 ETHEKWINI MUNICIPALITY

Occupational Health & Safety Unit

**Baseline Risk Assessment in terms of Construction Regulation 5.1(a)**

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| Document Title | Baseline Risk Assessment in terms of Construction Regulation 5.1(a) |
| Client | eThekwini Municipality – road provision |
| Project Name | Upgrade of 121612STR from gravel to concrete surface Ntuzuma ward 45 |
| Contract Number | 1R- |
| Revision | 01 |
| Date | 22/09/2022 |
| Internal Reference no. | BRA 34/09/2022 |
| Compiled by (Safety officer) | Siziwe Chiliza  Signature: |
| Reviewed by (Manager: Safety& Risk) | Arty Zondi  Signature: |

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| MAIN  ACTIVITY | |  | Site Establishment | | | | | | | | |
|  | **REF NO** |  | **SUB ACTIVITY** |  | **SAFETY RISKS** | **HEALTH RISK** |  | **ENVIROMENTAL RISK** |  | **PUBLIC RISK** | **RECOMMENDED RISK CONTROL MEASURE** |
| 1.1 | |  | Travel to site | * Potholes * Undulating roads * Poor visibility | | * Fatigue | * Oil/diesel spillages | | * Community livestock * Other vehicles driving recklessly * Pedestrians * Construction works on public road | | * All drivers to be deemed competent * No staff to travel in rear of vehicles with equipment * All equipment to be secured during transport * All vehicles to be road worthy * No drivers/Operators to be under the influence of alcohol or drugs of any kind. * Inspection Records must be kept for all vehicles and plant. |

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| 1.2 | | Site clearance and  de-vegetation | * Poor traffic control * Incompetent drivers * inadequate signage’s * Moving of construction vehicles and vehicle colliding * Snakes   insect bites  & stings | | * Back strain * cuts, * Abrasion * heat exhaustion * noise exposure * dust inhalation | * Spilling of oil diesel, petrol * Contamination of ground | * Tripping hazard * dust inhalation * intermittent noise level | * All staff to have medicals done by an occupational medical   practitioner prior to commencement of work. All workers to have valid medicals with annexure 3 documents signed and stamped by  Occupational Medical  Practitioner with records in file.   * All staff to work under supervision * Dust suppression is to be maintained * Responsible 8.1 to ensure Instructions are given on Manual handling using Safe Work Procedure (SWP) for Manual Handling. * Only Licensed and Appointed Mechanical Aids Operators (i.e.   Crane Operators, TLB operators, Bobcat Operators, etc.) to operate plant on site.   * Inspection & Maintenance records must be maintained for all mechanical aids on site. |

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| 1.3 | | Site fencing | * Pinch points from manual handling * Trip hazards * Underground services | | * Heat exposure * Dust * Noise * Chemical burns/ contact dermatitis from cement and eye   injuries from cement splashes | Hydrocarbon spills | * Unauthorised persons entering site * School learners entering site * Damage to underground services | * All contractor staff and local labour to be inducted of all “no go” areas * All staff have company logo PPE with name tags * Contractor staff to work within designated areas only * Contractor to conduct DSTI’s (Daily Safety Task Instruction) and communicated at the beginning of the shift daily. DSTI close out to be conducted and attendance registered signed by all staff. * Flagman to be provided to ensure vehicles are guided onto site. * Wear hand protection (PVC Gloves), safety glasses and face shield always by the operator of the concrete chute. * Concrete spillages to be cleaned up and concrete truck chute to be cleaned in concrete wash area. * Stacking & Storage Supervisor to be appointed to control lay down areas. |

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| 1.4 | | Placing of mobile offices | * Use of mechanical aids for offloading * Failure of lifting   equipment   * Fall from heights * Manual handling * Mechanical aids overturning * Overhead power lines | | * Noise * Hand and body injuries * Heat exposure * Dust exposure | Hydrocarbon spills | * Exposure to dust * Interaction of machinery and learners | * All operators to be deemed competent * All riggers to be deemed competent * All lifting equipment to be. load tested * Flagman/banksman to be present on-site during movement of plant * Access control to be managed on site * All staff to have the required PPE * Staff working at heights to be trained for heights safety * Contractor to conduct DSTI’s (Daily Safety Task Instruction) and communicated at the beginning of the shift on a daily basis. DSTI close out to be conducted and attendance registered signed by all staff. * Ensure Offloading area is clear, level, secure and free from slip trip and falling hazards. * Mechanical Aids must be operated in accordance with the operators training and manufacturers guidelines |

