



SITE MANAGEMENT AND SECURITY RULES ON WELL CONSTRUCTION SITES

Security rules and site management must be defined and presented before starting the activities. Site management and security are closely linked:

- Without management, security rules will not be respected.
- Without strict security rules, the site cannot be managed properly.

The site foreman has to take the lead; he must respect the established rules and be firm in their implementation.

What are security rules?

Security rules can be defined as safety acts and measures that must be respected by any worker during the construction activities in order to prevent any accident that could lead to minor or major injuries or even death but also damages and misuses of Inter Aide equipments.

What is site management?

The site management includes all the procedures and activities that must be implemented to ensure a good quality of work in a safe environment:

- Allocation and position of equipments, tools and materials including corresponding use and management ;
- Allocation and position of workers on the site and corresponding conditions of work and rules;
- Organisation and supervision of each specific activities.

The site management rules must be continually brought to the attention of the workers and the population during the construction of the well. It's a paramount importance to be sure that all the rules are well understood before starting the activities.

Definition of the working area

The working perimeter is marked by the temporally fence which is made by bush sticks, nylon rope and/or palm leaves. The temporal fence avoids community people to get close from the site, including children that could fall into the well. Like this, risks of accident or injuries are significantly reduced.



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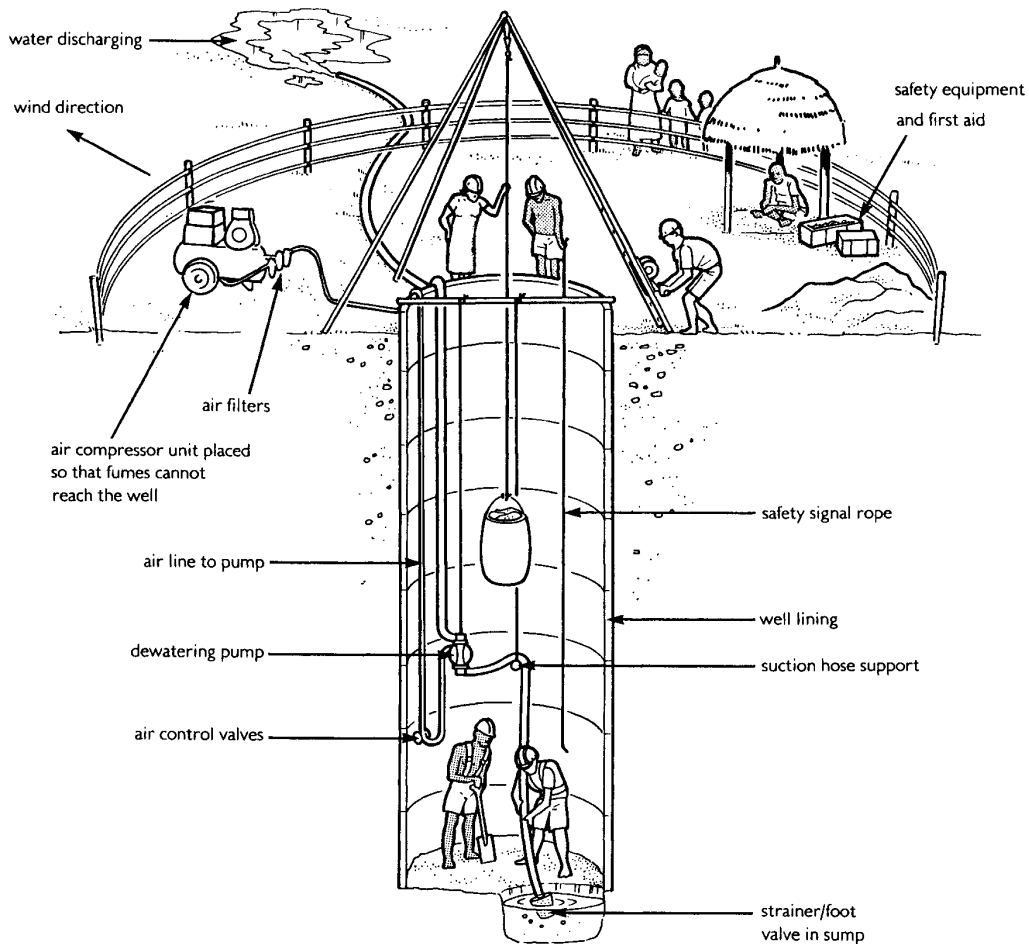


