

Topic 2 Section 1

Planning the Work

Contents

Identify the Scope of the Works/Project	2
Identify/Check Works/Project Documentation	5
Study the Works/Project Documentation	9
Conduct a Works/Project Site Inspection	11
Annex A: Site Visit Risk Checklist and Record	13
Understand What Needs to be Done to Complete the Job.....	18
Working with Other Contractors/Organisations.....	24
Integrating Work Activities	27
Section 1 – Assessment Activities	29

Identify the Scope of the Works/Project

‘Scope’ means the parts or components of a project that a person is responsible for at their level. For example, the area of responsibility, and therefore the scope of works, for a leading hand is different from that of a foreman, which in turn differs from that of the project supervisor. ‘Identifying the scope of the works’ means describing the extent to which a leading hand, foreman or supervisor is required to take charge, within the overall limits of the project.

In a road construction job, the scope of the works for the various areas of responsibility might be:

Leading hand:

- remove culvert 5F
- construct culvert 5G.

Foreman:

- construct bridge at kilometre 53.753.

Project supervisor:

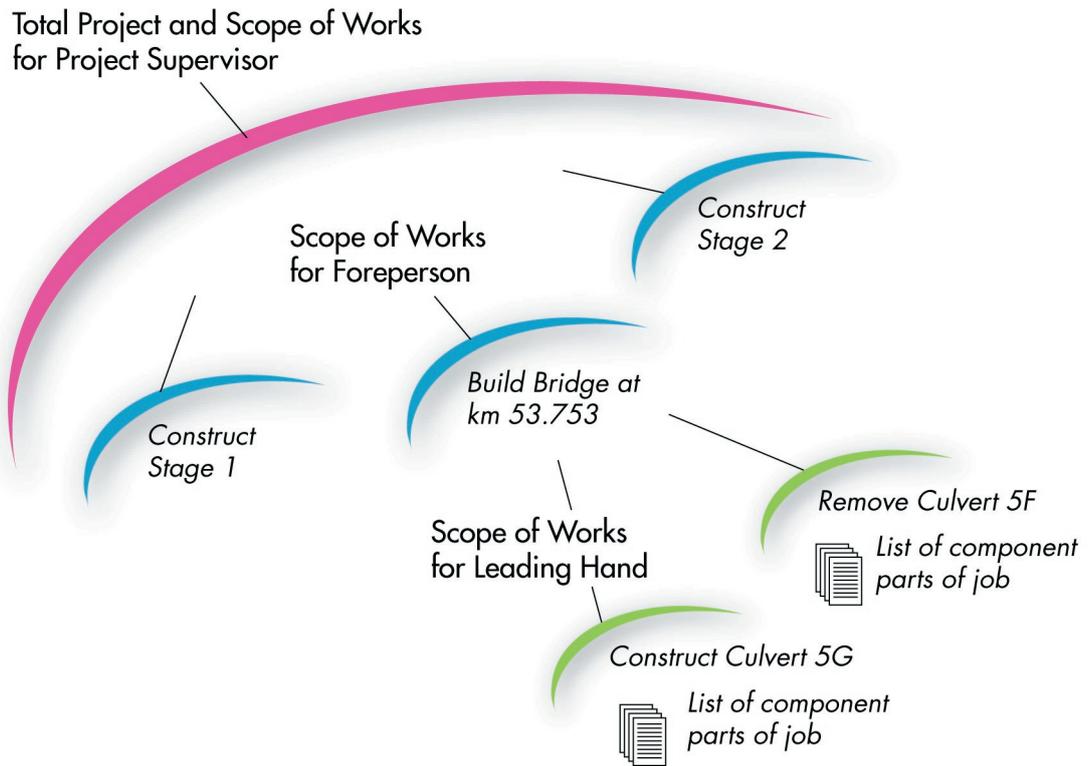
- construct stage 1
- construct bridge at kilometre 53.753
- construct stage 2.

The scope of works for the job as a whole is the overall list of the main activities that make up the project. For example, the scope of a road construction job might be:

- clearing
- earthworks
- drainage
- paving
- add bitumen emulsion as appropriate.

Alternatively, the scope may be the same as for the supervisor (two stages and a bridge). Either way, the term ‘scope’ is used in a broad sense.

The relationships between these areas of responsibility are shown in the diagram below.

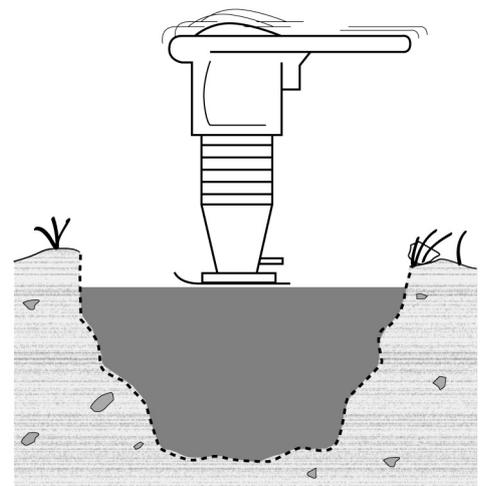


The scope of the work for the leading hand is part of the foreman’s scope of work, which in turn is part of the overall project for which the supervisor is responsible.

