Advanced Planning and Designing of Multi-Purpose System of Army Trench Base of Concrete Bunker

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This project paper says about advance planning and designing of multi- Purpose system of army trench base of concrete bunkers is assort of most superior of and 24 hours activations functions of a line of controls. It's the most purposes full planning evaluations of military defense barricades, these designed to prevent the soldier's in high impact explosions systems. Its the largest part of pre-effective functions can be used and large internal missile and ammunition storages. In our project planning's is limit state design method is used. It's highly economical and safe. And planning and high safe design. The design is done by according to IS (456-2000) the structural members are designed using HYSD rods with Fe-500 grade of steel and M-30 grade concrete. Here its followed by the framed rectangular planned structures are made up of the concrete retaining wall and it's connected to raft foundation. And the required planning area of the plot is (57x22) sq feet. With a space of required capacity of storage ammunition and radar inspection. It's a structural system, very strong and durable design propose and high lateral impact resistant and safety with invisible appearances.

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Keywords: Permanent bunkers, Steel bunkers, Trench bunkers, Defense radar systems, Ammunitions, aviation systems, Inertial guidance module, Trench bunker concrete reinforcement detail.

Introduction

Army bunkers is a bulwark full en-sealing barricades protect the solider from the enemy missile and mortar ammunitions bombs or included any other different tactical attack. Its should be semi beneath and inspections cavities of blockhouses are above the level of ground surfaces. Its first inventions of bunkers to introduced the war periods of expensively in world war 1 (1914 to 1918), world war 2 (1939 to 1945), and the in-build the development of bunkers in cold war for weapon storages facilities. Some of the defence bunkers are used only explosive storage for examples in (a nuclear warhead) because it is the reason is temperature

constant rate and activations ready to war zones area. And most of the bunkers are used partially storages of explosive and radar communication operations of explosive mortars that name is command and control centre and storage facility for example in the event of nuclear war status. Defence bunkers can also be used as protective from cumuli clouds. Trench base concrete bunkers are concrete mass structures and to installed ground base to fixed the missile (Prithvi 1, 2, 3, Shaurya) and supersonic (3M22 Zircon) and fixed the coastal artillery machine bofor gun. Have been available in extensively bunker system. And typically bunkers are included in bored for industrial mining sites. Food storage, material dumped, information storage and some other living in a tent quarters. Bunker deflect the blast shock waves in short adjacent side of the controlled actual area that explosion prevents the inside physical sever damages to people in army bunkers. Same types for made nuclear bunkers and also included lead plate and nylon ribbon en-seal material the safety precaution of blasting high impact thermal radiation effect. And after the nuclear explosion within second of shock waves pauses, and blocked the radiation effect of the bunkers. A most important part of the bunkers doors its should be greater than 100 mm thickness of metal doors and includes reinforced with the steel box shape reinforced nylon material. And should be ventilation or air conditions available at the bunkers. Plan and design in advance trench concrete bunker its will future implements in line of actual control. So that bunkers methods followed by the most developing countries. It is in build to future missile short and long-range missile systems with radar communication proposals where all types of functioning to be used. Its planning and designs suitable places of border controlled command (BSF). And assort planning and design of future functioning. And also essential facilities of bunkers in restroom, ammunition storeroom, activations missile launch rooms, computing of radar signal rooms.

Review of Literature and Types:

The current defence status of the army used 2- types of bunkers

Types

Permanent (concrete bunkers)

Steel bunkers

Permanent bunkers:

That bunkers are used to making such as stones, masonry's mud and logs. The longevity of these bunkers is an easily collapsible, for hardened reasons is vulnerable climatic conditions spalling in weathering, and enemies missile and mortar firing [1].

Steel bunkers:

The steel bunkers are constructed by ferrying material as shown in figure 1. To easily carrying to a higher altitude to lines of actual control areas. That highly needs more numbers of manual powers for lifting and constructions. It does not maintenance and flexibility barecades shells. And available in loops firing weapons. But defaults in mortars and ballistic (SRBM) missiles. Start ford upon the place in the UK its placed buried in 14 feet underground, the nuclear bunkers. Its approximately is 150 m in along north of the tower cross [2]. It construction in activations in cold wars monitoring post. It fully constructed concrete retaining walls and floors. Concrete shelter in Utah system it will design in swiss engineers in andel finges Switzerland. Its extensively experienced high team, consisting the nuclear bunkers engineering. That designed based on comfortable accommodated the large numbers of peoples that shelters are permanents that concrete shelters swizz assigned the heavy explosive shelters in the two hundred psi in resisting level. Building customized underground concrete shelters since 1990. For 25 years getting on, north-west shelter system has constructed-in concrete bunkers in underground. It's the highest calibre. And it does not a defence explosive resistance shelters. Worked both armies and civilians for protected natural disasters. It is 120years old and experienced to constructed in a shelter across in north America.

