

CONSTRUCTION SITE WORKRustam Hafizyar*¹Dr. Mohammad Ali Mosaberpanah²^{*1}PhD Student in Civil Engineering, Cyprus International University, North Cyprus, Turkey²Asst. Prof in Civil Engineering, Cyprus International University, North Cyprus, Turkeyrustamr323@gmail.com**ABSTRACT**

The current paper is to identifying proper site work for construction because the project starts a certain time and finished certain time, this responsibility directly and indirectly related to project manager of Construction Company and Site planning process is the most critical point of project activities, construction duration, cost and safety. This paper is leading on huge multi-target to optimum strategy for temporary and permanent construction of site work planning. In conducting of this paper a systematic literature review was done. A systematic literature review can see as a path for identifying, evaluating, studying and interpreting available research which specific area or a topic area of interest. In discussions was found the most critical point on site work such as cleaning of site work, destruction of existing structure on the site, site surveying, and drainage system and finally found best method for site preparing.

Keywords:

Site work, cutting trees, site cleaning, drainage system, sheet piles, temporary facilities, permanent facilities.

INTRODUCTION

Each civil engineers will be encountered one day to the construction work finally. Construction Company needs place for management of project. The manager of company must be meeting with owner to provide the all equipment for site preparation. Construction manager can decision making on construction site for specifying the temporary location into the frontier of a construction site to recognizing spatial connection and extending best solution alternative because of efficiency and effectiveness of construction procedure is improved performance project life cycle cost [1]. Temporary Facilities (TFs) it means specific tasks which support the procedure of construction.

TFs is not part of permanent structure just have related to short life limits. For instance TFs depends on construction projects involves; storage place, personnel road, materials road, staging areas, laydown zone, unloading area, prefabrication areas, equipment area, machinery area, hazard path, debris paths work area and tools finally protected area [2]. The size and types of TFs associated the project type, scale, properly design, and strategy of execution of construction.

In the most essential respects of TFs is trade- off issue that decision should be made according to project characteristics for instance cost, security and safety without self-devotion quality of site plane [3]. Site planning process is the most critical point of project activities, construction duration, cost and safety.

As known the jobsite layout, logistics as well documents are relating on site location within the construction site boundary. Utilization of site work needs to the construction planning and scheduling in long-term and be careful all evaluation of construction process [4].

Optimum of site work minimize the staff included movement of materials which staff can be spend time the carry out productivity construction tasks. Jobsite are cleaning and specifying staff working on environment which is positive pressure on worker moral and give a good results in high production during the work shift as well some important factors are related on site planning of construction such as allocation area for jobsite likes material delivery, material storage, temporary offices on site work, the next one is jobsite access like haul roads, the second one is material handling like movement of material on site work, since vertically and horizontally; equipment lifting, involve forklifts and cranes, third one is transportation of worker, the next phase are temporary opportunity; temporary office; facilities of storage dray shacks, sanitary facilities, temporary water, heat, telephone, power, and internet connections, the next stage should be arrange the security; these are includes guard dogs, electronic alarm system, temporary fencing, security patrols, and watch man, finally barricades and signage to protect the public through construction site work because site work is hazards [4].

RESEARCH PURPOSE

The main purpose of this research is to identifying proper site work for construction because the project start a certain time and finished certain time, these responsibility directly and indirectly relate to project manager of Construction Company such as these responsibility are temporary road, temporary office on site work for staff of project, cutting trees or extra materials from site, provide a parking for staff and worker as well for machinery, removing water from area to ready for excavation, security for site layout of project and installation of cranes, telephone lines sanitary network for construction site work all those thing the project manager done because of finishing the project on time as well behind of the budget not more than budget should spent money additionally safety of construction work is important for owner and manager.