Every main heading in the scope of works can be broken down into a list of tasks. In turn, each task can be broken down into a list of component parts. However, the details of the lists will depend on the level of the person responsible for the item.

For example, if a leading hand and workgroup are patching a pothole in a bitumen road, the list of component parts of the job might be:

- erect barricades and signs around the work area
- get materials and equipment together (e.g. Wackapacka, cold mix, oil, paint, pick, shovel, wheelbarrow)
- use paint to mark out the potholed area
- dig out a boxed area within the paint marks
- add bitumen emulsion as appropriate
- shovel in cold mix
- use Wackapacka to compact cold mix to same level as surrounding bitumen
- allow cold mix sufficient time to set
- dispose of excess dirt, clean up site



- remove barricades and signs
- pack up tools and equipment
- move on to next job.

Each person involved in a project establishes the scope of the works by referring to the project documentation, as described in the next section.

Identify/Check Works/Project Documentation

In most jobs that you will be called upon to complete, all the information you need is shown in a document or a series of documents. These come in different forms, such as:

- A4 pages in ring binders or other bound form
- bound A3 plans
- rolled maps
- computer files.

Some examples are shown below.

The image displays several technical drawings for a bridge project. At the top left is a 'PLAN' view showing the bridge layout with various annotations like 'CONTROL LINE', 'BRIDGE CONTROL', and 'LIMITS OF BRIDGE'. To its right are 'HORIZONTAL CURVE DETAIL' and 'VERTICAL CURVE DETAIL' diagrams showing curve data and elevations. Below the plan view is a table for 'STANDARD DRAWINGS' and 'MASS OF DECK UNITS'. The bottom half of the image shows two cross-sections, 'PLAN - ABUTMENT A' and 'PLAN - ABUTMENT B', with detailed reinforcement and structural specifications. A 'SECTION A' detail is also shown. A 'NOTES' section lists construction requirements. At the bottom is a project information table.

DESCRIPTION	Dis. No.
CHANGING AND SHIFTS	1043
ROCK, LIP AND RING DETAILS	1044
RAIL TIES	1045
BRIDGE SPILLTHROUGH	1117

DECK UNIT TYPE	MASS (TONNES)
DECK UNIT TYPE A	8.5 TONNES
DECK UNIT TYPE B	8.5 TONNES
DECK UNIT TYPE C	8.5 TONNES
DECK UNIT TYPE D	8.5 TONNES

DATE	BY	CHKD	APPD

QUALITY SYSTEM	REGISTERED TO	REG. NO.

PROJECT NAME	CLIENT	PROJECT NO.	DATE
BELLBRO CREEK BRIDGE	MALENTY - KENWORTHY ROAD		

An example of a list of documentation— using a road construction job as an example— is shown on the following pages.

List of Documents for a Road Construction Job

Reference	Title of part	Title/description of document
Vol. 1 Pt 1	Document list & information for tenderers	Document list Information for tenderers
Vol. 1 Pt 2	Conditions of tendering	Conditions of tendering Annexure to conditions of tendering
Vol. 1 Pt 3	Tender forms and tender schedules	Schedule of rates Schedule forms Planned cash flow schedule Tender program Form of security Receipt of notices to tenderers Tender schedule Site establishment and camp
Vol. 1 Pt 4	General conditions of contract	General conditions of contract Annexure to general conditions of contract
Vol. 1 Pt 5	Supplementary conditions of contract	Supplementary conditions of contract Annexure to supplementary conditions of contract
Vol. 2 Pt 6	Standard documents and specifications—annexures	Standard documents list Provision for traffic Drainage, retaining structures and protective treatments General earthworks Unbound pavements Sprayed bituminous surfacing (excluding emulsions) Road furniture Landscaping Supply of cover aggregate Site establishment, camp, transport of materials Environmental management
Vol. 2 Pt 7	Project-specific documents	List of drawings List of materials supplied by principal Summary of pre-cast pipes and box culverts Supplementary specifications (including bridge specifications)

Reference	Title of part	Title/description of document
Vol. 2 Pt 8	Other documents	Bank guarantee documents Performance bond documents Confirmation of trust account Statutory declarations Engagement of subcontractors Deed of guarantee, undertaking and substitution Deed of novation Training policy Workplace Health and Safety Act obligations Designer’s deed of covenant Insurance bond Warranty agreement
Vol. 3 Pt 9		District map Road declaration strip map
	Civil works	Plan index and type cross-sections Working plans (6) Connection and private entrance details Drainage details Drainage cross-sections (4) Annotated cross-sections (24)
	Bridge construction	General arrangement (3) Abutments (2) Cast in-situ kerbs Relieving slabs PSC units (2) 450 PSC piles Bridge traffic rail (2) Details of (existing) Class A bridge at 29228

Role of Project Documents

As shown in the list, the job documents cover a wide variety of subjects, including:

- location maps
- specifications
- terms and conditions of the job
- drawings
- legal requirements.

Studying the job documents is an exercise in looking forward. Use this time to gain a clear picture of job requirements and to:

- commence planning, for both the job itself and the site inspection.
- identify issues that are likely to arise.

