33 OF 1978

18/79

In The Privy Council

ON THE APPEAL

FROM THE SUPREME COURT OF NEW SOUTH WALES
COMMON LAW DIVISION COMMERCIAL LIST
IN PLAINT NO. 7012 OF 1977

BETWEEN

G. ABIGNANO PTY. LIMITED ..... *Appellant*

AND

COMMISSIONER FOR MAIN ROADS ..... *Respondent*

TRANSCRIPT RECORD OF PROCEEDINGS

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AND

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TRANSCRIPT RECORD OF PROCEEDINGS

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No. 1

SUMMONS

In the Supreme Court of New South Wales

No. 1

Summons

The Plaintiff claims:

1. A Declaration that upon the true construction of the contracts made between the Plaintiff and the Defendant and dated respectively October, 1973 and August, 1974 the Plaintiff should be paid by the Defendant for the removal of unsuitable material referred to in Section 3, Clause B3.05 (f) at the rate specified in Schedule item 8.
2. Such further or other order as the Court may see fit.

TO THE DEFENDANT:

If there is no attendance before the Court by you or by your counsel or solicitor at the time and place specified below, the proceedings may be heard and you will be liable to suffer judgement or an order against you in your absence.

Before any attendance at that time you must enter an appearance in the Registry.

TIME: 21st October, 1977, at 10.00 a.m.
PLACE: Supreme Court, Queens Square, Sydney.
PLAINTIFF: G. Abignano Pty. Limited of 21 Bridge St., Pymble.
SOLICITOR: Mr. Robert McLaughlin of Beston and Riordan, Solicitors, 82 Elizabeth St., SYDNEY.
PLAINTIFF'S ADDRESS FOR SERVICE: C/- Messrs. Beston and Riordan, Solicitors, 82 Elizabeth St., SYDNEY.
ADDRESS OF REGISTRY: Supreme Court Building, Queens Square, SYDNEY 2000

Solicitor for the Plaintiff

No. 2

AFFIDAVIT — A. J. LIVINGSTONE

In the Supreme Court of New South Wales Common Law Division

No. 2

Affidavit — A. J. Livingstone

ON the 30th day of September, 1977, I, ALLAN JOHN LIVINGSTONE of 12 Browning Road, Turramurra, Civil Engineer, make oath and say as follows:—

1. I am the General Manager of the Plaintiff company (hereinafter referred to as "the Contractor") and have held this position since January 1975.
2. I graduated as a Bachelor of Engineering in Civil Engineering from the University of New South Wales in 1967 and am a member of the Institute of Engineers.
3. Between 1967 and February 1970 I was employed as an engineer by the New South Wales Government Railways.
4. In February 1970 I began working for the contractor as a field engineer on Lake Makoan Dam in Victoria. I then became project engineer on the Southern Expressway and later became deputy project manager and ultimately project manager for the contractor on the Southern Expressway project. I am conversant with the excavation, earth-moving and road making industries, with the practice of contractors in those fields and with tendering procedures adopted.
5. In October 1973 and August 1974 the contractor entered two contracts with the Department of Main Roads. These were contracts for the construction, to sub-grade level, of sections of the South-Western Freeway from Yerrinbool to Aylmerton and from Yanderra to Yerrinbool respectively. The specifications covering these sections of the Freeway are exhibited to me and marked respectively "A" and "B".
6. The specifications referred to in the preceding paragraph cover the work to be done, the conditions under which that work was to be done and the terms of payment. Each was prepared by the Defendant, the Department of Main Roads.
7. During the course of the work material can be encountered which, in the opinion of the Resident Engineer employed by

the Defendant and acting as the representative of the engineer under the contracts, is considered to be unsuitable and in these circumstances the Engineer directs the removal of that material from below the sub-grade level.

8. A decision by a Resident Engineer to remove material from various locations on the site of the works is generally made after a close examination of each deposit and in some instances after laboratory analysis of the suspect material. When such excavation is necessary it is continuously monitored by Departmental personnel employed by the Defendant who define the limits of the work required as the excavation of the material proceeds.

9. Neither the contractor nor the Defendant is able to determine in advance the extent, location, consistency and geometry of unsuitable material which may be encountered in the course of the construction of the freeway. The deposits of unsuitable material can vary from small isolated or scattered pockets of material through to some larger less confined deposits. In many instances the unsuitable material is wet and puggy and thus difficult to work and handle. It is usually because of these characteristics that the material is regarded as unsuitable.

10. The techniques used to remove unsuitable material vary according to the nature, extent and location of the material. These techniques can vary from hand excavation to bulk excavation but even the excavation in bulk can differ in method from the general earth works required by the plans. What will be involved cannot properly be assessed at the time of tender.

11. In the excavation, earth moving and road making industries the removal of unsuitable material is recognised as a high risk area of work as the cost of removal can vary from as low as a dollar per cubic yard to as high as $100 per cubic yard. What the cost to a contractor of such removal may be cannot accurately be assessed at the time of tendering.

12. The removal of unsuitable material generally involves the disruption of other work in that the work is usually intermittent and is generally a difficult and time consuming operation and usually involves a dislocation to the programmable known work.

13. The quantity of unsuitable material in the Yanderra-Yerrinbool section of the work was 33,671 cubic yards. The Defendant has paid the Plaintiff for this quantity of unsuitable material, but has done so at the rate referred to in item 3 of

the Schedule to the contract i.e. that appropriate to earthworks.

14. The quantity of unsuitable material removed in the Aylmerton-Yerrinbool section of the work was 40,176 cubic yards. The Defendant has paid the Plaintiff for this quantity of unsuitable material, but has done so at the rate referred to in item 3 of the Schedule to the contract i.e. that appropriate to earthworks.

15. There is no dispute between the Plaintiff and the Defendant as to the quantity of unsuitable material removed, but a dispute exists as to the rate at which the Contractor should be paid in accordance with the Specifications for the removal of that material.

SWORN at Sydney the 30th day of September, 1977.
Before me:

A Justice of the Peace.

No. 3

AMENDED CROSS CLAIM

In the Supreme Court of New South Wales Common Law Division

No. 3

Amended Cross Claim

The cross claimant claims:

1. A declaration that upon the true construction of the contracts referred to in the summons, the cross defendant should be paid by the cross claimant for the removal of unsuitable material referred to in section 3 clause B.3.05 (f)
   (a) at the rate specified in Schedule Item 3; or
   (b) at the rate specified in Schedule Item 3, or at the rate specified in Schedule Item 8 according as to which rate is appropriate to the class of work directed to be done; or
   (c) at a reasonable rate of remuneration as upon a quantum meruit.

Solicitor for the cross claimant
H. K. ROBERTS,
Crown Solicitor,
8-12 Chifley Square,
SYDNEY. N.S.W. 2000
Telephone: 239.7661

No. 4

AFFIDAVIT — G. E. N. STRIKE

In the Supreme Court of New South Wales Common Law Division Commercial List

No. 4

Affidavit — G. E. N. Strike

On 25th October 1977, I, GRAEME EDWARD NEIL STRIKE of 37 Castlereagh Street, Tahmoor, Civil Engineer, say on oath:—

1. I graduated as a Bachelor of Engineering in Civil Engineering from Sydney University in 1968. Since graduation I have been employed as a Civil Engineer by the Department of Main Roads (N.S.W.) initially as Assistant Works Engineer, Bellambi, thence Works Engineer, Tumut and Goulburn; Area Engineer Wagga Wagga and Resident Engineer Bargo from 17 February, 1975 to the present time.

2. Following the departure, on transfer, of my predecessor, Mr. A. J. Wesley on 19 February, 1975, I assumed full responsibility as the Department's site representative (Resident Engineer) on two Roadwork Contracts then current between the Department and G. Abignano Pty. Ltd. Those Contracts were for the sections from Yerrinbool to Aylmerton (Section 1) and Yanderra to Yerrinbool (Section 2) of the South Western Freeway.

3. During the execution of work under both Contracts, a number of written directions were issued by my predecessor and myself pursuant to Clause 17 of the General Conditions of Contract, requiring the Contractor to remove quantities of unsuitable material. Towards the completion of the first Contract the Contractor made a claim on the Department for additional quantities of unsuitable material required by the Specification to be removed from the work but not covered by a written instruction. Details of the quantities and payments made as a result of the directions and claim are shown on the document marked with the letter "A" and annexed hereto.

4. In all cases where the Contractor removed material at my direction, the methods adopted and plant used by the Contractor were similar to those used for removal of topsoil i.e. tractor dozers and scrapers pushloading and transporting to stockpile. This organisation was also used by the Contractor to win and haul significant quantities of earthworks which was other than rock. In the case of earthworks, extra energy was expended to spread, water and compact the material which was not required for unsuitable material. From observation of the location, size and nature of material

in stockpiles constructed prior to 17 February, 1975 it would appear that this organisation was used throughout.

5. The quantities involved and the nature of material removed were such that hand methods were not required and to the best of my knowledge, were not used. The only exception to this statement could possibly be the removal of material from beneath pipelines.

SWORN by the said GRAEME EDWARD NEIL STRIKE
at Bargo.

Before me:

A JUSTICE OF THE PEACE

DETAILS OF QUANTITIES OF UNSUITABLE MATERIAL

SECTION 1 — Yerrinbool to Aylmerton

EXTRA NO.	QUANTITY (CU. YD.)	RATE PAID*	INSTRUCTION ISSUED BY
13	4300	Item 3	A. J. Wesley
14	5200	Item 3	A. J. Wesley
15	1340	Item 3	A. J. Wesley
16	1200	Item 3	A. J. Wesley
17	3780	Item 3	A. J. Wesley
18	1300	Item 3	A. J. Wesley
19	2180	Item 3	A. J. Wesley
20	840	Item 3	A. J. Wesley
21	740	Item 3	A. J. Wesley
22	167	Item 3	A. J. Wesley
23	3400	Item 3	A. J. Wesley
24	3100	Item 3	A. J. Wesley
52	12629	Item 3	No instruction — claimed by Contractor.

*Item 3 — Earthworks (Excavation to Subgrade Level)

SECTION 2 — Yanderra to Yerrinbool

EXTRA NO.	QUANTITY (CU. YD.)	RATE PAID*	INSTRUCTION ISSUED BY
8	64.8	Item 8	A. J. Wesley
11	5239	Item 3	A. J. Wesley
12	421	Item 3	A. J. Wesley
13	83	Item 8	A. J. Wesley
14	16496	Item 3	A. J. Wesley
20	3223	Item 3	G. E. N. Strike
21	2311	Item 3	G. E. N. Strike
23	1700	Item 3	G. E. N. Strike
41	107	Item 3	G. E. N. Strike
46	761	Item 3	G. E. N. Strike
52	3133	Item 3	G. E. N. Strike
55	280	Item 3	G. E. N. Strike

*Item 3 — Earthworks (Excavation to Subgrade Level)

Item 8 — Excavation for Pipes, Gully Pits, etc., including backfill.

This and the preceding page is the annexure marked "A" referred to in the annexed affidavit of Graeme Edward Neil Strike sworn before me on 25th October, 1977.

JUSTICE OF THE PEACE

No. 5

AFFIDAVIT — A. J. WESLEY

In the Supreme Court of New South Wales Common Law Division Commercial List

No. 5

Affidavit — A. J. Wesley

ON 26th October 1977 I, ARTHUR JOHN WESLEY of 309 Castlereagh Street, Sydney, Civil Engineer, say on oath —

1. I am a Supervising Engineer with the Department of Main Roads. I completed a Bachelor of Engineering Degree from the University of New Zealand in 1961. I was thereafter employed as an Engineer with the Auckland Metropolitan Water Sewerage and Drainage Board for one year; with a firm of Consulting Engineers in England for two years; with a firm of Consulting Architects and Engineers in Canada for 18 months and in October 1966 I commenced work with the Department of Main Roads.
2. I was the Department's site representative (Resident Engineer) at Bargo from October 1973 to 19 February, 1975 for the construction of the South Western Freeway from Aylmerton to Yanderra. I was the Resident Engineer for almost the entirety of the first contract (Yerrinbool to Aylmerton) and for approximately one third of the second contract. I was succeeded by Mr. Strike who supervised the completion of both contracts. The matters set out specifically relating to the present dispute between the Commissioner and the Contractor are based upon my observations whilst Resident Engineer.
3. During this period I issued a number of contract instructions to G. Abignano Pty. Limited to remove material from below the carriageway subgrade levels because it appeared to have insufficient strength to support the road constructions proposed above it. The great bulk of the material was soft and yielding and could be easily excavated and transported by the Contractors site equipment for bulk excavation; that is large push loaded scrapers and large tracked dozers. The suspect material comprised mainly a mixture of clay, silt, topsoil and sand with occasional lenses (or thin layers) of rocky material.
4. Material below subgrade level is unsuitable if it has insufficient strength to support the road above and this may be because it is wet or is not compacted in its natural state or for a combination of these reasons including its inherent natural properties. In the present case the predominant material was wet clay.

5. Approximately 90% of the removal of the unsuitable material was normal excavation work using scrapers and dozers but overall the excavation of unsuitable material was easier than average earthworks excavation because of the general absence of rock. Approximately 8% may have been more difficult to work because of (a) its swampy nature, (b) small quantities and (c) locality. However normal bulk excavation machinery was used. The remaining 2% involved the use of backhoes and other special equipment.

6. Generally speaking the soft yielding material found below subgrade level was the same as the soft yielding material found above subgrade level and as a consequence the same bulk excavation equipment was used.

7. The extent of the excavation of suspect material was determined by the Department but the method to be used was determined by the Contractor. There was no need in any excavation to use hand methods and to the best of my knowledge no hand excavation was requested by the Department's Officers or used by the Contractor.

8. Hand methods are rarely used in the removal of unsuitable material and would only be used in very limited circumstances such as under pipes.

9. It is my firm conclusion that the overall unit cost of removal of the suspect material was considerably below the unit cost achieved by the Contractor for earthworks under the same contract. This conclusion is based on the following points —

   (a) The suspect material required no blasting and virtually no ripping.

   (b) The average haul distance was considerably less than the average haul distance for earthworks.

   (c) The material did not have to be spread in uniform layers.

   (d) The material did not have to be compacted.

   (e) The stockpiles did not have to be rock faced as was required for road embankments.

   (f) The material did not have to be dried or wetted to permit compaction.

   (g) Stockpile sites did not have to be compacted before placement of excavated material.

10. I crave leave to refer to paragraph 11 of the affidavit of Allan John Livingstone sworn 30 September, 1977. The normal range of variation in the unit rate is from below the average

(tendered) rate for the removal of topsoil under item 4 to several times the rate for earthworks under item 3. However, as the removal of unsuitable material is generally an easy task using earthwork machinery the average rate usually levels at, or below, the tendered rate for earthworks (item 3).

11. With reference to paragraph 12 of the said affidavit I do not agree that the removal of unsuitable material generally involves the disruption of other work or is generally a difficult and time consuming operation. From my experience it is usually possible by proper programming to avoid any substantial dislocation.

SWORN by Arthur John Wesley at Sydney.

Before me:

A JUSTICE OF THE PEACE

No. 6

AFFIDAVIT — J. B. ANDERSON

In the Supreme Court of New South Wales Common Law Division Commercial List

No. 6

Affidavit — J. B. Anderson

ON 26th October 1977, I, JOHN BROWN ANDERSON of 20 Werona Street, Pennant Hills, Civil Engineer, say on oath —

1. I commenced employment with the Department of Main Roads in 1941 with the Engineering Branch and have had continuous employment with the Department since then.
2. I graduated with a Diploma of Civil Engineering from Sydney Technical College (Newcastle) in 1950 and was thereupon appointed Officer in Charge Waratah Works Office Newcastle.
3. Thereafter I served in various offices and various capacities until September 1968 when I was appointed a Divisional Engineer. At present I am the Divisional Engineer in charge of Outer Freeway Construction.
4. I was the Engineer under the first contract, which commenced October 1973, as from April 1974 and the Engineer under the second contract, which commenced August 1974, for its entirety.
5. The earthwork content of roadworks construction can be considered as entirely foundation work. As such and because of the difficulties associated with precisely determining the quality of material under the ground surface prior to commencement of excavation it is not uncommon to have variations in the quantity of excavation because of the need to remove material which is considered to be unsuitable for use in the road structure in its existing location. This material is removed from that location and either stockpiled or used elsewhere in the structure depending upon its quality. On the two contracts in question the variation in the quantity represented by the unsuitable material was less than three per cent of the total excavation quantity.
6. The removal of this unsuitable material is carried out as part of the normal earthwork excavation operation and appropriate consideration is given if warranted to extending the time of completion of the contract to cover the increased quantity of work involved in the contract. On the contracts in question the removal from the work of the unsuitable material was generally carried out as part of the normal earthwork operation.

7. Most of the unsuitable material involved was generally free of rock and easily removed by conventional earthwork plant. Some of the material was at times wet and difficult to handle. On the whole however removal of the material presented no more difficulty than that associated with the normal earthwork operation and indeed the material being generally free of rock its removal could be considered a less costly operation than the normal earthwork operation.

8. The additional excavation involved in the removal of unsuitable material requires excavation outside the design lines shown on the plans. However, this is a normal situation in foundation excavation and the additional work is usually carried out using the same techniques as for the specified excavation.

9. I crave leave to refer to paragraph 12 of the affidavit of Allan John Livingstone sworn 30 September, 1977. The removal of unsuitable material may, but generally does not, cause disruption to other work. In my view the quantities involved are usually such a significantly small part of the total quantity of earthworks as to be within the estimating tolerances allowed when programming the project. The removal of unsuitable material is carried out as part of the earthworks operation and, being generally an easier class of work, can be completed more quickly and have little effect, if any, on the programme.

SWORN by John Brown Anderson at Sydney.

Before me:

A JUSTICE OF THE PEACE

No. 7.

TRANSCRIPT OF PROCEEDINGS BEFORE HIS HONOUR MR. JUSTICE SHEPPARD

In the Supreme Court of New South Wales Common Law Division Commercial List

No. 7

Transcript of Proceedings before His Honour Mr. Justice Sheppard

MR. O'KEEFE Q.C. with MR. KIRBY appeared for the Plaintiff.
MR. MORLING Q.C. with MR. MASON appeared for the Defendant.

(His Honour granted leave to amend the summons by substituting the Commissioner for Main Roads for the named defendant).

MR. MORLING: We would seek leave to file an amended cross claim which we gave my learned friend notice of some time ago. It is only for more abundant caution; it does not raise any new issue.

HIS HONOUR: There is no difficulty about that, Mr. O'Keefe?

MR. O'KEEFE: No.

HIS HONOUR: I give leave to the defendant to file his amended cross-claim in Court.

MR. O'KEEFE: The issue between the parties relates to the rate at which the plaintiff is to be paid for quantities of unsuitable material — the quantities not being in dispute — removed at the direction of the defendant, in the course of carrying out construction of the South Western Freeway pursuant to two contracts which, except for the definition of "mileage" are in identical terms qua payment and other relevant matters. We have a stretch of freeway covered by two contracts in identical terms except one is for the first part and one is for the second and both of them contain in their specification provisions for empowering the engineer to direct the removal of unsuitable material. It is removed and the issue is what is the rate of payment.

The contractors contention is that it is to be paid for at a rate referred to in the schedule as referable to excavation. The defendant has paid for it on the basis of work covered by a rate referable to earth works and it has some further description that will loom in the argument, and the alternative argument now in the amended summons is that there is an intermediate view or views that is available and the resolution of the question depends upon a construction of cl.B3.05(f) of the specifications.

The form of contract, general conditions, I think your Honour may have in another case had to look at it — there is a clause in it that requires a reference to arbitration by the Commissioner in the event of certain disputes arising, and that was in fact done in this case and there was in fact a hearing before the Commissioner and submissions were put to him.

In the Supreme Court of New South Wales Common Law Division Commercial List

No. 7

Transcript of Proceedings before His Honour Mr. Justice Sheppard

The Commissioner before whom that was done was about to retire — it became clear to him, anyway, that there was a point of law involved and that there would have to be a stated case, and that request having been made — he was about to retire I think in three or four days time — and it was determined between the parties by agreement that the matter should come to the Court for a declaration which was a cleaner way of doing it, and that is how the matter comes to be before the Court at all pursuant to that agreement. As I see it the issue remains the same as it was before the Commissioner, which is an issue of construction.

Consequent upon that there may be other matters — one matter, for instance, that has not been adverted to but that I ought not to forget about, is a question that your Honour has considered on a number of occasions, and that is the question of interest in the circumstances.

But could I put that on one side because the construction point, resolved one way or another, is likely to result in the resolution between the parties, subject to one matter that arises out of the amended summons. We do not have a dispute about quantities, but if the intermediate situation that is contemplated by section B, I think it is, of the amended summons where you get a mixture of item 3 and item 8 in the Schedule — there might be some contention there and it may be that ultimately one will have to have a resolution of that by amendment of these proceedings, but this either resolves it or is in the nature of a preliminary point in what might ultimately be an action for the amount, depending on the determination made.

The summons is 21st October, 1977 and there is an affidavit of 30th September, 1977, by Allan John Livingstone and I would ask my learned friend Mr. Kirby to read that, your Honour.

(Above affidavit read).

MR. MORLING: I do not think there is any problem about this affidavit but I would just ask my friend what is the relevance of par. 12, and I think my friend would probably agree that the last part of the last sentence in par. 13 is slightly inaccurate, but we can sort those matters out later.

MR. O'KEEFE: In par. 13, I think it is the fact that some perhaps very minor item of quantity was paid for at an item 8 rate — what item 8 means will become apparent to your Honour when you see the specification.

HIS HONOUR: Should I look at those now, Mr. O'Keefe?

MR. O'KEEFE: Yes. Could I just inquire what your Honour does have? I did not see them before they were filed.

HIS HONOUR: I have volumes 1 and 2, Yanderra to Yerrinbool and to green volumes Yerrinbool to Aylmerton.

MR. MORLING: I have taken out of the documents some pages which I am sure my friend will be talking about, just as additional copies so your Honour can mark them and handle them more easily than the big volumes. So far as we are concerned the ten or so pages which are here are those which will be most discussed in our argument. I do not tender them, but if my friend wants to hand them to your Honour —

MR. O'KEEFE: Yes, if your Honour could mark those.