PROBLEM STATEMENT

A considerable quantity of this paper is leading on huge multi-target to optimum strategy for temporary construction of site work planning. This paper basically focused to identify optimum strategy about site work problem such as construction temporary road for delivery of materials to the site as well delivery of concrete trucks and temporary facilities of office on the site, cutting trees, the next stage should prepare parking lots for staff, removing water from surface of ground till to ready for excavation and setting for staff, security patrols and temporary installation of telephone line as well installation of cranes and lifting equipment and materials. As explain on the literature review.

LITERATURE REVIEW**Early stage of construction**

Early phase of construction work is site work must be prepared the site phase such as these factors are construction temporary road for delivery of materials to the site as well delivery of concrete trucks and temporary facilities of office on the site, cutting trees because of implementation the project, the next stage should prepare parking lots for staff, removing water from surface of ground till to ready for excavation and setting for staff, security patrols and temporary installation of telephone line as well installation of cranes and lifting equipment and materials [5]. Figure 1 following as shown (cutting trees, surveying, and temporary power line for telephone or electricity, security fences, set up trailers) at the bellow of context.

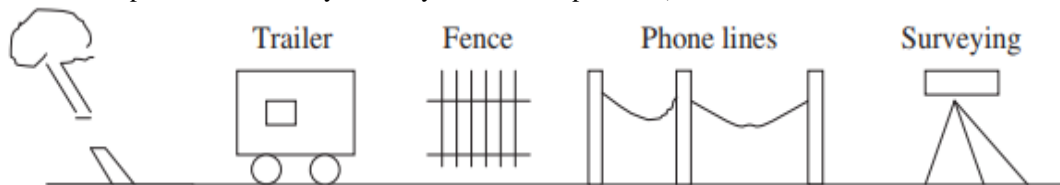


Fig. 1. Site work preparations [9]

Grading of soil cutting and filling

The site must be grading after site propartion some place of gournd is high and some of them may be low, for these factor must be cutting the high ground and filling the lew groung based on the surevyig level of site work [6]. Figure 2 at the bellow shows the cutting and filling of site work. The next Figure 3 as shown the process of soil grading is cutting the original field that it is the proposed of level on site work. The next Figure 4 as shown excavation is necessary point of foundation, basement, sewer pipes, manhole subgrade, tonal, swimming pools, and drainage pipes. These all procedure as shown grading of soil cutting filling by machine and because of accelerating the project according to specification paper, surveyor engineer done it.

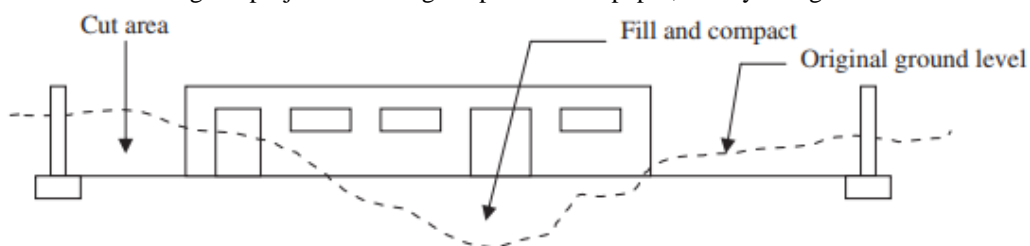


Fig. 2. Construction site work and original field level [9]



Fig.3. Cutting soil by dozer



Fig.4. Excavations of piles, basement, foundation and manhole

Since completed the worksite preparation, and pile driving must be concreting the work from the early stage and concrete work was dividing into two part first one is formwork preparation the second is installation of reinforcement bars, curing of concrete and duty to of framework is holding the concrete place.

Movement of materials and lifting

Avoiding from time is necessary in construction work because of this point should be installed the cranes on site work to deliver the material such as concrete, timber, equipment and steel. Some studies illustrated different types of cranes to day available in construction such as tower cranes by this crane can transfer the material an any corner of the building but it is cover a large area and crawler mounted cranes was use for small construction for limited site work as well it has gantry this crane is same above but it is moving on rail but mechanism is same no different on Figure 5 as shown the can cranes properties.



