

Topic 6 Section 3

Risks and Contingencies

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Project Risks and Contingencies

A 'contingency' is a future event whose occurrence is uncertain. Usually the term is applied to unplanned events that have a negative impact.

During the day-to-day operation of the contract, a wide variety of unplanned events may arise. Some of these, such as accident and injury, erosion and sediment control, and inconvenience to the public, are addressed in the safety, environmental or public consultation plans for the job, and are covered in separate Topics in this training series.

However, there are many other unplanned, but reasonably foreseeable, events that may critically impact on the progress of the job. These 'other' contingencies include:

- Unavailability of materials
- Hold-ups with supplies
- Labour shortages
- Sickness
- Equipment downtime
- Weather
- Sub-contractors not showing
- Utility issues (cables dug up, burst pipes, gas etc)
- Vehicle breakdowns
- Industrial disputes
- Workers on leave
- Rostered day off (RDOs)
- Public complaints.

All of these are day-to-day work risks. Effective planning means looking not only at the job as whole, but also in terms of its component parts, such as activities. It also means planning for things that can go wrong, and developing strategies for reducing their impacts if they do occur.

The following discussion covers the problems that may arise if any of the risks in the above dot-point list are realised, and possible remedies that may be applied through contingency planning.

Unavailability of Materials

Materials such as road base and gravel are critical to the job, and their non-appearance when required may set the job back by days or weeks.

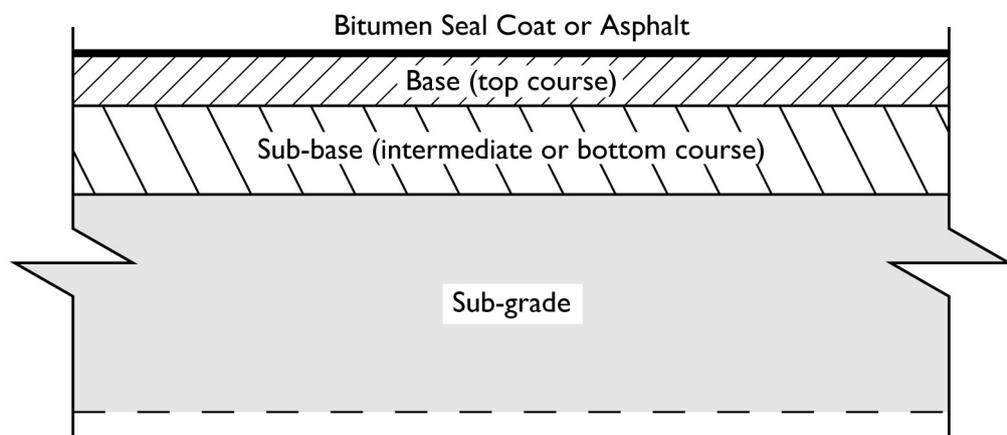
This problem of ‘no shows’ is common to many kinds of businesses, but is compounded in road work, because (as shown in the following paragraphs) a wide variety of materials may be needed or used.

Typical Road Pavement Materials

The more common types of flexible or non-rigid pavement consist of a number of layers of soil aggregate or crushed rock, compacted on a prepared subgrade (as shown in the drawing below).

The pavement (i.e. base and sub-base) in most cases is surfaced with a bituminous seal coat or, alternatively, one or more layers of asphalt. In some cases, the soil aggregate or crushed rock may be treated (stabilised) by the addition of small quantities of lime, cement or (in some cases) bitumen.

The subgrade is often constructed of a selected fill; in some cases, it may be stabilised with lime or cement.



Cross-section of Typical Pavement

The number of layers, the thickness of each layer and type and quantity of the materials to be used to construct the pavement will usually depend on such factors as:

- The anticipated traffic loads during the design life of the road
- The climate and drainage conditions prevailing
- The type of subgrade soil on which the road is built.

The paving specifications and special provisions set out the minimum standards for quality of materials and workmanship necessary to ensure that the pavement will perform as designed.

In general, the best materials are used in the road base, while wider specification limits are permitted for the sub-base.

