PURCELL

BRIDGEWATER CROSSING
DERWENT RIVER, BRIDGEWATER
ARCHIVAL RECORD

PREPARED FOR DEPARTMENT OF STATE GROWTH

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02 FINAL ISSUE TO CLIENT

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ARCHIVAL RECORD

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INTRODUCTION

BACKGROUND

This Archival Record of Bridgewater Crossing in Bridgewater, Tasmania has been prepared for the Department of State Growth. The recording is intended to capture the context and setting of the Bridgewater Crossing, inclusive of the bridge, causeway and associated features, prior to the construction of the new Bridgewater Bridge. The causeway, bridge, and associated features that form the Bridgewater Crossing are currently included on the Tasmania Heritage Register (THR) and due to their heritage significance, this Archival Record has been prepared prior to the proposed works. This report aims to document Bridgewater Crossing in accordance with the guidelines for Archival Recordings specified by the NSW Heritage Office, having been identified as a best practice guide.

Hanna Morgan, Heritage Specialist of Purcell prepared this report with overview by Lucy Burke-Smith, Associate and Tracey Skovronek, Regional Partner. The photographs that form this Archival Record were taken by Martin Passingham on Monday 22nd March, 2021. The historic drawings included at Appendix 5 were sourced from the Department of State Growth and Point Cloud model was prepared by JACOBS. Sample views of the Point Cloud Model and included in this report only; a copy of the model is held with the Department of State Growth and can be viewed with 3D Viewer freeware.

METHODOLOGY

This report has been prepared in accordance with the guidelines for Archival Recordings specified by the NSW Heritage Office, including methodology and report format.

Each photograph has been allocated a unique name/number, refer Appendix 3. The name/numbers are then cross referenced to the Plan and Catalogue Sheets, refer Appendices 1 and 2. Markers are used on the Plan Sheet to indicate the location in which the photographs were taken. The Catalogue Sheets record the project details, date, photographer's name, camera type and lenses used, photographic data, direction and brief description of each photograph.

This Archival Record captures close-up and overall views of the Bridgewater Crossing, limited to the bridge and causeway only, as well as the immediate context. The photographic documentation follows a clockwise order starting at Location 1 and finishing at Location 8 depicted on the aerial site map (refer plan at Appendix 1). Limitations include suitable vantage points to capture all angles of the bridge structure, causeway, and associated infrastructure features.

REFERENCES

The following references inform this report:

- *Guidelines for how to prepare Archival Records of Heritage Items*, NSW Heritage Office, 1998.
- Guidelines for the Photographic Recording of Heritage Items using Film or Digital Capture, NSW Heritage Office, 2006.
- Purcell, "*Bridgewater Bridge Replacement, Preliminary Heritage Impact Assessment*". Prepared for Department of State Growth, 25 March 2021.
- *Purcell, "Memorandum: Review of assessment of significance against state criteria/threshold*". Prepared for Department of State Growth, 12 October 2020
- GHD, "*Bridgewater Bridge Replacement Planning Study, Historic Heritage Investigations*". Prepared for DIER, August 2010.
- Austral (Tas), "*Draft Bridgewater Causeway and Bridge Historic Heritage Assessment and Archaeological Zoning Plan*". 27 August 2020.

UNDERSTANDING THE SITE

LOCATION

Bridgewater Crossing comprises the causeway and bridge which crosses the Derwent River, in Bridgewater Tasmania, located within the Brighton Municipal Council Local Government Area (LGA). The broader cultural landscape of the Bridgewater crossing has been considered in some detail by GHD and is summarised as follows[1]:

> The place connects Granton on the southern shore of the Derwent with Bridgewater on the north. It consists of the causeway, historic bridge infrastructure and the extant road and rail bridge. The crossing at this point of the Derwent is some 1.08 kilometres. The lower foothills of Snake Mount form the background on the southern shore, characterised by native vegetation on the upper slopes and low density residential development on the lower slopes. The immediate foreground of the causeway is the convict quarry from which the material used in its construction was obtained. Remnant historic buildings of these works include the Watch House and the Commandant's Cottage. The causeway itself is a low linear feature, approximately 785 metres long, as measured from the Brooker, Midland and Lyell Highway roundabout. Vegetated embankments rise on either side rise slightly above the roadway. The causeway has some visual prominence when viewed obliquely from surrounding road networks.
>
> The Bridgewater Bridge is a prominent element in the landscape, notable for its truss form and in particular the two towers and lifting mechanism. Although visible from the Brooker Highway, its dark colouring does not make the bridge a distinctive element on its southern approach until in close proximity to the causeway. Conversely, the bridge stands out distinctly against the sky when viewed from the Lyell Highway, Boyer Road and Woods Point at Bridgewater.

Location map showing extent of the Bridgewater Crossing (causeway and bridge) shaded in yellow (Source: Google Maps modified by Purcell, boundary information supplied by Austral Tasmania). Note: north to top of page.

[1] GHD, Bridgewater Bridge Replacement Planning Study. Historic Heritage Investigations, report prepared for DIER, August 2010

HISTORICAL SUMMARY

The following Historical Summary draws from the Draft Bridgewater Causeway and Bridge Historic Heritage Assessment and Archaeological Zoning Plan, prepared by Austral (Tas) 27 August 2020:

Introduction

The study area forms part of a rich historic cultural heritage landscape which demonstrates the evolution of transport over a period of more than two hundred years. The European history of the place has witnessed these changes from ferries, a causeway, numerous road and rail bridges, and the current structure built in the 1940s. Each phase has left evidence in the landscape, which is discussed in the following sections. It is drawn principally from previous detailed assessments of the place. Original references are provided.[2]

Arranged chronologically, this historical overview addresses the following key phases of use and development:

- The Aboriginal People of the Area and Contact History;
- Early European settlement of Hobart;
- The Black Snake Inn and Early Development of the Area;
- The Bridgewater Causeway and Convict Road Station;
- Earlier Bridge Crossings of the Derwent at Bridgewater:
  - The 1849 Timber Bridge;
  - The 1874 Tasmanian Main Line Railway Bridge;
  - The 1893 Road and Rail Bridge;
  - 1908 Conversion of the 1874 Rail Bridge to Road Uses;
- The Current Bridgewater Bridge;
  - The Designer of the Bridge AW Knight;
  - Welding Technologies used in the Bridge; and
- Later Modifications to the Bridgewater Bridge.

The Aboriginal People of the Area and Contact History

Before European settlement, Ryan has described Tasmanian Aboriginal society as consisting of nine nations, each containing multiple social units or bands. Boundaries between groups could vary between well-defined borders based on geographical features, to broader transitional zones existing between two friendly tribes.

The Derwent formed the boundary between two such nations. The western shore of the Derwent was part of the lands of the South East nation. Their territory covered an area of approximately 3,100 square kilometres to encompass the western shore of the Derwent north to New Norfolk, the D'Entrecasteaux Channel and Bruny Island, and south to South Cape, extending west to the Huon Valley. Ryan writes that prior to European contact, the area probably contained seven bands, each with about 70 to 80 people. The Hobart area was home to the Muwinina band. They knew the area as Nibberloone or Linghe.

The eastern shore is part of the country of the Oyster Bay people. Located on the east coast of Tasmania, their lands covered some 7,800 square kilometres, including 515 kilometres of coastline. Their country extended from St Patricks Head in the north, to the east bank of the Derwent. Inland, it reached St Peters Pass in the Midlands, before following the Eastern Tiers to the Break O'Day River, where it returned to the coast at St Patricks Head.

Prior to European settlement, Ryan proposes that ten bands formed part of the Oyster Bay nation with a population of between 700-800 people, the largest group in Tasmania. The Risdon and Pitt Water areas were the home of the Moomairremener band.[3]

Contact between Europeans and Aboriginal people occurred on both sides of the Derwent. With the establishment of Hobart Town in 1804 the Reverend Robert Knopwood made brief notes in his diary on contact between the two groups. An entry in March 1804 records his observations on encountering 'a great many native hutts [sic] and the fires they made' on the western shore of the Derwent, north of Hobart. Two days later he noted many Aboriginal people were around the camp at Sullivans Cove, but could not be persuaded to enter. On numerous occasions, Knopwood wrote of the fires lit by the Aboriginal people for both land management and hunting.[4]

Initial contact between the Muwinina and Europeans was positive. Although not visiting the settlement, the Aboriginal people were friendly with small groups of Europeans they met at more isolated areas. Such relations were not to last, as by 1806, violence had already began to emerge. Conflict over food resources was one of the triggers in the deteriorating relationship. By necessity, the European settlers sought to augment their meagre stores with fresh caught game, mainly kangaroos, thereby placing them in direct competition with the Aboriginal people. So insatiable was the European demand for kangaroos, that by late 1808 this food resource had largely been exhausted from the immediate surrounds of Hobart, with hunting parties having to venture further afield.[5]

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[2] See: GHD, Bridgewater Bridge Replacement Planning Study. Historic Heritage Investigations, report prepared for DIER, August 2010; GHD, Tasmania's Truss Bridges. Comparative Heritage Assessment, prepared for DIER, October 2009; Austral Archaeology, National Highway Approach to Hobart – Bridgewater Planning Study Heritage Assessment: Stage 1 – Volume 2, 1997; Austral Archaeology, Midland Highway Black Snake Lane to East Derwent Highway Historical Archaeological Survey Report, prepared for Road & Environmental Planning Group, 1996; Whitlam, L, 'The Bridges, Road and Rails of Bridgewater', Tasmanian Historical Research Association and Proceedings, Vol. 36, No.2, 1989

[3] Ryan, L, The Aboriginal Tasmanians, St Leonards: Allen & Unwin, 1996, p.12

[4] Nicholls, Mary (ed.), The Diary of the Reverend Robert Knopwood 1803-1808. First Chaplain of Tasmania, Tasmanian Historical Research Association: Hobart, 1977, p.46; Brown, S, Aboriginal Archaeological Resources in South East Tasmania. An Overview of the Nature and Management of Aboriginal Sites, National Parks & Wildlife Service Tasmania, Occasional Paper No. 12, April 1986, pp. 171-172

[5] Ryan, op. cit., pp.76-78

On the eastern shore of the Derwent, contact between Europeans and Aboriginal people began during the late-eighteenth century. In 1798 Bass and Flinders explored the Derwent venturing as far as what is now Bridgewater, and reaching an inlet of the river, which they named Herdsman's Cove. From here, Flinders travelled two miles inland up the Jordan River. It was in the vicinity of Herdsman's Cove that an encounter took place with Aboriginal people. Finding two women and a man carrying three spears, Bass and Flinders attempted to communicate with the group by offering them a black swan. The two women left, but the man remained.[6]

Following a failed attempt to follow him to his hut, Bass and Flinders left the man - their only encounter with Aboriginal people in Van Diemen's Land.[7] A few years later in 1802, Peron found some huts, smouldering fires and remains of food in the vicinity of Herdsman's Cove, but no Aboriginal people were seen.[8]

In September the following year, Lieutenant John Bowen arrived at Risdon Cove, establishing the first permanent European settlement in Van Diemen's Land. Uneasy contact between the Aboriginal people and settlers descended into conflict in May 1804.[9]

The period 1804 to 1824 has been described as one of 'uneasy coexistence' between Aboriginal people and Europeans. Certainly, there were outbreaks of hostilities, but by comparison with what occurred post-1824, the first two decades since the coming of the Europeans were relatively calm.[10]

Such relative peace was not to last. During the 1820s, the European population grew rapidly, accompanied by an explosion in the issuing of land grants over the most valuable grass plains. These actions created disputes over access to native game, hunting grounds and the connection of Aboriginal people with their traditional tribal lands. What followed was unprecedented violence.[11]

Early European settlement of Hobart

The first decade of European settlement in Hobart was marked by the close relationship between development and the waterfront. After the failure of the settlement at Risdon Cove and the relocation to Sullivans Cove on the western shore in February 1804, the early occupants of Hobart Town spent their first decade in a struggle for survival, building upon the camp clustered on the western boundary of the cove.[12]

In 1806 Lieutenant Governor Collins wrote of his reliance on the small amounts of wheat and barley which were grown at the government farm at New Town. This was supplemented by locally procured game. The lack of food was not the only problem faced by the young settlement, with the physical condition and morale of the general population being a cause of concern. Collins described them as having been scantily clad and badly fed for a year, and by mid-1806 they were largely destitute of clothing. To supply goods and food he requested that ships be sent to Hobart first instead of Sydney.[13]

Merchant ships were not permitted to enter the Derwent until 1813. After this time and most notably when the embargo on whaling was lifted, port activity gradually increased. Despite these impediments it was not long before settlement spread out along the shores of the Derwent, albeit on a limited scale. By the late 1820s the numbers and size of ships using the port had increased markedly, coinciding also with the beginning of urbanisation. At this time the population of the town had reached 6,000. The rapid increase in demand for port facilities was not solely due to the importation of goods as had previously been the case, but also the beginning of trade in export commodities.[14]

The Black Snake Inn and Early Development of the Area

Travellers were some of the first Europeans to visit the Granton area, or Black Snake as it was originally known. In 1811, Governor Macquarie during his first visit to Van Diemen's Land wrote in his diary about a trip to New Norfolk, where he and his party had breakfast at Black Snake Point. Knopwood's diary also mentions frequent visits to the Black Snake Inn between 1819 and 1825.[15]

The first Black Snake Inn was probably constructed between 1817 and 1821 by which time a ferry crossing the Derwent was in operation from the location. This also corresponds with the period when travel became more frequent with the completion of the road constructed by McCarty between Hobart and New Norfolk in 1819, Tasmania's first formed road. A population centre had emerged at Black Snake. In 1824, 23 children were attending school in the area.[16]

During the late 1820s or early 1830s the current gothic inspired building was constructed, presumably on the same site as the first inn.[17] The Black Snake Inn was one crossing place of the Derwent used by ferries. A number of flat bottomed punts and clinker type craft crossed the river back and forth from select locations. There were two well known crossing points on this part of the Derwent; one from Roseneath

[6] Flinders, M, A voyage to Terra Australis: undertaken for the purpose of completing the discovery of that vast country, and prosecuted in the years 1801, 1802, and 1803, in His Majesty's ship the Investigator ..., London: G and W Nicol, 1814, pp.135-136

[7] Ibid, p.136

[8] Alexander, A, Brighton and Surrounds. A history of Bagdad, Bridgewater, Brighton, Broadmarsh, Dromedary, Elderslie, Mangalore, Old Beach, Pontville and Tea Tree, Gagebrook: Brighton Council, 2006, p.3

[9] Ryan, op. cit., pp.73-75

[10] Boyce, J, Van Diemen's Land, Black Inc.: Melbourne, 2008, pp. 67-68, 105-106; McFarlane, I, 'Frontier Conflict', in Alexander, A, (ed.), The Companion to Tasmanian History, Centre for Tasmanian Historical Studies, University of Tasmania: Hobart, 2005

[11] Boyce, op. cit., pp.140-146

[12] Walker, JB, 'The English at the Derwent and the Risdon Settlement', Early Tasmania: Papers Read before the Royal Society of Tasmania during the Years 1888 to 1899, John Vail Government Printer, Hobart, p.59

[13] Austral Archaeology, Midland Highway Black Snake Lane to East Derwent Highway Historical Archaeological Survey Report, prepared for Road & Environmental Planning Group, 1996, p.4: Solomon, RJ, Urbanisation. The Evolution of an Australian Capital, Angus & Robertson, Sydney, p.27

[14] Austral Archaeology, 1996, pp.4-5: Solomon, op. cit., p.75

[15] Austral Archaeology, 1996, p.5: Macquarie, L, Governor of New South Wales, Journals of his Tours in New South Wales and Van Diemen's Land 1811-1822, Library of Australian History, pp.58-59

[16] Austral Archaeology 1996, p.5: Rait BE, Historic Buildings, City of Glenorchy, unpublished document; Robson, LL, A History of Van Diemen's Land Volume 1, Oxford University Press, 1983, p.130

[17] Austral Archaeology 1996, pp.5-6: Brand I, The Convict Probation System: Van Diemen's Land 1839-1854, Blubber Head Press, 1990, p.20

(Austin's Ferry) to Herdsman's Cove and Old Beach, and the second from Black Snake to Herdsman's Cove and Green Point. Travel by ferry could be dangerous and was often inconvenient, being dependant on the current, wind and availability of the service.[18]

By this time, the inn had diversified and offered both ferry and coach transport to travellers. Throughout its life the inn has functioned as a public house, shop and currently is a private residence.[19]

The Bridgewater Causeway and Convict Road Station

In 1826 the Land Commissioners investigated the best location for crossing the Derwent. After some deliberation a site at Black Snake was decided on. There was plentiful timber at nearby Mount Dromedary, while stone was available from quarrying away at the hill behind the intended causeway, at what is now Granton. The river at this point also included a sand and mud bar which ran most of the way over the Derwent, and at a shallow depth.[20] This was seen as a desirable attribute in constructing a causeway, but one that was later to cause considerable issues. In 1830 the convict station at Bridgewater (which later became known as Granton) was opened and works began on constructing the causeway.[21] Works were to prove a very slow affair. To hasten progress, John Lee Archer, civil engineer recommended the construction of a timber railway with trucks to be pulled by bullocks.[22]

Ross's almanac for 1831 wrote:

> An establishment has been formed at Bridgewater for a Chain Gang, which is employed in constructing that great work, the causeway over the Derwent. A gaol or barracks for the reception and safe keeping of the prisoners after their hours of labor, was among the first works completed; It is capable, of containing 160 men. A commodious barracks for the military has also been constructed, as well as a store, solitary cells for such convicts as misconduct themselves, &c, &c. On a commanding eminence stands a neat building for the Officers quarters.
>
> A very excellent quarry on the road side gives employment to one part of the gang, while the others are busily engaged in wheeling the stone out into the water. The bed of the river over the flats at this place is composed of soft mud, which the heavy mass of stone thus thrown upon it soon displaces, and in this manner a good foundation is obtained on which to raise the subsequent work. Five and twenty small abutments will then be built and covered with timber. From the piers to the edge of the deep channel a solid road of stone will be formed with a small basin at the end to haul the punt into. As the distance across is very trifling no delay can occur, because the punt instead of being towed by a boat will be made to swing backwards and forwards.[23]

This was perhaps the last positive account of the works, which were not trifling by any measure. The causeway was constructed at an oblique angle, which was not the shortest point of crossing, although planned that way to contend with the wind and currents at this stretch of the Derwent. Early attempts at constructing piers in the sand and mud were found to be a failure due the failure to find a solid bottom.[24] The work was beset by controversy and labelled a 'folly' when the tons of stone dumped into the river were continually submerged in the mud and silt, without a trace. This perhaps simplifies the construction of the causeway to little more than dumping rock in the river. There was however engineering to the structure, as referred to by Ross and the construction of 25 abutments. Other contemporary accounts provide a few more clues.

A curious description of the causeway was given, midway during construction. It noted a structure quite different to the one we know:

> The work at this station [Bridgewater], was the construction of a massive bridge across the Derwent, which is here three-fourths of a mile in breadth. It had been a long time since it was commenced, and was not yet completed when I finally left the island. It is composed almost entirely of stone. From either shore two solid stone abutments extends to some distance into the river. Other abutments are placed at regular distances, also filled with stone. Arches of stone span the spaces, at a sufficient height to permit the passage of small steam boats. Before its final completion the bridge somewhat resembles a shallow aqueduct, but instead of water is filled with pounded stone, thus making a way over the water in all respects like the road itself.[25]

Other than its description as being composed of stone and the presence of abutments, it is difficult to reconcile this description with what was actually constructed. Abutments only extended from the southern shore of the Derwent, and while arches were constructed, it seems unlikely that they could accommodate small steam boats. As a description made part way through construction works, the writer's interpretation may have been inaccurate.[26]

By 1833 the causeway extended for some 365 metres. It was 28 metres wide at its base and 16 metres wide at the top. Roderic O'Connor made an urgent request for 250 planks required to complete the 'bridge', used in some form in the construction of the causeway.[27] By the following year the causeway had reached a length of some 708 metres, reaching nearly its ultimate length. The causeway committee investigated the works in July 1834, finding that the portion immediately beyond the arches (towards its southern end) had already been sinking into the mud for some time. The obvious solution was to support the structure with piles, but the costs of such works were unacceptable. Instead, they favoured the use of vegetation rafts on which the stone would be supported, and disappointed that such a method had not been adopted from the start. They also recommended the removal of the arches at the southern end, where the current

[18] Austral Archaeology 1996, p.7; Newitt, L, Convicts & carriageways: Tasmanian road development until 1880, Hobart : Dept. of Main Roads, Tasmania, 1988, pp.35-37, 108-111
[19] Austral Archaeology 1996, p.7
[20] TAHO, CSO1/285/6777, Correspondence 6 October 1831
[21] TAHO, CSO1/285/6777, Land Commissioners to Survey Office, 6 November 1826; Austral Archaeology 1996, p.7; Newitt, op. cit., p.55
[22] TAHO, CSO1/284/6777, John Lee Archer to Colonial Secretary, 19 June 1831
[23] Launceston Advertiser, Monday 17 January 1831, p.24
[24] TAHO, CSO1/285/6777, Committee on the Causeway across the Derwent to Colonial Secretary's Office, 14 October 1831
[25] Austral Archaeology 1996, p.8: Gates, W, Recollections of Life in Van Diemen's Land, in Australian Historical Monographs, XL, Part 1
[26] Austral Archaeology 1996, p.8
[27] TAHO, CSO1/543/11623, Roderic O'Connor to Colonial Secretary, 12 September 1833

risked undermining the causeway.[28] A plan was prepared, recommending the proposed point of connection with the northern shore of the Derwent

It was to take a further two years however before it was finished, likely because of the continual subsidence into the mud. Works to date included the construction of six piers, upon which planks were laid, allowing carts to travel across the short distance. When finally the causeway formation did appear above the water line, it was prone to subsidence and had to be continually built up. The continued dumping of rock displaced large volumes of mud, creating banks on either side of the causeway. There was no shortage of opinion on how to deal with the problem and perhaps the original concept was modified over time. Nevertheless, the majority sources, including artwork, depict the causeway as an unbroken formation of stone.[29]

Structural problems continued into 1835. A report was prepared which supported the use of vegetation rafts as the best solution, but questioning the integrity of the embankments on either side of the causeway. It recommended that the walling on either side be at least 1.2 metres thick and battered. Those already constructed were found to be badly placed and did not have a sufficient hold on the bank.[30]

As it neared completion in 1835, more positive accounts began to be published on the 'magnificent work' that would address the dangers and difficulties of crossing the Derwent, which was cut to only a 3 minute punt ride connecting from the end of the causeway to the northern shore.[31] One very detailed report noted how the overseers had addressed the fruitless problem of stone being swallowed up by the mud. The *Hobart Town Courier* wrote:

> This stupendous undertaking is situated about 11 miles from Hobart town, It consists of a mound or roadway carried out over an extensive bank, near a mile in extent to the edge of deep water and the stream, so as to reach within a short distance of the opposite bank, the earth and stone for the purpose being dug from a hill contiguous with the river. Much of the stone and materials originally carried out of course subsided in the mud, until it became sufficiently solid, and in one part the mud thus pushed out has risen on each side and formed small islands, now rapidly covering with verdure.
>
> By adopting the expedient of laying a compact bottom of logs and dead timber on the mud so as better to prevent the earth and stone from subsiding, the work is proceeding with great rapidity and about three-quarters of a mile of the mound are now finished on a firm basis, so as to admit of carriages of any weight or description freely to pass.
>
> ….
>
> It is a curious fact and one which serves to declare the stability of the work that in times of heavy rains, when the flow of fresh water is strong down the river, that the level is invariably some inches higher on the lower side of the embankment, than on the upper, caused doubtless from the meeting of the tide with the freshwater. For these reasons, Lieut. Wrixon, with the advice of the Inspector has very judiciously shut up the arches that were originally left open at the south extremity as a sort of safety valve in case of any accumulated force of the stream pressing with injury on either side. The stones which composed these arches being removed, have been applied to the purpose of erecting a large and lofty room or hall, used as a church and school room.[32]

The ingenuity of constructing rafts of timber and vegetation to support the weight of the stones appears to have been the solution to the never ending problem of the mud. The article also describes arches on the southern end of the causeway, which is again consistent with the earlier description given above, but that these arches had been removed by 1835 and the stone used elsewhere. However, whether these arches were high enough to allow small steam boats to pass beneath seems somewhat dubious. The success of the raft system was however already in doubt, an acerbic article from as early as 1836 describing the causeway as 'floating on a foundation of brushwood faggots, which will continue at intervals to sink in various places with its super incumbent weighty until it has displaced the soft mud.'[33] This subsidence was already occurring as early as 1836. Wrixon had commanded the laying of the road metal along the course of the causeway, only to be ordered to raise the causeway in height by another 1.2 metres.[34]

The grand opening of the causeway was made in October 1836 by Lieutenant-Governor Arthur with a guard of honour and the band and colours of the Scotch Fusiliers. It was approximately 730 metres long, 20 metres wide and contained 400,000 cubic metres of fill. At the time, its cost of £45,000 was enormous. From its northern end was a gap approximately 340 metres across the Derwent to the northern shore. Between 1836 and 1849 a 'flying bridge' or ferry winched on cables connected the causeway with the shore.[35]

In 1863 the causeway was widened and raised by some 76 centimetres in attempt to avoid overtopping by the water. Low stone walls were constructed on both sides of the causeway to bind the new fill. It was again widened on the downstream side in 1874 to accommodate the Tasmanian Main Line Railway, and later in 1893 when the bridge was converted to combine both road and rail uses.[36]

The 1849 Timber Bridge

Parliament authorised the construction of the first bridge to span the gap of 340 metres in 1846. The contract for its construction was awarded to Messrs. Thomas and Blackburn in early 1847. Convicts from the Mount Dromedary probation station spent the remainder of the year cutting and stockpiling timber for the bridge. The *Illustrated London News* wrote in 1851 how roads first had to be cut into the gullies

[28] TAHO, CSO1/285/6777, Report of the Committee on the Causeway, 28 July 1834

[29] Austral Archaeology, *National Highway Approach to Hobart – Bridgewater Planning Study Heritage Assessment: Stage 1 – Volume 2*, 1997, p.6; *The Sydney Gazette and New South Wales Advertiser*, Thursday 17 October 1833, p.3; Austral Archaeology 1996, pp.7-8: Brand, *op. cit.*, pp.108-109

[30] TAHO, CSO1/285/6777, report made on the works carried on by Government at Bridgewater Van Diemen's Land June 11 1835

[31] *The Tasmanian*, Friday 3 April 1835, p.7

[32] *The Hobart Town Courier*, Friday 12 June 1835, p.2

[33] *The True Colonist Van Diemen's Land Political Despatch, and Agricultural and Commercial,* Friday 8 January 1836, p.7

[34] *The True Colonist Van Diemen's Land Political Despatch, and Agricultural and Commercial*, Friday 15 January 1836, p.14

[35] Austral Archaeology 1996, p.8: Whitlam, L, 'The Bridges, Road and Rails of Bridgewater', *Tasmanian Historical Research Association and Proceedings*, Vol. 36, No.2, 1989, p.57; Fowler, A, 'River Derwent, Tasmania – Bridgewater Bridges – Past and Present', 16th Engineering Heritage Australia Conference Hobart November 2011, p.2; *The True Colonist Van Diemen's Land Political Despatch, and Agricultural and Commercial*, Friday 21 October 1836, p.4

[36] Austral Archaeology, Stage 1 – Volume 2, 1997, pp.7-8

on the steep mountain sides to facilitate removal of the timber. Two of these gullies were lined with timber, forming a chute down which the logs were moved. The process was intensive. First the timber was loaded into a chute and propelled downward by its own momentum to a benched landing where it was manoeuvred to another chute which conveyed it to the base of the mountain. There, the terrain was of sufficient grade to allow the logs to be carried by wagons to the water's edge. From here, it was towed by boats to the work site.[37]

Construction of the timber bridge works began in January 1848, starting at the northern end of the causeway. The bridge was not built as a straight extension of the causeway, rather its alignment diverged ten degrees eastwards to the nearest point of the river bank, and the same location used for the ferry wharf. The wharf was demolished and a temporary wharf constructed nearby.[38]

The spans of the bridge were supported by over 360 timber piles. To allow for river navigation upstream to New Norfolk, the bridge (and all subsequent structures) included moving spans. Originally a swing span was proposed for Bridgewater, but this was substituted with a rolling span modelled on a prototype bridge over the Arun River, England.[39]

The bridge was opened to traffic on 26 April 1849 with a roadway 7.3 metres wide. A series of landing or fender piles were installed in the river both up and down stream for some 55 metres to assist shipping in negotiating the opening. Tolls were collected until 1880, and a toll keepers house was located near the bridge approach. A new house for the toll keepers was built c.1870 to replace the old one, but was located so close to the river that water entered its basement at high tide. The causeway was also raised around c.1860 to avoid 'overtopping' by water. Following the abolition of tolls the toll keeper became known as the bridge keeper and the old toll house survived until about 1947.[40]

The 1874 Tasmanian Main Line Railway Bridge

Works to construct a rail line between Hobart and Launceston began in 1872, with the Derwent being a key challenge to the project. In response, in 1874 the Tasmanian Main Line Railway Company constructed a separate timber rail bridge on the downstream side of the causeway. The bridge keyed into the causeway on a curve, approximately 30 metres before its end, before running parallel to the 1849 road bridge for 350 metres to the northern bank of the river. The 1874 bridge also required a moving span and a lattice girder iron bridge was installed which pivoted on a turntable. The railway was intended primarily for the transport of goods between Hobart and Launceston, but from 1875 passenger carriages were attached on weekdays with coach transfers.[41]

The moving bridge span was supported by timber piles, and this construction method caused problems with subsidence. As a precaution, measures were put in place to ensure that the span was locked in place before every train crossing. However, the Rail Engineer in Chief was never truly satisfied with these measures, nor the signalling equipment at the Bridgewater end. These fears came to be when disaster struck in 1886. The swing span had shifted slightly resulting in the Launceston express engine being derailed and overturned. One rail worker and one passenger died in the accident.[42]

Infrastructure changes in Bridgewater to accommodate the railway included the construction of a small stockyard and passenger station in the vicinity of the existing War Memorial Reserve, and gated crossings on all secondary roads. The junction between the railway and the Main Road was monitored from a small two storeyed signal box just north of the station.[43]

The 1893 Road and Rail Bridge

By 1888, the 1849 road bridge was declared unsafe. However, without other options, it continued to be used. In 1891 a contract was awarded for the construction of a new road bridge. Like all previous, it included a swing span, which was fabricated in England and completed in 1893. The new bridge was upstream, or to the west of the 1849 bridge. Its completion resulted in the strange scenario of three bridges extending from the northern end of the causeway.[44]

The design of the 1893 bridge allowed for its later conversion to a rail bridge. It was largely constructed from timber with the exception of the pier or caisson on which the plate girder swing span turned. This bridge extended straight out from the causeway and landed on the northern bank. The northern abutment adopted a dog-leg design to enable it to accommodate the heavy railway traffic straight ahead and a lighter roadway that would curve eastward. The bridge was over 360 metres long with a road width of 6.5 metres that narrowed to five metres over the swing span. The navigable channel was 13 metres wide. The 1849 road bridge was retained in anticipation that it would be required as a temporary detour while the new bridge was converted to rail use. However, this was not to happen until 1906-07 by which time the former had become a danger to the 1874 rail bridge. The 1849 was eventually demolished in 1899.[45]

The old 1874 Tasmanian Main Line Railway Bridge coupled with the advent of heavier locomotives, made the transfer to the 1893 bridge urgent. In 1906-07 the conversion works began. These works required the widening of the full length of the causeway on the upstream, western side, substantial filling in behind the northern abutment and land acquisition at Bridgewater. The rail line was transferred from the eastern to the western side of the causeway, where it remains to this day. In response, a new station was constructed adjacent to the bridge abutments on the Bridgewater side. Shared use by road and rail of the 1893 bridge began in January 1908. However, community disquiet about the length of delays in road traffic and compromised safety conditions, led to a reversal of positions and the conversion of the 1874 rail bridge to a road bridge.[46]

[37] Austral Archaeology 1996, p.9: *The Illustrated London News*, 12 April 1851
[38] Austral Archaeology 1996, p.9: Whitlam, *op. cit.*, p.57
[39] Austral Archaeology 1996, p.9: Whitlam, *op. cit.*, p.58
[40] Austral Archaeology 1996, pp.9-10: *The Illustrated London News*, 12 April 1851; Whitlam, *op. cit.*, p.59
[41] Austral Archaeology 1996, p.10: Whitlam, *op. cit.*, pp.62-63
[42] Austral Archaeology 1996, p.10: Whitlam, *op. cit.*, p.63
[43] Austral Archaeology 1996, p.10: Whitlam, *op. cit.*, pp.63
[44] Austral Archaeology 1996, p.10: Whitlam, *op. cit.*, pp.65-66
[45] Austral Archaeology 1996, p.10: Whitlam, *op. cit.*, pp.66-67
[46] Austral Archaeology 1996, p.10: Whitlam, *op. cit.*, p.67

1908 Conversion of the 1874 Rail Bridge to Road Uses

In 1908 the 1874 railway bridge was converted to road uses. This required the bridge to be re-piled and the deck converted to accommodate a two lane roadway. It was opened in 1908. The new approaches to the bridge resulted in demolition of the 1876 and 1887 railway station platforms at Bridgewater.[47]

Joint use of both rail and road of the 1893 bridge was short lived, lasting just ten months before reverting solely to rail. It was temporarily jointly used again in 1911, 1912, 1924-25 and 1926-27 while repairs were being carried out to the road bridge. Heavy vehicles were also regularly redirected over the 1893 bridge.

In 1916 the road bridge was rigged with timber gantries to carry power from the new Waddamana hydro-electric power station to Hobart. This was a temporary measure due to a war time delay in shipping of three special towers from England. On arrival, the towers were erected as planned. This included a backstay and 50 metre high tower on the north bank and another straddling the road at the end of the causeway. The towers were replaced with a submarine cable in 1987.[48]

When the Second World War broke out a number of strategic sites were declared, among them the Bridgewater Bridge. It was guarded by a small number of sentries located in temporary buildings off Nielsen Esplanade. By 1941 the road bridge was so rickety that a single lane system with coloured signal lights was brought into operation by the army.[49]

The Current Bridgewater Bridge

Whitlam notes the importance of the development of the Derwent Valley Paper Company in promoting the need for a new bridge at Bridgwater. Indeed, he suggests that had it not been for the Boyer paper operation, the road and rail bridges may never have been combined.[50]

Discussions between the government and the Paper Company began in 1933. To allow for shipping access, the company initially requested a clear opening in the bridge some 18 metres wide. The Public Works Department investigated, and found that modifying the existing bridges for such a width would be very difficult. Further, the existing road bridge had been constructed as the rail bridge in 1874, and although not dangerous, had reached the end of its life. The best solution would be for a new combined road and rail bridge. To maintain the essential transport connections, the new bridge would need to be built between the existing road and rail bridges. With such a constraint and the narrow distance between the two existing bridges, it would not be possible to construct a swing bridge. Initially the department favoured a bascule type of lifting span, but later came to favour a lift span.[51]

Preparatory geotechnical works were carried out in 1933. Boring of the riverbed found a solid rock bottom from 7.3 to 28 metres below the water level. The overlying strata of the bed was largely mud, but clay was also found over the northern half. A basalt base was found on the northern bank of the Derwent, but was underlaid by mud, which would require foundations to descend to a deeper level.

Department engineer and key designer of the bridge Allan Knight and director of Public Works George Balsille toured New South Wales in 1936 visiting a number of different types of moving bridges. Balsille also visited the combined road and rail bridge at Paringa, South Australia. Following the review of how other states had addressed similar problems, the department shifted its position to a lift span structure rather than a bascule arrangement.

A meeting was held with the Hobart Marine Board in April 1936 to determine the required width for the opening of a new structure at Bridgewater. Conflicting advice was given on the tonnage of shipping that would need to pass through the bridge, although it did confirm that a bascule bridge was not suitable. As a result, the preliminary concept was for a lift span bridge to be constructed with a horizontal clearance of 36 metres, and a vertical clearance above the high water mark of 30 metres.[52]

Further geotechnical work was required to determine costs for the piles supporting the lift span as no information was available on the likely behaviour of the mud should bridge cylinders be sunk. Testing was carried out on timber and concrete piles to determine if a satisfactory pile foundation could be constructed. Although timber piles were acceptable from a load point of view, they rapidly deteriorated about the mud line resulting in expensive and frequent renewal.

Initial costings for the new bridge were estimated at £100,000. A further £25,000 was needed when the lift span was widened, whilst the needs of other government departments added a £10,000 to the project. Offsets and savings in the pile testing reduced the final estimate of works to £123,000.

The Parliamentary Standing Committee on public works investigated the project in 1937. The Railways Department estimated that the existing rail bridge had an estimated lifespan of at least 15 years. However, if the road bridge was to be renewed, it was sensible to also replace the rail bridge at the same time. The Paper Company and the Marine Board were in support of an opening at least 30 metres wide, which would provide safe navigation of vessel up to 2,000 tons. They estimated that on establishment of the factory, the mill would be served by 60 to 80 ships.[53]

Public Works submitted plans for a steel and concrete lift bridge with a horizontal opening of 30 metres. The Department was satisfied that the proposed opening would be sufficient for the largest vessels that would need to reach Boyer. The cost of this opening was estimated at £19,800. Cost comparisons were also made on the use of different materials. A new timber bridge was estimated at £70,000 while a bridge in permanent materials would cost £103,500, excluding additional costs for the bridge approaches and incidental works.

[47] Austral Archaeology 1996, p.10: Whitlam, *op. cit.*, p.69
[48] Austral Archaeology 1996, p.10: Whitlam, *op. cit.*, pp.72, 82
[49] Austral Archaeology 1996, p.11: Whitlam, *op. cit.*, p.82
[50] GHD, *Tasmania's Truss Bridges. Comparative Heritage Assessment*, prepared for DIER, October 2009, p.195: Whitlam, *op. cit.*, pp.67-73
[51] GHD 2009, p.195: Whitlam, *op. cit.*, pp.67-73
[52] GHD, 2009, p.196; Memorandum 1/37, Removal of Bridgewater Bridge, Parliamentary Standing Committee on Public Works, 1937, pp.1-2
[53] GHD, 2009, p.196

The Committee was hesitant to support a project that would result in the demolition of a rail bridge which still had at least a 15 year lifespan left. As a result, the Department were asked to investigate further. They considered the construction of a new road bridge to the east of the existing, while a new rail bridge would be built at the end of its life. It was noted however that having two different bridges with two opening spans would make navigating between the bridges a difficult exercise. Balsille recommended the Department's preferred option of a new combined road and rail bridge, but noted that construction could be postponed until the old rail bridge had reached the end of its life.[54]

The Committee made three key recommendations:

1. Approval of the substructure of a bridge which combined road and rail uses and approval for the superstructure of the road portion including the lift and flanking truss spans. A cost estimate of £103,000 was given for this part of the works.
2. A decision on the superstructure of the rail portion of the bridge (with the exception of the lift and flanking spans) should be deferred until the Paper Company or other industries established that they needed sea going vessels to navigate above Bridgewater, or that the existing rail bridge required replacement; and
3. That before committing addition funds for the construction of the opening span, it was necessary to dredge the Derwent near its junction with the Jordan River.[55]

Construction began in 1937 with preliminary site work, and in January the following year, the acquisition of properties on the bridge approaches. On the Bridgewater side this included demolition of the Railway Hotel, stables and bazaar to make way for the steel fabrication yard and workshop. A nearby 1925 fruit drying factory was rented to provide extra space for the Public Works Department.[56]

It was originally planned that the road bridge would be completed by late 1940. However, the outbreak of the Second World War resulted in the loss of workers and materials, and resources, were instead transferred to completing the Hobart floating bridge. As a result, the Department had difficulties to get tenders for the hoisting material, and the bridge was constructed in a piecemeal manner.[57]

The bridge opened to road traffic in March 1942 once the lift span had been installed, although it was to take several years before the lift span came into operation. It was not until 1951 that the last of the piles from the redundant bridges were removed. The massive concrete filled steel caisson on which the 1893 swing span rotated was left *in situ*, along with the 1893 abutments on the Bridgewater side of the river.[58]

By 1944, demand had grown for newsprint and the government submitted plans for a revised railway station at Bridgewater to supply Boyer. The factory was also examining its transport needs, favouring river transport, but noting that as a temporary measure, a rail siding was also required. In response, the government continued the upgrade of the Bridgewater Station and brought the bridge lift span into operation. The old 1874 rail bridge was retained while these works occurred, allowing for traffic to be diverted to the old structure while completing the lift span towers in 1943-44. In mysterious circumstances, the old rail bridge caught fire in October 1945. The fire brigade were advised to let it burn, reducing demolition costs, but in the end only three spans were destroyed.[59]

Completion of the bridge towers and lifting mechanism were delayed by the Second World War, with the lifting span coming into operation in 1946. On completion, three bridges existed at the crossing: the new steel bridge combining road and rail traffic, and the old separate rail and road bridges. As a result, shipping had to zig-zag between them to navigate up stream.[60]

The new bridge started carrying rail in October 1946, in combination with a new station layout at Bridgewater. On completion, the old rail bridge was progressively demolished. The full width of the opening span was not available until 20 February 1946. It was take four more years before the old piles were removed from the River, the key survivor being the massive steel and concrete caisson which supported the swing span of the 1893 bridge.[61]

The extra costs of the lift span proved a wise investment. By 1946, the Paper Company favoured barging newsprint from Boyer to Hobart. Increased production at the factory resulted in growth in river traffic. In 1947-48, less than 400 vessels made the crossing at Bridgewater, but growing to just over a 1,000 in 1956 and 1,300 by 1969-70. The largest number of openings on a single day was 26 for the New Norfolk Regatta. The only vessels that ever needed the full height of the lifting span were a few of the Sydney-Hobart maxi yachts which ventured this far upstream. River transport to and from Boyer was progressively dropped, ceasing completing in 1986. As a result the number of bridge openings declined markedly. In 1987-88, the bridge opened less than one hundred times.[62]

The combination of road and rail on the bridge required extra safety precautions to be installed to prevent trains crossing the bridge whilst it was lifted. The solution was the interlocking of the power supply for the lifting mechanism and the signal station at the rail station, and human operation of the switches and signals. All physical systems for safe operation of the lift span were replaced with telephone rail orders in the 1980s.[63]

Like all structures, the Bridgewater Bridge has undergone a series of modifications since construction.

In 1951, the renewed Bridgewater railway station and its signalling equipment was destroyed by a fire. At first, the bridge rail locks which lowered and raised the opening span were operated by hand, which could be slow, particularly during high winds. These were later replaced with hydraulic cylinders to operate the locks from the machinery house located above the lift span.

[54] GHD, 2009, p.197
[55] GHD, 2009, p.197: Parliamentary Standing Committee on Public Works, 1937, pp.1-4
[56] GHD, 2009, p.197
[57] GHD, 2009, p.197
[58] GHD, 2009, p.198: Whitlam, pp.73-74; Austral Archaeology 1996, p.12
[59] GHD, 2009, p.199
[60] GHD, 2009, p.199
[61] GHD, 2009, pp.199-200
[62] GHD, 2009, p.200
[63] GHD, 2009, p.200

Changing rail demands also led to changes to the Bridge. During the 1960s, railway infrastructure was modified to cope with the heavy loads required for the Gordon Power Development project. At Bridgewater, this required the lowering of the rail tracks by 44.45 cm.[64]

Extra steel plates were welded to the under deck girders between 1987-1989 to increase the load limit of the bridge to its maximum limit. The transmission line towers and cables which ran alongside the bridge and causeway were also removed during this time.

The lift span was also subject to structural changes in the 1980s to increase its load capacity. The works included strengthening of the welded plate girders by the addition of plates to the top and bottom flanges and strengthening of piers by the application of transverse steel beams encased in concrete.

The addition of plates to the top and bottom flanges of the girders had the unintended effect of significantly distorting the girders so that they separated from the bridge deck, and in time causing corrosion. The issue was addressed by the addition of grout into the voids. Additional steel cleats were also added to the deck to provide full lateral restraint of the girders.[65]

In 1992 the southern end of the bridge and the causeway was raised and reconstructed, including some vertical realignment of the causeway over a distance of some 150 metres.[66]

The continued settlement of the causeway has resulted in horizontal displacement of sediments, which in turn apply horizontal loads to the piles. Since construction in 1942, settlement in the order of 60 cm has occurred and continues to be an ongoing issue. [67]

Some of the most significant refurbishment took place during the early 2000s. Substantial deterioration had been identified in 2006 in some of the bridges counterweight ropes, at their connections with the 170 tonne counterweights. Addressing the risk of rope failure, the bridge was closed for a two week period to allow for close inspection and the design of an alternative counterweight suspension system. This alternative system remained in place until 2010 when it was removed as part of the last major refurbishment project. The closure of the lift span temporarily stranded larger vessels upstream.[68]

The temporary support arrangement for the lift span was not a permanent measure. It also made it more difficult to maintain the ropes and other components. Refurbishment of the bridge and restoration of the operation of the opening span was identified as the appropriate response. Works carried out as part of this major refurbishment were extensive, replacing certain equipment, and making repairs and enhancements. Repairs were generally like-for-like to maintain the heritage values of the bridge. It included:

1. Full containment, grit blasting and repainting all plate girder approach spans to safely remove the lead-based paint, rectify steel corrosion and apply a new protective coating;
2. The installation of new cathodic protection[69] systems for the concrete piers. On opening the piers for the repair and installation of the protection system, it was found that not only was there insufficient concrete cover for the installation of a new system, but that the original anodes had damaged the pier reinforcement. The installation of new cathodic protection was therefore abandoned, and work instead focussed on repairing damaged reinforcement and concrete.
3. Structural repair of areas of the steel superstructure and concrete piers, with inclusion of cleats to the plate girders of the approach spans to provide them with full lateral restraint. Additional steel repairs were required including reattachment of a large number of braces to the steel plate girders.
4. Works were proposed to investigate or stabilise settlement of the causeway, although more urgent works were carried out instead.
5. Restoration of the opening lift span and upgrading the electrical and mechanical systems to meet current standards. This included replacement of the motors, a programmable logic control, electro-hydraulic brakes and improved guarding to reduce reliance on manually operated brakes and improve safety.[70]

[64] GHD, 2009, p.200
[65] Fowler, *op. cit.*, p.8
[66] Department of Transport, Materials & Research, *Derwent River Crossing at Bridgewater. Office Study Geotechnical Report*, File No. 2.0082, Report No. 2508/1, 24 June 1996
[67] Fowler, *op. cit.*, p.6
[68] Fowler, *op. cit.*, p.6
[69] i.e., a technique used to control the corrosion of a metal surface by making it the cathode of an electrochemical cell.
[70] Fowler, *op. cit.*, pp.9-10

HERITAGE LISTING

The Bridgewater Crossing including causeway and bridge has been assessed as having State level significance, recognised in its inclusion on the Tasmanian Heritage Register (THR) ID 618. The site is therefore subject to the Historic Cultural Heritage Act 1995 (HCHA 1995).

The Crossing is also included in Table E13.1 of the Heritage Code of the Brighton Interim Planning Scheme 2015 (BIPS 2015) as "Bridgewater Bridge (CT134751/4)".

ASSESSED HISTORIC CULTURAL HERITAGE SIGNIFICANCE

The following assessment of the Bridgewater Crossing including Statement of Significance has been extracted from the *Memorandum: Review of assessment of significance against state criteria/threshold*, prepared by Purcell, dated 12 October 2020:

The Bridgewater Causeway and Bridge forms part of a broader and significant cultural landscape which has historical importance with regard to the evolution of transport, and which concentrates at this point of the Derwent. Serviced first by ferries, then later the causeway, road and rail traffic, the place is arguably the focus of Tasmania's most historically important transport route.

The Bridgewater crossing as a major piece of civil infrastructure forms part of a suite of places including roads, bridges, dams and water supply systems. It is important as one of the largest items of civil infrastructure constructed in Van Diemen's Land using convict labour. The Bridgewater Causeway has the potential to enhance an understanding of early civil engineering construction from the early nineteenth century generally and more specifically a greater understanding of the construction methods employed to address the very difficult geological conditions encountered throughout its history.

The Bridgewater Bridge is rare as Tasmania's only surviving lift span bridge and is the largest surviving lift span bridge in Australia. The steel truss approach and lift spans demonstrate the early use of all welded connections in steel truss bridges and the early adoption in Tasmania of design details specifically to address the issue of fatigue. The Bridgewater Bridge is important in demonstrating the key characteristics of a lift span metal truss rail and road bridge. The extensive archive of construction documentation and engineering studies and has the potential to yield information as to historical advances made in welding details, and their long term performance.

The Bridgewater Causeway has a special association with the work of convict labour in the construction of major civil engineering projects during the first half of the nineteenth century. It is also important for its association with Governor Arthur. The Bridgewater Bridge is an important example of the work of engineer Sir Allan Knight. The place has special associations to Engineers Australia who have recognised its technical significance with an Engineering Heritage National Marker in 2018.

a) "The place is important to the course or pattern of Tasmania's history"

The Bridgewater Causeway and Bridge forms part of a broader and significant cultural landscape which has historical importance with regard to the evolution of transport, and which concentrates at this point of the Derwent.

Serviced first by ferries, then later the causeway, road and rail traffic, the place is arguably the focus of Tasmania's most historically important transport route.

The causeway was one of the largest items of civil infrastructure constructed in Van Diemen's Land using convict labour. It demonstrates the scale of public works that could be carried out by convict labour, which was the key workforce available during the first half of the nineteenth century. The length of time to construct the causeway, and the methods used to address the very difficult geological conditions are a testament to the work carried out by the convict workers.

Following completion, the causeway formed the point of construction for all future bridges. Evidence of the 1874 and 1893 bridges exists on the causeway and northern bank of the Derwent. Subsurface evidence of the 1849 bridge abutments may also exist on the northern bank. The current Bridgewater Bridge is of historical importance in demonstrating the development of civil infrastructure by the Public Works Department, during a period of great innovation and technical advancement in the 1930s.

The bridge is also historically significant with its association with a major phase of industrialisation in Tasmania, and in particular the development of the paper industry in the Derwent Valley. The bridge was specifically designed to help facilitate this industry through the provision of both rail and river navigation capabilities.

b) "The place possesses uncommon or rare aspects of Tasmania's history"

The causeway is a rare place. It is one of only two causeways constructed in the state during the early nineteenth century using convict labour. It is considerably larger in length and volume than the Hunter Island causeway, being the other convict built causeway.

The Bridgewater Bridge was Tasmania's second, and the only surviving lift span bridge. It is also the largest surviving lift span bridge in Australia. It is the largest and one of relatively few metal truss road bridges in Tasmania, and is a relatively early example of an all welded bridge.

c) "The place has the potential to yield information that will contribute to an understanding of Tasmania's history"

The Bridgewater Causeway has archaeological research potential. Detailed documentary evidence of its construction methods is limited. It offers opportunities to understand civil engineering construction from the early nineteenth century and methods to address the very difficult geological conditions over an extended period.

The Bridgewater Bridge has research potential to provide new information on bridge design and construction, and in particular, advances made in welding details, and their long term performance.

d) "The place is important in demonstrating the principal characteristics of a class of place in Tasmania's history"

The Bridgewater Causeway is an important example of large scale civil infrastructure that was built during the first half of the nineteenth century using convict labour. It forms part of a suite of places including roads, bridges, dams and water supply systems.

The Bridgewater Bridge is important in demonstrating the key characteristics of a lift span metal truss road bridge. It is a 'Pratt' type of truss in a half-through configuration. The truss consists of vertical diagonals that slope down towards the centre. Constructed from welded steel, the bridge demonstrates the essential truss form of light weight construction with a hollow skeletal structure formed from vertical, horizontal and diagonal chords creating the essential triangular section of the truss bridge type.

e) "The place is important in demonstrating a high degree of creative or technical achievement"

The Bridgewater Bridge is important in demonstrating a high degree of technical achievement. The steel truss approach spans and the lift span demonstrate the early use of all welded connections in steel truss bridges and the early adoption of design details specifically to address the issue of fatigue. It was designed and constructed some ten years after the world's first all welded bridge, and within a number of years of Tasmania's entry into this technology. Recent investigations have shown that some of the details originally incorporated to reduce susceptibility to metal fatigue are now considered susceptible to fatigue.

Innovative research was carried out and the weld details were designed to address problems with fatigue and brittle fracture.

f) "The place has a strong or special association with a particular community or cultural group for social or spiritual reasons"

No social values assessment has been carried out for this project. The following provides an indicative statement of values which may exist at the place.

The Bridgewater Causeway and Bridge are prominent landmarks and mark the northern entrance to Hobart. It has been the key crossing point of the Derwent since the 1830s.

The causeway and bridge may have strong or special associations with engineers as a group. Engineers Australia has recognised the Bridge with an Engineering Heritage National Marker in 2018.

g) "The place has a special association with the life or works of a person, or group of persons, of importance in Tasmania's history"

The Bridgewater Causeway has a special association with the work of convict labour in the construction of major civil engineering projects during the first half of the nineteenth century. It is among the largest items of infrastructure in Tasmania which demonstrates this association. The causeway is also important for its association with Governor Arthur and various government engineers and officials who designed and oversaw its construction. This includes Inspector of Roads and bridges Roderic O'Connor, and architect and engineer John Lee Archer. The Bridgewater Bridge is an important example of the work of engineer Sir Allan Knight. Knight enjoyed a highly successful career with the Public Works Department and later the Hydro Electric Commission.

He was the designer of a number of technologically advanced bridges including at Vincents Rivulet and the Leven River, and was closely involved with the three bridges across the Derwent – the floating bridge at Hobart, Bridgewater Bridge and the Tasman Bridge. Knight received many awards and honours during his career and was made a Knight Bachelor in 1970.

h) "The place is important in exhibiting particular aesthetic characteristics"

The Bridgewater Bridge is the dominant visual landmark in an aesthetically important cultural landscape, strongly associated with the evolution of transport. This evidence is layered in the landscape, and includes large and small elements.

The bridge with its high towers and distinctive truss forms are landmarks of the area, with important views to the structure available from surrounding road networks.

The still waters of the Derwent at this location and frequent presence of large flocks of Black Swans contribute to the setting of the place.

PHOTOGRAPHIC DOCUMENTATION

CAMERA AND LENS SPECIFICATIONS

The photographs that form this Archival Record were taken with a 50mm camera digital equivalent, meeting the requirements of the NSW Heritage Office Guidelines for Photographic Recordings. The camera and lens specifications are as follows:

Camera Canon 7D Digital SLR (18 Megapixel)

Lens Canon 70-200mm, 50mm

IMAGE FORMAT

The photographs were taken at 18 megapixels in RAW format and converted to high resolution TIF format (approx. 3MB to 6MB each), in accordance with the NSW Heritage Office Guidelines for Archival and Photographic Recordings. The digital copies of this Archival Record comprise each photograph in both RAW, TIF and JPEG format, as well as thumbnail sheets with reference numbers.

PHOTOGRAPHIC CATALOGUE

This Archival Record comprises the following sections, consistent with the NSW Heritage Office Guidelines:

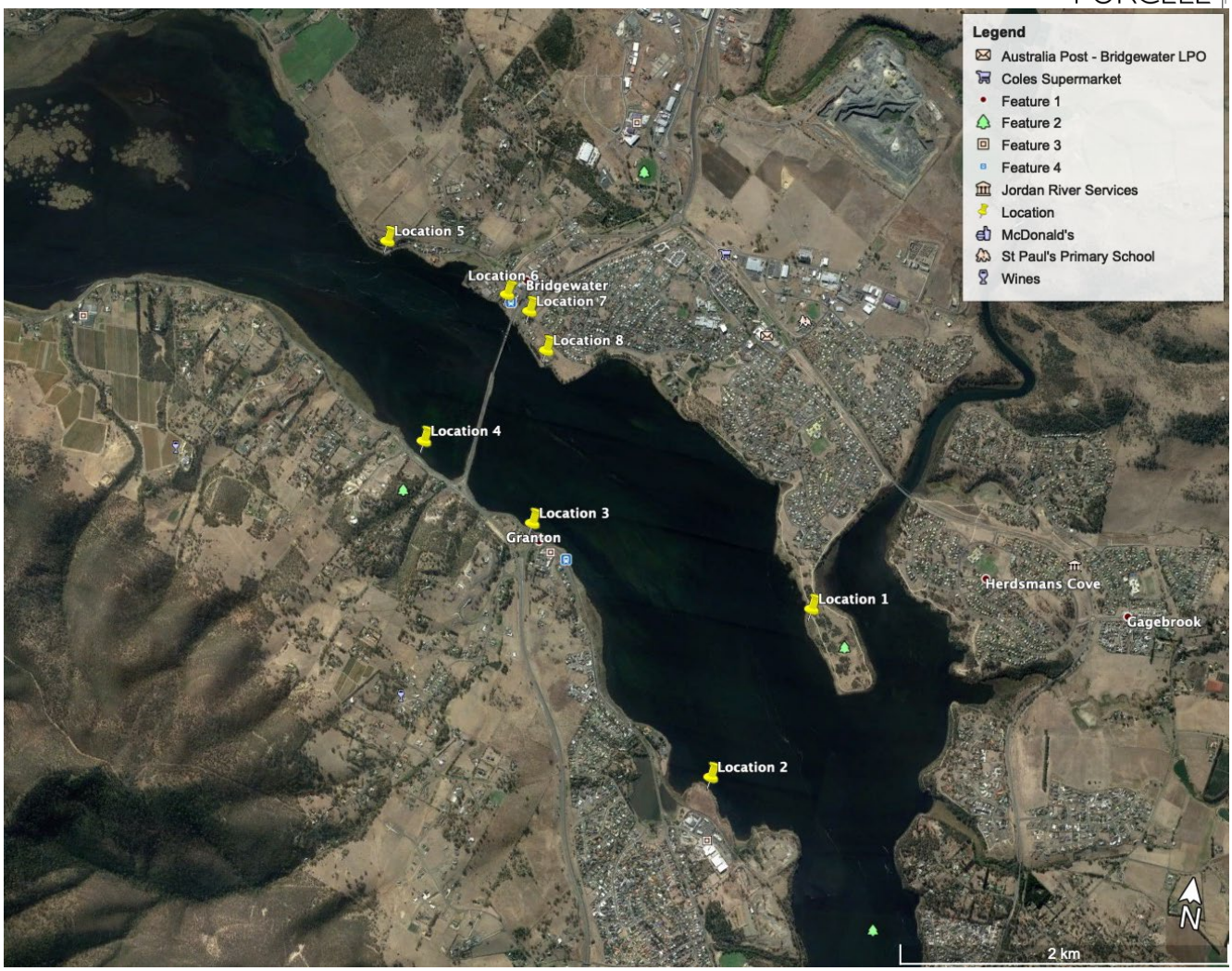
- Plan Sheets – documenting the location of each photograph using markers (Appendix 1);
- Catalogue Sheets – comprising detailed descriptions of each photograph, orientation of photographs and cross-references to both plan sheets and thumbnail images (Appendix 2);
- Thumbnail Sheets – comprising a thumbnail of each photograph and reference numbers (Appendix 3);
- Selection of Photographs – comprising a selection of photographs that capture the Crossing and setting (Appendix 4);
- Historic Photographs & Drawings – a selection of historic photographs sourced from Libraries Tasmania and original and early drawings of the bridge sourced from the Department of State Growth comprising survey, plan, elevation, section and detail drawings (Appendix 5), and;
- Point Cloud Survey, Sample Views – prepared by JACOBS and comprising sample views of the model (Appendix 6).

DISTRIBUTION

Digital copies of this Archival Record are to be distributed to the Department of State Growth, Heritage Tasmania and the Tasmania Heritage and Archive Office.

APPENDICES

APPENDIX 1 – PLAN SHEET


Legend
Australia Post - Bridgewater LPO
Coles Supermarket
Feature 1
Feature 2
Feature 3
Feature 4
Jordan River Services
Location
McDonald's
St Paul's Primary School
Wines
Location 5
Location 6
Bridgewater
Location 7
Location 8
Location 4
Location 3
Granton
Herdsmans Cove
Location 1
Gagebrook
Location 2
N
2 km

PURCELL

Project	Bridgewater Crossing Archival Record		
Camera	Camera Canon 7D SLR, Lens Canon 70-200mm, 16-35mm, 50mm		
Date Taken	22/03/21	**Photographer**	Martin Passingham

Image No.	View	Description
Bridgewater Crossing [Plan Reference: 100]		
BWC_01	NW	IMGL4860 22/03/21 4.34pm Wide angle 70-200 f/11. Viewed from Location 1, East elevation.
BWC_02	NW	IMGL4861 22/03/21 4.35pm Medium angle 70-200 f/8. Viewed from Location 1, East elevation.
BWC_03	NW	IMGL4958 21/05/21 8.45am Wide angle 70-200 f/7.1. Viewed from Location 2, East elevation.
BWC_04	NW	IMGL4960 21/05/21 8.45am Medium angle 70-200 f/6.3. Viewed from Location 2, East elevation.
BWC_05	NW	IMGL4961 21/05/21 8.45am Wide angle 70-200 f/9. Viewed from Location 2, East elevation.
BWC_06	NW	IMGL4962 21/05/21 8.45am Wide angle 70-200 f/7.1. Viewed from Location 2, East elevation.
BWC_07	NTH	IMGL4939 22/03/21 5.49pm Medium angle 70-200 f/4.5. Viewed from Location 3, East elevation
BWC_08	NTH	IMGL4940 22/03/21 5.49pm Medium angle 70-200 f/5. Viewed from Location 3, East elevation.
BWC_09	NTH	IMGL4949 21/05/21 8.34am Medium angle 70-200 f/7.1. Viewed fromLocation 3, East elevation.
BWC_10	NTH	IMGL4950 21/05/21 8.34am Medium angle 70-200 f/5.6.Viewed from Location 3, East elevation.
BWC_11	NTH	IMGL4954 21/05/21 8.35am Wide angle 70-200 f/8.Viewed from Location 3, East elevation.
BWC_12	NE	IMGL4912 22/03/21 5.31pm Wide angle 16-35 f/8.Viewed from Location 4, West elevation.
BWC_13	NE	IMGL4913 22/03/21 5.31pm Medium angle 70-200 f/5.Viewed from Location 4, West elevation.
BWC_14	NE	IMGL4914 22/03/21 5.31pm Medium angle 70-200 f/5.6.Viewed from Location 4, West elevation.
BWC_15	NE	IMGL4917 22/03/21 5.31pm Wide angle 70-200 f/5.6.Viewed from Location 4, West elevation.
BWC_16	NE	IMGL4918 22/03/21 5.32pm Medium angle 70-200 f/4.5.Viewed from Location 4, West elevation.
BWC_17	NE	IMGL4919 22/03/21 5.32pm Medium angle 70-200 f/5. Viewed from Location 4, West elevation.
BWC_18	NE	IMGL4923 22/03/21 5.33pm Medium angle 70-200 f/5. Viewed from Location 4, West elevation.
BWC_19	NE	IMGL4924 22/03/21 5.33pm Medium angle 70-200 f/5. Viewed from Location 4, West elevation.
BWC_20	NE	IMGL4926 22/03/21 5.40pm Medium angle 70-200 f/4.5. Viewed from Location 4, South Elevation
BWC_21	SE	IMGL4877 22/03/21 5.06pm Wide anglw 16-35 f/8. Viewed from Location 5, West elevation
BWC_22	SE	IMGL4878 22/03/21 5.07pm Medium angle 70-200 f/6.3. Viewed from Location 5, West elevation.
BWC_23	SE	IMGL4879 22/03/21 5.07pm Medium angle 70-200 f/5.6. Viewed from Location 5, West elevation.
BWC_24	SE	IMGL4880 22/03/21 5.08pm Medium angle 70-200 f/6.3. Viewed from Location 5, West elevation.
BWC_25	SE	IMGL4881 22/03/21 5.08pm Medium angle 70-200 f/5. Viewed from Location 5, West elevation.
BWC_26	SE	IMGL4884 22/03/21 5.09pm Wide angle 50mm f/7.1. Viewed from Location 5, West elevation.
BWC_27	STH	IMGL4885 22/03/21 5.14pm Medium angle 16-35 f/7.1. Viewed from Location 6, North elevation.
BWC_28	STH	IMGL4886 22/03/21 5.14pm Medium angle 16-35 f/7.1. Viewed from Location 6, North elevation.
BWC_29	STH	IMGL4891 22/03/21 5.16pm Medium angle 16-35 f/7.1. Viewed from Location 6, North elevation.
BWC_30	STH	IMGL4892 22/03/21 5.16pm Medium angle 16-35 f/8. Viewed from Location 6, Northe elevation.
BWC_31	STH	IMGL4896 22/03/21 5.17pm Medium angle 16-35 f/8. Viewed from Location 6, North elevation.
BWC_32	STH	IMGL4905 22/03/21 5.19pm Medium angle 16-35 f/8. Viewed from Location 6, North elevation.
BWC_33	STH	IMGL4097 22/03/21 5.20pm Medium angle 16-35 f/7.1. Viewed from Location 6, North elevation.
BWC_34	SW	IMGL4991 21/05/21 9.23am Medium angle 16-35 f/14. Viewed from Location 7, North East elevation.
BWC_35	SW	IMGL4995 21/05/21 9.25am Medium angle 16-35 f/11. Viewed from Location 7, North East elevation.
BWC_36	SW	IMGL4997 21/05/21 9.26am Close angle 16-35 f/13. Viewed from Location 7, North East elevation.
BWC_37	SW	IMGL4998 21/05/21 9.26am Medium angle 16-35 f/14. Viewed from Location 7,North East elevation.
BWC_38	W	IMGL4970 21/05/21 9.03am Close angle 16-35 f/14. Viewed from Location 8, East elevation.
BWC_39	W	IMGL4973 21/05/21 9.08am Wide angle 16-35 f/13. Viewed from Location 8, East elevation.
BWC_40	W	IMGL4975 21/05/21 9.09am Wide angle 16-35 f/13. Viewed from Location 8, East elevation.
BWC_41	W	IMGL4978 21/05/21 9.13am Wide angle 16-35 f/14. Viewed from Location 8, East elevation.
BWC_42	W	IMGL4981 21/05/21 9.17am Wide angle 16-35 f/13. Viewed from Location 8, East elevation.
BWC_43	W	IMGL4982 21/05/21 9.18am Wide angle 16-35 f/14. Viewed from Location 8, East elevation
BWC_44	W	IMGL4984 21/05/21 9.19am Medium angle 16-35 f/11.Viewed from Location 8, East elevation.
BWC_45	W	IMGL4987 21/05/21 9.20am Medium angle 16-35 f/11. Viewed from Location 8, East elevation.
BWC_46	W	IMGL4990 21/05/21 9.21am Medium angle 16-35 f/13. Viewed from Location 8, East elevation.

Bridgewater Crossing Archival Record - Thumbnails


BWC_01


BWC_02


BWC_03


BWC_04


BWC_05


BWC_06


BWC_07


BWC_08


BWC_09


BWC_10


BWC_11


BWC_12


BWC_13


BWC_14


BWC_15


BWC_16


BWC_17


BWC_18


BWC_19


BWC_20


BWC_21


BWC_22


BWC_23


BWC_24


BWC_25


BWC_26


BWC_27


BWC_28


BWC_29


BWC_30


BWC_31


BWC_32


BWC_33


BWC_34


BWC_35


BWC_36

Bridgewater Crossing Archival Record - Thumbnails

BWC_37

BWC_38

BWC_39

BWC_40

BWC_41

BWC_42

BWC_43

BWC_44

BWC_45

BWC_46

APPENDIX 4 – SELECTION OF PHOTOGRAPHS

BWC_01

BWC_02

BWC_10

BWC_20

BWC_31

BWC_34

BWC_38

BWC_44

Elevator Bridge, Bridgewater in 1956
Source: Libraries Tasmania | Item no. AB7 13/115677

Tugboat with barges from APPM Boyer passing under the Bridgewater Elevator Bridge in 1957
Source: Libraries Tasmania | Item no. AB7 13/115575

Bridgewater Bridge, looking towards Bridgewater in 1962
Source: Libraries Tasmania | Item no. AB7 13/118196

Aerial photograph of the Bridgwater Crossing and Derwent River in the 1970s
Source: Libraries Tasmania | Item no. AB7 13/1/1238

BRIDGEWATER BRIDGE

D1 - PRELIMINARY WORK

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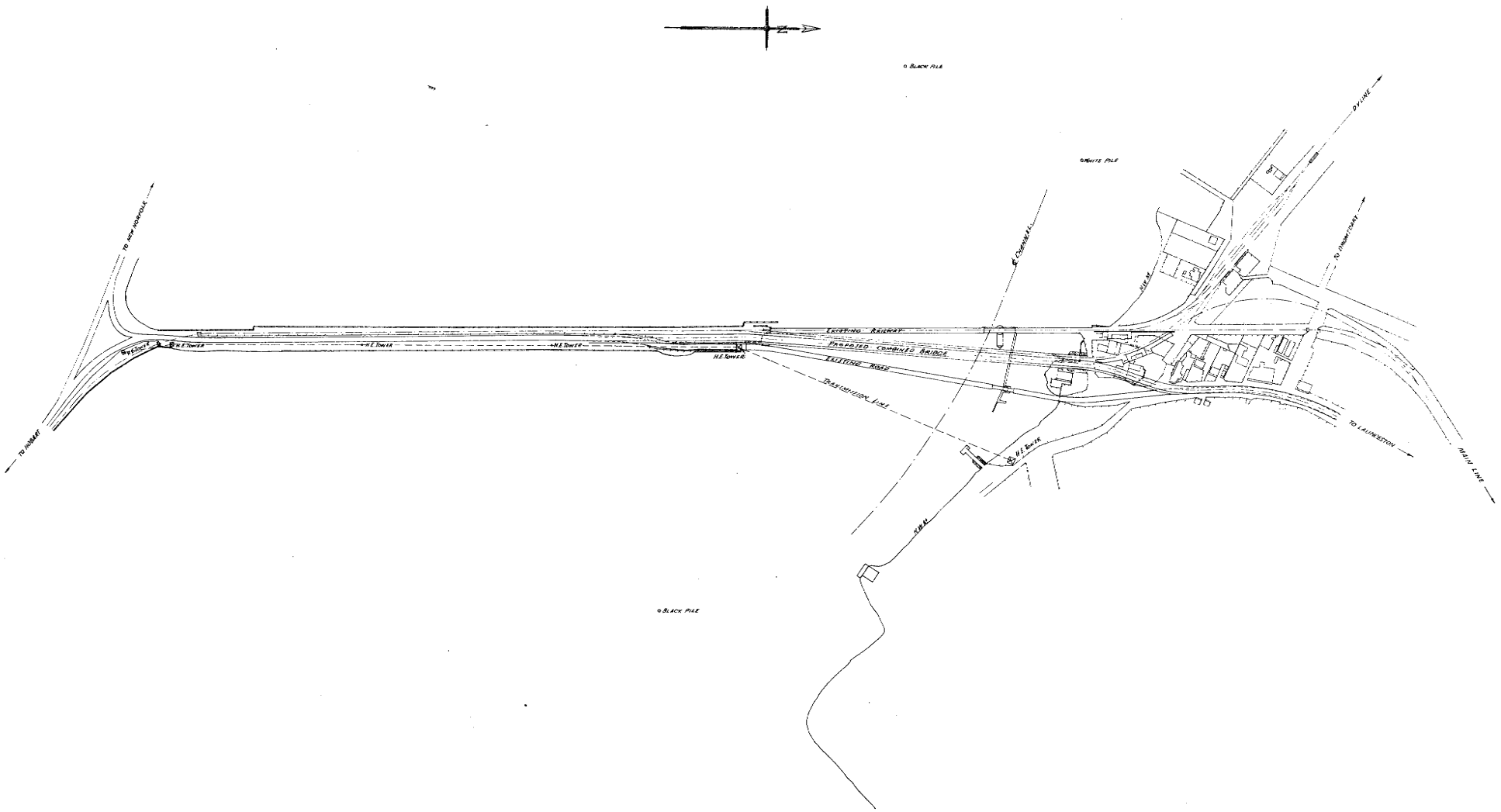
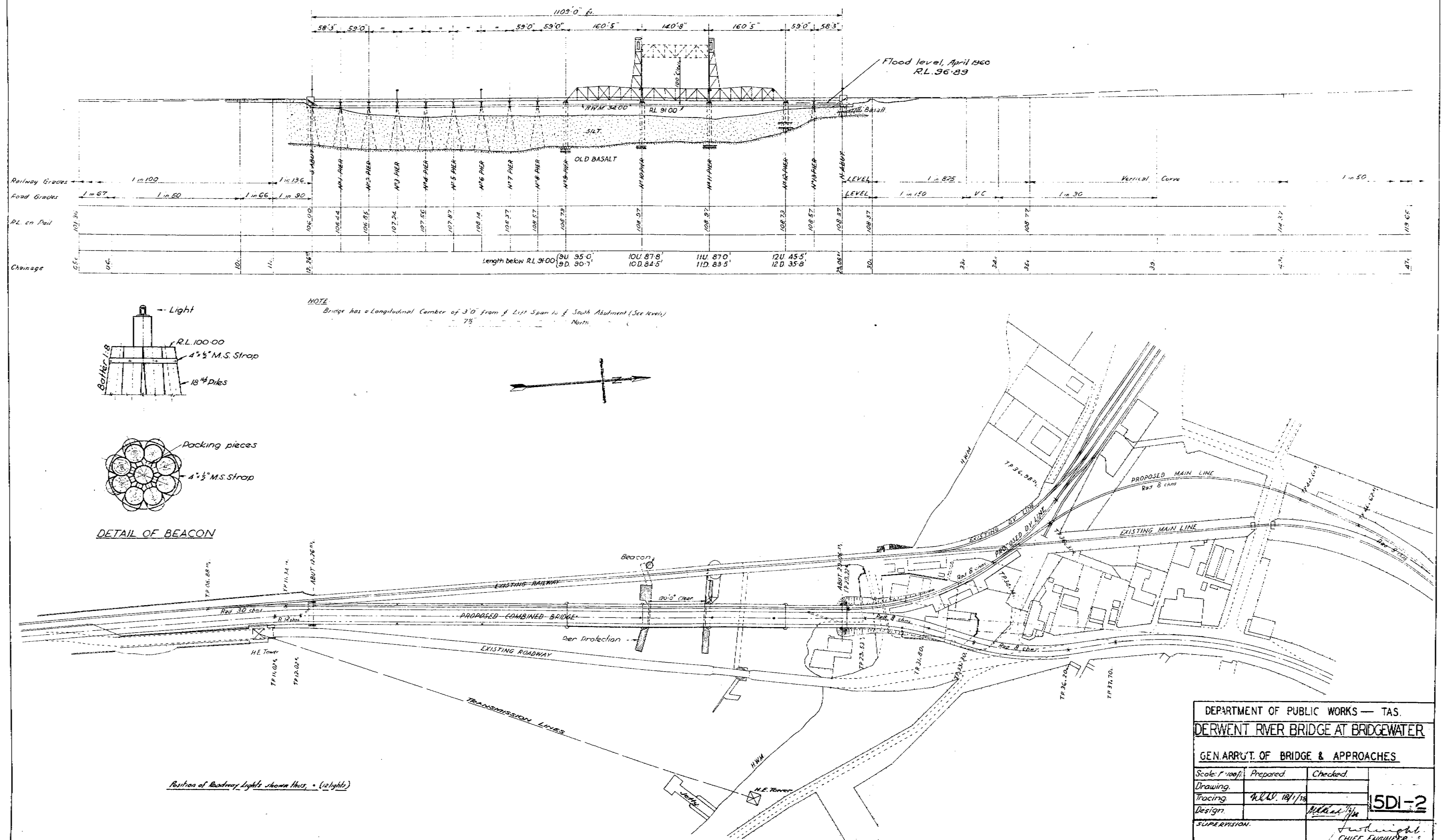


DERWENT RIVER BRIDGE

AT BRIDGEWATER

COMPREHENSIVE LAYOUT OF BRIDGE & APPROACHES

Scale 1" = 200'		Public Works Dept. Tas.	
No. Revisions	Submitted	[illegible]	15D1-1
	Checked	[illegible]	
	Approved	[illegible] DIR. OF PUBLIC WKS.	

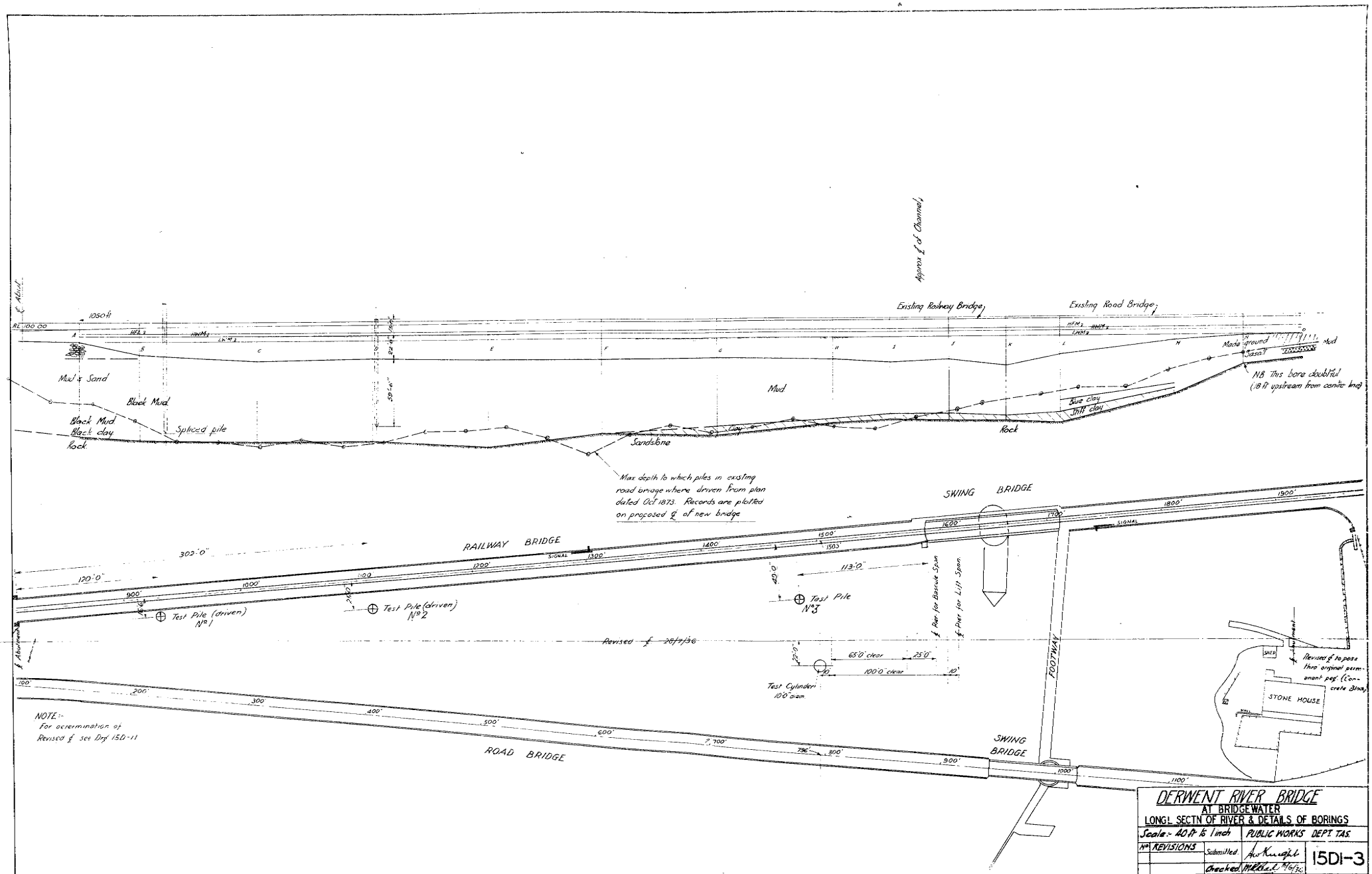


DEPARTMENT OF PUBLIC WORKS — TAS.

DERWENT RIVER BRIDGE AT BRIDGEWATER

GEN. ARR'G'T. OF BRIDGE & APPROACHES

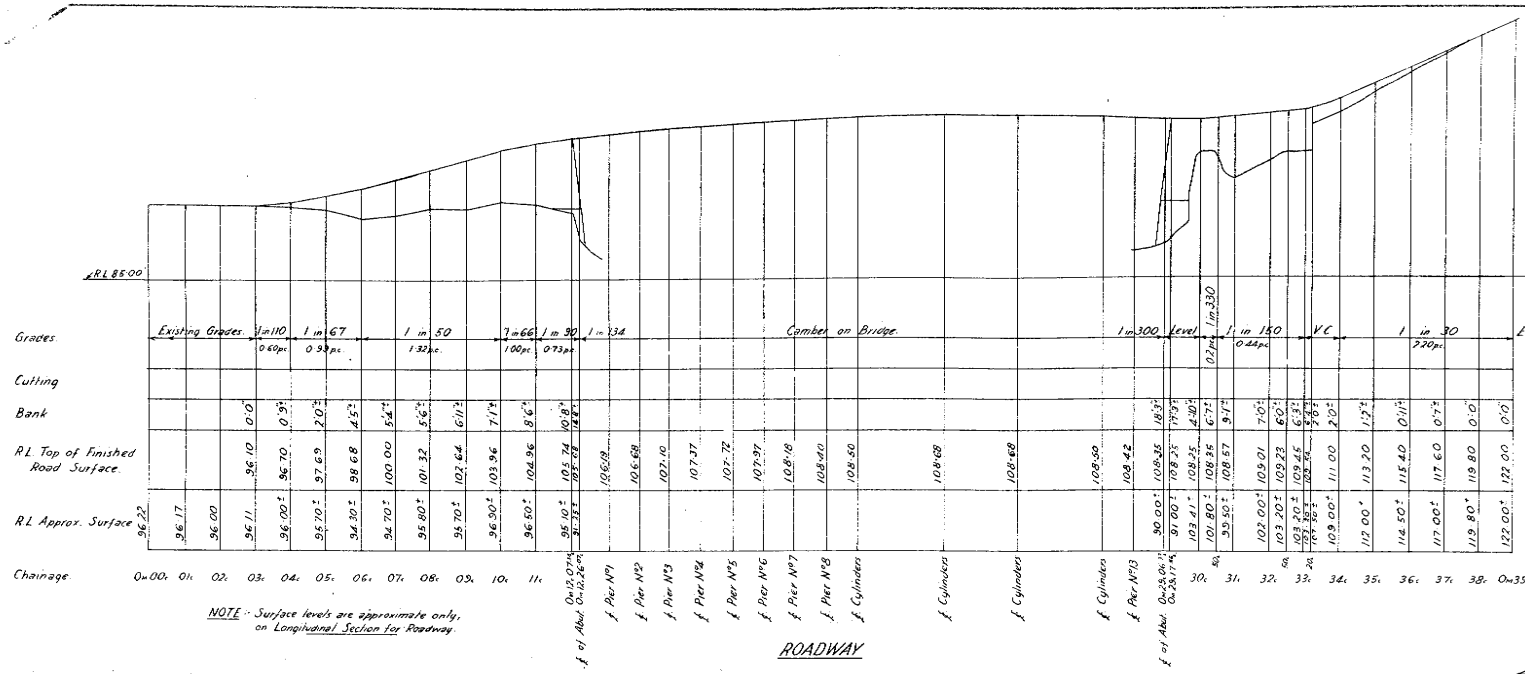
Scale: 1" = 100 ft.	Prepared.	Checked.	
Drawing.			
Tracing.	K.L.W. 18/1/38		15DI-2
Design.			
SUPERVISION.		CHIEF ENGINEER	

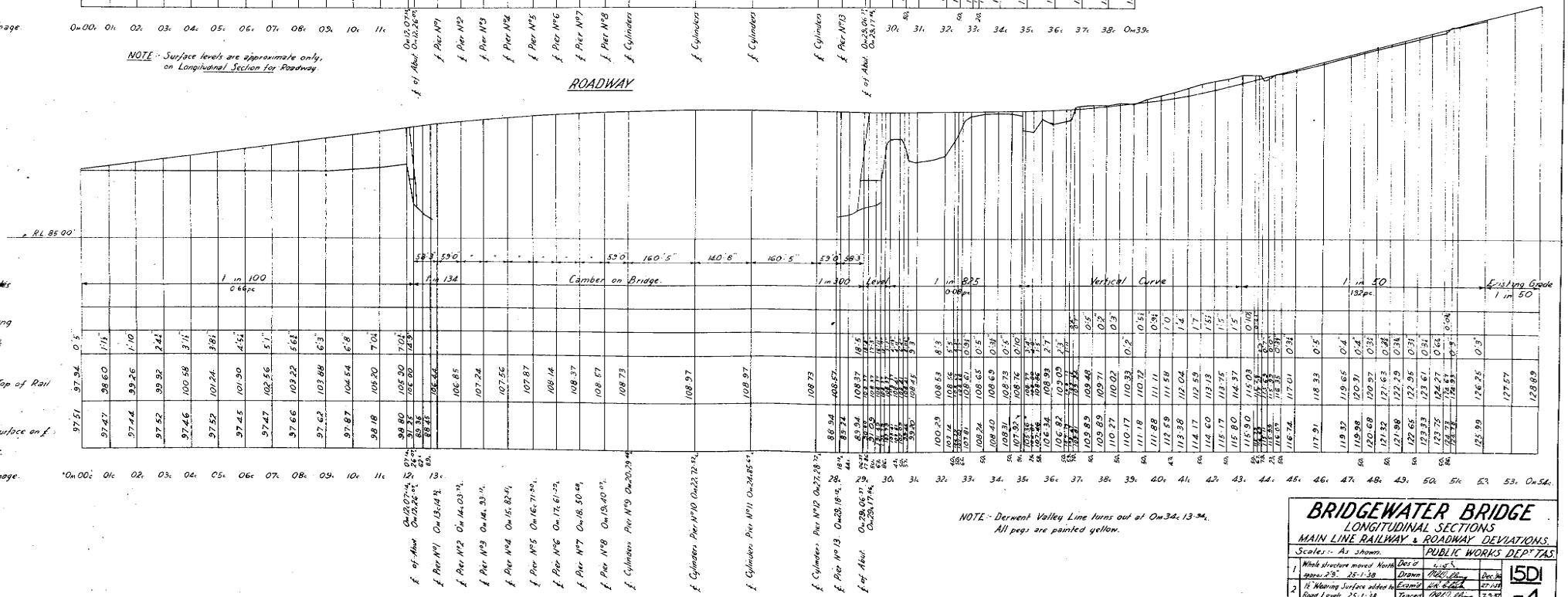


DERWENT RIVER BRIDGE
AT BRIDGEWATER
LONG! SECTN OF RIVER & DETAILS OF BORINGS

Scale:- 40 Ft to 1 inch		PUBLIC WORKS DEPT. TAS.	
No	REVISIONS	Submitted	
		Checked	15DI-3
		Approved.	
		DIR. OF PUB. WKS.	

J.B. 9/8/37





BRIDGEWATER BRIDGE

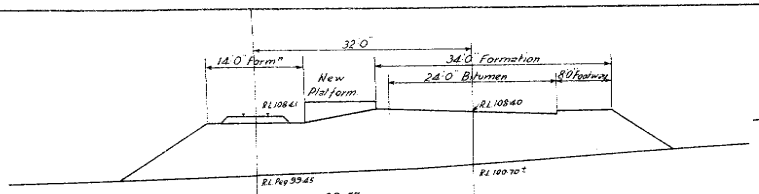
LONGITUDINAL SECTIONS MAIN LINE RAILWAY & ROADWAY DEVIATIONS.

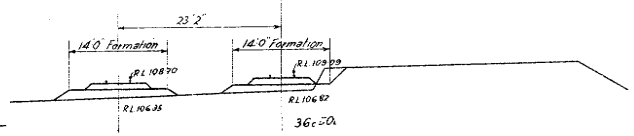
Scales :- As shown. PUBLIC WORKS DEP^T TAS.

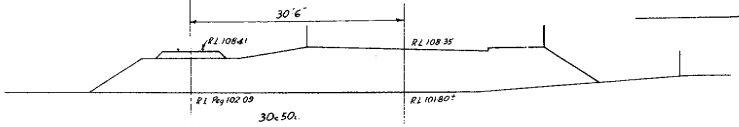
1	Whole structure moved North approx 2·5ft. 28-1-38	Des'd	J.L.S.	
		Drawn	A.R.C. Allen	Dec 36
2	1" Wearing Surface added to Road Levels 25-1-38	Examd	J.L.S.	27-1-37
		Traced	A.R.C. Allen	29-9-37
3	Road Surfaces R.L.'s adjusted	Checks	M.R. Clegg	23-2-38

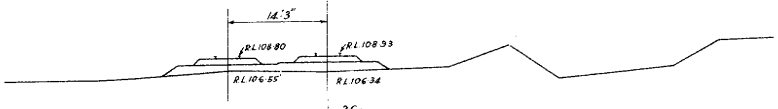
J. L. Sinclair Engr.

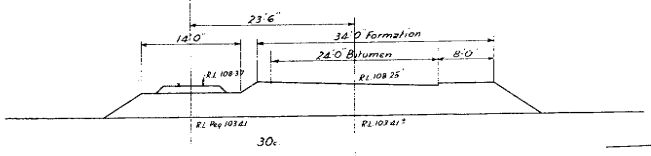
15DI -4

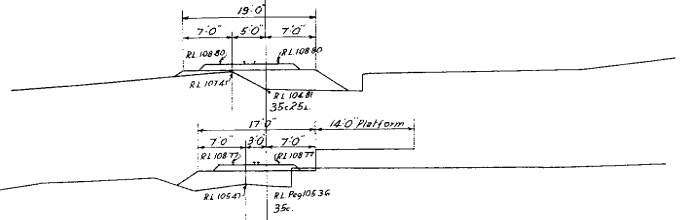




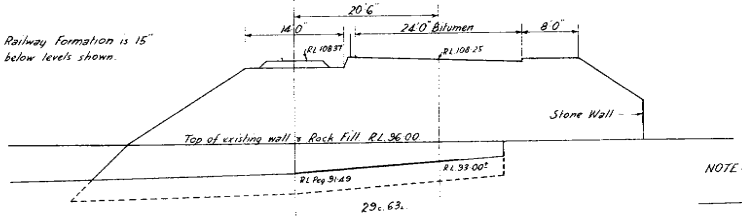




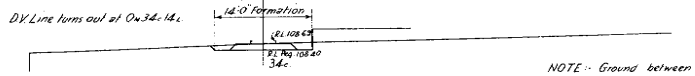




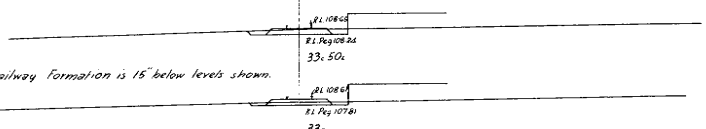
NOTE :- Railway Formation is 15" below levels shown.



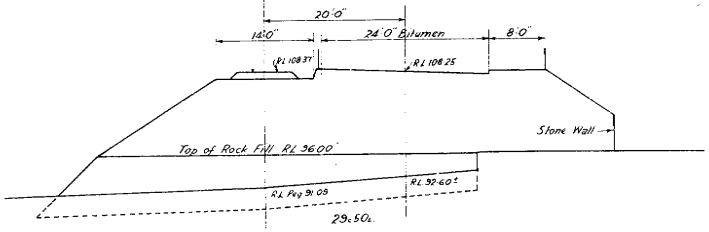
D.V. Line turns out at 0m 34c 14L.

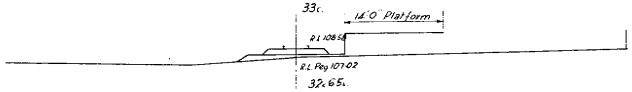


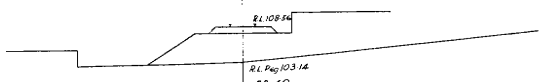
NOTE :- Ground between Station and Roadway is to be levelled off



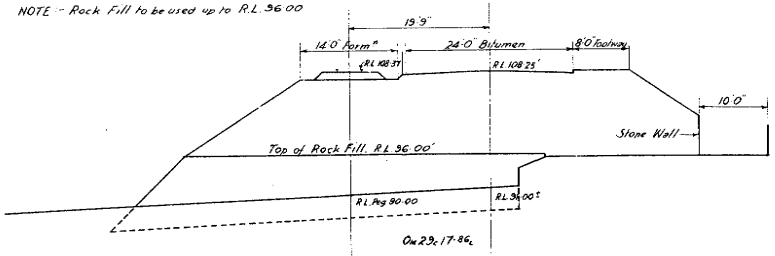
NOTE :- Railway Formation is 15" below levels shown.

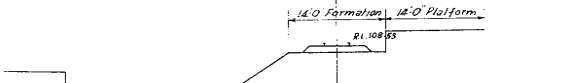


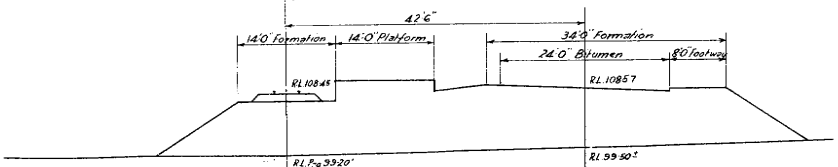




NOTE :- Rock Fill to be used up to R.L. 96.00







BRIDGEWATER BRIDGE

CROSS SECTIONS

NORTHERN APPROACH - M.L. RAILWAY & ROADWAY

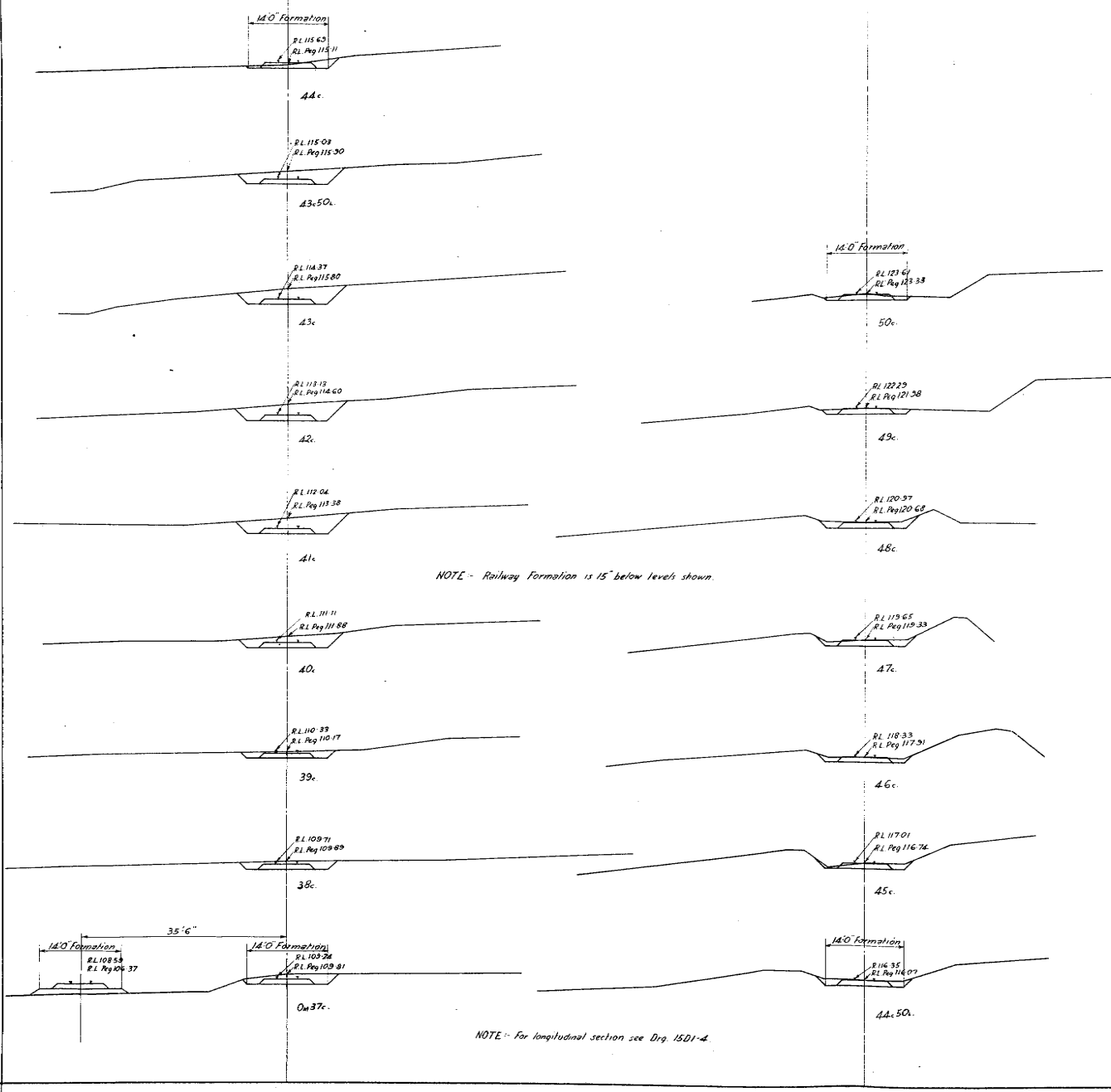
Scale - 10'-1"

PUBLIC WORKS DEPT TAS.

1	& Abutments, etc. 31/1/38	Des'd	[illegible]
		Drawn	[illegible] Dec 36
		Examd	[illegible]
		Traced	[illegible] 9.9.37
		Checkd	[illegible] 8/4/38

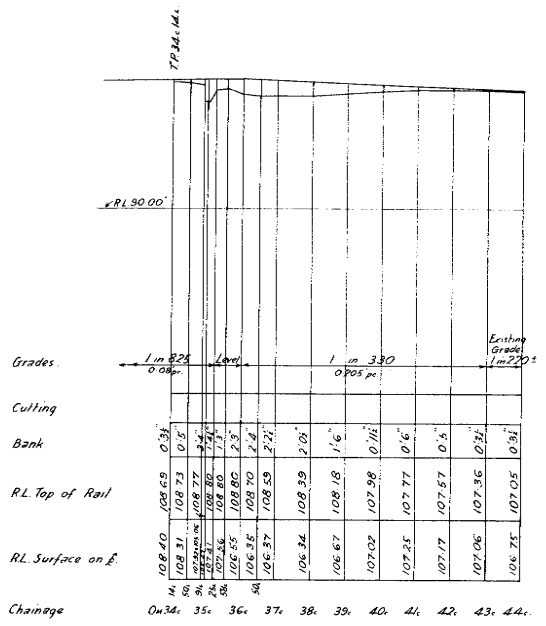
15D1 -6

L.O. Balmelli



LONGITUDINAL SECTION

Scales { Horizontal 2 chns / Vertical 10 ft } to an inch



NOTE :-
Cross sections are approx. level, except as shown included with Main Line cross sections

DERWENT VALLEY LINE

BRIDGEWATER BRIDGE

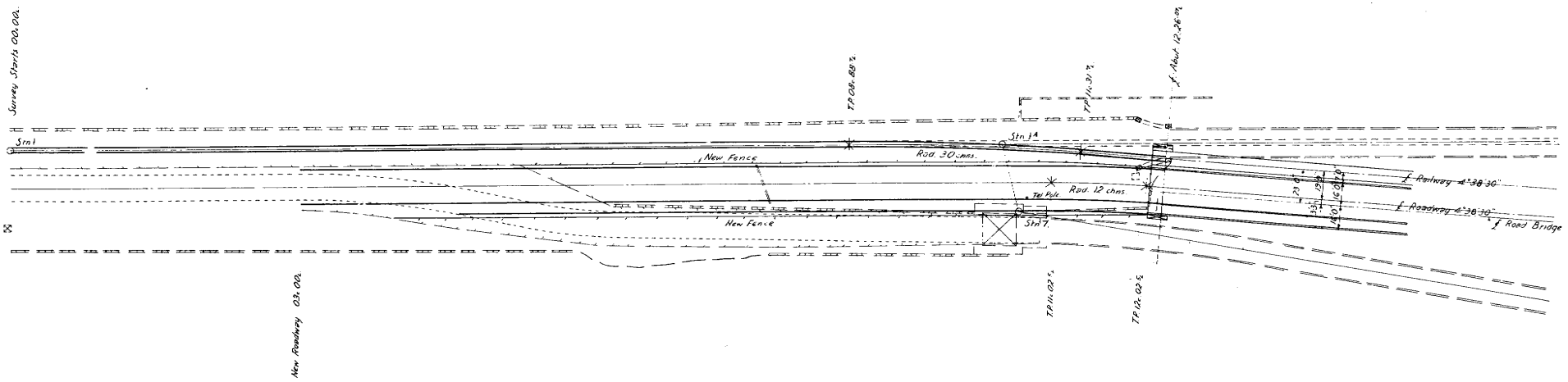
CROSS SECTIONS & LONGITUDINAL SECTION
M.L. RAILWAY & D.V. RAILWAY

Scale :- 10·1"

PUBLIC WORKS DEPT TAS

Des'd	[illegible]		15D1
Drawn	[illegible]	Dec 36	
Examd	[illegible]		-7
Traced	[illegible]	1937	
Checkd	[illegible]	[illegible]	

[illegible]



Fence 23'

Fence 40'

Fence 26' between middle fences

℄ field 1 in 48 batters

2/3/67

DERWENT RIVER BRIDGE

AT BRIDGEWATER

Southern Approach

Scale: 1" = 40'

PUBLIC WORKS DEPT TAS.

No	Revisions
1	℄ Abutment 24/1 ℄ Road Bridge 11/1

Submitted

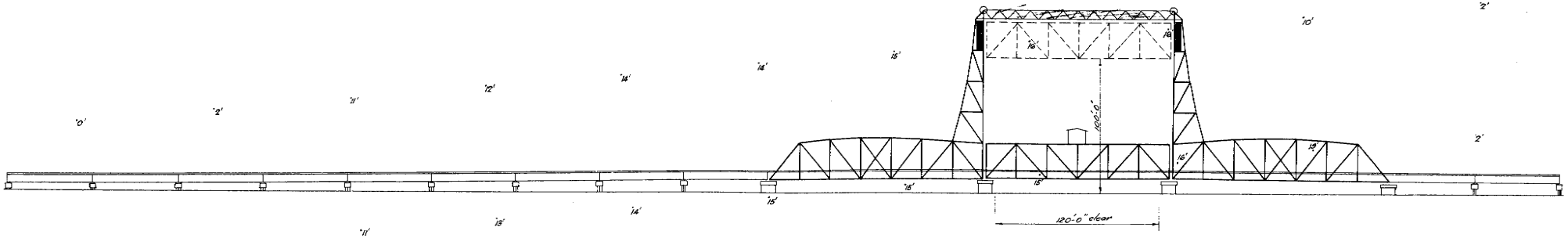
Checked

Approved

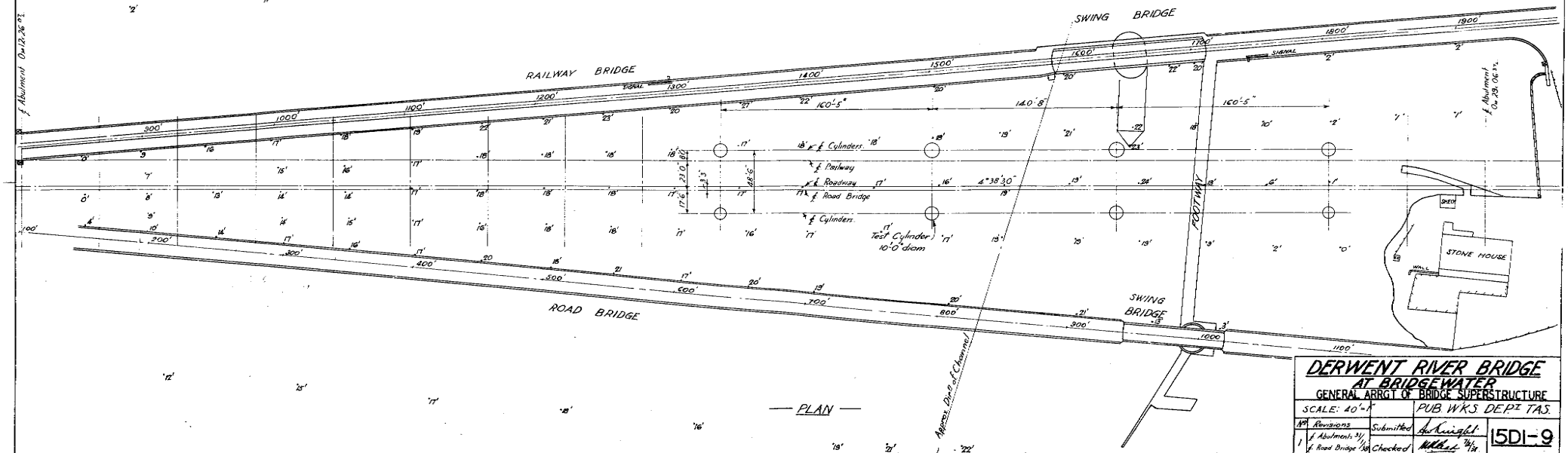
15D1-8

Dir. of Public Works

NOTE: All soundings shown in feet below Low Spring Level tide to correspond with Admiralty soundings taken in the harbour. R.L. Low Spring Level Tide is 88·38'.



—ELEVATION—



—PLAN—

DERWENT RIVER BRIDGE AT BRIDGEWATER

GENERAL ARRGT OF BRIDGE SUPERSTRUCTURE

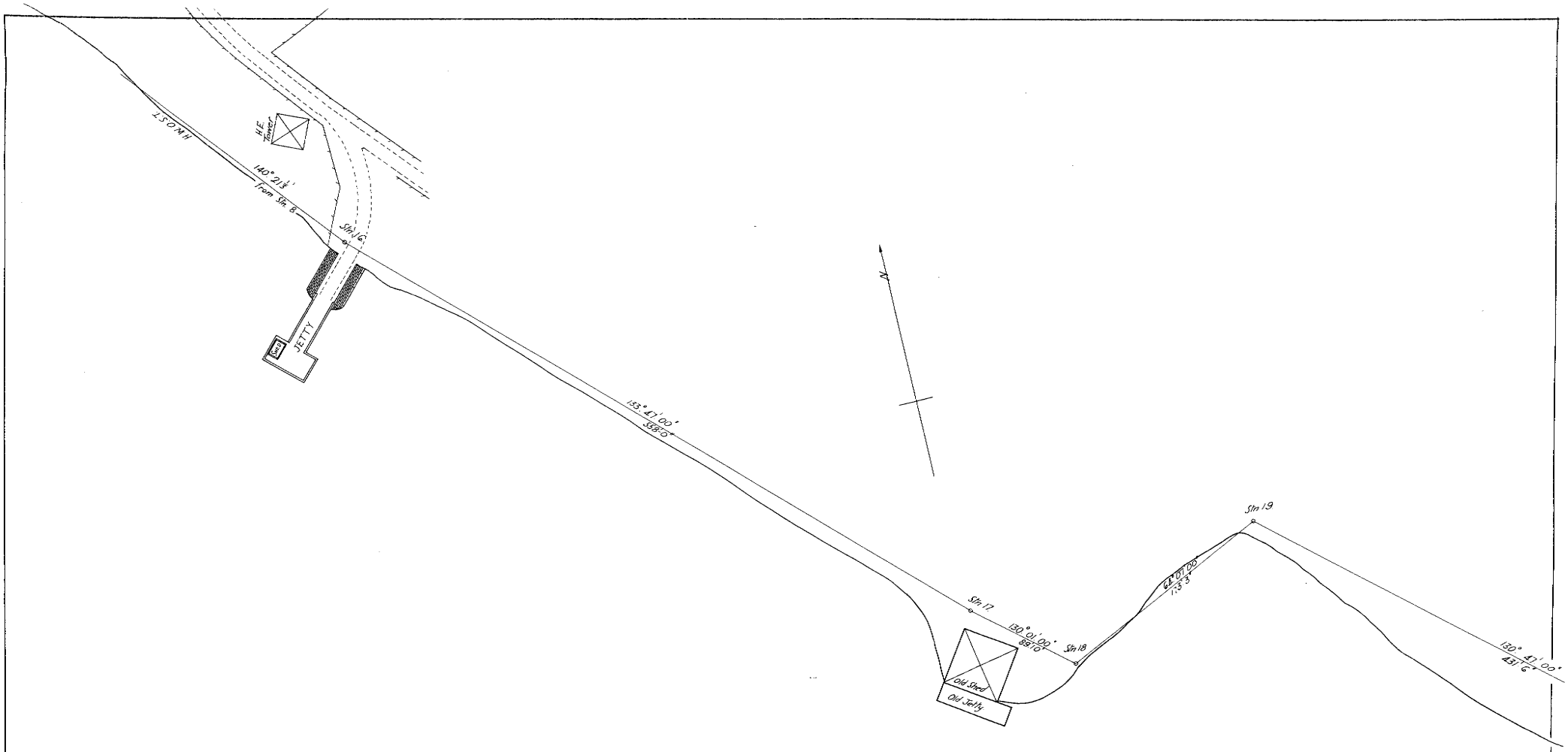
SCALE: 40'=1"

PUB. WKS. DEPT. TAS.

No.	Revisions	Submitted	Checked	Appd
1	℄ Abutments 31/1/58 ℄ Road Bridge 7/8/58	A.J. Knight 7/8/58	W.H.Hall 7/8/58	L.O. Baker Chief Draft. Dep. Pub. Wks.

15DI-9

CRW 7/8/58



DERWENT RIVER BRIDGE AT BRIDGEWATER

DOWNSTREAM FORESHORE ON NORTHERN SIDE.

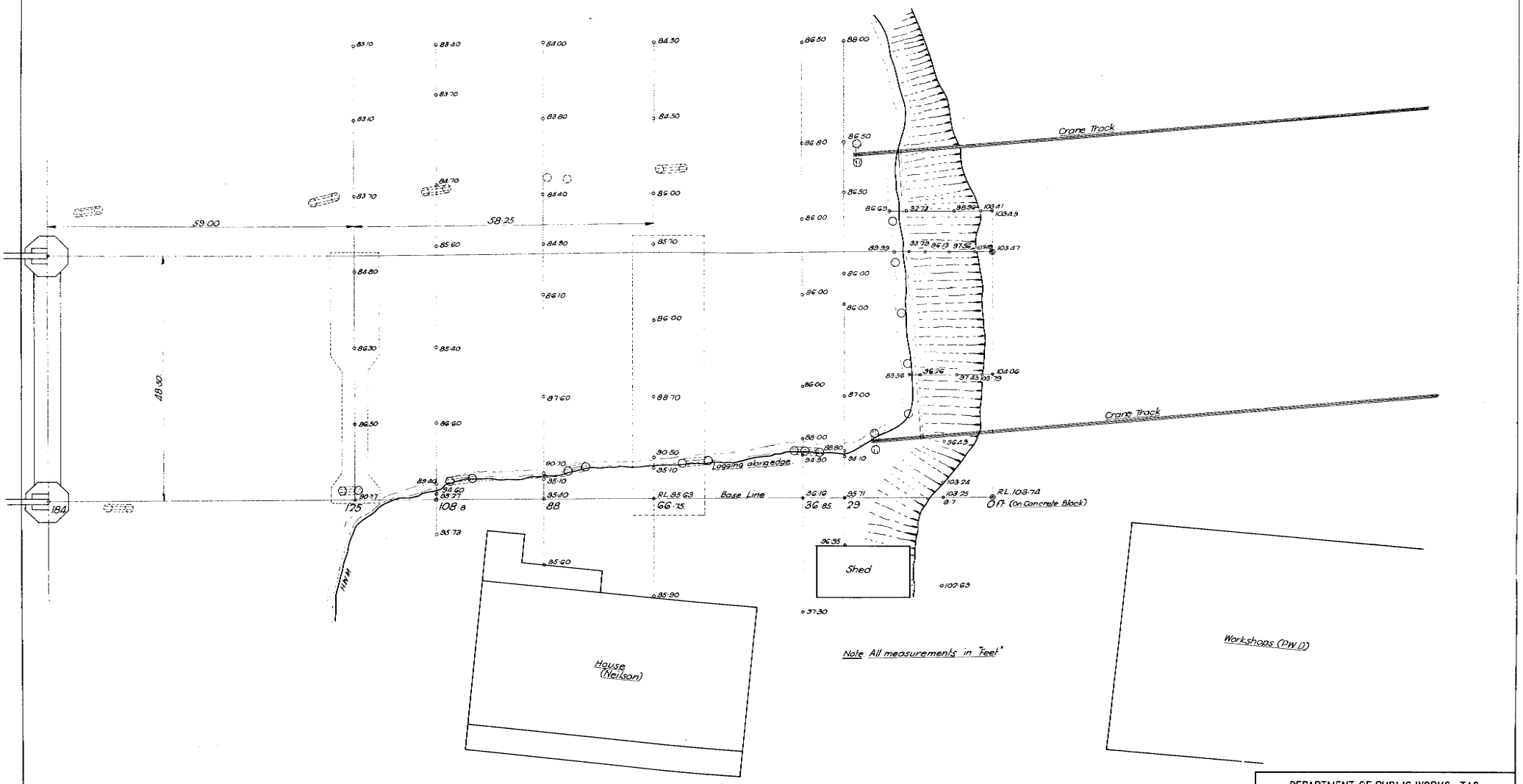
SCALE – 40'–1"

PUBLIC WORKS DEPT

Des'd	Swk.	
Drawn		
Traced	DWU II	4/58
Checked	[illegible]	7/58

15D1 – 11

G. O. Belasjac Asst.



DEPARTMENT OF PUBLIC WORKS – TAS.

DERWENT RIVER BRIDGE

AT BRIDGEWATER

DETAIL OF SOUNDINGS ETC. NORTH ABUT.

Scale 10 4/1"			15D 1
Drawing	Prepared	Checked	-15
Tracing	A.A. Holmes		
Design			
Supervision R.F. Ritchie			Chief Engineer

BRIDGEWATER BRIDGE

D2 - SUBSTRUCTURE

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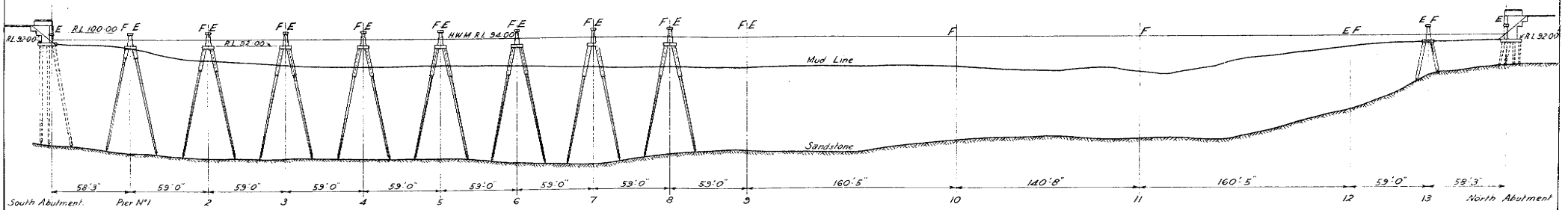
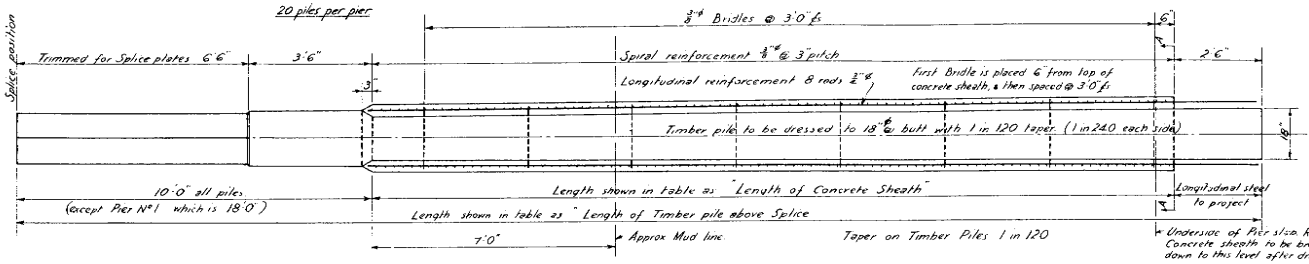
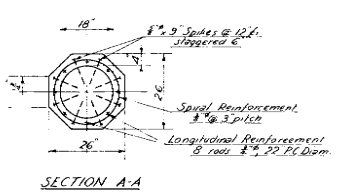


ELEVATION OF PIERS.

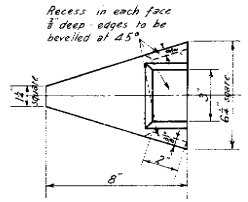
NOTE :- Pier N°13 has R.C. Piles.



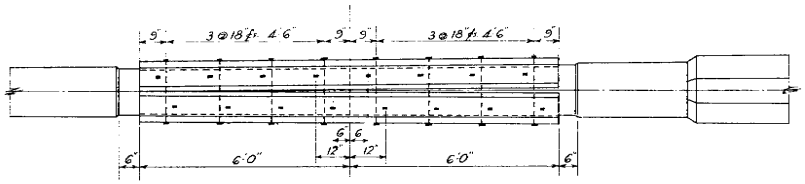
DETAIL OF COMPOSITE PILES.



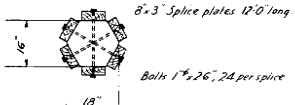
SECTION A-A



CAST STEEL PILE POINT
Make 20



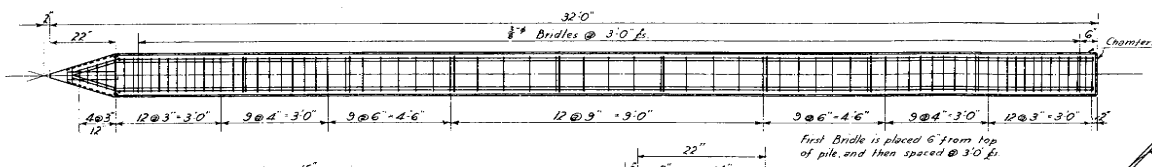
DETAILS OF TIMBER PILE SPLICE

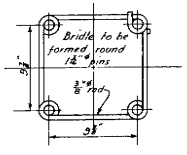


SECTION AT SPLICE

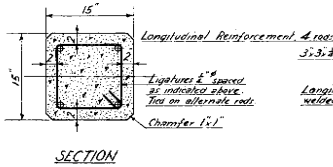
NOTE :- 30 piles in South Abut., 20 piles in each Pier, 36 piles in North Abut.

Pier N°	Approx RL of Pile Toes	Approx RL Lower end Conc Sheath	Length of Timber pile below splice	Length of Timber pile above splice	Total length of Timber piles per Pier	Length of Conc. Sheath	Quantity of Concrete in Sheath per pier	Length of long steel in each pile sheath	Length of Spiral steel in each pile sheath	Total weight of steel in each pier.
SOUTH ABUTMENT	11·50'	-	50'0"	31'6"	2445'	No concrete		-	-	-
1	5·00'	80·00'	57'0"	31'0"	1760'	10'6"	16·0 c yds	8/13'0", ⅝" ø	250'0", ⅜" ø	2·24 tons.
2	3·00'	70·50'	57'6"	32'6"	1800'	20'0"	30·0 "	8/23'0" "	460'0", "	4·00 "
3	2·00'	66·50'	54'6"	36'6"	1820'	24'0"	35·5 "	8/27'0", "	550'0", "	4·75 "
4	1·50'	66·00'	54'6"	37'0"	1830'	24'6"	36·0 "	8/27'0", "	560'0", "	4·78 "
5	+1·00'	66·00'	55'0"	37'0"	1840'	24'6"	36·0 "	8/27'0", "	560'0", "	4 ·78 "
6	-2·00'	66·00'	58'0"	37'0"	1900'	24'6"	36·0 "	8/27'0", "	560'0", "	4 ·78 "
7	-3·00'	64·50'	57'6"	38'6"	1920 '	26'0"	38·4 "	8/29'0", "	590'0", "	5·10 "
8	+3·50'	64·00'	50'6"	39'0"	1790'	26'6"	39·0 "	8/29'0", "	600'0", "	5·12 "
9	Cylinder Piers refer to details on sheet N° 15D2-2&8									
10	"	"	"	"	"	"	"			
11	"	"	"	"	"	"	"			
12	"	"	"	"	"	"	"			
13	59·00'	All piles are concrete					32'0"	35·6 c yds	4/31'3", ½" ø	360'0", ½" ø	4·30 tons.
NORTH ABUTMENT	68·50'	-	22'0"	No Splice	880'	No concrete				

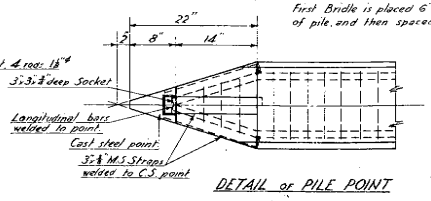




BRIDLES TO PILES PIER N°13
Make 200 Length = 5'7"

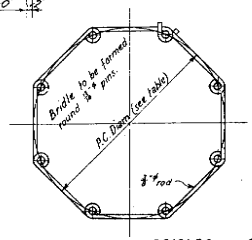


SECTION



DETAIL OF PILE POINT

DETAIL OF R.C. PILES PIER N°13.



