The proposal of passive defense management method in construction projects

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Abstract: Today, by threats facing our country, the need for appropriate mechanisms to minimize probable damage of the enemy has great importance and to achieve this aim all facilities should be properly used in order to obtain highest productivity from this perspective. One of important construction in this context is construction that if at time of planning, design, implementation and operation, the position of passive defense be considered, it will lead to reduction of likely life and financial losses to built monuments. Given the importance of consideration and implementation of passive defense requirements in construction projects, to achieve this goal, some recommendations are presented in this study in two phases, project design and construction and operation phase of the project.

Keywords: passive defense, construction management, project management

Introduction

Distinction between active and passive defenses is very important. Some defensive measures such as protective shield are potentially defensive. Other defensive, especially measures that require human power can be included active defense that means effort in the event of certain conditions [1].

defense includes performed measures to decrease the possibilities and minimize the effects of damage from hostile measures [2]. After terrorist attacks of September 11, 2001 and Katrina hurricane in August 2005, American government faced great challenge according to limited resources, on how to protect optimum of the country against terrorism and natural disasters [3]. The approach of confronting with all risks that were looking for support that was effective against all types of emergency events has been suggested for investigating this problem [4]. However, this approach does not precisely consider terrorist analysis and tendency to more focus on emergency reactions until prevention from occurrence.

Several researchers have studied about the response and protection against terrorism after the terrorist attacks of 11 September, 2001. In many of these works, they have dealt with the problem of optimizing defense against aggressive attempts. However, as Bier (2005) [5] mentioned, protection of goals against deliberate attack is fundamentally different from protection against natural disasters; because attackers can adapt their strategies in response to defense investment [5].

Construction in our country is mainly done by observation of engineering organization, and its members carry out their works and determined duties and according to related licenses and variety in work context in this field and having qualified personnel in each of these disciplines have created conditions that by development of comprehensive approaches in the field of passive defense, weaknesses of constructions and their communicational spaces can be minimized from this perspective, and in most city centers, military shelters are of the best places (such as Switzerland) equipping open spaces and construction of complex communication networks compatible with access and flexibility ability are of very necessary measures that we have to implement it to sustain urban neighborhoods [6].

The issue of passive defense in the world has history as long as the history of human life, and has always been an important component of human life throughout history, because human defense measures cause disposal or reduction of raped by attackers; but defense depends on various factors and conditions and people during your life have tried to choose and apply the best way of defense in different states against the invasion of their enemies using their thoughts, reasons and wills. In this regard, the human defense has not always done using weapons and military equipment; but in many cases, the man has applied methods for defense that weapons and military equipment were not significant in passive defense. Early humans used natural shelters such as caves and trees coverage. With formation of early civilizations using fort and moat and solid gates became common. For example, in Trench Battle, when Muslims under the command of Holy Prophet (PBUH) by the suggestion of Salman Farsi around Madineh entrenched a trench so that Islam's enemies failed to pass it, in fact they used passive defense method. During regional wars and after World War I and II, by development of weapons and threats, passive defense also took on a new shape, such as Germany, Soviet Union, the US, Canada, Switzerland, Yugoslavia, North Korea [7].

Inevitability of wars in human history, the occurrence of at least four major wars in privacy of territorial boundaries of Islamic homeland in past few years and US strategic objectives in the siege, harness, undermine and overthrow of Islamic Republic, a wide range of potential threats and actual crisis centers around the country say this message to us, ”As we were not intimidated by threats of enemies, on the other hand, we should get ready to deal with potential threats by effective
defense measures” and the very important and vital part of this preparation in asymmetric threats is passive defense strategies to neutralize and minimize damage of air attacks to the centers of gravity of Islamic nation and enhance national resistance threshold [8].

The importance of passive defense

According to the statistics of 1999, the number of cities across the country were 600 and the number of villages were 6,500, air defense of critical centers of the country in cities, only with anti-aircraft 23mm balls will require 240,000 artillery pieces, a million and two hundred thousand personnel (crew ), 30,000 artillery and 750 special battalion of air defense that its possibility of providing, forming, organizing and supporting it is not available [7]. Passive defense, in fact, is a set of measures, actions and initiatives that is developed in self-reliance using instruments, conditions, and possibly without the need for human resources. In one hand, such measures increase defense capability in times of crisis and on the other hand, reduce the consequences of crisis and provide the possibility of reconstructing damaged areas with the lowest cost. In fact, passive defense plans before performing invasive procedures are prepared and implemented in peacetime. Given the opportunity provided in peacetime to prepare such plans, it is essential that these measures be considered in the content of designs. Applying measures and considerations of passive defense in addition to intense costs reduction, defense performance of plans will increase goals and projects at the time of the invasion of enemies [3]. Now the main goal of passive defense is immunization and reducing the vulnerability of the infrastructure required to gradually create the conditions for security. Such important measures in most countries have been performed or are being performed. These measures if as a planning and design development (sustainable development) is established, most of the infrastructure is created automatically, will be autoimmune in nature. To improve the current infrastructure can provide solutions such as reengineering, they consolidated.

