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**PRESENTATION
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ON
PROJECT PREPARATION AND MANAGEMENT**

PROJECT PREPARATION

Pre-feasibility studies

A wise developer will commence project preparation before there is any commitment to proceed with their proposed housing development and perhaps even before their land acquisition exercise has been finalized. It can be an expensive mistake to acquire a parcel of land without considering its development potential and then fail to make it work.

A pre-feasibility study is essential to assist in planning and determining the best way forward. Many issues, and invariably the most important, need to be raised and investigated during the pre-feasibility stage, including an analysis of the project's location and its zoning and planning restrictions, an assessment of prevailing market conditions, a determination of the income range of prospective purchasers and what they are able to afford, all eventually leading to the preparation of an indicative or pre-feasibility development budget. This budget, capturing all components of development cost, leading up to projected selling prices, should fix the developer's thinking on density and the types and mix of housing units to be constructed, their sizes and an outline of their finishing specifications.

This pre-feasibility study is the start of a planning and design process eventually leading to construction and the completion and sale of a successful housing development.

Tweaking the numbers in the pre-feasibility, including an assessment of 'what if' risk factors, will assist in identifying solutions to a number of possible alternatives, such as:

- The affect of increasing densities (if permitted) and its likely impact on marketability.
- Will improving or reducing the quality of finishes, adjusting selling prices, affect the salability of units?
- If apartment units are being considered, what are the monthly service and maintenance charges likely to be and what impact will these have on affordability?
- How will profitability be affected if unit sales are delayed?

On completion of this pre-feasibility study, the developer will have incurred minimal expenditure but have a blueprint of the best way forward.

I have witnessed many examples of failed or unsuccessful housing schemes where the market was pre-determined by development cost and not by the 'market establishing what development cost should be'. The market must establish development cost and it is the role of the feasibility study to reflect this. The developer must be cognizant of the proposed market's income levels and determine realistic selling prices based on affordability.

It is important to emphasize that 'marketability is principally driven by affordability'. Location, aesthetics, size, features, services, all play important roles in buyers' perceptions and should not be ignored, but there is no market, no effective or realistic demand, if that market is unable to afford the monthly commitments associated with the purchase price of housing units.

Land Acquisition

Concurrent with the pre-feasibility exercise, the housing developer must adequately research the parcel of land which it is proposed to develop. The following is a brief checklist of areas to be researched. I recognize there may be reluctance to incur all of the costs associated with this list before the land is acquired but the more research done in the earliest stages of the development cycle may avoid costly mistakes later.

- i. Ensure legal advice is obtained concerning limitations imposed by restrictive covenants, rights-of-ways, etc.
- ii. Seek advice on your proposed subdivision, phasing and the issuing of splinter titles. If strata titles are involved there will be restrictions on the ability to phase a housing development.
- iii. Determine the future ownership of roads and services - are these to be retained by the developer and their ownership handed over to future purchasers or will they be transferred to local authorities? Identify the legal implications of what is proposed and the mechanics to achieve it?
- iv. Commission boundary and topographical surveys. I have seen numerous examples of developers unwilling to commission and pay for topographical surveys only to incur substantial cost over-runs because infrastructure works have been poorly planned and designed. Sewage collection by gravity is less expensive than lift stations and force mains. Constructing a road around a hill of hard rock or a depression is cheaper than through or over them! Are there encroachments to be resolved? Can roadways accessing the site be widened if required?

- v. Instruct land surveyors to identify major trees and other notable features. These have value and attractiveness and will increase marketability.
- vi. Agree with your civil & structural engineer whether soils investigations are needed. Do not skimp on the number of boreholes - you may regret it later.
- vii. Most important - walk the site and get a 'feel' for it. Are there security or noise problems which need to be addressed? Visit the site during heavy rainfall. How does it drain and where to? Are there old gully courses or river beds which may have been filled possibly resulting in foundation problems? Talk to neighbouring residents – very often they're a treasure trove of information.