BRIDLES TO OCTAGONAL PILES.

N° off	P.C. Diam	Length	Size
160	22"	9'0"	⅜" ø
160	21⅞"	8'11"	⅜" ø
160	21⅞"	8'10"	⅜" ø
140	21⅞"	8'9"	⅜" ø
140	20⅞"	8'8"	⅜" ø
140	20⅞"	8'7"	⅜" ø
140	20⅞"	8'6"	⅜" ø
120	19⅝"	8'5"	⅜" ø
40	19⅝"	8'4"	⅜" ø

DERWENT RIVER BRIDGE
AT BRIDGEWATER (Concrete and composite)
DETAILS OF PILES IN PIERS

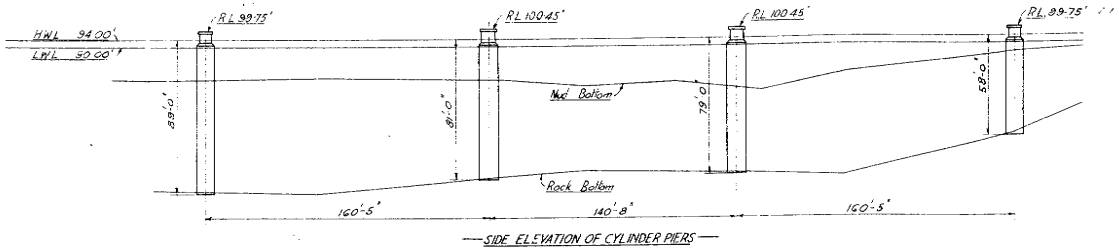
Scales :- ½" & 1" = 1'0" & 40'0" 1

PUBLIC WORKS DEPT TAS

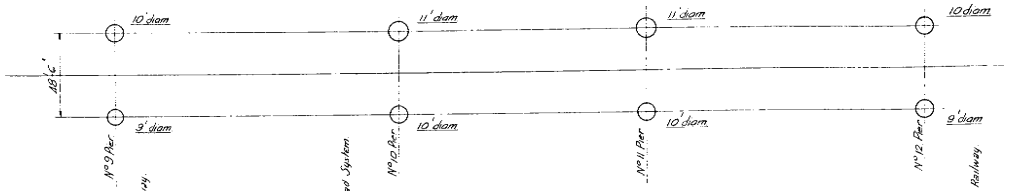
N°	Revisions		Design		
1	Bridle details	12/1/38	Drawn	R.A.M.	
2	Length of Piles	31/1/38	Traced		
3	Splice detail	6/6/38	Checked		2-11-38 6/6/38

15D2

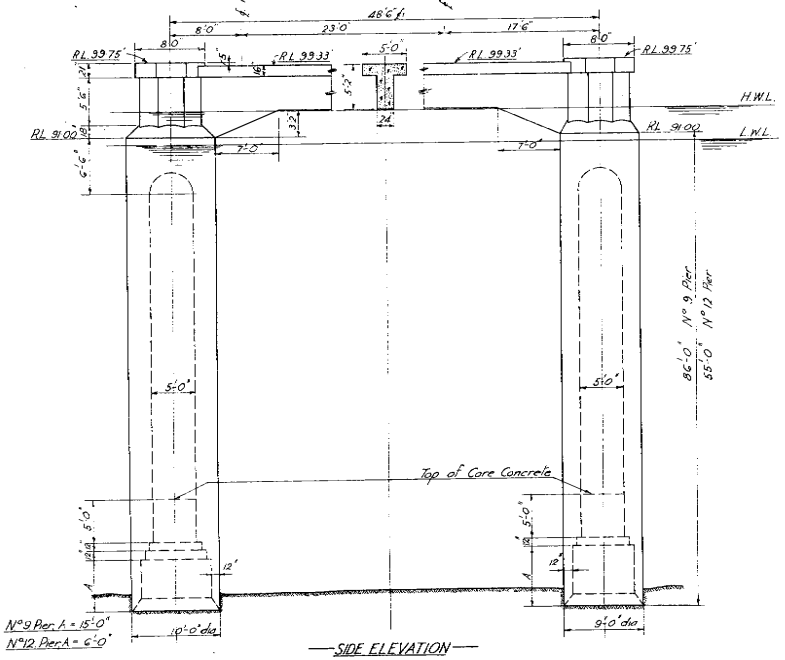
-1-



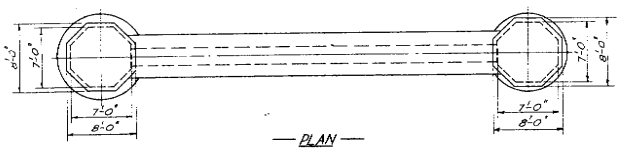
— SIDE ELEVATION OF CYLINDER PIERS —



— PLAN OF CYLINDER PIERS —

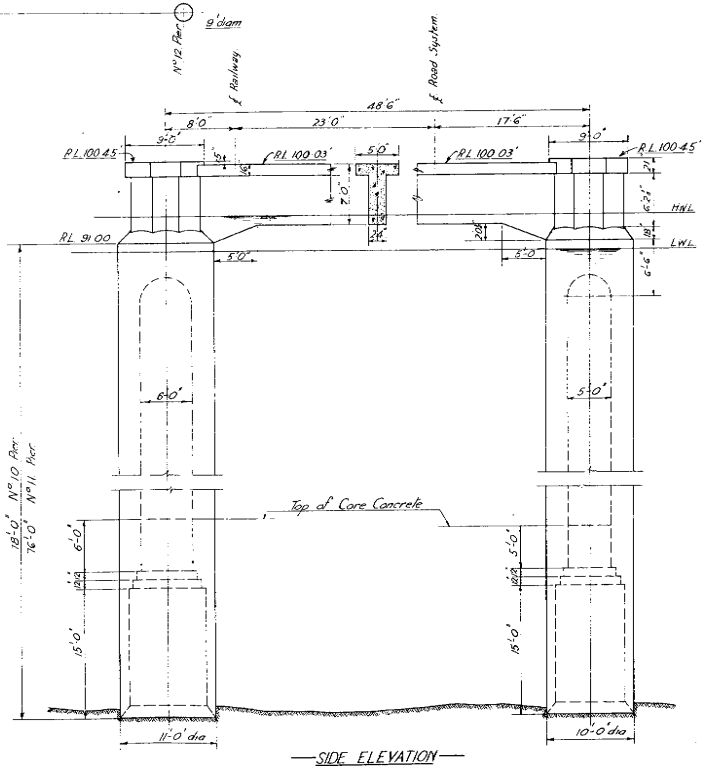


— SIDE ELEVATION —

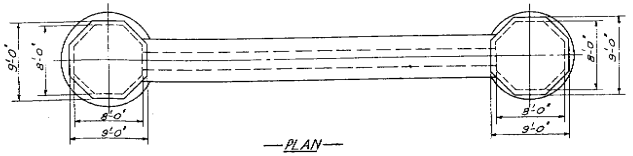


— PLAN —

— PIERS 9 & 12 —



— SIDE ELEVATION —



— PLAN —

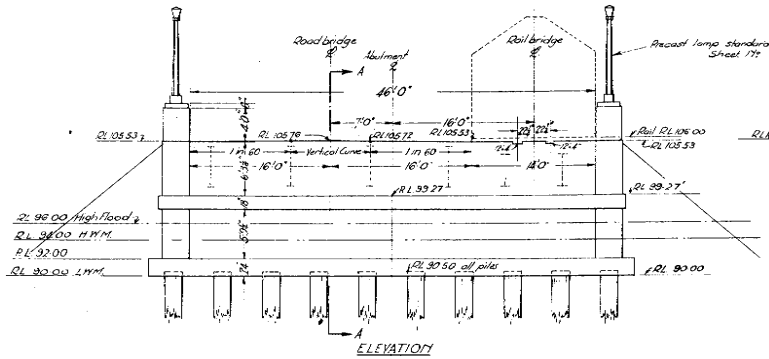
— PIERS 10 & 11 —

Reference
Cylinder reinforcement see Drg 15D2-8
Cross beams ... 15D2-7

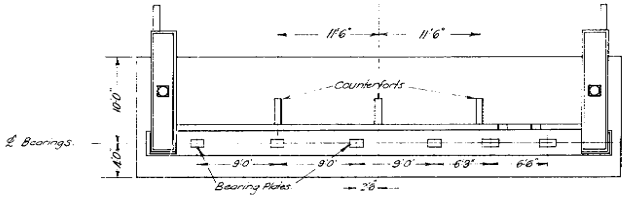
DERWENT RIVER BRIDGE
AT BRIDGEWATER
CYLINDER PIERS (GEN. ARRGT.)

SCALES: 40'-1" & 8'-1"-0" | PUBLIC WORKS DEPT TAS

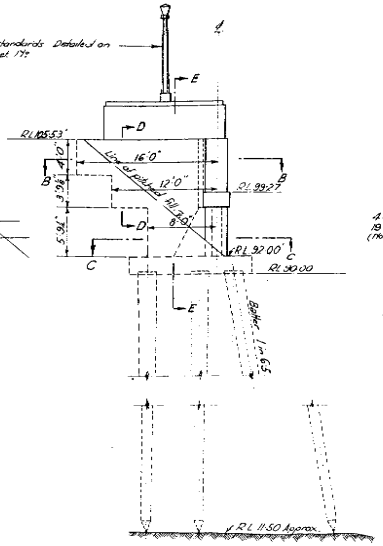
Desd			15D2
Drawn			
Exam'd			-2
Traced	CRW	1961	
Checkd			



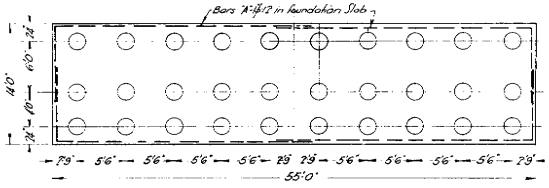
ELEVATION



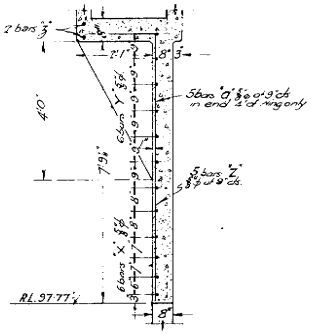
PLAN



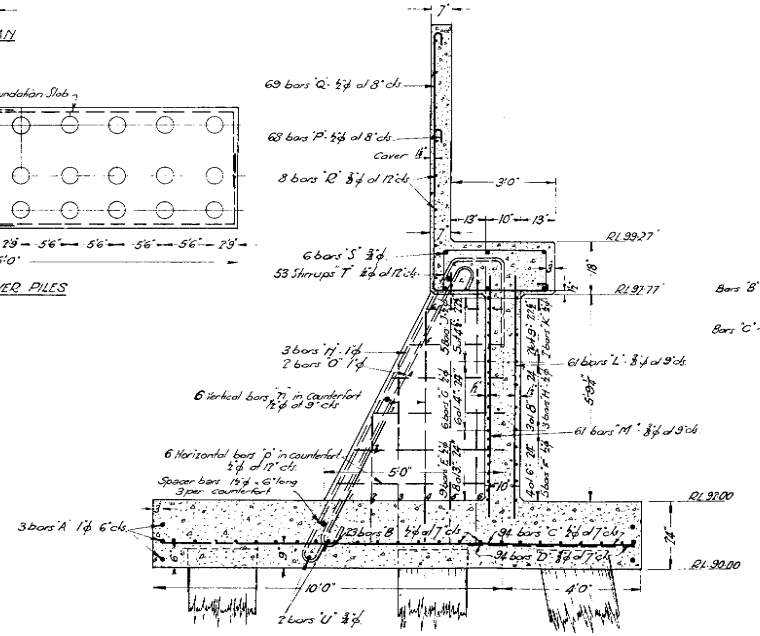
SIDE ELEVATION



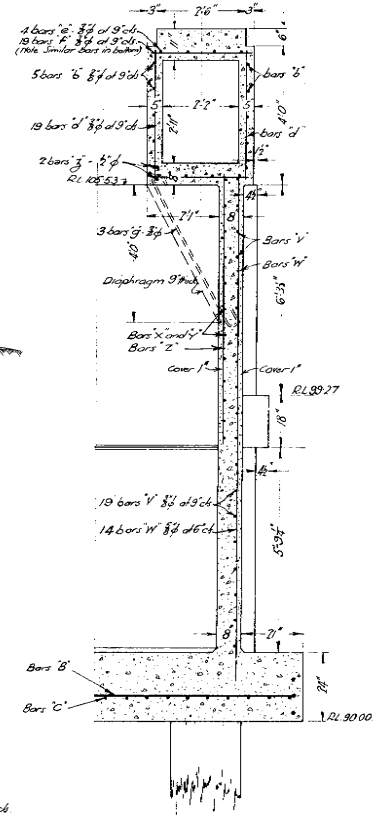
PLAN OVER PILES



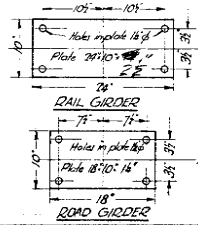
SECTION D-D.



SECTION A-A

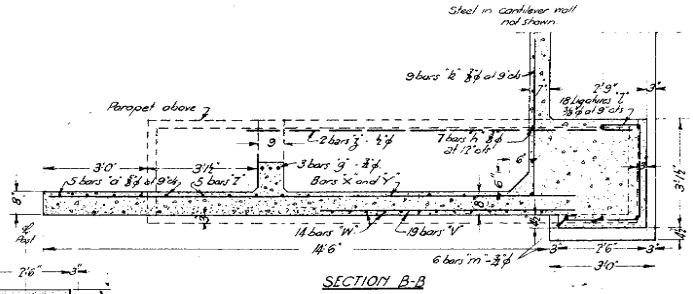


SECTION E-E

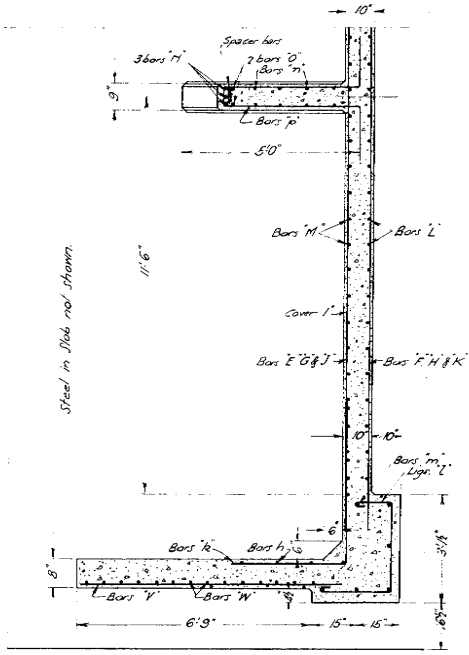


DETAILS OF BEARING PLATES AND BOLT CENTRES
Scale 1½"

Holding down bolts for plates are 1"ϕ.



SECTION B-B



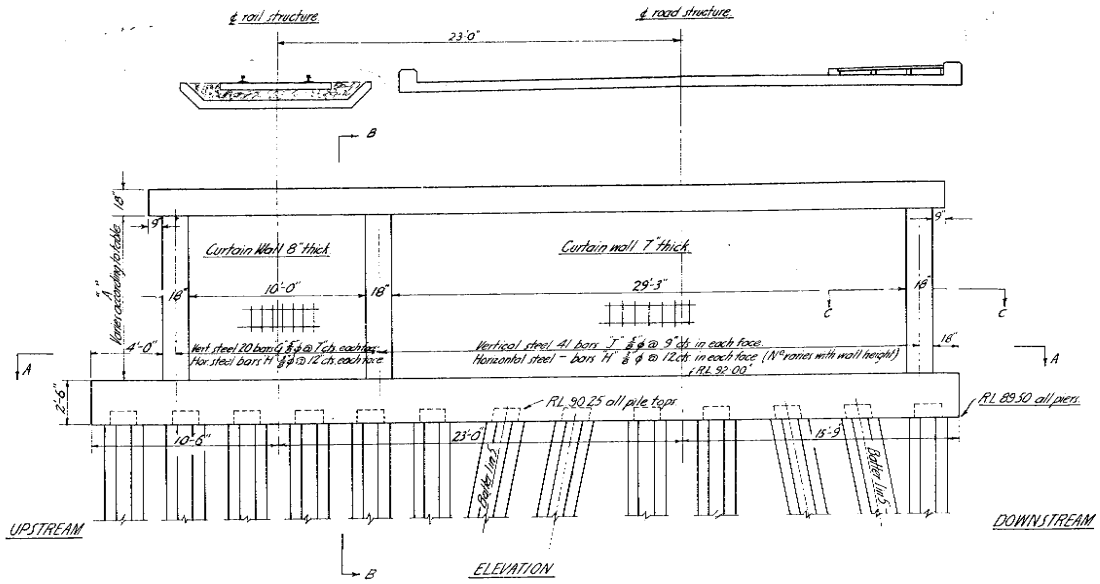
SECTION C-C

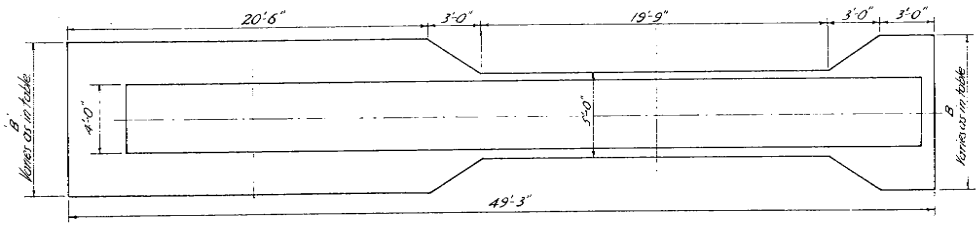
DERWENT RIVER BRIDGE. AT BRIDGEWATER DETAILS OF SOUTH ABUTMENT.

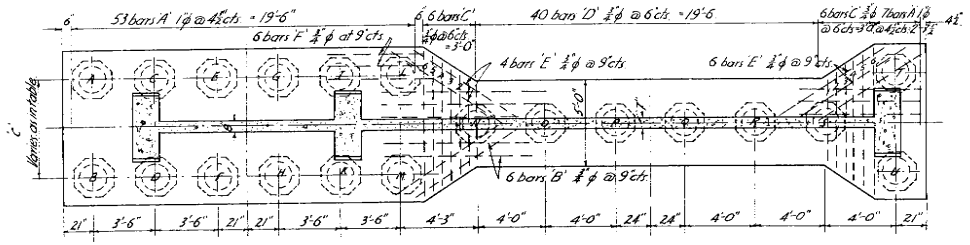
SCALES ½" and ¼" to 1 Foot PUBLIC WORKS DEPT-TAS.

Designed	[illegible]		15D2
Drawn	[illegible]		
Examined	[illegible]		-3
Traced	[illegible]	5/62	
Checked	[illegible]	9/62	

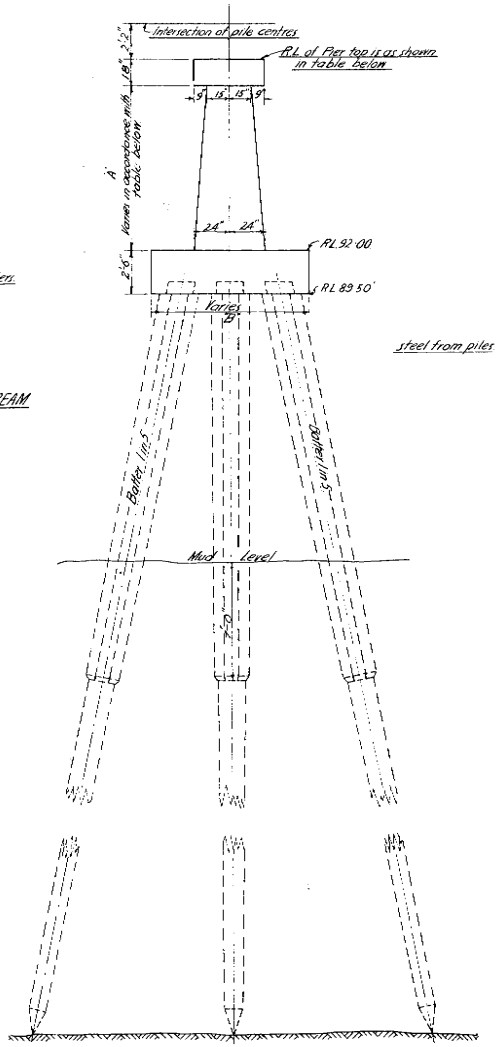
[illegible]
Engineer

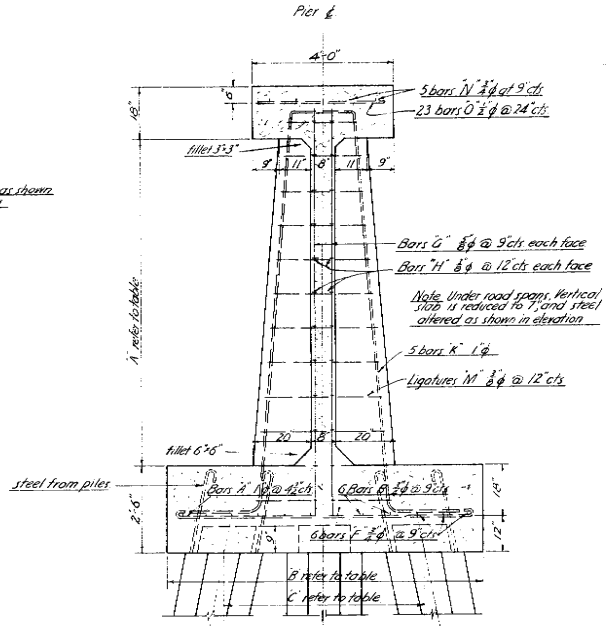


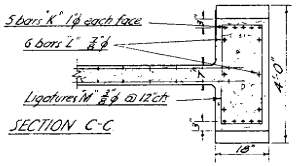




Note Piles 'A-M' inclusive and 'T' and 'U' are driven with a rake of 1 in 5 in direction of bridge ℄
Piles 'N', 'O', 'R' and 'S' are driven with a rake of 1 in 5 in direction at right angles to bridge ℄
Piles P and Q are ~~driven vertical~~







Pier N°	Reduced Level Top of Pier	Height of Curtain Wall 'A'	Width of Base Slab 'B'	Centres of Pile Tops 'C'
1	99·71'	6'-2⅞"	8'-6"	5'-3"
2	100·12'	6'-7⅝"	8'-7"	5'-5"
3	100·51'	7'-0⅜"	8'-9"	5'-6¾"
4	100·83'	7'-4"	8'-11"	5'-8¼"
5	101·14'	7'-7⅛"	9'-0"	5'-9¾"
6	101·41'	7'-10⅛"	9'-1"	5'-11"
7	101·64'	8'-1⅛"	9'-2½"	6'-0"
8	101·84'	8'-4⅛"	9'-4"	6'-1"
13	101·84'	8'-4⅛"	9'-4"	6'-1"

DERWENT RIVER BRIDGE
AT BRIDGEWATER
GENERAL ARRANGEMENT OF PIERS N°S 1 TO 8 & 13
SCALES ℄ & ½ inches = 1 foot.
PUBLIC WORKS DEPARTMENT TAS
1) Pier Footings raised 2·0
DES'D
DRAWN
E.I. AND
TRACED 24·7·64
CHECKED
15D2
-5

STEEL LIST FOR SOUTH ABUTMENT DRG. 15D2-3

Mark	N°off	Length	Size	Order List N°off	Order List Length	Weight	Shape	Remarks
AS	12	38'-0	1"ϕ	12	20'	627 lbs 377 "	See detail	To outside of footing
BS	23	54'-0	½"ϕ	69	18'	829 lbs.	Straight welded	Longitudinals in footing
CS	94	13'-6	½"ϕ	94	14'	879 "	Straight	Transverse in footing
DS	94	5'-0	⅜"ϕ	24	20'	180 "	"	" (toe)
ES	9	48'-0	½"ϕ	27	16'	288 "	Straight welded	Horizontals in back of abut wall (bottom)
FS	5	48'-0	½"ϕ	15	16'	160 "	" "	" front " " "
GS	6	48'-0	½"ϕ	18	16'	192 "	" "	" back " " (middle)
HS	3	48'-0	½"ϕ	9	16'	96 "	" "	" front " " "
JS	5	48'-0	½"ϕ	15	16'	160 "	" "	" back " " (top)
KS	2	48'-0	½"ϕ	6	16'	64 "	" "	" front " " "
LS	61	7'-0	⅜"ϕ	31	14'	163 "	Straight	Verticals " " "
MS	61	7'-0	⅜"ϕ	31	14'	163 "	"	Verticals " back " "
NS	9	14'-6	1"ϕ	9	16'	384 "	See detail	Bars in counterfort & " "
OS	6	10'-6	1"ϕ	6	12'	192 "	8'-6	" " "
PS	68	8'-9	1"ϕ	34	18'	409 "	See detail	Verticals in curtain wall & transverse in cap
QS	69	11'-9	1"ϕ	69	12'	553 "	"	" " " " " "
RS	8	50'-0	⅝"ϕ	20	20'	150 "	Straight welded	Horizontals " "
SS	6	52'-0	⅝"ϕ	12 6	20' 12'	180 " 108 "	" "	Longitudinals in cap
TS	53	9'-0	½"ϕ	27	18'	81 "	See detail	Ligatures " "
US	6	6'-0	⅜"ϕ	2	18'	54 "	Straight	Spacer bars in footing to 'N' & 'O' bars
VS	38	7'-6	⅜"ϕ	19	16'	114 "	"	Horizontals in wing walls (outside face)
WS	28	14'-6	⅝"ϕ	28	16'	467 "	"	Verticals " " "
XS	12	11'-0	⅜"ϕ	12	12'	150 "	"	Horizontals " " " (inside face)
YS	12	15'-0	⅝"ϕ	12	16'	200 "	"	" " " " "
ZS	10	9'-6	⅜"ϕ	5	20'	104 "	See detail	Verticals " " " " "
aS	10	4'-0	⅜"ϕ	2	20'	42 "	Straight	" " " " "
bS	20	13'-6	⅜"ϕ	20	14'	105 "	"	Horizontals " pylons (sides)
dS	76	3'-6	⅜"ϕ	19	14'	100 "	"	Verticals " " "
eS	16	13'-6	⅜"ϕ	16	14'	84 "	"	Longitudinals " " top & bottom
fS	76	2'-9	⅜"ϕ	11	20'	83 "	"	Transverse " " " "
gS	6	6'-0	¾"ϕ	2	18'	54 "	4'-6	Bars " haunch under pylons
hS	28	7'-0	⅜"ϕ	14	14'	74 "	Straight	Verticals in wing walls etc. See sections BB & CC
kS	36	6'-6	⅜"ϕ	12	20'	90 "	See detail	Horizontals " " " " " " "
lS	36	6'-9	⅜"ϕ	18	14'	94 "	"	Ligatures in columns
mS	12	14'-0	⅜"ϕ	12	14'	252 "	Straight	Verticals " "
nS	36	3'-9 to 9'-9	½"ϕ	11	20'	147 "	"	Verticals in counterforts
pS	18	15'-1 to 10'-1	½"ϕ	3 6 9	16' 14' 12'	32 " 56 " 72 "	See detail	Ligatures " "
sS	4	11'-0	½"ϕ	4	12'	32 "	Straight	Longitudinals in bottom of pylons (inside)
	9	0'-8	1¼"ϕ	1	6'	25 "	"	Spacers to bars in counterforts

TOTAL WEIGHT IN SOUTHERN ABUTMENT 9060 LBS. = 4.04 TONS

STEEL LIST FOR NORTH ABUTMENT DRG. 15D2-4

Mark	N°off	Length	Size	Order List N°off	Order List Length	Weight	Shape	Remarks
AN	12	38'-0	1"ϕ	12	20'	941 lbs 377 "	See detail	To outside of footing
BN	23	54'-0	½"ϕ	69	18'	829 "	Straight welded	Longitudinals in footing
CN	94	13'-6	½"ϕ	94	14'	879 "	Straight	Transverse in footing
DN	94	5'-0	⅜"ϕ	24	20'	180 "	"	" " " (toe)
GN	9	48'-0	½"ϕ	27	16'	289 "	Straight welded	Horizontals in back of abut wall (bottom)
HN	5	48'-0	½"ϕ	15	16'	160 "	" "	" " front " " "
JN	8	48'-0	½"ϕ	24	16'	256 "	" "	" " back " " " (middle)
KN	4	48'-0	½"ϕ	12	16'	128 "	" "	" " front " " "
LN	61	9'-0	⅜"ϕ	32	18'	217 "	" "	Verticals " " "
MN	61	9'-0	⅜"ϕ	32	18'	217 "	Straight	" " back " " "
NN	12	16'-4	1"ϕ	12	18'	730 "	See detail	Bars in counterfort & " "
ON	12	12'-6	1"ϕ	12	14'	449 "	10'-6	" " "
PN	68	8'-9	1"ϕ	34	18'	409 "	See detail	Verticals in curtain walls & transverse in cap
QN	69	11'-9	1"ϕ	69	12'	553 "	"	" " " " " "
RN	8	50'-0	⅝"ϕ	20	20'	150 "	Straight welded	Horizontals " "
SN	6	52'-0	⅝"ϕ	12 6	20' 12'	300 " 108 "	" "	Longitudinals in cap
TN	53	9'-0	½"ϕ	27	18'	81 "	See detail	Ligatures " "
UN	6	6'-0	⅜"ϕ	3	12'	54 "	Straight	Spacer bars in footing to N & O bars
VN	44	7'-6	⅜"ϕ	22	16'	132 "	"	Horizontals in wing wall (outside face)
WN	38	17'-0	⅝"ϕ	38	18'	713 "	"	Verticals " " " " "
XN	12	11'-0	⅜"ϕ	12	12'	150 "	"	Horizontals " " " (inside face)
YN	12	15'-0	⅝"ϕ	12	16'	200 "	"	" " " " "
ZN	10	9'-6	⅜"ϕ	5	20'	104 "	See detail	Vertical " " " " "
aN	10	4'-0	⅜"ϕ	2	20'	42 "	Straight	" " " " "
bN	20	13'-6	⅜"ϕ	20	14'	105 "	"	Horizontals in wing pylons (sides)
dN	76	3'-6	⅜"ϕ	19	14'	100 "	"	Verticals " " "
eN	16	13'-6	⅜"ϕ	16	14'	84 "	"	Longitudinals " " (top & bottom)
fN	76	2'-9	⅜"ϕ	11	20'	83 "	"	Transverse " " " "
gN	6	6'-0	¾"ϕ	2	18'	54 "	4'-6	Bars in haunch under pylons
hN	14 14	7'-0 9'-0	⅜"ϕ	14	16'	84 "	Straight	Verticals in wing walls (see sections BB & CC)
kN	40	6'-6	⅜"ϕ	20	14'	105 "	See detail	Horizontals " " " (" " " ")
lN	40	6'-9	⅜"ϕ	20	14'	105 "	"	Ligatures in columns
mN	12	17'-0	¾"ϕ	12	18'	324 "	Straight	Verticals " "
nN	48	3'-9 to 9'-9	½"ϕ	16	20'	214 "	"	Verticals in counterforts
pN	30	16'-10 to 10'-1	½"ϕ	6 9 9	18' 16' 12'	72 " 96 " 72 "	See detail	Ligatures " "
rN	6	48'-0	½"ϕ	18	16'	192 "	Straight welded	Horizontals in back of abut wall (middle)
tN	3	48'-0	½"ϕ	9	16'	96 "	" "	" " front " " "
wN	6	48'-0	½"ϕ	18	16'	192 "	" "	" " back " " (top)
yN	3	48'-0	½"ϕ	9	16'	96 "	" "	" " front " " (top)
zN	4	11'-0	½"ϕ	4	12'	32 "	Straight	Longitudinals in bottom of pylons (inside)
	12	1'-0	1¼"ϕ	1	12'	49 "	"	Spacers to bars in counterforts

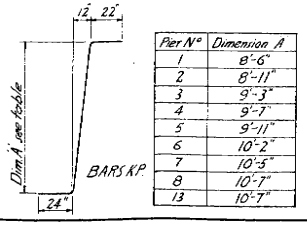
TOTAL WEIGHT, NORTHERN ABUTMENT, 9815 LBS. = 4.38 TONS.

STEEL LIST FOR PIERS NOS. 1 TO 8 AND 13 DRG. 15D2-5

Mark	N°off	Length	Size	Order List N°off	Order List Length	Weight	Shape	Remarks
AP	540	9'-9	1"ϕ	270	20'	14418 lbs	7'-9	Transverse in footings — All piers
BP	54	48'-9	½"ϕ	135	20'	4005 "	Straight welded	Longitudinals in footings (middle) " "
CP	108	6'-0 to 9'-0	¾"ϕ	54	16'	1296 "	4'-6 to 8'-0	Transverse in footings " "
DP	360	5'-10	¾"ϕ	120	18'	3244 "	4'-9	" " " " "
EP	90	7'-0	2"ϕ	45	14'	946 "	Straight	Diagonals " " " " "
FP	54	20'-0	¾"ϕ	54	20'	1622 "	"	Longitudinals in footings (outside) " "
KP (40 of Pier 1 to each pier Pier 2 to Pier 7 inclusive, Pier 8 & Pier 13 have 72 each)	122	8'-9	1"ϕ	122	18'	3298 "	"	Verticals in curtain walls Pier 1
	122	9'-2					"	" " " " " 2
	122	9'-6					"	" " " " " 3
	122	9'-10					"	" " " " " 4
	122	10'-2	1¼"ϕ	244	20'	7330 "	"	" " " " " 5
	122	10'-5					"	" " " " " 6
	122	10'-8					"	" " " " " 7
	122	10'-10	1¼"ϕ	366	12'	6595 "	"	" " " " " 8
	122	10'-10					"	" " " " " 13
HP	182	42'-0	⅞"ϕ	273	30'	3090 "	Straight welded	Horizontals in curtain walls All piers
KP	30	12'-4	1"ϕ	180	14'	6728 "	See detail	Main bars in columns Pier 1
	30	12'-9					" "	" " " " " 2
	30	13'-1					" "	" " " " " 3
	30	13'-5					" "	" " " " " 4
	30	13'-9					" "	" " " " " 5
	30	14'-0					" "	" " " " " 6
	30	14'-3					" "	" " " " " 7
	30	14'-5	1"ϕ	90	16'	3845 "	" "	" " " " " 8
	30	14'-5					" "	" " " " " 13

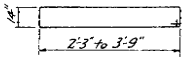
Mark	N°off	Length	Size	Order List N°off	Order List Length	Weight	Shape	Remarks
	18	8'-6					Straight	Verticals in columns Pier 1
	18	8'-11					"	" " " " 2
	18	9'-3					"	" " " " 3
	18	9'-7					"	" " " " 4
LP	18	9'-11	⅞"ϕ	81	20'	3311 lbs	"	" " " " 5
	18	10'-2					"	" " " " 6
	18	10'-5					"	" " " " 7
	18	10'-7					"	" " " " 8
	18	10'-7					"	" " " " 13
MP	273	2'-3 to 3'-9	⅝"ϕ	137	18'	927 "	See detail	Ligatures in columns All piers
NP	45	44'-9	1¼"ϕ	90	24'	3244 "	Straight welded	Longitudinals in cap " "
OP	207	3'-9	½"ϕ	52	16'	556 "	Straight	Transverse in cap " "

TOTAL WEIGHT IN ALL PIERS = 64455 LBS = 28.8 TONS

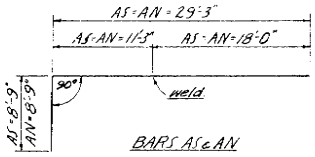


BARS KP.

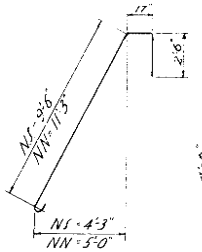
Per N°	Dimension A
1	8'-6"
2	8'-11"
3	9'-3"
4	9'-7"
5	9'-11"
6	10'-2"
7	10'-5"
8	10'-7"
13	10'-7"



BARS MP

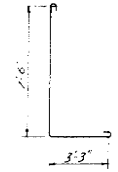


BARS AS & AN

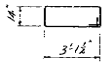


BARS NS & NN

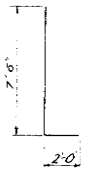
BARS PS & PN



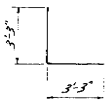
BARS QS & QN



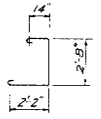
BARS TS & TN



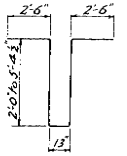
BARS ZS & ZN



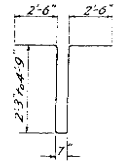
BARS KS & KN



BARS LS & LN



BARS pN



BARS pS

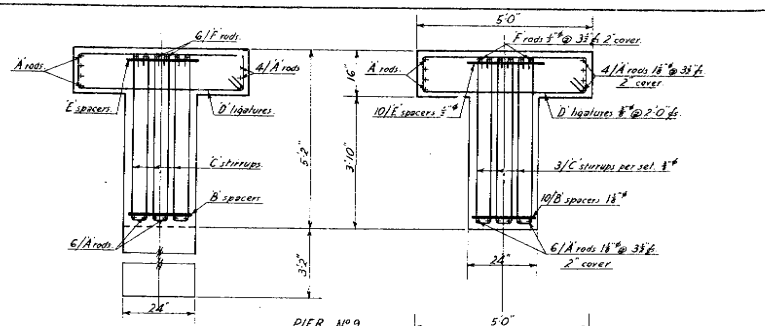
DEPARTMENT OF PUBLIC WORKS - TAS.

DERWENT RIVER BRIDGE

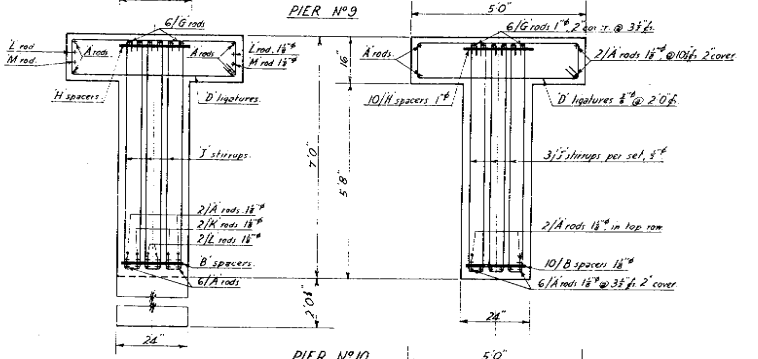
AT BRIDGEWATER

STEEL LISTS FOR ABUTMENTS AND PIERS

Tracing		Checked	15D-2
Surveyed		M.K.C. 3/9/54	
Traced	10-3-54 21-2-38	M.K.C. 3/9/54	-6
Designed			
SUPERVISION		CHIEF ENGINEER	



PIER N°9



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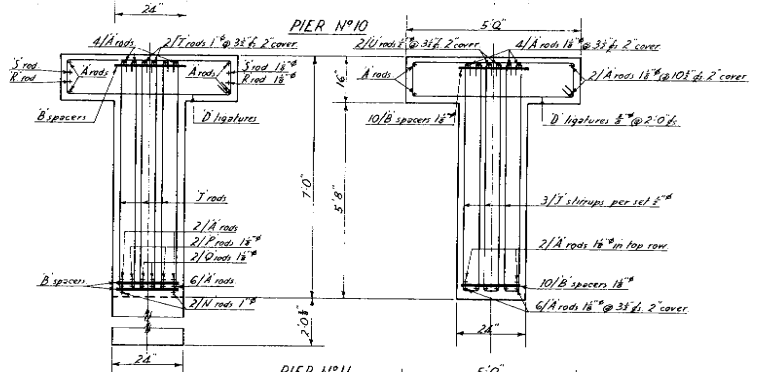
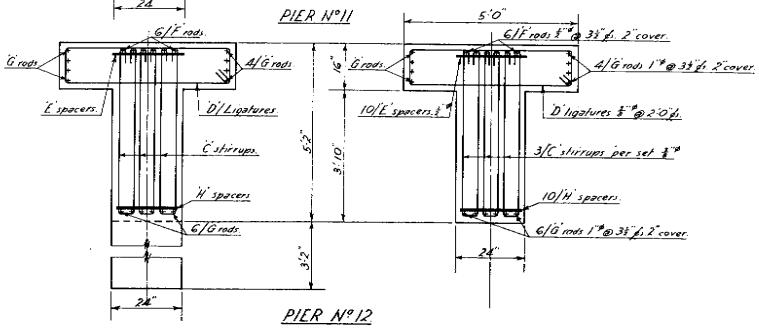


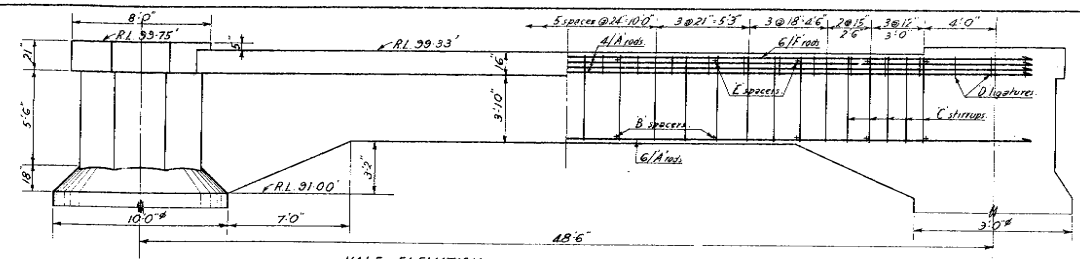
PIER N°11



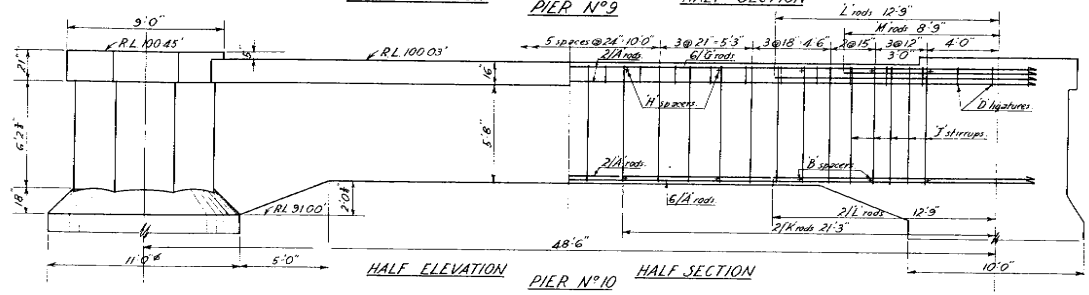
PIER N°12

SECTIONS NEAR END

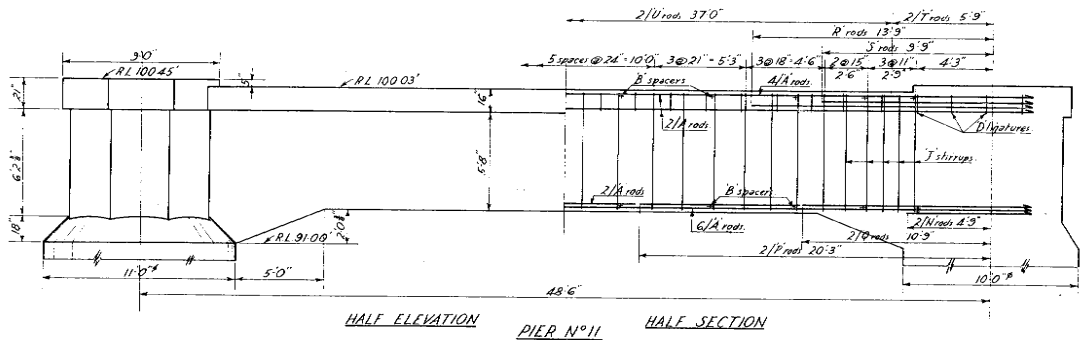
SECTIONS ON ℄



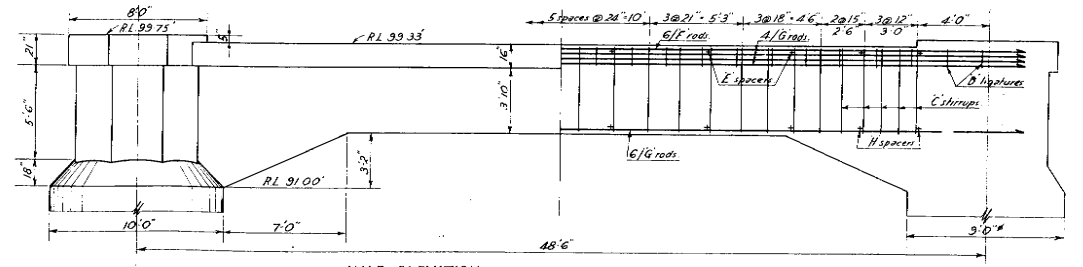
HALF ELEVATION PIER N°9 HALF SECTION



HALF ELEVATION PIER N°10 HALF SECTION



HALF ELEVATION PIER N°11 HALF SECTION



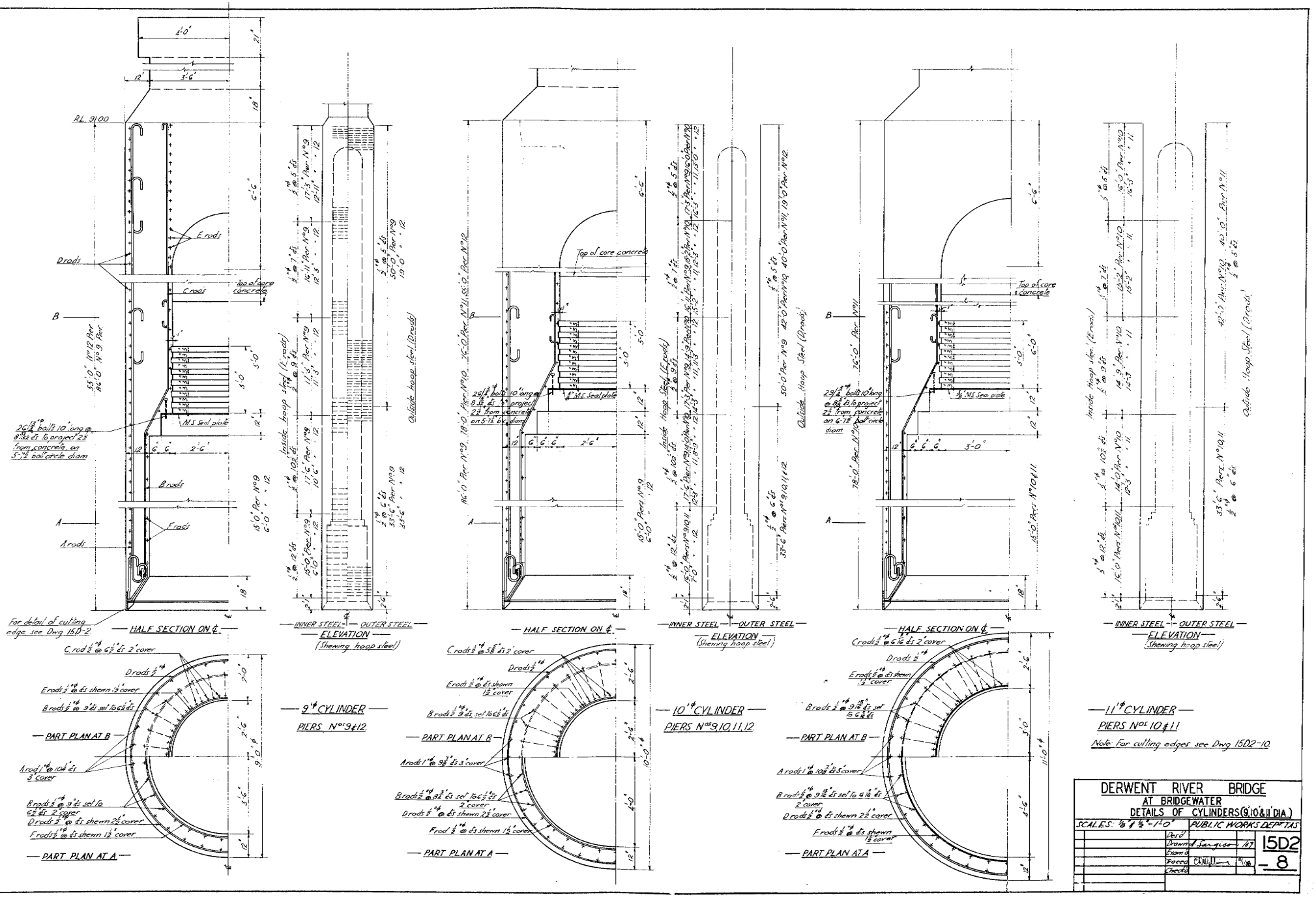
HALF ELEVATION PIER N°12 HALF SECTION

DERWENT RIVER BRIDGE
AT BRIDGEWATER
DETAILS OF CROSS BEAMS – PIERS Nos 9, 10, 11 & 12

Scales – ¼ & ⅜" = 1'-0"

PUBLIC WORKS DEPT TAS

Desid		15D2
Drawn	[illegible]	
Exam'd		-7
Traced	[illegible]	
Check'd		



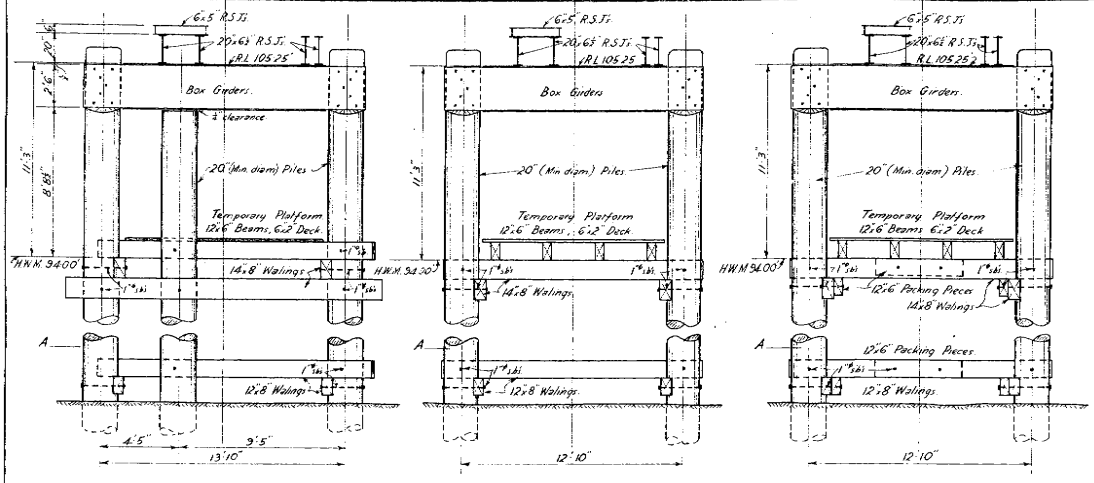
DERWENT RIVER BRIDGE
AT BRIDGEWATER
DETAILS OF CYLINDERS (9', 10' & 11' DIA.)

SCALES: ⅜" & ½" = 1'-0"

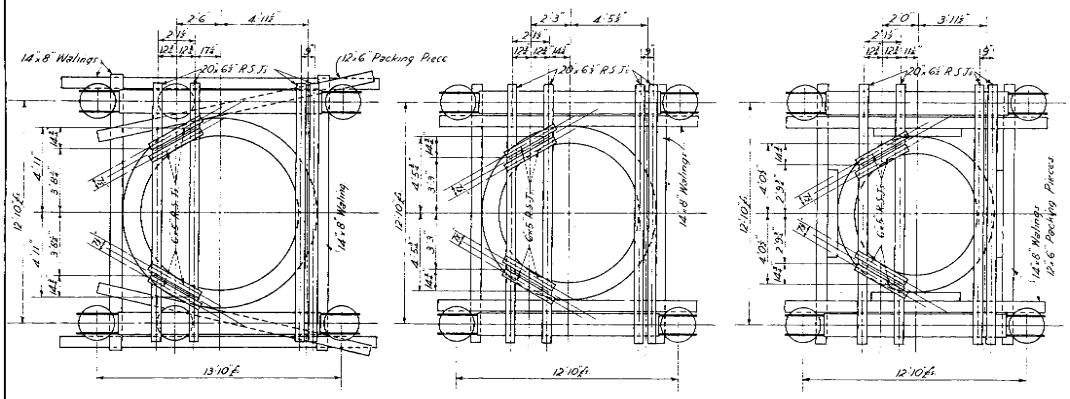
PUBLIC WORKS DEPT TAS

Dsd
Drawn J. Sangster 167
Exam'd
Traced C.W.Williams 15/8
Checked

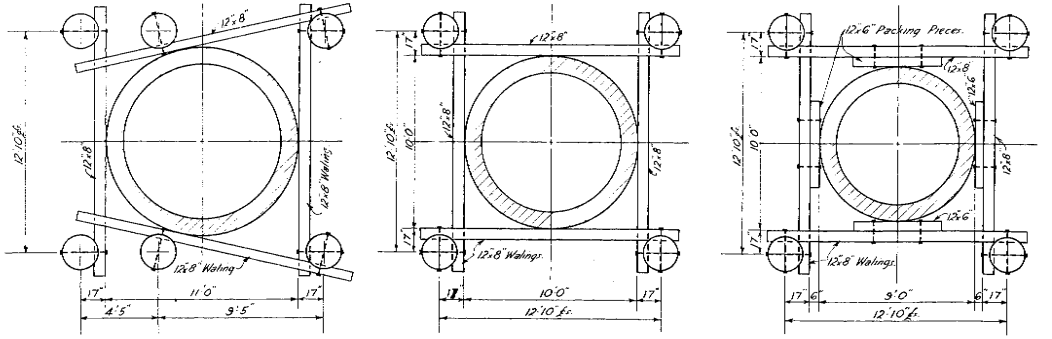
15D2 - 8



ELEVATION



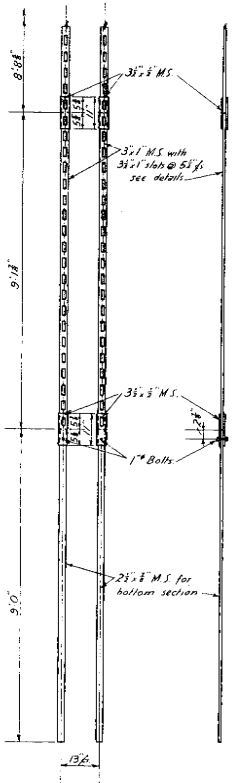
PLAN



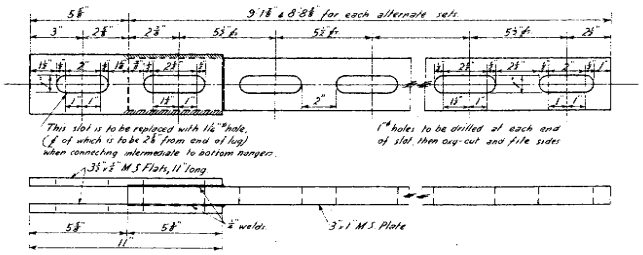
PLAN AT A
11'-0" CYLINDERS
PIERS Nos 10 & 11

PLAN AT A
10'-0" CYLINDERS
PIERS Nos 9, 10, 11 & 12

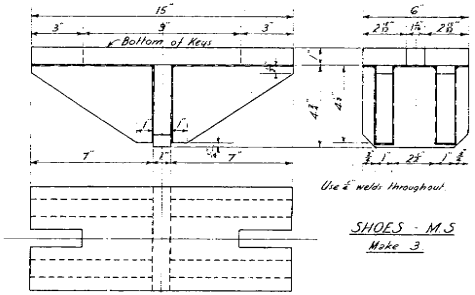
PLAN AT A
9'-0" CYLINDERS
PIERS Nos 9 & 12



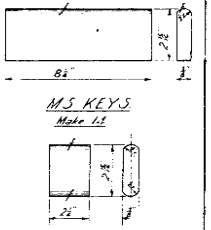
ARRANGEMENT of HANGERS
½" = 1'-0"



INTERMEDIATE HANGERS - M.S.
Make 6 for each lift on each Cylinder

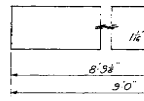


SHOES - M.S.
Make 3

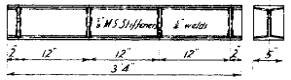


M.S. KEYS
Make 1.2

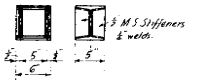
M.S. KEYS
Make 6 per set.



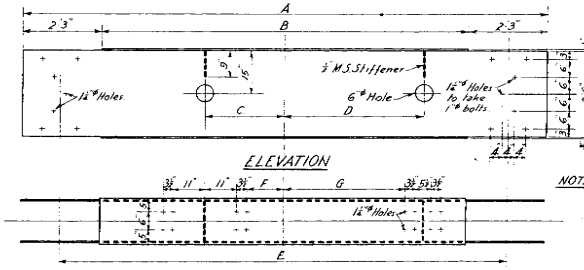
BOTTOM HANGERS M.S.
Make 6 per set.



6"x5"x25"lb R.S.J.s Make 4.

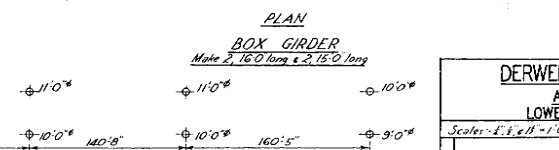


6"x5"x25"lb R.S.J.s Make 4.



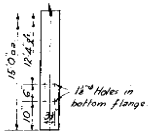
ELEVATION

SECTION



PLAN

BOX GIRDER
Make 2, 16'-0" long & 2, 15'-0" long



20"x6½"x65 lb R.S.J.s

NOTE:
½" fillet welds, except near stiffeners where ⅜" welds are to be used.

A	16'-0"	for 11'-0" cyls. & 15'-0"	for 9'-0" cyl.
B	11'-6"	"	10'-6"
C	2'-6"	"	2'-0"
D	4'-11½"	"	3'-11½"
E	13'-10"	"	12'-10"
F	15'-3"	"	9'-3"
G	4'-5½"	"	3'-5½"

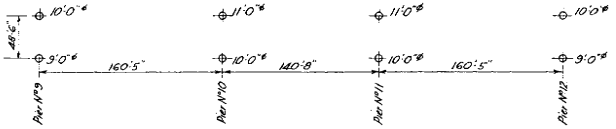


DIAGRAM of CYLINDERS.
Not to scale.

DERWENT RIVER BRIDGE

AT BRIDGEWATER (GLENORCHY SIDE)

LOWERING GEAR DETAILS (HALSTEAD)

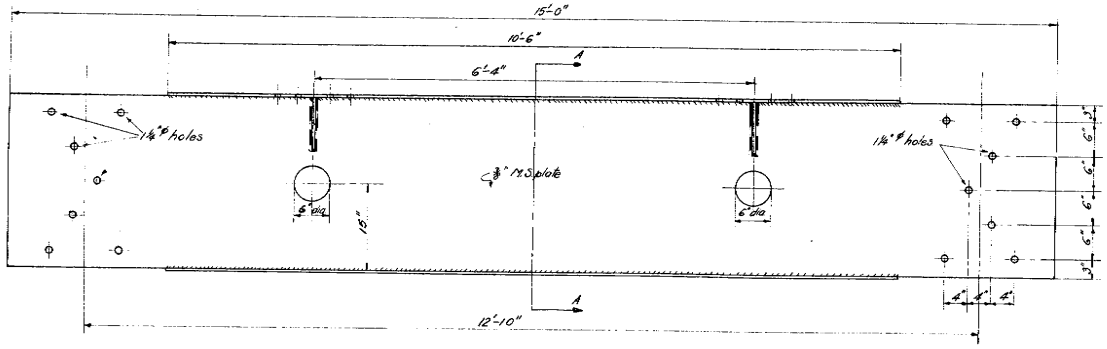
Scales:- ½", ¼" & 1" = 1'-0"

PUBLIC WORKS DEPT. TAS.

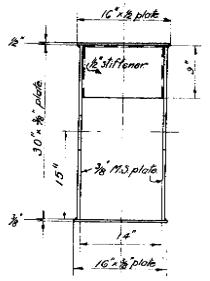
Design		
Drawn	[illegible]	2-11-37
Examd.	A.W.K.	
Traced	[illegible]	18-11-37
Checked	[illegible]	1/12/37

15D2
-9

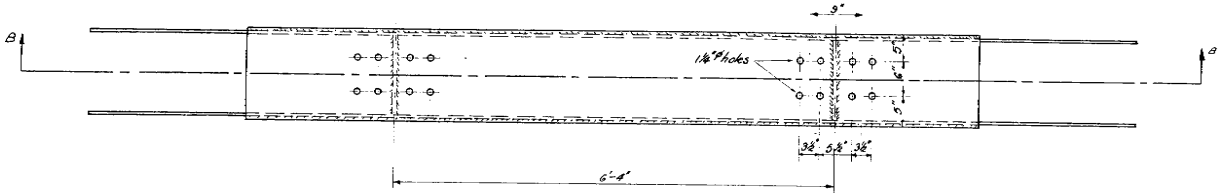
A. D. Baldock



— SECTION B-B —



— SECTION A-A —



— PLAN —

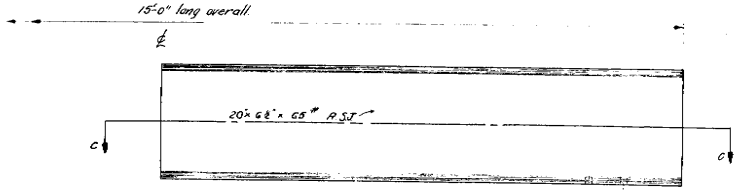
Welding— All fillets to be ⅜" except in the vicinity of the top flange Stiffeners where ⅝" fillets are reqd

— MATERIAL —

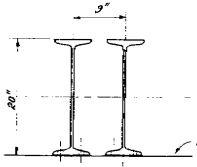
Item	Size	Number	Weight	Total Wt
M.S. plate	30"x⅜"x 15'-0"	4	229 lbs	
"	16"x⅜"x 10'-6"	2	571 "	
"	16"x⅜"x 10'-6"	2	428 "	
"	9"x⅜"x 14"	4	72 "	1.50 tons
R.S.J's	20"x 6½"x 65#x 15'-0"	4	3900 "	1.74 "
Bolts	1" dia 16" long	28	112 "	
Bolts (machined)	1" dia 3" long	32	36 "	1.32 cwt

— M.S. BOX GIRDER —

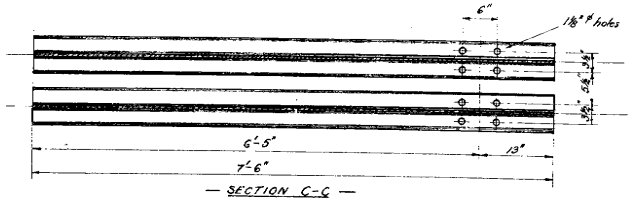
SCALE 1"=1ft WEIGHT-0.75 tons 2 REQUIRED



— ELEVATION —

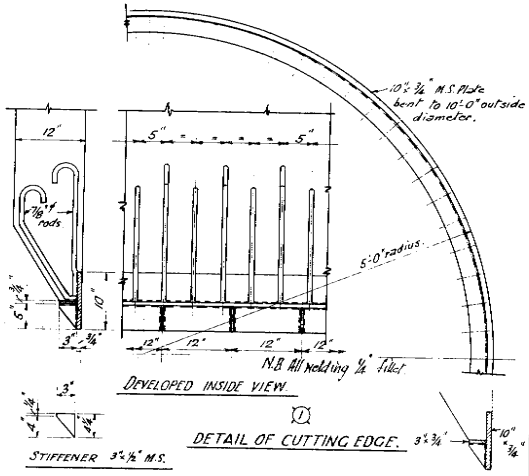


— END ELEVATION —



— SECTION C-C —

— DETAILS OF HOLES FOR BOLTS IN 20"x6½" R.S.J's —



DEVELOPED INSIDE VIEW

STIFFENER 3"x½" M.S.

DETAIL OF CUTTING EDGE. 3"x3⅛"

DERWENT RIVER BRIDGE AT BRIDGE-WATER

SUBSTRUCTURE:-BOX GIRDERS FOR LOWERING 9'&10' DIA. CYLINDERS & CUTTING EDGE.

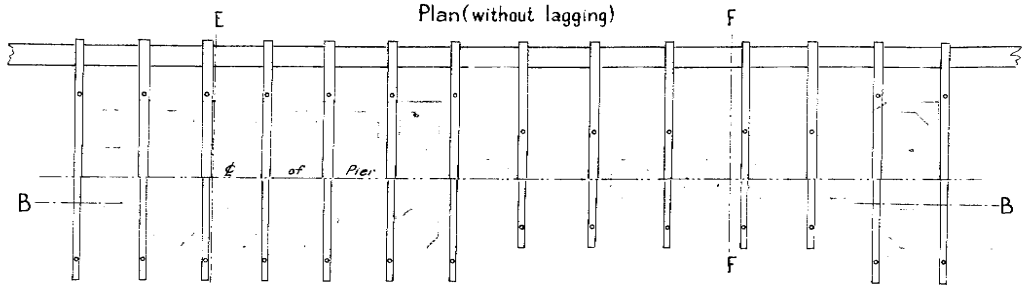
Scale 1"= 1 foot — PUBLIC WORKS DEPT

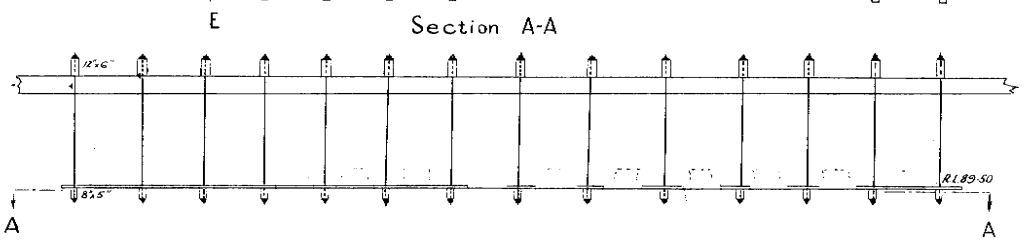
No	Revisions	Date
1	Detail of cutting edge added	

Designed
Examined — W.K.L. 4/5/40
Checked — W.K.L. 4/5/40
Date
A. D. Balfour, Dir. of Pub. Works

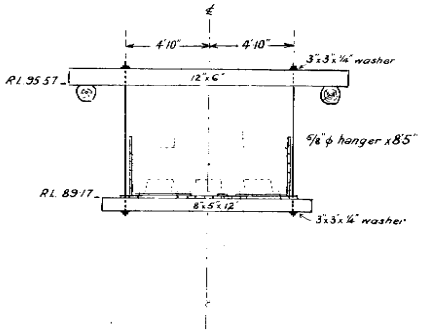
C.R.W. 19/5/40

15D210

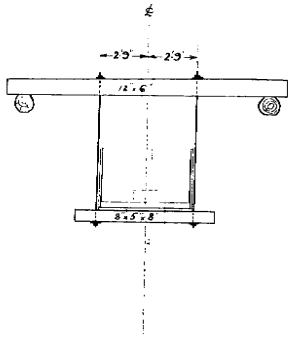




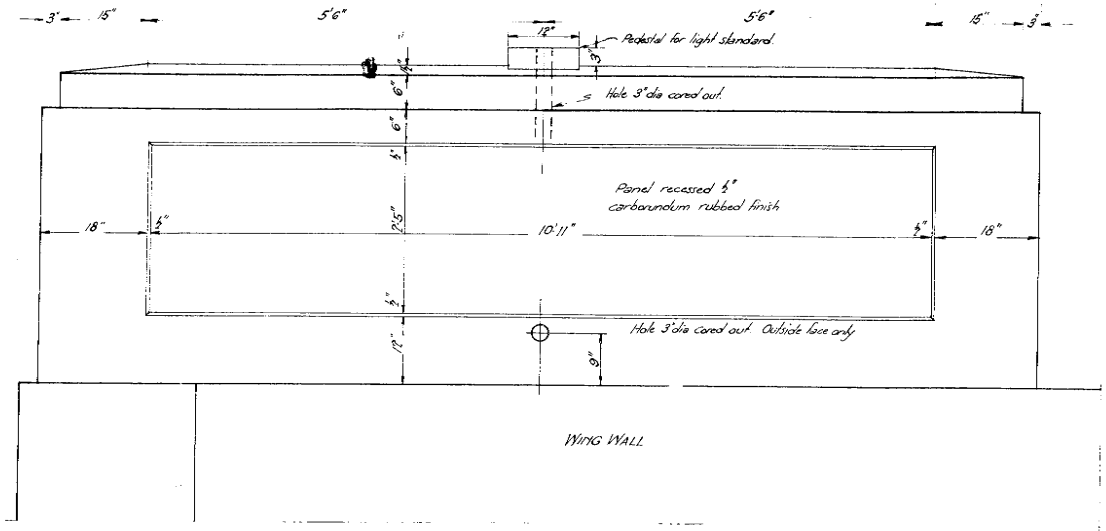
Section B-B



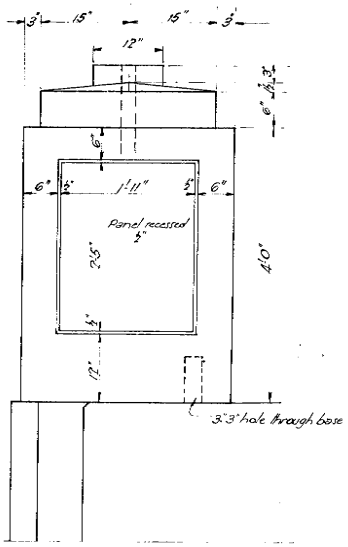
Section E-E



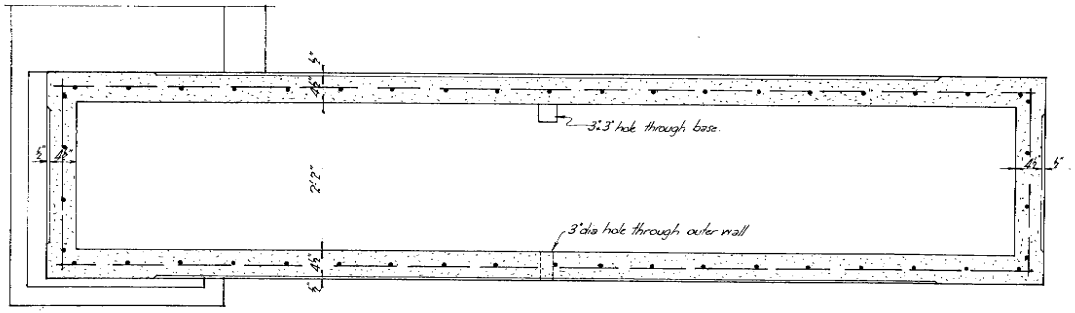
Section F-F



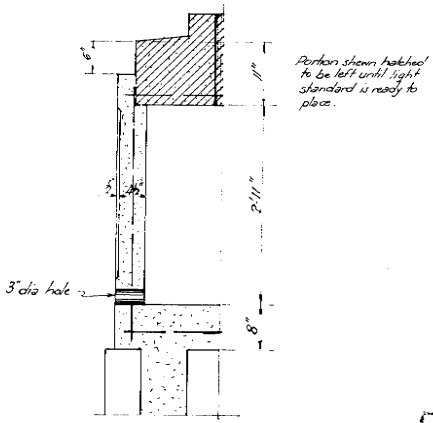
SIDE ELEVATION



END ELEVATION



SECTIONAL PLAN ABOVE BASE



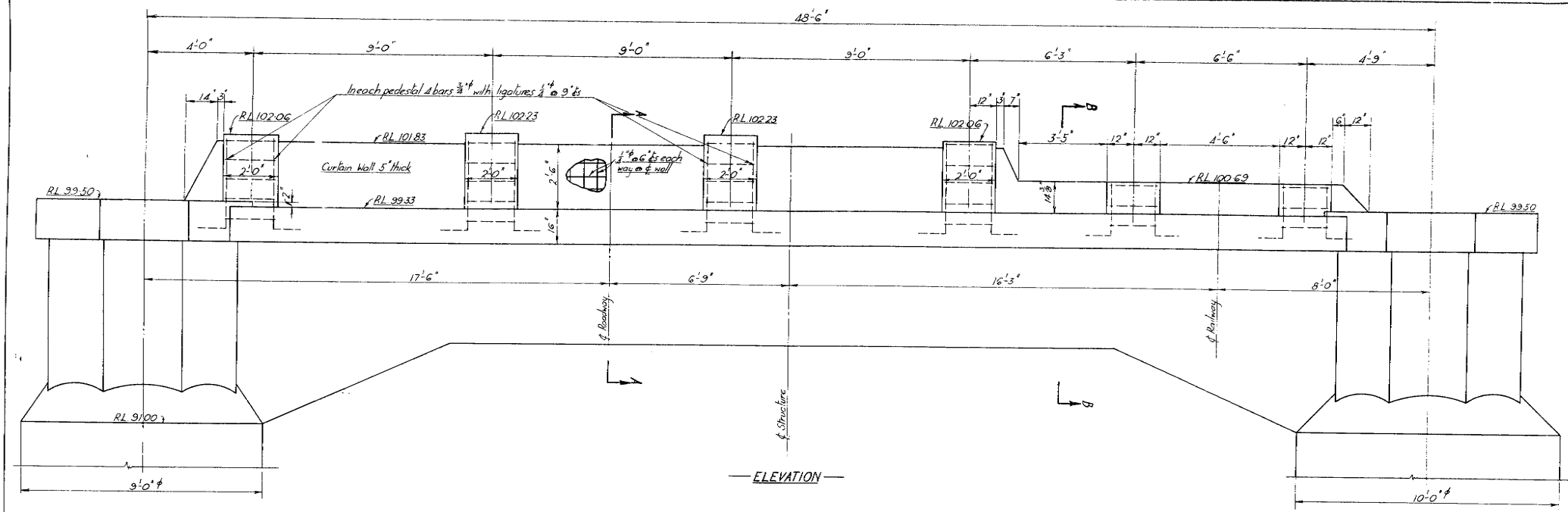
SECTION THROUGH OUTER WALL AT PYLON ℄

DEPARTMENT OF PUBLIC WORKS - TAS.

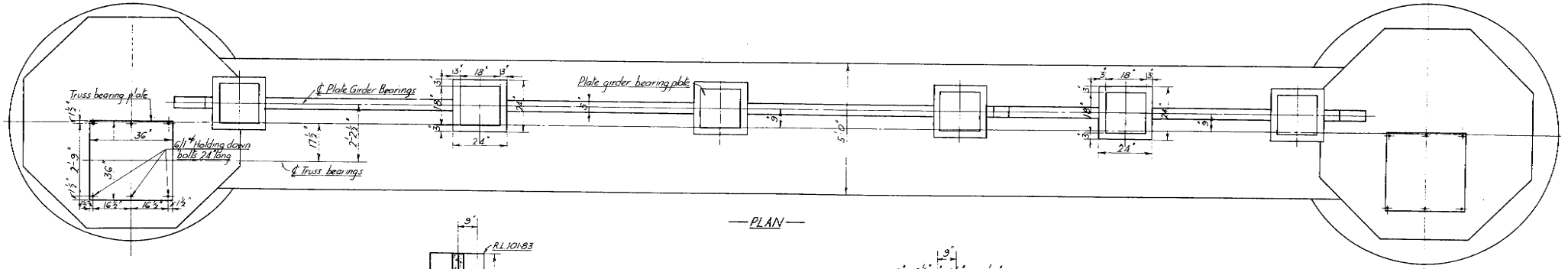
BRIDGE OVER DERWENT RIVER AT BRIDGEWATER

DETAILS OF PYLONS, LIGHT STANDARDS

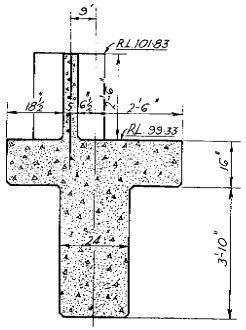
Scale	Prepared	Checked	15 D 2 -13
Drawing			
Tracing	"		
Design	" 8.12.38		
SUPERVISION			



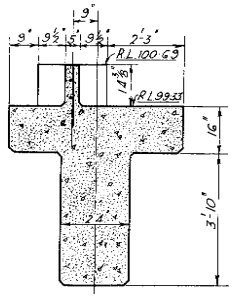
— ELEVATION —



— PLAN —



— SECTION A-A —

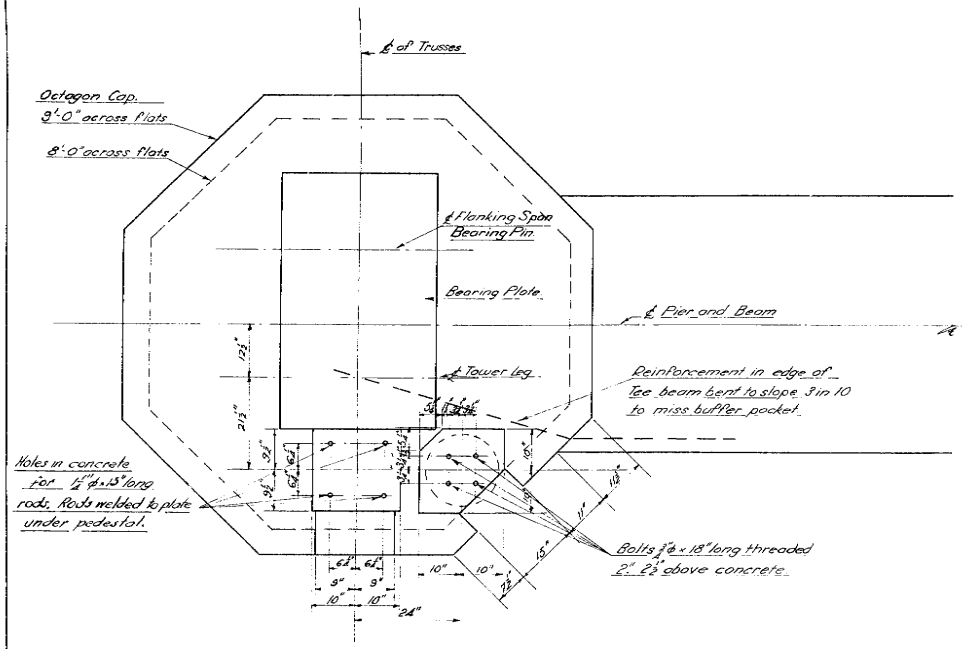


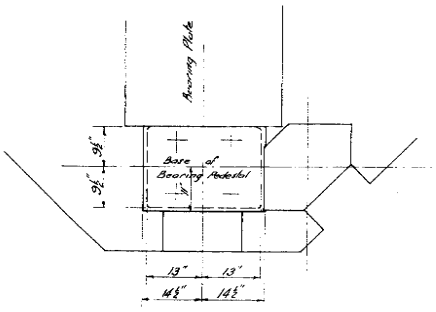
— SECTION B-B —

DEPARTMENT OF PUBLIC WORKS - TAS.

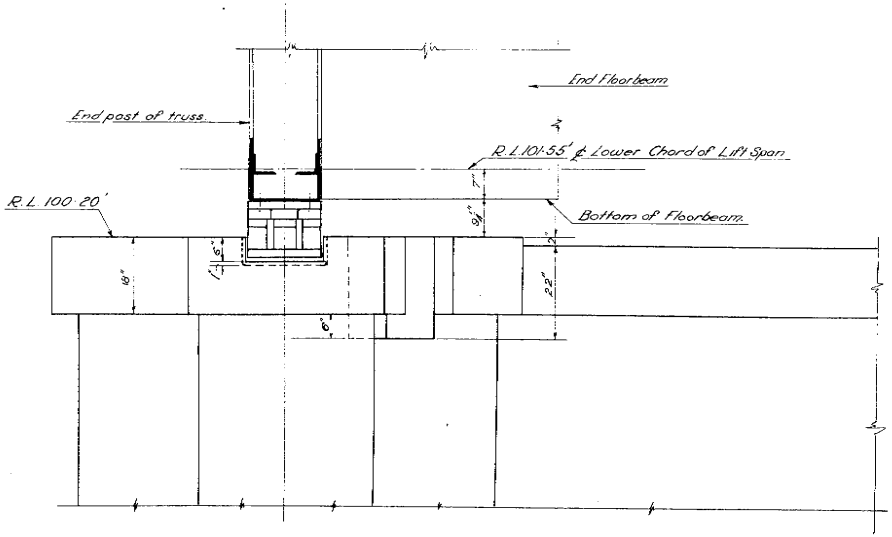
DERWENT RIVER BRIDGE
AT BRIDGEWATER
ARRANGEMENT OF BEAM — PIERS 9 & 12.

Scale: ½"=1'-0"	Prepared	Checked	15D2
Drawing			-14
Tracing	DRW 22/8/39		
Design			
SUPERVISION			CHIEF ENGINEER



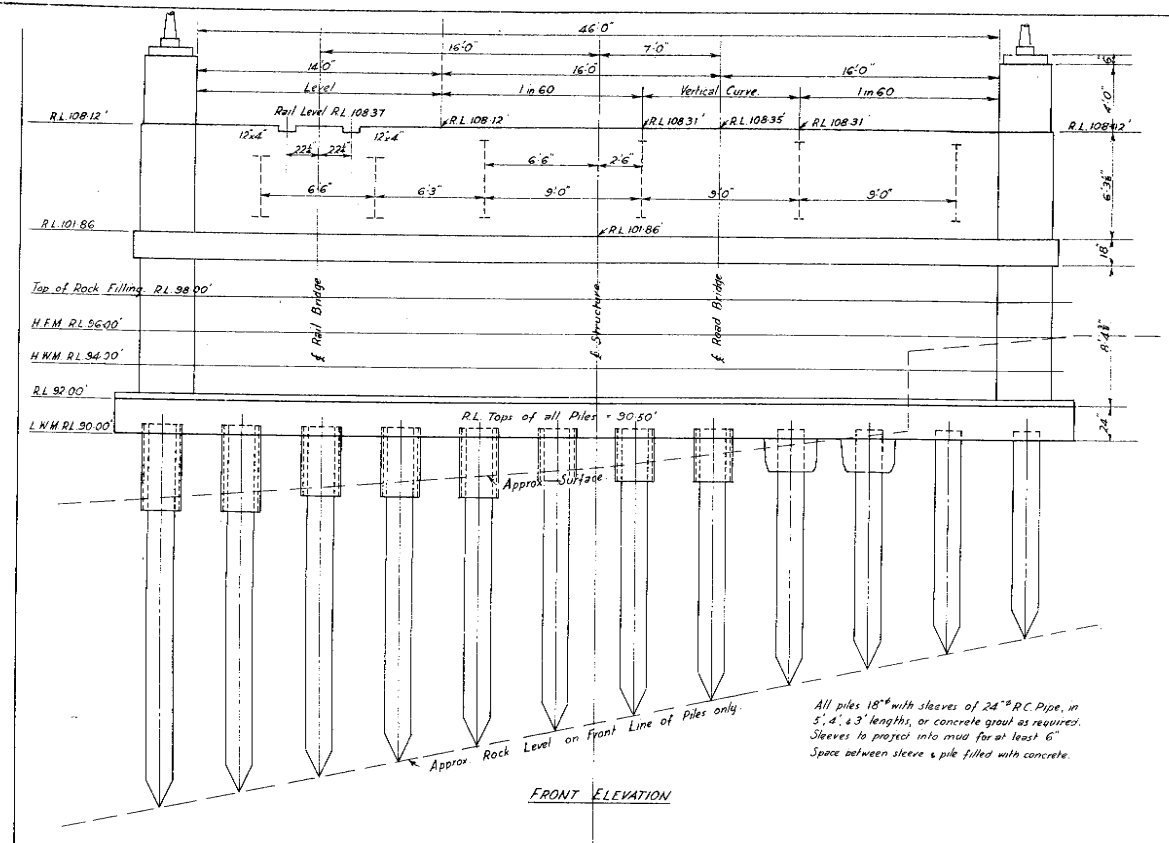


BEARING WELL FOR RAIL TRUSS BEARING

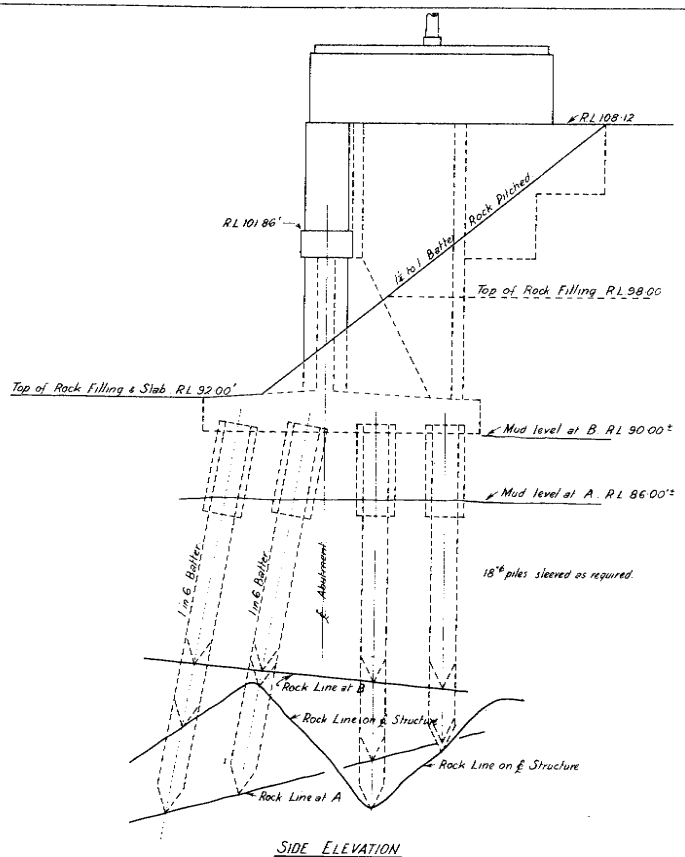


Dwg. revised 29/10/80

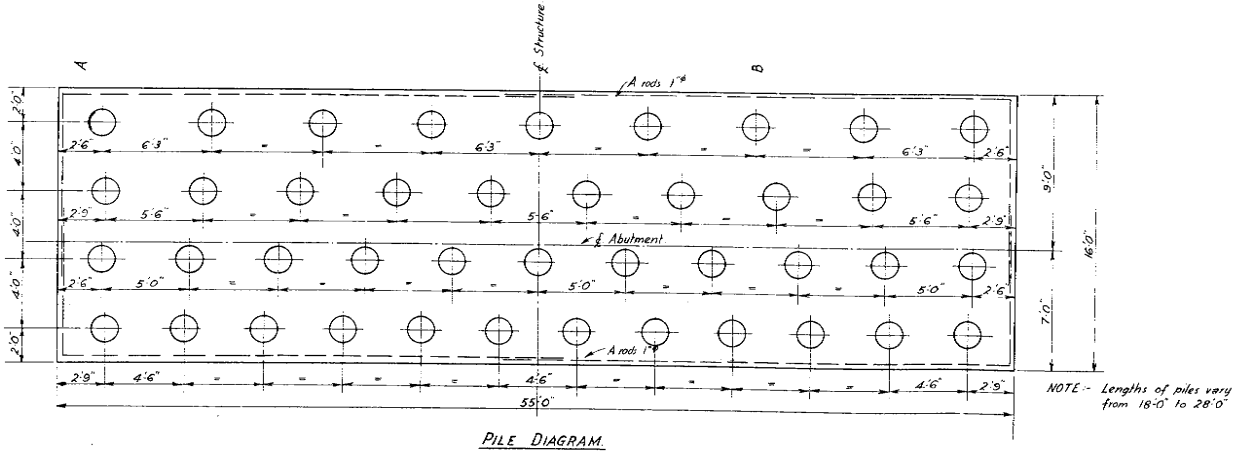
DEPARTMENT OF PUBLIC WORKS — TAS.			
DERWENT RIVER BRIDGE AT BRIDGEWATER			
DETAILS OF LIFT-SPAN BEARING WELLS FOR PIERS Nº 10 & 11			
Scale: ¼" = 1ft.	Prepared	Checked	15D2— —15
Drawing	R.A.M.		
Tracing	26/9/80	29/10/80	
Design			
SUPERVISION			
		CHIEF ENGINEER	



FRONT ELEVATION



SIDE ELEVATION



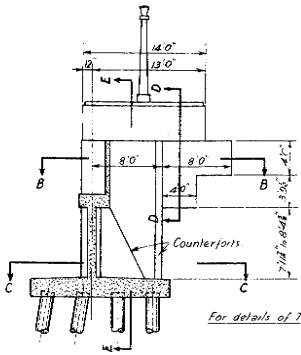
NOTE :- Lengths of piles vary from 18'0" to 28'0"

PILE DIAGRAM.

DEPARTMENT OF PUBLIC WORKS - TAS.

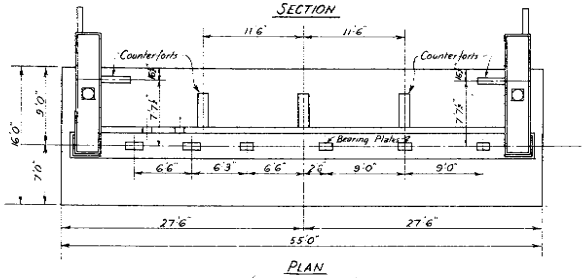
DERWENT RIVER BRIDGE
AT BRIDGEWATER
GENERAL ARRANGEMENT OF NORTH ABUT.

Scale - ⅛" : 1'0"	Prepared	Checked	1522
Tracing	[illegible]		
Drawing			- 16
Design			
SUPERVISION			CHIEF ENGINEER.



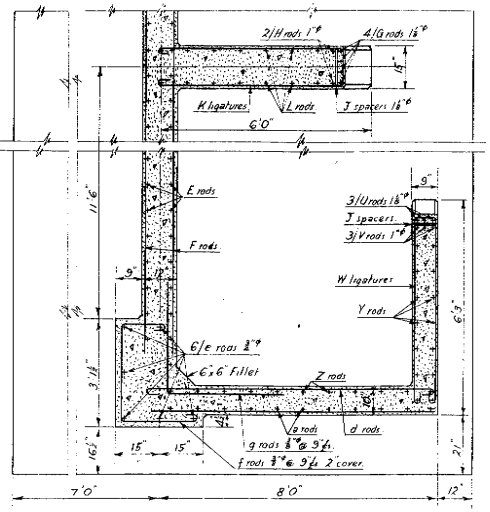
For details of Ties and Anchor see Drg 15D2-18

SECTION

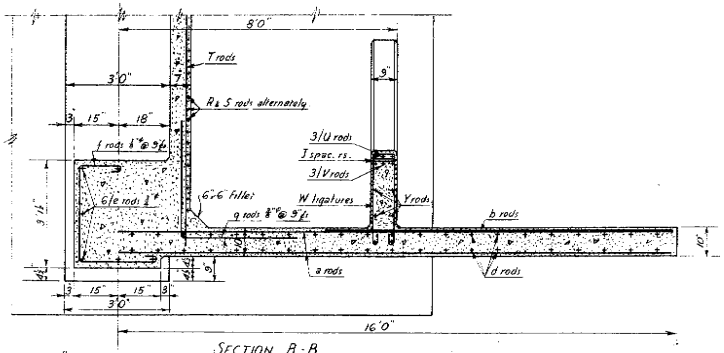


PLAN
(Filling not shown)
1/8" = 1'0"

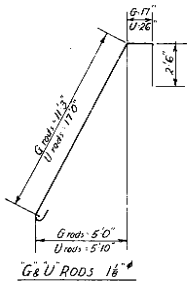
"R & S" RODS 1/2"ϕ



SECTION C-C



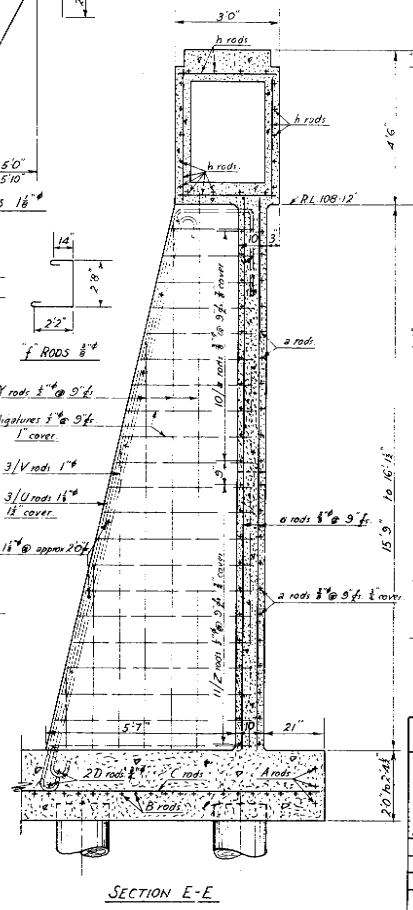
SECTION B-B



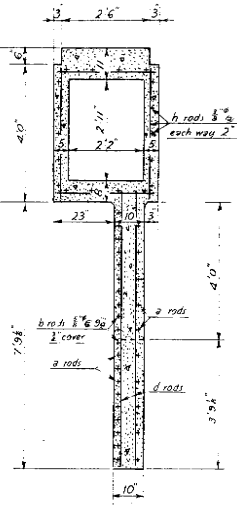
"G & U" RODS 1⅛"ϕ

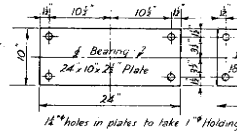
"P" LIGATURES 1/2"ϕ "f" RODS 5/8"ϕ

CROSS SECTION



SECTION E-E





SECTION D-D

1½" holes in plates to take 1" ϕ Holding Down bolts

UNDER RAIL GIRDERS UNDER ROAD GIRDERS
DETAILS OF BEARING PLATES & BOLT CENTRES

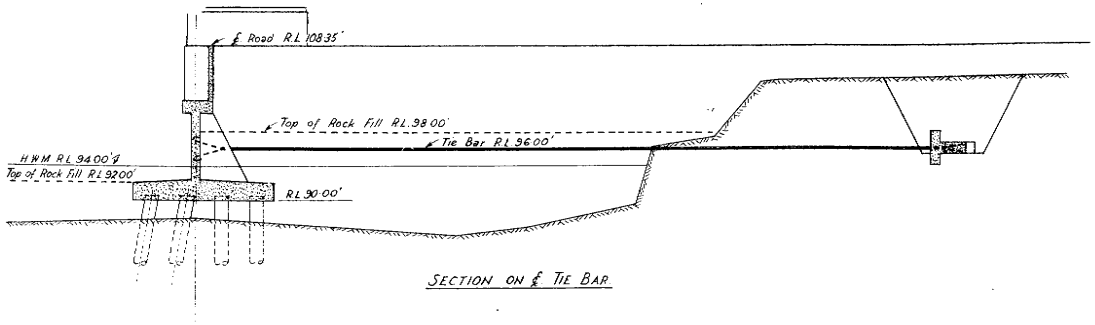
Mark	No	Length	Size	Order List No	Order List Length	Weight	Shape	Remarks
A	12	39'0"	1"ϕ	24	20'	11·45 cwt	39'3"	Rods to outside of footing
B	132	16'6"	1"ϕ	132	18'	56·67 "	15'6"	Transverse in "
C	29	54'0"	1⅛"ϕ	87	18'	21·00 "	Straight welded	Longitudinal " "
D	10	6'0"	3/4"ϕ	5	12'	0·80 "	"	Anchor rods to main counterfort steel
E	28	48'0"	1"ϕ	84	16'	8·02 "	" welded	Horizontals in lower abutment wall
F	130	8'6"	3/4"ϕ	65	18'	4·93 "	"	Verticals " " " "
G	12	16'4"	1⅛"ϕ	12	18'	6·52 "	As detailed	Main rods - back of - counterfort
H	6	12'6"	1"ϕ	6	14'	2·00 "	10'6"	" " " " " "
J	15 15	1'3" 0'8"	1⅛"ϕ	Ex. Scrap		—	Straight	Spacers - all counterforts.
K	33	10'0 or	1"ϕ	12 9	18' 14'	2·04 "	Varies	Ligatures - abut "
L	48	1'3 to 8'0	1"ϕ	16	20'	1·91 "	Straight	Verticals " " "
M	2	48'0	1"ϕ	6	16'	0·32 "	Spiral 3"pitch	Spirals " " " to Tie rods
N	6	52'0	3/4"ϕ	12 6	20' 12'	4·18 "	Straight welded	Longitudinals " cap.
P	53	9'0	1/2"ϕ	27	18'	0·72 "	As detailed	Ligatures " "
Q	22 48	2'0" 3'0"	5/8"ϕ	20	16'	1·08	Straight	Distributing mat under bearings.
R	74	8'9"	3/4"ϕ	37	18'	3·97 "	As detailed	Verticals in curtain wall & transverse in cap.
S	75	11'9"	3/4"ϕ	75	12'	5·38 "	"	" " " " " " " "
T	6	50'0	5/8"ϕ	15	20'	1·01 "	Straight welded	Horizontals - " " "
U	6	22'9"	1⅛"ϕ	6	24'	4·35 "	As detailed	Main rods - back of side wall counterfort
V	6	18'0"	1"ϕ	6	18'	2·57 "	16'0"	" " " " " " " "
W	42	10'0 or	3/4"ϕ	16 12	18' 14'	2·72	Varies	Ligatures - side wall counterfort
Y	32	2'3 to 16'0	5/8"ϕ	24	16'	2·30 "	Straight	Verticals " " "
Z	22	9'0	1/2"ϕ	11	18'	1·18 "	8'0"	Horizontals - " " (bottom)
a	20 20 20	16'0" 8'0" 8'0"	1"ϕ	31 20	16' 12'	2·47 "	Straight	" " " "
b	10 10	10'0" 6'0"	5/8"ϕ	5 4	20' 16'	1·60 "	"	" " " "
d	44 20 20	16'0" 8'0" 4'0"	3/4"ϕ	59	16'	3·18 "	"	Verticals " " "
e	12	17'0"	3/4"ϕ	12	18'0"	2·90 "	"	" columns
f	40	6'9"	3/4"ϕ	20	14'0"	0·94 "	As detailed	Ligatures " "
g	40	6'6"	3/4"ϕ	20	14'0"	0·94 "	2'3" 2'3"	Ties to curtain and side walls.
h	36 76 76	13'6" 9'6" 2'9"	3/4"ϕ	55 11	14'0" 20'0"	3·33 "	Straight	Rods in pylons.

Total weight of steel = 160·48 cwt = 8·025 tons.

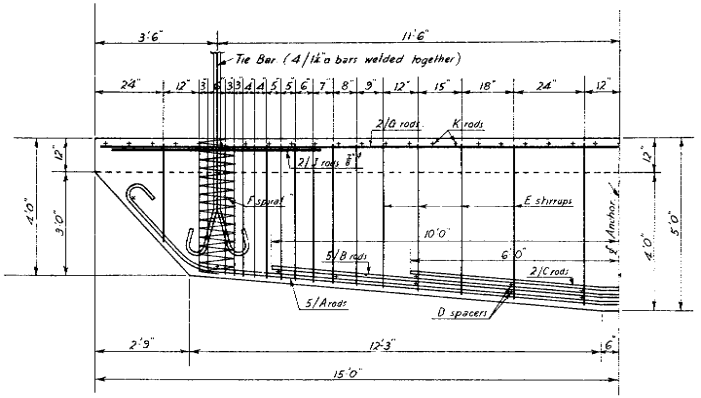
DEPARTMENT OF PUBLIC WORKS - TAS.

DERWENT RIVER BRIDGE
AT BRIDGEWATER
DETAILS OF NORTH ABUTMENT

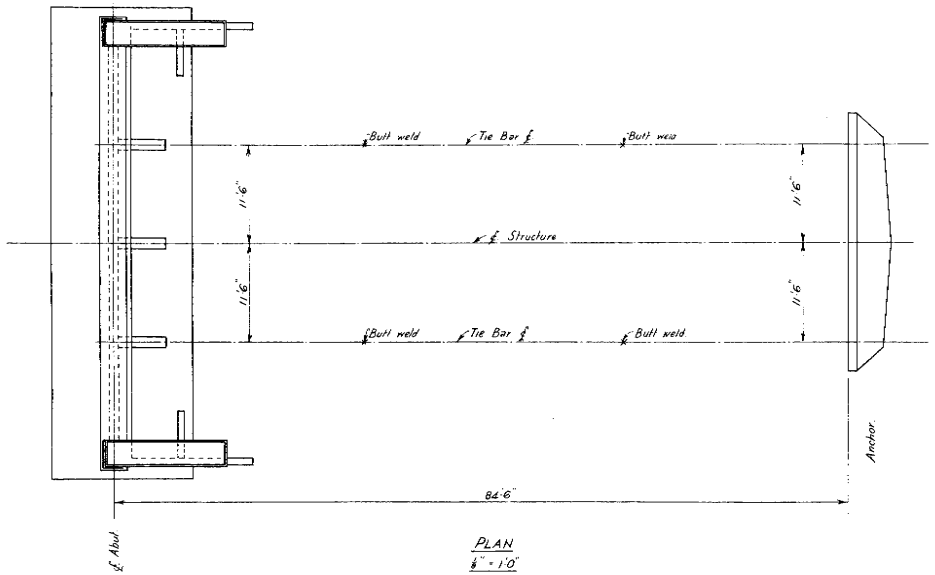
Scales: 1/8" & 1/2" = 1'0"	Prepared	Checked	15D2
Tracing	AGL 10/12/41		-17
Drawing			
Design			
SUPERVISION			CHIEF ENGINEER



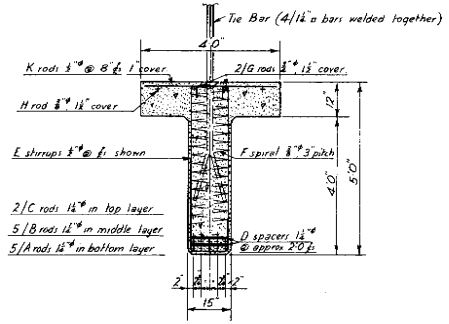
SECTION ON ℄ TIE BAR



HALF ELEVATION SHOWING REINFORCEMENT
½" = 1'0"



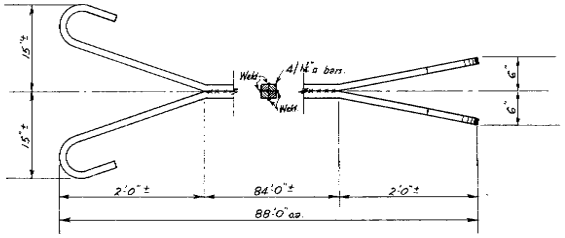
PLAN
⅛" = 1'0"



SECTION ON ℄
½" = 1'0"

Mark	N°	Length	Size	Order List N°	Order List Length	Weight	Shape	Remarks
A	5	30'0"	1½"ø	5	30'	5·59 cwt	Bent as shown	Main rods in back of anchor
B	5	20'0"	1½"ø	5	20'	3·73 "	" " "	" " " " " "
C	2	12'0"	1½"ø	1	24'	0·89 "	" " "	" " " " " "
D	20	1'2"	1½"ø	1	24'	0·89 "	Straight	Spacers " " " "
E	36	10'0" av.	¾"ø	18	20'	2·15 "	⌀ ⟨4'2" av.⟩	Stirrups " anchor
F	2	48'0"	⅜"ø	6	16'	0·32 "	Spiral @ 3" pitch	Spiral " "
G	2	29'6"	¾"ø	2	30'	0·64 "	Straight	Hangers " front of anchor
H	2	29'6"	¾"ø	2	30'	0·16 "	"	Longitudinals " " " "
J	2	6'0"	⅜"ø	1	12'	0·22 "	"	" " " " " at ends
K	45	3'9"	¾"ø	9	20'	1·08 "	"	Transverse " " " "
L	8	90'0"	1½"ø	24	30'	34·16 "	As detailed.	Tie bars.

Total weight of steel = 49·91 cwt = 2·50 tons.



DETAIL OF TIE BAR
1" = 1'0"

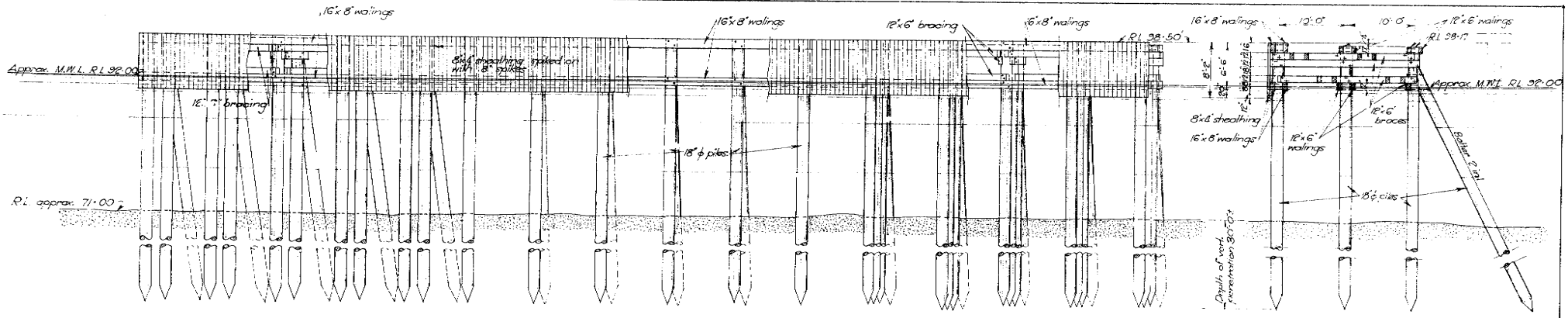
9 cyds of CONCRETE IN ANCHOR

DEPARTMENT OF PUBLIC WORKS - TAS.

DERWENT RIVER BRIDGE
AT BRIDGEWATER
GEN. ARR'G'T. & DETAIL OF TIE BAR & ANCHOR

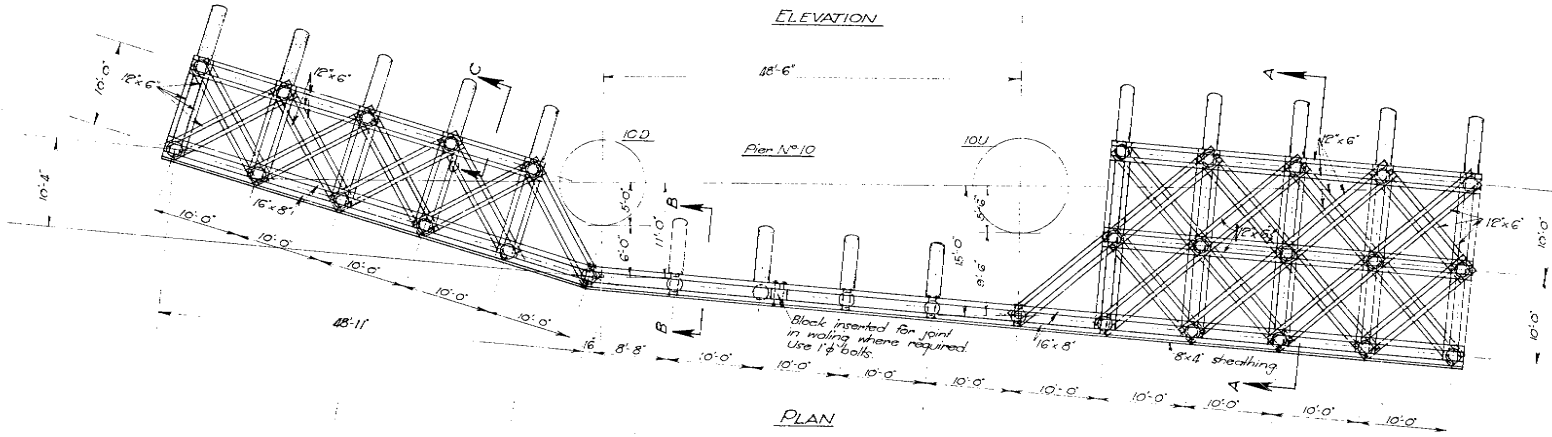
Scale: ⅛" & 1"=1'0"	Prepared	Checked	15D2
Tracing	4/10/0 15/7/41		-18
Drawing			
Design			
SUPERVISION			

CHIEF ENGINEER



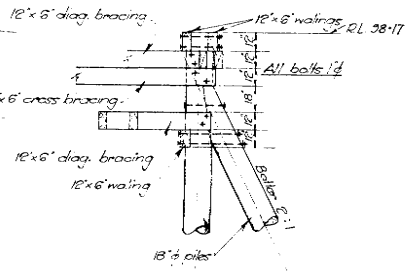
ELEVATION

SECTION ON A-A



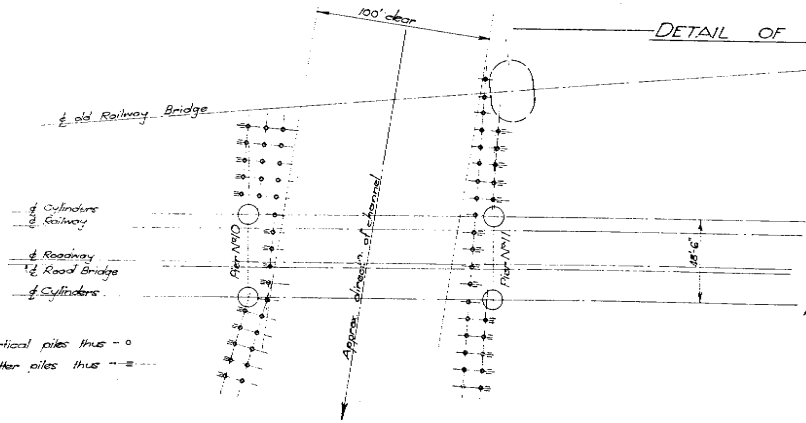
PLAN

Note: All walings, bracing & batter piles to be bolted on with 1"ϕ bolts.

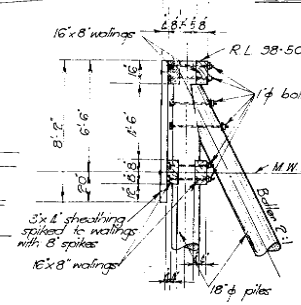


SECTION ON C-C
1/4" = 1'-0"

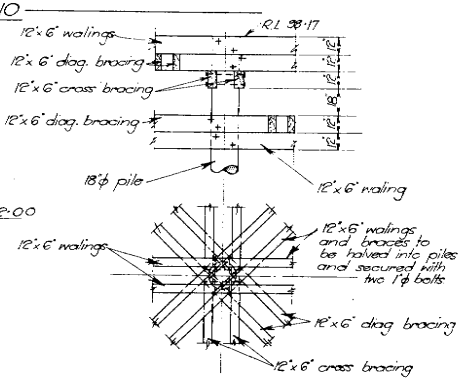
DETAIL OF PROTECTION FOR PIER N°10
1/8" = 1'-0"



GENERAL ARRANGEMENT OF PILES
Scale: 1" = 10'-0"

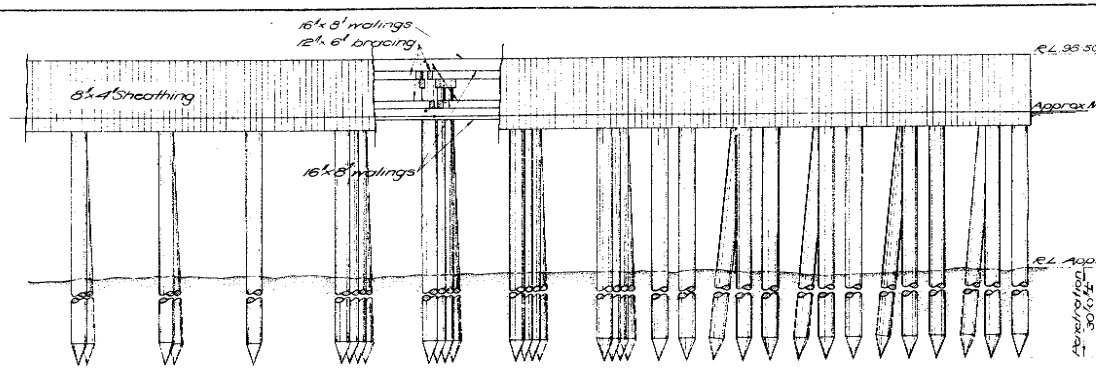


SECTION ON B-B
1/4" = 1'-0"

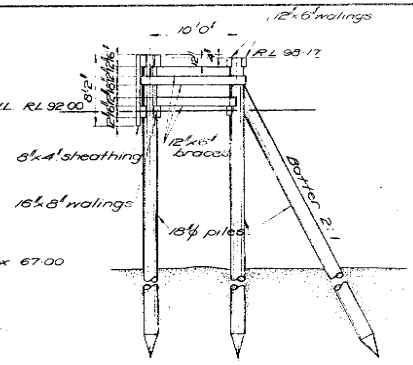


TYPICAL TOP OF PILE
1/4" = 1'-0"

DEPARTMENT OF PUBLIC WORKS-TAS.			
BRIDGEWATER BRIDGE			
PIER PROTECTION			
GEN. ARRGT. & FOR PIER N°10			
Scale: As shown	Prepared	Checked	15D2
Drawing			-19
Tracing			
Design			
Supervision			Chief Engineer.



ELEVATION

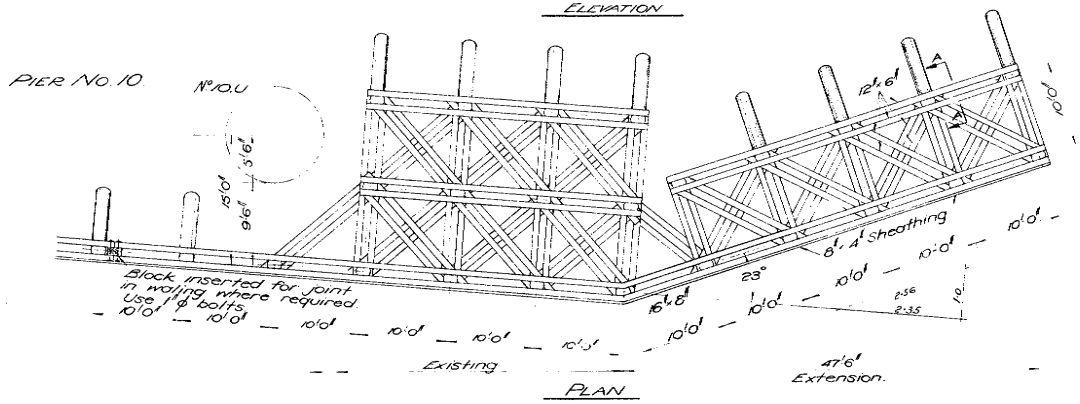


END ELEVATION

TIMBER LIST

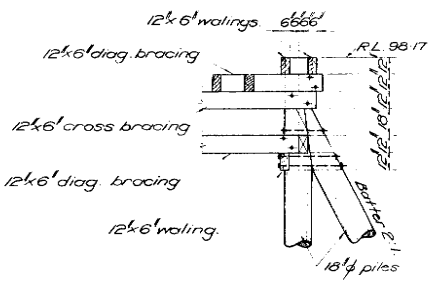
Size.	No	Length		Position
18" ϕ	10.			Vertical piles.
	4.			Batter piles.
16"x8"	12.	18'	2304.	Front walings
12"x6"	3	16'	288	Back walings.
	6	14'	504	
	10	12'	720.	Braces.
	18	18'	1944	Diagonal bracing
8"x4"	78	8'6"	1768.	Sheathing

Round timber
Squared timber — 7528 sq ft.



PLAN

EXTENSION TO PIER PROTECTION
Scale 1/8" = 1'0"



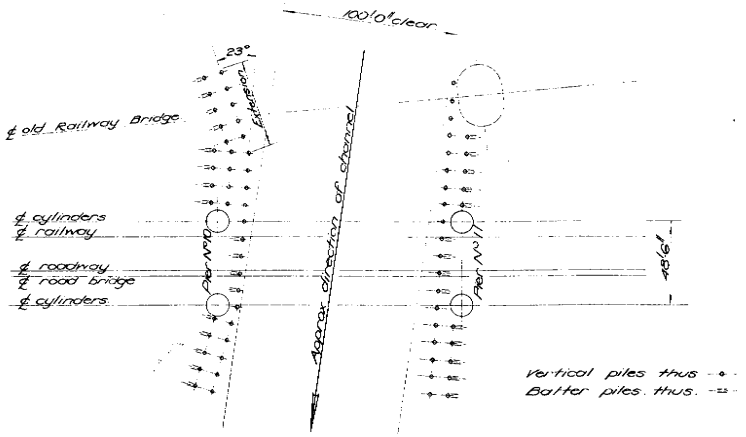
SECTION ON A-A
1/4" = 1 foot

BOLT LIST

Size.	No	Length	Wt	Position
1⅛" ϕ	4	3'-3"	26.03	Batter to vertical piles at lower back waling
	4	3'-6"	44.08	" " "
	4	2'-3"	36.12	Batter to vertical piles
1⅛" ϕ	24	2'-6"	200.33	Front walings to piles
	16	2'-0"	133.32	" " splices
1" ϕ	66	2'-2"	434.34	Braces and top back walings to piles
	8	2'-2"	59.92	Top back waling splices
	2	1'-0"	13.22	Lower back waling to pile.
	3	1'-8"	49.36	Lower back waling splices

Total weight — 1078.48 lbs.

Note. All walings and braces to be halved into piles and secured with two 1" ϕ bolts.

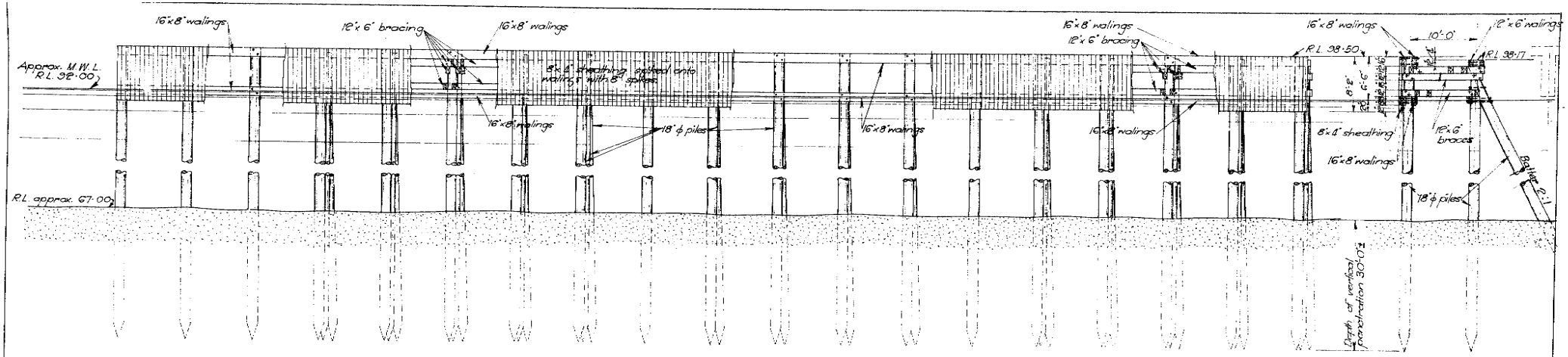


GENERAL ARRANGEMENT OF PILES
Scale 1" = 40'0"

DEPARTMENT OF PUBLIC WORKS, TAS.

BRIDGEWATER BRIDGE.
PIER PROTECTION
EXTENSION AT S.W. CORNER.