HIS HONOUR: The specifications for Yerrinbool to Aylmerton will be Ex.A and those for Yanderra to Yerrinbool will be Ex.B.

MR. O'KEEFE: There are then some plans, if your Honour would go to the yellow book. In the yellow book there is a section in vol. 1 — they are not numbered but those after the third lot of pink pages s.B, B1, 01 Extent of Work, in the second paragraph there is a reference to "The work described . . . ." and I tender a copy of that.

HIS HONOUR: I will add that to Ex.B.

MR. O'KEEFE: In vol. 1 of the green book, if I could just get these in and then perhaps come to the detail of them, because it does explain the typical cross-section that appears in the yellow book — in pt. B of the green book there is an equivalent provision and I tender that also.

HIS HONOUR: I will add that to Ex.A.

MR. O'KEEFE: If your Honour goes over to some green pages at the back of the yellow volume — just before the green pages, and the first page after the pink immediately before the green there is a document headed Schedule of Quantities. If your Honour goes to the first page of that your Honour will see, "3. Earth Works . . . . . 4. Removal of top soil . . . . . 8. Excavation for pipe . . . . . ". They are the three items I think we will be looking at.

That is my evidence. In respect of the affidavits filed on behalf of the defendant, in so far as the defendant seeks to adduce evidence of fact as opposed to contemplation, if I can put it in that way, we object to it as going to the contract.

HIS HONOUR: What is the evidence, Mr. Morling?

MR. MORLING: There is an affidavit of Graeme Edward Neil Strike of 25th October. I would not for one moment contend that the construction of a contract can depend on what happened under it, but on the other hand we submit it is basic to know what work was done in order to bring that work to the contract to see how it is measured in value. That is the purpose of the evidence. (Affidavit read). (Mr. O'Keefe's objection to relevance noted).

Then there is an affidavit of Arthur John Weslely of 26th October. (Affidavit read and Mr. O'Keefe's objection to relevance noted).

In the Supreme Court of New South Wales Common Law Division Commercial List

No. 7

Transcript of Proceedings before His Honour Mr. Justice Sheppard

Finally there is an affidavit of John Brown Anderson of 26th October which covers much the same sort of thing. (Affidavit read).

That is the whole of the evidence, your Honour.

(Counsel addressed).

(Judgment reserved).

No. 8

REASONS FOR JUDGMENT OF HIS HONOUR MR. JUSTICE SHEPPARD

In the Supreme Court of New South Wales Common Law Division Commercial List

No. 8

Reasons for Judgment of His Honour Mr. Justice Sheppard

HIS HONOUR: Both parties seek declaratory relief in relation to the construction of two contracts pursuant to which the plaintiff was to perform the substantial part of the work of constructing part of the South Western Freeway for the defendant. The dispute relates to the rate which the plaintiff was entitled to charge the defendant for the removal of what is described in the contracts as unsuitable material. The contracts comprise the plaintiff's tenders, general conditions of contract, specifications and plans: there is no difference between the two as regards the question at issue. I propose to refer to the specification for the construction of that part of the freeway which extends from Yanderra to Yerrinbool but in doing so the references to the terms of the specification which I shall make would be found to be precisely the same if reference were made to the contract for the construction of that part of the freeway which extends from Yerrinbool to Aylmerton.

The clause in question is cl.B3.05(f). I shall set out its terms in due course but before I do so I should indicate the context of the specification in which it appears and mention specifically certain other provisions in the specification and the contract. The clause in question is in Part B of the specification dealing with earthworks. Part B is divided into sections, the first of which is headed "General", the second "Clearing and Grubbing" and the third "Excavation and Filling". Clause B1.01 specifies the extent of the work. Amongst other things that clause says that the work described in the specification will be to the limit of contract work shown in figure 1. That figure shows that it was intended that the plaintiff was to construct the freeway from what is described in figure 1 as sub-grade level to sub-base layer. That layer is the surface immediately beneath the bitumen surface over which traffic would eventually pass. In short, the intention of the parties was that the plaintiff would construct the freeway up to the stage where a finishing surface could be laid over it.

The contract was a bulk sum contract but contained a schedule of quantities (that schedule forming part of the plaintiff's tender) to enable additions to and deductions from the bulk sum price to be made. Item 3 of the schedule was "Earthworks (Excavation to subgrade level)". Item 4 was "Removal of topsoil from the area covered by embankments . . .", and item 8 was "Excavation for pipes, gully pits etc. including backfilling". The item "Earthworks (Excavation to subgrade level)" unquestionably refers to the

excavation involved in achieving the sub-grade level referred to in figure 1.

The contest between the parties is whether the admitted extra payment to which the plaintiff is entitled was to be at the rate provided for in item 3 (the defendant's contention) or at the very much higher rate provided for in item 8 (the plaintiff's contention). An additional question raised by the defendant is whether any rate is specified for the work. If not, it would follow that the plaintiff would be entitled to be paid; as on a quantum meruit.

Obviously the country through which the freeway was to pass was undulating and would involve the plaintiff excavating so as to make cuttings and filling where there were depressions in the land, with the result that the sub-grade level would ultimately be at the level provided for in the contract. Thus not only excavation but also filling was required. Additionally embankment work needed to be done either by cutting away ground to make appropriate embankments or by filling ground to enable that to be done. It is plain that item 3 of the schedule of quantities earlier referred to contemplates only the removal of such amount of earth as was necessary to achieve the sub-grade level to which I have referred.

Section 3 of Part B of the specification is, as I have said, headed "Excavation and Filling". Clause B3.01 provides that work (i.e. excavation and filling) shall consist of excavation and embankment construction and all other grading operations necessary to prepare the roadway formation for subsequent pavement construction. Clause B3.03 provides that the quantities of earthwork shown in the drawings have been determined by solid measurement for the slopes marked with the expected types of material. Amongst other things the clause provides:

> "The scheduled rate submitted for earthworks is to be an average rate for all types of material, and SEPARATE RATES ARE NOT TO BE SUBMITTED FOR EARTH AND ROCK. The contractor shall not have any claim on the Department for an increase in the unit rate on account of the nature of the material found in cuttings, whether the type of material is shown in the Drawings or in site investigation data or otherwise. Any material whatsoever met with in the excavation shall be removed at the Contract rate."

The emphasis comes from the contract itself. The "Contract rate" undoubtedly refers to the rate specified in item 3 of the schedule of quantities.

Clause B3.05 is headed "Excavation". Subclause (a) thereof deals with the removal of topsoil. Amongst other things that subclause

provides that the removal of topsoil over cuttings has been included in the earthworks quantities to be carried out at the scheduled rate for earthworks and is part of the whole of the works to be completed for the bulk sum. Clause 3.05(d) deals with benching in cuttings. It provides amongst other things that the bench shall be graded longitudinally to maintain a falling grade from the highest point in the cutting. It continues, "Any increased quantities of excavation due to the grading of the bench shall be paid for as an extra AT THE SCHEDULED RATE FOR EARTHWORKS". The emphasis is mine. Obviously that is also a reference to item 3 in the schedule of quantities.

Clause 3.05(e) deals with excavation below sub-base level. Sub-base level is not a level or layer shown on figure 1 but it is either a reference to the sub-grade level already mentioned or to another level shown in figure 1 and described as selected sub-base layer. For present purposes it is not material to determine which of the two levels is referred to. The subclause provides that cuttings are to be excavated for their full width to a depth of one foot below the planned sub-base level or to such other depth as may be specified or directed by the engineer. That is subject to the exception which follows and which it is immaterial to mention. The subclause concludes:

> "In all the cuttings the contractor shall shatter or loosen the subgrade material for the full width of the formation, including sections at either end of the cutting on natural surface, to a minimum depth of six (6) inches below the subgrade level. Loosening shall be included IN THE SCHEDULED RATE FOR EXCAVATION and shall not be an extra to the Contract price."

Again the emphasis is mine. It is to be observed that the words used in subclause (e), namely, "in the scheduled rate for excavation" are not the same as those used in subclause (d), namely "at the scheduled rate for earthworks".

The subclause, the construction of which is in question here, follows next. It is in the following terms:

> "Where the Engineer considers that material in the bottoms of cuttings or in the natural surface beneath embankments is unsuitable, such material shall be removed and spread at locations outside the working area, as directed by the Engineer. Suitable approved material shall be backfilled and compacted as specified in Clause B3.06(f). Payment will be made for the removal of the unsuitable material AT THE SCHEDULED RATE FOR EXCAVATION, IRRESPECTIVE OF THE NATURE OF THE MATERIAL REMOVED."

The emphasis is mine. It is unnecessary to refer to the terms of cl.B3.06(f) which specifies the manner in which compaction is to be carried out.

It is to be observed that the expression used in relation to payment is different again from either of those used in subclauses (d) and (e) although it is more akin to that used in subclause (e). Indeed it would be the same were it not for the addition of the words "irrespective of the nature of the material removed".

Clause B3.06 deals with embankments. Subclause (a) thereof deals with foundations for embankments. It needs to be read in conjunction with subclause B3.05(a) dealing with the removal of topsoil to which I have already referred. Part of that subclause deals with the removal of topsoil from areas other than over cuttings. In relation to that matter subclause B3.05(a) provides:

> "The removal of topsoil from areas other than over cuttings has been included as a separate item in the 'Schedule of Quantities, Rates and Amounts' comprising the Bulk Sum Tender and the quantity shown shall be regarded as provisional for the purpose of comparison of tenders. Payment for this item will be at the scheduled rate for the quantity actually measured in the stock-piles, and as determined as set out in Clause B3.06(a) for unsuitable material, irrespective of the quantity shown in the schedule. An extra or deduction will be applied at the scheduled rate accordingly."

The relevant part of clause B3.06(a) is as follows:

> "Where the Engineer considers that material in the natural ground beneath embankments is unsuitable, such material shall be removed and spread at locations outside the working area, as directed by the Engineer. Suitable approved material shall be backfilled and compacted as specified in Clause B3.06(f). Payment will be made for the removal of the material which is deeper than 12" from the natural surface at the scheduled rate for excavation, irrespective of the nature of the material removed. Payment will be made for the removal of the material within 12" of the natural surface at the scheduled rate for the removal of topsoil from areas other than over cuttings, mentioned in Clause B3.05(a), irrespective of the nature of the material removed. Except for payments mentioned in that clause no payment will be made for other work carried out in preparing foundations, which shall be regarded as part of the earthworks."

Clause B3.06(a) in that part of it which I have set out above uses expressions not dissimilar from ones used in some of the earlier

clauses to which I have referred. Thus in relation to material which is deeper than twelve inches from the natural surface payment is to be made "at the scheduled rate for excavation, irrespective of the nature of the material removed". That is the same expression as is used in clause B3.05(f) (the clause in question) and is similar to the expression used in clause B3.05(e). The clause then provides for payment to be made for the removal of material within twelve inches of the natural surface. That is at the scheduled rate for the removal of topsoil from areas other than over cuttings, again irrespective of the nature of the material removed. That is a clear reference to item 4 of the schedule of quantities earlier referred to. Finally it is provided that except for payments mentioned therein no payment will be made for other work carried out in preparing foundations "which shall be regarded as part of the earthworks". That is a reference to item 3 of the schedule of quantities earlier referred to.

Part C of the specification is headed "Stormwater Drainage". It is divided into four sections, namely, "General", "Installation of Pipes", "Head Walls, Gully Pits, Junction Boxes and Drop Structures" and "Single Cell Reinforced Concrete Box Culvert".

As might be expected Part C deals with pipes and other installations which it was necessry to provide for the purpose of properly draining the land and avoiding subsidence. Extensive provisions are made in relation to the bedding of pipes and excavation work which is to be done for this purpose. Similarly provisions are made for head walls, gully pits, junction boxes and what are termed drop structures. In clause 2.03 it is contemplated that there may be unsuitable material below the level of the bottom of the excavation for the bedding of pipes. In that event the unsuitable material is to be removed and replaced with the material there specified "in which case payment will be made for the removal and replacement of the unsuitable material at the scheduled rate for excavation in accordance with clause B3.05(f)" (the clause here in question.)

As I have said, it is the plaintiff's contention that the appropriate item in the schedule of quantities for additional work required to be done pursuant to the provisions of clause B3.05(f) is item 8. It is the defendant's submission that it is item 3 or item 3 or item 8 depending on which is appropriate. Alternatively, as I have also said, the defendant submits that no rate is specified with the result that the plaintiff is entitled to be paid for work done under the subject clause as on a quantum meruit.

Each party concentrated upon demonstrating that it was inappropriate to regard the item relied upon by the other as the item pursuant to which the charge should be quantified. In other words

the plaintiff sought to demonstrate that it would be wholly inappropriate to regard the reference to the schedule in the subclause in question as a reference to item 3 thereof, whilst the defendant, subject to one of its alternative arguments, sought to show that on no basis could it be said that the clause was referring to item 8 of the schedule.

The starting point for the plaintiff's submissions was the fact that item 3 was not intended to apply in terms to any excavation below the level shown in figure 1 as sub-grade level. That is common ground. But the defendant says that that consideration is of no consequence because the clause in question like other clauses provided for additional work and for the charge for that work to be at the rate provided for in item 3 in the schedule notwithstanding that the item would not otherwise apply to such work. I think that that is correct but the strength of the plaintiff's submission arises from the fact that the draftsman has not referred to earthworks; rather he has referred to the scheduled rate for excavation. There is no rate specified, in terms, for excavation as distinct from earthworks unless it be item 8 which commences with the word "Excavation" albeit that it is followed by the words "for pipes, gully pits etc.".

The plaintiff also relies upon the words in the clause in question and in clause B3.06(a) "irrespective of the nature of the material removed". It is said that if this were intended to be a reference to item 3 of the schedule it was quite unnecessary to use those words. That is because of the provisions of clause B3.03 earlier mentioned and set out which provide that the scheduled rate submitted for earthworks (item 3) is to be an average rate for all types of material and separate rates are not to be submitted for earth and rock. Furthermore, at least so far as excavation for cuttings is concerned, topsoil, although easier to remove, is also included in the earthworks quantities — again item 3. The plaintiff submits that the use of the word "excavation" as opposed to "earthworks" coupled with the words "irrespective of the nature of the material removed" in two places in the contract (the clause in question and clause B3.06(a)) is a plain indication that the draftsman was not referring to earthworks (item 3) but to some other item. Furthermore when he wished to refer to that item he made his intention clear. So much is plain from the provisions of clause B3.05(d) earlier referred to, which specifically provides that payment for extra work under that subclause is to be "at the scheduled rate for earthworks". It also appears, so it was submitted, from the provisions of clause B3.06(a) which not only uses the same words as the clause in question — subclause B3.05(f) — namely, "at the scheduled rate for excavation, irrespective of the nature of the material removed". In contrast with the expression it

refers at the end to "earthworks". Thus the suggestion is open that the two expressions are deliberately used in contradiction to each other.

I find all these matters persuasive, but before deciding whether I accept the plaintiff's submissions in relation to them I should refer to the submissions made by the defendant that it would be wholly inappropriate to regard the work in question as falling within item 8 of the schedule of quantities. Before I come to that matter I should say that there is one provision in clause B3.05 which to my mind runs counter to the considerations put to me by the plaintiff. That is subclause (e) thereof where it provides that the loosening there referred to is to be included in the scheduled rate for excavation and shall not be an extra to the contract price. If the plaintiff's arguments were correct one would have expected the word "earthworks" to be used in that clause instead of the word "excavation". The clause must be referring to item 3 notwithstanding the use by the draftsman of the word "excavation". There is thus a basis upon which the defendant is able to suggest that the draftsman, in some places at least, used the word "excavation" interchangeably with the word "earthworks". In this respect it is to be observed that although the first word in item 3 is "earthworks", the word "excavation" is used within the words in brackets in that item.

It is the defendant's submission that item 8 refers to work done pursuant to Part C of the contract as distinct from Part B and is concerned with the more precise and detailed work which would be necessary to prepare ground for the laying of pipes and the construction of other drainage installations mentioned in Part C of the specification. Reliance is placed upon the fact that the abbreviation "etc." follows the words "pipes, gully pits" and that in such a context it means "and other things of the same or a similar kind". That is one of the dictionary meanings which the abbreviation has. It is said that it is altogether outside the bounds of reason that an item of such particularity could embrace excavation for the purposes of removing unsuitable material from cuttings where the amount of work to do with drainage would be minimal compared with the overall task of ridding the area of material which was regarded as an unsatisfactory base for the freeway which was to be constructed.

Whilst the ejusdem generis rule is only one of the aids to construction one has and the primary task is always to ascertain the intention of the parties from the words they have used, and whilst other dictionary meanings of the abbreviation "etc." give it a more general meaning than that ascribed to it in the defendant's submissions, I think, bearing in mind the contrast that can be drawn between Parts B and C of the specification, that the defendant's submissions must be given substantial weight.

Item 8 of course involves a substantially higher rate than item 3. That is why the plaintiff is endeavouring to have item 8 applied. I agree with the defendant that it does so because in the nature of things work of a more precise and detailed nature is required in relation to excavations for pipes and other installations to do with drainage than is the case in relation to the far more extensive work involved in removing the vast quantities of material necessary to form the cuttings of the freeway.

The plaintiff by its reference to the provisions of clause C2.03 above referred to was able to show that the draftsman intended that the same rate should be applied where unsuitable material had to be removed from areas over which it was proposed to lay pipes as was to be paid for the removal of unsuitable material generally. In its submission this was a reason for not taking the more restricted view which would be involved if one were to adopt the defendant's submissions. It would be unfair to expect the plaintiff to remove unsuitable material in these circumstances for the general and much lower rate provided for in item 3 of the schedule. I think that is a matter which must be taken into account in considering the weight to be accorded to the defendant's submissions that item 8 is a wholly inappropriate item to apply in relation to clause B3.05(f).

I agree with submissions put to me by the plaintiff that this is not a case where the draftsman has made no provision in the schedule for the rate of charge to be made. Plainly the terms of the clause in question indicate that he thought he had made such a provision both in the case in question and in relation to cases falling within clause B3.06(a). That consideration militates against accepting the defendant's third alternative of a quantum meruit. If the rate of charge is specified in the schedule it must be found either in item 3 or in item 8, or perhaps in a combination of the two. I leave that latter alternative out of account for the moment.

Having given the matter due consideration, I have reached the conclusion that I prefer the defendant's submissions. I am minded to do so particularly because of the use of the word "excavation" as opposed to "earthworks" in clause B3.05(e), by reason of the fact that it was intended by the parties that a schedule item should apply in respect of work done under the clause in question and because I think the arguments in favour of the view that item 8 is inappropriate substantially outweigh those in favour of the view that item 3 is inappropriate.

The defendant submitted that a preferable view was that the clause meant "at the appropriate scheduled rate for excavation". That involved the word "appropriate" being written into the clause or understood as being there. I have given that submission due

consideration. Support for it is I think to be found by reason of the provisions of clause C2.03 earlier mentioned. But on reflection I do not think that that is a justifiable course to adopt even though its adoption might involve a greater degree of fairness to the plaintiff.

In the circumstances I have reached the conclusion that item 3 alone is the item of the schedule of quantities to which the clause in question makes reference.

The plaintiff indicated when the case was opened that if it were successful it would seek a declaration to the effect that it was entitled to interest upon the amount which was due to it. It has been paid in accordance with the provisions of item 3 of the schedule. It would seek an award of interest pursuant to the provisions of s.94 of the Supreme Court Act 1970 upon the difference to which it would have been entitled had it been successful. That is not a matter I have dealt with because it is my view that the plaintiff's argument fails and that of the defendant succeeds.

The plaintiff's summons is dismissed. I make declaration 1(a) as asked in the cross-claim. I order the plaintiff to pay the defendant's costs of the proceedings.

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No. 9

Extracts from Exhibit A — bulk sum contract for construction of South Western Freeway — Yanderra to Yerrinbool

No. 9

EXTRACTS FROM EXHIBIT A — BULK SUM CONTRACT FOR CONSTRUCTION OF SOUTH WESTERN FREEWAY — YANDERRA TO YERRINBOOL

DEPARTMENT OF MAIN ROADS, N.S.W.
BULK SUM CONTRACT

THIS DEED made the 30th day of August One thousand nine hundred and seventy-four BETWEEN G. ABIGNANO PTY. LIMITED of 19-21 Bridge Street, Pymble in the State of New South Wales (hereinafter and in the documents annexed hereto called "the Contractor") of the one part and THE COMMISSIONER FOR MAIN ROADS (hereinafter and in the said documents called "the Commissioner") of the other part WHEREAS the Commissioner has accepted the tender of the Contractor for the provision and execution of the several works hereinafter mentioned for the bulk sum of Five million six hundred and fifty seven thousand three hundred and twenty three dollars and ninety one cents ($5,657,323.91) NOW THIS DEED WITNESSETH that in pursuance of the premises and in consideration of the payments to be made to the Contractor by the Commissioner under the provisions of this Contract the Contractor for himself, his executors, administrators, successors and assigns hereby covenants with the Commissioner to execute and perform the several works and provisions and supply all materials and labour and everything of every kind respectively named, shown, described and referred to in the copy Tender, Drawings, Specifications Volume I and Volume II and General Conditions of Contract Volume I and Volume II respectively annexed hereto to be executed and supplied by and on the part of the Contractor in conformity with the said Drawings and Specifications Volume I and Volume II and under and subject to the said General Conditions of Contract Volume I and Volume II and the Contractor for himself, his executors, administrators, successors and assigns hereby covenants with the Commissioner and the Commissioner hereby covenants with the Contractor to perform, fulfil, observe and comply with and submit to all and singular the conditions, stipulations and requisitions and all matters and things contained expressed and shown in or reasonably to be inferred from the said copy Tender, Drawings, Specifications Volume I and Volume II and by and on the part of the Contractor and the Commissioner respectively to be performed, fulfilled and observed, which copy Tender, Drawings, Specifications Volume I and Volume II and General Conditions of Contract Volume I and Volume II for the purpose of identification have been signed by the Contractor and are the documents forming the Schedule hereto AND

it is also mutually covenanted that if the party hereto of the first part shall consist of two or more persons, the term "the Contractor" herein and in the documents annexed hereto shall bind such persons jointly and severally and their respective executors, administrators, successors and assigns, and such persons shall jointly be entitled to the benefit of this Contract and these presents, and the said documents shall be read and construed accordingly.

