

INSPECTORS' HANDBOOK

FOREWORD

The best results are achieved when all concerned strive as a team towards a common objective. The objective I have set for the Department is -

"Adequate Roads at Minimum Cost."

On contract jobs success is measured against satisfaction; the satisfaction of the both parties concerned. The Department must be satisfied with the standard of construction (adequacy); the Contractor with the profit derived (minimum cost). To achieve satisfaction, both parties must be prepared to work as a team.

You, the Inspector, are the only departmental representative on the job all the time. From the relationship point of view, you are the all important link between the Supervising Engineer and the Contractor's Representative. The skill and tact you use in the performance of your duties may well determine the degree of teamwork and satisfaction achieved.

I commend this handbook to you and suggest that you refer to it often and that you take every opportunity to discuss its contents with the Supervising Engineer and the Contractor's Representative. By so doing, you will promote teamwork.

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COMMISSIONER OF MAIN ROADS.

INTRODUCTION

This handbook has been compiled in loose leaf form in order that chapters may be issued progressively as the need arises. The initial issue contains Chapters 1, 2 and 3.

To gain the maximum benefit from the handbook, it should be read in conjunction with and into the Department's General Conditions of Contract (Form 12G).

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CHAPTER 1

CONTRACT RELATIONSHIPS

1.1 GENERAL

1.1.1 The Contract

Contractors tender in open competition. When the contract is let, the Contractor undertakes to carry out the work to the job plans and specifications, at a given price and in a specified time.

1.1.2 Principal and Engineer

In Departmental contract documents, reference is made to the "Principal" and the "Engineer". The Constructing Authority for the job could be either the Department or a Local Authority. In the case of:-

- (i) The Department, the Commissioner is the "Principal" and the "Engineer" could be the District Engineer, another Main Roads Department Engineer, a Resident Engineer, or a Consulting Engineer appointed to supervise the Contract.
- (ii) Where the Local Authority is the Constructing Authority the Council is the "Principal" and the "Engineer" could be the Shire Engineer, a Resident Engineer, or a Consulting Engineer appointed to supervise the Contract.

1.2 AUTHORITY

1.2.1 Delegation of Authority

The "Principal" delegates certain authority to the "Engineer" to get the job done to plans and specifications. The Engineer may then delegate certain aspects of his authority to other Engineers, referred to in the handbook as "Supervising Engineers", who in turn may delegate authority to Inspectors. The authority pattern through the contract supervising staff could vary considerably. The important points to be remembered are -

- (i) The Principal could be either the Commissioner or the Council.
- (ii) When the Department is the Constructing Authority you may be made responsible to a Departmental

Engineer or a Consulting Engineer nominated by the Department.

- (iii) If the Local Authority is the Constructing Authority, then you will be responsible to the Local Authority through either a Council Engineer or a Consulting Engineer nominated by the Council.

1.2.2 Authority Between Inspectors

Two or more Inspectors may be employed on the one job, each being responsible for particular aspects of the work. Again, it could happen that you are put over or under another Inspector.

1.3 RELATIONSHIPS

1.3.1 Inspector to Engineers

Having been appointed as Inspector to a contract, you are then responsible to the Supervising Engineer of that contract, who could be a Consulting, Council or Main Roads Department Engineer. The Supervising Engineer is responsible for the issue of your working instructions and you are responsible to him and must report and refer all matters to or through him.

1.3.2 Inspectors to Contractor's Representative

The District Engineer or Council Engineer as the case may be, is required to arrange a "Prestart of Contract Conference" for the contract. At this Conference, the Contractor or his representatives meet the Contract Supervisory Officers. Both parties are required to indicate the responsibilities and authority of their respective representatives. You should, at this time, set the relationship pattern with the Contractor's Representative. Adopt a friendly and helpful approach and try to start the job on a basis of mutual understanding.

1.3.3 Legal Relationships

There are certain legal aspects to the supervision of contracts.