Fig. 5. Cranes on construction site

RESEARCH METHODOLOGY

One type of research design can be applied for this research paper which is descriptive. Thus the exploratory is applied because the research finding can be applicable on the web. In conducting of this paper a systematic literature review was done. A systematic literature review can be seen as a path for identifying, evaluating, studying and interpreting available research in a specific area or a topic area of interest [7]. It can be used to summarize the current and past literature specific to a keyword, and to recognize the gaps which exist in the research paper state to provide suggestions which will be a raised new framework can be guides new research activities. Research questions formulated, guided search terms and keywords used to get in previous studies. This study used four primary data sources that are;

- CIU Digital Library
- Science Direct
- Sensors
- Blog

Other papers were got from Google scholar, which were much few. The keyword is used for search through above database were accepted [8]. Which includes [site work, cutting trees, site cleaning, drainage, sheet piles, landscaping] discuss about construction site work and evaluated these factor above as mentioned to identifying and amount of them for using a better management in construction site work.

RESULTS AND DISCUSSION

It were found 100 papers returned from database which were searched and found useful 20 papers have to be studied. Ability to use articles based on selected there is an article about the subject considering the feasibility assessment using agile learning about construction site work. Most of the papers, report, books were discussed about site preparation such as cutting trees clearing natural surface to ready for excavation, installation internet, cranes temporary road for delivering the materials on site layout of project temporary telephone line, sanitary network of construction and so forth. It was prepared four models from literature reviewed as shown on Figure 6 at the below of context.

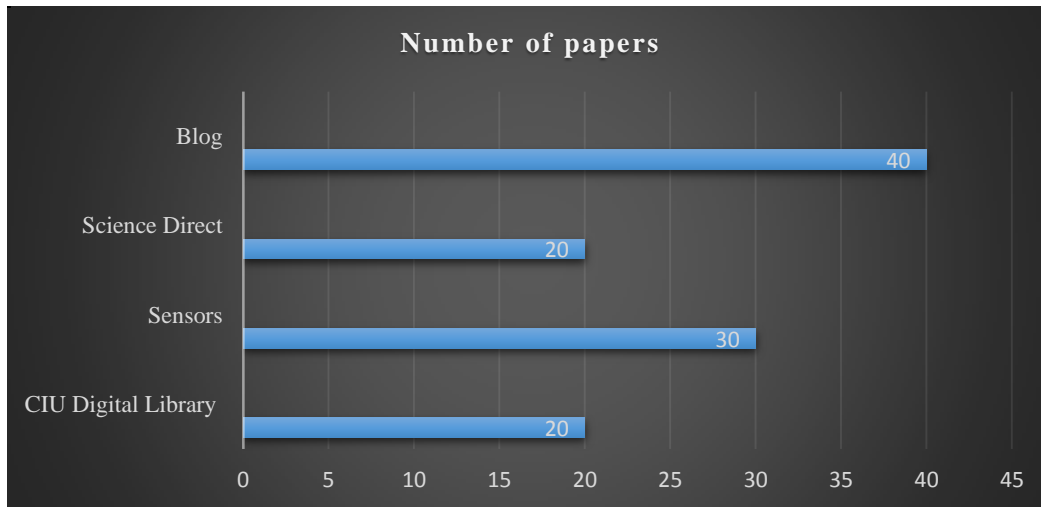


Fig. 6. Paper distribution graph

Site work

First step of site working is site clearing as known the “grubbing” but site clearing includes remove of top soil from surface of area, cutting trees, and remove of bushes [9]. Basically, backhoes dozers, will be used for site cleaning as well tree cutting by equipment. The list of work items that can be necessary on construction site are such as first of all the construction company needs to cut the tree and clean the surface of ground [10]. It is not more complicated issue, thus, there are many country police is different that must be permit to be achievement to cutting trees and any problem shows during cutting the trees the responsibility directly relate to developer. Site work is divided into part the first one is temporary site work and permanent site work.