IN WITNESS WHEREOF the parties hereto have hereunto set their hands and seals the day and year first hereinbefore written.

THE COMMON SEAL OF G. ABIGNANO PTY. LIMITED was hereunto affixed by one Director in the presence of:

Secretary

THE SCHEDULE OF DOCUMENTS hereinbefore referred to:—

Tender. Drawings. Specifications Volume I and Volume II. General Conditions of Contract Volume I and Volume II.

I, ANDREW FREDERICK SCHMIDT, The Commissioner for Main Roads have hereto affixed the Official Seal of The Commissioner for Main Roads in the presence of:

Secretary

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No. 9

Extracts from Exhibit A — bulk sum contract for construction of South Western Freeway — Yanderra to Yerrinbool

GENERAL CONDITIONS — CLAUSE 17

17. EXTRA WORKS — ALTERATIONS TO WORKS

1. If at any time whilst the works are in hand it shall be deemed expedient by the Engineer to order material or work of a different description to that specified, or to increase the dimensions or extent of any works to be done under this Contract, or to alter their situation or vary the form or dimensions of any of the said works, or any part thereof, or to make any deviation or to substitute one class of work for another, the Engineer shall have full power to do so, and to order and direct any such increase, alteration, deviation, or substitution, and the works involved in any such increase, alteration, deviation, or substitution shall be executed by the Contractor at and for the several prices or rates shown in the Schedule if of the class of works provided for. If any of the works so ordered to be done shall not be, in the opinion of the Engineer, of the same class of works provided for in the Schedule, or if there be no Schedule rates for such works, the same shall be executed by the Contractor at such prices as may be agreed upon with the Engineer, but if the Contractor and Engineer cannot agree as to the price to be paid, the Engineer may order the Contractor to carry out such work by Day Labour in accordance with Clause 32 hereof, or he may direct the same to be done by such person or persons as he may think fit.

2. Before any extra work, or work of an altered value or class, is undertaken by the Contractor, it shall be imperative for him to procure an order in writing from the Engineer for carrying out such extra or variation of the work, and no extras, additions, enlargements, reductions, deviations, or alterations whatever which may be claimed by the Contractor will be admitted or recognised under any circumstances, or will be allowed or paid for by the Commissioner, which shall have been done or executed without an order from the Engineer, in writing, nor unless the total quantities and the rates of payment for such extras, additions, enlargements, reductions, deviations, or alterations shall have been determined and certified by the Engineer, nor unless the claim for such extras, additions, enlargements, deviations, or alterations shall be made within fourteen days from the date of completion thereof respectively; and the Contractor shall not be entitled to plead that the Engineer omitted to give such written order, as it is

to be distinctly understood that the onus of obtaining such order shall be on the Contractor.

3. Provided always that no such increase, alteration, deviation, or substitution of works shall in any way annul or set aside this Contract, or extend the time for the completion thereof, unless such extension shall have been given as provided for in Clause 28 of these Conditions, and that the Contractor shall have no claim for compensation or damages for loss alleged to have been incurred by him in consequence of any exercise by the Commissioner of the power conferred by this clause.

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No. 9

Extracts from Exhibit A — bulk sum contract for construction of South Western Freeway — Yanderra to Yerrinbool

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No. 9

Extracts from Exhibit A — bulk sum contract for construction of South Western Freeway — Yanderra to Yerrinbool

BULK SUM TENDER — SCHEDULE OF QUANTITIES

WORK Construction of South Western Freeway from 63.8M to 68.9M South of Sydney. Contract No. 6005.287 RC 0014 6005.287 BC 0724. I/We, the undersigned, do hereby tender to execute the whole of the several works and supply all material and labour and everything of every kind respectively named, described and referred to in the Drawings, Specifications and General Conditions of Contract which have been inspected by us for the bulk sum of Five million six hundred & fifty-seven thousand three hundred & twenty three dollars and ninety one cents ($5,657,323.91) (being the total amount shown in the Schedule of Quantities, Rates, and Amounts hereinafter referred to) and to complete the same within the time stated in the General Conditions of Contract and in conformity therewith and with the said Specifications and Drawings; and I/We do hereby agree that any additions, deductions, enlargements, deviations, alterations, and omissions required by the Commissioner shall be paid or allowed for in accordance with the said General Conditions of Contract; and I/We do hereby undertake to execute and deliver to the Commissioner within fourteen days (14) after notice of acceptance of Tender a valid legal Contract with the Commissioner embodying the terms and conditions above mentioned; and further that this Tender is made subject to the Conditions of Tendering hereinafter mentioned, and by which I/We agree to be bound.

The sum of Fifty six thousand five hundred and seventy four dollars and Nil cents ($56,574.00), being the amount required as deposit, is forwarded herewith.

DATED this 9th day of July 1974.

(Signature of Tenderer)

(Address) G. ABIGNANO PTY., LTD.,
19-21 BRIDGE STREET,
PYMBLE . . . N.S.W. . . 2073.

THIS is the Tender referred to in Deed of Contract

dated the _____day of

_____ 19_____

G. ABIGNANO PTY. LIMITED

_____ Contractor

_____ Witness

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No. 9

Extracts from Exhibit A — bulk sum contract for construction of South Western Freeway — Yanderra to Yerrinbool

NOTICE TO TENDERERS

Materials used in carrying out contracts for the Department, where the ownership actually passes to the department, are exempt from Sales Tax.

CONDITIONS OF TENDERING

1. Tenders shall be in a lump sum for the works as specified or shown on the Drawings and subject to the General Conditions of Contract.
2. Each tenderer must send in his tender on the form of tender supplied by the Commissioner to which these Conditions are annexed. Tenders must be in all cases for the works as specified, and no conditions may be inserted contrary to or differing from those in the General Conditions of Contract and the Specification. Any tender which does not comply with these conditions is liable to rejection. However, proposals by a tenderer for alternative designs, procedures or conditions will be considered, provided the tenderer has also submitted a tender for the work to be carried out strictly in accordance with the exhibited General Conditions of Contract, Specification and Drawings.
3. Each tenderer shall furnish a schedule of the various items of work and material specified or shown on the Drawings or required in order to carry out all the works of the Contract, and of his estimated quantities, rates and amounts for each item of work described in such schedule, showing how his bulk sum price is arrived at, which bulk sum must correspond in amount with the total arrived at by the summing up of the

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Extracts from Exhibit A — bulk sum contract for construction of South Western Freeway — Yanderra to Yerrinbool

various amounts carried out in his schedule. If any discrepancy exists between the bulk sum and the addition of the several items, the tenderer shall be bound by the bulk sum and must, if requested to do so, alter the schedule to make them agree.

4. Tenderers must state distinctly on the envelope enclosing their tenders the work for which the tender is given, and such tender must be addressed to the Secretary, Department of Main Roads.

5. A preliminary deposit in amount of 1% of the tender must accompany each tender as a guarantee of good faith, otherwise such tender will be deemed absolutely rejected unless the Commissioner shall otherwise direct. No responsibility for the safety of any such deposit shall be accepted by the Department unless an official receipt therefore shall have been issued. Cheques must be made payable to the Commissioner, Department of Main Roads.

6 If any tenderer shall have complied with the foregoing conditions, and if he be approved as a tenderer, a letter notifying the acceptance of his tender, subject to the conditions stated in such letter, will be addressed to him, and he must thereupon, within the time given, deposit the amount stated in such letter to be held by the Commissioner as security for the due Performance of his Contract; and he must within the time specified in the General Conditions of Contract, execute the Contract Deed prepared for that purpose. Within the same prescribed time a Performance Bond in accordance with the requirements of the General Conditions of Contract shall be deposited with the Commissioner. In the event of his not making such a deposit, or not executing the said Contract Deed within the time aforesaid, the said tender shall be deemed to be absolutely rejected, unless the Commissioner shall otherwise direct, and all moneys already deposited by him under these conditions shall be absolutely forfeited to the Commissioner as liquidated damages. The exercise of all or any of the rights of the Commissioner in the event of failure or neglect of any tenderer to comply with all or any of the conditions of tendering shall not affect the rights of the Commissioner to institute procedings as Law or in Equity for damages or specific performance against such tenderer.

7. The deposit provided for in Condition 5 above will be credited to the tenderer as in part payment of the cash security required by the letter of acceptance mentioned in Condition 6 above.

8. The Commissioner shall not be bound to accept the lowest or any tender, and the acceptance of the tender shall not be deemed to complete the contract; and, although the tenderer shall have complied with all the above Conditions on the tenderer's part to be performed, the Commissioner may, by notice to the tender to that effect, annul the acceptance of any tender at any time before the required deposit has been acepted and the Contract executed by the Contractor, and until the required deposit has been accepted and the Contract executed by the Contractor, he will not be allowed to proceed with the works of the Contract, and he will not be entitled to claim for any loss or damage through not being allowed to execute the Contract and proceed with the Contract works.

9. Every notice to be given to a tenderer may, if the Commissioner thinks fit, be posted to the tenderer's address given in the tender, and such posting will be deemed good service of such notice, and the time mentioned in these conditions for doing any act after notice shall be reckoned from time of posting same.

10. Materials obtained from public or private property. Should the tenderer propose to obtain gravel supplies or other materials from Crown Lands or other public property, he shall obtain in advance all necessary authority from the Department or body controlling such lands. The tenderer shall state clearly on his tender form, whether his tendered price includes the payment of Royalty charges. In the case of materials taken from private property tendered prices must in all cases include any necessary provision for payment of Royalty.

11. If the tenderer desires to sublet any part or parts of the works tendered for, he must submit with his tender the nature and extent of the works proposed to be sublet. Permission to sublet ~~shall~~ not be granted unless this condition shall have been observed.

12. In the event of any tenderer withdrawing his tender within thirty days after it shall have been opened, whether such tender shall have been accepted, or not, or if a tenderer who has been notified that his tender has been accepted by the Commissioner shall fail to make payment of the deposit, or shall fail to execute the documents relating to the Contract as required by Condition 6 hereof, all moneys deposited by the tenderer on account of his tender shall be forfeited to the Commissioner as liquidated damages, and such tenderer may at the pleasure of the Commissioner be excluded from

further competition for the work or for any other works of the Commissioner.

13. The word "tenderer" in these Conditions shall be deemed to include two or more persons, the word "his" shall mean "their"; the word "he" shall also mean "they", and the word "Commissioner" shall mean the "Commissioner for Main Roads".

14. Tenders will be considered only from those Contractors who have been prequalified as at the date of closing of tenders.

NOTE: It has become the practice of some tenderers when submitting tenders for bridgeworks to attach to their tenders a list of conditions or assumptions on which they base their tender prices. Tenderers are advised that any tender to which is attached any document containing conditions or assumptions constituting a variation of the General Conditions of Contract, Specifications or Drawings may render the tender non-conforming.

Before submitting a tender, tenderers should write to the Department or arrange with the Chief Engineer (Bridges) (Telephone 20933 Extension 251) for the interpretation or clarification of any matters arising out of the tenderer's examination of the Drawings, Specification or the General Conditions of Contract.

SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
1.	Provision for traffic		Item		40,177.00
2.	Clearing and Grubbing	136	Acres	330.00	44,880.00
3.	Earthworks (Excavation to subgrade level)	1,430,000	Cu. yds.	1.89	2,702,700.00
4.	Removal of topsoil from the area covered by embankments loose in stockpile	112,000	Cu. yds.	0.60	67,200.00
5.	Trimming and compaction of selected sub-base material in place	259,000	Sq. yds.	0.49	126,910.00
6.	Boundary fencing	550	1100 lin. ft.	146.00	80,300.00
7.	Gates	18	No.	177.00	3,186.00
8.	Excavation for pipes, gully pits, etc. including backfilling	13,600	Cu. yds.	14.90	202,640.00
9.	Supplying, laying and jointing R. C. pipes including bedding.				
	A. FLUSH JOINT				
	15″ Ø Class X	1,608	lin. ft.	5.00	8,040.00
	18″ Ø Class X	908	lin. ft.	6.30	5,720.40
	21″ Ø Class X	1,584	lin. ft.	9.70	15,364.80
	24″ Ø Class X	936	lin. ft.	8.10	7,581.60
	30″ Ø Class X	1,120	lin. ft.	15.20	17,024.00
	30″ Ø Class Y	636	lin. ft.	16.20	10,303.20
	36″ Ø Class Z	404	lin. ft.	28.00	11,312.00
	60″ Ø Class Z	344	lin. ft.	63.00	21,672.00
	72″ Ø Class Z	496	lin. ft.	92.00	45,632.00
	B. RUBBER RING JOINT				
	15″ Ø Class X	2,152	lin. ft.	6.10	13,127.20
	15″ Ø Class Y	1,388	lin. ft.	6.70	9,299.60
	15″ Ø Class Z	Nil	lin. ft.	—	—
	18″ Ø Class X	1,276	lin. ft.	7.40	9,442.40
	21″ Ø Class X	1,312	lin. ft.	9.20	12,070.40
	21″ Ø Class Y	120	lin. ft.	10.00	1,200.00
	24″ Ø Class X	1,000	lin. ft.	11.20	11,200.00
	24″ Ø Class Y	Nil	lin. ft.	—	—
	30″ Ø Class X	1,680	lin. ft.	18.00	30,240.00
	30″ Ø Class Y	Nil	lin. ft.	—	—
10	Type "A" Bedding — concrete cradle	440	Cu. yds.	74.00	32,560.00
				TOTAL	$3,529,782.60

SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
11.	Construction of 12′ × 8″ R.C.B.C. 163 feet long and headwalls		Item		46,150.00
12.	Concrete in Headwalls for pipe culverts including reinforcement	72	Cu. yds.	230.00	16,560.00
13.	Gully pits				
	G.P. 4	Nil	No.	—	—
	G.P.8 — K.1.4	79	No.	527.00	41,633.00
	G.P.8A — K.1.4.	Nil	No.	—	—
	G.P.8 — K.1.6.	8	No.	534.00	4,272.00
	G.P.8A — K.1.6.	Nil	No.	—	—
	G.P.14	5	No.	1412.00	7,060.00
	G.P.15	24	No.	546.00	13,104.00
14.	Subsoil drains	481	100 lin. ft.	317.00	152,477.00
15.	Catch drains	193	,,	61.00	11,773.00
16.	Inlet and Outlet Minor Diversion drains	58	,,	71.00	4,118.00
17.	Lining of Catch, Inlet and Outlet Drains (concrete and/or stone pitching)	600	Sq. yds.	10.50	6,300.00
9.	(contd) Supplying, laying and jointing R.C. pipes including bedding.				
	FLUSH JOINT				
	15″ Ø Class Y	400	lin. ft.	5.40	2,160.00
	15″ Ø Class Z	16	lin. ft.	6.50	104
	36″ Ø Class X	396	lin. ft.	21.70	8,593.20
	42″ Ø Class X	208	lin. ft.	30.00	6,240.00
	42″ Ø Class Z	176	lin ft.	37.80	6,652.80
	48″ Ø Class Z	76	lin. ft.	46.40	3,526.40
	RUBBER RING JOINT				
	18″ Ø Class Y	80	lin. ft.	8.00	640.00
18.	Pipe to Pipe Connections	2	No.	210.00	420.00
19.	Junction Box	1	No.	320.00	320.00
		Earthworks		TOTAL	$3,861,886.00

SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
	Bridge Over Main Southern Railway at 64.3M SOUTH OF SYDNEY, NORTHBOUND CARRIAGEWAY.				
1.	Concrete — Class 4K in deck and kerbs	81	cu. yd.	195.00	15,795.00
2.	Concrete — Class 3K in abutments (including footings, anchor beams and wingwalls)	531	cu. yd.	207.00	109,917.00
3.	Mass Concrete — Class 3K under abutments	14.2	cu. yd.	124.00	1,760.80
4.	Precast, pretensioned bridge planks, including reinforcement, 49ft. 6in. long — construction and delivery	23	each	1540	35,420.00
5.	Precast, pretensioned bridge planks 49ft. 6in. long — erection	23	each	354.00	8,142,00
6.	Structural grade steel reinforcement (excluding bridge planks)	38.8	ton	637.00	24,747.45
7.	Steel reinforcing fabric	2.66	ton	589.00	1,566.74
8.	Excavation for foundations (including backfill)	702	cu. yd.	15.50	10,881.00
9.	Crashrailing (including connectors, bolts, nuts, washers and anchor bolts), all with protective treatment	1.13	ton	2260.00	2,553.80
10.	Post tensioned Macalloy bars 1.1/8" dia. approx. 61ft. long, including end plates, nuts, washers, stressing and grouting	12	each	373.00	4,476.00
11.	1" diameter galvanised dowels, including 1¼" diameter galvanised pipe dowel caps, rubber rings, etc.	44	each	22.00	968.00
12.	Elastomeric bearing strip 3¾" x ¾"	121	lin. ft.	15.00	1,815.00
13.	Fixing name plates	1	each	56.00	56.00
14.	Bituminous jointing in deck and abutments		bulk sum		860.00
15.	Temporary office for Superintending Officer (single room)		bulk sum		2,200.00
			BRIDGE	TOTAL	$221,158.79

SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
	Bridge over Main Southern Railway at 64, 3M SOUTH OF SYDNEY, SOUTHBOUND CARRIAGEWAY				
1.	Concrete — Class 4K in deck and kerbs	138.7	cu. yd.	140.00	19,418.00
2.	Concrete — Class 3K in abutments (including footings, anchor beams and wingwalls)	958.2	cu. yd.	197.00	188,765.40
3.	Mass Concrete — Class 3K under abutments	24.5	cu. yd.	124.00	3,038.00
4.	Precast, pretensioned bridge planks, including reinforcement, 49ft. 6in. long — construction and delivery	29	each	1526.00	44,254.00
~~5.~~	~~Precast, pretensioned bridge planks 49ft. 6in. long — construction and delivery~~	~~29~~	~~each~~	~~1526.00~~	~~44,254.00~~
5.	Precast, pretensioned bridge planks 49ft. 6in. long — erection	29	ton	340.00	9,860.00
6.	Structural grade steel reinforcement (excluding bridge planks)	68.45	ton	638.00	43,671.10
7.	Steel reinforcing fabric	3.76	ton	589.00	2,214.64
8.	Excavation for foundations (including backfill)	941	cu. yd.	15.50	14,585.50
9.	Crashrailing (including connectors, bolts, nuts, washers and anchor bolts), all with protective treatment	1.2	ton	2260.00	2,712.00
10.	Post tensioned Macalloy bars 1.1/8″ dia. approx. 72ft. long, including end plates, nuts, washers, stressing and grouting	12	each	373.00	4,476.00
11.	1″ diameters galvanised dowels, including 1¼″ diameter galvanised pipe dowel caps, rubber rings, etc.	56	each	22.00	1,232.00
12.	Elastomeric bearing strip 3¾″ x ¾″	143	lin. ft.	15.00	2,145.00
13.	Fixing name plates	1	each	56.00	56.00
14.	Bituminous jointing in deck and abutments		bulk sum		1,094.00
				BRIDGETOTAL	$337,521.64

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SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
	Bridge Over Main Southern Railway at 65.24M SOUTH OF SYDNEY. (N.B. Quantities are for both bridges).				
101	Excavate for abutments and backfill to final ground level	353	cu. yd.	27.00	9,531.00
201	Concrete Class 3K to abutments	299	cu. yd.	113.00	33,787.00
202	Supply and fix steel reinforcement to item 201				
	a) cold worked deformed bars	18.59	ton	617.00	11,470.03
	b) round structural grade bars	4.15	ton	622.00	2,581.30
301	Concrete Class 3K to deck and diaphragms	221	cu. yd.	122.00	26,962.00
302	Supply and fix steel reinforcement to item 301				
	a) cold worked deformed bars	21.17	tons	615.00	13,019.55
	b) round structural grade bars	0.6	ton	650.00	390.00
303	Concrete Class 3K to parapets	18	cu. yd.	260.00	4,680.00
304	Supply and fix steel reinforcement to item 303				
	a) cold worked deformed bars	0.8	ton	650.00	520.00
	b) round structural grade bars	0.44	ton	650.00	286.00
305	Supply and fix standard DMR precast pretensioned formwork slabs type C	221	sq. yd.	12.50	2,762.50
306	Test load standard DMR precast pretensioned formwork slab type C	4	No.	370.00	1,480.00
307	Supply and erect precast prestressed concrete girders 69′-11″ long to bridge on southbound carriageway	9	No.	4100.00	36,900.00
308	Test load 69′-11″ long precast prestressed girder to bridge on southbound carriageway	1	No.	2950.00	2,950.00
309	Supply and erect precast prestressed concrete girders 69′-11″ long to bridge on northbound carriageway	9	No.	4100.00	36,900.00
310	Test load 69′-11″ long precast prestressed girder to bridge on northbound carriageway	1	No.	2950.00	2,950.00
311	Supply and fix in position on Abutments A "Advanx" laminated rubber bearings P15-8 or approved equal including stainless steel pins	18	No.	155.00	2,790.00
		CARRY FORWARD		TOTAL	$189,959.38

SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
312	Supply and fix in position on Abutments B laminated rubber bearings P6-16-4 or approved equal including stainless steel pins.	18	No.	155.00	2,790.00
313	Supply and fix in position to side-stops "Hercuslip" P.T.F.E. faced neoprene Bearing pads or approved equal	8	No.	36.00	288.00
314	Supply and fix in position to abutments 3″ dia. p.v.c. drainage pipes	8	No.	20.00	160.00
315	Steel crash railing (including associated components)				
	a) Supply fabrication and delivery to site	289	lin. ft.	22.00	6,358.00
	b) Shop protective treatment	99	sq. yd.	9.50	940.00
	c) Erection	289	lin. ft.	6.00	1,734.00
	d) Field Protective treatment	99	sq. yd.	16.00	1,584.00
316	Supply and install at Abutment A "Compriband" 3″ x 1″ compressible strip or approved equal	115	lin. ft.	3.50	402.50
317	Supply and install at Abutment A "Lysaght Ornamesh TA 2604″ 12″ wide or approved equal	104.5	lin. ft.	2.20	229.90
318	Supply and install at Abutment A aluminium cover plate 8″ x 1/16″	104.5	lin. ft.	2.20	229.90
319	Supply "Pli-astic" joint sealer or approved equal	110	lin. ft.	1.00	110.00
320	Supply "Wabo WD-300" expansion joint seals or approved equal including mitre cutting and jointing	115	lin. ft.	18.00	2.070.00
321	Take delivery of and fix in position bridge name plates as supplied by DMR	2	No.	56.00	112.00
401	Supply, erect, maintain and remove temporary office for Superintending Officer	1	No.	2200.00	2,200.00
	2ND BRIDGES			TOTAL	$209,168.18

SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
	Bridge Over Hume Highway at 65.6M SOUTH OF SYDNEY (Quantities are for both bridges).				
101	Excavate for abutments and backfill to ground level	552	cu. yd.	15.50	8,556.00
102	Excavate for pier footings and backfill to ground level	46	cu. yd.	80.00	3,680.00
201	Concrete Class 3K to abutments	381	cu. yd.	147.00	56,007.00
202	Supply and fix reinforcement to item 201				
	a) cold worked deformed bars	26.5	ton	617.00	16,350.00
	b) round structural grade bars	1.9	ton	622.00	1,181.80
203	Concrete Class 3K to pier footings	56	cu. yd.	143.00	8,008.00
204	Supply and fix reinforcement to item 203 cold worked deformed bars	3.4	ton	622.00	2,114.80
301	Concrete Class 4.5K to deck and diaphragms	470	cu. yd.	332.00	156,040.00
302	Supply and fix reinforcement to item 301				
	a) cold worked deformed bars	81.5	ton	615.00	50,122.50
	b) round structural grade bars	0.8	ton	663.00	530.00
303	Concrete Class 4.5K to parapets	42	cu. yd.	262.00	11,004.00
304	Supply and fix reinforcement to item 303				
	a) cold worked deformed bars	1.8	ton	682.00	1,227.60
	b) round structural grade bars	1.0	ton	682.00	682.00
305	Steel girders and diaphragms (including shear connectors and field splices)				
	a) Supply, fabrication and delivery to site	155.9	ton	1280.00	199,552.00
	b) Shop protective treatment	2699	sq. yd.	9.50	25,640.50
	c) Erection	155.9	ton	300.00	46,770.00
	d) Field Protective treatment	2699	sq. yd.	16.00	43,184.00
306	Steel columns				
	a) Supply, fabrication and delivery to site	34	ton	1280.00	43,520.00
	b) Shop protective treatment	300	sq. yd.	9.50	2,850.00
	c) Erection	34	ton	300.00	10,200.00
	d) Field protective treatment	300	sq. yd.	16.00	4,800.00
		CARRIED FORWARD		TOTAL	$692,021.10

SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
307	Steel crashrailing (including associated components)				
	a) Supply, fabrication and delivery to site	648	lin. ft.	22.00	14,256.00
	b) Shop protective treatment	223	sq. yd.	9.50	2,118.50
	c) Erection	648	lin. ft.	6.00	3,888.00
	d) Field protective treatment	223	sq. yd.	16.00	3,568.00
308	Supply and fix in position "Advanx Pot-Glide" bearings (or approved equal) without side restraint and including all associated components	8	No.	580.00	4,640.00
	Supply and fix in position "Advanx Pot-Glide" bearings (or approved equal) with side-restraint and including all associated components.	8	No.	630.00	5,040.00
311	Supply and fix in position to abutments 3" dia. p.v.c. drainage pipes	8	No.	20.00	160.00
312	Supply "Wabo WD-300" expansion joint seals or approved equal	261	lin. ft.	18.00	4,698.00
313	Form Scuppers in deck	8	No.	45.00	360.00
314	Take delivery of and fix in position bridge name plates as supplied by DMR	2	No.	56.00	112.00
410	Provide, erect and remove temporary office for Superintending Officer	1	No.	2200.00	2,200.00
310	Supply fabricate deliver and install pier base bearing and components including protective treatment	16	No.	500.00	8,000.00
		2ND BRIDGES		TOTAL	$741,061.60

SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
	Sierra Street Overbridge at 67M 4580′ SOUTH OF SYDNEY				
1.	Lightweight concrete C lass 4.5K in deck kerbs and cross girders.	~~269.7~~ ~~296.5~~	cu. yd.	241.00	64,997.00
2.	Lightweight concrete Class 5.5K in cross girders at pier.	24.1	cu. yd.	310.00	7,471.00
3.	Concrete Class 4.5K in piers	8	cu. yd.	110.00	880.00
4.	Concrete Class 3K in pier, abutments and wingwalls.	141.9	cu. yd.	113.00	16,034.70
5.	Structural grade steel reinforcement (excluding girders)	51.11	ton	622.00	31,790.42
6.	Steel reinforcing fabric (excluding girders and footway slabs)	0.38	ton	866.00	329.08
7.	Precast, pretensioned bridge girders, 96′-8″ long — manufacture and delivery	10	each	7376.00	73,760.00
8.	Precast, pretensioned bridge girders, 96′-8″ long — erection, including temporary support for Girder C at centreline of pier, filling the cored holes for dowels with cement mortar and providing mortar pads under bearings	10	each	1028.00	10,280.00
9.	Excavation for foundation (including backfill)	162	cu. yd.	27.00	4,374.00
10.	Handrailing, (including connectors, connector pins, nuts, washers and anchor bolts), all with protective treatment.	6.29	ton	3000.00	18,870.00
11.	Steel in edge bars, plates, angles etc. in expansion joints, all with protective treatment.	1.78	ton	2240.00	3,987.20
12.	Steel in angles, anchor bolts, etc. for the attachment of fascia and soffit slabs, all with protective treatment	4.67	ton	2000.00	9,340.00
13.	Post-tensioned Macalloy bars 1.3/8″ dia. in cross girders at pier, including end plates, nuts, washers, sheathing, stressing, grouting, etc., bars approx. 35′-8″ long overall.	16	each	400.00	6,400.00
			CARRIED FORWARD TOTAL		$248,514.10

SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
14.	Elastomeric seal at expansion joints:				
	a) Supply	78	lin. ft.	20.00	1,560.00
	b) Placing	78	lin. ft.	3.20	249.60
15.	Precast, reinforced concrete footway slabs, concrete Class 4K (including steel reinforcing fabric, but excluding steel attachments for expansion joints)	95	each	33.00	3,135.00
16.	¾″ thick compressed asbestos cement fascia slabs — manufacture, supply and erection	90	each	132.00	11,880.00
17.	¾″ thick compressed asbestos cement soffit slabs — manufacture, supply and erection	348	each	42.00	14,616.00
18.	Supply and fixing of elastomeric bearings	19	each	91.00	1,729.00
19.	1½″ dia. steel dowels, with protective treatment	46	each	10.00	460.00
20.	Steel bearing plates, with protective treatment	24	each	80.00	1,920.00
21.	Fixing name plates	2	each	56.00	112.00
22.	Self expanding cork jointing		bulk sum		152.00
23.	Office for Superintending Officer (single room)		bulk sum		2,200.00
			BRIDGE	TOTAL	286,527.70
	SUMMARY				
	Earthworks etc.				3,861,886.00
	Bridges at 64.3M				558,680.43
	Bridges at 65.24M				209,168.18
	Bridges at 65.6M				741,061.60
	Bridge at 67.9M				286,527.70
				TOTAL	$5,657,323.91

EARTHWORKS

BRIDGE

BRIDGE

CARRY FORWARD

BRIDGE 2 NO./S

CARRY FORWARD/ . .

2 NO. BRIDGES.

CARRY FORWARD . . .

PART B

EARTHWORKS

SECTION 1 — GENERAL
SECTION 2 — CLEARING AND GRUBBING
SECTION 3 — EXCAVATION AND FILLING

PART B — EARTHWORKS

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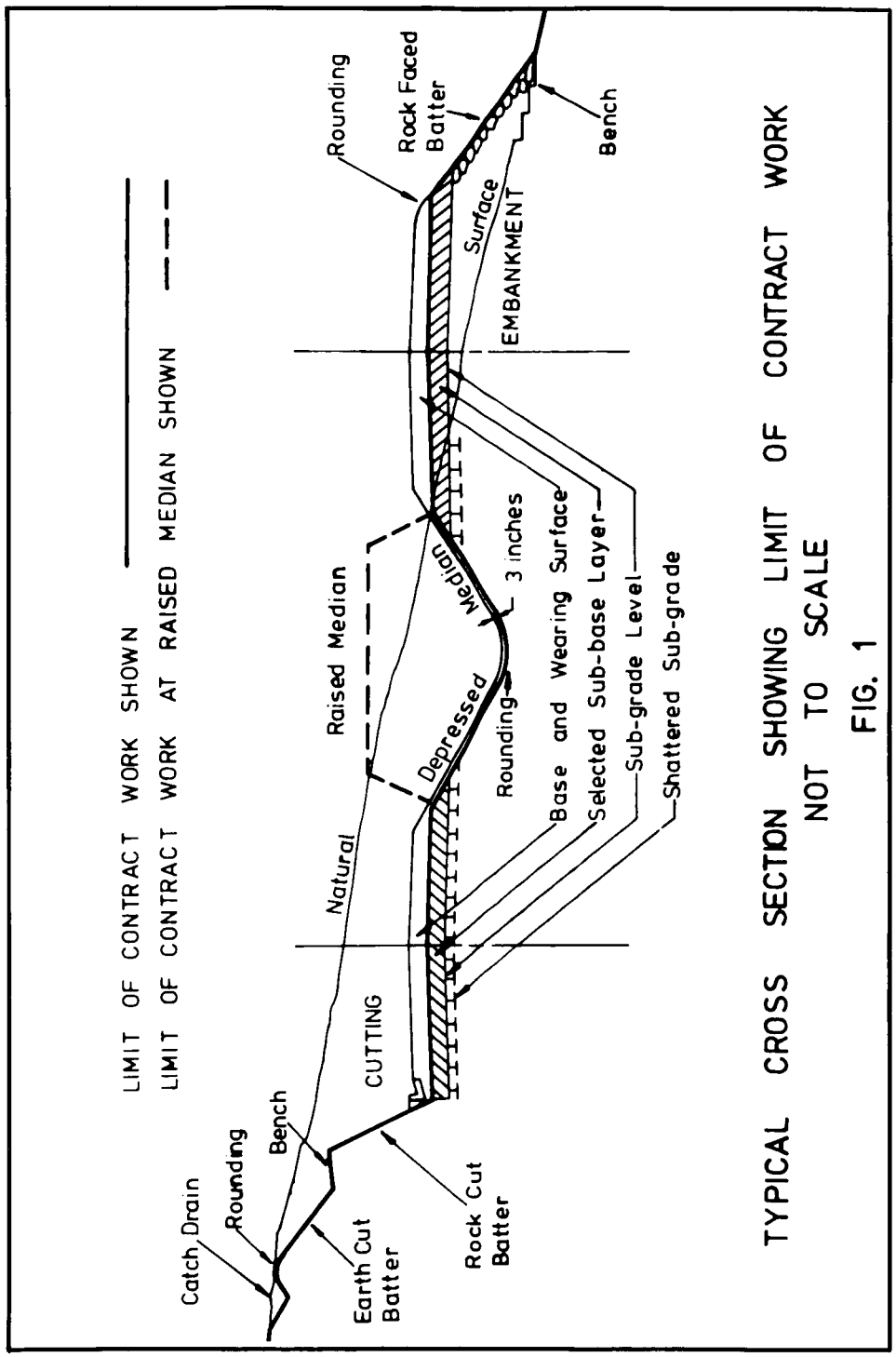

TYPICAL CROSS SECTION SHOWING LIMIT OF CONTRACT WORK
NOT TO SCALE
FIG. 1

50B

SPECIFICATION
PART B — EARTHWORKS
SECTION 1 — GENERAL

B1.01 EXTENT OF WORK

The work to be executed under this part of the Specification includes the clearing and grubbing; excavation and stock piling of topsoil; excavation and filling; provision of select sub-base layer; rock facing and pitching of embankments; back-filling of bridge abutments including spill through abutments above the natural surface level; and preparation of sub-base to receive base and wearing surface all of which shall be executed in accordance with the Drawings.

The work described in this Specification will be to the limit of contract work shown in Figure 1 below, and the typical cross sections shown on page 2 of plans 6005.287.RC.0014 and will not include the construction of table drains, kerbs and gutters, base or wearing surface, or the rock facing and pitching of embankments within the abutment lines of bridges.

Figure 1 is intended to indicate the limit of contract work for the cross section shown and to define some of the terms used in this Specification and is not intended to represent standard cross sections, which will be shown, with detailed dimensions, in the Drawings.

Slopes for cuttings and embankments are expressed as the horizontal distance "X" to unit vertical rise or fall and are shown as "X" to "1". Road pavement and shoulder crossfalls are expressed as the ratio of vertical rise or fall to horizontal distance and are shown as a percentage.

B1.02 STANDARDS REQUIRED

The following standards are referred to in this part of the Specification.

(a) Australian Standards.
CA 23 SAA Explosives Code.

(b) Department's Standard Forms.
76 Instructions for Design of Non-Rigid Pavements.
738 Specification for the Construction of Kerbs, Gutters and Channel Linings.

(c) Department's Standard Drawings.
A.1323 General Arrangement and Location of Temporary Signs at Works in Progress
A.1325 Details of temporary signs at Works in Progress

(d) Department's Drawings
RDS/10 Setting Out Diagram

(e) Department's Standard Test Methods
T.103 Pretreatment of Samples of Road Material by Artificial Weathering
T.106 Coarse Particle Size Distribution
T.107 Fine Particle Size Distribution
T.108 Liquid Limit of Road Materials
T.109 Plastic Limit and Plasticity Index of Road Materials
T.110 Maximum Dry Weight of Road Materials
T.111 Dry Density/Moisture Relation for Road Materials (Standard Compaction)
T.113 Linear Shrinkage of Road Materials
T.114 Maximum Dry Compressive Strength of Soils
T.118 Determination of Density-in-Situ of Pavement and Subgrade Materials.

B1.03 PUBLIC UTILITIES

The Contractor's attention is drawn to Clause A1.13 with respect to the Postmaster General's Department coaxial cable.

Where necessary, the Department will arrange to have any utility services adjusted in level or alignment or removed from the limits of the work. Where utility adjustments are not completed prior to the commencement of the work the Contractor shall permit the adjustments to proceed in conjunction with the Contract roadworks, and shall interfere as little as possible with the operations of the Authorities concerned. However, the Contractor will be held responsible for any damage caused by him or his agents directly or indirectly to any utility service, and shall exercise the greatest care during the progress of the work to avoid such damage. The Contractor shall be responsible for obtaining from the Utility Authorities full information regarding the location of their services.

The Contractor shall have no right to monetary compensation or to any claim for damages, arising from delay on the part of any Utility Authority in removing or adjusting its mains or services.

B1.04 ENCLOSED LANDS

Unless otherwise specified, fences and gates shall be erected in the positions shown in the Drawings or as required by the Engineer and in accordance with Part E of this Specification.

Where necessary in order to prevent trespass or the straying of stock, the Contractor shall erect temporary fences and gates, all of which shall be similar to and at least as effective as the existing fences and gates. During the progress of works, gates shall be kept securely locked when not in use.

The attention of the Contractor is drawn to Clauses 37, 38 and 40 of General Conditions of Contract, which set out his responsibilities relating to injury to persons or animals, damage to property, and the maintenance of fences.

B1.05 ALIGNMENT AND SETTING OUT

Control Points, Bench Marks and other monuments as shown on the Drawings have been marked on the ground and shall be indicated to the Contractor if requested.

The Contractor shall be responsible for setting out the various roadway control lines indicated on the Drawings.

Before clearing commences clearing pegs are to be placed, at a maximum of 100 feet centres, on each side of the formation in accordance with Setting Out Diagram RDS/10.

After clearing and before earthworks operations commence all the necessary pegs of the designated type and colour, as shown on the Setting Out Diagram RDS/10, shall be established at each cross section. In addition bench marks shall be established at the cut/fill lines and the position and level of each bench mark recorded.

The batter pegs shall be repositioned by the Contractor at each change in the cut slope of the batter, and on embankments at not more than 15 feet above the natural surface and thereafter at not more than 25 feet intervals of vertical height. All of these pegs shall remain in position and be maintained in the correct alignment and slope for the full duration of the construction of the fill.

The pegs shown on the Setting Out Diagram RDS/10 shall be the minimum requirement. Additional pegs shall be established at cross sections or intermediate locations where necessary to ensure that the works are constructed to the accuracy of dimensions required by the Specification.

B1.06 SPECIAL CONDITIONS

The Contractor's attention is drawn to:—

(i) Clause A1.13 concerning the need to relocate a coaxial cable;
(ii) Clause A2.09 concerning the establishment of temporary railway level crossings;
(iii) Clause B3.09 concerning the use of State Highway No. 2 for transporting earthwork materials;
(iv) Clause B3.10 concerning the haulage of earthwork materials over bridges to be constructed at various locations on the Freeway;
(v) Clause A1.29 concerning work performed on or over Railway property.

SECTION 2 — CLEARING AND GRUBBING

B2.01 GENERAL

This work consists of the removal of all rubbish or other objectional material which in the opinion of the Engineer is unsuitable for incorporation in the work, from the area that will be occupied by the completed works, and from such other areas where specified herein.

B2.02 EXTENT OF WORK

Unless otherwise specified, the area to be cleared is that which will be occupied by the completed works (excluding catch drains), plus a clearance of 5 ft. measured from the toes of embankments and the tops of cuttings.

The area specified shall be cleared of all trees, stumps, fallen timber, scrub and rubbish, with the exception of certain stumps and trees referred to below.

If a stump is less than 1 ft. high (measured from the natural surface), and the top of the stump will be more than 3 ft. below the sub-base level it may be left in position. Other stumps shall be grubbed out, or removed in part, until they satisfy these conditions.

Unless otherwise specified, all timber cleared in accordance with this Specification shall become the property of the Contractor, and shall be either burnt or removed from within the road boundaries. Any rubbish or other material which is indestructible by fire shall be removed from within the road boundaries. Any burning off shall be carried out under the conditions specified in Clause B2.03 and in such a way that no damage is done to any trees outside the limits of clearing and no hazard is caused by smoke. Any trees remaining within the road reserve which are, in the opinion of the Engineer, unsound, and may fall upon the roadway, and any branches which overhang the road formation shall be cut down and removed and paid for in accordance with Clause 17 of the General Conditions of Contract. No growing trees shall be destroyed or damaged by the Contractor, other than those specified or indicated by the Engineer. Every precaution shall be taken to prevent timber from falling on private property, and the Contractor shall remove at his own cost any timber so fallen, or produce the written consent of the owner to its remaining there. All damage of every kind, including damage to fencing occurring during clearing operations be made good by the Contractor at his own expense.

The Contractor shall give the Engineer written notice of 7 days, or such lesser time as the Engineer may decide, of his intention to clear any section of the work so that the Engineer may inspect the site and determine whether any trees in the area specified to be

cleared are to be preserved for ornamental reasons. The Engineer will mark or indicate to the Contractor the trees that are to be preserved, and the Contractor shall take particular care during the operations of clearing and road construction to avoid damaging or destroying such trees. If any tree, which is to be preserved, is found to be within the area to be covered by embankment, the circumstance shall be brought to the notice of the Engineer, who will decide whether the tree is to be removed, or protected as directed by the Engineer. Such protective measures will be paid for as extras in accordance with the General Conditions of Contract.

Holes left after trees are grubbed out will be inspected by the Engineer or his representative before being filled in and, after approval, shall be filled with sound material, which shall be compacted as specified in Clause B3.06(f). The cost of filling such holes is to be included in the rate for clearing and grubbing.

B2.03 FIRE PRECAUTIONS

The Contractor will be held responsible for any damage to fences, grass, cultivation, buildings or other property caused by fires lit for any purpose in connection with the Contract.

Fires shall not be lit within or adjacent to the road boundaries for the purpose of this Contract between the first day of October and the last day of March, unless the authority of both the Engineer, and the local Bushfire Captain are first obtained in writing. The Contractor shall at all times comply with the requirements of the Bush Fires Act, 1949-58 (amended 1965) and the Local Government Act, 1919. The Contractor shall give the Engineer and occupiers of adjoining properties at least 48 hours notice before burning off is commenced.

As provided for in the Bush Fires Act, spark arrestors shall be fitted to all items of plant used during the prohibition periods referred to abvove.

SECTION 3 — EXCAVATION AND FILLING

B3.01 GENERAL

This work shall consist of excavation and embankment construction and all other grading operations necessary to prepare the roadway formation for subsequent pavement construction. All roadways, drains and sideslopes to be constructed, shall be graded to conform to the alignments and elevations shown on the Drawings. The Contractor shall provide and maintain slopes, crowns and drains on all excavations and embankments to ensure satisfactory drainage at

all times. Catch drains, where required, shall be completed and approved by the Engineer before adjacent earthwork operations are begun.

B3.02 LONGITUDINAL GRADING AND CROSS SECTIONS

The centreline of the finished formation shall be graded in accordance with the Longitudinal Section shown in the Drawings, due allowance being made for the depth of base and wearing surface to be added. The cross-sectional shape of the formation shall be as shown on the cross-section, with surface and side slopes graded and trimmed to the tolerances specified in Clauses B3.05 (b), B3.06 (e), B306 (g) and B3.07.

B3.03 EARTHWORK QUANTITIES AND NATURE OF MATERIAL

The Quantities of earthwork shown in the Drawings have been determined by solid measurement for the slopes marked for the expected types of material. The quantities represent excavation in cuttings and filling in embankments, including the removal of topsoil (where appropriate), the excavation for and the supply and placing of selected sub-base material, and the supply and placing of selected material at bridges, culverts and retaining walls. The quantities do make allowance for the volumes to be occupied by the base, wearing surface and for benching at tops of cuttings as shown on the typical cross section, but do not make allowance for compaction or wastage during construction. The quantities shown in the Drawings and in the Schedule of Quantities are for the information of the Department, and are not to form any part of the Contract.

The scheduled rate submitted for earthworks is to be an average rate for all types of material, and separate rates are not to be submitted for earth and rock. The Contractor shall not have any claim on the Department for an increase in the unit rate on account of the nature of the material found in cuttings, whether the type of material is shown in the Drawings or in site investigation data or otherwise. Any material whatsoever met with in the excavation shall be removed at the Contract rate.

