



**TOI MAI**

Workforce  
Development  
Council

**PROGRAMME GUIDANCE**

**for**

**New Zealand Certificate in Entertainment and Event  
Technology (Level 4) with strands in  
Entertainment Rigging, Lighting, Live Sound, Video,  
Stage Management,  
Stage Mechanics, and Scenic Construction  
(ref 3417 v2)  
August 2018**

## Overview and use of specifications

These specifications have been developed in collaboration with the Entertainment and Event Technology sector and reflect their expectations for the design and delivery of programmes leading to the award of the NZC in Entertainment and Event Technology Level 4 (NZQA ref 3417). Providers developing programmes leading to this qualification should consider these specifications in their programme design to ensure that students and graduates seeking employment, or already employed (paid or volunteering) in the industry, meet the expectations of employers and industry.

If you are developing a programme that leads to a qualification listed on the NZQF, the Education and Training Act requires you to get the programme approved by NZQA. If you are interested in delivering a programme, you also need to be accredited as a provider of that programme.

Once you have finalised your programme, you will need a letter of endorsement from Toi Mai before seeking approval from NZQA.

Please contact us at [programmes@toimai.nz](mailto:programmes@toimai.nz) while you are developing your programme so we can advise you of any new rules, regulations, specifications or conditions since the qualification was listed.

## Overview of the NZC in Entertainment Technology Level 4

This qualification provides the entertainment and event technology industry with technicians who can operate safely, under indirect supervision.

The qualification includes strands that recognise specialist knowledge and practical skills in various areas relating to entertainment and events technology.

Within this qualification, health and safety knowledge and skills are implicit in all activities and tasks completed by technicians in every discipline, including, self-management, following codes of conduct and guidelines, problem solving and troubleshooting. Interpersonal and customer service skills are required to identify and respond to the needs of other crew members and personnel involved in the event or performance.

### General Conditions

Programmes should ensure learners are given the opportunity to practice and demonstrate competence within realistic (in-house or public) industry/community settings. (Recommended 400 hours).

All learning and assessment within a programme leading to this qualification must be carried out in accordance with the following as relevant:

- legislation including Health and Safety at Work Act 2015 and subsequent amendments;
- current industry best practice and industry guidelines (where available) including Safe Rigging Practices for the Entertainment Industry in New Zealand, June 2015, and A Guide for Safe Working Practices in the New Zealand Theatre & Entertainment Industry, April 2011, or replacements that supersede these guidelines;

Technical skills should be demonstrated across a range of performances and events, including a minimum number of complex performances or events in the relevant strand (refer to strand conditions for the required number of complex performances and events for each strand). Complex performances or events are defined as having technical complexity and must meet at least three of the following criteria:

- audience or guest capacity > 500;
- hours of technical production > 150 hours;
- production budget (covering technical and staffing requirements for rigging, lighting, video, live sound, stage mechanics and scenic construction) > \$100,000;
- quantity of Performers/Presenters > 20;
- length of time in the venue (or venues if a touring production) > 7 days.

### **Pre-requisite/Entry Conditions**

There are no entry or prerequisite requirements for entry into this qualification. Industry have recommended that learners hold a current full driving licence prior to entering a programme of study. It is also recommended that learners hold Unit Standard 17600, or can demonstrate equivalent knowledge and skills prior to engaging in learning to ensure an appropriate awareness of working at height.

Programme providers may wish to set their own pre-requisites/entry conditions based on the learning and assessment requirements of their programmes.

### **Award Requirements**

The qualification includes strands that recognise specialist knowledge and practical skills in various areas relating to entertainment and events technology. To meet the requirements of the qualification, programmes must require learners to complete the set of core skills as well as **two strand** disciplines. The requirement to complete two strands acknowledges the skill set of a large number of multi-disciplined technicians working in the industry.

### **Theory and Practical Requirements**

This qualification recommends 400 hours within realistic (in-house or public) industry/community settings to practice and demonstrate competence. This is the minimum number of practical hours that industry would expect for graduates to be able to prove competence in this qualification and ensures that graduates have experienced the dynamics of the industry and applied their skills in this context.

### **Recommended industry publications/standards/websites**

There are a number of useful and recommended industry publications and resources which should be referred to and utilised within a programme. These includes but is not limited to:

- *Entertainment Technology New Zealand (ETNZ) website* – [www.etnz.org](http://www.etnz.org)
- *The essential industry guide - [The guide to safe working practices in the New Zealand theatre and entertainment industry](#)*
- *[The safe rigging practices for the entertainment industry in New Zealand](#)*
- *The industry glossary of terms – to be added to the ETNZ website*
- *Working at heights – [Best practice guidelines for working at heights in New Zealand](#)*

## Skills and Knowledge to be covered per Graduate Profile Outcome

This section of the specifications provides more information on the skills, knowledge and behaviours that should be covered per graduate profile outcome. It also provides a reference to an appropriate unit standard that could be used to assess the outcome if developing a standards-based programme.

Graduate Profile Outcome	Skills, knowledge and behaviours to be covered	Possible unit standards
<b>Core</b>		
Implement industry practices, processes and protocols to work effectively as part of a crew and with other departments to meet performance or event requirements. Credits 15	<ul style="list-style-type: none"> <li>- roles, practices and hierarchy of personnel in entertainment and event organisations;</li> <li>- team or group collaboration to achieve an objective;</li> <li>- relationship management with internal and external stakeholders;</li> <li>- application of a problem-solving model;</li> </ul> Programmes must include production processes for a performance or event, including knowledge of planning requirements across different department and the impact on other departments.	<ul style="list-style-type: none"> <li>- 30457 - Describe production process requirements and roles and responsibilities in the entertainment and event industry Level 4 Credits 10</li> </ul>
Maintain professional conduct and etiquette and apply appropriate communication to respond to internal and external stakeholders. Credits 10	<ul style="list-style-type: none"> <li>- knowledge and application of professional conduct and industry etiquette requirements;</li> <li>- professional conduct and etiquette requirements of internal and external stakeholders and crew;</li> <li>- responding to multiple customer expectations and deadlines;</li> <li>- written and oral communication.</li> </ul>	<ul style="list-style-type: none"> <li>- 30455 - Operate professionally, collaboratively and solve problems systematically in the entertainment and event industry Level 4 Credits 20</li> </ul>
Implement safe working procedures and practices for performance and events. Credits 25	<ul style="list-style-type: none"> <li>- implementing health and safety plans for a workplace including fire safety;</li> <li>- hazard identification and risk assessment plans and processes;</li> <li>- awareness of the safe use of electrical devices;</li> <li>- health and safety management requirements for people working on site;</li> <li>- site and venue access and safe loading in, installation and loading out of technical equipment.</li> </ul>	<ul style="list-style-type: none"> <li>- 30265 - Apply health and safety risk assessment to a job role Level 3 Credits 8</li> <li>- 30266 - Demonstrate knowledge of workplace health and safety culture and practices Level 3 Credits 6</li> <li>- 30268 - Monitor the health and safety performance of a team within an organisation Level 4 Credits 5</li> </ul>

