Basic infrastructure Operations

Level I

NTQF

Learning Guide-59

Unit of Competence: Conduct Local Risk Control
Module Title: Conducting Local Risk Control
LG Code: CON BIO1M01 L15-LG-59
TTLM Code: CON BIO1 TTLM 1019v1

LO 1: Identify hazards

Instruction Sheet	Learning Guide #59

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- compliance documentation
- Risk control Application
- Inspecting of work area.
- Understanding safety systems information.
- Type and scope of hazards.

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, **upon completion of this Learning Guide, you will be able to**:

- Access, interpret and apply compliance documentation relevant to conduct local risk control
- Inspect work area conditions to identify potential ***hazards***in the workplace.
- Access and apply relevant safety systems information to eliminate situations covered by existing and adequate procedures.
- Recognize the type and scope of unresolved hazards and their likely impact.

- **Learning Instructions:**

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3,Sheet 4,Sheet 5”.
4. Accomplish the “Self-check 1,Self-check t 2, Self-check 3, Self-check 4, Self-check 5” **in page -6, 9, 12 and 14**respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceedto “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3” **in page -15.**
6. Do the “LAP test” **in page – 16** (if you are ready).

Information Sheet-1	• compliance documentation

1.1. Interpreting compliance documentation

In the process of Risk Management The document describes how

- The Risk Identification
- Qualitative Risk Analysis
- Quantitative Risk Analysis
- Risk Response Planning
- Risk Monitoring and Control

- **Identifying hazards in a work place**

Hazard: Anything (e.g. condition, situation, practice, behavior) that has the potential to cause harm, including injury, disease, death, environmental, property and equipment damage. A hazard can be a thing or a situation.

A hazard is simply a condition or a set of circumstances that present a potential for harm.

Hazards are divided into two broad categories

- Health hazards (cause occupational illnesses)
- Safety Hazards (cause physical harm - injuries)

Hazard Identification: This is the process of examining each work area and work task for the purpose of identifying all the hazards which are “inherent in the job”. Work areas include but are not limited to machine workshops, laboratories, office areas, construction and horticultural environments, stores and transport, maintenance and grounds, reprographics, and lecture theatres and teaching spaces. Tasks can include (but may not be limited to) using screen based equipment, audio and visual equipment, industrial equipment, hazardous substances and/or teaching/dealing with people, driving a vehicle, dealing with emergency situations, construction. This process is about finding what could cause harm in work task or area.

Notices:-

- Hazards are the main cause of occupational health and safety problems.
- Therefore, finding ways of eliminating hazards or controlling the risks is the best way to reduce workplace injury and illness.

✓ **Hazards may be identified in:**

- Environments (light, noise, rain, heat, sun)
- Substances (pesticides, fuels, dusts)
- Workplace layout (parlor designs, cattle passes)
- Work organization (unnecessary manual handling)
- Equipment (ladders, squeeze chutes, crowd gates)

- Heights (roofs, vertical and horizontal silos, manure pits)
- Electricity (switches, cables, leads, power tools, connections)

✓ **Hazards may be identified by:**

- Observation- use your senses of sight, hearing, smell and touch - combined with knowledge and experience.
- Material Safety Data Sheets (MSDSs)- obtain them from manufacturers and suppliers. Read them carefully to identify possible harm from hazardous substances and precautions that needs to be taken.
- Hazard and risk surveys- conduct hazard spotting surveys of main work areas. Talk to others about their safety concerns.
- Children and visitors- include in your surveys areas and activities in which children or visitors could be at risk.
- Record analysis- keep records of identified hazards, near misses, injuries and workers' compensation claims to help identify possible trends.
- Discussion groups- are useful for identifying hazards and recommending solutions.
- Safety audits- consider creating a safety committee to investigate safety and help prepare a management plan.
- Information- keep informed of hazards in the industry through the latest available information.
- Consumer information- carefully read and follows consumer guidelines on equipment and substances

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1._____are useful for identifying hazards and recommending solutions.

A.Consumer information B. Discussion groups

C. Safety audits D.Children and visitors

2. _____keep records of identified hazards, near misses, injuries and workers' compensation claims to help identify possible trends.

A. Information B.Hazard and risk surveys

C. Record analysis D.Observation

Note: **Satisfactory rating - 3 and 5 points Unsatisfactory - below 3 and 5 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Information Sheet-2	Risk control Application

2.1. Risk control

Risk analysis is to be carried out with proper perception of risk and cost involved in Analysis. Some practical measures of hazards are:

- ✓ Keeping workplace clear of waste or flammable materials
- ✓ Using of fireproof blankets or other fire suppression methods or equipment
- ✓ Removing flammable materials or storing them correctly
- ✓ Providing adequate firefighting equipment
- ✓ Worker fire fighting training
- ✓ Eliminating ignition sources from flammable atmospheres
- ✓ Providing shade structures
- ✓ Providing protective clothing and sunscreen
- ✓ Using of traffic signal people
- ✓ Traffic spotters within work zones
- ✓ Installing temporary traffic signals
- ✓ Using safety signs
- ✓ Guarding of rotating plant and hand tools
- ✓ Fitting noise suppression to noisy plant and equipment
- ✓ All personnel to wear appropriate hearing protectors
- ✓ Using gloves, respirators suitable to substance, protective closes.
- ✓ Hazardous substances & dangerous goods stored and labeled correctly
- ✓ Provide mechanical or other types of ventilation of extraction where necessary.
- ✓ Provide appropriate hard hat, safety boots, clothing appropriate

All accidents reduce efficiency and effectiveness. They are furthermore, symptoms that something is wrong. Because accidents stem from lack of control over workers, materials, processes, and environment lack of control will inevitably detract from an efficient and effective operation

A good production supervisor likes to operate on schedule. He wants to know that he has some one available to handle each job. He wants to know each day how close each job is to completion. Efficient production demands effective planning.

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. ----------is to be carried out with proper perception of risk and cost involved in Analysis. Some practical measures of hazards

A. Risk analysis. C.operation

B. production. D. planning.

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Information Sheet-3	Inspecting of work area.

