

Method Statement for Deep Excavations



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Scope of work:

The scope of work applies to all excavations with depth more than 2.0m which includes basement excavations, pile boring, etc.

Responsibility:

The Project Engineer/site engineer is responsible for the supervision of deep excavations. Chief engineer will bear the overall responsibility. Project engineer/site engineer will assist chief engineer in reviewing the Method Statement submitted by contractor and approve the same and also to supervise the excavation works as stipulated in the procedure.

Documents:

- 1) Approved foundation drawings with depth of excavation, which shall include the Design depth as per drawing, levels, Excavation protection measures viz, Sheet pile or soldier piles or shoring drawings
- 2) Structural drawings showing the foundation details
- 3) Approved Method statement of contractor.
- 4) safety and environmental measures.

Method of excavation:

- Obtain the good for construction drawings from the Architect/Engineer. Engineer refers to the Geotechnical/Structural consultant.
- Review and study the drawings well in advance viz before the start of construction and obtain all clarifications from the Architect/engineer.
- Demarcate the excavation setting out plan with reference co-ordinates and levels. Please note that the survey bench marks are away from the excavation in order to prevent the damage to markers and to maintain accuracy.
- Cable or utilities scanning has to be done in order to avoid the cables and pipes and underground utilities damage. It is recommended to go for trial pits so that underground utilities can be find out.
- Protect and support underground utilities.
- Mobilize the machinery for excavation.
- Start the excavation from one end and proceed to another end in layers such as one meter depth layers.
- If the excavation depth exceeds 2.0m depth, it is necessary to protect the sides of excavation by driving sheet piles or soldier piles or timber shoring with strutting. The vertical members to protect the excavation is to be driven first followed by horizontal members.
- The other option is to provide slope not less than 1:1.5 with intermediate berms and the slopes have to be protected by short creting or planting grass etc.
- After the completion of excavation 0.5m below the first strut level, install the first strut as per the drawings. The procedure may be repeated till the bottom of excavation.
- If the excavation is deep, it is better to provide long arm excavators to reach the required level.
- Stack the soil away from the excavation edge to prevent soil collapsing to the excavation area.

- In case of soil disposal, appoint banks man to guide the machinery movement.
- Appoint signal man if the excavation is done by a mini excavator followed by soil disposal by another excavator.
- Provision for drainage is to be made with sufficient pumps and collecting.
- If there is ground water percolating to excavation, Please inform the Consultant and find out suitable preventive measures.
- All the excavation area is to be barricaded with GI hand railing and sign boards such as “deep excavation is in progress, stay away” to be kept in all languages which can understand by workers easily.
- Sufficient flood lights have to be provided at regular intervals.
- Complete the excavation as per the levels mentioned in the Method statement.
- In case of over excavation, fill the extra depth with PCC.
- After the completion of excavation inform the architect/Engineer to visit the site for checking.
- The next step of construction can only be started after the approval of excavation by Architect/engineer

SAFETY MEASURES:

- All the workers at the excavation shall wear PPE at all times such as Safety helmets, safety shoes, Safety harness or belts, Gloves etc.
- All the workers have to be briefed about the excavation and safety measures required for excavation.
- Deploy enough banks man, signal man if there are many excavators viz more than 2.
- The soil shall be stacked away from the edge of excavation to prevent collapse of soil on to workers working at bottom.
- All the excavation area shall be barricaded with GI hand railing and should be strong enough to take the loading of human beings slanting on it.
- All the excavation areas to be provided with enough flood lights, the light intensity at any point shall not be less than 150amps.
- Sign boards to be kept at all visible places and to be protected.
- Close supervision and recording by site engineer/ supervisor is required.
- Place fire extinguisher / first aid box near the access.
- Proper access with hand railing to be provided to the bottom of excavation.
- In case of dry weather, Sprinkle water to prevent dust pollution, and cover the soil stacking area with canvas.
- All the machinery has to be checked by the operators every morning before the start of work and to fill the check lists with signature.
- The speed limit of dumpers to be controlled.
- The dumpers drivers are responsible for any collapse of soil from dumper or flying of dust to atmosphere.