(i) Legal Relationships to the Contractor

Legally, the Contractor is bound to work to plans and specifications and the Works Programme when it is part of the contract documents.

- (ii) Supervising Officers are required to adopt a fair and just attitude in their dealings with Contractors.
- (iii) The Supervising Officers have no right to dictate or even advise the Contractor on the job methods he is to adopt provided that he works within plans and specifications and that he causes no nuisance of undue inconvenience to others, e.g. the motoring public, land owners etc.

However, a Supervising Officer may instruct a Contractor on what he shall not do provided that it is forbidden in the contract, or there are sound technical or safety reasons for the restriction. It is stressed that it is the Contractor's responsibility to devise or determine the alternative means of doing the job.

(iv) Summary

To summarise, insist that the Contractor works according to plans, specifications and related instructions including the job programme when applicable. Act in a reasonable manner. Never direct the Contractor's staff on job methods.

1.3.4 Moral Obligations to the Contractor

Supervising Officers have moral obligations to the Contractor:-

- (i) To be co-operative and helpful and to act impartially.
- (ii) To avoid disrupting or impeding his progress.
- (iii) To give decisions without undue delay, if the specification requires them.
- (iv) To point out any matters in plans, specifications and related instructions that appear to have been misinterpreted or overlooked.
- (v) Not to disclose or discuss job information, contract and contractor problems etc. away from the job.

1.3.5 Moral Obligations to the Principal

Every Supervising Officer is morally obliged to safeguard the interests and reputation of the Principal and his Officers. Occasions may arise where it is essential that you take immediate action in the interests of safety. In

such cases, be reasonable, try to work through the Contractor's job representative. If this approach fails -

- (i) Take whatever action commonsense dictates.
- (ii) Record the circumstances and action taken in your diary.
- (iii) Report the matter to the Supervising Engineer at the first opportunity.

1.3.6 Favours

You have no right to accept favours in any form from the Contractor which could be construed as personal gain.

1.4 INSTRUCTIONS

1.4.1 Authority for Issue

The Supervising Engineer is authorised to issue instructions to the Contractor's Representative. You have no authority to issue instructions, except as delegated. You must never forget that instructions issued by you are given on behalf of the Supervising Engineer.

1.4.2 Authority to Interpret

The content of documents is often open to more than one interpretation. You may disagree with the Contractor's Representatives' interpretation of, say, a clause in specifications. If the difference in interpretation cannot be resolved by reasonable discussion, the Supervising Engineer must be contacted immediately to direct on what action is to be taken.

1.4.3 Contractor's Right to Request

The Contractor's Representative has the right to request direction by the Supervising Engineer.

1.4.4 Procedure

- (i) Instructions may only be issued to the approved Contractor's Representative, i. e. to one man only on a particular portion of the work, e. g. the quarry.
- (ii) Only those Inspectors authorised by the Supervising Engineer may issue instructions to the Contractor's Representative. The number of Inspectors authorised to issue instructions should be kept to a minimum.

- (iii) Instructions to the Contractor's Representative must be evidenced in writing. The number of copies to be prepared may vary. In the absence of definite instructions to the contrary by the Supervising Engineer, you should prepare an original and two copies.

1.4.5 Distribution of Instructions

Original to Contractor's Representative, who should sign to acknowledge receipt of the instruction.

Copy 1 to the "Engineer" for filing on the job file, i. e. Local Authority contracts to the Shire Engineer and Main Roads Department Contracts to the District Engineer.

Copy 2 (Book fast) to be retained on the job.

Note :- Adopt the principles stated in paragraphs 1.3.3, 1.3.4 and 1.3.5 when issuing instructions to the Contractor's Representative.