3.1. Inspection of work area

Hazards can be introduced over time as conditions on the job site change, for example, as the building goes up, equipment or tools become worn, different trades arrive at and depart from the site, and housekeeping practices decline. Setting aside time to frequently and regularly inspect the job site for hazards can help identify shortcomings so that they can be addressed before an incident occurs.

- **How to accomplish it**

Designate a competent person to conduct frequent and regular inspections of the job sites, materials, and equipment. Have workers on the inspection team, and talk to them about hazards that they see or report.

Plan ahead to anticipate the potential introduction of additional hazards by the next group of trades or sequence of construction activities and to address these additional hazards. For example, ensure that structures can handle any additional anticipated loads.

Be sure to document inspections so you can later verify that hazardous conditions have been corrected. Take photos or video of problem areas to facilitate on-the-job discussion and brainstorming about how to immediately control them.

Include all areas and activities in these inspections, such as trenching and excavations, staging areas, layout yards, working at heights, materials storage, heavy equipment maintenance, and the activities of on-site contractors, subcontractors, and temporary workers.

Regularly inspect both mobile construction equipment (e.g., forklifts, bulldozers, aerial lifts and cranes) and transportation vehicles (e.g., cars, trucks).

Create material delivery areas and internal traffic control plans for the construction site and lay down areas.

Use checklists that highlight things to look for. Typical hazards fall into several major categories, such as those listed below; each workplace will have its own list:

The site is the permanent working place for masons, concrete workers and others. While masons and concrete workers are permanently on one site from the beginning to the end other trades as painters, plasterers and tile layers are more or less short time workers and will leave the site after their work is done.

With working place or area including equipment, machines, storerooms and places in meant. A neat and tidy site safes time, eases the work, avoids accidents.

We have to know and understand what influences the health and safety culture of our organization.
Key points:

- ✓ We will develop a personal understanding of the influence different levels of management have on the organizational climate of an organization.
- ✓ We will make sure that all managers are committed to promoting health and safety.
- ✓ We will develop an open and honest organization, which is as receptive to bad news as it is to good news.
- ✓ We know that improving 'worker health and safety motivation' is fundamental to improving safety. I must ensure this phrase is understood and we all take action to ensure it happens. I must convince key groups such as supervisors of their importance to our safety culture.
- ✓ Corporate social responsibility principles tell me that it makes sound business sense to manage all business risks effectively.

Our performance measures show how well we are controlling our major hazards. Health and safety performance is an important element of performance reviews. Managers are accountable for the health and safety performance of their departments. They have specific and reasonable responsibilities

Self-Check -3	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1.----------isthe permanent working place for masons, concrete workers and others.

A. Storerooms
B. Site
C.organization
D. All

Note: **Satisfactory rating –3 and 4 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-4	Understanding safety systems information

4.1. safety systems information

Successful businesses increasingly encourage active participation of the workforce in the management of health and safety. We will ensure that we are tapping the knowledge of how to do things better, more simply and more safely, that resides in the large number of people who work for us. This includes our contract force and workforce representatives.

Employees must:

- ✓ take care of the health and safety of themselves and other workers

Follow the safety rules

- ✓ use personal protective equipment
- ✓ understand emergency procedures of Injury/Incidents/ Hazards

Safety policy deals with the followings-

- ✓ Arrangement of training at all levels,
- ✓ particular attention to the key workers i.e.,
- ✓ safflowers & crane operators whose mistake is especially dangerous for others
- ✓ Safe method & system for hazardous operations.

Self-Check -4	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

Matching

A	B
1. Follow the safety rules	A..Arrangement of training at all levels
2. Safety policy deals	B. use personal protective equipment
	C. Employees

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Information Sheet-5	Type and scope of hazards

5.1. Types of Risks

The following are some types of unresolved hazards

- ✓ Traffic hazards
- ✓ Consequential Risk- Loss of production
- ✓ Generation of and exposure to excessive noise
- ✓ Contact with chemicals or other substances
- ✓ Falling of stationery objects
- ✓ Persons Fall from height
- ✓ lose your balance
- ✓ Caught between crushed
- ✓ Overstress, collapse
- ✓ Biological hazards
- ✓ Plant or vehicle overturn
- ✓ Construction material Risk

Major types of environmental risk associated with the impacts include:

- ✓ Earth-moving, removal of vegetation, filling of wetlands, and similar activities can severely degrade habitat.
- ✓ Runoff from dewatering and storm water can erode the site, and can cause downstream degradation of water resources.
- ✓ Heavy equipment exhaust can degrade air quality through fine particulates and ozone precursors.

5.2. Simple Arithmetic Application for Risk Ranking of Hazards

Accident is an event which is unplanned, undesired, unexpected and uncontrolled & which may or may not result in damage to property or injury to person or both in the course of the employment.

If you have safety questions about any equipment, chemical, or process in the lab, do not hesitate to ask lab personnel for information.
Hazards can be:

- Chemical hazards
- Physical hazards

- Chemical hazards fall into 4 main categories:
  Flammables, Corrosives, Reactive and Health hazards
- Physical includes (but not limited to):
  Compressed gases, Electrical equipment, Lasers, Thermal hazards and Radiation.
  - Do not touch any chemicals in a lab.

Self-Check -5	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1is an event which is unplanned, undesired, unexpected and uncontrolled & which may or may not result in damage to property or injury to person or both in the course of the employment.

A. Safety

.C.Simple

B.Accident

D. None

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

List of Reference Materials

1. https://www.who.int/foodsafety/risk-analysis/risk-management/en/
2. https://flylib.com/books/en/1.468.1/identifying_project_resource_risk.html
3. https://www.intechopen.com/page/contact-us
4. https://survey.charteredaccountantsanz.com/risk_management/midsize-firms/treat.aspx

Basic infrastructure Operations

Level I

NTQF

Learning Guide-60

Unit of Competence: Conduct Local Risk Control
Module Title: Conducting Local Risk Control
LG Code: CON BIO1M15 LO2-LG-60
TTLM Code: CON BIO1 TTLM 1019v1

LO 2: Assess risk and identify unacceptable risk

Instruction Sheet	Learning Guide #60

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Assessment and determination of consequence of risk
- Identify criteria and Assess risk
- identifying unacceptable risk

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, **upon completion of this Learning Guide, you will be able to**:

- Assess and determine ***consequence***if the event should occur
- Consider and determine *likelihood* of the event
- Identify criteria for the acceptability/unacceptability of the *risk* or source from the appropriate party
- Assess risk against criteria to identify if it warrants ***'unacceptable risk'***status and either action or refer to the appropriate party.

