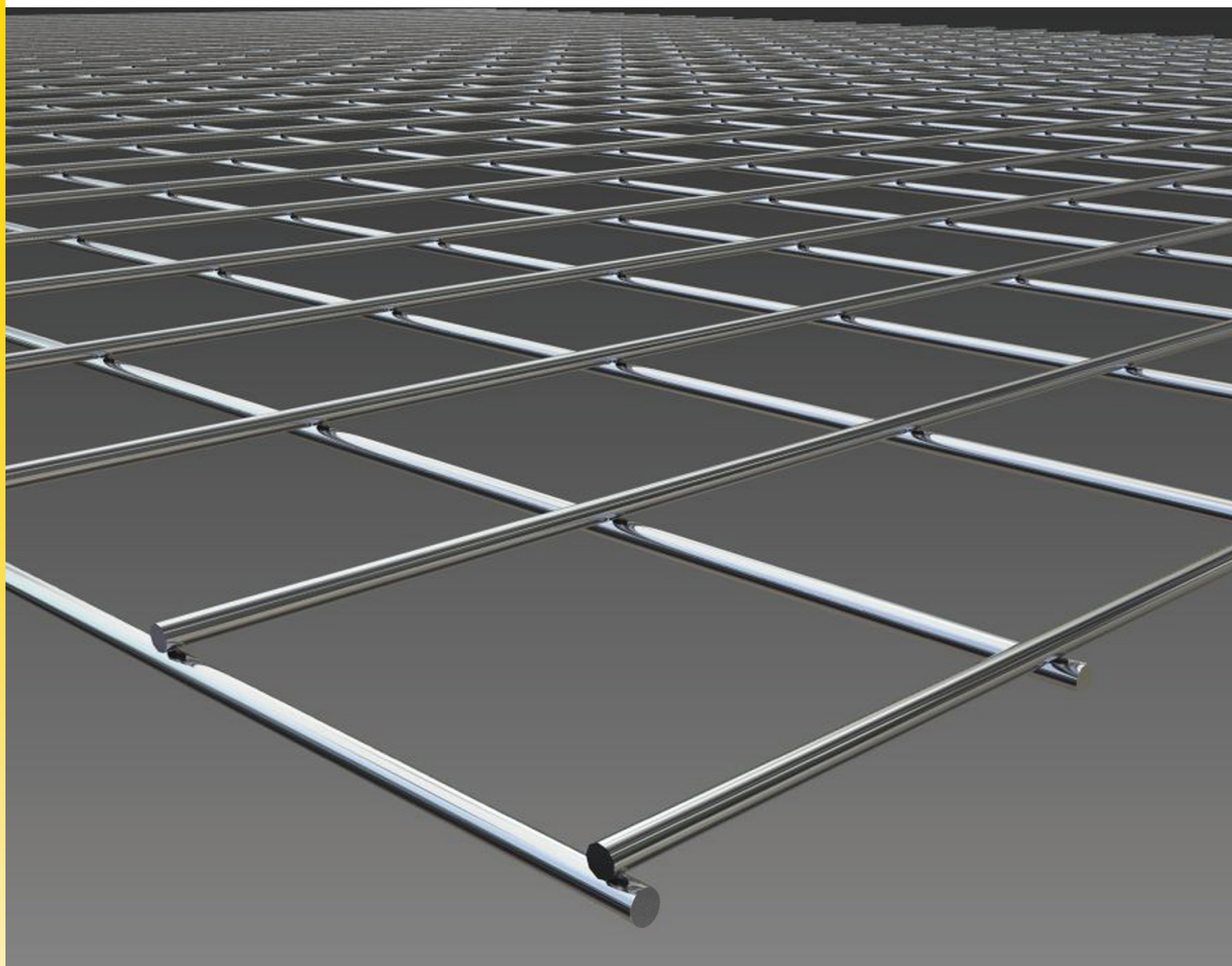




**RSC Ekusasa  
Mining**

# **Risk Assessment**

## **Welded Mesh**



Ver: 01/07/2013 Rev 2

## INTRODUCTION

RSC Ekusasa Mining is a well-established company owned by The Barnes Group. RSC Ekusasa Mining has a Level 5 BEE status and a 80% BEE Procurement Recognition which is accredited through SANAS. Black Woman Ownership of 26%, fronting listed as Low.

RSC EKUSASA Mining is ISO 9001, ISO 14001 and OHSAS 18001 accredited and has a certified Integrated Management System in place

RSC Ekusasa Mining has been involved in various ground control and underground roof support projects throughout the world. RSC Ekusasa Mining often works with other companies in order to provide cost effective solutions to our customer needs. The range of critical / safety products and services supplied, includes a wide range of lateral and reinforcing roof support systems. The group's services extend from initial manufacture to the ultimate supply of high quality, roof support tendons.

RSC Ekusasa Mining adheres strictly to the standards of the ISO 9001: 2008 and the SANS 1408: 2002 requirements for "Mechanical Components of tendon based rock support systems". These roof support tendons are delivered to the mine on purchase and these articles are used and installed by the mine's employees and or contractors employed by the mine.