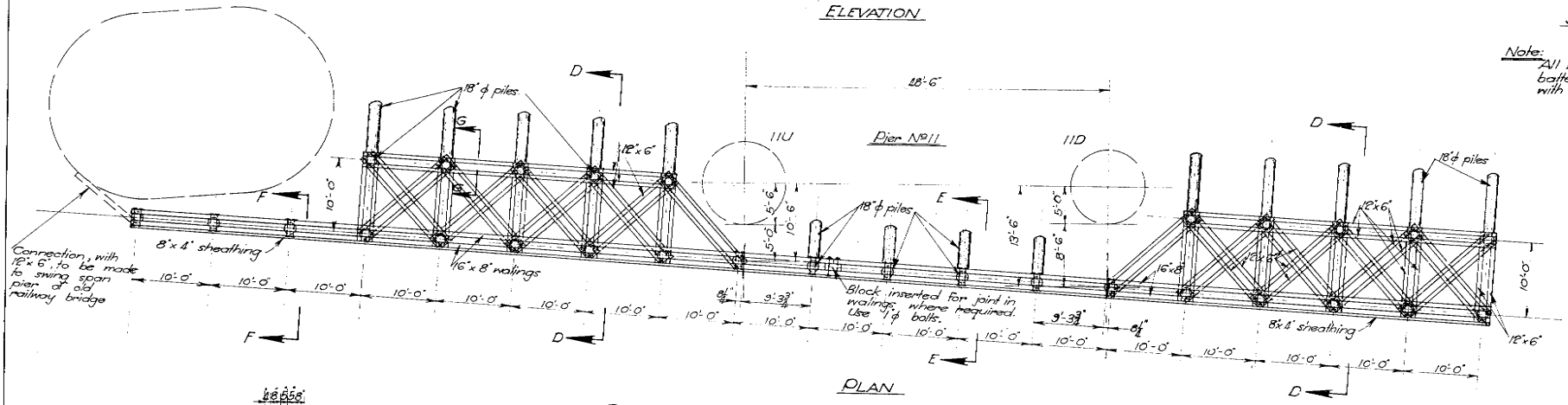
Scale shown	Prepared	Checked.	1502
Drawing	M.D.P. 3.4.58		
Tracing	M.D.P.	July 58.	-19A
Design			
Supervision		Bridge Engineer.	
M. Dunstan. Designs Engineer		Chief Engineer.	



ELEVATION

SECTION ON D-D

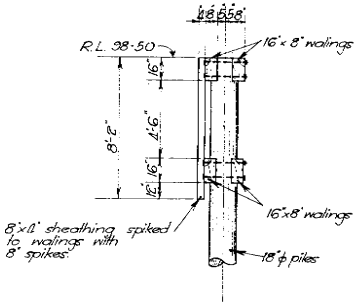
Note:
All walings, bracing, and batter piles to be bolted on with 1"ϕ bolts.



PLAN

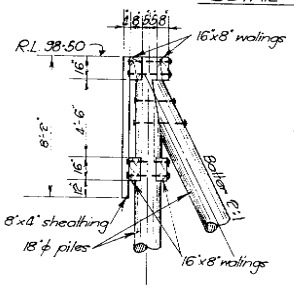
DETAIL OF PROTECTION FOR PIER No. 11

Scale: ½" = 1ft.



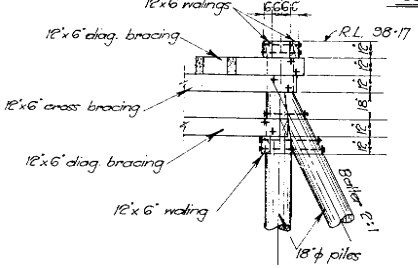
SECTION ON F-F

½" = 1ft.



SECTION ON E-E

½" = 1ft.

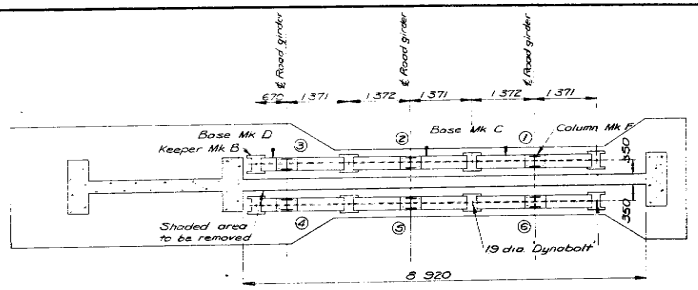


SECTION ON G-G

½" = 1ft.

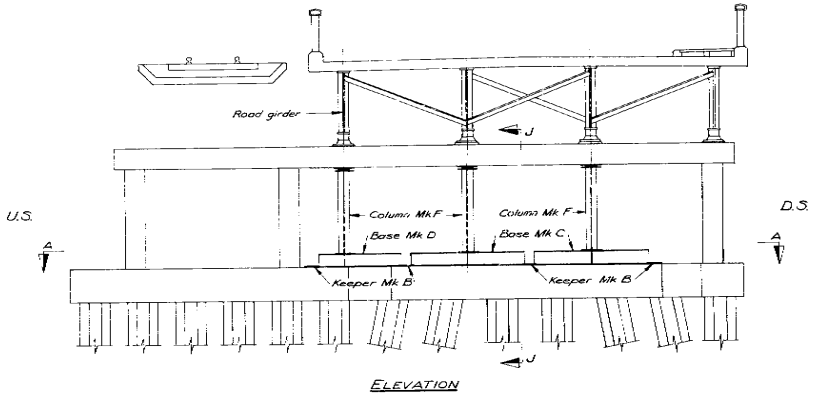
Note:
All walings and braces to be halved into piles and secured with two 1"ϕ bolts.

DEPARTMENT OF PUBLIC WORKS-TAS.			
BRIDGEWATER BRIDGE			
PIER PROTECTION FOR PIER No 11			
Scale: As shown	Prepared	Checked	15L
Drawing			
Tracing			~2
Design			
Supervision			Chief Engr



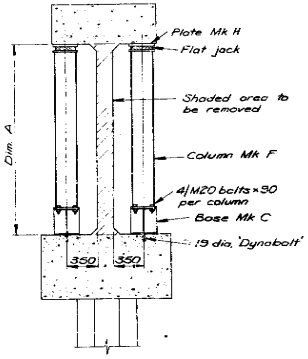
SECTION A-A

Location	Pier 4 Dim. A	Pier 6 Dim. A
1	2 205	2 362
2	2 201	2 351
3	2 201	2 348
4	2 201	2 365
5	2 207	2 362
6	2 203	2 363

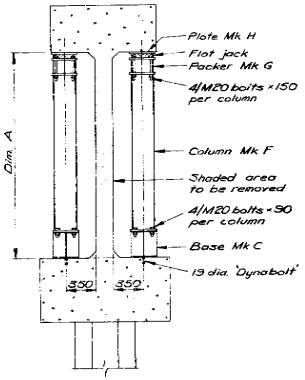


ELEVATION

Note - Flat jack to be 'VSL Type 250C' or equivalent Force = 540 kN

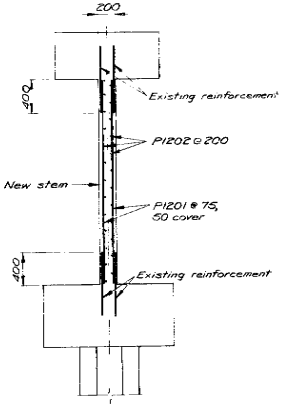


SECTION J-J - PIER 4



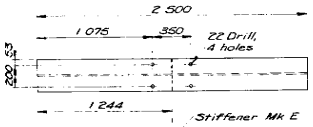
SECTION J-J - PIER 6

PRIOR TO RESTORATION

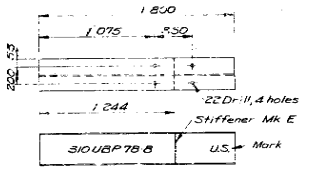


SECTION J-J - PIER 4 & 6

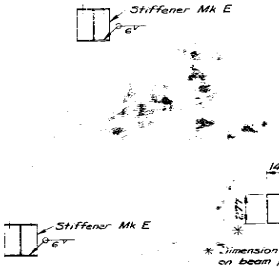
AFTER RESTORATION



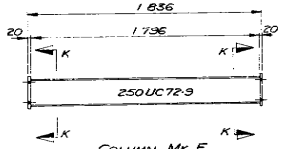
BASE Mk C
4 REQD



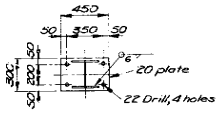
BASE Mk D
2 REQD



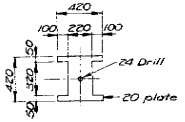
STIFFENER Mk E
12 REQD



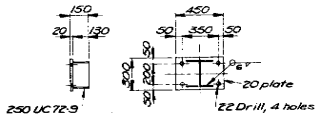
COLUMN Mk F
6 REQD



SECTION K-K



KEEPER Mk B
8 REQD



PACKER Mk G
6 REQD

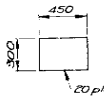


PLATE Mk H
6 REQD

NOTES
1. All shimming to be placed between Flat jack and Plate Mk H
2. Assembled height of falsework Pier 4 - 2 195
Pier 6 - 2 345

The concrete shall be to be in accordance with the Specifications for Ready Mixed Concrete Metric Units December 1974, and as may be subsequently amended.

Minimum design mean compressive strength (D.M.C.S.) determined by 28-day compression tests on cylindrical specimens shall be as follows:

Grade F'c MPa	D.M.C.S. MPa	Spec. Slump mm	Location in structure
20	27	50	Stem

1. All exposed edges to be chamfered 20mm unless otherwise shown.
2. All steel reinforcement 12 mm diameter and over to be structural grade deformed bars unless otherwise shown.
3. The designing engineer shall ensure that backfilling, and filling generally around substructure units together with rock packing and c-c-t packing requirements are conducted on the road plans. The engineer supervising the construction shall ensure that this work is done to his satisfaction and as specified.
4. Road plans:
5. Bench mark:
6. Design loading to be marked onto inside face of U.S. kerb at Abutment A end
7. Year of construction to be marked onto inside face of D.S. kerb at Abutment A end
8. Bridge number to be marked onto outside face of D.S. kerb at Abutment A end
9. Bridge number to be marked onto outside face of D.S. kerb at Abutment A end
10. If any doubt exists in the field or workshop about information on the drawings, the matter shall be referred to construction supervisors with the Division Engineer, Bridges for clarification. No work shall proceed if in doubt.

Date	Amendments	Approved

	Design	Drawing
Prepared	G.L.B.	K.J 10-4-80
Checked		A.J.W 23 4 80
Supervised		
Recommended	Approved	
Division Engineer, Bridges	Assistant Director	

Scale: 1:50, 1:25 & 1:20

Design loading:

Location: BRIDGEWATER

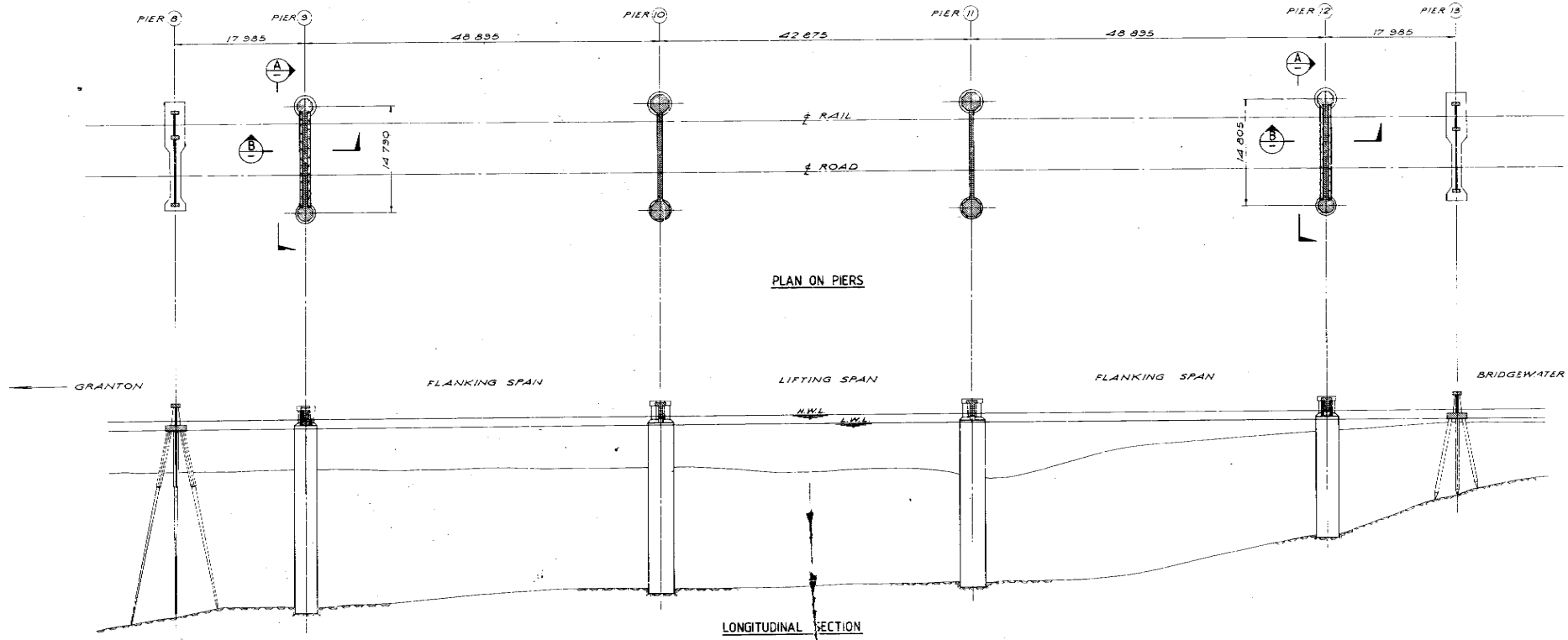
DEPARTMENT OF MAIN ROADS, TASMANIA

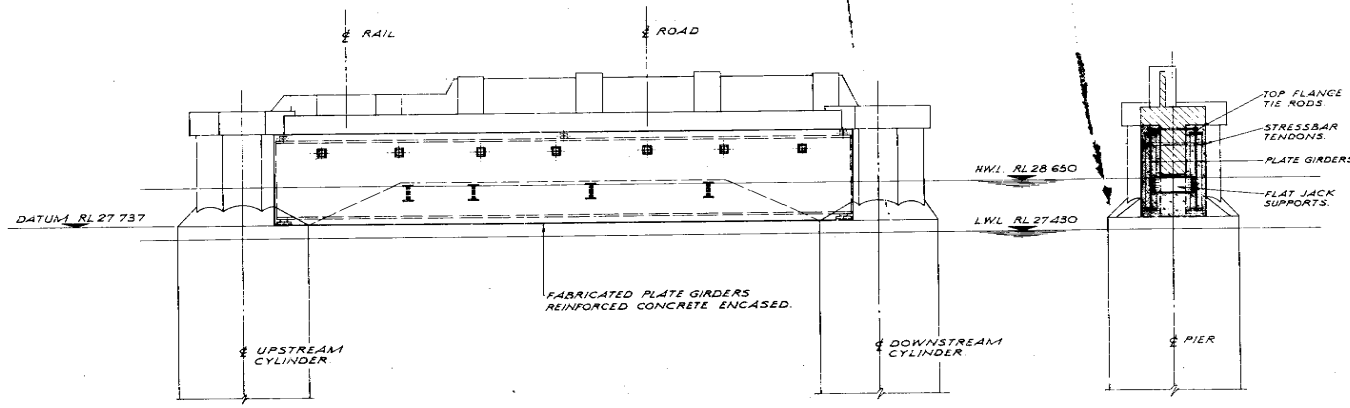
DERWENT RIVER BRIDGE
P! 4 & 6
STEM RESTORATION & FALSEWORK

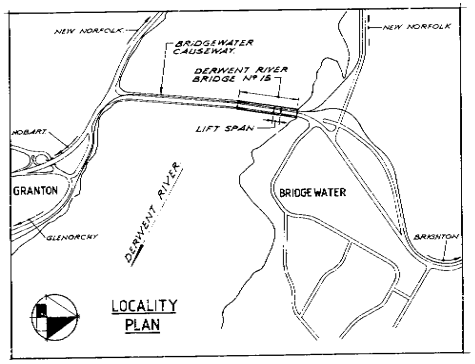
Bridge Number: 15 D 2

Sheet Number: 22

DRG. NO. 15/D2-23







1. THE CONCRETE MIX IS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS FOR READY MIXED CONCRETE METRIC UNITS DECEMBER '82 & AND AS MAY BE SUBSEQUENTLY AMENDED.
MINIMUM DESIGN MEAN COMPRESSIVE STRENGTH (f'm) : 53 DETERMINED BY 28-DAY COMPRESSION TESTS ON CYLINDRICAL SPECIMENS SHALL BE AS FOLLOWS:

GRADE (f'c) MPa	D.M.C.S. MPa	SPEC. SLUMP mm	LOCATION OF STRUCTURE

2. ALL EXPOSED EDGES TO BE CHAMFERED 20mm UNLESS OTHERWISE SHOWN.
3. STEEL REINFORCEMENT 12mm DIA AND OVER TO BE "TEMPCORE" DEFORMED BARS UNLESS OTHERWISE SHOWN.
4. THE DESIGNING ENGINEER SHALL ENSURE THAT BACKFILLING AND FILLING GENERALLY AROUND SUBSTRUCTURE UNITS TOGETHER WITH ROCK PACKING AND ROCK PITCHING REQUIREMENTS ARE NOTED ON THE ROAD PLANS. THE ENGINEER SUPERVISING THE CONSTRUCTION SHALL ENSURE THAT THIS WORK IS DONE TO HIS SATISFACTION AND AS SPECIFIED.
5. ROAD PLANS. 6.96KPH MARK
7. DESIGN LOADING TO BE MARKED INTO INSIDE FACE OF D.S. KERB AT ABUTMENT A END.
8. YEAR OF CONSTRUCTION TO BE MARKED INTO INSIDE FACE OF D.S. KERB AT ABUTMENT A END.
9. BRIDGE NUMBER TO BE MARKED INTO OUTSIDE FACE OF D.S. KERB AT ABUTMENT A END.
10. IF ANY DOUBT EXISTS IN THE FIELD OR WORKSHOP ABOUT INFORMATION ON THE DRAWING, THE MATTER SHALL BE REVIEWED BY CONSTRUCTION SUPERVISORS WITH THE DESIGN ENGINEER, ENQUIRIES FOR CLARIFICATION. NO WORK SHALL PROCEED IF IN DOUBT.

DATE	AMENDMENTS	APPROVED

DESIGN	C.B.	GB 11/10/88
PREPARED		
CHECKED	E.A.P.	D.H. 9-11-88
SUPERVISED		
RECOMMENDED		APPROVED
	DIVISION ENGINEER BRIDGES	ASSISTANT DIRECTOR

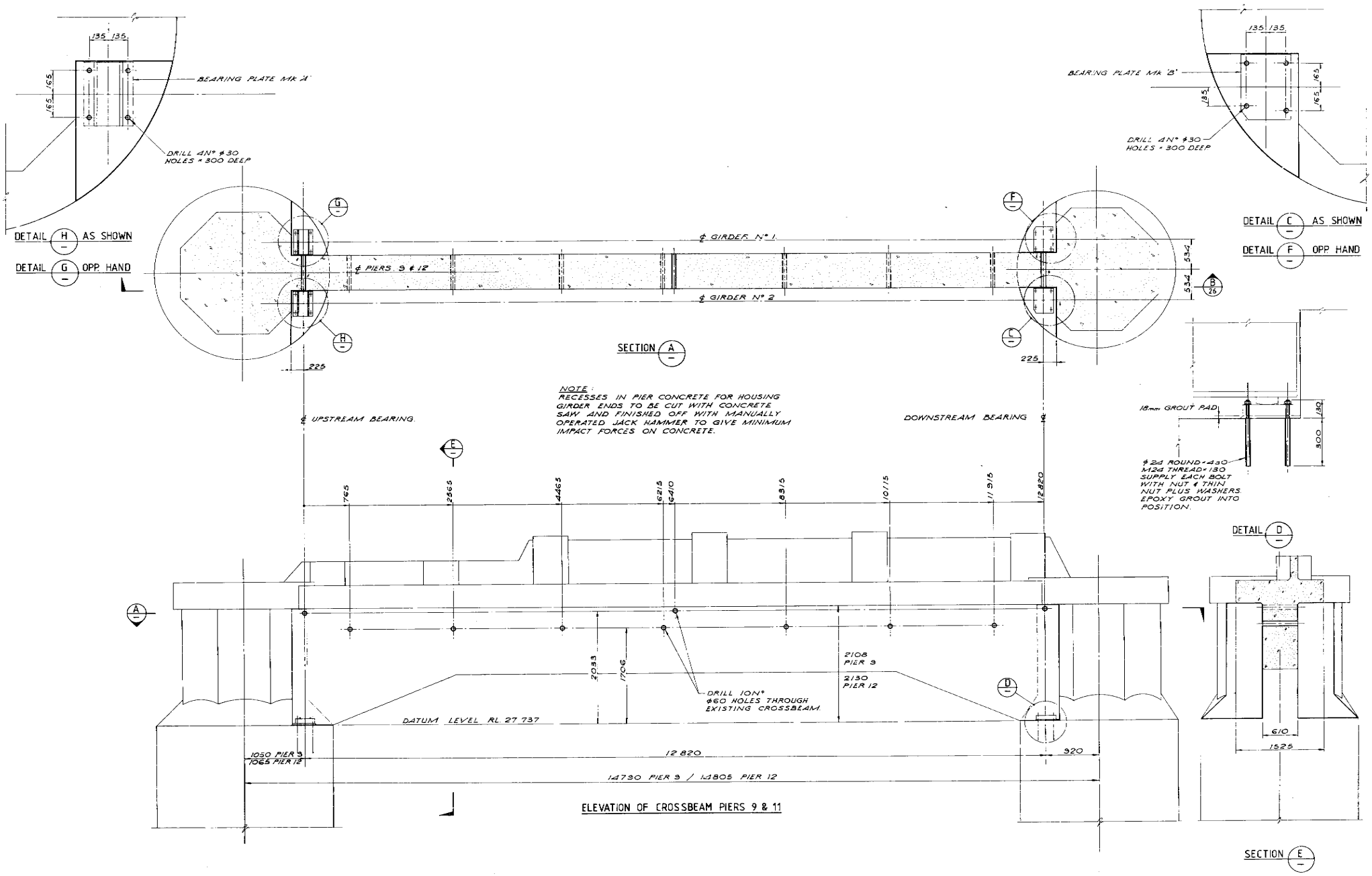
SCALE 1:250 1:50
DESIGN LOADING T44
LOCATION MIDLAND HIGHWAY BRIDGEWATER

DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE
PIERS 9 & 12 : CROSSBEAM STRENGTHENING
GENERAL ARRANGEMENT

BRIDGE NUMBER 15
SHEET NUMBER D2-23

DRG. NO. 15/D2-24



1. THE CONCRETE MIX IS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS FOR READY MIXED CONCRETE WITH UNITS DESIGNATED I 974, AND AS MAY BE SUBSEQUENTLY AMENDED. MINIMUM DESIGN MEAN COMPRESSIVE STRENGTH @ M.C.S.J. DETERMINED BY 28-DAY COMPRESSION TESTS ON CYLINDRICAL SPECIMENS SHALL BE AS FOLLOWS:

GRADE F'C MPa	S.M.C.S. MPa	SPEC. SLUMP mm	LOCATION OF STRUCTURE

2. ALL EXPOSED EDGES TO BE CHAMFERED 20mm UNLESS OTHERWISE SHOWN.

3. STEEL REINFORCEMENT 12mm DIA AND OVER TO BE "TEMPCORE" DEFORMED BARS UNLESS OTHERWISE SHOWN.
4. THE RESIDENT ENGINEER SHALL ENSURE THAT BACKFILLING AND FILLING GENERALLY AROUND CONCRETE UNITS TOGETHER WITH ROCK FACING AND ROCK PITCHING REQUIREMENTS ARE ENDORSED ON THE ROAD PLANS. THE ENGINEER SUPERVISING THE CONSTRUCTION SHALL ENSURE THAT THIS WORK IS DONE TO HIS SATISFACTION AND AS SPECIFIED.
5. BENCH MARK.
6. ROAD PLANS.
7. DESIGN LOADING TO BE STAMPED INTO INSIDE FACE OF U.S. KERB AT ABUTMENT A END.
8. YEAR OF CONSTRUCTION TO BE STAMPED INTO INSIDE FACE OF U.S. KERB AT ABUTMENT B END.
9. BRIDGE NUMBER TO BE STAMPED INTO OUTSIDE FACE OF U.S. KERB AT ABUTMENT A END.
10. IF ANY DOUBT EXISTS IN THE FIELD OR WORKSHOP ABOUT INFORMATION ON THE DRAWINGS, THE MATTER SHALL BE REVIEWED BY CONSTRUCTION SUPERVISORS WITH THE DIVISION ENGINEER, BRIDGES FOR CLARIFICATION. NO WORK SHALL PROCEED IF IN DOUBT.

DATE	AMENDMENTS	APPROVED

	DESIGN	DRAWING
PREPARED	C.S.	GS 30.5.88
CHECKED	G.A.P.	P.H. 9-11-88
SUPERVISED		

SCALE 1:25 1:10
DESIGN LOADING T44
LOCATION MIDLAND HIGHWAY BRIDGEWATER

RECOMMENDED DIVISION ENGINEER BRIDGES
APPROVED ASSISTANT DIRECTOR 8.8.89

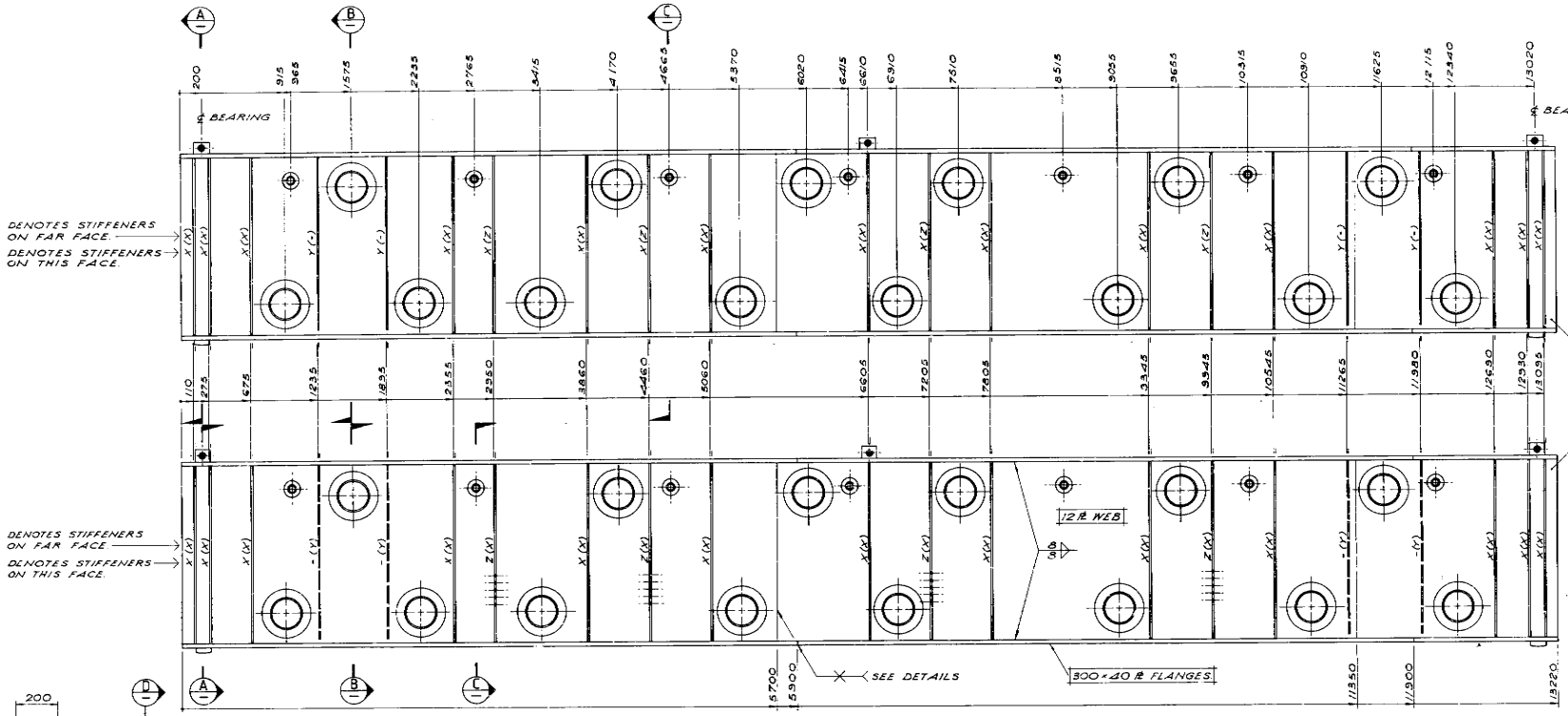
DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE

PIERS 9 & 12 : CROSSBEAM STRENGTHENING
EXISTING CROSSBEAM PREPARATION

BRIDGE NUMBER 15
SHEET NUMBER D2-24

DRG. NO. 15/D2-25



GIRDER Nº1 2 REQUIRED

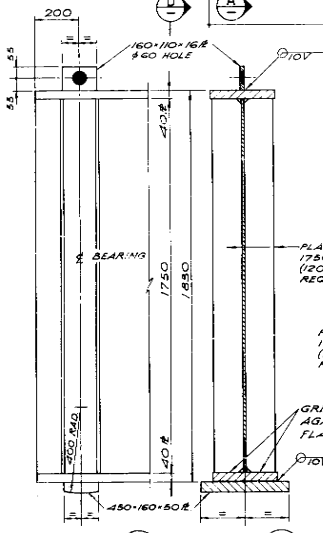
MASS PER GIRDER 6·4 TONNE.
1:20

GIRDER Nº2 2 REQUIRED

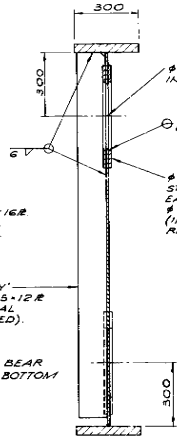
MASS PER GIRDER 6·4 TONNE.
1:20

NOTES :

1. ALL DIMENSIONS ℄ NOTES REFER TO BOTH GIRDERS 1 ℄ 2.
2. THE GIRDER ASSEMBLY SHALL BE COMPLETED PRIOR TO INSTALLING STIFFENER PLATES.
3. MATERIAL TO AS1204 GRADE 250.
4. FABRICATION TO AS1250 ℄ AS1554.
5. FINISH - GRIT BLASTED AND ONE HOLDING COAT OF INORGANIC ZINC SILICATE.
6. DURING TRANSPORTATION, CARE SHALL BE TAKEN NOT TO DAMAGE ROCKER PLATES, SEE ELEVATION (D)

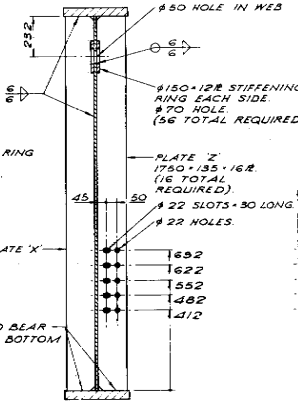


ELEVATION (D) 1:10

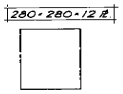


SECTION (A) 1:10

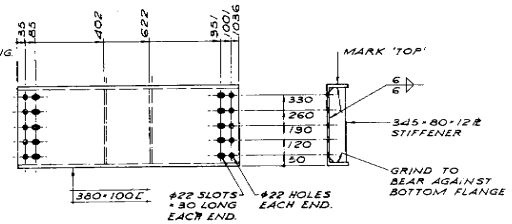
SECTION (B) 1:10



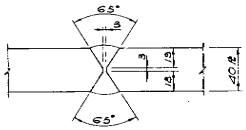
SECTION (C) 1:10



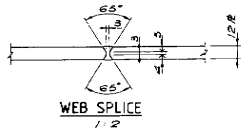
FLAT JACK PLATE
8 REQUIRED
1:10



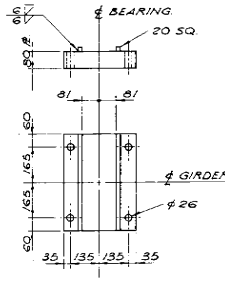
FLAT JACK SUPPORT
16 REQUIRED
1:10



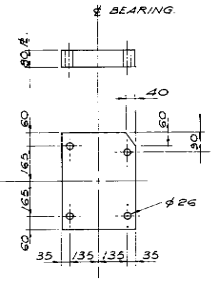
FLANGE SPLICE
1:2



WEB SPLICE
1:2



BEARING PLATE MK 'A'
4 REQUIRED



BEARING PLATE MK 'B'
4 REQUIRED

1. THE CONCRETE MIX IS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS FOR READY MIXED CONCRETE WITHIN UP-TO-DECEMBER 1974, AND AS MAY BE SUBSEQUENTLY AMENDED. MINIMUM DESIGN MEAN COMPRESSIVE STRENGTH (D.M.C.S.) DETERMINED BY 28-DAY COMPRESSION TESTS ON CYLINDRICAL SPECIMENS SHALL BE AS FOLLOWS:

GRADE FC MPa	D.M.C.S. MPa	SPEC. SLUMP mm	LOCATION IN STRUCTURE

2. STEEL REINFORCEMENT (2mm DIA AND OVER) TO BE 'TEMPCORE' DEFORMED BARS UNLESS OTHERWISE SHOWN.
3. THE RESIDENT ENGINEER SHALL ENSURE THAT BACKFILLING AND FILLING GENERALLY AROUND SUBSTRUCTURE UNITS TOGETHER WITH ROCK PACKING AND ROCK PITCHING REQUIREMENTS ARE INDICATED ON THE ROAD PLANS. THE ENGINEER SUPERVISING THE CONSTRUCTION SHALL ENSURE THAT THIS WORK IS DONE TO HIS SATISFACTION AND AS SPECIFIED.
4. BRIDGE NUMBER
5. ROAD PLANS.
6. DESIGN LOADING 'O' BE MARKED INTO INSIDE FACE OF U.S. KERB AT ABUTMENT A END.
7. YEAR OF CONSTRUCTION TO BE MARKED INTO INSIDE FACE OF D.S. KERB AT ABUTMENT A END.
8. BRIDGE NUMBER TO BE MARKED INTO OUTSIDE FACE OF D.S. KERB AT ABUTMENT A END.
9. IF ANY DOUBT EXISTS IN THE FIELD OR WORKSHOP ABOUT INFORMATION ON THE DRAWING, THE MATTER SHALL BE REVIEWED BY THE DESIGN ENGINEER, DRAWING FOR CLARIFICATION. NO WORK SHALL PROCEED IF IN DOUBT.

AMENDMENTS	DATE	APPROVED

	DESIGN	DRAWING
PREPARED	C.B.	GB 16.9.88
CHECKED	E.A.P.	P.H. 9-11-88
SUPERVISED		
RECOMMENDED	DIVISION ENGINEER BRIDGES	APPROVED ASSISTANT DIRECTOR

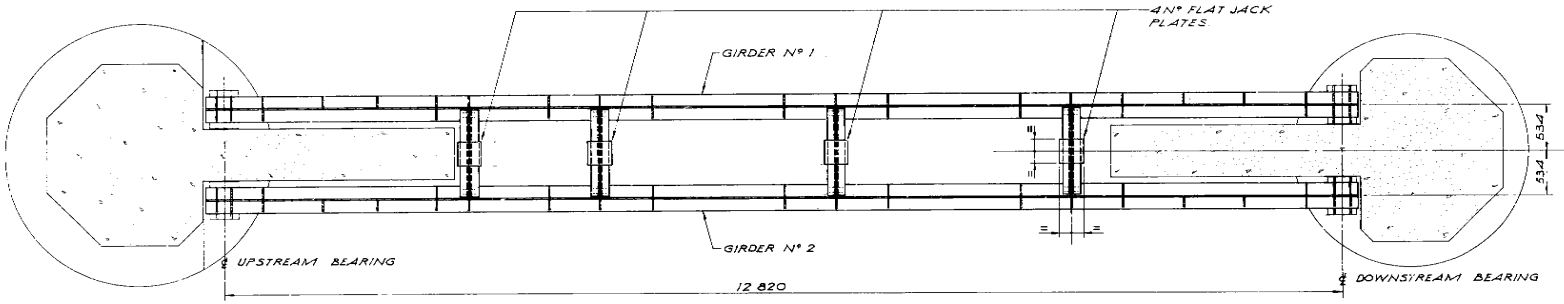
SCALE 1:20 1:10 1:5 1:2
DESIGN LOADING T44
LOCATION MIDLAND HIGHWAY BRIDGEWATER

DEPARTMENT OF MAIN ROADS, TASMANIA

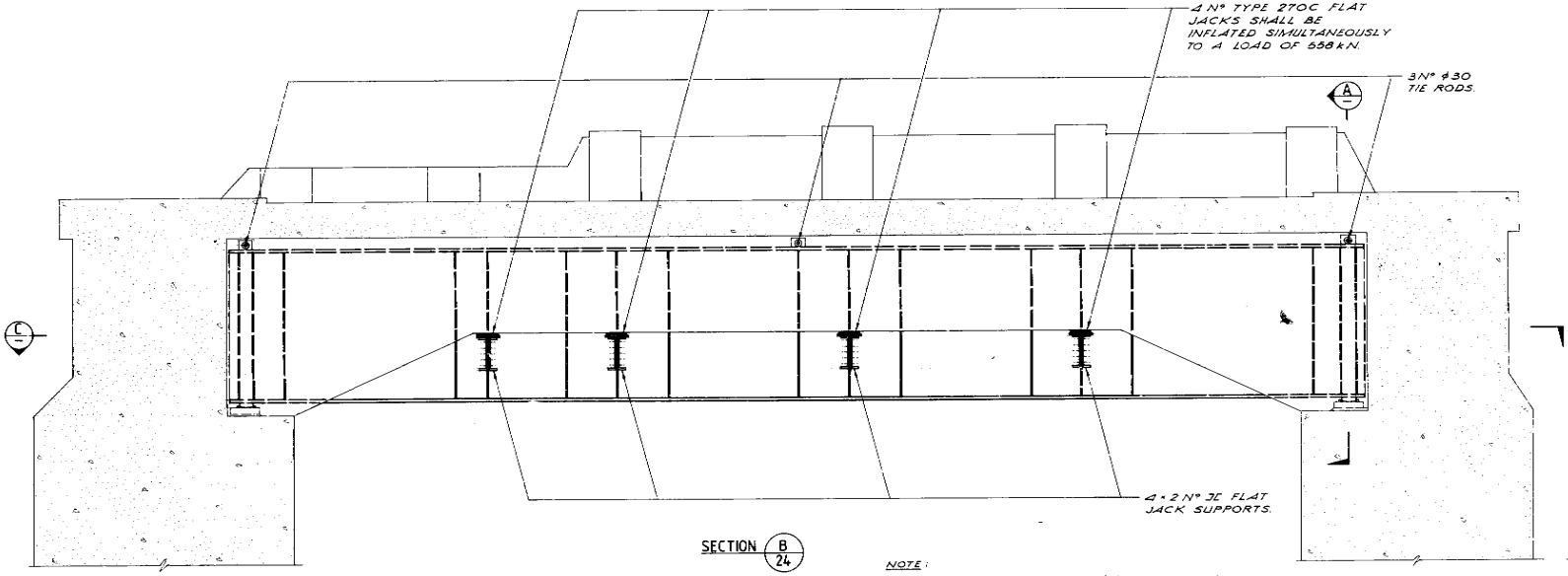
DERWENT RIVER BRIDGE
PIERS 9 & 12 : CROSSBEAM STRENGTHENING
GIRDER FABRICATION

BRIDGE NUMBER 15
SHEET NUMBER D2-25

DRG. NO. 15/D2-26

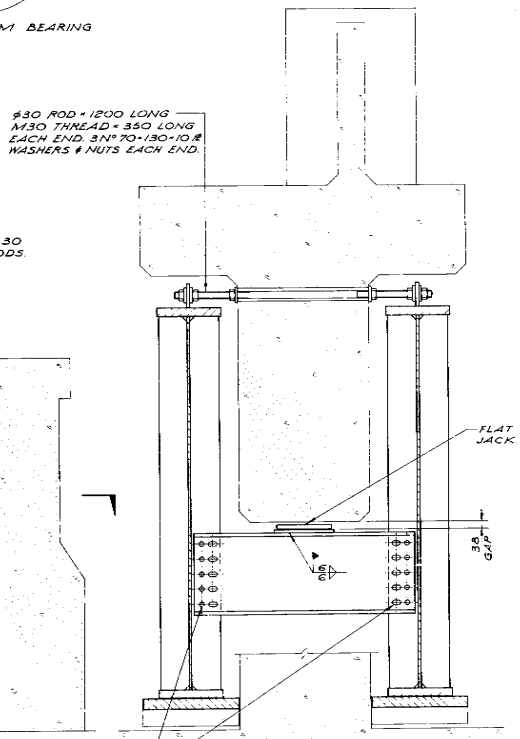


SECTION C



SECTION B 24

NOTE:
IT IS NOT POSSIBLE TO INSTALL THE SUPPORT CHANNELS AFTER THE GIRDERS ARE BOTH IN PLACE. THE CHANNELS SHALL THEREFORE BE LOOSELY BOLTED TO THE FIRST GIRDER INSTALLED, USING TIMBER WEDGES TO FACILITATE THE INSTALLATION OF THE SECOND GIRDER.



SECTION A

1. THE CONCRETE MIX IS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS FOR READY MIXED CONCRETE METRIC UNITS DECEMBER 1974 AMD AS MAY BE SUBSEQUENTLY AMENDED MINIMUM DESIGN MEAN COMPRESSIVE STRENGTH (D.M.C.S.) DETERMINED BY 28-DAY COMPRESSION TESTS ON CYLINDRICAL SPECIMENS SHALL BE AS FOLLOWS:

GRADE F'C MPa	D.M.C.S. MPa	SPEC. SLUMP mm	LOCATION IN STRUCTURE

2. ALL EXPOSED EDGES TO BE CHAMFERED 20mm UNLESS OTHERWISE SHOWN.
3. STEEL REINFORCEMENT 12mm DIA AND OVER TO BE "TEMPCORE" DEFORMED BARS UNLESS OTHERWISE SHOWN.
4. THE DESIGNING ENGINEER SHALL ENSURE THAT BACKFILLING AND FILLING GENERALLY ABOVE SUBSTRUCTURE UNITS TOGETHER WITH ROCK FACING AND ROCK PITCHING REQUIREMENTS ARE ENDORSED ON THE ROAD PLANS. THE ENGINEER SUPERVISING THE CONSTRUCTION SHALL ENSURE THAT THIS WORK IS DONE TO HIS SATISFACTION AND AS SPECIFIED.
5. ROAD PLANS & BENCH MARK
7. DESIGN LOADING TO BE MARKED INTO INSIDE FACE OF D.S. KERB AT ABUTMENT A END.
8. YEAR OF CONSTRUCTION TO BE MARKED INTO INSIDE FACE OF D.S. KERB AT ABUTMENT A END.
9. BRIDGE NUMBER TO BE MARKED INTO OUTSIDE FACE OF D.S. KERB AT ABUTMENT A END.
10. IF ANY DOUBT EXISTS IN THE FIELD OR WORKSHOP ABOUT INFORMATION ON THE DRAWING, THE MATTER SHALL BE REVIEWED BY CONSTRUCTION SUPERVISORS WITH THE DESIGN ENGINEER, BRIDGES FOR CLARIFICATION. NO WORK SHALL PROCEED IF IN DOUBT.

DATE — AMENDMENTS — APPROVED

	DESIGN	DRAWING
PREPARED	C.S	GS 30 3 88
CHECKED	E.A.P.H.C	P.H 9-11-88
SUPERVISED		
RECOMMENDED	APPROVED	
DIVISION ENGINEER BRIDGES	ASSISTANT DIRECTOR 7.12.88	

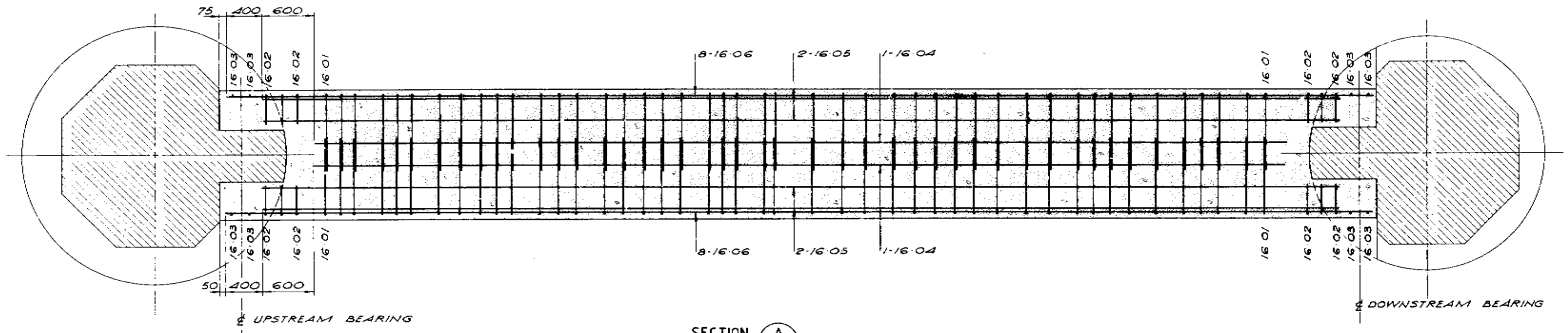
SCALE 1:25 1:10
DESIGN LOADING T44
LOCATION
MIDLAND HIGHWAY
BRIDGEWATER

DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE
PIERS 9 & 12 : CROSSBEAM STRENGTHENING
GIRDER INSTALLATION

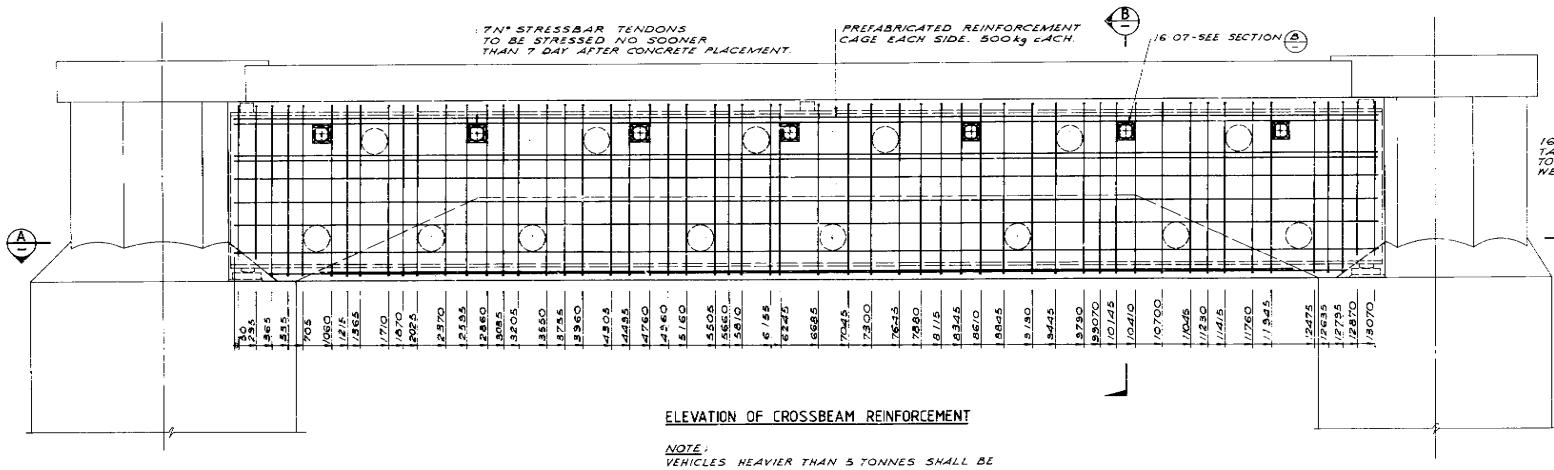
BRIDGE NUMBER 15
SHEET NUMBER D2-26

DRG. NO. 15/D2-27



SECTION A

GIRDERS OMITTED FOR CLARITY



ELEVATION OF CROSSBEAM REINFORCEMENT

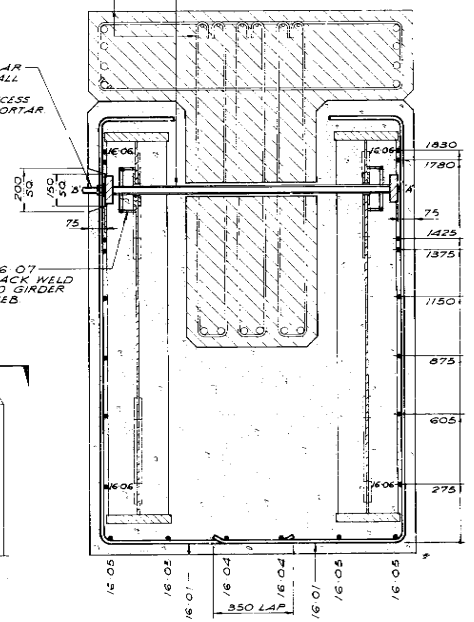
NOTE:
VEHICLES HEAVIER THAN 5 TONNES SHALL BE DIVERTED FROM THE BRIDGE DURING THE PLACEMENT OF CONCRETE AROUND THE NEW GIRDERS UNTILL 6 HOURS AFTER THE LAST CONCRETE HAS BEEN PLACED.

STRESSBAR TENDON

REGULAR GRADE ϕ26 × 1482 LONG. THREAD LENGTH 'A' = 50mm, 'B' = 134mm. STANDARD PLAIN & THREADED BEARING PLATES - 1298 BETWEEN FACES. SPHERICAL SEATING NUT & WASHER. GROUT FLANGE - 33 I.D. DUCTING. STRESS TO 393 kN.

EXISTING REINFORCEMENT TO CROSSBEAM. ϕ10 STIRRUPS AT VARIABLE CENTRES

PROJECTING STRESSBAR AFTER STRESSING, SHALL BE TRIMMED WITH A FRICTION CUTTER & RECESS FILLED WITH EPOXY MORTAR



16 07 TACK WELD TO GIRDER WEB

50mm COVER

MIN CEMENT CONTENT 400 kg/m³ OF CONCRETE.

SECTION B

1. THE CONCRETE MIX IS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS FOR READY MIXED CONCRETE METRIC UNITS DECEMBER 1974, AND AS MAY BE SUBSEQUENTLY AMENDED. WHERE DESIGN MEAN COMPRESSIVE STRENGTH (D.M.C.S.) DETERMINED BY 28-DAY COMPRESSION TESTS ON CYLINDRICAL SPECIMENS SHALL BE AS FOLLOWS:

GRADE 'FC' MPa	D.M.C.S. MPa	S.L.U.M.P. mm	LOCATION IN STRUCTURE
30	37	35-65	CROSSBEAMS.

2. ALL EXPOSED EDGES TO BE CHAMFERED 20mm UNLESS OTHERWISE SHOWN.

3. STEEL REINFORCEMENT 12mm DIA AND UNDER TO BE 'TEMPCORE' DEFORMED BARS UNLESS OTHERWISE SHOWN.

4. THE DESIGNING ENGINEER SHALL ENSURE THAT BACKFILLING AND FILLING GENERALLY AROUND SUBSTRUCTURE UNITS TOGETHER WITH ROCK PACKING AND ROCK PITCHING REQUIREMENTS ARE ENDORSED ON THE ROAD PLANS. THE ENGINEER / SUPERVISING THE CONSTRUCTION SHALL ENSURE THAT THIS WORK IS DONE TO HIS SATISFACTION AND AS SPECIFIED.

5. ROAD PLANS. 6. BENCH MARK.

7. DESIGN LOADING TO BE MARKED INTO INSIDE FACE OF U.S. KERB AT ABUTMENT A END.

8. YEAR OF CONSTRUCTION TO BE MARKED INTO INSIDE FACE OF D.S. KERB AT ABUTMENT A END.

9. BRIDGE NUMBER TO BE MARKED INTO OUTSIDE FACE OF D.S. KERB AT ABUTMENT A END.

10. IF ANY DOUBT EXISTS IN THE FIELD OR WORKSHOP ABOUT INFORMATION ON THE DRAWING, THE MATTER SHALL BE REFERRED BY CONSTRUCTION SUPERVISORS WITH THE DIVISION ENGINEER, BRIDGES FOR CLARIFICATION. NO WORK SHALL PROCEED IF IN DOUBT.

DATE	AMENDMENTS	APPROVED

	DESIGN	DRAWN
PREPARED	C.B.	G.S. 3.10.86
CHECKED	E.A.F.	P.H. 9-11-'88
SUPERVISED		
RECOMMENDED	APPROVED	
DIVISION ENGINEER BRIDGES	ASS'T DIRECTOR	

SCALE 1:25 / 1:10

DES ON LOADING T44

LOCATION MIDLAND HIGHWAY BRIDGEWATER

DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE

PIERS 9 & 12 : CROSSBEAM STRENGTHENING CONCRETE & REINFORCEMENT

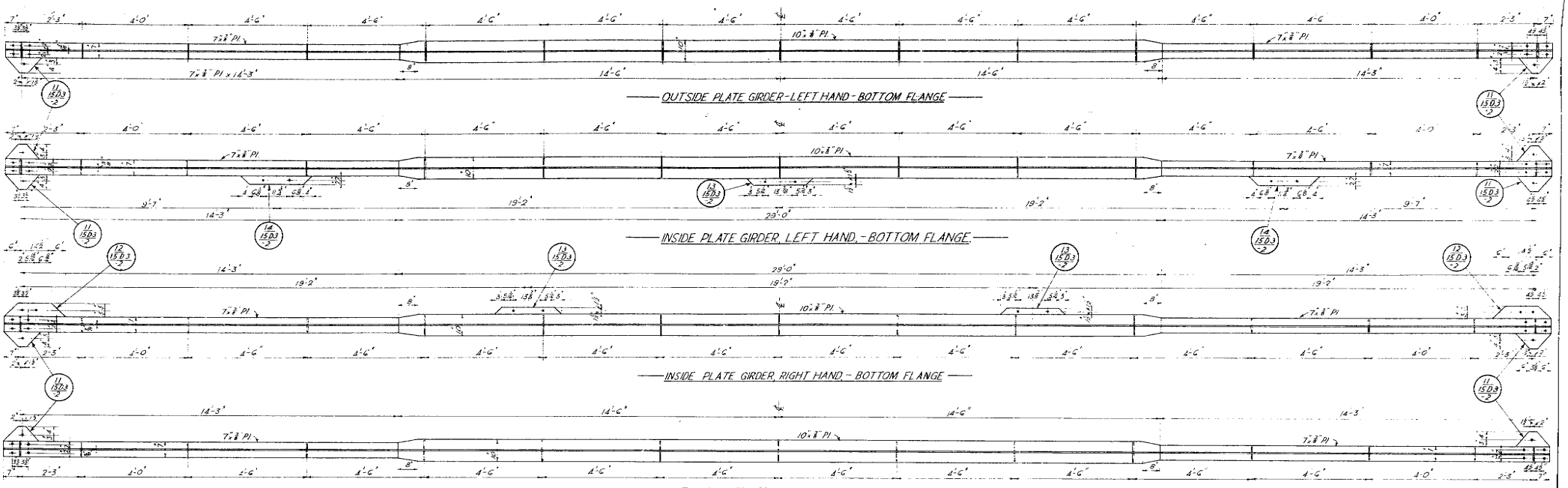
BRIDGE NUMBER 15

SHEET NUMBER D2-27

BRIDGEWATER BRIDGE

D3 - APPROACH SPANS SUPERSTRUCTURE

TABLE OF CONTENTS



OUTSIDE PLATE GIRDER - LEFT HAND - BOTTOM FLANGE

INSIDE PLATE GIRDER, LEFT HAND, - BOTTOM FLANGE

INSIDE PLATE GIRDER, RIGHT HAND, - BOTTOM FLANGE

OUTSIDE PLATE GIRDER, RIGHT HAND, - BOTTOM FLANGE

Note - Hands are taken looking towards Lift span from either end.

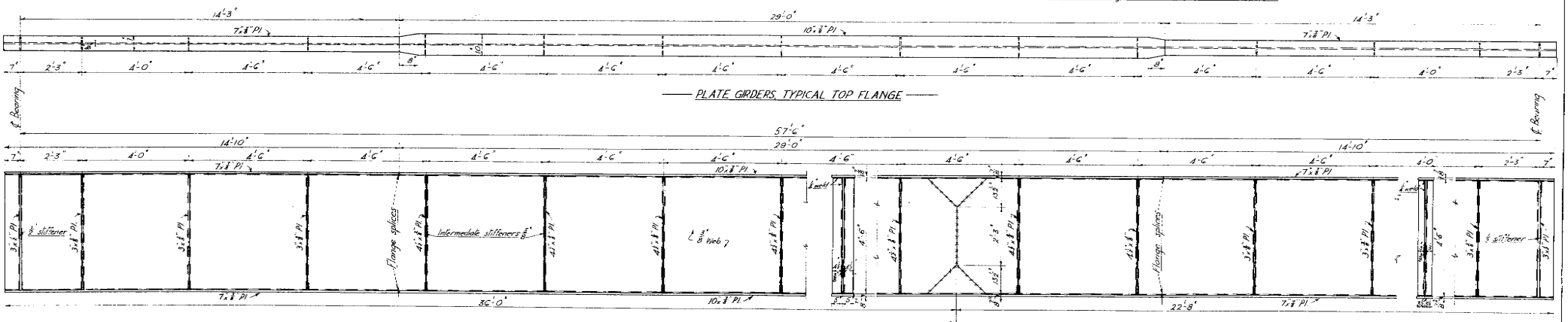
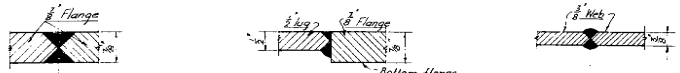


PLATE GIRDERS, TYPICAL TOP FLANGE

TYPICAL ELEVATION OF GIRDER



Flange plates double reed & butt welded. Weld ground off flush with face of plates.

Lugs to be prepared on both sides, butt-welded on to flange. Weld is not to project below bottom of flange plate & is to be ground off flush with top faces.

Web plates double reed & butt welded

Scale: ½ full size.

Note:- For details of lugs, bracing & welding of stiffeners etc. see Dwg 15D3-2

DERWENT RIVER BRIDGE

AT BRIDGEWATER

DETAILS OF PLATE GIRDERS UNDER ROAD-APPROACH SPANS

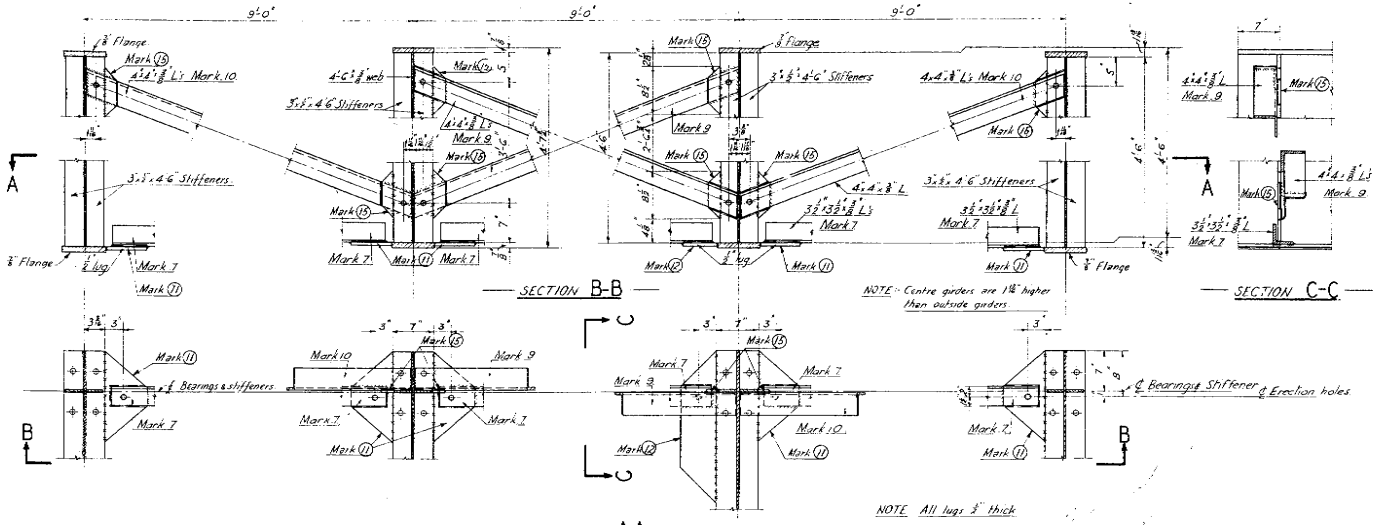
SCALE:- ½" = 1'-0"

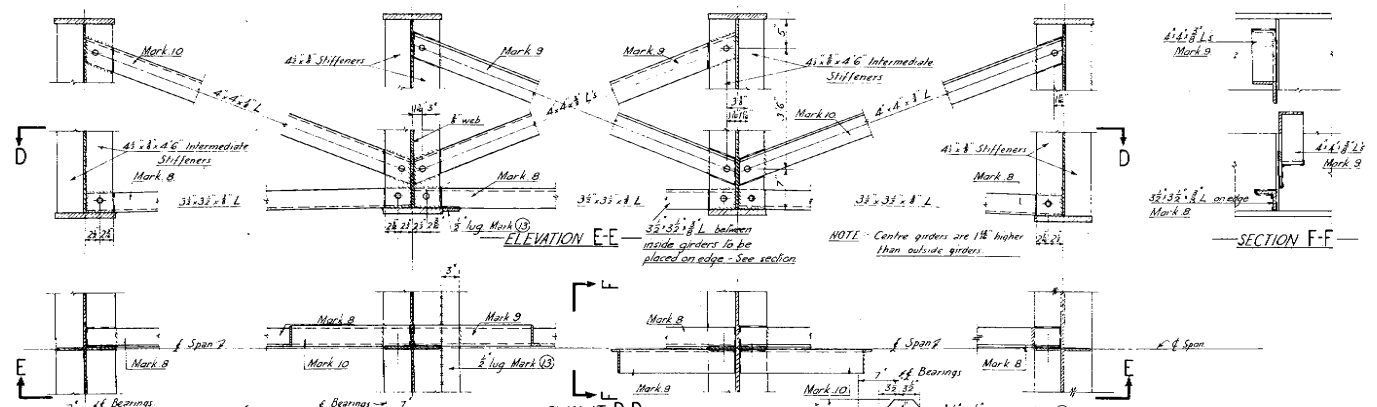
PUBLIC WORKS DEPT TAS

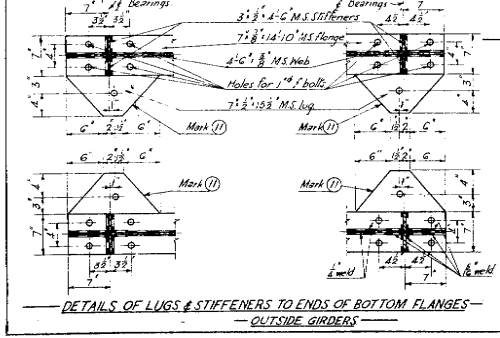
Desd		
Drawn	[illegible]	19/5/57
Examd	D.V.T.	
Traced	C.B. Wilson	4/6/57
Checked	[illegible]	9/7/57

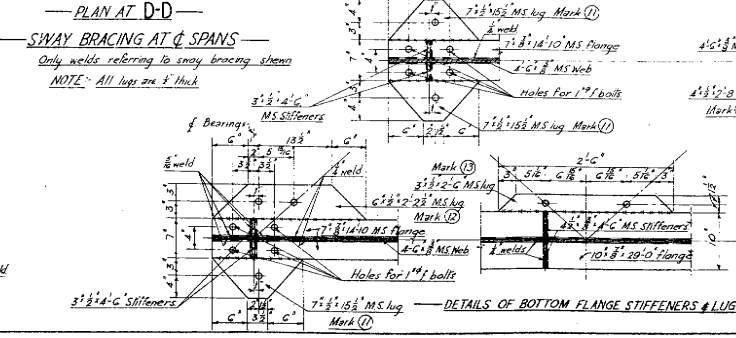
15D3 - 1

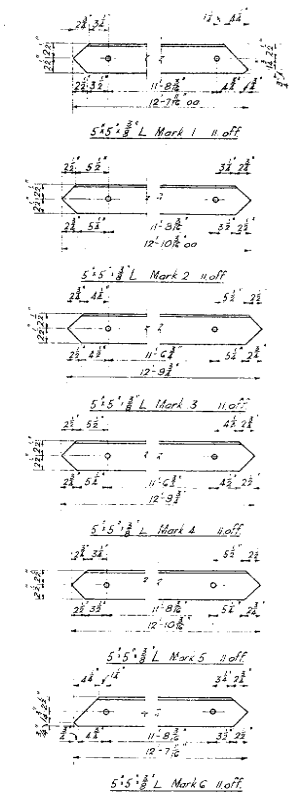
G. D. Balenger

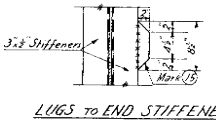


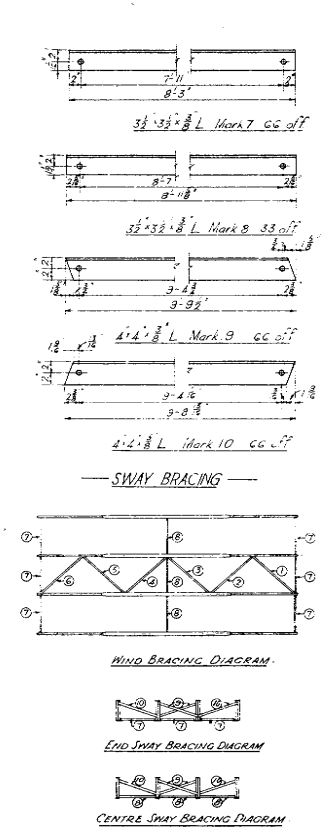












Note All holes for erection bolts to be ⅞" ø
All fillet welds except those shown ⅝" to be ¼"

DERWENT RIVER BRIDGE

AT BRIDGEWATER

APPROACH SPANS — PLATE GIRDERS

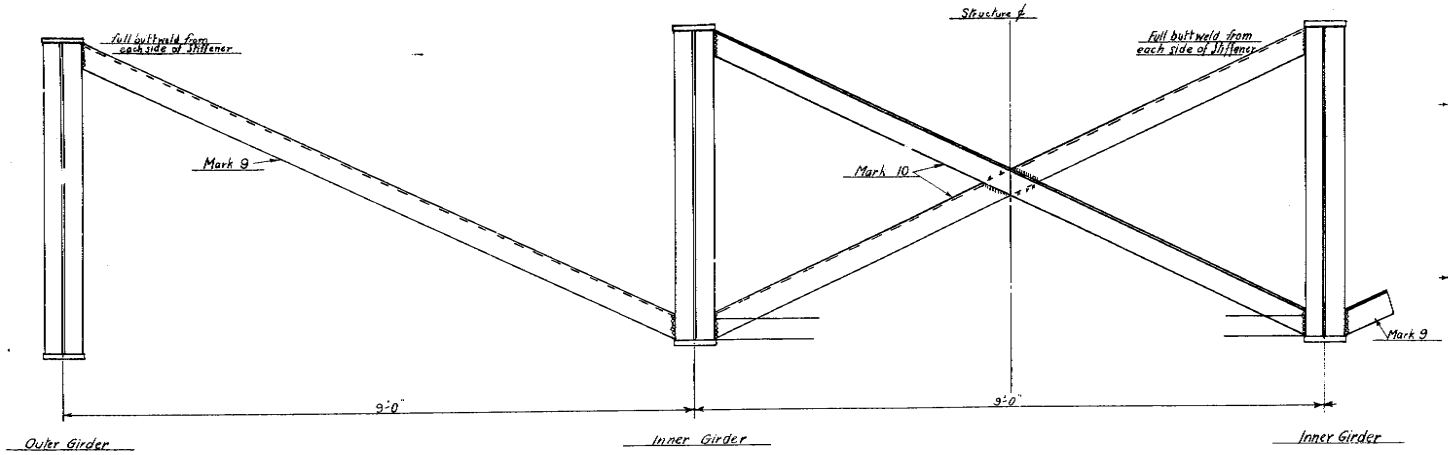
DETAILS OF LUGS & STIFFENERS, SWAY & WIND BRACING

SCALE 1"-1'-0"

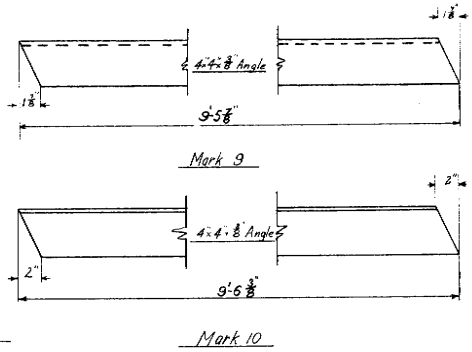
PUBLIC WORKS DEPT TAS.

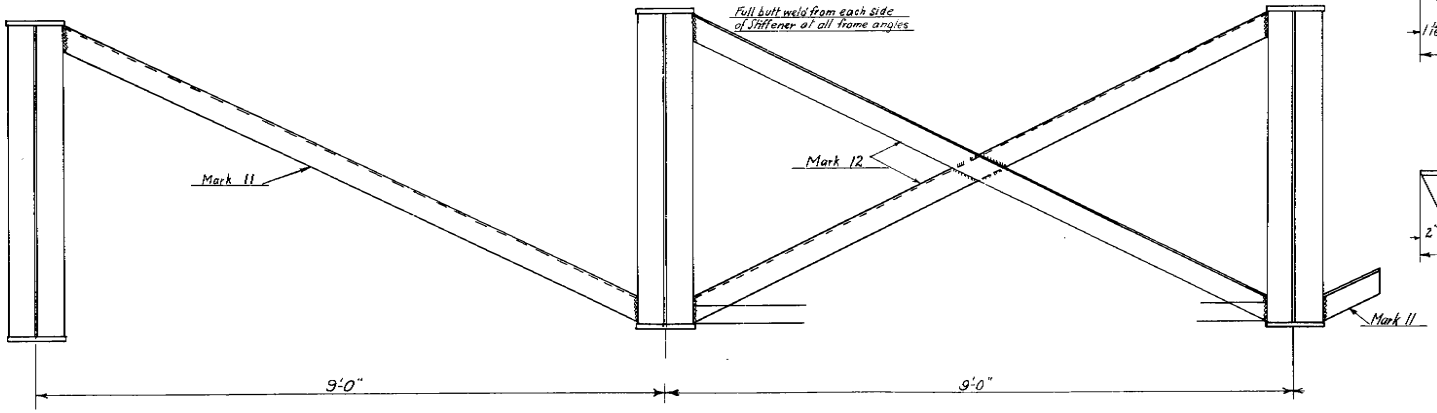
Design		15D3
Drawn	A Sargison	
Traced	D.V.T.	
Checked	[illegible]	1961 — 2

H. D. Balsillie

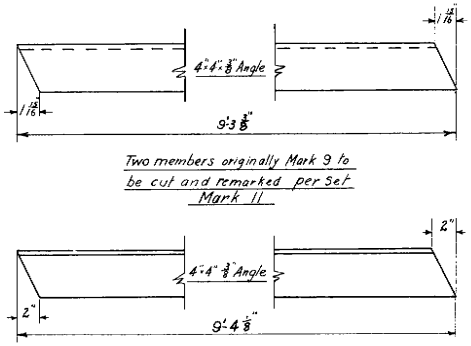


SWAY FRAMES AT ENDS OF PLATE GIRDERS

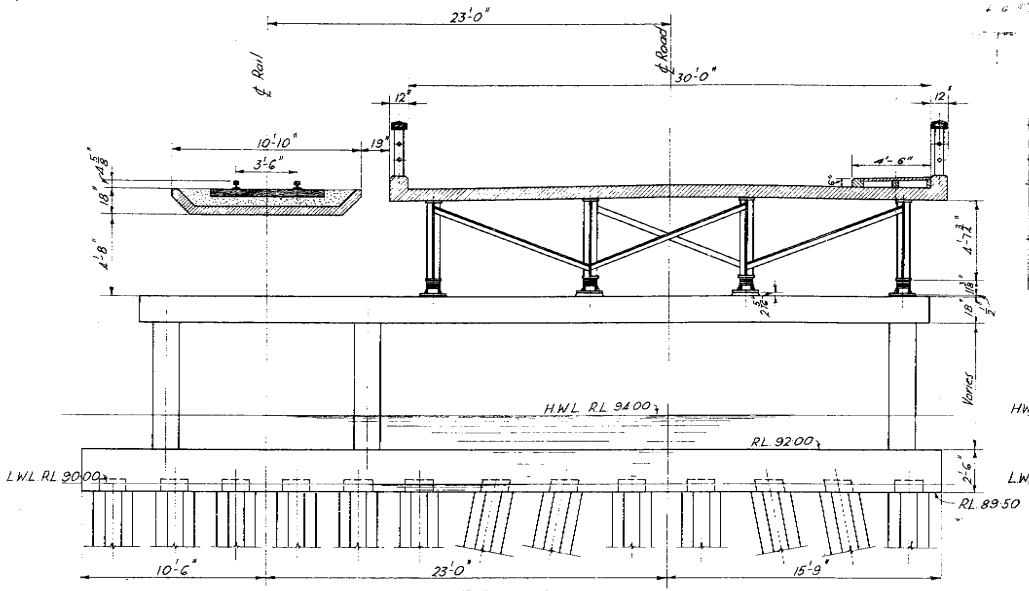




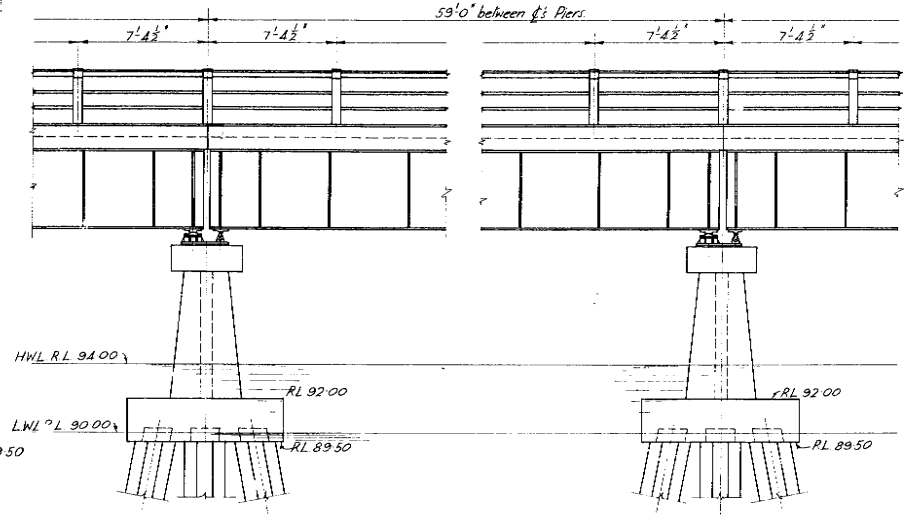
SWAY FRAMES AT CENTRES OF PLATE GIRDERS



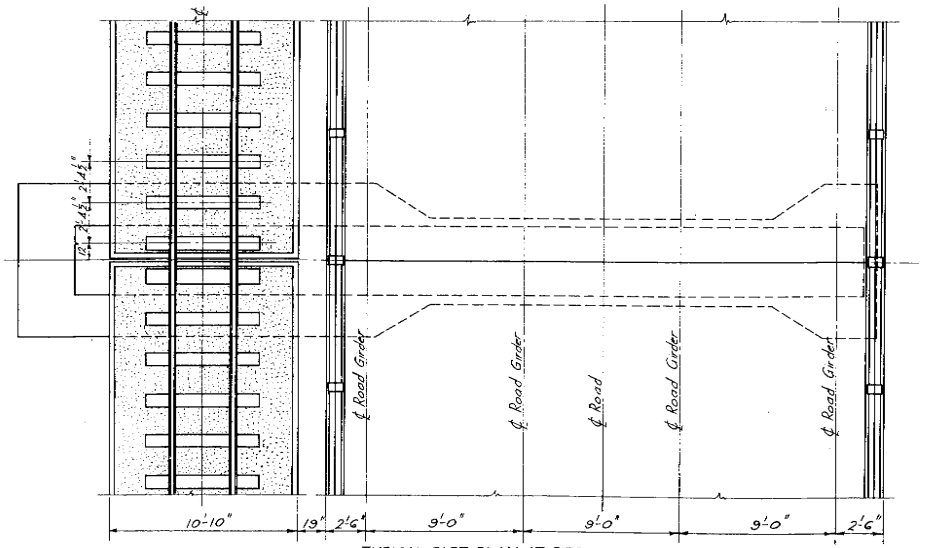
DEPARTMENT OF PUBLIC WORKS TAS.			
DERWENT RIVER BRIDGE AT BRIDGEWATER			
AMENDED SWAY FRAMES, PLATEGIRDER SPANS			
Scale	Prepared	Checked	15D3
Drawing	R. & M.		
Tracing	V.E.S. 7-3-39		2A
Design			
Supervision			CHIEF ENGINEER



—TYPICAL CROSS SECTION—



—TYPICAL PART ELEVATION – ROAD SIDE—



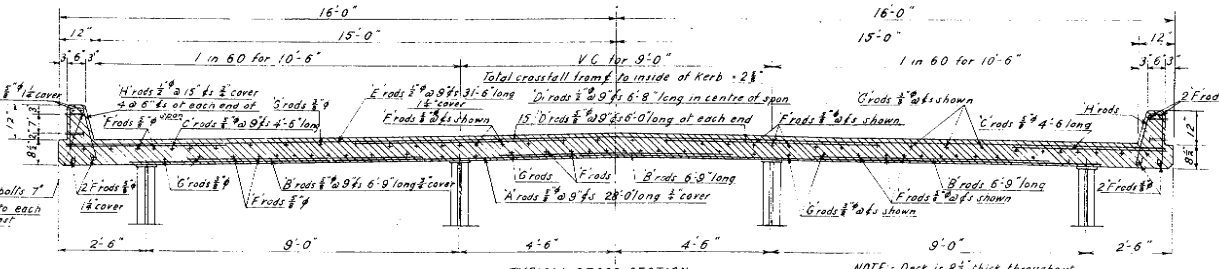
—TYPICAL PART PLAN AT PIER—

—REDUCED LEVELS—

Pier N°	R.L. Top of Pier	R.L. Top of outside P.G.	R.L. Top of inside P.G.	R.L. ℄ road Top concrete	R.L. ℄ road Top Wsurface
1.	99.71	105.35	105.50	106.20	106.32
2.	100.12	105.76	105.91	106.61	106.73
3.	100.51	106.15	106.30	107.00	107.12
4.	100.83	106.47	106.62	107.32	107.44
5.	101.14	106.78	106.93	107.63	107.75
6.	101.41	107.05	107.20	107.90	108.02
7.	101.64	107.28	107.43	108.13	108.25
8.	101.84	107.48	107.63	108.33	108.45
13.	101.84	107.48	107.63	108.33	108.45

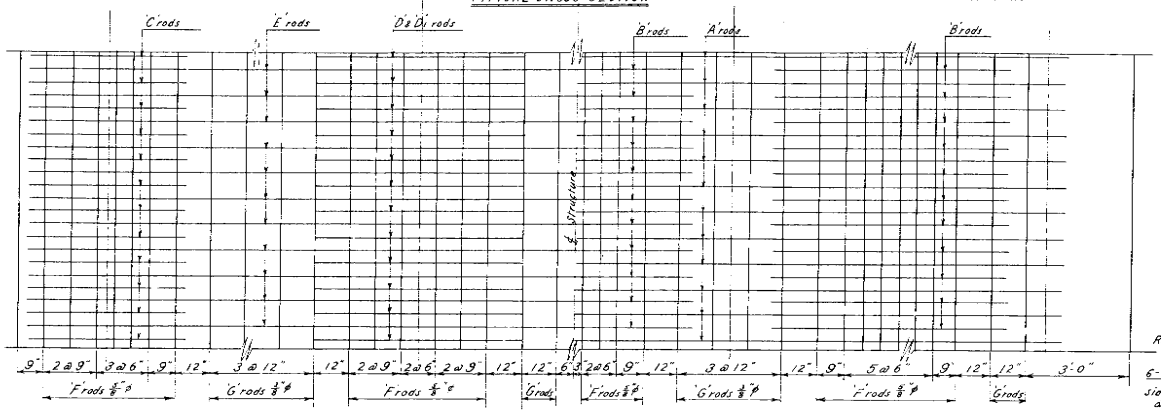
DERWENT RIVER BRIDGE
AT BRIDGEWATER
TYPICAL ARRANGEMENT OF APPROACH SPANS

15D3-
-3



—TYPICAL CROSS SECTION—

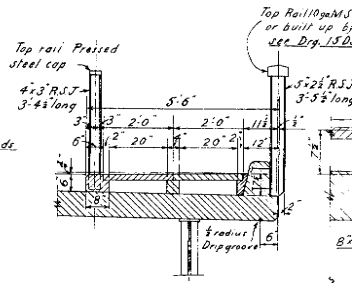
NOTE - Deck is 8¾" thick throughout



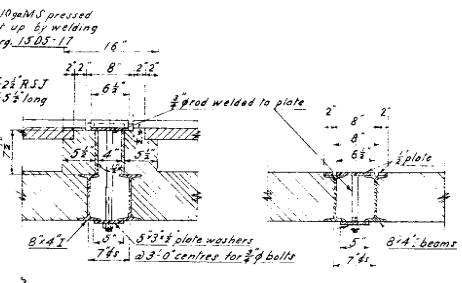
—TOP STEEL— —BOTTOM STEEL—

—PLAN—

—APPROACH SPANS—

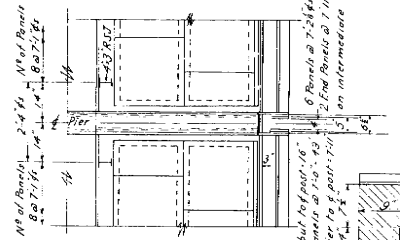


—SECTION THRO FOOTWAY—

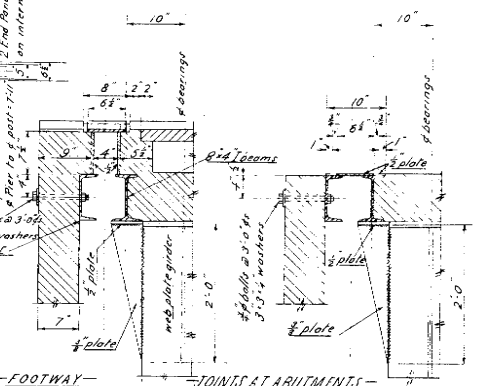


—FOOTWAY— —ROADWAY—

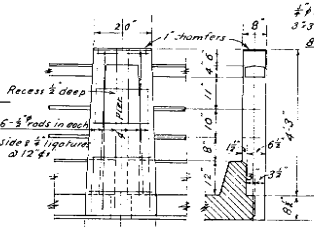
—JOINTS TO PIERS 1 TO 8 & 13—



—PLAN OF FOOTWAY—

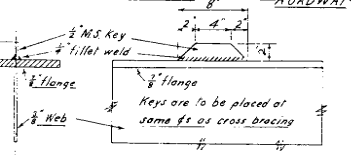


—FOOTWAY— —JOINTS AT ABUTMENTS— —ROADWAY—
Scale 1" = 1'-0"



NOTE: Cast pylon onto deck & kerb on one side of expansion joint & on the other side use paper joint

—DETAIL OF INTERMEDIATE PYLONS—



—DETAIL OF KEYS TO PLATE GIRDERS—
Scale 1½" = 1'-0"

CUTTING DETAILS (Per Span)

79 'A' rods ordered as 'B' rods on original drawing

240 'B' rods cut out of 18'-0" rods ordered as 'A' rods on original drawing

2 cut out of each 18'-0" length

120 'C' rods 4'-6" long length left after cutting 'B' rods

40 'C' rods 4'-6" long cut out of 18'-0" rods ordered as 'A' rods on original drawing

60 'D' rods 6'-0" long " " " " " 'A' " " "

100 'D1' rods 6'-8" long " " 20'-0" " " 'C' " " "

80 'E' rods new order

'F' rods ordered as 'A' & 'D' rods on original drawing

'G' rods new order

'H' rods new order 6 cut out of 'C' rods

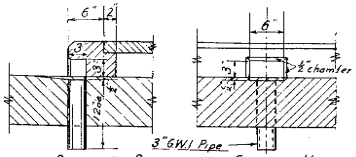
Mark	No	Length	Size	Order List No	Order List Length	Weight	Shape	Remarks
A	79	28'-0"	⅝ϕ	79	28'	2307 lbs	Bent to camber	Transverse in deck (Bottom)
B	240	6'-9"	⅝ϕ	240	6'-9"	1690 "	Straight	" " " (")
C	160	4'-6"	⅝ϕ	160	4'-6"	750 "	"	" " " (Top)
D	60	6'-0"	⅝ϕ	60	6'-0"	350 "	"	" " " (" at ends of span)
D1	100	6'-8"	⅝ϕ	100	6'-8"	460 "	"	" " " (" at middle of span)
E *	80	31'-6"	⅝ϕ	80	32'	1710 "	"	" " " (Top)
F	58	58'-6"	⅝ϕ	174 58	18' 18'	2880 " 1039 "	Straight (2'-1" lap)	Longitudinals - (Top & Bottom) & Kerbs
G *	24	58'-6"	⅞ϕ	72 24	18' 18'	433 " 143 "	" (" ")	" " " (- -)
H	108	4'-6"	⅝ϕ	27	18'	324 "	Bent as shown	Spacers in Kerbs

Weight per span = 12177 lbs = 5.44 tons Weight of 11 spans = 59.8 tons

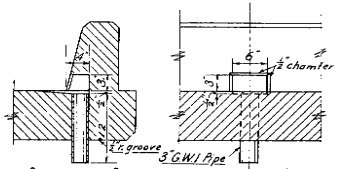
Additional steel to be ordered

880 E rods ⅝ϕ 32'-0" long 18810 lbs
792 G rods ⅞ϕ 16'-0" long 4763 "
264 G rods ⅞ϕ 18'-0" long 1793 "
240 H rods ⅝ϕ 18'-0" long 2880 "

Weight of additional steel = 28246 lbs = 12.6 Tons



—DETAIL OF SCUPPERS TO FOOTWAY KERBS—
4 off per span at 17'-0" ℓs



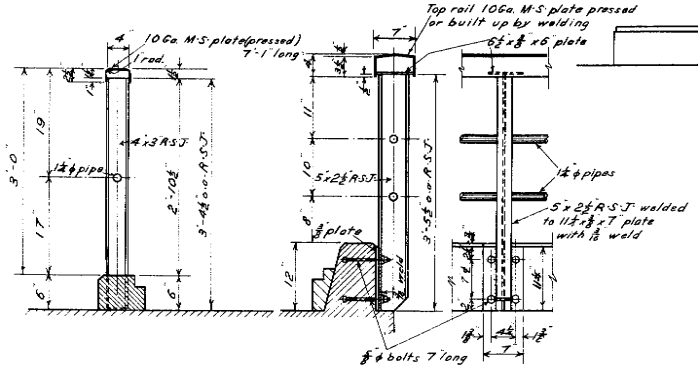
—DETAIL OF SCUPPERS TO OUTSIDE KERBS—
8 off per span (4 each side at 17'-0" ℓs)

—REVISIONS—
Kerbs amended 1/3/39
Pylons posts & footway amended 11/3/39

DEPARTMENT OF PUBLIC WORKS TAS

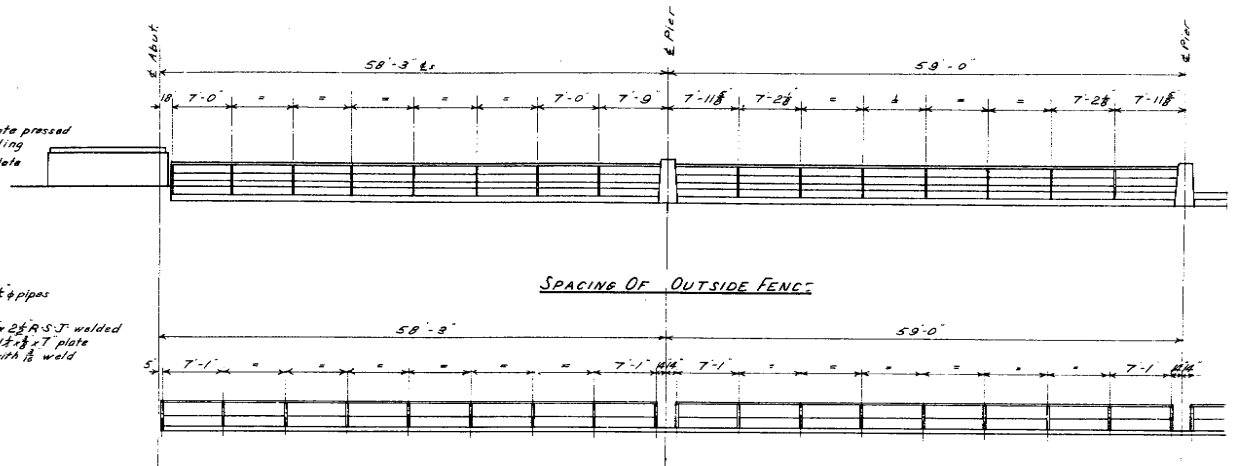
DERWENT RIVER BRIDGE
AT BRIDGEWATER
APPROACH SPANS — DETAIL OF DECK

Scale ½" = 1'-0"	Prepared	Checked	15D3
Drawing	K.E.W. 6-1-39		4
Re-Tracing	K.M.T. 17/1/45	K.M.K. 19-7-45	
Design	A.W.K.		
SUPERVISION		Signed A.W. Knight. CHIEF ENGINEER	



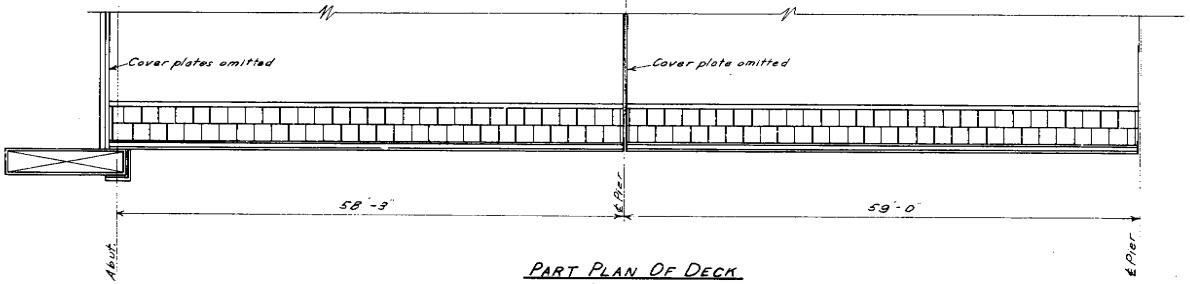
INSIDE POSTS
1"=1'-0"

OUTSIDE POSTS
1"=1'-0"

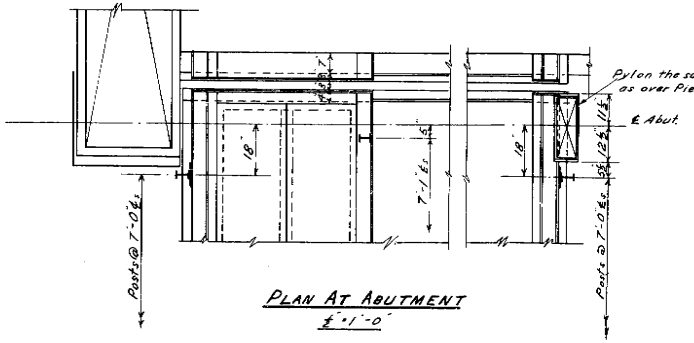


SPACING OF OUTSIDE FENCE

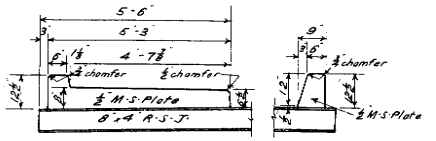
SPACING OF INSIDE FENCE



PART PLAN OF DECK
⅛"=1'-0"



PLAN AT ABUTMENT
⅛"=1'-0"

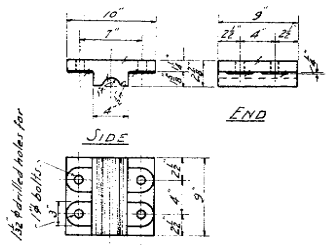


DETAIL OF PLATES TO ENDS OF DECK
22 off each
½"=1'-0"

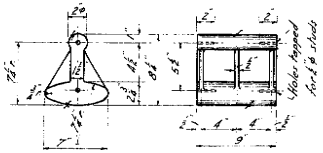
DEPARTMENT OF PUBLIC WORKS TAS.

DERWENT RIVER BRIDGE
AT BRIDGEWATER
DETAIL OF FENCES & EXPANSION JOINTS

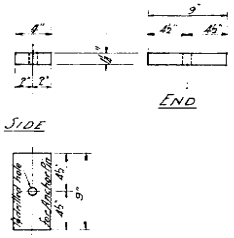
Scale-As shown	Prepared	Checked	15D3
Drawing			
Tracing			4A
Design			
Supervision		Chief Engineer	



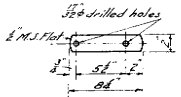
ROCKER SHOE C.S.
Make 44 Patt. A.
Weight 47·0 lbs.



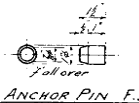
ROCKER C.S.
Make 44 Patt. B.
Weight 63·3 lbs.



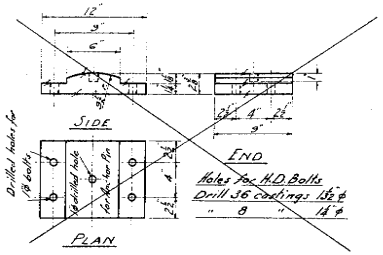
FIXED BEARING TOP PLATE S.
Make 44 Patt. C
Weight 12 75 lbs.



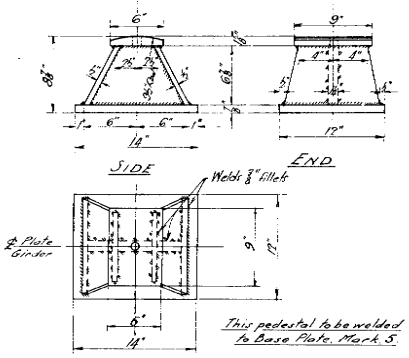
ROCKER LINK M.S.
Make 88 Mark 1
Weight 2·34 lbs.



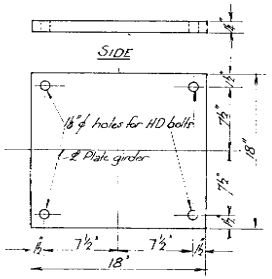
ANCHOR PIN F.S.
Make 44 Mark 2
Weight 0·3 lbs.



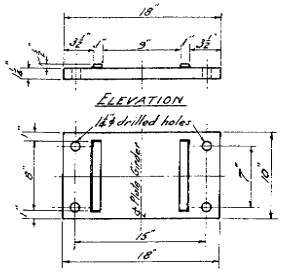
FIXED BEARING BOTTOM PLATE C.S.
Make 44 Patt. D.
Weight 54·4 lbs.



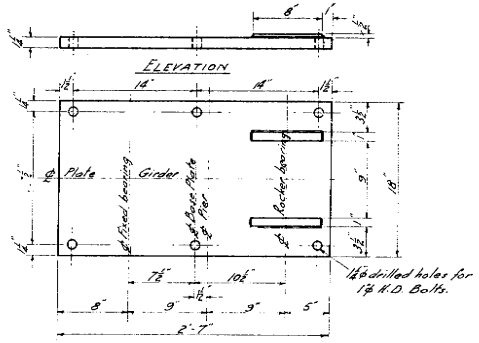
FIXED BEARING PEDESTAL M.S.
Make 44 Mark 3
Weight 34 40 lbs.



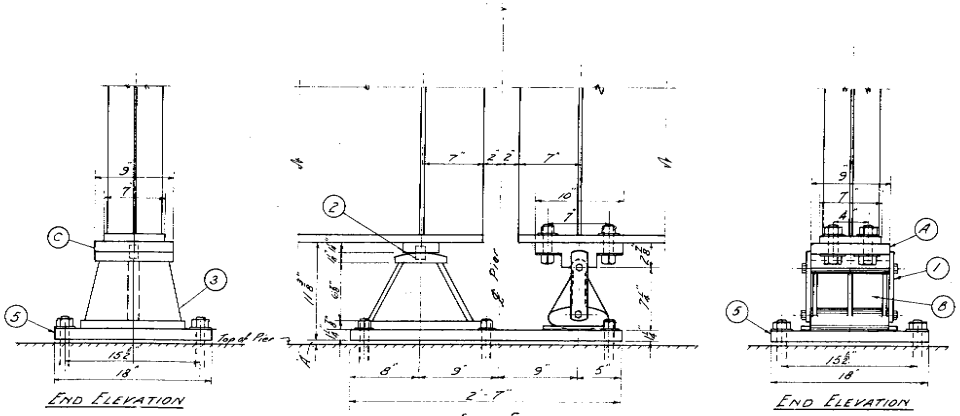
① FIXED BEARING BASE PLATE ON CYLINDER PIERS 9 AND 12
Make 8 Mark 6
Weight 114·8 lbs.



BASE PLATE M.S.
For Rocker Bearings on Abutments
Make 8 Mark 4
Weight 66·01 lbs.



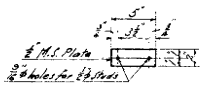
BASE PLATE M.S.
for Fixed and Rocker Bearings on Piers
Make 36. Mark 5.
Weight 199·88 lbs.



ASSEMBLY OF BEARINGS ON PIERS 1 to 8 AND 13.

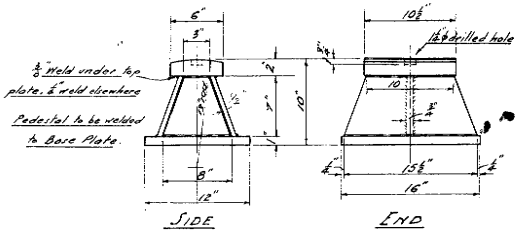
① Revision. Mark 6 altered from 18"20" to 18"18"
24/5/39

DEPARTMENT OF PUBLIC WORKS TAS.			
DERWENT RIVER BRIDGE AT BRIDGEWATER			
APPROACH SPANS			
PLATE GIRDER BEARINGS. — ROAD SIDE.			
Scale 1½"=1'0"	Prepared	Checked	15D3
Drawing	H.R.C.		
Tracing	1/2/39	24/5/39	-5
Design			
SUPERVISION			
BRIDGE ENGINEER		CHIEF ENGINEER	

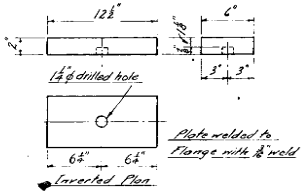


ROCKER GUIDE M.S.
Make 44 Mark 6
Weight 141 lbs.

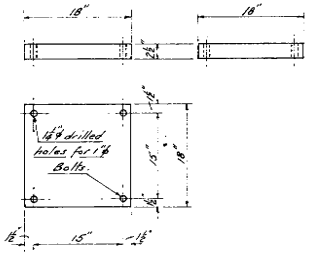
ANCHOR PIN F.S.
for Fixed Bearing
Make 22 Mark 7
Weight 0.5 lbs.



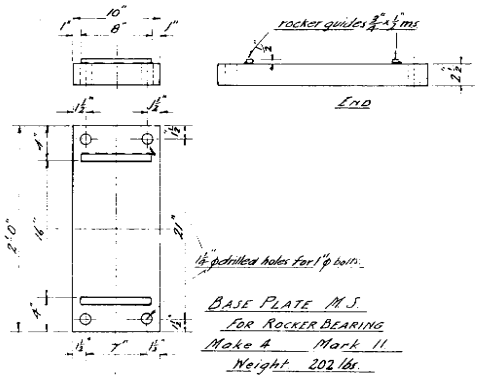
FIXED BEARING PEDESTAL M.S.
Make 22 Mark 8
Weight 124 lbs.



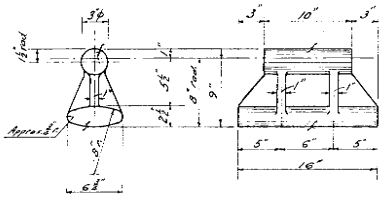
TOP PLATE M.S.
Make 22 Mark 9
Weight 4243 lbs.



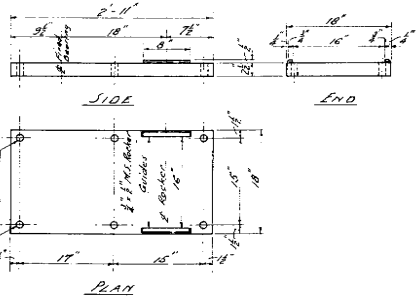
BASE PLATE M.S.
FOR FIXED BEARING
Make 4 Mark 10
Weight 230 lbs.



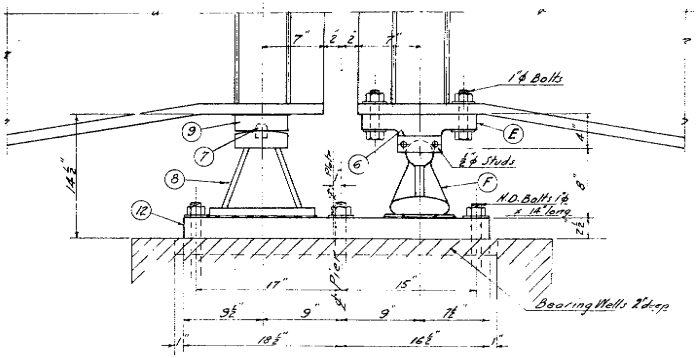
BASE PLATE M.S.
FOR ROCKER BEARING
Make 4 Mark 11
Weight 202 lbs.



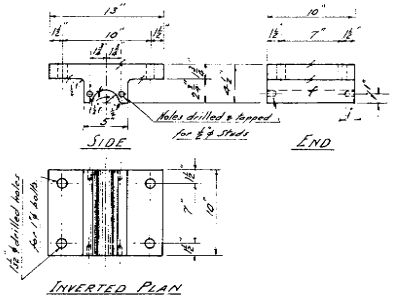
ROCKER C.S.
Make 22 Patt. F.
Weight 100 lbs.



BASE PLATE M.S.
Make 18 Mark 12
Weight 448 lbs.



ASSEMBLY OF BEARINGS ON PIERS
Scale 1" = 1ft.



ROCKER SHOE C.S.
Make 22 Patt. E
Weight 92·12 lbs.

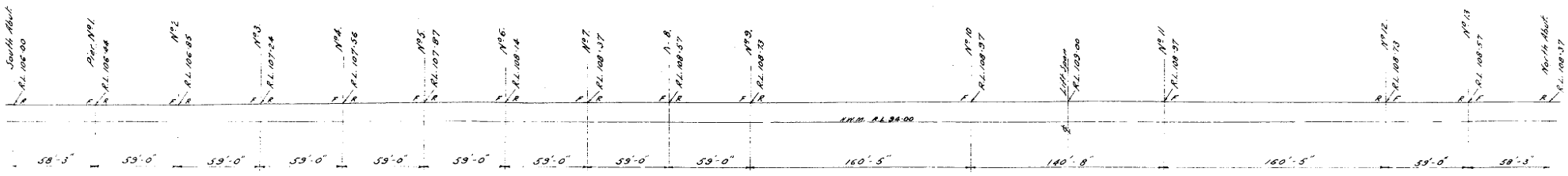
Reference

Details of Plate Girders	1503-7
" Deck & Stirrups	1503-8
" Cross Bracing	1503-9

DEPARTMENT OF PUBLIC WORKS — TAS.

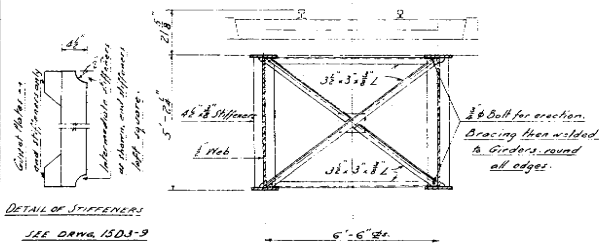
DERWENT RIVER BRIDGE
AT BRIDGEWATER
APPROACH SPANS — BEARINGS — RAIL SIDE

Scale: 1/2" = 1'-0"	Prepared	Checked	15D3
Drawing			— 6
Tracing			
Design			
SUPERVISION		CHIEF ENGINEER	



REDUCED LEVELS TOP OF RAILS AT ℄ PIERS

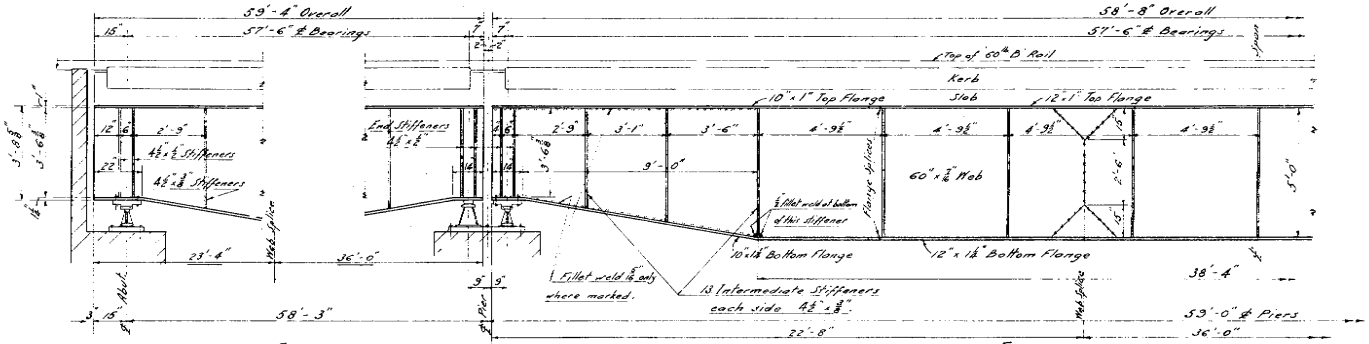
— Scale 1"=40' —



DETAIL OF STIFFENERS

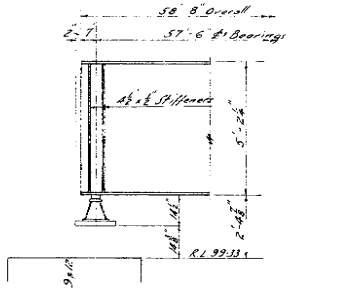
SEE DRWG. 15D3-9

TYPICAL CROSS SECTION



ELEVATION

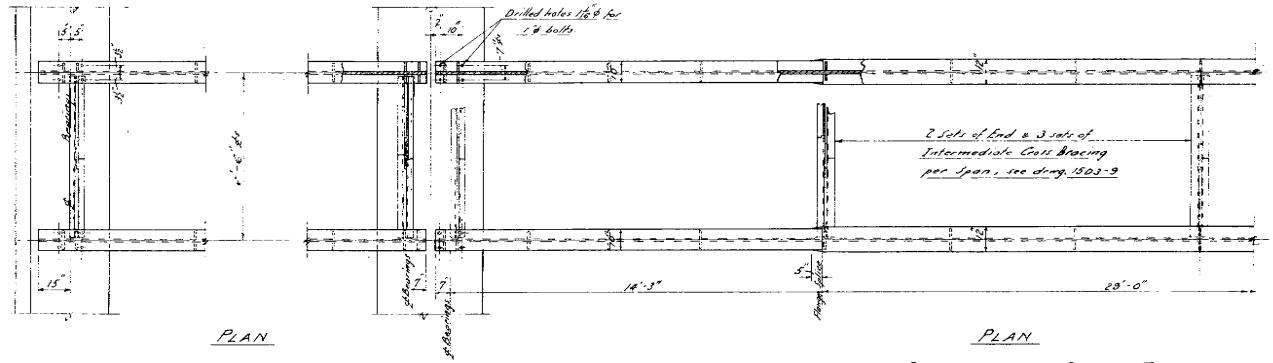
ELEVATION



ELEVATION

INTERMEDIATE SPANS 2 OFF

4 GIRDERS



PLAN

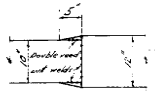
END SPANS 2 OFF

4 GIRDERS

PLAN

INTERMEDIATE SPANS 7 OFF

14 GIRDERS



PLAN OF FLANGE SPLICE

Flange Plates double reed & butt welded, welds ground o.T flush.

Web Plates double reed & butt welded

Note.
For detail of Stirrups on Plate Girders see drwg. 15D3-8.

Note.
Fillet welds ⅜" unless otherwise shown.

Reference:

Details of Bearings 15D3-6

" " Deck & Stirrups 15D3-8

" " Cross Bracing 15D3-9

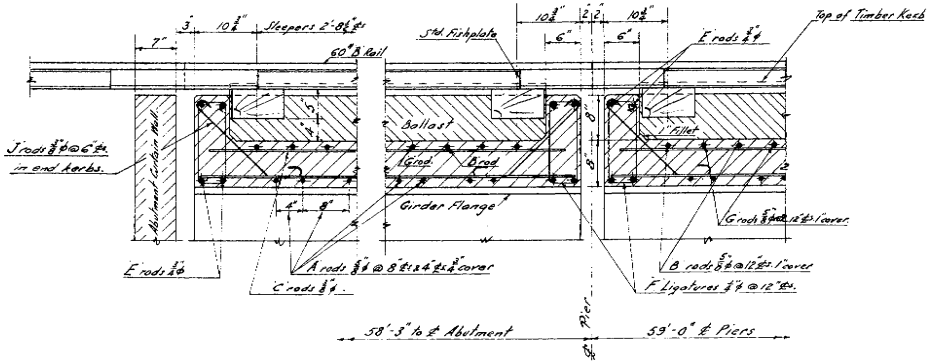
DEPARTMENT OF ENGINEER WORKS - TAS.

DERWENT RIVER BRIDGE

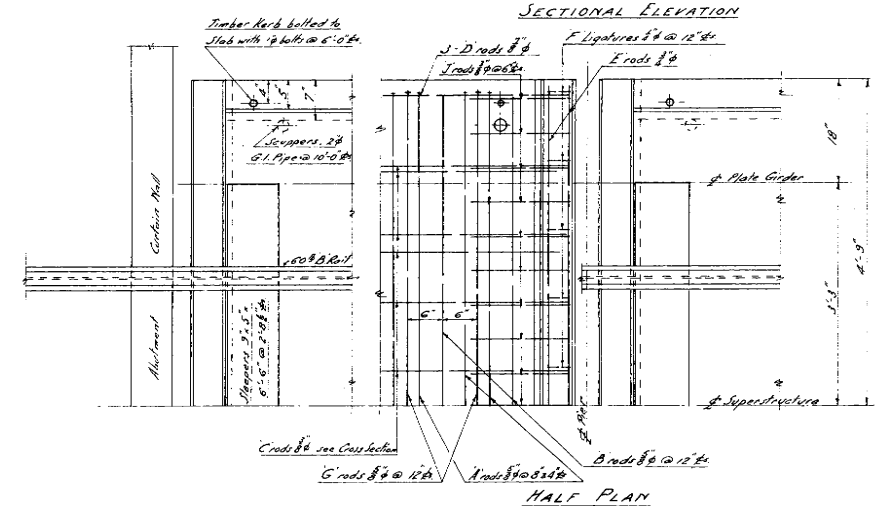
AT BRIDGEWATER

APPROACH SPANS - PLATE GIRDERS - RAIL SIDE

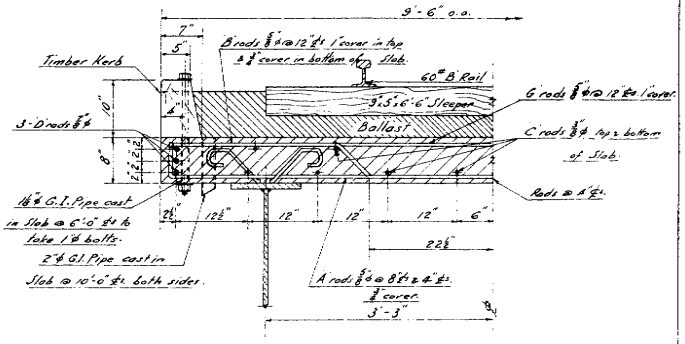
Scale: ½"=1'0"	Designed	Checked	15D3
Drawn	15/10/30		-7
Traced			
Checked			
SUPERVISOR			CHIEF ENGINEER



SECTIONAL ELEVATION



HALF PLAN



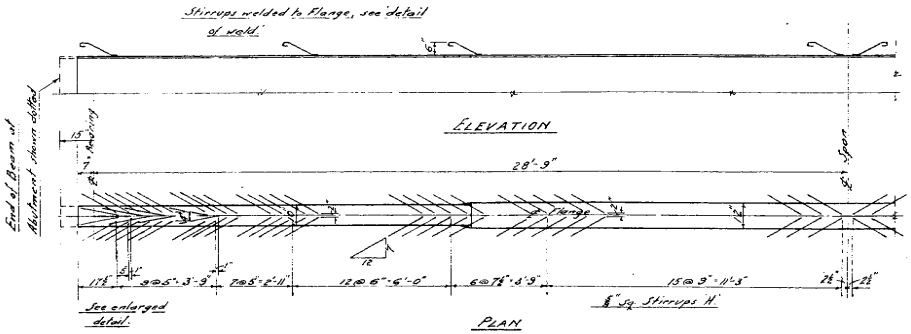
TYPICAL HALF CROSS SECTION

STEEL LIST

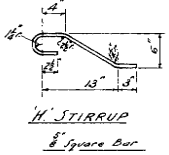
Mark	No Off	Length	Size	Order List No Off	Order List Length	Weight lbs.	Shape	Remarks
A	1262	10'-2½"	⅞ ϕ	1262	12'	15,800		Transverse in bottom of Slab
B	642	10'-7½"	⅞ ϕ	642	13'	8040		" " " & top of Slab.
C	132	Approx 55'	⅞ ϕ	462	18'	3130	Straight	Longitudinals in top & bottom of slab. (16" lap and spans) (18" lap, inter spans)
D	66	" 59'	⅞ ϕ	198	20	8090		Longitudinals in sides of Slab. (16'-0" rods cut to 8'-0") 3'-0" lap
				33	16	1080		
E	88	3'-4"	¾ ϕ	44	20'	1,322		Transverse at ends of Slabs.
F	220	4'-0"	½ ϕ	55	16'	147		Ligatures " " " "
G	631	10'-2½"	⅞ ϕ	631	12'	7900		Transverse in top of slab
H	4894	2'-1½"	⅝ Sq.	611	18'	11600	See detail	Stirrups on girders
J	418	2'-6"	⅞ ϕ	53	20'	400		End beams to slab.

Total Weight 60,509 lbs. = 27 tons.

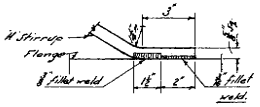
2" ϕ G.I. Pipe 122 ft.
1½" ϕ G.I. Pipe 147 ft.
220 - 1" ϕ Bolts 20" long.
Concrete: Slab & End Kerbs 154·14 cu. yds.



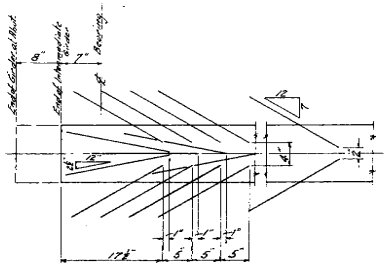
DETAIL OF STIRRUPS ON PLATE GIRDERS



'H' STIRRUP
⅝" Square Bar



DETAIL OF WELD



PLAN

ENLARGED DETAIL OF STIRRUPS AT END OF GIRDER

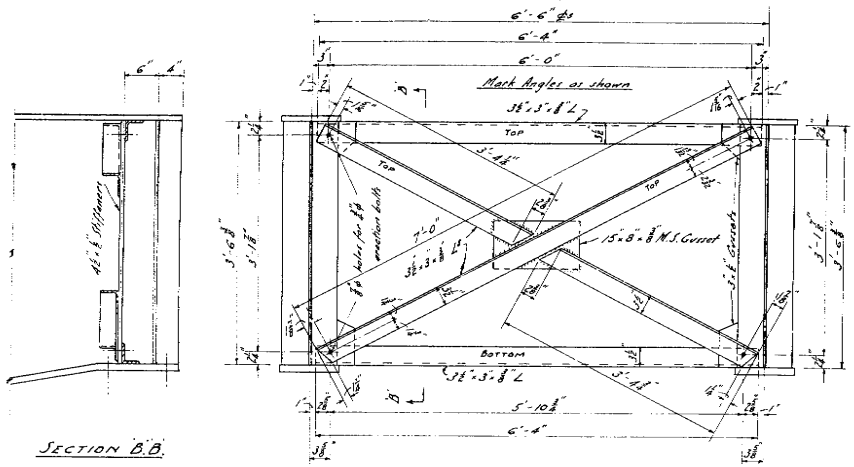
Reference:

Details of Bearings	1503-6
" " Plate Girders	1503-7
" " Cross Bracing	1503-9

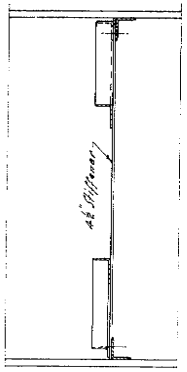
DEPARTMENT OF PUBLIC WORKS—TAS.

DERWENT RIVER BRIDGE
AT BRIDGEWATER
APPROACH SPANS-DETAILS OF DECK-RAIL SIDE

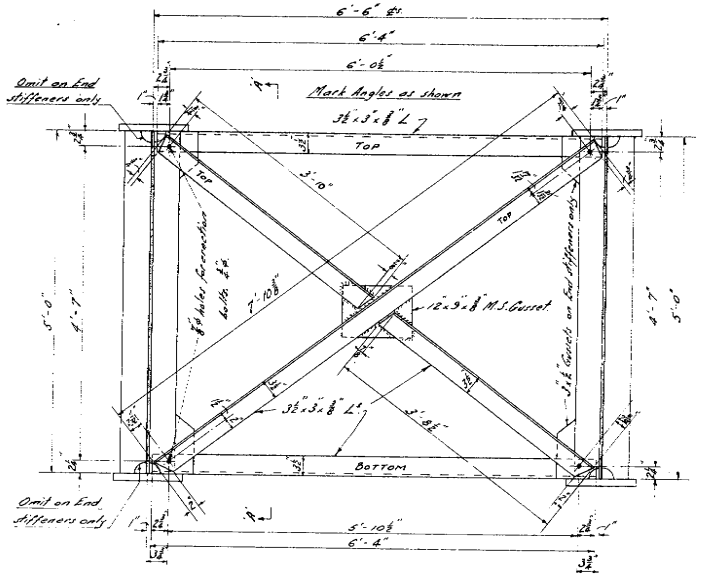
Scale 1"=1'-0"	Prepared	Checked	15D3
Drawing	[illegible] 4/4/58	[illegible] 11-5	- 8
Tracing			
Design			
SUPERVISION		[illegible] CHIEF ENGINEER	



SECTION B.B.



SECTION A.A.



INTERMEDIATE CROSS BRACING AND END BRACING OVER PIERS 9 & 12

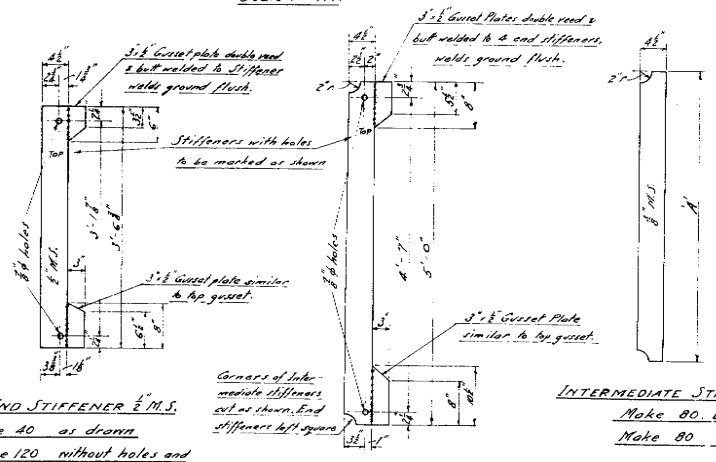
35 Sets required

Scale 1" = 1Ft.

END CROSS BRACING

20 Sets required

Scale 1" = 1Ft.



END STIFFENER ½" M.S.

Make 40 as drawn

Make 120 without holes and without Gusset Plates.

All lower ends carefully ground square.

INTERMEDIATE STIFFENER ⅜" M.S.

Make 66 as drawn without gusset plates

Make 346 without holes or gusset plates.

END STIFFENER OVER PIERS 9 & 12. ½" M.S.

Make 4 as drawn, but corners left square.

Make 12 without holes or gusset plates, but with square corners.

INTERMEDIATE STIFFENER ⅜" M.S.