Figure 1. Steel Bunkers

Trench Bunkers:

The types of bunkers are concrete box is the name of the pillbox. Is fully concrete structural bunkers as shown in figure 2. Such concrete pillbox prevents the soldiers in the enemy explosive shells [3]. And also protect the severe weather conditions. And advance concrete trench shelter is provided with the sides bays of available rocket heavy range launches barrels inside and see out the shell muzzles into the trench concrete bunkers. Its will target attacked in anti-aircraft weapons systems. The foreside of the bunkers is provided fixed in the heavy machine guns or propellers mortars and from a dominate the shooting point. Back of the bunkers are usually commands of the actual line of control post and are it is fully controlled in Tactical operation commands (TOCs).

Figure 2. Trench Bunker

Ordnance Bunkers:

The ordinance is a weapon of large cannonry guns ammunitions and missile launchers. Especially anti-ship artillery its historical actions of protected all-embracing bunkers systems [4]. That typically accommodated the group of squad operations of working weapons systems. Modern days weapons systems handled in fully electronic and hydraulic automation actions of counterattacked. Especially ammunition is prepared is dependent upon the site of the area of the bunkers. For examples of cold region, snow area is special ammunition weapon handled target. And long-range seashore areas, missile (short and long-range) and long-range air command anti-ballistic missiles, that types tactical weapons are handled in bunkers. Ordinance cannon bunkers are mass and entity in pre cold war bunkers. Dover strait coastal gun fixed provision in northern France were up to 3.5 m thick and beneath the bunkers. Is mechanical design productions for the V-3 multi charge cannon.

Types of weapons systems use in bunkers:

- Bofors gun systems
- Bantam (Rb 53)
- 0.53 calibre machine gun
- Anti-tank missile
- Internal navigation systems (INS) and (GPS)
- Defence radar systems
- Super & Hypersonic missile Systems
- **Bofors guns systems:**

Bofors guns are the simplest and most powerful efficiency of land, water and air base defence power systems. Is working for autocannon designed in 1930 Swedish defence designed and manufacturer "AB Bofors". Its services in 1930 to and for the most part popular weapons in currently services in 21st century's. its high activations in all types of wars in WW 2, Indo- Pakisthan war conflicts, Korean, Vietnam, Gulf, south African border, Yugoslav, Yemeni civil, Yemen wars, Yom Kippur, Falklands, Lebanese Civil War, Saudi-led

intervention in Yemen. Its typically used inland to air, land to water base, air to a land base and water ship base to land or air anti-aircraft attacks. Its 40 mm L/70 Bofors models are used by the ends of WW 2, tat model payload of ammunition is automatically [5]. And the speed of attack in jet aircraft. Its simplest Bofors gun Consequently has to long ranges higher rate of fire. And the efficiency of the integer of rounds fired the ended the period of rendezvous. Bofors designed updates of 40mm and alternative to making the 57 mm designed. It is most powerful for compared 40mm L/70. The new designed of 40mm is a larger 40 x 364R round firing. The shell weight is less than 1Kg and velocity of muzzle firing is 1030m/s. and rate of firing is 200 to 240 rounds/minutes [6]. Modern Bofors additional techniques to improvements of designed developments 300 rounds/minutes (5.56 rps). BAE systems C-ITC is Swedish acquired high-tech companies. Its includes innovators computer-based research replication and training technologies. Bantam (Rb 53) is also a model of Bofors missiles criteria lightweight anti-tank combating missiles, developed in the 1950s by Bofors.

0.53 Caliber Machine Gun:

M 2 browning gun [7] is a 53 calibre heavy machine gun (.53BMG) it designed models in world war 2, the designer name is john browning. It designed is the same First models M1919 (BMG) Browning Machine Gun. Which was a barrel for the 7.62mm ammunition are use M2 was more influential 50 BMG ammunition. Its development of updates in forename of the gun itself is standards for Browning Machine Guns. 50 calibre M2 browning machine gun is most flexibility in unarmored, and light armoured of vehicles in coast guard boats, attacking helicopters, and bunkers are majorly used. The 50 BMG is the late 1910s. entering by the C.I.P ammunition developed in the browning 50 machine gun in the late of 1910s. its heavy duties for the war of during WW 2, Korean, Vietnam, Falkland, etc. in the 2000s to 2010. Is a majorly used in the machines in NATO countries. And current M2HB is productions in the US general dynamics or US ordinance. Via foreign military scale. Specifications of BMG weight is 38 to 58 kg and used tripod traverse elevation mechanics. The total length of BMG is 1654 mm and the length of the barrel is 1143mm. 12.7x99mm NATO ammunition cartridges are fit for the gun. This operation is short recoiling-operated. 400 to 600 round/min and 750-800 round/min(AN/M2), 1200 – 1300 round/min (AN/M3). And muzzle velocity is 890m/s. long effective firing ranges (2500m) is long-range targets. M2 or M9 links belt loading systems. M2 BMG is the same visions of M1917 BMG using every time gauge.