Feasibility Studies

Throughout a project's life cycle, the current feasibility study (or developing business plan) should be constantly updated. They are dynamic and affected by the many changes likely to occur throughout the planning and design stages of a housing project. Know in advance what is likely to happen. The study will reflect the developer's assumptions and most recent knowledge at the time of their preparation. At the pre-feasibility stage, assumptions may be no more than intelligent guesswork but a gradual 'hardening of numbers' is achieved as designs proceed through their various stages allowing cost plans to be prepared and updated. Eventually, feasibility studies will be supported by detailed pre-construction budgets at the construction working drawings stage and by actual construction contract sums following the tender or negotiation of contracts.

A feasibility study should comprise:

- i. The housing development budget similar to a projected Profit & Loss Account.
- ii. A cash flow projection incorporating the pre-sales requirements determined by the developer or by the developer's financier, and peak loan borrowing requirements. The cash flow frequently establishes a project's phasing requirements as limitations on borrowings may determine phasing.
- iii. Market research information establishing selling prices, estimates of demand, deposits and prepayment installment structures and the developer's estimates on the pace or velocity of sales.
- iv. Risk analyses – an assessment of the 'what ifs'.

At the various stages of the planning and design process - schematic, design development and finally, construction working drawings, the feasibility study will update the financial projections allowing the viability of the proposed housing development to be assessed. Prior to awarding the construction contract, the housing developer should undertake a final review of their current feasibility study, and make the all-important milestone decision whether to proceed, suspend or abandon the project. Sometimes, this decision may be left to the lending agencies.

Financial institutions correctly place much emphasis on a developer's ability to control development costs in line with the approved budget. I believe insufficient emphasis is placed on the developer's ability to sell and deliver housing units and to physically collect the sales proceeds within the programmed time-frames. Many housing schemes fail because of an increasing interest cost burden directly relating to the collection, rather than the expenditure, of money. The Real Estate (Dealers & Developers) Act permits the use of prepayment deposits to fund 90% of construction expenditure and the importance of utilizing these deposits cannot be over-emphasized.

Financial institutions typically require the developer's equity contributions be used up-front to fund development expenditure before they will disburse their loans. These institutions will insist that cost overruns be funded by the developer and it is not unusual for third-party guarantees to be requested as a precaution against funding being unavailable to meet these overruns.

In summary, therefore, after a potential site has been identified, the housing developer must assess their target market and prepare a pre-feasibility study. This will assist in providing a realistic assessment of what can or must be achieved in terms of densities, sizes of units, infrastructure provisions and financing requirements. It should incorporate statutory and regulatory requirements, following Planning Enquiries at the Parish Councils and at NEPA as these investigations should identify restrictions such as maximum permissible densities, road reservations, amenity areas, maximum heights of structures, setbacks of buildings from boundaries and provisions for sewerage collection, treatment and disposal and storm water collection and disposal. The inputs of the utility companies should be obtained and the fees they are likely to charge assessed. This study can be completed even before the land has been acquired, i.e., the developer can enter into an option to purchase agreement, and should certainly be completed before architectural and engineering designs are underway.

The pre-feasibility study should be a requirement of and a prelude to the preparation of a design brief and should provide the housing developer with sufficient knowledge to instruct the technical design team as to what can reasonably be afforded for inclusion in the project at this stage. As with feasibility studies, the planning and design stages during the initial phases of a project should be dynamic with changes likely to occur during the conceptual and schematic stages. As design development is finalized and construction working drawings proceed, re-designs may prove costly so it is in the interests of all parties, developer and design professionals, to get it right during the early stages.

I must caution that development is a very risky business. I know of many successful businessmen who have ventured into real estate development and been badly burned. There is no substitute for meticulous project preparation and the most successful projects are those which have been planned in detail with a full assessment of all their risk factors.