Make 80 Dim. A = 4'-5⅛"

Make 80 " A = 3'-11⅛"

Reference

Details of Bearings	1503-6
" " Plate Girders	1503-7
" " Deck & Stirrups	1503-8

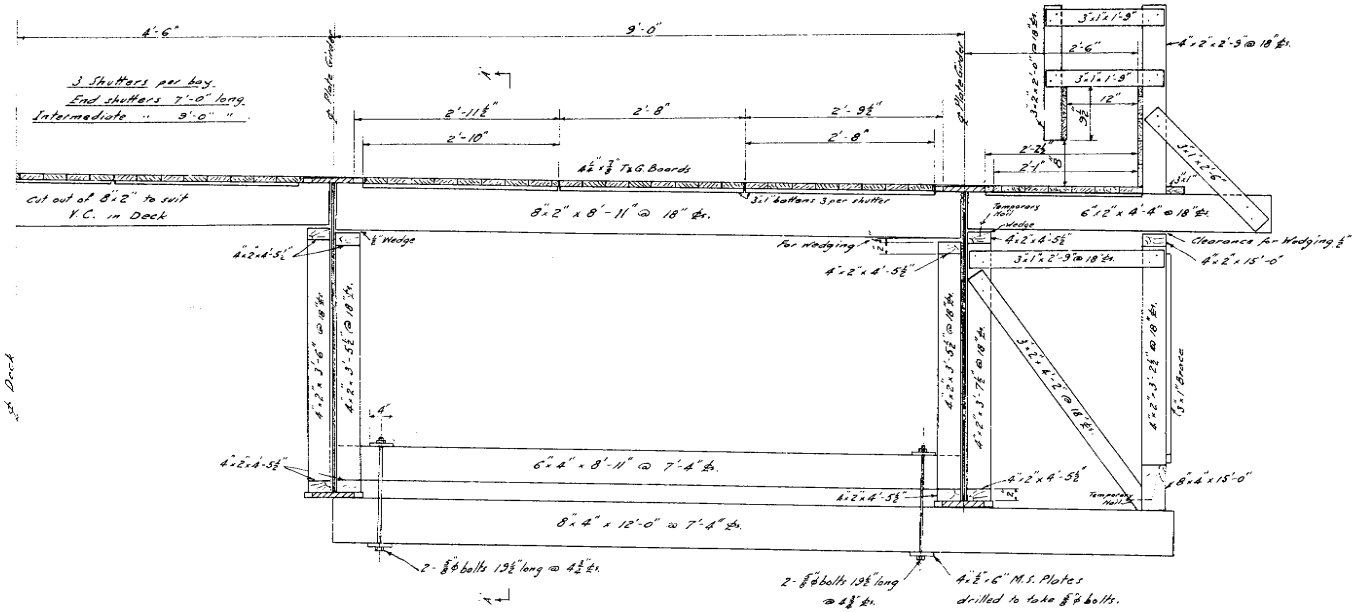
DEPARTMENT OF PUBLIC WORKS – TAS.

DERWENT RIVER BRIDGE

AT BRIDGEWATER

APPROACH SPANS – PLATE GIRDER CROSS BRACES

Scale: 1"=1Ft.	Prepared	Checked	15D3
Drawing			— 9
Tracing			
Design			
SUPERVISION		CHIEF ENGINEER	



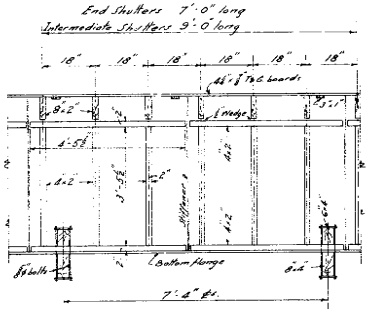
HALF CROSS SECTION

Scale 1" = 1ft.

MATERIAL LIST

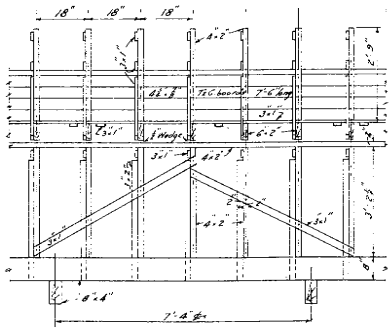
Size	Order List		To Cut	
	No Off	Length	No Off	Length
8"x4"	18	12'		
	8	15'		
8"x2"	123	9'	123	8'-11"
6"x4"	18	9'	18	8'-11"
6"x2"	28	13'	82	4'-4"
4"x2"	12	15'		
	78	14'	32	7'-0"
			82	3'-6"
			164	3'-5½"
	21	13'	82	3'-2½"
	49	11'	82	3'-7½"
			82	2'-9"
	80	9'	160	4'-6"
3"x2"	12	14'	82	2'-0"
	28	13'	82	4'-3"
3"x1"	8	15'		
	21	14'	164	1'-9"
	86	12'	82	3'-0
			Shutter Battens	
	21	10'	82	2'-6"
4½"x⅛" T&G Boards	445	9'	445	9'-0"
	40	12'		
	89	14'	178	7'-0"

Sawn Hardwood 5613 super ft.
3rd Grade Flooring 5731 Lin ft.



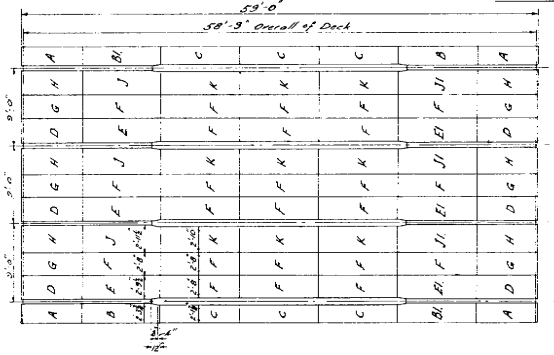
PART LONGITUDINAL SECTION AA

Scale ½" = 1ft.



PART ELEVATION

Scale ½" = 1ft.



KEY PLAN

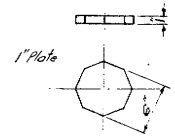
Scale ⅛" = 1ft.

Shutter	No Off	Width	Length	Remarks
A	4	2'-3⅛"	7'-0"	Under Kerbs at Ends.
B	2	2'-3⅛"	9'-0"	" one side cut to fit flange
B1	2	"	"	Opposite hand to B.
C	6	2'-1⅞"	9'-0"	Under Kerbs intermediate.
D	6	2'-3½"	7'-0"	Between Girders at Ends.
E	3	2'-3½"	9'-0"	" one side cut to fit flange
E1	3	"	"	Opposite hand to E
F	24	2'-8"	9'-0"	Intermediates.
G	6	2'-8"	7'-0"	Between Girders at Ends.
H	6	2'-11⅛"	7'-0"	" " " "
J	3	2'-11⅛"	9'-0"	" " one side cut to fit flange
J1	3	"	"	Opposite hand to J.
K	9	2'-10"	9'-0"	Intermediates.

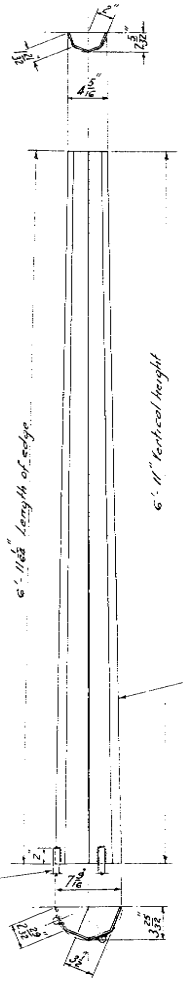
DEPARTMENT OF PUBLIC WORKS, TAS.

DERWENT RIVER BRIDGE
AT BRIDGEWATER
APPROACH SPANS - FALSEWORK FOR ROADWAY

Scale as shown	Prepared	Checked	15D3
Formwine	[illegible] 21/11/58	[illegible]	— 10
Issue 2			
Design			
SUPERVISION			CHIEF ENGINEER



OCTAGONAL CAP (2 off)
Weld to top of light standard



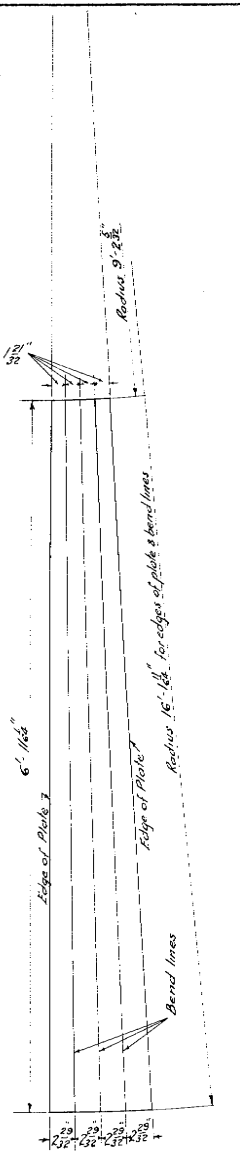
TOP (Octagonal)
Width across flats 4"
Width across corners 4 6/16"
Width of one side 1 21/32"

Note
Light Standard to be formed in two half sections and welded together at corners.

ANCHOR RODS
4 per standard.
Field welded. see drwg. 15D3-12.

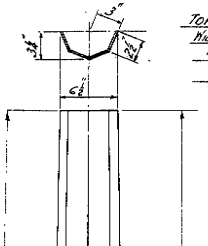
BASE (Octagonal)
Width across flats 7"
Width across corners 7 9/16"
Width of one side 2 29/32"

PLAN AND ELEVATION OF HALF SECTION OF LIGHT STANDARD



DEVELOPMENT OF HALF SECTION

INTERMEDIATE LIGHT STANDARD
2 off: Scale 1½" = 1'-0"



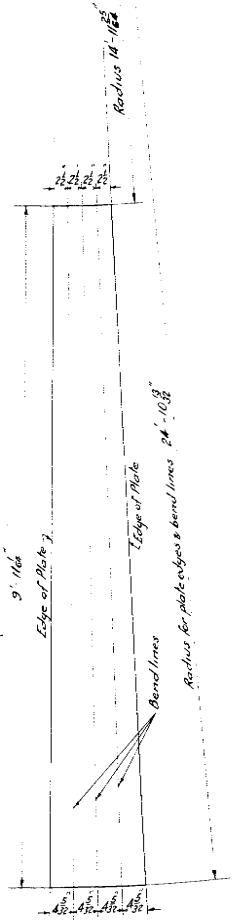
TOP (Octagonal)
Width across flats 6"
" " corners 6 6/8"
" of one side 2 6/8"

NOTE:
Light Standard to be formed in two half sections & welded together at corners.

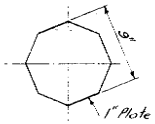
ANCHOR RODS
see drwg. 15D3-12.

BASE (Octagonal)
Width across flats 10"
" " corners 10 13/16"
" of one side 4 23/32"

PLAN AND ELEVATION OF HALF SECTION OF LIGHT STANDARD
Scale 1½" = 1'-0"



DEVELOPMENT OF HALF SECTION
Scale 1"=1'-0"



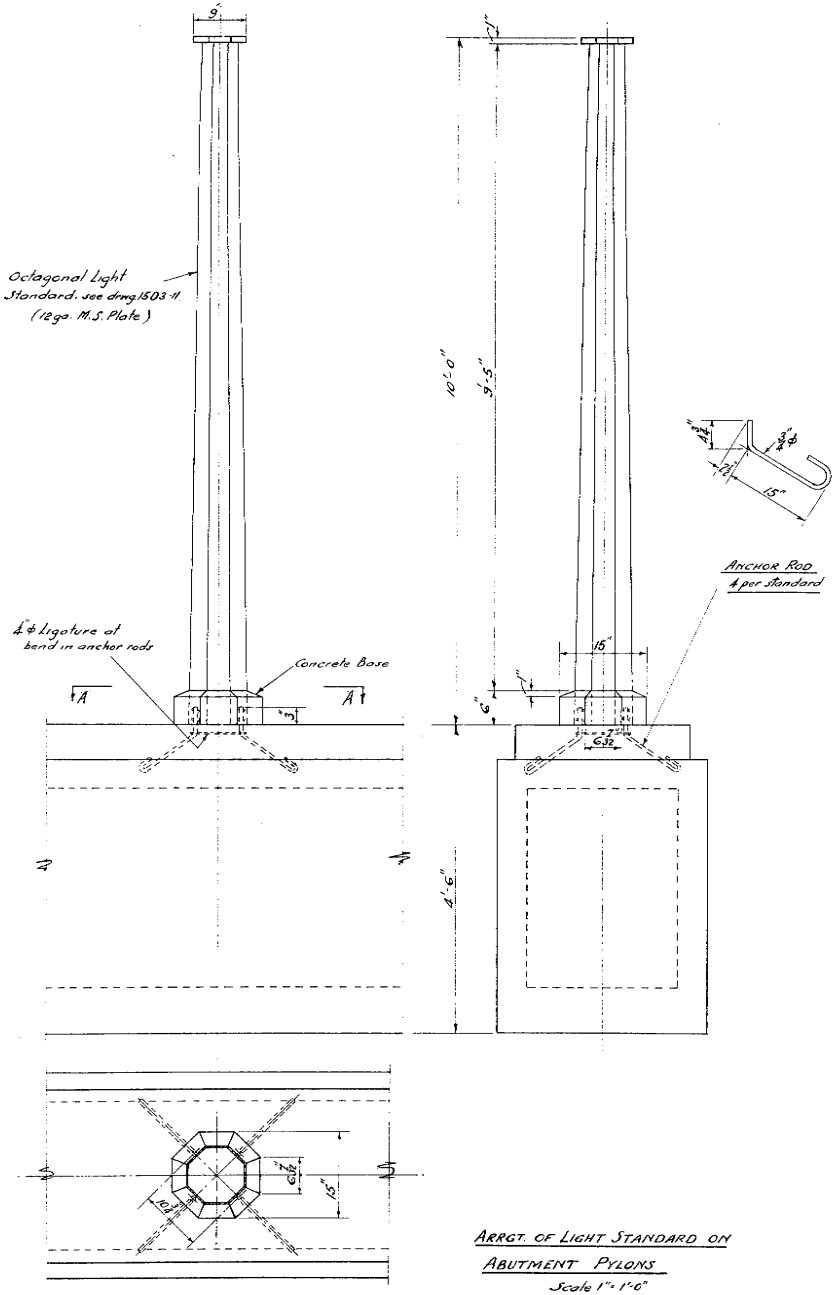
OCTAGONAL CAP (4 off)
Weld to top of light standard.

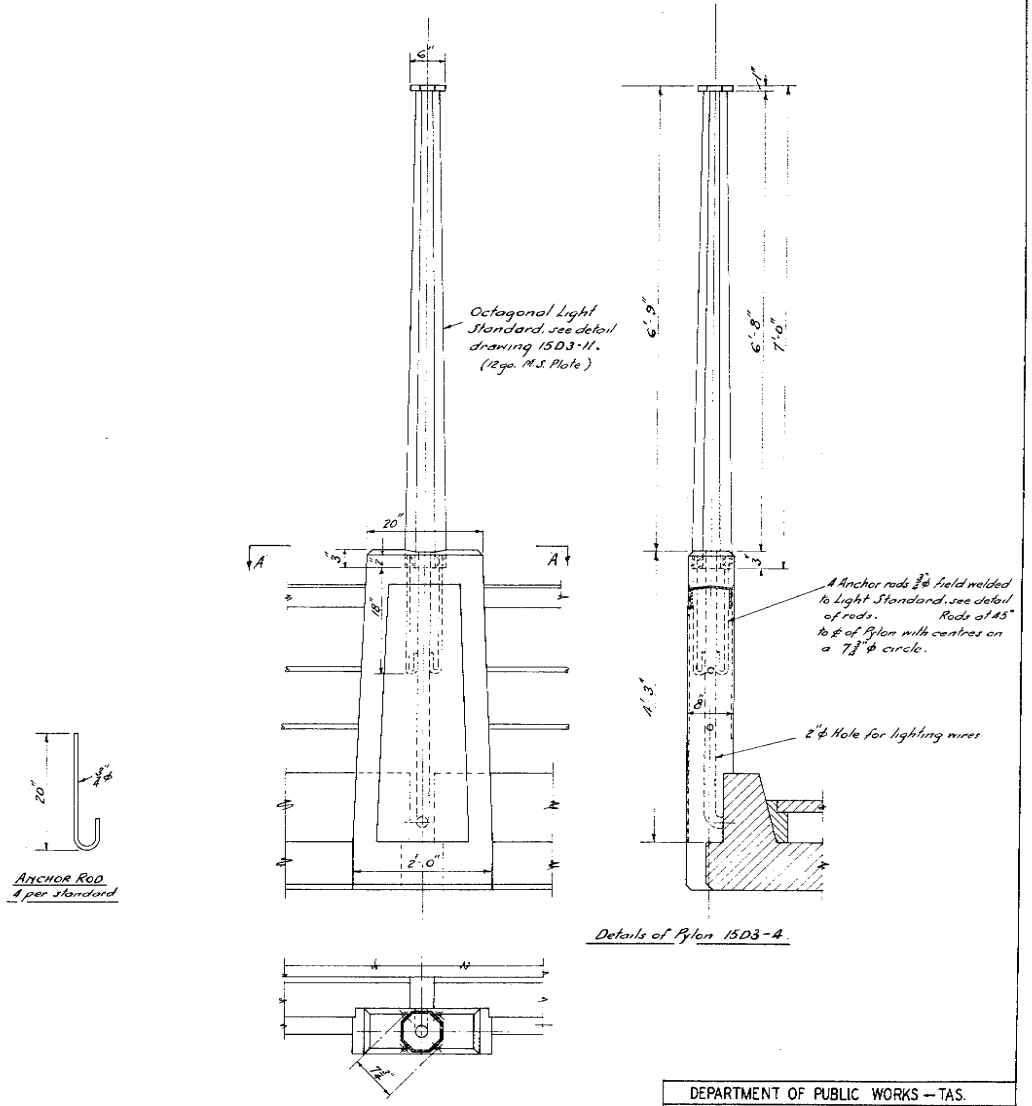
ABUTMENT LIGHT STANDARD. 4 off.

DEPARTMENT OF PUBLIC WORKS — TAS.
DERWENT RIVER BRIDGE AT BRIDGEWATER
APPROACH SPANS
DETAILS OF LIGHT STANDARD

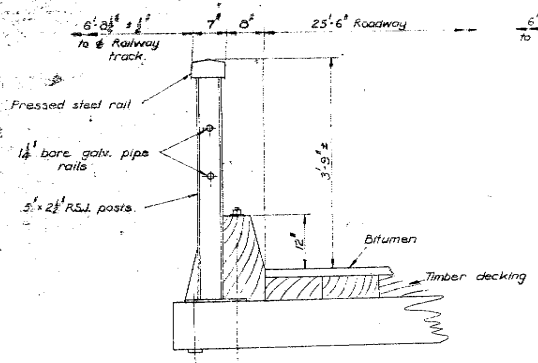
Scale: as shown	Prepared	Checked	15D3
Drawing	HMC 22/11/41		-11
Tracing	HMC		
Design			
Supervision			

30.7.41 CHIEF ENGINEER

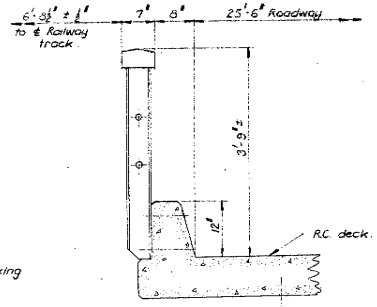




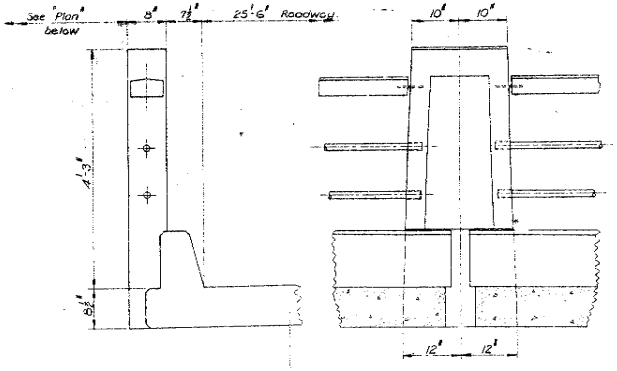
DEPARTMENT OF PUBLIC WORKS — TAS.			
DERWENT RIVER BRIDGE AT BRIDGEWATER			
APPROACH SPANS			
GEN. ARRGT. OF LIGHT STANDARDS			
Scale: as shown	Prepared	Checked	15D3
Drawing			-12
Tracing			
Design			
Supervision		30-7-41	CHIEF ENGINEER



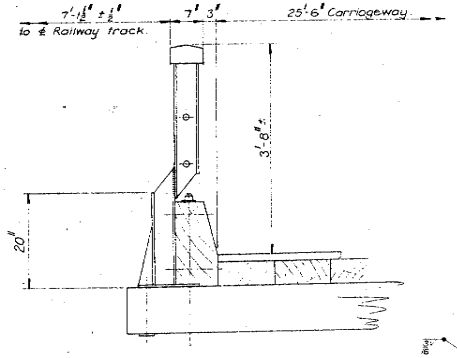
LIFT SPAN
22 IN No.

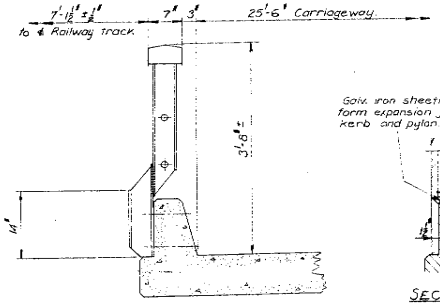


FLANKING & APPROACH SPANS
120 IN No.
EXISTING.

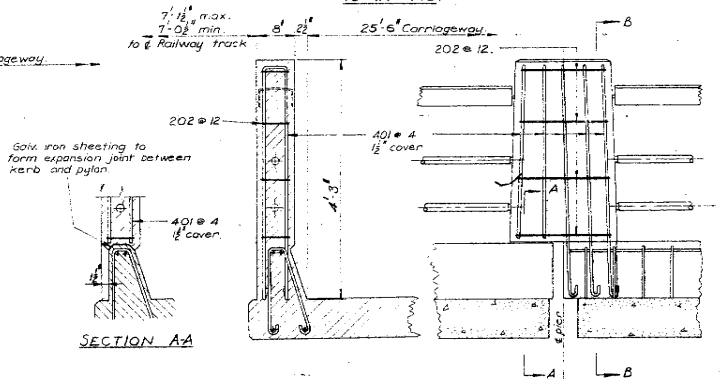


R.C. PYLON — FLANKING & APPROACH SPANS.
15 IN No.





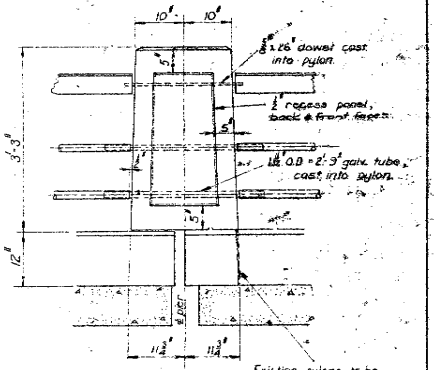
EXISTING.



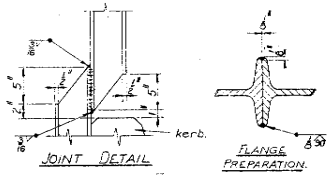
SECTION A-A

SECTION B-B

REINFORCING.



PROFILE.

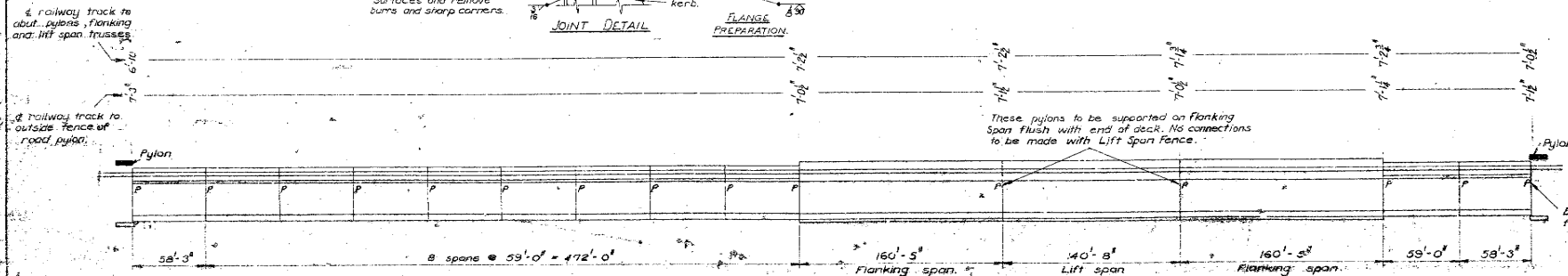


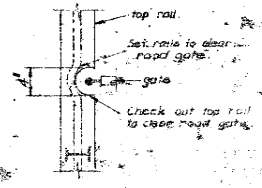
JOINT DETAIL

FLANGE PREPARATION.

Note: All flame cut surfaces and remove burns and sharp corners.

MODIFICATIONS





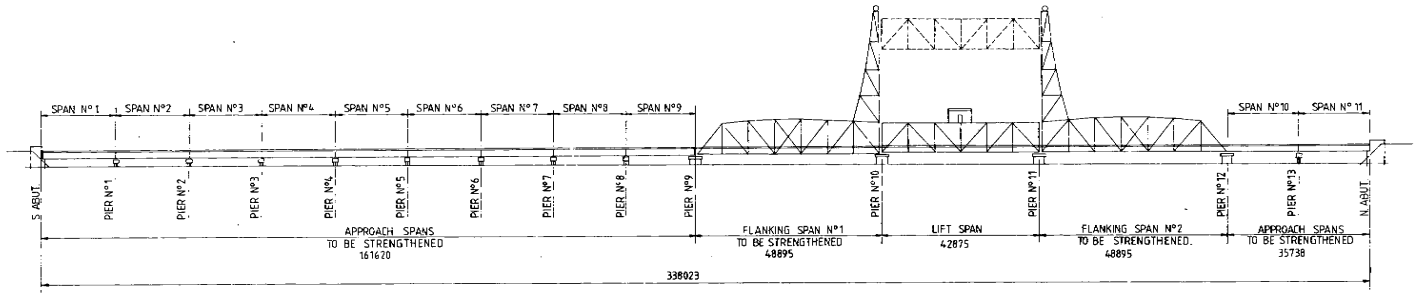
ROAD GATE CLEARANCE

Note "P" indicates the location of the R.C. pylons at the deck expansion joints.

PLAN — EXTENT OF WORK

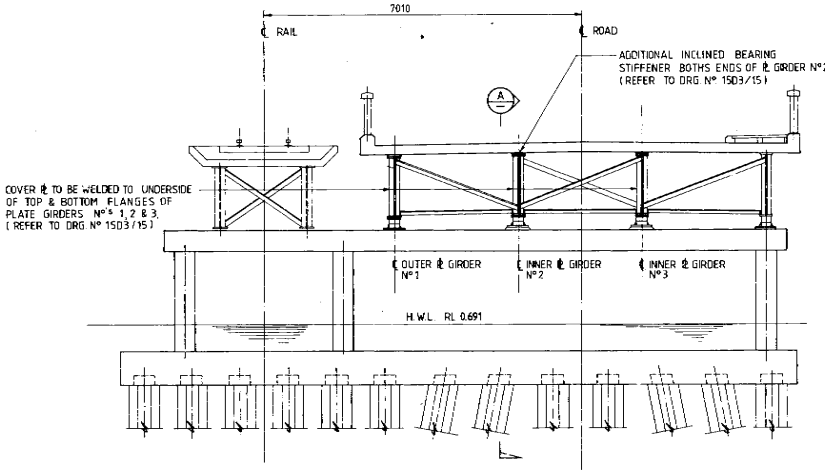
					Item	Prepared	Checked	Supervised	Scales	1" = 10' & 40'	DEPARTMENT OF PUBLIC WORKS
					Design	P.S.F.					DERWENT RIVER
					Drawing	I.K.S.	[illegible]		Drawing Location		MODIFICATIONS TO U.S. ROAD A1
23-8-68	Method of splicing R.S.J. post.				Tracing						
Date	Description	Number	Issued up	Date					BRIDGEWATER		

DRG. NO. 1503/14

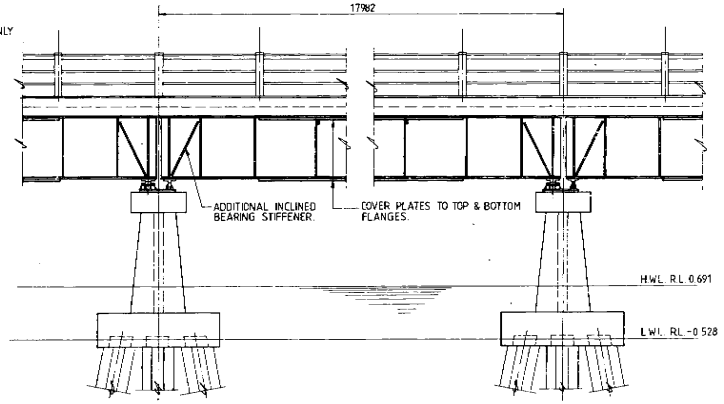


GENERAL ARRANGEMENT
N.T.S.

DRAWING LIST	
DRG N°	TITLE
1503/14	EXTENT OF STRENGTHENING FOR TYPICAL APPROACH SPAN
1503/15	APPROACH SPAN STRENGTHENING — DETAILS
1503/16	APPROACH SPAN UNLOADING FRAME



APPROACH SPAN — TYPICAL CROSS SECTION



NOTE BRACING OMITTED FOR CLARITY.

SECTION A

GENERAL NOTES

STRUCTURAL STEEL

1. ALL STRENGTHENING STEEL TO BE GRADE 250LO.
2. ALL TEMPORARY WORKS STEEL TO BE GRADE 250.

WELDING

1. ALL WELDING TO BE S.P. CATEGORY IN ACCORDANCE WITH AS1554 , PART 1.
2. ALL ELECTRODES FOR FILLET WELDS TO BE E48XX.
3. ALL FULL PENETRATION BUTT WELDS TO DEVELOP THE FULL STRENGTH OF 250LO STEEL.
4. ALL FILLET WELDS TO BE 6mm U.N.O.

DIMENSIONS

1. ALL KEY DIMENSIONS TO BE CHECKED ON SITE PRIOR TO STEEL FABRICATION COMMENCING.

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS
MAUNSELL DRAWING No. 17687—1001

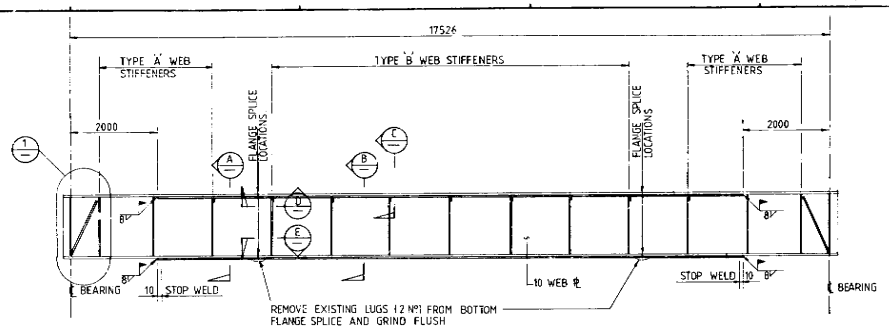
	REFERENCE DRAWINGS	SCALES	LOADING T44	DESIGN	DRAWING	LOCATION MIDLAND HIGHWAY BRIDGEWATER	CONTRACT NUMBER
			PREPARED			RECOMMENDED: Division Engineer Bridges	ACCEPTED: Assistant Director
			CHECKED				
			SUPERVISED				
DATE	AMENDMENTS	APPROVED					

DEPARTMENT OF MAIN ROADS, TASMANIA

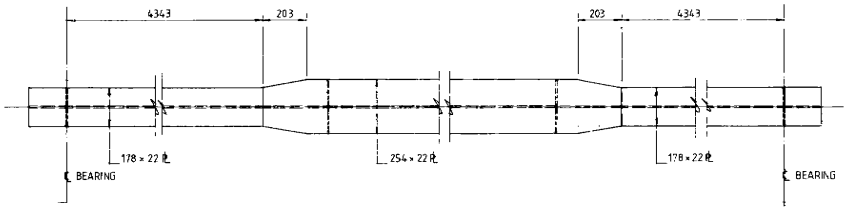
DERWENT RIVER BRIDGE
EXTENT OF STRENGTHENING FOR TYPICAL APPROACH SPAN

BRIDGE NUMBER 15
SHEET NUMBER D3-14

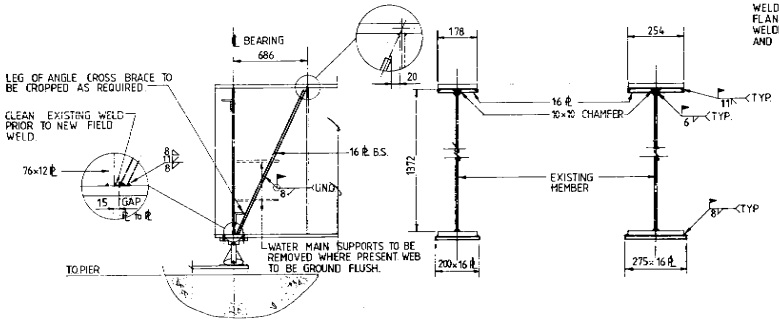
DRG. NO. 1503/15



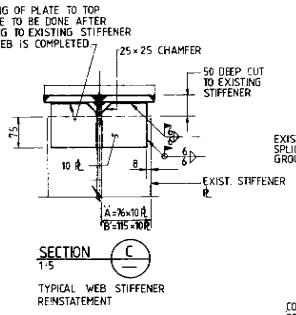
ELEVATION – APPROACH SPAN PLATE GIRDER STRENGTHENING (FOR LOCATIONS REFER DRG. No 1503/14)
1:50 (BRACING OMITTED FOR CLARITY.)



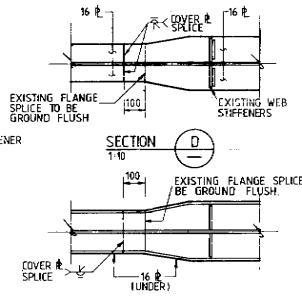
PLAN : EXISTING TOP FLANGE
1:10 BOTTOM FLANGE SIMILAR



DETAIL 1 (1:20) SECTION A (1:10) SECTION B (1:10)



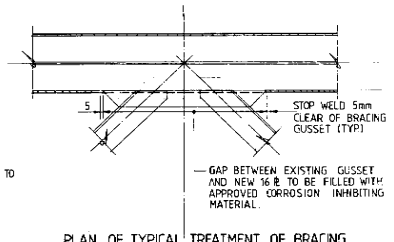
SECTION C (1:5)
TYPICAL WEB STIFFENER REINSTATEMENT



SECTION D (1:10)

NOTE ALL WELDS TO BE GROUND IN LONGITUDINAL DIRECTION

SECTION E (1:10)



PLAN OF TYPICAL TREATMENT OF BRACING GUSSET (BOTTOM FLANGE)
(FOR LOCATION REFER TO DRG No 1503/11)

NOTES :

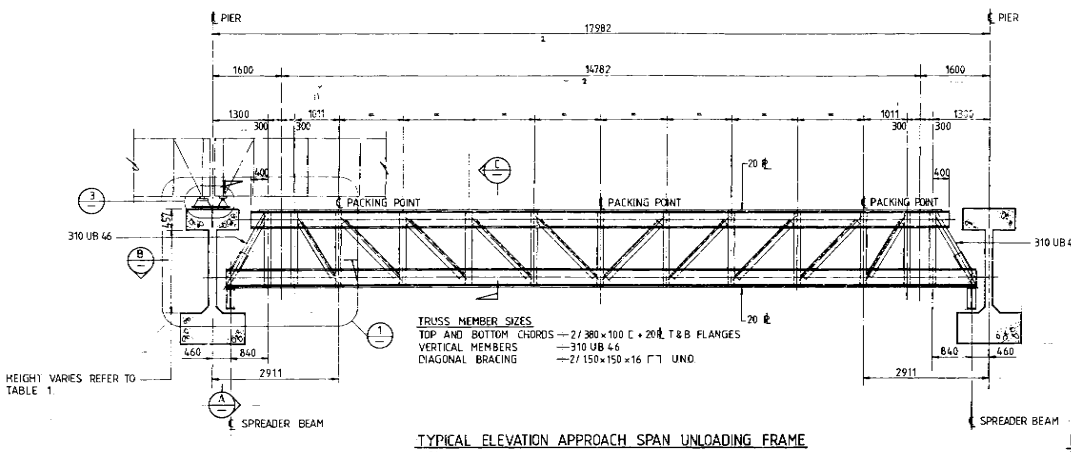
1. FOR GENERAL NOTES REFER TO DRAWING No 1503/14.

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS
MAUNSELL DRAWING No. 17687 – 1002

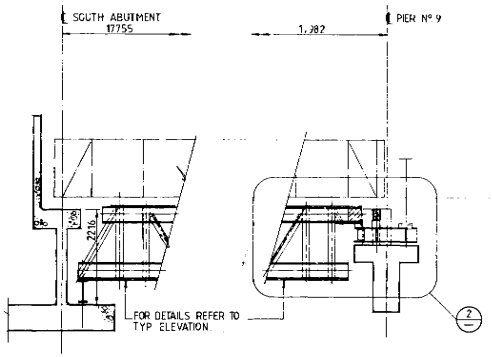
	REFERENCE DRAWINGS	SCALE	LOADING T44	DESIGN	DRAWING	LOCATION MIDLAND HIGHWAY BRIDGEWATER	CONTRACT NUMBER	DEPARTMENT OF MAIN ROADS, TASMANIA
DATE AMENDMENTS APPROVED			PREPARED					DERWENT RIVER BRIDGE
			CHECKED			RECOMMENDED ACCEPTED		BRIDGE NUMBER 15
			SUPERVISED			DIVISION ENGINEER BRIDGES ASSISTANT DIRECTOR		SHEET NUMBER D3-15

APPROACH SPAN STRENGTHENING – DETAILS

DRG. NO. 1503/16



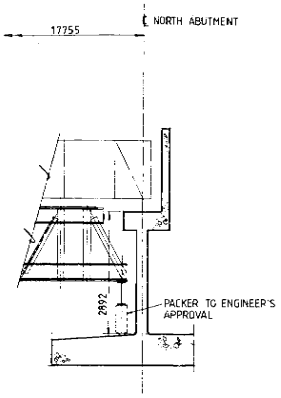
TYPICAL ELEVATION APPROACH SPAN UNLOADING FRAME
1·50



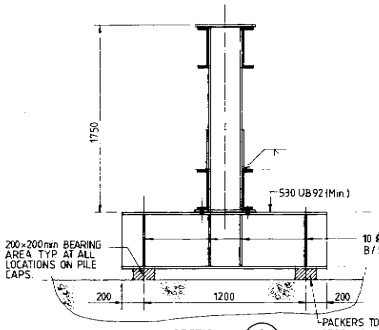
PART ELEVATION SOUTH ABUTMENT
1·50

NOTE: PIER N° 12 SIMILAR

PART ELEVATION PIER N° 9
1·50

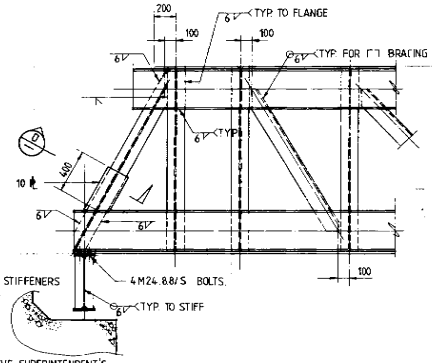


PART ELEVATION NORTH ABUTMENT
1·50

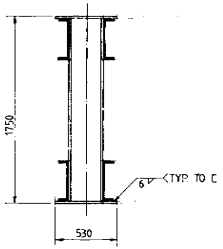


SECTION A
1·20

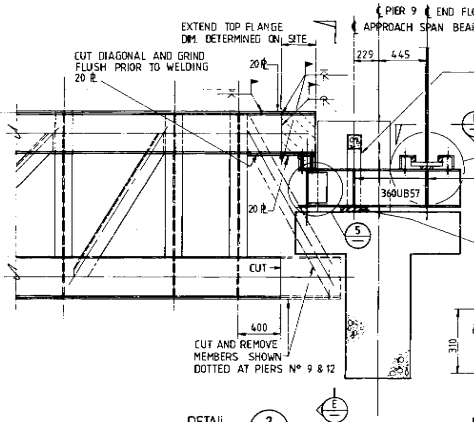
MAX. LOADS 110 KN / BEARING (VERT.)
5 KN / BEARING (HORIZ.)



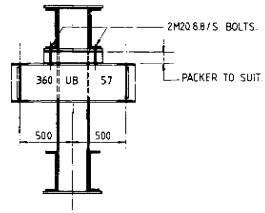
DETAIL 1
1·20



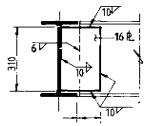
SECTION C
1·20



DETAIL 2
1·20

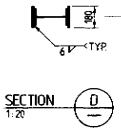


SECTION E
1·20

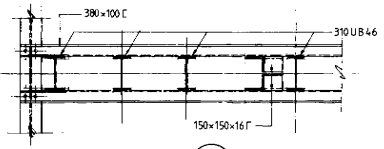


DETAIL 5
1·10

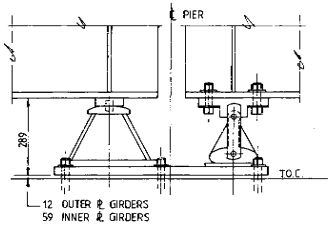
TABLE 1	
PIER N°	HEIGHT OF WALL
1	1892
2	2019
3	2137
4	2235
5	2331
6	2410
7	2483
8	2543
13	2543



SECTION D
1·20

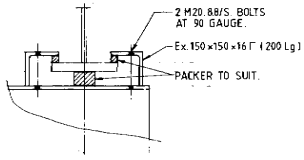


SECTION B
1·20

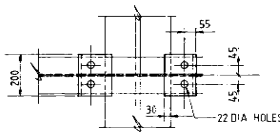


DETAIL 3
N.T.S.

TYP. ASSEMBLY OF BEARINGS ON PIERS 1 to 8 & 13



DETAIL 4



SECTION F

NOTES:

1. FOR GENERAL NOTES REFER TO DRG. N° 1503/14
2. MINIMUM JACK CAPACITY TO BE 400 KN.
3. JACKS SHALL BE LOCATED BETWEEN THE PACKING POINT AND THE CLOSEST TRANSVERSE WEB STIFFENER OF THE EXISTING ℄ GIRDER.
4. MAXIMUM ECCENTRICITY OF THE JACKS FROM THE ℄ OF THE PACKING POINT SHALL BE 200mm.
5. ALL JACKS AND PACKS ARE TO BE POSITIONED CENTRALLY BELOW ℄ GIRDER WEB.
6. JACKS TO BE SYNCHRONISED TO ENSURE EQUAL LOADING DURING JACKING OPERATIONS BY HYDRAULIC LINKING OR OTHER APPROVED METHOD.
7. LOAD PER JACK PRIOR TO PACKING TO BE AS FOLLOWS → INNER ℄ GIRDERS (N°s 2 & 3) 100 KN. OUTER ℄ GIRDER (N° 1) 85 KN.
8. MINIMUM BEARING AREA OF JACKS AND PACKERS ON BOTTOM FLANGE OF ℄ GIRDERS TO BE 150mm x 150mm
9. METHOD OF PACKING AT GIRDER PACKING LOCATIONS AND LOCATION OF JACKING POINTS SHALL BE TO THE APPROVAL OF THE SUPERINTENDENT.

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS
MAUNSELL DRAWING No. 17687—1003

			REFERENCE DRAWINGS	SCALES	LOADING T44	DESIGN	DRAWING	LOCATION: MIDLAND HIGHWAY BRIDGEWATER	CONTRACT NUMBER
					PREPARED			RECOMMENDED	ACCEPTED
					CHECKED				
					SUPERVISED				
DATE	AMENDMENTS	APPROVED							

DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE

APPROACH SPAN UNLOADING FRAME

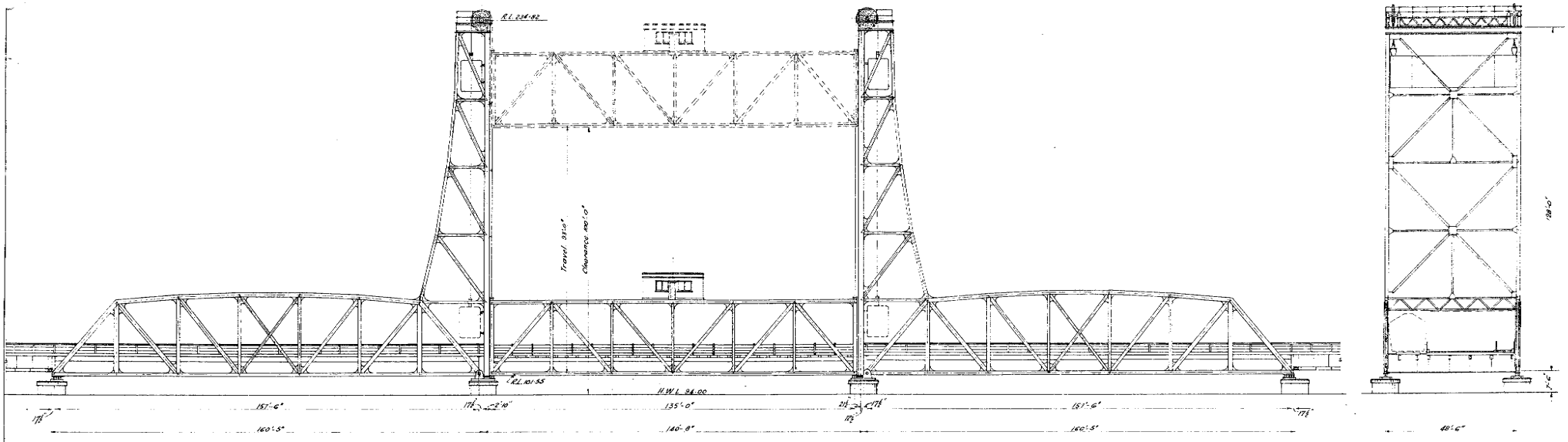
BRIDGE NUMBER 15

SHEET NUMBER D3-16

BRIDGEWATER BRIDGE

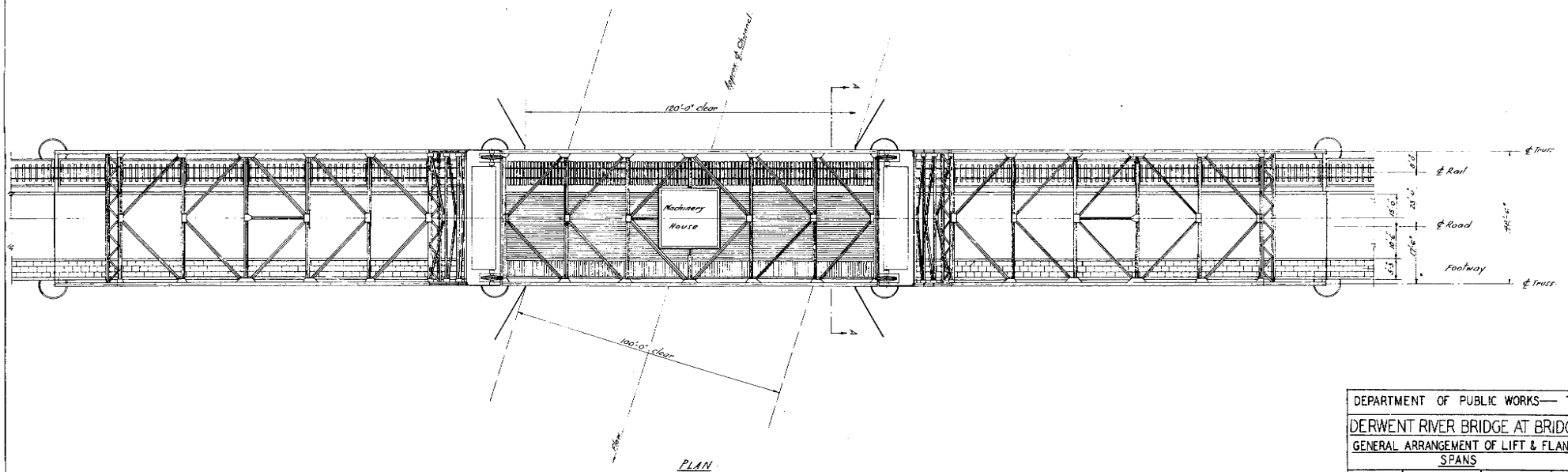
D4 - FLANKING SPANS

TABLE OF CONTENTS



DOWNSTREAM ELEVATION

SECTION A-A



PLAN

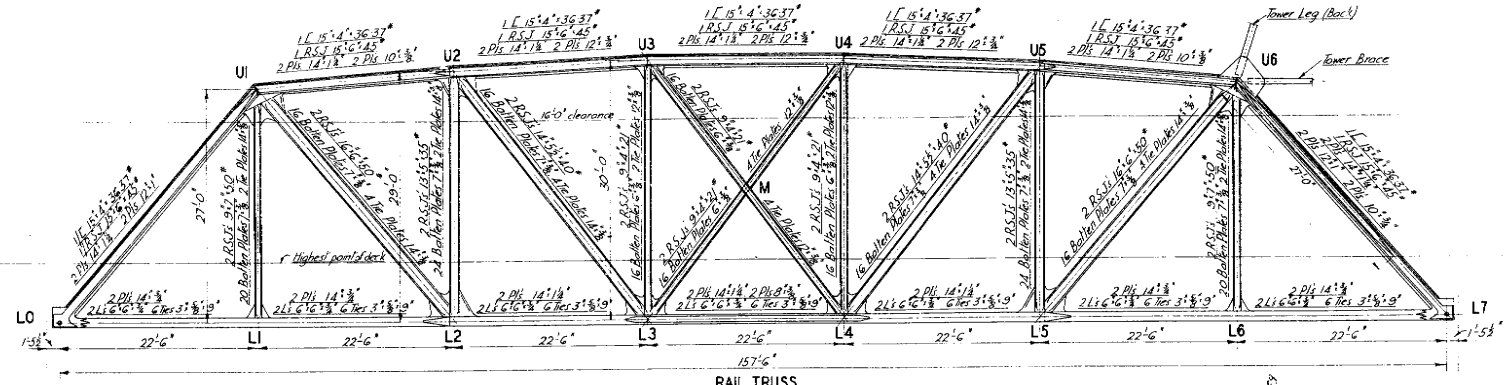
DEPARTMENT OF PUBLIC WORKS— TAS.

DERWENT RIVER BRIDGE AT BRIDGEWATER

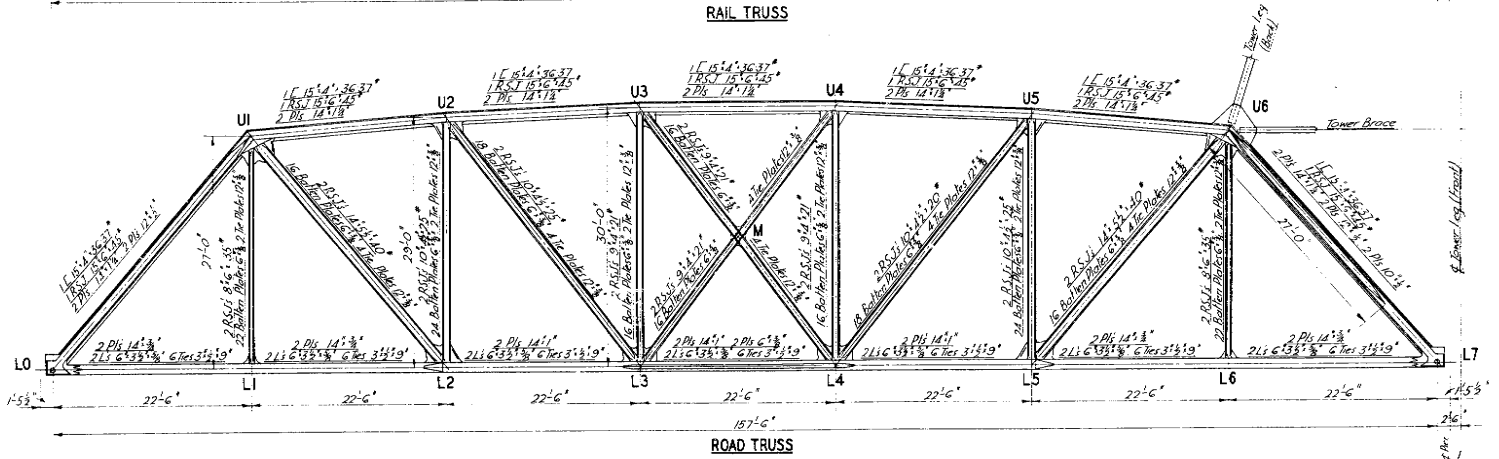
GENERAL ARRANGEMENT OF LIFT & FLANKING SPANS

	Prepared	Checked	
Scale 1" = 20'			
Drawing			
Tracing	A.S. 1938		15D4-1
Origin			
SUPERVISION			

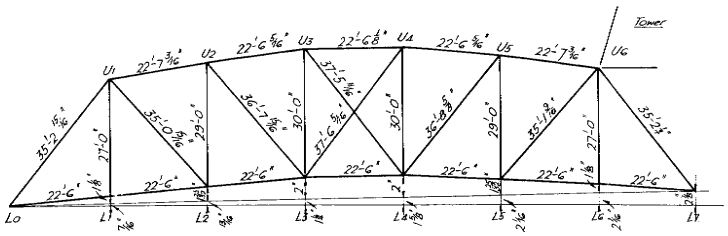
CHIEF ENGINEER.



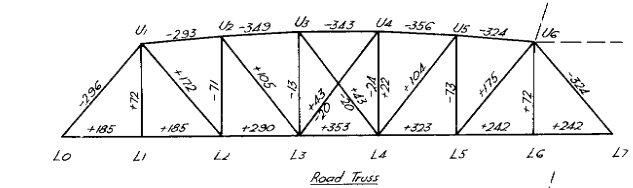
RAIL TRUSS



ROAD TRUSS



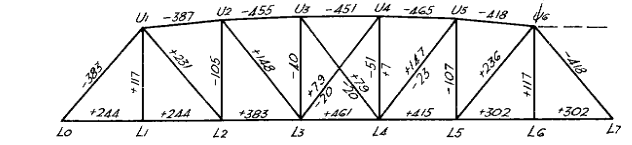
CAMBER DIAGRAM



Road Truss

Free End

Fixed end



Rail Truss

LOAD DIAGRAMS

(Loads in Tons)

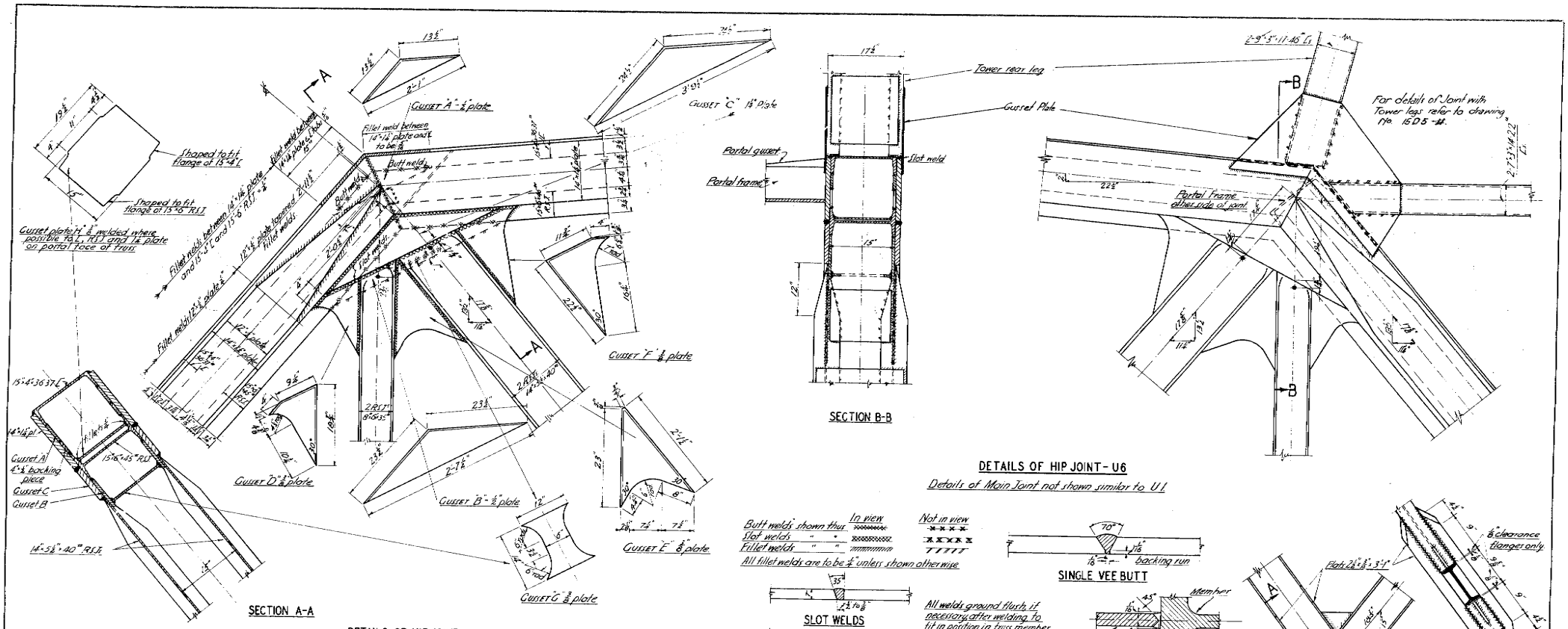
DERWENT RIVER BRIDGE

AT BRIDGEWATER

FLANKING SPAN TRUSSES

15D4

-2



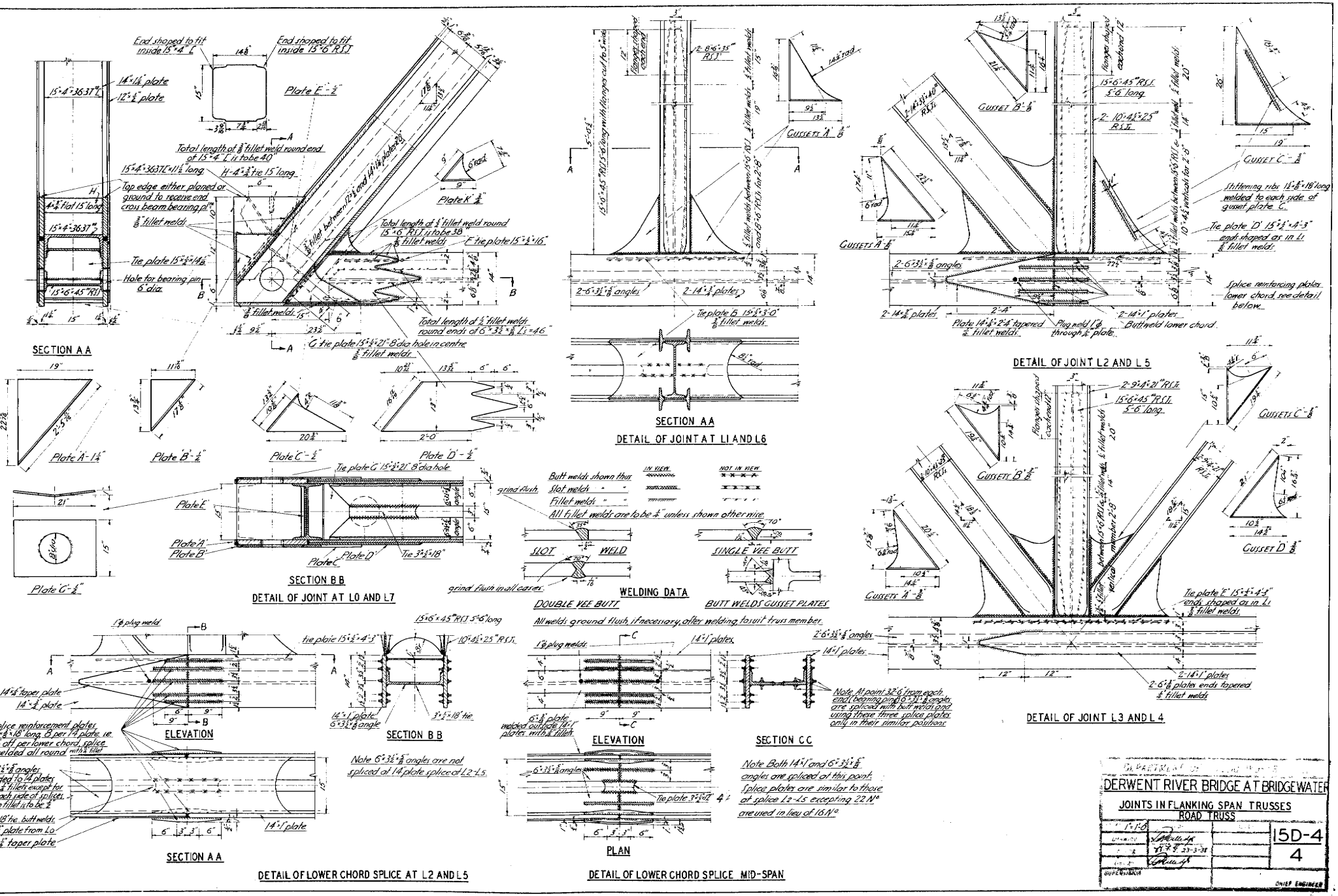
DEPARTMENT OF PUBLIC WORKS

DERWENT RIVER BRIDGE AT BRIDGEWATER

FLANKING SPAN

ROAD TRUSS JOINTS — TOP CHORD

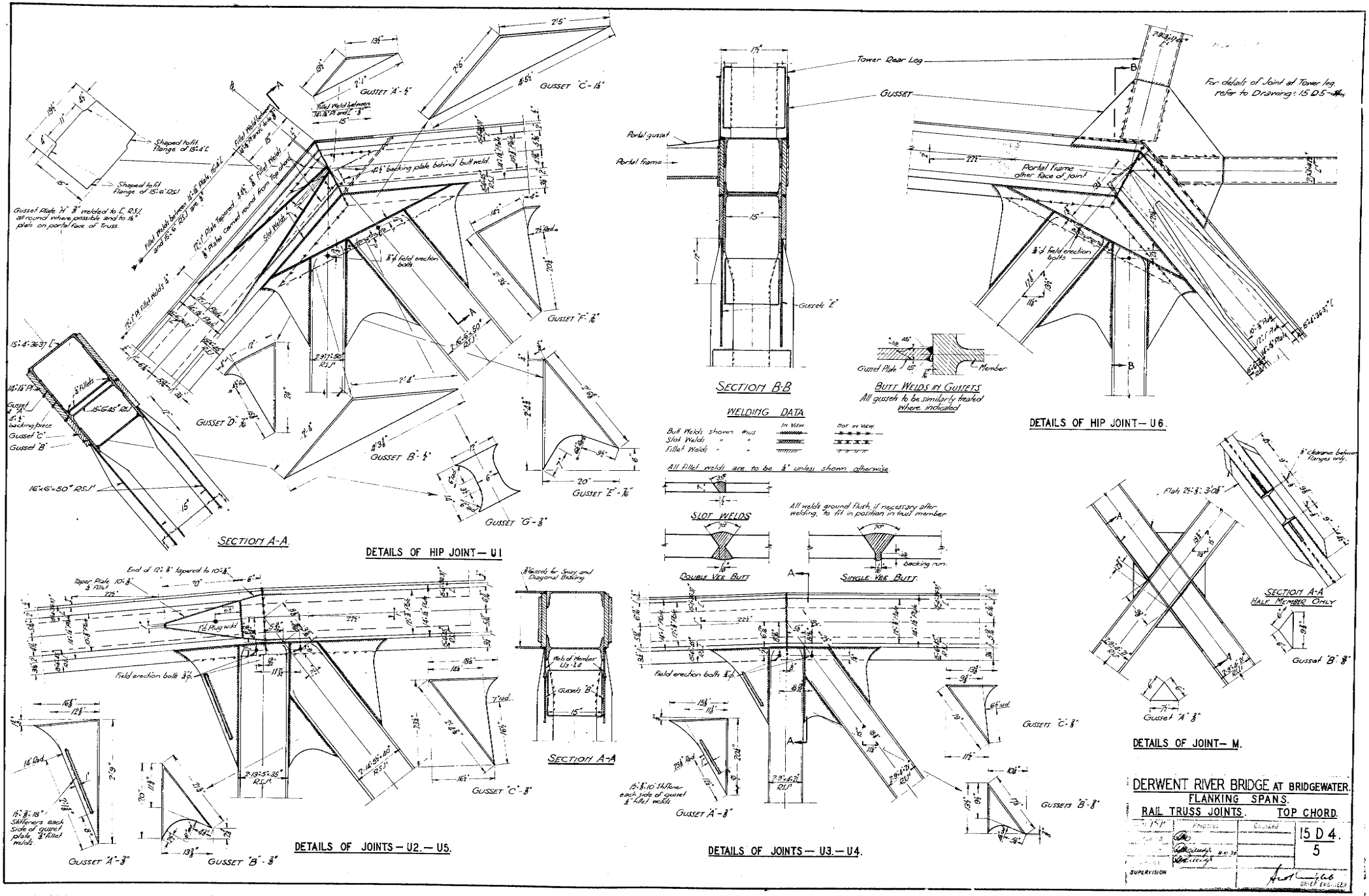
SCALE 1" = 1'-0"	TRACED	CHECKED	15D-4
DESIGNED	DATE 4-3-36	DATE	
DRAWN		APPD.	3
CHECKED			
SUPERVISION			CHIEF ENGINEER



DERWENT RIVER BRIDGE AT BRIDGEWATER

JOINTS IN FLANKING SPAN TRUSSES
ROAD TRUSS

15D-4
4



DERWENT RIVER BRIDGE AT BRIDGEWATER.

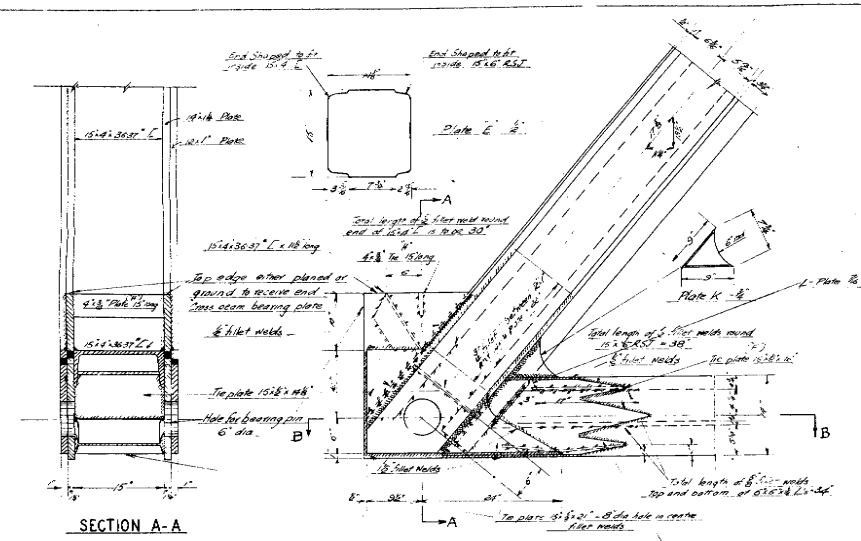
FLANKING SPANS.

RAIL TRUSS JOINTS. TOP CHORD.

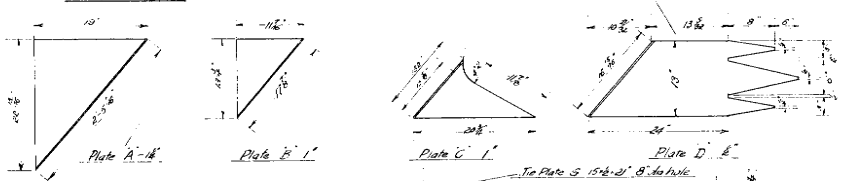
	PREPARED	CHECKED	15 D 4. 5

SUPERVISION

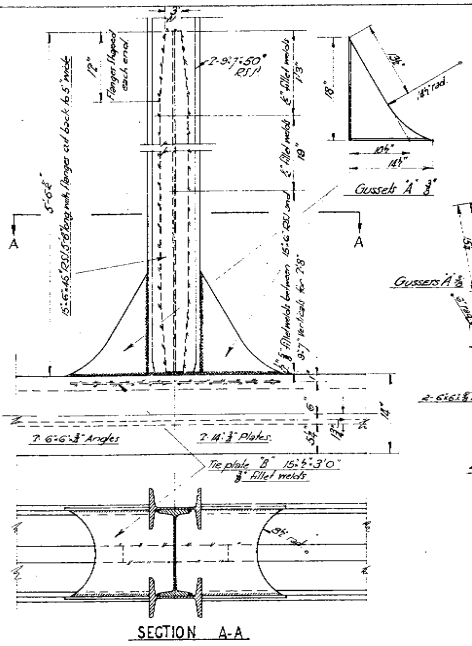
CHIEF ENGINEER



SECTION A-A

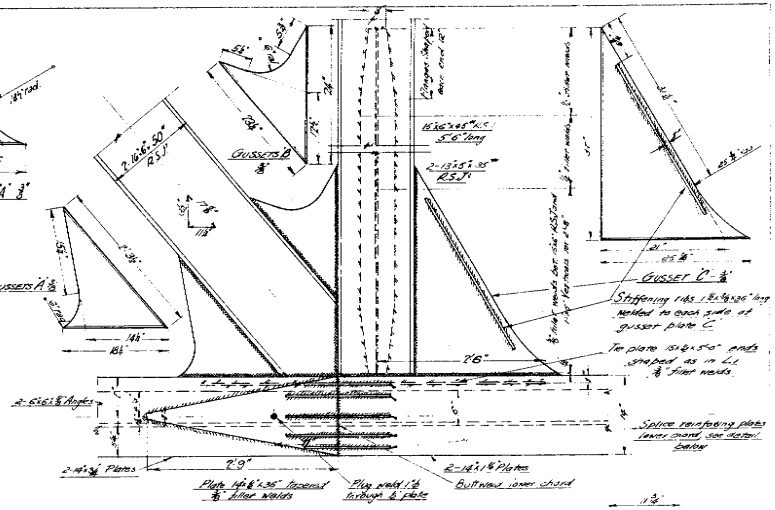


DETAIL OF JOINT AT L0 AND L7

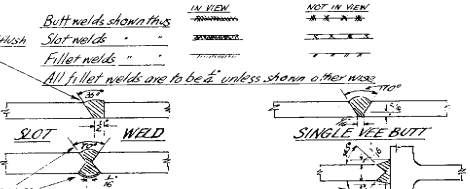


SECTION A-A

DETAIL OF JOINT AT L1 AND L6



DETAIL OF JOINT AT L2 AND L5

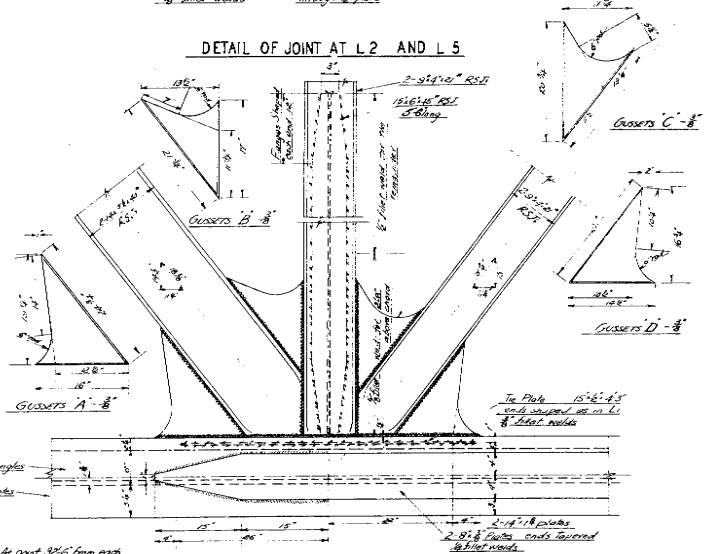


WELDING DATA

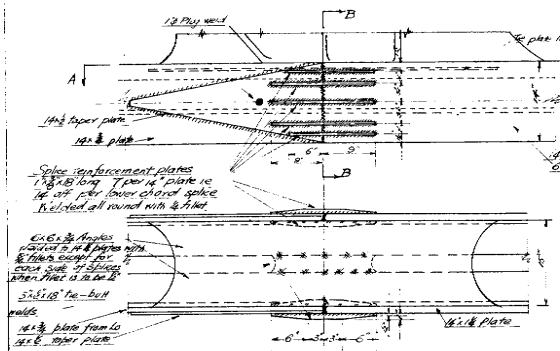
DOUBLE VEE BUTT

BUTT WELDS GUSSET PLATES

All welds ground flush if necessary, after welding to suit truss member.



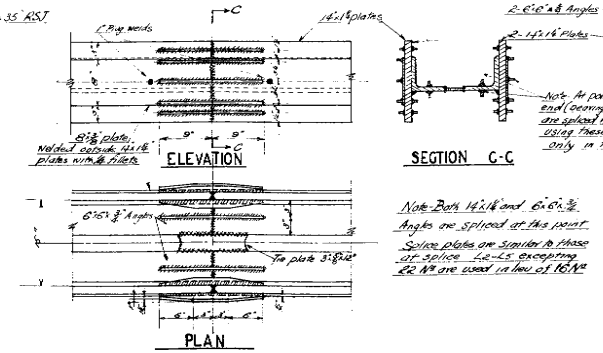
DETAIL OF JOINT AT L3 AND L4



SECTION B-B

SECTION A-A

DETAIL OF LOWER CHORD SPLICE AT L2 AND L5



ELEVATION

SECTION C-C

PLAN

DETAIL OF LOWER CHORD SPLICE MID-SPAN

DEPARTMENT OF PUBLIC WORKS — TAS.

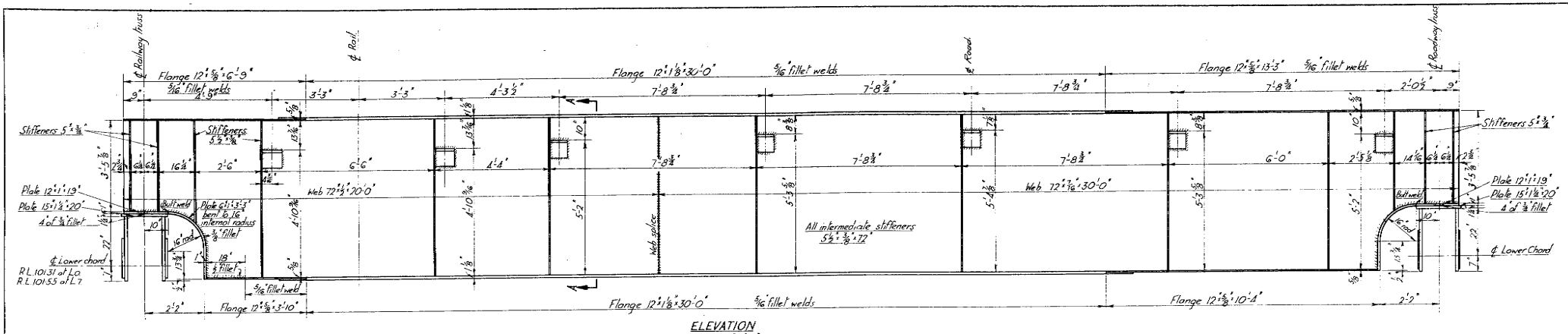
DERWENT RIVER BRIDGE AT BRIDGEWATER

JOINTS IN FLANKING SPAN TRUSSES

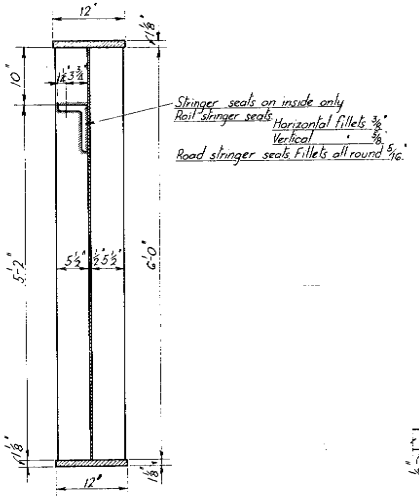
RAIL TRUSS

Scale 1/2 ft.			15D4 -6
		24-1-39	16.251.39
		O.K.I.	

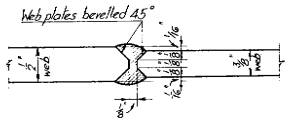
CHIEF ENGINEER

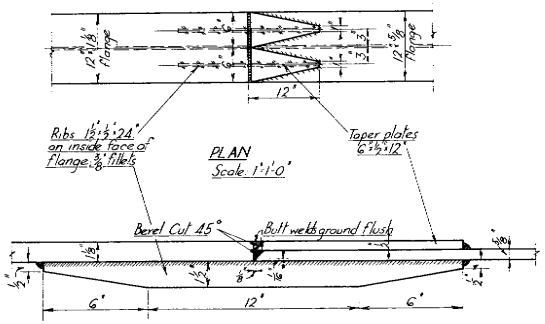


ELEVATION
Scale: ½"=1'-0"

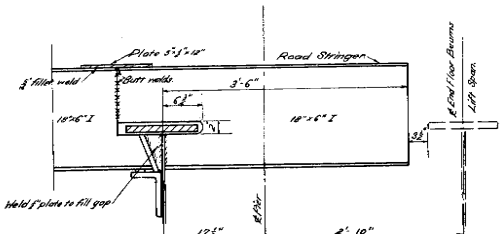


SECTION A-A
Scale: 1"=1'-0"





DETAILS OF FLANGE SPLICES



STRINGER EXTENSION AT END CROSS GIRDER PIERS 10 & 11

QUANTITY LIST OF MATERIAL—INTERMEDIATE & END FLOOR BEAMS

Material	Intermediate Floorbeams Detail Sheet 15D4-8 Length	No per beam	No in job	Location	End Floorbeams Length	No per beam	No in job	Location
M.S Plate 72"×⅜"	17'-2¼"	1	12	Web plates				
" " 72"×½"					20'-0"	1	4	Web plates
" " 72"×⅞"	30'-0"	1	12	Web plates				
" " 72"×⅞"					30'-0"	1	4	Web plates
M.S Flat 15"×1¼"					1'-8"	2	8	Lower flange seat
" " 12"×1½"	31'-6"	1	12	Upper flange				
" " 12"×1½"	31'-3"	1	12	Lower flange				
" " 12"×1⅛"	15'-6"	1	12	Upper flange	30'-0"	2	8	Upper and lower flange
" " 12"×1⅛"	15'-3"	1	12	Lower flange				
" " 12"×1"					1'-7"	2	8	Lower flange
" " 12"×⅝"					13'-3"	1	4	Upper flange
" " 12"×⅝"					10'-4"	1	4	Lower flange
" " 12"×⅝"					6'-9"	1	4	Upper flange
" " 12"×⅝"					3'-10"	1	4	Lower flange
" " 12"×½"	1'-0"	4	48	Upper flange to Post Plates				
" " 6"×1"					3'-3"	2	8	Lower flange
" " 6"×⅜"	1'-0"	4	48	Flange taper plates	1'-0"	8	32	Flange taper plates (6"×⅜")
" " 5½"×½"	6'-0"	18	216	Stiffeners Note: 8 to be cut to 4½"×½"	32 " " " 4½"×½"			
" " 5½"×⅜"					6'-0"	14	56	Intermediate stiffeners
" " 5½"×⅜"					3'-11"	2	8	" "
" " 5½"×⅜"					3'-9½"	2	8	" "
" " 5"×¼"					2'-5⅝"	8	32	End stiffeners
" " 1½"×½"	2'-0"	4	48	Flange Ribs	2'-0"	8	32	Flange Ribs
Angle 8"×8"×1"	0'-9"	4	48	Rail stringer seals	0'-9"	2	8	Rail stringer seals
" 8"×8"×1"	0'-8"	10	120	Road stringer seals	0'-8"	5	20	Road " "

Weight
One Intermediate Floor Beam = 5·62 tons
" End " " = 4·00 tons

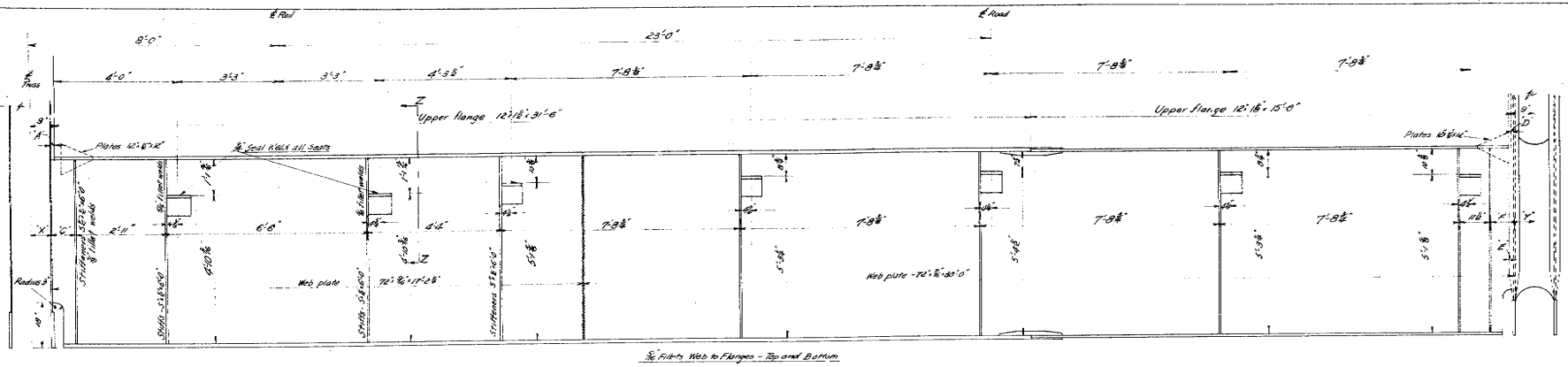
NOTE: For details of stringer seats refer to sheet 15D4-6.

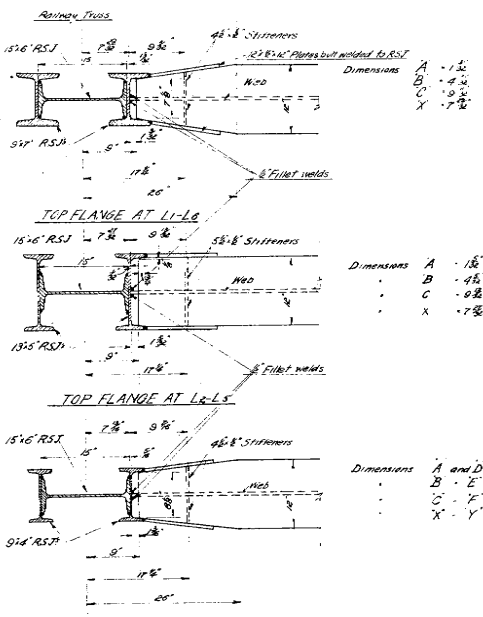
Unless shown otherwise all fillets are to be ⅜" minimum & continuous.

Revision.
Road Stringer extension added. 11/6/[illegible]

DEPARTMENT OF PUBLIC WORKS TAS.
DERWENT RIVER BRIDGE
BRIDGEWATER
END FLOOR BEAMS—FLANKING SPAN TRUSSES

	Designed	Checked	15D4
Drawing	[illegible]		-7
Tracing	C.R.W. 19/5/39		
Checked	[illegible] DEPUTY CHIEF		
SUPERVISOR			CHIEF ENGINEER

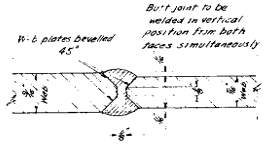


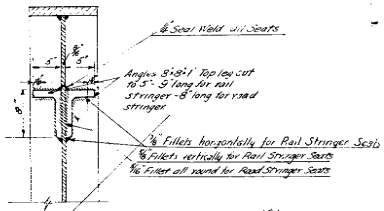


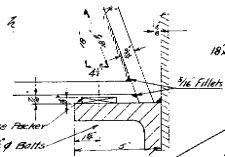
Dimensions		
A	1⅛"	
B	4½"	
C	9⅜"	
X	7⅞"	

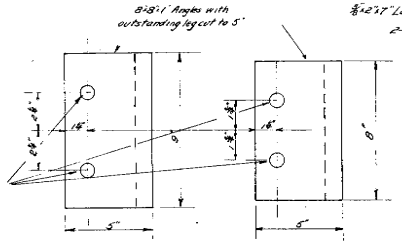
Dimensions		
A	1⅝"	
B	4⅝"	
C	9⅜"	
X	7⅞"	

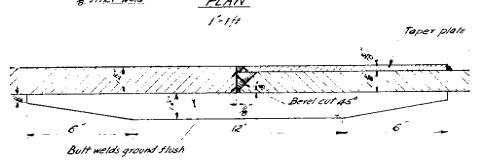
Dimensions		
A and D	1⅞"	
B	E	4⅝"
C	F	9⅜"
X	Y	7⅞"

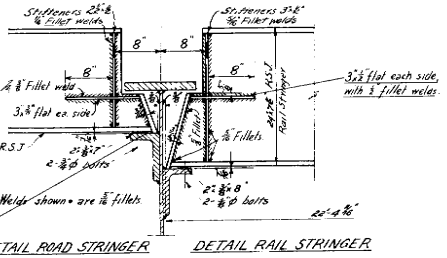


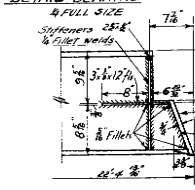


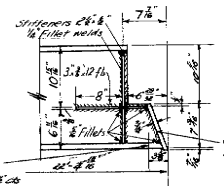


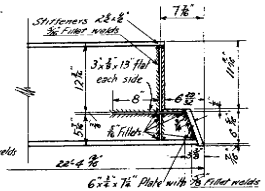


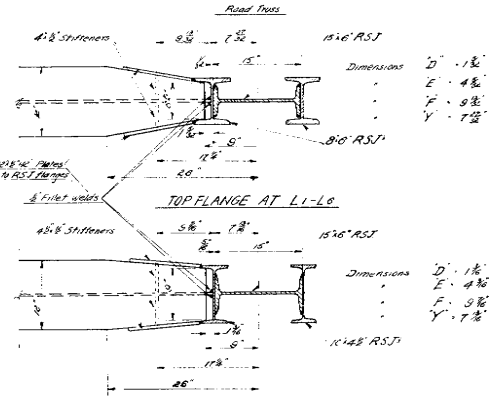


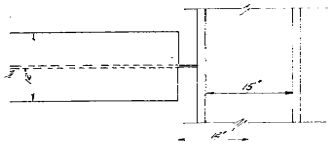










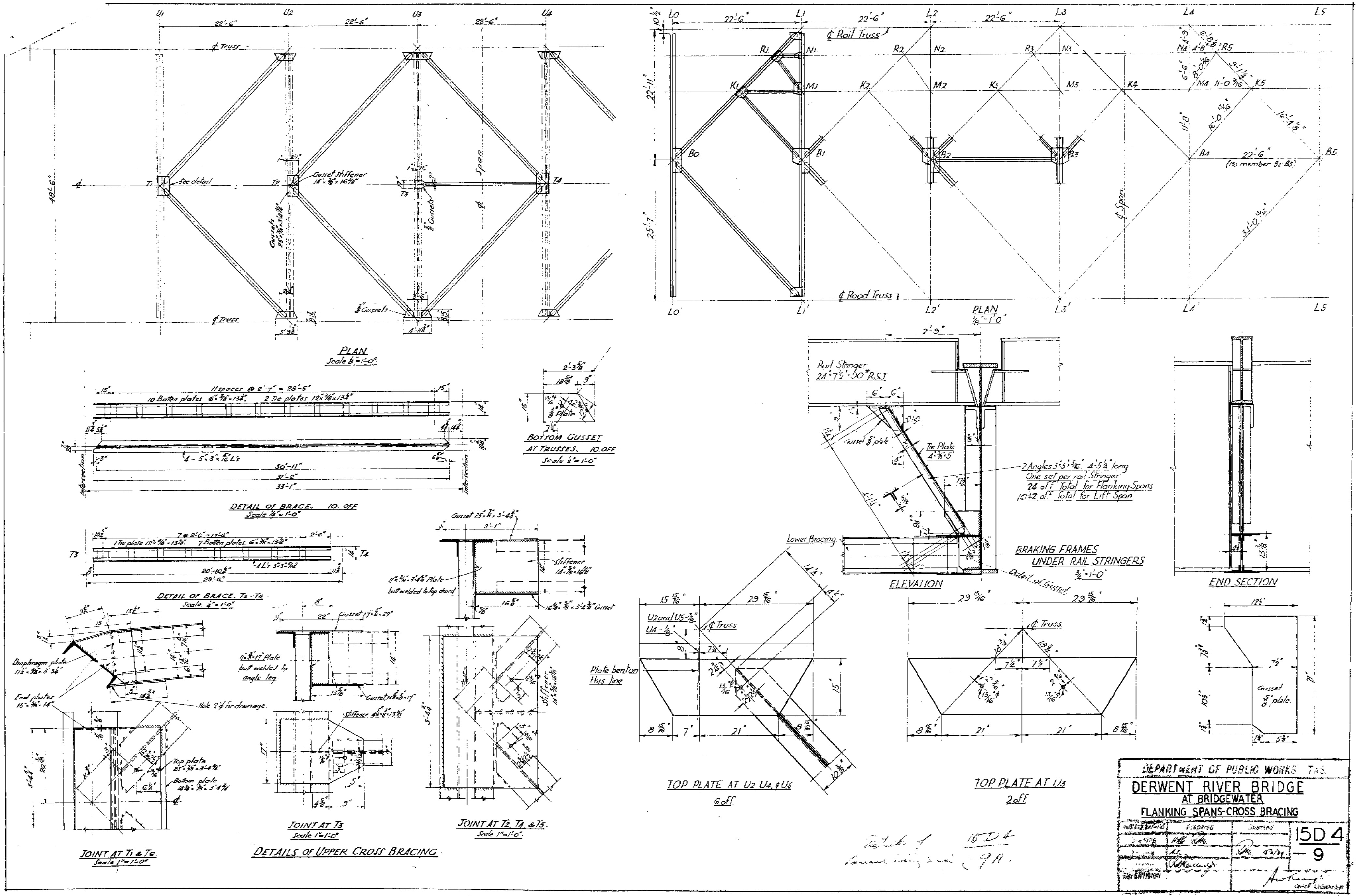


DEPARTMENT OF PUBLIC WORKS - TAS.

DERWENT RIVER BRIDGE AT BRIDGEWATER

INTERMEDIATE FLOORBEAMS - FLANKING SPAN TRUSSES

15D4
8

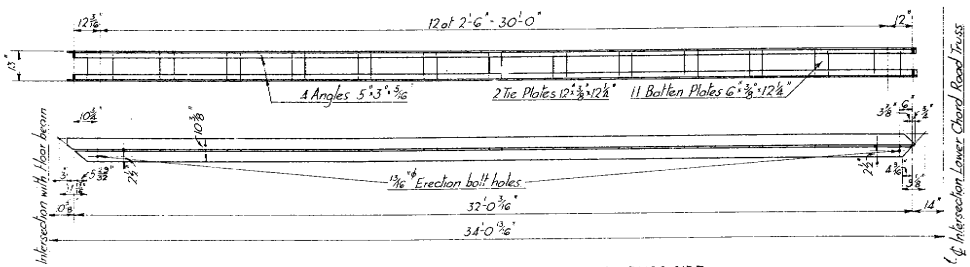


DEPARTMENT OF PUBLIC WORKS TAS.

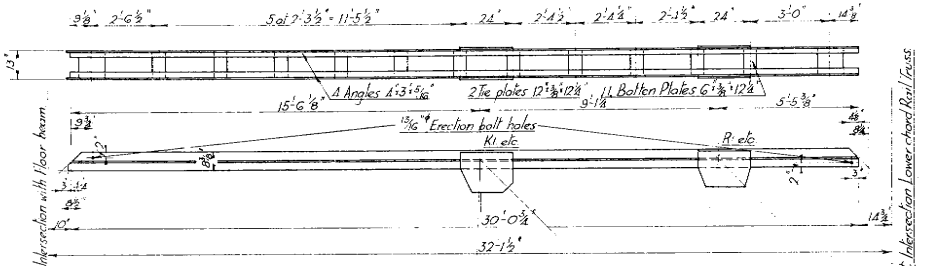
DERWENT RIVER BRIDGE
AT BRIDGEWATER
FLANKING SPANS-CROSS BRACING

15D4 - 9

Details of 15D4
Lower Bracing ... 9A.

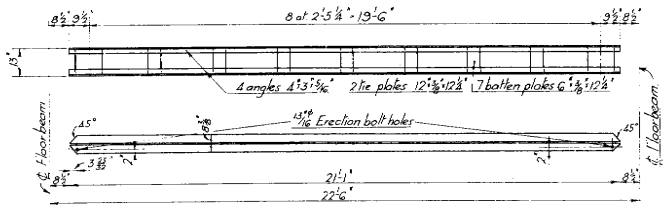


DETAIL OF BRACING MEMBER ROAD TRUSS SIDE
7 off per truss (3 as drawn, 4 opposite hand)
Scale: 3/8"=1'-0"

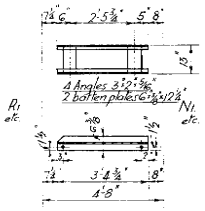


DETAIL OF BRACING MEMBER RAIL TRUSS SIDE
7 off per Truss (3 as drawn, 4 opposite hand)
Scale: 1/8"=1'-0"

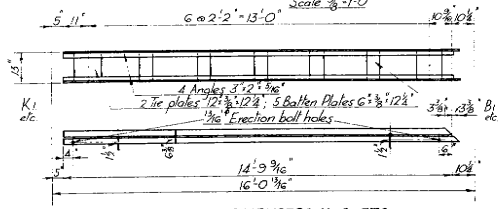
Note:- Member L3 B4 Gussets at R4 are omitted



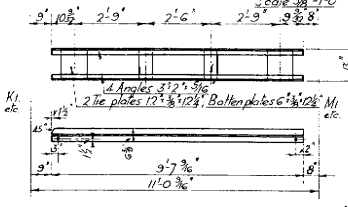
DETAIL OF MEMBER B2-B3
1 off per Truss
Scale 3/8"=1'-0"



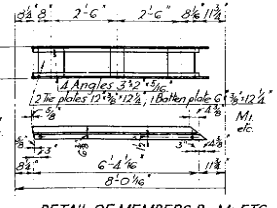
DETAIL OF MEMBERS R1-N1 ETC.
6 off per truss (3 as shewn 3 opposite hand)
Scale 3/8"=1'-0"



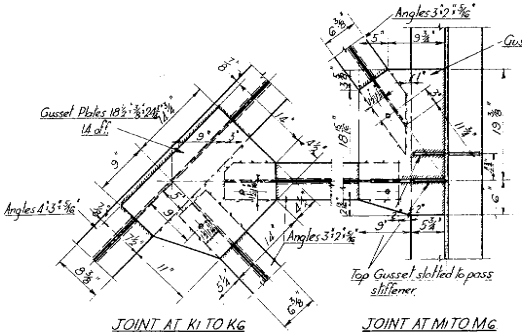
DETAIL OF MEMBERS K1-B1 ETC.
7 off per truss (3 as drawn, 4 opposite hand)
Scale: 3/8"=1'-0"



DETAIL OF MEMBERS K1-M1 ETC.
6 off per truss (3 as drawn, 3 opposite hand)
Scale: 3/8"=1'-0"

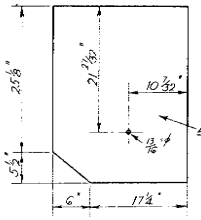


DETAIL OF MEMBERS R1-M1 ETC.
6 off per truss (3 as drawn, 3 opposite hand)
Scale: 3/8"=1'-0"

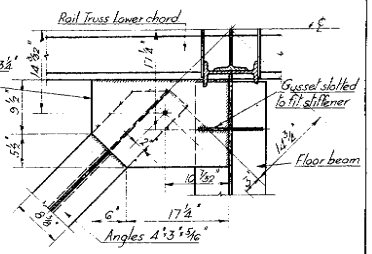


JOINT AT K1 TO K6
Scale: 1"=1'-0"

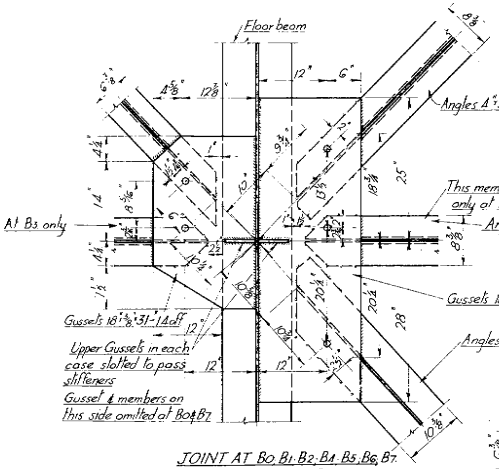
JOINT AT M1 TO M6
Scale 1"=1'-0"



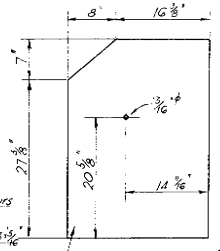
Lower Gusset Plate 23 1/4"x3/8"x30 3/8"
7 off



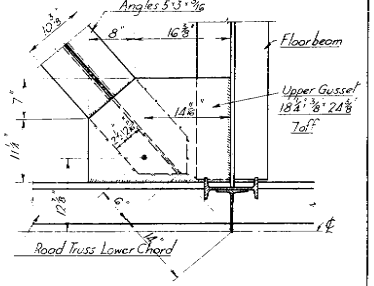
JOINT AT L1 TO L6 RAIL TRUSS
Scale: 1"=1'-0"



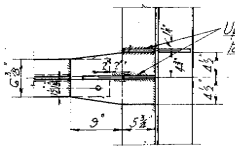
JOINT AT B0, B1, B2, B4, B5, B6, B7
Scale: 1"=1'-0"



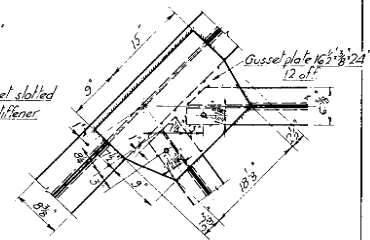
Lower Gusset Plate 24 3/4"x3/8"x34 3/8"
7 off



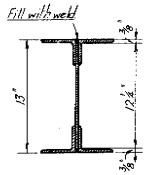
JOINT AT L1 TO L6 ROAD TRUSS
Scale: 1"=1'-0"



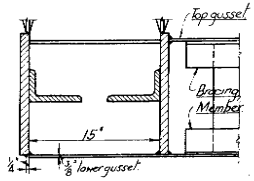
JOINT AT N1-N6
Scale: 1"=1'-0"



JOINT AT R1-R6
Scale: 1"=1'-0"



SECTION THRU MEMBERS
Scale: 1 1/2"=1'-0"



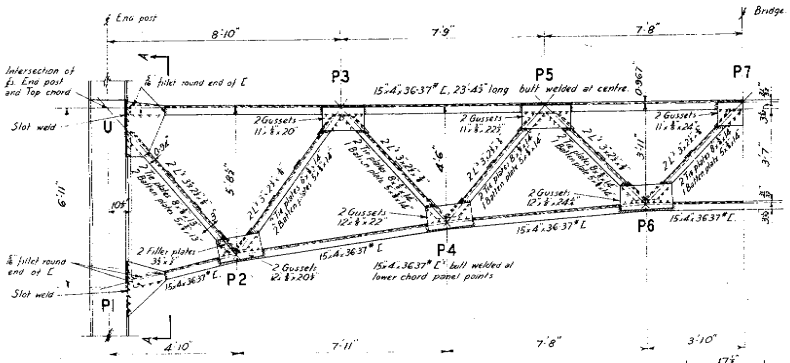
CONNECTION TO LOWER CHORD
Scale: 1 1/2"=1'-0"

Note: All welding to be 5/16" fillets

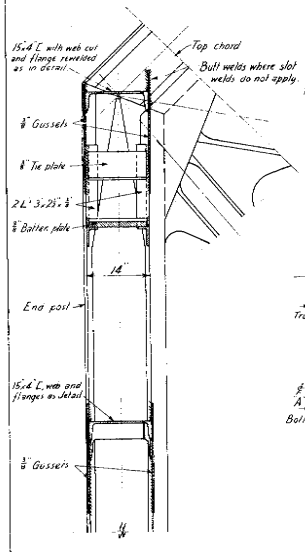
DEPARTMENT OF WORKS HOBART TAS.

DERWENT RIVER BRIDGE
AT BRIDGEWATER
FLANKING SPANS — LOWER DIAGONAL BRACING

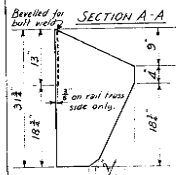
Scales 3/8"=1'-0"	Dwg. No.	CHECKED	15D4
DRAWN	Drawings		-9A
TRACED	BRW 12/1958	DATE 4/8/59	
	Drawings		



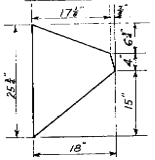
HALF ELEVATION OF PORTAL



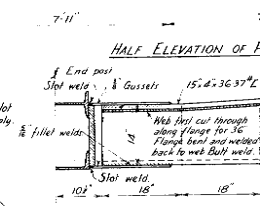
SECTION A-A



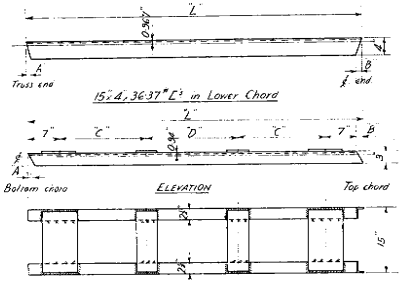
Inner Gussets at U - ⅜" plate
2 off per frame

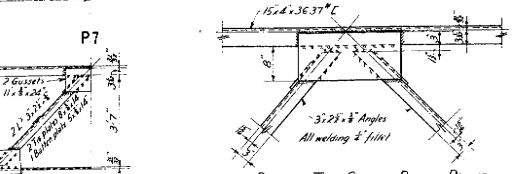


Gussets at P1 - ⅜" plate
4 off per frame.

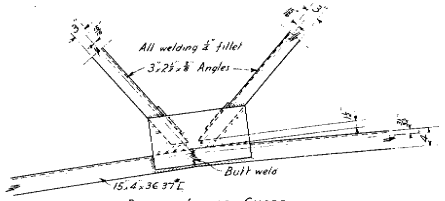


DETAIL OF CHANNEL ENDS

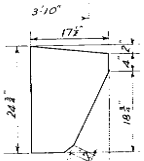




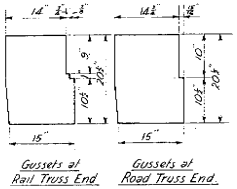
DETAIL TOP CHORD PANEL POINT
PORTAL FRAME



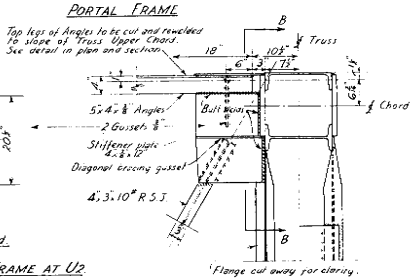
DETAIL LOWER CHORD
PORTAL FRAME



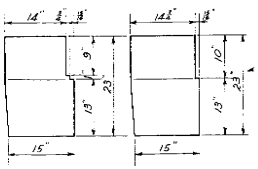
Outer Gussets at U - ⅜" plate
2 off per frame



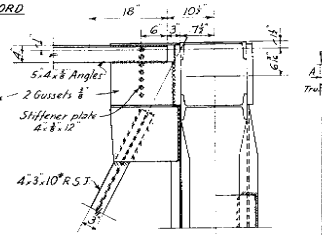
Gussets at Rail Truss End
Gussets at Road Truss End



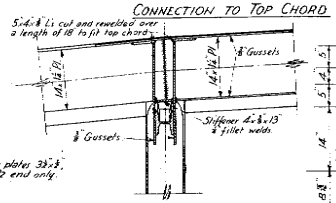
SWAY FRAME AT U2
CONNECTION TO TOP CHORD



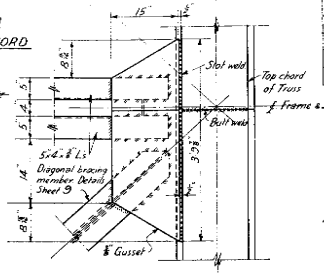
Gussets at Rail Truss End
Gussets at Road Truss End



SWAY FRAME AT U3
CONNECTION TO TOP CHORD



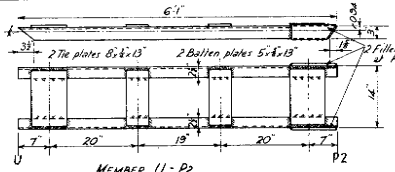
SECTION B-B
SWAY FRAME



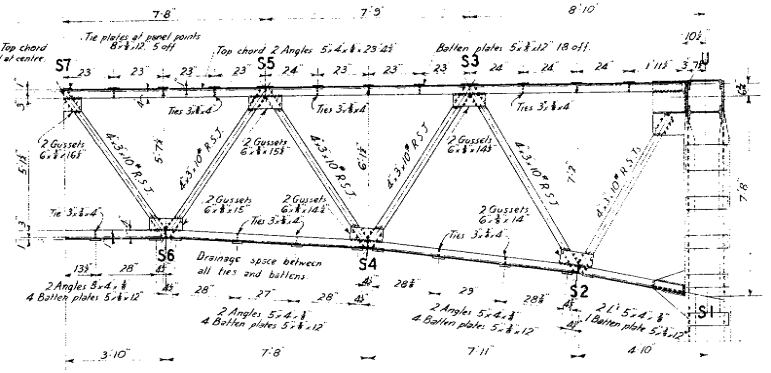
PLAN OVER FRAME AT U2
CONNECTION TO TRUSSES
For connection to trusses at U3 refer to Sheet

TABLE OF MEMBERS IN ONE PORTAL FRAME

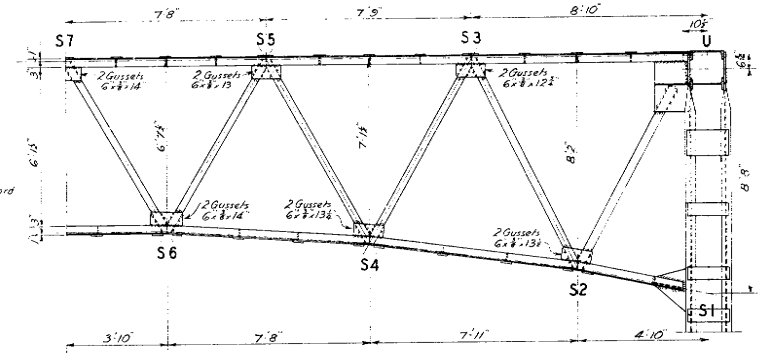
Member	Fabrication	Dimensions L	A	B	C	D	No off
P1 - P2	15"x4"x36.37#" L	4'0½"	Square	⅜"	–	–	2
P2 - P4	" "	8'0"	⅝"	⅝"	–	–	2
P4 - P6	" "	7'8"	⅝"	⅝"	–	–	2
P6 - P4'	" "	7'8"	⅝"	⅝"	–	–	1
P2 - P3	2L 3"x2½"x⅜" 2 Tie Pls ⅜"x1'-4"x 2 Batt Pls ⅜"x1'-4"	6'4½"	3⅜"	2⅜"	20"	20⅛"	2
P3 - P4	2L 3"x2½"x⅜" 2 Tie Pls ⅜"x1'-4"x 2 Batt Pls ⅜"x1'-4"	5'5⅝"	2¼"	2⅝"	24⅛"	–	2
P4 - P5	" "	5'4½"	3⅛"	2⅜"	24"	–	2
P5 - P6	" "	5'0½"	2⅝"	2¼"	21⅜"	–	2
P6 - P7	" "	4'11½"	3⅜"	2⅛"	21⅜"	–	2



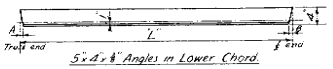
MEMBER U - P2
2 off to detail per portal. All other members per table.



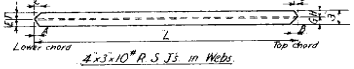
HALF SWAY FRAME AT U2 AND U5



HALF SWAY FRAME AT U3 AND U4
With exception of gussets, all other details as for Frame at U2



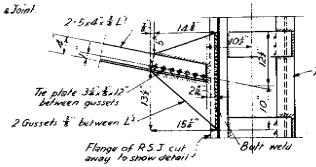
5"x4"x⅜" Angles in Lower Chord.



4"x3"x10" R S J's in Webs.

Member	Fabrication	Dimensions Frame at U2 - U5 L	A	B	C	D	E	F	G	H	Dimensions Frame at U3 - U4 L	A	B	C	D	E	F	G	H
S1 - S2	2 Angles 5"x4"x⅜" 1 Batten Plate 5"x⅜"x12"	6'-1"	3/16	3/16	Dimension A reads opposite hand						4'-1"	3/16	3/16	Dimension A reads opposite hand					
S2 - S4	2 Angles 5"x4"x⅜" 4 Batten plates 5"x⅜"x12"	7'11 11/16"	5/16	5/16							7'11 11/16"	5/16	5/16						
S4 - S6	" "	7'8 5/16"	5/16	5/16							7'8 5/16"	5/16	5/16						
S6 - S6'	" "	7'8 5/16"	5/16	5/16							7'8 5/16"	5/16	5/16						
U - S2	1, 4"x3"x10" R S J	6'10 5/16"	1/16	–	45°	–	1⅛"	1 1/16"	–	–	7'10 1/16"	1/16"	–	54°	–	1⅛"	1 1/16"	–	–
S2 - S3	" "	8'3 3/16"	2 3/16"	1 1/16"	1 3/16"	3½"	1⅝"	1⅝"	1 1/16"	1 1/16"	9'2 3/16"	2 3/16"	⅜"	⅜"	3⅜"	1 1/16"	1 1/16"	1 1/16"	1 1/16"
S3 - S4	" "	7'4 3/16"	1 9/16"	2 3/16"	3 3/16"	2 3/16"	1⅝"	1⅝"	1⅝"	1⅝"	8'2 3/16"	1 9/16"	2 3/16"	4 3/16"	⅜"	1⅝"	1 5/16"	1 5/16"	1 5/16"
S4 - S5	" "	7'3 3/16"	2 3/16"	⅜"	1 3/16"	2 3/16"	1⅝"	1⅝"	1 5/16"	1 5/16"	8'2 3/16"	2 3/16"	1 3/16"	⅜"	3⅜"	1 3/16"	1 3/16"	1 5/16"	1 5/16"
S5 - S6	" "	6'10 3/16"	1 3/16"	2 3/16"	2 13/16"	2 13/16"	1 3/16"	1 3/16"	1⅜"	1⅜"	7'9 3/16"	⅜"	3⅜"	3⅜"	1 3/16"	1⅜"	1 3/16"	1 3/16"	1 3/16"
S6 - S7	" "	6'10 3/16"	2 3/16"	1 3/16"	1 3/16"	2 3/16"	1⅜"	1⅜"	1⅜"	1⅜"	7'9 3/16"	2 3/16"	1 3/16"	1 3/16"	3 3/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"

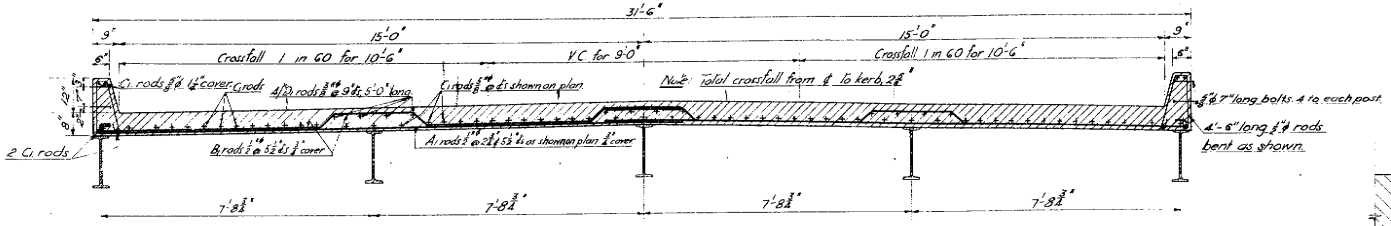
All fillet welds to be ⅜" unless indicated.



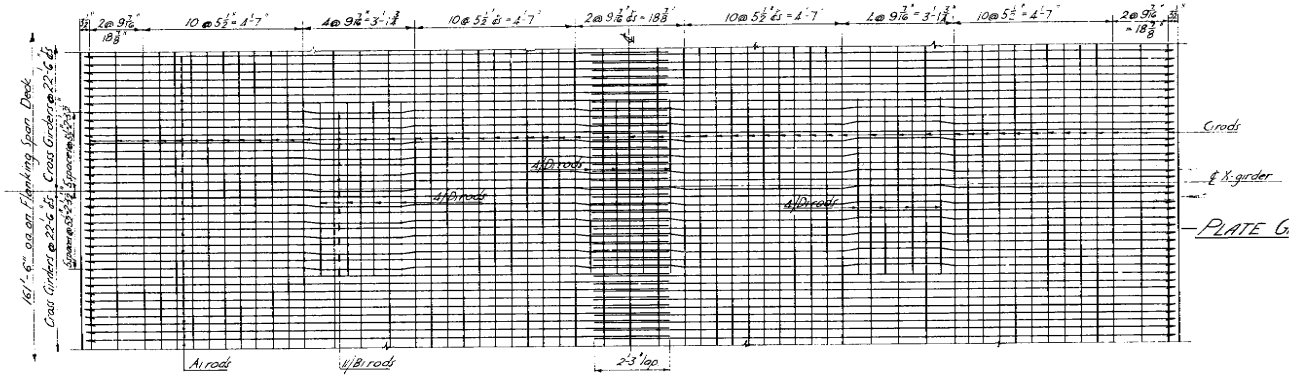
SWAY FRAME DETAIL
LOWER CHORD AT TRUSS

DERWENT RIVER BRIDGE
AT BRIDGEWATER
PORTAL & SWAY BRACING - FLANKING SPAN

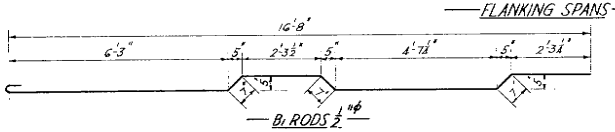
15D4
10

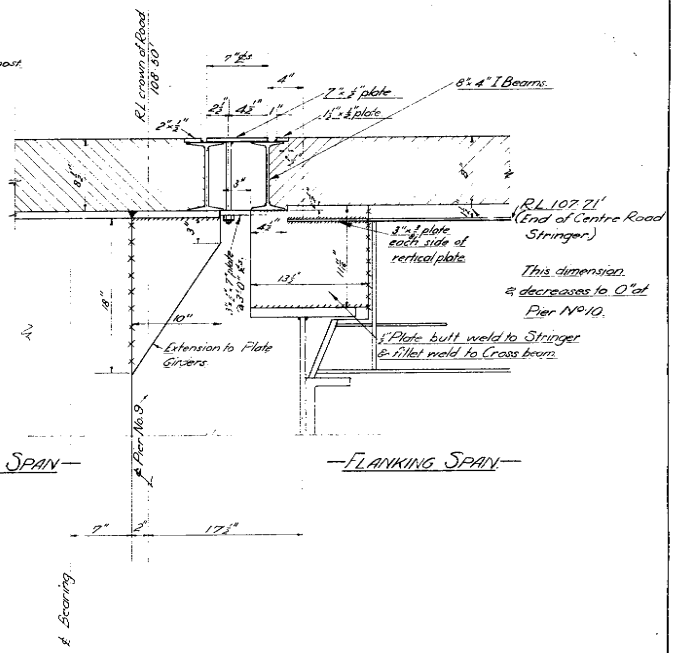


TYPICAL CROSS SECTION



PART PLAN
FLANKING SPANS





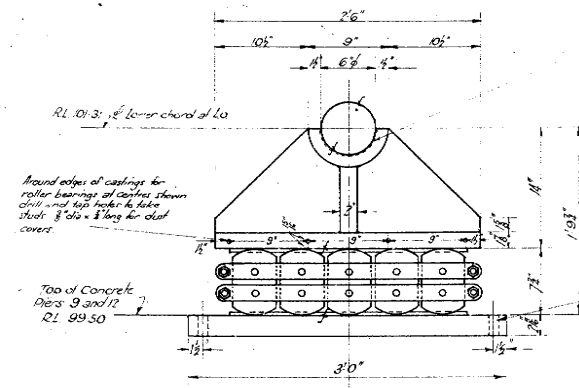
ROADWAY EXPANSION JOINT OVER PIERS Nº 9 & 12
Scale: 1½" = 1ft

STEEL LIST (FLANKING SPANS)

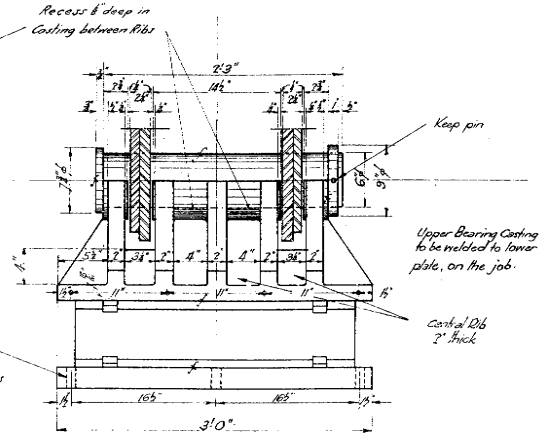
Mark	Nº	Length	Size	Order List Length	Weight	Shape	Remarks
A1	1232	17'-2"	⅝" ϕ	18'	1480 lbs	Hooked one end 2'-3½" lap	transverse in deck
B1	164	7'-8"	⅝" ϕ	18'	197 "	See detail (2'-3" lap)	" "
C1	6	160'-0"	⅝" ϕ	161 "	1018 "	Straight (2'-4") lap	Longitudinals " ℄ kerbs
D1	22	4'-0" c/c	⅝" ϕ	21 "	158 "	"	Ties in deck over cross girders & stringers
E1	80	7½"	⅝" ϕ	3 "	36 "	"	Spacers in kerbs
		Weight per span =			2811 "	12 58 tons	Weight for 2 spans = 25 16 tons

DERWENT RIVER BRIDGE
AT BRIDGEWATER
FLANKING SPANS: DETAILS OF EXP. JOINTS & DECK.

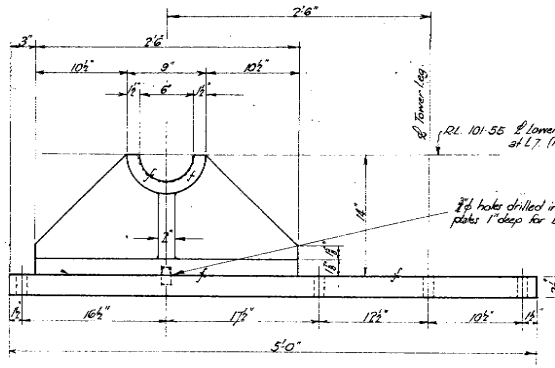
SCALES ½" = 1'-0"		PUBLIC WORKS DEPT. TAS.
	Des'd	15D4
	Drawn	
	Exam'd	
	Passed	-12
	Checked	

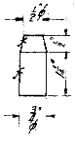


SIDE ELEVATION



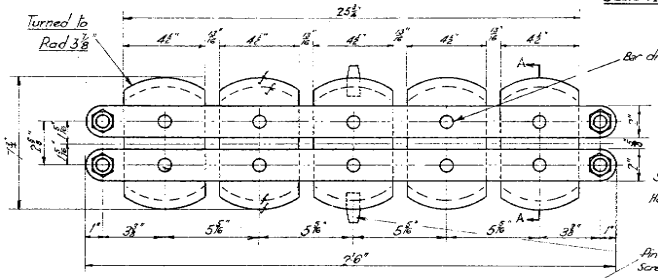
FRONT ELEVATION



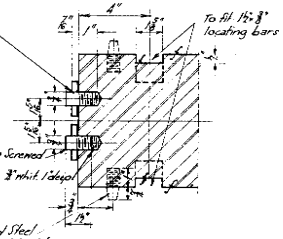


LOCATING PIN FIXED BEARING
2 per bearing
Half Full Size.