Where increased or decreased quantities of excavation become necessary as a result of variations in the Drawings authorised by the Engineer (including variations from the slopes as shown on plans), extras or deductions will be applied at the scheduled rates on the basis of solid measurement determined from the variation in the Drawings. Borrow not shown in the Drawings will be measured in solid form as indicated in Clause B3.06 (k).

B3.04 INSPECTION, SAMPLING AND TESTING OF EARTHWORKS

Before commencing the construction of an embankment, or placing selected sub-base material referred to in Clause B3.07 or opening up new sections of the work, the Contractor shall notify the Engineer sufficiently in advance of the work to permit any inspections and/or sampling to be undertaken.

When any section of the work is considered by the Contractor to conform with the specified requirements he shall notify the Engineer who will arrange for such inspection, sampling and testing as he considers necessary.

Field density of earthworks, including the selected sub-base materials, may be tested by the sand replacement method in accordance with the Department's standard Test Method T118 or by other methods as the Engineer may determine.

Test Methods required for the works of the Contract are listed in Clause B1.02 (e).

As required by Clause 8(2) of the General Conditions of Contract, the Contractor shall give any assistance requested by the Engineer or his representative in the taking of samples.

B3.05 EXCAVATION

(a) Removal of Topsoil

Topsoil over the full width of all cuttings, sections on natural surface and the base of all embankments throughout the length of the work and over other sections affected by the construction shall be removed and stockpiled clear of the work to the satisfaction of the Engineer. Stockpile sites shall be so arranged that a minimum of destruction of natural vegetation occurs and no trees are destroyed. The stockpile sites are to be so positioned that topsoil can be loaded in trucks and transported away at any time.

The removal of topsoil over cuttings has been included in the earthworks quantities to be carried out at the scheduled rate for earthworks and is therefore part of the whole of the works to be completed for the Bulk Sum.

Topsoil from areas other than over cuttings shall be removed to the depths directed by the Engineer or his representative and stock piled separately. The removal of topsoil from areas other than over cuttings has been included as a separate item in the "Schedule of Quantities, Rates and Amounts" comprising the Bulk Sum Tender and the quantity shown shall be regarded as provisional for the purpose of comparison of tenders. Payment for this item will be at the scheduled rate for the quantity actually measured in the stock-piles,

and as determined as set out in Clause B3.06(a) for unsuitable material, irrespective of the quantity shown in the schedule. An extra or deduction will be applied at the scheduled rate accordingly.

Topsoil stockpiles shall be made free of rock, clay, timber and other rubbish and shall be trimmed to a regular shape to facilitate measuring.

(b) Cuttings, including Slopes

Materials of all classes encountered in cuttings shall be excavated at the scheduled contract rate, including excavation for selected sub-base material referred to in Clause B3.05 (e). As shown in the Drawings, the top edges of cuttings shall be neatly rounded to the dimensions given. Such work shall be deemed to be part of the Contract and will not be paid for as an extra.

The excavation shall be so arranged that the working areas are adequately drained throughout the period of construction. Any damage resulting from the Contractor not observing this requirement shall be rectified by the Contractor at his cost.

Cuttings shall have slopes as determined by the Engineer on the basis of site inspection and investigation before and during the excavation. Unless otherwise specified, the slopes will conform with the following:

Material	Slope (Horizontal Distance to Vertical Rise)	
Drift Sand	Five to one	5 : 1
Sand	Three to one	3 : 1
Clay, loam, gravel or other material subject to rapid weathering	One and one Half to one	1½ : 1
Hard Shale	One to one	1 : 1
Rock with clay seams	Three quarters to one	¾ : 1
Jointed, laminated or soft rock	One half to one	½ : 1
Massive Rock	One quarter to one	¼ : 1

Slopes shown on the cross sections in the Drawing's represent the estimated requirements for the expected types of material and will be subject to re-determination by the Engineer according to his assessment of the materials encountered.

In cuttings where the slope has been determined by the Engineer as 1 to 1 or flatter, no point on the completed slope shall vary from the specified or ordered slope by an amount exceeding 1 ft. (measured at right angles to the slope), and no portion of the toe of the cutting shall be less than the specified distance from the road.

Rock cuttings in which the slope has been determined as ¾ to 1 or steeper, are to be trimmed accurately to the slope determined by

the Engineer by presplitting or other satisfactory method as specified in Clause B3.05 (c). The same method of trimming shall be used for the entire length of the cutting.

In all cuttings, whether in earth or rock, undulations in the general plane of the slope will not be permitted.

The Engineer may direct that any overhanging, loose or unstable material, whether outside or behind the specified slope, be removed. No additional payment will be made for the removal of this material.

Where the Engineer re-determines a slope, the Contractor shall not be entitled to claim an increase in the schedule rate for earthworks for re-cutting the slope, or for re-trimming. Where increased or decreased quantities of excavation become necessary because of re-determined excavation slopes, extras or deductions will be applied as set out in Clause B3.03.

If the Contractor excavates the slope of a cutting beyond the specified line and the tolerance applicable thereto, the Engineer may authorise a minor change in the general slope of the cutting to suit the convenience of the Contractor, but such a change shall not be regarded as a re-determination of the slope under this clause, and no payment will be made for any increase in excavation quantities resulting from the change in slope.

(c) Trimming of Rock Batters

Rock cuttings and exposed rock surfaces in the median areas and adjacent to the roadways shall be excavated so as to obtain smooth, uniformly trimmed surfaces in accordance with the Drawings and to the satisfaction of the Engineer.

The uniform slope shall be such that no point on the slope, measured at right angles to the slope is more than one foot towards the centre line or two feet away from the centre line when measured from the approved slope line. Notwithstanding the foregoing, all loose pieces of rock on excavated slope surfaces shall be removed. No rock shall project beyond the specified batter for a height of six (6) feet above the level of the table drain.

Trimming of the batters to the required standard is to be carried out by pre-splitting or such other method as may be approved by the Engineer.

Pre-splitting of the rock batter shall be carried out by firstly drilling holes at a maximum of three (3) feet centres along the batter alignment, the holes to be extended at least four (4) feet below the level of excavation for each lift. Splitting shall then be carried out by firing explosive charges, spaced at not more than five (5) feet centres, for the full length of the holes prior to any main blast. Where numerous clay or shale seams exist the spacing of drill holes shall be reduced to provided the required surface texture on the rock face.

Before commencing pre-splitting the Contractor shall submit for approval by the Engineer details of the proposed blasting procedure.

If any section of the batter for a height of up to 10 feet above the sub-base level has been over excavated beyond the tolerance limit specified, the batter shall be reformed to the average slope of the cutting using random mortared stone. The stone shall be similar to the sound rock in the cutting and the mortar shall be coloured to match the colour of the rock. No extra payment will be made for this work.

(d) Benching in Cuttings

Where the material in the upper portion of a cutting requires a slope of 1 to 1, or flatter, and during excavation a harder material is met at a lower level requiring a slope steeper than 1 to 1, a bench 10 ft. wide shall be formed at the upper surface of the harder materials as indicated on the Drawings. The harder material shall be excavated at the appropriate slope as determined by the Engineer.

The bench shall be graded longitudinally to maintain a falling grade from the highest point in the cutting. Any increased quantities of excavation due to the grading of the bench shall be paid for as an extra at the scheduled rate for earthworks.

Where benching is not shown in the Drawings, but is directed by the Engineer, or where benching is shown in the Drawings, but is deleted by the Engineer, any variation in excavation quantities will be dealt with in accordance with Clause B3.03.

(e) Excavation below Sub-base Level

Cuttings shall be excavated over their full width to a depth of 1 ft. below the planned sub-base level or to such other depth as may be specified or directed by the Engineer, except that where the material in the bottom of the cutting has been tested and fully meets the requirements for selected sub-base material, the Engineer may direct that it be retained generally in its original position, and be compacted as specified in Clause B3.06 (f).

The finished level of the cuttings, prior to placing the selected sub-base layer, shall be as ordered by the Engineer to suit the thickness of pavement and selected sub-base layer adopted. The crossfall of the cuttings shall be trimmed to a crossfall identical with that of the finished wearing surface. The cuttings shall be trimmed so that the level does not vary more than 0.08 ft. (1 in.) above or 0.17 ft. (2 in.) below the levels determined by the Engineer before the selected material is placed. Compaction of the subgrade and sub-base in the cuttings shall be as specified in Clause B3.06 (f).

Where the existing material meets the requirements for the selected sub-base material, and is not removed, the tolerances in

levels and the compaction requirements shall be as specified for the selected sub-base layer in Clauses B3.06 (f) and B3.07.

In all cuttings the Contractor shall shatter or loosen the subgrade material for the full width of the formation, including sections at either end of the cutting on natural surface, to a minimum depth of six (6) inches below the subgrade level. Loosening shall be included in the scheduled rate for excavation and shall not be an extra to the Contract price.

Unless otherwise specified, the earthwork quantities will include the removal of material to a depth of 1 ft. below the planned sub-base level in all cuttings. Where this layer is not removed, or is reduced in thickness, a deduction will be made from the Contract price for the reduced quantity of earthworks.

(f) Unsuitable Material

Where the Engineer considers that material in the bottoms of cuttings or in the natural surface beneath embankments is unsuitable, such material shall be removed and spread at locations outside the working area, as directed by the Engineer. Suitable approved material shall be backfilled and compacted as specified in Clause B3.06 (f). Payment will be made for the removal of the unsuitable material at the scheduled rate for excavation, irrespective of the nature of the material removed.

(g) Blasting Operations

If explosives are to be used, the Contractor shall obtain all necessary licences from the appropriate authorities, and shall conform to all Government regulations relating to transport, storage handling and the use of explosives, also to the rules set out in the S.A.A. Explosives Code, C.A. 23. The Contractor shall provide the Engineer with at least 24 hours notice of any blast.

The Contractor shall be liable for any accident, damage or injury to any person, property or thing, resulting from the use of explosives. Prior to the start of blasting operations, the Contractor, in the presence of the Engineer or his representative, shall conduct a survey of all structures within 400 yards of the site where blasting is proposed, and any other structure which the Engineer considers may be affected, in order to determine the existing or pre-blast condition of these structures. Prior to commencing blasting operations, a written report, supported by photographs where necessary, listing any existing defects in the structures, is to be submitted to the Engineer. Blasting will not be permitted within 300 feet of any concrete structure unless approved in writing by the Engineer.

When blasting operations are being carried out, precautions shall be taken relating to the safety of persons and animals and the road shall be closed to traffic and the appropriate signs erected in

accordance with Part A, Section 2 of this specification and M. R. Drawing No. A1325, Details of Temporary Signs at Works in Progress.

(h) Raised Medians

Raised medians shall be provided where shown on the Drawings or where directed by the Engineer. The slopes of the medians shall be as determined by the Engineer in accordance with Clause B3.05 (b) and trimmed to the specified tolerances, as set out in Clause B3.05 (c).

The top of the median shall be trimmed to an average height of eight feet above the roadway centreline levels unless shown otherwise on the Drawings or directed otherwise by the Engineer. The minimum height of the raised median shall be 6 feet above the finished level at the centrelines unless shown otherwise on the Drawings or directed otherwise by the Engineer.

If any section of the slope of the median has been over-excavated beyond the tolerance limit specified in Clause B3.05 (c) or if any section of the top of the median has been over-excavated beyond the tolerance specified above, the median shall be reformed to the specified dimensions using random mortared stone. The stone shall be similar to the sound rock in the median and the mortar shall be coloured to match the colour of the rock. No extra payment will be made for this work.

B3.06 EMBANKMENTS

(a) Foundations for Embankments

Prior to embankment construction being commenced catch drains as shown on Plan 6005.287.RC.0014 shall be constructed.

Embankment construction shall include the preparation and compaction to the degree specified in Clause B3.06 (f) of the areas upon which embankments are to be placed, the placing and compacting of approved material within areas from which unsuitable material has been removed as specified hereunder, and the placing and compacting of embankment material in holes, pits, and other depressions within the foundation area.

Where the Engineer considers that material in the natural ground beneath embankments is unsuitable, such material shall be removed and spread at locations outside the working area, as directed by the Engineer. Suitable approved material shall be back-filled and compacted as specified in Clause B3.06 (f). Payment will be made for the removal of the material which is deeper than 12" from

the natural surface at the scheduled rate for excavation, irrespective of the nature of the material removed. Payment will be made for the removal of the material within 12" of the natural surface at the scheduled rate for the removal of topsoil from areas other than over cuttings, mentioned in Clause B3.05 (a), irrespective of the nature of the material removed. Except for payments mentioned in that clause no payment will be made for other work carried out in preparing foundations, which shall be regarded as part of the earthworks.

Any overhanging rock ledges within the foundation area shall be removed before the placing of fill commences.

Where ground water or extensive seepage is encountered in the foundation area, and no special drainage arrangements are shown in the Drawings, the Engineer may direct that suitable sub-soil drains in accordance with Clause D1.02 of this Specification be installed in the embankment area. This work will be paid for as an extra at the scheduled rate for sub-soil drains.

The construction of any section of an embankment shall not be commenced until the foundation for that section has been approved by the Engineer.

(b) Hillside Embankments

Where embankments are to constructed on a hillside, or where the natural surface falls away at the toe of the embankment at a slope steeper than 4 to 1, a bench shall be cut to support the toe. In cross section, the bench shall be approximately horizontal. The minimum width of the excavation to form the bench shall be equal to one quarter of the vertical height of the embankment (measured from the toe) provided that the width shall not be more than 12 ft. nor less than 2 ft. Material excavated in benching may be used in embankments, if it is satisfactory quality.

Where embankments are to be constructed on natural slopes or on the slopes of existing embankments, or where embankments are to be constructed in part-widths, the existing slope, if it is steeper than 4 to 1, shall be cut in the form of horizontal terraces over the full area to be covered by new filling.

As each layer of new embankment is constructed, the existing slope shall be stepped in successive terraces, each at least 2 ft. in width, the terraces to be cut progressively as the embankment is placed. The height of the steps on solid rock slopes may be increased to approximatley ¼ of the vertical height of the embankment to be placed over the terrace above the step, provided that the maximum height of the step shall be not more than 6'. Wherever possible terraces shall co-incide with natural fissures which are nearly

horizontal in the rock. The width of each terrace shall be approximately equal to the height of the adjacent steps. Material thus excavated shall be re-compacted as part of the new embankment material. Where topsoil is to be removed under Clause B3.05 (a), it shall be removed before benching is commenced. No payment will be made for the material removed in the construction of terraces, which shall be regarded as part of the earthworks.

The embankment shall be built up in layers as specified in Clause B3.06 (d). Other methods may only be used with the approval of the Engineer. Such approval will not exempt the Contractor from compacting the material to the specified density. If, in preparing hillsides, the Contractor removes material outside limits specified in this Clause in order to facilitate his operations, no payment will be made for the removal of this extra material, and he will be required to make good at his own expense any scars created by him.

(c) Rock Facing of Embankments

In building all fills, the face of the batter where shown on the cross sections at four (4) horizontal to one (1) vertical or steeper, shall be of sound clean rock for a thickness of at least four (4) feet measured horizontally.

The rock facing shall be built up in layers ahead of each layer of filling. It may be placed by hand, plant or other means but shall be placed in such a manner that no rock is allowed to roll down the face of the slope. Rocks shall be placed in such a manner that interlocking between the larger stones is developed. Any rock deposited in the rock facing which has an excess of fine material surrounding it shall be removed and replaced.

The rocks used for facing will generally be as obtained from cuttings in the course of excavation and shall be firm and sound, having no dimension less than 6" and having a minimum volume of 2 cu.ft. except adjacent to concrete structures where the requirements of Clause B3.06 (h) shall apply. The space between the rocks shall be filled with fine material but shall not be overfilled to cause the rocks to lose contact with one another or to cover the outside of the rocks on the face of the batter.

The upper surface of the rock facing shall terminate between 4 ft. and 6 ft. below the shoulder level.

If material suitable for rock facing is not available from adjoining cuttings, or is not available from those cuttings at the required time, suitable material shall be obtained from other places in the work.

Where filling is placed in the formation above other roads in use

by motorists the outer rock layer shall be placed in such a manner as to prevent spillage down the batter. Suitable precautions are to be taken during placing of the rock fill to the satisfaction of the Engineer, to ensure that under no circumstances could any rock be dislodged and roll onto any adjacent roadway or track in use. The provision of this clause does not preclude the necessity to erect barriers and make other necessary traffic arrangements as specified in Clause A2.04 of this Specification.

(d) Placing Filling in Embankments

Embankments shall be constructed and compacted in layers parallel to the grade line, the degree of compaction to be as specified in Clause B3.06 (f). The layers shall be of a uniform thickness not exceeding 12" before compaction, except that where the filling is composed of more than 25% of rock larger than 6" after removal of the rock facing (See Clause B3.06 (c)), the thickness of the uncompacted layers may be increased to 18" provided that the density specified in Clause B3.06 (f) is attained.

Notwithstanding the foregoing, the maximum size of rock pieces shall not exceed 2/3 of the approved loose layer depth. Any larger rock pieces shall be used in the rock facing or rock drains or reduced in size for incorporation in the embankment layers.

Embankments shall be built up progressively in the longitudinal direction from the lowest point.

Where in the opinion of the Engineer the material being placed in the embankment is such that the Department's Test Method T118 cannot be carried out satisfactorily, the Engineer shall determine the manner in which the material is to be compacted.

Where the specified density is not attained, the Engineer may direct that the thickness of the layers, and if necessary, the size of the rock pieces be reduced. The Contractor shall not be entitled to any additional payment for any reduction in layer thickness or rock size necessary to meet the density requirements.

Embankments and permanent drainage works shall be constructed in such order and manner that adequate drainage of the working areas is maintained throughout the period of construction.

Rock material shall be broken down and well distributed through the filling, and sufficient fine material shall be placed around the larger material as it is deposited to fill the voids and produce a dense compact embankment. Where insufficient fine material is present to fill the voids, additional fine material shall be obtained from other places in the work or by a change in the method of winning.

(e) Embankment Slopes

Unless otherwise specified, the slopes will conform with the following:

Material	Slope (Horizontal distance to Vertical Rise)	
For fills 8.0″ or less in height.	Five to one	5 : 1
Drift Sand	Five to one	5 : 1
Sand	Three to one	3 : 1
Shale or earth	Two to one	2 : 1
All other materials	One and one Half to one	1½: 1

The slopes shown in the cross sections in the Drawings represent the estimated requirements for the expected types of material, and will be subject to re-determination by the Engineer according to his assessment of the materials encountered.

When completed, the average planes of the slopes of embankments shall conform to those determined by the Engineer. For a vertical distance of 4 ft. below the shoulder no point on the completed slope shall vary from the specified or ordered slope by an amount exceeding 6 inches, measured at right angles to the slopes. At distances greater than 4 ft. below the shoulder, the outer most point on each exposed rock on the rock facing shall not vary from the specified or ordered slope by an amount exceeding 1 ft.

Undulations in the general plane of the slope will not be permitted.

Where the Engineer orders that a slope be made flatter than that shown in the Drawings, the Contractor shall not be entitled to claim an increase in the schedule rate for earthworks. Where increased quantities of borrow become necessary because of re-determined embankment slopes, extras will be applied as set out in Clause B3.03.

(f) Compaction

Each layer of material placed in embankments (including the selected sub-base layer), material backfilled in cuttings, and material replacing unsuitable portions of the natural surface referred to in Clause B3.05 (f) shall be trimmed as construction proceeds, and shall be uniformly compacted to the required density in accordance with this Clause before the next layer is commenced.

Material in the natural ground in areas to be covered by embankments and at the junctions of cuttings and embankments shall be compacted to not less than 95% of the density obtainable

using Test Method T111 unless written approval is given by the Engineer to vary this compaction requirement.

Embankments from natural surface level up to the underside of the selected sub-base layer over the entire area shall be compacted to not less than 95% of the density obtainable using Test Method T.111.

The selected sub-base layer shall be compacted over the entire area and depth to not less than 100% of the density obtainable using Test Method T.111.

At the time of compaction of each layer, the moisture content of the material shall be adjusted so as to permit the specified compaction to be attained. Water shall be added to material which contains insufficient moisture for compaction. The added water shall be sprayed uniformly and thoroughly mixed with the material until a homogeneous mixture is obtained. Material containing in excess of the optimum moisture content for compaction in accordance with Test Method T.111 shall not be compacted without the approval of the Engineer. No additional payment will be made for wetting or drying the material to be compacted.

Compaction shall be undertaken to obtain the specified density for the full depth of each layer in embankments and for the full width of the formation over the entire length of the work within eight (8) hours of the material being placed. At locations where it would be impracticable to use mobile compacting equipment, layers of filling shall be compacted to the specified requirements by any means approved by the Engineer.

The Contractor shall inform the Engineer of the proposed method of compaction and the equipment to be used at each location.

Haul roads within the embankment area shall be constructed and compacted in the same manner and to the same minimum degree of compaction as specified for embankments.

Compaction is deemed to form part of the Contract earthworks, and no additional payment will be made for such work.

(g) Shaping Tops of Embankments

The finished levels of the embankments at the road centre line, prior to placing the selected sub-base layer, shall be as ordered by the Engineer to suit the thickness of pavement and selected sub-base layer adopted. The crossfalls and tolerances in trimming of the tops of embankments shall be as specified in Clauses B3.05(e) and B3.06(e).

(h) Filling Adjacent to Bridges, Culverts and Retaining Walls

Material adjacent to weepholes in abutments, wing and retaining walls shall consist of clean, hard and durable broken stone, graded

from 2 in. to 3/8 in. size of particles. The larger particles shall be placed adjacent to the weepholes and the smaller particles behind and above the larger particles.

The broken stone shall extend horizontally at least 1 ft. from each weephole, and at least 1 ft. 6 in. vertically above the weephole.