- **Learning Instructions:**

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2 and Sheet 3”.
4. Accomplish the “Self-check 1,Self-check 2 and Self-check 3” **in page -6, 9, 12 and 14**respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3” **in page -15.**
6. Do the “LAP test” **in page – 16** (if you are ready).

Information Sheet-1	Assessment and determination of consequence of risk

1.1. Identification of risk

For most small businesses, and the self-employed, the hazards will be easy to identify. Project risk is defined as a “combination of probability of an event occurring and its consequences for project objectives”,

Involving staff in the process of identifying and managing risks is a key aspect of managing health and safety successfully. We know that there are a number of ways of involving ourselves in improving our management of health and safety, for example (but not exclusively) using safety representatives (unionized or non-unionized), safety committees and work councils.

- Use the Risk / Hazard Identifier to recognize known and potential Risk / Hazards in your work area.
- It is designed to be an aid in situational assessments before you begin a job.
- Before beginning a job, select a category and read the questions that identify some risks and/or hazards that you feel are problems for you on this job assignment.

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1.----------is a key aspect of managing health and safety successfully.

A.designedC. Job

B. process D.managing risks

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Information Sheet-2	Identify criteria and Assess risk

2.1.Identify criteria and Assess risk against to it

For this part the questions to the respondent focused on what is being done regarding risk identification, how it is done and by whom. To get the respondents thinking, the questions were frequently reformulated during the interviews.

Risks are identified early in the process, before the bid. It could be all kinds of risks such as technical risks, environmental risk, in other words anything that could jeopardize the project.

Steps to risk assessment;

- ✓ Look for hazards that may result in harm when driving on public roads
- ✓ Decide who might be harmed
- ✓ Evaluate the risk and decide whether existing precautions are adequate or more should be done
- ✓ Record your findings
- ✓ Review your assessment and revise it if necessary

We often make a choice that will have consequences in our risk environment. Good choices tend to reduce variability in income without changing the likely level of income received; bad choices will increase variability for any given level of income, or increase variability and reduce income. In this sense, we manage risk by making the right choices.

There are three possible interpretations:

- ✓ First, more risk might refer to a higher likelihood or probability of an adverse outcome, a hazard or peril, or a potential loss,
- ✓ Second, it might refer to the magnitude of a loss should it occur,
- ✓ Third, risk might refer to a combination of its expected value and loss.

The interpretation of a “risky” outcome is pretty important. Unacceptable risk to the farm business may come from an event with a low probability of occurrence but the outcome is a huge loss. For example, a flood that destroys ditches may only occur once every hundred years – but the loss might wipe out the construction business. To most producers this is a “risky” event because the loss is large. Fortunately, we might be able to transfer some of the risk using insurance. Conversely, an unacceptable risk might also result from a relatively modest size of loss that has a high probability of occurring or even a relatively small loss that is happens frequently.

- **Assessing risk against criteria**

A risk assessment is simply a careful examination of what, in your workplace, could cause harm to people, so that you can determine whether you have taken enough precautions or should do more to prevent harm. Workers and others have a right to be protected from harm caused by a failure to take reasonable control measures. Accidents and ill health can ruin lives and affect your business too if output is lost, machinery is damaged, insurance costs increase or you have to go to court. WRAP and the law in many countries require you to assess the risks in your workplace so that a plan is put in place to control the risks.

- **How to assess the risks in your workplace**

Follow these five steps:

- ✓ Step 1 Identify the hazards
- ✓ Step 2 Decide who might be harmed and how
- ✓ Step 3 Evaluate the risks and decide on precautions
- ✓ Step 4 Record your findings and implement them
- ✓ Step 5 Review your assessment and update if necessary

When thinking about your risk assessment, remember:

- a hazard is anything that may cause harm, such as chemicals, electricity, working from ladders, an open drawer etc;
- the risk is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.

Step 1: Identify the hazards

First you need to work out how people could be harmed. When you work in a place every day it is easy to overlook some hazards, so here are some tips to help you identify the ones that matter:

- Walk around your workplace and determine what could reasonably be expected to cause harm.
- Ask your employees or their representatives what they think. They may have noticed things that are not immediately obvious to you
- check manufacturers' instructions or data sheets for chemicals and equipment as they can be very helpful in spelling out the hazards and putting them in their true perspective.
- Have a look back at your accident and ill-health records – these often help to identify the less obvious hazards.
- Remember to think about long-term hazards to health as well as safety hazards

Examples:	
-cord running through the aisle	-exposure to harmful substances
-product sitting in front of emergency exit door	-missing needle guard
-high levels of noise	-cracks in the wall

Step 2: Decide who might be harmed and how

For each hazard you need to be clear about who might be harmed; it will help you identify the best way of managing the risk. That doesn't mean listing everyone by name, but rather identifying groups of people.

In each case, identify how they might be harmed (i.e., what type of injury or ill health might occur).

Remember

- Some workers have particular requirements (e.g., new and young workers, new or expectant mothers and people with disabilities may be at particular risk).

Extra thought will be needed for some hazards

- cleaners, visitors, contractors, maintenance workers etc., who may not be in the workplace all the time
- ask your staff if they can think of anyone you may have missed.