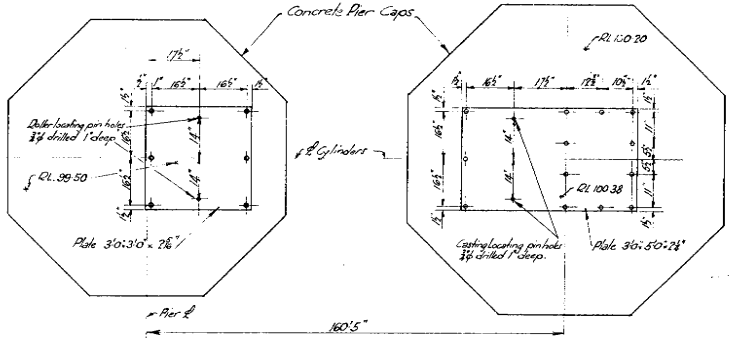
BEARING AT ROLLER END
Scale 1½"·1'



END ELEVATION

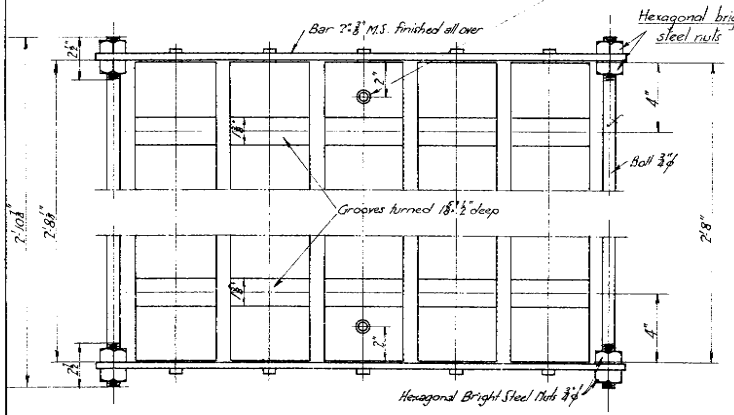


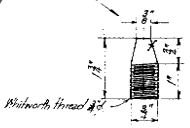
SECTION A-A



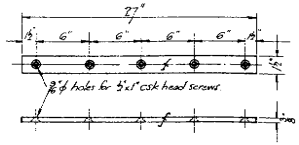
PIERS 9 AND 12

PIERS 10 AND 11





LOCATING PIN
4 Per centre roller
Half full size.



LOCATING BAR
4 required per roller set.
Scale 1½"·1'

DETAILS OF ROLLER SETS
Make 4 complete sets
Scale 3"·1'

BEARING PLATES ON PIERS
Scale ½"·1'

TABLE OF QUANTITIES

Item	Material	No off	Weight each	Total Weight	Remarks
Upper Pedestal.	Cast Steel	8	1689 lbs.	6·04 tons.	Finished where shewn
Rollers	Forged Steel	20	292·8 "	2·62 "	" " "
Roller Side Guide bars	Mild Steel	16	5·9 "	94·3 lbs.	Finished all over.
Guide bar end spacer with Bright Nuts	" "	16	5·22 "	83·58 "	" " "
Roller Guide bar Studs	" "	80	0·188 lbs.	15·05 lbs.	" " "
" Locating Pins	Hardened Steel	16	0·18 "	2·88 "	" " "
" Locating Bars with Screws	Mild Steel	16	4·3 "	68·8 "	" " "
Fixed Bearing Locating Pins	" "	8	0·194 "	1·55 "	" " "
6" dia Bearing Pins with Collars.	Rolled or Steel forged	8	236·7 "	0·844 tons	" " "
Base Plates Roller End.	Mild Steel.	4	842 "	1·504 "	Finished Top Surface
" " Fixed End.	" "	4	1368 "	2·44 "	" " "

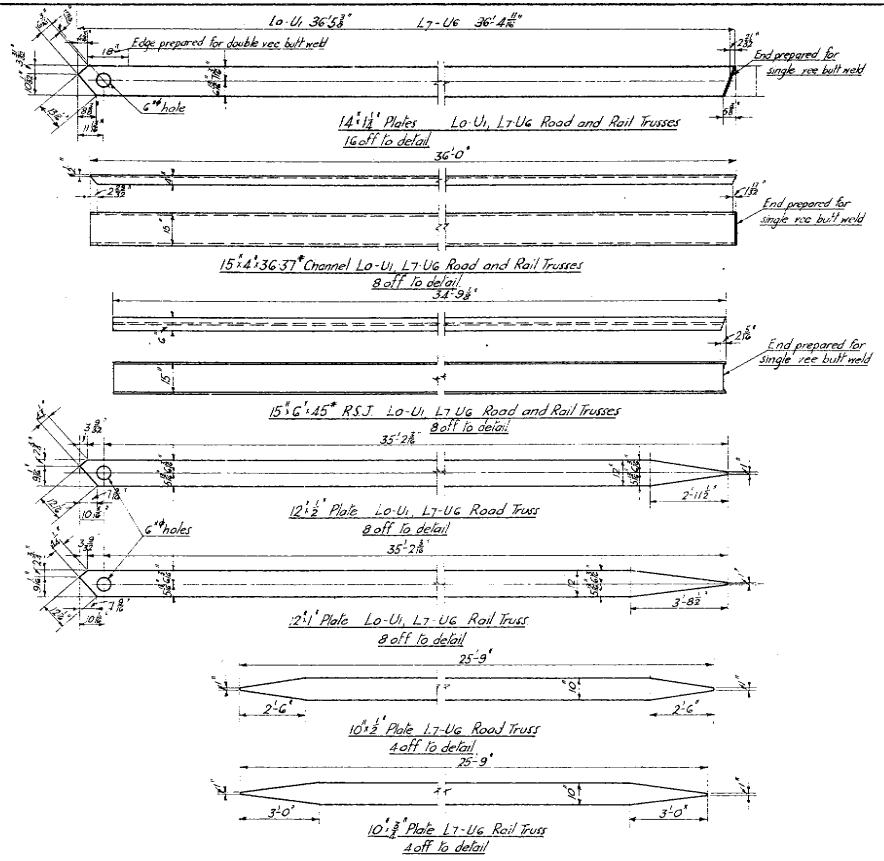
DEPARTMENT OF PUBLIC WORKS

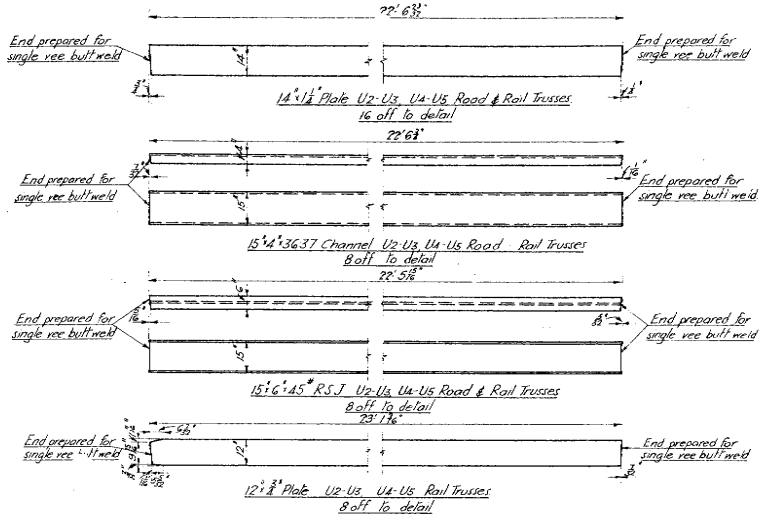
DERWENT RIVER BRIDGE
AT BRIDGEWATER
FLANKING SPAN:- TRUSS BEARINGS

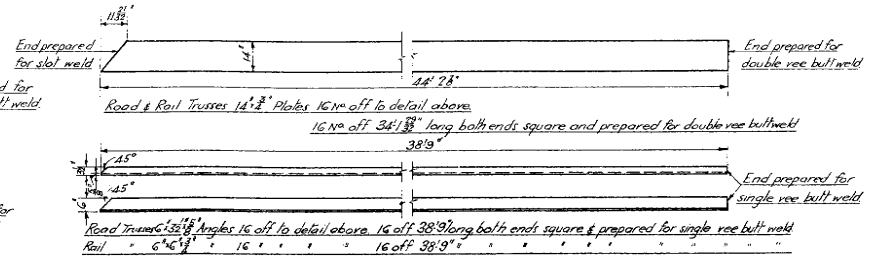
DESIGNED as shown	TRACED	CHECKED
W.D.W.		

15D4
-13

Authorised







NOTE. At splices in lower chord Angles are to be welded to plates by ½" fillet welds for a length of 12" each side of splice.

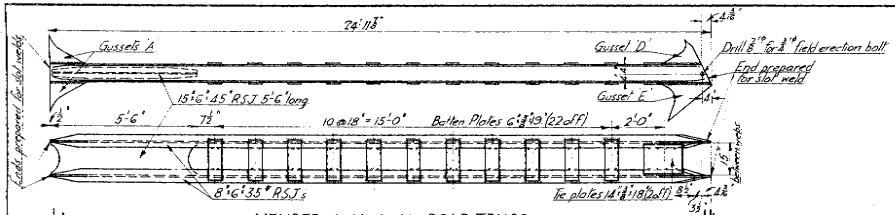
DEPARTMENT OF PUBLIC WORKS - TAS.

DERWENT RIVER BRIDGE

AT BRIDGEWATER

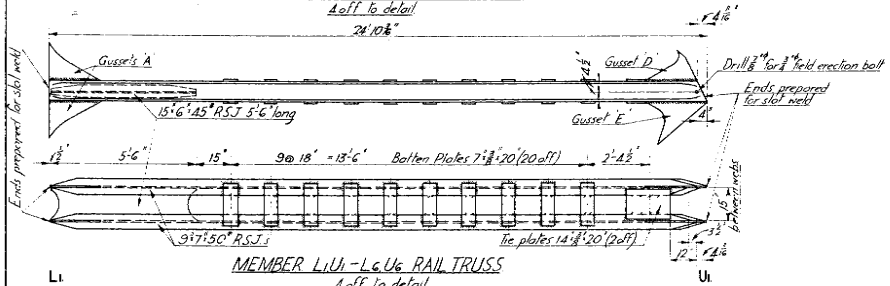
DETAILS OF MEMBERS, FLANKING SPAN TRUSSES

Scale ½" = 1'-0"	Prepared	Checked	15D4
Drawing			-14
Tracing		Date 14/3/58	
Design			
SUPERVISION		CHIEF ENGINEER	



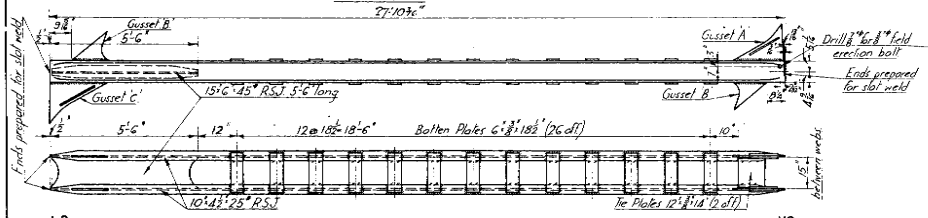
MEMBER L_1U_1-L_6U_6 ROAD TRUSS

4 off to detail



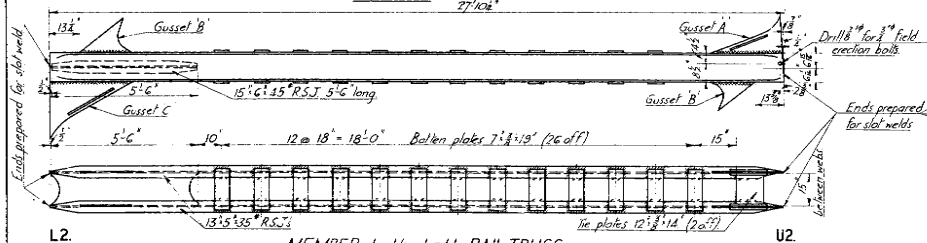
MEMBER L_1U_1-L_6U_6 RAIL TRUSS

4 off to detail



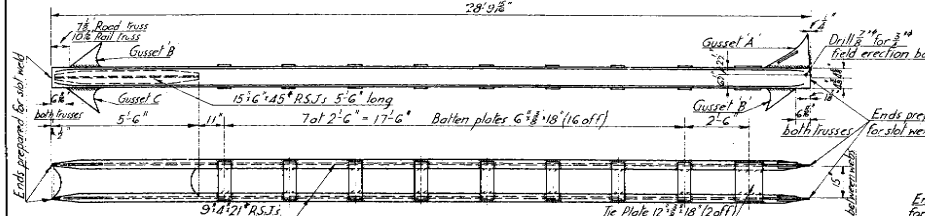
MEMBER L_2U_2-L_5U_5 ROAD TRUSS

4 off to detail



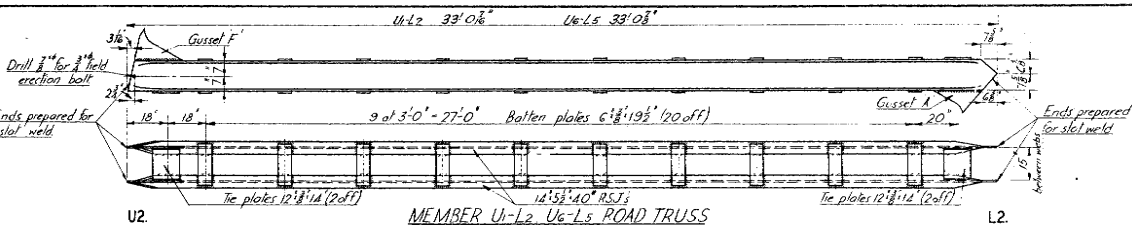
MEMBER L_2U_2-L_5U_5 RAIL TRUSS

4 off to detail



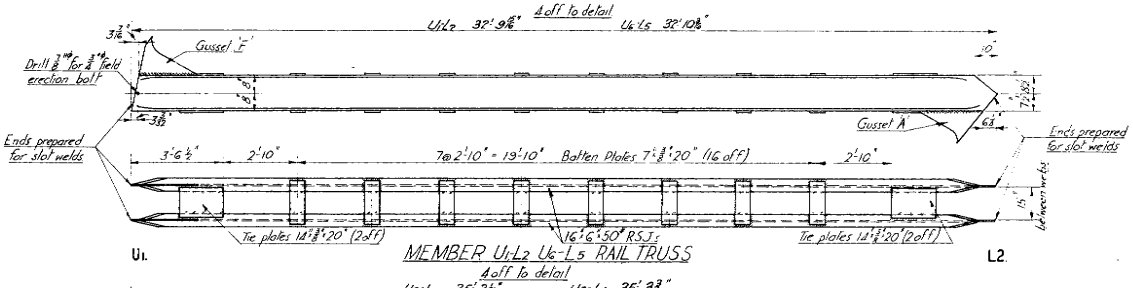
MEMBER L_3-U_3, L_4-U_4 ROAD & RAIL TRUSSES

8 off to detail



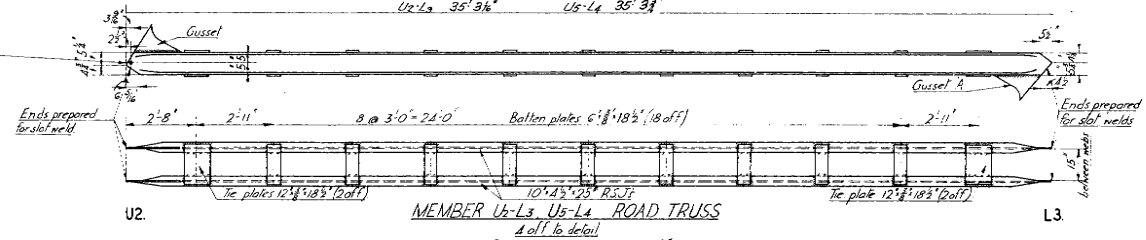
MEMBER U_1-L_2 U_6-L_5 ROAD TRUSS

4 off to detail



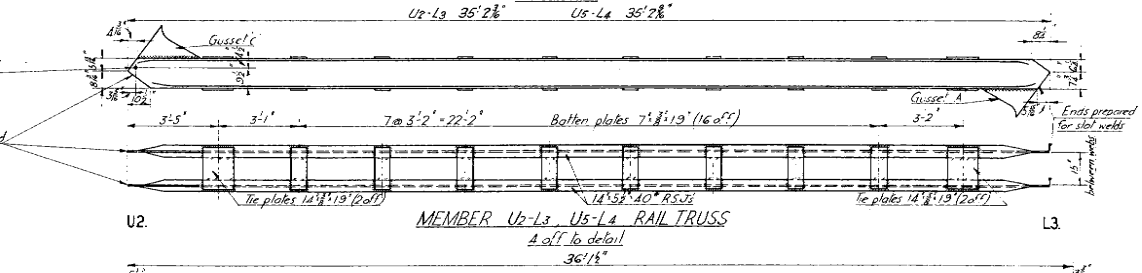
MEMBER U_1-L_2 U_6-L_5 RAIL TRUSS

4 off to detail



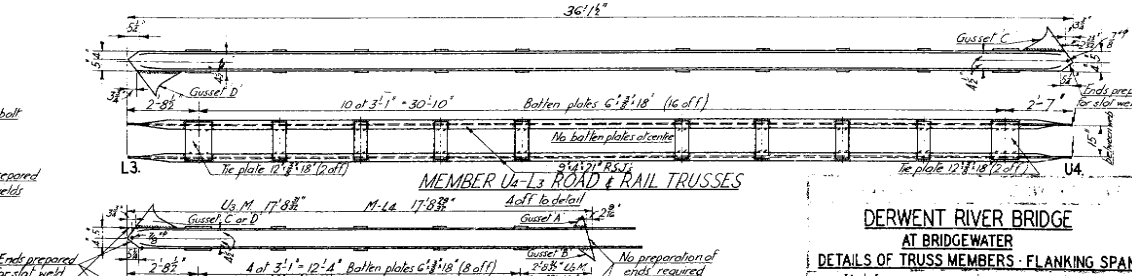
MEMBER U_2-L_3, U_5-L_4 ROAD TRUSS

4 off to detail

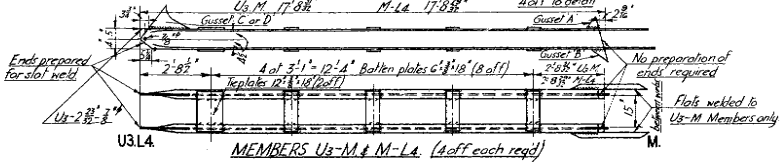


MEMBER U_2-L_3, U_5-L_4 RAIL TRUSS

4 off to detail



MEMBER U_4-L_3 ROAD & RAIL TRUSSES



MEMBERS U_3-M & M-L_4 (4 off each reqd)

DERWENT RIVER BRIDGE

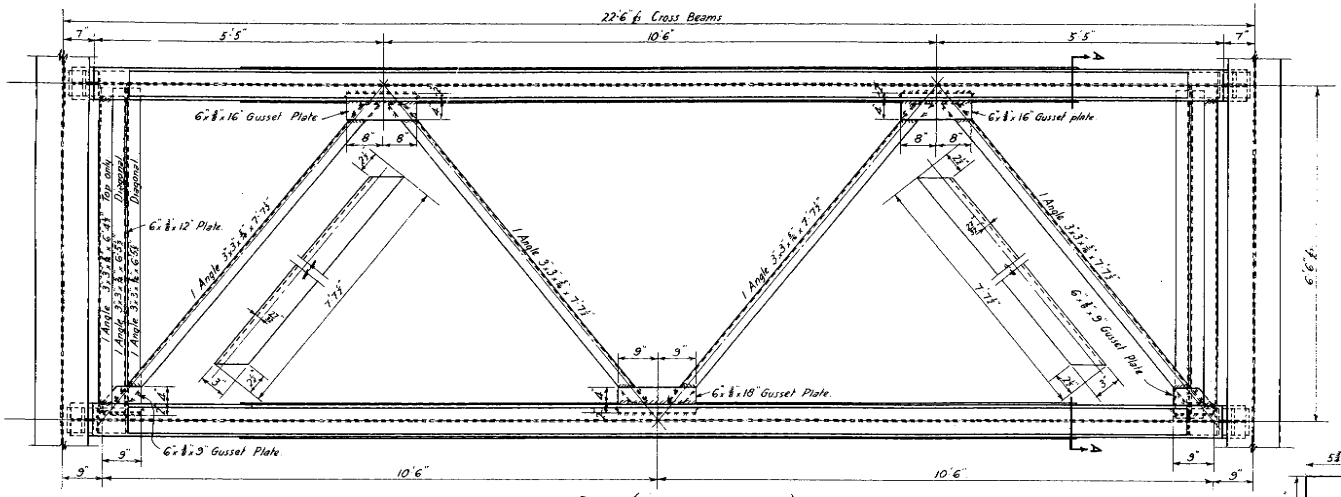
AT BRIDGEWATER

DETAILS OF TRUSS MEMBERS · FLANKING SPANS

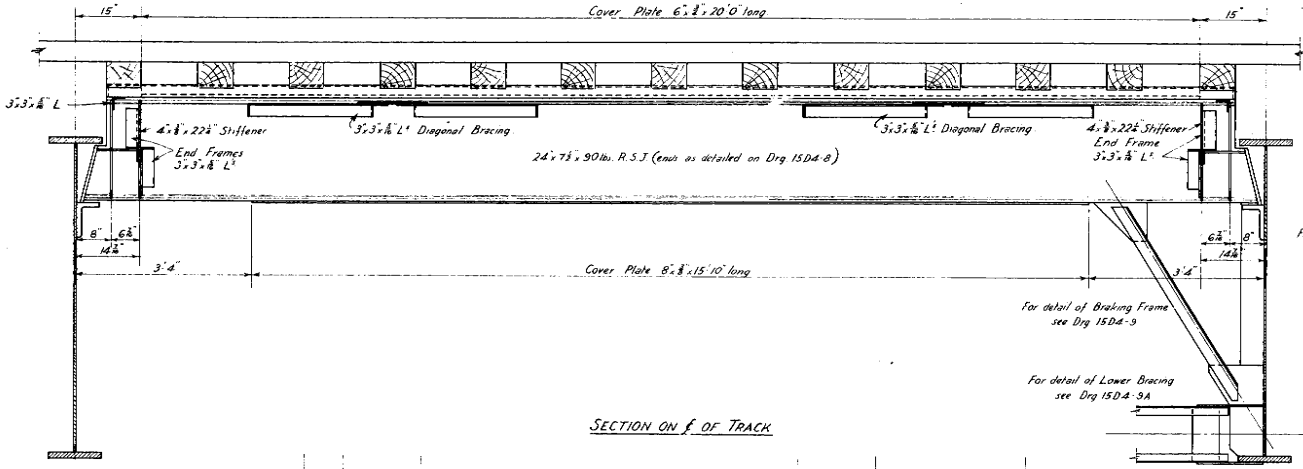
1'-1'-0"			15D4
		9/11/32	-15

DRAWN | CHECKED | DATE | DRAWING No.

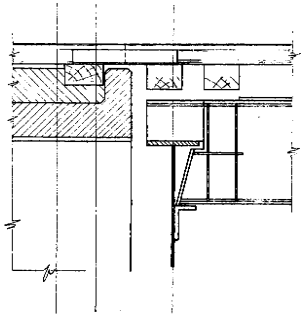
DEPUTY CHIEF ENGINEER



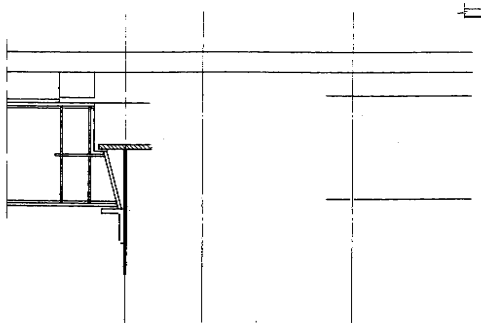
PLAN (RAILS & TIES OMITTED)



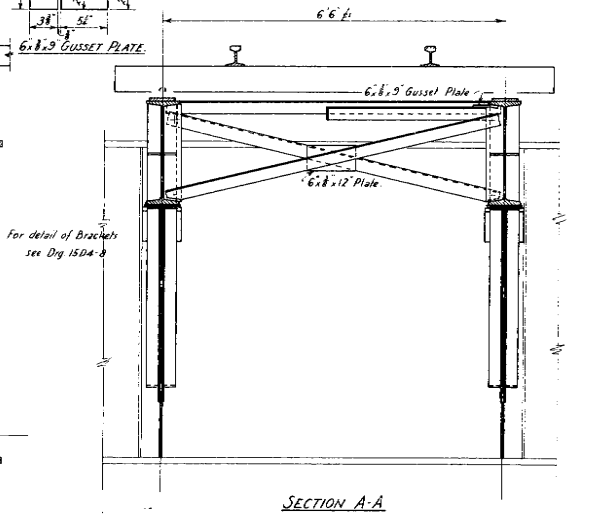
SECTION ON ℄ OF TRACK



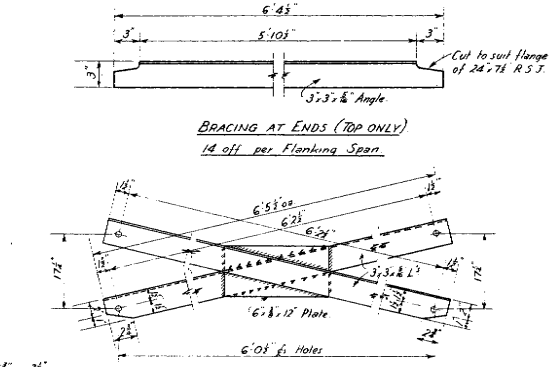
JOINT OVER PIERS Nos 9 & 12



JOINT OVER PIERS Nos 10 & 11

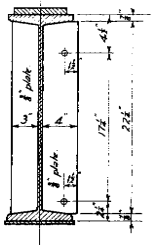


SECTION A-A



BRACING AT ENDS (TOP ONLY)
14 off per Flanking Span.

END FRAMES
14 off per Flanking Span.



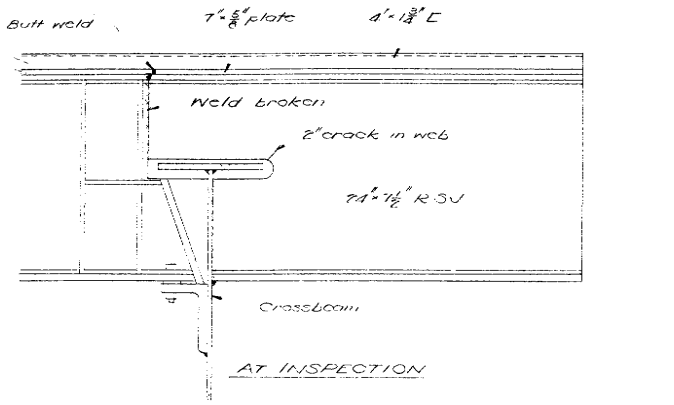
DETAIL OF STIFFENERS TO TAKE END FRAMES

DEPARTMENT OF PUBLIC WORKS. - TAS.

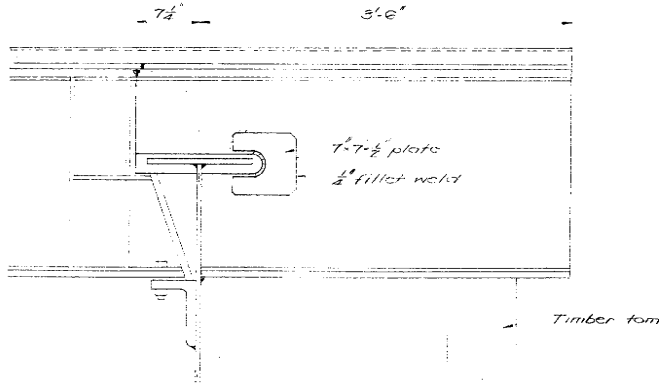
DERWENT RIVER BRIDGE
AT BRIDGEWATER
FLANKING SPANS - RAILWAY STRINGERS

Scales: ½"=1'-0"	Prepared	Checked	15D4
Drawing			-16
Tracing			
Design			
SUPERVISION			

CHIEF ENGINEER



AT INSPECTION

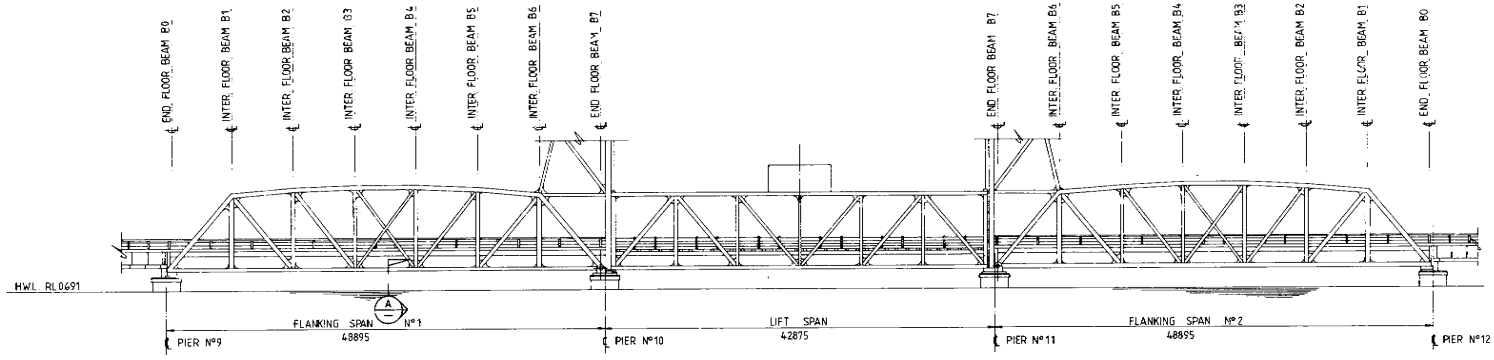


AFTER REPAIRS

15D4
-16A

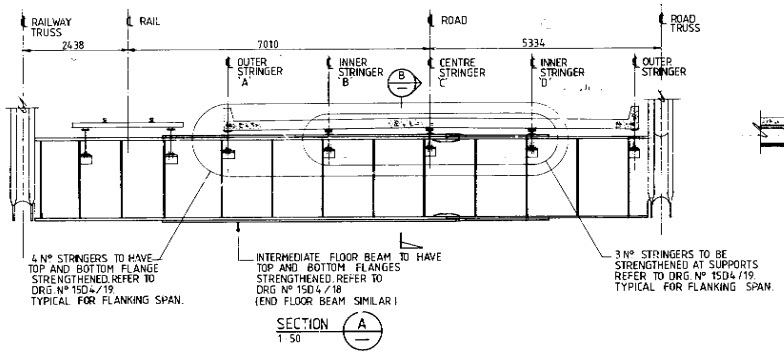
BRIDGEWATER BRIDGE
UPSTREAM STRINGER-NORTHERN FLANKING SPAN
Scale: 1½"=1'0"

DRG. NO. 1504/17

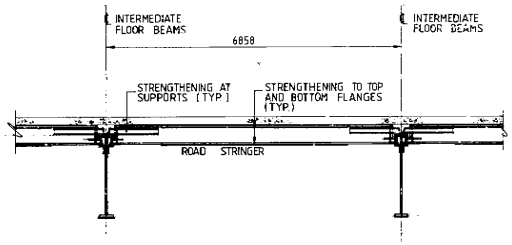


LIFTING AND FLANKING SPAN — GENERAL ARRANGEMENT
N.T.S.

DRAWING LIST	
DRG. N°.	TITLE
1504/17	EXTENT OF STRENGTHENING FOR FLANKING SPANS.
1504/18	FLOOR BEAMS: DETAILS OF STRENGTHENING
1504/19	STRINGERS: DETAILS OF STRENGTHENING.
1504/20	FLANKING SPAN UNLOADING OF FLOOR BEAMS
1504/21	FLANKING SPAN STRINGER UNLOADING FRAME



SECTION A
1:50



SECTION B
1:50

TYP. ROAD STRINGER ARRANGEMENT

GENERAL NOTES:

STRUCTURAL STEEL
1. ALL STRENGTHENING STEEL TO BE GRADE 250LO
2. ALL TEMPORARY WORKS STEEL TO BE GRADE 250

WELDING
1. ALL WELDING TO BE S.P. CATEGORY IN ACCORDANCE WITH AS1554, PART 1
2. ALL ELECTRODES FOR FILLET WELDS TO BE E48XX
3. ALL FULL PENETRATION BUTT WELDS TO DEVELOP THE FULL STRENGTH OF 250LO STEEL
4. ALL FILLET WELDS TO BE 6mm U.N.O.

DIMENSIONS
1. ALL KEY DIMENSIONS TO BE CHECKED ON SITE PRIOR TO STEEL FABRICATION COMMENCING

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS
MAUNSELL DRAWING No. 17687—1004

	AMENDMENTS	APPROVED	REFERENCE DRAWINGS	SCALE	CODING T44	DESIGN	DRAWN	SECTION MIDLAND HIGHWAY BRIDGEWATER
					PREPARED			RECOMMENDED ACCEPTED
					CHECKED			
					SUPERVISED			

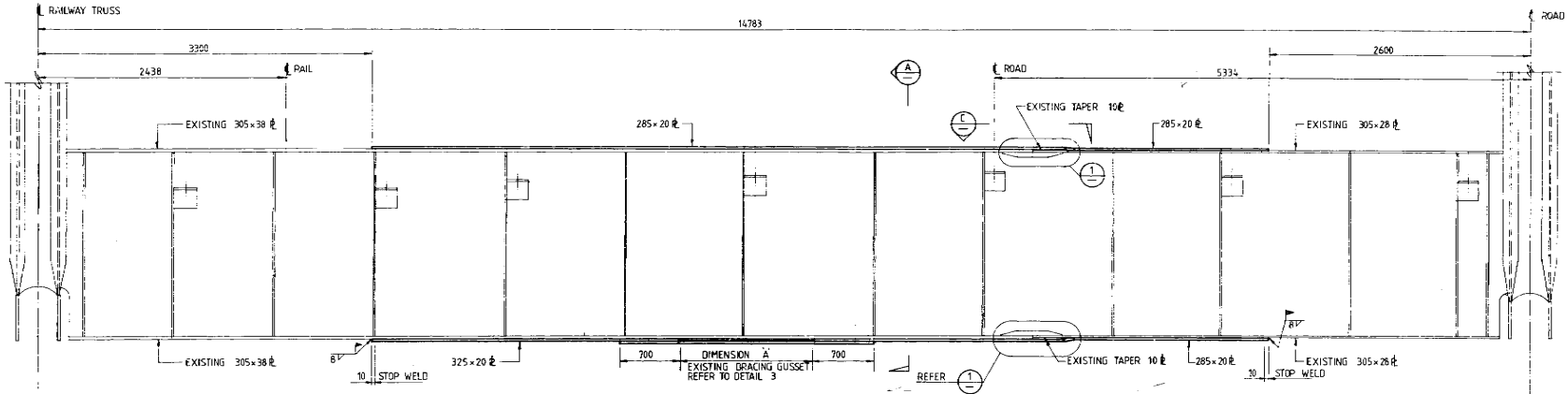
CONTRACT NUMBER

DEPARTMENT OF MAIN ROADS, TASMANIA

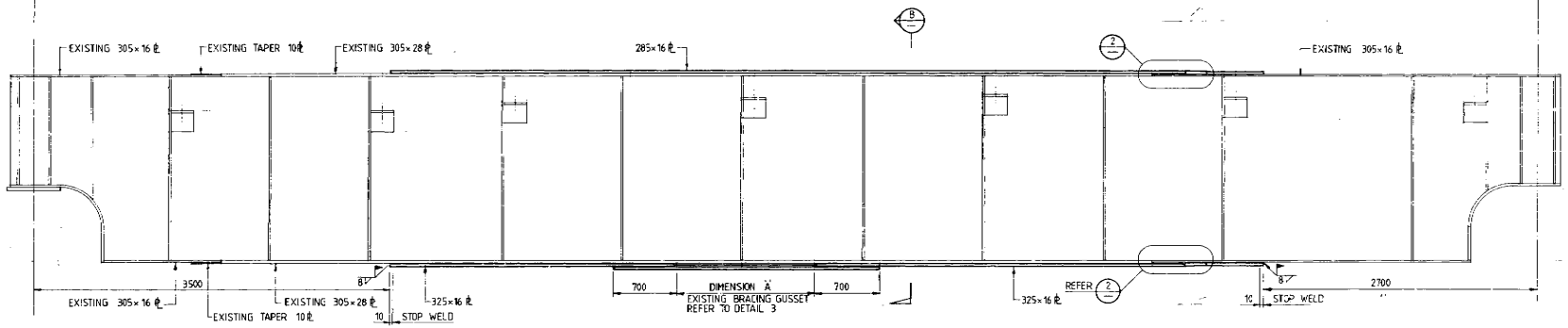
DERWENT RIVER BRIDGE
EXTENT OF STRENGTHENING FOR FLANKING SPANS

BRIDGE NUMBER 15
SHEET NUMBER 04-17

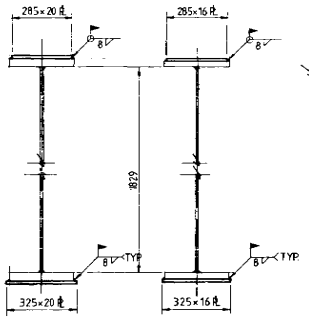
DRG. NO. 15D4/18



ELEVATION : FLANKING SPANS INTERMEDIATE FLOOR BEAM STRENGTHENING
1:20
(N°S B1 to B6)

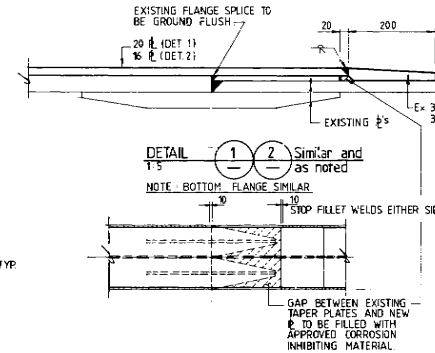


ELEVATION : FLANKING SPANS END FLOOR BEAM STRENGTHENING
1:20
(N°S B0 & B7)

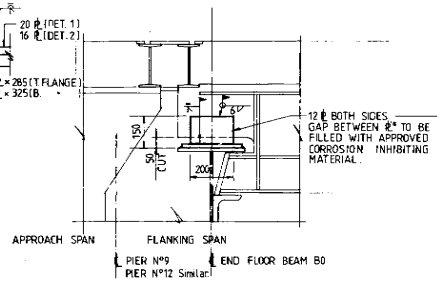


SECTION A
1:10

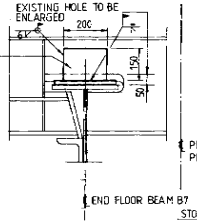
SECTION B
1:10



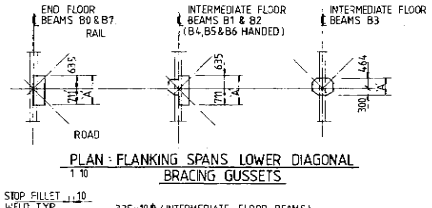
PLAN ON C
1:10



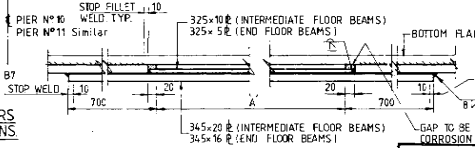
TREATMENT OF ROADWAY STRINGERS AT END FLOOR BEAM B0 LOCATIONS.
1:10



TREATMENT OF ROADWAY STRINGERS AT END FLOOR BEAM B7 LOCATIONS.
1:10



PLAN : FLANKING SPANS LOWER DIAGONAL BRACING GUSSETS
1:10



TREATMENT OF BOTTOM FLANGE BRACING GUSSET.

DETAIL 3
1:5

NOTES:
1. FOR GENERAL NOTES REFER TO DRG. 15D4/17

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS

MAUNSELL DRAWING No. 17687—1005

ISSUED	REFERENCE DRAWINGS	SCALES	DRAWING T44	DESIGN	DRAWN	LOCATION MIDLAND HIGHWAY BRIDGEWATER	CONTRACT NUMBER
			PREPARED			RECOMMENDED	ACCEPTED
			CHECKED				
			SUPERVISED				

DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE

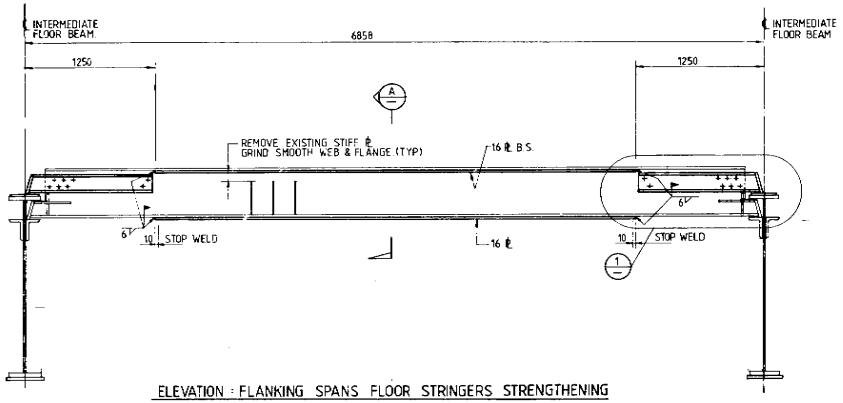
BRIDGE NUMBER 15

FLOOR BEAMS : DETAILS OF STRENGTHENING

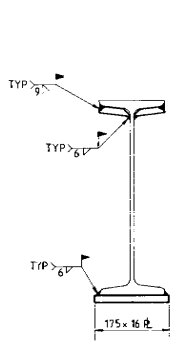
SHEET NUMBER D4-18

DATE	AMENDMENTS	APPROVED

DRG. NO. 1504/19

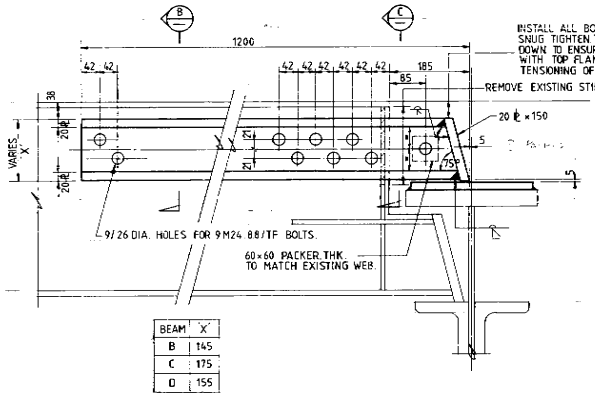


ELEVATION : FLANKING SPANS FLOOR STRINGERS STRENGTHENING
1:20



SECTION A
1:5

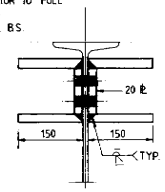
STRENGTHENING FOR STRINGERS A,B,C & D.
REFER DRG N° 1504/17



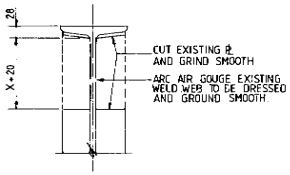
BEAM	X
B	145
C	175
D	155

DETAIL 1
1:5

STRENGTHENING FOR STRINGERS B,C & D APPLIES AT ALL INTERMEDIATE FLOOR BEAM LOCATIONS. REFER TO DRG N° 1504/17



SECTION B
1:5



SECTION C
1:5

REMOVAL OF EXISTING STIFFENER

NOTES:

1. FOR GENERAL NOTES REFER TO DRAWING N° 1504/17
2. ALL CONTACT SURFACES TO BE FASTENED WITH FRICTION GRIP BOLTS TO BE PREPARED AS DETAILED IN THE SPECIFICATION.

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS

MAUNSELL DRAWING No. 17687-1006

DATE	AMENDMENTS	APPROVED

REFERENCE DRAWINGS

SCALES

LOADING T44

	DESIGN	DRAWING
PREPARED		
CHECKED		
SUPERVISED		

LOCATION: MIDLAND HIGHWAY BRIDGEWATER

RECOMMENDED: Division Engineer Bridges

ACCEPTED: Assistant Director

CONTRACT NUMBER

DEPARTMENT OF MAIN ROADS, TASMANIA

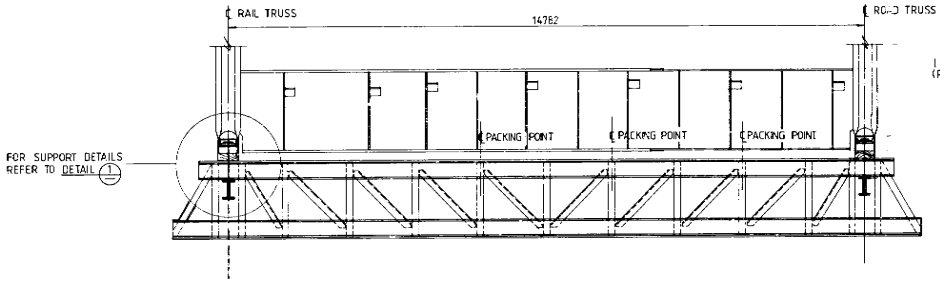
DERWENT RIVER BRIDGE

STRINGERS : DETAILS OF STRENGTHENING

BRIDGE NUMBER 15

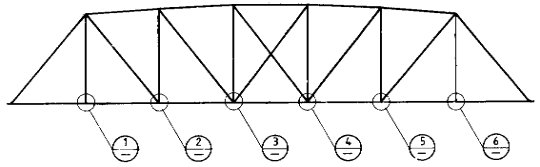
SHEET NUMBER D4-19

DRG. NO. 1504/20

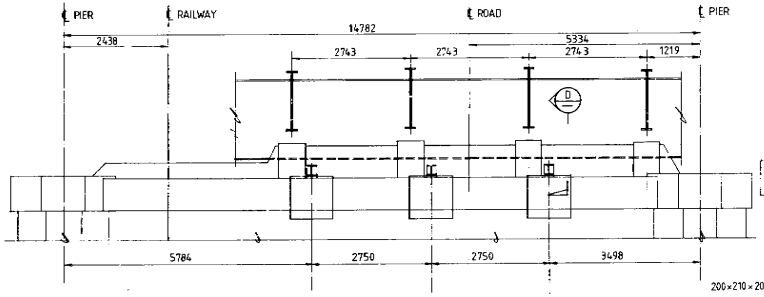


TYPICAL ELEVATION UNLOADING FRAME
INTERMEDIATE FLOOR BEAMS (FLANKING SPANS)

NOTE: FOR DETAILS OF FRAME REFER TO DRG.N° 1503/16
FOR DETAILS OF FLOOR BEAMS REFER TO DRG.N° 1504/18

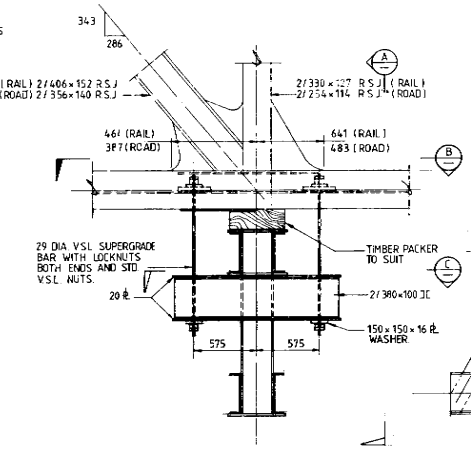


ELEVATION FLANKING SPAN RAIL TRUSS (ROAD SIMILAR)

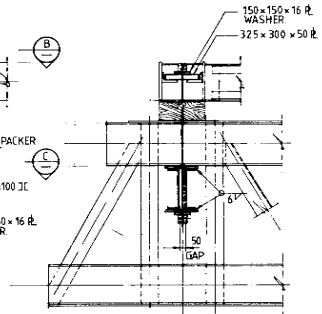


ELEVATION UNLOADING FRAME
END FLOOR BEAM PIER N°9 (FLANKING SPAN)

NOTE: FOR DETAILS OF FLOOR BEAMS REFER TO DRG N° 1504/18.
ARRANGEMENT AT PIERS 10 11 & 12 SIMILAR.

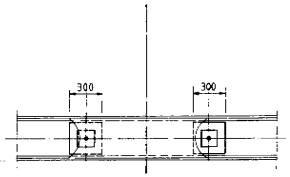


DETAIL 2 5 Similar



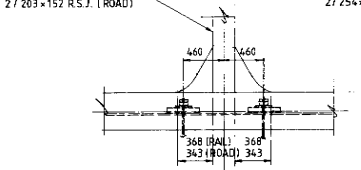
SECTION A

NOTE: DRILL HOLES THROUGH BRACING GUSSET PLATES FOR 29 DIA. VSL BAR AS REQUIRED AND AS DIRECTED BY THE SUPERINTENDENT.



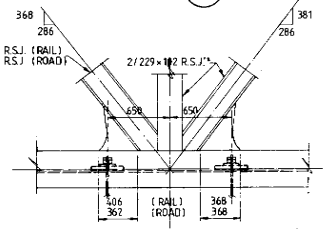
SECTION B

NOTE: VERTICAL MEMBERS NOT SHOWN.



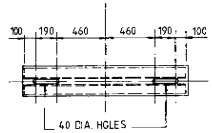
FOR ALL DETAILS REFER DETAIL 2 UNO.

DETAIL 1 6 Similar

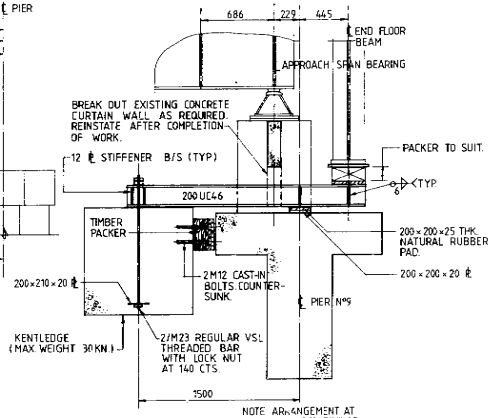


FOR ALL DETAILS REFER DETAIL 2 UNO.

DETAIL 3 4 Similar



SECTION C



NOTE ARRANGEMENT AT PIERS 10 11 & 12 SIMILAR

SECTION D

NOTE RUBBER PADS TO HAVE A MAX. COMPRESSIVE STIFFNESS OF 400 KN/mm/metre length.

NOTES.

GENERAL

1. FOR GENERAL NOTES REFER TO DRAWING N°1504/17
2. JACKS SHALL BE SYNCHRONISED TO ENSURE EQUAL LOADING DURING JACKING OPERATIONS BY HYDRAULIC LINKING OR OTHER APPROVED METHODS.
3. ALL JACKS AND PACKS ARE TO BE PLACED CENTRALLY BELOW ℄ GIRDER WEBS.
4. METHODS OF PACKING AND LOCATION OF JACKING POINTS SHALL BE TO THE APPROVAL OF THE SUPERINTENDENT.
5. MINIMUM BEARING AREA OF JACKS AND PACKS SHALL BE 250mm × 250mm.

INTERMEDIATE FLOOR BEAMS

1. JACKS SHALL BE LOCATED BETWEEN THE PACKING POINT AND THE CLOSEST TRANSVERSE WEB STIFFENER OF THE EXISTING PLATE GIRDER
2. THE MAXIMUM ECCENTRICITY OF JACKS FROM THE ℄ OF THE PACKING POINT SHALL BE 200mm.
3. MINIMUM JACK CAPACITY 656 KN.
4. LOADS PER JACK PRIOR TO PACKING TO BE 200 KN.
5. VSL STRESSING BARS TO BE TENSIONED TO 300 KN PRIOR TO JACKING OPERATION.

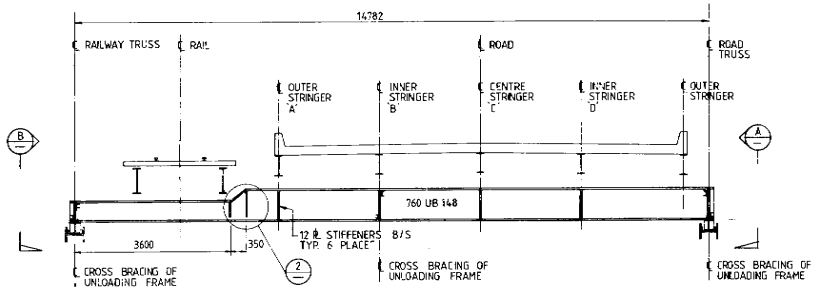
Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS

MAUNSELL DRAWING No. 17687—1007

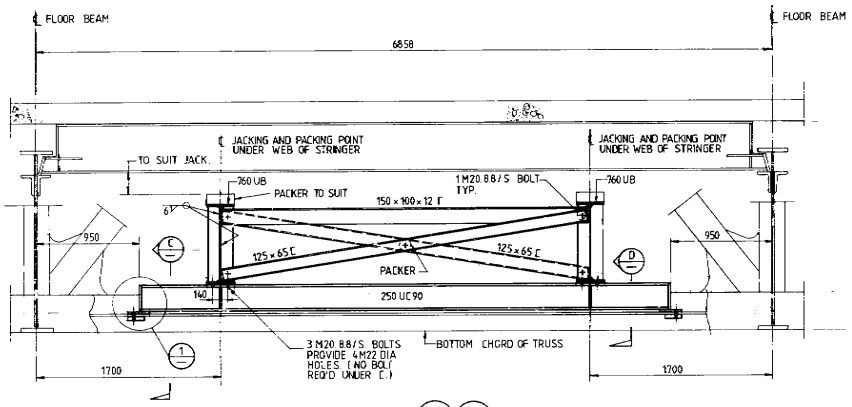
DATE	AMENDMENTS	APPROVED	REFERENCE DRAWINGS	SCALES	DRAWING T44	DESIGN	DRAWING	DEPARTMENT OF MAIN ROADS, TASMANIA
					PREPARED			DERWENT RIVER BRIDGE — BRIDGE NUMBER 15
					CHECKED		BH	FLANKING SPAN UNLOADING OF FLOOR BEAMS. — SHEET NUMBER D4-20
					SUPERVISED			

DRAWING: MIDLAND HIGHWAY BRIDGEWATER
RECOMMENDED: DIVISION ENGINEER BRIDGES
ACCEPTED: ASSISTANT DIRECTOR
CONTRACT NUMBER

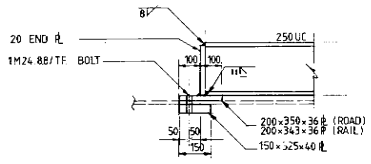
DRG. NO. 1504/21



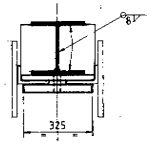
TYPICAL ELEVATION : FLANKING SPAN STRINGER UNLOADING FRAME
1:50 ROAD/RAIL TRUSS DETAILS OMITTED FOR CLARITY.



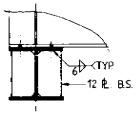
ELEVATION A B Similar
1:20



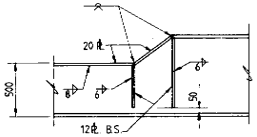
DETAIL 1
1:10



SECTION C
1:10



SECTION D
1:10
(SHOWING STIFFENER ONLY)



DETAIL 2
1:20

NOTES:

1. FOR GENERAL NOTES REFER TO DRAWING N° 1504/17.
2. MINIMUM JACK CAPACITY SHALL BE 100 KN.
3. JACKS SHALL BE SYNCHRONISED TO ENSURE EQUAL LOADING DURING JACKING OPERATIONS BY HYDRAULIC LINKING OR OTHER APPROVED METHOD.
4. LOAD PER JACK PRIOR TO PACKING SHALL BE AS FOLLOWS. STRINGER 'A' — 25 KN. STRINGER 'B','C' & 'D' — 43 KN.
5. METHOD OF PACKING AT STRINGER PACKING LOCATIONS AND LOCATIONS OF JACKING POINTS SHALL BE TO THE APPROVAL OF THE SUPERINTENDENT.
6. ONLY ONE STRINGER TO BE SUPPORTED ON UNLOADING FRAME AT ANY TIME.
7. MINIMUM BEARING AREA OF JACKS AND PACKS ON BOTTOM FLANGE FLANGE OF STRINGER 150 mm x 150 mm.

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS
MAUNSELL DRAWING No. 17687 – 1008

DATE	AMENDMENTS	APPROVED

REFERENCE DRAWINGS

SCALES

DATUM T44

	DESIGN	DRAWING
PREPARED	K.P. Davies & R. Rowell	
CHECKED	Ken Holland	
SUPERVISED		

LOCATION: MIDLAND HIGHWAY BRIDGEWATER

RECOMMENDED: for DIVISION ENGINEER BRIDGES

ACCEPTED: for ASSISTANT DIRECTOR

CONTRACT NUMBER

DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE

FLANKING SPAN STRINGER UNLOADING FRAME

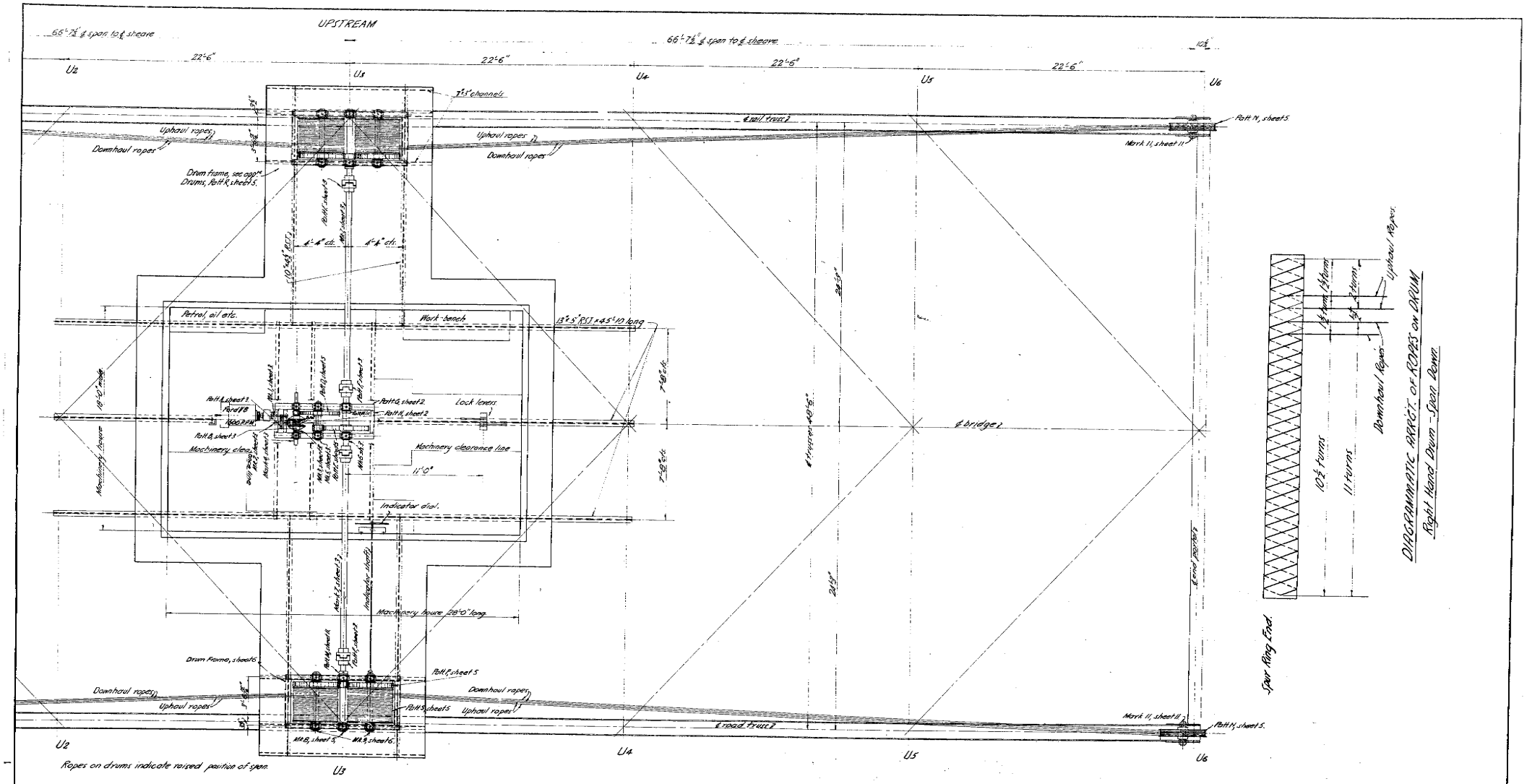
BRIDGE NUMBER 15

SHEET NUMBER D4-21

BRIDGEWATER BRIDGE

D6 - LIFT SPAN MACHINERY

TABLE OF CONTENTS

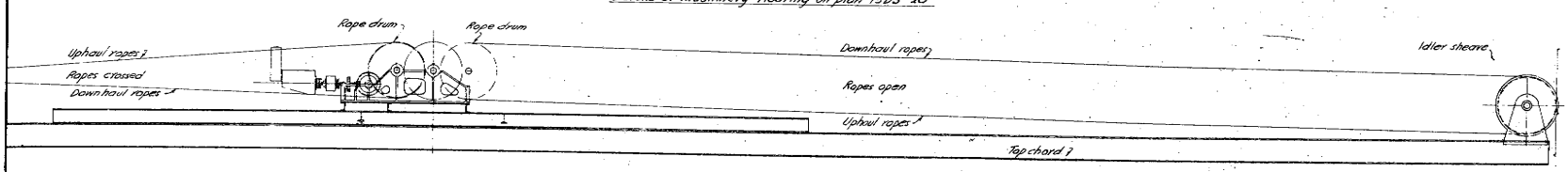


Ropes on drums indicate raised position of span.

DOWNSTREAM

PLAN

Details of machinery flooring on plan 15D5-20



SECTNL. ELEV.

DEPARTMENT OF PUBLIC WORKS TAS.

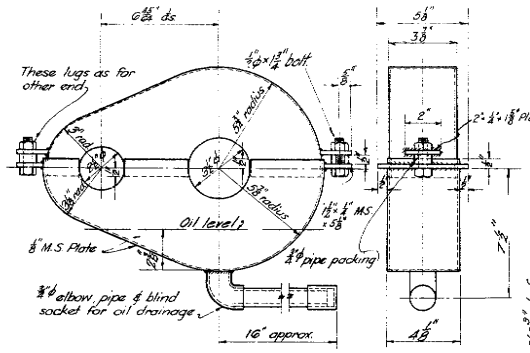
DERWENT RIVER BRIDGE AT BRIDGEWATER

LIFT SPAN MACHINERY

GENERAL ARRANGEMENT

	Prepared	Checked	
Scale ⅛"=1ft.			15D6
Drawing	[illegible] 4/4/61	[illegible] 4/4/61	—1
Tracing			
Design			
Supervision			Chief Engineer

6-8-61



PETROL MOTOR REQ'd GEAR CASING & SUMP

Make 1 Mark 10

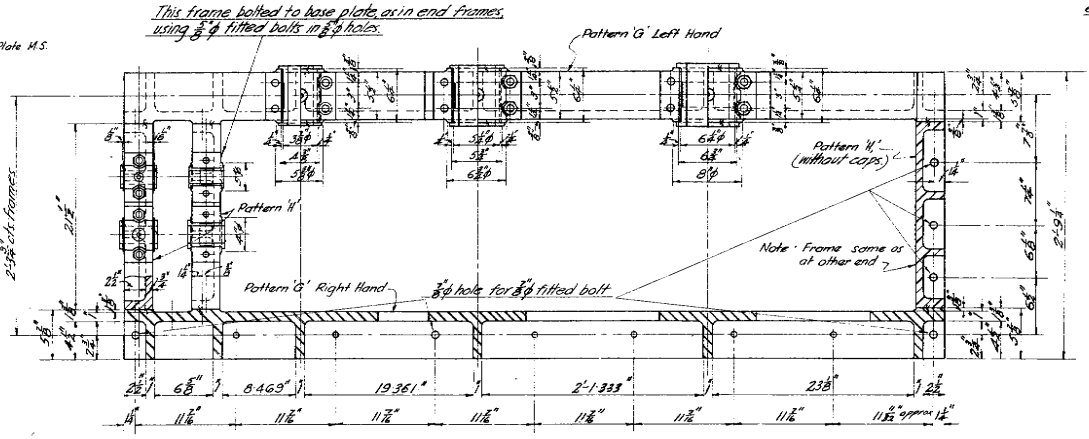
Weight 19 lbs.

Material M.S plate, to conform to S.A.R. N°A1-1931

WEIGHTS - C.S.

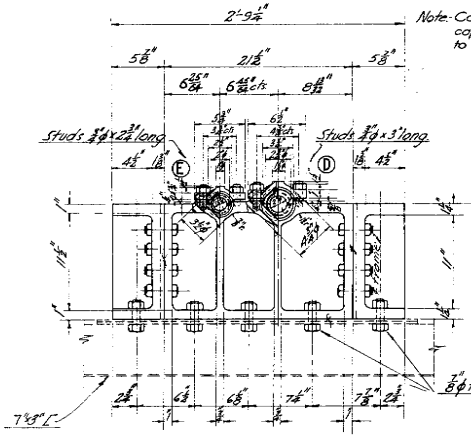
Cap 'a'	2 off each	29# ea.
Cap 'b'		26# "
Cap 'C'		16# "
Cap 'D'		8# "
Cap 'E'		6# "
Pattern 'H'	3 off	170# "
Pattern 'G'	1 Rt & 1 Lft	900# "
Total Wt. C.S.		2480# = 22.14 cwts.

Material Cast steel, to conform to R.S.S. N°827-1931, Grade 1

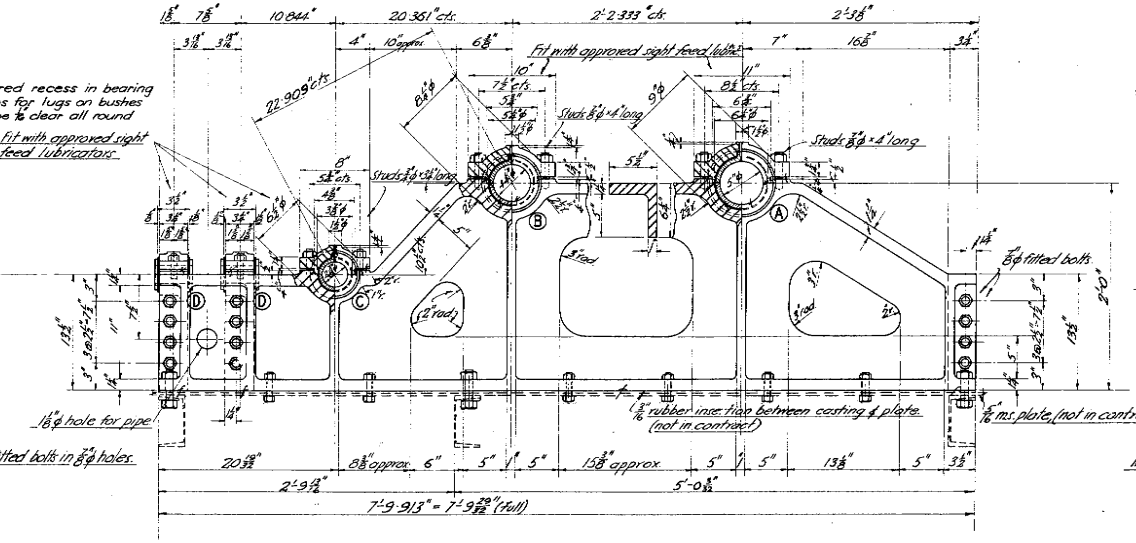


Note. All holes, not otherwise marked, in base flange are ⅞" ϕ for ⅞" ϕ fitted bolts.

PLAN



END ELEVATION



SIDE ELEVATION

Machining Allowances & Tolerances.

To conform to Newall Standard, Class A for holes & Class Y for shafts.

Base Bolt List (Fitted Bolts)

Dia.	Length	No.	Remarks
⅞"	3½"	12	With 12 tapered washers.
⅞"	2¾"	15	

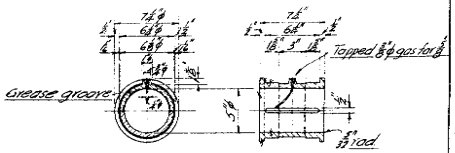
All bolt seatings on castings to be spot faced.

Machined surfaces denoted by 'f'.

Fillets, except where otherwise shown, are ⅜" rad.

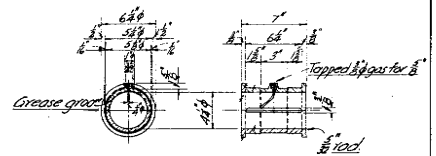
Quantities.

Part	Part.	Make
Side frame	6	1 left & 1 right
Cross frames	H.	3 (one without caps)



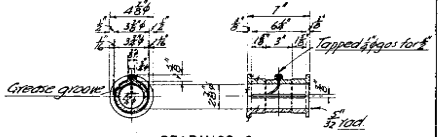
BEARINGS A

Make 2 off Weight 12⅝ lbs. ea.



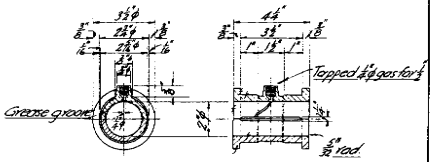
BEARINGS B

Make 2 off Weight 16¾ lbs. ea.



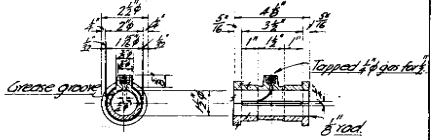
BEARINGS C

Make 2 off Weight 12¾ lbs. ea.



BEARINGS D

Make 2 off Weight 4¾ lbs. ea.



BEARINGS E

Make 2 off Weight 3 lbs. ea.

DETAILS OF BUSHES - PHOS. BRONZE

Total Weight Phos. Br. 124 lbs

Material Phos Br to conform to Sect'n 2, clause 'e' of Spec.

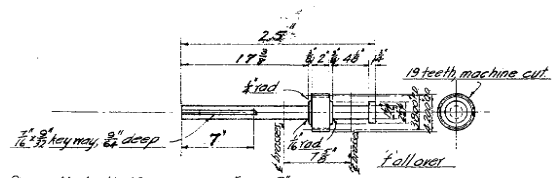
DEPARTMENT OF PUBLIC WORKS - TAS.

DERWENT RIVER BRIDGE AT BRIDGEWATER

LIFT SPAN MACHINERY

DETAILS OF MAIN GEAR FRAME (1)

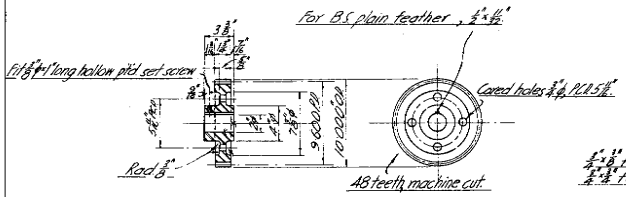
Scale 1½ 3/4	Prepared	Checked	15 D6
Drawing	[illegible] 6.41		-2
Tracing		11/7/41	
Design			
Supervision		Chief Engineer	



Pinion. No teeth 19 — Face 2"
D.P. 5 — Form 20° involute
P.D. 3·800" — Material. Forged steel, to conform to
Out. dia. 4·200" — A.S.S. N°B63-1938, Class M. Pinion teeth surface-
Root dia 3·337" — hardened to Brinell 514 (case)

PINION AND SHAFT. F.S.

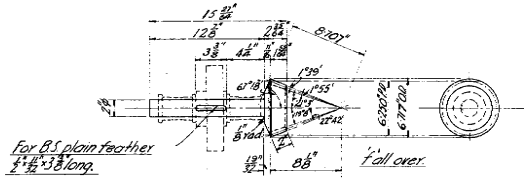
Make 1 — Mark 1
Weight (machined) 19 lbs.
(Petrol Motor Shaft Extension & Pinion)



No. teeth 48 — Face 1 3/4"
D.P. 5 — Form 20° involute
P.D. 9·600" — Material. Cast steel, to conform to
Out dia 10·000" — A.S.S. N°B27-1931, Grade 3. Gear teeth surface-
Root dia. 9·137" — hardened to Brinell 514 (case).

GEARWHEEL C.S.

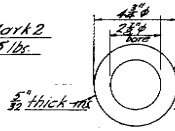
Make 1 — Patt A
Weight (Machined blank) 32·1 lbs.
(Petrol Motor Drive Reduction Gear)



Pinion. No teeth 25 — Face 2" — Back angle 67°18'
D.P. 4 — Pitch angle 21°3' — Form 20° involute
P.D. 6·250" — Addendum angle 1°39' — Material. Forged steel, to conform
Out dia. 6·717" — Dedendum angle 1°55' — to A.S.S. N°B63-1938 Class M. Pinion teeth
Cone. dist. 8·707 — Cone turning angle 22°42' — surface-hardened to Brinell 514 (case)

BEVEL PINION AND SHAFT. F.S.

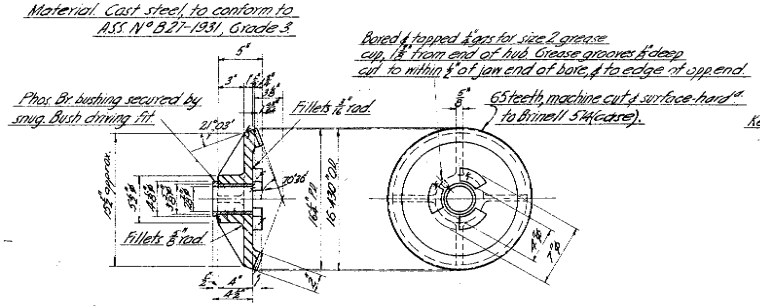
Make 1 — Mark 2
Weight (machined blank) 34·5 lbs.
(Drive from Petrol Motor)



5/32" thick MS. — Mat. A.S.S. No B1-1931

DISTANCE PIECE COLLAR M.S.
Make 1 — Mark 3

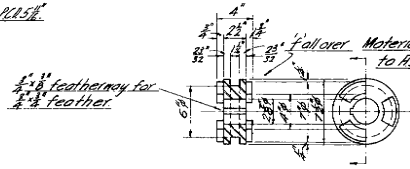
Material. Cast steel, to conform to A.S.S. N°B27-1931, Grade 3.



No. teeth 65 — Out dia 16·430" — Pitch angle 68°57' — Cone turning angle 70°36'
D.P. 4 — Cone dist 8·707" — Addendum angle 1°39' — Back angle 21°03'
P.D. 16·250" — Face 2" — Dedendum angle 1°55' — Form 20° involute

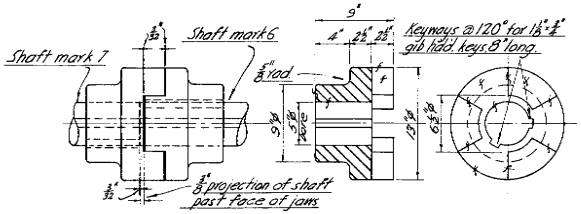
BEVEL WHEEL C.S.

Make 2 — Patt B
Weight (machined) 80·5 lbs. ea. C.S.
" 5·6 lbs. ea. Mk. Br.



DOG CLUTCH C.S.

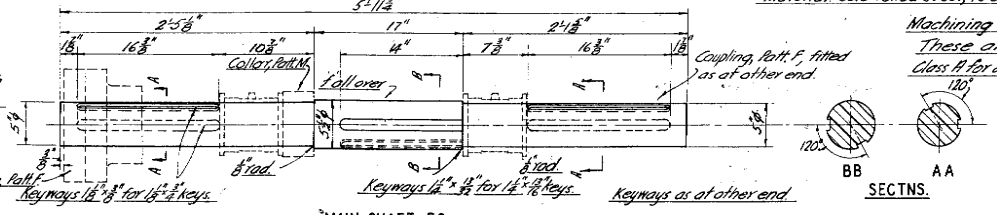
Make 1 — Patt C
Weight (machined) 27·3 lbs.
(To suit Electric Motor Drive Shaft)



Material. Cast steel, to conform to A.S.S. N°B27-1931, Grade 2.

CLAW COUPLING C.S.

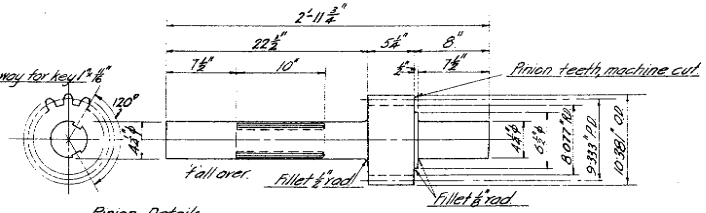
Make 4 — Patt F
Weight (machined) 32·6 lbs. each pair
(Connecting between Main Gear Frame & Drum Frames)



MAIN SHAFT F.S.

Make 1 — Mark 6
Weight (machined) 437 lbs.
(Lost gear reduction, Main Frame)

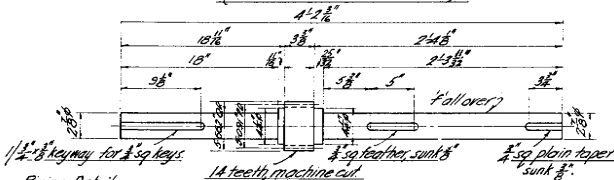
Material. Forged steel, to conform to A.S.S. N°B63-1938, Class L.



Pinion Details
No. teeth 14 — Root dia. 8·077" — Width face 5 1/4"
D.P. 1 1/2 — Whole depth 1·152" — Form 20° involute stub teeth (Nuttall)
P.D. 9·333" — Addendum 576" — Material. Forged steel to conform
O.D. 10·381" — Dedendum 628" — to A.S.S. No B63-1938, Class M. Pinion
teeth surface-hardened, Br 514 (case).

INTERMEDIATE PINION AND SHAFT. F.S.

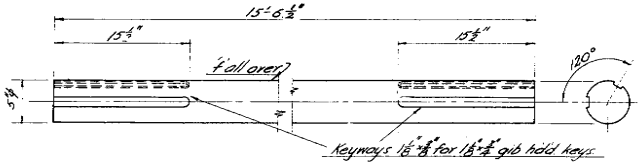
Make 1 — Mark 5
Weight (machined) 232 lbs.
(Main Gear Reduction Frame)



Pinion Details.
No. teeth 14 — O.D. 5·662" — Addendum 285" — Form 20° involute stub teeth (Nuttall)
D.P. 2 1/2 — Root dia. 4·406" — Dedendum 343" — Material. Forged steel, to conform to
P.D. 5·091. — Whole depth 628". — Width of face 3 5/8" — A.S.S. N°B63-1938 Class M. Pinion teeth
surface-hard^d to Brinell 514 (case)

DRIVE SHAFT AND PINION. F.S.

Make 1 — Mark 4
Weight (machined) 97·5 lbs.
(Coupled to Electric Motors)

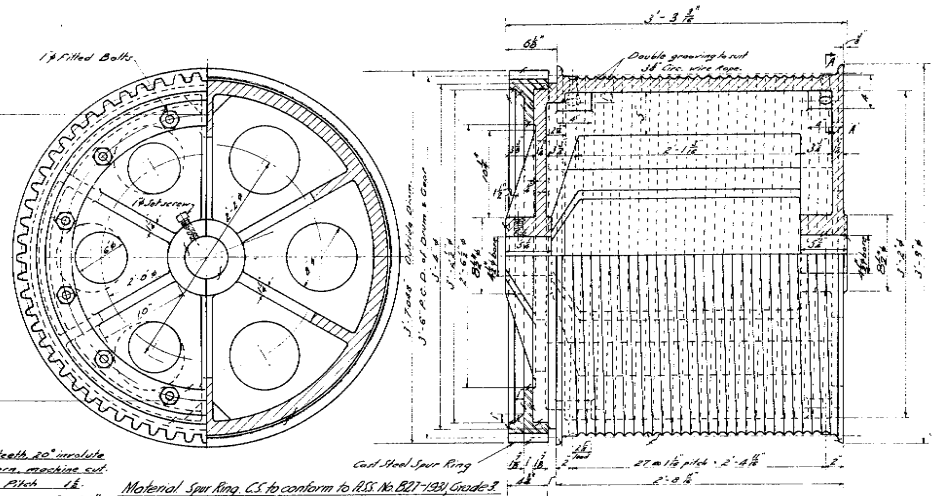


MAIN SHAFT EXTENSION C.R.S.

Make 2 — Mark 7
Weight 1035 lbs. ea.
(Drive connection between Main Gear Frame & Drum Frames)
Material. Cold rolled steel, to conform with A.S.S. N°A1-1931.

Machining Allowances and Tolerances.
These are to conform to the Newall Standard.
Class A for all holes; Class P for keyed shafts; Class Y for journals.

DEPARTMENT OF PUBLIC WORKS - TAS.			
DERWENT RIVER BRIDGE AT BRIDGEWATER			
LIFT SPAN MACHINERY			
DETAILS OF SHAFTS AND GEARS.			
Scale 1/2" = 1ft.	Prepared	Checked	15D6 -3
Drawing	[illegible] 30/6/41	[illegible] 4/10/41	
Tracing			
Design			
Supervision			Chief Engineer 4.10.41



Material Spur Ring C.S. to conform to A.S.S. No. B27-1931 Grade 3
Winding Drum C.I. to conform to A.S.S. No. B26-1931, Grade A.

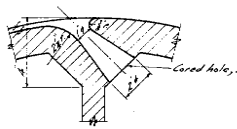
Nuttall Stub teeth, 20° involute pattern, machine cut.
Diam. Pitch 1½
Circ. " 2·094"
Addendum 0·524"
Whole depth 1·152"
N° of teeth 63
Dedendum ·628"
Root dia. 3'-4·744"

SPUR RING C.S.

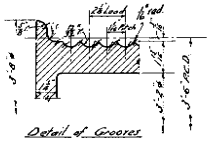
Make 4 Patt P.
Weight 430·0 lbs. each.

WINDING DRUM C.I.

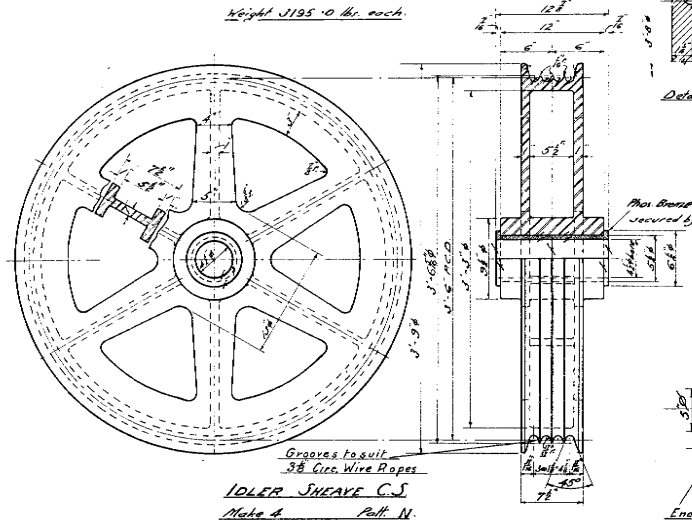
Make 2 grooves right hand Patt R.
Make 2 " left " Patt S.
Weight 3195·0 lbs. each.



Detail of Rope Attachment A.A.
3" = 1 ft.



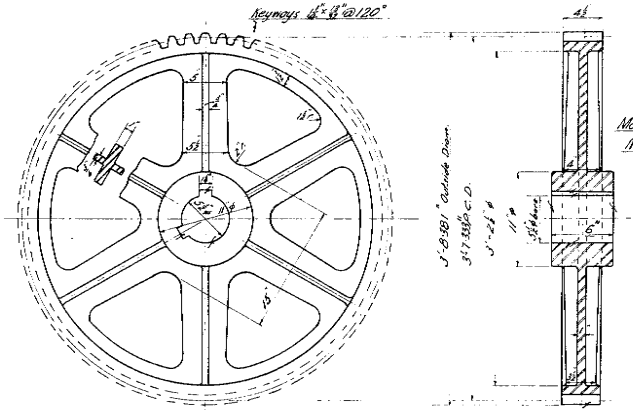
Detail of Grooves
3" = 1 ft.



IDLER SHEAVE C.S.

Make 4 Patt N.
Weight 1140·0 lbs. each.

Material C.S. to conform to A.S.S. No. B27-1931, Grade 2.

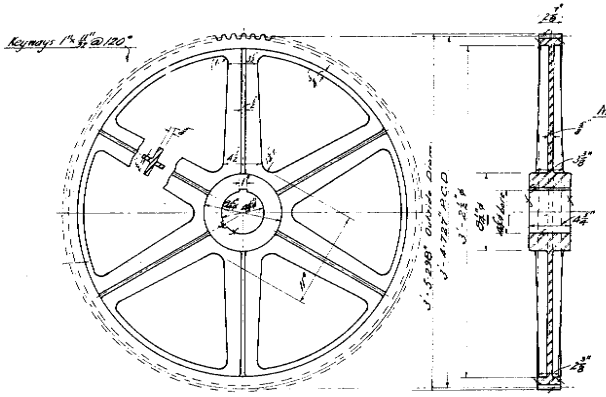


Material C.S. to conform to A.S.S. No. B27-1931, Grade 3.

Stub teeth, 20° involute (Nuttall) pattern, machine cut.
Diam. Pitch 1½
Circ. " 2·094"
Addendum 0·524"
Whole depth 1·152"
N° of teeth 65.
Dedendum ·628"
Root dia. 3'-6·077"

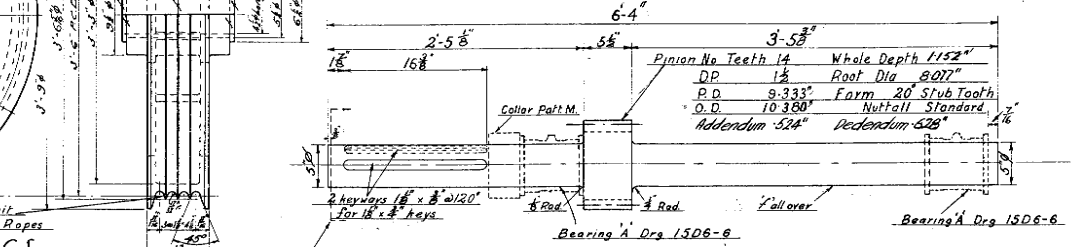
SPUR WHEEL C.S.

Make 1 Patt E
Weight 6136·0 lbs.



Material C.S. to conform to A.S.S. No. B27-1931 Grade 3

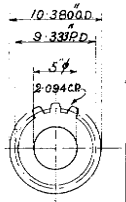
Stub teeth, 20° involute (Nuttall) pattern, machine cut.
Diam. Pitch 2½
Circ. " 1·142"
Addendum 0·285"
Whole depth 0·628"
N° of teeth 112.
Dedendum ·343"
Root dia. 3'-4·041"



Pinion No Teeth 14 Whole Depth 1·152"
D.P. 1½ Root Dia 8·017"
P.D. 9·333" Form 20° Stub Tooth
O.D. 10·380" Nuttall Standard
Addendum ·524" Dedendum ·628"

DRUM PINION & SHAFT F.S.

Make 2. Mark B.
Weight (turned) 532 lbs.
Material Med. Carb Forging Steel to conform to SAA. B63-1938, Class M.



SPUR WHEEL C.S.

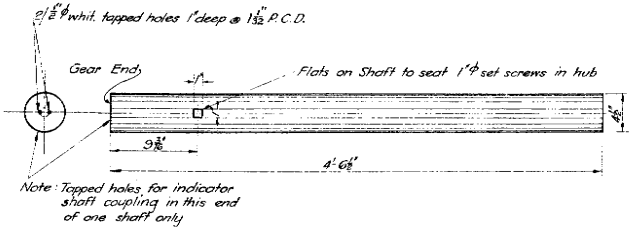
Make 1 Patt D
Weight 287·0 lbs.

Machining Allowances & Tolerances
To conform to the Newall Standard,
Class 'A' for holes, Class 'P' for shafts carrying gears & hubs, & Class 'Y' for running parts.

DEPARTMENT OF PUBLIC WORKS TAS.

DERWENT RIVER BRIDGE
AT BRIDGEWATER
SPUR WHEELS, DRUM and IDLER SHEAVE

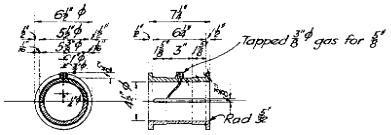
Scales ½" & 3" ft	Prepared	Checked	15D6
Drawing	HRC & HFC		
Tracing	HRC & VCT		—5
Design			
Supervision		Chief Engineer	



DRUM SHAFTS C.R.S.

Make 4 off — Mark 9 — Weight 245·5 lbs. each

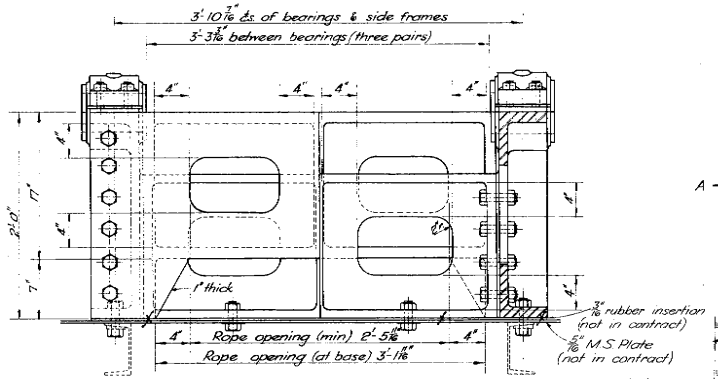
Material C.R.S. to conform to S.A.E. N° A1-1931



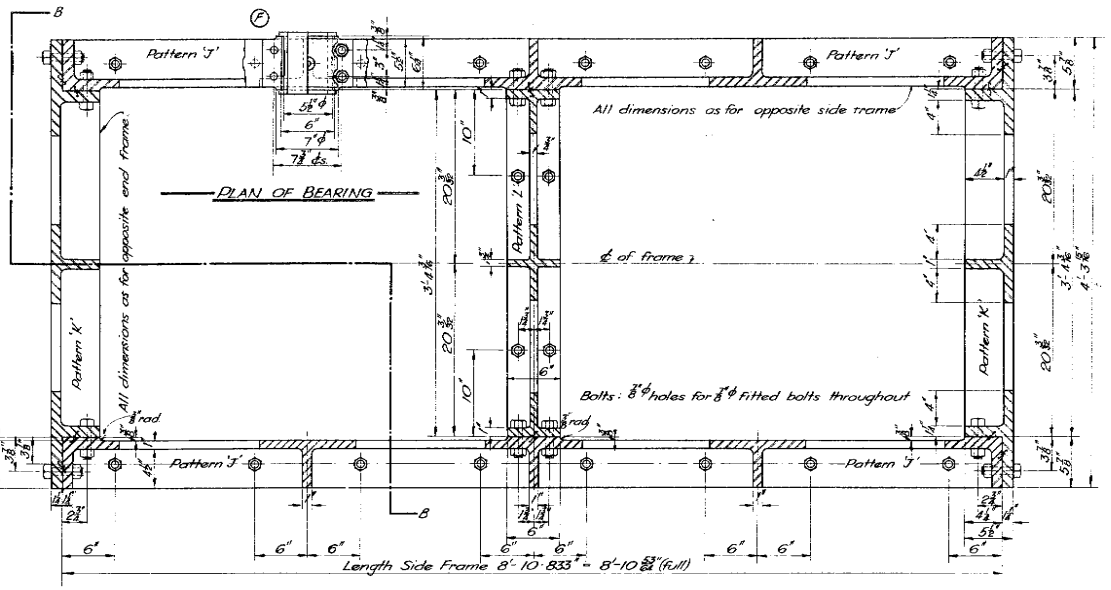
BUSHES FOR BEARINGS 'F' PHOS. BRONZE

Make 8 off (both frames) — Weight 19·7 lbs. each

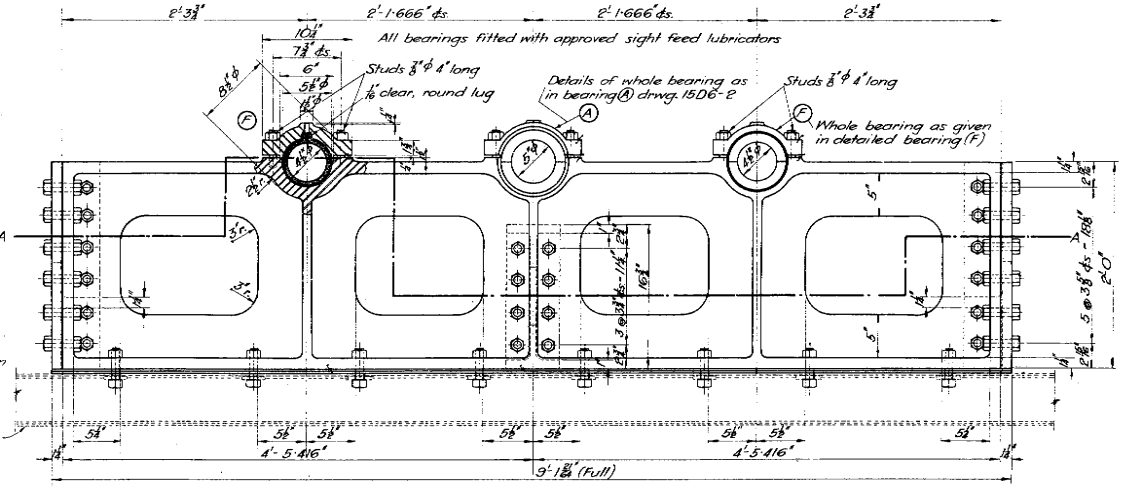
Machining Allowances & Tolerances. These are to conform to the Newall Standard, Class 'K' for holes & Class 'Y' for journals.



SECTIONAL ELEVATION B-B



PLAN A-A



ELEVATION

Note: All fillets not shown otherwise to be 5/8" radius. Bolt seatings on casting to be spot faced. Machined finished surfaces denoted by 'f'.

Fitted bolts required for Base Flanges per frame.

ϕ	Length	N°	
7/8	3 1/2"	16	(with tapered washers)
8	2 1/2"	4	

Make 4 off Pattern 'J'
Make 4 off Pattern 'K'
Make 2 off Pattern 'L'

WEIGHTS FOR BOTH FRAMES

MATERIAL	ITEM	N° off	WEIGHT	TOTALS
Phos. Bronze/In accord with specn. Section 2 Clause 4	Bushes for 'F' Bearings	8	19·7 lbs. each = 157·6 lbs.	
	" " 'A' "	4	25·5 " " = 102·0 "	260 lbs = 2·32 cwts.
C.R.S./A.S.S. N° A1	Drum Shafts	4	~~1010 lbs. each = 4040 lbs.~~	~~9 3/2 lbs~~
1931			245·5 = 982 lbs	~~4040 lbs = 36·714 cwts.~~
C.S./A.S.S. N° 801-1931	Pattern 'J'	4	1060 lbs. each = 4240 lbs.	
Grade 1	Pattern 'K'	4	490 lbs. each = 1960 lbs.	
	Pattern 'L'	2	300 lbs. each = 600 lbs.	
	Caps for 'F' Bearings	8	26·5 lbs. each = 212 lbs.	
	Caps for 'A' Bearings	4	29 lbs. each = 116 lbs.	7128 lbs. = 63·6 cwts.
	Bolts & Studs - 216 required.			

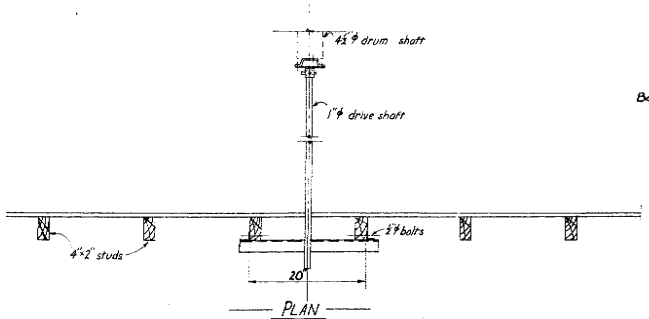
DEPARTMENT OF PUBLIC WORKS - TASMANIA

DERWENT RIVER BRIDGE AT BRIDGEWATER

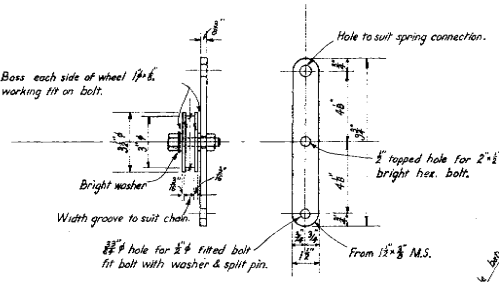
LIFT SPAN MACHINERY

DETAILS OF C.S. DRUM FRAMES (2)

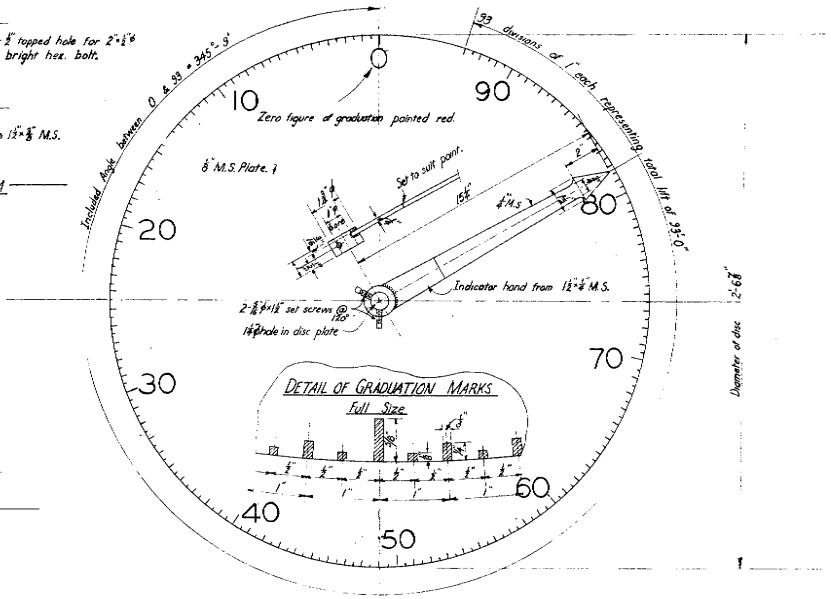
Scale 1/2"=1'0"	Prepared	Checked	15D6
Drawing	A.F.G.		
Tracing	[illegible] 26/6/41.	4/7/41	— 6
Design			
Supervision			Chief Engineer 4-8-41



PLAN
Showing position of framework on studs.
Scale 1"=1'-0"



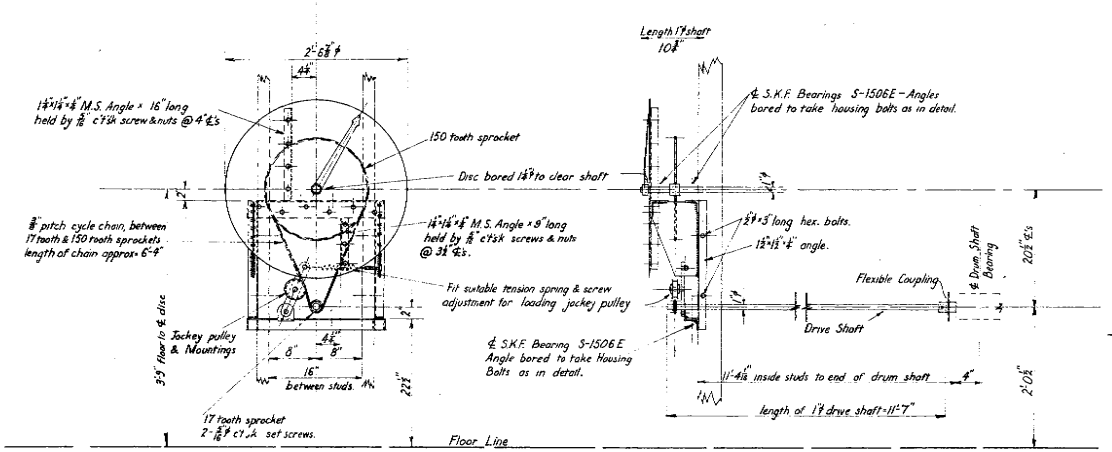
DETAIL OF JOCKEY PULLEY & ARM
Scale 3"=1'-0"



DETAIL OF GRADUATION MARKS
Full Size

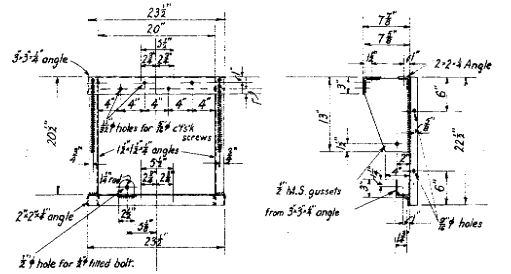
DETAIL OF INDICATOR DISC, GRADUATIONS, & M.S. HAND
Make 1 complete
Scale 3"=1'-0" & Full Size

Note: Disc to be painted black
Indicating hand, figures, & graduations, not otherwise marked to be painted white.
Disc to be drilled for bolt holes, marked off from angles — see detail of supports.

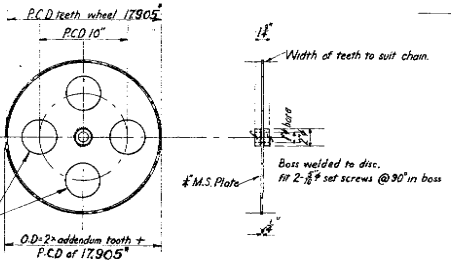


FRONT ELEVATION
SIDE ELEVATION

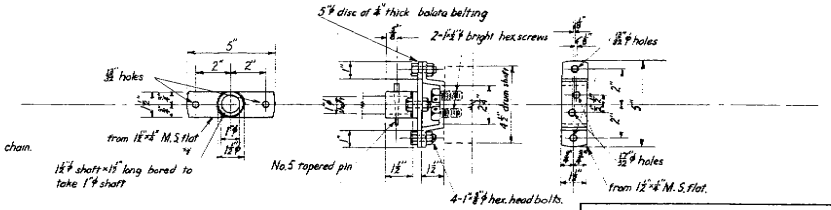
ARRANGEMENT OF INDICATOR & DRIVE
Scale 1"=1'-0"



DETAIL OF FRAMEWORK
Scale 1"=1'-0"



DETAIL OF SPROCKET
Scale 12"=1'-0"



ASSEMBLY

ARRANGEMENT & DETAILS COUPLING

Note: After screwing up ⅞" ϕ screws, lock in position by wiring heads. Fit washers between bolt heads & nuts & belting.

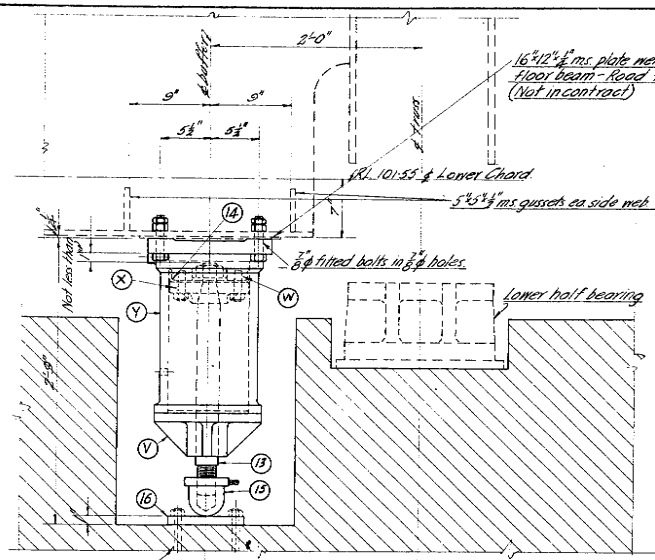
Scale 3"=1'-0"

DEPARTMENT OF PUBLIC WORKS — TASMANIA

DERWENT RIVER BRIDGE — BRIDGEWATER
LIFT SPAN MACHINERY
DETAILS OF HEIGHT INDICATOR

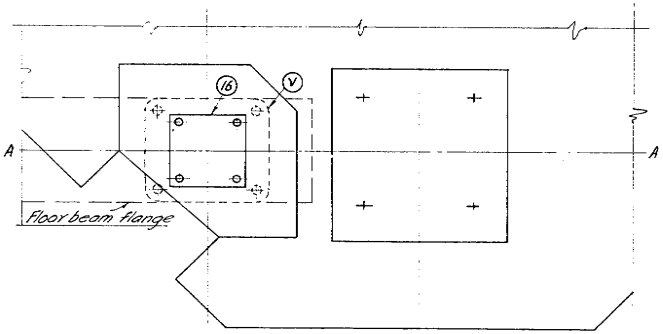
Scale	3"; 12"=1'-0"	Prepared	Checked	15D6
Drawing		D.A.W. 11/1/43		
Tracing		M.G.L. 20/1/43		-7
Design				
Supervision				

Chief Engineer



SECTN. A.A.

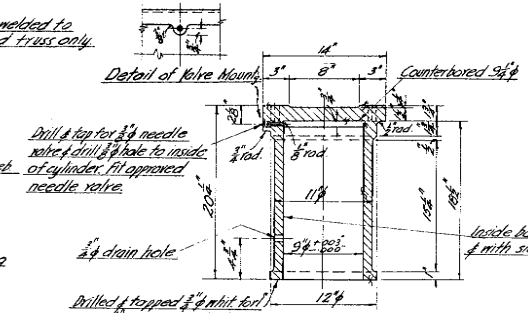
(Concrete in section only)



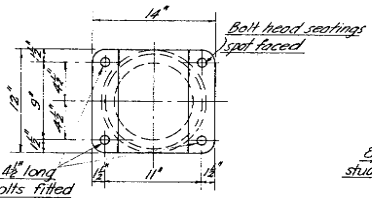
Details of Buffer Well as in Drg. No. 15D2-15

PLAN OF BUFFER WELL

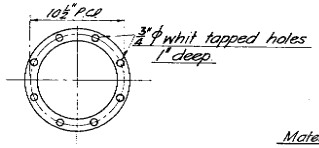
ARRANGEMENT OF PNEUMATIC BUFFER



SECTION ON ℄.



PLAN OF BASE



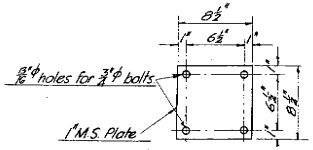
PLAN OF OPEN END

DETAILS OF CYLINDER

Make 4 Patt 'Y'

Weight - 247 lbs ea.

Material C.I. to conform to A.S.S. N° 826 - 1931 Grade 'A'



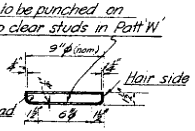
BUFFER NUT SEATING PLATE M.S.

Make 4 Mark 16

Weight 18 lbs. approx.

Material M.S. to conform to S.A.A. A1 - 1931

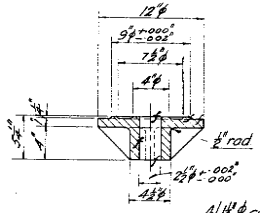
Note: 4/13/16"ϕ holes to be punched on 6¼" P.C.D. to clear studs in Patt 'W'



LEATHER CUP

Make 4 Mark 14

Material Leather to conform to S.A.A. B4 - 1931

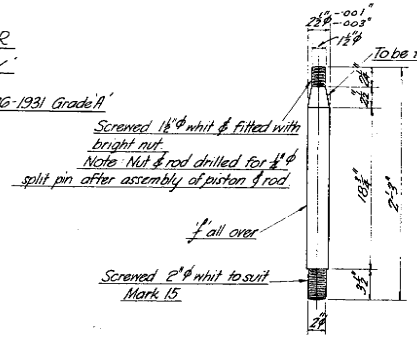


GUIDE AND COVER C.I.

Make 4 Patt 'V'

Weight - 56 lbs ea.

Material C.I. to conform to A.S.S. N° 826 - 1931 Grade 'A'

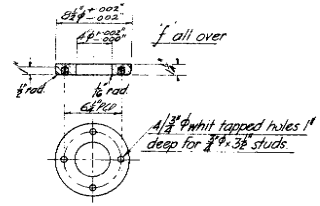


PISTON ROD C.R.S.

Make 4 Mark 13

Weight - 34 lbs ea.

Material C.R.S. to conform to S.A.A. N°A1 - 1931

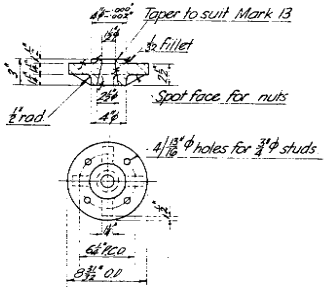


JUNK RING C.I.

Make 4 Patt W

Weight 11 lbs ea.

Material C.I. to conform to S.A.A. N° B2G - 1931 Grade 'A'

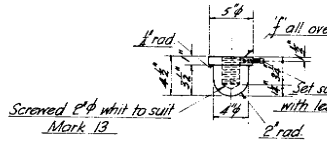


PISTON C.I.

Make 4 Pattern 'X'

Weight - 30 lbs ea.

Material C.I. to conform to S.A.A. N° B2G - 1931 Grade 'A'



ADJUSTING NUT C.R.S.

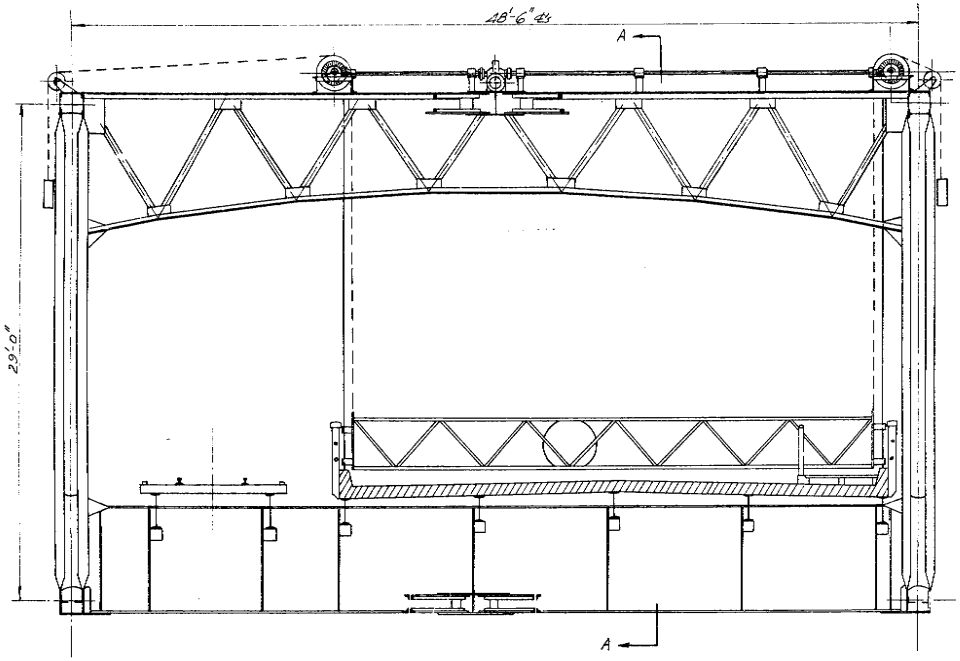
Make 4 Mark 15

Weight 15·5 lbs. ea.

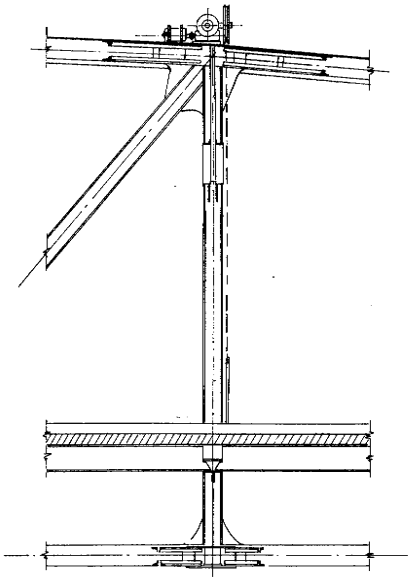
Material C.R.S. to conform to S.A.A. N°A1 - 1931

DEPARTMENT OF PUBLIC WORKS - TASMANIA			
DERWENT RIVER BRIDGE AT BRIDGEWATER			
LIFT SPAN MACHINERY			
PNEUMATIC BUFFERS			
Scale 1½" to 1'	Prepared	Checked	15D6
Drawing	W.F.G.		
Tracing	W.F.G. 24/5/41		-8
Design			
Supervision			

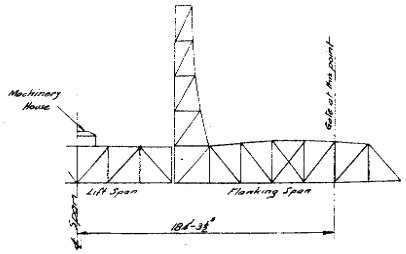
4-8-41. Chief Engineer



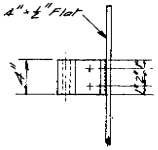
CROSS SECTION



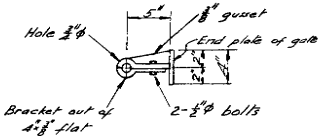
SECTION AA



LOCATION OF GATES



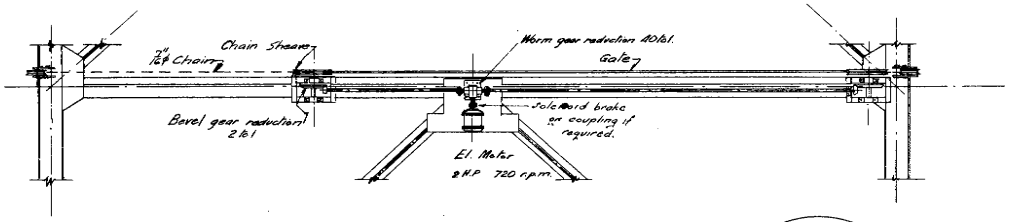
Elevation



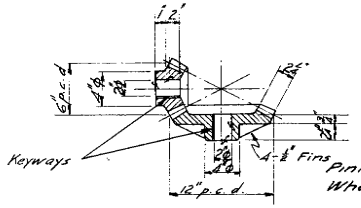
Plan

DETAIL OF GUIDE WIRE BRACKETS

Scale 1" = 1'-0"



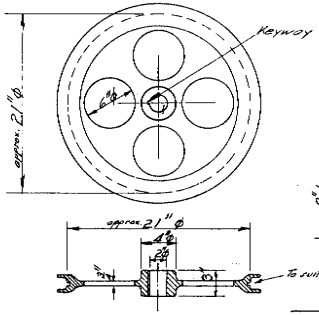
PLAN



Pinion 6"ϕ 18 teeth
Wheel 12"ϕ 36 "
3. D.P. 2½" face.

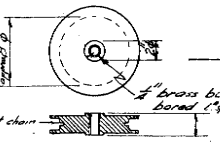
BEVEL GEARS—C.S.

Make 4 pairs Machine cut teeth



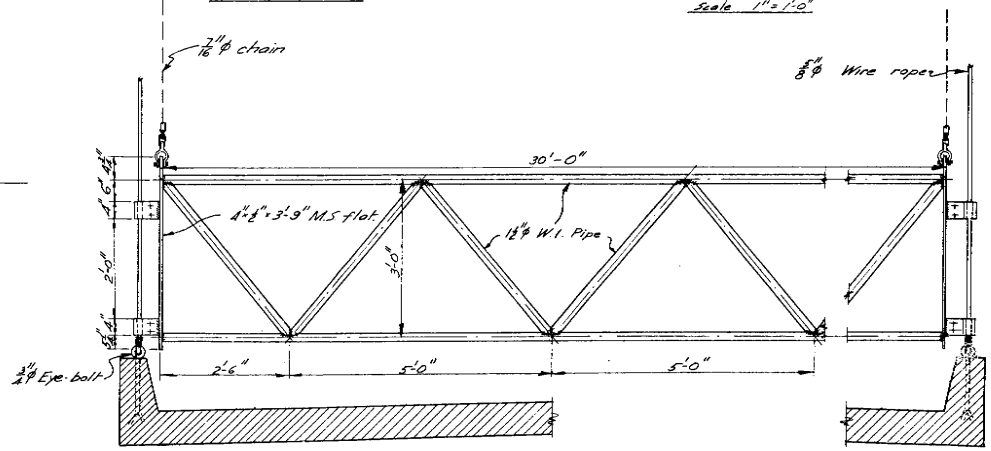
CHAIN SHEAVE C.I.

Make 4



IDLER SHEAVE—C.I.

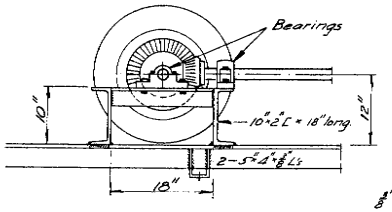
Make 4



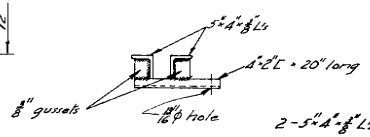
DETAIL OF GATES

Scale: ½" = 1'-0"

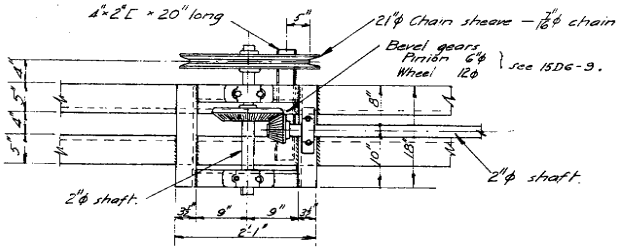
DEPARTMENT OF PUBLIC WORKS—TAS			
DERWENT RIVER BRIDGE AT BRIDGEWATER			
MACHINERY			
ROAD GATES GEN ARRGT			
Scale ½"=1'-0"	Prepared	Checked	15D6
Drawing	F.N.L 8.1.53		—9
Tracing	F.N.L.		
Design			
SUPERVISION			A.J. Wright CHIEF ENGINEER



ELEVATION

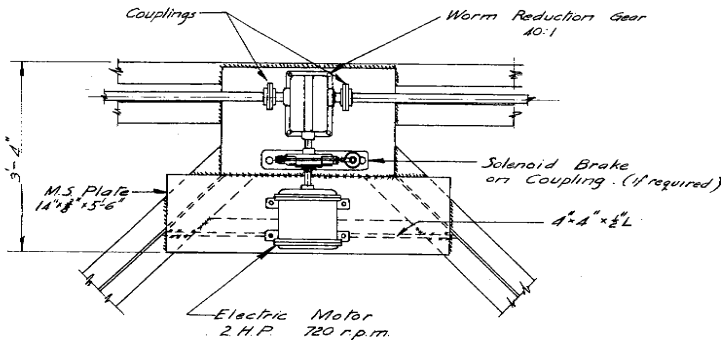


GUIDE ROPE ATTACHMENT.

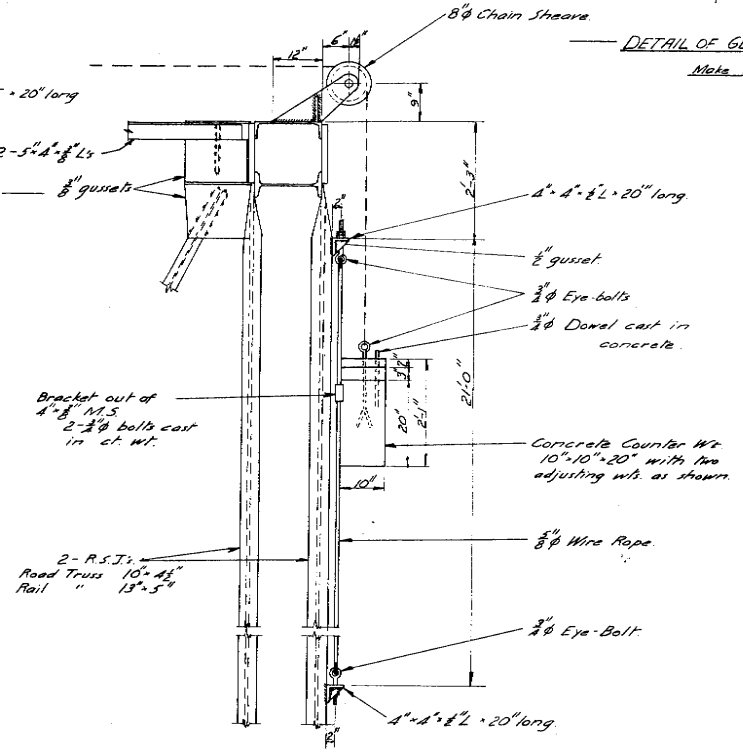


PLAN

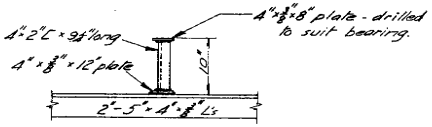
DETAIL OF CHAIN SHEAVE MECHANISM.



