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Sustainable Construction Management Practice- Site Waste Management

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Abstract- With the urge for development and to satisfy the needs and wants, working and growth of Construction Industry is unavoidable. However, the conventional approach and negligence towards future generation bought the concept of "Sustainability" which simply means the proper use of resources or to sustain resources for further generation to come. Using scarily and Eco- friendly material even though is a great compatible approach for achieving it but what about the construction already existing? brings a great question to one's mind. Million tons of resources are utilized per year for construction purpose and million tons get waste both at construction and demolition time. This C & D waste needs to be given special attention .The aim of paper over here is to develop sound planning for such site waste material and the implementation of 3 R's –Reduce , Reuse & Recycle for sustainable construction management practice.

Index Terms- C & D waste, sustainability , 3R's –Reduce, Reuse and Recycle, sustainable, Site waste management plan.

I. INTRODUCTION

The construction industry has been found to be among the main consumers of resources and energy. Moreover, the construction sector is reported to be generating unacceptable levels of material waste. Millions of tons of waste is generated every year leading world towards depletion of resources. It is strange but still many of the country have no plans, rules and regulation for minimizing waste generation. Although "waste" is a familiar term in the industry world-wide, it is difficult to compare construction waste figures from different construction sites due to a number of reasons, including the use of varying definitions; and the use of different estimation approaches, by different groups.

From the earlier studies it can be stated that 30 to 40 % of wastage is done while the construction is under execution stage, similarly the sources reveals that in some of countries contribution of construction waste is about 70 to 75 % out of total waste generated annually. These construction waste needs to me minimized, reuse and recycle. But, for this it is must to undertake waste assessment study.

II. CLASSIFICATION AND SOURCES OF WASTE

A. Waste Classification:

Construction waste can be divided into three major categories: material, labor, and machinery waste. However, material wastage is of more concern because most of the raw materials from which construction inputs are derived come from non-renewable resources. These wastes can be called as controlled waste as they are avoidable in nature and can be further reuse for commercial purpose.

B. Sources of waste:

Right from planning, designing, scheduling phase to execution and controlling phase the waste is generated at any construction project. As we have already said the waste term is just not used for material but any of the resources standing out of 5 M's- Man, Machine, Money, Material and motivation. Finding of study reveals the sources as – Incorrect planning and Resource allocation, Improper use of efficiency of resource, negligence of management and control system, procurement, handling of materials , improper design , low market study, lacking in R and D , gap in communication etc.

C. Scope:

Even though it is the general approach for reducing, reusing and recycling C & D waste , the paper highlights some of the observation and aspects that can become essential element of Planning.

It's the foremost preliminary step for proceeding with any research work writing. While doing this go through a complete thought process of your Journal subject and research for it's viability by following means:

1) Read already published work in the same field.
2) Goggling on the topic of your research work.
3) Attend conferences, workshops and symposiums on the same fields or on related counterparts.
4) Understand the scientific terms and jargon related to your research work.

III. STUDIES AND FINDINGS

Site waste Management Plan:

Site Waste Management Plan (SWMP) is an important tool for Sustainable construction practice which Companies and their clients, of all sizes should follow to improve their environmental performance, meet regulatory controls and reduce rising costs of disposing of waste. It includes useful checklists and other guidance to help ensure the Plan is a practical tool.

There are eight important steps suggested for successful implementation of this Site Waste Management Plan:

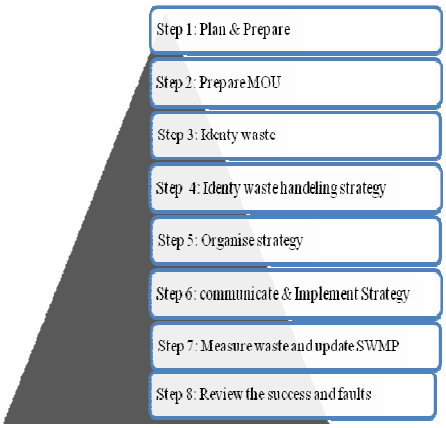

Figure no.1: Steps involved in SWMP

Step 1: Exact planning of construction including scheduling and resource allocation according to efficiency is of prime importance.
Step 2: Preparation and declaration of authority and responsibility of individual and duty as a whole towards common motive in favour of public and companies interest should be developed. This memorandum of understanding helps a lot for avoiding unnecessary conflict and misconduct.
Step 3: Identify waste and reasons for generation of such waste on basis of hierarchy, on- and off-site, Hazards, economical aspects etc.
Step 4: Plan out the strategy for handling various type of waste considering its reuse, economical aspects, social aspects etc. Input for reducing and reusing waste and output desired from planned strategy.
The strategy that can be applied under hierarchy is:-

- Avoid waste generation at first place.
- Minimise the amount of waste produce at project site.
- Reuse waste items as many time as one can provided desired specifications to be maintained.
- Recycle what only should be recyclesd after knowing its potential use and place to fit.
- Dispose of what's left in responsible way.