Examples	
Who is at risk?	**What are they at risk of?**
1. Workers in the storage room	1. In danger of something falling on them from a shelf.
2. Pregnant female using chemicals	2. Unborn child may be at risk of developing disease or illness
3. Any/all workers in areas with blocked exits/escape paths	3. Not being able to escape in case of emergency

Step 3: Evaluate the risks and decide on precautions

Having spotted the hazards, you then have to decide what to do about them. WRAP and some laws require you to do everything 'reasonably practicable' to protect people from harm. The easiest way is to compare what you are doing with best practice

First, look at what you're already doing; think about what controls you have in place and how the work is organized. Then compare this with best practice and see if there's more you should be doing to bring yourself up to standard. In asking yourself this, consider:

- Can I get rid of the hazard altogether?
- if not, how can I control the risks so that harm is unlikely?

When controlling risks, apply the principles below and, if possible, in the following order: Try a less risky option;

- prevent access to the hazard;
- organize work to reduce exposure to the hazard;
- issue personal protective equipment; and
- provide welfare facilities (onsite clinic, eye washing station, etc.

Step 4: Record your findings and implement them

Putting the results of your risk assessment into practice will make a difference when looking after people and your business. Writing down the results of your risk assessment, and sharing them with your staff, encourages you to do this.

When writing down your results, keep it simple, for example 'Tripping over rubbish: bins provided, staff instructed, weekly housekeeping checks', or 'Fume from welding: local exhaust ventilation used and regularly checked', or "all fire doors to be kept clear at all times" or only one electrical plug to be used per electrical socket".

We do not expect a risk assessment to be perfect, but it must be suitable and sufficient. You need to be able to show that:

- a proper check was made;
- you asked who might be affected;
- you dealt with all the significant hazards, taking into account the number of people who could be involved;
- the precautions are reasonable, and the remaining risk is low; and
- You involved your staff or their representatives in the process.
- You must show documented evidence of this process.

A good plan of action often includes a mixture of different things such as

- a few cheap or easy improvements that can be done quickly, perhaps as a temporary solution until more reliable controls are in place;
- Long-term solutions to those risks most likely to cause accidents or ill health;
- Long-term solutions to those risks with the worst potential consequences;
- Arrangements for training employees on the main risks that remain and how they are to be controlled;
- Regular checks to make sure that the control measures stay in place; and
- clear responsibilities – who will lead on what action, and by when.

Step 5: Review your risk assessment and update if necessary

Your workplace will inevitably change over time. Sooner or later, you will bring in new equipment, substances and procedures that could lead to new hazards. It makes sense, therefore, to review what you are doing on an ongoing basis. WRAP recommends conducting a risk assessment, at the minimum, once a year or more to make sure you are still improving, or at least not sliding back.

Look at your risk assessment again. Have there been any changes? Are there improvements you still need to make? Have your workers spotted a problem? Have you learned anything from accidents or near misses? Make sure your risk assessment stays up to date.

When you are running a business it's all too easy to forget about reviewing your risk assessment – until something has gone wrong and it's too late. Why not set a review date for this risk assessment now? Write it down and note it in your calendar as an annual event

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1.One of the followingis not A good plan of action often includes a mixture of different things such as

A. Long-term solutions to those risks most likely to cause accidents or ill health

B. Short-term solutions to those risks with the worst potential consequences

C. Regular checks to make sure that the control measures stay in place

D. clear responsibilities – who will lead on what action, and by when.

2.One of the following is not a step How to assess the risks in your workplace

A.Decide who might be harm and how

B. Evaluate the risks and decide on precautions

C. Record your findings and implement them

D. Review your assessment and update if necessary

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Information Sheet-3	Identifying unacceptable risk

3.1. Types of unacceptable risk

- **Design Risks**
  - ✓ Design incomplete
  - ✓ Unexpected geotechnical or groundwater issues
  - ✓ Inaccurate assumptions on technical issues in planning stage
  - ✓ Surveys incomplete
  - ✓ Changes to materials/geotechnical/foundation
  - ✓ Bridge site data incomplete to DES
  - ✓ Hazardous waste site analysis incomplete
  - ✓ Unforeseen design exceptions required
  - ✓ Consultant design not up to Department standards
  - ✓ Unresolved constructability items
  - ✓ Complex hydraulic features
  - ✓ Unable to meet Americans with Disabilities Act requirements
  - ✓ Project in a critical water shortage area and a water source agreement required
  - ✓ Incomplete quantity estimates
  - ✓ Unforeseen construction window and/or rainy season requirements
  - ✓ New or revised design standard
  - ✓ Construction staging more complex than anticipated
- **External Risks**
  - ✓ Landowners unwilling to sell
  - ✓ Local communities pose objections
  - ✓ Unreasonably high expectations from stakeholders
  - ✓ Political factors or support for project changes
  - ✓ Stakeholders request late changes
  - ✓ New stakeholders emerge and request changes
  - ✓ Threat of lawsuits
  - ✓ Increase in material cost due to market forces
  - ✓ Water quality regulations change
  - ✓ New permits or additional information required
  - ✓ Reviewing agency requires longer than expected review time
  - ✓ Changes to storm-water requirements
  - ✓ Permits or agency actions delayed or take longer than expected
  - ✓ New information required for permits
  - ✓ Environmental regulations change
  - ✓ Controversy on environmental grounds expected
  - ✓ Pressure to deliver project on an accelerated schedule
  - ✓ Labor shortage or strike
  - ✓ Construction or pile driving noise and vibration impacting adjacent businesses or residents

- **Environmental Risks**
  - ✓ Environmental analysis incomplete
  - ✓ Availability of project data and mapping at the beginning of the environmental study is insufficient
  - ✓ New information after Environmental Document is completed may require re-evaluation or a new
  - ✓ document (i.e. utility relocation beyond document coverage)
  - ✓ New alternatives required to avoid, mitigate or minimize impact
  - ✓ Acquisition, creation or restoration of on or off-site mitigation
  - ✓ Environmental clearance for staging or borrow sites required
  - ✓ Historic site, endangered species, riparian areas, wetlands and/or public park present
  - ✓ Design changes require additional Environmental analysis

