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Cost Segregation Analysis - The Emerging Practice Of Quantity Surveyors And Cost Engineers.

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----------ABSTRACT----------
This research paper attempted to examine cost segregation analysis and its practice with a view to sensitizing and apprising cost Engineers and Quantity Surveyors to embrace it. It presented cost segregation analysis as an engineering process which identifies and classifies particular elements or assets within a plant or building into shorter life periods for tax depreciation in order to save substantial tax payments by companies within the ambit of the law. It identified that the practice is yet fledging for Quantity Surveyors and Cost Engineers especially in heavy engineering and process plants, notwithstanding their knowhow and analytic skill to perform the service. It thus presented the cost segregation analysis process and practical steps to be followed by Cost Engineers/Quantity Surveyors to implement them. It crafted an illustrative template of cost segregation analysis to be used by Cost Engineers in reporting cost segregation analysis study for heavy process, oil/gas projects. It recommended the application of electronic tax filing, E-filing in submitting tax returns in line with global best practice, and the implementation of partnering practices in plant construction by project professionals to engender useful cost records and data bases for efficient implementation of cost segregation analysis service.

Keywords *-, Capital Allowance, Cost Segregation Analysis, Depreciation, Tax rate.*

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I. INTRODUCTION

The dwindling revenues of most governments that have largely depended on oil resources, as a result of the current fall in global oil price, has introduced severe financial strains on the public sector and consequently the private sector. Government is tightening its belt and most, have fallen back to expanding tax revenues for survival. The implication is that companies which cannot file appropriate tax returns will suffer great profit losses due to large tax deductions. This study is therefore designed to showcase how companies can prevent excessive tax loss through the application of Cost Segregation Analysis using the services of Quantity Surveyors and Cost Engineers.

Cost segregation analysis is an engineering process that seeks to identify and classify particular elements or assets within a plant or building into shorter life periods in respect to tax depreciation, thereby saving substantial tax payments within the ambit of the law.

This research examined the laws of Nigerian government and that of USA on administration of Capital Allowance and Depreciation incentive schemes respectively. It attempted to expose the myths of tax income as a source of government revenue and why cost segregation analysis has become imperative. It explained the processes and steps of cost segregation analysis and showed why and how it should best be implemented by quantity surveyors and cost engineers as an engineering practice especially in heavy engineering and oil/gas projects.

II. LITERATURE

The economic and financial fortunes of Nigeria have become overwhelmingly dominated by the performance of the oil industry. Hence the reduced level of government revenue associated with the recent decline in global oil price has imposed severe financial strains on the public sector and consequently the private sector. Government is seeking to diversify revenue resources base, such that the non-oil resources revenue should also contribute an equally sizeable proportion to total revenue. Company taxation is one of the various options open to government for diversifying her revenue base. For the share of taxation revenue in national

income to rise to a significant level, the tax system and its rates must be sufficiently income elastic. High company income tax can stifle businesses. It may not be politically or economically feasible to raise taxation to a relatively high level in circumstances of general low incomes. Frequent legislative measures to do so, may prove counter-productive and may invite strong resistance from taxpayers[1]. Government emphasis should be focused on creating enabling fiscal and other general incentives that will enable businesses and industries to thrive eg depreciation and capital allowance incentives among others, at rates that will stimulate profit and enhance business capital formation.

A study group that reviewed the recommended structure for government portfolio of fiscal incentives noted among other things that – "Nigeria Corporate Income Tax of 30% is one of the highest in the world and diverges from the growing international trend that harmonizes the rate of personal and corporate taxes around 20% [2].

2.1 Tax Mitigation/Profit Saving Incentives

2.1.1 Depreciation

Depreciation is a Tax-deductible business expense. Depreciation is the wear and tear of any equipment, furniture, or building used in a trade or business for the production of any income. Depreciation is thus an accounting technique of deducting a portion of the cost of this terminal life: assets as an expense when calculating annual taxable income and therefore taxes [3]. Depreciation as a business expense does not involve the out-flow of cash. It measures the proportion of tax saving (TS) or profit that is saved from tax. Hence TD = TS where T = Company Income tax rate and D = annual depreciation charge.

In US and Canada, depreciation is a tax-deductible expense. Use of double declining balance and sum of year digit depreciation methods provide rapid write down of costs in the early part of the life of an asset thereby reducing tax liability and improving corporate profit.

The Nigerian Tax Law disallows depreciation in computing tax-assessable profit, while recognizing it as a legitimate business expense (Income Tax Management Act 1961, I. TMA, S. 18, and amended updates [2,4&5]. Capital expenditure attracts an alternative form of tax relief known as capital allowance. Thus Nigeria industrial policy substitutes Capital Allowances for tax-deductible depreciation. This substitution perceivably affects the firms' cash flow position and influences their investment decisions.

2.1.2 Capital Allowances

Capital allowances are incentives designed to enable qualifying company's assets to attract an amount of tax relief (Within their economic life) which are roughly equal to their costs (i.e. cost net of the assets' salvage value at disposal, I.T.M. A Schedule 5). The Nigerian Income Tax Act (ITMA) provides for two forms of capital allowances for Assets – an Initial Allowances and an Annual Allowance. The initial allowance is a fixed percent of the cost of qualifying assets and accrues during the period/year the relevant capital expenditure was incurred. The annual allowance is a fixed rate of the written down cost or value of the qualifying asset for each year of assessment the asset was in effective use. It does not remove the initial allowance in amortizing cost for annual allowance. Sample of an un-updated schedule of capital allowance in Nigeria is shown in table 1, while current schedule as recorded by Food and Agricultural organization FAO [4a] is shown as table 1a.

