



Oyu Tolgoi LLC

Health, Safety and Environment Management System Procedures

Technical Rehabilitation Procedure

Technical Rehabilitation Procedure		
Effective Date: 2016.04.01	Document Number: OT-10-E14-PRC-0002-E	Version: 1.1

1. PURPOSE

To provide guidance on steps and requirements for the technical rehabilitation of construction sites, temporary roads, tracks and borrow pits. The procedure also ensures compliance with the Oyu Tolgoi (OT) HSE policy and procedures, including those relating to closing, capping, recovery and logging of the drill holes.

2. SCOPE

This procedure is an integral component of the Land Disturbance Control and Rehabilitation Plan (OT-10-E14-PLN-0001) and therefore, applies to the technical rehabilitation of disturbed lands with exception of certain mining facilities such as open pits, subsidence zones, and mineral waste disposal facilities which are included in the Mine Closure Plan (OT-10-E14-PLN-0002).

The procedure applies to disturbed areas during exploration, construction, development and mining operations.

3. ROLES AND RESPONSIBILITIES

Role	Accountabilities
PMT and OpCo	<ul style="list-style-type: none"> <input type="checkbox"/> Identifies unused roads and tracks and approves the rehabilitation commencement. <input type="checkbox"/> Identifies disturbed areas associated with OT activities that can be progressively rehabilitated, and initiates the rehabilitation procedures for these areas. <input type="checkbox"/> Ensures cost estimated for technical rehabilitation of the identified areas is included and approved in annual business budgets.
Earthworks Department and Project coordinating teams	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure this procedure is followed when rehabilitating roads, tracks, borrow pits; and drill holes. <input type="checkbox"/> Ensure drill hole rehabilitation procedures are followed to minimise risk of local herdsmen and livestock being injured and having incidents due to improper completion of capping works and leaving the holes uncapped. <input type="checkbox"/> Notify the Environmental Officer – Land timely of technical rehabilitation commencements and completions at planned sites. <input type="checkbox"/> Place signposts for successful technical rehabilitation sites .
Manager Environment & Biodiversity	<ul style="list-style-type: none"> <input type="checkbox"/> Supports the Environmental teams in discussions with relevant Departments management on technical rehabilitation implementations.
Environmental Officer - Land	<ul style="list-style-type: none"> <input type="checkbox"/> Determines whether ripping is required for road or track rehabilitation and performs rehabilitation monitoring on the rehabilitated road or track areas to determine the success of the rehabilitation. <input type="checkbox"/> Ensures that rehabilitation of borrow pits are undertaken in an appropriate manner and ensures that rehabilitation monitoring is

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	<p>performed on the rehabilitated borrow pit areas to determine the success of the rehabilitation.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Shall ensure that land is rehabilitated and restored in line with the Rio Tinto E14 Land Disturbance Control and Rehabilitation Standard. <input type="checkbox"/> Signposts the sites where technical rehabilitation is not coordinated by responsible project coordinating teams.
Officer GIS	<ul style="list-style-type: none"> <input type="checkbox"/> Maintains geodatabase on technical rehabilitation achievements.
Flora Research team	<ul style="list-style-type: none"> <input type="checkbox"/> Participates in technical rehabilitation inspections and confirms whether pre-requisite condition for biological rehabilitation is achieved, by providing clear commentaries.
HSE Compliance team	<ul style="list-style-type: none"> <input type="checkbox"/> Organizes State Inspections for returning the offsite rehabilitation lands to the local administration in accordance with the relevant legal requirements.
Senior Drilling Coordinator	<ul style="list-style-type: none"> <input type="checkbox"/> Ensures that capping, rehabilitation and monitoring of all drill holes and drill pads occurs in accordance with this procedure. <input type="checkbox"/> Notifies the Environmental Officer – Land timely of technical rehabilitation completions at drill sites.
Social Performance (SP) Department	<ul style="list-style-type: none"> <input type="checkbox"/> Monitors earthworks team or Contractors compliance with the cultural heritage protection requirements during the technical rehabilitation activities. <input type="checkbox"/> Participates in rehabilitation inspections, and provides written comments on the rehabilitation conditions from the community relations perspectives to the Environmental Officer – Land. <input type="checkbox"/> Informs the Environmental Department (specifically Land team) on community complaints on technical rehabilitation conditions.