The Mine Health and Safety Act (Act 29 of 1996) section 21 however states the following:

"21.1 Any person who-

(a) designs, manufactures, repairs, imports or supplies any article for use at a mine must ensure, as far as reasonably practicable

(i) that the article is safe and without risk to health and safety when used properly; and

(ii) that it complies with all the requirements in terms of this Act;

(b) erects or installs any article for use at a mine must ensure, as far as reasonably practicable, that nothing about the manner in which it is erected or installed makes it unsafe or creates a risk to health and safety when used properly; or

(c) Designs, manufactures, erect or installs any article for use at a mine must ensure, as far as reasonably practicable, that ergonomic principles are considered and implemented during design, manufacture, erection or installation.

21.2 Any person who bears a duty in terms of sub-section (1) is relieved of that duty to the extent that is reasonable in the circumstances, if –

(a) that person designs, manufactures, repairs, imports or supplies an article for or to another person; and

(b) That other person provides a written undertaking to take specified steps sufficient to ensure, as far as reasonably practicable, that the article will be safe and without risk to health and safety when used properly and that it complies with all prescribed requirements.”

Because of these legal requirements RSC Ekusasa Mining embarked on a full risk assessment to ensure as far as reasonably practical, that all potential health ,safety and financial hazards are identified, relevant risks measured and control measures taken to ensure the articles are safe and without risk to the user. Furthermore, the risk assessment serves as proof of RSC Ekusasa Mining’s due diligence towards the mine, its employees, and assets and contributes in ensuring a healthy and safe work environment as far as reasonably practicable.

## EXECUTIVE SUMMARY

Introduction - The risk assessment on the support articles considered activities such as loading, offloading, transport, storage, installation, maintenance, and inspections which are typical activities the user performs whenever using the articles being supplied. These activities are normally performed on surface and mainly underground. The risk assessment was therefore structured in such a manner that all potential health, safety, financial hazards and other relevant risks could be identified, as far as reasonably practical covering any of the activities when using the articles being supplied. The format of the risk assessment was laid out such, that the user can use the information as specified steps, whenever performing any of the activities using the articles.

Mentioned activities were broken down into specific task steps, as the supplier foresees the user using the articles, then all potential hazards were identified, related risks measured and recommendations made to guide the user of the most effective means in handling the articles when performing such activities.

Risks were measured using a risk index, which considers the three factors influencing the degree of risk such as consequence; exposure and probability (**Refer to APPENDIX 1 for an example of the Risk Index used**). The reason for risk measurement is to prioritize the hazards identified looking at the significant risks it poses, and then deciding whether the risks should be eliminated, controlled, minimized or are the risks perhaps tolerable as is.

## DESCRIPTION

Welded Mesh is used to support fractured ground between rock anchors by providing a continuous mesh between the anchor points and for various other means of prevention in mining. Welded mesh may be bolted to the rock by rock tendons /anchors and can be bent to conform to the rock surface. Because anchors locate at any point through the mesh it is adaptable to any rock bolt spacing and are commonly used in the meshing and lacing practice.

## FEATURES

- Large surface containment area for fragmented rock.
- Are available in a range of lengths.
- Accommodates all anchor spacing patterns.

## Installation of Welded Rock Support Mesh by User

### SCOPE OF WORK

**Objective** – To conduct a suitable and sufficient risk assessment that will, as far as reasonably Practicable, identify all potential health, safety and financial hazards the articles could pose to the user and measure the level of risk of each hazard identified in order to recommend controls to mitigate or control the relevant risks.

**Aim** – To provide the user with sufficient information – specified steps - that can/should be used to train and guide employees to enable them to use the articles properly.

The risk assessment was therefore structured in such a manner that all potential health, safety and financial hazards and relevant risks could be identified, as far as reasonably practicable, whenever performing any of the activities using the articles being supplied. The format of the risk assessment was laid out such, that the user can use the information as specified steps, whenever performing any of the activities using the articles.

Mentioned activities were broken down into specific task steps, as the supplier foresees the user using the articles, then all potential hazards were identified, related risks measured and recommendations made to guide the user of the most effective means in handling the articles when performing such activities Risks were measured using a risk index, which considers the three factors influencing the degree of risk such as consequence; exposure and probability (**Refer to APPENDIX 1 for an example of the Risk Index used**).

The reason for risk measurement is to prioritize the hazards identified looking at the significant risks it poses, and then deciding whether the risks should be eliminated, controlled, minimized or are the risks perhaps tolerable as is.