1.4.6 Where Differences Occur

If you find some aspect of the job which does not conform to plans, specification or allied instructions, you should

- (i) Point this out to the Contractor's Representative and discuss the matter using your job documents to support your claim.
- (ii) If the Contractor's Representative agrees and takes the necessary corrective action, an entry in your job diary would be sufficient record.
- (iii) If the Contractor's Representative disagrees, or having agreed, takes no corrective action, and, if you are sure of your grounds and the Supervising Engineer has given you authority to handle the type of problem concerned, issue a written instruction. Always include reference to the paragraph, clause, etc. of the contract documents to support your instruction.
- (iv) If at this time you are not sure of your grounds or the Supervising Engineer has not delegated you the authority to handle the type of problem involved or the Contractor's Representative is not prepared to co-operate, contact the Supervising Engineer immediately. A joint telephone call where both parties speak to the Supervising Engineer will quickly resolve many problems.

1.4.7 Diary Record

All dealings with the Contractor's Representative and subsequent action taken by all parties concerned, including yourself, must be recorded in your job diary.

1.4.8 Keep Yourself Informed

You must be kept aware of all instructions issued relative to your part of the job, including those made by the Supervising Engineer direct to the Contractor's Representative. Make it your business to accompany the Supervising Engineer whenever he is on your portion of the job and ask him for copies of written instructions issued.

1.5 PLANS AND SPECIFICATIONS

Plans and specifications vary considerably between jobs. To avoid dissention between yourself and the Contractor's Representative you must forget all past documents and concentrate only on what is contained in the job documents being handled. You must make constant reference to job documents and read and apply them to the job in hand.

1.6 COMMON OBJECTIVE

You must understand that a contract job requires a co-operative team effort between all parties concerned. The team objective is to get the job done to everybody's satisfaction. You fit into the team as the "Go between", between the Supervising Engineer and the Contractor's Representative. The Supervising Engineer will invariably delegate some authority to you. Work within the limits imposed and use your authority wisely. Adopt a positive attitude in your dealings with all concerned. Help everyone concerned to get the job done satisfactorily.

CHAPTER 2

DUTIES AND RESPONSIBILITIES

2.1 BEFORE THE START OF THE CONTRACT JOB

Normally a pre-start of Contract Conference will have been organised by the District Engineer or Council Engineer as the case may be. Regardless of how and when you join the contract job the relationship problems must be sorted out before you start on the job. There is a need for two conferences.

(i) Briefing

Between the Supervising Engineer and the Inspector or Inspectors to sort out authority, duty and responsibility problems.

(ii) Co-ordinating

Between the Supervising Engineer, the Contractor's Representative and the Inspector/s.

2.1.1 Briefing of Inspectors

The Supervising Engineer is responsible for the briefing of the Inspectors. He will

- (i) Go through the plans and specifications and allocate the general areas of responsibility of the various Inspectors and appoint one as the Senior Inspector.
- (ii) Go through with you the portions of the plans and specifications which affect your area of responsibility and inform you of what quality and quantity checks are to be made and when, how and by whom this work is to be done.
- (iii) Allot tasks and tell you the limits of your authority to handle them.
- (iv) Indicate whether, and, if so within what limits, you can instruct the Contractor's Representative directly.
- (v) Indicate to whom you are to report, i. e. to another Inspector or to the Supervising Engineer. If you are required to report to him direct, he should notify you where he can be contacted normally and in an emergency, and you should likewise notify him of

your address.

- (vi) Give you a copy of the Contractor's programme, when applicable, showing the start, finishing and duration times of the various stages throughout the contract.
- (vii) Give you instructions regarding any specific matters concerning the handling of the job, e.g. Awards, relationship with land owners and the travelling public etc.
- (viii) Issue special instructions regarding any unusual aspect of the job.
- (ix) Instruct you on what information is to be recorded in your job diary.
- (x) Advise on matters of job safety.

Having settled all domestic problems the Supervising Engineer will then call in the Contractor's Representative.

2.1.2 Co-ordinating Conference

Aim:

To sort out Contract relationship problems.

Likely conference matters -

- (i) Areas of responsibility of each Inspector and their individual authority.
- (ii) Nomination of Inspectors authorised to issue instructions.
- (iii) Nomination of Inspectors to whom the Contractor's Representative may make requests.
- (iv) Nomination by the Contractor's Senior Representative of -
 - (a) The areas of responsibility of his supervisors.
 - (b) Supervisors to whom instructions are to be issued and from whom requests are to be received.
 - (c) Persons who are to function as Safety Officers.