Currency of Documents

When reading documents, always identify which version you have. Some documents will have undergone several amendments before you have the opportunity to read them; always check that you have the most recent version.

Study the Works/Project Documentation

It is important to obtain the project documents well before the job starts. It is important to put aside the time required to study and absorb the contents of the material. If you do not read these documents before the project starts, you will begin work on the project without full knowledge of the project requirements. As a result, you may be making decisions without taking one or more of the project requirements into account.

Information Available from Documents

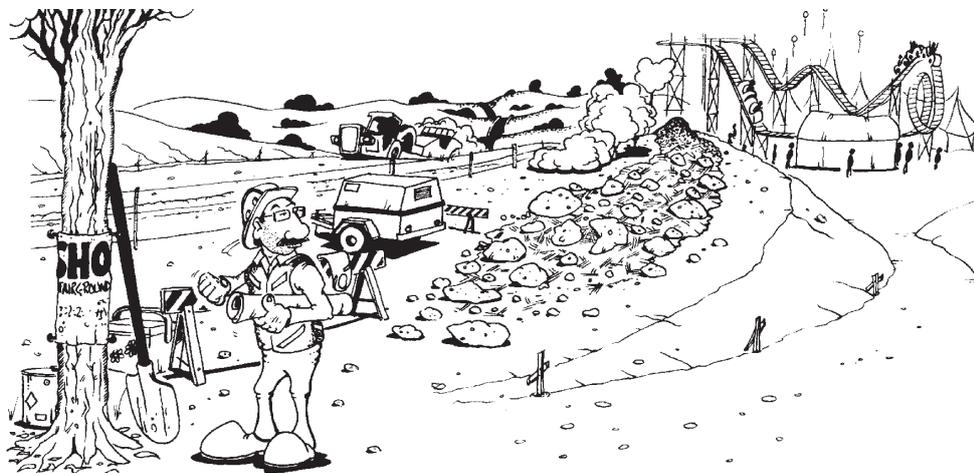
When you study the job documents, your main aim is to gain an understanding of as many aspects of the work as possible. As a minimum, you need to read and understand the following information:

- the job scheme (plans, specification, quantities, estimates)
- the commencement date
- the target completion date
- details of resources available for the work
- results of the materials surveys.

When the designers are drawing up the project documents, they survey both the imported and in-situ materials that will be used for the job— such as type and quantity of rock and gravel. This information will help you to foresee potential problems during construction.

Sometimes, the job includes unusual situations or special conditions. Examples include:

- environmental management (e.g. sensitive areas, vegetation protection requirements, bunded areas around fuel storages)
- emergency management requirements (e.g. Material Safety Data Sheets and manifests of chemicals)
- cultural heritage (e.g. aboriginal or European heritage objects)



- works shutdown periods (e.g. local show holidays or special events).

You must be familiar with these requirements before the job starts.

Always take notes while studying the works documents.

Case Study No. 1 presents an example of typical documents for a road construction job, and illustrates the kinds of information that might be gained by studying the documents.

Information Obtained from Job Documents

After studying the works documents, you should understand:

- the available documents
- where the job is
- what types of work will be needed (e.g. lay concrete blocks, compacting)
- which parts of the job are likely to take the longest
- which parts of the job are likely to present more problems
- when the job will start and finish
- what resources are available for the overall job
- any special problems or requirements.

This information allows you to decide:

- what questions you need to ask
- what additional information you need to research.

Questions

Your survey of the documents will leave you with some questions. Make a list of questions as they occur to you. Think about people you could seek answers from. For example, ‘who in the company has done work involving stone pitching?’

You will often find some of the answers during the site inspection (see later).

Research Needs

In many cases, you will need to obtain more information. This may come from a variety of sources, such as:

- site records
- company or departmental records
- company or municipal library
- websites.

Conduct a Works/Project Site Inspection

‘Site inspection’ means going to the actual job location and looking at the conditions on site, and relating them to the information shown in the job documents. This is an opportunity to become familiar with any special features or conditions that will affect job’s progress or cost.

The value of the work you did in studying the job documents and taking notes from them should now be apparent. You will be approaching your inspection of the site with a good knowledge of the project requirements. As you look over the site and discuss the requirements with others who are involved, your preliminary work should make you more alert to potential problems or cost savings.

As you did while studying the works documents, take notes during the site inspection.

Main Items for Attention During Site Inspection

The list of items that will occupy the most time and demand the most attention during the site inspection varies from job to job, depending on the site conditions. However, it is likely the list will include several of the following:

- Access to the site.
- Do the site conditions match those shown in the documentation?
- Gradients.
- Shape of the ground (e.g. will water cover or remain on the site after heavy rain?)
- Layers of material.
- Places where construction problems may occur, such as:
 - steeply sloping ground
 - drainage and seepage areas
 - nearby buildings likely to be affected by job vibrations
 - property boundaries.
- Possible sources of in-situ or nearby material that will be suitable for:
 - selected fill, shoulder or pavement (e.g. borrow pits)
 - pipe bedding
 - stone pitching
 - side track paving
 - water for dust suppression.
- Other sources and local suppliers of materials.