Components of a Housing Development

The design brief, emanating from the pre-feasibility study, should instruct the site planner and architect on:

- i. Site planning alternatives including densities. Planning a subdivision is critical and requires careful consideration and may be the difference between profit and loss. At this point in time, the developer should be aware of the statutory requirements for amenity areas, building set backs, seeding, road reservations, parking, water storage, sewage disposal, storm water disposal, etc.
- ii. The 'affordable' building areas of the housing units proposed including the number of bedrooms, bathrooms, areas of living and dining rooms, patios and parking.
- iii. The scope and price ranges of finishes and specifications, e.g., floor and wall finishes, sanitary fixtures and bathroom fittings, types of roofs and finishes, types of windows and doors.
- iv. Details of recreational amenities and the provision of hard and soft landscaping.

The design brief should assist engineers in defining engineering specifications for:

- i. Road reservations, carriageways and types of paving.
- ii. Sidewalks, kerbs and gutters.
- iii. Street and landscape lighting
- iv. Storm water drainage
- v. Sewerage collection and treatment (including the disposal of effluent)
- vi. Electricity supply - above or underground.
- vii. Telephone, CATV, internet and security.

In our generic housing development, the developer has completed a pre-feasibility followed by updated feasibility studies and a design brief has been prepared allowing the design team to be properly instructed by the developer. We should now look at the components of the housing development budget including items to be incorporated into the budget. There are ten (10) components to my development budget.

They are:

1. Land Acquisition.

This has been mentioned above. Land as a percentage of selling price varies considerably, with lower priced housing units typically reflecting a much lower percentage for land than higher priced units. The provision of existing infrastructure services will impact the input value of land, e.g., road access, potable water supply, central sewage collection.

2. Professional Fees

- a. Developers must have professional advice and a competent technical team and I've learned that 'you get what you pay for'. Increasing the input or quality of your professional team may add fees equivalent to say 3% of budgeted construction cost, having an impact of 2% on selling prices or reducing the developer's margin. My experience tells me that it is preferable to proceed with a lower budgeted profit margin but to proceed with greater confidence and less risk
- b. How many developers retain the services of a landscape architect? For the equivalent of say 2% of selling price a developer may receive an increase of 4% or more in market value benefiting from aesthetics, sales promotion and marketability.
- c. Encourage or insist that your quantity surveyors and mechanical and electrical engineers reduce the value of provisional sums contained within construction contracts. Ensure drawings and specifications have been completed before appointing a building contractor and see that all elements of work are priced. The higher the value of provisional sums, the greater the risk of cost overruns. Frequently, provisional sums reflect the laziness of professionals who fail to provide construction details until the last moment. There are developers who have no idea what a provisional sum represents.
- d. The two major causes of compensable extension of time or disruption claims are (i) changes requested by the developer and (ii) lack of information available to the contractor. Both must be managed and controlled by the developer.

3. Infrastructure or Siteworks

- a. This is an area of the housing developer's budget most likely to incur cost overruns. Don't short change the necessary inputs such as the topographical survey or geotechnical investigations

- b. It is important to understand the design and budgetary implications of statutory requirements and the provision of utilities. JPS may charge a fee for providing a high voltage electricity supply to the site but a substantial element may be refundable, usually after 3 years. What do you budget? The Parish Council's subdivision and building approval may provide for the ownership of roads and other services to be taken over by the local authority or utility but will impose a maintenance guarantee, usually for a one year period. Has this been budgeted? There are many examples of housing schemes and subdivisions where Parish Councils have refused to accept responsibility for maintaining roads as they contend they were not constructed in compliance to their specifications. Years and even decades later, there are examples of these roads in deplorable conditions with the disputes still unresolved.

4. Building Construction

This is the largest component of the housing development budget.