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| 1.5 | | Connection of power supply | Electrocution Hand injuries | | Heat exhaustion | None | Interruption of power supply | * Only authorised person to do electrical connection * A COC is to be provided for all electrical works done * Monthly inspections to be done for all temporary electrical connections * Contractor is to be responsible for power consumption * Required agreements to be in file for electrical usage |
| 1.6 | | Water supply | Injuries during the laying of water pipes | | Drinking water which is not safe for human consumption | None | Theft of water by residents | * All drinking water is to be labelled/sign posted * Water use is to be managed on site * The location of standpipes to be correctly positioned to mitigate theft of water from site |
| 1.8 | | Construction of staff facilities: eat area/toilets/ change area | * Manual handling * Fall from heights * Hand injuries * Use of portable electrical power tools | | * Electrocution * Dust exposure * Heat exposure | None | None | * Separate facilities for both male and female * Drinking water to be provided for staff on site * If portable toilets are to be used required service slips are to be maintained on site * Staff facilities area to be suitable for staff use |

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| MAIN  ACTIVITY | | Construction Works | | | | | | |
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| 2.1 | | Site survey | * Trips and falls * Injuries from use of hand   tools | | * Heat exhaustion * Dust exposure | Use of cement for markings contamination | * Trips and falls * Unauthorised entrance | * Works to be supervised * DSTI to be done * Lime to be used for ground markings * Required PPE to be used * All survey pegs to be made visible * If steel is to be used rebar caps are to be fitted onto them |
| 2.2 | | Mechanical excavations | * Machinery collides with people * Collision with machinery * Fall into open excavation * Collapse of side walls | | * Dust exposure * Back injuries * Noise exposure | Hydrocarbon spills | * Dust exposure * Collision with machinery | * DSTI to be done * All staff to have the required PPE * All plant to be inspected before use * All open excavations to be netted off and sign posted * Excavated spoil to be 500mm away from edge of excavation * Nil staff to be in any excavation when machinery in use |
| 2.3 | | Manual excavations | * Slips and falls * Fall into open excavations * Collapse of side walls | | * Dust exposure * Back injuries * Heat exhaustion | None | Fall into open excavations | * All staff to be trained in safe works procedure * All spoil to be away from edge of excavation * Ladders to be provided for access and egress from excavations |

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| 2.4 | | | Unsafe stacking and storage practices | * Manual handling injuries * Pinch points * Slips and trips | | | Back injuries | None | None | | * Required PPE to be used * DSTI to be done * All works to be supervised * All steel to be stacked within a designated area |
| 2.5 | | | Installation of Temporary  Electrical Installations | * Use of hand tools injuries * Trips and falls * Collapse of excavation side walls * Contact with machinery | | | * Chemical burns from concrete * Heat exhaustion * Dust exposure | Ground contamination | Collision with pedestrians | | * DSTI to be done * Flagman to direct all trucks to site * All staff to have the required PPE when handling concrete * Nil staff to be in foundation during discharge of concrete into excavation * Delivery trucks to use designated access * Washing of truck chutes to be done within a concrete wash area |
| 2.6 | | | Housekeeping | * Manual handling injuries * Trips and falls | | | * Dust exposure * Back strains * Ergonomically injuries | Ground contamination due to mixing of mortar on natural ground | Unauthorised access to site | | * Proper stacking of bricks to be done * Movement of bricks to be done with proper wheelbarrows * All staff to have required PPE * A platform to be created for mixing of mortar * Housekeeping to be maintained on site |

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| 2.7 | | Site Induction | * Struck by machinery * Manual handling injuries * Fires | | * Dust exposure * Heat exhaustion * HAVS * Noise | Hydrocarbon spills | Unauthorised access | * All staff to have required PPE * DSTI to be done * All works to be supervised * Safe works procedure to be done and communicated to staff * Risk assessments to be communicated by means of training |
| 2.8 | | Setting up of temporary road works signage | * Struck by machinery * Placing of incorrect signage at locations | | incident  Damage to property | Environmental degradation | None | The Contract   * Manager must ensure that a suitable site-specific Traffic Management Plan is developed and implemented and a competent Traffic Safety Officer |
| 2.9 | | Public vehicular and pedestrian traffic travelling on the public road during construction work | * injuries * car collision | |   incident  Damage to property | None | None | * All works to be supervised   All All temporary road traffic signage must  comply with the   * SARTSM * Flagman to direct all vehicles to site |
| 2.10 | | Layer works (asphalt layer) | * Use of hand tools injuries * Trips and falls * Contact with machinery   Respiratory failure     * Burns | | * Chemical burns from asphalt * Heat exhaustion * High temperature of product | Ground contamination | none | * Flagman to direct all vehicles * All staff to have the required PPE when handling asphalt * Delivery trucks to use designated access * All spills to be cleaned and disposed   Enforced reverse alarms to be fitted Application of dust masks |