Anti tank missile systems:

Anti Tank Missile is an (ATGMs) Anti guidance missile weapons systems [8]. It is designed to be primarily to hit the targets and destroyed the heavily armed defence vehicles. ATGMs is short-range to desired to the efficiency of long ranges. In sizes is from shoulder-launched weapons. Which is used single-armed to soldiers or tripods fixed the launched the tactical target ranges. It required a squat team to transported fire, handled with air naval and land major forces. The introduction to the contemporary battlefield. It will operate the man-portable ATGMs. Comparing heavy with large missile systems and Advance is the same power and comparing with large missile tripods and similar power and compact handled ability operation systems [9]. And defeat the light and medium tank. Older ages anti-tank infantry missile is such as Anti-tank Rifles, anti-tank rockets (RPG, Bazooka) and magnetic anti-tank mines. Its worked in limited range distance and armour diffusion capability is required closed target approaches. And modern anti-tank missile is identified the years is 2016 and used over the 130 countries.

Types of anti-tank missiles systems:

- FGM-148 Javelin (ATM) of the US army,
- 9M133 Kornet tripod-mounted Russian ground force,
- PARS3 LR fire and Forget missile of German army's,
- RAFs Brimstone missile
- Spikes (missile) a capable of making ground top attack flight profile in anti-aircraft surface missile systems.
- **Internal Navigation and Global Position Systems (INS, GPS):**

Its use of GPS satellite signals to accurate or regulate as salvation from an internal navigation system (INS) its application for GNSS/INS systems [10]. The GPS/INS methods are gives is a accurately gather free positions values that used to assigned the values of reset the internal navigation systems blended with it used by the mathematical algorithms, for as a Kalman filters, it is trigonometry angular compass reading of the unit can be contingent from the series of location latitude and longitude or Co-ordinates positions updated from the global position systems [11]. INS/GPS systems benefits are may be calculated by the GPS signal and that the Internal Navigations System can provide the location point of positions and angles updates at fast to analyze the calculation rate of that GPS for heavy impact mount mobilization. And one plus points of GPS is some time lose the signal and the internal navigation systems is continued to complete the task of the intended position and deviation of angle during the period of the lost GPS signal. INS and GPS are 2 types of systems is complementary and worked to accurately the employed mutually. Its commonly used on warships and aircraft and navigation purposes. Its allowed the level positions of velocity and analyzed the calculated rate is quicker than the GPS receiver. Its always allows for accurately calculate the aircraft altitude its rolls, pitch yaw angles. Its usually proposes using the extended Kalman filter (EKF) and Unscented Kalman Filter (UKF) [12]. The UKF is required the estimating of a matrix square root of the state error covariance matrix, used to calculate the overspread of the sigma points for the unscented transform. That lot of ways to determine the calculate the prevailing conditions square root. And have been currently and compared to the GPS/INS systems application. That works is optional to analyzed the Cholesky decomposition linear algebraic methods. GPS and INS are automatically applied for an autonomous navigation area. Its mobilized mount impact vehicles such as warships, tanks, aircraft, bunkers skate slips, roll and tire cornering stiffness estimations.

Figure 3. Inertial guidance module peacekeeper (MX) ICBM 1986 [13]

Defense radar systems:

Defense radar systems [14] is a used of radio waves to analyzed the range of angles or distances and velocity of speed of objects. Its can be mostly used for bunkers, warships, aircrafts, spacecrafts, guided missile systems. That systems consists of transmitted to waves or microwaves produced the electromagnetic wave. It transmitting to the antenna. The antenna operated both transmission and receiving the operation to determine the properties of the objects. Radar developed and used for defense purposes that waves sequences for pulses or continues from the waves transmitter hit and reflect the objects and return the receiver, through come the information about the object location and velocity of objects and position of points. Its used WW2. A key in moderate to develop was the cavity of magnetron in the UK, which allowed the creation of compare the small systems with sub-meter resolutions [15]. That full from of radar is "Radio Detection and Ranging" or "Radio Direction and Ranging". The modernized radar system are controlled the air and terrestrial traffic control. Controlled the air defense systems, antimissile systems, marine radars to position of landmarks and other ships, ocean surveillance systems, and outer space surveillance, assignation systems, metrological precipitation monitoring. Controlled and monitoring the flight control systems, and ground penetration radar for especially used for geological observations, and controlled the waves signals that purposes of public health surveillance.