Table 1: Un-updated Schedule of Rates of Capital Allowance in Nigeria

Capital expenditure	**Initial Allowance**	**Annual Allowance**
Plant (excluding transport)	20%	12.5%
Industrial buildings	15%	10%
Other buildings	5%	10%
Mines	20%	12.5%
Plantations	25%	15%
Transport and Moving Equipment	20%	12.5%

Table 1a: Capital Allowances Sectoral Schedule Initial and Annual Tax Percentages

	Initial %	**Annual %**
Building Expenditure	15	Nil
Industrial Building Expenditure	15	Nil

Mining	95	Nil
Plant		
i) Agric Production	95	Nil
ii) Others	50	20
Furniture fittings	25	20
Motor Vehicles		
Public Transportation	95	Nil
Other	50	25
Housing Estate	50	25
Ranching/Production	30	50
Research and Development	95	Nil
Agro plants and Equipment leased	Additional Investment Allowances 10%)	Nil

Source: [4a]

Firms are basically interested in reducing total tax liability over each period and would therefore carry out total assets evaluation of tax saving rather than single asset tax saving report.

Since the initial and annual rates for capital allowance are fixed, a firm is severely constrained in any bid to boost tax savings by manipulating accruable capital allowances. This apparent limitation on ability to manipulate the rate and Timing of capital allowance, should make for comparability in financial reporting among Nigerian firms. But the comparability is equally affected by; the industry, background, skill or expertise of the professional doing the tax assessment. (E.g. a cost engineer/quantity surveyor, accountant, tax auditor etc).

2.2 Ideal Rate for Capital Allowance:

As earlier exposed, high taxes tend to stifle businesses and create disincentive to invest. A regime of capital allowance is intended to reduce the effect of tax burden during each year through the life of an asset.

Below are some demonstrable models of impact of tax and capital allowances on net capital value (NPV) of a firm.

Company's net Discounted Earnings/net Capital value under Tax-free regime.

$$\boldsymbol{NPV_F = \sum_{i=1}^{n} \frac{CFi}{(1+r)^i} - I_0} \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \qquad (\mathbf{1})$$

Company's Tax-reduced Earnings/Net Present Value Under Tax Regime

$$\boldsymbol{NPV_T = \sum_{i=1}^{n} \frac{CFi\,(1-t)}{(1+r)^i} - I_0} \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \qquad (\mathbf{2})$$

Company's protected Earning/Net Present Value Tax and Capital Allowance Regime

$$\boldsymbol{NPV_{tc} = \sum_{i=1}^{n} \frac{CFi\,(1-t)}{(1+r)^i} - I_0 \quad (1-t) = NPV_F \quad (1-t)} \qquad \ldots\ldots \qquad (\mathbf{3})$$

Where: 1_0 = Outlay, t = Corporate tax rate, r = Interested Rate,

NPV_F = High Net Present value under tax free regime

NPV_T = Low Net Present value under tax regime

CF_i = Net Cash flow for applicable year

CF_i (1-t) = Net cash flow for the year less tax

NPV_{tc} = Net Present Value under a regime of Tax and Capital Allowance

N = Number of Years.

As is depicted in model (3) above, the ideal rate for capital allowance would be a rate capable of neutralizing completely the effect of taxation on the decision to acquire or not to acquire an asset/plant (see model (3). That is, a rate that would make $NPV_{tc} = NPV_F$ (1-t), such that where tax t, is completely neutralized NPC_{TC} would become NPV_F i.e., Net present values free of tax. Such capital allowance rates regime would erase the worry by companies as to whether or not to invest in capital assets because of corporate taxation, thus rendering taxation neutral in investment decision process.

2.3 Comparing Capital Allowance and Depreciation Deduction Methods

Some related past studies [4 & 5], presented and compared the tax-saving impacts of substituting capital allowance for tax deductible depreciation in Nigeria tax system. The studies show that using capital allowance tend to reduce the relative effective tax burden only in the first year of asset purchase or plant set up as depicted in table 2 . The studies further show that in any year where the depreciation value is greater than the capital allowance value for eligible asset, the profit after tax PAT_{CA} using capital allowance method is reduced as shown in model [5]. And that Capital Allowance method is admissible in regime of high initial and annual rates of deduction for assets having over 15 years life. The ideal rate for Capital allowance would be a once-and-for-all 100% rate of initial deduction of asset cost. For profit before tax using capital allowance, depreciation is added back and capital allowance subtracted. See model (4).

$$\mathbf{PBT_{CA} = PBT_D + D - CA} \text{ ……..... } \mathbf{[4]}$$

Where PBT_{CA} = Profit before tax using Capital Allowance

PBT_D = Profit before tax using depreciation method

D = Depreciation, CA = Capital Allowance

$$\mathbf{Also,\ PAT_{CA} = PAT_D - t\ (D - CA)} \text{ ……} \mathbf{[5]}$$

Where PAT_{CA} = Profit after tax using capital allowance

PAT_D = Profit after tax using Depreciation Method

t = Corporate tax rate, D = Depreciation, CA = Capital Allowance

Table 2 below is a comparison of tax savings from capital allowances and straight line depreciation of an asset costing $30,000 and having economic life of 10 years, initial and annual capital allowance rate of 20% and 12½% respectively. Assumed corporate tax of 45% and interest of 10%.

It is seen from table 2 that in year 1, capital allowance method present positive tax saving of +$ 2761.09 over depreciation method.