## RISK MATRIX

| PROBABILITY                                         |   | CONSEQUENCE                                              |   | EXPOSURE                                             |   |
|-----------------------------------------------------|---|----------------------------------------------------------|---|------------------------------------------------------|---|
| Can it happen                                       |   | What injury / damage could we expect                     |   | How often are people currently exposed to the hazard |   |
| Well expected / Happens often                       | 7 | Catastrophic / Disaster / Multiple Fatalities / + R5 Mil | 7 | Continuous / Full Shift                              | 7 |
| Quite possible                                      | 6 | Fatality / Severe Permanent Disability / R1 - R5 Mil     | 6 | Frequent / Daily                                     | 6 |
| Unusual - Has happened here before                  | 5 | Very Serious Injury (ICU) / R500 000 - R1 Mil            | 5 | Often / Weekly                                       | 5 |
| Remotely Possible - Happened elsewhere              | 4 | Serious Injury (ICU) / R100 000 - R500 000               | 4 | Occasional / Monthly                                 | 4 |
| Very unlikely but conceivable - Hasn't happened yet | 3 | Disabling Injury / R1 000 - R100 000                     | 3 | Unusual / Yearly                                     | 3 |
| Practically Impossible - 1 in a million chance      | 2 | Treat & Return Injury - Below R1 000                     | 2 | Rare / Within 5 Years                                | 2 |
| Virtually Impossible - Full certainty               | 1 | Near Miss Injury / Damage                                | 1 | Remote / Beyond 5 Years                              | 1 |

**RISK RATING = Probability X Consequence X Exposure**

|            |               |             |     |
|------------|---------------|-------------|-----|
| 0          | 100           | 215         | 343 |
| <b>LOW</b> | <b>MEDIUM</b> | <b>HIGH</b> |     |

| Category                                                       | Hazards                                                      | What if                                                      | Consequences                                                                                                                                                                                        | Existing controls                                                                                                                                                                                                                                                                                                    | C | E | P | RR | Additional Recommended controls                                                     | C | E | P | RR | Responsible Person                       |
|----------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|-------------------------------------------------------------------------------------|---|---|---|----|------------------------------------------|
| Manufacturing of Welded Mesh.                                  | Welded Mesh not manufactured to manufacturer specification.  | The manufacturing process is not quality checked.            | 1. Substandard Product.<br>2. Financial loss to business and client.<br>3. Orders not able to be delivered on time.<br>4. F.O.G.<br>5. Fatal<br>6. Serious injury<br>7. Production loss             | 1. Quality check are conducted throughout the process and recorded.<br>2. Manufacturer ISO 9001/2008 accredited.                                                                                                                                                                                                     | 6 | 5 | 3 | 90 | Manufacturer specification and manufacturing process to be adhered to at all times. | 7 | 5 | 2 | 70 | Manufacturing and quality control staff. |
| Raw materials and components not quality checked prior to use. | Raw materials from supplier not quality assured and checked. | Raw materials from supplier not quality assured and checked. | 1. Substandard Product.<br>2. Financial loss to company and client.<br>3. Supply company not able to deliver orders on time.<br>4. F.O.G.<br>5. Fatal.<br>6. Serious injury.<br>7. Production loss. | 1. Quality checks are conducted throughout the process and recorded.<br>2. Quality controllers.<br>3. Manufacturer ISO 9001/2008 accredited.<br>4. Only products and raw material with quality control certification are used.<br>5. Certificates are kept for reference in the event of serious injury or incident. | 6 | 5 | 3 | 90 | Ensure supplier's quality assurance check accompanies each batch when delivered.    | 7 | 5 | 2 | 70 | Quality control staff.                   |

| Category                                                            | Hazards                                                         | What if                                                                | Consequences                                                                                                                                                                                     | Existing controls                                                                                                                                                                                  | C | E | P | RR | Additional Recommended controls                                                                                                                                                                                                                                                                           | C | E | P | RR | Responsible Person                            |
|---------------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|-----------------------------------------------|
|                                                                     |                                                                 |                                                                        |                                                                                                                                                                                                  | 6. Random checks by quality controllers and the quality assurance manager.                                                                                                                         |   |   |   |    |                                                                                                                                                                                                                                                                                                           |   |   |   |    |                                               |
| Quality control.                                                    | Product not quality inspected during the manufacturing process. | The product is not quality inspected during the manufacturing process. | 1. Substandard Product.<br>2. Financial loss to company and client.<br>3. Supply company not able to deliver orders on time.<br>4. F.O.G.<br>5. Fatal<br>6. Serious injury<br>7. Production loss | 1. Quality control certification.<br>2. Competent quality controllers.<br>3. Over inspection by Senior Personnel.<br>4. Recording and certification.<br>5. Manufacturer specifications (Technical) | 6 | 5 | 3 | 90 | 1. The product must be inspected in all stages of manufacturing to ensure that a quality product is delivered at all times.<br>2. All inspections must be recorded and the batch records quality checked stamped.                                                                                         | 3 | 4 | 3 | 36 | Quality controllers and Quality Manager.      |
| Man handling Welded Mesh material during the manufacturing process. | Product not handled with care.                                  | Product not handled with care.                                         | The product has sharp edges that could result in serious injuries if not handled with care e.g. injuries to hands, eyes and other body parts.                                                    | 1. Competent appointed personnel<br>2. Supervision<br>3. PPE                                                                                                                                       | 3 | 5 | 3 | 45 | 1. Persons handling the product must wear PVC gloves at all times.<br>2. Warn persons in the vicinity (persons not handling the product) to take up a safe position.<br>3. Ensure sure footing at all times to prevent slipping and falling while handling the product.<br>4. Maintain good housekeeping. | 3 | 4 | 3 | 36 | Supervisors and persons handling the product. |