Passive defense in construction projects

Today, by threats facing our country, the need for appropriate mechanisms to minimize probable damage of the enemy has great importance and to achieve this aim all facilities should be properly used in order to obtain highest productivity from this perspective. One of important construction in this context is construction that if at time of planning, design, implementation and operation, the position of passive defense be considered, it will lead to reduction of likely life and financial losses to built monuments. New geographic distribution procedure of population in urban and rural areas of the country indicates excessive housing and concentration of population in urban areas. A procedure which has been led to formation of metropolitan centers and high concentration of population in urban centers. The formation of new population areas, based on rapid and high urbanization and rise of construction increase the necessity of attention to civil defense categories and passive defense in the urban centers is increasing. War, willingly or unwillingly has been mixed with life and human societies and in many cases it seems that escape from it is not possible. Cities as centers of human and material investment accumulation will turn to a main target for the enemy in time of war, so attacking it, will cause many losses. Therefore, focusing on passive defense subject can considerably reduce the amount of damage caused by the war [2]. Given the importance of consideration and implementation of the requirements of passive defense in infrastructure projects, the below procedure is suggested in two phases for this purpose; the first phase in design of the project and the second phase in the construction and operation.

Project design phase

Explanation of goals and general policies of Passive Defense Plan

Discussion and exchange of ideas with the employer about the specifications of the project, its goals and policies of passive defense.

Checking the status of plan region from the viewpoint of land use / region / province.

Checking the status of plan region from the viewpoint of national // regional / provincial defense.

Assessing the mutual effects of proximity with vital, important and critical installations.

Adapting the plan’s objectives with policies of land, defense use planning and passive defense of employer

Gathering information and general recognition plan and its options

Visiting the location / area of proposed options regions for implementing the plan.

Recognizing general capacities and superior and inferior dependencies of the plan.

Identification the body of the external environment of each project location options, including population centers, military centers, the industry, infrastructures and access ways.

Recognizing social, economic and cultural status of the area of each plan options.

Recognizing the natural status of location of plan options include: natural features, and vegetation coverage type of the region, climate condition.

General geology report and seismicity of the region.

Checking general status of local security of options (proximity to air corridors, international borders, sea passages, terrorist records / evil / social security / riots, etc.).
Checking available facilities of immediate assistance in proximity with place of options (fire stations, rescue aid, the Red Crescent, emergency, hospital, etc.).

The impact of project on macro-policies of passive defense of country / region / province
Checking the project from the viewpoint of optimal scale.
Checking the effect of the project on national / regional / provincial sustainability.
Checking the effect of the project in increasing national / regional / provincial risks.
Explaining the impact of the project on national / regional / provincial passive defense programs.

Checking threat scenarios and methods of enemy invasion in each option
General possible description Strategy (Strategy) of enemy threat.
Checking possible invasion methods in threat strategy in any options.
Describing potential risk capacities of options’ environment.
Explaining strategies and invasive methods with more likelihood of occurrence in each option and providing threat package.

Checking vulnerability of options against threats with more probability
Determining the impacts of natural hazards resulting from the implementation of project.
Checking the consequences of attacking the enemy at each option.
Determining the strengths and weaknesses of project options according to threat.

Risk analysis and comparison of options from the viewpoint of passive defense
Providing general evaluation table from project options.
Preparation threat assessments table in each option.
Preparation of vulnerability assessment table in each option.
Risk assessment and options comparison from the viewpoint of passive defense.

Suggesting a superior project option
Comparing the options by taking into account technical and economic advantages of each option and its risk scores.
Providing superior option based on technical requirements and passive defense.
Summing up the subjects and final conclusion.

Technical calculations and providing administrative maps and relevant details
Providing technical specifications
Estimating the project and estimating administrative costs
Providing a schedule for implementation of the work
Providing specifying information of the project
Providing tender documents
Documentation of the project
Providing the history of the project.
Providing and presenting initial specification of the project.
Providing documentation for checking and additional services for providing basic technical data.
Providing documents for project process.
Providing documents for project implementation.
Providing documents for assessment of project effectiveness.