Table 2: Comparison of Tax Savings From Capital Allowances and S.L. Depreciation

Year (1)	Capital Allowance (2)	S.L. Depreciation (3)	Differential Tax Relief (4) = 2-3	Differential Nominal Value (5) = 4 x t	Tax Savings Present Value at 10%, PV of (5)
	$9750.00	$300.00	+$6750.00	+$3037.50	+$2761.09
	2531.25	3000.00	- 468.75	- 210.94	- 174.24
	2214.84	3000.00	- 785.16	- 253.32	- 265.34
	1937.99	3000.00	- 1062.01	- 477.90	- 326.41
	1695.74	3000.00	- 1304.26	- 586.92	- 364.48
	1483.77	3000.00	- 1516.23	- 682.30	- 384.82
	1298.30	3000.00	- 1701.70	- 765.77	- 392.84
	1136.01	3000.00	- 1863.99	- 838.80	- 391.72
	994.01	3000.00	- 2005.99	- 902.70	- 382.74
	869.76	3000.00	- 2130.24	- 958.61	- 370.02
Total Present Value P.V					**- 291.52**

Source: Adapted from [4].

2.4 History of American Tax laws on Depreciation

In US, The first depreciation studies were conducted in the 1930s by using estimated lives for all depreciable assets which were arbitrary and unrealistic. In 1954, the US, Congress authorized the use of accelerated method of depreciation including declining/double declining balance and sum of years digits methods to increase the amount a firm could deduct as depreciation per year [6, 7]. In 1962 radical shift to strict depreciation rule followed from IRS guidelines requiring depreciation deduction to pass two tests; (1) reserve ratio test and (2) transparency test, which proved impractical. In 1971 came the classified life asset depreciation range system (ADR) which established; (1) class life for broad general assets and (2) ranges from which a life asset could be selected for depreciation purposes. The ADR apparently fail to include depreciation for buildings and site improvements. Then came Accelerated Cost Recovery System (ACRS) in 1981 which assigned class lives for depreciation for many items including buildings and site improvements to stimulate capital formation (see table 3, Appendix 1 & Table 4 Appendix 2). Under ACRS, capital asset salvage value or useful lives are not estimated. The IRS law establishes various property classes and provides for deductions calculated as specific percentages of the cost of the asset (see table: 4).

The property classes are:
Three year property: Research/ experimentation property with midpoint class life of, 4 or less than 4 years, automobiles, light truck and short-lived personal property.
Five year property: Undefined property that are not real property e.g. equipment and machinery
Ten year property: Public utility property having midpoint class life of more than 18 but less than 25 years, constructed homes, rail road tank cars, coal utilizing property, amusement park property and others.
Fifteen years property: Long-lived public utility property
10/15 year real property classes - the 15 year class consists of real property with a midpoint class life > 12.5 years. All other real property falls into the 10 year class.

The logic/impact of ACRS set percentages as outlined in table 4, is that between 1981-1984 rates are approximately equal to 150% declining balance depreciation with a switch to straight line depreciation in later years. The 1985 rates similarly approximate to 175% declining balance depreciation. And the rates for 1986 are essentially those for the double declining balance, both with a switch to sum of year digits method at the optimum point in time. The ACRS is merely a combination of previously used and widely accepted methods of computing accelerated depreciation [8].

Modified Accelerated Cost Recovery System (MACRS)
The MACRS came on board in 1987 following the 1986 tax reform Act that revised the depreciation regulations, to replace the ACRS. MACRS expanded the ACRS property classes from 5 to 8, revised the depreciation periods for most items shown in Depreciation class lives and Recovery Periods (table 3) and redefined the classes. The definitions including minor tax law changes since 1987 is annexed as appendix 3. It included ceiling for depreciation cost recovery of 39 years and 31.5 years for other tangible real and personal properties in use after and before 12th May 1993, under sections 1250 and 1245 respectively. Like the impact of ACRS, MACRS is an improved combination of previously used and widely accepted methods of computing accelerated depreciation.

The ACRS and MACRS underline the need for corporate sensitization by Quantity Surveyors/cost Engineers on the relevance of availing cost segregation analysis services especially in industrial and oil and gas plants to reduce their excessive tax burden.

1. Justification for Provision of Cost Segregation Analysis Service by Quantity Surveyors/Cost Engineers

Cost Segregation study following U.S, tax law seeks to designate certain components of a facility as fitting into section 1245 or section 1250 property and then assign each asset an appropriate tax saving depreciation life.

Companies tend to focus depreciation calculation on main plant equipment and machinery item, according less significance to their supporting bulk items and installation sub factors, buildings and site improvement short life components which constitute greater percentage of total project facility cost, and which will ensure greater early cost deduction and drastically reduce tax liability.

As depicted earlier in Humphreys [8], there exist up to eight different assets depreciable life years under the tangible personal property modified accelerated cost recovery system MACRS tax code classification (3yr property, 5yr, 7yr, 10yr, 15yr, 20yr, 27yr, and 39/31.5 yr properties).

Generally accountants or non engineers depreciate only assets that they can identify and class accordingly, and handle un professionally and incorrectly those they do not clearly understand for classification. This leads to insufficient depreciation recovery each year.

But a cost engineer performing segregation study has the ability to take classification of property assets a step further. An engineer has the ability to analyze a project from blue prints, specifications, cost details most of which he estimated himself, and site visits and can determine additional specific assets that can be qualified as short life property using his construction experience rather than depreciating as a regular 39 years asset.

Through cost segregation tax-studies, client with large property portfolios can maximize their tax benefit savings up to 20% by identifying short life depreciable items.