4. PROCEDURE

4.1. Technical Rehabilitation Timing

To ensure implementation of the progressive rehabilitation, technical rehabilitation must be undertaken as soon as practicable on land that is no longer in use, rather than deferring large scale rehabilitation to the mine closure phase. Land disturbance permits require the disturbed land must be technically rehabilitated upon the permitted work completion. Moreover, a technical rehabilitation plan is prepared on an annual basis, and this plan more focuses on identifying non-LDP old lands that are ready for technical rehabilitation.

4.2. Technical Rehabilitation Completion Criteria

Technical requirements for successful technical rehabilitation vary from site to site and all necessary requirements will be identified during planning of particular site technical rehabilitation. Generally success technical rehabilitation must meet the following criteria:

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- Site must be clean: Prior to commencement of the technical works, the rehabilitation **site must be cleaned up** from residual debris and spills, and the collected materials must be transported to the appropriate disposal sites at OT site. Rocks or stones larger than 15 cm in radius shall be removed from the rehabilitation site. The latter is a special requirement suggested by OT Flora Research and Rehabilitation team with a purpose of preventing damages to the seeding machinery when using it during biological rehabilitation.
- Final land form** must appear natural and similar to the surrounding terrain.
- Final slope angles** must be no more than 18 degree gradient. When breaking the edge effect to meet this requirement, disturbance must be limited within the permitted area boundaries.
- Stability of land** must be closely considered to ensure safety of human, livestock and wildlife in the post-rehabilitation lands. Engineering designs must be implemented when re-contoured borrow pits and/or similar structures, and also excess soil rises/mounds to prevent slope failures. Adequate degree of compaction must be implemented when backfilling of excavated lands – compaction degree must be determined by specialized engineers. Aligning with the scope of this procedure, this factor is not discussed in regards to technical rehabilitation of mineral waste disposal facilities, open pit walls, and the underground mine facilities.
- Erosion mitigation** considerations must be implemented in the rehabilitated lands so that erosion of the rehabilitated areas does not contribute to environmental degradation outside the rehabilitated area. The engineering evaluation for the need of erosion control implementation at the rehabilitation site must be completed during technical rehabilitation planning. Generally, the less the slope angles, the lower the run-off velocity. Scarification grooves along contour (not up and down slope) also contribute to minimizing erosions. Moreover, natural drainage patterns shall be restored. If necessary, sediment trap ditches shall be prepared at the perimeter of the rehabilitation land or where feasible to prevent sediment run-off to the natural vegetation surrounding areas. To prevent river bank erosions, culverts must be installed at the road crossing the river bed, water flows must be directed towards the culverts.
- Ponding from rainfall** creates safety concerns for local community members, livestock or wildlife. Therefore, ponding potential shall be prevented by re-sloping the pit, filling the pit floor with excess excavation materials, and/or prepare outlets to handle concentrated or increased runoff.
- Topsoil cover** depth and preparation should be adequate so that rehabilitation does not require ongoing amendment or weed control. Implementation of this requirement will be guided and checked by OT Flora Research and Rehabilitation team.
- When **backfilling** the excavated structures, benign rock materials or other geological materials are replaced first followed by the subsoil, and compacted. Topsoil will be spread only after the completion of contouring and compaction works.
- Scarification** grooves must be perpendicular to the dominant wind direction which is North or North West in the South Gobi region. This ensures accumulation of humidity and trapping of wind-blown seeds in depressions.

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- Signposts** must be placed at the perimeters of the rehabilitation sites upon completion to prevent machinery movements over the rehabilitated lands. The signposts must be stable against wind blows and written in a dual language, Mongolian and English, clearly readable to drivers.

4.3. Topsoil Reuse in Technical Rehabilitation

Strategies in topsoil reuse management are detailed in Section 7 in Topsoil Handling Procedure (OT-10-E14-PRC-0001).

The following requirements apply to topsoil reusing in rehabilitation of disturbed lands:

- Evenly spread the stored topsoil over the prepared/restored land surface. Depth of the topsoil cover shall be the same as the depth of topsoil layer which was removed at commencement of the land disturbing activities.
- If topsoil not available at the rehabilitation site, topsoil will be transported in from other available sources. It can be either transported directly from a new land disturbance site or from the long-term topsoil stockpile. Flora Research and Rehabilitation team will decide on the topsoil source.
- Topsoil reused in rehabilitation must be its original topsoil or similar type. If original topsoil quality is changed over time, treatments will be made prior to reuse.
- Dust generation must be minimized by implementing standby of hauling, loading/unloading, and spreading during high speed winds.