<p>Apply understanding of the entertainment technology industry to develop own career.</p> <p>Credits 10</p>	<ul style="list-style-type: none"> <li>- the origins and use of theatre and event terminology;</li> <li>- technological advances in the industry;</li> <li>- description of business systems and financial responsibilities for employment in the entertainment and event industry;</li> <li>- requirements for people working in entertainment and event technology who are not employed by the venue including the self-employed, contractor, employee and volunteers;</li> <li>- self-promotion through evidence portfolio and scope of practice.</li> </ul>	<ul style="list-style-type: none"> <li>- 30456 - <i>Demonstrate knowledge of worker responsibilities and professional development in the entertainment and event industry</i> Level 4 Credits 10</li> </ul>
<p><b>Strands (choose two of)</b></p>		
<p><b>Entertainment Rigging Strand</b></p> <p>The level four technician, as with the other disciplines, can keep themselves safe and apply safe practices to maintain the safety of others. They can identify hazards, locate safety information, use equipment safely, understand the importance of load calculations for safe rigging and follow all safety guidelines and legislation. For arena and event rigging they need to understand truss science and terminology, the safe use of chain hoists and lifting appliances as well as rigging plan assembly and rigging science. For the theatre they need to understand theatre proprietary rigging systems, motors, winches and counterweight systems and the general operation under show conditions.</p>		
<p>Safely install, operate and remove rigging equipment to meet the production and rigging plan requirements for a range of complex performances and events.</p> <p>Credits 30</p>	<p>Technical skills must be demonstrated across a range of performances and events, including a minimum of five complex events (refer to general conditions for the definition of a complex event).</p> <ul style="list-style-type: none"> <li>- knowledge of operating systems, workflows and terminology for theatre and arena rigging systems;</li> <li>- interpreting plans and documents for theatre and arena rigging systems;</li> <li>- selecting and operating rigging equipment to meet the requirements of a rigging plan;</li> <li>- executing the rigging plan for a performance and/or event.</li> </ul>	<ul style="list-style-type: none"> <li>- 30460 - <i>Demonstrate knowledge of industry terminology, equipment and practices for event and arena rigging systems</i> Level 4 Credits 10</li> <li>- 30461 - <i>Install, operate and remove rigging equipment for a performance or event</i> Level 4 Credits 20</li> </ul>
<p><b>Lighting Strand</b></p> <p>Lighting technicians at Level 4 require a range of skills to be a valuable member of the lighting crew, electrical theory, knowledge of signal flow, electrical safety and guidelines, how to plot a simple event, understanding recording protocols and be able to use a range of different lighting fittings, fixtures and types. They need to understand the capability of the venue they're working in, control the lighting equipment and lighting desks and have some knowledge of the basic operation of a theatre or event.</p>		
<p>Safely install, operate and remove lighting equipment to meet</p>	<p>Technical skills must be demonstrated across a range of performances and events, including a minimum of four complex</p>	<ul style="list-style-type: none"> <li>- 30458 - <i>Demonstrate knowledge of electrical theory and</i></li> </ul>

<p>the production and lighting plan requirements for a range of complex performances and events.</p> <p>Credits 30</p>	<p>events (refer to general conditions for the definition of a complex event).</p> <ul style="list-style-type: none"> <li>- knowledge of the purpose and function of luminaires, effects and control equipment for technicians in the entertainment and event technology industry;</li> <li>- interpreting plans and documents for a lighting plan;</li> <li>- selecting and operating lighting equipment to meet the requirements of a lighting plan;</li> <li>- executing the lighting plan for a performance and/or event.</li> </ul>	<p><i>lighting equipment for stage lighting for a performance or event</i></p> <p><i>Level 4 Credits 10</i></p> <ul style="list-style-type: none"> <li>- <i>30459 - Install, operate and remove lighting systems for performances or events</i></li> </ul> <p><i>Level 4 Credits 20</i></p>
<p><b>Live Sound Strand</b></p> <p>At Level 4 sound technicians need to know their own standards and what a good sound is for the genre. They should have the operational knowledge required for the show as well as be able to interpret sound or technical riders. They need to allow for unexpected situations and not try to cover things up but find solutions and use dynamic troubleshooting.</p>		
<p>Safely install, operate and remove sound equipment to meet the production and sound plan requirements for a range of complex performances and events or a live recording.</p> <p>Credits 30</p>	<p>Technical skills must be demonstrated across a range of performances and events, including a minimum of four complex events (refer to general conditions for the definition of a complex event).</p> <ul style="list-style-type: none"> <li>- knowledge of the purpose and functions of equipment commonly used in live sound;</li> <li>- interpreting plans and documents for a sound plan;</li> <li>- selecting and operating sound equipment to meet the requirements of a sound plan;</li> <li>- executing the sound plan including selecting and applying a range of techniques to improve sound quality during a performance or event or a live recording.</li> </ul>	<ul style="list-style-type: none"> <li>- <i>30466 - Demonstrate knowledge of signal flow, sound system requirements and factors affecting performance or event sound quality</i></li> </ul> <p><i>Level 4 Credits 10</i></p> <ul style="list-style-type: none"> <li>- <i>30467 - Install, operate and remove sound equipment for performances, events or a live recording</i></li> </ul> <p><i>Level 4 Credits 20</i></p>
<p><b>Video Strand</b></p> <p>The graduate profile outcomes for video technicians match the lighting outcomes the main difference being the equipment used. They need to know what the equipment is capable of and understand test bars, playback systems, and software and monitor calibration. Their equipment can be projectors, screens, laptops and they need to understand interfaces, projection surfaces, file formats, carriers and production documentation and the external influences on visual elements.</p>		
<p>Safely install, operate and remove video equipment to meet the production and video plan requirements for a range of complex performances and events.</p> <p>Credits 30</p>	<p>Technical skills must be demonstrated across a range of performances and events, including a minimum of four complex events (refer to general conditions for the definition of a complex event).</p> <ul style="list-style-type: none"> <li>- the purpose and characteristics of the commonly used components of a video system and video system signal flow;</li> <li>- interpreting plans and documents for a sound and video plan;</li> </ul>	<ul style="list-style-type: none"> <li>- <i>30470 - Explain equipment, components and video signal quality relating to video systems for performances or events</i></li> </ul> <p><i>Level 4 Credits 10</i></p> <ul style="list-style-type: none"> <li>- <i>30471 - Select, install, operate and</i></li> </ul>