In Nigeria, Federal Inland Revenue Service (FIRS) has introduced E-filing [9]. E-filing is an electronic tax filing system which enables taxpaying companies to assess and file their tax returns electronically to the FIRS without needing to go to FIRS tax office or see any tax officer for the purpose. This saves time and reduces corruption etc in tax administration.

This development further underlines the need for use of the service of cost engineers and quantity surveyors to carryout cost segregation analysis and estimate accurately, following the tax assessment guideline, the company's tax liability that portends greatest tax saving for the company and report or file this virtually to the FIRS.

III. COST SEGREGATION PROCESS

Cost segregation analysis is an engineering review of existing or new buildings and site improvements with the objective of maximizing tax savings on the facility owners' capital investments. It seeks to identify subcomponents of shorter life and reclassify them. It thus identifies and classifies as many elements as possible within a plant or building into shorter life periods for tax depreciation.

a. Steps in Cost Segregation

As exposed earlier, the tax code law section 1250 covers tangible real property, while section 1245 property is a broader category covering items within a facility such as appliances, business equipment and machinery and office furniture and fixtures etc.

First we identify and list items falling within sections 1250 and 1245 properties. Then fit their tax code class lives/recovery periods prescribed by IRS under ADR, ACRS and MACRS. Other short life components not listed with class lives under ADRS, ACRS or MACRS would then be assessed and assigned class lives by the Quantity Surveyor/Cost Engineer. The quantity surveyor uses his skill, expert engineering/construction knowledge and that of case laws or analogies from previously decided cases to justify or defend the assigned class lives. Thus the steps applied include; information gathering, property classification, costs reconciliation, documentation and justification [3].

i. Information Gathering

Accurate information is critical in cost segregation studies. As-built drawings or blue print of plant and site improvement facilities are reviewed to isolate various potentially qualifying short life assets. The plant has to be physically inspected by the cost engineer or quantity surveyor in the company of owner representatives to gain general information and to jointly identify various short life subcomponents which qualify for section 1245 or 1250 depreciation code classification.

ii. Property Classification

Next after information generation from drawings, site appreciation and components identification, is to present the components in a table classifying them into tangible real (1250) and personal (1245) properties. And specifying in table columns their direct, indirect and total allocated costs (see table 5). The items contained in the table include all facilities. Those which have substantial tax code authority and those items that have a realistic possibility of being sustained administratively or judicially, if their inclusion as tangible personal property is challenged by tax authority. Always use the current tax code, recent case law rulings and engineering expertise, in considering and assigning components to designated short- class lives. Adopt two approved tests in assessing and classifying personal assets that do not have official life code; (1) Permanency test and (2) functional use test.

Use official code law for 1245 property on permanency test, and assign only items not permanently fixed but are moveable or detachable from permanent structure. Your engineering design and construction expertise is put to use here for detail and accurate assignment of components, with supportive or analogous rulings of case laws.

Similarly for functional use test, assign only components whose functions are merely supportive or ancillary to the functions of the main components, and which are possibly moveable, applying recent cases or analogies from past rulings.

iii. Cost Reconciliation

Cost reconciliation is the third step in cost segregation analysis. The direct and indirect cost allocations in table 5 must aggregately correspond with the expended/executed total plant cost. Sample of executed total plant cost details is shown in table 6. The listed indirect cost allocation total ($c_2 + x_2 + y_2 + z_2$) in column 3 of table 5 must reconcile or correspond with actual indirect cost expenditure of the process project, in the same way the total direct cost (c1 + x1 + y1 + z1) must reconcile with actual or recorded field/associated direct project cost. These records are available for process projects implemented using project partnering processes [10]. Where any item or asset cost is missing from the record it should be estimated anew by the cost engineer using his vast estimating skill [11, 12 & 13].

	Direct Costs **(2)**	**Indirect Costs Allocated** **(3)**	**Total Costs** **(4)**
Fuel equipment hookups. Kitchen equipment hookups Laundry equipment hookups. Sinks (Counter-mounted) Sound system Special hood exhaust Decorative lighting Telephone system hookups Project/Equipment Prototyping Project pre/commissioning costs Working Capital			
SUBTOTAL 5 YEAR REAL PROPERTY	z_1	z_2	z_3
TOTAL DEPRECIABLE PROPERTY	$\sum c_1 + x_1 + y_1 + z_1$	$\sum c_2 + x_2 + y_2 + z_2$	$\sum c_3 + x_3 + y_3 + z_3$

Source: Authors' Survey 2014

For process plants, contractor's indirect field costs and Home Office costs and owner's costs form part of the indirect costs allocated. Also allocated are the expended contingency and risk costs. All must be reflected to make the assigned/classified costs and total plant cost to balance.

Contractors' Indirect Fields Costs Allocated:

1. Temporary contractors' facilities
2. Site supervision and design
3. Contractors service supplies/consumables
4. Field staff subsistence expenses
5. Payroll burden/benefits/insurance and permits
6. Construction equipment, tools and rentals
7. International expenses

Home Office Costs Allocated

1. Project Management
2. Project control/estimating
3. Project procurement
4. Project construction management
5. Engineering design

6. Home office expenses
   Total assigned costs must balance with the Total Installed plant cost shown in table 6.
   Sample Breakdown of a Detailed Total Cost Estimate Is Shown in Table 6