| Category                                             | Hazards                                                         | What if                                                                  | Consequences                                                                                                                                                                                                                                                      | Existing controls                                                                    | C | E | P | RR  | Additional Recommended controls                                                                                                                                                                              | C | E | P | RR | Responsible Person                            |
|------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---|---|---|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|-----------------------------------------------|
| Storing and stacking of Welded Mesh by manufacturer. | Product not stored in a dry, safe place and not stacked safely. | The product is not stored in a dry, safe place and not stacked safely.   | 1. Damage to product<br>2. Financial loss<br>3- Shortage of stock will lead to<br>- F.O.G.<br>- Multiple fatal<br>- Serious injury<br>- Production loss                                                                                                           | 1. Competent appointed personnel<br>2. Supervision<br>3. Company storage standard.   | 7 | 6 | 3 | 126 | 1. The product must be stored in a dry, safe place where it is protected against damage and water/rain.<br>2. Pallets may not be stacked higher than 2m and must be secured to prevent it from falling over. | 3 | 6 | 2 | 36 | Supervisors and persons handling the product. |
| Loading and transporting mesh products by forklift.  | Forklift operated by an untrained or unauthorized operators.    | The forklift is operated by an untrained or unauthorized operator.       | 1. Damage to product leading to:<br>2. Financial loss<br>3. Insufficient quantity mesh available for users.<br>4. User's personnel may opt to work without it that in turn can result in<br>- F.O.G.<br>- Multiple fatal<br>- Serious injury<br>- Production loss | 1. Competent appointed personnel<br>2. Supervision<br>3. Company forklift standards. | 7 | 6 | 3 | 126 | 1. Only competent appointed Forklift Operators may operate forklifts.                                                                                                                                        | 3 | 6 | 3 | 54 | Supervisors and Forklift Operators.           |
|                                                      | Forklift not inspected prior to use or defective Forklift used. | The forklift is not inspected prior to use or a defective Forklift used. | 1. Damage to product<br>2. Financial loss<br>3. Insufficient quantity mesh available for users.<br>4. User's personnel may opt to work without it that in turn can result in<br>- F.O.G.<br>- Multiple fatal<br>- Serious injury<br>- Production loss             | 1. Competent appointed personnel<br>2. Supervision<br>3. Company forklift standards. | 7 | 6 | 3 | 126 | 1. Forklifts must be inspected prior to use.<br>2. Defective forklifts may not be used.                                                                                                                      | 3 | 6 | 3 | 54 | Supervisors and Forklift Operators.           |

| Category                                      | Hazards                                                      | What if                                                            | Consequences                                                                                                                                                                                                                                                                                                                              | Existing controls                                                                    | C | E | P | RR  | Additional Recommended controls                                    | C | E | P | RR | Responsible Person                  |
|-----------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---|---|---|-----|--------------------------------------------------------------------|---|---|---|----|-------------------------------------|
| Transport of Welded Mesh to user.             | Transport standards not adhered to.                          | The truck is overloaded or unevenly loaded.                        | 1. Poor control over vehicle<br>2. Road accident<br>3. Fatalities<br>4. Damage to property and equipment<br>5. Damage to load<br>6. Insufficient quantity mesh available for users.<br>7. User's personnel may opt to work without it that in turn can result in<br>- F.O.G.<br>- Multiple fatal<br>- Serious injury<br>- Production loss | 1. Competent appointed drivers<br>2. Supervision<br>3. Company transport standards.  | 7 | 6 | 3 | 126 | Company transport standards must be adhered to and enforced.       | 3 | 6 | 3 | 54 | Supervisors and Truck Drivers.      |
| Off- loading of Welded Mesh products by user. | Forklift operated by an untrained or unauthorized operators. | The forklift is operated by an untrained or unauthorized operator. | 1. Damage to product<br>2. Financial loss<br>3. Insufficient quantity mesh available for users.<br>4. User's personnel may opt to work without it that in turn can result in<br>- F.O.G.<br>- Multiple fatal<br>- Serious injury<br>- Production loss                                                                                     | 1. Competent appointed personnel<br>2. Supervision<br>3. Company forklift standards. | 7 | 6 | 3 | 126 | Only competent appointed Forklift Operators may operate forklifts. | 3 | 6 | 3 | 54 | Supervisors and Forklift Operators. |

