplementary cost item and is added to the manufacturing cost of the finished product after that cost has been determined for the accounting period.

#### (12) SELLING EXPENSE

Salesmen's Salaries and Commissions  
Traveling Expense  
Advertising Expense  
Sample Expense  
Miscellaneous Expense

The Selling Expense group properly includes all expenses incident to the marketing of the saleable product. These expenses like the preceding group are not included in the manufacturing cost.

## REPORT ON COST FINDING

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### EXPENSE DISTRIBUTION

#### (12) SELLING EXPENSE—Concluded

Necessarily, they are taken into account, however, before the selling price can be determined.

In those smaller plants where a selling organization is not maintained separate and distinct from the administrative organization or where the selling expense is comparatively small, no distinction will be made as between selling expense and administrative expense and with the latter it will be carried in this case into the manufacturing cost of the product.

#### (13) PROMOTION EXPENSE

##### Association Dues and Assessments Convention Expenses

This group of expenses includes all those which are incurred incident to membership in the national association and in one or more of the state or local organizations of face brick manufacturers.

These expenses are not carried into manufacturing costs. They are treated as supplementary cost items and in the accounting procedure are handled in the same manner as has been explained in connection with primary groups eleven and twelve.

### UNIT OF PRODUCTION

In the course of our investigations in the face brick manufacturing plants to which we have been directed we have given due consideration to the basis on which should be determined the unit of production in a face brick manufacturing enterprise. We have observed that two separate and distinct units are in use in different plants. The one is based on the quantity of production and the other on tonnage. The unit of production in the first case invariably is one thousand bricks of a certain standard size and in the second case it is the net ton of finished bricks of a certain standard size and weight each.

For purposes of cost comparisons among face brick manufacturers interested in the adoption of a uniform cost finding procedure it is, of course, quite necessary that in the last analysis the manufacturing cost of face brick should be expressed in the same unit in all plants. It is our opinion that in the great majority of plants the quantity basis will prove to be the more satisfactory of the two for uniform adoption in connection with a general plan of uniform cost finding. In those few plants which manufacture paving brick in addition to face brick or other building brick of different sizes, we recommend that the tonnage basis be adopted for use. It is not necessary in our opinion that an extended discussion in this report should be devoted to this subject. Whether a plant for reasons of convenience in accordance with local conditions has in use the one unit or the

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### UNIT OF PRODUCTION

other, a cost based on either unit may be reduced to terms of the other by a simple mathematical calculation.

In accordance with the methods generally pursued in brick manufacturing plants, production expressed in terms of quantity or tonnage usually is based on the gross machine count applicable to each accounting period less fixed deductions for loss between machine and setting and for kiln loss. The results obtained under normal conditions of operation may be regarded as quite satisfactory for all practical purposes provided the discount or brick lost is determined within a fair degree of accuracy. An accurate determination relative to the finished brick produced in any fixed period or the brick partially processed in any one of the manufacturing departments necessarily must take into consideration the quantities or tonnage in process at the beginning and at the end of the period and the gross machine production applicable to the period less the losses to which reference has been made.

### OFF GRADE PRODUCT

We give consideration to the fact that in every face brick manufacturing plant there is produced in each accounting period necessarily a variable quantity of off grade brick which usually is sold at a price below the cost of production.

In the adoption of a uniform cost finding procedure in the face brick industry with the object of an intelligent determination of selling prices, it becomes imperative that all manufacturers interested pursue uniform methods in the handling of the loss incurred in the manufacture and sale of off grade product.

As a material result of the manufacturing processes employed the production of off grade brick in quantities depending on existing conditions is necessary and incidental to the production of No. 1 grade brick. It is our opinion, therefore, that the off grade product properly is considered as a by-product resulting from the production of first quality brick and that the revenue derived from the sale thereof should be credited against all operating expenses applicable to an accounting period. The balance of these expenses then should be charged to the production of first quality brick. In consideration of the fact that the off grade brick produced in any accounting period may be sold at any time subsequent thereto, it naturally follows that for accounting and cost finding purposes the amount of revenue which may be derived from the sale of the off grade product necessarily will be estimated. This estimate will be based on the off grade product drawn from kilns within the particular accounting period under consideration and the amount thereof will be credited to the cost of burned brick drawn from kilns within the same accounting period.