Figure 1 : Working area for well digging (Source : Oxfam, Instruction manual for Hand Dug Well Equipment)

A proper working area must include:

- A fence of at least 70 cm high (except in case of existing concrete fence during well rehabilitation) 3 to 5 meters away from the hole ;
- A tripod that can be made with 3 bush sticks (2 standing ones of at least 40 cm diameter each / 1 crossing bar of at least 30 cm diameter);
- Some shade for diggers to rest in when they return to the surface;
- The safety equipment needed and the first aid kit¹;
- A space outside the area for water discharging when a dewatering pump is used. If the well is emptied with buckets, a drum will be used to collect the water.
- A reliable person at the top of the well at anytime someone is working inside
- Some boards or zinc leaves to cover the hole during the night (can be provided by the community).

¹ See “Safety equipments on site” below for more details



Responsibilities on site

| IA supervision team ² | Site foreman | Community, contractors, trainees and labourers |
|---|---|---|
| <p>Before starting the activities, provide to the staff and the community workers the proper equipment and explain all the rules regarding the site management and the security.</p> <p>At anytime during the activities and at least once a week, check the proper management of the site and the respect of the security rules.</p> <p>Assess once a month the site foreman and his contractors regarding the security.</p> | <p>Supervise and manage the site considering all the rules established. Make sure everything is well understood and respected. In case of any conflict, a report must be transmitted to the supervision team.</p> | <p>Follow at anytime the instructions provided by the site foreman regarding the site management, the equipment and the security rules. Respect any disciplinary decision taken by the site foreman and / or IA supervision team.</p> |

Safety equipments on site

| Equipment | When? | | | Who? ³ | Quantity on each site |
|--------------------|-------------|----------------|--------------------|-------------------|-----------------------|
| | Digging | Lining/Casting | Chlorination | | |
| Security boots | X | X | | SF | 1 |
| Rain boots | X | X | | All | 3 |
| Protection Clothes | X | X | X | All | 3 |
| Harness/life rope | X | X | | SF/C | 2 |
| Security rope | X | X | | SF/C | 1 |
| Safety stick/seat | X | X | | SF/C | 1 |
| Nose Mask | | | X | SF/PO | 1 |
| Safety goggles | X | X | X | All | 2 |
| Ladder steps | X | X | | All | 1 |
| Helmet | X | X | X | All | 3 |
| Gloves | X (2 pairs) | X (2 pairs) | X (1 plastic pair) | All | 3 |

² See attached Appendix for more detail about the responsibilities of each member of IA staff

³ SF : Site foreman, C : Contractor, PO : Pump Officer



BEFORE STARTING THE ACTIVITIES

Every working day: Site foreman / IA monitoring

• Working area

- Ensure that the working area is still well fenced.
- Prepare and check the tripod: install the pulley, check the stability and solidity.
- Prepare the water discharging space and/or install the drum.
- Check the shelter (needed for the shade).
- Bring the first aid kit on site.

• Team

- Remind the community members about the dangers existing around the well and the tools used.
- Assess the community workers team: experience, awareness of danger and risks, physical condition (drugs, alcohol, sickness, tiredness...).
- Present and remind the established rules: security, management, signaling system. Ensure everyone is familiar with it.
- Explain the activities plan for the day, the objectives and the position of each worker. Ensure everything is clear before starting.

• Equipment, tools and material

- All safety equipments and tools must be checked by the on-site responsible person before approval for use (see *"Tools and equipment check list"* below for more details).
- Bring on site all the appropriate equipment, tools and material needed for the day

DURING THE ACTIVITIES

• Working area

- Depending on the deepness of the hole/well, a candle test has to be done when first entering (see *"The candle test"* below for more details).
- Clear the area for at least 2 meters all around the well and keep it clear of people, animals, materials, equipment (especially fuel/oil containers). Keep an outside space for water discharging and mud/rubbles.