	<ul style="list-style-type: none"> <li>- operating video equipment including switcher, input and output equipment, to meet the requirements of a video system brief;</li> <li>- implementing a video system brief.</li> </ul>	<p><i>remove video equipment for performances or events</i></p> <p><i>Level 4 Credits 20</i></p>
<p><b>Stage Management Strand</b></p> <p>Stage Management skills are often soft skills that are difficult to document in a qualification or unit standard format, this includes maturity, emotional intelligence and remaining calm in all situations. Stage managers need to work with other disciplines and rarely in isolation, developing relationships with the production manager and other departments. They need to demonstrate an aptitude for making calls in high pressure situations. Distributing information, troubleshooting, problem solving, modifying, conflict resolution and multi-tasking are all highly sought after skills in stage managers. They also have to be sensitive to the performer aware of their needs and expectations. Where possible it's handy for stage managers to have a drivers licence, food preparation and safety certificate.</p>		
<p>Implement stage management documentation and production process requirements to ensure the smooth running of a range of complex performances and events.</p> <p>Credits 30</p>	<p>Technical skills must be demonstrated across a range of performances and events, including a minimum of three complex events (refer to general conditions for the definition of a complex event).</p> <ul style="list-style-type: none"> <li>- the key components to stage manage a performance or event, including pre-production planning and preparation;</li> <li>- interpreting and preparing plans and documents for a performance or event;</li> <li>- stage managing the production rehearsal phase of a performance or event;</li> <li>- executing the stage management function for performances or events.</li> </ul>	<ul style="list-style-type: none"> <li>- 30468 - <i>Demonstrate knowledge of roles and responsibilities within the stage management team for performances or events</i> <i>Level 4 Credits 10</i></li> <li>- 30469 - <i>Perform a stage management role and produce documentation for all phases of performances or events</i> <i>Level 4 Credits 20</i></li> </ul>
<p><b>Stage Mechanics Strand</b></p> <p>Stage mechanists work on stage, completing the set up for the show and the de-rig breakdown, often working in low light situations and confined spaces. They need to be able to manage stress and fatigue. Technicians work with mechanical and automated control systems and it's important they understand the two different parts to the stage mechanist role, construction mode and show mode. They have a direct relationship with the stage manager calling the show and the performer so they need to understand cues, use headsets and microphones and understand the needs of performers, modes of change and etiquette requirements.</p>		
<p>Safely set up, operate and remove scenery and stage mechanical devices to meet the production requirements for a range of complex performances and events.</p> <p>Credits 30</p>	<p>Technical skills must be demonstrated across a range of performances and events, including a minimum of four complex events (refer to general conditions for the definition of a complex event).</p> <ul style="list-style-type: none"> <li>- scenery;</li> <li>- interpreting plans and documents for scenery, mechanics and equipment on stage;</li> <li>- operating stage mechanical equipment and flying systems;</li> <li>- executing the staging requirements for a performance or event.</li> </ul>	<ul style="list-style-type: none"> <li>- 30464 - <i>Demonstrate knowledge of scenery, rigging and mechanical stage equipment for performances or events</i> <i>Level 4 Credits 10</i></li> <li>- 30465 - <i>Prepare, set up, operate, and remove scenery, rigging, and</i></li> </ul>

		<i>mechanical stage equipment for performances or events Level 4 Credits 20</i>
<p><b>Scenic Construction Strand</b></p> <p>The scenic construction crew work together to complete a range of tasks depending on their level of skill and the tool box of techniques and processes they accrue as they become proficient technicians. At level 4 you need an understanding of who you're working with, how to work safely and the purpose and function of tools, equipment and materials for constructing scenery. Graduates require knowledge of digital technologies and 3D printing and their application in drawing and interpreting the designer's requirements.</p>		
<p>Construct stage scenery using a range of construction methods, equipment and digital technologies for a range of complex performances and events.</p> <p>Credits 30</p>	<p>Technical skills must be demonstrated across a range of performances and events, including a minimum of four complex events (refer to general conditions for the definition of a complex event).</p> <ul style="list-style-type: none"> <li>- knowledge of the purpose and function of components to construct stage scenery;</li> <li>- interpreting plans and drawings for the construction of stage scenery;</li> <li>- operating tools and equipment to construct stage scenery, including the use of digital technologies such as computer aided design programmes, to meet the brief for a performance or event;</li> <li>- executing the construction of stage scenery for a performance and/or event.</li> </ul>	<ul style="list-style-type: none"> <li>- 30462 - <i>Demonstrate knowledge of the drawings, materials and methods used to construct stage scenery for performances or events Level 4 Credits 10</i></li> <li>- 30463 - <i>Construct stage scenery for a performance or event Level 4 Credits 20</i></li> </ul>

## Assessment conditions and evidence

Where possible, evidence of competence should be collected as naturally occurring evidence. For example, assessing a trainee while they are engaged in an event is a great way to view competence at any level depending on the tasks being performed. This also aligns with the requirement for learners to complete a minimum of 400 hours in realistic workplace/community setting:

Examples of naturally occurring evidence could be:

- Visual evidence such as videos and photos
- Meeting minutes, emails, personal glossaries, job lists, task sheets, job descriptions, stage notes, event or performance log book, back stage task lists.
- Organisational structure diagrams, codes of conduct verification documents, induction information, safety tour information, uniform or dress standards,
- Rehearsal sheets, pack in pack out sheets.
- Stage plan, stage plots, masking information sheets, props list, prompt book.
- Technical Riders - diagrams and notes for technical information, AV, lighting, feature lists.
- Method Statements
- Rigging plans - diagrams and notes for rigging and stage mechanics, mother grids, load specifications
- Lighting plans, lighting plots, lighting cue synopsis

- Sound plans and sound plots
- Signal flow diagrams
- Equipment lists, equipment testing sheets, PAT testing, etc. Maintenance schedules, test tags, venue or manufacturers requirement information, equipment safety labels. PPE equipment sheets, documentation for checking or removing defective equipment.
- Risk plans and schedules

## Further information

This section provides even further detail about what should be covered in a programme, by subject area:

### **Production process requirements**

#### *Pre-production process*

vision, venue, expectations, requirements, objectives, themes, format, meetings, scale models, creation of budget and timelines.