The list of materials needed to construct the pavement may therefore include:

- soil aggregate
- crushed rock
- crushed river gravel with at least two crushed faces
- mixtures of crushed rock with other materials such as soil binder
- stabilised crushed rock, soil aggregate or soil
- decomposed rock (e.g. decomposed granite, basalt or other igneous rock)
- sedimentary or metamorphic rocks (e.g. sandstone)
- fine-grained materials (e.g. loam, sand clay mixes)
- pit, ridge, creek or waterworn gravels
- non-standard materials prepared to a specification.

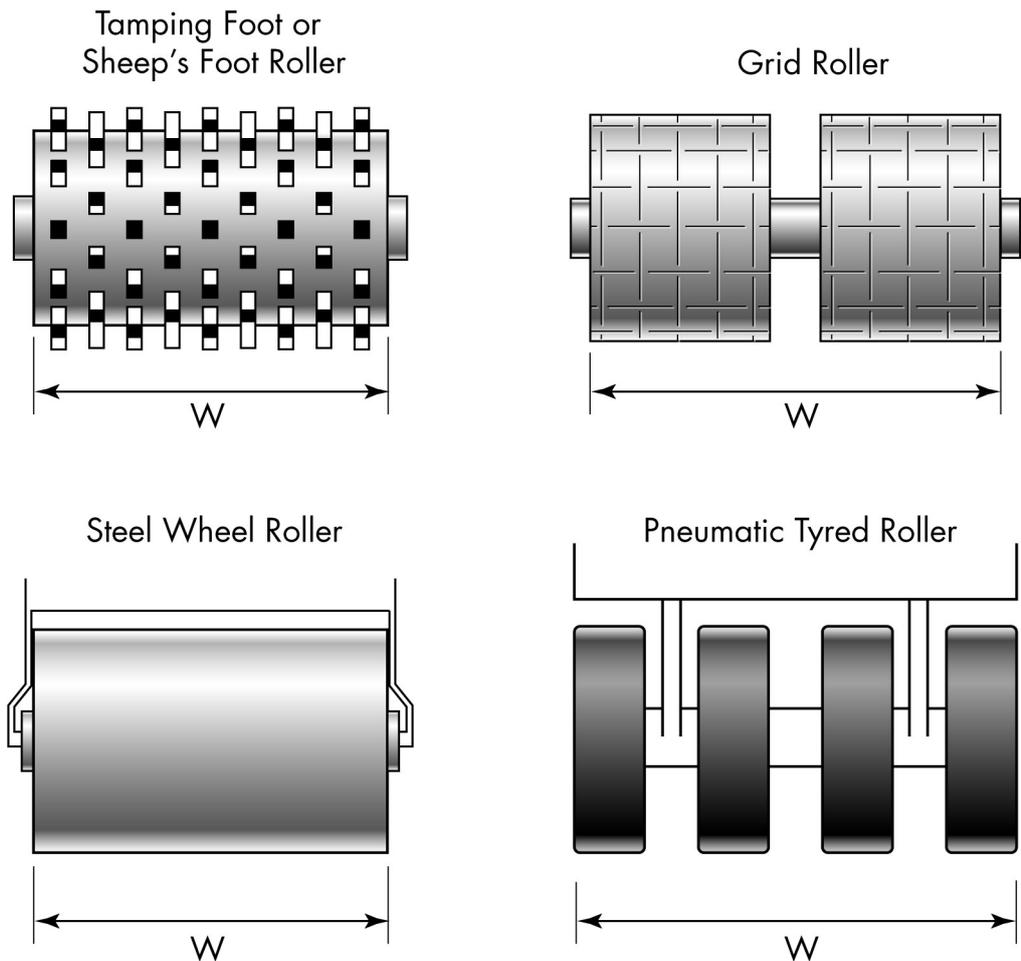
The mixtures can be either in the natural state or processed/combined with soil fines to produce a paving material which conforms to specified grading and plasticity requirements.

Using Materials from Alternative Sources

Identifying alternative sources of required materials is part of the detailed planning carried out before commencement of the works. These supplies are normally tapped into once a regular supply becomes unavailable. However, unexpected failure of supplies (e.g. due to breakdown of a sub-contractor's plant) may mean (at least in the short term) the use of locally available or otherwise alternative materials or sources.

Such materials may need to be processed before they can meet the job specifications. Processing may include:

- The removal of vegetable material (i.e. leaves, grass, sticks, roots)
- Crushing or the addition of crushed material
- The removal of excess fine material or oversize material by screening.
- The addition of other approved materials (eg. addition of cement or lime for stabilisation)
- Removal of oversized materials
- Recombining of materials
- The breaking of oversized material in place on the subgrade by means of grid, sheepsfoot, vibrating or cleated roller, or other suitable equipment.