Figure 4. Surveillance Radar

its makes to similarly other parts of the systems are electromagnetic spectrum [16]. Infrared laser waves. The distance motion and types of the hit and coming waves frequency signal have analyzed the compare to echo noises depends upon the shape of pulses. That lilt to improved performances using a technique known as pulse compression. The waves transmission of time taken for the distance travels one nautical mile. To hit and reflect the waves to the antennas. For examples, the nautical miles define as a 1952m then calculate the distance divided by the light speed is 299792458 m/s. As shown in figure 5.

Figure 5. Defense radar

The radar change in speed to distance to an object is time to respects [17]. Measured the distance to stored the one-time memories its plotted with making grease pencil sketch marks on the radar screen. And calculating speed with using skate rules. Advance developed radar systems are the equivalent operation quick and faster using, the computers. Most modern development radar systems are working principles into Doppler radar or radar systems are working principles into Doppler radar or pulse synchronized Doppler radar systems as shown as figure 6.

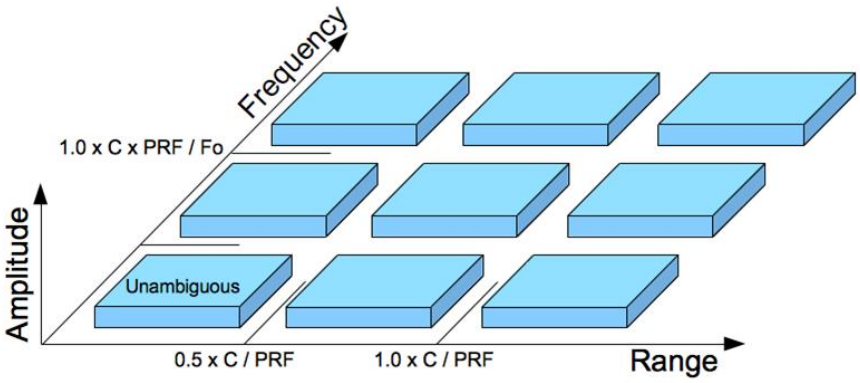

Figure 6. Pulse-Doppler ambiguity zones [18].

Without any pulsing in radar operation is a continues waves radar (CW radar) by through a pulse signal as frequency. It determined the radial component of a target range of velocity. And other calibration used to determine the radar signal that methods also followed by time-frequency analysis.

Super & Hyper sonic missile systems:

Super and hypersonic is a group of cruise guided missile systems [19]. It is used against the accurate terrestrial target and major portions of its air path assigned speed. Its arrival long distance and high accuracy delivered the warheads. And modern cruise missile is the efficiency of capable to travelled in supersonic and hypersonic speed and self diversion guided the GPS or radar signals. To destroy the enemies shelters and building. Its has different in many types depending on warheads.

Types cruise missile:

Short-range missile (140 to 900Km)

Medium range missile (1000Km)

Long-range missile (5500Km)

Intercontinental range missile (8500 to 10200 or more)

A general cruise missile is consists of guidance in GPS or radar systems [20]. Its explosive loads to carry the high speed the airframe to travelled to the controlled the empennage. Explosive payloads are 2 types of conventional explosive and nuclear warheads. Missile propulsion systems are different from the depend on the launching station the ground to ground, ground to air, air to land target cruise missiles propulsion systems are based on the solid fuels and turbo engines. The turbo engine preferred due to their great efficiency at altitude and subsonic speed. Guidance systems also fluctuate greatly low-cost systems use a radar altimeter, digital strip map. Super and hypersonic missile systems are used advance method are internal guidance satellite guidance controlled the ground stations points. And visible of ground terrain counter matching (TERCOM) [21]. Missile launching to the station to pre-programming forms recognized the Automatic Target Recognition (ATR) [22]. Algorithm calibration devises guidance systems it guides the ground to satellite and satellite to missile command are passing to diversion assigned destructive in precious targets [23]. Altercation land bunkers, navy, air attacks.

Industrial Bunkers

Characteristic industrial bunkers are used in food storage, data storages are explosive storages in a WW 2 periods [24]. It some protective industrial test in the scientific contribution of new inventions there are missile warheads, rocket motor engines or explosive experiments. And its operation of control rooms is one of the part of the job in industrial bunkers. It is stored in radioactive explosive ammunition and sometimes its build in an atomic or hydrogen bombs [25]. Types of bunkers are build in an underground referred depth and provided metallic doors in secret inspections. Majorly worn in this bunkers in protected the important of aerial bombardment and specific conditions of bombs. Such type of industrial bunkers also exists on non-military conveniences.