#### *Pre-production rehearsals*

direction, participants positioning, movement and blocking, experimentation, calls, devising.

#### *Pre-production process sourcing, manufacturing, and allocating resources*

specifications, procurement of props and costumes, installation, programming, clearance, load in, loading onto stage, set construction, shifts, shift crew, painting scenery, sewing and costume repair, seating plans and layout.

#### *Production process, delivering, packing or setup*

crew, resources, issues, props, ground plan, set construction, automation, curtains, blacks, prompt book, sightlines, cloth, set dressing, escape stairs, masking, marking out, on stage, off stage.

#### *Production process, cue to cue, technical rehearsal, technical dress rehearsal*

crew, resources, issues, needs, curtain call, paper tech, piano dress, point cue, production desk, run through, cue synopsis.

#### *Production process pack out and load out*

set tear down, props and costume return, rentals.

#### *Post-production archiving requirements*

crew lists, resources, issues, needs, prompt, score, cue synopsis, digital files, plans, timelines and schedules, budgets, supplier information, show reports, successful outcomes, statistics, resource allocations, running times, audience numbers, cast issues, performance issues, post-show report, missed cues, hazards, audience issues, stoppages and interruptions, noise levels, wardrobe and stage malfunctions.

### **Worker responsibilities**

#### *Organisational behaviour requirements*

codes of conduct, induction requirements, behaviours, contractor management requirements, contractor health and safety pre-qualification process (CPNZ).

### *Risk identification*

hazard identification, reporting accidents and incidents, incidents that harmed or might have harmed (near miss).

### *Compliance*

notification, notifiable work, evacuation procedures, emergency exit routes, fire curtains, flame retardants, fire extinguishers, earthquake procedures, safe areas, seating, crowd control, occupation of buildings.

### *Contracts for service*

work hours, force majeure, G.S.T., withholding tax, termination, completion, obligations, professional standards, code of conduct, communication processes, service provision.

### *Insurance and liability*

insurance, indemnity, work permit, equipment inspections, site inspections, audits, handover procedures, conflict of interest, security procedures.

## **Rigging Strand**

### **Industry terminology, equipment and practices for event and arena rigging systems**

#### *Rigging equipment*

slings, chains, ropes, bridles, pulleys, pull lifts, shackles, baskets, blocks, hoists, clamps, grips, o-rings, masterlinks, hooks, eyebolts, choke, lug, chocks and wedges, winches, spreader beams and equalising gear, rigging screws, tirsors, turn buckles, snatch blocks, bull dog clips, pin rails, tying off, sandbags, arbors, trim clamp, catenary line, spot line, drifts, stingers, mousing, screw gun.

#### *Natural or synthetic fibre and wire rope construction*

three strand twist, tensile strength, manila rope, braided rope, wire rope construction, stand and wire configuration 7x7 and 6x19, fibre core, independent wire rope core (IWRC).

#### *Types of blocks*

rigging blocks, sheaves, bearings, shaft, side plates, retainer, mounting device, head blocks, spot blocks, mule blocks, idler pulleys, sag bars, snatch blocks, rescue block, loft block.

#### *Counterweight rigging systems*

counterweight, single purchase counterweight system, double purchase counterweight system, cradle (arbor), control line (rope), rail brake, idler block, head block, loft block, lift line, trim chain, flybar, barrel, batten (timber, truss, pipe, ladder), load limit, rigging points.

#### *Stage terms*

house curtain, stage curtain, lights, scenery, stage effects, in and out, cyclorama, brail, breast, bridle, guying, surge line.

#### *Communication terminology for theatre, arena and events*

types of theatre and arena, rigging equipment, theatre curtains, types of blocks, counterweight rigging systems, truss science, foreign terms, calculations and conversions, fly systems, stage terms.

#### *Parts of a truss*

chord, diagonal brace, node;

### *Truss construction materials*

timber, steel, aluminium, carbon fibre; connection types include but are not limited to - conical coupler, plate and bolt, sleeve, fork and clevis; purpose of truss identifies but is not limited to -light duty decorative, medium duty general purpose, heavy duty;

### *Types of truss*

shape ladder truss, two chords, triangular three chords, box rectangular four chords, custom truss, curved truss.

### *Foreign terms*

snotters, stingers, DIN, TUV, CNUT, WLL, short ton, imperial tonne, metric ton.

### *Terminology for calculations and conversions*

kilonewton, kilogram, breaking load, pounds, shackle kg, lifting load, metric to imperial, computer aided design (CAD) scale, round up, round down, lbs, cwt, derating of equipment, weight, force, ratios, inch, metre.

### *Theatre proprietary systems*

fly system, theatrical rigging system, blocks and pulleys, counterweights, hoists, lifting tackle.

### *Mechanised rigging systems*

automated rigging system, hydraulic system, motorised winch fly system, direct drive winch system, chain hoists.

### *Types of fly systems*

fibre rope rigging systems, hand lines, counterweight rigging systems.

### *Fly system components*

battens, lines, blocks, counterweights, cradles (arbors), hoists, winches.

### *Fly system infrastructure*

fly tower (loft), grid deck, loading gallery (bridge), fly gallery, pin rail, locking rail, cradle well (arbor pit), roof truss, catwalk, lighting bridge.

### *Counterweight rigging systems*

single purchase, double purchase, blocks, locking, loading and unloading from the loading gallery, increasing capacity.

### *Motorised rigging systems*

motorised winches, counterweight balanced loads, part balanced load, chain drive, wind on wind off system, power assist, traction drive, dead haul winch, drum winch, line shaft system, packaged hoist system, electric and hydraulic motor, closed and open loop control.

### *Lift apparatus*

chain hoists, multi point hoisting, slings.

### *Site access equipment*

fixed ladders, catwalks, fixed platforms, mobile elevated work platform (MEWP), access towers, wire rope ladders.

### *Slinging loads and calculations*

strength of connection to the load, stability of the slung load, ratings, type of lift, appropriate use of a sling to wrap a truss, define choke and basket and the strengths and weaknesses.

### *Movement of loads*

communication and signal methods, centre of gravity of load, access, obstacles, final resting place, design specifications, stability, use of load shifting equipment, use of rigging gear.