| Category                                 | Hazards                                                         | What if                                                                  | Consequences                                                                                                                                                                                                                                          | Existing controls                                                                    | C | E | P | RR  | Additional Recommended controls                                                                                                                                                                              | C | E | P | RR | Responsible Person                            |
|------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---|---|---|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|-----------------------------------------------|
|                                          | Forklift not inspected prior to use or defective forklift used. | The forklift is not inspected prior to use or a defective forklift used. | 1. Damage to product<br>2. Financial loss<br>3. Insufficient quantity mesh available for users.<br>4. User's personnel may opt to work without it that in turn can result in<br>- F.O.G.<br>- Multiple fatal<br>- Serious injury<br>- Production loss | 1. Competent appointed personnel<br>2. Supervision<br>3. Company forklift standards. | 7 | 6 | 3 | 126 | Forklifts must be inspected prior to use.<br>2. Defective Forklifts may not be used.                                                                                                                         | 3 | 6 | 3 | 54 | Supervisors and Forklift Operators.           |
| Storage and stacking on surface at user. | Product not stored in a dry, safe place and not stacked safely. | The product is not stored in a dry, safe place and not stacked safely.   | 1. Damage to product<br>2. Financial loss<br>3. Insufficient quantity mesh available for users.<br>4. User's personnel may opt to work without it that in turn can result in<br>- F.O.G.<br>- Multiple fatal<br>- Serious injury<br>- Production loss | 1. Competent appointed personnel<br>2. Supervision<br>3. Company storage standard.   | 7 | 6 | 3 | 126 | 1. The product must be stored in a dry, safe place where it is protected against damage and water/rain.<br>2. Pallets may not be stacked higher than 2m and must be secured to prevent it from falling over. | 3 | 6 | 2 | 36 | Supervisors and persons handling the product. |
| Loading and securing of Welded Mesh.     | Forklift not inspected prior to use or defective forklift used. | The forklift is not inspected prior to use or a defective forklift used. | 1. Damage to product<br>2. Financial loss<br>3. Insufficient quantity mesh available for users.<br>4. User's personnel may opt to work without it that in turn can result in<br>- F.O.G.<br>- Multiple fatal<br>- Serious injury<br>- Production loss | 1. Competent appointed personnel<br>2. Supervision<br>3. Company forklift standards. | 7 | 6 | 3 | 126 | Forklifts must be inspected prior to use.<br>2. Defective forklifts may not be used.                                                                                                                         | 3 | 6 | 3 | 54 | Supervisors and forklift Operators            |

| Category                  | Hazards                                                               | What if                                                                    | Consequences                                                                                                                                                                                      | Existing controls                                                                     | C | E | P | RR  | Additional Recommended controls                                                    | C | E | P | RR | Responsible Person                                                |
|---------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---|---|---|-----|------------------------------------------------------------------------------------|---|---|---|----|-------------------------------------------------------------------|
|                           | Load not secured on flat car if used.                                 | The load is not secured when loaded onto flat car if used.                 | 1. Load can fall from flat car.<br>2. Injury to pedestrians.                                                                                                                                      | Competent appointed personnel by user.<br>Supervision<br>User standards.              | 4 | 5 | 3 | 60  | The user's standards must be enforced.                                             | 3 | 5 | 3 | 45 | User operators and supervisors.                                   |
|                           | Load not secured on utility vehicle when transported.                 | The load is not secured when loaded onto utility vehicle when transported. | 1. Load can fall from utility vehicle.<br>2. Injury to pedestrians.                                                                                                                               | Competent appointed personnel by user.<br>Supervision<br>User standards.              | 4 | 5 | 3 | 60  | The user's standards must be enforced.                                             | 3 | 5 | 3 | 45 | User operators and supervisors.                                   |
|                           | Correct PPE not worn when product is man handled.                     | The correct PPE not worn when the product is man handled.                  | Because the product has sharp edges, it could result in cuts on hands, eyes and body.                                                                                                             | PPE issued by user to all workers in accordance with the Health and Safety Act.       | 3 | 5 | 3 | 45  | As a minimum gloves and eye protection must be worn when man handling mining mesh. | 3 | 5 | 2 | 30 | All employees man handling mining mesh.<br>Appointed Supervisors. |
| Transport of Welded Mesh. | Mine vertical, horizontal and hand transport procedures not followed. | Mine vertical, horizontal and hand transport procedures not followed.      | 1.Collisions<br>2.Damage to equipment<br>3.Fatal<br>4.Production loss<br>5. Shortage of mesh due to damage could result in mining without it which in turn can result in serious or fatal injury. | Mine horizontal transport procedures<br>Competent appointed personnel<br>Supervision. | 6 | 5 | 4 | 120 | Mine/user's vertical, horizontal and hand transport procedures to be adhered to.   | 6 | 5 | 3 | 60 | Transport crew.                                                   |