Types of Rollers

In addition to the above, processed materials may need watering to bring them to required moisture contents, and may need to be stockpiled on site. These requirements will need to be addressed in contingency planning.

The method of selection and/or processing of material at the pit or on the road should be approved by the resident engineer before full-scale production commences.

Ask whether the materials you will need for the job are available in sufficient quantities and whether you can gain access to them.

You may need to arrange supplies of a wide variety of materials, including but not limited to:

- rock for fill and walls
- sand, gravel and earth
- cement
- gabions
- bricks or concrete building blocks
- signs and barricades

- fuels and oils
- safety gear
- erosion prevention materials (e.g. matting, grass)
- landscaping materials (e.g. treated timber and fastenings, trees, shrubs, bark chip).

The other important issues arising from the use of materials on the job are safe storage and security. Supervisors can only address these issues by planning ahead— for example, by:

- locating borrow pits
- planning transport routes from source to site
- identifying materials used on the job that may be attractive to thieves
- arranging secure storage on site, and security in situ until the materials are fixed in place.

Hold-ups with Supplies

Depending on the job, a variety of consumables may be required for road work, including:

- water
- cement
- lime
- diesel fuel for heavy plant
- unleaded petrol for light vehicles
- gas for camp heating and cooking.

These consumables are usually purchased locally, with relatively small quantities being held in stock on site.

Local suppliers may experience problems in sourcing sufficient quantities for the job, or may be affected by delays in delivery.

Supervisors must always maintain lists of alternative suppliers of such materials, and be aware that additional supplies may not be readily available, especially in rural or remote areas. For example, a fuel supplier in a small town will have commitments to existing customers which have to be fulfilled, and may be subject to lead times or credit limits that reduce his or her capacity to obtain additional supplies in the short term.

Labour Shortages

It has been common practice in the past to obtain skilled labour for road construction from the pool of such people in the local area. However, there is a need to have a plan in place for hiring people from other origins, to cover the possibility that insufficient people are available in a particular district. Depending on the requirements of the job, it may be an option to source:

- skilled people from within the company
- skilled people from labour hire firms
- skilled people from other districts
- unskilled people by advertisement in the local media
- unskilled people through Centrelink
- unskilled people from employment agencies.

Each of these alternative strategies has potential costs, such as:

- accommodation and start-up costs for people brought from other areas
- training costs for unskilled people
- higher turnover rates.

The job may require the use of specialised staff, such as plant supervisors, cost clerks, or soil testers. These may be sourced from within your organisation or as sub-contractors.

State governments may have purchasing policies in place that include special conditions on some contracts. These conditions may have implications for contractors and companies working within their boundaries. For example, the ‘10% training policy’ applies in Queensland and contractors must be aware of their responsibilities to comply with the conditions of this policy.

What is the ‘10% Training Policy’?

The Queensland Government’s Building and Construction Contracts – Structured Training Policy (known as the 10% Training Policy) has been in force since 1993.

The policy requires that a minimum of 10% of the total labour hours on any Queensland Government building or civil construction project be undertaken by apprentices, trainees or cadets and through the up-skilling of existing workers, to a maximum of 25% of the deemed hours. They must be engaged in training that has been approved and leads to a nationally recognised building and construction qualification.

Contractors will be required to provide evidence of compliance with the policy and this information will ultimately be considered in any review of their eligibility to tender for future Government work.

The 10% Training Policy is applicable to all Queensland Government funded building and construction projects over \$250,000 for building and \$500,000 for civil construction.

The contractor has a number of options when deciding where the hours of training will come from, including:

- employing their own apprentices/trainees/cadets, including school-based and part time
- using Group Training Scheme apprentices/trainees/cadets
- using sub-contractor apprentices/trainees/cadets
- using Q-Build apprentices/trainees/cadets
- up-skilling existing workers to a maximum of 25% of the deemed hours.