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| 2.11 | | Backfilling | * Manual handling injuries * Trips and falls | | * Dust exposure * Back strains * Ergonomically injuries * Heat exhaustion | Ground contamination due to mixing of mortar on natural ground | Unauthorised access to site | * All staff to have required PPE * A platform to be created for mixing of mortar * Waste skips to be provided on site * All asphalt waste to be properly disposed on site * Housekeeping to be maintained on site |
| 2.12 | | Refuelling plant and equipment | Extremely flammable, high hazard. The liquid can release vapours at temperature below ambient which forms flammable mixtures | | Heat exhaustion | Ground contamination due to mixing of mortar on natural ground | Unauthorised access to site | * Required appointments to be in file * All works to be supervised   Remove all sources of ignition. Contain and   * collect spillage with non-combustible absorbent materials. Place in a suitable container for disposal in accordance with waste regulations |

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| 2.13 | Excavator Plate compactor, Bomag roller, Front end loader, Mobile crane  TLB, milling machine, paver, excavator, skid steer(bobcat), rollers (steel drum/ rubber tyre) grader, insist recycler, chip spreader, bitumen distributor(tanker) | * Collapse of scaffolding * Slips and falls * Fall from heights/ elevated   positions | Heat exhaustion | None | Unauthorised access to site | * All staff will be deemed fit for work with medicals records in file * Required PPE will be provided for staff * All works to be supervised |

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| 2.15 | Employees working in close proximity to  moving machinery Exposure to noise | noise | | noise | | none | | No unauthorised access | | * All power tools to be inspected before use. Records to be in file * Housekeeping to be maintained on site   Employee to make use of SABS approved hearing protection, supervisor to ensure that the correct P.P.E is used. Task to be supervised by a competent supervisor |
| 2.16 | * Hazardous chemical substances | | injuries  Contact with skin/ eyes    Inhalation or indigestion | | Skin irritation, burns or infections Could cause loss in eyesight | |  | | * Required PPE to be used * DSTI to be done * All works to be supervised * All steel to be stacked within a designated area * Exposed rebar to be fitted with rebar caps * All power tools to be inspected before use. | |
| 2.17 | Neighbouring business and public exposed to the nature of the construction activities | | * Dust exposure * Heat exhaustion | | Dust pollution | | Unauthorised access to site | | Communication with neighbouring business is critical.  Health risk must be communicated to all   * employees’ dust, noise generated out of the construction work must be managed * Fence constructed to approved standard | |

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| 2.18 | Emergency Preparedness, Emergency Drill & Evacuation | No training  No implementation Planning done  Failure to have a basic site-specific Emergency Management Plan | Person/s unprepared to respond to the emergency at hand | none | none | The Construction Manager must  ensure that a site specific Emergency Management Plan is developed for implementation.  Adequate number of employees trained in  the use of fire equipment |
| 2.17 | Utilizing incompetent Sub-  Contractors | * Use of hand tools injuries * Trips and falls * Contact with machinery | * Chemical burns from concrete * Heat exhaustion * Dust exposure | Ground contamination | Collision with pedestrians | The Construction Manager must be reasonably satisfied that the Sub  Contractors intended to be appointed have the necessary competencies and resources to carry out the work safely |
| 2.18 | Brickwork at manholes | * Manual handling injuries * Use hand   tools injuries | * Ergonomical injuries * Heat exhaustion | None | None | * DSTI to be done * Risk assessment and SWP to be communicated to all staff * All power tools to be inspected before use * Fall arrest equipment to be used at all heights |

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| 2.19 | Mixing mortar | * Unsafe * electrocution * loading strain | Loading / unloading material | none | none | The Construction Manager must ensure that a SWP is developed implemented about safe lifting and loading procedures  All work needs to be supervised |

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| 2.20 | Install Geosynthetic layer | Poor Ergonomics may result in muscular skeletal injuries | * Ergonomical injuries * Heat exhaustion | None | None | The Construction Manager must ensure that workers are trained in the risk of ergonomically injuries and methods to mitigate the risks |

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| 3.3 | Construction of drains | * Trips and falls * Manual handling injuries * Underground services * Open excavations | * Dust exposure * Heat exposure * Ergonomical injuries * Noise exposure | None | None | * All works to be supervised * DSTI to be done * Risk assessments & SWP to be done * All open excavations to be netted off * Access and egress to be provided for all open excavations * All spoil to be away from excavation side wall |