ASSEMBLY OF MOTOR AND REDUCTION GEAR

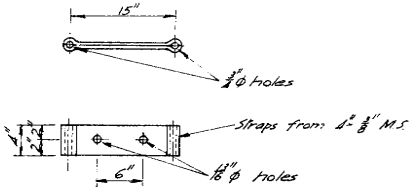


DETAIL OF COUNTER WEIGHT ARRANGEMENT.



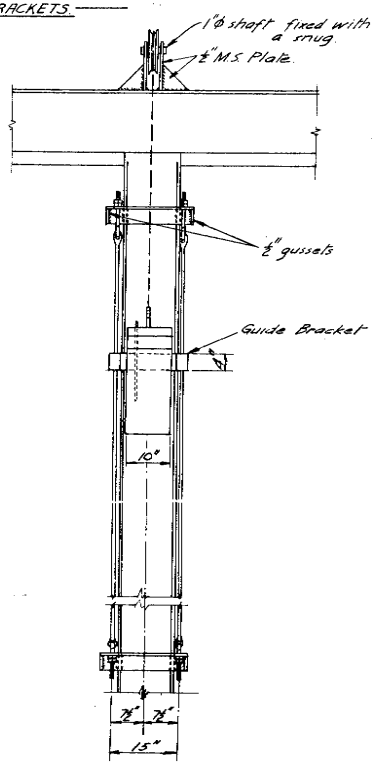
BEARING SUPPORTS

Make 2

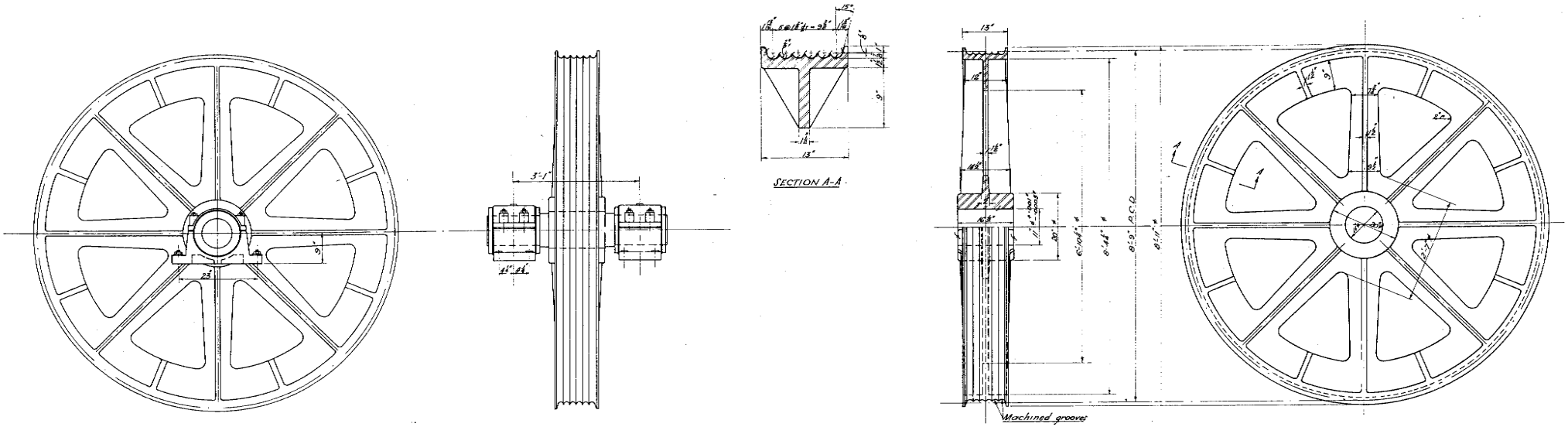


DETAIL OF GUIDE BRACKETS.

Make 2 prs.



DEPARTMENT OF PUBLIC WORKS—TAS			
DERWENT RIVER BRIDGE AT BRIDGE WATER			
MACHINERY			
ROAD GATES—DETAIL OF COUNTER WTS.			
Scale: 1"=1'-0"	Prepared	Checked	15D6
Drawing			-9A
Tracing			
Design			
SUPERVISION			CHIEF ENGINEER



ASSEMBLY OF SHEAVE, TRUNNION & BEARINGS.

SECTION A-A

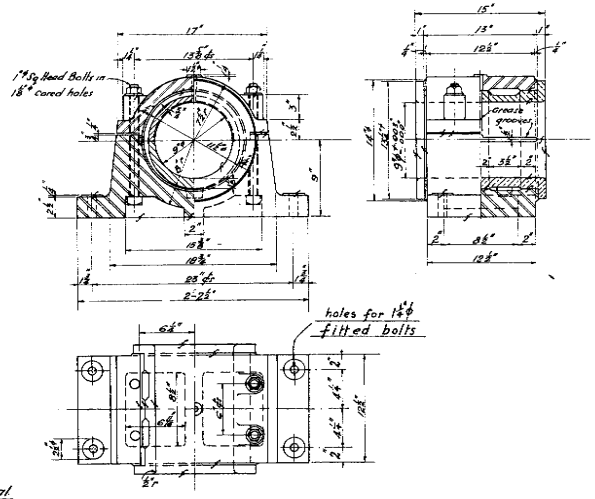
Machined grooves

SHEAVE. C.S.

MAKE 4. PATT T.

Weight 7208 lbs each.

Material C.S. to conform to S.A.A. No. B21-1931, Grade 2.

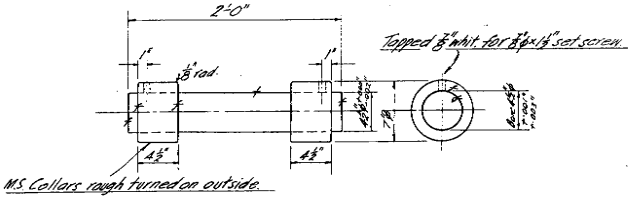


Material.
Cast Steel. To conform to S.A.A. No. B2T-1931, Gr. 1
Phos. Bronze. " " " Section 2, clause 6 of this specification.

TRUNNION BEARING C.S.

MAKE 8. PATT U.

Weight. Steel casting 745 lbs each. approx.
" Bronze " 181 " " "

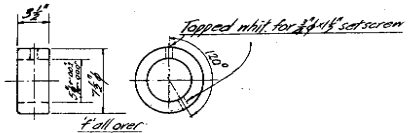


IDLER SHEAVE PIN M.S.

Make 4 Mark 11

Weight 108 lbs. (pin only)

Material. To conform to S.A.A. No. A1-1931

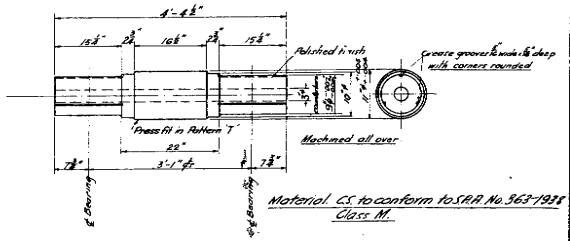


COLLAR C.I.

Make 3 Patt. M

Weight 24 lbs. ea.

Mat. C.I. to conform to A.S.S. No. 826-1931 Grade A.



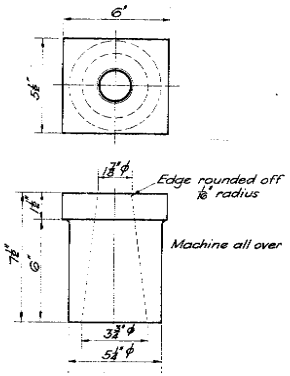
Material. CS to conform to S.A.A. No. 963-1935 Class M.

TRUNNION F.S.

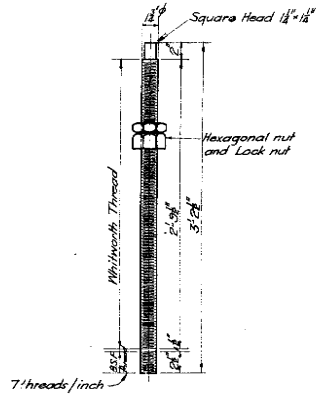
MAKE 4. MARK 12.

Weight 1011 lbs each.

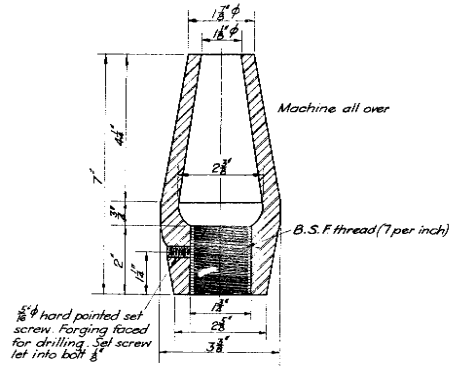
DEPARTMENT OF PUBLIC WORKS TAS.			
DERWENT RIVER BRIDGE AT BRIDGEWATER. DETAILS OF C'WEIGHT SHEAVE TRUNNION & BEARING			
Scale	Prepared	Checked	15 D6
Drawing	MRR	11/4/41	
Tracing	MRR	11/4/41	
Design			
Supervision		4-8-41	CHIEF ENGINEER



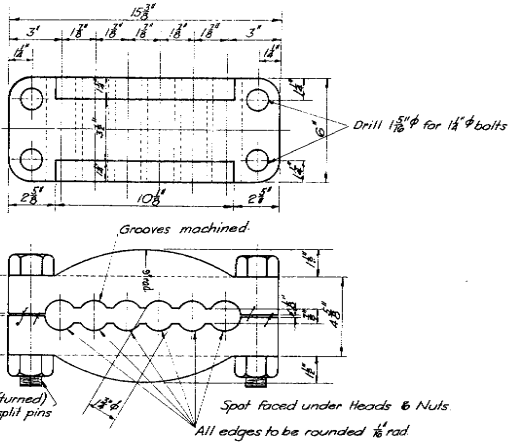
C.T.W.I. ROPE SOCKET FORGED M.S.
Make 24 — Mark 17
Weight - 38 lbs.
For counter weight end of rope
Scale 3" = 1'-0"



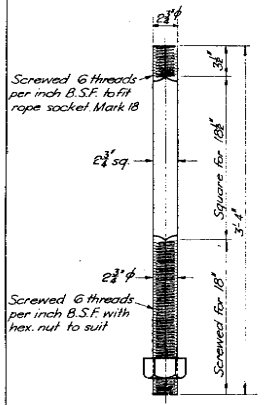
BOLT M.S. (For Mark 19)
Make 16 — Mark 21
Weight - 26 lbs.
Scale 12" = 1'-0"



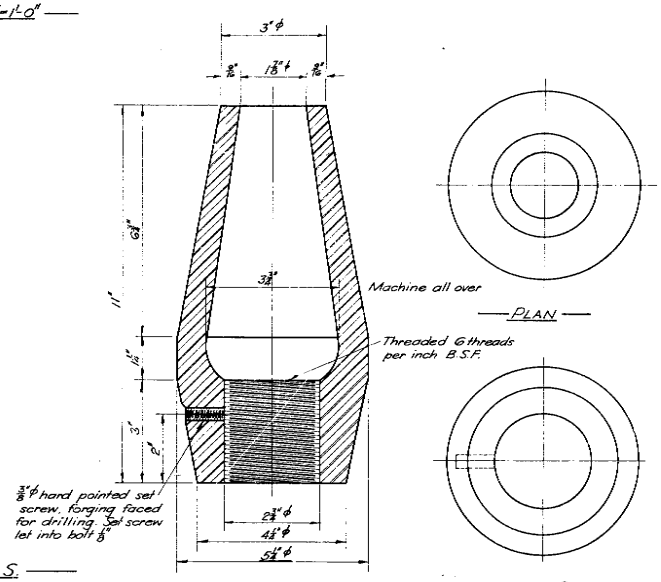
SECTION on ℄
OPERATING ROPE SOCKET FORGED M.S.
Make 16 — Mark 19
Weight - 11 lbs.
Scale ½ Full Size



CLAMP C.S.
Make 8 — Patt. 'Z'
Weight - 118·5 lbs.
Scale 3" = 1'-0"



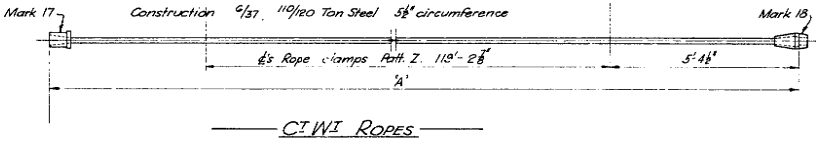
C.T.W.I. ROPE ANCHOR BOLT M.S.
Make 24 — Mark 20
Weight - 82 lbs.
For Lift Span end of rope
Scale 1½" = 1'-0"



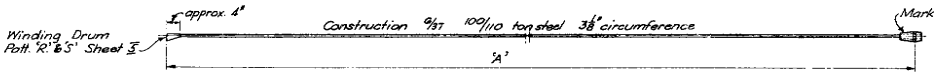
SECTION on ℄
C.T.W.I. ROPE SOCKET, FORGED M.S.
Make 24 — Mark 18
Weight - 28 lbs.
For Lift Span end of rope
Scale ½ full size

PLAN

INVERTED PLAN



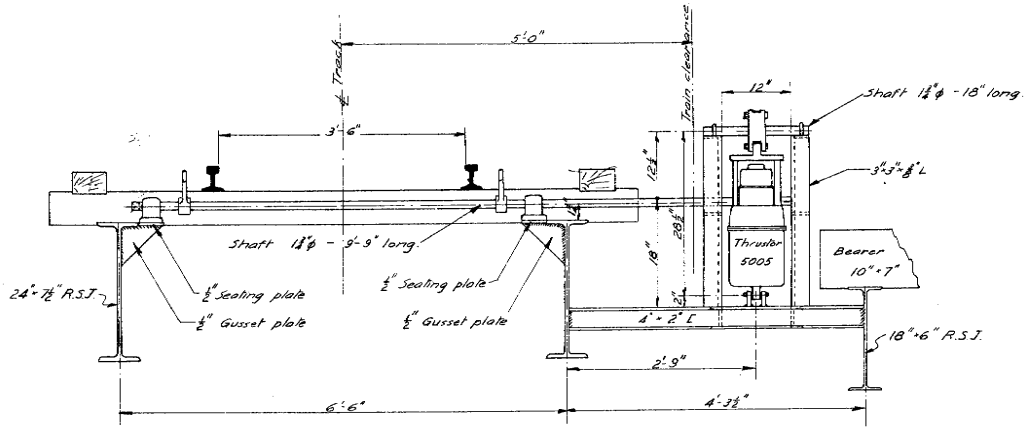
C.T.W.I. ROPES
Make 16 Dimension 'A' = 131'-3½"
Make 8 Dimension 'A' = 133'-3½"



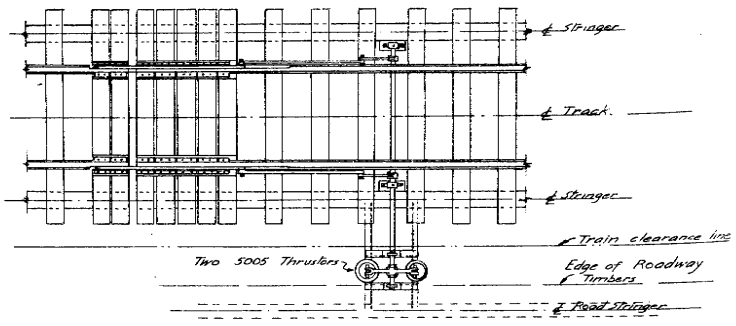
OPERATING ROPES
Make 4 Dimension 'A' = 180'-11½" } Uphaul Ropes
Make 4 Dimension 'A' = 186'-5½" }
Make 4 Dimension 'A' = 202'-7" } Downhaul Ropes
Make 4 Dimension 'A' = 197'-1" }

DEPARTMENT OF PUBLIC WORKS - TASMANIA
DERWENT RIVER BRIDGE AT BRIDGEWATER
LIFT SPAN MACHINERY
DETAILS OF ROPE SOCKETS & C.S. CLAMP

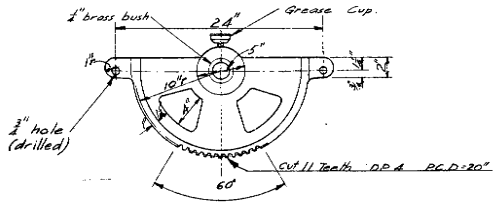
Scale	as shown	Prepared	Checked	15D6
Drawing		J.K. & M.R.R.		
Tracing		[illegible] 29/5/41	11/6/41	-12
Design				
Supervision			4.8.41 Chief Engineer	



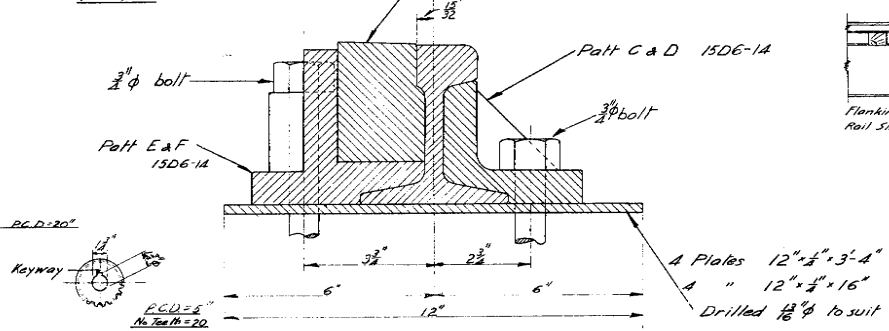
— CROSS SECTION —
1" = 1'-0"



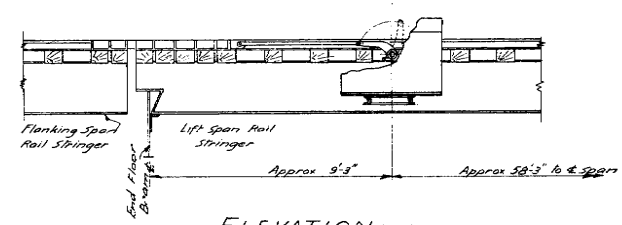
— PLAN —



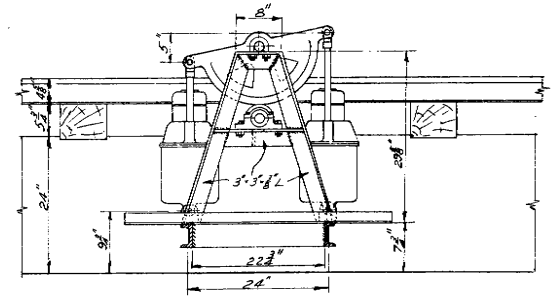
— THRUSTOR LINK - C.S. —
Make 2 Patt A
1½" = 1'-0" Wt = 50 lbs



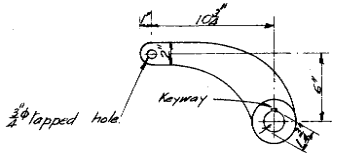
— SECTION THRO' LOCKING BAR —
Half-Size



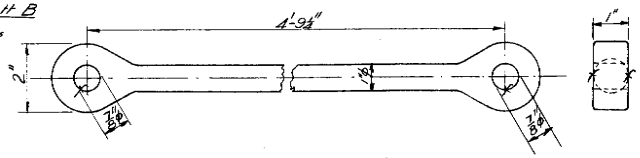
— ELEVATION —
⅜" = 1'-0"



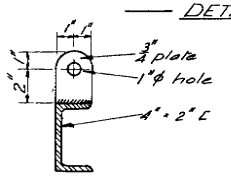
— DETAIL OF THRUSTOR ASSEMBLY —
1" = 1'-0"



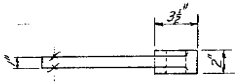
— PINION — C.S. —
Make 2 Patt B
Wt. = 12 lbs



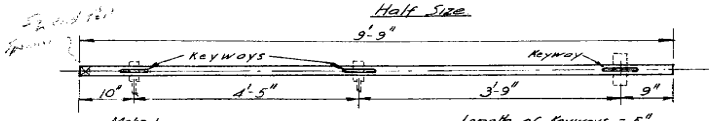
— LOCKING - BAR LINK — F.S. —
Make 4 Mark 2
Half Size



— THRUSTOR BRACKETS —
Make 8

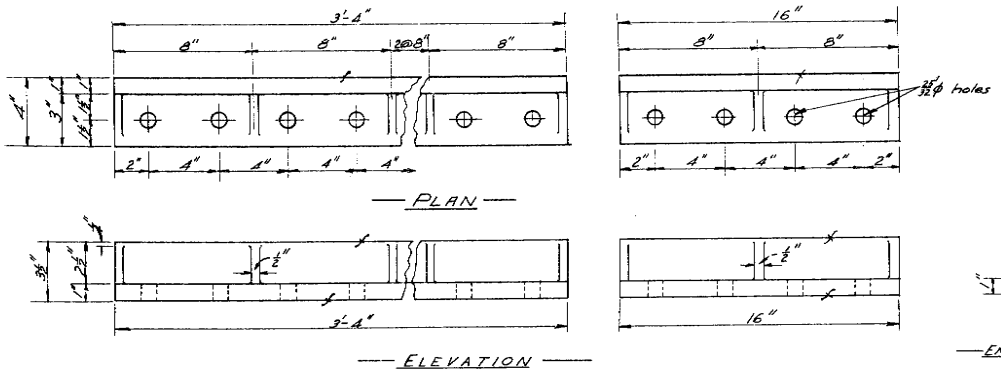


— THRUSTOR LEVER — F.S. —
Make 4 Mark 1
1" = 6"



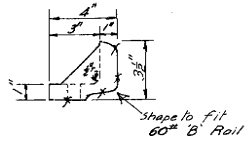
— DETAIL OF SHAFT - 1⅞"ϕ —

DEPARTMENT OF PUBLIC WORKS — TAS			
DERWENT RIVER BRIDGE AT BRIDGEWATER			
MACHINERY			
RAIL LOCK — GENERAL ARRGT			
Scale As Shown	Prepared	Checked	15D6 — 13
Drawing			
Tracing			
Design			
SUPERVISION			H. W. Wright CHIEF ENGINEER



— PLAN —

— ELEVATION —



— END ELEVATION —

— RAIL CLAMP C.S. (LIFT SPAN) —

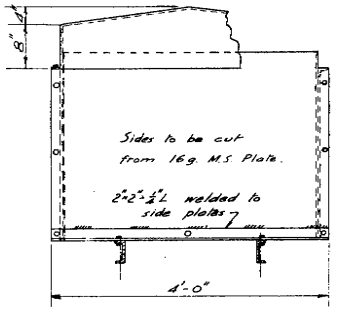
Make 4 Patt C

Weight 64 lbs

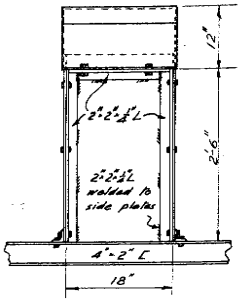
— RAIL CLAMP C.S. (FLANKING SPAN) —

Make 4 Patt D

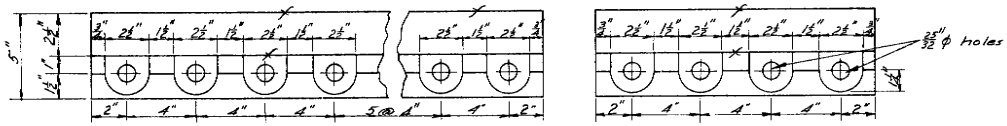
Weight 26 lbs



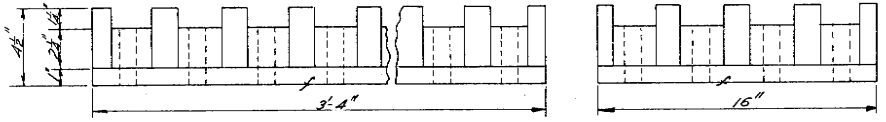
— SIDE ELEVATION —



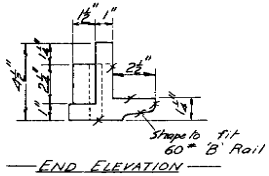
— END ELEVATION —



— PLAN —



— ELEVATION —



— END ELEVATION —

— RAIL CLAMP & GUIDE C.S. (LIFT SPAN) —

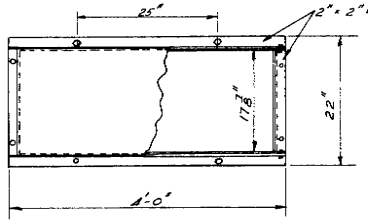
Make 4 Patt E

Weight 113 lbs

— RAIL CLAMP & GUIDE C.S. (FLANKING SPAN) —

Make 4 Patt F

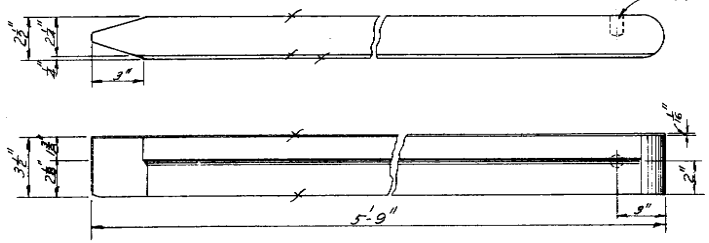
Weight 46 lbs



Cover bolted together with ⅝" ϕ bolts

— PLAN —

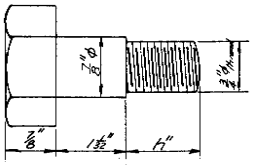
— MACHINERY COVER —



— LOCKING BAR — C.S. —

Make 2 R.H. Patt G

" " L.H. " H

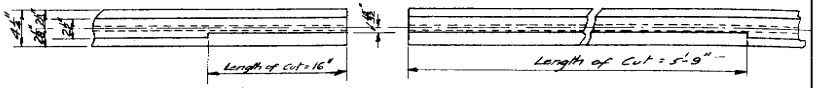


— LINK BOLT — BS —

Scale: Full size

Make 4 dim. h = 1" Mark 3

" 4 " h = 2" " 4



— DETAIL OF MACHINING OF RAILS FOR LOCKING BAR —

60# 'B' Rail (Flanking Span) Make 2 R.H. 2 L.H.

60# 'B' Rail (Lift Span) Make 2 R.H. 2 L.H.

Scale: 1½" = 1'-0"

DEPARTMENT OF PUBLIC WORKS — TAS

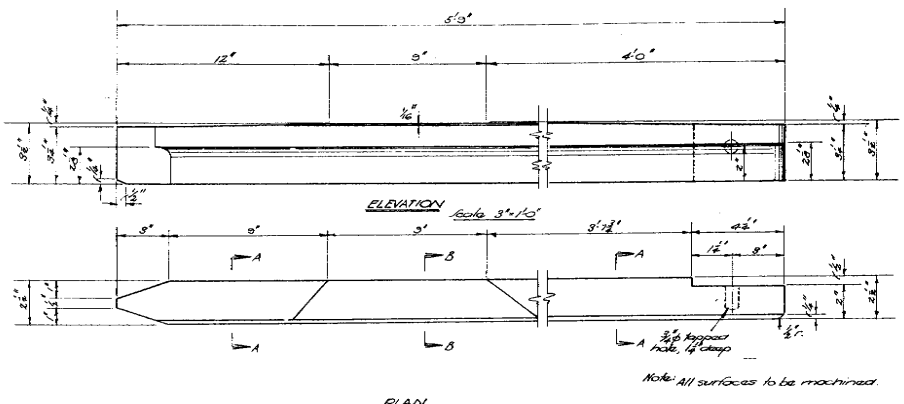
DERWENT RIVER BRIDGE AT BRIDGEWATER

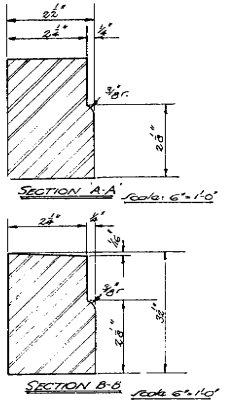
MACHINERY

LOCKING BARS & COVER

Scale: 3/8"/1'0"	Prepared	Checked	15D6
Drawing			—14
Tracing			
Design			
SUPERVISION			

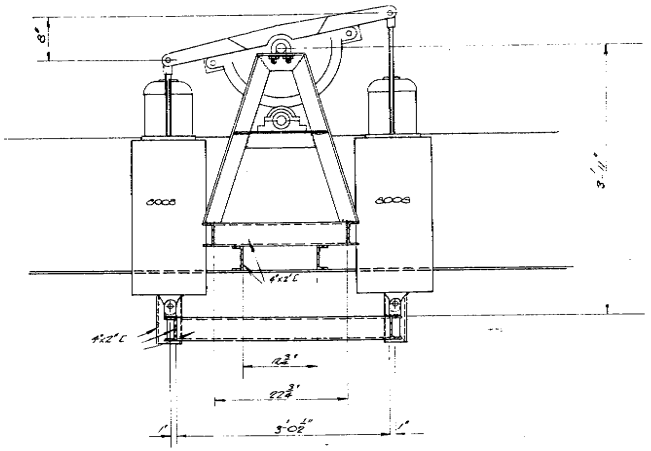
CHIEF ENGINEER



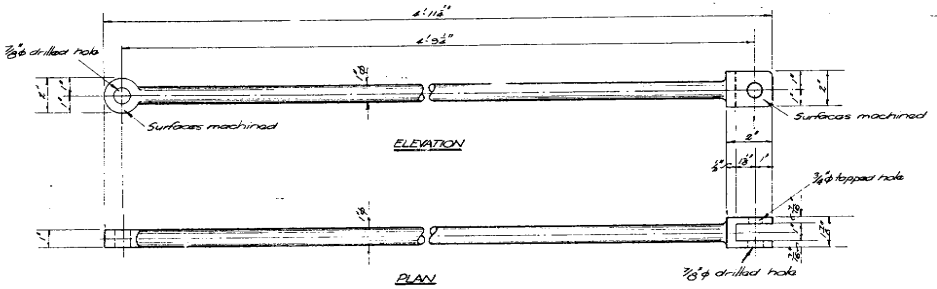


DETAIL OF LOCKING BAR ~ CAST STEEL

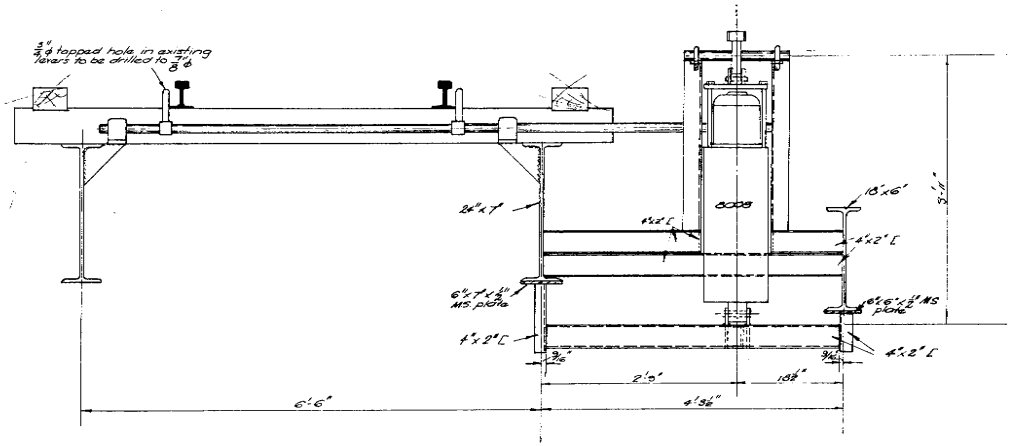
Make 2 off as drawn
Make 2 off opp. hand.



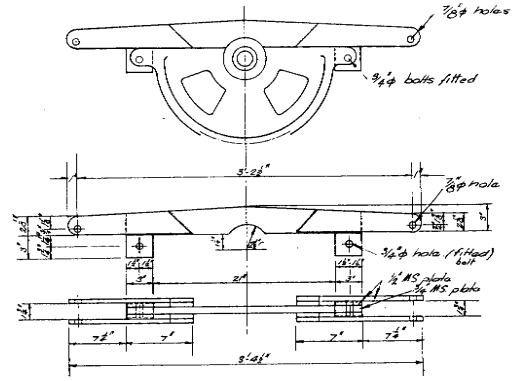
DETAIL OF THRUSTOR ASSEMBLY
Scale 1"=1'-0"



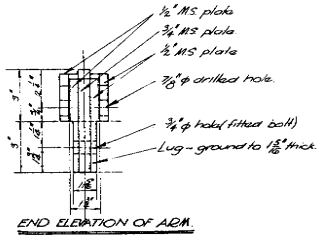
DETAIL OF LOCKING BAR LINK ~ F.S.
Scale: 3"=1'-0" Make 4

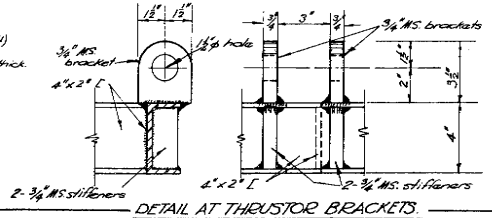


CROSS SECTION OF THRUSTOR ASSEMBLY
Scale 1"=1'-0"

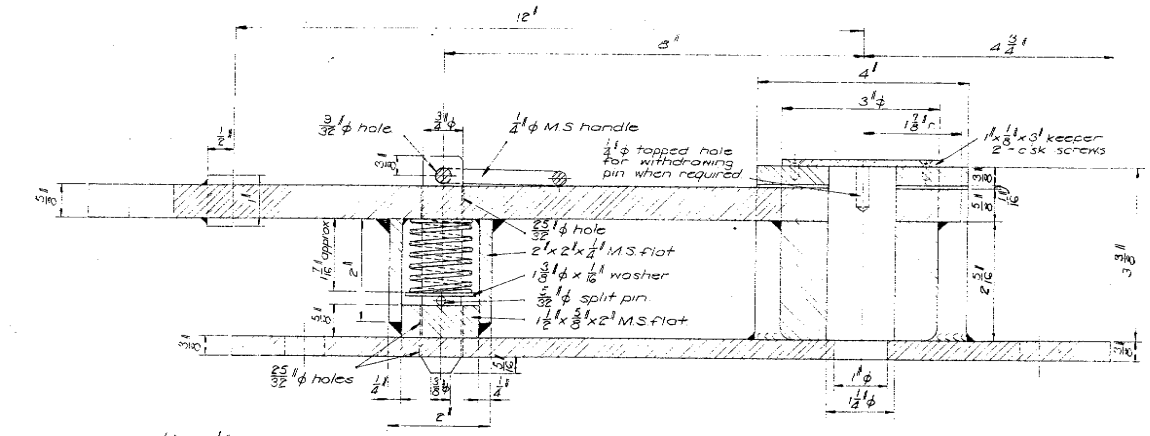


Make 2

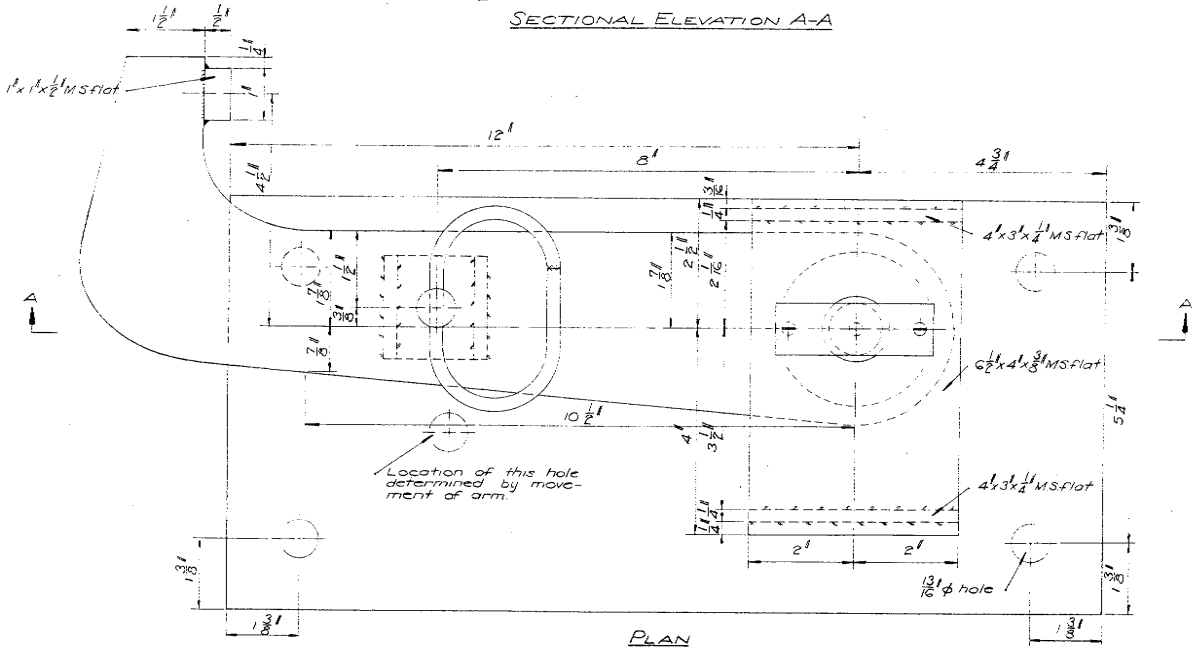




DEPARTMENT OF PUBLIC WORKS - TAS.			
DERWENT RIVER BRIDGE - BRIDGEWATER MACHINERY.			
RAIL LOCK AMENDMENTS			
Scale as shown	Prepared	Checked	15D6
Drawing	K.J. May '60		
Tracing			14A.
Design			
Supervision			Chief Engineer



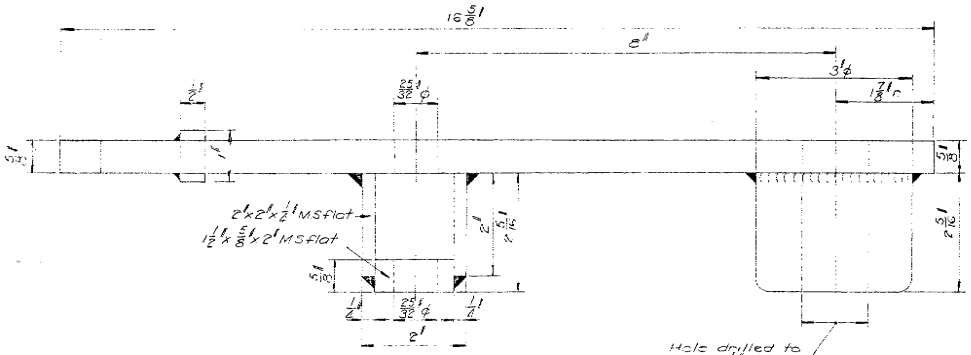
SECTIONAL ELEVATION A-A



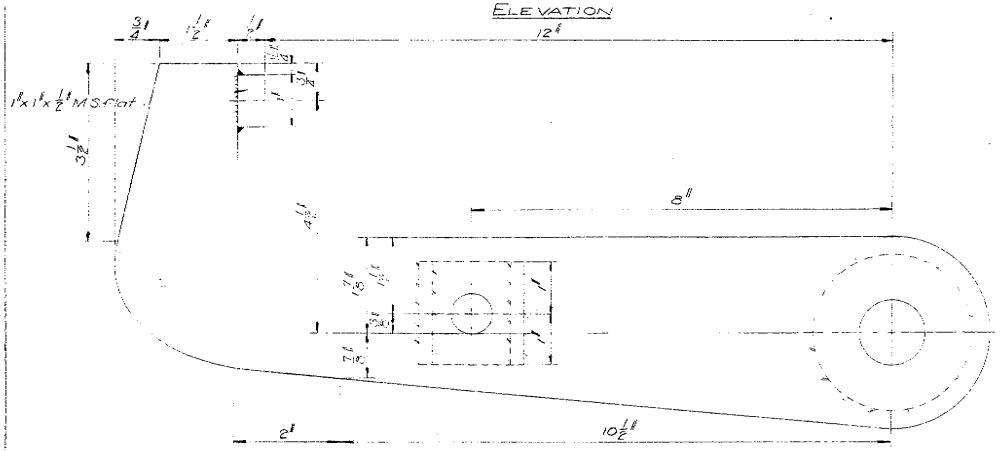
PLAN

2 OFF AS SHOWN
2 OFF OPP HAND

Scales	Road Plans		DEPARTMENT OF PUBLIC WORKS ~ TASMANIA
Full Size	File No		DERWENT RIVER BRIDGE ~ BRIDGEWATER 15 D 6
	Looding		MACHINERY
	Prepared	Checked	RAIL LOCKING BAR ~ STOPS ASSEMBLY 15
Design	H.R.C.		
Drawing	P.H. 5-1-53		
Tracing			
Supervision			Designs Engineer / Chief Engineer — Sheet No. of sheets

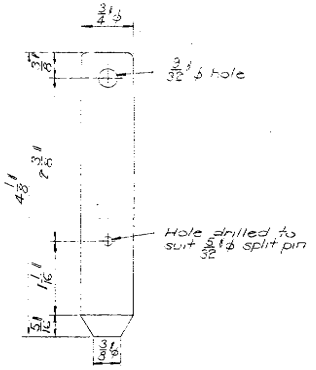


ELEVATION

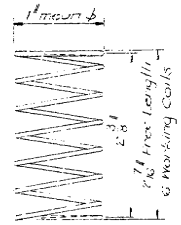


PLAN
Scale ¾ Full Size

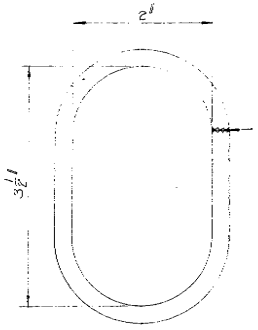
2 OFF AS SHOWN
2 OFF OPP. HAND



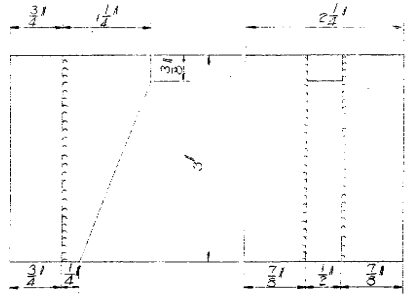
¾" DIA. M.S. PIN
4 OFF
Scale Full Size



SPRING ~ 16 GA ~ 4 OFF
Scale Full Size

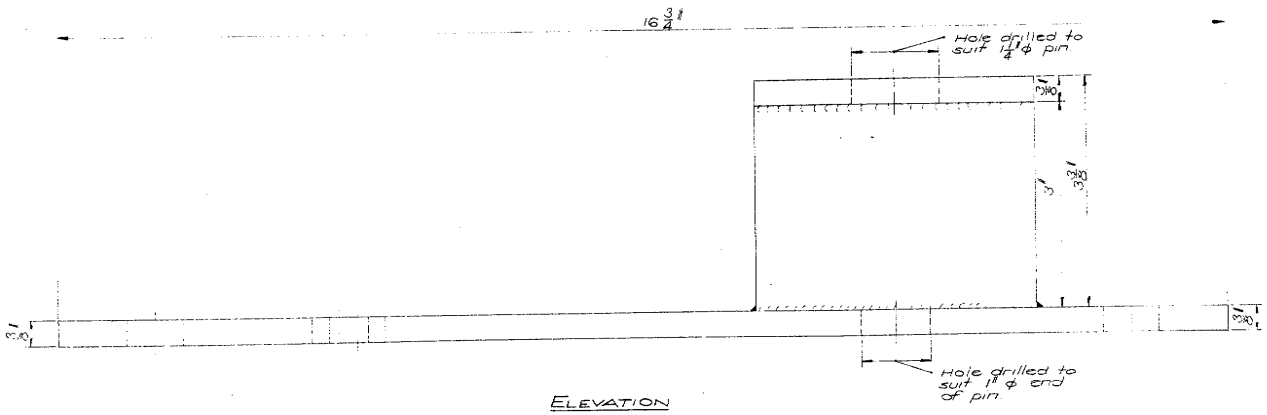


¼" DIA. M.S. HANDLE
4 OFF
Scale Full Size

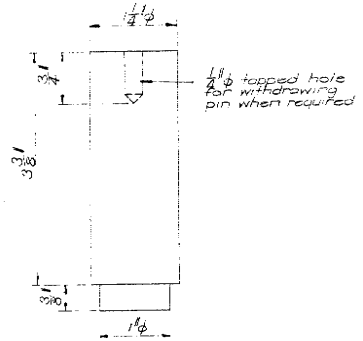


BRACKET FOR ATTACHMENT TO RAIL LOCKING BARS
8 OFF
Scale Full Size

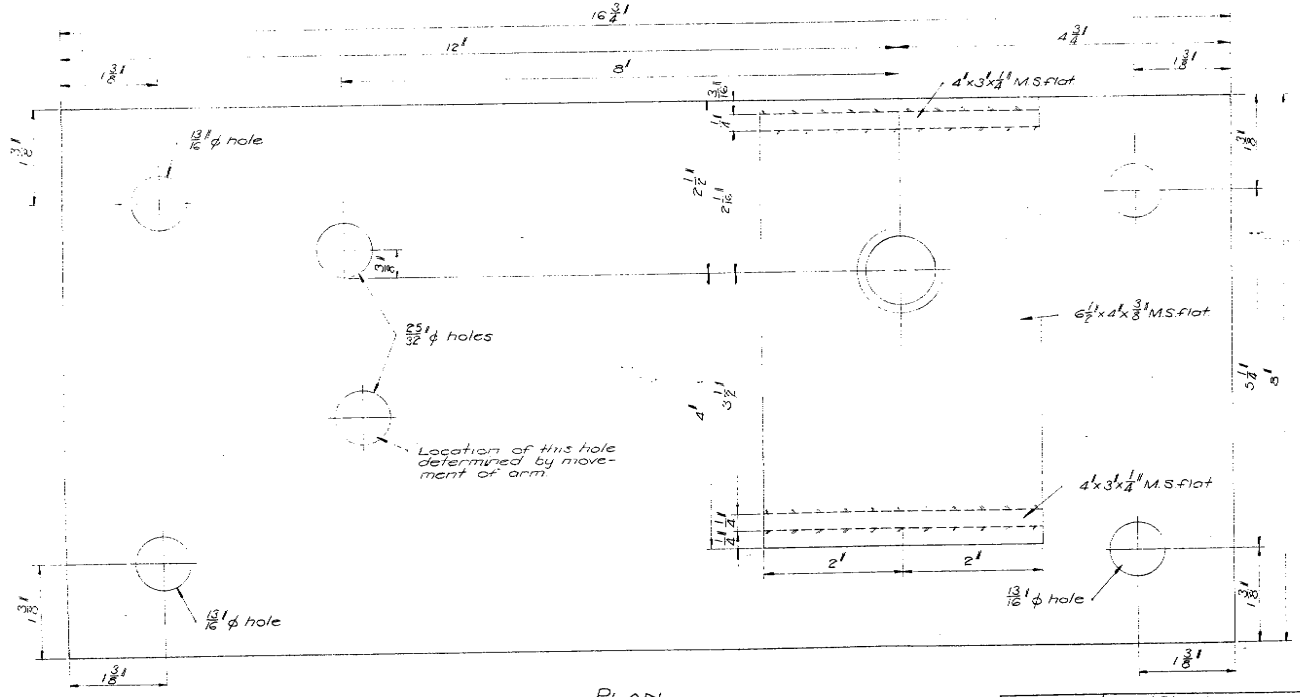
Scales.	Road Plans.		DEPARTMENT OF PUBLIC WORKS ~ TASMANIA
¾ Full Size / Full Size	File No.		DERWENT RIVER BRIDGE ~ BRIDGEWATER — 15 D6
	Loading.		MACHINERY
	Prepared.	Checked	RAIL LOCKING BAR STOPS. — 16
Design	H.R.C.		
Drawing	PH 6-1-53		
Tracing			
Supervision.			Designs Engineer / Chief Engineer / Sheet No. of sheets



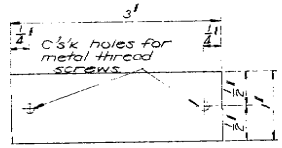
ELEVATION



1 1/4" DIA M.S. PIN
4 OFF
Scale: Full Size

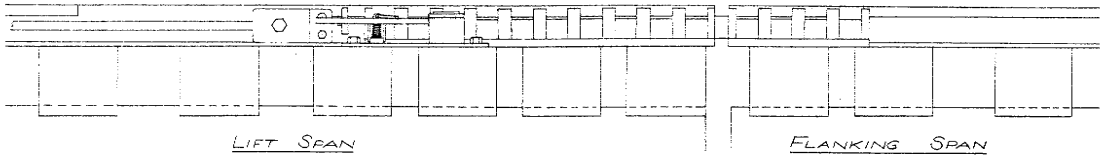


PLAN
2 OFF AS SHOWN
2 OFF OPP HAND
Scale: F ill Size

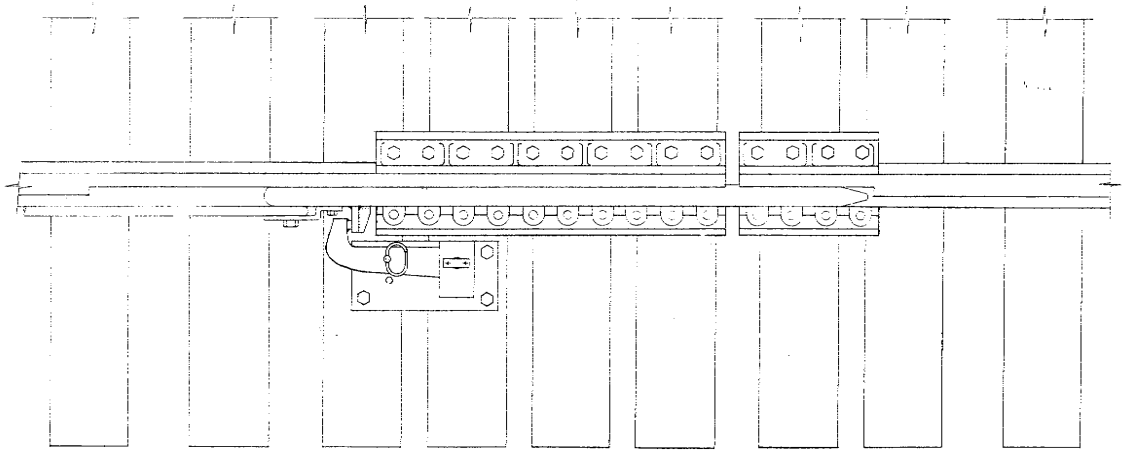


1/8" M.S. COVER PLATE
4 OFF
Scale: Full Size

Scales	Road Plans	DEPARTMENT OF PUBLIC WORKS ~ TASMANIA	
Full Size	File No	DERWENT RIVER BRIDGE ~ BRIDGEWATER	15D6
	Loading	MACHINERY	
	Prepared / Checked	RAIL LOCKING BAR STOPS	17
Design	H.R.C.		
Drawing	PH 7-1-58		
Tracing		Designs Engineer / Chief Engineer	Sheet No. of sheets
Supervision			

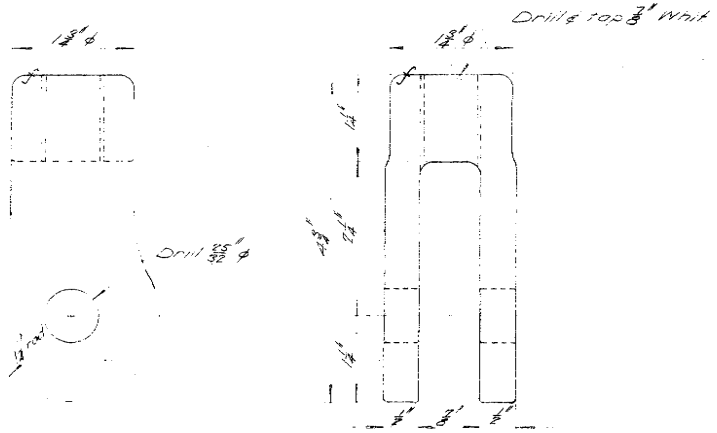


ELEVATION



PLAN
Scale $1\frac{1}{2}'' = 1'-0''$

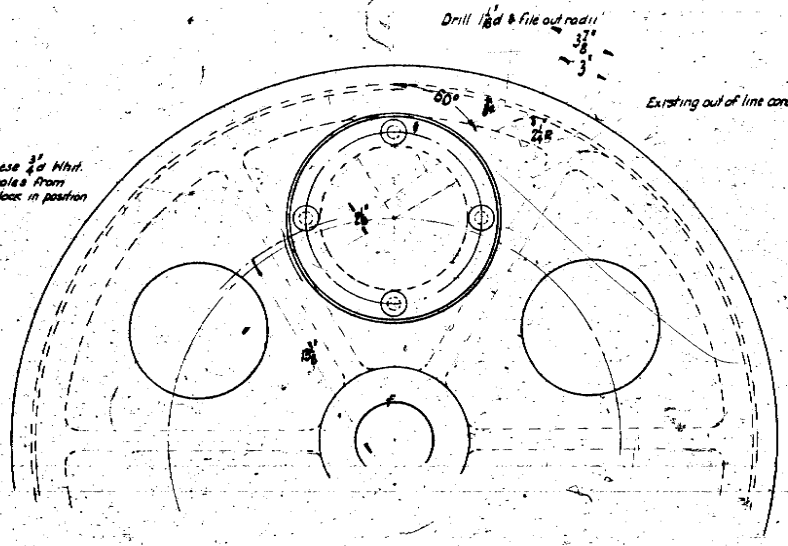
Scale $1\frac{1}{2}'' = 1'-0''$	Road Plans		DEPARTMENT OF PUBLIC WORKS ~ TASMANIA.
	File No.		
	Loading		DERWENT RIVER BRIDGE ~ BRIDGEWATER — 15 D6
	Prepared	Checked	MACHINERY
Design	H.R.C.		RAIL LOCKING BAR STOP ~ LOCATION — 18
Drawing	P.H. 14-1-59		
Tracing			Designs Engineer. / Chief Engineer. — Sheet No. of sheets.
Supervision			



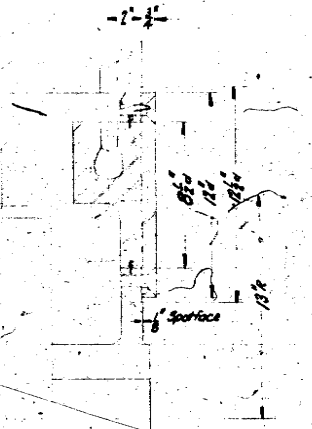
NOTE:

1. Cast solid without holes & do not allow for machining
2. Tapped hole to be square to drilled hole.
3. Cast in cast iron grade 2 A.S.S. B82.

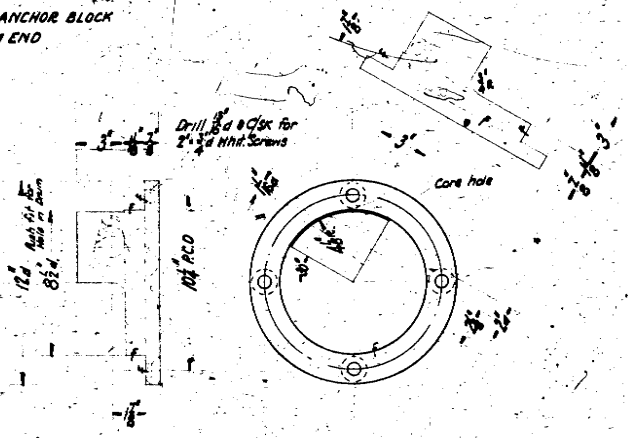
Scales	Road Plans		DEPARTMENT OF PUBLIC WORKS - TASMANIA
Full Size	File No.		BRIDGEWATER BRIDGE GUIDE LUG FOR TRAFFIC GATE — 15 D — 6-19
	Loading		
	Prepared	Checked	
Design	H. F. G.		
Drawing	B. D. T.		
Tracing	——		
Supervision			Bridge Engineer / Chief Engineer — Sheet N° 13 of sheets



END ELEVATION SHOWING ANCHOR BLOCK IN POSITION IN DRUM END



SECTION



DETAIL OF ANCHOR BLOCK

4 - Off, Steel Castings.

To replace out of line cored Rope End Anchorages in L.H. Helix Winding Drums, Dwg No. H/4988

No. Off	Description
16	M.S. 2" 3/4d. Whit Screws C'bk
4	C.S. Anchor Block Castings.

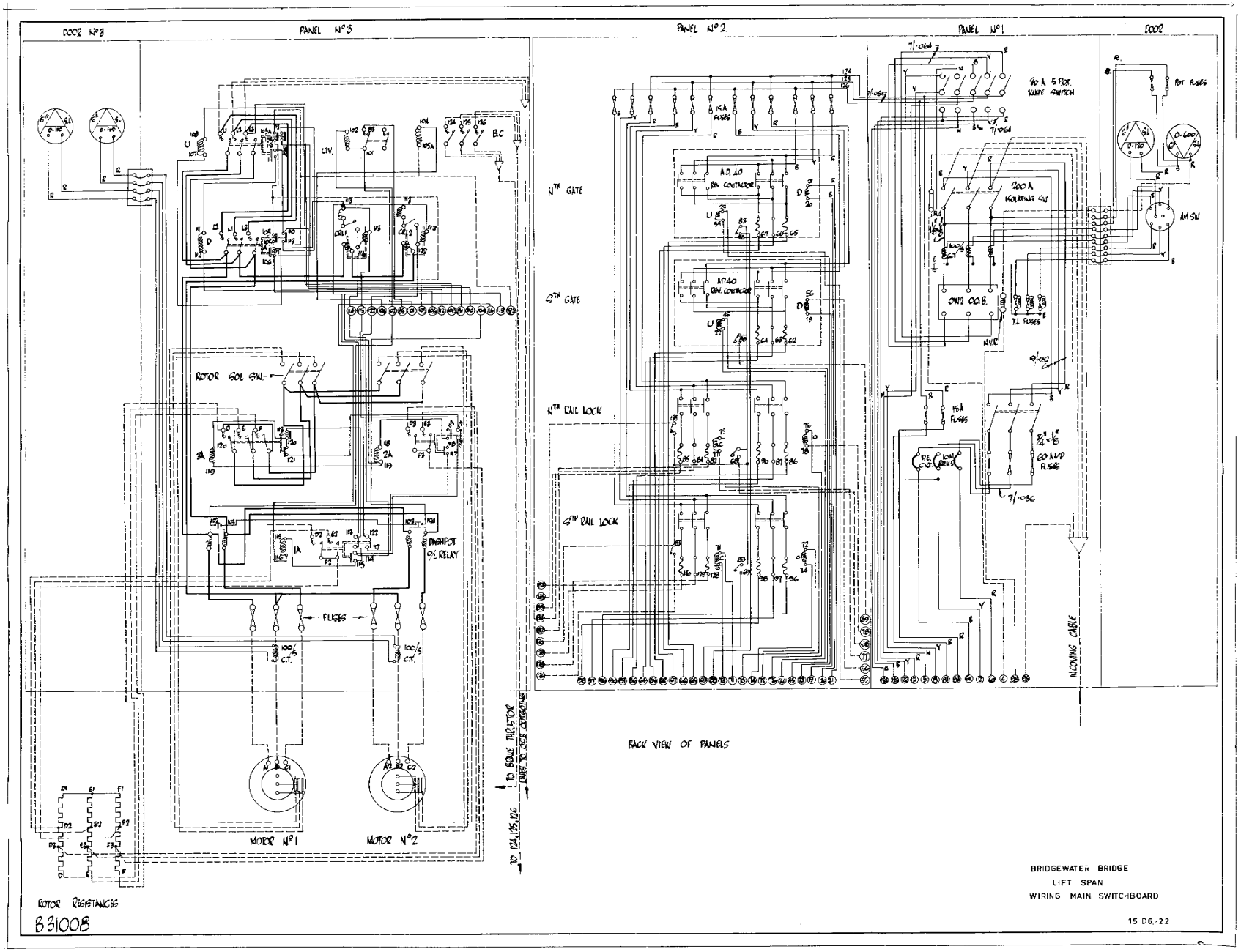
DERWENT RIVER-BRIDGE LIFTING GEAR ADDITIONS.

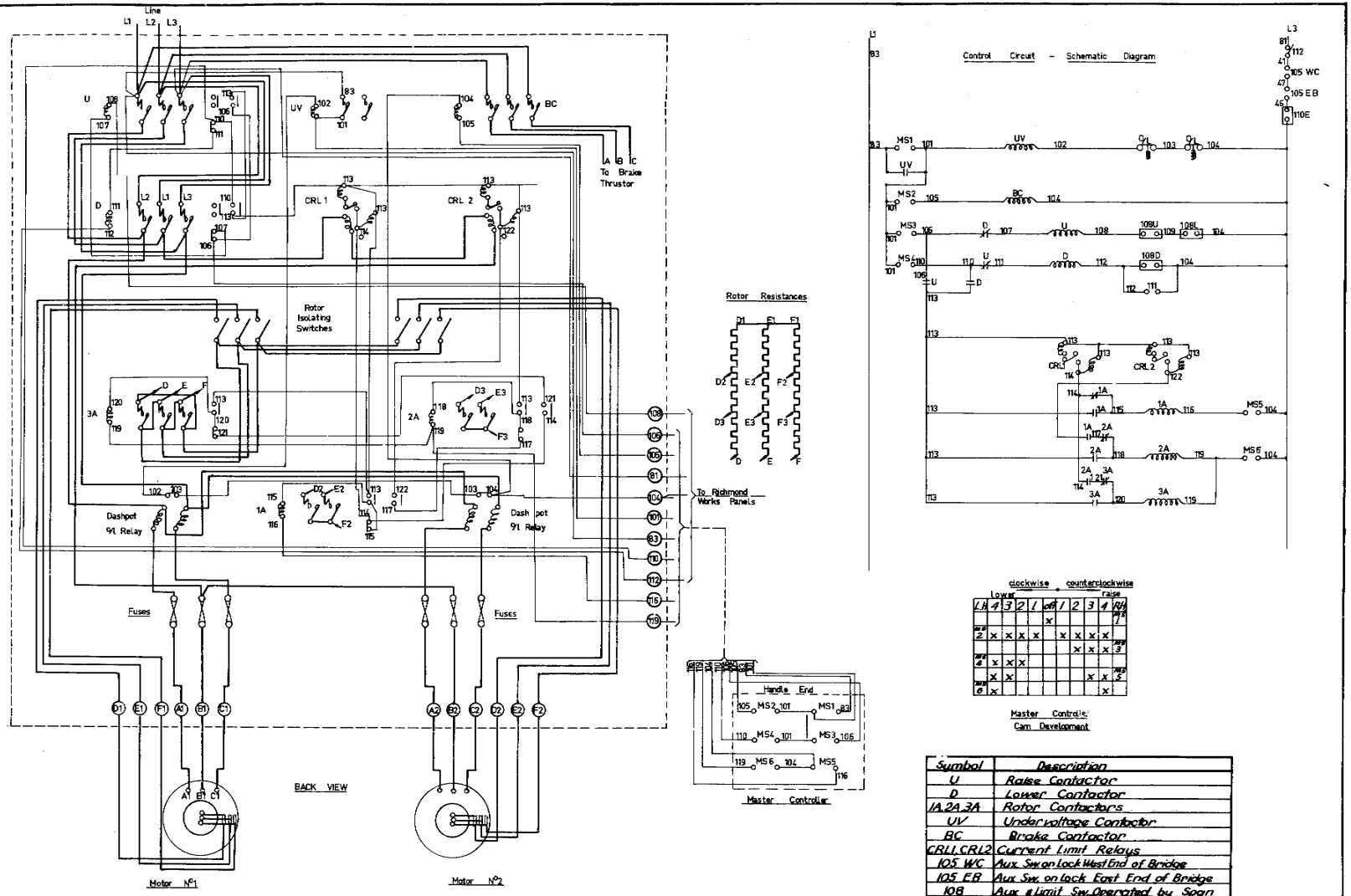
DETAILS OF ROPE END ANCHOR BLOCKS FOR DRUMS

Public Works Dept. Tas.

3" 5.6.45

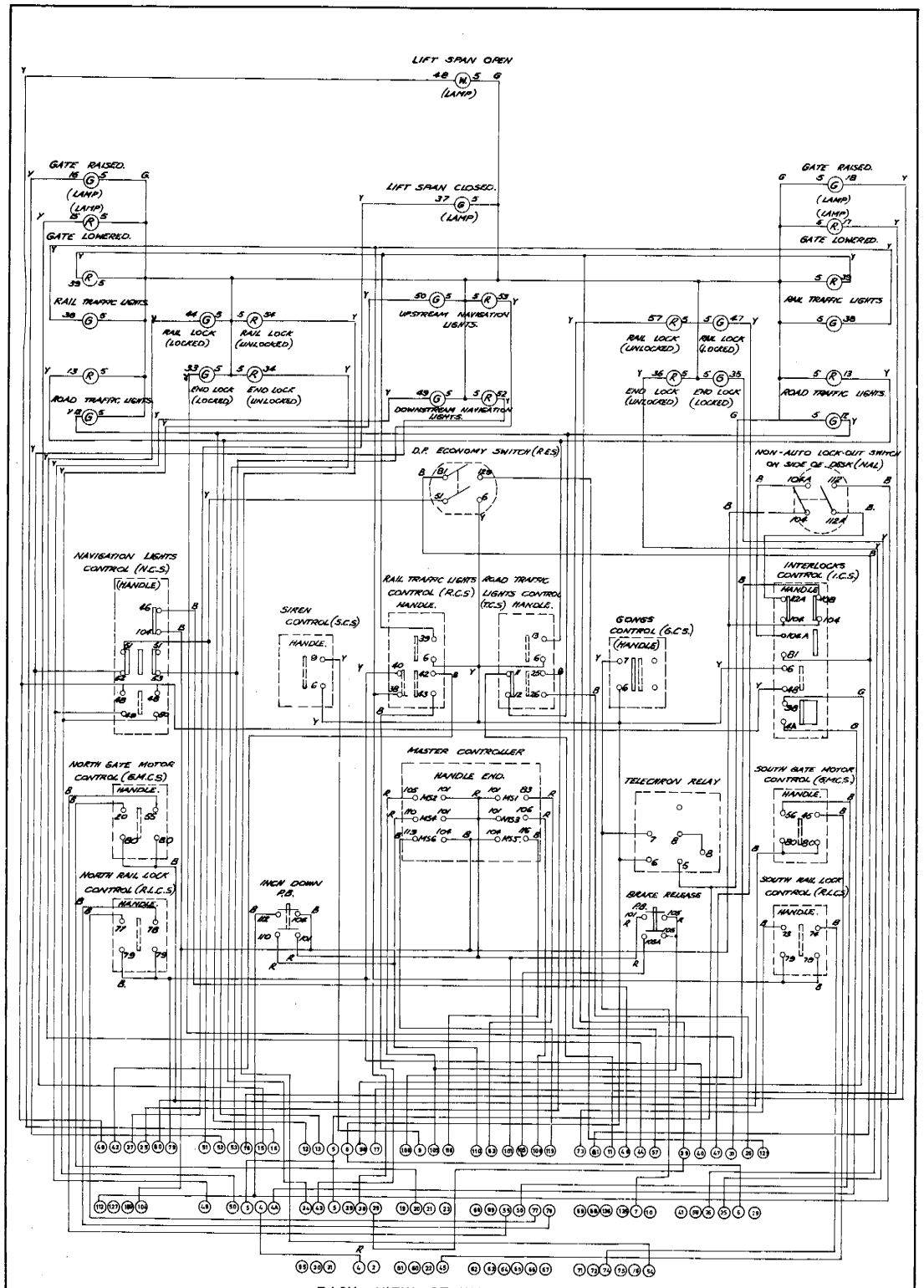
15576


DOOR N°3
PANEL N°3
PANEL N°2
PANEL N°1
DOOR
N^TH GATE
S^TH GATE
N^TH RAIL LOCK
S^TH RAIL LOCK
ROTOR ISOL SW.
ENGINE O/L RELAY
FUSES
MOTOR N°1
MOTOR N°2
ROTOR RESISTANCES
B31008
TO BASE, TAILLIGHTS
TO 124, 125, 126
CABLE TO DECK OUTSTATIONS
BACK VIEW OF PANELS
60 A 5 POS. JUMPER SWITCH
200 A ISOLATING SW.
AM SW.
POT FUSES
T.L. FUSES
15A FUSES
60 AMP FUSES
ALCOVING CABLE
BRIDGEWATER BRIDGE
LIFT SPAN
WIRING MAIN SWITCHBOARD
15.06.22



Symbol	Description
U	Raise Contactor
D	Lower Contactor
1A,2A,3A	Rotor Contactors
UV	Undervoltage Contactor
BC	Brake Contactor
CRL1,CRL2	Current Limit Relays
105 WC	Aux. Sw on lock West End of Bridge
105 EB	Aux Sw. on lock East End of Bridge
108	Aux. Limit Sw. Operated by Span
118	D.P.Sw Economy Contr. on Red Nav. Lgts.

	BRIDGEWATER BRIDGE LIFT SPAN WIRING DIAGRAM	15D6 -23



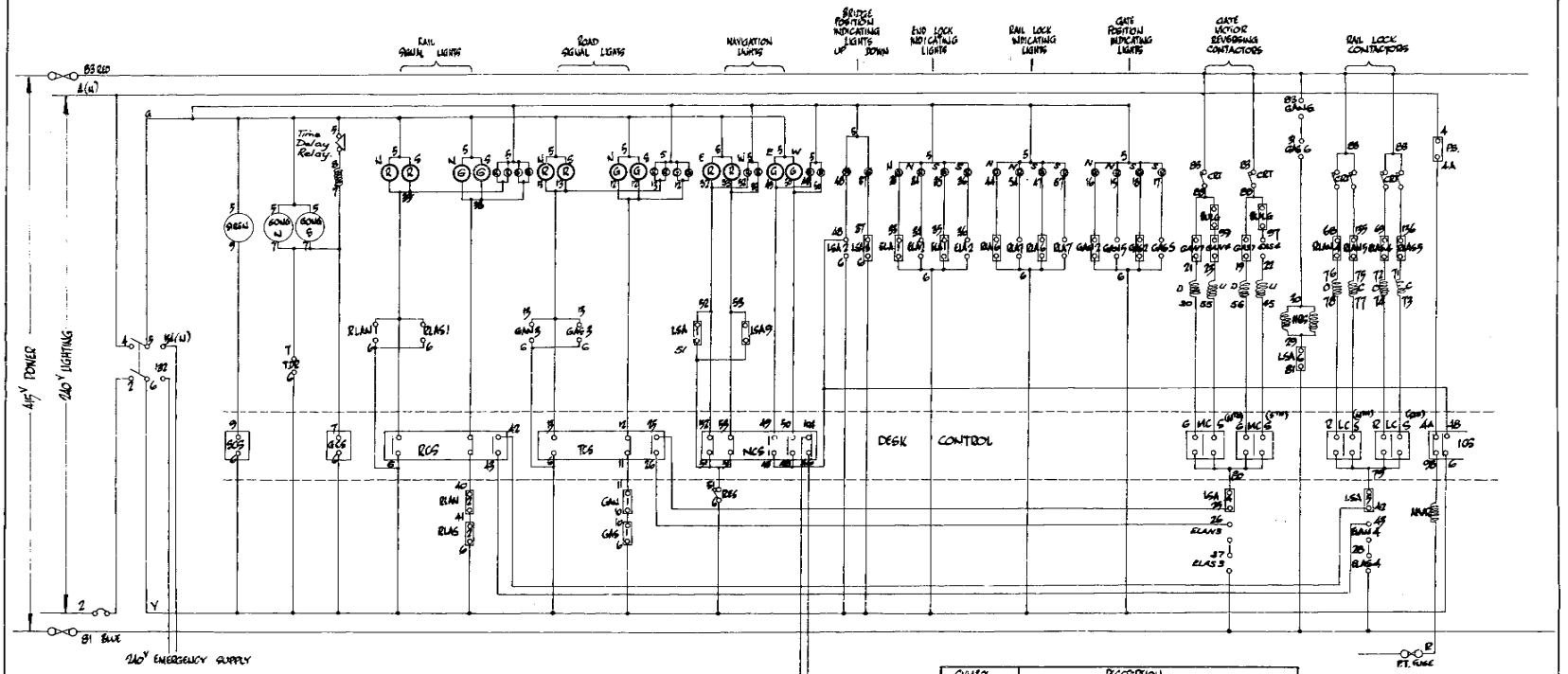
BACK VIEW OF WIRING SHOWN

MON DOWN SB WAS 103-108-106-107 MSB WAS 107-110 MLR " 106-101

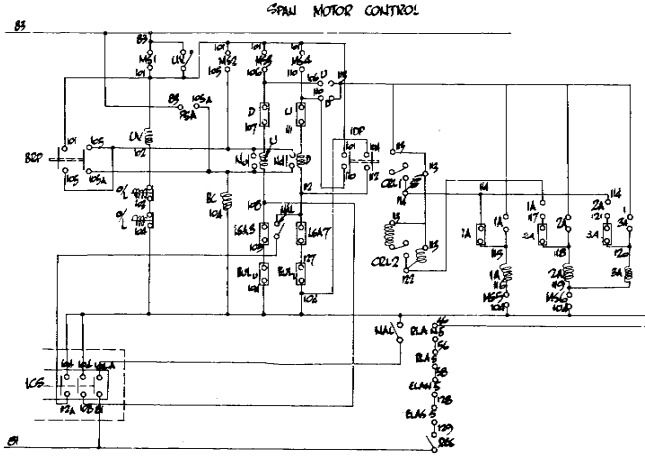
BRIDGEWATER BRIDGE WIRING - DESK CONTROL

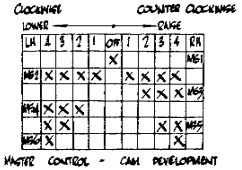
15 D6 - 24

DIAGRAM SHOWS SWITCH POSITIONS FOR LIFT SPAN IN LOWERED LOCKED POSITION



SPAN MOTOR CONTROL





MASTER CONTROL - CAM DEVELOPMENT

SYMBOL	DESCRIPTION
ACS	NORMALLY OPEN HOA RETURN CONTROL SWITCH (HAND)
GCS	" " " SPRING " " " (GATES)
RLCS	RAIL LIGHTS CONTROL SWITCH
TCS	ROAD " " "
NCS	NAVIGATION LIGHTS CONTROL SWITCH
GMCS	GATE MOTOR CONTROL SWITCH
RLCS	RAIL LOCKS " "
ICS	HUMPER LOCKS " "
BRP	BRAKE RELEASE PUSH BUTTON STATION
IDP	INCH DOWN " " "
TDR	TIME DELAY RELAY CONTACTS
RLA 1 2 3 ETC.	RAIL LOCK AUX & LIMIT SWITCHES } NUMBERS REFER TO
GA 1 2 3 "	GATE " " " } INDICATING SWITCHES
LSA 1 2 3 "	LIFT SPAN " " " } IN EACH CASE
ELA 1 2 3 "	END LOCK " " " } N-NORTH ; S-SOUTH
BG	RED NAVIGATION LIGHTS IN ECONOMY SWITCH
NRS	END LOCK MANUAL RELEASE SOLENOID
CDT	CONTACTOR RELAY HEATER STRIP
PB	PEDAL SWITCH
NVR	NO VOLT RELEASE TRIP ON MAIN SUPPLY OCB
UV	UNDERVOLTAGE CONTACTOR
U	RAISE CONTACTOR FOR SPAN LIFTING MOTORS
D	LOWER " " " " " "
N_U N_d	AUX. SWITCHES ON "UP" AND "D" RESPECTIVELY
MAL	"HAND-AUTO" LOCK OUT SWITCH
CRL1 , CRL2	CURRENT LIMIT RELAYS
BUL u	BACK UP UPPER LIMIT SWITCH OPERATED BY LIFT SPAN
BUL l	" " LOWER " " " " " "
1A, 2A, 3A	MOTOR CONTACTOR FOR SPAN LIFTING MOTORS
BC	BRAKE CONTACTOR
PSA	PEDAL OR PB SWITCH FOR BRAKE RELEASE USING ROCKING
	LIMIT SWITCH CONTACTS CLOSED
	" " " OPEN
	OPERATING COIL
	INDICATING LIGHT ON DESK CONTROL PANEL
	MAIN TRAFFIC OR NAVIGATION LIGHTS
BULG	BACK-UP UPPER LIMIT SWITCH OPERATED BY ROAD GATE

BRIDGEWATER BRIDGE
WIRING CONTROL CIRCUITS

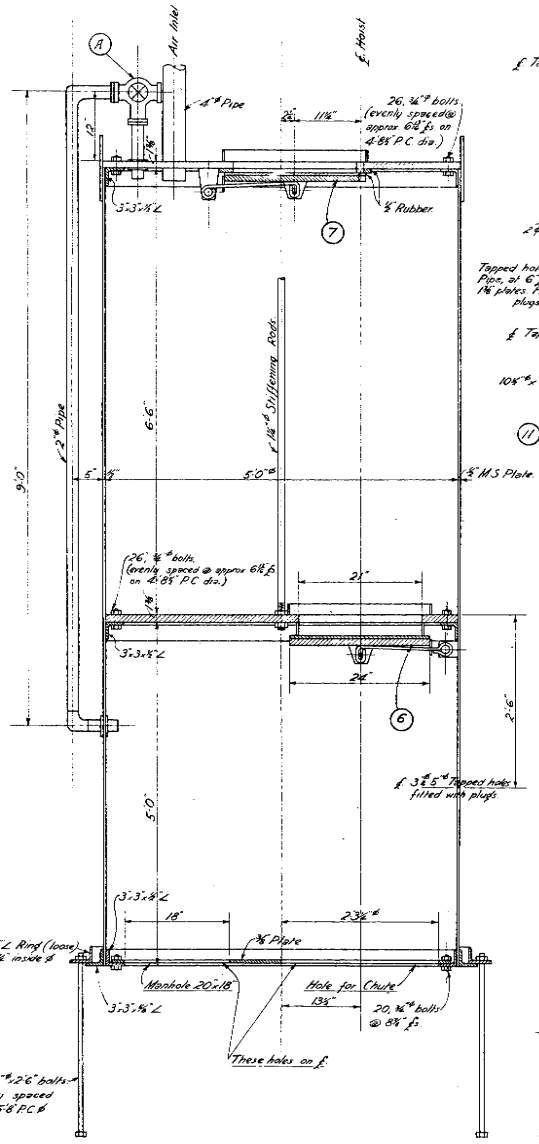
15 D6 - 25

B 33100

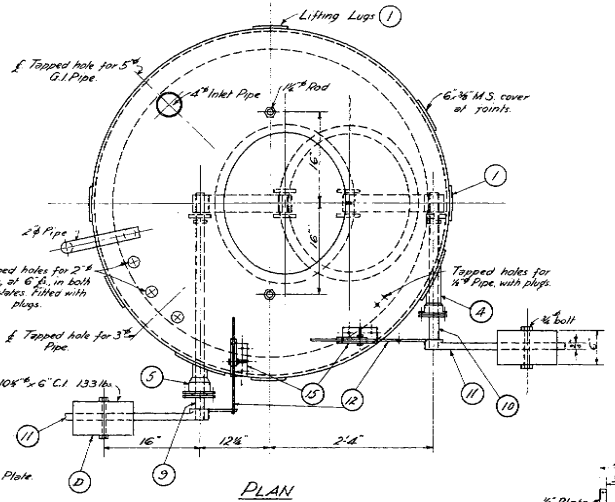
BRIDGEWATER BRIDGE

D7- MISCELLANEOUS

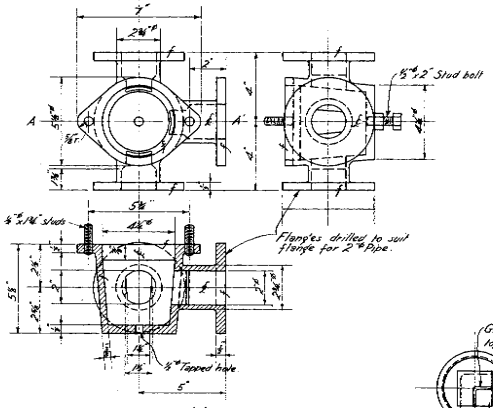
TABLE OF CONTENTS



SECTIONAL ELEVATION

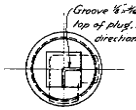


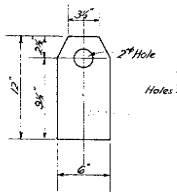
PLAN



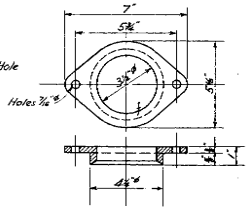
SECTION A'A'

PLUG COCK C.I.
Make 1 Patt A

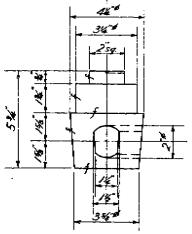




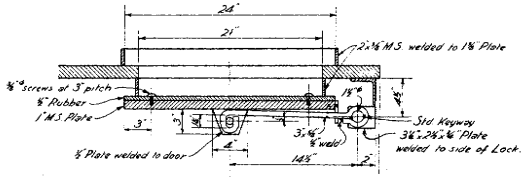
LIFTING LUGS M.S.
Make 4 Mark 1

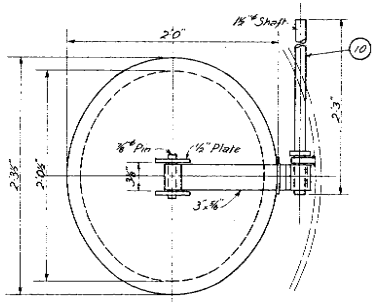


GLAND C.I.
Make 1 Patt B

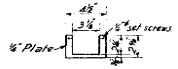


PLUG C.I.
Make 1 Patt C

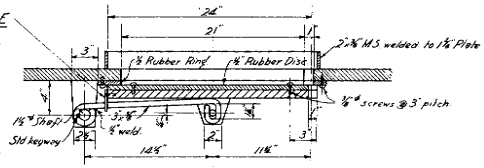


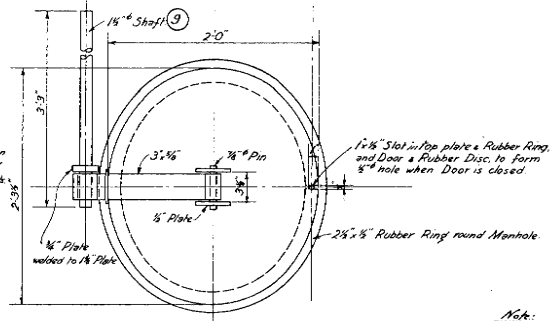


INVERTED PLAN
MANHOLE DOOR & HINGE M.S.
Make 1 Mark 6

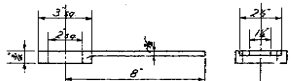


HINGE GUIDE
Make 2 Mark 8

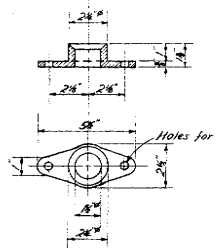




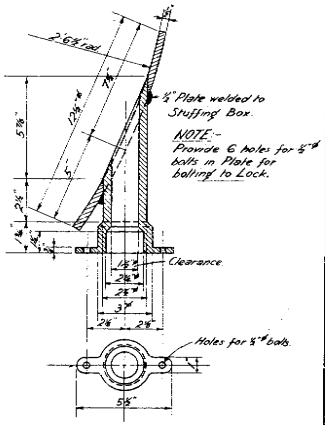
INVERTED PLAN
MANHOLE DOOR & HINGE M.S.
Make 1 Mark 7



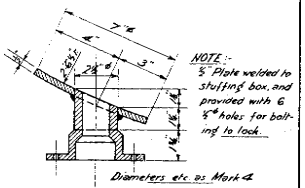
PLUG COCK LEVER M.S.
Make 1 Mark 2



GLAND M.S.
Make 2 Mark 3



STUFFING BOX M.S.
Make 1 Mark 4



STUFFING BOX M.S.
Make 1 Mark 5

Note:
All welds, unless otherwise shown, to be ¼".
Electrodes to be either O.A. Ironium or E.M.F. New Era.

Reference:
Engr's Details of Air Lock 450-6.

DERWENT RIVER BRIDGE
AT BRIDGEWATER
Details of Air Lock

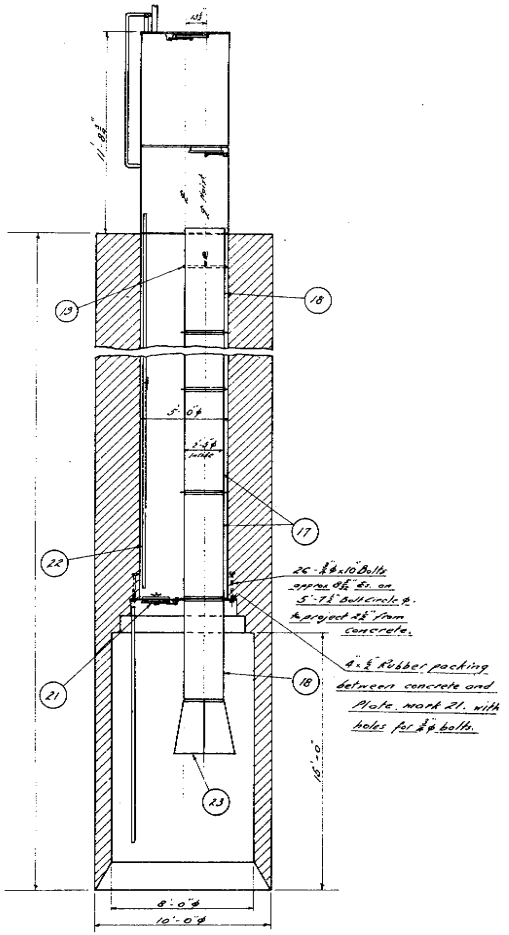
Scales:- 3", 1½", 1"-1'0"

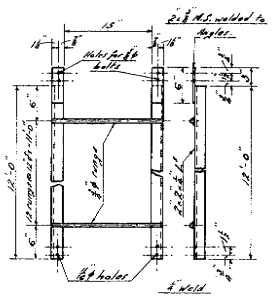
PUBLIC WORKS DEPT TAS.

No	Revisions		
		Submitted	
		Checked	
		Approved	

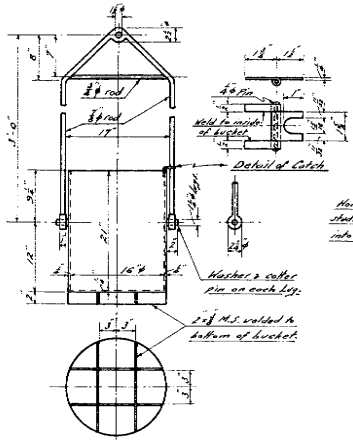
15 D-5

15 D 7-1 DRR. No PUB. WKS.



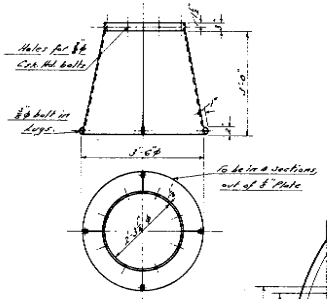


LADDER M.S.
Make Mark 22
Weight 108 lbs.

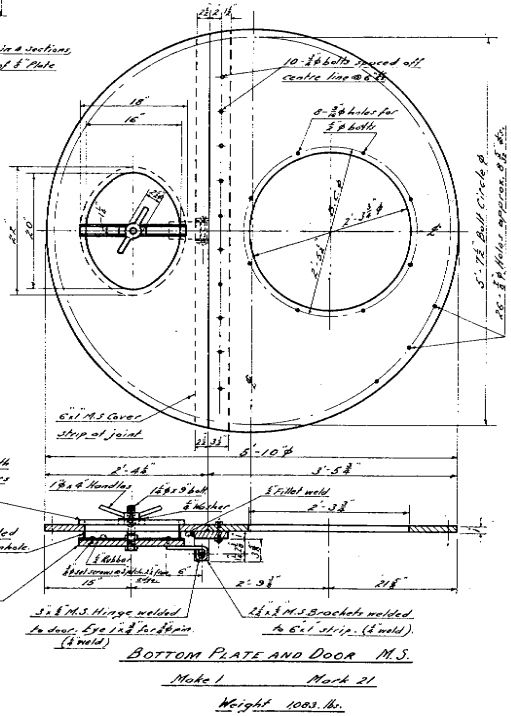


Plan of Bottom

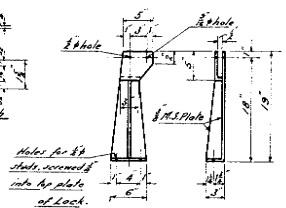
BUCKET M.S.
Make 1 Mark 20
Weight 126 lbs.



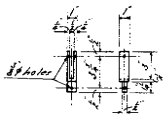
BUCKET GUIDE M.S.
Make 1 Mark 23



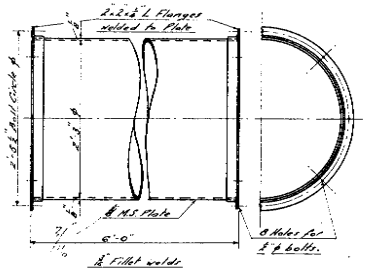
BOTTOM PLATE AND DOOR M.S.
Make 1 Mark 21
Weight 1083. lbs.



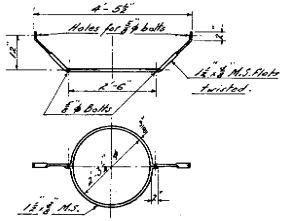
LEVER SUPPORT M.S.
Make 2 Mark 15



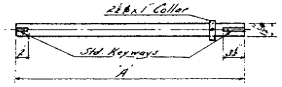
CONNECTING LINK M.S.
For Mark 13
Make 2 Mark 16



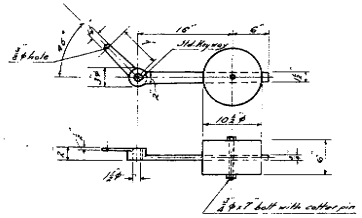
CHUTE M.S.
Make as drawn Mark 17
Weight 262 lbs.
Make 2 with one flange and one end drilled to suit Mark 23. Mark 18
Weight 239 lbs.



CHUTE SUPPORT M.S.
Make 1 Mark 19

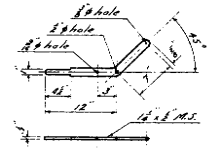


DOOR SHAFT M.S.
Make 1 Dim. A - 3'-3" Mark 9
Make 1 " " - 2'-3" Mark 10

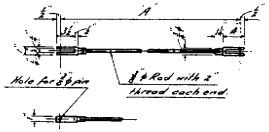


CT WEIGHT LEVER M.S.
Make 2 Mark 11

COUNTER WEIGHT CI.
Make 2 Path D
Weight 133. lbs.



DOOR LEVER M.S.
Make 2 Mark 12



DOOR LINK M.S.
Make 1 Dim. A - 15⅝" Mark 13
Make 1 " " - 8'-7½" Mark 14

References:-
Details of Air Lock 15D-5
Substructure Glinder under Toe of Barcule 15D-7.

DERWENT RIVER BRIDGE
AT BRIDGEWATER
ARRGT AND DETAIL OF AIR LOCK

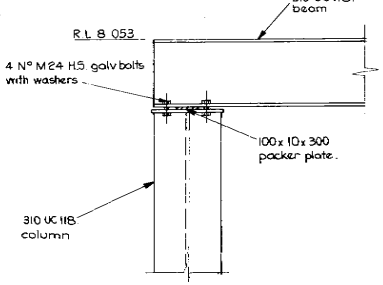
Scales:-3", 1", ½" & ¼"-1 Foot

PUBLIC WORKS DEPT TAS.

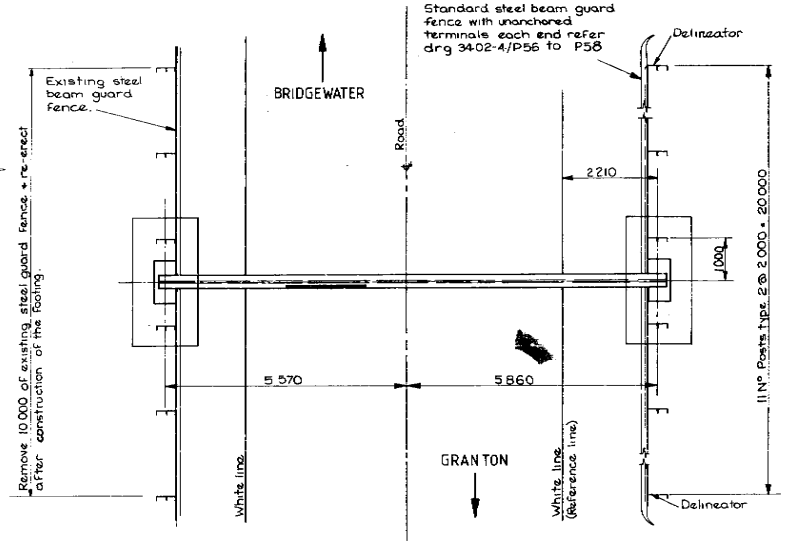
No	Revisions		
		Submitted	15D-6
		Checked	
		Approved	15D7-2 DIR OF PUB WKS

15D7

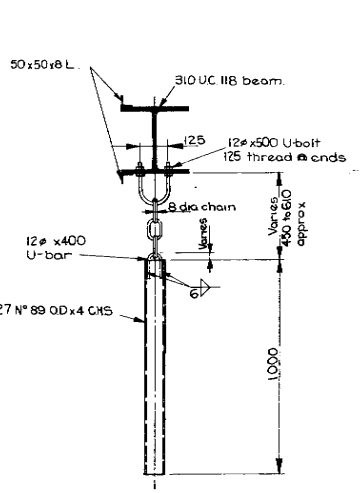
DRG. NO. 1507/ 6



DETAIL A
Scale 1:10

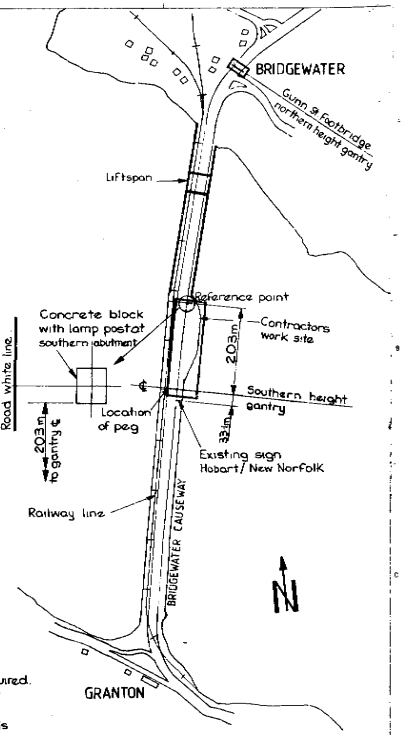


PLAN
Scale 1:50

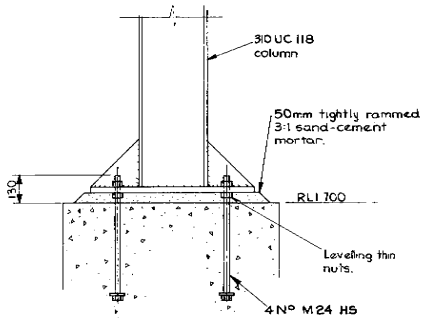


DETAIL C
Scale 1:10

NOTES
1. N° of chain links to each bell varies according to road crossfall and road clearance of 4 600 required.
2. Fine levelling of bells by U-bolt adjustment.
3. After final levelling, cut U-bolt ends above nuts to give 25mm projection

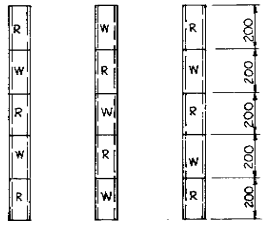


LOCALITY PLAN
LIMITS OF CONTRACT shown thus ▭



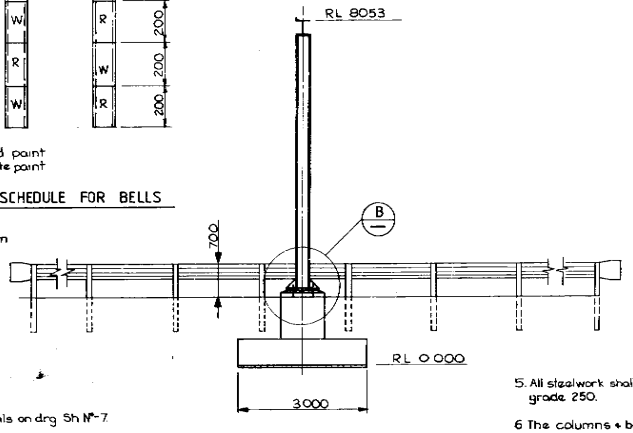
DETAIL B
Scale 1:10

FRONT ELEVATION
Scale 1:50



R- Red paint
W- White paint

PAINTING SCHEDULE FOR BELLS

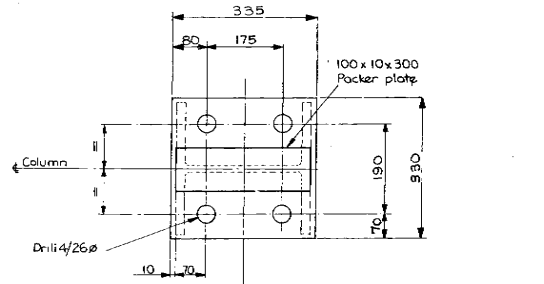


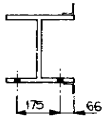
SIDE ELEVATION
Scale 1:50

NOTES
1. Footing, column and beam details on drg Sh N°-7
2. Design bearing pressure for footing is 150 KPa. Footings shall not be constructed on filled ground unless approved by Engineer.
3. Concrete grade 32 + blinding concrete grade 15
4. Refer to spec for protective treatment to gantry members.
5. All steelwork shall be AS 3679 1990 grade 250.
6. The columns + beam of the gantry shall be applied top coating of bronze olive colour
7. All bells shall be applied top coating as shown with alternate stripes of red + white paint.

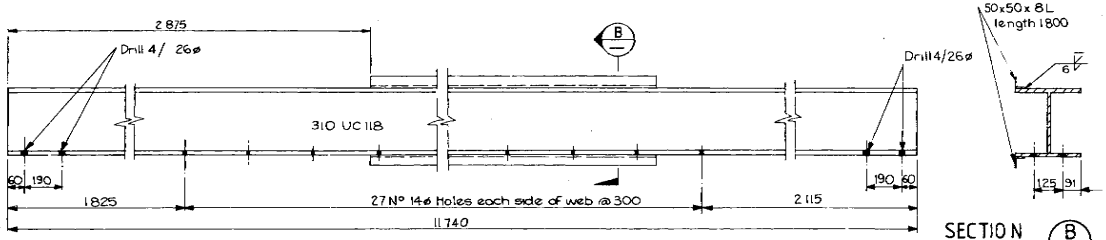
	REFERENCE DRAWINGS: Standard steel beam guard fence. 3402-4/P56, P57, P58.	SCALES: 1:50 / 1:10	LOADING	DESIGN	DRAWING: R.J.D 30-10-90	LOCATION: MIDLANDS HIGHWAY BRIDGEWATER	CONTRACT NUMBER: 202	DEPARTMENT OF ROADS AND TRANSPORT, TASMANIA
DATE	AMENDMENTS	APPROVED	PREPARED: DP	CHECKED: EAP	SUPERVISED:	RECOMMENDED: PRIN. ENGINEER BRIDGE DESIGN	APPROVED: DESIGN MANAGER	DERWENT RIVER BRIDGE SOUTHERN HEIGHT GANTRY ASSEMBLY
							CONTRACT SHEET NO.	PROJECT NUMBER: 1507 SHEET NUMBER: 6

DRG NO 15D7/ 7



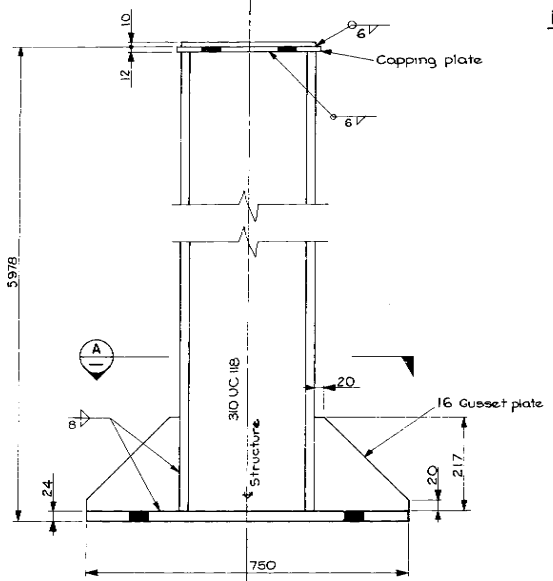


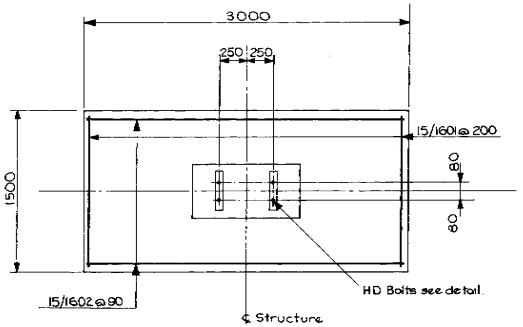
END ELEVATION
Opposite end similar

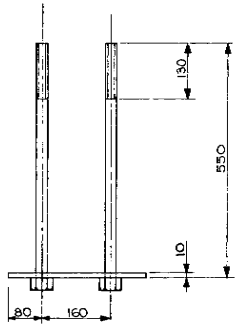


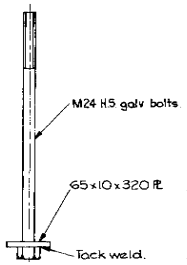
SECTION B

BEAM 1 REQD
Scale 1:10



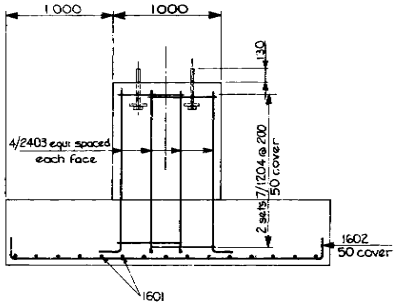


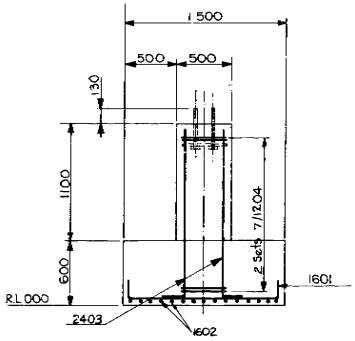




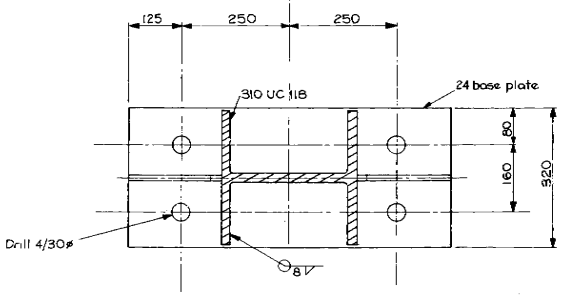
FOOTING HD BOLTS 4 REQD
Scale 1:5

Note Supply each bolt assembly with galv nuts, thin nuts and washers.





FOOTING 2 REQD
Scale 1:20

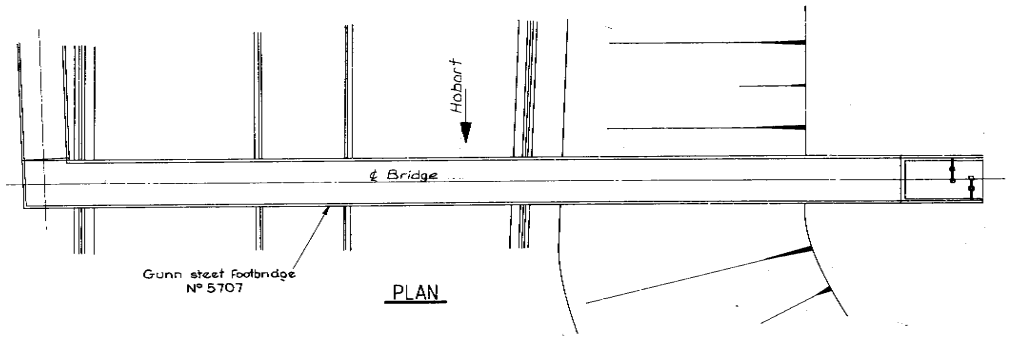


SECTION A

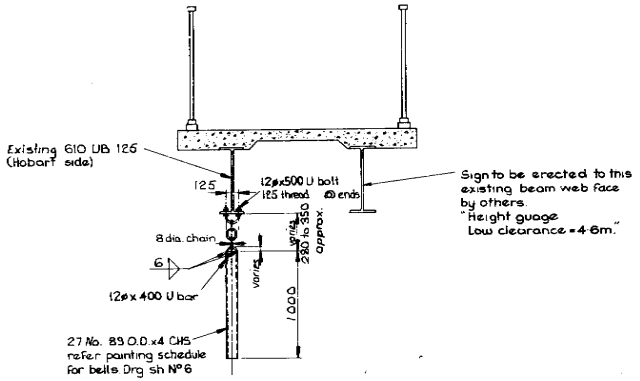
COLUMN 2 REQD
Scale 1:5

DATE	AMENDMENTS	APPROVED	REFERENCE DRAWINGS	SCALES 1:5 1:10 1:20	LOADING	DESIGN	DRAWING	LOCATION: MIDLANDS HIGHWAY BRIDGEWATER	CONTRACT NUMBER: 202	DEPARTMENT OF ROADS AND TRANSPORT, TASMANIA	
					PREPARED	DP	R.J.D 5-12-90	RECOMMENDED: PRIN. ENGINEER BRIDGE DESIGN	CONTRACT SHEET NO.	DERWENT RIVER BRIDGE	BRIDGE NUMBER 15D7
					CHECKED			APPROVED: / DESIGN MANAGER		SOUTHERN HEIGHT GANTRY DETAILS	SHEET NUMBER 7
					SUPERVISED						

DRG. NO. 1507 | 8



PLAN

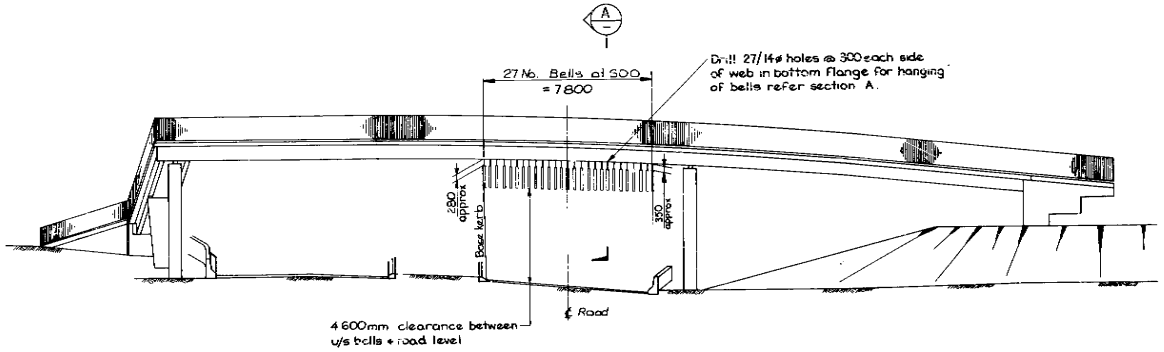


SECTION A

Note 1. N° of chain links to each bell varies according to road crossfall and road clearance of 4 600 required.

2. Fine levelling of bells achieved by U-bolt adjustment.

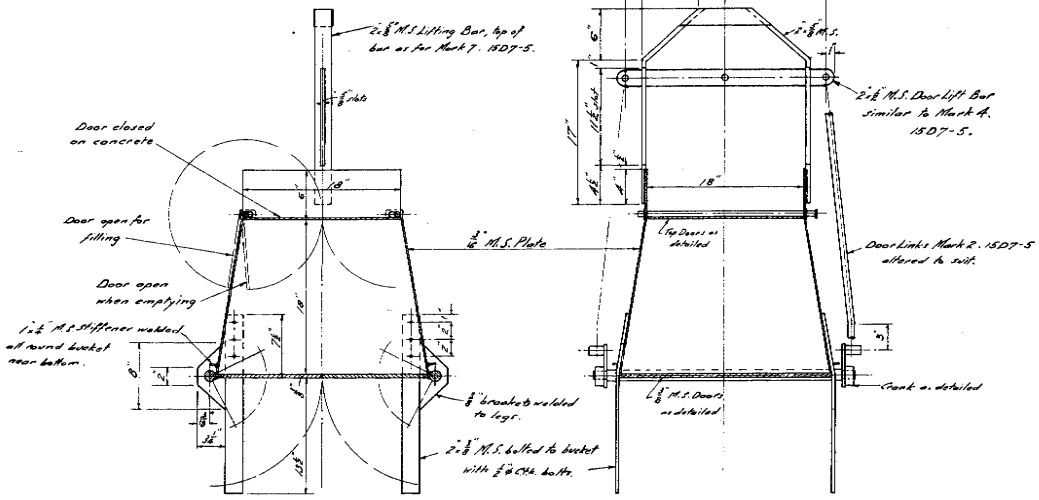
3. After final levelling, cut U-bolt ends above nuts to give 25mm projection.



ELEVATION

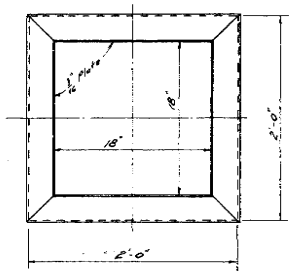
Refer to 1507/N°6 for footbridge location + limit of contract

DATE	AMENDMENTS	APPROVED	REFERENCE DRAWINGS	SCALES 1:100 1:20	LOADING	DESIGN	DRAWING	LOCATION MIDLAND HIGHWAY BRIDGEWATER	CONTRACT NUMBER 202	DEPARTMENT OF ROADS AND TRANSPORT, TASMANIA
					PREPARED	DP	JWCC 18-3-91	RECOMMENDED PRIN. ENGINEER BRIDGE DESIGN	APPROVED DESIGN MANAGER	DERWENT RIVER BRIDGE
					CHECKED	EAP	AMW 26-3-91		CONTRACT SHEET NO.	NORTHERN HEIGHT GANTRY ASSEMBLY
					SUPERVISED		JK 25.3.91			BRIDGE NUMBER 1507 SHEET NUMBER 8

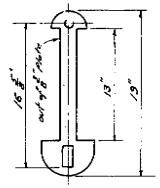


SECTIONAL ELEVATION

SECTIONAL ELEVATION

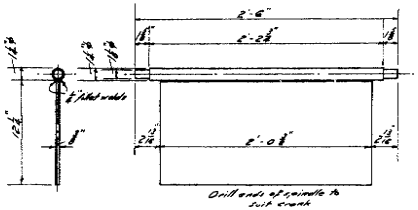


PLAN



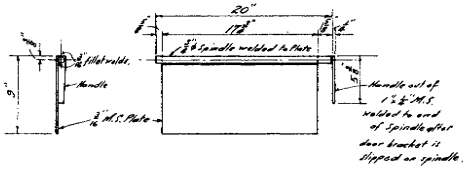
Remaining dimensions as on Mark 6. 15D7-5.

LINK M.S.



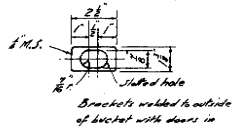
BOTTOM DOOR M.S.

2 off.



TOP DOOR M.S.

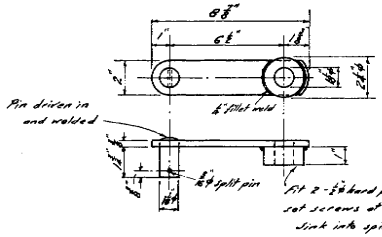
2 off.



Brackets welded to outside of bucket with doors in position.

TOP DOOR BRACKET M.S.

4 off.



DOOR CRANK M.S.

4 off.

Reference:
Bottom Dump Bucket 15D7-5

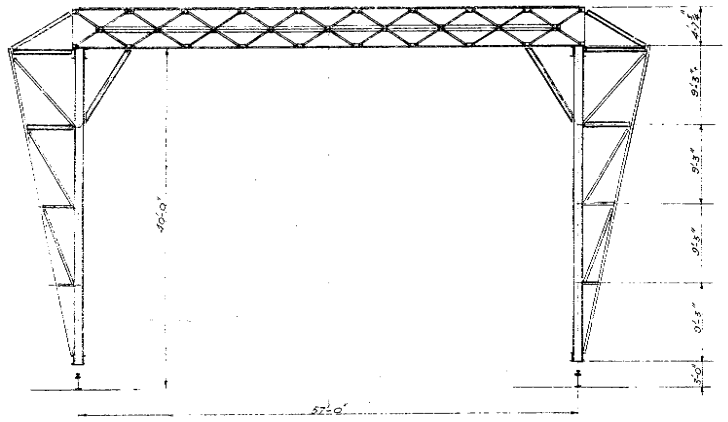
Note:
Door Lift Hook. Mark 5. 15D7-5.

DEPARTMENT OF PUBLIC WORKS - TAS.

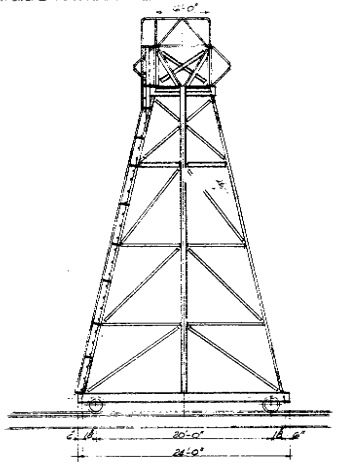
DERWENT RIVER BRIDGE
AT BRIDGEWATER
REVISED BOTTOM DUMP BUCKET

	Prepared	Checked	
State Highways			15D7 -17
Bridges			
Plans			
Supervision			

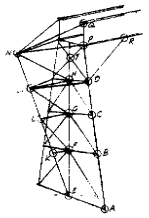
CHIEF ENGINEER



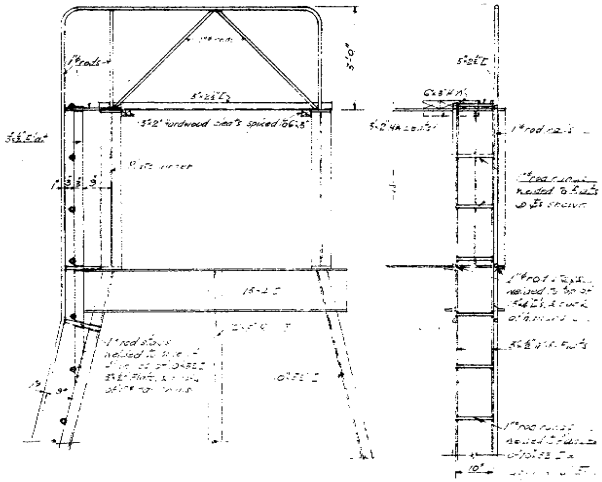
SIDE ELEVATION



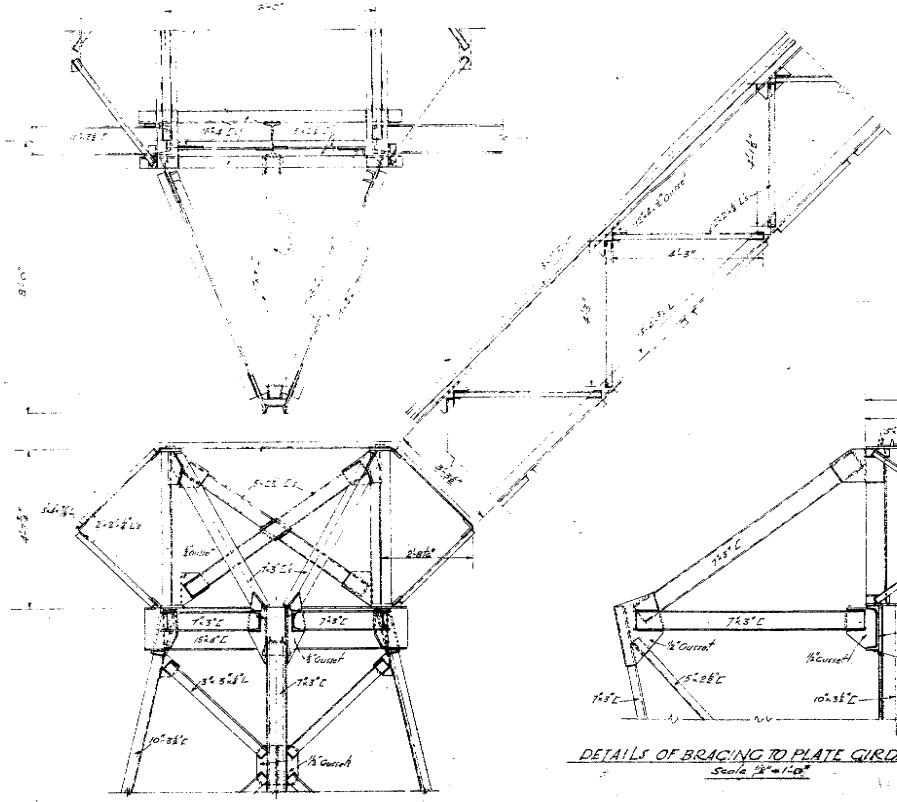
END ELEVATION



JOINT DIAGRAM
NOT TO SCALE

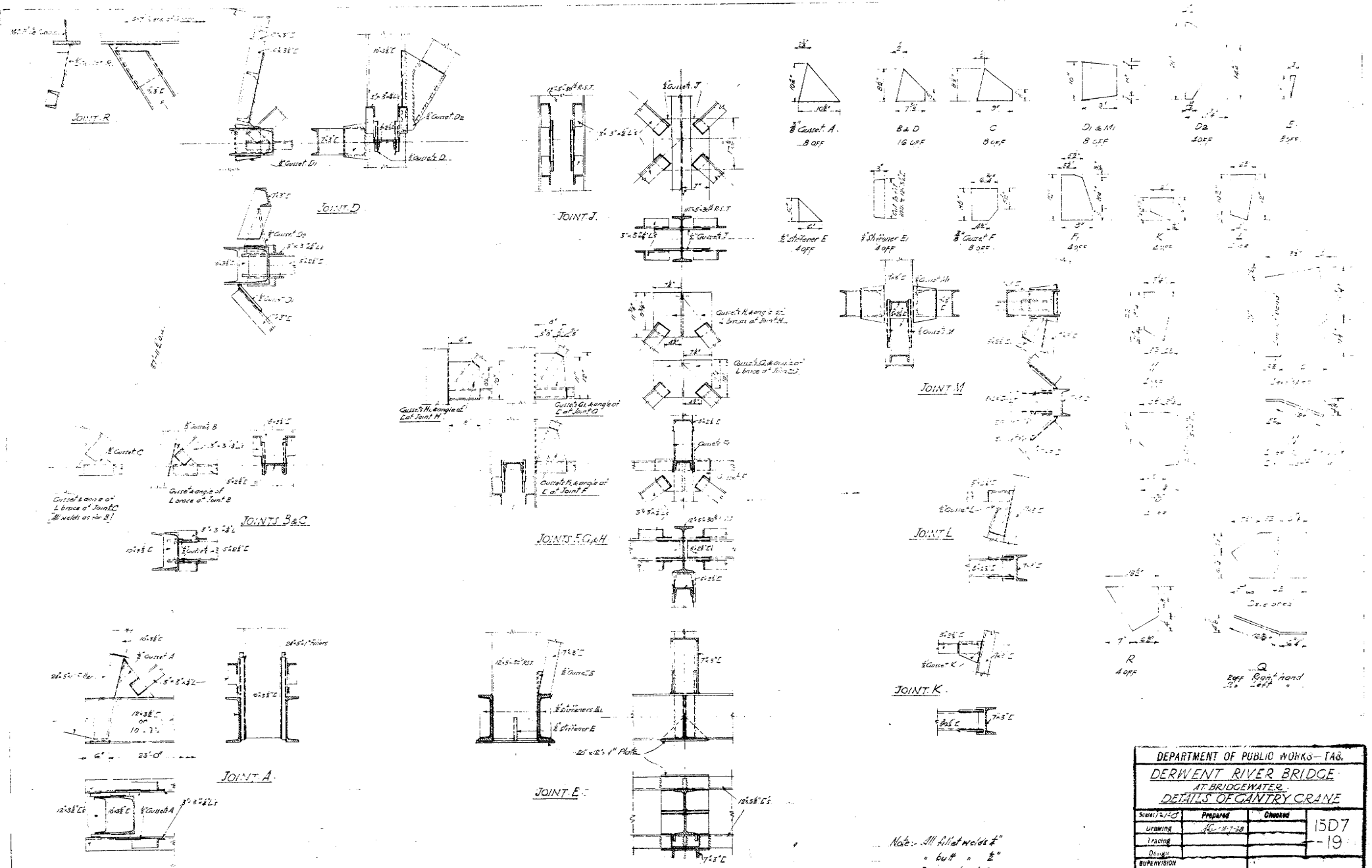


DETAILS OF LOWER HANGERS & STRUTS
"A" in bracing on "end"
Scale 1"=1'-0"



DETAILS OF BRACING TO PLATE GIRDERS ETC.
Scale 1"=1'-0"

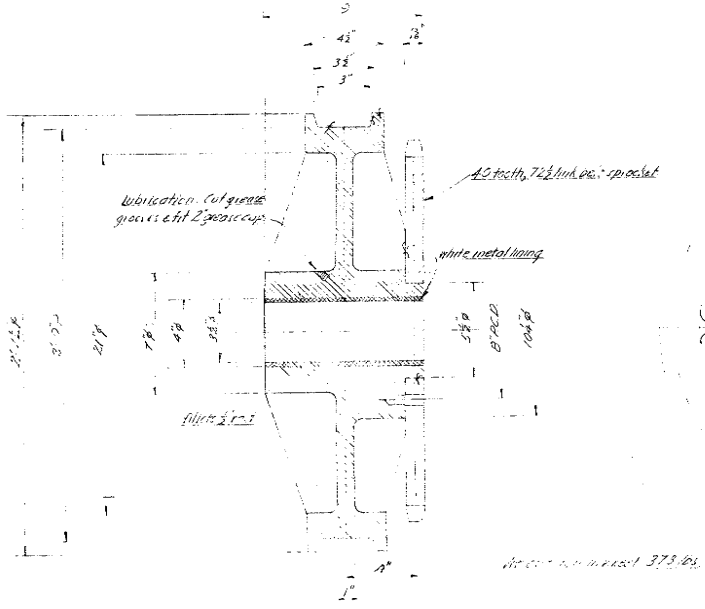
DEPARTMENT OF PUBLIC WORKS – TAS.			
DERWENT RIVER BRIDGE AT BRIDGEWATER DETAILS OF GANTRY CRANE.			
SCALE 1"=1'-0"	Prepared	Checked	15D7 -18
DRAWN	J.C. 15-7-30		
TRACED			
CHECKED			
SUPERVISION			CHIEF ENGINEER



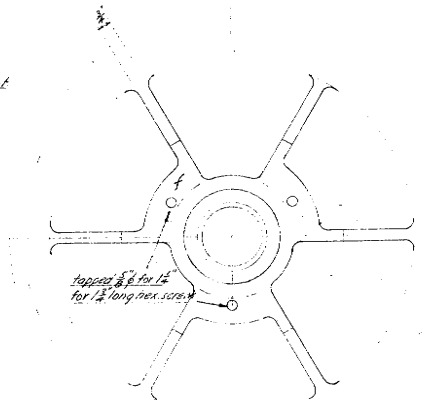
DEPARTMENT OF PUBLIC WORKS—TAS.