4.4. Road or Track for Rehabilitation

4.4.1. Identification of Road or Track for Rehabilitation

The following procedures shall be implemented in the identification of roads and tracks for rehabilitation:

- Identify old or unused roads and tracks that may require rehabilitation through consultations with the relevant stakeholders; and
- Obtain approval from the PMT or OpCo on the commencement of rehabilitation works for each particular road or track.

4.4.2. Road or Track Rehabilitation Process

The following process is implemented in defining tracks and roads to be rehabilitated:

- The OT Environmental Department will assess the road or track condition to determine whether recontouring or scarification is required. In order to manage erosion risks, road or track established on steep slopes will not be scarified. In addition, road or track where significant vegetation re-growth is establishing may be left to naturally regenerate;
- Regular contour banks are required to be built across the track to minimize any potential water erosion for ripping occurring along slopes;
- Topsoil with vegetative matter that was pushed to the road or track sides during preparation of road or track alignment will be pulled over the surface to be ripped along the road / track length;
- Undulating surfaces will be created during scarification to encourage seed retention and water infiltration in these surfaces. This facilitates seed germination in uncompacted soil;

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- For rehabilitation of upgraded roads prepared, the filling materials used in road levelling will be removed to the surrounding ground level and transported where such materials can be used (for example, for borrow pits restoration). The hard ground will be ripped to a depth of 15-20 cm to facilitate bonding of the topsoil to the subsoil. The ripped surface will be covered with topsoil which was stored at side(s) of the road for its rehabilitation, and scarified.

4.4.3. Completion of Road or Track for Rehabilitation

Upon completion of road and track rehabilitation, the following management measures will be implemented:

- Appropriate signs must be placed at the ends of the track to prevent vehicles traffic on it;
- Rehabilitation inspection/monitoring will be conducted on the track to assess the rehabilitation outcome; and
- If the rehabilitation outcome is determined to not meet the rehabilitation criteria the Earthworks team or Contractors will undertake the improvement actions recommended in the rehabilitation reports.

Roads or tracks considered long term shall have verges and curb sides rehabilitated using available topsoil supplies, which will ensure surfaces are stabilised and resistant to erosion.

4.5. Borrow Pit for Rehabilitation**4.5.1. Borrow Pit Rehabilitation Procedure:**

The following requirements apply when rehabilitating borrow pits:

- Areas to be rehabilitated must be free of rubbish and construction debris. All materials and rubbish associated with borrow pit activities shall be removed from the site on completion of trenching and brought to the OT Landfill Facility;
- All contaminated soil must be collected and disposed of to the OT Landfarm facility;
- Rehabilitation equipment must reach the borrow pit area via an access road and the movement must be kept within the disturbed area;
- Stockpiled material must be backfilled into the borrow pit in the same order that it was removed from the borrow pit (i.e. subsoil is replaced first, followed by the topsoil) using excavators. Note: Topsoil will be spread only after the completion of contouring and compaction works;
- The disturbed borrow pit area must be re-contoured so that the shape of the landform is in safe condition for the local community, livestock and wildlife;
- Using a loader or dozer, the surface shall be re-contoured using surrounding material to ensure a gentle gradient of no more than 15-18 degrees is achieved from ground level to the bottom of the depression. Material from around the perimeter of the borrow pit may be dragged over the borrow pit from undisturbed vegetation to break up the edge effect and achieve the 15-18 degree gradient, however disturbance must not be outside the approved disturbance area (as defined in the Land Disturbance Permit application);
- Because surface ponding leads to potential erosion and thus reduces the effectiveness of re-vegetation, attempts must be taken to minimize bowl effect within pit as far as is practicable to decrease ponding chances; Ponding also poses risks for animal injury.
- The re-contoured surfaces will be compacted to reduce wind erosion and increase stability of the landform;

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- Spread topsoil evenly across the borrow pit area, with a minimum depth of 15cm. The original topsoil depth stripped from the area will be restored to the area being rehabilitated;
- The area along contour will be ripped perpendicular to the slope to avoid erosion. Deep ripping is required to enable rip lines to hold up after heavy rainfall or wind occasions. By using a scarification blade of 3 – 4.5m width attached to a grader, drive over the backfilled trench with tines lowered to 15cm ensuring an additional 500mm on either side of the trench is scarified. This practice will ensure additional compaction and create grooves perpendicular to the dominant wind direction, which is North and North West in this region, to enhance seed capture.
- Around the perimeter of the borrow pit, drag undisturbed vegetation from up to 5 m to break up edge-effect and promote seed distribution and mulching;
- Clearly identify the borrow pits which have to be left open for future work, and consequently do not require immediate rehabilitation. However, such site must be fenced around to prevent any incidents.