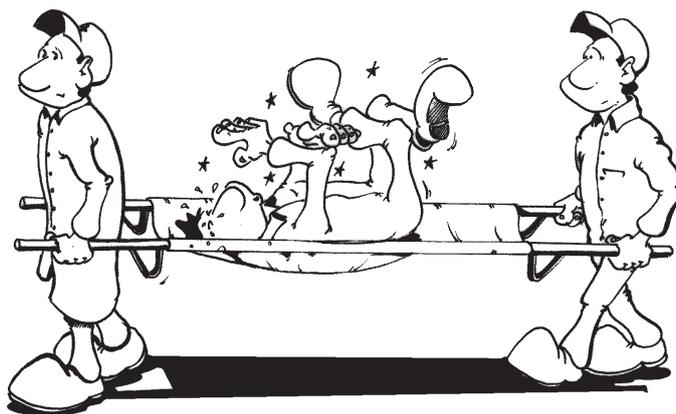
It is important to note that this policy is designed to provide on-site training opportunities. This policy should be read in conjunction with the Indigenous Employment Policy.

For further reference:

<http://www.qgm.qld.gov.au/training/10/what.htm>

Sickness

The impact of sickness may range from the loss of an individual for a day to the loss of a noticeable proportion of the workforce for several days or a week at a time.



The loss of a key person may have serious effects on the progress of the job. However, good communication and delegation skills on the part of the supervisor offer a partial solution. If a supervisor effectively makes his or her intentions clear in regard to the next few days' work, it may be possible for subordinates to carry on, even if only to a limited extent, while the supervisor is absent, and therefore reduce negative impacts on the job.

In some cases, persistent illness may become a large enough problem to set back the works schedule. For example:

- In parts of southern inland Queensland, where temperatures below 5°C may be recorded for 60 consecutive days each winter, a noticeable proportion of the workforce may be off-duty with colds or flu for several days at a time.
- In northern coastal areas, workers may be affected by mosquito-borne diseases such as Ross River Fever.

These problems can be addressed by contingency planning, but only to a limited extent. It is true that the likely occurrence of unfavourable conditions, such as cold weather or heat and humidity, can be predicted. However, illness cannot be predicted, as it depends on many other factors, such as pre-disposition, personal care and lifestyle.

In cases of persistent illness, possible solutions are to bring in workers from other areas (at additional cost), or to shut down the job temporarily, until sufficient, able people are available for a return to duty.

Equipment Downtime

Supervisors must have strategies in place for dealing with machine breakdown, as it is both a likely and a foreseeable event. Once a machine is out of action, the risk that the job will fall behind schedule increases, as changed weather conditions may apply when the machine is again available.

Contingency planning for equipment downtime therefore involves:

- making arrangements for alternative machinery, or to do other work, while equipment is being serviced or repaired
- compiling lists of manufacturers' representatives and field repair crews applicable to each machine that is or will be used on the job
- compiling names and contact numbers of people who own suitable floats or low-loaders (e.g. to move a disabled machine off the job or to bring in a replacement machine)
- compiling names and contact numbers of plant hirers
- developing positive working relationships with all of the above groups.

Weather

Weather will have an effect on operations during the construction period, but extremes of weather such as storms and heat waves are often unplanned events. You will need to consult weather records for the area, to see what conditions are expected during the months that the work will be in progress. For example:

- if the weather is likely to be hot and dry while the job is in progress, supervisors may need to arrange extra tankers of water to wet down surfaces and control dust nuisance
- if wet weather is expected, supervisors may need to ensure more drainage is provided, or improve the level of protection against erosion, or suspend or shut down operations for duration of the wet season.