• Team

- Always keep a reliable person at the top of the well when someone is inside. Only 1 or 2 trained, reliable people should be in charge of the winch operation. Keep noise levels down so that what is going on in the well can be heard.
- Make sure everyone in the well can be seen from the surface, and can get out quickly. Lower and raise workers with the harness and a safety stick/seat.
- Nobody is allowed to look down the hole, or climb down, without his helmet chin strap fastened.

• Equipment , tools and material

- Tools must be lowered into the well with bucket.
- Do not lower moulds, well rings or any other heavy item while someone is inside the well (max. 30 Kg for single operator).
- While lifting/lowering equipment, the staff down the hole must stand against the wall on the opposite side of the winch.
- Never use internal combustion or electric engine down the well with someone inside.
- Always locate the wheel barrow perpendicularly to the well.

AFTER THE ACTIVITIES

At the end of each working day

• Equipment

- All the equipment and tools have to be properly cleaned and stored in a dry safe place at the end of each working day.
- All the ropes must be properly coiled and parked.
- The electrical cable and hose of the dewatering pump must be cleaned and parked in their box.

• Working area

- Clean the site and park all the equipment and tools.
- Cover the top of the well (involving the community and water committee).
- Protect the site with visible signs.
- Close the fence and ensure the area is secured before leaving the site.
- Remind the community and the water committee about the risks and involve them on the sensitization to prevent accident during the night (by informing elders, children...).

IMPORTANT NOTICE REGARDING SAFETY

Tools and equipment check list:

For most of the small equipment, like boots, clothes, mask or gloves, a basic inspection has to be done every morning in order to assess the general condition of each item.

Some others are more critical and require a particular attention:

| Safety equipment / Tools | Elements to check |
|--------------------------|---|
| Harness | Solidity, fixing knots, security hook |
| Security/life rope | General condition, solidity |
| Safety stick/seat | Solidity, fixing knots |
| Safety goggles | Frame, glass, visibility |
| Helmet | General condition, chin strap |
| Pulley | Installation, greasing, security hook (made with a ring of 8mm iron rod) + practical test without anybody inside the well |
| Bucket | Handle, bottom |
| Dewatering pump | Oil and fuel level, electric cable, hose, water discharging space |

Movements on site:

- **Movement of workers:**

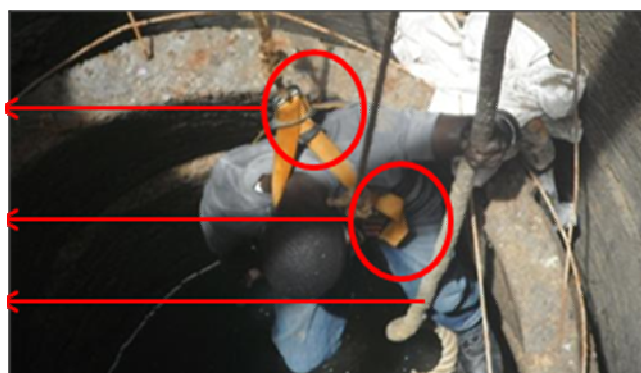
A particular attention should be given to the lowering and lifting of workers into the well.

Always use the harness (tied with the life rope), the security rope and the safety stick/seat (tied with the main rope). Once the worker is tied up, crosscheck the hook and all the fixing knots before sending him inside.

Life rope: permanently tied to the harness with a security hook. Must be used to pull the worker up if any problem happens inside.

Main rope: the safety stick/seat is tied on it in order to lower or pull the worker up (usual situation).

Security rope: the worker must use this rope as support to go down and to come up.



Watch out! To avoid injuries when the worker is pulled up from the hole, be careful that his hand holding the main rope does not go into the pulley when reaching the top of the well.

- **Movement of moulds and heavy equipments:**

- Always crosscheck all the fixations before lowering moulds inside the well. Depending on the weight, the ropes can be doubled for more safety.
- To send the moulds down, there are two options:
 - ✓ Set it outside and send the whole assembly at once. Then position it properly;
 - ✓ Sent the moulds down piece by piece and assemble it directly inside the well.