## REPORT ON COST FINDING

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### OFF GRADE PRODUCT

The accounting in connection with this procedure will require that there be maintained an Off Grade Brick Inventory account to which will be charged at the end of each accounting period the amount of the credit which is applied against the cost of the finished brick drawn from kilns. The amount of revenue actually derived from the sale of off grade brick will be credited to the Off Grade Brick Inventory account and charged to the Cost of Sales account which properly will be maintained in the general scheme of accounts.

### SUMMARY COST STATEMENT

The Summary Cost Statement presented at the close of this report is designed to show a complete and systematic procedure by which may be determined, at the close of each accounting period, through the various progressive steps outlined the cost of the finished product delivered into stock, the cost value of the product in process of manufacture, and the units of production both finished and in process.

Those face brick manufacturers who wisely entertain the purpose and desire to determine accurately the cost of their product will expend the time and effort necessary to acquaint themselves with the details of the procedure as outlined in this summary statement. Those who are not interested to this extent necessarily will be satisfied with results inaccurate and unsatisfactory in greater or less degree.

A careful study of the procedure as outlined will disclose to the close observer that in certain details a departure has been made from certain theoretical principles governing cost finding practice as generally applied in a manufacturing enterprise. In the results obtained certain inaccuracies also will be observed which from the practical viewpoint of the manufacturer will be regarded as of little significance and of minor importance. We believe that the results obtained are accurate in a degree which should be regarded as entirely satisfactory to the face brick manufacturer.

In order that the results obtained in accordance with the methods proposed herein for your adoption may be represented properly in the books of account, we recommend that the following accounts be maintained:

Brick Manufacturing Account  
Finished Brick Inventory Account—First Grade  
Finished Brick Inventory Account—Off Grade  
Cost of Sales Account

All operating expenses incurred within an accounting period and properly applicable thereto should be closed at the end thereof into the Brick Manufacturing account.

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### SUMMARY COST STATEMENT

The total cost of the first grade product manufactured and finished in the period and the estimated revenue to be derived from the off grade product drawn from kilns in the same period should be credited at the end of the period to the Brick Manufacturing account and charged to the Finished Brick Inventory accounts accordingly as it is first grade product or off grade product.

The first grade product at cost and the off grade product at selling price should be credited when shipped to customers to the finished brick inventory accounts properly affected and charged to the Cost of Sales account.

To outline a practical method of cost finding procedure possible of uniform adoption in the face brick industry and which will be productive of results accurate within a degree consistent with a reasonable amount of detail involved is the particular object which we have before us. We believe that this object is accomplished in pursuit of the methods outlined in this report.

REPORT ON COST FINDING

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SUMMARY COST

DRIED BRICK

Units

DEBITS

1—Net Machine Production (Gross Production LESS: Dryer and Setting Loss)

3—In Dryers at Beginning of Period

CREDITS

5—In Dryers at End of Period

BALANCE

7—Transferred and Set in Period

EXPLANATION

9—Item 2 divided by Item 1 equals Dry Cost per Unit (Approx.)

11—Item 5 multiplied by Item 9 equals Item 6

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SET—NOT FIRED

Units

DEBITS

13—Transferred and Set in Period

15—Set, Not Fired at Beginning of Period

CREDITS

17—Set, Not Fired at End of Period

BALANCE

19—Fired in Period

EXPLANATION

21—Item 10 plus Item 12 divided by Item 13 equals Set cost per Unit Set in Period

Item 17 multiplied by Item 21 equals Item 16

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STATEMENT

DRIED BRICK

Cost

DEBITS

Office and Administrative Expense  
Fixed Charges  
General Plant Expense  
Power Generation Expense  
Shale or Clay Mining and Transportation Expense  
Processing and Machining Expense  
Drying Expense