### *System load requirements*

positive and negative forces, moment of force, resultant force, bridle analysis, bridle length calculation, hanging points of different heights, horizontal force, vectors, moment theory or method, effects of bridles on hanging points, hanging lines on beams.

### *Manufacturers specifications*

manufacturers' ratings, finite strength, failure, tensile force, compressive force, shear force, stress, yield point and elasticity, breaking point, allowable deflection, torsion, unpredictable forces, fatigue, shock loads.

### *Safety with fall protection systems*

suitability, conditions, traceability, compatibility, security, anchorage, fit, age of equipment, clearance, selection.

### *Safe rigging work*

components, and/or equipment, uncompleted structures, confined and enclosed spaces, static lines, fall arrest systems

### *Safety margins*

factor of safety, degree of risk, known forces, strength reduction factors (SRF), derating, fatigue bending and abrasion, termination.

### *Safety and safe work practice requirements*

weight of load, weight of block and tackle, capacity of block and tackle, self weight of rigging equipment, working load limit (WLL), lead line pull (LLP), supporting member load capacity, total load on supporting member, load distribution, dynamic load, inertia and friction, mechanical advantage, total load on the system, attaching, operating, storage.

### *Safe use of types of ropes*

allowable working load, knotting, bends and hitches, care of rope, balance, coiling and uncoiling, storing, dirt and dust, chemicals, overload, sharp bends, small sheaves, abrasion, shock load, humidity, visual inspection, rotating rope position, indentations, variations in colour, variation in diameter, broken internal strands, high strand, rot and mildew, age of the rope.

### *Rigging tasks*

working at height, correct order of tasks, high traffic areas.

### *Safety with fibre rope and hand line rigging components*

ropes and sandbags, ropes weighted with pipes, untying a line set, attaching load, removing loads, trim marks, yarn trim mark, tie off lashing, re trimming, coiling and dressing, show operation, tying knots, lock rail, rope lock, line lock, taping of tails, double purchase set, loft block positioning, head block positioning, fleet angle, aligning blocks, running rope, natural and synthetic splicing, whipping.

## **Installation, operation and removal of rigging equipment**

### *Purpose of a method statement*

risk assessment, range of methods, highlighting strengths and weaknesses, planning, adequate

safety mechanisms, emergency procedures, delivery requirements, pack out requirements, storage on site, personal protective equipment (PPE) requirements;

#### *Benefits of a method statement*

cost benefits, information for stakeholders, commercial advantage.

#### *Method statement documentation for site requirements*

venue structural load capability, power supplies, known rigging points, previous production information, laser beam fire protection positions, hazard registers, notification to Worksafe.

#### *Method statement schedule of work*

arrival on site, briefing the crew, rigging crew numbers, people access, power access, stage access, access to roof space and catwalks, timeframes, transport requirements, hanging and hoisting times, lifting operations, insurance coverage limits, de rigging times and access, rigging equipment collection and loading times, access to loading dock.

#### *Method statement professional standards and certificates*

rigging certificates held, rigging plan compliance, standards of practice, professional conduct, rigging principles used.

#### *Working at height requirements*

access to work at height, machine or mobile access equipment, off catwalk requirements, fall arrest equipment information, vertical fall equipment, use of appropriate anchors, support rigger, rescue training, first aid kit availability, unsecured tools and equipment, safety line systems, fixed anchorage points, truss walking safety guidelines, rescue planning

#### *Method statement safe rigging practices*

assessment of load, rigging plan checks, proof of inspection, safe use of bridles, correct attachment to building structures, safe use of self climbing hoist chains, termination of steel wire ropes, electrical sign off requirements, safe use of slings and chains, type of truss and hardware used.

#### *Assembly and installation of rigging equipment*

chain of command, checklists for monitoring on site, up to date risk assessments, training records, rigging crew capabilities, health and safety awareness, when to escalate issues, visibility, limiting features, proximity hazards, testing, equipment integrity, safe lifting.

#### *Selection of ropes, wire ropes and accessories*

elasticity, elongation, flexibility, durability, handling characteristics, strength, reserve strength, abrasion resistance, size, core construction, classification, grades, uneven cable stretch, adjustment device, trim chain, safety bolt.

#### *Truss science and requirements*

safe load limits, load dimensions, centre of gravity, lift requirements, anchorage points, power and control cables, stability.

#### *Slinging load requirements*

potential hazards, potential injury to handler, slipping on load, catching on objects, potential to damage the load, potential injury to others.

#### *Safe selection and use of slings*

regular, irregular, overload, under load, uneven distribution, slippery, fragile, unstable.

### *Selecting slings*

load types may include but are not limited to - regular, irregular, overload, under load, uneven distribution, slippery, fragile, unstable, rough or sharp edge, environmental conditions may include but are not limited to - nearby heat source, moisture, sling construction materials include but are not limited to - chain, wire rope, polyester or nylon, other natural or synthetic fibres.

### *Checking of slings for issues*

hazard identification, injury to handler, slipping on load, catching on objects, potential to damage the load, potential injury to others.

### *Rigging equipment and load specifications*

using rigging accessories to join slings, terminating wire ropes, lifting loads without a crane, rig loads into position.

### *Common types of knots and hitches*

bowline, reef knot, figure eight knot, clove hitch, round turn and two half hitches, rolling hitch, Italian hitch, sheet bend, bow, alpine butterfly.

### *Implementation pre use checks*

visual pre checks, safe working load markers, kinked or knotted wire, abrasions, damp, mildew, burns, friction marks, safety catches, safe working load checks, calculations, communications, de rating requirements, fire safety checks.

### *Fibre rope selection issues*

susceptibility to rot, abrasion resistance, stretch, flexibility, cost.

### *Industry standards for checking knots and hitches*

hauling, rigging, easy to untie, use in unstable dynamic situations, joining two lines, high stability, repeat use without untying, attaching rope to solid objects, vertical lifts, use with other knots, lowering heavy loads, belaying a person, tie cloths to fly bars, for loops in the bight of a rope.

### *Completion of secondary suspensions*

excessive slack, material components, independent structural member, vertical rigging, safe practices, choking, protection materials.

### *Existing and potential hazards*

electric shock, noise, dust, moving parts, falling, dropping from height, electrocution.

### *Hand tools*

sledge and copper, headed hammers, pry bars, podge bars, sockets, spanners, drills, angle grinders.

### *Safety with hand tools*

personal safety, safety of others, environmentally safe, safe noise levels, low traffic areas, under time pressure, low light.