RESPONSIBILITY MATRIX FOR DEEP EXCAVATIONS

S.NO	ITEM	ARCHITECT/ CONSULTAN T	CE	PE	SE	SO/SS
1)	Construction Drgs	R	A	C		
2)	Levels/Co-ordinates			R	A	
3)	Barricading					R
4)	Workers Training			R		A
5)	Proper Access				R	A
4)	Lighting				R	A
5)	Excavation protection			R	A	
6)	Machinery condition					R
7)	Pumps availability			R		A
8)	Silt traps				R	A
9)	Sedimentation tanks			R		A
10)	Excavation final approval	R		A	C	
11)	Dumper speeding					A
12)	Competency of operators			R		A
13)	Enough banks man/signal man			R	A	C
14)	Prevent mud water pumping into drains					R
15)	Safety PPE				A	R
16)	Review and approval of Method statement of Contractor		R	A	C	
17)	Overall safety		A	C	C	R
18)	Overall quality		R	A	C	

R....Responsible

A..Authorised

C.. Can be authorized

CE..Chief Engineer

PE...Project Engineer

SE...Site Engineer

SO..Safety Officer

SS...Safety Supervisor

RISK ANALYSIS FOR DEEP EXCAVATIONS

S.NO	HAZARD	RISK LEVEL	LIKELY HOOD	SEVERITY	RISK CONTROL MEASURES
1	Workers falling in to excavation	Low	Low	High	Provide barricading around the excavation.
2	Workers hit by excavator	Low	Low	Medium	Appoint banks man to control excavator movements
3	Soil collapse	Low	Low	Medium	Stack soil away from excavation
4	Flooding of water in to excavation	Low	Low	High	Provide enough pumps
5	Workers falling from the slopes	High	Low	Medium	Provide proper access with hand railing
6	Workers hit by dumpers	High	Low	Medium	Appoint signal man to guide dumpers movement
7	Workers working in dark	High	Medium	High	Provide enough lighting
8	Excavators over turning	High	Low	High	Appoint competent operators
10	Collision of dumpers	Medium	Low	Medium	Appoint signal man
11	Sudden down pour	Low	Low	High	Provide alarm to evacuate the workers.

QUALITY CHECK LIST FOR DEEP EXCAVATION

Project ID:-

Location:-

Bldg. No.

Date:-

S.No	ITEM DESCRIPTION	YES	NO	Signature of site engineer
1	Good for Construction drawings available			
2	Ground levels, co-ordinates marked and recorded.			
3	Average depth of excavation recorded			
4	Surveyor certified the co-ordinates and levels.			
5	Soil samples collected at 0.5m intervals			
6	Soil is stacked away from the edge of excavation			
7	Soil is reaching the proper dumping yard			
8	Supervision from the contractor is enough			
9	Technical skills are enough for the operators			
10	Protection of the excavation sides is met.			
11	Strutting is at right levels			
12	Strutting details are as per the approved drawings			
13	The stacking soil is covered			
14	Excavation botto0m level is correct as per drawings.			

Verified By

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SAFETY CHECK LIST FOR DEEP EXCAVATION

Project ID:-

Location:-

Bldg. No.

Date:-

S.No	ITEM DESCRIPTION	YES	NO	Signature of site engineer
1	Sign boards are kept at all visible places			
2	All the excavation area is properly barricaded			
3	Enough banks man are appointed			
4	Enough signal man are appointed			
5	Enough flood lights are provided			
6	Condition of excavator is checked by operator on daily basis.			
7	Speeding of dumpers is ok.			
8	Conditions of dumpers viz no spillage of soil from sides or top.			
9	Access to the excavation bottom is proper.			
10	Fire extinguisher is available near by area			
11	First aid is available with trained first aider.			
12	Alarm is available in case of emergency evacuation.			
13	Sufficient Pumps are available			
14	Collection pit is available			
15	Excavation slopes are properly protected			

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ENVIRONMENTAL CHECK LIST FOR DEEP EXCAVATION

Project ID:-

Location:-

Bldg. No.

Date:-

S.No	ITEM	YES	NO	Signature of site engineer
	DESCRIPTION			
1	Water is sprinkled to avoid dust pollution			
2	No mud water is pumped in to public drains			
3	No contaminated water is pumping into public drains			
4	All the soil slopes are protected from erosion of soil.			
5	Smoke emitting from the machinery is ok			
6	Noise levels are less than 70db			
7	Sedimentation tank is available			
8	Silt traps are provided			
9	Temporary excavation drainage is ok.			

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