In addition to the broken stone at weepholes, selected filling, consisting of granular material having a maximum size of 2 in., a Plasticity Index not more than 12, and having at least 60% retained on a No. 7 B.S. sieve, shall be placed adjacent to bridges, culverts and walls. Unless otherwise specified, the minimum width of selected filling adjacent to the structure shall be as shown in the following table:—

Structure	Minimum width of Selected Filling (feet)
Bridge abutments and wingwalls	6
Culvert Wingwalls	$H/3$)
Retaining Walls	$H/3$) Max. 6
Barrels of box culverts (each side)	$H/3$) ~~Max. 6~~
Barrels of pipe culverts (each side — excluding trenches)	1½

(Where H = height of structure)

The Engineer will determine whether the material is suitable for use as selected filling. If in the opinion of the Engineer, selected material of the required quality is un-obtainable from the excavation under the Contract, he may give authority for the material to be obtained as borrow, in which case payment will be made in accordance with Clause B3.03.

The selected filling shall be placed in layers, as set out in Clause B3.06(d). Compaction shall start at the wall and proceed away from it, and shall be carried out as specified in Clause B3.06(f).

Where the slope of the natural surface behind abutment walls and wingwalls exceeds 4 to 1, the existing slope shall be cut in the form of successive horizontal terraces at least 2 ft. in width, and the selected material placed in accordance with Clause B3.06(b).

No filling shall be placed against abutments or wingwalls of concrete structures within 21 days after placing concrete in the abutments or walls and in the superstructure of the adjacent span, unless the walls are properly strutted to the approval of the Engineer.

In the case of spill-through abutments, rock shall not be dumped

against the columns but shall be built up evenly by hand placing around individual columns.

In the case of framed structures, embankments at both ends of the structure shall be brought up simultaneously, the difference between the levels of the embankments at the respective abutments not to exceed 2 ft.

The selected filling forms part of the earthworks, and no extra payment will be made, except for borrow as outlined above.

(j) Spoil

Where it is evident to the Engineer that excess material will be available, he may direct that flatter slopes be provided on embankments which have not been commenced, and/or direct that the excess material be used in the uniform widening of embankments, the surface of which shall be shaped so as to provide good appearance and effective drainage. The spoil material shall be spread and compacted as specified for material in embankments.

Alternatively the Engineer may direct that the spoil be disposed of in the manner and at locations indicated by him. Material so deposited shall be compacted as specified for material in embankments. The Contractor shall not be entitled to extra payment for such haulage, disposal and compaction. If these locations are in excess of one (1) mile from the point of excavation payment will be made for haulage at the rate of ten (10) cents per cubic yard for each mile or part thereof in excess of one (1) mile.

(k) Borrow

Approval will not be given to borrow material, unless there is an overall deficiency of suitable material excavated from cuttings in the Contract.

Where borrow material is required to complete the work, the location of borrow pits will be as authorised by the Engineer, and the quality of the material shall be acceptable to the Engineer. In general the edges of borrow pits shall be at least 10 ft. from any fence line, road reserve boundary or line of earthworks. Adequate clearance shall be maintained for the provision of catch drains. Borrow pits shall have drainage outlets as approved by the Engineer, cut slopes not steeper than 3 to 1, and shall be left by the Contractor in a tidy and safe condition.

If borrow material is obtained by uniformly widening a cutting, the requirements of this Specification as to the trimming of slopes and compaction of subgrade will apply to the borrow area.

Where borrow is obtained outside the road boundaries, the Contractor will be responsible for obtaining permits for entry on land and for payment of any royalty for borrow material. Restoration of

borrow areas, including respreading of topsoil, erosion control measures and grassing shall be carried out as required by the Engineer, who will take into account the requirements of the Council, landowner, or Pastures Protection Board and the practices of the N.S.W. Soil Conservation Service.

Payments for borrow as an extra will be made only if, in constructing cuttings and embankments to the slopes ordered by the Engineer, and by reason of excess widening of embankments or wastage of material, there is an overall deficiency in material greater than shown in the Drawings. Where the Engineer authorises the Contractor to borrow material from pits more than one (1) mile from the point of delivery payment will be made for the material at the schedule rate for excavation, on the basis of solid measurement in its original position, plus a haulage rate of ten (10) cents per cubic yard for each mile or part thereof in excess of one (1) mile. For distances less than one (1) mile the schedule rate for excavation will apply.

B3.07 SELECTED SUB-BASE LAYER

Except for the bottoms of the particular cuttings in which the existing material meets the requirements for the selected sub-base layer (See Clause B3.05(e)), the full area of the formation shall be provided with a compacted upper layer of selected material, having a minimum compacted thickness of 12 inches or such other thickness as may be specified (See Clause B3.05(e)). The material shall be free from all clay and stone larger than six (6) inches maximum dimension and shall have a Plasticity Index not exceeding twelve (12) as determined in accordance with test procedures defined in Test Methods Nos. MR-T.108 and MR-T.109 attached to this specification. When determined in accordance with Appendix 3 of M. R. Form No. 76 "Procedures for the Determination of Pavement Thickness" attached to this specification the effective thickness of pavement required over the material for heavy loading shall not exceed eight (8) inches.

Except where borrow is authorised, the selected sub-base material shall be obtained from the cuttings excavated under the Contract, and shall be either placed directly or stockpiled at locations determined by the Engineer, for future use in the sub-base layer. If necessary, the Contractor shall adjust his excavation methods to yield suitable sub-base material, and shall process the material by removing or breaking down oversize rocks, or by other means, to ensure that the resulting material conforms to the requirements of this Clause.

If material having the required properties is not available, the Engineer may direct that material be selected and suitably processed

or modified with lime or other admixture to conform with the Specification.

The Engineer will determine whether the material proposed by the Contractor is suitable for use in the selected sub-base layer. If, in the opinion of the Engineer, material of the specified quality is unobtainable from the excavation under the Contract, or cannot reasonably be obtained by processing or modifying such material, he may give authority for the material to be obtained as borrow, in which case payment will be made in accordance with Clause B3.06(k).

The selected material shall be placed and compacted in layers with a compacted thickness not exceeding 6 inches. Compaction shall be as specified in Clause B3.06(f).

The finished subgrade after compaction shall be trimmed to the same crossfall as specified in Clause B3.05(e) for the bottoms of cuttings prior to the selected sub-base material. The finished level of the select sub-base layer shall not vary more than 0.08 ft. (1 in.) above or 0.05 ft. (⅝ in.) below the planned grade at any point, and shall not deviate at any point more than 0.04 ft. (½ in.) from the bottom of a 10 ft. straight edge laid in any direction.

The sub-base shall be maintained to the specified grade and cross section until the base is placed, or until the work is accepted as being satisfactorily completed.

The selected sub-base layer forms part of the earthworks, and no extra payment will be made for this work, except where borrow is required as described above, or where blending of two or more materials on the road is necessary to meet the specified requirements.

B3.08 STONE PITCHING

Where specified in the Drawings, stone pitching or alternatively concrete blocks shall be provided at the locations shown. Before any pitching is placed, the embankment/cutting slope shall be neatly shaped and compacted to the satisfaction of the Engineer.

Stone pitching shall consist of rectangular blocks of sound durable stone, having a minimum dimension of at least 9 inches and a volume of at least 1 cu. ft. As an alternative, blocks conforming to the above dimensions may be made from 1:2:4 concrete manufactured in accordance with M. R. Form No. 738, Specification for the Construction of Concrete Kerbs, Gutters and Channel Linings.

The stone or concrete blocks shall be placed in courses and bedded normal to the slope with the larger blocks at the bottom of the slope, firmly bedded in a trench cut at least 1 ft. 6 in. into natural

ground or 6 inches into rock. The blocks shall be laid with staggered joints, so that the distance between blocks is not more than ½ in., and so that each block is supported by the embankment/cutting and not by adjacent blocks.

The finished pitching shall present an even, tight and reasonably smooth surface of the required contour.

B3.09 HAULAGE VIA STATE HIGHWAY NO. 2 — THE HUME HIGHWAY

State Highway No. 2 shall not be used as a route or level crossing for the transporting of earthwork material unless approved by the Engineer in writing. The Contractor shall have no claim for any loss or damage he may consider himself to have suffered in consequence of not being able to use the Highway as a route for the transporting of earthwork material.

The Contractor's attention is drawn to the requirements of Clause A2.09.

B3.10 HAULAGE VIA FREEWAY BRIDGES

Subject to certain requirements permission will be given by the Engineer for the Contractor to haul earthwork materials over the following bridges after their completion:—

(i) 64M.1650′ southbound carriageway bridge.
(ii) 65M.1270′ southbound carriageway bridge.
(iii) 65M.3150′ southbound carriageway bridge.

The requirements to be observed are as follows:—

1. Traffic to be restricted to the central 15 ft. width of the deck by 12″ x 15″ timber kerbs bolted to the bridge decks.

2. Only one plant item to be on the bridge deck at any time.

3. Wheel loading not to exceed the equivalent of a Terex 35 Ton Dump Truck or a Caterpillar 631C tractor scraper (laden weight).

4. Speed of unit travelling over the bridge deck to be restricted to 5 m.p.h.

5. Bridges at 65M.1270′ southbound carriageway and 63M.3150′ southbound carriageway to have six inches of asphaltic concrete placed and compacted on the bridge deck over the central 15 ft. width of deck.

Bridge at 64M.1700′ on southbound carriageway to have two inches of asphaltic concrete placed and compacted over the central 15 ft. width of deck.

6. Approaches to bridge decks to be built up and surfaced for a distance of 30 ft. back from the bridge with a two inch thick, 15 ft.

wide strip of asphaltic concrete, the build up of the approaches to be such as to provide a smooth transition to the bridge deck to reduce impact forces to a minimum.

7. A steel plate be fixed over expansion joints in such a manner as to exclude ingress of asphaltic concrete or other material into the joint.

Prior to acceptance of the work the Contractor will be required to remove the asphaltic concrete, kerbs, etc. from the bridge decks and adjust the approaches to each bridge to conform with the limits of contract as shown on the typical cross section for the work.

The cost of all such special provisions is to be included in the scheduled tender rates for the work.

PART C

STORMWATER DRAINAGE

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SECTION 2 — INSTALLATION OF CONCRETE PIPES
SECTION 3 — HEADWALLS, GULLY PITS, JUNCTION BOXES, DROP STRUCTURES AND OPEN DRAINS
SECTION 4 — SINGLE CELL 12′0″ x 8′0″ REINFORCED CONCRETE BOX CULVERT

PART C — STORMWATER DRAINS

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SPECIFICATION

PART C — STORMWATER DRAINAGE

SECTION 1 — GENERAL

C1.01 EXTENT OF WORK

The work to be executed under this part of the Specification includes all drainage pipes, headwalls, inlet and outlet drains, minor diversion drains, catch drains and other open drains, the lining of open drains and any other operations necessary for the complete construction of the stormwater drainage in accordance with this Specification and the Drawings.

If in the opinion of the Engineer other drains are necessary they shall be constructed as directed by the Engineer, and payment for drains so constructed will be made in accordance with Clause 17 of the General Conditions of Contract.

Pipe culverts shall extend from toe to toe of bank when placed under embankment, and from the table drain to the toe of the bank when in side cutting. The work shall include all necessary inlet and outlet drains within the road boundaries, of discharge capacity equal to that of the culvert or other stormwater drain. The tendered rates for pipe culverts or pipe drains shall include the supply, laying and jointing of pipes, concrete or other bedding as specified, together with excavation and back-filling for pipes, but shall exclude the construction of headwalls, wingwalls and drainage pits, which are scheduled separately.

Where shown, existing pipes shall be lifted and relaid, and extended if necessary, in accordance with this Specification. Such relaying shall include the replacement of all damaged pipes, whether damaged in lifting or otherwise.

The Drawings will indicate the diameter and class of each pipeline, the type of bedding, the conditions of installation, the invert levels, and, if appropriate, the use of sand back-filling in trenches.

C1.02 STANDARD FORMS

The following standards are referred to in this part of the Specification:—

(a) Australian Standards

A.S. A2 — 1963,	Specification and Methods of Test Portland Cement.
A.S. A35 — 1957,	Precast concrete Drainage Pipes.
A.S. A64 — 1971,	Ready Mixed Concrete.
A.S. A77 — 1957,	Aggregate for Concrete.
A.S. A81 — 1958,	Plain Steel Reinforcing, Bars for Normal Reinforced Concrete.
A.S. A101 — 1967,	Method for the Determination Consistency of Concrete (Slump Test).
A.S. A103 — 1968,	Method of Making and Curing Concrete Compression and Flexure Test Specimens, in the Field.
A.S. A104 — 1969,	Method of Test for Compressive Strength of Concrete Specimens.
A.S. A130 — 1963,	Los Angeles Test.
A.S. CA2 — 1973,	Code for Concrete in Buildings.

(b) Main Road Standards

M.R. Form No. 738,	The Construction of Concrete Kerbs, Gutters and Channel Linings.
M.R. Form No. 861,	The Supply and Laying of Asbestos Cement Drainage Pipes (as amended).

(c) Main Road Test Methods

Test Method No. T109,	Plastic Limit and Plasticity Index of Road Materials.
Test Method No. T111,	Dry Density/Moisture Relation for Road Materials (Standard Compaction).

C1.03 SITING OF PIPE CULVERTS AND DRAINS

It shall be the responsibility of the Contractor to locate pipe culverts and pipe drains generally as shown in the Drawings, subject to the actual location being to the satisfaction of the Engineer. The contractor shall carry out all necessary survey work required for this purpose.

Where the specified location for a pipe is in a steep gully, the Drawings may require the construction of a drop-inlet pit to permit the pipe to be laid on a reduced grade. Alternatively, if shown on the Drawings or directed by the Engineer, the pipe shall be laid on the

flank of the gully in order to reduce the grade and the length of pipe, and suitable drains, leading to and from the culvert shall be constructed for the purpose of diverting the flow well clear of the embankment on both the upstream and downstream ends of the culvert. In addition natural watercourses in gullies to be covered by embankments shall be back-filled with rock pieces or coarse free draining material to permit free drainage. The cross sectional area of the free draining back-filling shall be approximately 10 sq. ft. and shall consist of at least 4 rows of rock in the longitudinal direction of the drain. If there will be small undrained catchment area between the upstream side of the embankment and the point of diversion of the stream the Engineer may direct that a pipe of eighteen (18) inches diameter be laid in the gully for the full width of the embankment. If not shown on the Drawings additonal pits or pipelines ordered by the Engineer will be paid for as extras under Clause 17 of the General Conditions of Contract.

The lengths of pipe culverts shown on the Drawings have been determined from the cross sections, but the lengths of pipes to be provided by the Contractor are such as may be found, in the field, to be necessary to support embankments in the manner shown on the Drawings, and may be greater or less than the lengths shown. No variation in payment will be made by reason of the necessary lengths of pipes being greater or less than shown on the Drawings.

C1.04 QUALITY OF PIPES

Pipes shall conform to the requirements of Australian Standard A35 — 1957, Precast Concrete Drainage Pipes for classes S, X, Y and Z, for all sizes of pipes up to and including six (6) feet in diameter, or Main Road Form No. 861. — The Supply and Laying of Asbestos Cement Drainage Pipes for all sizes of pipe up to and including two (2) feet in diameter. Sizes larger than six (6) feet in diameter shall also conform with the provisions of AS A35 in respect of the quality of manufacture of the pipes and the application of physical tests, except that the test loads to be applied to the pipes in the manner described in Appendix B of the abovementioned Australian Standard shall be of the magnitudes given in the following table:—

Test Loads for Pipes 7 ft. to 10 ft. in diameter

Nominal Internal Diameter (in.)	Cracking Load (lb. per lin. ft.) Class S Pipes	Class X Pipes	Class Y Pipes	Class Z Pipes
84	2,600	4,800	7,100	9,500
96	2,800	5,300	7,900	10,500
108	3,000	5,800	8,600	11,500
120	3,200	6,300	9,400	12,500

NOTE: The ultimate load in each case shall be not less than the cracking load plus 50%.

If shown in the Drawings, the pipes shall have special sockets incorporating rubber ring joints, the details of which shall be subject to the approval of the Engineer. All other pipes shall have similar joints or (a) rebated ends to form either external or internal flush joints, with grooves for the reception of the jointing mortar, the groove to be on the outside for all sizes of pipes up to approximately twenty four (24) inches in diameter, and on the inside for larger sizes of pipes or (b) spigot and socket joints.

The Contractor shall indicate the source of supply of pipes, and shall signify in advance when each consignment of pipes will be ready for despatch so that arrangements may be made for inspection and testing at the place of manufacture or alternatively the Department may arrange to test the pipes at the point of delivery, or on the work.

Any pipe or pipes may be selected for test, and if any pipes do not comply with the test requirements they shall be replaced with satisfactory pipes by the Contractor at his own expense. Pipes are not to be placed in position in the work until passed for this purpose by the Engineer, either with or without testing at his discretion. The fact that the pipes are passed by the Engineer shall in no way preclude their subsequent rejection by the Department in the event of it being found that they do not conform to the Specification.

If the Contractor can produce evidence that pipes have previously been tested and found to be satisfactory, the Department may accept such pipes, but reserves the right to carry out any further tests to ensure that the pipes conform to the Specification.

Where existing reinforced concrete pipes are removed by the Contractor without damage, the Engineer may authorise their reuse as Class S pipes of the same diameter.

SECTION 2 — INSTALLATION OF PIPES

C2.01 TYPES OF BEDDING

The type of bedding to be used will be indicated on the Drawings and shall conform with the following requirements:—

(a) Type A Bedding

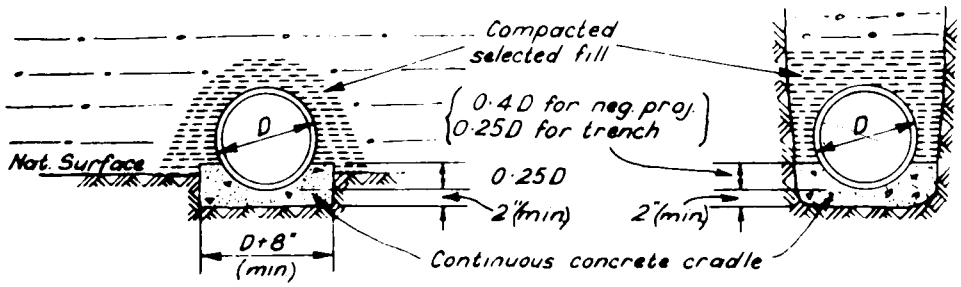
This type of bedding is not to be used with asbestos cement pipes.

The pipe shall be evenly supported on a continuous unreinforced concrete cradle of monolithic cross section, having a compressive strength of not less than two thousand five hundred (2,500) pounds per square inch, constructed in accordance with the provisions of M. R. Form No. 738, Specification for the Construction of Concrete Kerbs, Gutters and Channel Linings.

In the Supreme Court of New South Wales Common Law Division Commercial List

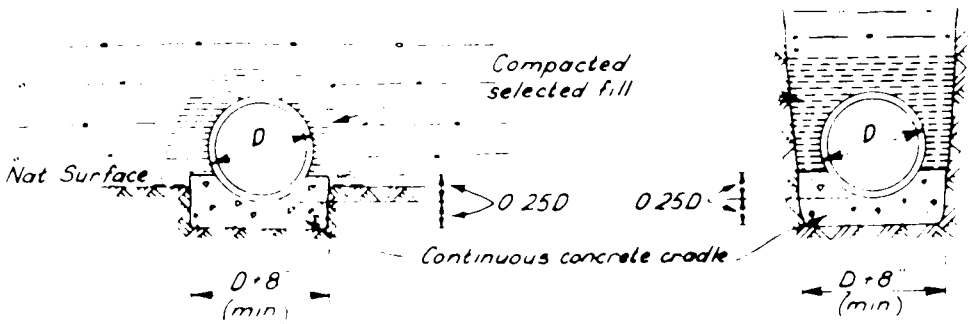
No. 9

Extracts from Exhibit A — bulk sum contract for construction of South Western Freeway — Yanderra to Yerrinbool



Embankment Trench

ROCK FOUNDATION

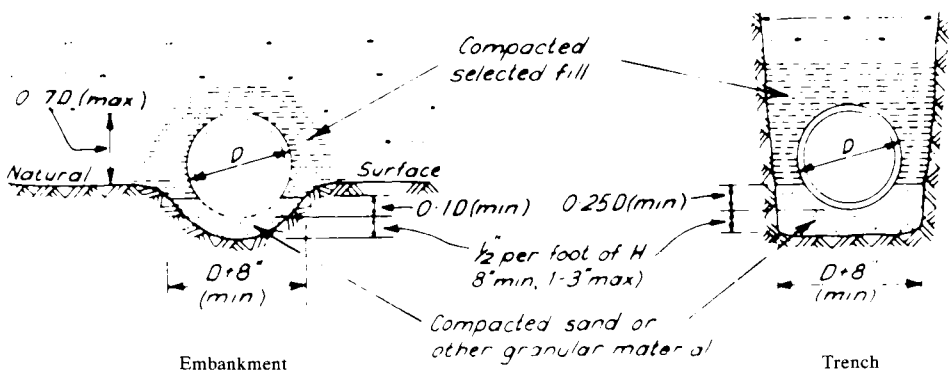


Embankment Trench

EARTH FOUNDATION

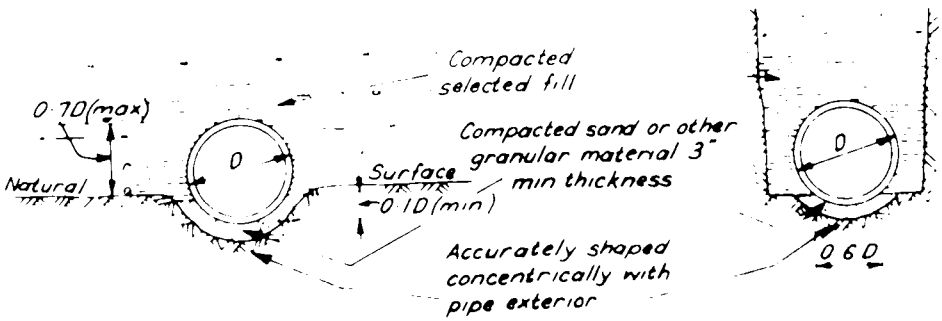
(b) Type B Bedding

The pipe shall be evenly bedded on a continuous layer of compacted sand or other granular material approved by the Engineer.



