Basic Rigging Study Notes

- You have 60 days to apply for your licence.
- Your licence will be cancelled 12 months after expiry date.
- You can carry out high risk work if you are enrolled and being supervised by someone licensed.
- You have a duty of care to protect yourself and others from harm.
- If you work unsafely your licence will be suspended or cancelled.
- You must provide High risk licence upon request to your employer etc.
- Some tasks an Basic Rigger can legally do are:
    - Structural steel erection, Install hoist, Install cantilevered crane loading platforms, Place pre-cast concrete.
- By consulting with these people you can find out:
    - Safety officers - Site-specific hazards, policies & procedures
    - Engineers – plans, drawings & load bearings
    - Supervisors - Job specifics & Work area arrangements
- Some Rigging hazards to consider and plan for.
    - Electrical lines, Buildings, Trees, Pedestrians, Plant Obstructions, Underground services, Excavations, Lighting, Weather.
- Planning considerations are:
    - Permits P
    - Location L
    - Access & Egress A
    - Communications C
    - Equipment E
- Hierarchy of control
    - Elimination Every
    - Substitution Saturday
    - Isolation I
    - Engineering Eat
    - Administration Apple
    - PPE Pie
- PPE & communications must be inspected before use.
- If something unsafe happens when rigging (STIRR) Stop, Tag, Isolate, Record, Report.

- Safe minimum distance from power lines for QLD 3m, 4.5m, 5m, 6m. To work closer than that you need to isolate insulate lines or employ spotters
- Find out voltage contact electrical authority.
- Tiger tails are a visual aid only to highlight powerlines.
- Consult with engineer to find out ground stability to ensure surface is capable of supporting structure or task safely
- Moving structures or plant or erecting over a pedestrian footpath some control measures are Warning sign and barriers, Pedestrian exclusion zones eg. Gantries or scaffolds, Overhead protection
- When Rigging some control measures to protect safety of pedestrians, workers, vehicles or plant are Flag Person, Warning sign and barriers, Flashing Hazard Lights.
- Other then basic PPE some other safety equipment used by Riggers are Safety harness, Lanyard, Static lines.
- Methods of communicating used in workplace:
  Written instruction, Hand signals & whistles
- When rigging dynamic forces and wind loads need to be considered.
  - Dynamic Forces: Forces caused by movement of crane and load being lifted.
  - Wind loads: Loads caused by wind catching on crane and load.
- Some defects that make flexible steel wire rope are (FSWR) unsafe are Broken wires, More than 10% wear in diameter, Missing Tags.
- Some defects that make chains unsafe are More than 10% wear, Cracks in spot welds, Missing Tags.
- Some defects that make Synthetic slings unsafe are Missing tags or labels, Cuts and abrasions, Damaged stitching, Burns.
- In an emergency you must communicate What & Where the emergency is & Who is involved. (WWW) Alert everyone.
- Some defects that make safety net unsafe Damaged, Stretched, Frayed fibres.
- Some defects that make Harnesses unsafe NO current inspection tag, signs of any damage to any part.
- Only use ratchet and pawl, or other tensioning device, to tension static line if permitted by Manufacturer or engineer to specified tension.
- Some device, to tension static line can be turnbuckles, come a longs. When using tensioning device secure static line then remove device.

- In most circumstances maximum length for single span static line is 6m. And should be no less than 2.1m from floor where possible. Allowed sag is 50mm per meter. Some ways to terminate (FSWR) static lines are Suitable wedge and socket, Purpose- designed fittings, Machine splice with thimble eye. Some approved anchors used to install static lines are Cast in, chemical and mechanical
- Anchorage points for fall arrest systems must be Collared eye bolts. When attaching static line to eye bolts you must use turnbuckles you must use Formed open design allowing for inspection.
- Secure cantilevered crane loading platform (CCLP) to prevent lateral displacement needles supporting platform must be braced preventing lateral movement and adequately anchored to prevent uplift. Use bolts anchored through support structure and/or props secured at top and base. (CCLP) should be flush with floor if not possible suitable ramps must be fitted. (CCLP) Must not extend past the line of public overhead protection.
- Some check that should be done using (CCLP) are
  All bolts or connectors must be secured and tightened in position
  All props must be plumb and have the secure rear ties in position
  There must be no gap between the platform floor and floor slab
  Adjustable props must be set to ensure minimal jack extension
  Rear handrails must be in position
  Side panels and gates must be positively fixed in position
- Safety nets must be installed As per manufactures specks. Some things that could condemn safety net for use are Dragging the net over rough surfaces or edges, Contact of chords with sharp edges, Stacking of materials on the net, Accumulation of debris in the net, Sparks or flame from welding equipment or oxy cutting equipment.
- Erection of steel packers are used To ensure column is plum or vertical. When using guys to stabilise freestanding columns you must use (FSWR) flexible steel wire rope.
- To stop roof trusses bending when lifting Trusses should be bridled and slung with central vertical sling and mass evenly distributed to sling. When truss is in position you must support truss until wind bracing is fitted with Temporary guys at apex of truss.
- When erecting steel correct nuts, bolts and washers must be used or the strength or stability of steel structure can be affected seriously.
- To identify high-strength structural bolts, nuts and washers