Special Bunkers:

That bunker is specially constructed with personal or domestic nuclear bunkers as shown in figure 7. Are built in house with normal locations [26]. It is available beneath the plinth level of the house that spaces of subfloors into the residential house. Its mostly used for purposes of old valuable thing food preparation materials, paper stacks, important files and radio signal & weapons are stored. Are the availability of large cabinets with bathroom. The shelter is beneath the residential buildings or separated to constructed the underground surfaces near the residency. The shelter is fully based on fibre-reinforced plastic shells [27]. Volumetric compression safety is are provided at inexpensive or irregular earth pressure and safely protection of nuclear radiation. It is for eternity purposes of safety rooms in wartime periods.

Figure 7. Personal or Domestic Nuclear bunkers

Munitions storages:

The munitions storage bunkers securely storages platforms of subways in explosive ordinances [28]. Like warheads. It is the heaviest and high powerful explosions materials stored in a bunker. Its structure is designed as a concrete dome. The stored explosive items are fretful in standard cooled temperature conditions. They are often built into a hillside or restricted forest area to provided additional suppression mass. Munitions bunkers are the name of gravel Gertie, specifications of gravel Gertie it is designed contained radioactive refuse of explosive actions accidents in the job of assembling for the built mantle or dismantle in nuclear warheads [29]. That constructed separately and secretly organized that production plants and part of work in assembling or dissembling nuclear warheads in the plants.

1. **Materials and Methods**
2. **Design theory of Bunker in concrete structure:**

The design concept of reinforced concrete bunker structures is followed by the ultimate load method and limit state methods. Ultimate load methods mean it is carrying the multiple of the maximum working load. The ratios of collapse load to the working load are known as factor load. It designed the component member is a higher load factor, resists the required loads. At failure, material ceased to behave elastic theory. The member to develop its maximum capacity for resisting the condition of applied load conditions. As-usual performed the limit state of safety and serviceability requirement before failure occurs is called a limit state, the design codes followed IS 456 2000 [30].

Design components of a bunker:

- Beam
- Concrete wall
- Slab

Each design parts are followed by special conditions are applied in design criteria depends upon the architectural features, each model design analysis are requirements in concrete components sections into the architectural features.

Section of Model Plan in Bird View of Advanced Planning and Designing of Multi-Purpose System of Army Trench Base of Concrete Bunker:

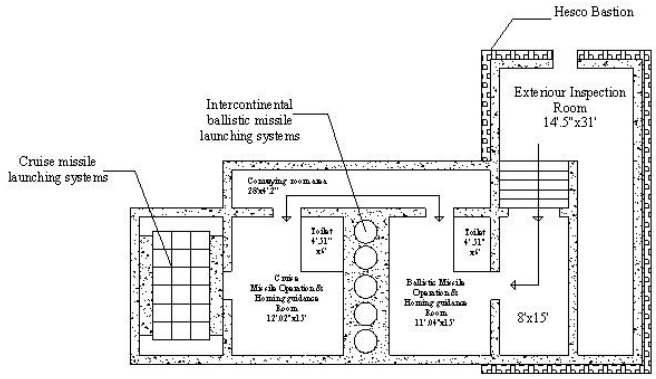

Figure 8. Section plan in Army Trench Base of Concrete Bunker (included features)

The section of bird view represented the aerial view of plan x-z drawing. That view of Bunker direct observations at high locations perspective of isometric projections. It's shown in figure 8 real and imaginary true perspective. The Bunker vertical plans of standing features. That features of Concrete bunkers represented that the beneath the land surfaces.

Section of Model Plan in Elevation View of Advanced Planning and Designing of Multi-Purpose System of Army Trench Base of Concrete Bunker:

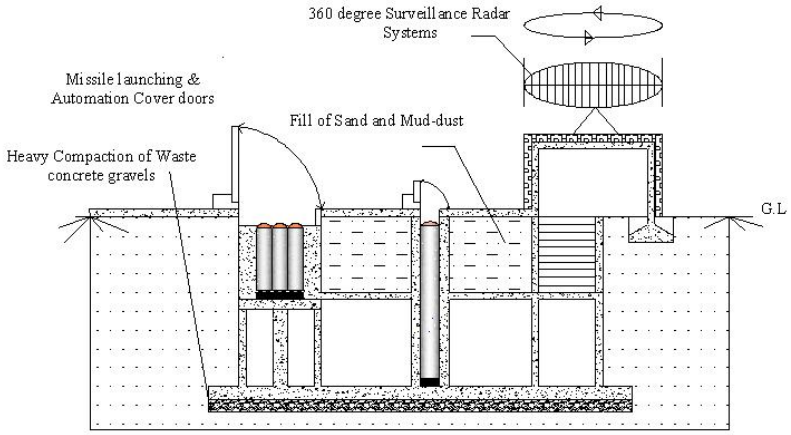

Figure 9. Section Elevation in Army Trench Base of Concrete Bunker (included features)

Elevation of Concrete Bunker plans x-y planes scales of term hypsometry view Figure 9. That planes represented drawing of availability multi-special features concrete bunkers.