- Security of plant, equipment and materials (e.g. possible locations for safe on-site storage areas).
- Underground and overhead infrastructure (pipelines, powerlines, etc).
- Cultural artefacts protected by legislation.
- Trees protected under a council by-law (e.g. is the tree large enough to be affected by the by-law? does it actually exist in the location shown on the plan?)
- Wildlife.
- Is the project actually feasible?

Other Items That May Arise from Site Inspection

The following list is a guide to other items that often need to be considered during a site inspection:

- Possible camp sites and costs of establishing camp.
- Accommodation issues (e.g. comparative costs of local hotel, motel or b&b; driving to site daily vs setting up camp).
- Access to the actual working areas.
- Disruption of private access.
- Supplies of potable water and electricity.
- Alterations to services (Check details on plans).
- Availability of public facilities, such as ambulance, medical and hospital, telephone, postal, gas, fuel and oil depots.
- Traffic control during construction, including side tracking and detouring.

Forms and Templates for Site Inspections

Printed forms and software templates are available to assist you to record the information you have collected during the site visit. An example of such a form follows.

The example gives a list of factors that may need to be considered, and allows space for assessing the level of risk associated with each.

Annex A: Site Visit Risk Checklist and Record

PROJECT No:

ROAD NAME:

PROJECT DESCRIPTION:

LOCATION:

REGION:

DISTRICT:

DATE OF SITE VISIT:

Attendance at Site Visit

Qualitative Risk Analysis Matrix

Attendee	Organisation

Likelihood	Consequences				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	H	H	E	E	E
Likely	M	H	H	E	E
Moderate	L	M	H	E	E
Unlikely	L	L	M	H	E
Rare	L	L	M	H	H

Ref.	Item	Risk				Comments
		Low	Moderate	High	Extreme	
<i>Please prepare a photographic record of the site to assist with estimating and risk management tasks.</i>						
1.0	POLITICAL					
1.1	Sensitive issues					
1.2	Accommodation works on local government roads					
1.3	Community expectations					
2.0	CLIMATE					
2.1	Average annual rainfall					
2.2	Average annual wet days					
2.3	Likelihood of flooding					
3.0	TOPOGRAPHY					
3.1	Geotechnical report					
3.2	Foundation bore logs					
4.0	LAND ACQUISITION					
4.1	Resumption from properties					
4.2	Accommodation works					
4.3	Fencing					
4.4	Native title					

Ref.	Item	Risk				Comments
		Low	Moderate	High	Extreme	
4.5	Names of affected property owners					
5.0	ENVIRONMENT					
5.1	Air quality					
5.2	Water quality					
5.3	Contaminated land					
5.4	Hazardous materials (for example asbestos)					
5.5	Disturbance to waterways					
5.6	Marine habitat					
5.7	Noise amelioration					
5.8	Cultural heritage					
5.9	Erosion and sediment control					
5.10	Temporary structures					
6.0	SAFETY					
6.1	Safety of workers					
6.2	Safety of pedestrians					
6.3	Safety of traffic					
7.0	TRAFFIC					
7.1	Traffic management					
7.2	Traffic diversions					
7.3	Temporary work (for example side tracks, pavement widening, etc.)					
7.4	Construction haul roads					
8.0	PUBLIC UTILITY SERVICES					
8.1	Alterations to electricity					
8.2	Alterations to telecommunications					
8.3	Alterations to gas					
8.4	Alterations to water and local services					
8.5	Alterations to sewerage					
9.0	SITE FACILITIES					
9.1	Location of site accommodation					
9.2	Accommodation required					
9.3	Availability of public utilities					
9.4	Security					
9.5	Construction water supply					
9.6	Permits and fees					

Ref.	Item	Risk				Comments
		Low	Moderate	High	Extreme	
10.0	ACCESS					
10.1	Nearest centre					
10.2	Property access					
10.3	Public transport					
10.4	Construction access, including restrictions					
10.5	Rail head					
11.0	CLEARING					
11.1	Clearing limits					
11.2	Vegetation density					
11.3	Construction methods (for example burning, chipping, dozer, excavator etc)					
11.4	Removal of structures					
11.5	Preservation of heritage sites					
12.0	EARTHWORKS					
12.1	Mass haul diagram					
12.2	Borrow and spoil areas					
12.3	Rock					
12.4	Construction methods					
12.5	Stripped material stockpile areas					
12.6	Unsuitable material to be removed and replaced					
13.0	LONGITUDINAL & CROSS DRAINAGE					
13.1	Access to sites					
13.2	Excavation in rock					
13.3	Unsuitable material to be removed and replaced below structures					
13.4	Depth of trenching					
13.5	Shoring					
13.6	Construction method					
13.7	Exposure to flooding					
13.8	Dewatering or stream diversion					
14.0	BRIDGES					
14.1	Site establishment					
14.2	Access roads and hard stand areas					
14.3	Construction methods					
14.4	Dewatering or stream diversion					
14.5	Exposure to flooding					