DERWENT RIVER BRIDGE
AT BRIDGEWATER.
DETAILS OF GANTRY CRANE

Scale: 1/2"=1'-0"	Prepared	Checked	1507 -19
Drawing	AC 15-7-38		
Tracing			
Design			
SUPERVISION		CHIEF ENGINEER	



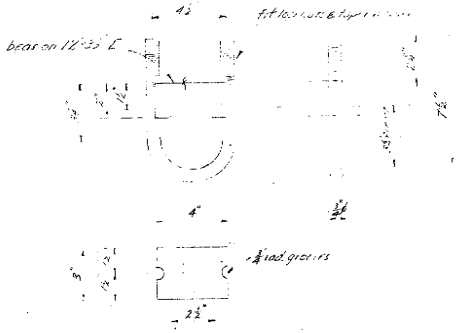
SECTION



ELEVATION

ATTACHMENT OF DRIVING WHEEL

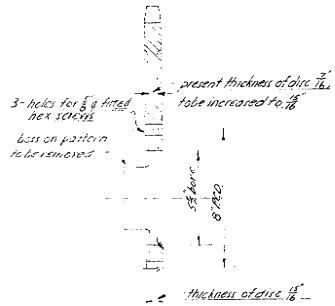
Cast 4 off one fit two only with sprocket.



SHAFT PILLOW AND U-BOLT

U-bolt ¾ ø m.s. Pillow C.I.

Make 8 off



ALTERATIONS TO 40 TOOTH SPROCKET PATTERN

Cast 2 off C.I.

Sprocket for use with 7½" link belting.

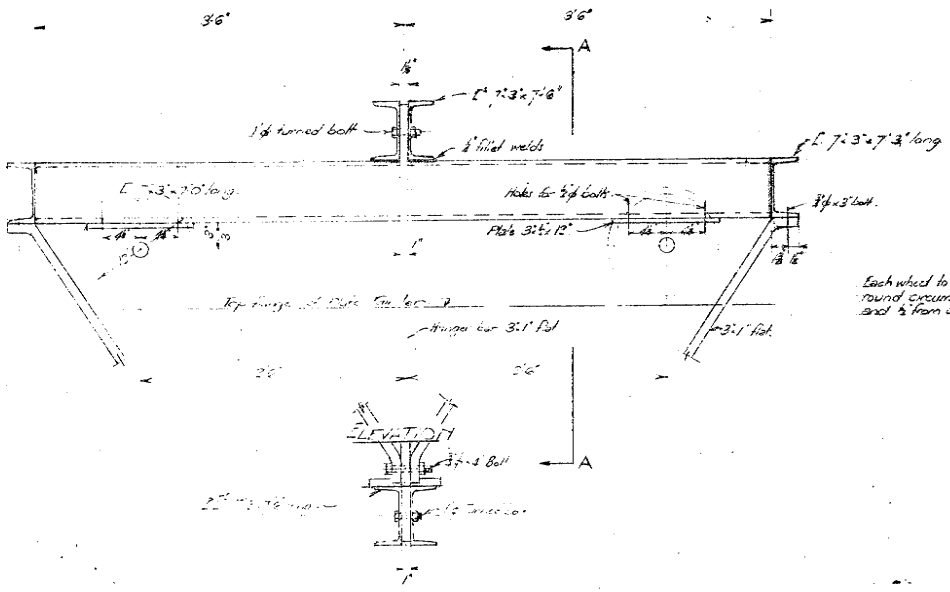
AXLE PINS 3½" ø M.S.

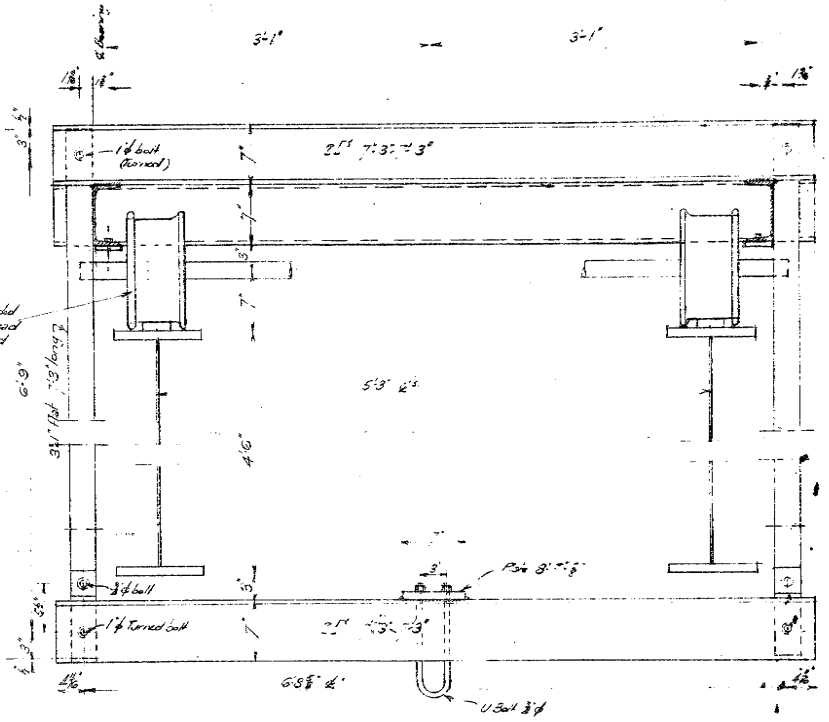
Make 4 off Weight 52 lbs. ea.

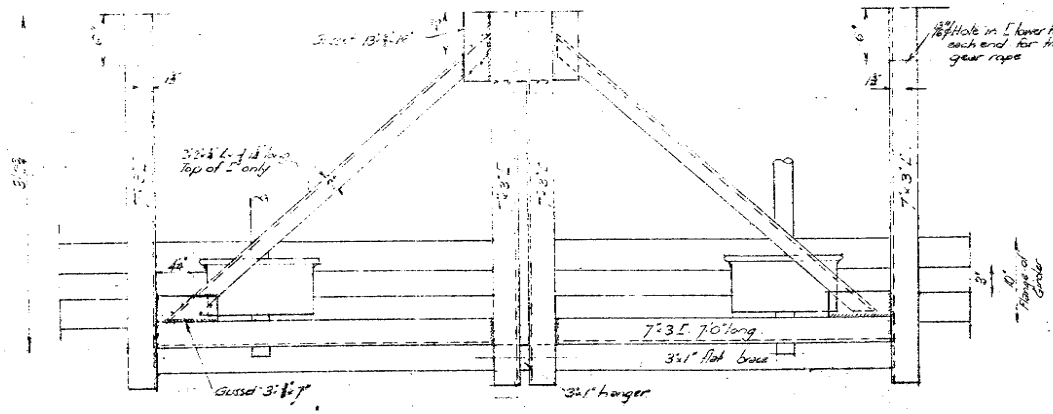
AXLE PIN COLLAR M.S.

Make 8 off.

DEPARTMENT OF PUBLIC WORKS TAS.			
DERWENT RIVER BRIDGE AT BRIDGEWATER			
DETAILS OF GANTRY ROAD WHEELS			
Scale: 3"=1'0"	Prepared	Checked	15D 7
Drawing	[illegible]	[illegible]	20
Tracing			
Det.			
SUPERVISION			CHIEF ENGINEER

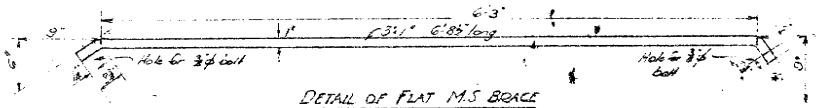




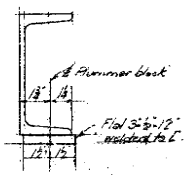


HALF PLAN

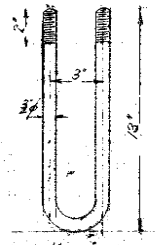
SECTION A-A



DETAIL OF FLAT M.S BRACE



Drilling L for Wheel bearings



Detail of U Bolt

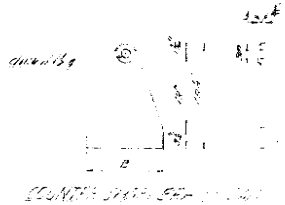
All welding ¼" fillets.

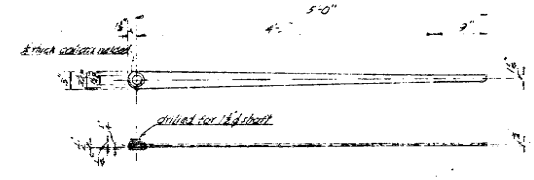
DEPARTMENT OF PUBLIC WORKS TAS.

DERWENT RIVER BRIDGE AT BRIDGEWATER

DETAILS OF CRANE TRUCK

15 D 7 - 21

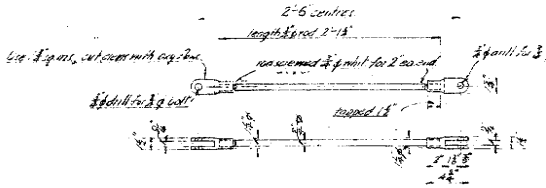




HAND LEVER M.S.

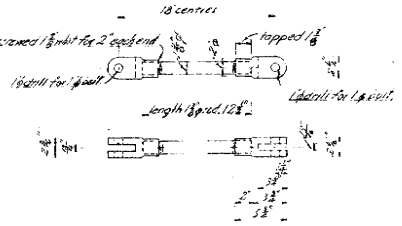
To be welded to 1½ ϕ spindle in position

Make 2 off



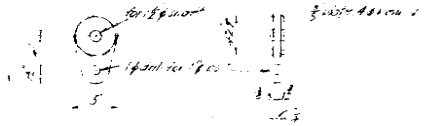
FIRST LINK M.S.

Make 2 off



SECOND LINK M.S.

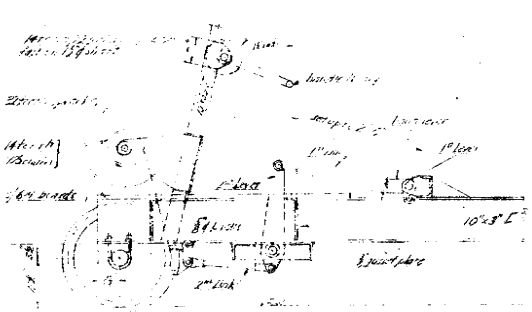
Make 2 off



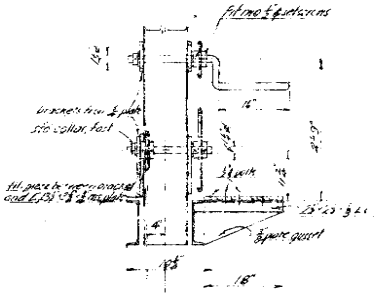
SECOND LEVER M.S.

To be welded to crank in position

Make 2 off

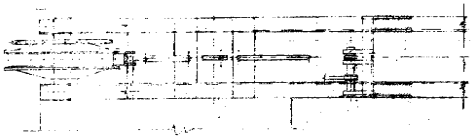


ELEVATION



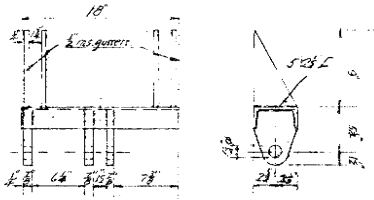
ELEVATION OF DRIVE

Note. If chain fouls 10"×3½" C at turn end, shift 14 tooth sprocket ℄.



PLAN

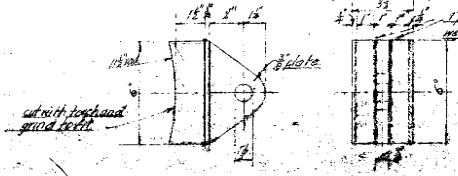
LAYOUT OF BRAKING.



BEARING FIRST LEVER SPINDLE

Make 2 off.

Length plain 1½ ϕ shaft 11½"



Hexhd 2½"-⅞ ϕ bolts - 4 off

" " 3½"-⅞ " - 2 off

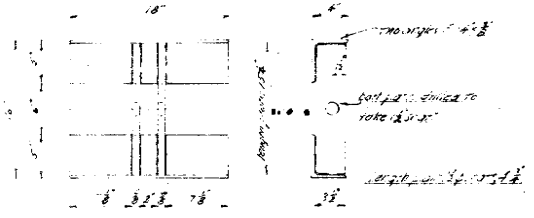
" " 4½"-⅞ " - 2 off

LINK PIN BOLTS M.S.

Steps cut on large and square ends

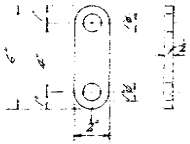
BRAKE BLOCK M.S.

Make 2 off



BEARING SECOND LEVER SPINDLE

Make 2 off



BRAKE BLOCK SUPPORT LINK

Make 4 off

DEPARTMENT OF PUBLIC WORKS - TAS.

DERWENT RIVER BRIDGE

AT BRIDGEWATER

DETAILS OF CANTRY CRANE BRAKING

Drawn	Traced	Checked	15D-7
Tracing	R.A.B. & W.T.S. 9/6/61		
Design	R.A.H.		22
Supervision			

CHIEF ENGINEER

GEAR LIST
(From gears supplied)

LETTER	No TEETH	* FACE	BORE
A	18	2"	1⅞"ø
B	36	2¼"	2¼"ø
C	28	2¼"	2¼"ø
D	96	2¼"	2½"ø
* E	32	3¼"	2½" square
F	96	3"	2¾"ø

* Conjoined with 52 tooth gear.

GROOVED PULLEYS
Details on sheet 25

LETTER	No GROOVES	BORE	PITCH DIA
G	4	1⅞"ø	6"
H	4	1⅞"ø	2'6"

All gears + pulleys excepting Gear E Keyed to shafts

SHAFTING LIST

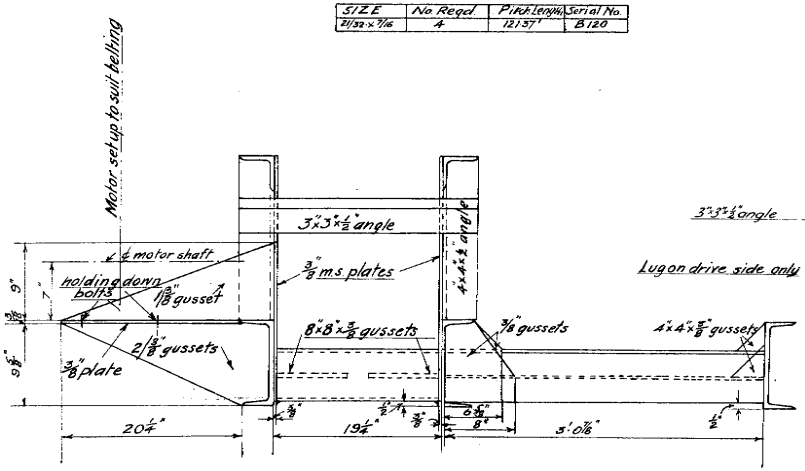
DIA	LENGTH	COLLARS	To Carry
1⅞"	2'8"	2 (fast)	A + H
2½"	2'4"	2 (-)	B + C
2¼" + 2½" sq.	as supplied	2 (-)	D + E
2¾"	5'7"	2 (-)	F + drum

BEARING LIST

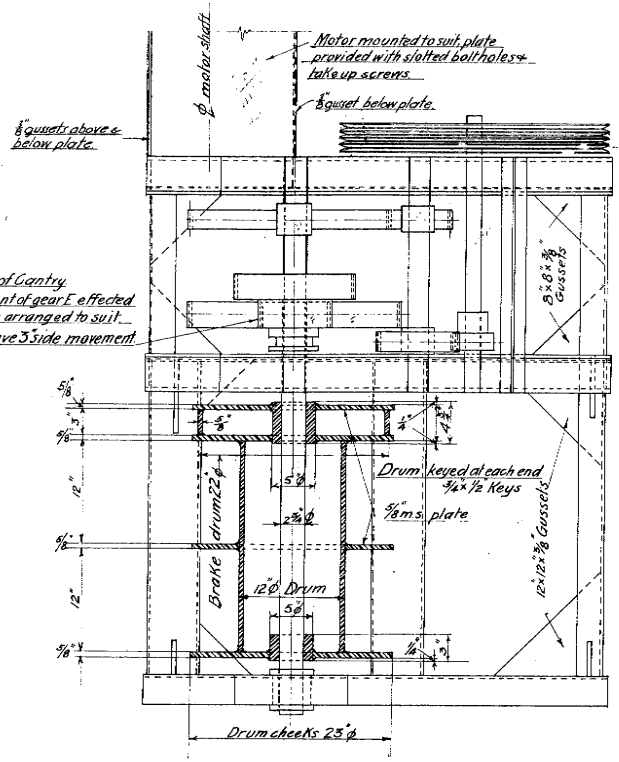
BORE	No Reqd	Height to Centre	Length Brasses
2½"ø	2	2¾"	4¼"
2¾"ø	3	2 7/8"	4 5/8"

VEE BELTS

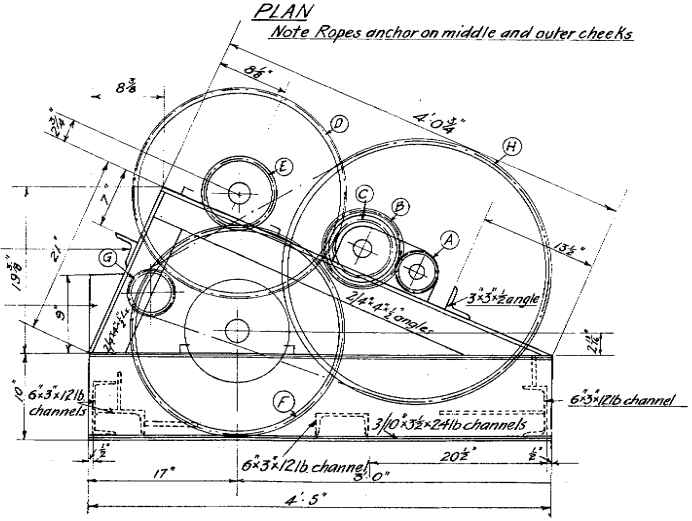
SIZE	No Reqd	Pitch Length	Serial No.
21/32 × 7/16	4	121.37"	B120



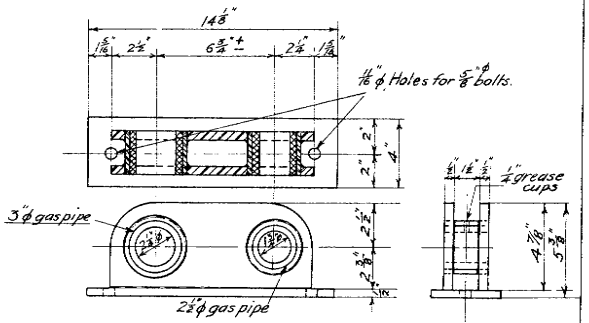
FRONT ELEVATION OF FRAMEWORK



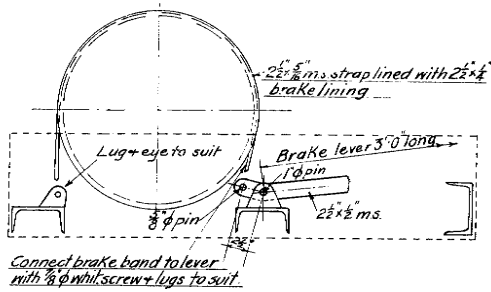
PLAN
Note Ropes anchor on middle and outer cheeks



SIDE ELEVATION
¼" fillet welds throughout



DETAIL OF TWIN BEARING BLOCK M.S.
Make 2 off Scale 3 in = 1 ft
Note Tin tubing + set shafts in position prior to pouring white metal.

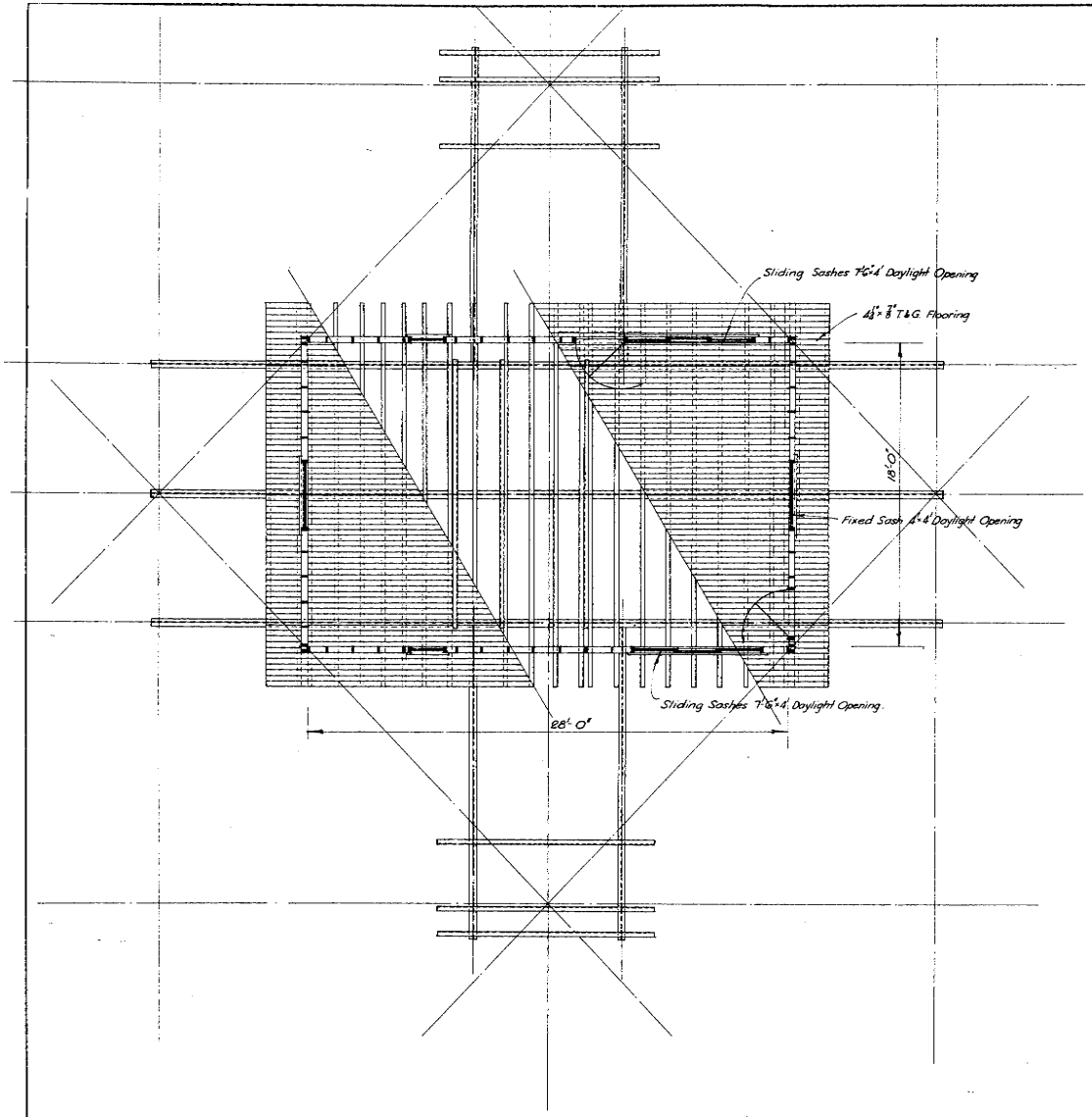


LAYOUT OF BRAKING GEAR

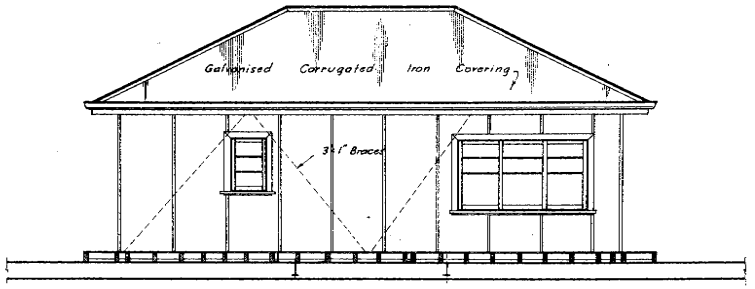
DERWENT RIVER BRIDGE
AT BRIDGEWATER
GANTRY HAULAGE WINCH

T.J.S. 6-4-39
T.A.J. 12-4-39

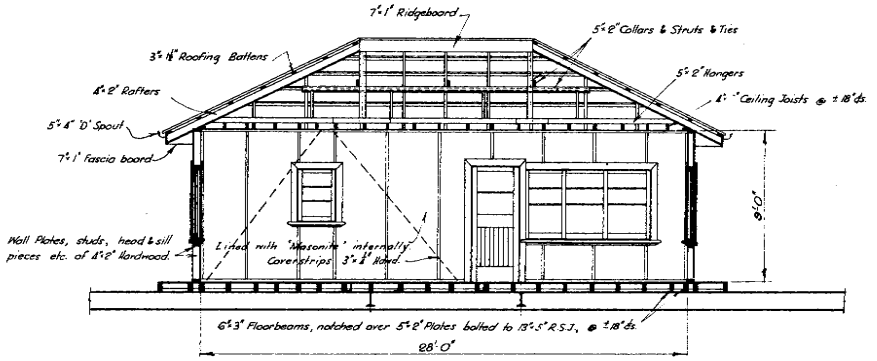
15D7
-24



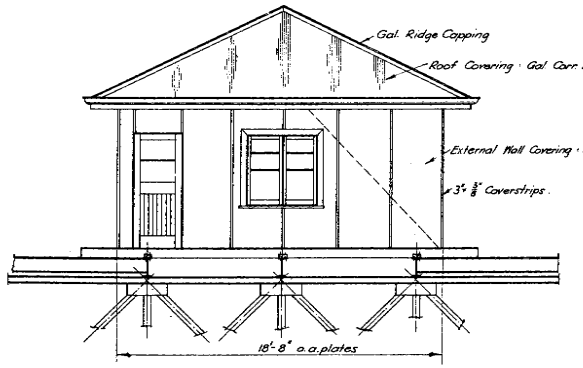
PLAN



SIDE ELEVATION



SECTION on ℄

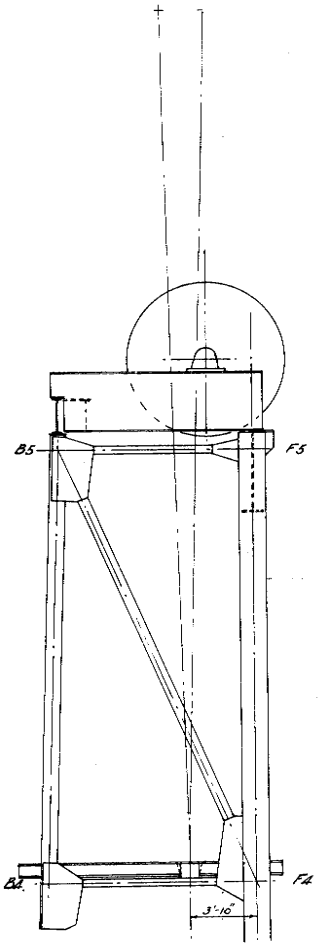


END ELEVATION

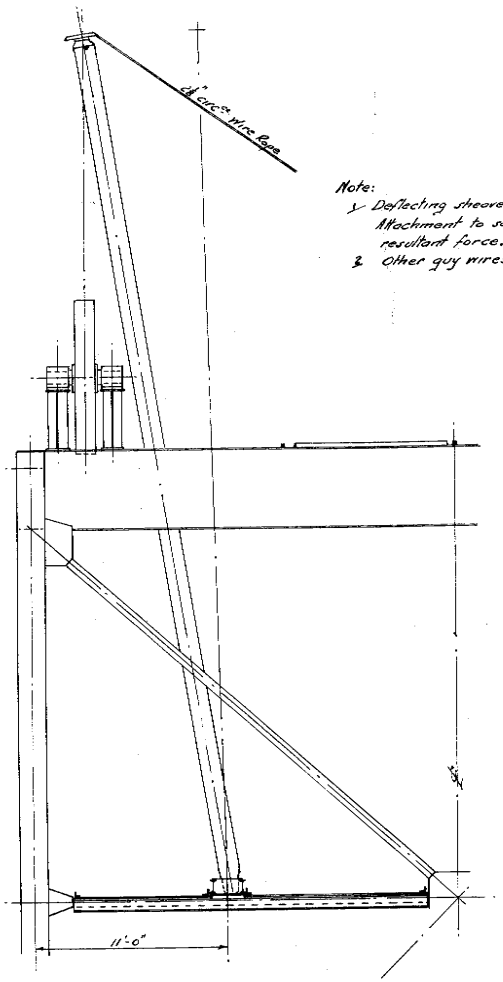
DEPARTMENT OF PUBLIC WORKS TASMANIA

DERWENT RIVER BRIDGE AT BRIDGEWATER
LIFT SPAN
MACHINERY HOUSE

Scale ½"=1'0"	Prepared	Checked	15D7 -30
Drawing	[illegible] ½"=1'0"		
Tracing	[illegible] ½"=1'0"		
Design			
Supervision		A.W. Knight Chief Engineer	

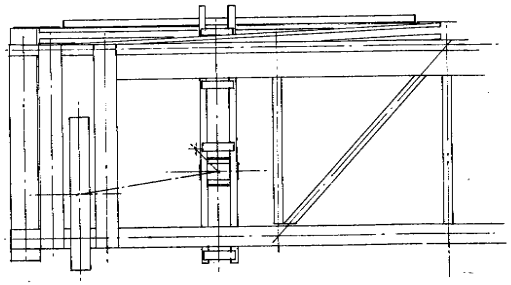


— SIDE ELEVATION —



— HALF FRONT ELEVATION —

Note:
1. Deflecting sheave attached to Front Leg. Attachment to safely withstand a 2·5 Ton resultant force.
2. Other guy wires etc. as required.



— PLAN —

Note: Details of Beams etc. 15D7-31A.

DEPARTMENT OF PUBLIC WORKS - TAS.

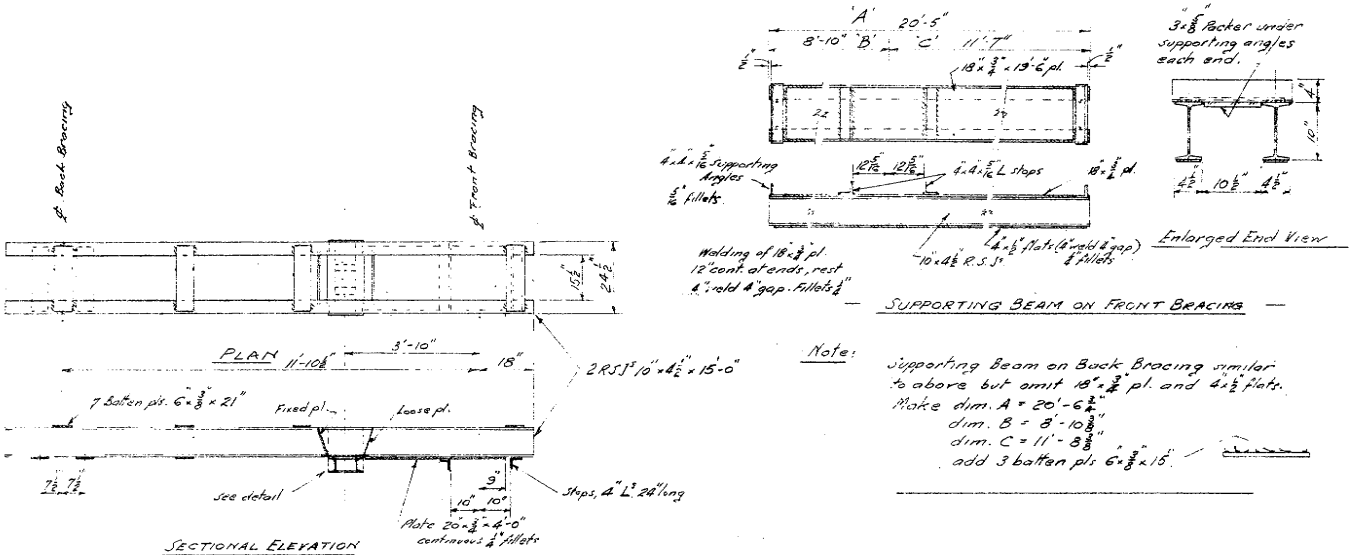
DERWENT RIVER BRIDGE AT BRIDGEWATER

SHEAVE ERECTION ON TOWERS

Scale: 1/2"-1'-0"	Prepared	Checked	15D7
Drawing			-31
Tracing	W.G.	11/4/65	
Design			
Supervision			

CHIEF ENGINEER

15D7-31

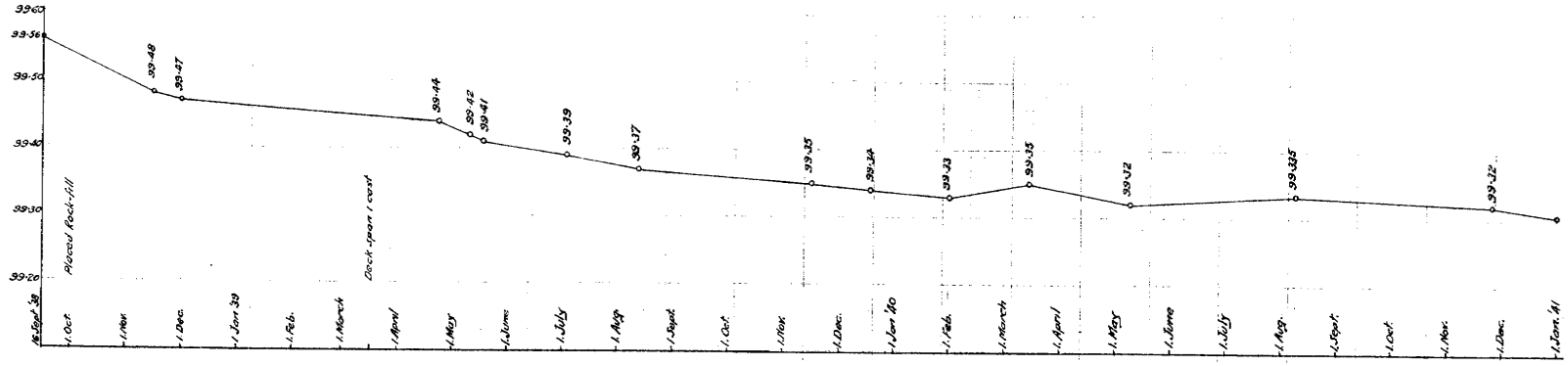


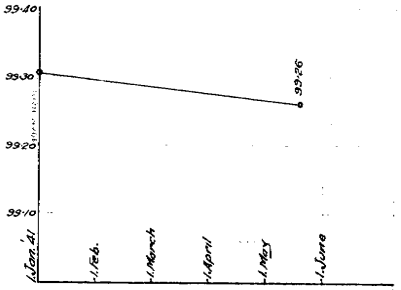
BRIDGEWATER BRIDGE

SHEAVE ERECTION

Holt 11/4/45

15 DT
-31A





Settlement as observed on N.W. seating bolt.

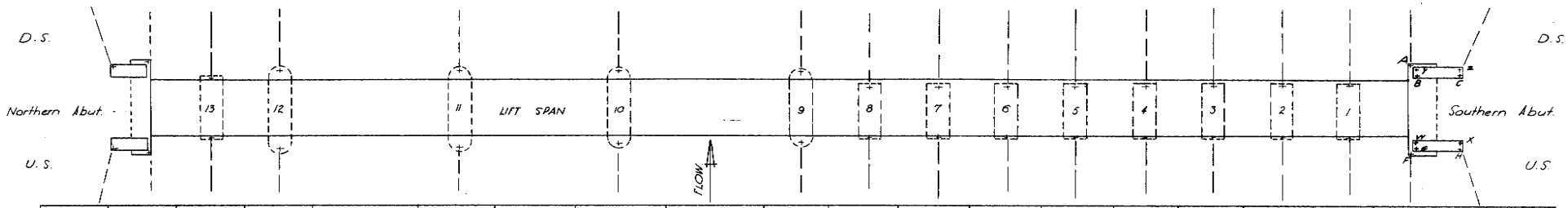
DEPARTMENT OF PUBLIC WORKS – TAS.

DERWENT RIVER BRIDGE AT BRIDGEWATER

SETTLEMENT OF SOUTH ABUTMENT

Scale: –	Prepared	Checked	15 D 7
Drawing			-32
Tracing			
Design	–		
Supervision			CHIEF ENGINEER

Sept 12, 1950	112·55[5]	101·85	109·03[5]	99·47		100·18[8]		100·16[3]		99·38[5]	109·09[5]	108·86[3]	108·67[7]	108·39	108·07	107·73	107·34[5]	106·52[5]	98·16[5] (A)	108·87[5](C)	J.J.D
Aug 18, 1948	112·55	101·84	109·03 (101·76[5])	99·48		100·22		100·19		99·42	Kerb 109·12	Kerb 108·89	108·70	Kerb 108·41	Kerb 108·09[5]	107·76	Kerb 107·38	Kerb 106·58	108·10 (B)	108·95(C)	A.A.H.
Nov 16 1948	112·52	101·84	109·01[5] (101·75)	99·46		100·17		100·15[5]	Calm Weather Reads L.B. 1538	99·39	109·10[5] (101·78)	108·87[5] (101·53[5])	108·69	108·39 (101·04)	108·07 (100·77[5])	107·73	107·35 (100·07[5])	106·58 (99·24)	98·26(A)	108·95[5]	J.J.D & C.E.L.K.
Aug 8, 1947	112·54	101·84	101·78[5]	99·44		100·16		100·12		99·35[5]	101·79	101·56[5]	108·65[5]	101·02[5]	100·76[5]	107·72[5]	100·07	99·23	98·30	109·03	J.D.
Jan 17, 1947	112·54	101·84	101·76[5]	99·44		100·15		100·12		99·36	101·77[5]	101·52	108·67	101·02	100·75[5]	107·73	100·05[5]	99·25	98·32	109·06	C.E.L.K.
Nov 18, 1946	112·54	101·86	101·78	99·47		100·16		100·13	This run had plotting error-all these levels are adjusted	99·34	101·78	101·57	108·65	101·03	100·77	107·72	100·07	99·25	98·34	109·07	
Nov 1 1946	112·55	101·86	101·76	99·47		100·17		100·14		99·36	101·78	101·57	108·67	101·03	100·77	107·73	100·07	99·25	98·34	109·07	
Oct 21, 1946	112·56	101·85	101·77	99·46		100·16		100·14		99·35	101·80	101·58	108·66 New mark (kerb)	101·04	100·77	107·73 New mark	100·08	99·29	98·35	109·09	J.D.
Jan 1946	112·56	101·85	101·78	99·46		100·19		100·16		99·39	101·80	101·64	101·38	101·08	100·80	100·51	100·14	99·34	98·43	109·18	J.D
May 1945	112·57	101·85	101·86	99·51		100·19		100·16		99·40	101·83	101·63	101·38	101·10	100·80	100·50	100·09	99·31	98·46	109·22	J.D.
May 1939											101·83	101·63	101·38	101·08	100·80	100·51	100·14	99·62			R.F.R.



May 1939											101·82	101·61	101·36	101·11	100·78	100·50	100·11	99·63 (see note 'A')			R.F.R.
May 1945	112·43	101·85	101·85	99·47		100·20		100·19		99·37	101·81	101·61	101·36	101·08	100·79	100·50	100·10	99·28	98·72	109·39	J.D
Jan 1945	112·43	101·85	101·79	99·48		100·19		100·20	Rail traffic commenced 8-10-46	99·37	101·82	101·62	101·36	101·11	100·78	100·50	100·10	99·39	98·69	109·37	J.D.
Oct 21, 1946	112·42	101·85	101·76	99·46		100·18		100·18		99·34	101·79	101·58	101·33	101·08	100·76	100·48	100·07	99·33	98·63	109·27	J.D.
Nov 1, 1946	112·44	101·86	101·76	99·47		100·18		100·16		99·33	101·78	101·56	101·35	101·08	100·75	100·47	10006	99·32	98·61	109·27	J.D
Nov 18, 1946	112·44	101·85	101·78	99·47		100·18		100·16		99·31	101·78	101·57	101·33	101·07	100·75	100·46	100·06	99·32	98·61	109·26	J.D.
Jan 17, 1947	112·43	101·84	101·78	99·45		100·16		100·15		99·33	101·79	101·58	101·34	101·07	100·75	100·47	100·06	99·31	98·59	109·25	C.E.L.K.
Aug 8, 1947	112·43	101·85	101·75[5]	99·45		100·17		100·15		99·32[5]	101·78	101·57[5]	101·33	101·07[5]	100·75	100·46	100·06	99·31	98·59	109·32	J.D
Nov 16 1948	112·42	101·84		99·43[5]		100·18		100·17[5]		99·38[5]	101·82	101·61[5]	101·37	101·11	100·76[5]	100·48[5]	100·09[5]	99·32[5]	98·56(F)	109·20	J.J.D & C.E.L.K.
Aug 18, 1948	112·46[5]	101·85[5]		99·46		100·22		100·20		99·37	101·83	101·63							108·35 (G)	109·17(H)	A.A.H.
Sept 12, 1950	112·42	101·84[5]		99·44		100·19[5]		100·18		99·37	101·80[5]	101·59[7]	101·35[5]	101·11	100·77	100·48[5]	100·08	99·27	98·47[5] (F)	109·09	J.J.D.

NOTES.

'A' Assume level 99·63 on . U.S. of Pier N°1 May 1939 as being correct.

'B' New . B.M. brass pin in old railway bridge abutment to be used as datum for future levels RL 104·18 (REF. R.: 10·'46)

'C' Symbol + represents spot levels on △ marks on bridge.

DEPARTMENT OF PUBLIC WORKS TAS.

BRIDGEWATER BRIDGE

OBSERVATIONS OF SUBSTRUCTURE LEVELS.

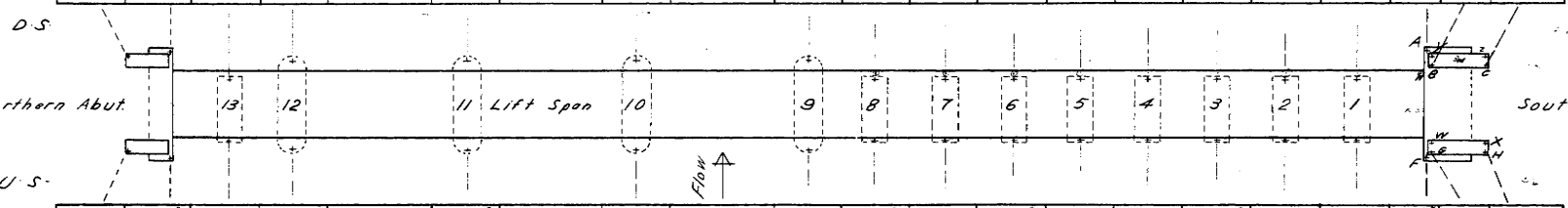
LEVEL BOOK 142.

Scale	Prepared	Checked	15D7
Drawing			
Tracing	J.R.C. Feb 47		-33A
Design			
Supervision		Chief Engineer.	

Adjustment figures for transferring levels from D.S kerb (on south side of joint) to top of piers

Pier No 13 the difference is 7.26[5]
" " 8 " " " 7.31[5]
" " 7 " " " 7.34
" " 5 " " " 7.35
" " 4 " " " 7.29[5]
" " 2 " " " 7.27[5]
" " 1 " " " 7.34

Oct. 5. 1956											109·1665	108·9245	108·7055	108·4395	108·1135	107·8020	107·3805	106·4815	105·4470 [4]	108·8140	108·5945	as below	(conditions ideal) Pin 101·8925
March 10. 1955											109·1723	108·9317	108·7161	108·4829	108·1170	107·8040	107·3873	106·5035	105·4361 [4]	108·9015	108·6560	Levels on new pins in kerb	(conditions perfect) Pin under A.A. Holmes J.H.E.C. Taylor 101·9358.
Dec 20 1954		101·84[1]	109·03[4]	99·46[6]		100·17[3]		100·14[4]		99·37[7]	109·08[5]	108·85[7]	108·68[4]	108·37[3]	108·05[4]	107·72[2]	107·33	105·43[5]		108·83[6]	108·66[1]	A.A. Holmes	Conditions ideal
Oct 14 1952		101·86	109·03	99·47[3]		100·18[2]		100·15		99·37[4]	109·09	108·86	108·67	108·36	108·06	107·72[3]	107·34	106·48		108·92	108·75[7]	A.A. Holmes.	Conditions ideal
Sept 27 1951	112·55[5]	101·84[3]	109·02[4]	99·47[4]		100·17[1]		100·17		99·40	109·12[6]	108·88[9]	108·68[9]	108·39[7]	108·09[4]	107·77[6]	107·38[3]	106·54[3]	98· [5]	109·01[6]	108·85[3]	J.Dwyer	
Sept 12. 1950	112·55[5]	101·85	109·03[5]	99·47		100·18[5]		100·16[2]		99·38[5]	109·09[5]	108·86[2]	108·67[1]	108·33	108·07	107·73	107·34[2]	106·52[3]	98·16[6]	109·02[2]	108·87[5]	J.J.Dwyer	



Sept. 12. 1950	112·42	101·84[5]		99·44		100·19[5]		100·18		99·37	101·80[5]	101·59[7]	101·35[5]	101·11	100·77	100·46[5]	100·08	99·27	98·47[8]	109·29	109·09	J.J.Dwyer	
Sept 27 1951	112·42	101·84[4]		99·44[4]		100·18[3]		100·19		99·39[3]	101·83[4]	101·62	101·36[4]	101·11[7]	100·79[1]	100·52[3]	100·12[3]	99·29	98·48[1]	109·30[6]	109·11[3]	J.Dwyer	
Oct 14 1952		101·85		99·46		100·18[3]		100·16		99·36[4]	101·80	101·59	101·35	101·09	100·76	100·48	100·08	99·23[3]		109·20	108·99	A.A. Holmes.	Conditions ideal
Dec. 20 1954		101·84[4]		99·45[4]		100·17[3]		100·18[5]		99·35[8]						100·46[3]	100·06[3]	99·19[3]		109·12[6]	108·90[4]	A.A. Holmes	Conditions ideal
March 10. 1955																				109·1263	108·8935	"	"
Oct. 5. 1956																				109·0765	108·8450		

BM. Brass pin in old railway bridge abutment, datum R.L. Rod. 19

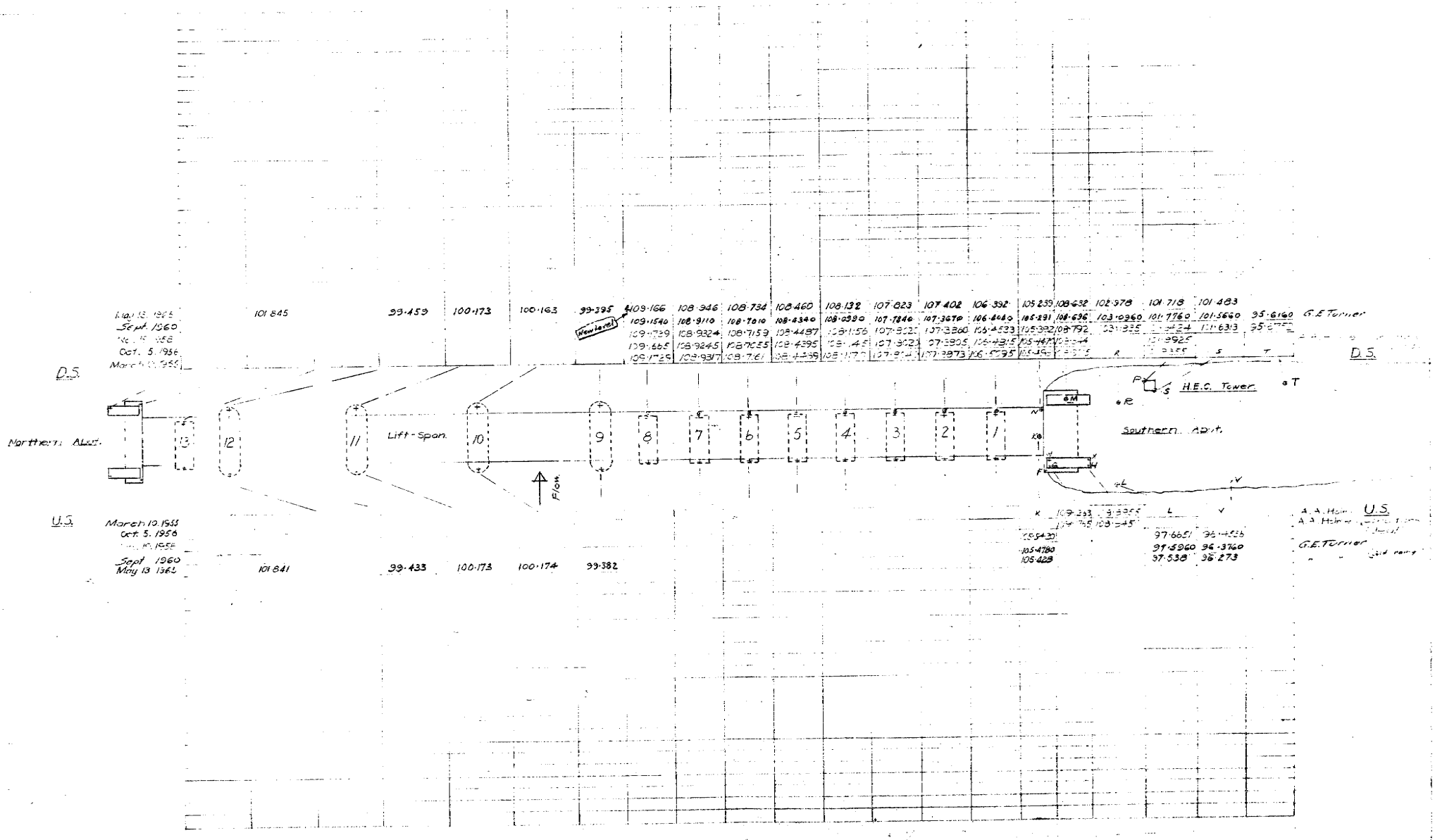
Symbol + represents spot levels on △ marks on bridge

DEPARTMENT OF PUBLIC WORKS TAS

BRIDGEWATER BRIDGE

OBSERVATIONS OF SUBSTRUCTURE LEVELS. LEVEL BOOK 142

Scale	Prepared	Checked	15 D7
Drawing			
Tracing			33 B
Design			
Supervision		Chief Engineer	



Flood Level. R.L 96·89. (April 60)

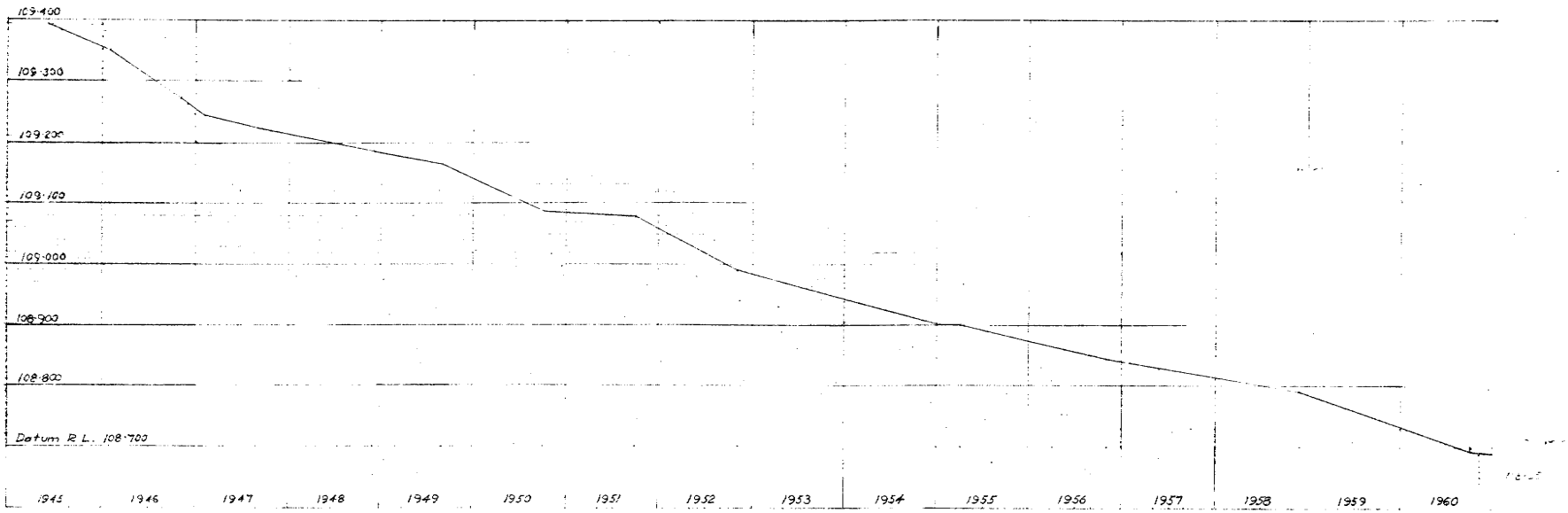
Symbol + represents spot levels on △ marks on bridge.
Symbol ⊙ represents steel pins in kerb, Eylon end causeway

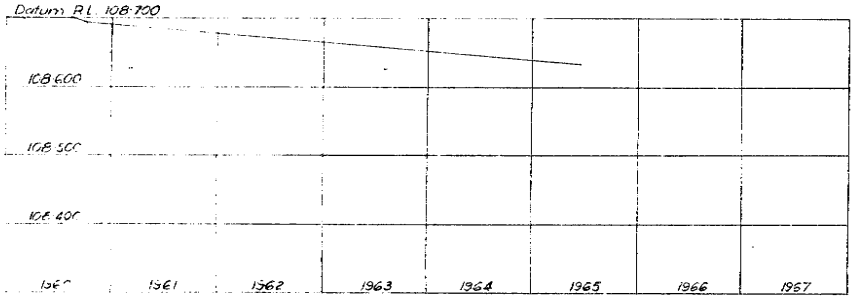
B.M. Brass pin in old railway bridge abutment, datum B.L. 104·18.

Adjustment figures for transferring levels from D.S. kerb (on south side of joint) to top of kerb (prior to 10·3·55)

Pier No.	13	the difference is	7·26 ft	Pier No.	4	the difference is	7·29 ft
" "	9	" "	7·31 ft	" "	2	" "	7·27 ft
" "	7	" "	7·34	" "	1	" "	7·34
" "	5	" "	7·35				

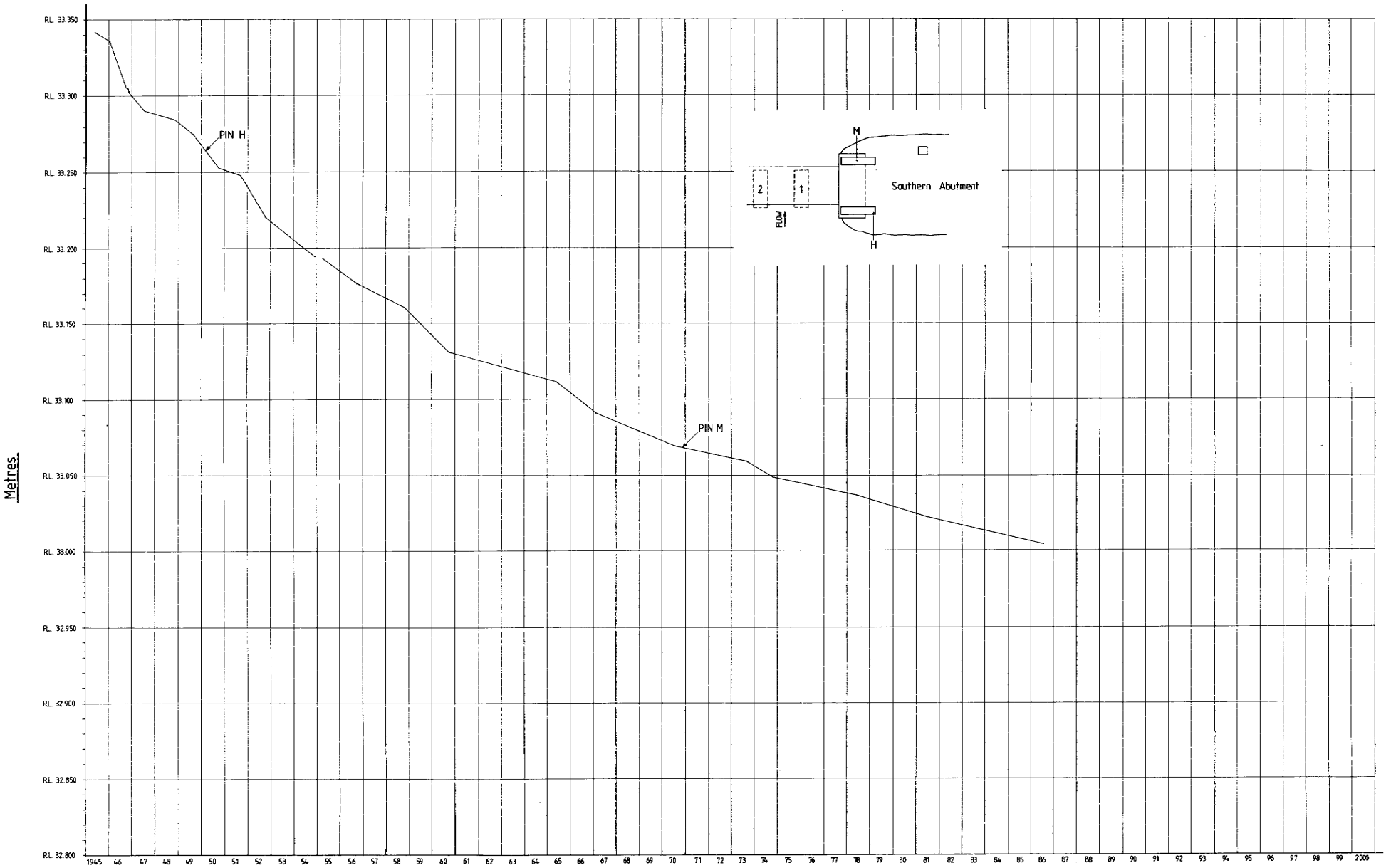
Scales	Road Plans		Department of Public Works — Tasmania
	File No.		
	Loading		Bridgewater Bridge 15.07
	Prepared	Checked	Observations of Substructure Levels.
Design			Level Book 142. 33 B
Drawing	A. Buchan		
Tracing			
Supervision			Designs Engineer / Chief Engineer / Sheet 15/7 of sheets





Scales	Road Plans		DEPARTMENT OF PUBLIC WORKS — TASMANIA
Vertical scale 1" = 0·1 ft.	File No.		LEVELS ON PIN M ON D.S. PYLON OF SOUTH ABUTMENT OF BRIDGEWATER BRIDGE. 15D7 33C.
	Loading		
	Prepared	Checked	
Design			
Drawing	A. Buchan.		
Tracing			
Supervision			Designs Engineer / Chief Engineer / Sheet No. of sheets

DRG. NO. 1507/33D



Note : Levels obtained from level book 142 B.

1. The concrete mix is to be in accordance with the specifications for Ready Mixed Concrete Metric Units December 1974, and as may be subsequently amended.
   Minimum design mean compressive strength (D M C S) determined by 28-day compression tests on cylindrical specimens shall be as follows

Grade F'c MPa	D M C S MPa	Spec. Slump mm	Location in structure

2. All exposed edges to be chamfered 20mm unless otherwise shown.
3. All steel reinforcement 12 mm diameter and over, to be structural grade deformed bars unless otherwise shown.
4. The designing engineer shall ensure that backfilling, and filling generally around substructure units together with rock pitching and rock pitching requirements are endorsed on the road plans. The engineer supervising the construction shall ensure that this work is done to his satisfaction and as specified.
5. Road plans.
6. Bench mark.
7. Design loading to be marked into inside face of U.S. kerb at Abutment A end.
8. Year of construction to be marked into inside face of D.S. kerb at Abutment A end.
9. Bridge number to be marked into outside face of D.S. kerb at Abutment A end.
10. If any doubt exists in the field or workshop about information on the drawing, the matter shall be reviewed by construction supervisors with the Division Engineer Bridges for clarification. No work shall proceed if in doubt.

No.	Date	Amendments	Approved
1			
2			
3			
4			
5			

	Design	Drawing
Prepared		G.W.B. 13-8-86
Checked		
Supervised		
Recommended	Approved	
	Division Engineer Bridges	Assistant Director

Scale

Design loading

Location

MIDLANDS HIGHWAY
BRIDGEWATER

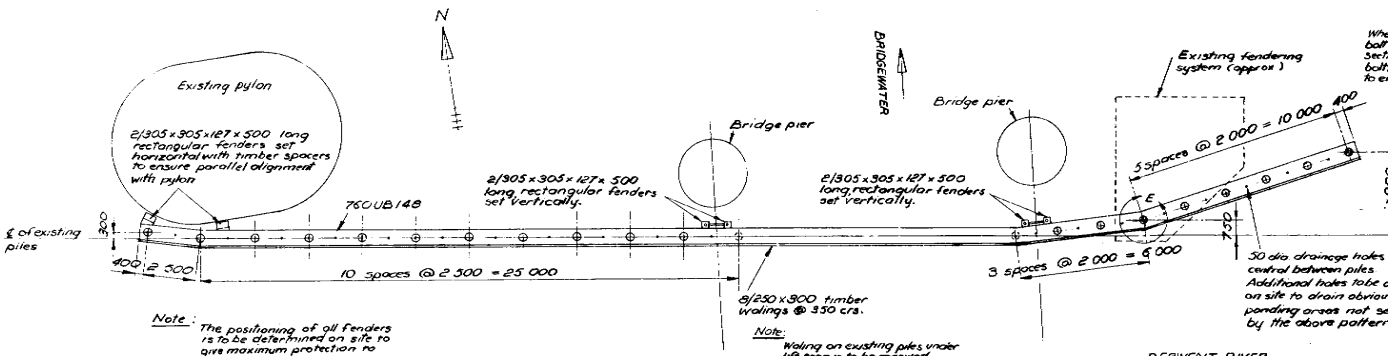
DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE
LEVELS ON PIN H AND M ON THE SOUTHERN ABUTMENT

Bridge Number 1507
Sheet Number 33 D

DRG. NO. 15/D7—34

† Vary to suit pile dimensions



Note: The positioning of all fenders is to be determined on site to give maximum protection to the bridge piers.

Note: Waling on existing piles under liift span is to be renewed

Where required waling to bolt directly to channel sections with M20 galv. bolts & timber spacer to ensure correct alignment

Steel rings provided as required to prevent excessive splitting

6/M20 galv bolts nuts and washers

2/305 x 89 channels Mark J

760UB148

RL 30 400

† 400 - 450

200 Varies

200

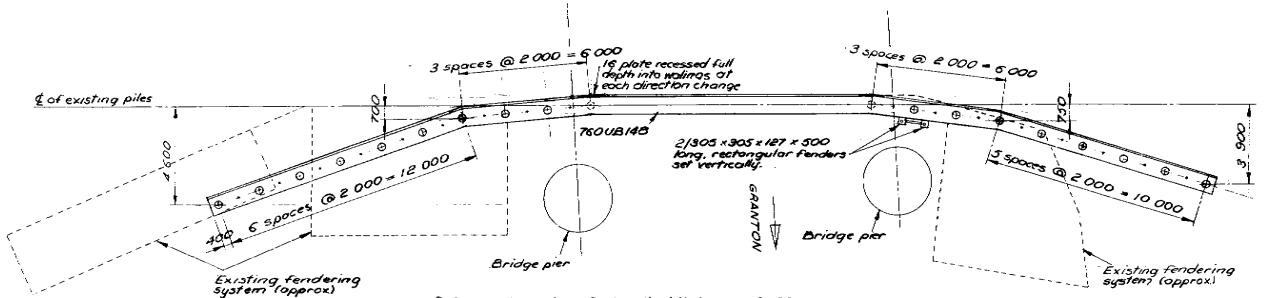
250 250

150

* This dimension is to be as close to 900 as the condition of pile allows and adjusted to clear bolts of waling.

DISTRIBUTION BEAM ATTACHMENT TO SHORT TIMBER PILES

Scale 1:25

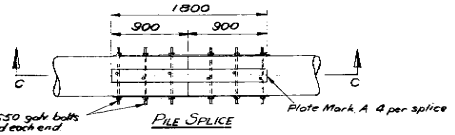


○ Denotes the position of a tanalised timber pile of 300 mm. top dia., 450 mm. dia. 12 000 from top. Pile length 21 000 min. splices at bottom of pile only.

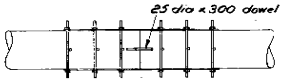
○ Existing piles

PILE SPLICE LOCATION

Not to scale

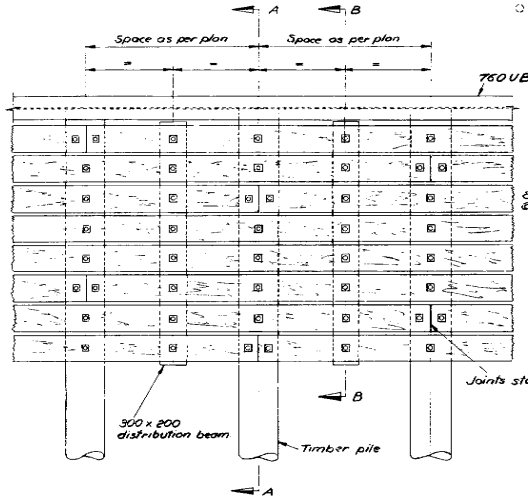


PILE SPLICE

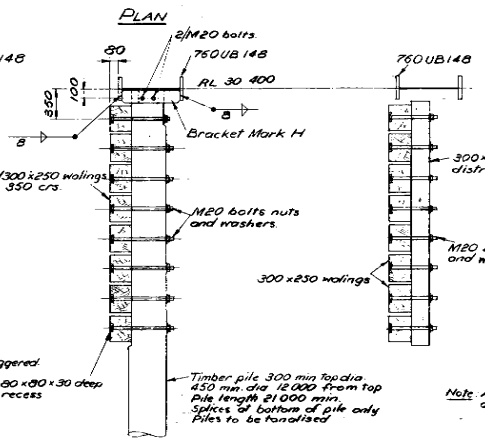


SECTION CC

Scale 1:25



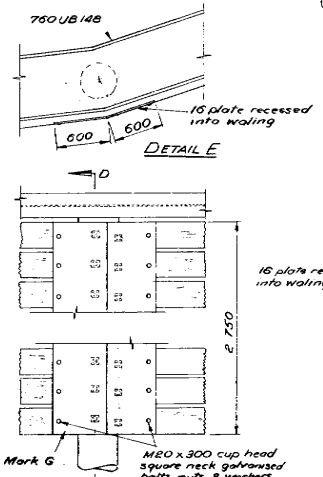
PART ELEVATION



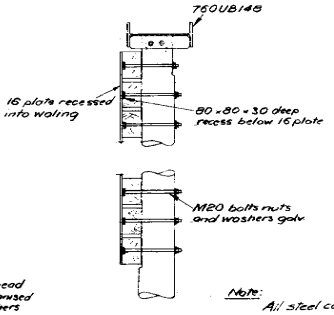
SECTION AA

SECTION BB

Note: All bolts, nuts & washers are to be galvanised



ELEVATION



SECTION DD

Note: All steel components including the 760UB148 to be galvanised. Procedure for repairing galvanising shall be specified by the DEB.

Scale 1:25

1. The concrete mix is to be in accordance with the Specifications for Ready Mixed Concrete Metric Units – December 1974, and as may be subsequently amended.
Minimum design mean compressive strength (D.M.C.S.) determined by 28-day compression tests on cylindrical specimens shall be as follows:

Grade F'c MPa	D.M.C.S. MPa	Spec. Slump mm	Location in structure

2. All exposed edges to be chamfered 20mm unless otherwise shown.
3. All steel reinforcement 12 mm diameter and over to be structural grade deformed bars unless otherwise shown.
4. The designing engineer shall ensure that backfilling, and filling generally around substructure units together with rock pitching and rock pitching requirements are endorsed on the road plans. The engineer supervising the construction shall ensure that this work is done to his satisfaction and as specified.
5. Road plans:–
6. Bench mark:–
7. Design loading to be marked into outside face of U.S. kerb at Abutment A end.
8. Year of construction to be marked into outside face of D.S. kerb at Abutment A end.
9. Bridge number to be marked into outside face of D.S. kerb at Abutment A end.
10. If any doubt exists in the field or switchboy about information on the drawing, the matter shall be reviewed by construction supervisors with the Division Engineer, Bridges for clarification. No work shall proceed if in doubt.

No.	Date	Amendment	Approved
○			
○			
○			
○			
○			

	Design	Drawing
Prepared	N.C.M	A.A.T. 2.4.81
Checked		27.10.81
Supervised		27/4/82
Recommended	Approved	
Division Engineer Bridges	Assistant Director	

Scale 1:25, 1:100

Design loading

Location

MIDLAND HIGHWAY BRIDGEWATER.

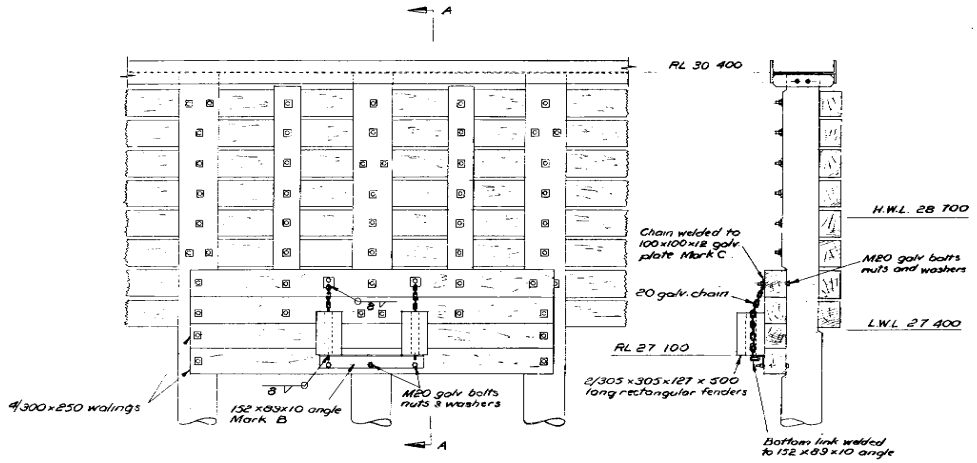
DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE
RENEWAL OF FENDERING
GENERAL ARRANGEMENT

Bridge Number 15

Sheet Number D7—34

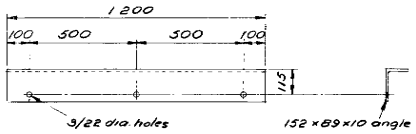
DRG. NO. 15/ D7 — 35



TYPICAL VERTICALLY SET PIER FENDERING

SECTION AA

Scale 1:25



ANGLE MARK B - 3 REQUIRED GALVANISED

Scale 1:10

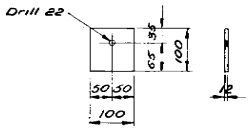
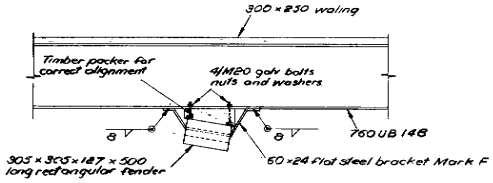


PLATE MARK C

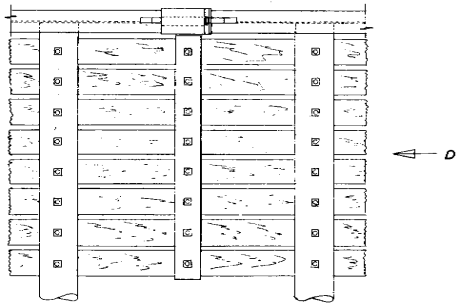
6 REQUIRED GALVANISED

Scale 1:5

Note: The galvanising of angle Mark B and plates Mark C is to take place after the welding of the 20 dia. chain.

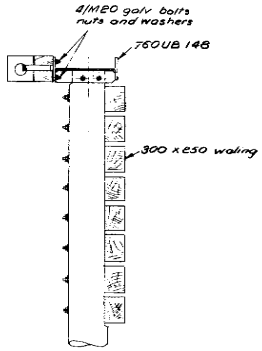


PLAN

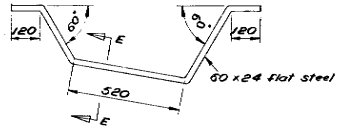


TYPICAL PYLON FENDERING

Scale 1:25



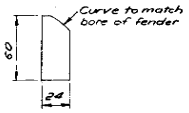
VIEW D



Dimensions not shown are to be determined from the actual positioning of the fender.

BRACKET MARK F - 2 REQUIRED

Scale 1:10



SECTION EE

Scale 1:10

1. The concrete mix is to be in accordance with the Specifications for Ready Mixed Concrete Metric Units - December 1974, and as may be subsequently amended.
Minimum design mean compressive strength (D.M.C.S.) determined by 28-day compression tests on cylindrical specimens shall be as follows:

Grade F'c MPa	D.M.C.S. MPa	Spec. Slump mm	Location in structure

2. All exposed edges to be chamfered 20mm unless otherwise shown.
3. All steel reinforcement 12 mm diameter and over to be structural grade deformed bars unless otherwise shown.
4. The designing engineer shall ensure that backfilling, and filling generally around substructure units together with rock packing and rock pitching requirements are endorsed on the road plans. The engineer supervising the construction shall ensure that this work is done to his satisfaction and as specified.
5. Road plans:-
6. Bench mark:-
7. Design loading to be marked into inside face of U.S. kerb at Abutment A end.
8. Year of construction to be marked into inside face of D.S. kerb at Abutment A end.
9. Bridge number to be marked into outside face of D.S. kerb at Abutment A end.
10. If any doubt exists in the field or workshop about information on the drawing, the matter shall be reviewed by construction supervisors with the Division Engineer, Bridges for clarification. No work shall proceed if in doubt.

	Date	Amendments	Approved

	Design	Drawing
Prepared	N.C.M.	A.A.T. 9.4.81
Checked		9.4.81
Supervised		27.4.81
Recommended	Division Engineer Bridges	Approved: Assistant Director

Scale: 1:25, 1:10, 1:5
Design loading:
Location: MIDLAND HIGHWAY BRIDGEWATER.

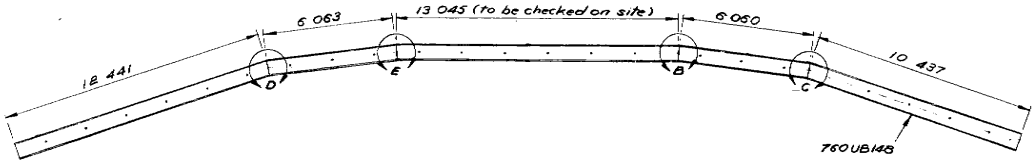
DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE
RENEWAL OF FENDERING
DETAILS AT PIERS & PYLON

Bridge Number: 15
Sheet Number: D7 — 35

DRG. NO. 15/ D7—36

NORTHERN DISTRIBUTION BEAM



SOUTHERN DISTRIBUTION BEAM

Scale 1:100

Note:
All steel 760UB148 to be galvanised. Procedure for repairing galvanising shall be as specified by the DEB.

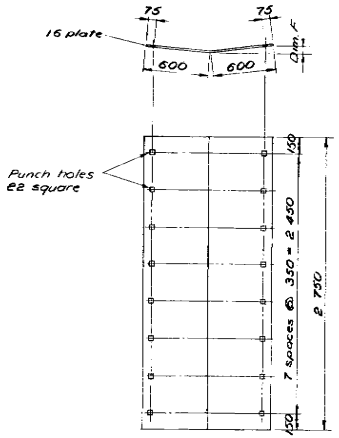
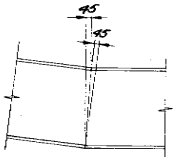


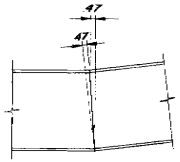
PLATE MARK G

3 Required Dim F = 60
4 Required Dim F = 35

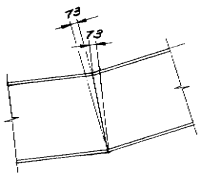
Scale 1:20



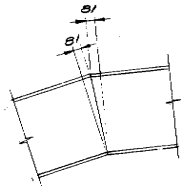
DETAIL A



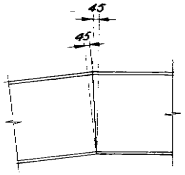
DETAIL B



DETAIL C



DETAIL D

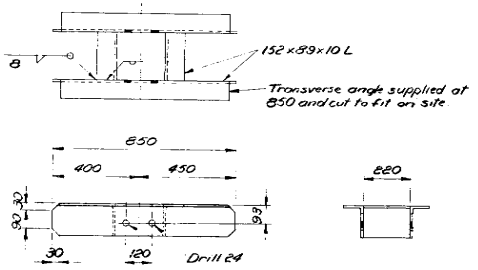


DETAIL E

Scale 1:20

WELDING PROCEDURE

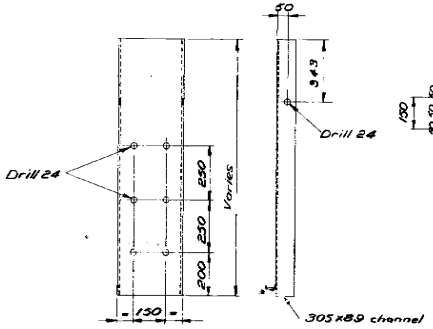
1. Edges of 760UB148 to be prepared as indicated
2. 50°c preheat both members.
3. Ensure 3 gap between ends
4. Weld ⅝ leg of flange weld.
5. Gouge or grind back of first pass of flange weld exposing sound metal of first pass.
6. Weld ⅝ leg of flange weld
7. Preheat all flanges to 150°c.
8. Weld web, after each pass gouge or grind back to expose sound metal.



BRACKET MARK H

36 min. required

Scale 1:10



CHANNEL MARK J

Note:
The number and dimension of channels Mark J is to be determined on site from the RL of the top of the driven piles

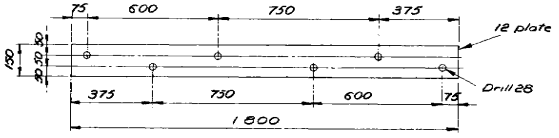
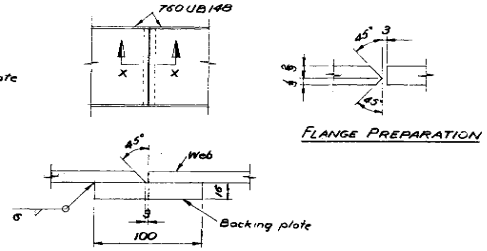


PLATE MARK A

4 plates per splice



SECTION XX

WELD PREPARATION

1. The concrete mix is to be in accordance with the Specifications for Ready Mixed Concrete Metric Units — December 1974, and as may be subsequently amended.
Minimum design mean compressive strength (D.M.C.S.) determined by 28-day compression tests on cylindrical specimens shall be as follows:

Grade F'c MPa	D.M.C.S. MPa	Spec. Slump mm	Location in structure

2. All exposed edges to be chamfered 20mm unless otherwise shown.
3. All steel reinforcement 12 mm diameter and over to be structural grade deformed bars unless otherwise shown.
4. The designing engineer shall ensure that backfilling, and filling generally around substructure units together with rock packing and rock pitching requirements are endorsed on the road plans. The engineer supervising the construction shall ensure that this work is done to his satisfaction and as specified.
5. Road plans:—
6. Bench mark:
7. Design loading to be marked into inside face of U.S. kerb at Abutment A end.
8. Year of construction to be marked into inside face of D.S. kerb at Abutment A end.
9. Bridge number to be marked into outside face of D.S. kerb at Abutment A end.
10. If any doubt exists in the field or workshop about information on the drawing, the matter shall be reviewed by construction supervisors with the Division Engineer, Bridges for clarification. No work shall proceed if in doubt.

Date	Amendments	Approved

	Design	Drawing
Prepared	N.C.M	A.A.T. 15 & 81
Checked		6/11 77-10-81
Supervised		
Recommended	Division Engineer, Bridges 15/12/81	Approved 16/12/81 Assistant Director

Scale 1:2, 1:10, 1:20, 1:100

Design loading

Location
MIDLAND HIGHWAY
BRIDGEWATER.

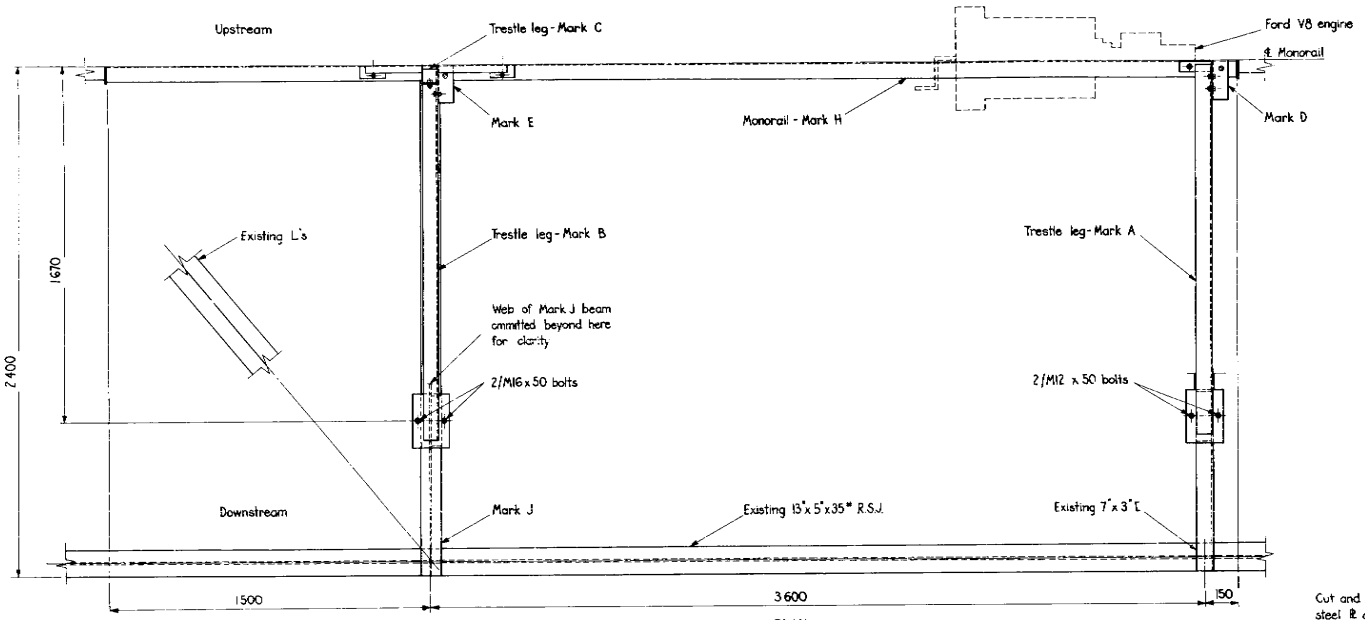
DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE
RENEWAL OF FENDERING
STEELWORK

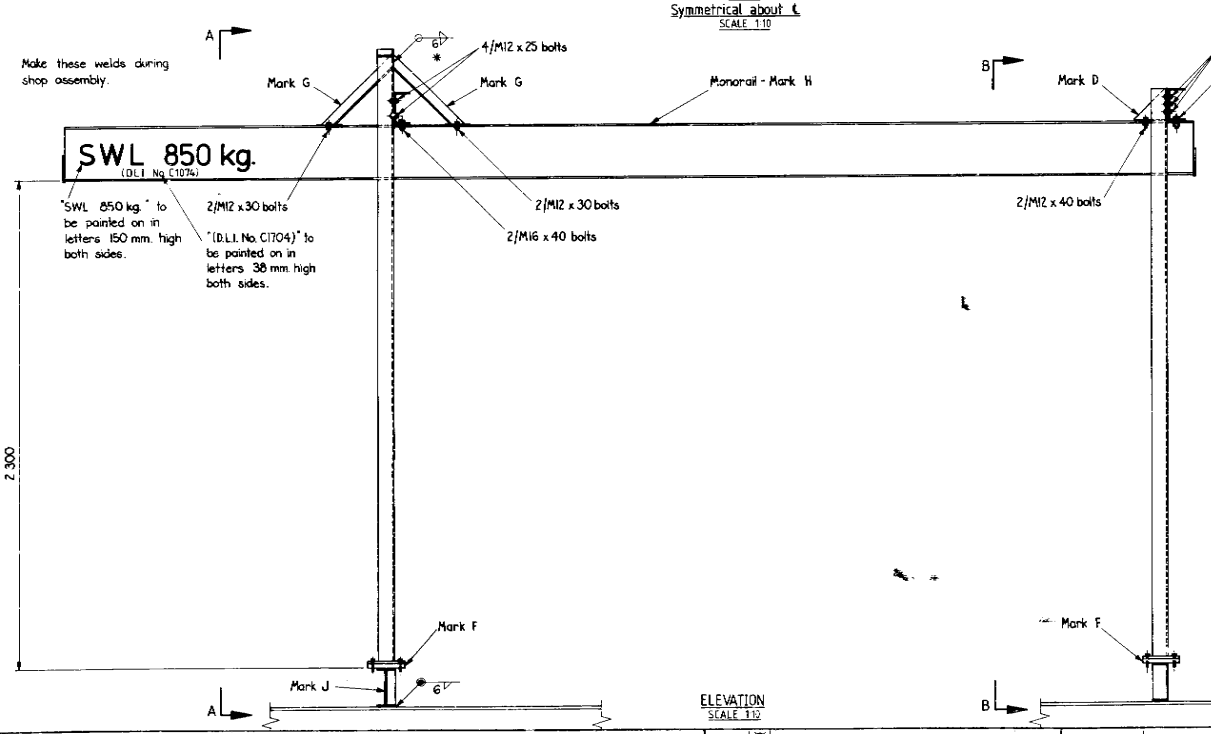
Bridge Number 15

Sheet Number D7 — 36

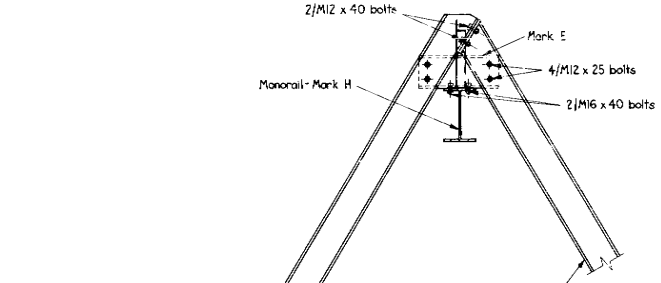
DRG. NO. 15D7/37



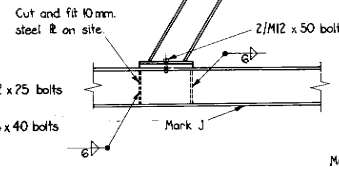
PLAN
Symmetrical about ℄
SCALE 1:10

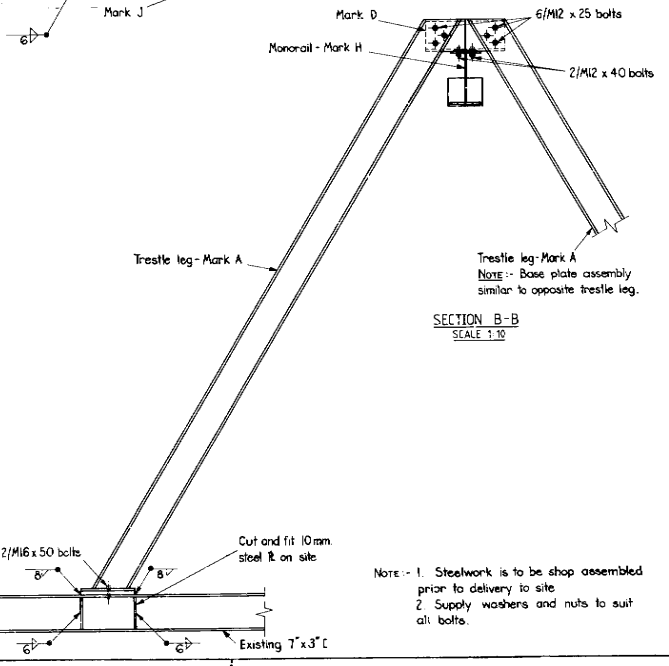


ELEVATION
SCALE 1:10



SECTION A-A
SCALE 1:10





SECTION B-B
SCALE 1:10

Note :- 1. Steelwork is to be shop assembled prior to delivery to site
2. Supply washers and nuts to suit all bolts.

1. The concrete mix is to be in accordance with the Specifications for Ready Mixed Concrete Metric Units December 19 and as may be subsequently amended
Minimum design mean compressive strength (D.M.C.S.) determined by 28 day compression tests on cylindrical specimens shall be as follows:

Grade 'F' MPa	D.M.C.S. MPa	Spec. Slump mm	Location in structure

2. All exposed edges to be chamfered 20mm unless otherwise shown
3. All steel reinforcement 12mm diameter and over to be "Tempcore" deformed bars unless otherwise shown
4. The designing engineer shall ensure that backfilling and filling generally on all substructure joints together with rock pitching and rock gabioning requirements are endorsed on the road plans. The engineer supervising the construction shall ensure that this work is done to his satisfaction and as specified
5. Road plan
6. Bench mar
7. Design loading to be marked into outside face of C. kerb at Abutment and
8. Year of construction to be marked into inside face of D.S. kerb at Abutment A end
9. Bridge number to be marked into outside face of D.S. kerb at Abutment A end
10. If any doubt exists in the field or workshop about information on the drawing, the matter shall be reviewed by construction supervisors with the Division Engineer, Bridges for clarification. No work shall proceed if in doubt

Date	Amendments	Approved

	Design	Drawing
Prepared	G.M.N.	A.J.D. 2.7.87
Checked		P.H. 16.7.87
Superviced		20/7/87

Recommended: Division Engineer Bridges 16.9.87
Approved: Minister / Director

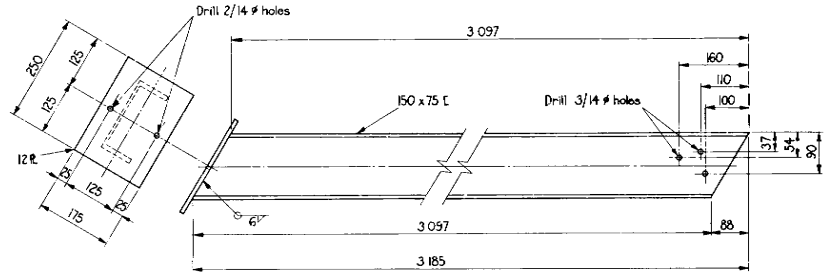
Scale: 1:10
Design loading:
Location: TASMAN HIGHWAY BRIDGEWATER

DEPARTMENT OF MAIN ROADS, TASMANIA

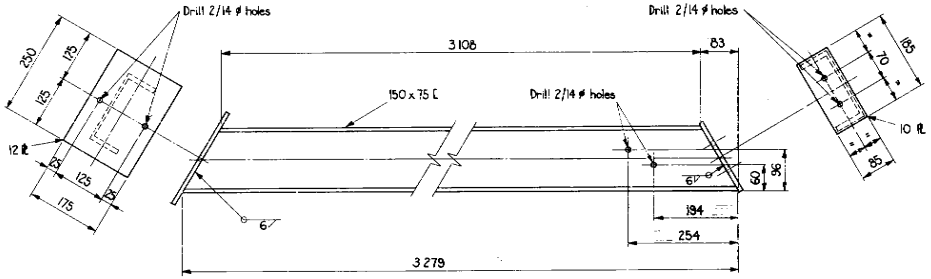
DERWENT RIVER BRIDGE
MONORAIL AND TRESTLE ASSEMBLY

Bridge No.-Name: 15
Sheet Number: D7-37

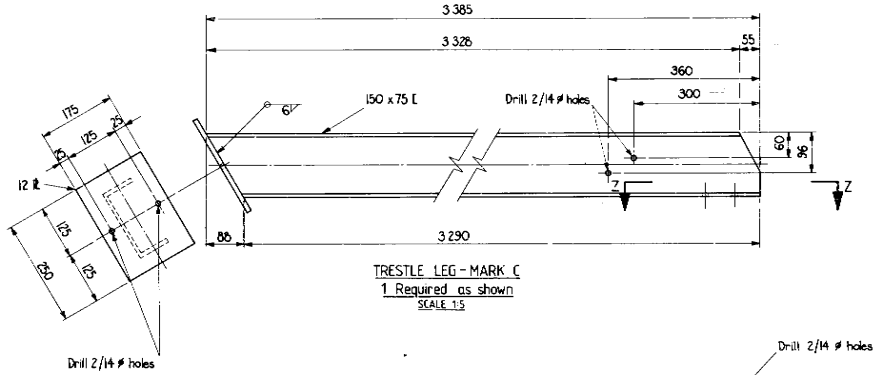
DRG. NO. 1507/38



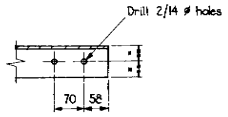
TRESTLE LEG-MARK A
1 Required as shown
1 Required opposite hand
SCALE 1:5



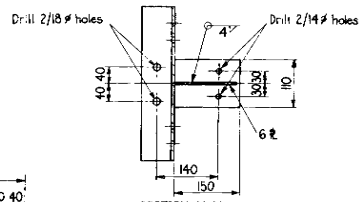
TRESTLE LEG-MARK B
1 Required as shown
SCALE 1:5



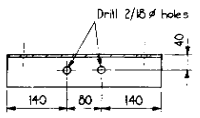
TRESTLE LEG-MARK C
1 Required as shown
SCALE 1:5



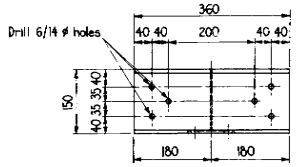
SECTION Z-Z

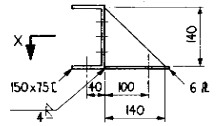


SECTION X-X

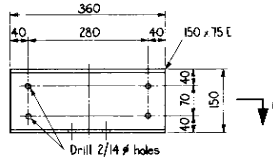


SECTION Y-Y

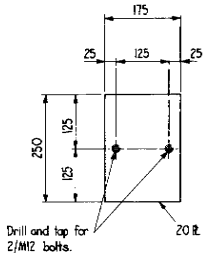




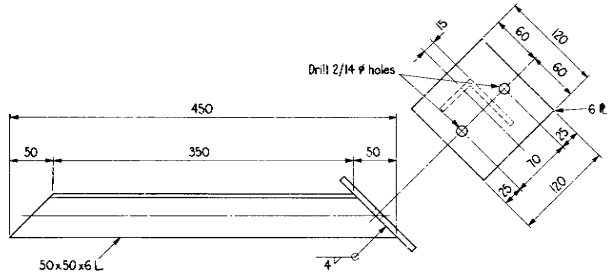
MARK D
1 Required
SCALE 1:5



MARK E
1 Required
SCALE 1:5



MARK F
Galvanised, 4 Required
SCALE 1:5



MARK G
1 Required as shown
1 Required opposite hand
SCALE 1:25

NOTE - Preheat steel to 50°C for all welds.

1. The concrete mix shall be in accordance with the Specifications for Ready Mixed Concrete Metric Ch December 1974 and its amendments, as subsequently amended.
Minimum design mean compressive strength - D.M.C.S. - determined by 28-day compressive tests on cylindrical specimens shall be as follows:

Grade F.c MPa	D.M.C.S. MPa	Spec. Slump mm	Location in structure

2. All exposed edges to be chamfered 20mm unless otherwise shown.
3. All steel reinforcement 12mm diameter and over to be Tensilone deformed bars unless otherwise shown.
4. The designing engineer shall ensure that backfilling of the bridge generally around substructure units together with rock packing and rock pitching requirements are endorsed on the road plans. The engineer supervising the construction shall ensure that this work is done to the satisfaction and as specified.
5. Road plans.
6. Bench mark.
7. Design loading to be marked into south face of U.S. kerb at Abutment A end.
8. Year of construction to be marked into south face of D.S. kerb at Abutment A end.
9. Bridge number to be marked into outside face of D.S. kerb at Abutment A end.
10. Many double events in the field or working drawings information. Drawing the engineer shall be required by construction supervisors with the Division Engineer Bridges for clarification. No work shall proceed in doubt.

Date | Amendments | Approved

	Design	Drawing
Prepared	G.M.N.	A.J.D. 9-7-97
Checked	[signature]	P.H. 10-7-97
Supervised		[signature] 16/7/97
Recommended	Approved	
[signature] 10.9.97 Division Engineer Bridges	[signature] 16.9.97 Assistant Director	

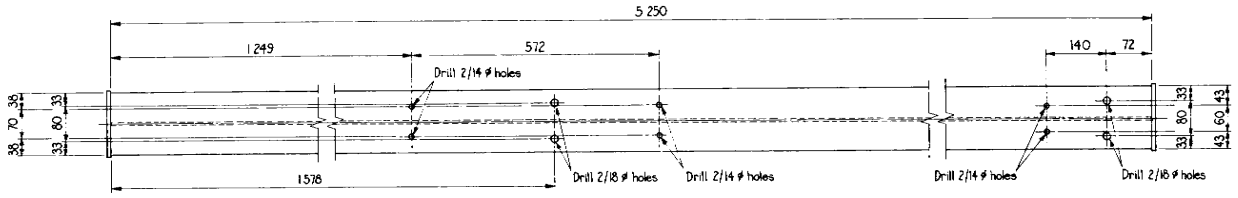
Scale: 1:25, 1:5
Design Loading:
Location: MIDLAND HIGHWAY BRIDGEWATER

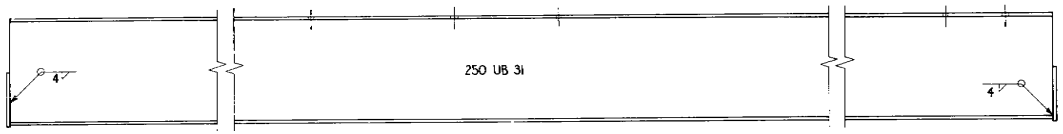
DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE
TRESTLE COMPONENTS

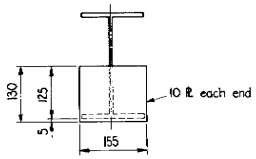
Revision Number: 15
Drawing Number: D7-38

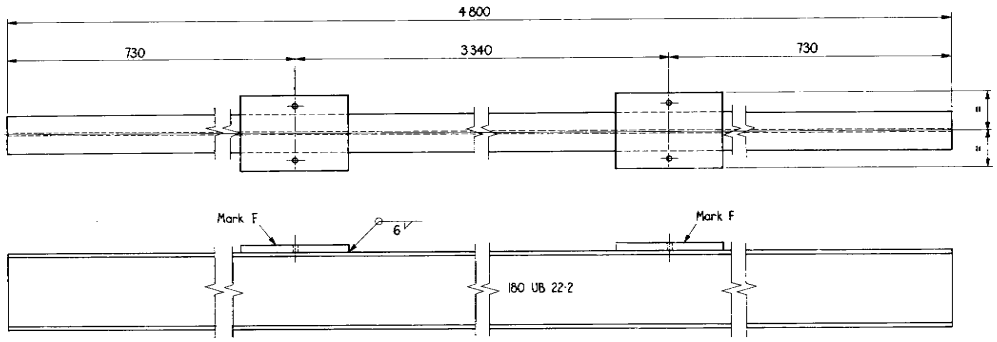
DRG. NO. 15D7/39





MONORAIL MARK H
1 Required
SCALE 1:5





MARK J
1 Required
SCALE 1:5

NOTE :- Preheat steel to 50°C for all welds.

1. The concrete mix is to be in accordance with the Specification for Roads, Minor Concrete Mixes Units December 1974 and as may be subsequently amended.
   Minimum design mean compressive strength (D.M.C.S.) determined by 28 day compression tests on cylindrical specimens shall be as follows:

Grade No. MPa	D.M.C.S. MPa	Spec. Slump mm	Location in structure

2. All exposed edges to be chamfered 20mm unless otherwise shown.
3. All steel reinforcement 12mm diameter and over to be Tempcore deformed bars unless otherwise shown.
4. The designer engineer shall ensure that backfilling and filling generally around substructure units together with rock packing and rock pitching requirements are enforced on the road plans. The engineer supervising the construction shall ensure that this work is done to his satisfaction and as inspected.
5. Road plans.
6. Bench mark.
7. Design loading to be marked into inside face of U.S. kerb at Abutment A end.
8. Year of construction to be marked into inside face of D.S. kerb at Abutment A end.
9. Bridge number to be cut into outside face of D.S. kerb at Abutment A end.
10. If any doubt exists in the field or workshop about information on the drawing the matter shall be referred to construction supervision with the Division Engineer Bridge for clarification. No work shall proceed if in doubt.

No.	Date	Amendments	Approved
1			
2			
3			
4			
5			
6			

Design G.M.N.
Drawing A.J.D. 7-7-87
Checked P.H. 10-7-87
Supervised
Recommended 10.9.87 Division Engineer Bridge
Approved 10-9-87 Assistant Director

Scale 1:5
Design loading
Project MIDLAND HIGHWAY BRIDGEWATER

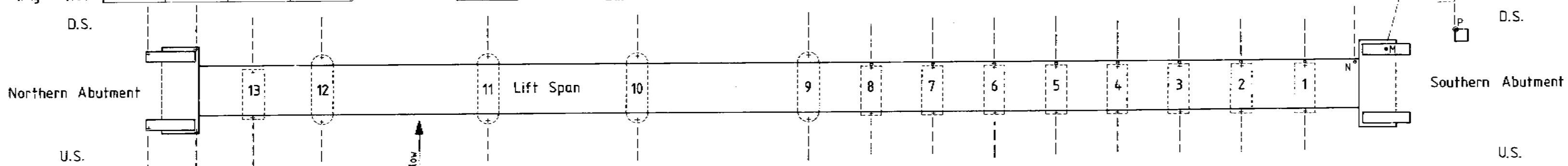
DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE
MONORAIL AND BEAM

Bridge Number 15
Drawing Number D7-39

D.S.

Sep 26 1988		3·079		2·355	2·570	2·561	2·328		5·240	5·176	5·092	4·991	4·895	4·766	4·402	3·997	5·024	2·920
May 12 1986		3·078		2·355	2·570	2·565	2·325		5·241	5·176	5·093	4·993	4·897	4·769	4·411	4·010	5·041	2·933
Mar 12 1981		3·076		2·355	2·566	2·557	2·324		5·234	5·169	5·086	4·988	4·894	4·766	4·418	4·028	5·058	2·954
May 2 1978		3·074		2·355	2·566	2·555	2·323		5·236	5·170	5·087	4·985	4·890	4·763	4·422	4·039	5·069	2·963
Sep 18 1974		3·079		2·357	2·568	2·555	2·322	5·287	5·237	5·172	5·090	4·988	4·892	4·764	4·430	4·053	5·086	2·978
Jul 20 1973									5·239	5·172	5·092	4·992	4·897	4·769	4·437	4·061	5·095	
Jul 1970		3·078		2·349	2·556	2·550	2·318	5·288	5·236	5·171	5·089	4·987	4·892	4·762	4·439	4·073	5·106	
Jan 31 1967		3·077		2·354	2·567	2·558	2·321	5·288	5·236	5·172	5·089	4·989	4·893	4·765	4·453	4·093	5·128	3·021
May 13 1965		3·078		2·351	2·568	2·565	2·331	5·311	5·243	5·179	5·095	4·995	4·901	4·773	4·465	4·113	5·148	3·039
Sep 1960		3·076						5·307	5·233	5·169	5·088	4·985	4·889	4·762	4·468	4·129	5·167	3·057
Nov 19 1958								5·313	5·240	5·173	5·092	4·990	4·895	4·768	4·483	4·157	5·196	3·077
Oct 5 1956								5·311	5·237	5·170	5·089	4·990	4·895	4·766	4·492	4·176	5·213	3·092
Mar 10 1955								5·313	5·239	5·174	5·092	4·991	4·895	4·768	4·501	4·192	5·230	3·105
Dec 20 1954		3·078	3·055	2·353	2·568	2·558	2·323	5·287	5·217	5·157	5·069	4·972	4·870	4·751	4·478		5·230	
Oct 14 1952		3·082	3·054	2·355	2·571	2·561	2·324	5·288	5·217	5·159	5·071	4·973	4·872	4·754	4·492		5·257	
Sep 27 1951	6·344	3·078	3·052	2·354	2·569	2·567	2·332	5·299	5·226	5·165	5·076	4·984	4·887	4·767	4·511		5·283	
Sep 12 1950	6·344	3·079	3·056	2·353	2·572	2·565	2·328	5·289	5·217	5·162	5·074	4·976	4·873	4·755	4·504		5·287	
Aug 19 1949	6·343	3·076	3·052	2·357	2·582	2·573	2·338	5·297	5·227	5·169	5·080	4·984	4·882	4·766	4·522		5·310	
Nov 16 1948	6·334	3·076	3·049	2·350	2·567	2·562	2·329	5·292	5·222	5·166	5·074	4·976	4·873	4·757	4·522		5·317	
Aug 8 1947	6·340	3·076	3·053	2·344	2·564	2·552	2·318	5·292	5·229	5·155	5·070	4·973	4·871	4·757	4·519		5·325	
Jan 17 1947	6·340	3·082	3·053	2·344	2·561	2·552	2·320	5·288	5·217	5·159	5·068	4·970	4·873	4·752	4·525		5·335	
Nov 1 1946	6·343	3·082	3·052	2·353	2·567	2·558	2·320	5·289	5·233	5·159	5·071	4·975	4·873	4·757	4·525		5·341	
Oct 21 1946	6·346	3·079	3·055	2·350	2·564	2·558	2·317	5·295	5·236	5·156	5·074	4·975	4·873	4·758	4·537		5·344	
Jan 1946	6·346	3·079	3·058	2·357	2·573	2·564	2·329	5·295	5·254	5·156	5·086	4·984		4·778	4·553		5·366	
May 1945	6·349	3·079	3·082	2·366	2·573	2·564	2·332	5·304	5·251	5·156	5·092	4·984		4·763	4·543		5·380	
May 1939								5·304	5·251	5·156	5·086	4·984		4·778	4·638			



U.S.

May 1939								3·070	3·006	2·930	2·854	2·753	2·668	2·549	2·402			
May 1945	6·306	3·079	3·079	2·353	2·576	2·573	2·323	3·067	3·006	2·930	2·845	2·756	2·667	2·546	2·297			
Jan 1946	6·306	3·079	3·061	2·357	2·573	2·576	2·323	3·070	3·009	2·930	2·854	2·753	2·667	2·546	2·329			
Oct 21 1946	6·302	3·079	3·052	2·350	2·570	2·570	2·314	3·061	2·997	2·921	2·845	2·747	2·662	2·536	2·311			
Nov 1 1946	6·309	3·082	3·052	2·353	2·570	2·564	2·311	3·058	2·997	2·927	2·845	2·744	2·658	2·533	2·308			
Jan 17 1947	6·306	3·076	3·058	2·347	2·564	2·561	2·311	3·061	2·998	2·924	2·841	2·744	2·658	2·533	2·305			
Aug 8 1947	6·306	3·079	3·050	2·347	2·567	2·561	2·309	3·058	2·996	2·921	2·841	2·744	2·655	2·533	2·305			
Nov 16 1948	6·303	3·076		2·343	2·570	2·568	2·328	3·070	3·008	2·933	2·854	2·748	2·662	2·543	2·308			
Aug 19 1949	6·317	3·075		2·350	2·582	2·576	2·323	3·073	3·012									
Sep 12 1950	6·303	3·078		2·344	2·575	2·570	2·323	3·065	3·002	2·928	2·854	2·750	2·662	2·540	2·292			
Sep 27 1951	6·303	3·078		2·346	2·571	2·573	2·328	3·075	3·009	2·931	2·856	2·756	2·675	2·553	2·299			
Oct 14 1952		3·079		2·350	2·571	2·564	2·321	3·064	3·000	2·927	2·848	2·747	2·662	2·540	2·281			
Dec 20 1954		3·078		2·349	2·568	2·562	2·319						2·659	2·536	2·269			
Mar 10 1955																		
Oct 5 1956																		
Nov 19 1958																		
Sep 1960		3·070																
May 13 1965		3·077		2·342	2·568	2·568	2·327											
Jan 31 1967		3·076		2·346	2·569	2·563	2·318											
Jul 1970		3·073		2·340	2·565	2·558	2·316											
Jul 20 1973																		
Sep 18 1974		3·079		2·343	2·571	2·563	2·318											
May 2 1978		3·076			2·567	2·565	2·322											
Mar 12 1981		3·075		2·341	2·566	2·561	2·319											
May 12 1986		3·076		2·342	2·574	2·570	2·323	3·064	3·001	2·927	2·851	2·745	2·661	2·539	2·198			
Sep 26 1988		3·077	3·059	2·342	2·571	2·563	2·319	3·060	2·998	2·921	2·843	2·741	2·656	2·534	2·189			

Symbol + represents spot levels on △ marks on bridge.
Symbol ⊕ represents steel pins in kerb, pylon and causeway.

B.M.-Brass pin in old railway bridge abutment, datum R.L 3·790m A.H.D.

NOTE: Levels taken from Field Books 1424 & 142B, then changed to Australian Height Datum.

1. THE CONCRETE MIX IS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS FOR READY MIXED CONCRETE METRIC UNITS DECEMBER 1974, AND AS MAY BE SUBSEQUENTLY AMENDED. MINIMUM DESIGN MEAN COMPRESSIVE STRENGTH (D.M.C.S.) DETERMINED BY 28-DAY COMPRESSION TESTS ON CYLINDRICAL SPECIMENS SHALL BE AS FOLLOWS:

GRADE F'C MPa	D.M.C.S. MPa	SPEC. SLUMP mm	LOCATION IN STRUCTURE

2. ALL EXPOSED EDGES TO BE CHAMFERED 20mm UNLESS OTHERWISE SHOWN.
3. STEEL REINFORCEMENT 12mm DIA AND OVER TO BE 'TEMPCORE' DEFORMED BARS UNLESS OTHERWISE SHOWN
4. THE DESIGNING ENGINEER SHALL ENSURE THAT BACKFILLING AND FILLING GENERALLY AROUND SUBSTRUCTURE UNITS TOGETHER WITH ROCK PACKING AND ROCK PITCHING REQUIREMENTS ARE ENDORSED ON THE ROAD PLANS. THE ENGINEER SUPERVISING THE CONSTRUCTION SHALL ENSURE THAT THIS WORK IS DONE TO HIS SATISFACTION AND AS SPECIFIED.
5. ROAD PLANS. 6. BENCH MARK.
7. DESIGN LOADING TO BE MARKED INTO INSIDE FACE OF U.S. KERB AT ABUTMENT A END.
8. YEAR OF CONSTRUCTION TO BE MARKED INTO INSIDE FACE OF D.S. KERB AT ABUTMENT A END.
9. BRIDGE NUMBER TO BE MARKED INTO OUTSIDE FACE OF D.S. KERB AT ABUTMENT A END.
10. IF ANY DOUBT EXISTS IN THE FIELD OR WORKSHOP ABOUT INFORMATION ON THE DRAWING, THE MATTER SHALL BE REVIEWED BY CONSTRUCTION SUPERVISORS WITH THE DIVISION ENGINEER, BRIDGES FOR CLARIFICATION. NO WORK SHALL PROCEED IF IN DOUBT.

DATE	AMENDMENTS	APPROVED

	DESIGN	DRAWING
PREPARED		S.C.C. 16-11-'88
CHECKED		P.H. 1-12-'88
SUPERVISED		[signature]
RECOMMENDED: DIVISION ENGINEER BRIDGES	APPROVED: ASSISTANT DIRECTOR	

SCALE

DESIGN LOADING

LOCATION: MIDLAND HIGHWAY, BRIDGEWATER

DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE

LEVELS ON PIERS & ABUTMENTS

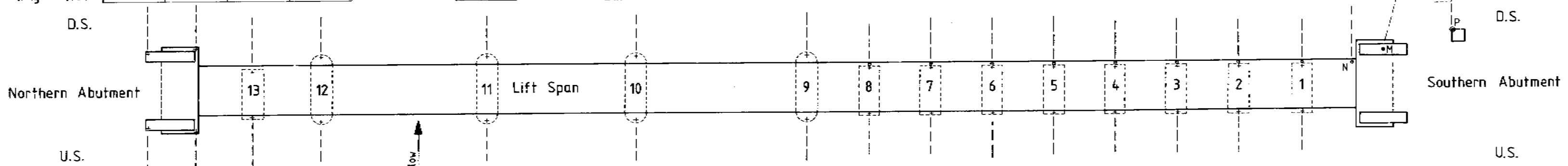
BRIDGE NUMBER 15

SHEET NUMBER D7-40

DRG. NO. 15D7/40

¤ Jul 17 1997		3.079		2.352	2.565	2.559	2.320		5.237	5.171	5.087	4.986	4.980	4.766			4.976	2.865
¤ Sep 16 1991							2.324			5.172				4.765				2.909
¤ Sep 5 1991		3.074		2.355	2.569	2.560	2.325		5.237	5.174	5.091	4.990	4.893	4.765	4.396	3.984	5.013	2.908
¤ Feb 26 1990				2.349			2.319											
¤ Apr 26 1989													4.896	4.766	4.401	3.994	5.022	2.917
¤ Mar 21 1989													4.894	4.765	4.399	3.993	5.021	2.917
¤ Feb 21 1989													4.895	4.765	4.399	3.994	5.022	2.918
¤ Jan 24 1989													4.895	4.765	4.399	3.992	5.022	2.915
Sep 26 1988		3.079		2.355	2.570	2.561	2.328		5.240	5.176	5.092	4.991	4.895	4.766	4.402	3.997	5.024	2.920
May 12 1986		3.078		2.355	2.570	2.565	2.325		5.241	5.176	5.093	4.993	4.897	4.769	4.411	4.010	5.041	2.933
Mar 12 1981		3.076		2.355	2.566	2.557	2.324		5.234	5.169	5.086	4.988	4.894	4.766	4.418	4.028	5.058	2.954
May 2 1978		3.074		2.355	2.566	2.555	2.323		5.236	5.170	5.087	4.985	4.890	4.763	4.422	4.039	5.069	2.963
Sep 18 1974		3.079		2.357	2.568	2.555	2.322	5.287	5.237	5.172	5.090	4.988	4.892	4.764	4.430	4.053	5.086	2.978
Jul 20 1973									5.239	5.172	5.092	4.992	4.897	4.769	4.437	4.061	5.095	
Jul 1970		3.078		2.349	2.556	2.550	2.318	5.288	5.236	5.171	5.089	4.987	4.892	4.762	4.439	4.073	5.106	
Jan 31 1967		3.077		2.354	2.567	2.558	2.321	5.288	5.236	5.172	5.089	4.989	4.893	4.765	4.453	4.093	5.128	3.021
May 13 1965		3.078		2.351	2.568	2.565	2.331	5.311	5.243	5.179	5.095	4.995	4.901	4.773	4.465	4.113	5.148	3.039
Sep 1960		3.076						5.307	5.233	5.169	5.088	4.985	4.889	4.762	4.468	4.129	5.167	3.057
Nov 19 1958								5.313	5.240	5.173	5.092	4.990	4.895	4.768	4.483	4.157	5.196	3.077
Oct 5 1956								5.311	5.237	5.170	5.089	4.990	4.895	4.766	4.492	4.176	5.213	3.092
Mar 10 1955								5.313	5.239	5.174	5.092	4.991	4.895	4.768	4.501	4.192	5.230	3.105
Dec 20 1954		3.078	3.055	2.353	2.568	2.558	2.323	5.287	5.217	5.157	5.069	4.972	4.870	4.751	4.478		5.230	
Oct 14 1952		3.082	3.054	2.355	2.571	2.561	2.324	5.288	5.217	5.159	5.071	4.973	4.872	4.754	4.492		5.257	
Sep 27 1951	6.344	3.078	3.052	2.354	2.569	2.567	2.332	5.299	5.226	5.165	5.076	4.984	4.887	4.767	4.511		5.283	
Sep 12 1950	6.344	3.079	3.056	2.353	2.572	2.565	2.328	5.289	5.217	5.162	5.074	4.976	4.873	4.755	4.504		5.287	
Aug 19 1949	6.343	3.076	3.052	2.357	2.582	2.573	2.338	5.297	5.227	5.169	5.080	4.984	4.882	4.766	4.522		5.310	
Nov 16 1948	6.334	3.076	3.049	2.350	2.567	2.562	2.329	5.292	5.222	5.166	5.074	4.976	4.873	4.757	4.522		5.317	
Aug 8 1947	6.340	3.076	3.053	2.344	2.564	2.552	2.318	5.292	5.229	5.155	5.070	4.973	4.871	4.757	4.519		5.325	
Jan 17 1947	6.340	3.082	3.053	2.344	2.561	2.552	2.320	5.288	5.217	5.159	5.068	4.970	4.873	4.752	4.525		5.335	
Nov 1 1946	6.343	3.082	3.052	2.353	2.567	2.558	2.320	5.289	5.233	5.159	5.071	4.975	4.873	4.757	4.525		5.341	
Oct 21 1946	6.346	3.079	3.055	2.350	2.564	2.558	2.317	5.295	5.236	5.156	5.074	4.915	4.873	4.758	4.537		5.344	
Jan 1946	6.346	3.079	3.058	2.357	2.573	2.564	2.329	5.295	5.254	5.156	5.086	4.984		4.778	4.553		5.366	
May 1945	6.349	3.079	3.082	2.366	2.573	2.564	2.332	5.304	5.251	5.156	5.092	4.984		4.763	4.543		5.380	
May 1939								5.304	5.251	5.156	5.086	4.984		4.778	4.638			

D.S.