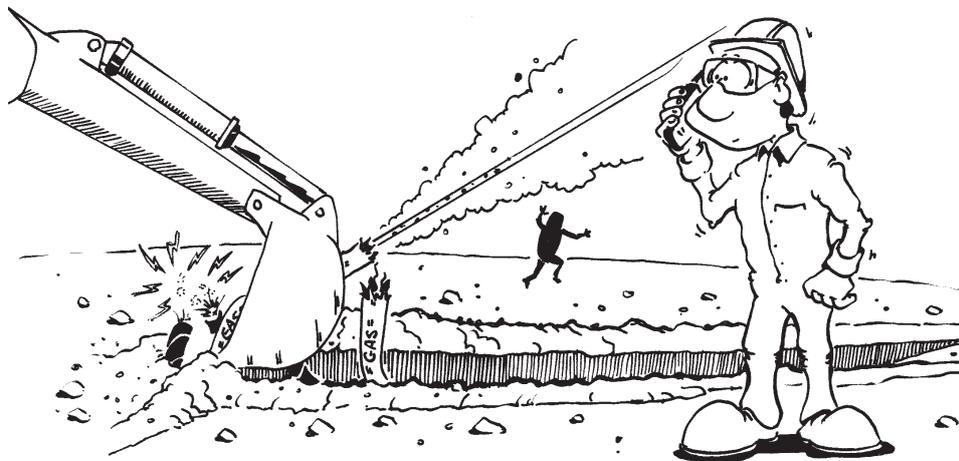
Sub-Contractors Not Showing

Some of the work may be done by sub-contractors. As with contingency planning for machine breakdowns, subcontractor no-show is both possible and likely. The contingency plan therefore involves making lists of and developing relationships with alternative sub-contractors.

For each type of work likely to be needed during the course of the job (e.g. bridge construction, stone pitching), you will need to check what alternative and suitable sub-contractors are available.

Utility Issues

Utility services are a common source of many unplanned events—for example, cables may be dug up, or pipes may burst.