Table 6: Sample Breakdown of a Detailed Estimate of Total Plant Cost

	Foreign Content Us $000			**Domestic Content US $000**			**Total US $000**		
	Material	**Install**	**Total**	**Materials**	**Install**	**Total**	**Material**	**Install**	**Total**
EQUIPMENT Furnace Package Plants Heat Exchangers Air Coolers Compressors/fans Pumps and Drivers Turbines Tanks Vessels Columns and Reactors Miscellaneous Equipment items **SUBTOTAL A = Main Plant Items Cost**									
BULK ITEMS Electrics Instrumentation Computer Control System Piping and Valves Structures Insulation and paint Catalysts, Chemicals, oils **SUBTOTAL B**									
CIVIL WORKS Roads Foundation Piling Buildings **SUBTOTAL C**									
CONSTRUCTION Labour/Subcontractors Site Supervision Tools, Rentals etc **SUBTOTAL D** **SUBTOTAL A-D = Installed Plant Cost**									
Home Office costs rocurement ngineering roject Mgt xpenses **SUBTOTAL E**									
COMMISSIONING, CONTINGENCY AND RISK ALLOWANCES									
FORWARD ESCALATION COST									
WORKING CAPITAL									
GRAND TOTAL A- H = Total Plant Cost									

Source: Adapted from [10, 14 & 15]
It is rendered in foreign and domestic cost components to support cost segregation and management.

Justification Format [3]

Carpet and Padding

Carpet was specifically designated as tangible personal property Rev. Rul.67 349 1967 2G.B. 48 in which the IRS determined that the carpet was installed in such a manner that it was not an integral part of the 1700r itself and therefore was not a permanent covering for tile floor. Carpet was also specifically designated as tangible personal property in the Senate Finance Committee Report on the Revenue Act of 1978.

Electrical Service to Personal Property

The electrical costs associated with connections to tangible personal property such as outlets, conduits, wiring, and the like qualify, as tangible personal property because they are essential to the operation of tangible personal property. Reg. Sec. 1.48 1 (c) provides that property which is of the nature of machinery shall he considered tangible personal property. See also Rev. Rul. 66299, 1 Y66 2 GB. 14; Rev. Rul. 69 558, 19692 GB. 4; Central Citrus Co. v. Commr., 58 TC 365 (1972); Morrison Inc. v. Comm., No. 34300 83, TCM 1986 129, March 31, 1986; court of appeals, CA 11: Hatchett J; and Morrison, 1nc. v. Commr., No. 88-868665, January 9, 1990.

Exit Signs

Exit signs are not permanent improvements to land or building but tangible personal property, as were signs and displays in Whiteco Industries, Inc. v. Commr. 65 TC 644 (1975, acq., 1980-24 I.R.B. p.5); Alabama Displays, Inc. v. U.S. 507 F. 2d 844 (1974); Southland Corporation v. U.S., 611 F.2d 348 (1979); National Advertising Company v. U.S., 507 F. 2d 850 (1974); and Rev, Rul. 80-151 1980-1 C.B.7

Fire Extinguishers and Cabinets

The fire extinguishers and cabinets are supplementary fire equipment items and are not essential to the overall fire control system. The fire extinguishers are items that are not permanently attached or associated with a particular building, but can be used in various facilities. This category includes only the cost of the fire extinguishers, cabinets, and related hardware. The extinguishers are tangible personal property as defined in Reg. Sec. 1.48 1 (c). See Rev. Rev. 67417, 19672 CB. 49.

Grease Trap

In Morrison Inc. v. Commr., No. 34300 83, TCM 1986 129, March 31, 1986, the court found that the hitch en drainage system was unrelated to the general drainage of wastes from the building, and thus not a permanent plumbing fixture. The drainage system serviced the petitioner equipment and machinery. Similarly, the grease trap and waste piping serve the kitchen equipment, and thus qualify as Section 1245 property.

Plumbing Service to Personal Property

This category consists of plumbing connections to tangible personal property and other tangible property, including rough-ins, piping, drains, and the like. These items are not to be considered structural components, as they do not relate to the operation of the building as a building. Ruther, the subject piping and equipment serve qualified Section 1245 property, and therefore qualify as tangible personal property. This argument is supported by Rev. Rul. 66 299, 1966 2 C.B 14, which states the "special plumbing connection which are necessary to and are used directly with a specific item of machinery or equipment, or between specific items of individual machinery or equipment, are not structural components of the building, but are essentially items of machinery or equipment, and qualify as Section 1245 property." In Morison Inc. v. Commr., No. 34300 83, TCM 1986 129, March 31, 1986, kitchen water piping was considered necessary to and used directly with specific pieces of cafeteria equipment, not art of the general plumbing system; thus it qualified as Section 1245 property.

Sinks

Stainless steel sinks are installed in the countertops. The sinks are a component of the movable counters and are easily movable as the needs of the taxpayer change. The sinks qualify as Section 1245 property based on means of attachment. In Morison Inc. v. Commr. No 34300 83, 1986 129, March 31, 1986, kitchen hand sinks were designed to stay permanently in place and thus constituted structural components. The subject sinks are parts of easily removable counterparts.