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| 3.4 | Pouring Ready Mix concrete | * Noise * Dust * Bumping against, * Concrete truck tipping over | * noise induced hearing loss | None | None | * flag person required and Visual check required * Wearing required PPE |
| 3.5 | Waste removal | * Noise * Dust * Bumping against, * Struck by flying items | * cuts and abrasions * dust inhalation * noise induced hearing loss | None | None | * Safe & proper use of hand tools * Wearing required PPE * practise of proper manual lifting of material |

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| 3.9 | Inlet and outlet structures | * Use of hand tools injuries * Trips and falls * Contact with machinery * Working in a restricted area * Manual handling | * Dust exposure * Ergonomical injuries * Chemical burns | None | None | * Safe & proper use of hand tools * Wearing required PPE * practise of proper manual lifting of material * Supervise the works by a competent supervisor |
| 3.10 | Working with hot asphalt | * lack of proper access / working platform |  Heat exhaustion | None | None | * DSTI to be done * Risk assessment and SWP to be communicated to all staff * Scaffold to be erected by competent person * Scaffold to be erected as per   SANS 10085   * Supervise the works by a competent supervisor * Staff to be trained for work at heights * Fall arrest equipment to be used at all heights * Adequate lighting to be provided |

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| 6.3 | Cleaning tools with solvent | * Use of power tool – electrocution * Manual handling * Work in restricted area |  Dust exposure | None | None | * All power tools to be inspected before use * DSTI to be done * Risk assessment/SWP to be done and in file * All staff to have required PPE |
| 6.5 | Manual lifting of tool | * Fall from heights * Fall of * equipment from heights | * Dust exposure * Heat exhaustion * Manual exertion | None | None | * Work platform to be inspected * Full supervision at all times * Staff to have fall arrest equipment in use * Manual lifting techniques to be practiced at all times |
|  | Welding, flame cutting, soldering and similar operations | * Fumes inhalation * Eye injury | * Chest pain * heat | none | none | * Proper PPE required * Close supervision |

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| 7.1 | Inlet and outlet structures | Struck by vehicle | heat | none | none | Traffic management plan required |
| 7.2 | Applying tack | Eye injury | contamination | none | none | Close supervision all the time |

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| 8.1 | Site levelling using excavator/  bob cat | * Trips and falls * Exposed survey pegs * Use of hand tools | * Heat exposure * Noise exposure | Hydrocarbon spills | * Pedestrians exposed to machinery * Accidents | * Works to be supervised * Staff to use required PPE * Dust suppression to be maintained * Refuelling to be done in designated areas * Rebar caps to be fitted on exposed pegs * Risk assessments and SWP to be done for staff * All plant operators to be deemed competent * Flagman to be present on site |
| 8.2 | Backfill and compaction of other layers | * Manual handling * Trips and falls * Use of mobile plant accidents | * Heat exhaustion * Dust exposure * Noise exposure | Hydrocarbon spills | * Pedestrians exposed to machinery * Accidents | * Works to be supervised * Staff to use required PPE * Dust suppression to be maintained * Refuelling to be done in designated areas * Rebar caps to be fitted on exposed pegs * Risk assessments and SWP to be done for staff * All plant operators to be deemed competent * Flagman to be present on site |
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| 8.4 | Concreting of walkways/ driveway | * Use of hand tools injuries * Trips and falls * Collapse of excavation side walls * Contact with machinery | * Chemical burns from concrete * Heat exhaustion * Dust exposure | Ground contamination | Collision with pedestrians | * DSTI to be done * Flagman to direct all trucks to site * All staff to have the required PPE when handling concrete * Nil staff to be in foundation during discharge of concrete into excavation * Delivery trucks to use designated access * All spills to be cleaned and disposed |