- (v) Discussion of plans and specifications if the Contractor so desires.
- (vi) Discussion of Awards, pertinent Regulations and hours of work.
- (vii) Job Safety matters.
- (viii) Relationship with the motoring public and land owners.

Briefing and co-ordination conferences should take place -

- (a) Before the start of the job.
- (b) During the job whenever :-

A new Inspector is appointed.

or

The area of responsibility of Inspectors
is altered.

2.1.3 Instructions

- (i) After the co-ordinating conference the Supervising Engineer will confirm your job instructions in writing. The Contractor's Representative will receive a copy.
- (ii) It is your duty to ensure that you do receive job instructions from the Supervising Engineer. On receipt of instructions read them carefully, list all matters which are not clear, then ask for further details at the first opportunity; file for frequent reference.

2.1.4 Summary

The time to sort out relationship problems is before you start on the job. The Supervising Engineer is responsible for briefing and co-ordination. It is your duty to ensure that you understand your briefing and the job documents in detail.

2.2 DURING THE CONTRACT

Your duties may vary considerably according to the size of the job, its location and complexity. The Supervising Engineer is responsible to allot you specific duties and to tell you exactly how

you are to carry them out. A guide to inspection duties and responsibilities in check list form is shown on the following page of this chapter. Discuss it with the Supervising Engineer and under his direction make up a duty check list for the particular job in hand. Paste a copy of the job check list inside the cover of your job diary as a constant reminder.

2.3 ON COMPLETION OF THE CONTRACT JOB

The Supervising Engineer is responsible to brief you on detailed job close down procedures. This briefing should cover details of the following :-

- (i) Finalisation of commitments to property owners, i.e. fencing, grids, pits, access roads etc.
- (ii) Withdrawal of Departmental plant from hire, i.e. transportation arrangement. Check on condition, tool kits and final running records.
- (iii) Disposal of stores and or materials supplied by the Department and salvage items.
- (iv) Job site and adjacent area clean up requirements.
- (v) Removal of construction signs and placement of traffic signs.
- (vi) Finalisation of accounts and records.
- (vii) Disposal of job records including diaries.

A GUIDE TO INSPECTION DUTIES AND RESPONSIBILITIES

(To be discussed with Supervising Engineer)

DUTIES

1. Provision for Traffic (All weather conditions)	Safety Adequacy and maintenance of detours. Provision for through traffic. Location and maintenance of signs and lighting. Stability of temporary barricades.
2. Protection of the Public	Safety Protection from construction hazards. Safe handling and control of explosives.
3. Public Utilities	Adequate provision for protection. Within the work area. Adjacent to the work area.
4. Property (Abutting/Adjacent)	Provision of reasonable access. Adequate security - fencing, gates etc. Control of construction to avoid damage.
5. Setting out of work	Check off all aspects against plans and specifications before commencement of any stage of construction.
6. Earthworks (Specifications and good practices)	Soils, for suitability for incorporation in the formation as they open up. Depth of layers and compaction of loose materials. Dimensions of cuttings and embankments. Line and level of completed work. Trimming of batters, slopes and drains.
7. Drainage	Position, level and line of culverts. Foundation and suitability of bedding. Drainage works - type, laying and jointing. Head walls and cut off walls. Cast-in-situ structures - dimensions. Formwork - adequacy stability, reinforcement construction joints.

	Adequacy of inlet and outlet drains. Subsoil water (refer to Supervising Engineer).
8. Pavements	Materials used tested and accepted. Depth width and compaction. Finish to line and level.
9. Surfacing	Surface sound and swept. Primer aggregate and binder approved and available on site. Suitable plant available - condition. Records - Temperatures road and tank. Details of mix. Application rate. Premix materials - tested and approved paving and compaction plant available and serviceable. Compaction adequate.
10. Roadside Furnishings	Guide posts - location, dimensions, dilineators and fixing. Safety fencing - location and fixing.
11. Sampling	Representative samples required. Quantity, labelling and consignment procedures.
12. Site Tests	Compaction concrete etc.