Ref.	Item	Risk				Comments
		Low	Moderate	High	Extreme	
14.6	Tidal influences					
15.0	RETAINING WALLS					
15.1	Foundation investigations					
15.2	Construction methods					
16.0	PAVEMENT					
16.1	Design method (for example whole-of-life, capital cost analysis)					
16.2	Materials supply					
16.3	Construction methods					
16.4	Stockpile sites					
17.0	TRAFFIC CONTROL DEVICES					
17.1	Existing signs and line marking to be removed					
17.2	New signing					
17.3	Temporary signing and line marking					
17.4	Traffic controllers					
17.5	Traffic barriers					
17.6	Temporary signals					
18.0	STREET LIGHTING					
18.1	Existing lighting to be removed					
18.2	New lighting					
18.3	Temporary lighting					
18.4	Construction lighting					
19.0	PROJECT MANAGEMENT					
19.1	Program of work					
19.2	Staging of construction					
19.3	Possession of site					
19.4	Separable portions					
19.5	Exposure to wet weather					
19.6	Community consultation					
19.7	Workplace relations					
20.0	DIRECT LABOUR					
20.1	Site allowance					

Ref.	Item	Risk				Comments
		Low	Moderate	High	Extreme	
20.3	Travel arrangements					
21.0	PROJECT MANAGEMENT					
21.1	On-site staff					
21.2	Project office					

Understand What Needs to be Done to Complete the Job

The best way to gain an understanding of what needs to be done is to discuss all aspects of the job with your supervisor. This discussion is also an opportunity to follow up any questions arising from the site inspection.

Working in Co-Operation

You can only gain an understanding of all aspects of the job and of what needs to be done if you learn to work in co-operation with your supervisor and others involved in the works. This is the right time to develop a good working relationship with your supervisor.

Both of you will contribute ideas, knowledge and skills to the planning process. Your aim is to combine skills to come up with the most likely and practical job plan.

You will need to make decisions about details of the job program, such as:

- starting date
- type of organisational structure
- construction methods
- plant, material and manpower requirements
- sequence of work activities.

These decisions will have a major effect on job outcomes, especially the rate of construction. To achieve the best results, you may need to consider the following components of the job and other factors that may influence job outcomes, such as:

Factors Influencing Job Outcomes

Factors influencing job outcomes include:

- labour
- on-site relationships
- safety
- environmental issues
- plant and equipment
- materials
- weather
- industrial relations
- sub-contract work
- specialised staff
- public acceptance of the project
- utility service alterations.

It will be useful to discuss each of these with your supervisor.

Labour

Labour is basic to any works job. You must have enough people with the appropriate skills to complete the job. This includes covering for periods when people are on leave (e.g. sick or recreation).

There may be limitations on the origins or numbers of personnel used on the job, particularly if the project is a state government contract. For example, Queensland government contracts include clauses specifying that:

- on civil construction projects valued at over \$500 000, a minimum of 10% of the total labour hours must be undertaken by apprentices, trainees or cadets, or used for up-skilling of existing employees
- on civil construction projects where it is considered appropriate according to size, complexity and location of the project, contractors must allocate a minimum of 20% of the deemed on-site labour hours to employ the local indigenous people.

Further information on these requirements is available from your supervisor.

Plant and Equipment

You need to look at what plant and equipment will be available and whether it will have the required capabilities for the job.

The following zoning system provides a ‘rule of thumb’ basis for matching a machine to a job:

Zone	Zone Description	Distance (m)	Required Machine Type
1	Power	<150	Dozer, small loader, excavator
2	Power/Speed	100–450	Loaders, elevating scrapers, dozers
3	Speed/Power	150–1500	Large elevating scrapers, small trucks
4	Speed	>1500	Large belly-dump and rear-dump trucks, large tandem-powered open-bowl scrapers

The zoning used in the table is based on knowledge of the operational distances best suited to each type of machine. Zone 1 indicates machines of high power where speed is low, because the operational distance is generally less than 150m. In the remaining zones, the machines sacrifice power but speed becomes more important. The machines listed in Zone 4 are designed for transporting materials at higher speeds.

Another question is sourcing plant and equipment. This means considering not only who owns it (e.g. company, government department, contractor) but also its present location.

You will also need to:

- organise transport to get the equipment to the work site (e.g. low loaders)
- (for jobs involving long distances) calculate whether it is cheaper to float the machine within the works site, or to tram it from point to point.

Materials

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
- water
- cement
- concrete
- 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. You 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.

Weather

Weather will have an effect on operations during the construction period. You will need to gather information from relevant sources, such as web sites, and a rain gauge installed on site.

Weather records for the area will indicate the expected conditions 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 (e.g. Longreach in November), you may need extra tankers of water to wet down surfaces and control dust nuisance
- if wet weather is expected (e.g. Cairns in February), you may need to suspend or shut down some operations for a period (e.g. earthmoving), provide more drainage, or improve the level of protection against erosion.



The following website is recommended for current weather information and forecasts:

www.bom.gov.au

Industrial Relations

You need to make an assessment of any existing or likely industrial problems on site, and prepare some possible 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.

Sub-Contract Work

Some of the work may be done by sub-contractors. You will need to check whether any suitable sub-contractors are available and, if necessary, move towards finalising the relevant agreements.