- **Signalling system:**

To avoid accident and injuries, it is a paramount importance to agree on a specific signalling system for raising/lowering equipment and personnel. Any operation must be done after being signalled to the different operators. The operation is done in three-steps:

- Transmission of the information (e.g.: “We lower the sledgehammer”)
- Confirmation that the information has been received (“OK, go ahead”)
- Raising/lowering of the equipment (in the e.g. : sledgehammer)

The candle test

To assess the air quality quantity of oxygen inside the well, it is better to realize a candle test by lowering a lighted candle to the bottom. If the candle goes out there is not enough oxygen inside to go down. Clear the air by lowering and raising a brush of twigs/branches of almost the same diameter than the well. Once it is done, retest with the candle.



Candle tied with binding wire



Useful knots

Knots are really important for well construction since the security during movements of people, equipment and material strictly depends on it. Hereinafter are some useful knots:

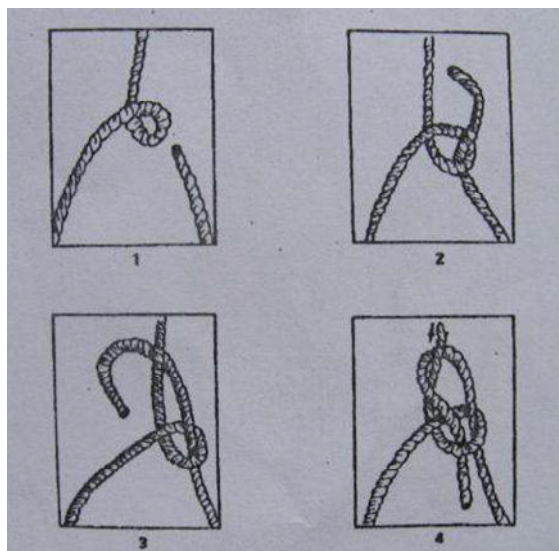


Figure 4 : The "eight". At the end of the rope, to stop it when slipping.

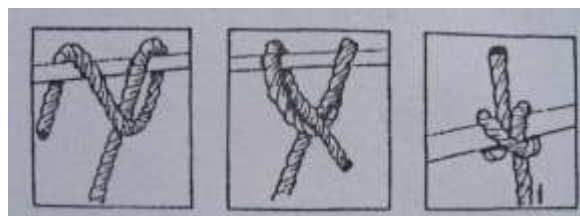


Figure 3: The Rolling hitch: to secure a rope

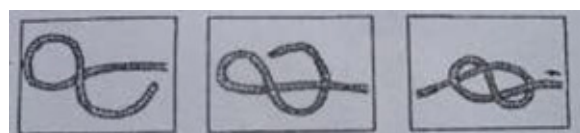


Figure 2: The "bowline". Will not slip if tied, and easy to untie

Other grand rules

- Only IA staff and IA's approved community workers and contractors can enter the working perimeter marked by the temporary fence.
- Drinking and smoking is forbidden all over the working area and inside the hole/well.
- Never urinate nor defecate on the working site
- Never allow community labourers under 16
- Never allow community labourers under the influence of marijuana, alcoholic beverage or any intoxicant, to work or stand on the fenced working site. This also includes person with physical or mental dysfunction (blind, deaf, dumb or epileptic people for instance).
- Villagers involved on the well construction must officially agree with the discharge form signed on behalf of their community if they want to work on the site (*see Appendix below for discharge form*).

Always bear in mind that we are looking for water, not problems... So don't take risks!

Bibliography

- <http://policy-practice.oxfam.org.uk/publications/instruction-manual-for-hand-dug-well-equipment-126727>
- <http://policy-practice.oxfam.org.uk/publications/repairing-cleaning-and-disinfecting-hand-dug-wells-126709>
- http://www.oxfam.org.uk/equipment/catalogue/resources-included-available/water-and-sanitation/well-digging/handdugwell-BOOK.pdf/at_download/file
- Water, Sanitation and hygiene for populations at risk, ACF, Herman éditeurs

IMPORTANT NOTICE

These technical notes are distributed through the "Pratiques" network between the NGOs who have signed the "Inter Aide Charter" The aim of this network is to facilitate the exchange of ideas and methods between field teams working on development programmes.

We would like to stress here that these technical notes are not prescriptive. Their purpose is not to "say what should be done" but to present experiences that have given positive results in the context in which they were carried out.