Special Hood Exhaust

This category includes special ductwork, exhaust fans, and air curtains that services the kitchen and the hoods. In Rev. Rul. 70 103, 1970 1 C.B.6, exhaust equipment and mental louvers, which functioned as [art of an operating unit equipment, were held to be tangible personal property qualifying as Section 1245 property. In addition, Rev. Rul. 70 103, supra, held that the exhaust fans in the restrooms were tangible personal property qualifying as Section 1245 property. In Morrison Inc. v. March, No. 34300 83, TCM 1986 129, March 31, 1986, a makeup air until, which re placed air that needed to be exhausted, qualified as tangible personal property since it was in the nature of machinery and was installed to meet temperature and humidity equipments essential for t*he taxpayer's business.*

figure 1: typical justification for 5-year life section, 1245 MACRS personal property

iv. Documentation and Justification

` The final report of cost segregation study must showcase quality documentation [16]. As in all cost and engineering studies, proper documentation and justification are critical and must be reflected efficiently in this last step of the cost segregation process. It must reflect collaborative work. Professional input of all should be elicited to reduce blight in the final document. IRS or the Nigerian counterpart FIRS have in-house cost experts and engineers whose inputs can be availed in the final report. Documentation to support recommendations and schedules must be maintained in an organized file until the current tax year is no longer open for audit by the IRS or the FIRS and should be digitized.

The joint team of experts must critically review existing tax authorities', codes case laws and previous rulings to determine qualifying assets. The engineer must prepare comprehensive assets description as further backup for the assigned decisions, linking each asset to justifying case precedents, in the same way we relate every contractual claim to a specific claim clause.

He must be fully convinced that all assigned assets have realistic possibility of being sustained administratively or judicially if challenged and should get informed approval of the organization management before preparing the final report. Justification takes reasonable portion of the report, each being thoroughly documented. They discuss the engineers' rationale including appropriate revenue rulings, court cases and other documentation of assets as section 1250 MACRS real property or section 1250 MACRS personal property. A sample of justification for items assigned for section 1245 personal property as was illustrated by Kuprenos [3] in a building facility is shown in figure 1.

Submission or filing to IRS or FIRS must be virtual, in line with modern trend which endorses electronic E-filing system.

V. CONCLUSION AND RECOMMENDATION

This study was undertaken to showcase how companies can prevent excessive tax loss through utilizing the services of cost engineers in cost Segregation Analysis. It established that for government plan to increase income through taxes to succeed, tax system must be reasonably income elastic. Profit saving incentive schemes like depreciation and capital allowance must be administered at rates that will not confiscate businesses but will neutralize the effect of tax-burden. It gave a comparative assessment of impact of capital allowance and depreciation on company's tax-saving and posited that capital allowance is good in situation of once-and-for-all 100% rate of initial deduction of asset costs. It traced the history of capital allowance and depreciation regimes in Nigeria and U.S; respectively. It concluded that cost segregation analysis is an engineering economic evaluation which should best be performed by cost engineers. It posits that cost segregation study will enable organizations to minimize the tax burden on their depreciable assets while functioning within the incentive structure provided by the federal government. It presented the cost segregation process and its essential steps to include information gathering, property classification, cost reconciliation, documentation and justification and recommend for their proper implementation by cost engineers.It crafted an illustrative template for use by cost engineers in implementing cost segregation analysis for oil and gas projects. It recommends that Quantity Surveyors and cost engineers must embrace this practice because they are best suited to render the service. They possess the requisite training, strong analytical abilities and organizational practice skill necessary to perform the economic evaluation. It recommends for development professionals to embrace effective partnering [10], in the development process to support the generation of useful cost records and data bases for efficient implementation of cost segregation analysis service.

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APPENDIX 1

Table 3: Depreciation Class Lives and Recovery Periods

	Recovery periods (in years)		
	Class Life	GDS MACRS)	ADS
SPECIFICATION DEPRECIABLE ASSETS USED IN ALL BUSINESS ACTIVITIES, EXCEPT AS NOTED			
Office furniture, fixtures, and equipment ……	10……	7…….	10
Information system……	6 ……..	5 …….	5
Data handling equipment, except computers…… .	6 ……..	5 …….	6
Airplanes (airframes and engines), except those used in			

commercial or contract carrying if passengers or freight, and all helicopters (airframes and engines)	6	5	6
Automobiles, taxis	6	5	5
Buses	9	5	9
Light general purpose trucks	4	5	5
Heavy general purpose trucks	6	5	6
Railroad cars and locomotive, except those owned by railroad transportation companies	15	7	15
Tractor units for use over the road	4	3	4
Trailers and trailer mounted containers	6	5	6
Vessels, barges, tugs, and similar water transportation equipment, except those used in marine construction	18	10	18
Land improvements	20	15	22
Industrial steam and electric generation and/or distribution systems	22	15	22
DEPRECIABLE ASSETS USED IN THE FOLLOWING ACTIVITIES:			
Agriculture	10	7	10
Cotton gaining assets	12	7	12
Cattle breeding, or diary	7	5	12
Any breeding or work horse that is 12 years old or less at the time it is placed in serviced	10	7	10
Any breeding or work horse that is more than 12 years old at the time it is placed in service	10	3	10
Any race horse that is more than 2 years old at the time it is places in service	None	3	12
Any race horse that is more than 2 years old at the time it is places in service and that is not a race horse, breeding horse, nor a work horse	None	3	12
Any horse not described above	None	7	12
Hogs, breeding	3	3	3
Sheep and goats, breading	5	5	5
Farm buildings except single-purposes agricultural or horticultural structures	25	20	25
Single-purpose agricultural or horticultural structures (GDS = 7 years before 1989)	15	10	15
Mining	10	7	10
Offshore drilling	7.5	5	7.5
Drilling of oil and gas wells	6	5	6
Exploration for and production or petroleum and natural gas deposits	14	7	14
Petroleum refining	16	10	16
Construction	6	5	6
Manufacture of grain and grain mill products	17	10	17
Manufacture of sugar and sugar products	18	10	18
Manufacture of vegetable oils and vegetable oil products	18	10	18
Manufacture of other food and kindred products	12	7	12
Manufacture of food and beverages – special handling devices	4	3	4
Manufacture of tobacco and tobacco products	15	7	15
Manufacture of knitted goods	7.5	5	7.5
Manufacture of yarn, thread, and woven fabric	11	7	11
Manufacture of carpets and dyeing, finishing, and packaging of texile products and manufacture of medical dental supplies	9	5	9
Manufacture of texture yarns	8	5	8