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| MAIN  ACTIVITY | | COVID 19 | | | | | | | | | | | | |
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| 9.1 | | Travel to site  Deliveries -use of public transport | | * Nil   decontamination  of public transport   * Passengers in public transport   not using face  masks   * Nil social distancing in public transport * Nil   decontamination of supplies and  deliveries | | | * Staff contracting the virus during use of public transport * Staff contracting virus during handling of contaminated   supplies | | | None | | | None | * All staff to ensure that they use a face mask and sanitise when using the public transport * Contractor could arrange for a dedicated transport for all staff to and from work. * Staff are not to use their work PPE when travelling on public transport. * All staff to follow decontamination procedures when entering work site |
| 9.2 | | Management to prepare site before construction works commence | | * Nil   decontamination of offices and facilities   * Failure to align policies and procedures to COVID 19 virus | | | * Returning staff not provided with COVID related PPE and disinfectants * Possible contamination   to staff | | | none | | | Unauthorised persons  entering site | * Management to ensure all   offices, facilities are disinfected with proper disinfectants   * Overgrown vegetation to be cut before any staff can return to site * Required COVID 19 PPE is to be purchased and made available for staff when project   commences |
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|  | Site preparation | | * Failure to display related signage’s   for site access due to COVID virus.   * Nil PPE and sanitisers (COVID related) for staff   to return to work   * Management not inducted/educate   d on COVID 19 | | | Staff returning to work are not educated on  policy changes  Management  unable to provide correct  information to  staff on COVID 19 issues | | | none | | | none | | * Required access control signage’s (COVID related) to be displayed at main entrance * Management to rearrange   facilities area to ensure social distancing   * Policies and procedures (COVID related) to be amended and approved before site can reopen. This is to be communicated to all staff * An induction program (COVID 19) is to be prepared which is to be communicated to all staff when project commences * Required sanitisers and disinfectants to be purchased and made available before project commences * Contractor to ensure required staff information form pertaining to COVID 19 is available which is to be filled out by each staff * Adequate hazardous waste bins to be made available on site |
| 9.3 | Entering of construction work site | | Staff fail to use required PPE | | | Staff may be infected with the virus | | | none | | |  | |  All staff to follow the required social distancing when at main entrance |
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|  | Entering construction work | | * Congestion of staff at main entrance to site * Failure of contractor to screen staff entering site * Staff not maintaining   social distancing | |  Staff spreading of the virus to  other staff | | | none | | | none | | | * Due to lockdown, staff are to declare their movement, medical history during lockdown. These records are to   be kept on site for record/tracing purposes   * All staff are to be tested as per contractor’s protocol to enter the site. Taking of staff temperature and desensitising of entire staff. An infrared thermometer is to be used. * Contractor to ensure all staff conducting the required testing is provided with the required PPE and is supervised by management. * Staff are not permitted to enter the site with their work PPE. Work PPE is to be left on site when leaving site to prevent   possible contamination of work PPE   * Any staff tested with a high temperature or signs of COVID is to follow the quarantine procedure until staff can be tested by the DOH for possible COVID 19 infection. |

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| 9.4 | Work tasks | * Nil social distancing on   site   * Staff socialising on site * Staff not using their required   PPE to prevent COVID  infections | * Spreading of the virus to other staff * Possible infections | none | Possible closure of site due to  infection | * Identified tasks are to be evaluated to encourage social distancing * All staff to have the required   PPE when on site   * Staff to decontaminate all tools and workspace prior to any activity * Monitoring to be done by management * Inductions to be done for all staff on social distancing whilst at work. * Failure of staff to comply with COVID control measures are to be removed off site. |

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| **REF NO** | **SUB ACTIVITY** | **SAFETY RISKS** | **HEALTH RISK** | **ENVIROMENTAL RISK** | **PUBLIC RISK** | **RECOMMENDED RISK CONTROL MEASURE** |
| 9.5 | Use of  facilities during break intervals | * Nil social distancing * Nil hygiene been maintained   at break intervals   * Nil paper towel provided for   staff at wash facilities   * Lack of chairs for staff at   facilities area | * Possible contamination   of staff   * Staff not practising adequate hygiene control measures * Possible spread of virus * Inadequate provision of hand wash   /sanitisers for  staff | none | none | * Breaks are to be staggered to allow social distancing of staff * All staff are to take their breaks at the identified facilities area * Layout of facilities area to be planned to encourage social distancing * Table and chairs to be disinfected before and after all break intervals * Toilets to be disinfected at frequent interval. * Adequate hand wash and   sanitisers are to be provided for  staff to frequently wash their  hands   * Paper towels to be provided for staff use * Labelled bins to be provided for all hazardous waste * Staff are not to share any meals or utensils * Staff are not to leave the site to purchase any meals |
| 9.6 | Use of jackhammer | * Injuries * Noise * Loss limb | * vibration | none | none | * Tools need to be inspected * Safety team supervisor |
| 9.10 | Ground water | * Injuries * Wet soil * Soil erosion | * Ground seepage | Rock formations  Water  Wet soil | none | * Proper PPE required * Close supervision |
| 9.11 | Slope stability | * Multiple injuries * Cracks caused by compacting * fatality | * Excavation collapsed | Rock formation |  | * Racking back required * Close supervision * PPE required |
| 9.12 | excavation | * Collapsed and cause multiple injury * fatality | * vibration |  |  | * Competent person to check on excavation * Close supervision on blasting * Notification for blasting |