A sheet pile will be erected to back the soil during construction. This can be sustainable as temporary holding well. Furthermore some holding walls can permanent structure which is part of design. May be the developer that it means contractor to have some dirty drainage line during construction in site work that after a period of time it will be constructed as temporary drainage lines to the site work and some places should be temporarily created road for delivering materials on site work by truck and lifter or somewhere else [11].

Some journal and article was study as shown temporary site work;

- Grubbing or site leaning
- Destruction of abandoned structure on site work
- The depressed area should be filled
- Cutting and filling
- Excavation of the basement or something else
- Rock breaking
- Grading of miss
- Fine grading
- Soil compaction
- Removing of existing dirty materials utility
- Installation of temporary lighting, water and gas supply
- Creating temporary drainage on the site work
- Proving the temporary road
- Temporary creating walls, sheet pile walls and coffer dams
- Temporary sediment and erosion control structures (silt fences, rip rap) [9].
- Stabilization of soil (dynamic compaction, vibroflotation, surcharging of soil)

Some permanent site work was found such as are;

- retaining walls
- pavement
- parking lots

- permanent utilities (water supply, electricity, cable gas and communication)
- planting trees
- landscaping
- ponding and canals

Clearing of site work

Each civil engineer know clearing of site “grubbing”. Cleaning o site includes: removing the bushes, cutting the trees and removing the top soil of the area as needed. Basically, backhoes dozers, will be used for site cleaning as well tree cutting by equipment. It will used on the site on figure 7 as shown the area of the site as well some important machinery used for site cleaning such as:

- Grapples
- Clearing rakes
- Stump splitters
- Stump pullers



Fig. 7. Clearing of site work

Destruction of present structures and utilities

In some condition old structure need to destructed, thus destructed includes destroy of concrete, steel structures, masonry structures, fences and roofs [12].

Mass Grading

Leveling is a process of obtaining the field area elevation. Distress grounds must be filling and high places must be cutting by machine after these operation area leveling is done. By dozer and excavator is good for grading to cutting and filling the area but it is not good for transporting that it will be transfer by truck the materials and based path for grading but high depressed that it is scraper. It can be transport soil and most effective in transportation than loaders [13].

Fine Grading

The blade of grader doesn't much more robust as dozer blade. Generally graders blade is in the center among wheels. But the dozers are more robust than grader as well located on in front [14].

Drainage system on site work

Generally, in most circumstances construction of drainage and water systems are influenced by water sources and water destination, the volume and capacity of water required, and the facilities to be installed to carry out the operations. It is usually the final operation carried out in site works which show case a beautiful finished work. The installation of a proper drainage system is highly required as it will go a long way in minimizing future damages that could result from flooding; therefore such drainage system is expected to improve the conveyance and carriage capacity of water volume [15]. All necessary processes involved in managing

successively the drainage system aims at an appropriate control of erosion velocity, volume and expected damages from specified location [16]. Table 1 shows the aims that could be achieved as a result of employing proper drainage system.

Table 1- Application of drainage control measures

Aspects applicable to erosion control	Aspects applicable to sediment control
<ul style="list-style-type: none"> • Diversion of up-slope storm water runoff around soil disturbance. • Diversion of a site into manageable drainage area. • Management of sheet runoff to minimis the risk of rill erosion down slopes. • Control of flow velocity and soil erosion within drainage channel and chutes. 	<ul style="list-style-type: none"> • Diverting up-slope runoff around excavation (benefits sediment control through a reduction in the volume of water required to be de-watered form the pit). • Diversion of “clean” water around sediment traps, thus improving their sediment-trapping efficiency and reducing the size of major sediment traps, such as sediment basins.