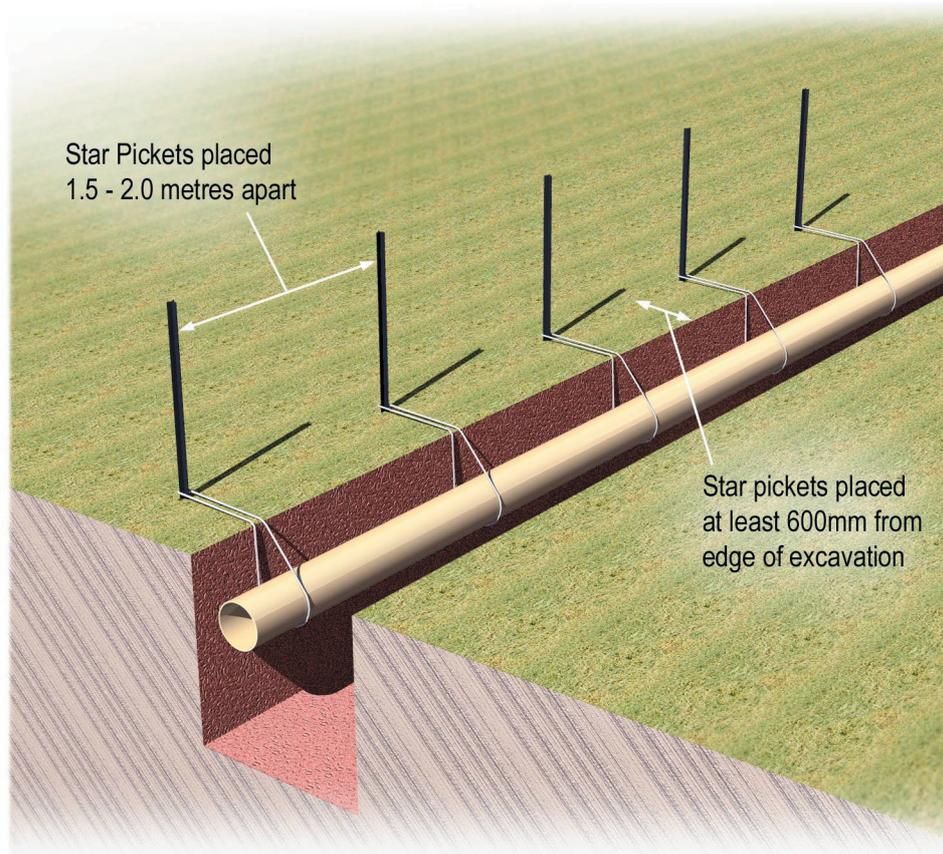


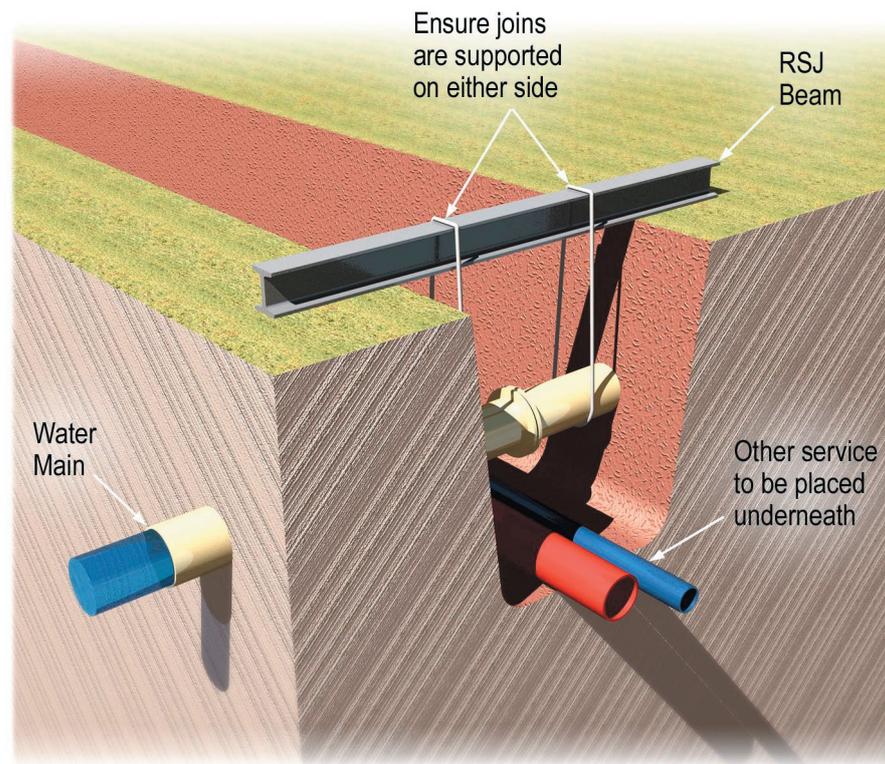
You need to be aware of the effects that all of these events will have on the job. It is better to include these considerations in the plans before work begins, than to attempt to address them 'on the run'.

You must take all reasonable steps to prevent damage to utility services. Before the job starts, always contact Dial Before You Dig (DBYD) on 1100. They will provide all available information on buried infrastructure in the area, but its protection is first and foremost the responsibility of the works supervisor. In many cases, utility service lines may have to be shifted before work can begin, or may need to be supported during the period of exposure. You need to check:

- the plans and documents for points where utility services cross or come near to the works
- what services are affected and who is the relevant person to contact
- how long it will take to move the service lines to their new location
- whether utility personnel are available to carry out the service alterations.

Two common strategies for supporting exposed utility service lines are shown in the following illustrations:



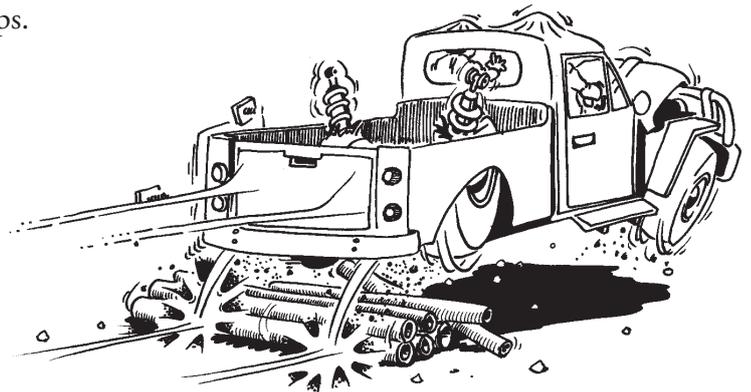


If you cause any damage to infrastructure, whether through carelessness, lack of planning or failure to consult, the results can be very costly. For example, if you break open a sewerage line and the discharge affects a waterway, you and/or your company may face prosecution under the *Environmental Protection Act 1994*, and the company may be liable for the cost of repairs to the pipes.

Vehicle Breakdowns

Contingency planning for light vehicle breakdowns is similar to that for equipment downtime, and involves:

- making arrangements for a replacement vehicle, or to do other work, while a vehicle is being serviced or repaired
- compiling lists of relevant dealers and repairers
- compiling names and contact numbers of light vehicle hirers
- developing positive relationships.



Industrial Disputes

The Industrial Relations Framework

‘Industrial relations’ is a general term used to describe the interactions between employers and employees in the workplace. However, it also refers to the formal system of legislation, industrial courts and legal precedents that has been set up to deal with such relationships. (The Queensland industrial relations legislation is covered in a separate Topic in this training series).