Table. 1 Design model of Beam in bunkers

Beam Specification	Load Requirements	Results and analysis
Length = 4.8 meter, Clear Span length is 4.5 meter. Dimension = 350 mm (Overall Depth) x 250 mm (wide), Grade of Concrete = M 30, Grade of Steel = Fe 500, Code design = IS 456	Explosive Load (Pressure) = 100 Kg, 0.065 MPa for detonated in 10 m distance act at center of Beam	Deflection = 1.468 mm, FOS = 2.5, Singly Reinforced Cross Sections. 20 mm diameter of bars used at 2-numbers in bottom sides. Figure 10 Figure 11 Doubly Reinforced Cross sections. 10 mm diameter of bars used at 10-Number in top and bottom sides. Shear Reinforcement = 8 mm diameter @ 9-numbers of links, 230 mm c/c distance.
	Explosive Load (Pressure) = 150 Kg, 0.0975 MPa for detonated in 10 m distance act at center of Beam	Deflection = 2.446 mm, FOS = 2.5, Singly Reinforced Cross Sections. 20 mm diameter of bars used at 3-numbers in bottom sides. Doubly Reinforced Cross sections. 12 mm diameter of bars used at 12-Number in top and bottom sides. Shear Reinforcement = 8 mm diameter @ 9-numbers of links, 230 mm c/c distance.
	Explosive load above 150 to 500 Kg, detonated with 5m distance act at center of beam	Increased depth of beam 400 to 450 mm, and provided pre tention or post tensioning wire ducts. And following the special case additive material. Increased the grade of concrete.
Length = 3.96 meter, Effective Span length is 3.66 meter. Dimension = 470 mm (Overall Depth) x 250 mm (wide), Grade of Concrete = M 30, Grade of Steel = Fe 500, Code design = IS 456	Explosive Load (Pressure) = 165 Kg, 0.105 MPa for detonated in 10 m distance act at center of Beam	Deflection = 1.211 mm, FOS = 2.5, Doubly Reinforced Cross sections. 16 mm diameter of bars used at 3-Number in top and bottom sides. Shear Reinforcement = 8 mm diameter @ 240 mm c/c distance. Figure 12

Table. 2 Design Model for Slab in bunker:

Slab Specification	Load Requirements	Results and analysis
Clear span = 4.5m Span Dimention = 4.5 x 9.45m, Concrete wall thickness = 0.25m, Slab Thickness = 0.2m, Grade of Concrete (Fck) = M30 Grade of Steel Fe 500, Design Code: IS 456	Pressure Load: (Activation of Blast Load) 100KN	Maximum Displacement = 1.008mm Figure 13

Slab Specification	Load Requirements	Results and analysis
Clear span = 2.44m Wall thickness = 0.25m Fck = 30KN/m2 Fy = 500KN/m2 Solutiuon Dimention of slab = 2.44m x 4.60m Span thickness 0.15m. Design Code: IS 456	Pressure Load (activation of blast) = 120KN	Maximum Displacement= 4.5mm, Figure 14

Note: Design model beam and slab is denoting the maximum deflection is 1 to 5mm for required loads. Even those projectiles velocity is higher order level observed the energy with specific limits without collapsed.

Table. 3 Design Model for Concrete wall and footing in bunker:

Specification	Load Requirements	Result and analysis
Height of concrete wall = 3.5m Thickness of wall = 300mm Grade of concrete use = M30 Grade of steel use = Fe 500 Design Code: IS 456	Carrying load = 1000KN	Provided 20mm diameter @ 200mm c/c vertical reinforcement. Horizontal nominal reinforcement = 0.4% into cross section of Ast = (0.4/100)x250x1000 = 1000mm^2 Provided 10mm diameter @ 100mm c/c. Figure 15
Concrete wall Footing, Dimention = 1.5m x 8.55m, Grade of Steel Fe 500, Grade of Concrete = M30	Load Requirements as per ACI code Axial load for vertical section is taken in 2000KN	Figure 16

Design of blast protection wall

2 different types of blast protection wall it invited with critical site conditions.