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APPENDIX

Roles and Responsibilities of IA Field Staff and Contractors

SITE FOREMAN

Responsibilities:

- Represent Inter Aide at all times
- Supervise Contractors on technical aspects
- Train and animate the entire work team, with respect to good quality work, in any required technical purpose
- Manage and supervise the maintenance (cleaning, storage...) and the use of equipments and tools
- Cross check and monitor the use of industrial materials and material consumption, update management as needs arise
- Validate local materials in terms of quality and quantity
- Define and supervise the management of the construction site. A mapping of the site has to be prepared in collaboration with the community
- Insure a good quality of the construction
- Respect and make respected the security rules and organize security debriefing each day
- Give immediate report to management concerning any issues with construction activities
- Respect the organisation defined previously in collaboration with the Field Facilitator and the community
- Make all the points of the IA/Community contract (as responsibilities, process, ...) respected by each part as the community, the mason/contractor and Inter Aide
- Report the field activities weekly and any relevant information to the Technical Supervisor.
- Follow up on Contractors daily activities by cross checking their activity booklets

THE SITE FOREMEN MUST GIVE THE GOOD EXAMPLE, RESPECT THE RULES AND BE STRICT IN THEIR APPLICATION

Relationship with the community:

In order to allow good conditions of work, the site foreman will have to:

- Be known and accessible to the community
- Be respected by the community
- Respect the community and the workers. **They are volunteers and not professional.**
- Be strict especially about security rules.
- Be punctual
- Explain clearly the work to the community at each stage
- Avoid conflict within the community, leave Field Facilitators to resolve any conflicts
- Not give any loan to the community. The community workers can not, in any case, take personal benefits from the project. It can harm its reputation.

THE SITE FOREMEN HAS TO WORK IN COLLABORATION WITH THE COMMUNITY TO CONSTRUCT A GOOD AND SAFE WELL.

FIELD FACILITATOR

Responsibilities:

- Supervision of the Contractors in the absence of the Site Foreman
- Organize the gathering and transport of local materials
- Organize community labor (between 8 and 10 people per day)
- Responsible for the provisions in the First Agreement with the community: provision for food, lockable store for materials/equipment, and provide lodging arrangements for workers
- Conduct sensitization on well stages to the community
- Continue hygiene sensitization with community, especially on cleanliness and use of latrines and hand washing
- Organize community for first access: brushing and cleaning of access road and well site
- Resolve conflict in the community between any involved parties
- Report on social activities to the Team Leader
- Be known and accessible to the community
- Have respect for and be respected by the community

JUNIOR CONTRACTOR

Responsibilities:

- Represent Inter Aide at all times by being honest, trustworthy, transparent, and respectful
- Take good care of all tools and equipment at site, making sure to properly clean and store at the end of each day
- Respect all security rules at all times, failure to do so will result in discipline
- Manage the site properly
- Follow up on use of materials, report any needs to Site Foreman
- Respect each other in the team, ensure good understanding between Contractors
- Respect time of work schedule, be punctual
- Follow technical specifications of job
- Respect community traditions and customs
- Follow and respect the contract of work and job desk, any breach will result in discipline
- Take supervision from the Site Foreman or Field Facilitator (in absence of the Site Foreman)
- Give respect to and be respected by the community

SENIOR CONTRACTOR

Responsibilities:

Senior Contractor maintains the same responsibilities as that of the Junior Contractor with the following additions:

- Communication with community elders and Water Committee in absence of Field Facilitator or Site Foreman
- Supervise the training of community members and trainees in well construction
- Supervise the use and care of tools and materials
- Coordinate between the Junior Contractors and the project management
- Follow up of construction activities more globally
- Ability to work alone at site
- Take supervision from Site Foreman or Field Facilitator (in absence of the Site Foreman)

APPENDIX
Discharge Form

I, under signed Mr/Ms/Mss. _____,
from the Village of _____,
Section of _____,

on behalf of my community, involved in the building a community well, project supported by Inter Aide Sierra Leone, as a non governmental organization.
We, the community, discharge Inter Aide Sierra Leone from any accident that could happen to us during the building of the above mentioned facility for the sustainable improvement of our community.

By signing this letter, I acknowledge that in case of any accident, whatever serious it may be, **in no expenses nor responsibility can be charged to Inter Aide Sierra Leone and its staff.**

_____ (Name of the village),

_____/_____/_____(Date in dd/mm/yy)

Mr. _____ (Name of the person)

Signature