| Category                                                        | Hazards                                                                       | What if                                                                               | Consequences                                                                                                                                                                                                                                          | Existing controls                                                                                                     | C | E | P | RR  | Additional Recommended controls                                                                                                                                                                                   | C | E | P | RR | Responsible Person                            |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---|---|---|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|-----------------------------------------------|
| Unsafe storage and stacking of Welded Mesh by user underground. | Product not stored in a dry, safe place and not stacked safely.               | The product is not stored in a dry, safe place and not stacked safely.                | 1. Damage to product<br>2. Financial loss<br>3. Insufficient quantity mesh available for users.<br>4. User's personnel may opt to work without it that in turn can result in<br>- F.O.G.<br>- Multiple fatal<br>- Serious injury<br>- Production loss | 1. Competent appointed personnel.<br>2. Supervision<br>3. Company storage standard.                                   | 7 | 6 | 3 | 126 | 1. The product must be stored in a dedicated dry, safe place where it is protected against damage and water.<br>2. Pallets may not be stacked higher than 2m and must be secured to prevent it from falling over. | 3 | 6 | 2 | 36 | Supervisors and persons handling the product. |
| Installation of Welded Mesh.                                    | Hanging not examined, barred and made safe in accordance to the mine standard | The hanging is not examined, barred and made safe in accordance to the mine standard. | 1. FOG<br>2. Fatal<br>3. Production loss<br>4. Serious injury<br>5. Financial loss                                                                                                                                                                    | 1. Mine Standards<br>2. Safety recommendations by RSC Mining.<br>3. Competent appointed personnel.<br>4. Supervision. | 6 | 6 | 4 | 144 | 1. Miner/ Competent 'A' person to examine, and bar the hanging safe from between installed support.                                                                                                               | 6 | 5 | 3 | 90 | 1. Miner or Competent 'A' person.             |

| Category          | Hazards                                                               | What if                                                                   | Consequences                                                                                                                                                                    | Existing controls                                            | C | E | P | RR  | Additional Recommended controls                                                                                                                                                                                                                                                                                                                  | C | E | P | RR | Responsible Person                            |
|-------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---|---|---|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|-----------------------------------------------|
| Usage of product. | Welded Mesh is used for purposes other than what it was designed for. | The Welded Mesh is used for purposes other than what it was designed for. | Not determined                                                                                                                                                                  | Manufacturing safety recommendations.                        | 5 | 5 | 5 | 125 | Use only for purpose designed for.                                                                                                                                                                                                                                                                                                               | 3 | 5 | 3 | 45 | User.                                         |
|                   | Product not handled with care.                                        | Product not handled with care.                                            | The product has sharp edges that could result in a serious injury if not handled with care e.g. hand, eyes and other body parts to persons handling or persons in the vicinity. | 1. Competent appointed personnel<br>2. Supervision<br>3. PPE | 3 | 6 | 3 | 54  | 1. Persons handling the product must wear PVC gloves at all times.<br>2. Warn persons in the vicinity (persons not handling the product) to take up a safe position.<br>3. Ensure sure footing at all times to prevent slipping and falling while handling the product.<br>4. Take care not to bump the mesh against yourself or fellow workers. | 3 | 6 | 2 | 36 | Supervisors and persons handling the product. |

| Category                | Hazards                                                                                                    | What if                                                                                                    | Consequences                                                                                                                                                                      | Existing controls | C | E | P | RR  | Additional Recommended controls                                                                                                                                                                                                                                                                                                                                                     | C | E | P | RR | Responsible Person                                                                        |
|-------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---|---|---|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|-------------------------------------------------------------------------------------------|
|                         | Temporary support paint marks on hanging wall not visible when product is lifted against the hanging wall. | Temporary support paint marks on hanging wall not visible when product is lifted against the hanging wall. | 1. Installation spacing of temporary support jacks not to standard<br>2. Inadequate support<br>3. FOG<br>4. Fatal<br>5. Production loss<br>6. Serious injury<br>7. Financial loss |                   | 6 | 6 | 6 | 216 | 1. Indicate the position where the jack is to be installed by means of a rock on the footwall and place the temporary support jacks next to the rocks.<br>2. Lift the Welded Mesh evenly against the hanging ensuring sure footing and install the jacks underneath the mesh from the marked position.<br>3. The responsible Rock Mechanics Engineer to determine support strategy. | 6 | 6 | 2 | 72 | 1+2 Supervisors and persons handling the product.<br>3. Rock Engineer<br>4 SHEQ officers. |
| Removal of Welded Mesh. | Temporary support units not remotely released.                                                             | Temporary support units not remotely released.                                                             | 1. FOG<br>2. Fatal<br>3. Production loss<br>4. Serious injury<br>5. Financial loss                                                                                                |                   | 6 | 6 | 3 | 108 | Temporary support jacks must always be released remotely as loose rocks above the mesh can fall on persons attempting to release the same. Do an onsite risk assessment to determine the safest method.                                                                                                                                                                             | 6 | 6 | 2 | 72 | Supervisors and persons handling the product.                                             |
| Short supply.           | Orders not placed timeously.                                                                               | Orders not placed timeously.                                                                               | 1. Shortage of Welded Mesh due to orders not place timeously could result in mining without it which in turn can result in serious injury or fatal.                               |                   | 6 | 6 | 6 | 216 | Orders must be placed timeously and additional units kept ensuring that damage units could be replaced when required.                                                                                                                                                                                                                                                               | 6 | 6 | 2 | 72 | Supervisors.                                                                              |