### *Safe use of slings*

type and condition, connection to the lifting equipment, mechanical action identified, cutting and pinching, centre of gravity, sling rating, compressive force, height of sling triangle, angle of the sling, fouling of chain bag or power cable, sling protection, avoidance of heat sources.

### *Safe use of bridles*

dead hang, bridle angle, bridle leg tension, bridle force, suitability of supporting structure, dynamic

loading, checking ready made bridles.

#### *Health and safety rigging forms*

notifications, inspections, registers, plans, schedules, statements

#### *Rigging equipment and storage considerations*

equipment includes but is not limited to - ropes, slings, harnesses, truss, battens; contaminants include but are not limited to - chemical, water damage, heat

#### *Storage issues and contaminants*

shackle, carabiner, rope, slings, harness, truss, batten; contaminants include but are not limited to - chemical, water damage, heat, mechanical damage, ultraviolet.

### **Lighting Strand**

#### **Electrical theory and lighting equipment for stage lighting for a performance or event**

##### *Luminaire*

profiles, blinders, follow spots, fresnel, flood lights, plano convex, parcan, beamlight, cyc light, light emitting diodes (LED), luminaire data sheets.

##### *Optics and light fittings*

lamp, reflector, lens, lenses, focus point, gate, shutters.

##### *Electricity terminology*

wave form, current direction, current, voltage, sine wave, frequency, cycle, root-mean-square (rms) value, maximum or peak value, amps, volts, watts, resistance, power factor.

##### *Industry terms*

1k, 5k, ½ k or 500w, aircraft landing light (ACL), 650W, 1.2kW, 2kW.

##### *Simple dimmer and control circuit components*

triode for alternating current (TRIAC) Silicon controlled rectifier (SCR), residual current device (RCD), circuit breaker, fuse, interrupted sine wave.

##### *Lamps*

incandescent, tungsten, halogen, 12, 24, 80, 120 or 240 volts, HID/discharge lamps, fluorescent lamps, construction, operation, colour temperature, lampbase type (bayonet cap, Edison screw), expected lamp life, Bi-plane filament, safe handling procedures, the relative efficiencies of the different types of lamp, and their pros and cons.

##### *Low voltage lights*

BUD lights, xmas tree lights, party lights, 12 volt birdies.

##### *Risks and procedures for accidents and injuries*

electric shock, heat related burns, UV burns, fire, instruments at height.

Optics-electromagnetic spectrum, the speed of light, colours, Kelvin.

##### *Interpreting lighting plans*

selective visibility, revelation of form, focus, mood, location and time of day, projection, stage elements, plot or script, composition and design, mood, atmosphere, beams, area and wash.

### *Cleaning luminaire*

protective glass panels, optical controls, pH neutral cleaning agents, lint free cloths, gloves, exertion of pressure, clean surroundings, surface maintenance, operating time, type of luminaires, environmental influences, contamination, dust, heat, cooling period, power off, luminaires casings, cleaning maintenance schedule.

### *Qualities of lighting*

intensity, brightness and glare, illumination, colour, direction, focus, position, hanging, chroma, hue and value, illumination value, movement, direction, visibility versus mood

### *Effect equipment*

smoke machines, haze machines, fog machines, mirror ball, bubble machine, heavy fog machine, dry ice machine, strobes.

### *Lighting accessories*

cables, barndoors, stands, strip lights, light meters, colour filter (Gel), gobo, shutter, iris, top hats, animation discs, rotators, animators, scrollers.

### *Control equipment*

dimmers, lighting consoles, switch packs, DMX system, multicore patching, universes, power reticulation, patch panels, waylines.

### *Moving lights*

moving mirror, moving head, wash, profile, LED, discharge, tungsten, quality of fitting.

### *Flexible cord types*

twin vs three conductor cord, rubber sheath (RS), tough plastic sheath (TPS), and polychloroprene compound (PCP), polyvinyl chloride (PVC), rated operating temperature.

### *Situations*

faults, overload, short circuit, electric shock hazard, damage to property, damage to cables, explosion.

### *Energy*

electromechanical energy, heat energy.

### *Conditions*

underrated fuse, overrated fuse, incorrectly sized fuse link, overloaded circuit, short circuit in fixed wiring, short circuit to earth, mechanical overload, and excessive earth leakage.

## **Installation, operation and removal of lighting systems for performances or events**

### *Patching requirements for the lighting plan*

channel numbering, DMX addresses, multiple universe patching, multiple address patching, non-dim patching.

### *Instrument schedule for lighting plan*

quantity, type, wattage, use, colour media, accessories, rigging and plugging, connection requirements, dimmers, location and position, focus on stage, gobo, top hat, half hat, barndoor.

### *Cable list for lighting plan*

dimmer supply, distribution, loads to dimmers, control data distribution, non-dimmed power supply distribution.

### *Equipment*

luminaires, dimmer pack, power source, cables, lighting desk, multicores and leads, plugs, access equipment, gobos, gel, digital multiplex (DMX) reticulation equipment.

### *Best options for cable runs*

cables across doorways, safe lighting position choices, proximity to audio lines, aesthetically pleasing, not spanning gaps in a grid system.

### *Implementation, focus activity*

lash through, trimming of bars, tidying of looms and cables, setting up production desk, checking for smoke isolation, pan tilt, lock off, peak flat lamp, lens orientation, barndoors.

### *Focussing techniques*

panning, tilting spotting, zooming, adjusting doors and shutters, peaking.

### *Lighting console*

manual pre-set, faders, crossfader, lighting state transition, speed, timing, record enable, editor, playback, effects, patch, remote focus unit, inputs, outputs, tracking, submaster, step time, in time, dwell time, down time, forward, reverse, bounce, build, random, groups, pre sets.

### *Unexpected changes*

equipment failure, skipped dance steps, missed cue, dancer injury, set list changes, performer improvisation.

### *Labelling*

labelled desk, marked up script, annotated run sheet, cue notes.

### *Groupings*

colour, gobos, specials, upstage, downstage, effect and blinders.

## **Sound Strand**

### **Signal flow, sound system requirements, and factors affecting performance or event sound quality**

#### *Conventions and formats*

blocks, left to right, top to bottom, female and male connectors, 2 and 3 wire circuits, T connections, switches, headphones, snake, stage box, speakers, microphones, line amplifier, resistance, balanced and unbalanced output, reasons for using, labels, diagram key.

#### *Power, voltage, resistance*

Ohm's law, simple DC circuit, simple AC circuit,  $V = I \times R$ ,  $\text{Power} = V \times I$ .