4.5.2. Completion of Borrow Pit for Rehabilitation

The following requirements apply following the completion of borrow pit rehabilitation:

- Completion of the rehabilitation must be notified to the Environmental Department immediately;
- Environmental Land team jointly with Flora Research team and Social Performance Department representatives will conduct inspection on rehabilitation condition;
- If condition doesn't meet environmental and community requirements, the Earthworks team or Contractors will undertake improvement actions recommended in the rehabilitation reports;
- Successful rehabilitation sites will be notified to the HSE Compliance team for arrangements of State Inspection who will determine whether rehabilitation requirements specified in standards such as MSN 5917:2008 and MNS 5918:2008 be satisfied;
- The rehabilitated borrow pit areas must be returned to the local administration and
- Respective LDPs for borrow pits will be closed on basis of Rehabilitation Acts issued by the local administration.

4.6. Geology exploration Drill Holes for Rehabilitation**4.6.1. Geology exploration Drill Hole Rehabilitation Procedure:**

The following procedure will be implemented for Geology exploration drill hole rehabilitation:

- The drill hole location will be determined with GPS, prepare the hole for PVC piping by clean around the rim area of the hole and dig out a 40 cm deep hole;
- A 2 or 3 m PVC tube will be installed down the hole leaving 50 cm of it on the surface, with a 50 cm wooden stake aligning with it to keep the PVC tube stable;
- Mud will be prepared by mixing cement, sand and gravels in percentage of 30x50X20. Before pouring the cement put the 60x60 cm mould around the PVC tube. 7-8 cm depth of cement will be poured into the mould and place 4x4 cm checked 40x10 cm iron cages to prevent cement from tearing apart and keeps it solid. Subsequently, cement aligning with the edge of the mould will be poured to a height of approximately 15 cm;
- Before the cement hardens the number of the hole will be engraved with gravels of 10 mm size to make the hole number visible; and

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- On the aluminium sheet, the number of the hole will be engraved at the upper edge of the PVC.

4.6.2. Completion of Drill Hole for Rehabilitation

Following drill hole rehabilitation, the following shall be implemented by Geosciences Department to ensure the area is left in safe and acceptable condition prior to demobilising from the work area:

- The hole surrounding the area must be cleaned up and trash thrown away;
- Photographic evidence shall be captured of the capped holes and record it;
- Details of the capping and the photo shall be entered into the database;
- Rehabilitation completion will be notified to the Environmental Department;
- If condition doesn't meet environmental and community requirements, the Earthworks team or Contractors will undertake improvement actions recommended in the rehabilitation reports; and
- Respective LDPs for drill sites will be closed on basis of rehabilitation inspection reports.

4.6.3. Site Clean Up prior to Demobilisation

Equipment and hazardous materials must be removed from completed work areas and open pits/other hazards secured against public access prior to rehabilitation.

Please refer to Attachment A for the detailed procedure.

4.7. Constructions Sites Technical Rehabilitation

Construction sites vary in land disturbance purpose (pipeline construction, airport, offices, camps, etc.) and extent. Site-specific guidance on technical rehabilitation is provided to the responsible team for effective planning. This guidance covers all necessary requirements for successful technical rehabilitation. Generally, the following requirements must be implemented in technical rehabilitation of constructions sites:

- Dismantling all standing structures including buildings, barriers, etc., with exception of the perimeter fence. The perimeter fence shall be removed upon completion of the fenced area restoration to keep animals and local community away from open holes, trenches, pits, as well as from interactions with heavy machineries working in the rehabilitation area.
- Removal of concrete foundations.
- Removal of underground structures such as cables, septic tank, pipelines, pipes, etc.
- Clean up the site from residual debris, waste, and concrete residues.
- Disposal of all removed materials in accordance to OT waste management procedures, if not for reuse. Disposal methods and sites will be advised by Water Utilities Infrastructure team.
- Septic facilities restoration includes emptying and sanitization of septic tanks prior to transport to OT site for disposal at the metal waste collection point. The pit where the septic tank was removed from must be sanitized prior to backfilling with excavation materials. To prevent subsidence, the backfilled area must be compacted well.
- Gravel covers need to be removed from the rehabilitation site surface and can be used in backfilling of the evaporation pond, septic tank pit and perimeter trenches. Stones/rocks

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- larger than 15 cm in diameter will need to be removed from all rehabilitation areas to prevent damage to the seeding machinery when biological rehabilitation is performed by OT Flora team.
- Any excess piles of earth materials must be removed from the rehabilitation site, it can be used in backfilling of trenches or pits either in the rehabilitation site or in other locations.
 - Excavated areas where the underground structures had been removed from must be backfilled with earth materials in order of deep excavation materials places first followed by subsoil filling, and finally the topsoil placed on top. Compaction must be completed before spreading topsoil.
 - Once the fenced area is flat (or shaped to a land form similar to the surrounding terrain) and clean, all surfaces (excluding the natural vegetation cover area) must be ripped to a depth of 30 cm to facilitate sufficient contact between the subsoil and topsoil layers. Skipping this requirement will result in erosion of topsoil cover by wind, and also such surface will not support re-vegetation, i.e. biological rehabilitation success.
 - The prepared surface will be covered with topsoil to a depth specified by Flora Research and Rehabilitation team.
 - The topsoil covered surface will be scarified in a perpendicular direction to North or North West.

4.8. Technical rehabilitation inspections

Rehabilitation requirements are summarized in approved LDPs and implementation of those is checked by Environmental Land and Flora Research and Rehabilitation team jointly in LDP-completion inspections. For the non-LDP lands, Environmental Land team provides a comprehensive guidance on technical rehabilitation implementation for successful outcome to Project coordinating teams and Contractors prior to rehabilitation commencement. Scope of technical rehabilitation work is identified through pre-rehabilitation site visits and prepared in a comprehensive document for the Project coordinating teams and Contractors' implementation.

Technical rehabilitation inspections conducted in the following steps:

- Project coordinating teams notify the Environmental Land team of technical rehabilitation completion.
- Environmental Land team schedules the technical rehabilitation inspection.
- Environmental Land team and Flora Research team jointly conducts technical rehabilitation inspection.
- Flora Research and Rehabilitation team checks implementation of requirements for topsoil cover and rocks removal, and provides Environmental Land team a conclusive commentary whether condition of the rehabilitated land is suitable for biological rehabilitation.
- Environmental Land team checks implementation of all requirements indicated in the scope of work for the particular site technical rehabilitation, and prepares a report with recommendations for improvements or conclusions for acceptance of the rehabilitated site, in LDP-completion inspection report form (Attachment B).
- Reports on successful completion of technical rehabilitation in off-lease areas are transferred to HSE Compliance team notifying the site is ready for returning to the local administration.

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- HSE Compliance team organizes State Inspections at the off-lease technical rehabilitation sites.
- Issuing Rehabilitation Acts, the local administration confirms the particular land is no longer of OT liability, however, OT remains responsible for completion of biological rehabilitation of this land.
- Successful technical rehabilitation lands will be registered in the OT geodatabase.

5. DEFINITIONS & ABBREVIATIONS

Borrow pit: An area where material (usually soil, gravel or sand) has been dug for use at another location

GPS: Global Positioning System

PMT: Project Management Team

LDP: Land Disturbance Permit

Rehabilitation: The measures and actions of returning disturbed land to a stable, self-sustaining landform that is compatible with the surrounding environment

Topsoil: A finite resource and a biologically active living component that is typically referred to an upper layer (i.e., "A" horizon) of the soil, it is essential for supporting the vegetation growth and creating new landscapes. Topsoil contains a natural seed bank, roots, microorganisms, organic contents and a high nutrient content. This can be easily damaged by disturbances such as tracking, excavating, etc.