RESPONSIBILITIES

In addition to responsibility for the stated duties, the Inspector has other administrative responsibilities delegated by Supervising Engineer.

1. Representative	To look after the Supervising Engineer's interests viz. Exercise of delegated authority. Keeping him informed on construction practices, contractor's requests progress, anticipated problems, possible errors, omissions on his part and supervision of work to requirements of plans and specifications.
2. Control	Control measures taken not to unnecessarily inconvenience the Contractor.

<p>3. Materials (Supplied by Principal)</p> <p>4. Plant (Hired to Contractor)</p> <p>5. Acts and Regulations</p> <p>6. Safety</p> <p>7. Records</p>	<p>Soil testers, Plant Inspector, Driver Instructor - adequate warning to Supervising Engineer when services required.</p> <p>Ordered in adequate time. Arrives in adequate time. Checked at point of delivery to Contractor for quality and quantity Adequate storage arrangements.</p> <p>Ordered in adequate time. Delivered in adequate time. General condition (including tools and accessories) on arrival. Worked within safe capacity. Maintained to required standard. Serviced regularly. Withdrawn and disposed of.</p> <p>Not overlooked by Contractor.</p> <p>Contractor appoints Safety Super- visor. Reasonable safety measures taken.</p> <p>Maintained in diary form and as directed by the Supervising Engineer.</p>
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CHAPTER 3

JOB DIARY

3.1 NECESSITY FOR JOB DIARY

The job diary is the only document which covers all the happenings on the job. It should be kept in your job office. It must be brought up to date at the end of each day. It must be easy to read. This means that you must use a note book to record information, then rewrite it into the job diary every day as neatly as you can.

3.2 IDENTIFICATION

The following information should be printed on the outside of the front cover of the diary:-

MAIN ROADS DEPARTMENT

JOB NO.

LOCAL AUTHORITY

HIGHWAY

ROAD

CHAINAGES

DESCRIPTION OF JOB

CONTRACTOR

DIARY NO.

3.3 RECORDS - TYPE AND EXTENT

The information to be recorded will vary between jobs. You may have to supervise a road or bridge job or a part of a job, e.g. a quarry. In all cases you are required to keep a diary.

The Supervising Engineer is responsible to instruct you on what information is to be recorded. Use the following diary checklist and layout example in discussion with him to find his diary record requirement.

DIARY CHECK LIST

Records Required	Reason
<p>1. <u>PLANT ON JOB</u></p> <p>(a) Contractors (b) M. R. D. (c) Others</p>	<p>The number, type, condition and balance of plant used may affect the duration, quality or cost of the job. Arrival, departure and condition of plant hired from M. R. D. may be disputed.</p>
<p>2. <u>MEN EMPLOYED</u></p> <p>(a) Operators (b) Labourers (c) Specialists</p>	<p>Similar to 1 above. Information for RISE & FALL calculations. Disputes may arise on continuity of contract works.</p>
<p>3. <u>WEATHER</u></p> <p>(a) General description (b) Rainfall (location extent)</p>	<p>May determine whether an extension of time is justified.</p>
<p>4. <u>JOB CONDITIONS</u></p> <p>(a) Related to weather (b) How job affected</p>	<p>Confirms whether extensions of time are justified.</p>
<p>5. <u>WORK DONE</u> (use sub-headings, e. g.)</p> <p>(a) Drainage (b) Earthworks (c) Gravelling</p> <p>Brief notes under each heading to show -</p> <p>(i) Start date or time. (ii) Location (chainages) (iii) Plant used. (iv) Progress against programme on long jobs (at least fortnightly) (v) Finish date or time</p>	<p>Separate sub-headings make for better continuity.</p> <p>Location identifies area of work. Plant used may indicate that job conditions did not in fact stop work.</p> <p>From this information, progress may be assessed against the programme and programmed completion date.</p>