2— TOTAL

4—Cost of Units in Dryers at Beginning of Period

CREDITS

6—Cost of Units in Dryers at End of Period

BALANCE

8—Dry Cost of Units Transferred and Set in Period

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SET—NOT FIRED

Cost

DEBITS

10—Dry Cost of Units Transferred and Set in Period  
12—Transferring and Setting Expense in Period  
14—Set Cost of Units Set, Not Fired at Beginning of Period

CREDITS

16—Set Cost of Unit Set, Not Fired, at End of Period

BALANCE

18—Set Cost of Units Fired in Period

REPORT ON COST FINDING

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SUMMARY COST

BRICK BURNED—NOT DRAWN

Units

DEBITS

- 25—Units Fired in Period
- 27—Units Burning at Beginning of Period

CREDITS

- 29—Units Burning at End of Period

BALANCE

- 31—Units Burned in Period

EXPLANATION

- 33—Item 20 divided by Item 25 equals Set Cost per Unit Fired in Period
- 35—Item 29 multiplied by Item 33 equals Item 26
- 37—Item 26 plus Item 28 equals Cost of Units Burning at End of Period

DETERMINATION OF BURNING EXPENSE APPLICABLE TO UNITS IN PROCESS OF BURNING AT END OF PERIOD

- 39—Total Burning Expense in Period divided by Total Burning Hours in Period equals Burning Expense per Hour
- 41—Total Burning Hours chargeable to Total Units Burning at End of Period multiplied by Burning Expense per Hour (39) equals Item 28.

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BRICK DRAWN

Units

DEBITS

- 43—Units Burned in Period
- 45—Units Burned, Not Drawn, at Beginning of Period

CREDITS

- 47—Units Burned, Not Drawn, at End of Period

BALANCE

- 49—Units Drawn in Period

EXPLANATION

- 51—Item 32 divided by Item 43 equals Cost per Unit Burned in Period
- 53—Item 47 multiplied by Item 51 equals Item 38



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STATEMENT

BRICK BURNED—NOT DRAWN

Cost

DEBITS

- 20—Set Cost of Units Fired in Period
- 22—Burning Expense in Period
- 24—Cost of Units Burning at Beginning of Period

CREDITS

- 26—Set Cost of Units Burning at End of Period
- 28—Burning Expense applicable to Units Burning at end of Period

BALANCE

- 30—Cost of Units Burned in Period

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BRICK DRAWN

Cost

DEBITS

- 32—Cost of Units Burned in Period
- 34—Cost of Units Burned, Not Drawn, at Beginning of Period
- 36—Sorting and Drawing Expense in Period

CREDITS

- 38—Cost of Units Burned, Not Drawn, at End of Period

BALANCE

- 40—Cost of Units Drawn in Period

REPORT ON COST FINDING

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SUMMARY COST

BRICK DRAWN

No. 1 Units

DEBITS

55—Units Drawn in Period—All Grades

CREDITS

57—Units Drawn in Period—"Off Grades"

BALANCE

59—Units Drawn in Period—No. 1 Grade

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EXPLANATION

61—Item 46 divided by Item 59 equals Cost per Unit of No. 1 Grade  
Brick Drawn in Period

63—Total Rehandling Expense in Period divided by Total Units  
Shipped equals Rehandling Cost per Unit Shipped in Period.

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STATEMENT

BRICK DRAWN

Cost of No. 1 Grade

DEBITS

42—Cost of Units Drawn in Period—All Grades

CREDITS

44—Estimated Revenue from “Off Grade” Product Drawn in Period

BALANCE

46—Cost of Units Drawn in Period—No. 1 Grade

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BRICK ON CARS

No. 1 Grade

48—Cost per Unit of No 1 Grade Brick Drawn in Period

PLUS:

50—Rehandling Cost per Unit Shipped in Period

PLUS:

52—Selling Expense per Unit

EQUALS

54—Cost of No 1 Grade Brick on Cars