- **Organizational Risks**
  - ✓ Inexperienced staff assigned
  - ✓ Losing critical staff at crucial point of the project
  - ✓ Insufficient time to plan
  - ✓ Unanticipated project manager workload
  - ✓ Internal “red tape” causes delay getting approvals, decisions
  - ✓ Functional units not available, overloaded
  - ✓ Lack of understanding of complex internal funding procedures
  - ✓ Priorities change on existing program
  - ✓ Inconsistent cost, time, scope and quality objectives
  - ✓ Overlapping of one or more project limits, scope of work or schedule
  - ✓ Funding changes for fiscal year
  - ✓ Lack of specialized staff (biology, anthropology, geotechnical, archeology, etc.)
  - ✓ Capital funding unavailable for right of way or construction

- **Project Management Risks**
  - ✓ Project purpose and need is not well-defined
  - ✓ Project scope definition is incomplete
  - ✓ Project scope, schedule, objectives, cost, and deliverables are not clearly defined or understood
  - ✓ No control over staff priorities
  - ✓ Consultant or contractor delays
  - ✓ Estimating and/or scheduling errors
  - ✓ Unplanned work that must be accommodated
  - ✓ Lack of coordination/communication
  - ✓ Underestimated support resources or overly optimistic delivery schedule
  - ✓ Scope creep
  - ✓ Unresolved project conflicts not escalated in a timely manner
  - ✓ Unanticipated escalation in right of way values or construction cost

- ✓ Delay in earlier project phases jeopardizes ability to meet programmed delivery commitment
- ✓ Added workload or time requirements because of new direction, policy, or statute
- ✓ 32 Project Risk Management Handbook
- ✓ Appendix C: Sample Risk List
- ✓ Local agency support not attained
- ✓ Public awareness/campaign not planned
- ✓ Unforeseen agreements required
- ✓ Priorities change on existing program
- ✓ Inconsistent cost, time, scope, and quality objective

- **Right of Way Risks**
  - ✓ Utility relocation requires more time than planned
  - ✓ Unforeseen railroad involvement
  - ✓ Resolving objections to Right of Way appraisal takes more time and/or money
  - ✓ Right of Way datasheet incomplete or underestimated
  - ✓ Need for “Permits to Enter” not considered in project schedule development
  - ✓ Condemnation process takes longer than anticipated
  - ✓ Acquisition of parcels controlled by a State or Federal Agency may take longer than anticipated
  - ✓ Discovery of hazardous waste in the right of way phase
  - ✓ Seasonal requirements during utility relocation
  - ✓ Utility company workload, financial condition or timeline
  - ✓ Expired temporary construction easements
  - ✓ Inadequate pool of expert witnesses or qualified appraisers

- **Construction Risks**
  - ✓ Inaccurate contract time estimates
  - ✓ Permit work window time is insufficient
  - ✓ Change requests due to differing site conditions
  - ✓ Temporary excavation and shoring system design is not adequate
  - ✓ False work design is not adequate
  - ✓ Unidentified utilities
  - ✓ Buried man-made objects/unidentified hazardous waste
  - ✓ Dewatering is required due to change in water table
  - ✓ Temporary construction easements expire
  - ✓ Electrical power lines not seen and in conflict with construction
  - ✓ Street or ramp closures not coordinated with local community
  - ✓ Project Risk Management Handbook 33
  - ✓ Appendix C: Sample Risk List
  - ✓ Insufficient or limited construction or staging areas
  - ✓ Changes during construction require additional coordination with resource agencies

- ✓ Experimental or research features incorporated
- ✓ Unexpected paleontology findings
- ✓ Delay in demolition due to sensitive habitat requirements or other reasons
- ✓ Long lead time for utilities caused by design and manufacture of special components (steel towers or special pipe

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1.One of the following is not a Right of Way Risks

A.Utility company workload, financial condition or timeline

B. New temporary construction easements

C.Utility relocation requires more time than planned

D. Unforeseen railroad involvement

2. One of the following is not a Project Management Risks

A. Project purpose and need is not well-defined

B. Project scope definition is incomplete

C. Project scope, schedule, objectives, cost, and deliverables are not clearly defined or understood

D. More control over staff priorities

3. One of the following is not aDesign Risks

A. Design incomplete

B. Unexpected geotechnical or groundwater issues

C. Accurate assumptions on technical issues in planning stage

Surveys incomplete

D. Hazardous waste site analysis incomplete

4.WhichOne of the following is Construction Risks

A.Change requests due to differing site conditions

B. Public awareness/campaign not planned

C. Unforeseen agreements required

D. Priorities change on existing program

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

List of Reference Materials

5. https://www.who.int/foodsafety/risk-analysis/risk-management/en/
6. https://flylib.com/books/en/1.468.1/identifying_project_resource_risk.html
7. https://www.intechopen.com/page/contact-us
8. https://survey.charteredaccountantsanz.com/risk_management/midsize-firms/treat.aspx

Basic infrastructure Operations

Level I

NTQF

Learning Guide-61

Unit of Competence: Conduct Local Risk Control
Module Title: Conducting Local Risk Control
LG Code: CON BIO1M15 LO3-LG-61
TTLM Code: CON BIO1 TTLM 1019v1

LO 3: Identify, assess and implement risk treatments

Instruction Sheet	Learning Guide #61

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Risk treatment options
- preliminary analysis and consideration of possible options
- Implementation of the risk treatment.
- identification of resource requirements
- selecting most appropriate action
- Review of risk management

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, **upon completion of this Learning Guide, you will be able to**:

- Identify and consider all possible ***risk treatment options***
- Identify options by preliminary analysis and consideration of possible options
- Analyze options, including the identification of resource requirements
- Select most appropriate action for dealing with the situation
- Plan and prepare the course of action in detail and acquire/ obtain required resources.
- Implement the risk treatment.
- Review risk management processes.

- **Learning Instructions:**

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3, Read the information written in the information “Sheet 1, Sheet 2, Sheet 3,Sheet 4,Sheet 5 and Sheet 6”.
4. Accomplish the “Self-check 1,Self-check t 2, Self-check 3, Self-check 4, Self-check 5 and Self-check 6” **in page -6, 9, 12 and 14**respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3” **in page -15.**
6. Do the “LAP test” **in page – 16** (if you are ready).