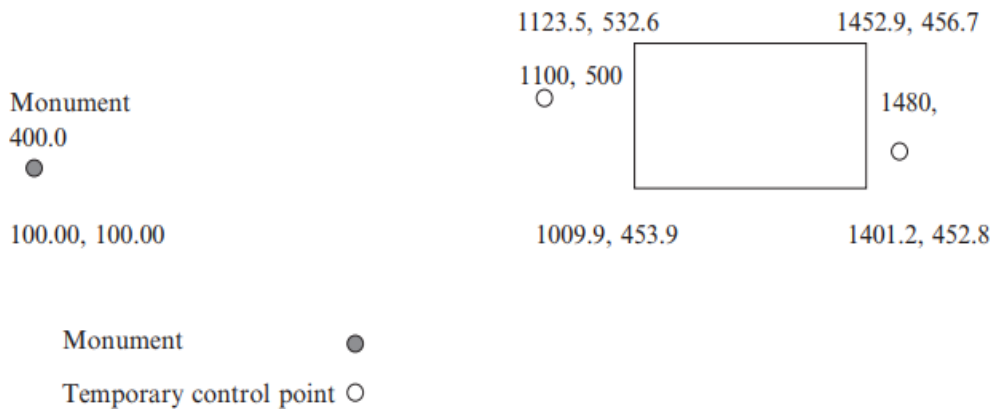
The role of a drainage system is to clear out storm water from the area while water system are used to circulate safe and portable water on site and also inducted in completed buildings. These systems are so necessary to be constructed for commercial, industrial or residential sites because they need constant pumping of clean water and disposal of waste water. The technique of drainage control includes Catch Drains, Chutes, Diversion Channels, Flow Diversion Banks, Level Spreaders, Outlet Structures, Check Dams, Slope Drains, and Temporary Watercourse Crossings as shown on Figure 8.



Fig. 8. Control drainage system on site work

Site Surveying

Horizontal control: surveyor must be preparing a document for surveying and coordinate the benchmark based on nearby roads and monument building. It is essentially to use monument or road provided and create control point near the construction site. Recently those benchmark get surveyor by machines and new control point must be installed. If the control point is wrong the building as well as wrong coordinates.

*Fig. 9. Coordinates [9]*

Vertical control some with horizontal control the document design should be indicated the elevation and the datum used [9]. Surveyor must be used temporary control point to near the worksite for grading and create footing as well slab evaluation and elevations of utility pipes or something else. Manhole construction: Manholes are required to clean out pipes. Manholes can be temporary or permanent.

Sheet piles on construction site

Sheet pile is raring on construction site to see without sheet piles. Sheet pile can retain walls, trenching, cofferdams, excavation support and baring platforms as shown on Figure 9.

*Fig. 10. Sheet pile walls [9]*

Utilities of construction site work (Sewer Pipes, Water Pipes, and Electrical conduits)

All facility needs electricity, sanitary, water, cable and lines of communication and these are part of worksite. Another worksite items are detention system, retaining wall storm water, landscaping and playground. Storm water must be maintaining versus of during storm water because the storm water com to the storm pipes. Landscaping is a processing of establish an aesthetic and natural environment around area. Basically, flowers, water ponds, trees and plants are used to create a pleasant environment [9].

CONCLUSION

This research paper carried out to identifying proper site work for Construction Company. A considerable quantity of this paper is leading on huge multi-target to optimum strategy for temporary construction of site work planning. This paper basically focused to identify optimum strategy about site work problem such as construction temporary road for delivery of materials to the site as well delivery of concrete trucks and temporary facilities of office on the site, cutting trees, the next stage should prepare parking lots for staff, removing water from surface of ground till to ready for excavation and setting for staff, security patrols and temporary installation of telephone line as well installation of cranes and lifting equipment and materials as well permanent facilities for sit work likes pavement, parking load, retaining walls, water supply, electricity, cable, gas, and communication, plating trees, landscaping, ponding, and canals finally installation of cranes.

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