Table 3
Depreciation class lives and recovery periods (continued)

	Recovery periods (in years)		
	Class Life	GDS MACRS)	ADS
Manufacture of nonwoven fabrics	10	7	10

Manufacture of apparel and other finished products ……	9 ……	5 ……	9
Cutting of timber ……	6 ……..	5 ……..	6
Sawing of dimensional stock from logs, permanent or well established …	10 ……	7 ……	10
Sawing of dimensional stock from logs, temporary ……	6 ……	5 ……	6
Manufacture of wood products and furniture ……	10 …….	7 ……	10
Manufacture of pulp and paper ……..	13 …….	7 ……	13
Manufacture of converted paper, paperboard, and pulp products …….	10 …….	7 ……...	10
Printing, publishing, and allied industries ……	11 …….	7 ……..	11
Manufacture of chemical and allied products ……	9.5 ….....	5 ……..	9.5
Manufacture of rubber products ……..	14 ……	7 ……..	14
Manufacture of rubber products –special tools and devices …….	4 ……	3 ……..	4
Manufacture of finished plastic products ……..	11……	7 ……..	11
Manufacture of finished plastic products-special tools …….	3.5 ……	5 ……..	3.5
Manufacture of leather and leather products …….……	11 …….	7 ……..	11
Manufacture of glass products ……..……	14 ……	7 ……	14
Manufacture of glass products-special tools ……..…….	2.5 ……..	3 ……..	2.5
Manufacture of cement ……	20 …….	15 ……	20
Manufacture of other stone and clay products ……	15 …….	7 ……..	15
Manufacture of primary nonferrous metals ……	14 …….	7 ……..	14
Manufacture of primary nonferrous meals-special tools …….	6.5 ……	5 ……..	6.5
Manufacture of foundry products……..…..…..	14 …….	7 ……..	14
Manufacture of primary steel mill products …….……	15 …….....	7 ……	15
Manufacture of fabricated metal products –special tools ……	3……	3 ……	3
Manufacture of electrical and non-electrical machinery and other mechanical products …….	10 ……..	7……	10
Manufacture of electronic components, products, and systems ……..……	6 ……...	5 ……..	6
Any semi conduct manufacturing equipment ……..…….	5 ……	5 ……	5
Manufacture of motor vehicles ……..…	12 ……	7 ……..	12
Manufacture of motor vehicles – Special tools ……..	3 ……	3 ……	3
Manufacture of aerospace products ……..	10 ……...	7 ……	10
Ship and boat building machinery and equipment ……..…	12 …….	7 ……..	12
Ship and boat building dry docks and land improvement ……..	16 ……	10 ……	16
Ship and boat building – special tools ……...….	6.5 ……..	5 ……..	6.5
Manufacture of locomotives ……..	11.5 ……	7 ……..	11.5
Manufacture of railroad cars ……..……	12 ……..	7 ……..	12
Manufacture of athletic, jewelry, and other goods ……..…	12 ……	7 ……	12
RAILROAD TRANSPORTATION:			
Railroad Machinery and equipment ……..	14…….	7 ……..…	14
Railroad structure and similar improvements ……...……	30 …….	20 ……	30
Railroad wharvers and docks ……	20 ……...	15 ……	20
Railroad track ……...…….	10 ……...	7 ……..	10
Railroad hydraulic electric generating equipment …….	50 …….	20 ……	50
Railroad nuclear electric generating equipment ……	20 …….	15 ……	20
Railroad steam electric generating equipment ……..	28 …….	20 ……	28
Railroad steam, compressed air, and other power plant equipment ……	28 …….	20 ……	28
Motor transport-passengers ……	8……	5 ……..	8
Motor transport-freight ……..……	8……	5 ……..	8
Water transportation ……..……	20……	15 ……	20
Air transport ……	12…….	7 ……..	12
Air transport (restricted) …….	6 …….	5 ……..	22
Pipeline transportation ……	22……	15 ……..	22

Table 3: Depreciation Class Lives and Recovery Periods (continued)

	Recovery periods (in years)		
	Class Life	GDS MACRS)	ADS
TELEPHONE COMMUNICATIONS:			