Under the legislation, a wide range of issues related to employment may be considered as ‘industrial matters’. These include, but are not limited to:

- wages
- allowances
- pay equity
- leave on full pay
- board and lodging
- hours of work
- conditions of employment
- discrimination in employment
- protective clothing or devices.

The effect of the legislation is to ensure that many questions or issues arising from or related to a person’s employment may be resolved through disputation processes or (ultimately) by an industrial court.

The Role of Supervisors in Industrial Relations

A supervisor can take three positive steps to assist in promoting a good industrial relations climate on site:

- maintaining high standards of personal conduct
- dealing with union representatives on cordial terms
- maintaining an up-to-date knowledge of industrial relations laws.



Personal Conduct

The day-to-day behaviour of supervisors is a key element in maintaining good relations. It can mean the difference between a problem that can be resolved and an industrial dispute. In general, a supervisor should gain the respect of subordinates, by:

- consistently demonstrating a careful, positive and efficient attitude
- speaking to people in an appropriate manner
- showing respect to all employees, regardless of their position in the organisational structure
- not allowing personal opinions and biases to enter the working relationship
- leaving personal problems at home, i.e. not allowing them to affect relationships on the job.

Dealing with Union Representatives

In most instances, the supervisor is the first representative of the company contacted by union officials when they visit a worksite. As a result, the supervisor has the responsibility of treating these officials in a proper manner and of discussing with them matters affecting employees.

Supervisors should be willing to work together with union representatives to help create a safer workplace for all employees and to resolve any issues or disputes promptly, for the benefit of all parties. A civil and courteous approach may help to prevent confrontational and acrimonious situations from arising.

Union officials may arrive on the worksite at any time and supervisors must be familiar with the industrial awards and agreements that apply on the site so that they can be sure that correct procedures are being followed.

Supervisors should be aware of the following guidelines:

- Union representatives must identify themselves to the supervisor when arriving on site— i.e. before approaching company employees or sub-contractors. This may be a safety issue as well as a site agreement requirement.
- The supervisor should check that the union representative has authority to talk to the employees that are on site, i.e. that the union has coverage according to the site awards and agreements.
- Be aware of what the union representative is authorised to do and what is the agreed process that must be followed— e.g. to organise a meeting or to call a strike.
- Supervisors should co-operate with union representatives if genuine issues regarding award conditions are raised, but need to know who to talk to within their own organisation. This is especially true if the situation escalates to a point where unreasonable demands are made and significant project delays or extra costs may be incurred.
- If the supervisor's company is acting as a sub-contractor on the site, then discussions with union representatives may have to be referred to the head contractor, according to the conditions of the contract.

Knowledge of Industrial Laws

It is essential that in each job office there is at least one copy of all awards covering the various workers on the job.

Whilst a supervisor is not expected to memorise all the details, he or she should be reasonably familiar with the documents. This means knowing where to look to quickly obtain the answer to a question on award requirements.

Handling Industrial Disputes

Supervisors need to make an assessment of any existing or likely industrial problems on site, and prepare strategies to address the causes or underlying issues. For example, working hours, accommodation conditions and personal protective equipment are common industrial issues on job sites.

The supervisor should alert the contractor to any matter causing or likely to cause an industrial dispute.

The supervisor should not add to any trouble by adopting an antagonistic or unco-operative approach to union officials. Instead, people should recognise the legitimate role that each has to play.

Industrial disputes are part of the industrial relations system. During a recognised industrial dispute, all actions taken, whether by workers or managers, must be in accordance with the Queensland *Industrial Relations Act* 1999. Supervisors must act only in accordance with directions received from the company.

Workers on Leave

Workers have leave entitlements that are a condition of employment. Types of leave available to construction workers may include:

- annual leave
- sick leave
- long-service leave
- bereavement leave
- parental leave.

Generally, the times at which staff will take annual, long-service or parental leave are known in advance. However, unexpected events will occur, such as illness or death of a family member.

The solution in such cases, especially where a key member of staff is involved, is to find a temporary replacement. Supervisors should have a knowledge of people, from within the company or otherwise, who may be able to fill positions temporarily, and of company policies for dealing with such situations.