Specialised Staff

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.

Limitations Imposed by Others

Work on site may be affected by limitations on how, when or where you carry out the work. Often, these arise from legislation administered by state government departments. It is important to understand which departments may have legal jurisdiction over some or all activities on a particular site (e.g. Department of Natural Resources).

Dial Before You Dig (DBYD) is another important source of information for civil construction work. This organisation has been set up to provide information about buried utility services. Before the job starts, always to contact DBYD on 1100. They will provide all available information on buried infrastructure in the area, but its protection is first and foremost the responsible of the works supervisor. In many cases, utility service lines may

need to be shifted before work can begin, or may need to be supported during the period of exposure.

The following factors that may therefore affect job outcomes:

- buried power or telecommunications lines in the area
- water supply or sewerage pipes
- conditions imposed by local governments, such as maintaining access to public footpaths and bus stops, or retention of vegetation
- the discovery (or even the possible presence of) an item of environmental or heritage significance.

You need to be aware of the effects that all of these limitations will have on the job. All such factors must be considered in planning for the job; they cannot be addressed 'on the run'.

Checking an item of cultural heritage



Any damage to infrastructure, whether caused through carelessness or lack of planning or failure to consult, can involve high costs. 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, in addition to the cost of repair.

The following websites are recommended for more information:

www.dnr.qld.gov.au

www.dialbeforeyoudig.com.au

www.epa.qld.gov.au

Utility Service Alterations

Utility services such as water supply and sewerage lines, power lines and telecommunications cables may have to be shifted before work can begin. 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.

The Value of Planning Ahead

Your plan for the job is like a road map that tells you which road to follow on a long journey.

For example, imagine a trip by car from Brisbane to Sydney. You would plan the trip in a number of different ways:

- the overall plan— your road map tells you which towns you will pass through, how far apart they are, and what services are available en route
- the start-up plan— before you set out, you have mental list of things to do, such as check the car's air, water and fuel level, pack the bags, load them into the boot, etc
- the day-by-day plan— starting time for the journey; where you are likely to get fuel, stop for meals, or stop for the night
- the hour-by-hour plan— how much further to the next town, the car's fuel level, when you need a break.

In the same way, your plan for a construction job must occur at different levels. It is not enough just to have an overall plan. The planning documents, if well used, will enable you to think ahead about the problems that are likely to occur, so that (if possible) you can prevent them from occurring or at least reduce their impacts.

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 looking at the job from different viewpoints, such as:

- contingencies (what can go wrong?)
- scope (which part of the job does this affect?)
- roles (whose area of responsibility is this?)
- timing (what are we doing today? next week?)

When planning ahead, always remember the 5Ms—

- Men (labour)
- Minutes (time)
- Memory (documents)
- Machines (equipment)
- Method (systems)

Remember the 6Ps of planning—

- Prior
- Planning
- Prevents
- Particularly
- Poor
- Performance

Working with Other Contractors/Organisations

As the person responsible for the detailed management and day-to-day running of the job, you are performing the work of a manager, which includes planning, organising, directing and controlling people. This means organising and co-ordinating people's actions, and maintaining motivation, so that they do their work properly.

This 'managing' part of the job applies to your working relationships with people in outside organisations, as well as to the people for whom you are directly responsible. You will need to work as effectively as possible with all parties involved with the work. You can only do this if you communicate effectively.

The following is a brief discussion of effective communication. For more information on the subject, refer to Topic 7, Communications, in this training series.

Effective Communication

Whether people co-operate and carry out instructions depends largely on your ability to speak and write in a manner that can be clearly understood by the particular group.

The information you receive will often be in written form. For example, you will be given the particular job requirements on plans and in specifications. It is your responsibility to:

- correctly interpret the information
- explain it to others
- re-state it into a form which can be readily understood by others.



On the job, you will often need additional information from subcontractors and others (such as service authorities) before you can give effective instructions to your team.

At times, you will need to stop and think carefully about what specific information you need from supervisors and team members, and how to effectively convey this information to contractors and other organisations. In particular, you will need to think about:

- information structure
- how you will give an instruction or receive some piece of information
- the amount of information
- timing
- clarity
- keeping records, such as the site diary.

Information Structure

Whether you are working with a few tradesmen, a number of workgroups, or a whole project, people on the job will depend on you to provide the correct information.

Think carefully about whether you expand on the information, or express it in fewer words. The answer depends on the needs of the person you are communicating with. In either case, the aim is to ensure that they understand your expectations and the requirements of the job.

Giving Instructions/Receiving Information

How you give an instruction to a contractor or request information from another organisation is important. Will it be verbally or in writing?

In some cases, there is a legal requirement to obtain information (e.g. permission to perform some activity) in writing. If you are not sure about such requirements, always check first.

All personnel on site should adopt the habit of writing legibly, so that the others can easily read the writing. All written instructions should be retained (see below, re record-keeping).

Amount of Information

You must provide sufficient information to contractors, outside organisations and team members to enable them to control their section of the job and align it to the overall job program. Do not ‘hang on’ to information.