Step 5: Organising the flow of work for managing each and every elemental part of it. Carry out any necessary training of in-house and sub-contract staff so that everyone understands the requirements of project Site Waste Management Plan.
Step 6: Communication and implementation of planned strategy describing desired milestone. Designing and filling checklist and datasheets related to quantity and quality, type and future potential use of site generated waste.

Sample check list:

- Have you considered the construction methods and materials that you can use to reduce the amount of waste your project produces?
- Have you thought about ordering materials that have less or reusable/returnable packaging?
- Have you recorded all of your waste reduction decisions in your plan?
- Has someone with authority been assigned overall responsibility for the SWMP?
- Have you assessed the waste produced at each stage of the project - the types, how much and when, including the processes involved?
- Have you identified which workers will produce waste?
- Has an area of the site been set aside for storing new materials and waste, including
- Separate containers for different types of waste? You must store new materials separately from waste, and make sure storage areas are secure against vandalism.
- Have you set targets for the different types of waste likely to be produced by the project?
- Include targets for the amounts of each waste type to be reused, recycled and disposed of.
- Have measures been put in place to deal with expected and unexpected hazardous waste?
- Have you considered whether you can reuse materials either on site or off site?
- Have you considered on-site and off-site processing and reuse of materials?
- Have you assessed the quantities of materials you need to order to reduce over-ordering and site waste?
- Can you return unused materials to the supplier, sell them or use them on another job?
- Have you considered using recycled materials?
- Will you separate different types of waste to get the best value from good waste management practices?
- Are your storage areas secure and weatherproof to prevent wind and rain damaging your materials?
- Have you covered or netted any loose materials to prevent them being spread and possibly causing pollution?
- Is everyone who will handle waste aware of the SWMP requirements?
- Are contractors and subcontractors trained and aware of their responsibilities?
- Are SWMP requirements built into contracts?
- Are you carrying out spot checks and monitoring your staff regularly to make sure they are following procedures?
- Are you updating your plan every time waste is removed from your site?
- Are you checking the SWMP regularly and making sure targets are being reached?
- Have any issues or problems been taken into account for action in future projects?

Sample (Site waste management Data records):

- Name of Project;
- Cost of Project:
- Location of Project:
- Utility of Project;
- Stage or Phase at time of Recording:
- Total Resource demand:

- Classification of resources on basis of quantity and cost:(Percentage Participation)
- Type of waste generation, quantity :
  1) Inert
  2) Hazardous
  3) Nonhazardous
- Waste that can be Reduce:
- Waste that can be Reuse:
- Wastes that can be recycled maintaining specifications of work:
- Disposed waste, Location, treatment:
- Process for reusing and recycle adopted:
- Percentage success achieved:
- Failure for works:
- Risk associated:
- Review of earlier work:
- Post process measure:
- Next suggested date for recording data:

Step 7: Measure how much waste is still generating at site so that to cope up with the baseline plan for handling it efficiently. To update the amount of waste treated and the quantity still reaming to be treated within desired duration.

Step 8: As the process is continuum process the time to time of review of success and faults achieved should be done so as to consider it while developing future plans and assigning weighted points to such risk and possibility of failure.

Limitation Of SWMP: Lack of responsibility and devotion of individual, missing role of Govt. Bodies and faults in rules and regulations related to construction waste. Lack of Training programme for concern people, awareness camps etc.

IV. CONCLUSION

The study for this research work highlights many aspects which are lacking for developing sustainable construction planning. Over here the approach for overcoming such waste mitigation strategy can only be successful by joint efforts of governing regulatory bodies as well as individual concern with it. Application of such sustainable waste management planning may increase the potential to reduce, reuse and recycle construction waste generation. Public - private awareness and participation on such alerting agendas will help to secure and sustain future generation to come.

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