#### *Input devices*

dynamic microphones, condenser microphones, contact pick ups, magnetic pick ups, tape heads, laser pick ups, optical pick ups

#### *Output devices*

output transducers - dynamic speaker, piezoelectric speaker, ribbon speaker, electrostatic speaker,

compression driver, heil air motion transformer (AMT) speaker. Speakers - subwoofer, midrange, tweeter, front loaded, horn loaded, band pass, bass reflex, point source, line array, passive box, active box, wedge.

#### *Components of a mixing desk*

channel input, gain, equalization (EQ), auxiliary (aux), aux master, aux out, stage monitor mix, pan, master faders, front of house mix.

#### *The components of audio perception*

loudness, pitch, timbre, masking, ambient noise, the Haas effect, temporary threshold shift, permanent hearing loss, sound pressure level (SPL) exposure.

#### *Elements of sound signals*

gain distortion, (THD and IMD), signal to noise ratio, dynamic range, cross talk, frequency, phase, frequency and phase response, sound pressure level.

#### *Good sound quality*

reverberation times, reflection, absorption, diffusion, room dimensions and standing waves, resonant frequencies, changing audience numbers, the effects of temperature and humidity.

#### *The effects of equipment placement*

audience coverage, uniformity of level and frequency response, loudspeaker directional pattern control, polar patterns, comb filtering and interference, stage bleed.

#### *Mixing effects*

reverb, delay, harmony, compression, limiting, gating, auto tune.

#### *Personal likes and dislikes*

listening volumes, frequency balances, music genres, special effects, types of venue, age of the audience.

### **Installation, operation and removal of sound equipment**

#### *Sound requirements for personnel*

external power requirements, equipment storage capacity, resources for hire, technical support, venue administration personnel.

#### *Personal equipment list*

PPE, hearing attenuators, steel cap boots, batteries, electrical tape, pen torch, USB, tools, leatherman, gerber, crescent soldering iron, drum key.

#### *Equipment*

speakers, amplifiers, microphones, cables, sound desk.

#### *Preparation*

labelling, colour coding, testing, patching, pre-programming, tuning (RF).

#### *Choice of racks and road cases*

sound equipment requirements, preventing equipment damage, efficient fit of equipment into cases, efficient fit of cases into vehicle.

#### *Spare equipment*

spare speakers, amplifiers, microphones and cables, windsocks, adapter, electrical and gaffa tape, cable ties, tarpaulins, rope.

### *Safety equipment for cable runs*

rubber mats, cable ramps, cones for audience free zones.

### *Troubleshooting techniques*

swapping out faulty equipment for spares, rerouting around faulty equipment, repairing faulty equipment, checking connections, adjusting equipment to reduce distortion or noise, changing signal flow to eliminate hums/buzzes, equalizing for hiss or hum.

### *Feedback control mechanisms*

reduce gain, adjust EQ, adjust mic placement, swap out equipment.

### *Safety equipment*

personal protective equipment (PPE) for working at height, ladders, lifts, platforms.

### *Pack out and loading of sound system*

department manager requirements, housekeeping, storage, timelines, transport requirements.

## **Video Strand**

### **Equipment, components and video signal quality relating to video systems**

#### *Selection criteria*

maximising video quality, reducing video signal degradation, maximising bandwidth and screen resolution, reducing interface issues, correct screen output selection, requirements for cable length, required signal types.

#### *Requirements of output devices*

type of image, portability, resolution, format, contrast ratios, connectivity, type of venue.

#### *Inputs*

computers, media servers, playback devices, cameras

#### *Output devices*

projectors, recorders, monitors, multi-image viewers, LED screens, flat panel screens.

#### *Characteristics of input devices*

lens ratios, low light, audio connections, suitability to venue, formatting with monitors, depth of field, protocols, SDI, HDMI.

#### *Video signal flow diagram*

senders, receivers, media servers, convertors, connectors, display devices, monitors, video production switcher, video scaler, router, test signal generator, radio frequency modulator, scan converter, waveform monitor, distribution amplifier, camera control units, cameras, projectors, multi-image viewer, video playback deck, character generator, record decks, encoders and decoders.

### **Select, install, operate and remove video equipment**

#### *Mix effect functions*

mix or dissolve, dip, wipe, DVE, sting.

#### *Programme option switching*

sources, black, camera, colours, test bars.

### *Configuration of keys*

preview monitor settings, media players, graphics, live stream video.

### *Video production switcher operation*

timing of cues, troubleshooting, coping with changing demands and timelines.

### *Reasons for testing*

input voltage, quality of the video image, colour calibration, the relationship between signals, checking connectivity.

### *Types of testing equipment*

digital volt meter (DVM), test bars, densitometer, waveform monitors, graphical user interface (GUI), from AV1.4 test signal generator.

## **Stage Management Strand**

### **Roles and responsibilities within the stage management team**

#### *Key personnel*

performers and musicians, design team, artistic team, production personnel, administration, venue personnel, consultants.

#### *Roles*

stage manager, deputy stage manager, assistant stage manager

#### *Responsibilities*

props, food preparation, chaperoning.

#### *Time management responsibilities*

manage overall timeframes, manage inflexible deadlines, adhere to schedules, execute rehearsals in a timely manner, manage personnel time frames, personal impact on time management.

#### *Attributes of the stage management team*

confidence, confidentiality, equanimity, multi-tasking, responsiveness, patience, humour, enthusiasm, versatility, self-motivating, inventiveness, self-governing, resilience, foresight, empathetic, approachable, clear communicator.

#### *Behaviours*

code of conduct, etiquette, perseverance, deliver constructive criticism, follow through, systematic approach to problem solving, adjusting to unexpected situations, time management.

### **Performing a stage management role and producing documentation**

#### *Pre-rehearsal period*

auditions, design meetings, rehearsal preparedness.

#### *Preparing rehearsal room*

requirements of the rehearsal process and room, health and safety, preparing the space.

#### *Notes taken*

administration, technical, prompt book, notation, setting lists, rehearsal reports, schedules.

### *Rehearsal space marked out*

orientation of stage to rehearsal room, entrances and exits, centre line, upstage, downstage, flown scenery, stage elements.

### *Assistance and support*

health and safe environment, meeting the needs of the production process, cultural sensitivity, etiquette.

### *Rehearsal room requirements*

transport, allocation of space, placement and marking out of props, scenery and wardrobe, transferring spike marks, performers and musicians side of stage requirements, signage.