There are

1. permanent and prefabricated concrete wall

2. semi-permanent wall. (HESCO bastions)

The permanent and prefabricated concrete wall is no necessity for that advanced planning and designing of the multi-purpose system of army trench base of a concrete bunker. Because bunkers wall are already designed in 250mm structural member in the concrete wall. It needs only exterior protection of bunker wall for high shock impact high yield blast. It takes of second protection coat barrier of semi-permanent wall Hesco bastion. Hesco Bastion is an updating of the gabion. Gabion means a bags or cage filled with the sand and rocks used in the constructions barriers or military applications [31]. And its modern days used in the application of blast wall opposition of explosion and small arms weapons. Its contains preparation wire mesh reinforced with heavy-duty fabric wire liner. It conceptually makes with the origination of Brittan used against to control the soil erosion and flood controls barriers. Developed in the late period of the 1980s by an England company. Hesco mil quickly is development by Jimi Haselden he is a British entrepreneur. Hesco mil bags assembling progress is filled rock and sand in-unit wise using a pay-loader. Main advantages of Hesco bastion barrier protect the lateral shock impact blast and most strong and flexibility of tightening filler. It will stop the 9mm projectile short-range shooting sites. Hesco sand barriers make the quick and fast to setups in emergencies conditions or previously filled hesco Baston bags takes place to use of front end loader and fixed the warzone areas. working operation is similar to the normal sandbags stodgy to

place it. The Hesco barrier comes in a variety of sizes most of the barrier can compact sizes for examples (4.6x3.6x32.2 feet) to (6.9x4.9x98.4 feet). Filled with compacted sand or soil and hoisted with the mobile crane to take place in ships to get critical site conditions. Modern Hesco bastion gabion bag barriers make in a military update for bunkers and used in critical building sites for prevented to the high impact bombs [32]. This is dragged along the streak of ground barriers to formed. Unfolded Hesco gabion bags are fixed in a more than a few hundred meters of barriers ready for filling within hardly some minutes. Hescon bags are used in these Army Trench Base of Concrete Bunker it provided in exterior walls.

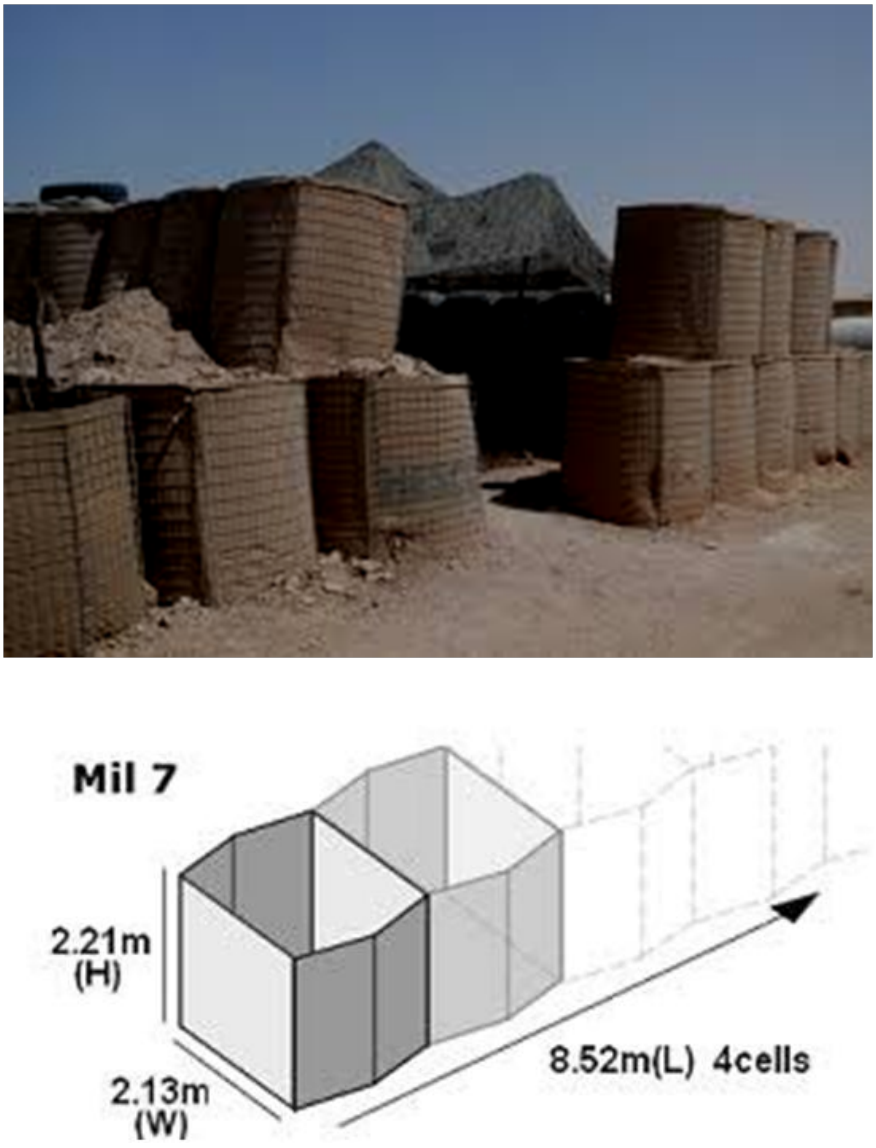

Figure 17. Hescon Bastions

Design of Nuclear Protection

Nuclear protection is specially made for the protection for a nuclear blast. The nuclear warhead is hit to react to the form of heavy shock waves and after to induced the high thermal reaction it's based on chain reactions [33]. The effect of mass destructions is to act on surface structures and livable and not livable things. A

nuclear explosion is exposed to neutron from the explosion emits the α, β, gamma rays [34]. That radiation particles affected the skins and body cells in after few years of discharge. Highly radioactive material falls on the earth surfaces the site of zones area is blast spread becoming the significant hazards. The radiations are expected ranges for the depend upon the yield capacity of warheads ability in (TNT) [35].