- a. In my experience, and as a rule of thumb, building construction should not exceed 55% - 60% of selling price. If this percentage is exceeded, the project may have increased risk of not being viable. Alternatively, the developer may be willing to accept a reduction in their indirect overheads and profit margin but this will increase their risk factor as the lower margin will be eroded faster if cost over-runs are incurred.
- b. In Jamaica, and I'm sure in many other countries, we believe a construction 'system' exists which will substantially reduce construction costs and is the panacea towards achieving 'affordable' housing. I don't believe this. Systems construction definitely has a place but why not describe a one square foot construction block as a system. Many construction systems require skilled management and expertise to be successful and rigid construction scheduling as routines must be established increasing plant and equipment usage and efficiency. Benefits are derived because of this rigid scheduling usually in reduced construction periods leading to interest cost savings.

If you accept the reasonableness of my estimate that in a typical housing development construction cost should not exceed 60% of selling price, the superstructure structural component of building construction cost probably amounts to approx. 40%. Therefore, the typical 'system', which impacts the method of building the structure, directly impacts less than 25% of typical selling price, i.e, 60% of 40%. Controlling the cost of the structure, equivalent to 25% of selling price, is important and not to be ignored but it is not the solution to affordable housing.

Good management is. 'Systems' construction enhances opportunities for efficiency and effective management. Some 'systems' require building contractors to undertake a substantial element of their construction input in 'factory-type' environments, even on the construction site such as tunnel form construction, where supervision, inventory management, cost control, scheduling, adherence to specifications and quality control are better managed.

'Systems' construction has an important role to play but is not appropriate for all types of development. Invariably, cost over-runs and delays can be traced back to poor supervision and management, including:

- Poor quality of information provided the contractor – insufficient details provided on drawings or in specifications resulting in procurement delays followed by claims. 'Systems' construction has the advantage of requiring all information to be available prior to construction commencing and typically allows no changes to be made thereafter, except at considerable cost. I consider this is a major plus as it enforces discipline on professionals.
 - Ineffective supervision resulting in non-productive labour and loss and wastage of materials. Defective workmanship is frequently not identified early in the construction process requiring succeeding works to be removed and replaced as well.
 - An inability to properly schedule the various elements of the construction process and to properly resource these elements. I will discuss this later.
- c. The developer's decision whether to tender or negotiate a construction contract should be made early in the design stage. With negotiation, it is advantageous for the contractor to join the project team and provide a 'value engineering' input into the design process. However, competitive tendering always ensures transparency, providing assurance that the best possible price has been obtained.
- d. Designs and specifications must be completed. As previously mentioned, this is the probable cause of the majority of contractor's claims for extensions of time with compensation.
- e. The developer must decide which form of construction contract is appropriate. Whichever form is used, Special Conditions of Contract should be drafted to ensure the developer's intent is reflected in the contract.

Construction drawings, specifications and the contractor's programme of works are all contract documents. Do not forget this. It is important to emphasize that a poorly prepared drawing or set of drawings may have similar, if not more, financial implications as a poorly drafted contract.

- f. In today's relatively low inflation environment, clauses permitting escalations or fluctuations in the construction contract sum must be carefully written and should be limited in scope. The currency of contract generally determines their scope. Material price increases should only be permitted if invoices from prime suppliers are received to authenticate valid increases. Obviously, if the contract does not permit the contractor to be compensated for fluctuations, they will price the risk.

5. Landscaping

No comments other than I wish more attention was paid to both hard and soft landscaping with an enlightened recognition of their advantages. Please remember to identify major trees and make every effort to retain them.

6. Financing Costs

- a. Legal fees and costs on loan security documentation must be budgeted.
- b. Interest costs should be calculated in the cash flow projection. Carefully review the loan documentation to determine if interest rates are variable or fixed. Assess the likelihood of interest rates increasing.
- c. Commitment and other fees on loans. Incorporate the financial implications of the terms and conditions contained in commitment letters and loan agreements.
- d. Understand the implications of the Real Estate (Dealers & Developers) Act. The use of purchasers' deposits is restricted by Law with cash flow implications.
- e. I repeat interest charges as they should always raise a 'big red flag' in the context of real estate development in Jamaica. There are many risks and pitfalls each with the potential to result in a substantial increase in interest charges. These increases may result in a reduction or total elimination of the developer's profit margin, leading to steadily increasing losses and, ultimately, a failed development. Some 'red flags' are:

- The cost of delays in completing construction works and achieving Substantial or Practical Completion. Additional interest costs may be irrecoverable from liquidated and ascertained damages imposed on the contractor.
- Inability to sell housing units within the time-frames contemplated.
- Delays in collecting sales proceeds - it is essential to monitor the mortgage lending agencies and their attorneys-at-law and your attorneys-at-law.
- It is also important to monitor the issuing of splinter certificates of title by the Registrar of Titles as well as the registration of Transfers and mortgage loans. Delays caused by third-parties ultimately increase a development's interest costs.

7. Developer's Overheads.

- a. Property taxes on the land prior to purchasers assuming responsibility for their payment.
- b. The cost of statutory approvals – these are no longer insignificant.
- c. Insurances, e.g., property all risks insurance on unsold units after Practical Completion has been granted or on units where legal possession has not been delivered to purchasers.
- d. The developer's security costs

8. Selling Expenses.

- a. Advertising and promotion including the costs of establishing a model unit.
- b. Commissions paid to real estate brokers.
- c. Legal fees for preparing sales agreements.
- d. Legal fees and costs on Transfers including Stamp Duties, Registration Fees and Transfer Tax.

9. Developer's Profit Margin

- a. The most flexible of all elements of the development budget and, unfortunately, the only element likely to decrease and not increase.

- b. Factors influencing the potential amount of the developer's profit margin are:
- Strength of the housing market - buyers' or sellers' market.
 - The amount of the developer's equity contribution – the higher the percentage of equity, the larger the return expected on total development cost. An imputed interest return should be available to developers on their equity contributions.
 - Influence exerted by financing institutions such as the NHT and JMB to keep selling prices low.
- c. I would expect developers' margins to be in the 10% to 12% range, calculated on total development cost. This percentage does not reflect Return on Investment (or internal rate of return) as a 12% margin on total development cost may equal a Return on Equity Invested of 40% or more per annum. It is important not to confuse the developer's margin with the contractor's margin. They are distinctly separate margins for different risks. This must be carefully considered and evaluated if the developer and contractor are one and the same or are closely associated.
- d. I do not begrudge a developer their profit margin. There are few business ventures so fraught with risk and uncertainty. The successful developer will make every effort to reduce their exposure to risk and uncertainty to a minimum and this is achieved by investing in project preparation – detailed planning and accurate budgeting, well prepared drawings and specifications and contract documents.

10. Selling Price

All elements of the development budget at 1 to 9 above, when added, equate to selling price. Selling price in the main is inflexible and fixed and can only be increased if permitted by the developer's sales agreements. If demand is strong and a housing scheme is phased, later phases may permit selling prices to be increased. But the opposite may prevail, requiring a reduction in selling prices or the abandonment of later phases. Therefore, cost overruns must be compensated by cost savings or the developer will face a reduction in his projected margin.

PROJECT MANAGEMENT

Described below are some of the critical areas of construction management.

Construction Scheduling

As a project and construction manager one of the most useful tools we have is computer software facilitating the scheduling or programming of construction and other activities involved in the development process. It is surprising how few developers and contractors avail themselves of the opportunities afforded by the use of programming software. If nothing else, it forces the developer to logically schedule and sequence the development process and the contractor to plan and sequence his scheduled tasks recognizing both preceding and succeeding construction activities and to efficiently schedule the use of their resources – manpower, materials and equipment.

A contractor drawing a line across a time scale for a small number of tasks, creating a Bar or Gantt Chart, means little and is an ineffective tool. It places the contractor at considerable risk as a programme prepared in this manner, when submitted to the developer, is likely to be accepted as the contract programme of works and the project manager may deny extensions of time or disruption claims as the programme will be insufficiently detailed to enable an assessment to be carried out of the contractor's claim(s).