| Category         | Hazards                                                               | What if                                                                   | Consequences                                                                                                                                                                    | Existing controls                                            | C | E | P | RR  | Additional Recommended controls                                                                                                                                                                                                                                                                                                                  | C | E | P | RR | Responsible Person                            |
|------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---|---|---|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|-----------------------------------------------|
| Usage of product | Welded Mesh is used for purposes other than what it was designed for. | The Welded Mesh is used for purposes other than what it was designed for. | Not determined.                                                                                                                                                                 | Manufacture's safety recommendations.                        | 5 | 5 | 5 | 125 | Use only for purpose designed for.                                                                                                                                                                                                                                                                                                               | 3 | 5 | 3 | 45 | User.                                         |
|                  | Product not handled with care.                                        | Product not handled with care.                                            | The product has sharp edges that could result in a serious injury if not handled with care e.g. hand, eyes and other body parts to persons handling or persons in the vicinity. | 1. Competent appointed personnel<br>2. Supervision<br>3. PPE | 3 | 6 | 3 | 54  | 1. Persons handling the product must wear PVC gloves at all times.<br>2. Warn persons in the vicinity (persons not handling the product) to take up a safe position.<br>3. Ensure sure footing at all times to prevent slipping and falling while handling the product.<br>4. Take care not to bump the mesh against yourself or fellow workers. | 3 | 6 | 2 | 36 | Supervisors and persons handling the product. |

## CONCLUSION

This risk assessment is not absolute and should always be seen as a live document, because risk assessment in any form is a process and not a once-off activity. Part of this process is that the user receiving the risk assessment from the supplier should scrutinize it, make recommendation or relevant comments and contribute to the assessment to make it more suitable and sufficient and thus more applicable for the proper use of the articles.

Should any recommendations be made from the user, or the supplier should add or remove anything as far as the design of the article is concerned, such recommendations or changes should be incorporated into this risk assessment, thus, and the risk assessment should be revised for its adequacy. Most importantly is that the user should take the recommended specified steps made by the supplier, evaluate them for practical implementation, and incorporate the information into the organizations specific training material, and train employees accordingly. This must be done to ensure the employees responsible for using the articles are familiar with potential hazards and risks they or any other employee might be exposed to. Only then one can ensure as far as reasonably practicable the articles will be used properly. Only then one can ensure as far as reasonably practical the articles will be used properly. If any significant problems or health and safety issues are identified by the user, and the user would like to bring it under the attention of the supplier, the supplier can be contacted at the following numbers:

**Office : 011- 824 8660**

**Fax : 011- 824 0146**

**E-Mail: info@rscekusasa.co.za**

If any significant problems or health and safety issues are identified by the user, and the user would like to bring it under the attention of the supplier, the supplier can be contacted.

### Technical Data of Rock Support Mesh:

- Raw material specification will be according to the metallurgical composition as specified AS4671:2001 Grade 500L.
- Galvanising of the wire will be as specified in AS2424:2002 to type W02Z.
- Yield strength of wire will be in the range of 500-700 MPa.
- Weld Quality – Welds shall have a minimum breaking load of 9.5 kN when tested in accordance with AS 1304-1991.
- Flatness – Mesh shall not lift more than 50mm at any point when laid on a flat surface.
- Dimensional tolerances – Length = nominal size +/- 5mm  
Width = nominal size +/- 5mm
- Zinc coating – 100g/m<sup>2</sup> - penetration 10%.
- Tensile strength main wire – 600 MPa.
- Tensile strength cross wire – 500 MPa.
- Aperture – 100mm x 100mm.
- Ø of cross and main wire 5,6 mm.

## **SAFETY RECOMMENDATIONS**

### **1. Manufacturing of Welded Mesh:**

- 1.1 Manufacturer specification and manufacturing process to be adhered to at all times.
- 1.2 Ensure that quality assurance check documents accompany each batch when delivered.

### **2. Quality control:**

- 2.1 The product must be inspected during all stages of manufacturing to ensure that a quality product is delivered at all times.
- 2.2 All inspections must be recorded and each batch's records stamped with a 'quality checked' stamp.

### **3. Man handling Welded Mesh:**

- 3.1 Warn persons in the vicinity, (persons not handling the product) to take up a safe position.
- 3.2 Ensure sure footing at all times to prevent slipping and falling while handling the product.
- 3.3 The correct PPE must be worn at all times.
- 3.4 Take care not to bump the mesh against yourself or fellow workers.

### **4. Storing and Stacking of Welded Mesh by manufacturer:**

- 4.1 The product must be stored in a dry, safe place where it is protected against damage and water/rain.
- 4.2 Pallets may not be stacked higher than 2m and must be secured to prevent it from falling over.

### **5. Loading of Welded Mesh by manufacturer:**

- 5.1 Only competent appointed Forklift Operators may operate a Forklift.
- 5.2 Forklifts must be inspected prior to use.
- 5.3 Defective Forklifts may not be used.

### **6. Transport of Welded Mesh to user:**

- 6.1 Company transport standard must be adhered to and enforced.

**7. Off - loading of Welded Mesh by manufacturer:**

- 7.1 Only competent appointed Forklift Operators may operate a Forklift.
- 7.2 Forklifts must be inspected prior to use.
- 7.3 Defective Forklifts may not be used.