6. REFERENCES AND RELATED DOCUMENTS

- MNS 5914:2008 Environment. Land Reclamation. Terms and Definitions
- MNS 5917:2008 Environment. Reclamation of land destroyed due to mining activities. General technical requirements
- Law on Subsoil, Article 20.2.4 Law on Subsoil
- Land Disturbance Control and Rehabilitation Plan (OT-10-E14-PLN-0001)
- Mine Closure Plan (OT-10-E14-PLN-0002)
- Atmospheric Emissions Management Plan (OT-10-E14-PLN-0001)
- Hazardous Materials and Non-mineral Waste Management Plan (OT-10-E15-PLN-0001)
- Land Disturbance Permit Procedure (OT-10-E14-PRC-0003)
- Topsoil Handling Procedure (OT-10-E14-PRC-0001)
- Biological Rehabilitation Procedure (OT-10-E14-PRC-0010)
- Chance Find Procedure (no reference number available)

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7. DOCUMENT CONTROL

File Name	OT-10-E14-PRC-0002-E-Technical Rehabilitation Procedure
Description	To provide guidance on steps for the rehabilitation of roads and tracks, borrow pits, drill holes and construction sites.
Original Author(s)	Roads and Tracks Rehabilitation Procedure (RTRP): Tsetsegsuren Luvsan Borrow Pits Rehabilitation Procedure (BPRP): Tsetsegsuren Luvsan Drill Hole Capping and Rehabilitation (DHCR): Enkhbayar Damdiimaa
Creation Date	RTRP: 2010.10.30 BPRP: 2010.12.02 DHCR: 2011.12.10
Approved By	Mark Newby, Environmental manager
Approval Date	2013.05.06
Change Record Number	##

Risk Ranking	Assessment Date	Risk Assessor	Review Schedule	Next Review Date
Moderate	2013.05.06	Dolgor Baasansuren	2 Yearly	2015.05.06

Version	Revision Date	Author(s)	Approved By	Revision Notes
1.0	2013.05.06	Tsetsegsuren.L Enkhbayar. D	Mark Newby	Combined OT rehabilitation documents for roads, tracks, borrow pits and drill holes into a single guidance document on rehabilitation procedures. Approved version.
1.1	2015.09.02	Tsetsegsuren L	Dennis Hosack	Revised the procedure name to fit to the scope of this procedure; aligned roles and responsibilities to the current practice in rehabilitation management at OT; updated references and related documents names; added necessary requirements and steps; removed Weed management section and requirements as related to biological rehabilitation procedure; added new sections on timing, completion criteria, topsoil reuse, inspections, and requirements for construction site technical rehabilitation.

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ATTACHMENT A: DRILL HOLE CAPPING AND REHABILITATION PROCEDURE / TASK STEPS

JOB STEP #	JOB STEP DESCRIPTION (List the stages in completing the job)	POTENTIAL HAZARDS (Environment, Safety & Health)	HAZARD MANAGEMENT (Describe how hazards will be controlled)
STAGE 1 PRESTART CHECK OF THE VEHICLES AND TOOLS			
1	Prestart check of vehicles	<ul style="list-style-type: none"> ▪ Lubricants, leakage of lubricants ▪ Hydraulics and break liquid leakage ▪ Other damages of the vehicles ▪ Safety devices not working 	<ul style="list-style-type: none"> ▪ Make the prestart check to every vehicle in accord with prestart record card and undergo the repair and maintenance if problem observed before operating it ▪ Read procedure GEN008
2	Check for broken or incomplete tools	<ul style="list-style-type: none"> ▪ Break of equipment at off-site area (tyre tear of and etc.) ▪ Get lost in the open field (Check for GPS failure) ▪ Get injured due to work with broken or improper tools at the work place 	<ul style="list-style-type: none"> ▪ Every day get used to making the prestart check to every tools and equipment in accord with prestart record card and undergo the repair and maintenance if problem observed before starting to operate it ▪ Check the GPS works, get ready its batteries and accessories in enough quantity
STAGE 2 LOADING, UNLOADING, TRANSPORTATION AND STORAGE			
3	Loading and unloading sand, cement and other raw materials	<ul style="list-style-type: none"> ▪ The leakage of cement causes littering to the environment ▪ Cement and dust may affect respiratory organs ▪ Cement and dust contacts eye causing irritation ▪ Cause skin dermatitis ▪ Backache and back injury due to lifting heavy load ▪ Overload may cause the vehicle damage 	<ul style="list-style-type: none"> ▪ Get acquainted with MSDS for Portland Cement before starting the work ▪ Work in accord with First Aid part of MSDS ▪ Wear PPE ▪ Use dust protective accessories ▪ Safety glasses, boots and gloves ▪ Make the sealing of the cement and sand bags well, avoid overloading them and putting them next to the item with sharp edges ▪ Load and unload heavy items in compliance with the Site Safety Standards and Procedures ▪ Load the vehicles for ¾ tons in accord with its capacity ▪ Put cement away from water
4	Safe driving on the way to and back from the work area	<ul style="list-style-type: none"> ▪ Driving accidents 	<ul style="list-style-type: none"> ▪ Follow procedure GEN008
5	Storing cement	<ul style="list-style-type: none"> ▪ Cause allergy, contacts eyes, affect respiratory organs, litter the environment 	<ul style="list-style-type: none"> ▪ Store away from acids and wet in the metal box or paper bags tightly sealed