Telephone central office buildings ……	45……..	50……	45
Telephone central office equipment ……..……	18……..	10……	18
Computer-based telephone central office switching equipment …….	9.5 …….	5 …….	9.5
Telephone station equipment ……	10 ……..	7…..……	10
Telephone distribution Plant ……..…	24……..	15……	24
Radio and television broadcasts ……	6……...	5……. …	6
TELEGRAPH, OCEAN CABLE, AND SATELLITE COMMUNICATIONS (TOCSC):			
TOCSC – Electric power generation and distribution system ……	19……..	10……	19
TOCSC – High frequency radio and microwave system ……,.....……	13……..	7……	13
TOCSC – Cable and long-line systems……	26.5……..	20……	26.5
TOCSC – Central office control equipment ……..…	16.5……..	10……	16.5
TOCSC – Computerized switching, channeling, and associated control equipment ……	10.5 ……	7 ……..10.5	
TOCSC – Satellite ground segment property ……	10 …….	7 ……..10	
TOCSC – Satellite space segment property ……..	8 ……...	5 ……. 8	
TOCSC – Equipment installed on customer's premises……	10 …….	7 ……..10	
TOCSC – Support and Service equipment ……	13.5 ……..	7 ……..13.5	
CABLE TELEVISION (CATV):			
CATV – Headend …….	11 ……..	7 ……..	11
CATV – Subscriber connection and distribution system ……	10 ……..	7 ……..	10
CATV – Program origination ……..…	9 ……..	5 ……..	9
CATV – Service and Test ……	8.5 ……..	5 ……..	8.5
CATV – Microwave System ……	9.5 ……..	5 ……..	9.5
ELECTRIC, GAS, WATER, AND STEAM, UTILITY SERVICES:			
Electric utility hydraulic production plant …….	50……	20 ……	50
Electric utility nuclear production plant …….	20 ……...	15 …….	20
Electric utility nuclear fuel assemblies…….	5 ……	5 ……..	5
Electric utility steam production plant ……	28 …….	20 ……	28
Electric utility transmission and distribution plant …….	30 …….	20 …….	30
Electric utility combustion turbine production plan ……	20 ……...	15 …….	20
Gas utility distribution facilities ……..	35 ……...	20……...	35
Gas utility manufactured gas production plants…….	30 ……...	20 …….	30
Gas utility substitute natural gas (SNG) production plant (naphtha or lighter hydrocarbon feedstocks) …….	14 ……...	7 ……..	14
Substitute natural gas-coal gasification ……	18 ……	10 …….	18
Natural gas production plant …….	14 ……...	7 ……	14
Gas utility trunk pipeline and related storage facilities ……	22 ……...	15 …….	22
Liquefied natural gas plant ……	22 ……	15 ……..	22
Water utilities ……	50 ……...	20(1) ……	50
Central steam utility production and distribution …….	28 ……...	20 …….	28
Waste reduction and resource recovery plants …….	10 ……...	7 ……	10
Municipal wastewater treatment plant …….	24 …….	14 ……..	24
Municipal sewer …….	50 …….....	20(2) …….	50
Distributive trades and services …….	9 ……	5 ……	9
Distributive trades and services –billboard, service station buildings and petroleum marketing land improvements ……..	20 ……...	15 …….	20
Reaction ……..	10 ……	7 ……	10
Theme and amusement parks …….	12.5 ……..	7 ……	. 12.5

Notes: (1) 25-years straight line may apply if placed in service after June 12, 1996. See IRS Publication 946.
(2) in those cases where guidelines are not listed for any given industry or type of equipment, or where the listed are clearly inappropriate, the depreciable life of such property shall be determined according to the particular facts and circumstances.

Source: *Depreciation*, U.S. Department of the Treasury, Internal Revenue Service, Publication No.534, 1994.

APPENDIX 2
Table 4: ACRS Deductions (%) for Personal Property and 10 –Year Real Property

	Year property was puts in service		
	1981-1984	**1985**	**1986**
3-year property			
1st year	25	29	33
2nd year	38	47	45
3rd year	37	24	22
5-year property			
1st year	15	18	20
2nd year	22	33	32
3rd year	21	25	24
4th year	21	8	8
5th year			
10-year property			
1st year	8	9	10
2nd year	14	19	18
3rd year	12	16	16
4th year	10	14	14
5th year	10	12	12
6th year	10	10	10
7th year	9	6	8
8th Year	9	8	6
9th year	9	4	4
10th year	9	2	2
15-year personal property			
1st year	5	6	7
2nd year	10	12	12
3rd year	9	12	12
4th year	8	11	11
5th year	7	10	10
6th year	7	9	9
7th year	6	8	8
8th Year	6	7	7
9th year	6	6	6
10th year	6	5	5
11th year	6	4	4
12th year	6	4	3
13th year	6	3	3
14th year	6	2	2
15th year	6	1	1

APPENDIX 3
Modified Accelerated Cost Recovery System (MACRS)

Eight Property Classes

Three year Property: Tractor units for use over the road Qualified rent-town property Items with IRS approved class life of 4years or less. The major change in the 3 years class was the transfer of automobiles, light trucks and other short-lived personal property to 5-year class.

Five year property: Were redefined to include; trucks, computers and peripheral equipment, office machinery and any automobile. Most item with an IRS-approved class life of 4-plus included are taxis, buses, property used in research and experimentation, breading cattle, dairy cattle and furnishings (furniture rugs etc) used in residential-rental real estate.

Seven-Year Property: Include; office furniture and fixtures, any property that does not have a classlife, and that has not been designated by law as being in any other class and, if placed in service before 1989, any single purpose agricultural or horticultural structure. It also covers items with an IRS approved class life of 10 years or more and less than 16 years. **It includes all industrial machinery and equipment,** and also agricultural machinery and equipment.

Ten-year Property: - Include **vessels** berges, tugs and similar water transportation equipment in use after 1988, any single-purpose agricultural or horticultural structure, and any tree or Vince bearing fruit or nuts. It also include items with IRS classlife of 16 years or more but less than 20 years.

Fifteen-Year Property: Include items with IRS approved classlife of 20 years or more but less than 25 years, waste water treatment plants and equipment used for two-way exchange of voice/data communications. It includes improvements made to land or added to land such as shrubbery, fences, roads and bridges. Also retail motor fuels. Outlets, such as convenience store.

Twenty-year Property: Item with IRS approved life of 25 years or more excluding real property but including sewer system, farm buildings

Twenty-Seven Year Property: Residential rental property.

Thirty one and half/thirty Nine year property: Non Residential real property. Before May 12 1993 31.5 years. After May 12, 1993 39 years.