### *Auxiliary spaces*

green room, dressing rooms, warm up spaces, practice rooms.

### *Technical equipment*

communication, systems, timing systems, sound, video or lighting equipment, show relay system, house curtains.

### *Courtesy calls*

half hour call, house open, 15 minute call, 5 minute call, beginners, places, interval calls, calls to stage.

### *Duties*

running a wing, calling the show, assisting with performers, assisting with scene changes and staging, maintaining production standards, maintaining a safe and healthy work environment, problem solving, escalating concerns to appropriate personnel, managing other personnel.

### *Pack out roles*

packing props and equipment, returning equipment, storage of props, wardrobe tasks, collating documentation.

### *Audition phase documentation*

personnel lists, contacts lists, schedule, script selections.

### *Performers and musicians documentation*

contact lists, performer and musician information, attendance, availability, casting lists, rehearsal schedule.

### *Induction documentation*

venue safety, identifying hazards, safety plans, entry and exit points, fire exits, fire extinguishers.

### *Rehearsal process documentation*

props setting/running lists, cross character plot, rehearsal cues.

### *Rehearsal reports*

blocking notes, props notes, performer notes, actions, timings.

### *Technical rehearsal documentation*

event guides, schedules, running lists, cue lists, cue plots, crew plots, venue signage.

### *Prompt book documentation*

blocking notes, technical cues and notes, props notes, performer notes, actions, timings, performance notes, courtesy calls.

### *Distribution lists and show report*

running times, performer notes, technical notes, repairs required, house numbers, company morale notes, audience response notes, accident and incident reporting.

### *Production resource book*

casting lists, running lists, scripts, scores, props, set, lighting plots, sound plots, show reports, stage, markings, stage drawings, props setting diagrams, props purchase history, consumables lists, crew calls, venue notes, information relating to performers, staging, crew information, equipment, sound, lighting, set, props, costumes, venues, transportation.

## **Scenic Construction Strand**

### **Drawings, materials and methods used to construct stage scenery**

#### *Scenic construction tools*

battery and electric drills, drill press, circular saw, jig saw, angle grinder, router, biscuit joiner, drop saw, staplers and nail guns, appropriate hand tools.

#### *Set requirements (hard scenery)*

hard and soft flats, masking flats, painted flats, 3 dimensional built up set pieces.

#### *Set requirements (soft scenery)*

backcloth, masking cloth, backdrop, gauze, cyclorama, show cloth, translucent and opaque drops, scrim drops, cut out drops, draperies, masking borders, curtains, curtain runners, pelmets, blinds, café curtains, front cloth, venetians, drapes, tabs, swags, bobbinet nets, mosquito net.

#### *Flying scenery*

masking drapes, borders & legs, flown scenery, kabuki drop.

#### *Scenery props*

stairs, railings, rocks and trees, tables, chairs, false floors.

#### *Scenery moving apparatus*

flying system, revolve, trucks, stage traps, using hydraulics, pneumatics, electrics, mechanical.

#### *Types of wood*

plywood, medium density fibre board (MDF), balsa, particle board, finger jointed timber, rough sawn and gauged timber.

#### *Types of fabric*

muslin, velour, paper, cotton, scrim, canvas, netting, wool serge, calico.

#### *Types of man made products*

polystyrene, plaster, latex, plastics, acrylic, polyvinylchloride (PVC), fibreglass, cement renders, polyurethane.

#### *Types of natural materials*

plant material, stones and rocks, sand, gravel.

### *Methods of joining timber scenery*

butt joint, lap joint, mitre joint, notched joint, scarf joint, mortise and tenon joint, doweled joint, biscuit joint.

### *Methods of welding*

MIG, TIG, manual arc and gas welding.

### *Methods to secure assemble and suspend scenery*

hinges, pins, metal fixing plates, brace, fasteners, adhesives, flying hardware.

### *Paint effect methods*

glazing, embossing, rag rolling, marbling, stencilling, spattering, sponging, ageing, wet blending, gilding, sponge printing.

### *Hand tools for constructing and repairing scenery*

hand and power tools, nail & staple gun, heat gun, hot glue gun, foam cutter, sander, spray gun.

### *Scenic construction safety with hand tools*

personal safety, safety of others, environmentally safe, safe noise levels, appropriate personal protective equipment (PPE).

## **Construction of stage scenery**

### *Design brief style requirements*

location, period, mood, style, genre.

### *Design brief practical considerations*

equipment storage space, entrances and exits, collapsibility, stage dimensions, stage load limits, access to performance space, access to rehearsals, stage surface, rigging requirements, flying scenery, safety of performers, safety of audience, stage mechanics requirements, budget, touring and transport considerations.

### *Parameters for scale and standard of scenery*

schedule of materials, assembly, installation, human resources, timeline, type and standard of finishing,

### *Stage plans and ground plans*

position, size, masking requirements, sight lines, visibility.

### *Drawing techniques*

hand sketches, drawing board, computer software.

### *Design and drawing information*

component dimensions, position, size, shape, thickness, construction methods.

### *Documentation*

scanned hand drawings, digital drawings, cut list.

### *Emergency and evacuation events*

chemical spill, paint spill, fire, paint or chemical inhalation, accident.

### *Safe use documentation and signage*

material safety data sheets, risk assessment plans, safety sign.

### *PPE for scenic construction*

gloves, gloves, earmuffs, eye protection, high visibility clothing, work boots, hats, machinery, guards, residual currency devices, breathing apparatus.

### *Automated or mechanical moving devices*

revolves, trap doors, flying scenery and props, trucks, moving platforms

### **Preparation of stage scenery**

#### *Stage set up documentation*

production drawings, notes, hanging plot, riders.

#### *Interpretation of stage drawings*

sight lines, setting line, drapes, centre line, proscenium line, stage dimensions, drift, stage side elevations, stage front elevations and plans.

#### *Stock scenery*

doors, windows, platforms, rostra, flats, false floors, treads.

#### *Moving scenery equipment*

trucks, hoists, revolves, stage traps, stage rigging, lifts.

#### *Access equipment*

tallescope, ladders, scaffold, personnel lifts, elevated work platforms (EWP).

#### *Stage communication protocols*

performers, commands, cues, directions, communication systems.

#### *Manual scenery handling techniques*

flats, trucks, rostra, drapes, floors and cloths.

#### *Mechanical stage equipment*

trucks, revolves, stage traps, lifts

#### *Managing wings*

side masking dressed, carpet runners in place, quick change areas, scenery park and store areas.