Embankment Trench

ROCK FOUNDATION



Embankment Trench

EARTH FOUNDATION

C2.02 CONDITIONS OF INSTALLATION

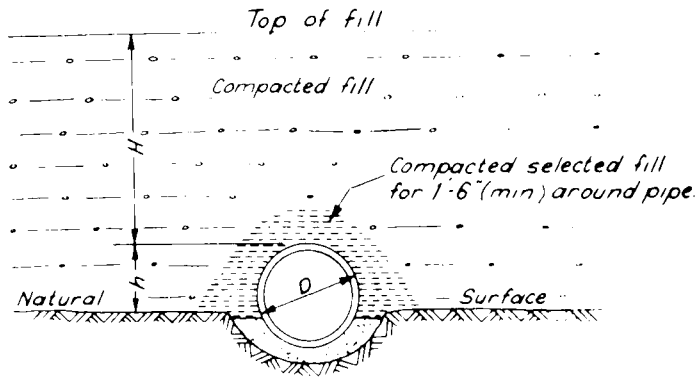
The drawings will indicate which of the following conditions of installation shall apply:—

(a) Embankment (Positive Projection)

The pipe shall be laid in a shallow excavation, with type A or B bedding as required, and with the top of the pipe projecting above the adjacent natural surface. Selected fill material, having a maximum particle size of two (2) inches for concrete pipe and one (1) inch for asbestos pipe at least sixty (60) per cent retained on a No. 7 B.S. sieve, and a Plasticity Index of not more than twelve (12) as determined by the Department's Test Method No. T109 (Plastic Limit and Plasticity Index of Road Materials), shall be placed around the pipe, extending for a distance of at least one foot six inches (1′ 6″) from it.

The selected material shall be placed in layers not exceeding six (6) inches loose thickness, compacted to not less than ninety five (95) per cent of the density obtainable when using the Department's Test Method No. T111, Dry Density/Moisture Relation for Road Materials (Standard Compaction).

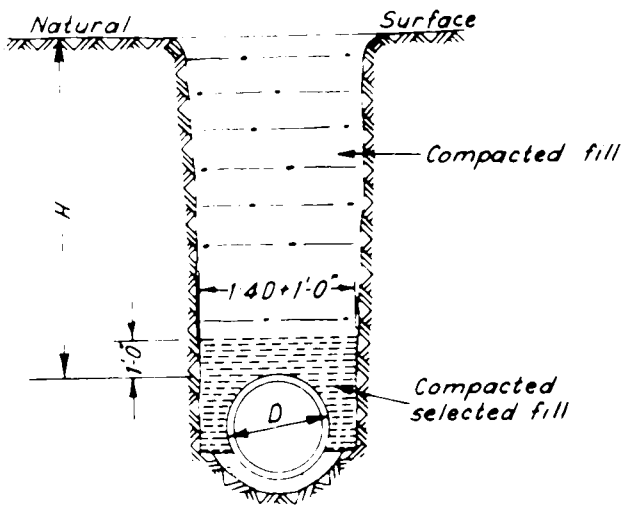
Ordinary fill material shall then be placed and compacted as specified for the embankment except that, in the case of large diameter pipes under shallow fills, the Engineer may direct that a layer of fill above the pipe be given less than normal compaction so as to minimise the future formation of a hump in the road surface above the pipe.



(b) Normal Trench

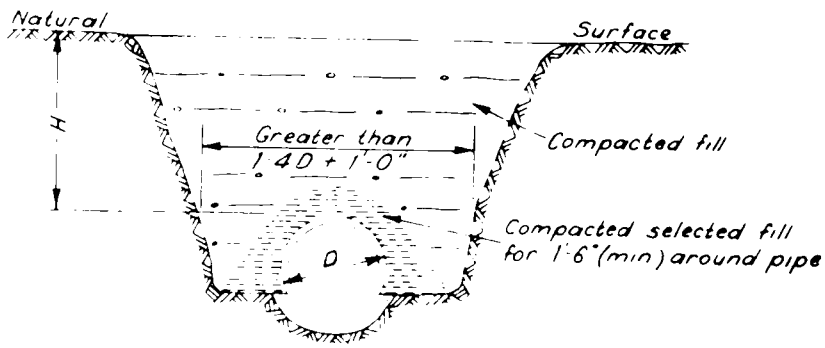
The pipe shall be laid under normal trench conditions, with type A or B bedding as required, with width of the trench at the level of the top of the pipe being not greater than 1.4 times the external diameter of the pipe plus one (1) foot. Selected fill material as specified in Clause C2.02 (a) shall be placed and compacted around the pipe for the full width of the trench to a height of one (1) foot above the pipe. The remainder of the trench to natural surface level shall be back-filled with ordinary fill material, placed in layers not exceeding six (6) inches loose thickness, and compacted to not less than ninety five (95) per cent of the density obtainable when tested by Test Method No. T111.

If indicated on the Drawings, or otherwise specified, the above procedure shall be varied by back-filling the full depth of the trench with sand acceptable to the Engineer, compacted to the degree specified above.



(c) Wide Trench

When the pipe is laid in a wide trench (i.e. a trench of width greater than that shown in Clause C2.02 (b) above) the installation shall be taken as being equivalent to positive projection embankment conditions, and the provisions of Clause ~~C2.20~~ C2.02 (a) shall apply.



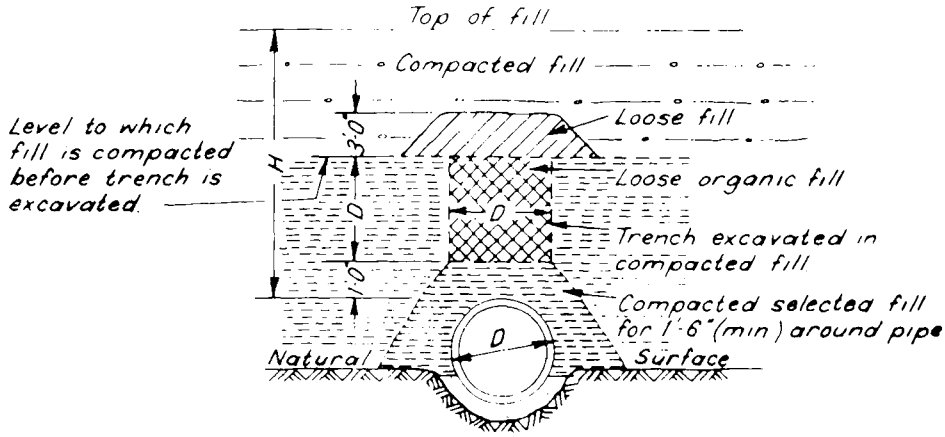
Wide Trench

(d) Embankment — Induced Negative Projection (Imperfect Trench)

The pipe shall be laid initially under positive projection condition as specified in Clause C2.02 (a), with type A or B bedding as required. Ordinary embankment fill material shall be placed and compacted as specified to a height of D + 1 feet above the top of the pipe, where "D" is the external diameter of the pipe. A trench of depth and width D, with vertical sides and ends, shall be excavated in the compacted fill material, directly over the pipe, the bottom being one (1) foot above the top of the pipe.

Each end of the trench shall be about four (4) feet inside the embankment batter (measured horizontally at the level of the top of the trench). The trench shall be refilled as loosely as possible with a compressible organic material such as small branches containing a high proportion of leaves, or topsoil containing a high proportion of leaf mould. Ordinary topsoil including only a small amount of organic matter shall not be used in an imperfect trench. The organic fill material shall be subject to the approval of the Engineer.

The loosely filled trench shall be covered by additional loose embankment fill to a depth of three (3) feet before earthmoving or compaction equipment is permitted to travel over it. Ordinary fill material shall then be placed and compacted as specified for the embankment.



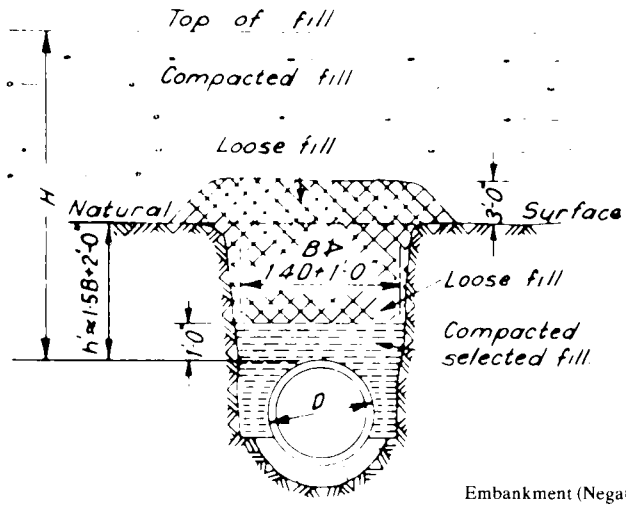
Embankment-Induced Negative Projection (Imperfect Trench)

(e) Embankment (Negative Projection)

This method shall be used only where the pipe can be placed beneath the embankment in a trench, having a depth from the natural surface to the underside of the pipe equal to about two and one half (2½) times the outside diameter of the pipe, plus two (2) feet.

The pipe shall be laid under normal trench conditions, as described in Clause C2.02 (b), with type A or B bedding as required. The width of the trench at the level of the top of the pipe shall be not greater than 1.4 times the external diameter of the pipe plus one (1) foot. Selected fill material as specified in Clause C2.02 (a) shall be placed and compacted around the pipe for full width of the trench to a height of one (1) foot above the pipe. The remainder of the trench, having a depth approximately equal to the width of the trench, shall be filled as loosely as possible to natural surface level with ordinary embankment material, which shall be left uncompacted. The loose material shall terminate at about four (4) feet inside the embankment batter at each end of the trench (measured horizontally at the level of the top of the trench).

The loosely filled trench shall be covered by additional loose embankment fill to a depth of three (3) feet before earthmoving or compacting equipment is permitted to travel over it. Ordinary fill material shall be placed and compacted as specified for the embankment.



Embankment (Negative Projection)

C2.03 METHOD OF LAYING

Except as directed otherwise by the Engineer, the classes of pipes and the conditions of installation shall be as set out in the Drawings. If two or more classes of pipe are specified for different lengths of the one pipeline, they shall be placed in the positions indicated. Pipes shall be laid on type A or B bedding as required, in trenches or shallow cuts made in solid ground or compacted fill. Pipes which have marks indicating the crown or invert of the pipes shall be laid strictly in accordance with the markings. No individual length of pipe under four (4) feet long shall be used directly beneath traffic loads.

Except as specified otherwise, pipes shall be laid to a uniform grade towards the discharge end in conformity with the grade or grades shown on the Drawings or ordered by the Engineer.

Trenches for pipes shall be parallel with the inverts of the pipes. Additional material below the bottom of the pipe shall be excavated as necessary to provide the bedding conditions specified.

The designed levels for the pipes and the finished surface above the pipes shall not be varied without the approval of the Engineer, who will arrange for the design to be checked to determine whether the proposed change will provide satisfactory grades and cover for the pipes. If it becomes necessary to vary the cover during construction work, the Engineer may order the installation of a stronger class of pipe, for which extra payment will be made in accordance with the General Conditions of Contract.

If the Engineer considers the undisturbed foundation material to be insufficiently firm, it shall be compacted to not less than ninety-five (95) per cent of the density obtainable when tested by the Department's Test Method No. T111, Dry Density/Moisture Relation

for Road Materials (Standard Compaction). Where pipes are to be laid on fill, the latter shall be compacted to a density of not less than ninety-five (95) per cent of the density obtainable in Test Method No. T111.

Any material which cannot be compacted to at least ninety-five (95) per cent of the density as set out above, whithin the depth of the bedding shall be removed by the Contractor and replaced with sound material at no expense to the Department and compacted in accordance with the above requirements.

If the Engineer orders the removal of unsuitable material below the level of the bottom of the excavation for the bedding, it shall be removed and replaced with non-plastic granular material compacted in accordance with the above requirements, in which case payment will be made for the removal and replacement of the unsuitable material at the scheduled rate for excavation in accordance with Clause B3.05 (f).

It will be the Contractor's responsibility to take all necessary steps to drain the excavation for the bedding to allow the bedding to be constructed in the dry until the specified compaction of the bedding has been obtained. This work may include the temporary diversion of the stream, the excavation of drains or trenches at the sides of the bedding, the construction of temporary rubble drains, sub-soil drains, outlet drains, or the dewatering of the trenches by continuous pumping. No extra payment will be made for this work which shall be regarded as part of the bedding and laying of pipes. If type B bedding material is disturbed during placing of the pipes, additional material of the same type shall be packed beneath the pipes to restore the specified bedding conditions.

Where a pipe culvert or pipe line is to be laid in a trench, the width of the trench at the level of the top of the pipes shall not exceed 1.4 times the external diameter of the pipe plus twelve (12) inches, otherwise the load upon the pipes may become excessive.

In cases where pipe trenches are to be back-filled with sand (see Clause C2.02 (b)), a 10 ft. length of subsoil drain shall be constructed in the bottom of the trench immediately upstream from each drainage pit. The subsoil drain shall consist of 4 in. diameter agricultural or other approved pipes, butt jointed, with joints wrapped with hessian or other pervious material approved by the Engineer. The upstream end of the subsoil drain shall be sealed with cement mortar, and the downstream end shall discharge through the wall of the pit.

Where two or more lines of pipes are laid side by side under embankment conditions, the space between the lines of pipes shall be not less than one third (1/3) of the diameter of the pipes or one foot, whichever is the greater. Provided, however, that where pipes are

laid under imperfect trench or negative projection embankment conditions, the space between the lines of pipes shall be not less than three (3) times the diameter of the pipes, measured between the outside of the pipes, or four (4) times the diameter of the pipes measured between the centre lines of the pipes. The space between the lines of pipes may be increased to permit free access in the area for compaction equipment, however no extra payment will be made for increased quantities for concrete in headwalls due to increasing the space between pipe lines.

Where the Engineer considers that the existing ground conditions will not permit an adequate permanent bedding for the pipeline without permanent subsoil drainage, he may direct that subsoil drains in accordance with Clause D1.02 of this Specification be constructed, in which case payment will be made as an extra at the scheduled rate for subsoil drains.

C2.04 JOINTING OF PIPES

(a) Concrete Pipes

Rubber ring joints shall be fitted in the manner described by the manufacturer. Rebated joints, and spigot and socket joints, shall be filled with mortar made of three parts of fine sand to one part of Portland Cement. The faces of the pipes to be joined shall be thoroughly wetted, then butted as tightly as possible against each other. The space between the abutting ends of the pipes shall not exceed one half (½) per cent of the diameter of the pipe. The joint shall then be sealed with mortar, both on the inside and outside of the pipe, to give neat, smooth surfaces uniform with the inside and outside surfaces of the pipe, respectively.

In all cases care shall be taken that the interior of the pipe is cleaned of any excess mortar after joining. Mortar joints shall be protected from the sun, and if necessary covered with earth or wet bags to prevent rapid drying of the mortar for at least forty eight (48) hours after placing.

Where possible, in order to minimise the effect of disturbance during the construction of headwalls, the joint between the end pipe and the remainder of the pipeline should not be filled with mortar until after the headwall has been constructed.

(b) Asbestos Cement Pipes

Asbestos cement pipes shall be jointed in accordance with Clause 21 of Main Road Form No. 861. The Supply and laying of Asbestos Cement Drainage Pipes.

C2.05 TRAVELLING OF EARTHMOVING PLANT OVER PIPELINES

Earthmoving plant in excess of five (5) tons gross weight shall not be permitted to travel over any pipeline unless the height of filling

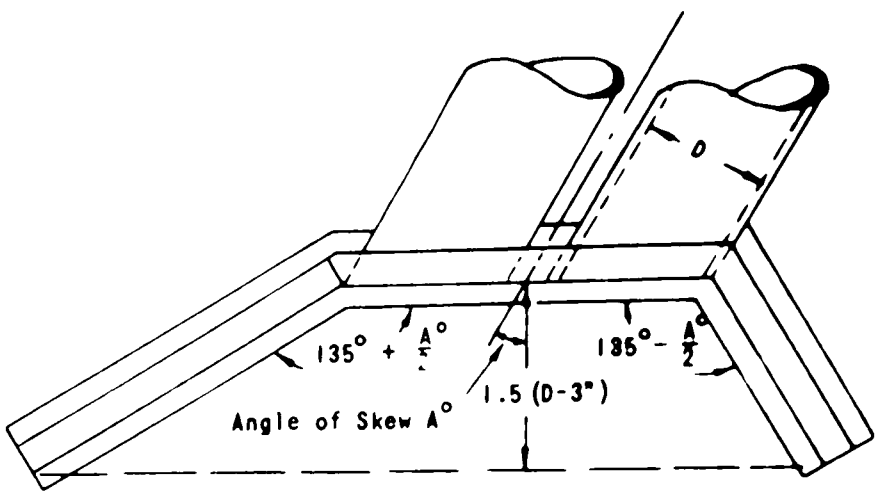
over the pipeline exceeds the pipe diameter or 3 ft., whichever is the greater, or unless approved otherwise in writing by the Engineer.

SECTION 3 — HEADWALLS, GULLY PITS, JUNCTION BOXES AND DROP STRUCTURES

C3.01 GENERAL

The Contractor shall construct all headwalls and drainage structures as shown on the Drawings and in accordance with this Specification. The rates shown in the Schedule shall include all work and material required to construct the headwalls, gully pits, junction boxes or drop structures in place including excavation and back-filling.

Headwalls and gully pits shall be constructed parallel to the roadway centre line. Where the pipe is laid skew to the road the wingwalls of headwalls shall be splayed so that the front edge of the wing bisects the angle formed by the intersection lines of the pipe and headwalls, thus —



The wingwalls shall be constructed in all cases of sufficient length to effectively retain the batters and no variation of payment will be made in this respect.

Subject to the prior approval of the Engineer, external forms will not be required for gully pits or junction boxes and the concrete may be placed against the existing ground.

C3.02 STANDARD CULVERT HEADWALL AND GULLY PIT DRAWINGS

Culvert headwalls and gully pits shall be constructed of 1:2:4 mix concrete in accordance with the standard M.R. Drawings or as

directed by the Engineer. The following M.R. Drawings are applicable to the Work:—

M.R. Drawings No. A143 —Std. Reinforced Concrete Headwalls for 15″, 18″ and 21″ pipe culvert.
A139 —Std. Reinforced Concrete Headwalls for 24″, 30″ and 36″ pipe culvert.
A172 —Std. Reinforced Concrete Headwalls for 3′-6″ pipe culvert.
A173 —Std. Reinforced Concrete Headwalls for 4′-0″ pipe culvert.
A177 —Std. Reinforced Concrete Headwalls for 6′-0″ pipe culvert.

M.R. Drawings No.
RDS/35 —Vertical connection to median gully pit.
RDS/42 —Standard Median Gully Pit Grating and Frame.
RDS/44 —Gully Pit type GP.14.
RDS/45 —Gully Pit Type GP.8.
RDS/46 —Standard Grating and Frame for Type GP. 8 Gully Pit.
RDS/47 —Gully Pit Type GP.15.

C3.03 FOUNDATIONS

The foundation, if of rock, shall be satisfactorily excavated to form a bed for the headwalls or drainage structure and shall be thoroughly scraped, cleaned and roughened for bond. The depth of cut-off in rock may be reduced to less than that shown on the standard Drawings, if so directed by the Engineer.

The foundation, if of earth, shall as far as possible be excavated to the neat lines from the solid, and formed at the required depth below the invert of pipe, in accordance with the standard Drawings. All soft and yielding or other unsuitable material shall be removed and the bed shall be compacted to not less than ninety-five (95) per cent of the maximum density obtainable when using the Department's Test Method No. T111, Dry Density/Moisture Relation for Road Materials (Standard Compaction). The surface shall then be checked for uniformity, and all irregularities shall be made good. If the bed is dry, it shall be sprinkled with as much water as it will readily absorb before concrete is placed.

C3.04 FORMWORK

Forms shall be so designed and constructed that they can be removed without injuring the concrete. They shall be built true to

line and braced in a substantial and unyielding manner. They shall be mortar-tight, and if necessary, timber forms shall be thoroughly soaked with water to close cracks due to shrinkage. The interior surface shall be lightly oiled, greased or soaped to ensure the non-adhesion of the concrete, but care shall be taken not to stain the surface of concrete which will be exposed. The material used for forms for exposed surfaces shall be such as to give a smooth and even surface to the concrete.

Forms shall not be removed earlier than twenty-four (24) hours after the placing of the last of the concrete in the section concerned.

C3.05 CONCRETE

The manufacture, supply, delivery and placing, testing and curing of concrete shall be in accordance with Clauses 4 to 7 inclusive, 9 to 14 inclusive and 16 and 17 of M.R. Standard Form No. 738, The Construction of Kerb, Gutters and Channel Linings.

C3.06 STEEL REINFORCEMENT

The supply and placing of steel reinforcement shall be in accordance with Clause 8 of M. R. Standard Form No. 738, The Construction of Concrete Kerb, Gutters and Channel Linings.

C3.07 INLET, OUTLET, MINOR DIVERSION, CATCHDRAINS AND OTHER OPEN DRAINS

Inlet drains shall be constructed where necessary to direct the flow of water into the pipe culvert. The drains shall have the same capacity as the pipe culvert and where necessary shall act as a collector drain for two or more smaller channels.

Outlet drains shall be constructed to lead water discharging from stormwater pipes clear of the work to points of natural water flow.

Outlet drains shall follow existing watercourses or low points in the natural surface, unless otherwise shown on the Drawings. The drains shall be so constructed as to discharge flows of equal capacity to the drainage structure discharging into them, without overtopping.

Minor diversion drains shall be constructed where shown in the Drawings or where directed by the Engineer, in which latter case the work will be paid as an extra at the schedule rate for this item. Minor diversion drains shall have the same capacity as the nearest pipe culvert on the line of the drain.

Catchdrains shall be provided above each cutting as shown in the Drawings or as directed by the Engineer before or during construction of the adjacent roadway.

The edges of catchdrains shall neither be less than 8 ft. from the toes of fills or tops of cuts nor more than is necessary to maintain the fall of the drains.

Unless shown otherwise in the Drawings or directed otherwise by the Engineer catchdrains shall be at least 1 ft. deep have a waterway area of not less than 2 sq. ft. and side slopes not steeper than the slope applicable to the material through which they are cut. The gradients shall be such as will ensure free flow of water and unless the Engineer directs otherwise shall not be less than 1%.