Information Sheet-1	Risk treatment options

1.1.Risk treatment

Risk identification has the least systems and tools related to it. Still, it may be the most important and time-consuming step in the above process.

- **Implementation of the risk treatment**

After the risks have been identified, they must be evaluated in terms of the probability of occurrence and impact. An understanding of the possible effects on project objectives is needed: since most projects have only a limited amount of resources to use for risk management, concentration on only the major risks is essential.

- ✓ Assess likelihood and possible severity of injury
- ✓ Determine how to best minimize risk
- ✓ Address high risk hazards first
- ✓ The same hazard could lead to several outcomes
- ✓ Consider likelihood of each possibility
- ✓ Prioritize

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1.One of the following is not a major riskinImplementation of the risk treatment

A. Assess likelihood and possible severity of injury
B. Determine how to best maximize risk
C. Address high risk hazards first
D. Consider likelihood of each possibility

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Information Sheet-2	**preliminary analysis and consideration of possible options**

2.1. **Preliminary risk management activities** comprise the initial process. It includes the establishment of a risk profile to facilitate consideration of the issue within a particular context, and provides as much information as possible to guide further action. As a result of this process, the risk manager may commission a risk assessment as an independent scientific process to inform decision-making.

2.2. **Evaluation of risk management options** is the weighing of available options for managing a food safety issue in light of scientific information on risks and other factors, and may include reaching a decision on an appropriate level of consumer protection. Optimization of food control measures in terms of their efficiency, effectiveness, technological feasibility and practicality at selected points throughout the food-chain is an important goal. A cost-benefit analysis could be performed at this stage.

2.3. **Implementation of the risk management decision** will usually involve regulatory food safety measures, which may include the use of HACCP. Flexibility in the choice of individual measures applied by industry is a desirable element, as long as the overall programmed can be objectively shown to achieve the stated goals. Ongoing verification of the application of food safety measures is essential.

2.4. **Monitoring and review** is the gathering and analyzing of data so as to give an overview of food safety and consumer health. Monitoring of contaminants in food and forborne disease surveillance should identify new food safety problems as they emerge. Where there is evidence that required public health goals are not being achieved, redesign of food safety measures will be needed.

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Preliminary risk management activities comprise the initial process
   a) True
   b) false
2. Evaluation of risk management options is the weighing of available options for managing a food safety issue in light of scientific information on risks
   a) True
   b) False

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Information Sheet-3	Implementation of the risk treatment.

3.1.Risk treatment options

Risk management systems are used in companies and organizations to ensure the control of risks in the business process.

Risk management is generally a part of other management systems such as quality, environmental or work environmental management systems.

The current focus on risk management should be regarded as a complement and a development of the already implemented quality management systems used by companies. Risks related to the work environment are highly regulated by laws and regulations.

The risk management process in its simplest approach has been chosen. The risk process consists of the risk analysis followed by the risk response. Risk analysis refers to the inclusion of identification and assessment,
Risk identification has the least systems and tools related to it.

Self-Check -3	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1.----------is generally a part of other management systems such as quality, environmental or work environmental management systems

a) current focus
b) assessment
c) Risk management
d) identification

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Information Sheet-4	Identification of resource requirements

Definition of risk

Risk is defined in terms of uncertain events which may have positive or negative effect on the project objectives. Risks include circumstances or situations, the existence or occurrence of which, in all reasonable foresight, results in an adverse impact on any aspect of the implementation of the project. Various definitions of risks are presented in Table 1.

Sl. no	Source	Definition
1	Project Management Institute [10]	An uncertain event or a condition that if it occurs has a positive or negative effect on project objectives
2	Institute of Risk Management [7]	The combination of a probability of an event and its consequences
3	Association of Project Management Body of Knowledge [1]	Project Risk is an uncertain event or condition, that, if it occurs, has a positive/negative effect on project objectives. A risk has a cause and if it occurs, a consequence.
4	British Standard BS IEC 62198:2001	Combination of probability of an event occurring and its consequences on project objectives
5	www.business.dictionary.com/definition/risk.html	A probability or threat of damage, injury, liability, loss, or any other negative occurrence that is caused by external or internal vulnerabilities and that may be avoided through preemptive action.
6	Fundamentals of Risk Management [9]	"A chance or possibility of danger, loss, injury or other adverse consequences" and the definition of risk is "exposed to danger." However, taking risk can also result in positive outcome. A third possibility is risk related to uncertainty of outcome.
7	Adams [8]	Risk is the probability "that a particular adverse event occurs during a stated period of time, or results from a particular challenge."
8	Philosophy of Risk [3]	Risk has been interpreted as Risk = hazard × exposure where Hazard is defined as the way in which a thing or situation can cause harm and exposure as the extent to which the likely recipient of the harm can be influenced by the hazard

Table 1.
Definitions of risk.

2. Classification of risks

Classification and definition of risks is furnished in Table 2.

Risk	Definitions
Pure risk	A risk which has chance of loss or no loss. **Example**. A building may get affected by fire or not. These are best covered by insurance
Speculative risk	Involves chance of gain/loss. **Example**. A builder may take a risk by promoting a new venture depending upon the prevailing conditions in the vicinity of proposed project, but it may bring him gain/loss.
Fundamental risk	These are external to a project and which, if they materialise, would be on a large scale and cannot be prevented. These risks are associated with major natural, economic, political or social changes and generate large scale losses. Examples are: Floods, earthquakes, fluctuation of exchange rates, etc. This risk may or may not be insurable.
Particular risk	These are project specific risks and are identified within the parameters of a project and can be controlled during the implementation of a project, e.g. quality risks, safety risks, legal risks, etc.