Timing

Works programs usually have a time limit, and activities carried out by different people need to be co-ordinated. In this setting, if you provide information too early or too late, the results can be serious.

Clarity

All instructions you give must be clear, especially verbal ones. If necessary, ask questions to make sure that the person has clearly understood the information.

Here is an example of how an unclear instruction led to a misunderstanding on a job site:

A supervisor tells a truck driver to unload drainage pipes “opposite the gum tree beyond the bridge”. The driver did just that. However, he chose the wrong tree because he went to the wrong bridge.

The error wasn’t discovered for two days. The pipes had to be re-loaded onto the truck and offloaded in the correct place, several kilometres away.

This unnecessary work cost several thousand dollars and set the job back by a week.

Keeping Records

It is extremely important to establish and maintain records that document the both the progress of the work and the problems experienced. The reasons for keeping records of all actions and decisions on a works site are described in detail in Topic 4 of this training series.

Documents that play a role in communications on site include:

- Correspondence
- Minutes of meetings
- Daily progress report
- Job diary
- 'As constructed' drawings
- Photographs and videos.

If records are kept on a computer hard drive or network, they must be backed up regularly.

Importance of Working Effectively with Contractors and Other Organisations

You must make the effort to communicate effectively with contractors and people in other organisations, because if you do:

- the chances of the project's success are increased.
- the morale of everyone on the job will be improved.
- as a supervisor, you will have more opportunities to address adverse attitudes and situations.
- more information will be exchanged, leading to increased understanding and trust.

Integrating Work Activities

While it true that organisations cannot function without people, it is also true that people need organisations. They provide structures that allow people to integrate their work activities with those being performed by others.

The organisational structure provides a framework where people can understand their role and its relationship to the role of others. The framework makes it easier to get the job done, and facilitates communication. A good organisational structure is therefore essential to any enterprise. Any organisational structure that cannot be described clearly is likely to be illogical and confusing.

Setting up the right organisation is therefore all-important to the successful completion of most projects.

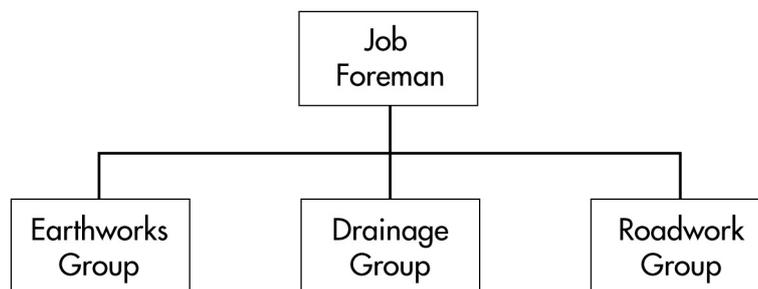
Simple Organisational Structures

The following discussion talks about three common organisational structures used in road construction projects. The structures are:

- all employees directly responsible to the job foreman.
- each work group responsible to a sectional foreman (who is responsible to the job supervisor).
- several work groups responsible to one sectional foreman (who is responsible to the job supervisor).

These relationships are depicted below in the form of simple charts.

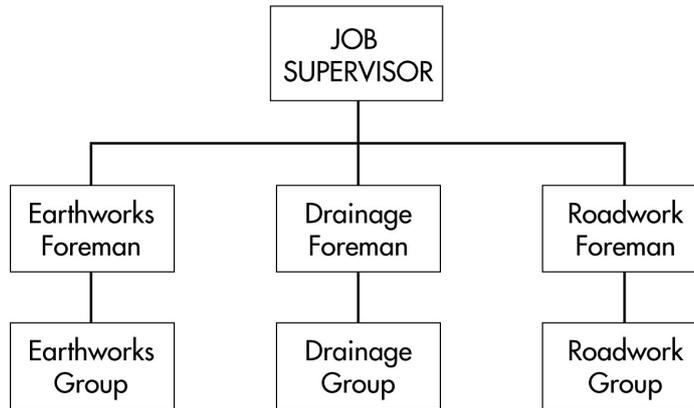
All Employees Responsible to Job Foreman



This organisation is suitable for small jobs, as there is a practical limit to the number of men one foreman can direct and instruct.

This type of organisation is simple and has the advantage of a single line of authority that everyone can understand.

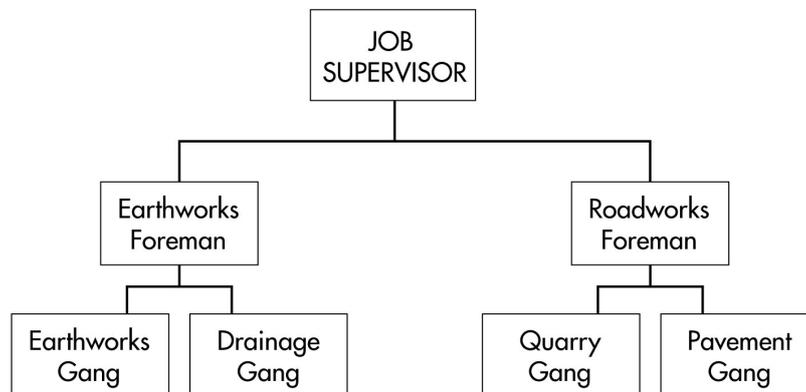
Each Work Group Responsible to a Sectional Foreman



A sectional foreman controls all employees working in a particular field; each sectional foreman is responsible to the job supervisor.