Construction schedules with thousand of tasks can now be programmed with predecessor and successor linkages. This is not as onerous as it may sound, as the ability to copy and paste creates more detailed and accurate programmes particularly with projects having repetitive buildings or construction tasks such as housing developments. Theoretically, once you have one house or a phase of houses accurately programmed, their scheduling can be repeated ad infinitum with appropriate linkages between the completion of a selected task and the commencement of another.

The computer software automatically identifies critical tasks allowing the project manager and contractor to concentrate on areas most likely to delay construction. Alternative scheduling may be preferable to avoid or mitigate delays.

As mentioned above, a major advantage of construction scheduling is that it forces the developer, contractor and the project and construction manager to 'think a project through' in detail. Apart from identifying critical paths, which may change as schedules are updated, milestone dates will be identified which can be incorporated as sectional completion dates into construction contracts. For example, completing an early phase of construction by a milestone date may be a pre-condition for being awarded later phases of construction.

It is important to partially resource construction schedules particularly when limited resources are available and not easy to increase. Scheduling tasks on paper is easy and scheduling the completion of a contract on time can be easily achieved by artificially shortening durations. But are the resources available to complete these tasks within the shortened time-frames contemplated?

Experience shows that the most critical resources are equipment, skilled trades and the lead-times for specialized materials.

We have worked on projects where resourcing construction schedules have identified constraints such as:

- i. Insufficient concrete batching equipment on site to meet the contractor's scheduling of concrete requirements. This was in a Caribbean territory with no pre-mix plants.
- ii. Insufficient back-hoes on site to excavate building foundations in keeping with their programme. This was a critical activity and would have ultimately delayed Practical Completion.
- iii. Inadequate craneage on site to handle the turn-around of tunnel forms. The casting of the tunnel forms was programmed on a 24 hour cycle with tasks identified at half-hourly intervals. A delay of more than 2-3 hours in the 24 hourly cycle resulted in a full day's delay.
- iv. Inadequate numbers of skilled tradesmen to achieve the desired programme.
- v. Procurement delays caused by the failure of the developer's project team to detail or specify materials in advance as they failed to anticipate availability, the suppliers' shop drawings approval processes, importation requirements, customs delays and delivery to site.

The construction contract must stipulate the requirement for the construction schedule to be periodically updated, at intervals of not more than one month, with completion percentages incorporated. Computer software permits the tracking of progress with uncompleted and delayed tasks automatically rescheduled to commence immediately after the progress update, but still recognizing and retaining their linkages.

Delays in construction schedules usually require the compressing of the durations of trades, particularly finishing trades, within shorter time-frames, if these delays are to be reduced. This is referred to as the 'stacking of trades' and requires the additional resources to be identified and sourced. Acceleration may be requested with the associated costs such as additional equipment or increased overtime being a cost factor to be paid by the developer or contractor, depending on the party responsible for delays.

A detailed construction schedule assists contractors, project and construction managers, architects and engineers to evaluate claims for extensions of time and also claims for disruption, acceleration and the stacking of trades. It is ironic that many contractors have become increasingly sophisticated in developing and submitting claims but have yet to adopt the sophisticated tools available to assist and enhance their management techniques.

Project Administration

Site meetings between the contractor and the project's technical team must be scheduled at least at monthly intervals and preferable every two weeks. The project manager must be allowed to insist on attendance by any member of the contractor's team, including major subcontractors. We require this as a contract condition.

We also insist that contract specifications require:

- i. The contractor to prepare a progress report to be issued prior to site meetings. The report must identify delays, the contractor's major concerns including insufficiency of information, workforce numbers by trade and any other matters the contractor considers important. As project manager, we prepare the minutes of minutes and identify those parties responsible for actioning follow up issues.
- ii. A paper trail to be established ensuring there are written instructions and the required authorizations for the issuing of:
 - Site Instructions
 - Contractor's Requests for Information (RFIs).
 - Confirmation of Verbal Instructions (CVIs)
 - Change Orders – unpriced and priced and without and with their impact on the contractor's construction schedule identified.

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