4.1. Sources of Resource Risk

Resource risks represent less than one-third of the records in the PERIL database. There are three categories of resource risk: *people*, *outsourcing*, and *money*. People risks arise within the project team. Outsourcing risks result from the use of people and services outside the project team to perform critical project work. The third category, money, is something of an anomaly in the data, as very few of the problems reported were *primarily* about funding. Money is, however, a key factor in many of the people and outsourcing problems, and the effect of insufficient funding on projects has substantial impact on a project in many other ways. The summary shows:

RESOURCE RISKS	COUNT	CUMULATIVE IMPACT (WEEKS)	AVERAGE IMPACT (WEEKS)
People	45	194	4.3
Outsourcing	17	109	6.9
Money	2	58	29.0

The root causes of people and outsourcing risk are further characterized by type, and a Pareto chart of overall impact by type of risk is summarized in Figure 5-1. Although risks related to internal staffing dominate the resource risk data, the single most damaging factor is delay associated with outsourced work.

Self-Check -4	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Risks related to people represent the most numerous resource risks, accounting for more than two-thirds of the incidents

a) People Risks
b) Money risk
c) Environmental risk
d) Geological risk

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Information Sheet-5	selecting most appropriate action

5.1. Document the Risks

Resource risks become visible throughout the planning and scheduling processes. Resource risks discussed in this chapter include:

- Activities with unknown staffing
- Understaffed activities
- Work that is outsourced
- Contract risks
- Activities requiring a unique resource
- Part-time team members
- Remote team members
- The impact of the work environment
- Budget requirements exceed the project objectives

Add each specific risk discovered to the list of scope and schedule risks, with a clear description of the risk situation. This growing risk list provides the foundation for project risk analysis and management.

Key Ideas for Identifying Resource Risks

- Identify all required skills you need for which you lack named, committed staffing.
- Determine all situations in the project plan where people or other resources are overcommitted.
- Find all activities with insufficient resources.
- Identify uncertain activity effort estimates.
- Note outsourcing risks.
- Gain funding approval early for needed training, equipment purchases, and travel.
- Ascertain all expected project costs.

Self-Check -5	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Identifying Resource Risks is

a) Find all activities with insufficient resources.
b) Identify uncertain activity effort estimates.
c) Note outsourcing risks.
d) Ascertain all expected project costs
e) all.

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Information Sheet-6	Review of risk management

6.1.Risk management

Risk management is one of the most critical project management practices to ensure a project to be successfully completed.

“Experience has shown that risk management must be of critical concern to project managers, as unmanaged or unmitigated risks are one of the primary causes of project failure.”

Risk management is thus in direct relation to the successful project completion. Project management literature describes a detailed and widely accepted risk management process, which is constructed basically from four iterative phases: risk identification, risk estimation, risk response planning and execution, often managing the risk management process are included.

Risk management courses for all construction project parties to increase the level of knowledge of formal risk management processes and understanding its benefits would increase the willingness to invest in risk management and capabilities to do it.
Risk management requires statistical techniques.

- ✓ Avoidance
- ✓ Reduction
- ✓ Transfer and
- ✓ Assumption.

Let’s talk about each of these in turn.

- ✓ **Avoidance-** Planning activities or structuring the business so that risks are avoided.
- ✓ **Reduction-** Taking action to reduce the uncertainty. It is a process of reducing the probability of occurrence for the outcome.
- ✓ **Transfer-** The act of shifting risk to another. We have to make a decision about the risk we are willing to transfer, and should be cognizant of what it costs us, both directly in terms of a fee and indirectly in terms of a foregone opportunity, to do so.
- ✓ **Assumption-** Recognizing and accepting risk that would have been borne by another party. Recognizing and accepting risk that would have been borne by another party.

What risks are present in our business environment? Five different categories for describing risk: production risk, market risk, legal/institutional risk, human relations risk and financial risk. All those risks have either positive or negative sides.

Self-Check -6	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1._____Is aPlanning activities or structuring the business so that risks are avoided.

A. Reduction B. Avoidance

C. Assumption D. Transfer

2. _____Is Recognizing and accepting risk that would have been borne by another party.

A.Assumption. B. Transfer

C. Reduction D. Avoidance

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

List of Reference Materials

9. https://www.who.int/foodsafety/risk-analysis/risk-management/en/
10. https://flylib.com/books/en/1.468.1/identifying_project_resource_risk.html
11. https://www.intechopen.com/page/contact-us
12. https://survey.charteredaccountantsanz.com/risk_management/midsize-firms/treat.aspx

Basic infrastructure Operations

Level I

NTQF

Learning Guide-62

Unit of Competence: Conduct Local Risk Control
Module Title: Conducting Local Risk Control
LG Code: CON BIO1M15 LO4-LG-62
TTLM Code: CON BIO1 TTLM 1019v1

LO 4: Complete records and Reports

Instruction Sheet	Learning Guide #62

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Information communication methods and techniques
- Methods and techniques record and reporting

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, **upon completion of this Learning Guide, you will be able to**:

- Communicate information on the course of action and implementation
- Complete records and reportsfor hazards and actions from personal risk assessment as specified by legislation and site requirements.

- **Learning Instructions:**

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3, Read the information written in the information “Sheet 1, and Sheet 2,”.
4. Accomplish the “Self-check 1, and Self-check 2,” **in page -6, 9, 12 and 14**respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3” **in page -15.**
6. Do the “LAP test” **in page – 16** (if you are ready).

Information Sheet-1	Information communication methods and techniques

1.1.Information communication

Information can be transmitted through: Telephones, Letters, e-mail etc.

- **Channel of communication:**

  - ✓ Verbal Communication Channels
    - ➢ Face-To-Face meetings,
    - ➢ Telephones,
    - ➢ Video Conferencing

  - ✓ Written Communication Channels
    - ➢ Letters,
    - ➢ e-Mails,
    - ➢ Memos,
    - ➢ Reports.

- **Strengths and Weaknesses**

  - ✓ Verbal Communication:

Strength-Role of Body Language.

Weakness - Not possible to give long list of directions

- ✓ Written Communication:

Strength- A proof of a communication

Weakness- Written words does not show a person's actual feelings.