Records Required	Reason
<p>6. <u>MATERIALS SUPPLIED BY DEPARTMENT</u></p> <p>(a) Date ordered</p> <p>(b) Date received</p> <p>(c) Condition at point of delivery or pick up.</p> <p>(d) Method of transfer to job.</p> <p>(e) Storage method.</p>	<p>Extension of time against delay may be claimed. Disputes may arise regarding responsibility for damage.</p>
<p>7. <u>INSPECTIONS</u> (Acceptance only)</p> <p>(a) Date and/or time</p> <p>(b) Location</p> <p>(c) Result</p>	<p>Disruption through undue delay may be claimed.</p>
<p>8. <u>INSTRUCTIONS ISSUED</u></p> <p>(a) Number</p> <p>(b) Date and/or time</p> <p>(c) By whom originated</p> <p>(d) Brief reference to content.</p>	<p>Reference to this record may determine quality, quantity or time problems.</p>
<p>9. <u>REQUESTS RECEIVED</u></p> <p>(a) Date and/or time</p> <p>(b) Brief description</p> <p>(c) Action taken</p> <p>(d) Result</p>	<p>Similar to 8. above.</p>
<p>10. <u>OTHER MATTERS</u></p> <p>Unusual events, e. g.</p> <p>(a) Accidents</p> <p>(b) Industrial problems</p> <p>(c) Landowner problems</p> <p>(d) Removal or relocation of Services</p> <p>(e) Access to site.</p>	<p>Unusual events often influence the whole job and could lead to claims from other persons or Departments.</p>

Always make sure that the Supervising Engineer reads your job diary on each visit. Get him to initial each page.

A recommended diary layout follows.

DIARY LAYOUT EXAMPLE

Date	Weather Rainfall	Plant on Job			Instructions Issued	Requests Received	Remarks	Date	
		Description	Hours Worked	Work Done					At Chainages
11. 7. 66	Morning showery Heavy showers Afternoon Rainfall 1"	Cat 12	3½	E/W fill	19300-19700	<u>1629</u> Layers not to exceed 6 in. Compaction not to spec.	Progress - very slow Disagreement on com- paction standard. Soil tester required urgently. Informed Engineer.	11. 7. 66	
		John Deere	3½	E/W fill	"				
		EL/Loader	3½	E/W fill	"				
		D4S/F Roller Tandem D6	3½	Stripping swamp) section)	19700-20400				
		D6 (hired)	3½	")					
12. 7. 66	Wet Rainfall ½"			No work			Overnight rain made materials unworkable	12. 7. 66	
13. 7. 66	Wet Rainfall ½"			No work			Some drying out of materials will be necessary.	13. 7. 66	
14. 7. 66	Fine and Cloudy	Cat 12	7	Blade mixing - drying	19300-19700		Fill not trimmed prior to rain - pools in centre. Considerable drying out required. Problem area 19300- 19500.	14. 7. 66	
		Cat 12	3	Batters	"				
		D4S/F Roller Tandem	5½	Rolling	"				
		John Deere) E/Scoop) ²	3	Drying out	"				
15. 7. 66	Fine	Cat 12	10	Blade mixing	18700-19500	<u>1630</u> No further filling 19300-19500 until dried out and stability achieved in fill material already placed	<u>20</u> Engineer to inspect before midday Monday	Fill must come out at 19300-19500. Water penetrated from top and sides. Informed Engineer of request.	15. 7. 66
		Cat 12	10	Batters	18700-19300				
		J. Deere Scraper	9½	E/W fill	"				
		J. Deere "	9½	E/W fill	"				
		D6 Dozer	Idle		"				
		D6 Scraper	4	E/W fill	"				
		D4 S/Foot	9	E/W fill	"				
		Fordson	5		"				
Vib. Roller		E/W fill	"						