**8. Storage and stacking on surface by user:**

- 8.1 The product must be stored in a dedicated dry, safe place where it will be protected against damage and water/rain.
- 8.2 Pallets may not be stacked higher than 2m and must be secured to prevent it from falling over.

**9. Loading and securing Welded Mesh by user:**

- 9.1 Only competent appointed Forklift Operators may operate a Forklift if used.
- 9.2 Forklifts must be inspected prior to use.
- 9.3 Defective Forklifts may not be used.
- 9.4 Loads must be secured whether it is transported on a flat car or utility vehicle to prevent it from falling off.
- 9.5 If hand loading is done, loading personnel must use the correct PPE and handle each individual section with care to prevent themselves or other persons from being injured by it.

**10. Storing of Welded Mesh underground:**

- 10.1 The product must be stored in a dedicated dry, safe place where it will be protected against damage and water.
- 10.2 Pallets may not be stacked higher than 2m and must be secured to prevent it from falling over.

**11. Installation of Welded Mesh:**

- 11.1 Miner/ Competent 'A' person to examine and bar the hanging safe from between installed support.
- 11.2 Personnel must use the correct PPE and handle each individual section with care to prevent themselves or other persons from being injured by it.
- 11.3 Indicate the position where the jack is to be installed by means of a rock on the footwall and place the temporary support jacks next to the rocks.
- 11.4 Lift the Welded Mesh evenly against the hanging ensuring sure footing and install the jacks underneath the mesh from the indicated position.
- 11.5 The responsible Rock Mechanics Engineer to determine support strategy.
- 11.6 Never worked further than 1m from installed support.

**12. Removal of Welded Mesh:**

- 12.1 Temporary support jacks must always be released remotely as loose rocks above the mesh can fall on persons attempting to release the same.
- 12.2 Do an on-site risk assessment to determine the safest method to remove installed mesh.

**13. Short supply:**

- 13.1 Orders must be placed timeously and additional units kept ensuring that damage units could be replaced when required.

**14. Illegal usage of product:**

- 14.1 The product must only be used for the purpose it is designed for.

## 1. RISK MEASUREMENT INDEX

CONSEQUENCES (Worst case scenario if hazard should realize)

| Index                                                      | Value | Result |
|------------------------------------------------------------|-------|--------|
| Catastrophic (many fatalities or damage over R100,000,000) | 100   |        |
| Disaster (a few fatalities or damage over R10,000,000)     | 40    |        |
| Very Serious (one fatality or damage over R1,000,000)      | 15    |        |
| Serious (serious injury or damage over R 100,000)          | 7     |        |
| Important (temporary disability or damage over R10,000)    | 3     |        |
| Of Concern (minor injury or damage over R1,000)            | 1     |        |

EXPOSURE (How often hazardous event occurs or is present)

| Index                                                          | Value | Result |
|----------------------------------------------------------------|-------|--------|
| Continuous (many times daily)                                  | 10    |        |
| Frequent (once daily)                                          | 6     |        |
| Occasionally (once per week to monthly)                        | 3     |        |
| Unusual (once / month to once / year)                          | 2     |        |
| Rare (yearly)                                                  | 1     |        |
| Very rarely (not known to have occurred but remotely possible) | 0.5   |        |

PROBABILITY (Chance of loss / harm during the exposure period)

Current controls / safeguards in place to be objectively assessed for sufficiency.

| Index                                                         | Value | Result |
|---------------------------------------------------------------|-------|--------|
| <i>Is the most likely and expected result if event occurs</i> | 10    |        |
| Quite possible (50/50 chance)                                 | 6     |        |
| Unusual but possible                                          | 3     |        |
| Only remotely possible (has happened somewhere)               | 1     |        |
| Conceivable but very unlikely (hasn't happened yet)           | 0.5   |        |
| Practically impossible (one in a million)                     | 0.1   |        |

**RISK RESULT = CONSEQUENCE x EXPOSURE x PROBABILITY**

### RISK CLASSIFICATION

| Classification                        | Action                                            |
|---------------------------------------|---------------------------------------------------|
| <b>More than 400 - Very High Risk</b> | <b>Immediate correction with high level input</b> |
| <b>200 to 400 - High Risk</b>         | <b>Immediate correction required</b>              |
| <b>70 to 200 - Substantial Risk</b>   | <b>Correction needed</b>                          |
| <b>20 to 70 - Possible Risk</b>       | <b>Attention indicated</b>                        |
| <b>Less than 20</b>                   | <b>Risk perhaps tolerable as is</b>               |

**RISK REDUCTION**

| <b>% Reduction</b> | <b>DESCRIPTION</b> | <b>VALUE</b> |
|--------------------|--------------------|--------------|
| 10%                | Small              | 6            |
| 20%                | Small              | 4            |
| 50%                | Effective          | 3            |
| 75%                | Very Effective     | 2            |
| 100%               | Eliminated         | 1            |

| <b>Risk Assessors</b> | <b>Occupation</b>  |
|-----------------------|--------------------|
| Simon Delport         | Operations Manager |
| Johann Steyn          | Rock Engineer      |
| Warren Morton         | SHEQ Manager       |