The second phase in construction stage and operation of the project
Coordination with the employer to determine the level of safety and other checking needs for the project
Determining the limits and capacities of employer to plan for measures can be done of passive defense in the project.
Receiving project development policies for inclusion in studies.
Receiving employer policies on how to manage emergency situations and protection.
Setting a study schedule.

Recognition existing situation
Recognizing the importance of the project in the country / region / province.
Visiting the establishment area of the project and checking maps, photos and reports.
Role of project in national / regional / provincial logistics.
Role of project in defense logistics.
Accurate identification of superior and inferior project dependencies.
Identifying the body of external environment of project include: population centers, military centers, industrial areas, infrastructures and access ways.
Investigating social status of population centers on the project.
Investigating positive and negative effects of the project on the region.
Negotiating with project designer (if possible) to get technical and administrative records.
Understanding the fundamentals and technical and safety standards used in the design of the project and its components.
Checking technical reports and maps like construction for familiarity with project specialized process.
Investigating number, density and how the staff work in the project.
Identifying plan site, components and how to deploy them, attachments, components, raw materials and product or service.
Evaluating project components, processes, strengths and materials available according to their functional importance and classification of them to vital, important and critical parts.
Checking natural elements of project location related to passive defense include: terrain, vegetation coverage type, climatic conditions.
Checking general status of local security situation in the project area (proximity with air corridors, international borders, sea passages, terrorist records / evil / social security / riots, etc.).
Checking available facilities of immediate assistance in proximity with place of options (fire stations, rescue aid, the Red Crescent, emergency, hospital, etc.).

**Description and analysis the threats**
Checking threat scenarios and methods of enemy invasion in each option
Describing the potential risks of the project.
Describing invasive procedures in scenarios with more probability.
Presenting threats package with more probability.

**Analyzing the current status from the perspective of passive defense (to determine the strengths and weaknesses)**
Checking social, cultural (religion, ethnicity, etc.) and economic conditions (way of foreign and domestic investment, native skilled manpower, the efficiency and added value, etc.) in the area.
Natural and physical capacities of project site (terrain, climate, access ways, status of groundwater, capability of space development, etc.).
Checking the status of proximity with vital, sensitive and important project and effects of mutual possible threats.
Existing capacities to deal with industrial threats.
Checking the level of project dependency to foreign products or services and way of collecting them in existing conditions.
Checking existing structures protection and crisis management in the project.
Checking the status of existing shelters and facilities and related equipment.
Checking computer systems (hardware and software) and local networks and operational independency of the project to communicate with them.
Checking reports of risk possibility
Checking available reports on natural disasters in project and plans and measures to deal with them, including earthquakes, hurricanes, floods, drift and slip.
Checking project ability to withstand against natural hazards using available technical documents and information.
Hazard analysis within the project according to threats package.
Presenting the strengths and weaknesses of project components using relevant indicators.
Adapting effective elements of the project and its physical environment and providing the final ratings table of components.

**Evaluating performance and economic assets of the Website**
Determining key assets of the project.
Determining the impact of each asset in the project.
Checking the economic value of each asset.
Providing the table of main assets value of the project.

**Assessment of threats (scenarios and threat methods)**
Evaluating attack ways and determining weapons used in the most likely methods.
Modeling and analysis of the consequences of threats for the project and the neighboring region's population.
Providing a table of threat assessment for the main components of the project.

**Vulnerability analysis versus the most likely forms of attack**
Providing indicators of vulnerability assessment.
Assessing vulnerability of components against more likely attack techniques.
Providing table of project vulnerability assessment.
Presenting the strengths and weaknesses and providing vulnerability map of project using relevant indicators.

**Risk assessment and analysis (general and in part)**
Providing of a table of risk of major components of the project.
Analysis of threats status and vulnerability and classification of risk based on threats and components.

**Presenting package solutions, according to the results of the risk analysis based on value engineering**
Providing strategies for improving project status against threat package.
Provide solutions to protect and preserve human resources.
Provide solutions to improve the management of various stages of emergency conditions.

**Prioritization of guidelines (based on the effectiveness and other related indicators)**
Providing prioritization criteria based on the time required, the cost of implementing the strategy, scope of solution, ease, etc.
Classifying strategies based on indicators and providing a table of classification of priorities.

**Suggesting superior strategies and estimating all costs and their effectiveness (reducing vulnerability)**
Estimating the costs caused by acts of passive defense suggestions in the components of the project.
Estimating the time required to implement strategies for improvement projects.
Estimating and announcing the effectiveness of proposed solutions to resolve, reduce the likelihood and impact of threats.
Estimating the effectiveness of strategies at various stages of crisis management (emergency situations).

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