The Engineer will produce as necessary technical reports and position papers dealing with technical matters arising during the project. In particular, for each major design change, the Engineer shall prepare a detailed design review report containing:

- ➢ The data on which the original as-tendered design was based
- ➢ A complete record of all new design data relevant to the design review
- ➢ An as-built record showing the location and detailed dimensions of all work carried out to date under the contract
- ➢ A copy of all previously approved Change Orders and Contract Addenda
- ➢ A copy of the Contractor's bid, including all the tendered unit prices and detailed unit price analyses
- ➢ A description of the design assumptions adopted where these differ in any way from the standards adopted for the project
- ➢ Drawings clearly showing both the original design and the proposed revised design
- ➢ A rescheduled list of quantities and costs, relevant to the proposed revised design and

- Drawings showing the exact location of the proposed design changes can be reported.

Employees shall report any suspected illegal or unethical conduct connected with the business of your organization. The following summarizes a sample's Reporting of Illegal or Unethical Conduct Policy:

- Any employee who observes any activity which he or she believes is illegal or unethical shall advise his or her supervisor and the appropriate controlling department.

- If a supervisor receives such a report, the supervisor must quickly advise the Internal Auditing Department, Human Resources Department, the Law Organization or the Business Integrity Office.

- The Internal Auditing Department, Human Resources Department or the Law Organization shall investigate the allegations quickly and take necessary and appropriate action.
- If requested by the employee source, the organization will treat the employee's identity and the alleged illegal or unethical conduct as strictly confidential information.

- No employee shall be discharged, disciplined, or otherwise disadvantaged in his or her career or suffer any other form of reprisal as a result of having reported in good faith suspected illegal or unethical conduct by others under this policy

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. _____Is not the types of Channel of communication

a) Letters,
b) e-Mails,
c) Memory
d) Reports

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Information Sheet-2	Methods and techniques record and reporting

2.1.Methods and techniques of reporting

All employee accidents must also be reported. Accidents must be reported to the Risk Management Department immediately by telephone. The supervisor will complete an "Employers First Report of Injury" and submit the original to the Risk Management Department with the Accident Investigation Report within two days of the reported accident.

Report can be presented by:
Oral report (with little short note)
Written report (totally written)

The report of all the accidents must include the following details:

- Name of organization and department of working
- Date of accident,
- Name of injured person.
- Home address of the employee,
- Time of the accident.
- Name of the supervisor.
- First aid given
- Details about previous disability of working,If yes, whether investigation about accidents conducted, Report of investigation
- Name of person who first reported about the accident along with witness
- Investigation report.

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. The report of all the accidents must include the following except
   a) Name of organization and department of working
   b) Date of collection,
   c) Name of injured person.
   d) Home address of the employee,

Note: **Satisfactory rating –3 points** **Unsatisfactory - below 3 and 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Operation Sheet 1	Dividing Line in to Two (bisecting line)

1.1. Steps of bisecting a line

Steps 1-Place your compass point on A and stretch the compass MORE THAN half way to point B.
Steps 2-With this length, swing a large arc that will go BOTH above and below segment AB.
Steps 3-Without changing the span on the compass, place the compass point on B and swing the arc again. The new arc should intersect the previous one above and below the segment AB.
Steps 4-With your scale/ruler, connect the two points of intersection with a straight line.
Steps 5-This new straight line bisects segment AB. Label the point where the new line and AB cross as C.Segment AB has now been bisected and AC = CB.

Operation Sheet 2	Dividing angle in to Two(bisecting angle)

2.2. Steps in bisecting an angle

1. Place the point of the compass on the vertex of angle BAC (point A).
2. Stretch the compass to any length so long as it stays ON the angle.
3. Swing an arc with the pencil that crosses both sides of angle ABC. This will create two intersection points (E and F) with the sides of the angle.
4. Place the compass point on E, stretch your compass to a sufficient length and draw another arc inside the angle - you do not need to cross the sides of the angle.
5. Without changing the width of the compass, place the point of the compass on F and make a similar arc. These two small arcs in the interior of the angle should be crossing each other.
6. Connect the point of intersection of the two small arcs to the vertex A of the angle with a straight line.

Operation Sheet 3	Reading maps and sketch

3.1. Steps for Reading maps and sketch are;

Steps 1-Understanding your map needsMap symbols explained, Map scale: What it means
Step 2-Understanding your map 1. The basicsfeatures that most maps will include:
Step 3-Understanding your map 2. Grid lines explainedGrid references, National Grid lines
Step 4-Understanding your map 3. Reading contours and relief
Step 5-Understanding your map 4. Orienting your map
Step 6-Understanding your map 5. Using your compassAdjustments for magnetic variation, A word of caution

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 8-12 hours.

Task 1:bisect a line

Task 2:bisect an angle

Task 3: Read maps and sketch

List of Reference Materials

13. https://www.who.int/foodsafety/risk-analysis/risk-management/en/
14. https://flylib.com/books/en/1.468.1/identifying_project_resource_risk.html
15. https://www.intechopen.com/page/contact-us
16. https://survey.charteredaccountantsanz.com/risk_management/midsize-firms/treat.aspx

The trainers (who developed the LEARNING GIDE)

No	Name	Level	Emil
1	GirumTadesse	B	Girumtadesse2011gmail.com
2	Wegderesfwkadu	B	Meherete2009@gmail/com
3	Begnakumsa	B	Begnakumsa5@gmail/com
4	MohammedNurgeba	B	mnurgeba@yahoo.com
5	Tihtenatadele	B	

The facilitator (who the LEARNING GIDE)

No	Name	Qualification level	TVET Bureau
1	AYELE ESHETE	A	(ADIS ABABA TVET Bureau)

Lo 2

1. B. Discussion groups
2. C. Record analysis

1. A Risk analysis
2. D ,All

1. A.. use personal protective equipment
2. B. Arrangement of training at all level

1. B. New temporary construction easements
2. D More control over staff priorities
3. D Accurate assumptions on technical issues in planning stage
4. Surveys incomplete
5. A Change requests due to differing site conditions

Lo 3

Self check 1

1. Determine how to best maximize risk

Self check 2

1. **True**
2. **True**

Self check 3

1. Risk management

Self check 4

1. People risk

Self check 5

1. D, all

Self check 6

1. B, avoidance
2. A, assumption

Lo 4

Self check 1

1. **C, memory**

Self check 2

1. B, date of collection