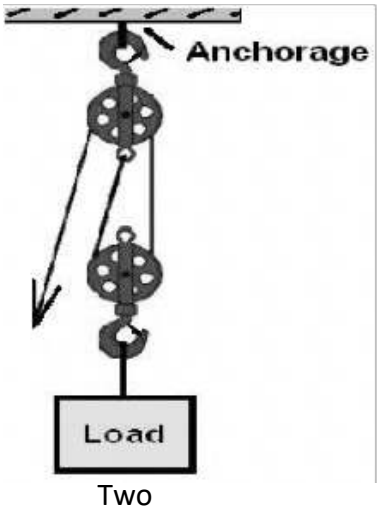
  Bolts: 3 radial lines and 8.8

  Nuts: 3 arcs

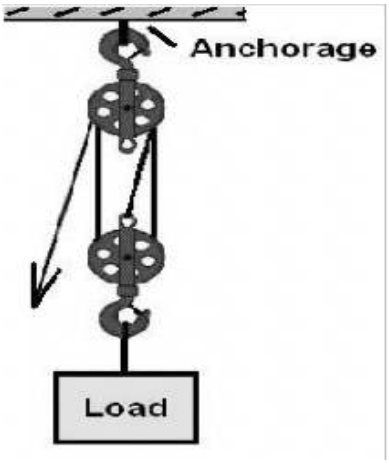
  Washers: 3 protruding nibs
- Some types of equipment riggers use unattached rigging gear elevated work platform, remote release shackles.

- Devices to level and plum columns Packers, hammers, tirfors, guys.
- Minimise work at height by prefabricating as much as possible on the ground and putting into position with a crane.
- Angle for fixing ladders to structure 75° or 4:1
- Always fix wall girts from bottom to allow standing room
- Fix Field bolted beams in diagonally opposite sides to prevent rolling.
- Working on wet, painted or moisture covered concrete, timber or steel could cause you to slip or fall.
- If a lift is attempted and no movement occurs some possible hazards are beam coming loose and falling, uncontrolled movement and could shock load crane with serious chance of damage or injury.
- Working at heights use correct size ring r open spanner
  Type of spanner not to use shifting spanners
  Tool to locate and pin steel beams or columns podger.
- When lifting precast facade precast panels or beams you must pull on the inserts Vertical.
- Lowering precast facade precast panels or beams into final position As slow as possible.
- If lifting insert breaks or pulls loose Stop if possible, safely lower or support panel isolate panel from use.
- It's dangerous to turn pre-cast or pre-stressed on side while suspended it could collapse causing damage to equipment and plant or serious injury.
- When lowering pre-cast if radio communications stop working stop operations, follow emergency procedures for communication failure, don't recommence until communications are re-established.
- The manufacturer or engineer is responsible for determining lifting points on pre-cast beams.
- If groove is to large rope will Flatten if grove is to small rope will cause Pinching and abrasion.
- For power-operated winch lifting with (FSWR) sheave diameter minimum is 15 x rope diameter.
- Minimum depth of groove on grooved winch drum 1/3 x rope diameter or as per manufactures specks.
- Minimum height of flanges on un-grooved winch drum is 3 x rope diameter or as per manufactures specks.
- You cannot use (FSWR) in a fibre rope tackle block Fibre rope can be used in wire rope purchase block.