Material excavated from catchdrains or outlet drains shall be placed and compacted on the lower sides of the drains to form banks and increase the capacity of the drains.

Where trees exceeding 4 ft. in girth at 18″ above the ground occur in line of a catchdrain, the latter may be neatly diverted as directed; in other cases the drain shall be cut in regular lines and the necessary clearing and grubbing shall be done without extra charge.

Where graded banks are required in lieu of catchdrains the Contractor shall construct in the same location an embankment not less than 1′ 6″ high 1 ft. wide on top with side slopes not steeper than 2 to 1. Material for the embankment shall be obtained either within the limits of the excavation or by neatly and uniformly trimming back the top edge of the slope of the adjacent cutting.

Other open drains shall be constructed where shown on the Drawings or where directed by the Engineer, in which latter case the work will be paid for as an extra in accordance with Clause 17 of the General Conditions of Contract.

Catchdrains and other open drains shall be extended as necessary to lead the water clear of the work to points of natural drainage depression, into culverts, or into pits connected to underground drainage systems. As far as practicable the drains shall follow existing watercourses and depressions in the natural surface, unless other locations are shown in the drawings or are indicated by the Engineer.

Minor watercourses shall be diverted into drains, larger watercourses or culverts.

All drains shall be concrete line or stone pitched in accordance with Clause C3.08 of this Specification. Where the drain is fully in rock that is not subject to scour, the lining may be omitted.

On completion of excavation and lining of drains the adjacent ground surface shall be trimmed and compacted to a level one (1) inch above the edge of the drain to allow free entry of water into the drain and prevent scour alongside the drain. Any areas adjacent to the drain which were disturbed by construction shall be trimmed and left in a tidy condition.

C3.08 LINING OF DRAINS

Where shown in the drawings, or directed by the Engineer, or

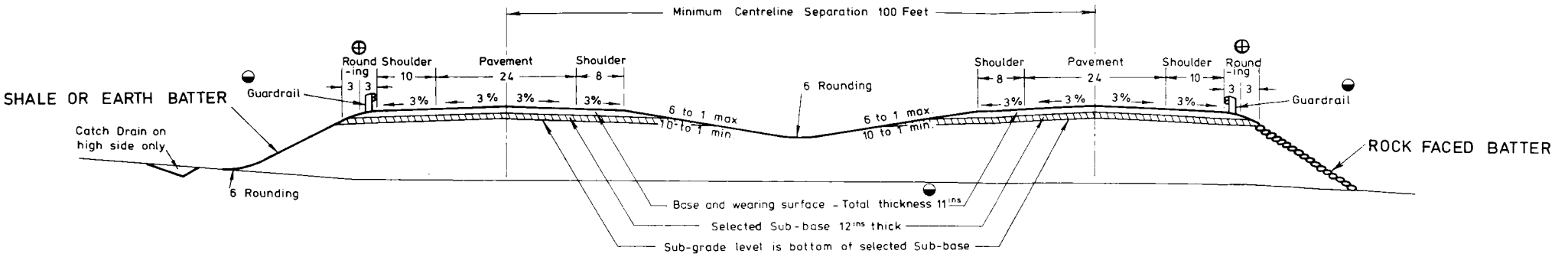
where the grade of the drain is steeper than 1 vertical to 20 horizontal drains shall be lined with cast-in-situ concrete or with stone or concrete pitching. The pitching or lining shall conform to the profile of the drain for a height of at least 12″ measured vertically.

Pitching shall consist of sound durable rock not less than 4″ thick, or pre-cast concrete blocks not less than 4″ thick, properly bedded on approved loam or sand and mortared to present a uniform surface. The exposed surface of each stone or block shall be approx. flat and not less than ½ sq. ft. in area. Spaces between adjacent stones or blocks shall not exceed ½″ in width.

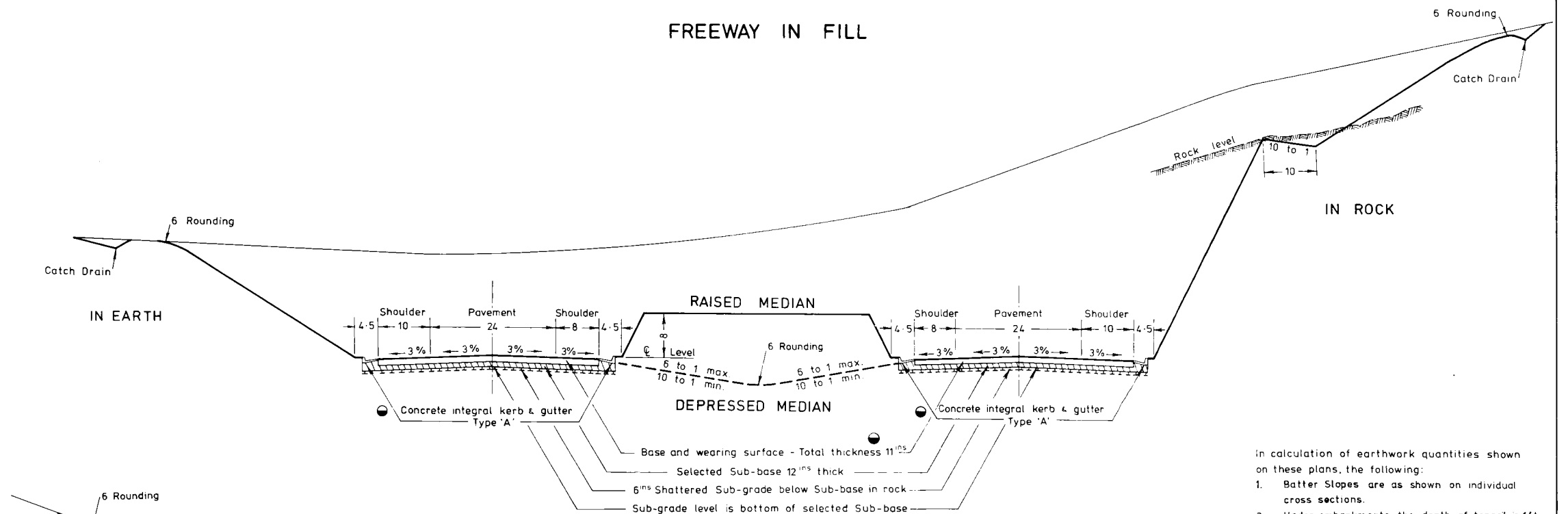
The minimum thickness of cast-in-situ concrete shall be 4″. Cast-in-situ concrete is to be coloured using an approved black colouring compound at a rate of ½ lb. per sq. yd. applied evenly over the surface before final screeding. Precast concrete is to be coloured using an approved black colouring compound in the proportions of 20 lbs per cubic yard of concrete.

Concrete used for all linings and precast blocks shall be a 1:2:4 mix.

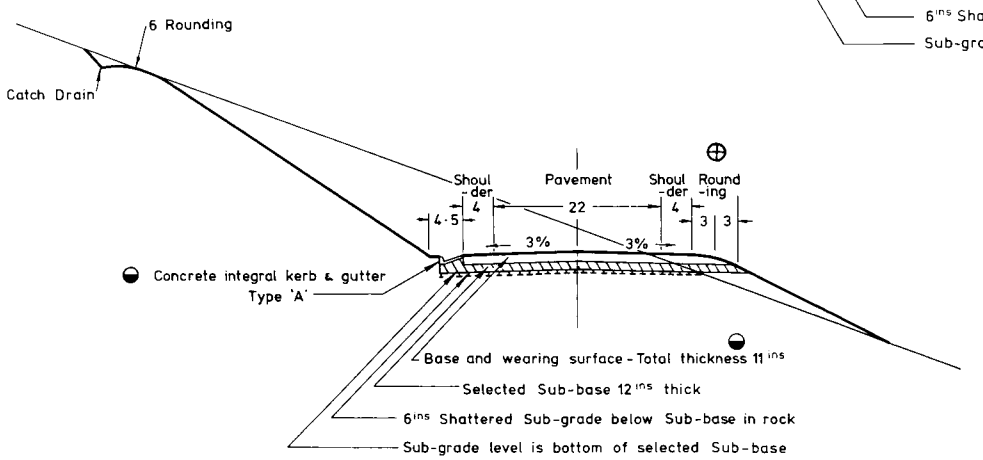
Where pitching or lining abuts any headwall, gully pit or other concrete structure, the joint shall be given an application of an approved epoxy adhesive.



FREEWAY IN FILL



FREEWAY IN CUT



RAMP
2 LANES

In calculation of earthwork quantities shown on these plans, the following:

1. Batter Slopes are as shown on individual cross sections.
2. Under embankments the depth of topsoil is 1ft.
3. A berm is provided at the top of all rock cuttings, based on an assumed rock level 10ft. below natural surface.

NOTE :- No allowance has been made for bulking or consolidation.

NOTE :- Superelevation to be 3% on all curves, (curves 64M.2200 to 65M.4700 excluded) see drawing RDS/118

All batter slopes to be in accordance with the specification

ALL DIMENSIONS ARE IN FEET

⊕ Rounding not required where batter slopes are 5 : 1.

◒ NOT IN CONTRACT. FOR LIMITS OF CONTRACT SEE SPECIFICATION.

DEPARTMENT OF MAIN ROADS, N.S.W.

SHIRE OF MITTAGONG
F5-SOUTH WESTERN FREEWAY
YANDERRA TO YERRINBOOL
TYPICAL CROSS SECTIONS

File No.	No. of Sheets	Sheet No.
F5/287·1130	40	2

Regn. No. 6005 287 R C 0014

A 1128

SECTION 4 — SINGLE CELL 12' X 8' REINFORCED CONCRETE BOX CULVERT

C4.01 GENERAL

The Contractor shall construct a single cell 12′ x 8′ reinforced concrete box culvert 103 feet long at Freeway Chainage 66M.1950′. The completed culvert will be used to provide private access beneath the Freeway. The culvert shall be constructed in accordance with drawings Registered Number 6005.287.RC.0014 and 6005.287.BC.0124 and this Specification.

C4.02 MAIN ROAD FORMS

The following Main Road Forms are included in this Specification and shall form part of this contract:—

MAIN ROAD FORM NO.	TITLE FOR DESCRIPTION
563	Excavation for bridges.
350	Concrete work for bridges.

C4.03 ACCESS ACROSS FREEWAY

As required by Clause A2.09 it shall be necessary for the Contractor to provide for stock movement across the Freeway on the property owned by Mr. C. E. Thiessen until such time as the access culvert at 66M.1950′ is available for use by Mr. Thiessen.

In the Supreme Court of New South Wales Common Law Division Commercial List

No. 9

Extracts from Exhibit A — bulk sum contract for construction of South Western Freeway — Yanderra to Yerrinbool

No. 10

EXTRACTS FROM EXHIBIT B — BULK SUM CONTRACT FOR CONSTRUCTION OF SOUTH WESTERN FREEWAY — YERRINBOOL TO AYLMERTON

BULK SUM CONTRACT

THIS DEED made the fifth day of November one thousand nine hundred and seventy three BETWEEN G. ABIGNANO PTY. LTD., (hereinafter and in the documents annexed hereto called "the Contractor") of the one part and THE COMMISSIONER FOR MAIN ROADS (hereinafter and in the said documents called "the Commissioner") of the other part WHEREAS the Commissioner has accepted the tender of the Contractor for the provision and execution of the several works hereinafter mentioned for the bulk sum of One million four hundred and forty one thousand five hundred and fifteen dollars ($1,441,515.00).

NOW THIS DEED WITNESSETH that, in pursuance of the premises and in consideration of the payments to be made to the Contractor by the Commissioner under the provisions of this Contract the Contractor for himself, his executors, administrators, successors and assigns hereby covenants with the Commissioner to execute and perform the several works and provisions and supply all materials and labour and everything of every kind respectively named, shown, described and referred to in the copy Tender, Drawings, Specification and General Conditions of Contract respectively annexed hereto to be executed and supplied by and on the part of the Contractor in conformity with the said Drawings and Specification and under and subject to the said General Conditions of Contract, and the Contractor for himself, his executors, administrators, successors and assigns hereby covenants with the Commissioner and the Commissioner hereby covenants with the Contractor to perform, fulfill, observe and comply with and submit to all and singular the conditions, stipulations and requisitions and all matters and things contained, expressed and shown in or reasonably to be inferred from the said copy Tender, Drawings, Specification and General Conditions of Contract and by and on the part of the Contractor and the Commissioner respectively to be performed, fulfilled and observed, which copy Tender, Drawings, Specification and General Conditions of Contract for the purpose of identification have been signed by the Contractor and are the documents forming the Schedule hereto AND it is also mutually covenanted that if the party hereto of the first part shall consist of two or more persons, the term "the Contractor" herein and in the documents annexed hereto shall bind such persons jointly and severally and their respective

executors administrators, successors and assigns, and such persons shall jointly be entitled to the benefit of this Contract and these presents, and the said documents shall be read and construed accordingly.

IN WITNESS whereof the parties hereto have hereunto set their hands and seals the day and year first hereinbefore written.

THE COMMON SEAL of G. ABIGNANO PTY. LTD was hereunto affixed by a Director in the presence of the Secretary,

.....
Director

_____
Secretary.

BRIAN JOSEPH SEXTON The Deputy Commissioner for Main Roads have hereto affixed the official seal of The Commissioner for Main Roads in the presence of:

.....

_____
Secretary.

SCHEDULE OF DOCUMENTS hereinbefore referred to:—
Copy Tender. Drawings. Specification. General Conditions of Contract.

SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
1.	Provision for traffic		Item	LS	$15,714
2.	Clearing and Grubbing	82	Acres	189.00	15,498
3.	Earthworks (Excavation to subgrade level)	959,530	cu. yds.	.86	825,196
4.	Removal of topsoil from the area covered by embankments. Loose in stockpile.	65,000	cu. yds.	.28	18,200
5.	Trimming and compaction of selecting material in place.	~~234.00~~ 234,360	sq. yds.	.24	56,246
6.	Boundary fencing	380	100 l. ft.	77.82	29,572
7.	Gates	4	No.	125.00	500
8.	Excavation for pipes, gully pits etc., including backfilling.	5,800	cu. yd.	9.50	55,100
9.	Supplying, laying and jointing R.C. pipes including bedding.				
	A FLUSH JOINT				
	15″ Ø Class X	504	l. ft.	3.18	1,603
	18″ Ø Class X	132	l. ft.	3.99	527
	21″ Ø Class X	56	l. ft.	4.79	268
	24″ Ø Class X	40	l. ft.	5.98	239
	30″ Ø Class X	108	l. ft.	9.27	1,001
	30″ Ø Class Z	652	l. ft.	12.~~56~~ 46	8,124
	36″ Ø Class Z	612	l. ft.	17.06	10,441
	60″ Ø Class Z	240	l. ft.	47.48	11,395
	72″ Ø Class Y	260	l. ft.	56.03	14,568
	B. RUBBER RING JOINT				
	15″ Ø Class X	3,240	l. ft.	3.94	12,766
	15″ Ø Class Y	228	l. ft.	4.22	962
	15″ Ø Class Z	108	l. ft.	4.39	474
	18″ Ø Class X	1,768	l. ft.	4.73	8,363
	21″ Ø Class X	244	l. ft.	5.52	1,347
	21″ Ø Class Y	220	l. ft.	6.17	1,357
	24″ Ø Class X	600	l. ft.	6.51	3,906
	24″ Ø Class Y	296	l. ft.	7.62	2,256
	30″ Ø Class X	504	l. ft.	11.22	5,655
	30″ Ø Class Y	180	l. ft.	13.44	2,419
				TOTAL	$1,103,697

SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
10.	Type "A" Bedding — concrete cradle	173	cu. yds.	47.48	8,214
11.	Transportation from the Campbelltown Works Office (approx. 38 miles) excavation bedding and complete erection of a 162 inch diameter multiplate steel pipe culvert 540 ft. long, in accordance with the instructions of the manufacture.		Item	L.S.	65,103
12.	Concrete in Headwalls for pipe culverts including reinforcement.	38	cu. yds.	127.00	4,826
13.	Gully pits				
	G.P. 4	1	No.	180.00	180
	G.P. 8 — K.1.4	34	No.	271.82	9,242
	G.P. 8A — K.1.4	4	No.	331.25	1,325
	G.P. 8 — K.1.6	5	No.	283.80	1,419
	G.P. 8A — K.1.6	1	No.	331.00	331
	G.P. 14	2	No.	318.00	636
	G.P. 15	16	No.	259.94	4,159
14.	Subsoil drains	350	100 l. ft.	132.94	46,529
15.	Catch drains	150	,,	20.65	3,098
16.	Inlet and Outlet Minor Diversion drains	33	,,	36.15	1,193
17.	Lining of catch, inlet and outlet drains (concrete and/or stone pitching).	300	sq. yds.	9.50	2,850
	CHURCH AVENUE BRIDGE OVER FREEWAY AT 71M935′ SOUTH OF SYDNEY				
101.	Excavate for abutments and backfill to existing ground level.	216	cu. yd.	4.60	994
102.	Excavate for pier footing, including backfilling to existing ground level.	192	cu. yd.	3.64	699
103.	Construct 20″ nom. dia. vertical shafts.	404	lin. ft.	5.35	2,161
104.	Construct 20″ nom. dia. shafts raked at 1 m 6.	410	lin. ft.	5.35	2,194
105.	Reinforcement to piles.	10.8	Ton	321.02	3,467
106.	Form concrete bases to piles.	32	No.	107.00	3,424
107.	Concrete pile shafts.	814	lin. ft.	3.74	3,044
201.	Concrete Class 3.0K to 2″ mass concrete layer under footing and pile caps.	145	sq. yd.	5.35	776
202.	Concrete Class 3.0K to abutment pile caps.	98	cu. yd.	107.00	10,486
203.	Concrete Class 4.0K to pier footing.	56	cu. yd.	107.00	5,992
204.	Supply and fix steel reinforcement to Items 202 and 203:				
	a) cold worked deformed bars.	12.95	Ton	321.00	4,157
				TOTAL	$1,290,196

SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
205.	Concrete Class 3.0K to abutment upstands and walls.	126	cu. yds.	187.25	23,594
206.	Supply and fix steel reinforcement to item 205:				
	a) cold worked deformed bars.	9.6	Ton	321.04	3,082
	b) structural grade deformed bars.	.3	Ton	320.00	96
	c) fabric no. 601	10	sq. yd.	2.70	27
	d) fabric no. 640	109	sq. yd.	3.74	408
207.	Concrete Class 4.0K to piers.	31	cu. yd.	160.52	4,976
208.	Supply and fix steel reinforcement on Item 207:				
	a) cold worked deformed bars.	2.35	Ton	320.85	754
	b) round structural grade bars.	.3	Ton	320.00	96
	c) structural grade deformed bars.	.4	Ton	320.00	128
209.	Supply and fix 2″ x 2″ x 3/8″ M.S. angle plate to abutment upstands.	56	lin. ft.	18.20	1,019
301.	Concrete Class 5.0K to insitu spine and cantilevers, including all holes, built in items, etc.	576	cu. yd.	85.60	49,306
302.	Concrete Class 3.0K to edge beams, kerbs and upstands.	50	cu. yd.	96.30	4,815
303.	Supply and fix 2′-10″ O.D. cylinders or other approved void formers cast into spine beam.	1,149	lin. ft.	8.56	9,835
304.	Supply and fix steel reinforcements to Items 301 and 302:				
	a) cold worked deformed bars.	31.9	Ton	427.99	13,653.
	b) structural grade deformed bars.	8.7	Ton	428.05	3,724
	c) round structural grade bars.	1.2	Ton	428.33	514
	d) fabric no. 301.	148	sq. yd.	3.74	554
305.	Supply and instal 3.¾ inch inside diameter lead-lined, steel ducts to position as shown on the Drawings.	2,901	lin. ft.	.54	1,567
306.	Supply, reeve, stress and grout prestressing tendons.	2,901	lin. ft.	7.49	21,728
307.	Supply and install anchor plates for tendons.	28	No.	53.50	1,498
308.	Supply and fix position fixed 'pot' bearings, load capacity 475 tons to pier.	2	No.	321.00	642
309.	Supply and fix in position movement 'pot' bearings, load capacity 185 tons to Abutment 'A'.	2	No.	267.50	535
310.	Supply and fix in position movement 'pot' bearings, load capacity 210 tons to Abutment 'B'.	2	No.	294.50	589
311.	Supply and erect steel railing, including protective treatment.	487	lin. ft.	12.84	6,253
				TOTAL	$1,439,589

SCHEDULE OF QUANTITIES, RATES AND AMOUNTS HEREINBEFORE REFERRED TO

ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	RATE	AMOUNT
312.	Supply and fix 'Wabo W.D. — 200L' expansion joints, or similar approved, to bridge decks at abutments.	82	lin. ft.	7.49	614
313.	Take delivery of and fix bridge name plates as supplied by D.M.R.	2	No.	5.50	11
314.	Supply and install precast concrete footway paving slabs in 4.0K concrete, including reinforcement.	152	No.	8.56	1,301
				TOTAL	$1,441,515

In the Supreme Court of New South Wales

No. 7012

Certificate Verifying Transcript Record

No. 11

CERTIFICATE OF THE REGISTRAR OF THE SUPREME COURT OF NEW SOUTH WALES VERIFYING TRANSCRIPT RECORD

I, TERENCE GREENWOOD, of Sydney in the State of New South Wales, Prothonatory of the Supreme Court of the said State DO HEREBY CERTIFY that the sheets hereunto annexed and contained in pages numbered 1 to 99 inclusive contain a true copy of all the documents relevant to the appeal by the appellant G. Abignano Pty Limited from the judgment of the Court delivered in this matter on 21st April 1978 so far as the same have relation to the matters of the said Appeal together with reasons for the said judgment given by the said court and an index of all the papers, documents and exhibits in the said suit included in the annexed transcript record which true copy is remitted to the Privy Council pursuant to the Order of Her Majesty in Council of the Twentieth day of December in the year of Our Lord One thousand nine hundred and fifty-seven.

IN FAITH AND TESTIMONY whereof I have hereunto set my hand and caused the seal of the said Supreme Court to be fixed this Fifteenth day of July in the year of Our Lord One thousand nine hundred and seventy-eight.

Prothonotary of the Supreme Court of
New South Wales