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JOB STEP #	JOB STEP DESCRIPTION (List the stages in completing the job)	POTENTIAL HAZARDS (Environment, Safety & Health)	HAZARD MANAGEMENT (Describe how hazards will be controlled)
			<ul style="list-style-type: none"> In case of spillage, scrub out with spade accurately without causing dust
STAGE 3 DIGGING AND PREPARING DRILL HOLES			
6	Determine the drilled hole location with GPS, get prepared the hole for PVC piping by cleaning around the rim area of the hole, dig out 40 cm deep hole	<ul style="list-style-type: none"> Any incidents may occur at a time of digging the hole (hit legs or arms with crow bar) Manual handling injuries Drop the tools down the hole 	<ul style="list-style-type: none"> Wear PPE Put on dust preventive masks and glasses Safety boots Don't distract the attention of the worker digging the hole, work carefully with tools
STAGE 4 SETTING UP PVC TUBE AND CAVING WITH CEMENT MUD			
7	Put the 2 or 3 m PVC tube down the hole with leaving 50 cm of it on the surface. Spike a 50 cm wooden stake aligning with it to keep the PVC tube stable.	<ul style="list-style-type: none"> Dropping the PVC tube down the hole 	<ul style="list-style-type: none"> Have one person hold the PVC
8	Prepare mud by mixing the cement, sand and gravels in percentage of 30x50x20. Before pouring the cement put the 60x60 cm mould around the PVC tube. Pour 7-8 cm cement into the mould and place 4x4 cm checked 40x10 cm iron cages. It prevents cement from tearing apart and keeps it solid. Afterwards pour the cement aligning with the edge of the mould. The mould height must be approximately 15 cm.	<ul style="list-style-type: none"> Risks may occur with regard to mixing the cement: <ul style="list-style-type: none"> allergy eye contact affect respiratory organs litter of the environment 	<ul style="list-style-type: none"> Getting mud mixed in the 2/3 tons of the mud bucket Mix mud observing the wind flow direction Wear PPE Safety boots, glasses, mask and boots
STAGE 5 NUMBERING, TAGGING and CLEANING THE AREA			
9	Before the cement hardens put the number of the hole embedding with gravels of 10 mm size making it visible	<ul style="list-style-type: none"> Skin irritation in contact with cement 	<ul style="list-style-type: none"> Wear gloves
10	On the aluminium sheet engrave the number of the hole, punch it in at the upper edge of the PVC	<ul style="list-style-type: none"> Puncher staple may spring into the eye 	<ul style="list-style-type: none"> Wear PPE Safety glasses Safety boots Safety gloves
11	Clean up the hole surrounding area and throw away the trash	<ul style="list-style-type: none"> Slip and skid incident Finger and arm cut 	<ul style="list-style-type: none"> Observe the cleaning area Wear PPE



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JOB STEP #	JOB STEP DESCRIPTION (List the stages in completing the job)	POTENTIAL HAZARDS (Environment, Safety & Health)	HAZARD MANAGEMENT (Describe how hazards will be controlled)
		<ul style="list-style-type: none">▪ Dust, dirt may contact with eyes at the time of cleaning trash▪ Trash may blow all over at a time of cleaning trash	<ul style="list-style-type: none">▪ Safety glasses▪ Safety boots▪ Safety gloves▪ Put the trash into bag and tie it
STAGE 6 PHOTO PROTOCOL AND CREATING DATABASE			
12	Capture a photo of the capped holes and record it	N/A	N/A
13	Enter the details of the capping and the photo into the database	N/A	N/A