- Mechanical advantage ratio



Two



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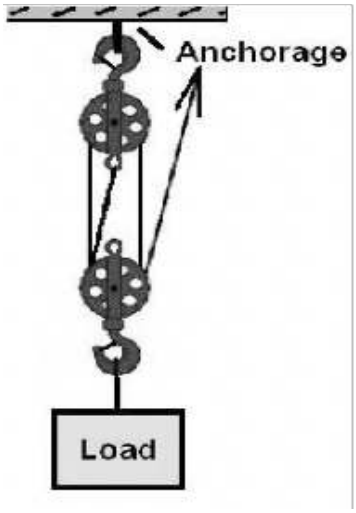

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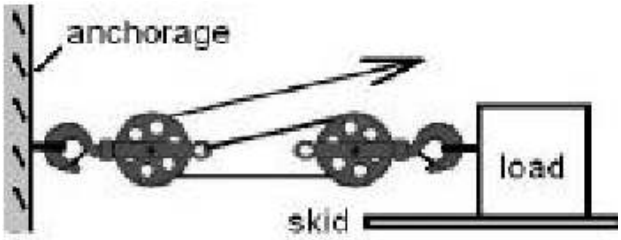
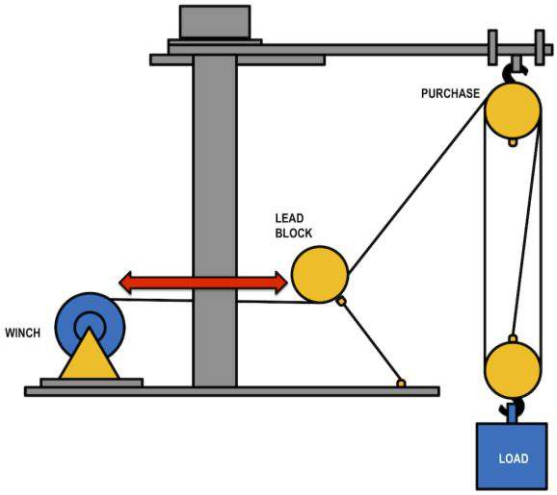


Two

- Minimum depth of groove for wire rope purchase block for rigging work 1.5 times rope diameter
- The circumference that sits within the groove of sheave 1/3
- When a rope has been wound the maximum number of turns on a hoist drum, how much needs to be left on the flange of the drum past the outer layer of rope? 2 x rope diameter.
- Minimum number of full turns to remain on drum 2 full turns.
- Some defects that will mean a sheave is not safe to use

  Flange cracked or chipped, Grooves worn or seized, Bending or warping, Worn bearing.
- Secure or fix tail of hoist rope to winch drum with Cable clamps and wedge and socket (keeper plate), Wedge and clamp, According to the manufacturer's specifications.



Drum Width	Drum type
0.3m	**ungrooved**
Lower block load	Sheaves used in purchase
5t	**4**

5% friction allowance

Inclued angle between the lead rope and the load line through the lead block is **90°**

1. Calculate minimum distance between the lead block and the winch drum? Show Workings

2. Calculate load in lead rope?

3.Size of FSWR required?

4. Calculate the head load for the purchase support sling?

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5. Calculate the head load for the lead block support sling?

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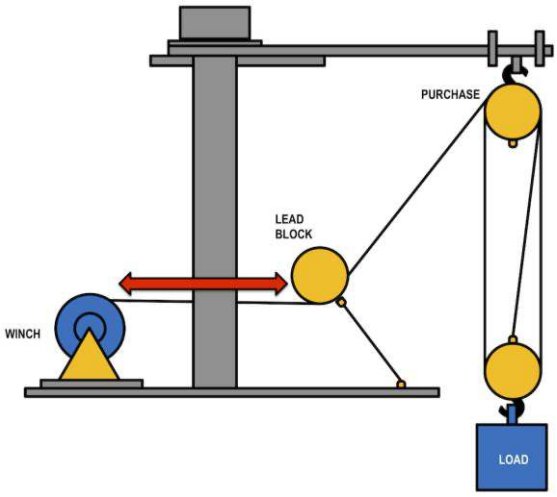

Drum Width	Drum type
0.4m	**grooved**
Lower block load	Sheaves used in purchase
8t	**5**

5% friction allowance

Inclued angle between the lead rope and the load line through the lead block is **60°**

1. **Calculate minimum distance between the lead block and the winch drum? Show Workings**

2. **Calculate load in lead rope?**

3. **Size of FSWR required?**

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4. **Calculate the head load for the purchase support sling?**

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5. **Calculate the head load for the lead block support sling?**

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