For examples for the atomic explosions:

20 g of detonations maximum approximation range is 1.5 feet to 2 feet distances. 1000000 g detonation range is [?] 133333.33 feet (40.64 kilometres) actual average calculation is distraction are covered in that mass areas.

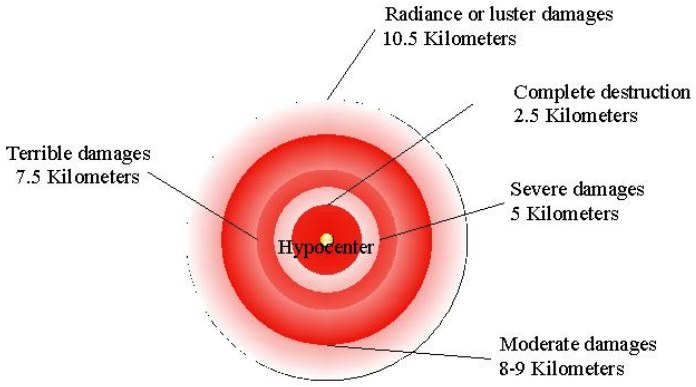

Figure 18. Atom bomb destruction

Refer figure 18 that ranges areas include the surface structure is collapsible for a yield of detonation ranges. It will protect the atomic explosion is created the substructures shelters into the required depths. Most of the subsurface shelters are consists of shielding in an exterior surface because of the protection of gamma rays. The shield army trench base concrete bunkers are the 10-times thickness of the material. It reduces the stopped 50% of the radiation effects. Thus a practical fallout the shield is a 10 halving-thickness of packed earth. It reduced the gamma rays average of approximate rates in 1024 times. The usual trench army base shelters are partially safe for the radiation effect in and to any times 24-hours attacking strategically conditions. And underground bunkers are shelters is a trench its connections are strong roofs of bunkers (reference analysis previous designs in Table 1, 2, 3 structural components) $<$ 1 m of earth. There is make loaded in 2-sides, and emergency use in one-side of ways. Right angle entranced to exterior inspection rooms go after the beneath to the interior inspection sites, through proper ways. So that the gamma rays are not entered they can travel the straight line. To makes constructed the overburden water ceiling proofs. In case of heavy rains, and provided the proper drains in an above the surface of the trench bunkers because the wide reasons are not affected the sub-surface of bunkers roofs. Are another technique is handled in heavy rainfalls situation, there are plastic shut provided buried a few inches depth below the surfaces and held down the rocks, mud-dust, rice husk ash are poured to closed compacted the sheets. Types of actions are followed to protected high percolation of bunker site zone area. Blast doors are designed in a suitable prevented the heavy shock waves of atomic detonation. Blast doors it will works in deformation of bend and after original position.

Locations of the attacking and activation of bunkers are below the ground levels and points of borders areas like lines of control sites. Presented in critical war zones areas. the thickness of the structural members is the effectiveness and most toughness of effective shield protections. The army bunkers area must not view fallout covered ground that is closer than 2 km.

Content of bunkers is:

- Radar communications and signal systems.
- Missile operations ranges and target fixing rooms.
- Command transpirations box.
- EMP protections.
- Emergency alert systems.
- Nuclear war survival analysis skills (And systems progress to identified to ballistic missile destructive to use of anti-ballistic missile command).

DC battery is must be needed for shelters.

Conclusion

Advanced Planning and Designing of Multi-Purpose System of Army Trench Base of Concrete Bunker project paper shows the outcomes of the design in terms of drawing and result analysis. In the design projects, And advanced innovative structural systems to attain the stated. An objective such as durability and economical with defence construction safety of appealing appearance. This bunker planning in 2-ways systems, One is the inspection position and the same way to another is attacking positions for the suitable site of warhead conditions. It most strongly and compacted concrete designed. And this bunkers is intended in heavy concrete wall frames for resistances, likes earth pressures and heavy explosive projectiles. For the most part, important things of underground shelters are not identified the enemies global visual satellites images, And it secured developed underground bunker construction mission implementation higher values. And army trench base concrete bunkers systems is successful use for purposely in emergencies defended to attack destroyed the enemies target points.

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