This organisation is suitable for larger jobs where the amount of work warrants a separate foreman to control each type of work, or where the nature of an activity requires specialist skills (e.g. a bitumen-surfacing work group, reporting to a bitumen foreman).

Several Work Groups Responsible to One Sectional Foreman



This type of organisation is used where the work load of the supervisor is such that he or she needs assistance. Often, each work group has a leading hand in charge.

Whether a sectional foreman or a leading hand is needed depends on the:

- time required to adequately supervise the operation.
- difficulty of controlling the operation (e.g. it is very easy for a dozer stockpiling gravel in a pit to dig too deep, and include undesirable material from the pit floor in the stockpile).
- cost of the operation (e.g. an earthworks group would cost far more per day than a stone-pitching workgroup, and should therefore be given greater supervision).
- distance between operations (operations spread out over a larger distance may require additional leading hands or foremans).

Section 1 – Assessment Activities

For information on how these assessment activities may be used as part of the learning process, see the section on ‘Assessment’ in the ‘Topic Descriptor’ section at the front of this topic.

Theory Questions

The following questions allow you to assess your progress in understanding the material presented in Section 1. The questions may be of any of the following types:

- multiple choice (identify correct answer or answers)
- multiple choice (identify incorrect answer or answers)
- fill in the gaps in a sentence or statement
- identify a sentence or statement as TRUE or FALSE
- write a few sentences or a short paragraph.

Answers to the question are shown in the separate ‘Answer’ section.

Question 1

Identify the correct statement or statements from the following list.

Scope of the works is defined by reference to the appropriate level of responsibility.

The scope of the works is the same for the foreman as for the leading hand.

The scope of the works at one level becomes part of the scope of the works at the next level of responsibility.

The list of activities for a job is the same as the scope of the works.

Question 2

While on a site inspection, you are reading a project document marked with the date February 2005. Identify the correct statement or statements from the following list.

The document may be used for the site inspection.

The document may be used in planning the works.

The document should not be used until you have checked that it is the current version.

You have been given the document for the site inspection, so it is safe to assume it has not been amended.

Question 3

Name three types of special conditions that may apply to a construction project.

Question 4

Name four types of information that you would be able to obtain from the job documents.

Question 5

Name three site conditions that are typically associated with construction problems.

Question 6

List four items that are often considered during site inspections before a job starts.

Question 7

The availability of labour and materials, weather conditions, and utility services alterations are likely to affect the overall outcomes of the job.

True

False

Question 8

Name two kinds of specifications that may apply to labour employed under state government civil construction projects.

Question 9

Identify, by placing a tick (✓) in the appropriate box, the most likely use of each type of plant where earth has to be moved from one part of the job to another:

Type of plant	Tracked dozer	Wheel loader	Large rear-dump truck
Distance over which earth is moved (m)			
<150			
100–450			
150–1500			
>1500			

Question 10

A machine that operates most efficiently within a range of >1500m is likely to:

Compromise speed to achieve maximum power.

Operate at relatively low speeds.

Transport materials at relatively high speeds.

Represent a compromise between speed and power.

Question 11

Name six types of materials that may need to be supplied to a construction site on a regular basis.

Question 12

What is the name of the company that has been set up by utility service owners to provide information about the ‘as installed’ locations of utility lines?

Question 13

List four types of documents that may play a role in communications on site.

Question 14

If a person in a supervisory role makes an effort to communicate effectively with contractors and representatives of other organisations working on site, the likely outcomes are:

- Improved chances that the project will be successful.
- Decreased morale, because everyone will spend more time talking and less time achieving results.
- That some employees will develop adverse attitudes.
- There will be greater information interchange, leading to increased understanding.

Question 15

Which of the following would be the most likely type of site organisation on a very large construction project?

- All employees are responsible to a single foreman.
- Each work group reports to a sectional foreman.
- Several works group report to a sectional foreman.
- A foreman directly supervises the dozer pushing up material in the pit.

Practical Exercises

Practical Exercise 1

Study the Table of Contents for the documentation for a construction project. What types of documents are included in the list?

Practical Exercise 2

Study the drawings for a construction project in your area, including (if possible) the plan, sections and drainage cross-sections. Do you have the current version of the drawings? How can you identify which is the current version?

Practical Exercise 3

In studying the drawings for the construction project in PE2 above, were you able to identify special conditions related to any of the following:

- Environmental management
- Emergency management
- Cultural heritage
- Works shutdown periods.

Practical Exercise 4

Under supervision, take part in a site inspection for works that have not yet commenced. What document did you use to record relevant information and issues that were identified during the inspection?

Practical Exercise 5

If possible, obtain a copy of the organisational chart for works that have not yet commenced. Identify the main reporting relationships. Do employees report:

- Individually to the job foreman?
- To a sectional foreman, as part of a work group?
- To a leading hand, who in turn reports to a sectional foreman?
- Through some other arrangement?