Rostered Days Off (RDOs)

Most awards are currently based on a 38-hour week; however, new enterprise agreements and award conditions with more flexible arrangements have changed this in some cases. Rostered days off (RDOs) are optional on many construction worksites and may, in some cases, be replaced with overtime payments.

The provision of RDOs will depend on the agreed site conditions and will be determined by current awards, enterprise agreements, or project agreements.

RDOs are built-in to some awards and are fixed and clearly specified; however, in many cases they may be negotiated by mutual agreement so that the time taken off suits employees and, at the same time, does not impact adversely on workplace productivity.

Many federal awards and agreements provide for alternative days off where an RDO falls on a public holiday. The general rule is that each individual should check the arrangements that apply in his or her workplace.

Supervisors must consider the impact of RDOs in planning work schedules, so that an efficient balance between plant, materials and available labour can be maintained.

Public Complaints

Despite the company's best efforts to reduce nuisance caused by road construction, and to consult the local community, public complaints are still possible. Usually, they are about one or more of the following:

- Noise
- Dust
- Vibration.

In general, complaints by the public are handled as a serious matter. Strategies for handling particular complaints are described below.

Noise

Noise is inevitable during road construction work. However, it is recognised that construction noise may become a nuisance to nearby residents. Affected residents have two options: complaining directly to the company, or making a formal complaint to the Environment Protection Agency.

Careful management of noise levels during construction is important. Many options are available, both to reduce operational noise and to lessen its impact. For example, it may be possible to:

- change the type of plant used on the job (e.g. a machine with less power, or more modern a machine)
- restrict the hours of use of specified plant

- fit noise suppression devices (e.g. mufflers) to machinery.

Sometimes, people may complain about the hours being worked by the company on site. The usual concern underlying such a complaint is that a small amount of noise at the wrong time causes disruption to normal routines (e.g. if a grader is operating in the early morning).

If a complaint is made to the EPA, the company must comply with procedures prescribed by that agency, such as regular monitoring of noise levels. The EPA's Operational Policy for road noise states:

The object of the Noise Policy is to protect Queensland's acoustic environment while allowing for ecologically sustainable development. Section 5 of the Noise Policy introduces the concept of a "beneficial asset":

1. A beneficial asset is an airport, approved industrial estate, navigable waterway, public road or railway.
2. It is recognised that, although the operation or use of beneficial assets may have significantly adverse effects on the environmental values, they are necessary for the community's environmental, social and economic wellbeing.
3. However, it is intended that, so far as practicable, any significantly adverse effects from their use or operation (will) be progressively reduced.

The design of the road may include construction of noise barriers, such as timber walls, earth banks, or tree plantings. These options are usually adopted when the finished road will carry high traffic volumes.

Dust

Dust may be generated during the construction period, as a result of:

- movement of construction machinery
- construction of earth banks and ramps
- clearing of vegetation.

The occurrence of dusty conditions depends on moisture content of the soil.

Provision for control of dust will usually be included in the contract and requirements will be specified in the job documents. Any or all of the following practices may be used:

- watering for dust suppression
- minimising or reducing the extent of vegetation clearance
- limiting the extent of unconsolidated earth used or stockpiled on the job
- dust monitoring.

In some areas and situations, there may be restrictions on the burning-off of felled vegetation, as a result of either smoke nuisance or high fire danger.

Vibration

Compaction machinery (e.g. vibrating rollers) and pile driving are the most common causes of complaints about vibration.

Vibration becomes a concern because it:

- causes annoyance when continued for long periods
- can cause structural damage to nearby buildings if occurring at sufficient intensity.



Consultation with residents well in advance of works commencement can result in greater acceptance of the need for inconvenience. Complaints are less likely when people are aware that the effects will last for a limited period only. Nevertheless, compaction and pile-driving must be carefully planned, so that these activities do not take place for longer than is necessary.

In residential or business areas, it may be necessary to conduct pre-construction property surveys of all buildings within a specified distance (e.g. 100m) of the proposed vibratory activity. This will establish the existing condition of buildings and structures that may be affected by vibration, and provide baseline information to enable measurement of construction impacts. However, such surveys can only be conducted with the permission of the owner of the building or structure. In such cases, owners must be provided with a copy of the survey report.

Case study No. 4 at the end of this training manual gives examples of methods used to reduce the impact of pile-driving on residential and business premises in a built-up area.