U.S.

May 1939								3.070	3.006	2.930	2.854	2.753	2.668	2.549	2.402		
May 1945	6.306	3.079	3.079	2.353	2.576	2.573	2.323	3.067	3.006	2.930	2.845	2.756	2.667	2.546	2.297		
Jan 1946	6.306	3.079	3.061	2.357	2.573	2.576	2.323	3.070	3.009	2.930	2.854	2.753	2.667	2.546	2.329		
Oct 21 1946	6.302	3.079	3.052	2.350	2.570	2.570	2.314	3.061	2.997	2.921	2.845	2.747	2.662	2.536	2.311		
Nov 1 1946	6.309	3.082	3.052	2.353	2.570	2.564	2.311	3.058	2.997	2.927	2.845	2.744	2.658	2.533	2.308		
Jan 17 1947	6.306	3.076	3.058	2.347	2.564	2.561	2.311	3.061	2.998	2.924	2.841	2.744	2.658	2.533	2.305		
Aug 8 1947	6.306	3.079	3.050	2.347	2.567	2.561	2.309	3.058	2.996	2.921	2.841	2.744	2.655	2.533	2.305		
Nov 16 1948	6.303	3.076		2.343	2.570	2.568	2.328	3.070	3.008	2.933	2.854	2.748	2.662	2.543	2.308		
Aug 19 1949	6.317	3.075		2.350	2.582	2.576	2.323	3.073	3.012								
Sep 12 1950	6.303	3.078		2.344	2.575	2.570	2.323	3.065	3.002	2.928	2.854	2.750	2.662	2.540	2.292		
Sep 27 1951	6.303	3.078		2.346	2.571	2.573	2.328	3.075	3.009	2.931	2.856	2.756	2.675	2.553	2.299		
Oct 14 1952		3.079		2.350	2.571	2.564	2.321	3.064	3.000	2.927	2.848	2.747	2.662	2.540	2.281		
Dec 20 1954		3.078		2.349	2.568	2.562	2.319						2.659	2.536	2.269		
Mar 10 1955																	
Oct 5 1956																	
Nov 19 1958																	
Sep 1960		3.070															
May 13 1965		3.077		2.342	2.568	2.568	2.327										
Jan 31 1967		3.076		2.346	2.569	2.563	2.318										
Jul 1970		3.073		2.340	2.565	2.558	2.316										
Jul 20 1973																	
Sep 18 1974		3.079		2.343	2.571	2.563	2.318										
May 2 1978		3.076			2.567	2.565	2.322									1.861	
Mar 12 1981		3.075		2.341	2.566	2.561	2.319									1.851	
May 12 1986		3.076		2.342	2.574	2.570	2.323	3.064	3.001	2.927	2.851	2.745	2.661	2.539	2.198		
Sep 26 1988		3.077	3.059	2.342	2.571	2.563	2.319	3.060	2.998	2.921	2.843	2.741	2.656	2.534	2.189	1.824	
¤ Jan 24 1989													2.653	2.532	2.187	1.822	
¤ Feb 21 1989													2.657	2.534	2.190	1.824	
¤ Mar 21 1989													2.657	2.533	2.189	1.822	
¤ Apr 26 1989													2.658	2.534	2.189	1.823	
¤ Feb 26 1990				2.340			2.317										
¤ Sep 5 1991		3.079	3.060	2.343	2.573	2.567	2.325	3.064	3.001	2.922	2.848	2.742	2.658	2.535	2.186	1.816	
¤ Sep 16 1991		3.077	3.059	2.342	2.572	2.564	2.320	3.060	2.998	2.921	2.845	2.743	2.657	2.534	2.187	1.818	
¤ Jul 17 1997		3.077	3.052	2.340	2.570	2.565	2.318	3.058	2.996	2.920	2.843	2.739	2.656	2.530	2.173	1.791	

Symbol + represents spot levels on △ marks on bridge.
Symbol ⊕ represents steel pins in kerb, pylon and causeway.

B.M.-Brass pin in old railway bridge abutment, datum R.L 3·790m A.H.D.

NOTE: Levels taken from Field Books 142A & 142B, then changed to Australian Height Datum.

1. THE CONCRETE MIX IS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS FOR READY MIXED CONCRETE METRIC UNITS DECEMBER 1974, AND AS MAY BE SUBSEQUENTLY AMENDED. MINIMUM DESIGN MEAN COMPRESSIVE STRENGTH (D.M.C.S.) DETERMINED BY 28-DAY COMPRESSION TESTS ON CYLINDRICAL SPECIMENS SHALL BE AS FOLLOWS:

GRADE F'C MPa	D.M.C.S. MPa	SPEC. SLUMP mm	LOCATION IN STRUCTURE

2. ALL EXPOSED EDGES TO BE CHAMFERED 20mm UNLESS OTHERWISE SHOWN.
3. STEEL REINFORCEMENT 12mm DIA AND OVER TO BE 'TEMPCORE' DEFORMED BARS UNLESS OTHERWISE SHOWN.
4. THE DESIGNING ENGINEER SHALL ENSURE THAT BACKFILLING AND FILLING GENERALLY AROUND SUBSTRUCTURE UNITS TOGETHER WITH ROCK PACKING AND ROCK PITCHING REQUIREMENTS ARE ENDORSED ON THE ROAD PLANS. THE ENGINEER SUPERVISING THE CONSTRUCTION SHALL ENSURE THAT THIS WORK IS DONE TO HIS SATISFACTION AND AS SPECIFIED.
5. ROAD PLANS. 6. BENCH MARK.
7. DESIGN LOADING TO BE MARKED INTO INSIDE FACE OF U.S. KERB AT ABUTMENT A END.
8. YEAR OF CONSTRUCTION TO BE MARKED INTO INSIDE FACE OF D.S. KERB AT ABUTMENT A END.
9. BRIDGE NUMBER TO BE MARKED INTO OUTSIDE FACE OF D.S. KERB AT ABUTMENT A END.
10. IF ANY DOUBT EXISTS IN THE FIELD OR WORKSHOP ABOUT INFORMATION ON THE DRAWING, THE MATTER SHALL BE REVIEWED BY CONSTRUCTION SUPERVISORS WITH THE DIVISION ENGINEER, BRIDGES FOR CLARIFICATION. NO WORK SHALL PROCEED IF IN DOUBT.

DATE	AMENDMENTS	APPROVED
	¤ Additional levels added	

	DESIGN	DRAWING
PREPARED		S.C.C. 16-11-'88
CHECKED		P.H. 1-12-'88
SUPERVISED		[signature]
RECOMMENDED: DIVISION ENGINEER BRIDGES	APPROVED: ASSISTANT DIRECTOR	

SCALE

DESIGN LOADING

LOCATION: MIDLAND HIGHWAY BRIDGEWATER

DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE

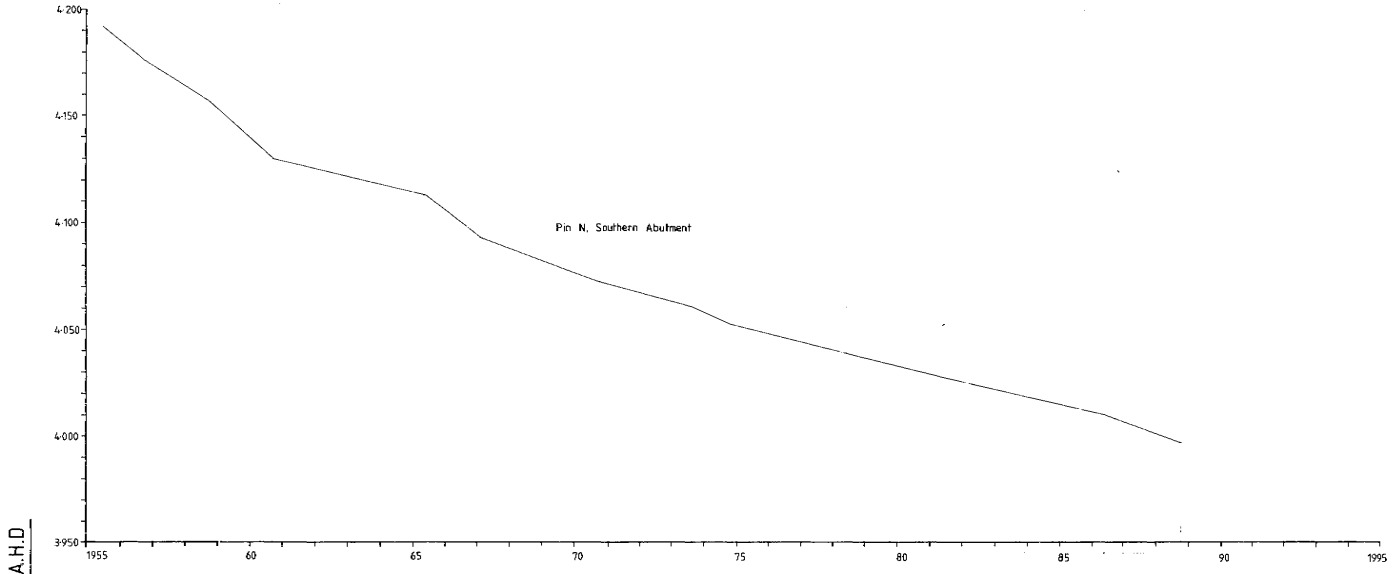
LEVELS ON PIERS & ABUTMENTS

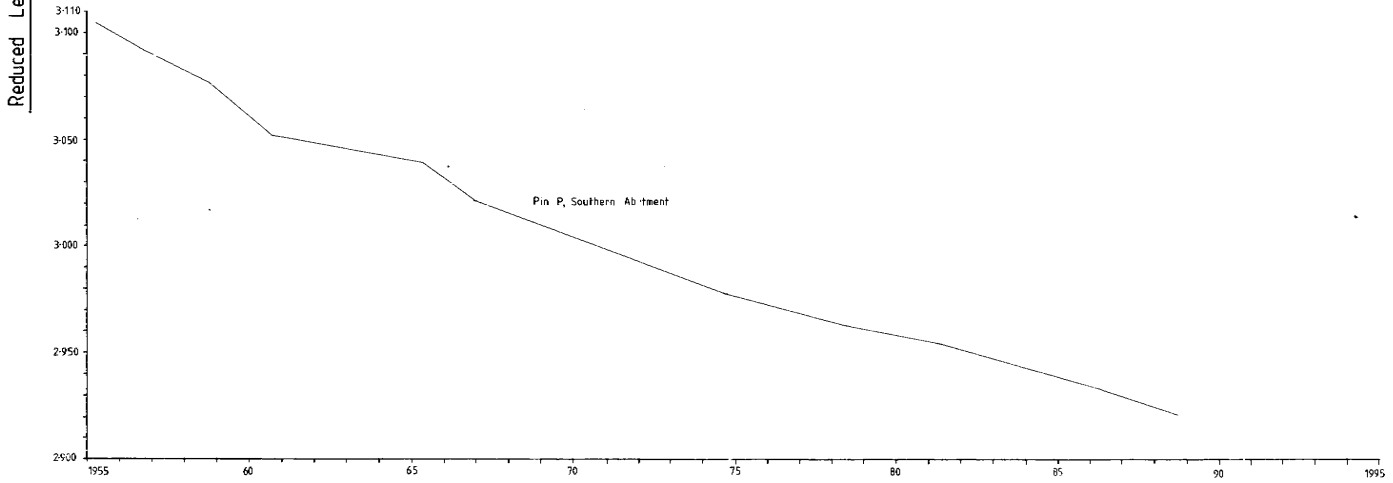
BRIDGE NUMBER 15

SHEET NUMBER D7-40A

DRG. NO. 15D7/40

DRG. NO. 1507|41





Reduced Level (metres) - A.H.D

1. THE CONCRETE MIX IS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS FOR READY MIXED CONCRETE METRIC UNITS - DECEMBER 1974, AND AS MAY BE SUBSEQUENTLY AMENDED. MINIMUM DESIGN MEAN COMPRESSIVE STRENGTH @ 28 DAYS DETERMINED BY 28-DAY COMPRESSION TESTS ON CYLINDRICAL SPECIMENS SHALL BE AS FOLLOWS:

GRADE f'c MPa	D.M.C.I. MPa	SPEC. SLUMP mm	LOCATION IN STRUCTURE

2. ALL EXPOSED EDGES TO BE CHAMFERED 20mm UNLESS OTHERWISE SHOWN.

3. STEEL REINFORCEMENT 12mm DIA AND OVER TO BE "TEMPCORE" DEFORMED BARS UNLESS OTHERWISE SHOWN.
4. THE DESIGNING ENGINEER SHALL ENSURE THAT BACKFILLING AND FILLING GENERALLY AROUND SUBSTRUCTURE UNITS TOGETHER WITH ROCK PACKING AND ROCK PITCHING REQUIREMENTS ARE ENDORSED ON THE ROAD PLANS. THE ENGINEER SUPERVISING THE CONSTRUCTION SHALL ENSURE THAT THIS WORK IS DONE TO HIS SATISFACTION AND AS SPECIFIED.
5. ROAD PLANS
6. BENCH MARK.
7. DESIGN LOADING TO BE MARKED INTO INSIDE FACE OF D.S. KERB AT ABUTMENT A END.
8. YEAR OF CONSTRUCTION TO BE MARKED INTO INSIDE FACE OF D.S. KERB AT ABUTMENT A END.
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10. IF ANY DOUBT EXISTS IN THE FIELD OR WORKSHOP ABOUT INFORMATION ON THE DRAWING, THE MATTER SHALL BE REVIEWED BY CONSTRUCTION SUPERVISORS WITH THE DIVISION ENGINEER, BRIDGES FOR CLARIFICATION. NO WORK SHALL PROCEED IF IN DOUBT.

DATE	AMENDMENTS	APPROVED

	DESIGN	DRAWING
PREPARED		S.C.C. 18-11-88
CHECKED		P.H. 1-12-88
SURVEYED		
RECOMMENDED	APPROVED	
DIVISION ENGINEER BRIDGES	ASSISTANT DIRECTOR	

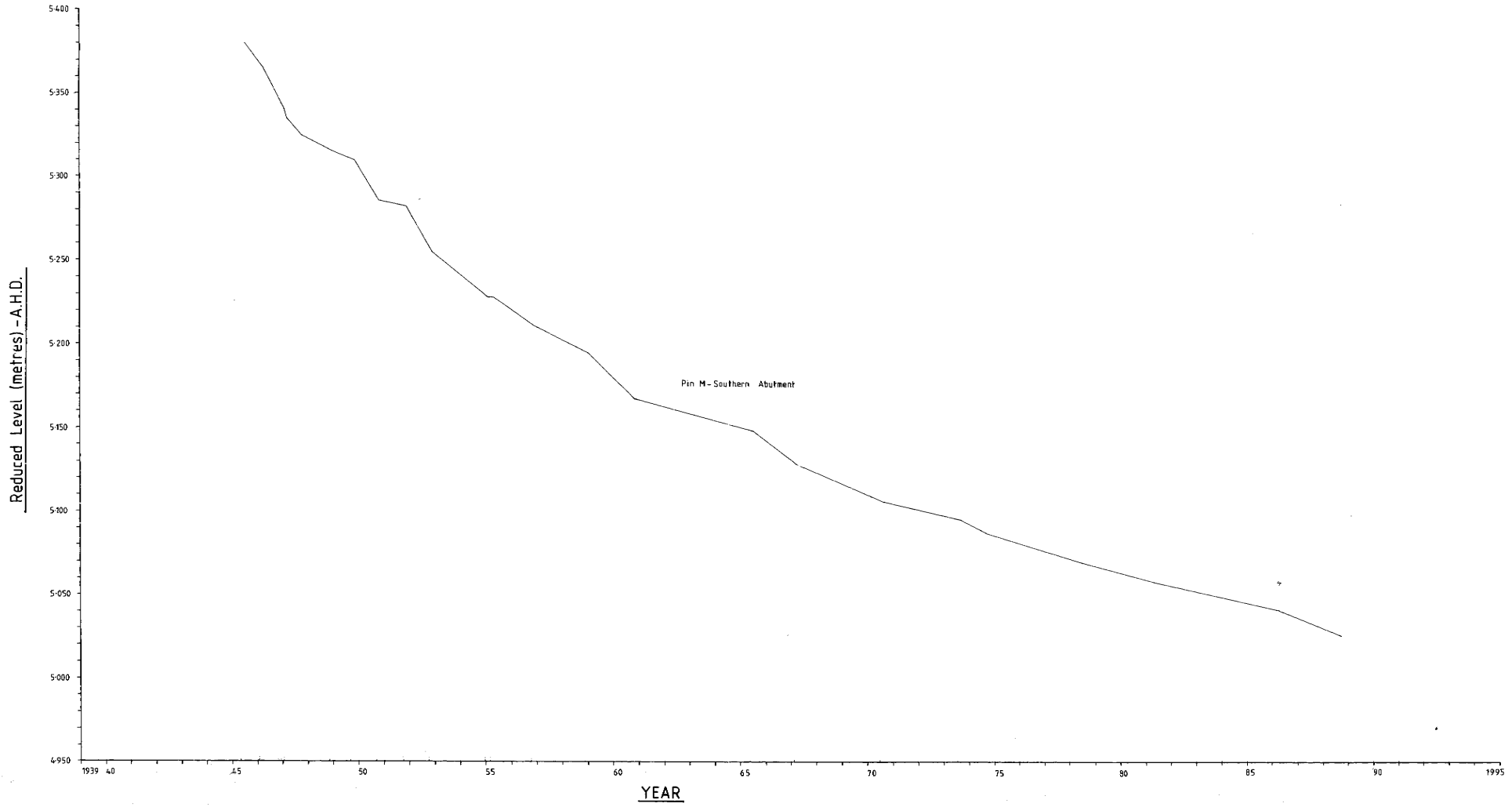
SCALE
DESIGN LOADING
LOCATION MIDLAND HIGHWAY BRIDGEWATER

DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE
LEVELS ON SOUTHERN ABUTMENT

BRIDGE NUMBER 15
SHEET NUMBER D7-41

DRG. NO. 1507 | 42



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DATE	AMENDMENTS	APPROVED

	DESIGN	DRAWING
PREPARED		SCC 21-11-88
CHECKED		P.H. 1-12-88
SUPERVISED		
RECOMMENDED	APPROVED	
DIVISION ENGINEER BRIDGES	ASSISTANT DIRECTOR	

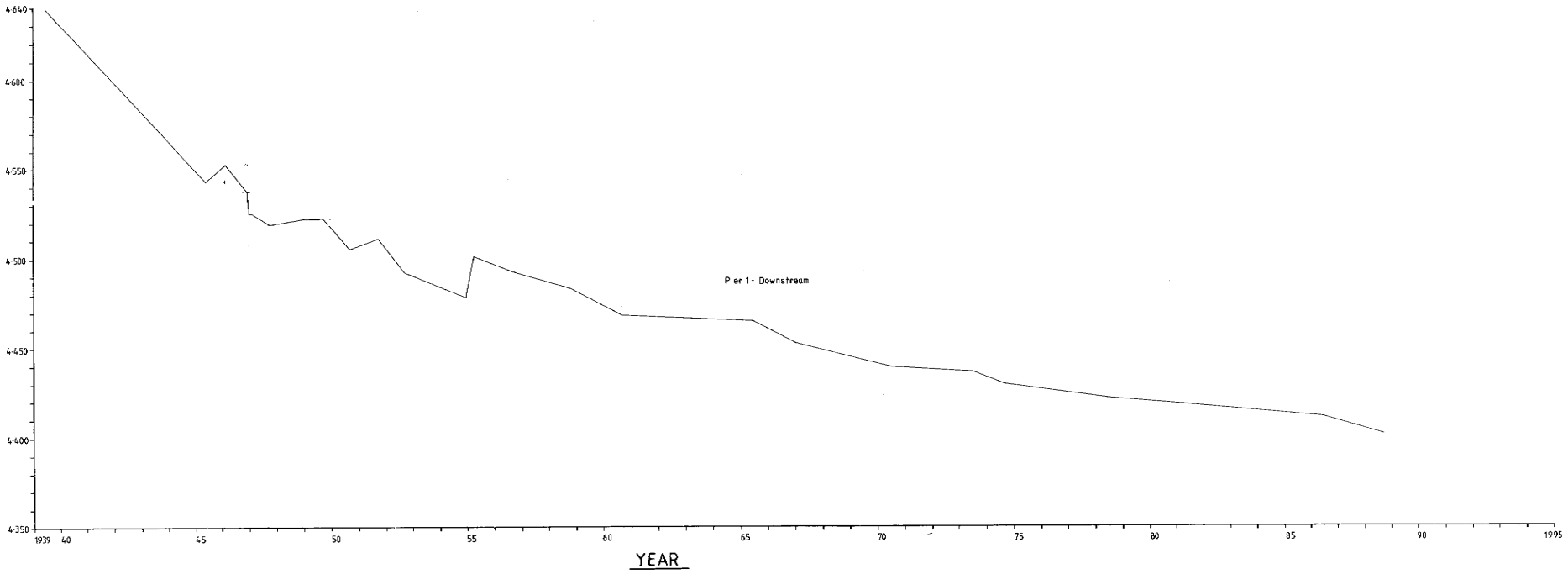
SCALE
DESIGN LOADING
LOCATION
MIDLAND HIGHWAY
BRIDGEWATER

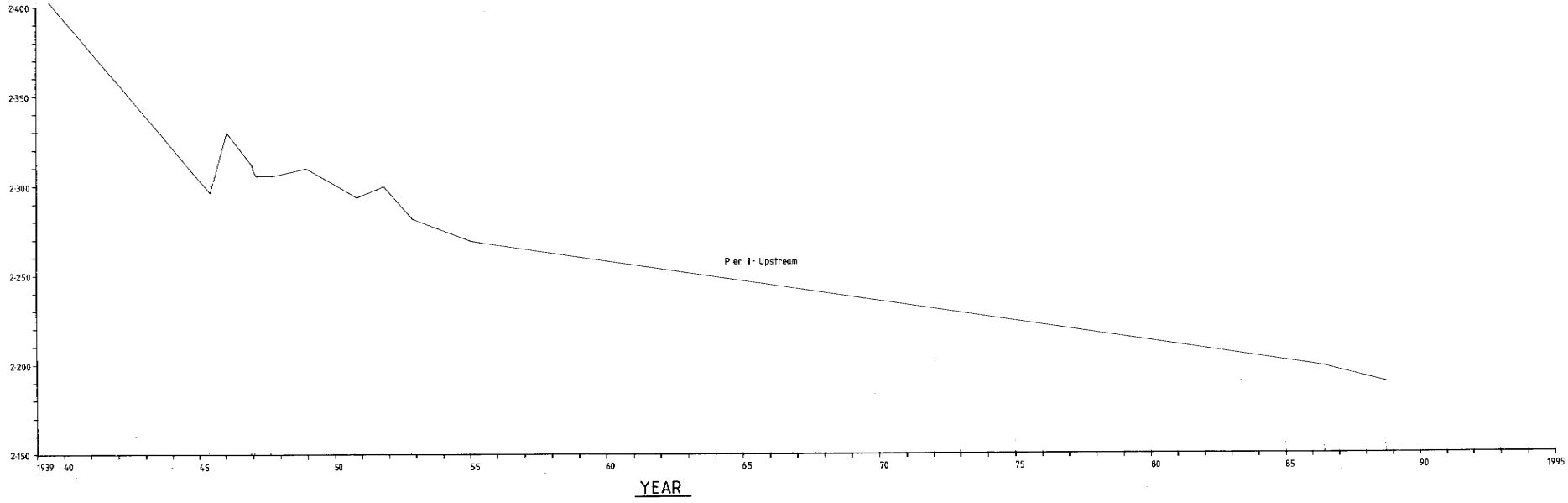
DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE
LEVELS ON SOUTHERN ABUTMENT

BRIDGE NUMBER 1507
SHEET NUMBER 42

DRG. NO. 1507/43





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GRADE F'C MPA	D.M.C.S. MPA	SPEC. SLUMP mm	LOCATION IN STRUCTURE

2. ALL EXPOSED EDGES TO BE CHAMFERED 20mm UNLESS OTHERWISE SHOWN.
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4. THE DESIGNING ENGINEER SHALL ENSURE THAT BACKFILLING AND FILLING GENERALLY AROUND SUBSTRUCTURE UNITS, TOGETHER WITH ROCK PACKING AND ROCK PITCHING REQUIREMENTS ARE ENDORSED ON THE ROAD PLANS. THE ENGINEER SUPERVISING THE CONSTRUCTION SHALL ENSURE THAT THIS WORK IS DONE TO HIS SATISFACTION AND AS SPECIFIED.
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DATE	AMENDMENTS	APPROVED

	DESIGN	DRAWING
PREPARED		S.C.C. 18-11-88
CHECKED		P.H. 1-12-'88
SUPERVISED		
RECOMMENDED	APPROVED	
DIVISION ENGINEER BRIDGES	ASSISTANT DIRECTOR	

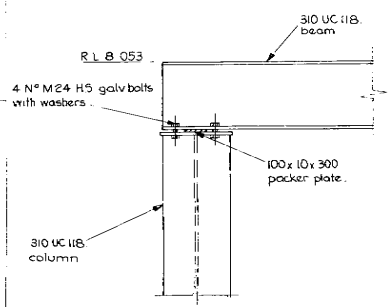
SCALE
DESIGN LOADING
LOCATION
MIDLAND HIGHWAY
BRIDGEWATER

DEPARTMENT OF MAIN ROADS, TASMANIA

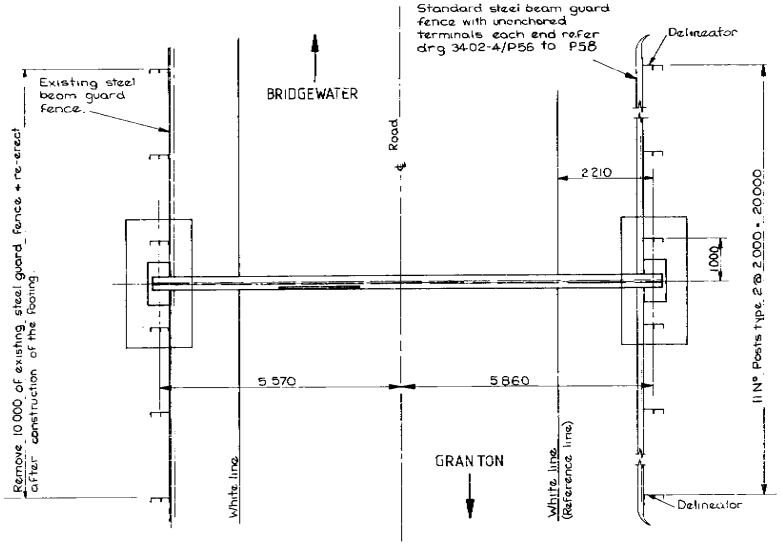
DERWENT RIVER BRIDGE
LEVELS ON PIER 1

BRIDGE NUMBER 1507
SHEET NUMBER 43

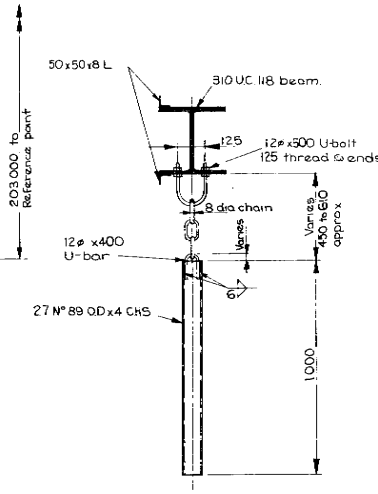
DWG. NO. 1507/44



DETAIL A
Scale 1:10

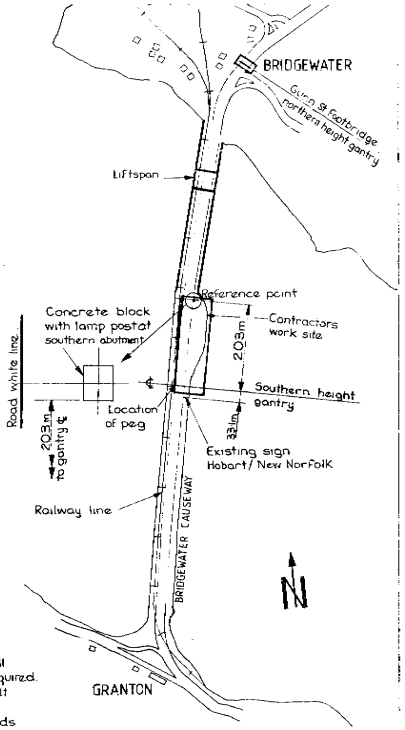


PLAN
Scale 1:50

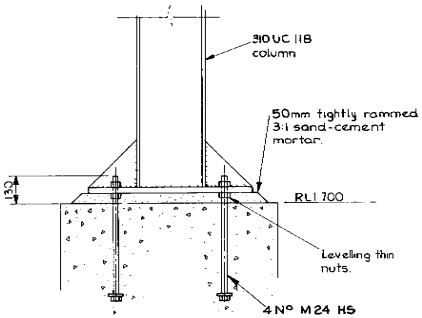


DETAIL C
Scale 1:10

NOTES
1. N° of chain links to each bell varies according to road crossfall and road clearance of 4 600 required.
2. Fine levelling of bells by U-bolt adjustment.
3. After final levelling, cut U-bolt ends above nuts to give 25mm projection

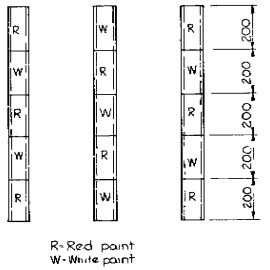


LOCALITY PLAN
LIMITS OF CONTRACT shown thus ▭



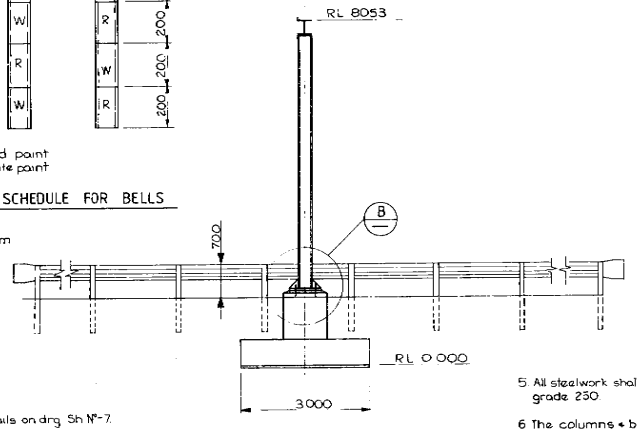
DETAIL B
Scale 1:10

FRONT ELEVATION
Scale 1:50



R-Red paint
W-White paint

PAINTING SCHEDULE FOR BELLS



SIDE ELEVATION
Scale 1:50

NOTES
1. Footing, column and beam details on drg Sh N°-7.
2. Design bearing pressure for Footing is 150 KPa. Footings shall not be constructed on filled ground unless approved by Engineer.
3. Concrete grade 32. & blinding concrete grade 15
4. Refer to spec for protective treatment to gantry members.
5. All steelwork shall be AS 3679 1990 grade 230.
6. The columns & beam of the gantry shall be applied top coating of bronze olive colour.
7. All bells shall be applied top coating as shown with alternate stripes of red & white paint.

	REFERENCE DRAWINGS: Standard steel beam guard fence. 3402-4/P56, P57, P58.	SCALES: 1:50 / 1:10	LOADING	DESIGN	DRAWN: R.J.D 30-10-90
			PREPARED: DP	CHECKED: [illegible] 13-12-90	
			SUPERVISED: [illegible]		

LOCATION: MIDLANDS HIGHWAY BRIDGEWATER

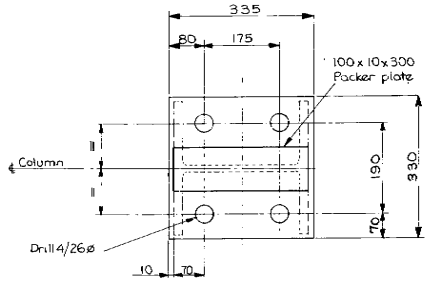
202

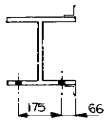
DEPARTMENT OF ROADS AND TRANSPORT, TASMANIA

DERWENT RIVER BRIDGE
SOUTHERN HEIGHT GANTRY ASSEMBLY

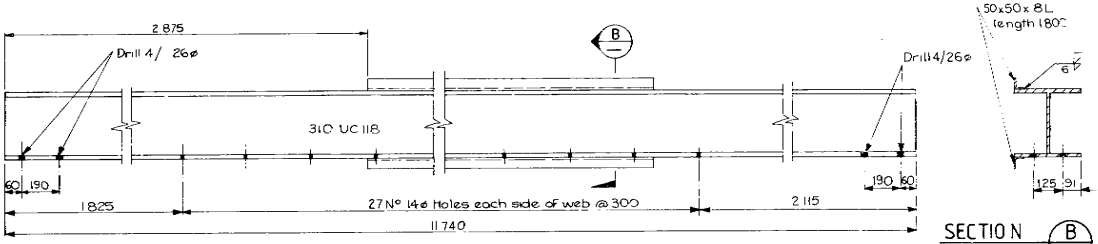
15
D7-44

DRG. NO 1507/45



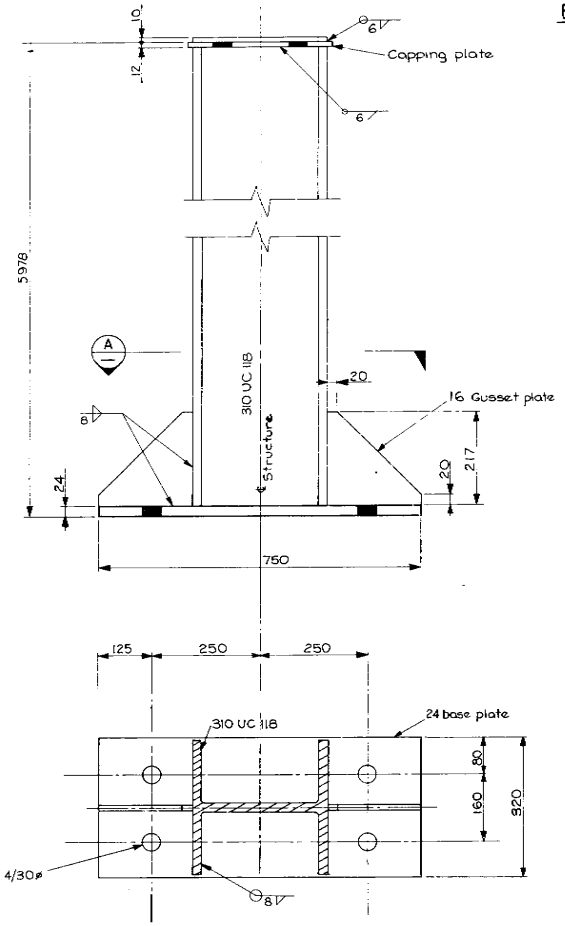


END ELEVATION
Opposite end similar



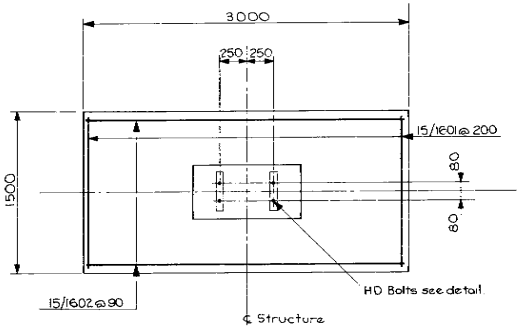
SECTION B

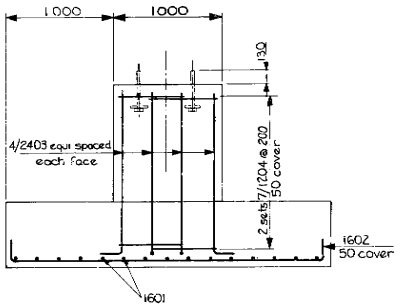
BEAM 1 REQD
Scale 1:10

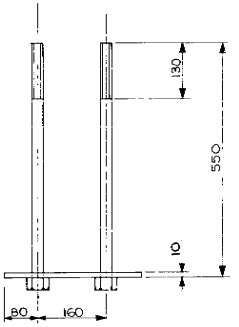


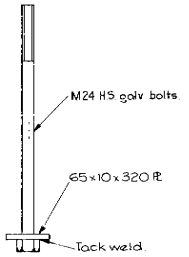
SECTION A

COLUMN 2 REQD
Scale 1:5



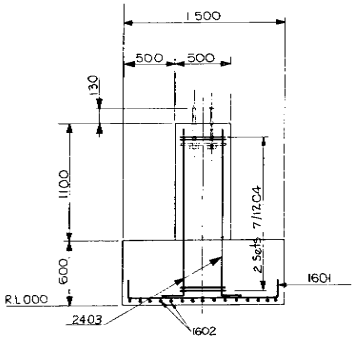






FOOTING HD BOLTS 4 REQD
Scale 1:5

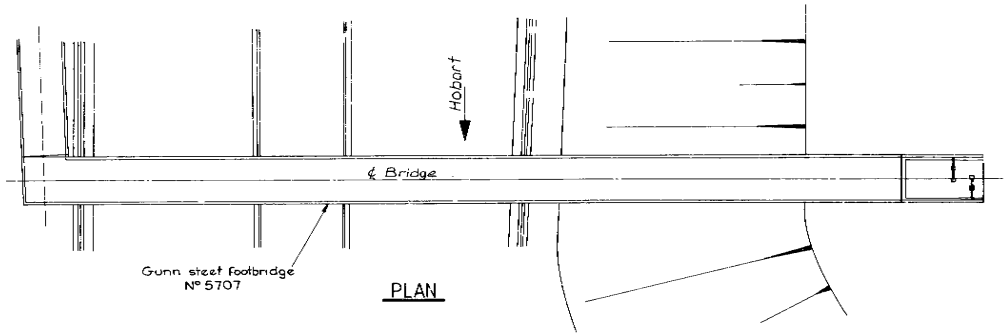
Note Supply each bolt assembly with galv nuts, thin nuts and washers



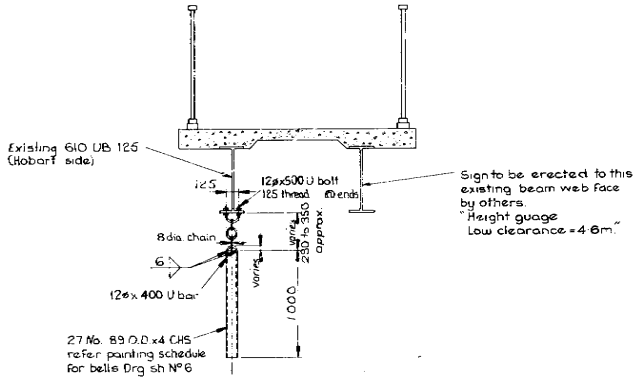
FOOTING 2 REQD
Scale 1:20

			REFERENCE DRAWINGS	SCALES 1:5 1:10 1:20	LOADING	DESIGN	DRAWN	LOCATION MIDLANDS HIGHWAY BRIDGEWATER	DEPARTMENT OF ROADS AND TRANSPORT, TASMANIA
					PREPARED	DP	R.J.D. 5-12-90	RECOMMENDED	APPROVED
					CHECKED			202	DERWENT RIVER BRIDGE
DATE	AMENDMENTS	APPROVED			SUPERVISED			ENGINEER BRIDGE DES SE	DESIGN MANAGER CONTRACT SHEET NO.	SHEET NUMBER 15
									SOUTHERN HEIGHT GANTRY DETAILS D7-45

DRG. NO. 15D7/46



PLAN

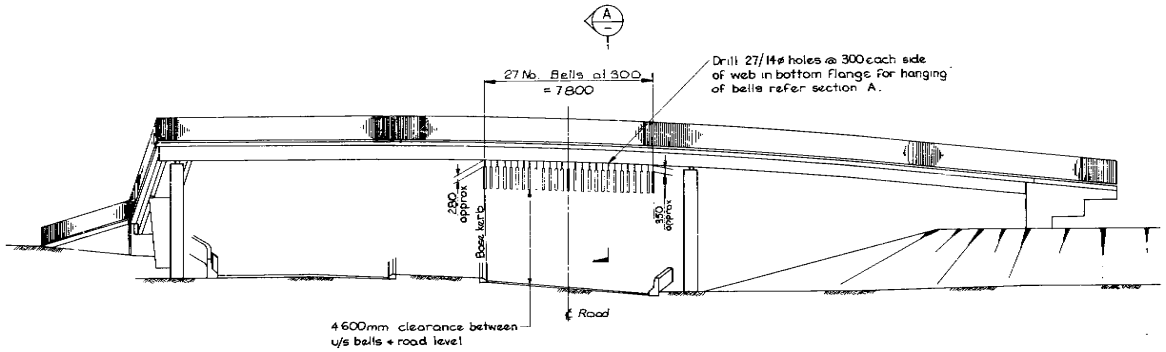


SECTION A

Note 1. N° of chain links to each bell varies according to road crossfall and road clearance of 4 600 required.

2. Fine levelling of bells achieved by U-bolt adjustment.

3. After final levelling, cut U-bolt ends above nuts to give 25mm projection.



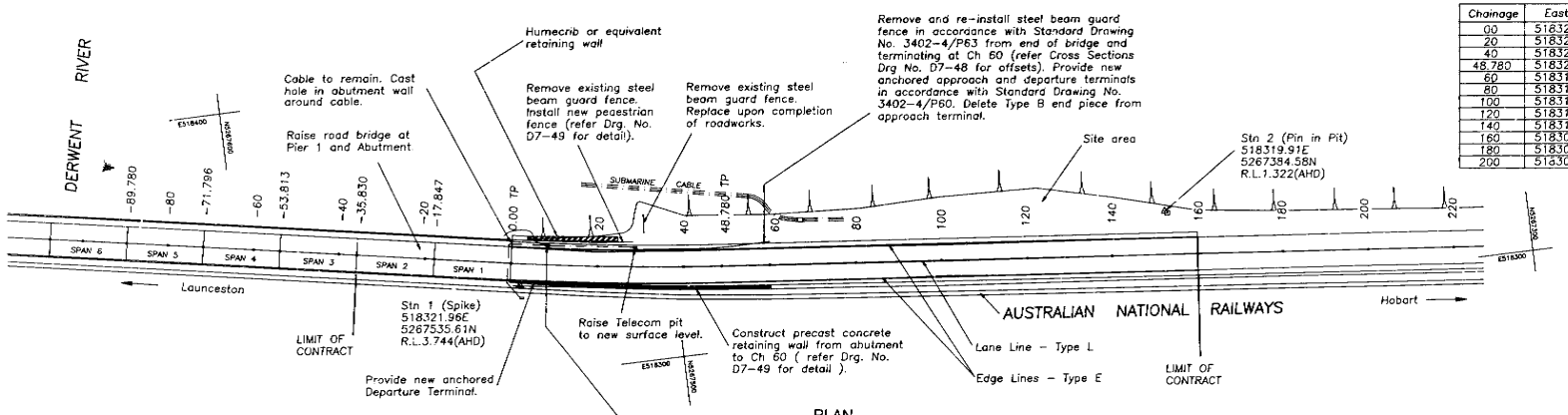
ELEVATION

Refer to 15D7/N°6 for footbridge location + limit of contract

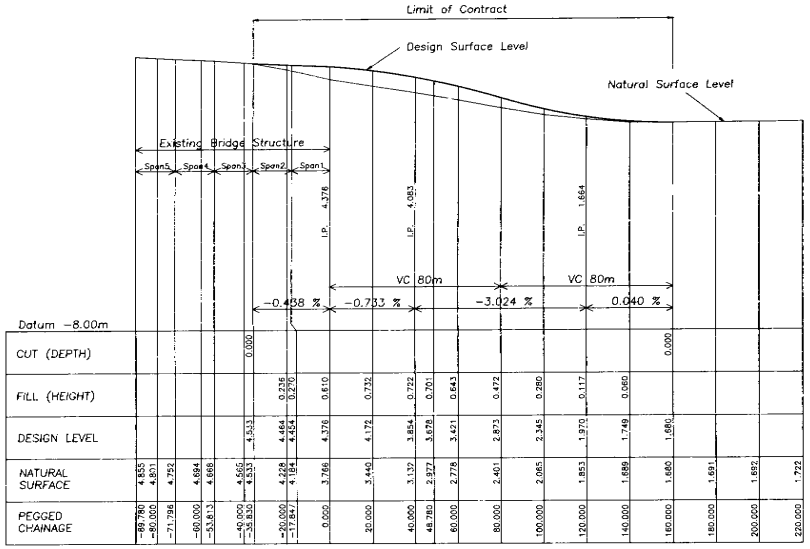
DATE	AMENDMENTS	APPROVED	REFERENCE DRAWINGS	SCALES 1:100 1:20	LOADING	DESIGN	DRAWING	LOCATION MIDLAND HIGHWAY BRIDGEWATER	CONTRACT NUMBER 202	DEPARTMENT OF ROADS AND TRANSPORT, TASMANIA
					PREPARED	DP	JWCC 18-3-91	RECOMMENDED PROJ. ENGINEER BRIDGE DESIGN	APPROVED DESIGN MANAGER 18-3-91	DERWENT RIVER BRIDGE NORTHERN HEIGHT GANTRY ASSEMBLY
					CHECKED	EAP	AJW 25.3.91		CONTRACT SHEET NO.	BRIDGE NUMBER 15
					SUPERVISED		29.3.91			SHEET NUMBER D7-46

ROAD CENTRELINE SETOUT CO-ORDINATES

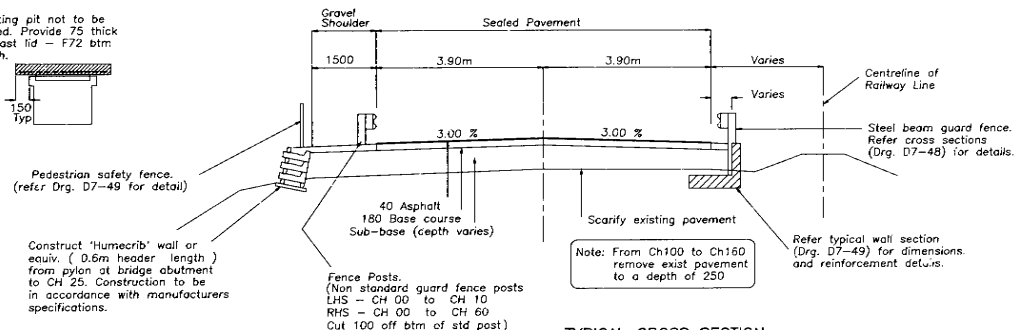
Chainage	Easting	Northing
00	518326.807	5267537.005
20	518323.545	5267517.323
40	518320.942	5267497.494
48.780	518320.009	5267488.764
60	518318.898	5267477.599
80	518316.917	5267457.698
100	518314.936	5267437.796
120	518312.955	5267417.894
140	518310.975	5267397.993
160	518308.994	5267378.091
180	518307.013	5267358.189
200	518305.033	5267338.288



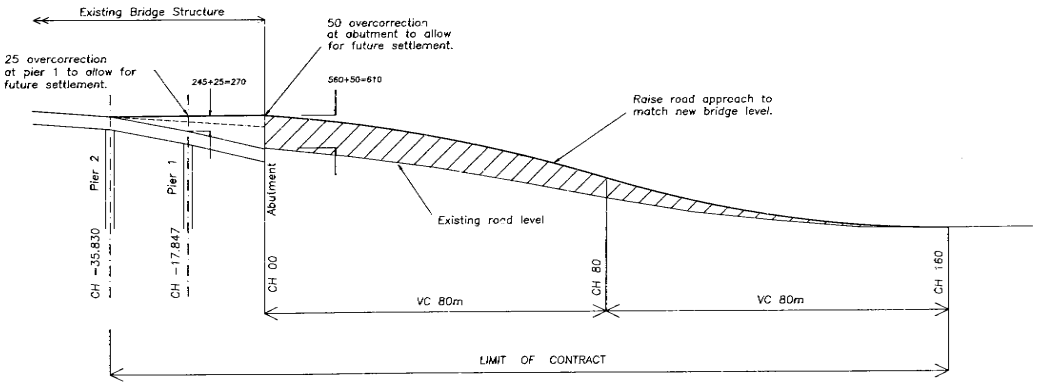
PLAN
Scale 1:500



LONGITUDINAL SECTION Scales 1:1000 H
1:100 V



TYPICAL CROSS SECTION
Scale 1:50



SCHEMATIC OF PROPOSED WORKS
Not to Scale

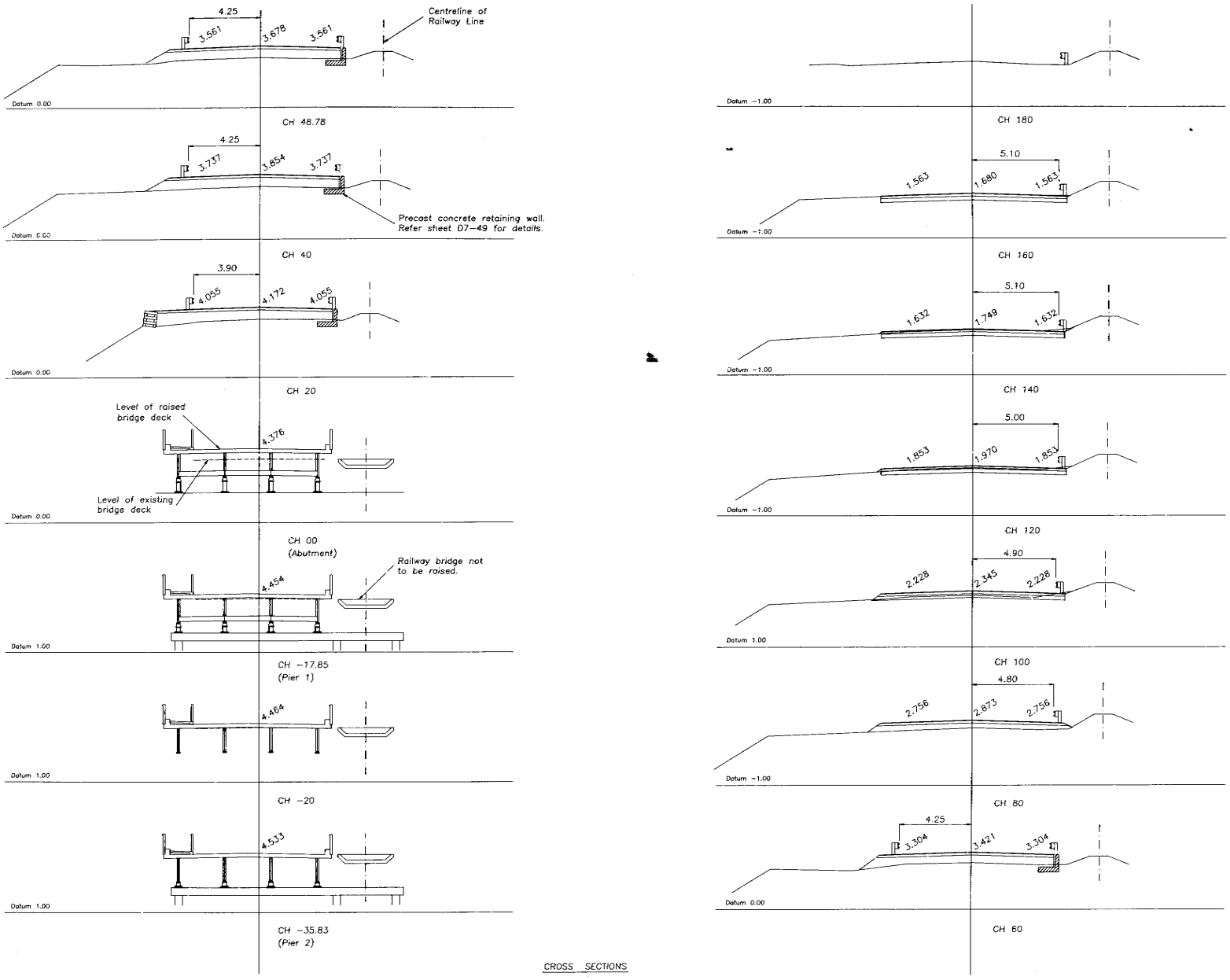
DERWENT RIVER BRIDGE

Sheet Number	Drawing Number	Description
1	D7-47	General Arrangement of Southern End Raising 1991
2	D7-48	Road Cross Sections
3	D7-49	Fences and Retaining Walls
4	D7-50	Abutment Alterations and Jacking Sequence
5	D7-51	Bearings and Steelwork
6	D7-52	Polystyrene Fill
7	D7-53	Temporary Road Signs

LAWSON POTTER HURD PTY. LTD. LPH CONSULTING ENGINEERS
APPROVED DIRECTOR
LPH DRAWING No. 39190
SHEET 1 OF 7

SURVEYED DATUM
MOSS PROJECT No.
MOSS SURVEY MODEL
MOSS DESIGN MODEL
SCALES LOADING
REFERENCE DRAWINGS
DRAFTING DESIGN
DRAWING AMENDMENTS CHECKED DATE APPROVED COMPUTER PRINTOUT No. DATE
COMPUTER PRINTOUT AMENDMENTS CHECKED DATE APPROVED

DEPARTMENT OF ROADS AND TRANSPORT, TASMANIA
DERWENT RIVER BRIDGE
General Arrangement of Southern End Raising - 1991
CONTRACT No. 233
SHEET No. 1
DRG. No. D7-47



CROSS SECTIONS

Scale 1:100

LAWSON POTTER HUGO PTY. LTD. CONSULTING ENGINEERS

APPROVED DIRECTOR

LPH DRAWING No. 39190

SHEET 2 OF 7

SURVEYED | DATUM

MOSS PROJECT No.

MOSS SURVEY MODEL

MOSS DESIGN MODEL

No. | DRAWING AMENDMENTS | CHECKED | DATE | APPROVED

SCALES

LOADING

REFERENCE DRAWINGS

COMPUTER PRINTOUT No. | DATE | COMPUTER PRINTOUT AMENDMENTS | CHECKED | DATE | APPROVED

DRAFTING		DESIGN	
DRAWN	DATE	DESIGNED	DATE
CHECKED	DATE	RECOMMENDED/ENDORSED	DATE
APPROVED WRLE	DATE	APPROVED WRLE	DATE
		E.A.P.	A/FIELD 22-10-21

DEPARTMENT OF ROADS AND TRANSPORT, TASMANIA

DERWENT RIVER BRIDGE

Cross sections

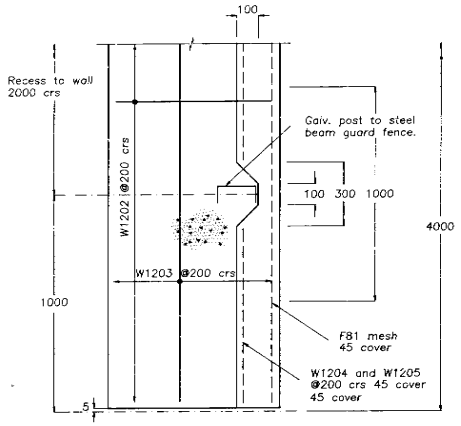
CONTRACT No. 233

SHEET No. 2

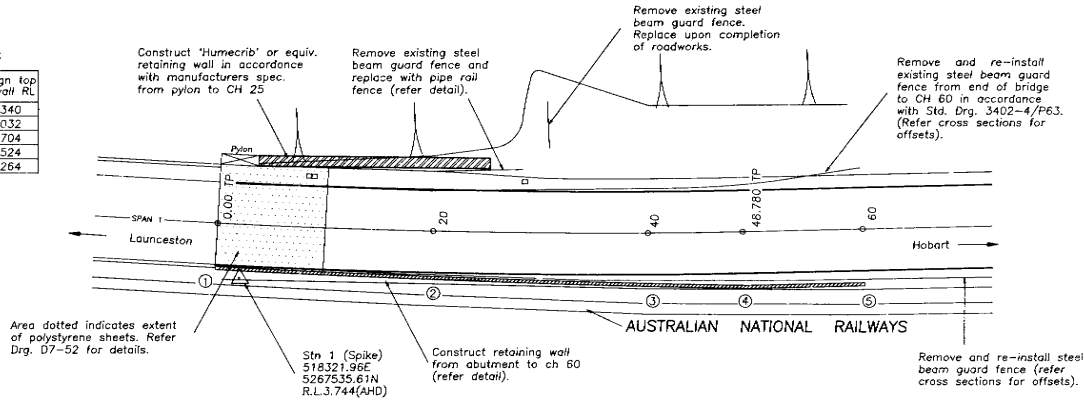
DRG. No. D7–48

RETAINING WALL SETOUT CO-ORDINATES

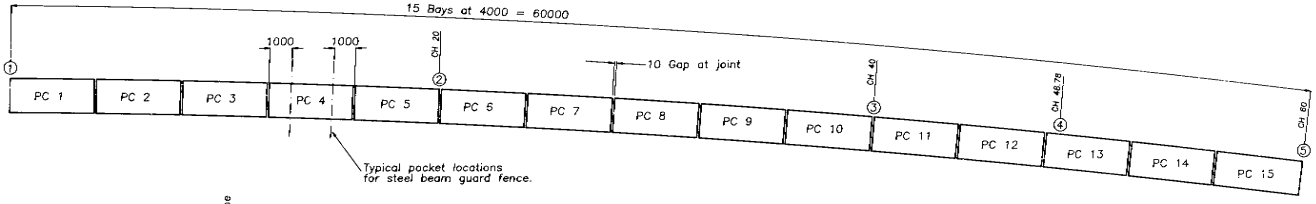
Point	Easting	Northing	Design top of wall RL
1	518322.439	5267537.854	4.340
2	518319.044	5267517.991	4.032
3	518316.052	5267498.065	3.704
4	518314.894	5267489.273	3.524
5	518313.683	5267478.118	3.264

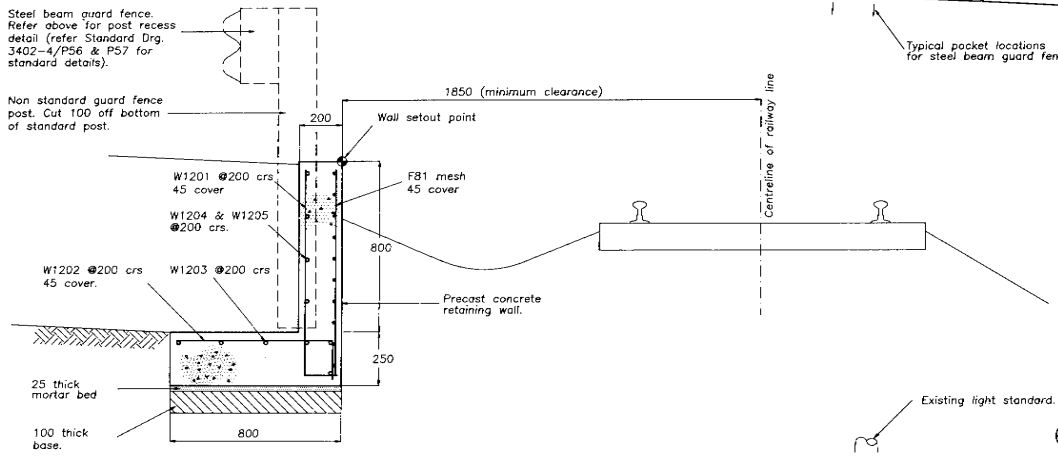


PRECAST RETAINING WALL PLAN
Scale 1:10



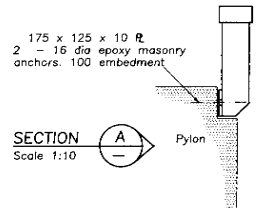
PLAN
Scale 1:200

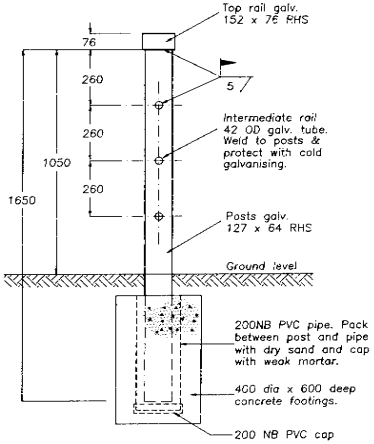




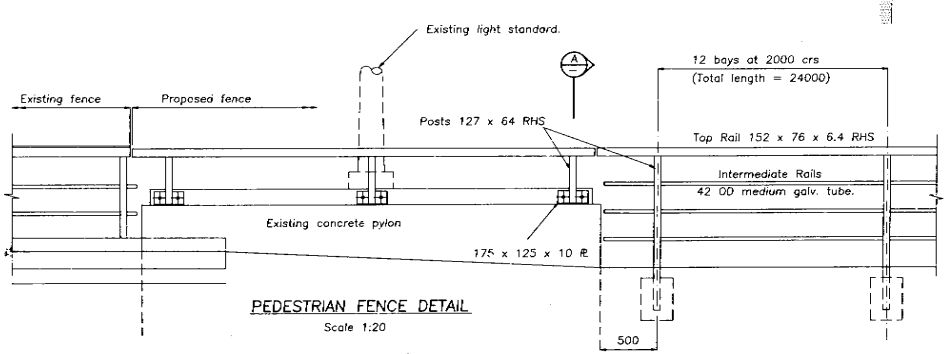
PRECAST RETAINING WALL SECTION
Scale 1:10

PRECAST CONCRETE RETAINING WALL PROFILE
Scale 1:100 horiz
1:50 vert





TYPICAL SECTION THROUGH PEDESTRIAN SAFETY FENCE
Scale 1:10



PEDESTRIAN FENCE DETAIL
Scale 1:20

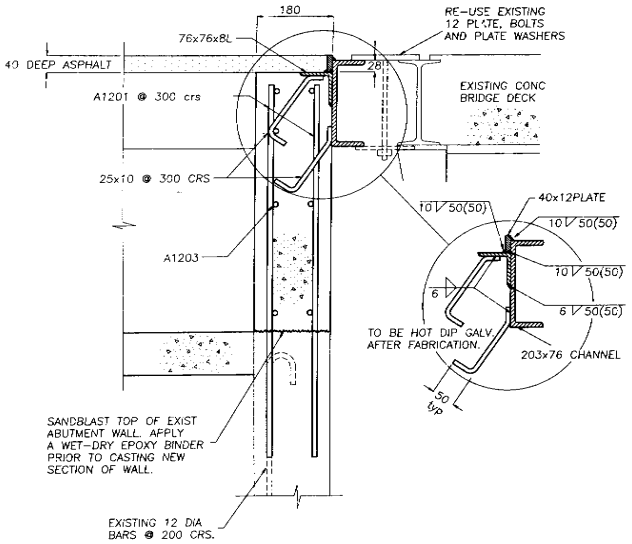
LAWSON POTTER HURD PTY. LTD. CONSULTING ENGINEERS
APPROVED
DIRECTOR
LPH DRAWING No. 39190
SHEET 3 OF 7

SURVEYED | DATUM
MOSS PROJECT No.
MOSS SURVEY MODEL
MOSS DESIGN MODEL
SCALES
LOADING
REFERENCE DRAWINGS
DRAFTING | DESIGN
No. | DRAWING AMENDMENTS | CHECKED | DATE | APPROVED | COMPUTER PRINTOUT No. | DATE | COMPUTER PRINTOUT AMENDMENTS | CHECKED | DATE | APPROVED

DEPARTMENT OF ROADS AND TRANSPORT, TASMANIA

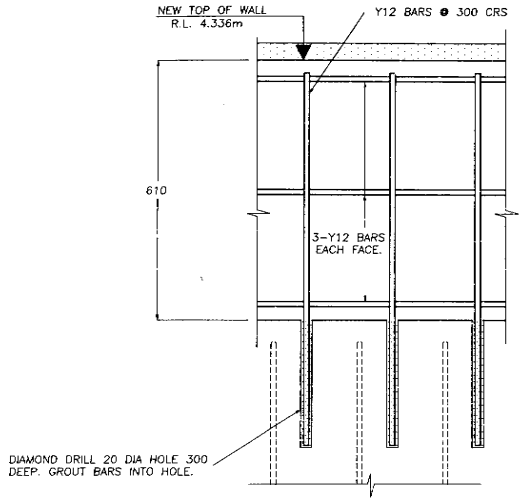
DERWENT RIVER BRIDGE
Fences and Retaining Walls.

CONTRACT No. 233
SHEET No. 3
DRG. No. D7-49



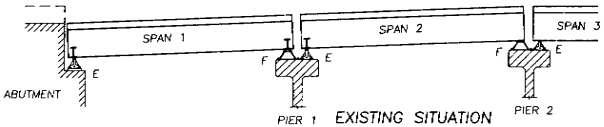
SECTION AT ROADWAY

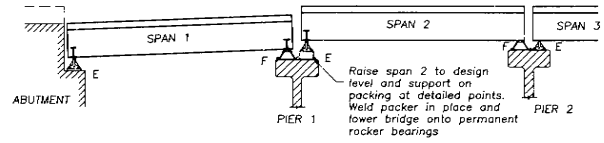
SCALE 1:5

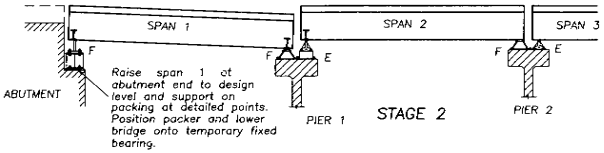


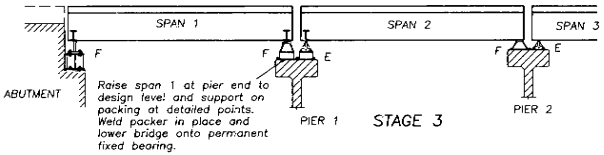
ELEVATION AT ROADWAY

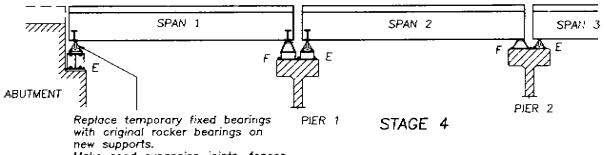
SCALE 1:5







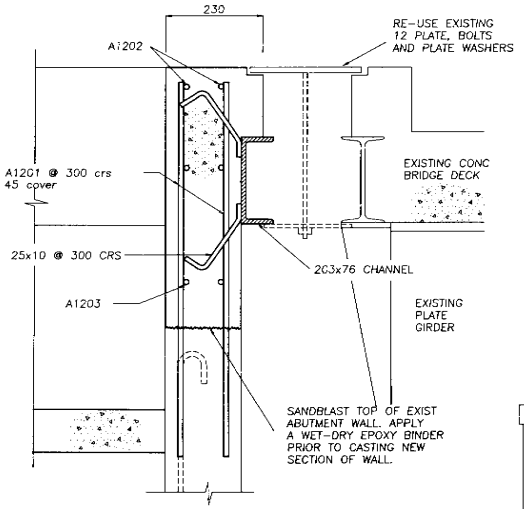




JACKING SEQUENCE

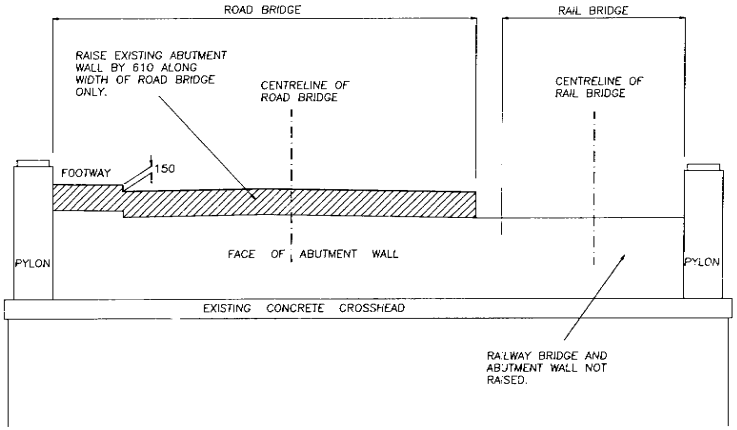
NOT TO SCALE

EXTENSION TO ABUTMENT CURTAIN WALL



SECTION AT FOOTWAY

SCALE 1:5



ELEVATION AT ABUTMENT

SCALE 1:50

LAWSON POTTER HURD PTY LTD — LPH — CONSULTING ENGINEERS

APPROVED — DIRECTOR — LPH DRAWING No. 39190 — SHEET 4 OF 7

SURVEYED DATUM | MOSS PROJECT No. | MOSS SURVEY MODEL | MOSS DESIGN MODEL | SCALES | LOADING | REFERENCE DRAWINGS | DRAFTING | DESIGN

DRAWING AMENDMENTS | No. | CHECKED | DATE | APPROVED | COMPUTER PRINTOUT No. | DATE | COMPUTER PRINTOUT AMENDMENTS | CHECKED | DATE | APPROVED

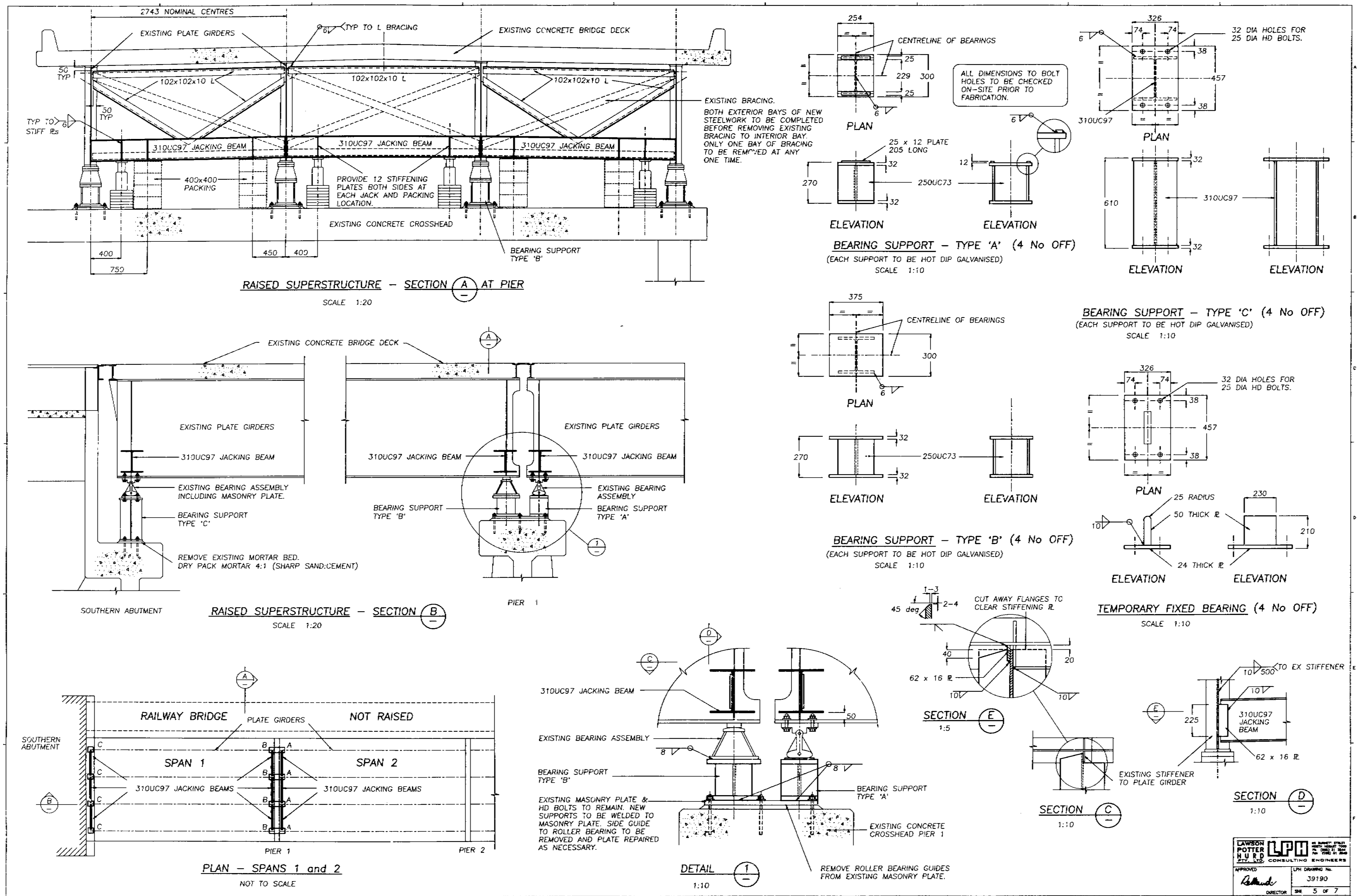
DEPARTMENT OF ROADS AND TRANSPORT, TASMANIA

DERWENT RIVER BRIDGE

ABUTMENT ALTERATIONS AND JACKING SEQUENCE

CONTRACT No. 233 | SHEET No. 4

DRG. No. D7-50



LAWSON POTTER HURD PTY. LTD. CONSULTING ENGINEERS

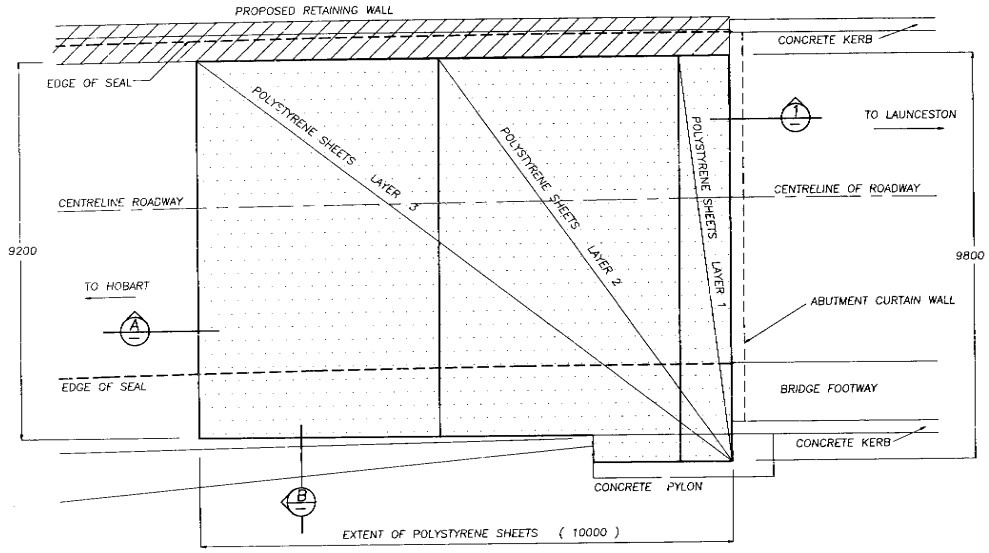
LPH DRAWING No. 39190 — SHT 5 OF 7

DEPARTMENT OF ROADS AND TRANSPORT, TASMANIA

DERWENT RIVER BRIDGE
BEARINGS AND STEELWORK

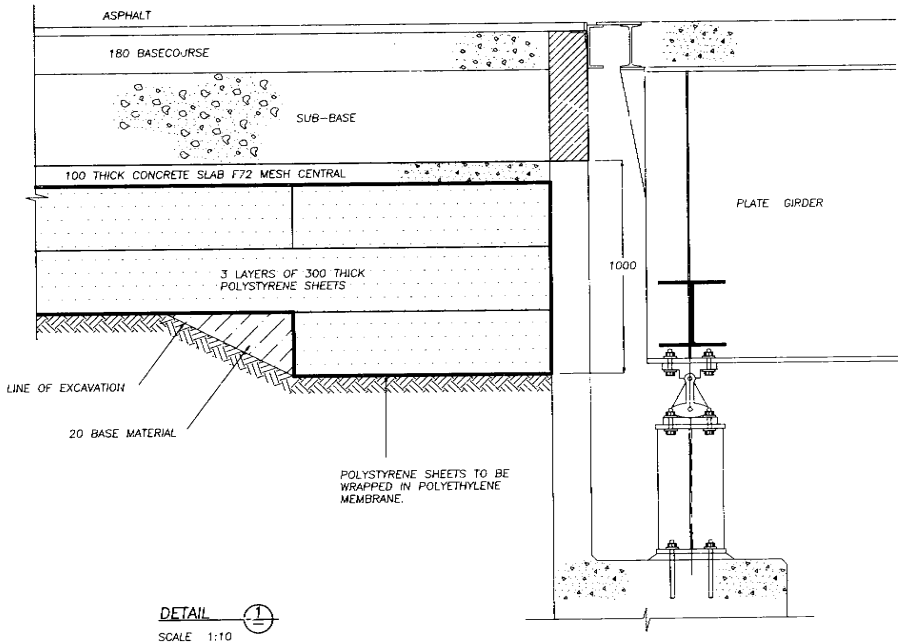
CONTRACT No. 233 — SHEET No. 5 — DRG. No. D7-51

AUSTRALIAN NATIONAL RAILWAYS



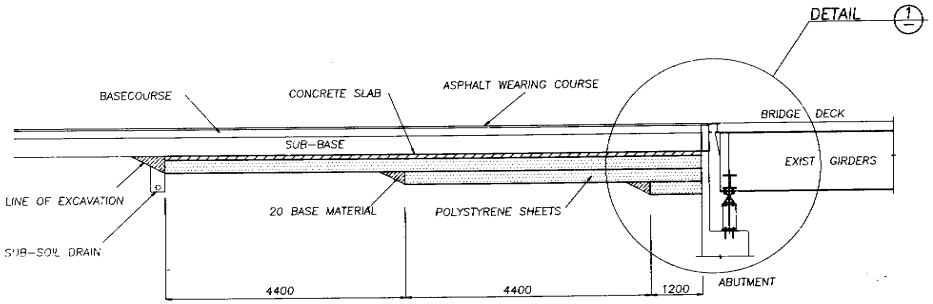
PLAN AT SOUTHERN ABUTMENT

SCALE 1:50



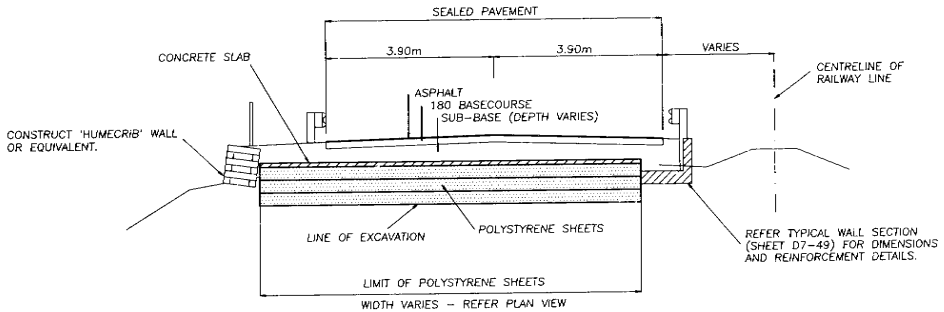
DETAIL (1)

SCALE 1:10



SECTION (A)

SCALE 1:50



SECTION (B)

SCALE 1:50

LAWSON POTTER HUSD PTY. LTD. CONSULTING ENGINEERS

APPROVED DIRECTOR

LPH DRAWING No. 39190

SHEET 6 OF 7

SURVEYED DATUM

MOSS PROJECT No.

MOSS SURVEY MODEL

MOSS DESIGN MODEL

No. DRAWING AMENDMENTS CHECKED DATE APPROVED

SCALES

LOADING

REFERENCE DRAWINGS

COMPUTER PRINTOUT No. DATE COMPUTER PRINTOUT AMENDMENTS CHECKED DATE APPROVED

DRAFTING DESIGN

DRAWN DATE DESIGNED DATE

CHECKED DATE RECOMMENDED/CHECKED DATE

APPROVED TITLE DATE APPROVED TITLE DATE

A/DEPUTY

DEPARTMENT OF ROADS AND TRANSPORT, TASMANIA

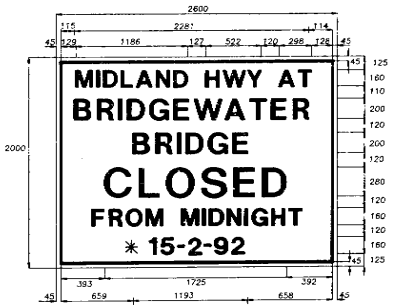
DERWENT RIVER BRIDGE

POLYSTYRENE FILL

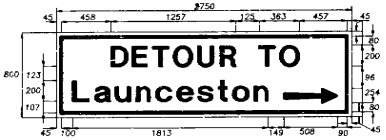
CONTRACT No. 233

SHEET No. 6

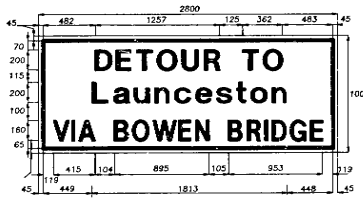
DRG. No. D7-52



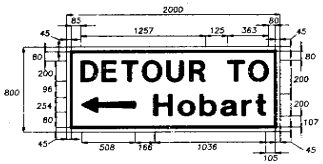
MARK A



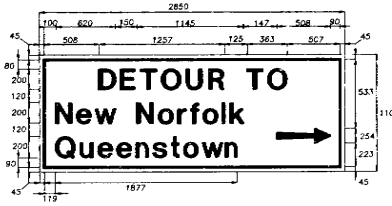
MARK B



MARK C



MARK D



MARK E

* DATE AND TIME TO BE CONFIRMED AT AWARD OF CONTRACT

TEMPORARY SIGNS

MARK	No. REQUIRED	LOCATION
A B – Left	1 1	Glenora Road – Lyell Highway (Glenora Approach) 300m north of Blair Street Junction at New Norfolk.
A B – Ahead	1 1	Boyer SR – Lyell Highway (Gretna Approach) 50m north of Sackriver Road Junction at New Norfolk.
A	1	Lyell Highway – Midland Highway (New Norfolk Approach) 300m north west of Junction or 50m north west of existing AD.
A	1	Brooker Highway – Lyell Highway (Hobart Approach) 400m south of Black Snake Lane Underpass.
E – Right	1	Boyer SR – Midland Highway (Brighton Approach) 200m north east of junction.
A D – Left	1 1	Midland Highway – East Derwent Highway (Brighton Approach) North entrance to "Parkholme".
A C	1 1	Brooker Avenue – Howard Road Roundabout (Hobart Approach) 200m south of pedestrian overpass bridge.
B – Right	1	Brooker Highway – Goodwood Road (Hobart Approach) North of Howard Road Roundabout.
B – Left	1	Brooker Highway – Goodwood Road 700m north of Elwick Road.
A	1	Brooker Highway 400m north of Euston Street Overpass.

TOTAL No. OF SIGNS = 14

SIGNS TO BE COVERED

LOCATION	PART OF SIGN TO BE COVERED	No. OF SIGN PARTS TO BE COVERED
Lyell Highway – Midland Hwy:– (New Norfolk)	Cover existing "Launceston " AD, route marker shield and "Launceston" ID.	3
Brooker Highway – Lyell Hwy:– (Hobart Approach)	Cover existing "Launceston" AD and route marker shield.	2
Brooker SR – Midland Hwy:– (Boyer Approach)	Cover "Hobart" FB.	1
Boyer SR – Midland Hwy:– (Brighton Approach)	Cover route marker shield and existing "Hobart" ID.	2
Boyer SR – Midland Hwy:– (Brighton Approach)	Cover route marker shield	1
Midland Highway – East Derwent Hwy:– (Old Beach Approach)	Cover existing "Hobart" FB, route marker shield, "Hobart" AD	3
Brooker Highway – Goodwood Roundabout (Hobart Approach)	Cover "Launceston" AD and route marker shield.	2
Brooker Highway – Goodwood Rd Jcn:– (Hobart Approach)	Cover existing "Launceston" AD and route marker shield.	2
Brooker Hwy – Goodwood Rd Jcn:– (Bowen Bridge Approach)	Cover "Launceston" AD and route marker shield. Cover "Launceston" FB.	3
Brooker Hwy, Claremont Link Rd:–	Cover existing "Launceston" ID (2 signs).	2

TOTAL No. OF SIGNS TO BE COVERED = 21

AD = Advanced Direction Sign, white on green.

ID = Intersection Direction Sign, white on green

FB = Fingerboard Sign, black on white.

LETTERING TO AS 1743

160, 200, AND 280 HIGH UPPER CASE LETTERING SERIES E

200/150 LETTERING – SERIES E MODIFIED

LAWSON POTTER HURD PTY. LTD. CONSULTING ENGINEERS

APPROVED DIRECTOR

LPH DRAWING No. 39190

SHEET 7 OF 7

DEPARTMENT OF ROADS AND TRANSPORT, TASMANIA

DERWENT RIVER BRIDGE

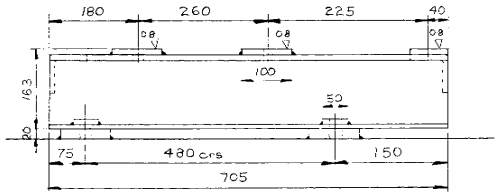
TEMPORARY ROAD SIGNS

CONTRACT No. 233

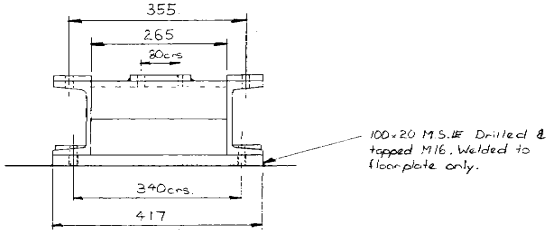
SHEET No. 7

DRG. No. D7-53

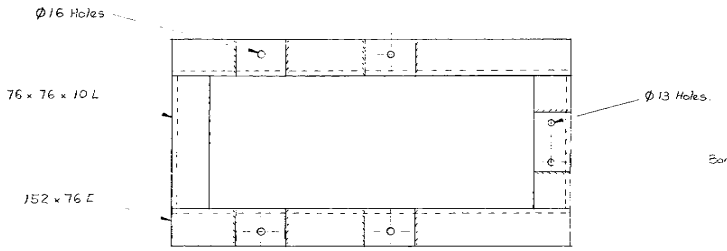
DRG. NO. 374M338-000



SIDE ELEVATION.

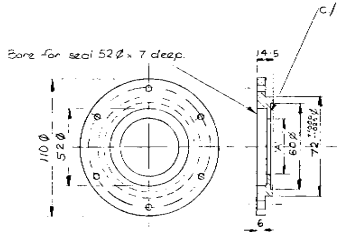


END ELEVATION.

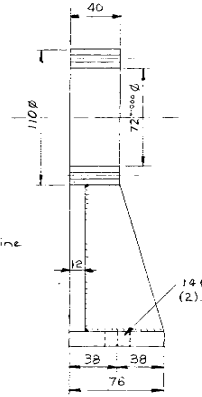


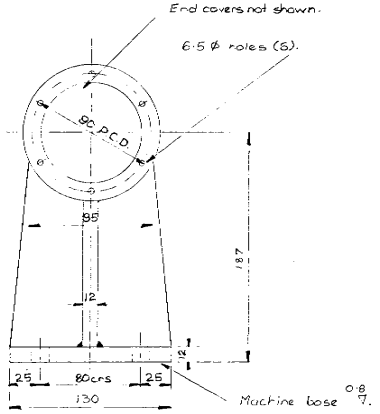
PLAN.

ENGINE BED.

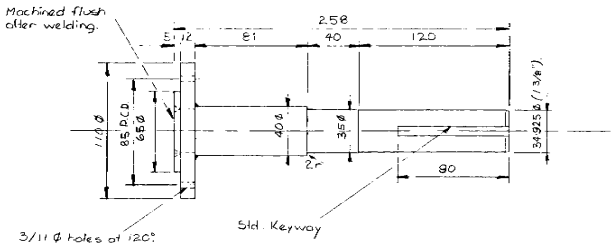


END COVERS - 2 OFF.
Dim 'A' - 36Ø 1 OFF.
Dim 'A' - 41Ø 1 OFF.

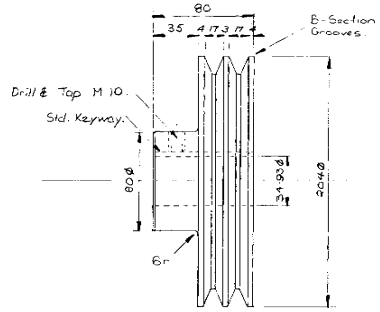




OUT - RIGGER BEARING.



ALTERNATOR DRIVE EXTENSION SHAFT.
1OFF - M.S.



ALTERNATOR DRIVE PULLEY.
1OFF - M.S.

Note:

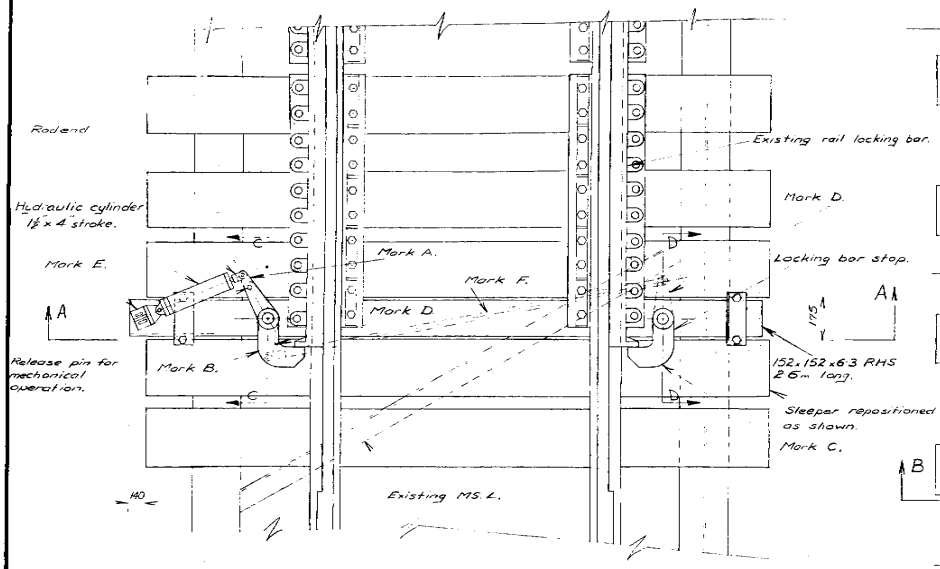
1. Engine bed to suit VM Diesel Series SV 298.
2. Outrigger support bearing for alternator drive bolted to machined base.
   S.A. Ball bearing Nº 2207.
   Seals type A.B.C1.
   1/52 O.D. x 40 I.D.
   1/52 O.D. x 35 I.D.
3. Metal guard to be provided over V-Belt drive.

Originally 374M 338-000

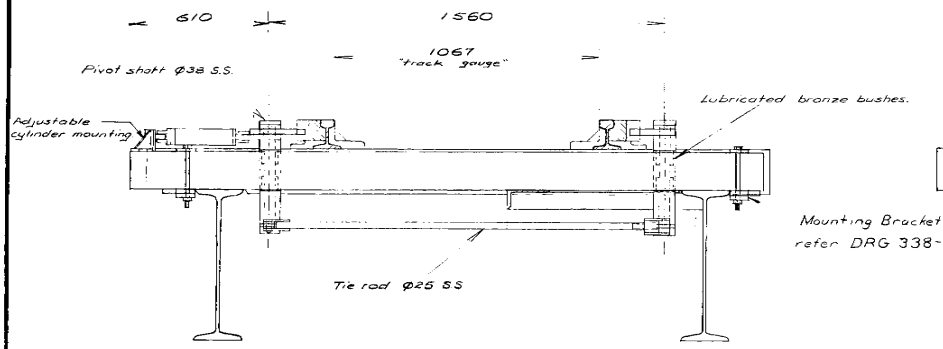
Scale 1:2, 1:5	Design Number		Design	Drawing	DEPARTMENT OF MAIN ROADS, TASMANIA
Date	Amendments	Prepared		TJC 18-10-85	
		Checked		GAS 18.10.85	(PROPOSAL) BRIDGEWATER BRIDGE
		Supervision		[illegible]	AUXILIARY POWER
		Recommended (Division Engineer Plant)	Approved (Assistant Director)		DETAILS - ENGINE BED, ALTERNATOR DRIVE

15 / D7-54 (Number of Sheets)

374M 338-1

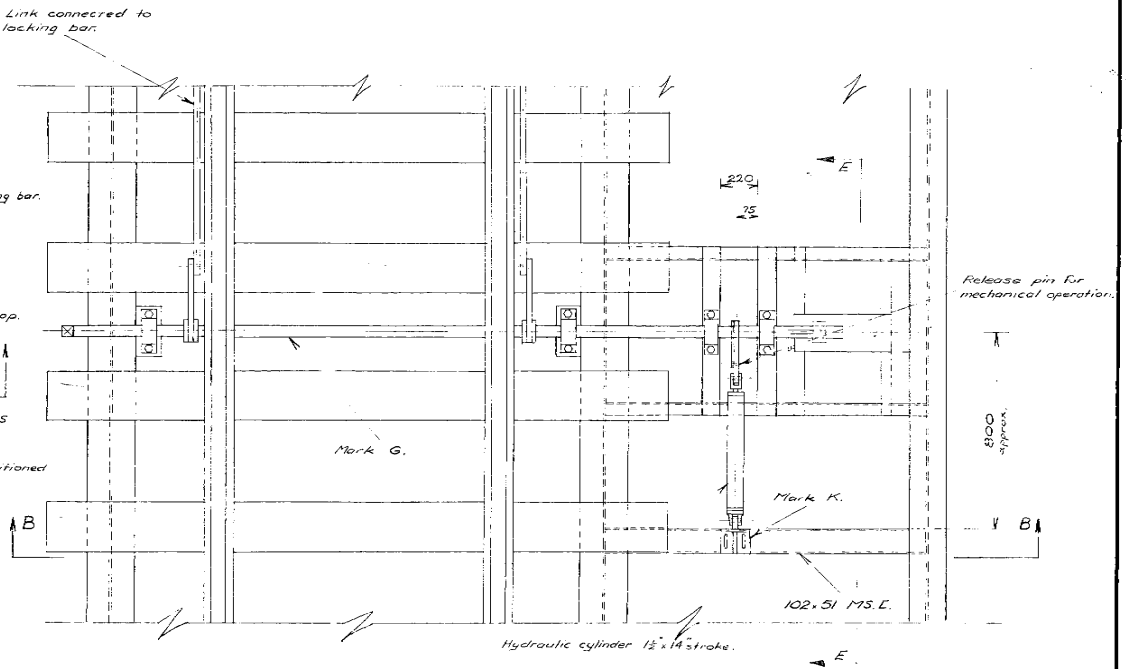


PLAN

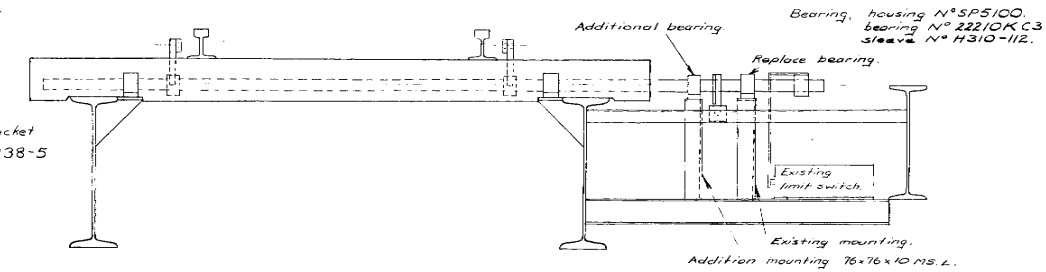


SECTION A-A

LOCKING BAR STOP MECHANISM
GENERAL ARRANGEMENT.



PLAN.



SECTION B-B.

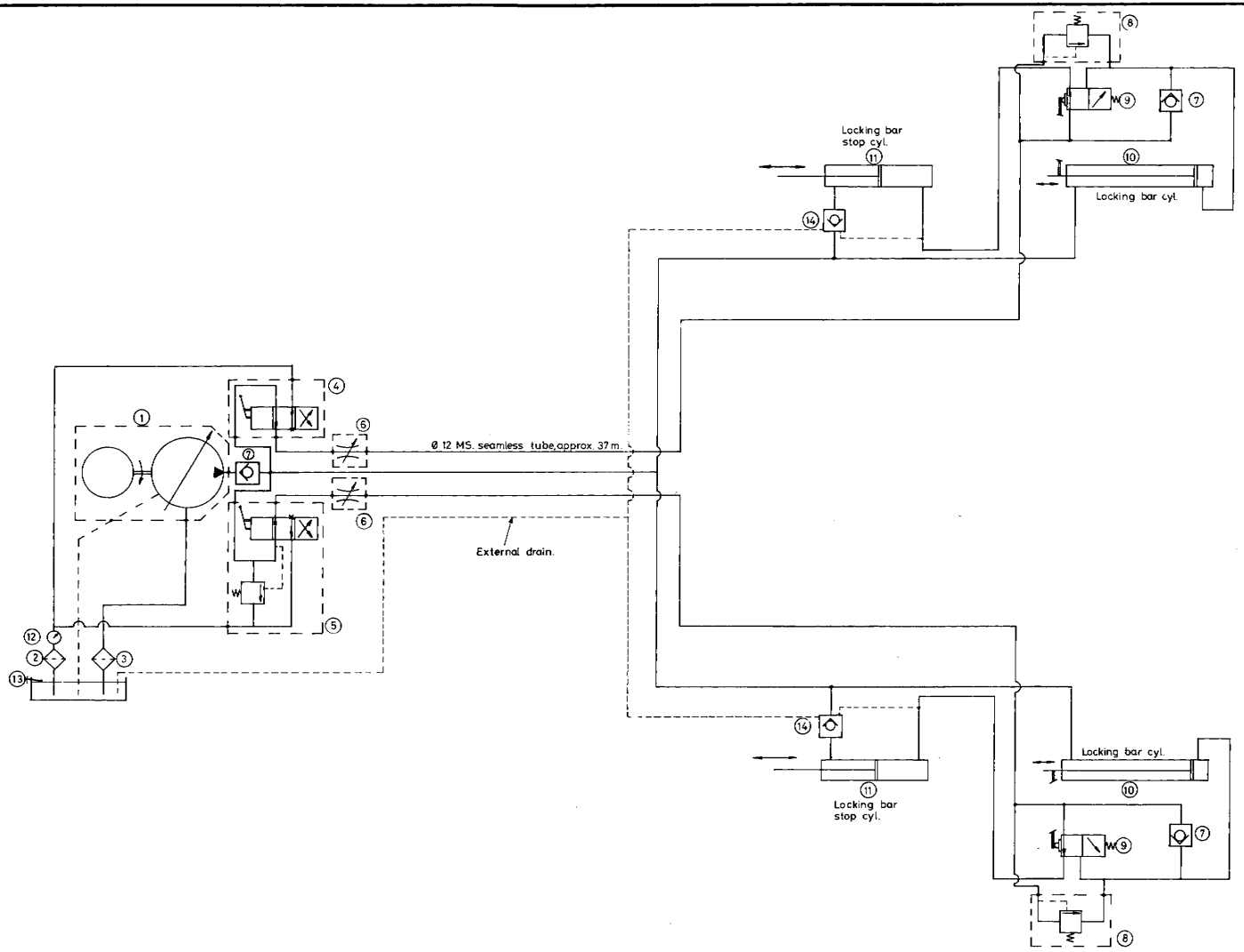
LOCKING BAR MECHANISM
GENERAL ARRANGEMENT

Originally 374M 338-1

Scale	1:10		Design	Drawing	DEPARTMENT OF MAIN ROADS, TASMANIA
Date	Amendments	Prepared	C V Goodman	S Lipscombe 1/3/1975	
		Checked		10/4 & 3-79	DERWENT RIVER BRIDGE - BRIDGEWATER
		Supervision			RAIL LOCKING BAR & STOP MECHANISM
		Recommended: Division Engineer Plant	Approved: Assistant Director 12/3/79		HYDRAULIC CONVERSION

15
D7-55
Number of Sheets

374M 338-2



ITEM	NO OFF	DESCRIPTION
1	1	Vari-vane pump, Rex Roth 1PV2V3—20/12 R.I.M.C. 63, c/w bell housing, coupling & electric motor 2·2 kW, 3ph foot-flange horizontal mounting.
2	1	Return line filter, Moore MF20B.
3	1	Suction strainer, Moore SFR–50.
4	1	Directional valve, Moore H3319 A.L.E.C.
5	1	Directional valve, Moore H3319A.B. 1060 EC.
6	2	Flow valve, Moore MFA–12.
7	3	Check valve, Moore SV 10.
8	2	Relief valve, Moore MPRV–15.
9	2	Spool valve, Rex Roth 3WMR6A30 & subplate G342/1.
10	2	Hyd. cylinder, Vickers W30 FC CC HS 1R & 5H 1 AU 37, 1½ x 14 stroke.
11	2	As above, 1½ x 4 stroke.
12	1	Return line pressure gauge, UCC 02100.
13	1	Oil level switch, Morbrey 5191/F91.
14	2	Pilot check valve "Yuken Kogyo" C.P.T.–03–E–30–2090 with Ø10 B.S.P. connections.

ITEM	SPECIFICATION
1	5·515 MPa. at full stroke.
5	6·895 MPa.
6	0·85 l/min.
8	4·137 MPa.
10	1·5 m/min, 2490 N. max. force.
11	As in 10.

N.B.

1. Spool valve (9) mounted on cyl. (10)
2. Hydraulic oil – Caltex Rando HD 46.
3. Paint – primer – British paint, luxa prime, zinc phosphate.
   Topcoat – Ferreko N°2, silver gray.
4. Provide 3 M.S. PL. covers over all hydraulic rams.

Originally 374M 338-2

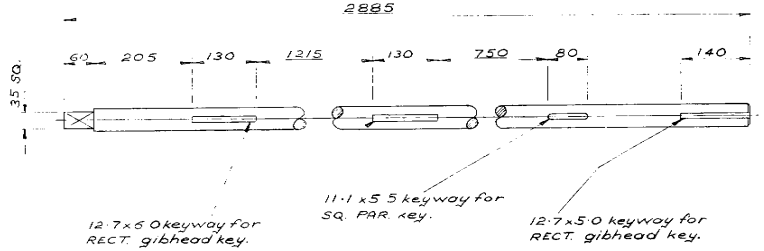
Scale	N.T.S.		Design	Drawing
Date	Amendments	Prepared	C.V.G.	C.V.G. 8·3·79.
		Checked		SRL 8/3/79.
		Supervision		
		Recommended: Division Engineer Plant		Approved: Assistant Director

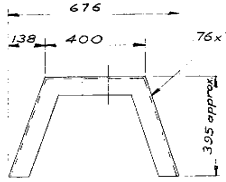
DEPARTMENT OF MAIN ROADS, TASMANIA

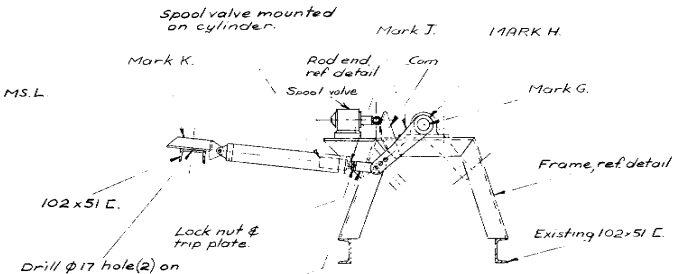
DERWENT RIVER BRIDGE – BRIDGEWATER.
RAIL LOCKING BAR & STOP MECHANISM.
HYDRAULIC CIRCUIT DETAIL.

15
D7-56
Number of Sheets

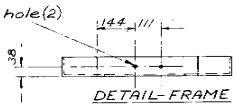
374M 338-3





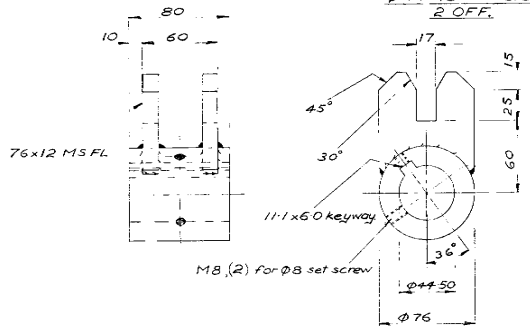


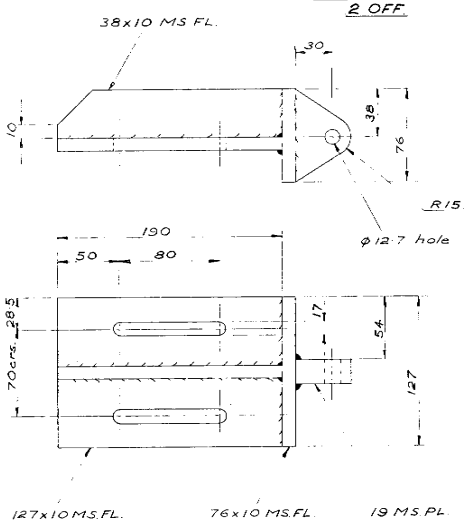
SECTION E E.



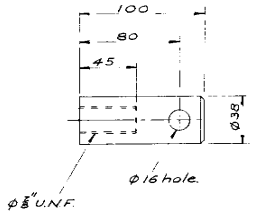
DETAIL- FRAME
2 OFF.

DETAIL- MARK G.
ϕ44·45 'Comsteel' grade En25.
2 OFF.

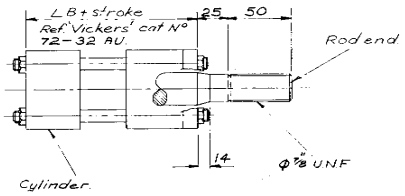




DETAIL- MARK K
2 OFF.

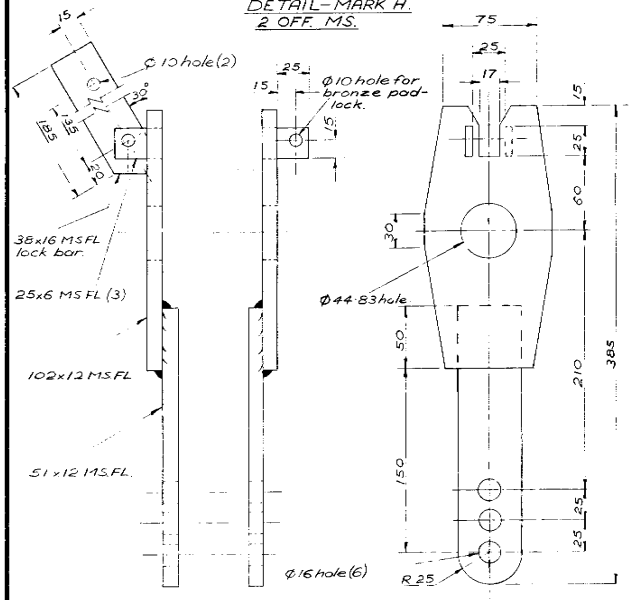


DETAIL MARK L
S.S grade 316
2 OFF.



DETAIL- CYL. ROD END.
(to suit 14"ϕ 4" stroke cyl').

DETAIL- MARK H.
2 OFF. MS.

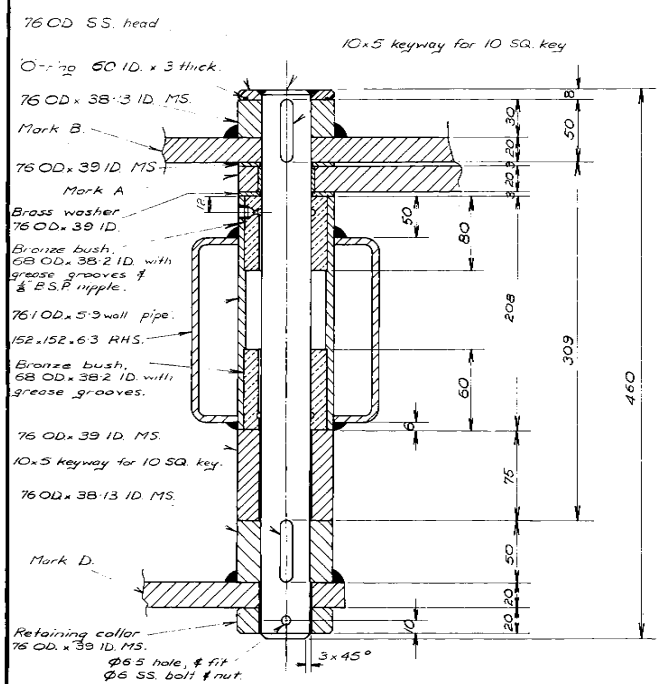


DETAIL- MARK J
2 SETS

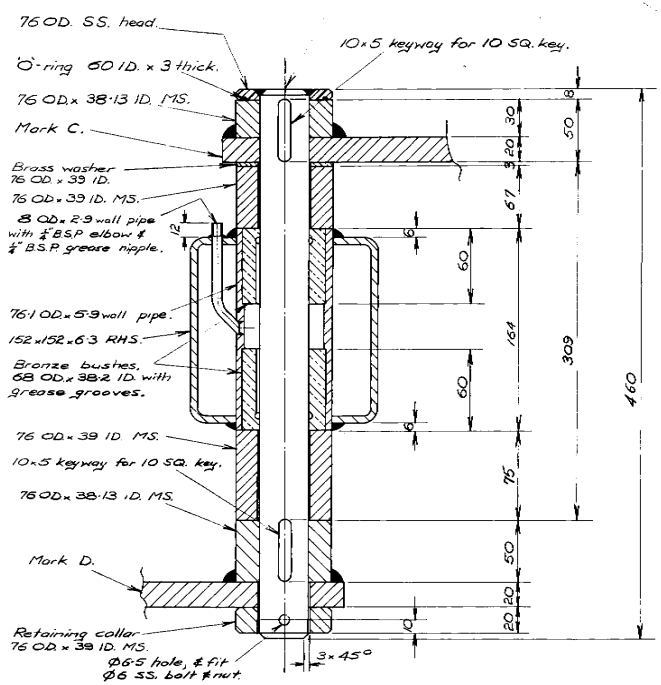
Originally 374M 338-3

Scale	1:2, 1:5, 1:10.		Design	Drawing	DEPARTMENT OF MAIN ROADS, TASMANIA
Date	Amendments	Prepared	C.V.G.	C.V.G. 20.3.79	
		Checked		20.3.79	DERWENT RIVER BRIDGE BRIDGEWATER. RAIL LOCKING BAR & STOP MECHANISM. DETAILS.
		Supervision		4/4/79	15 / D7-57
		Recommended: Division Engineer 29/3/79 Plant		Approved: Assistant Director 4/4/79	Number of Sheets

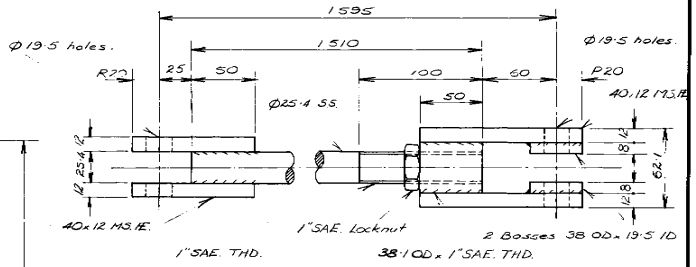
374M 338-4



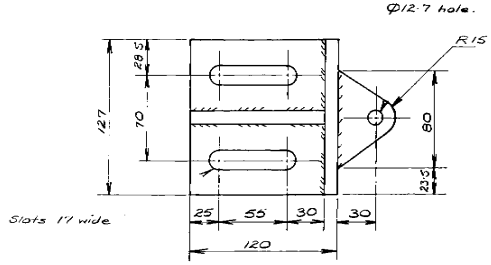
SECTION C-C.
Scale 1:2. 2 off.



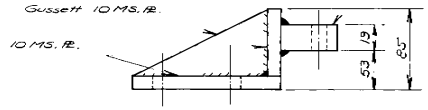
SECTION D-D.
Scale 1:2. 2 off.



DETAIL - MARK F.
Scale 1:2. 2 off.

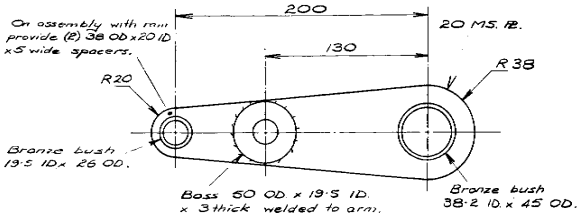


PLAN.

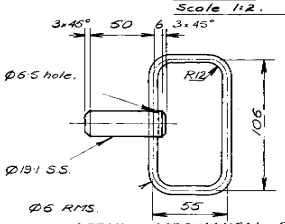


ELEVATION.

DETAIL - MARK E
Scale 1:2. 2 off.

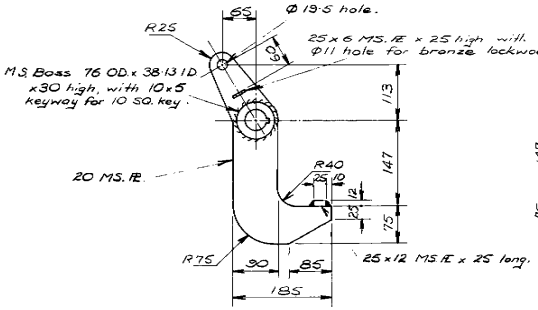


DETAIL - MARK A
Scale 1:2. 2 off.

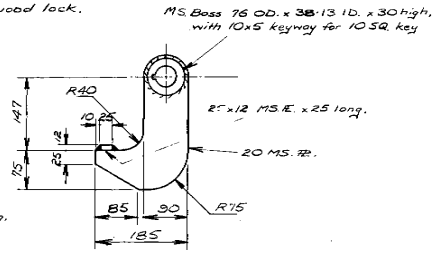


DETAIL - MECHANICAL RELEASE PIN.
Scale 1:2. 2 off.

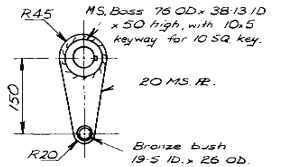
Notes:
1. Manufacture S.S. link pivot pins to suit, & assemble with SS. flat washers & Ø5 SS. cotter pins.
2. All welds to be 6mm Fillet.
3. Surface treatment to be 'Hot Zinc Spray'.
4. All dimensions are in millimetres except where otherwise stated.
6. Fit Ø3 Galvanized Chain to handle of mechanical release pin & weld to mark B.



DETAIL - MARK B.
Scale 1:5. 1 off L.H & 1 off R.H.



DETAIL - MARK C.
Scale 1:5. 1 off L.H & 1 off R.H.



DETAIL - MARK D.
Scale 1:5. 2 off L.H & 2 off R.H.

Originally 374M 338-4

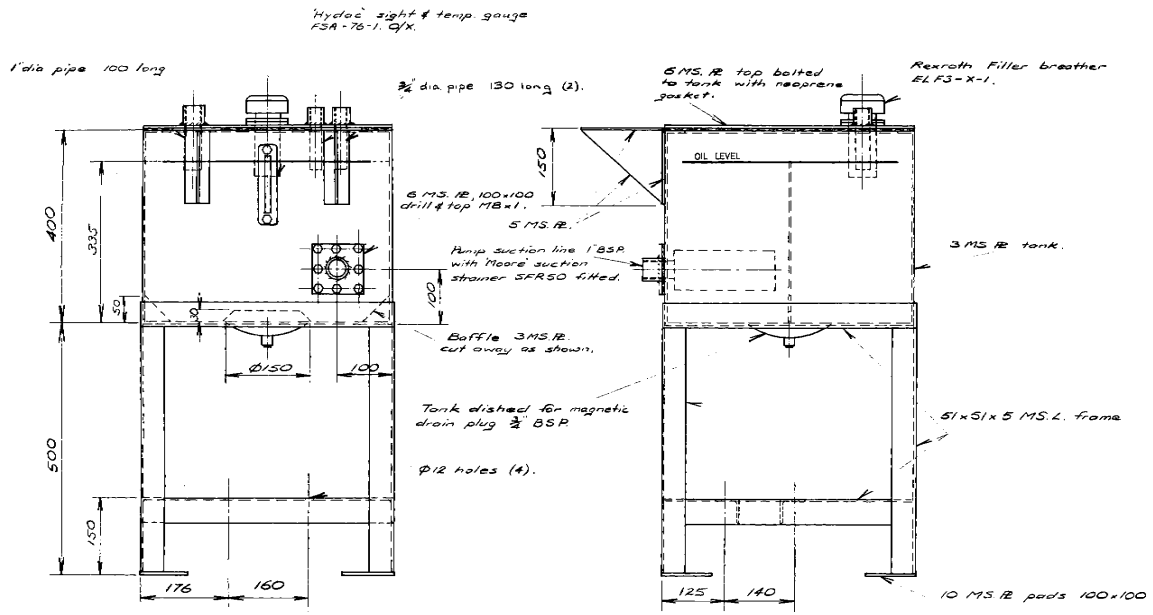
Scale	As shown		Design	Drawing
Date	Amendments	Prepared		S. LIPSCOMBE 21-3-1979
		Checked		21-3-79
		Supervision		21-3-79
		Recommended: Division Engineer Plant 29/11/79	Approved: Assistant Director 4/12/79	

DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE - BRIDGEWATER
RAIL LOCKING BAR & STOP MECHANISM
DETAILS.

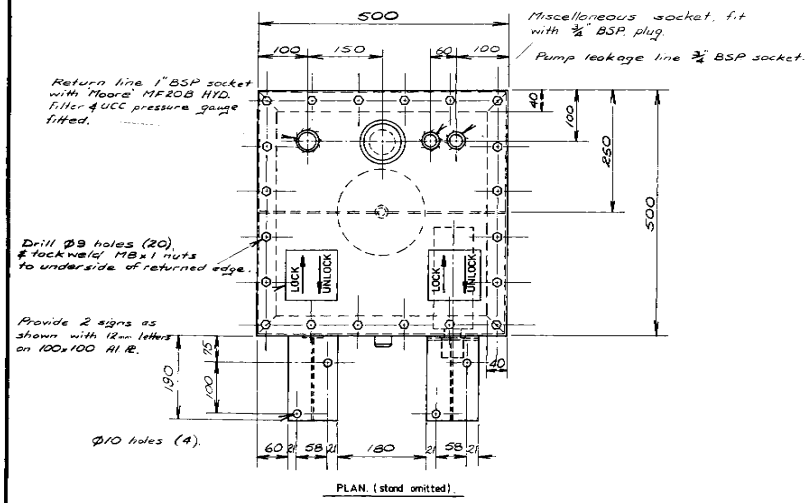
15
D7-58
Number of Sheets

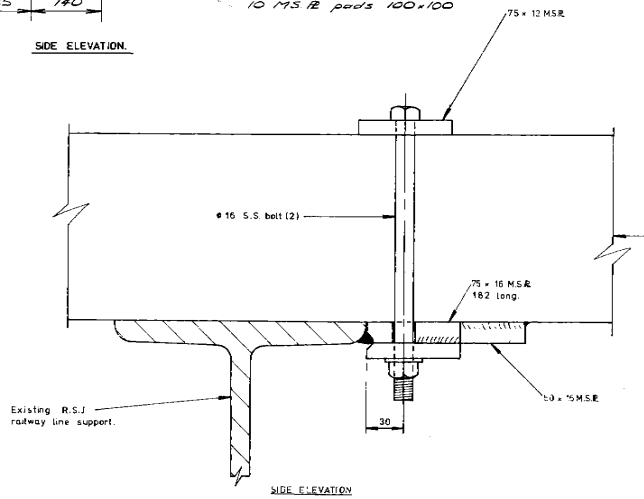
374M 338-5

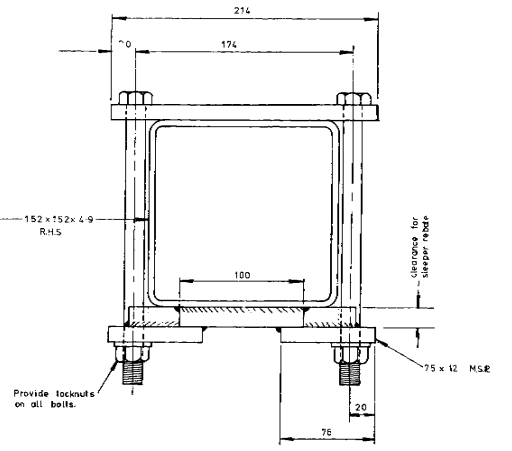


Note

1. Fit automatic level switch, 'Morbrey' S191/F91 to inside of tank
2. Pump suction line to be 25 I.D. class R4 HYD suction hose







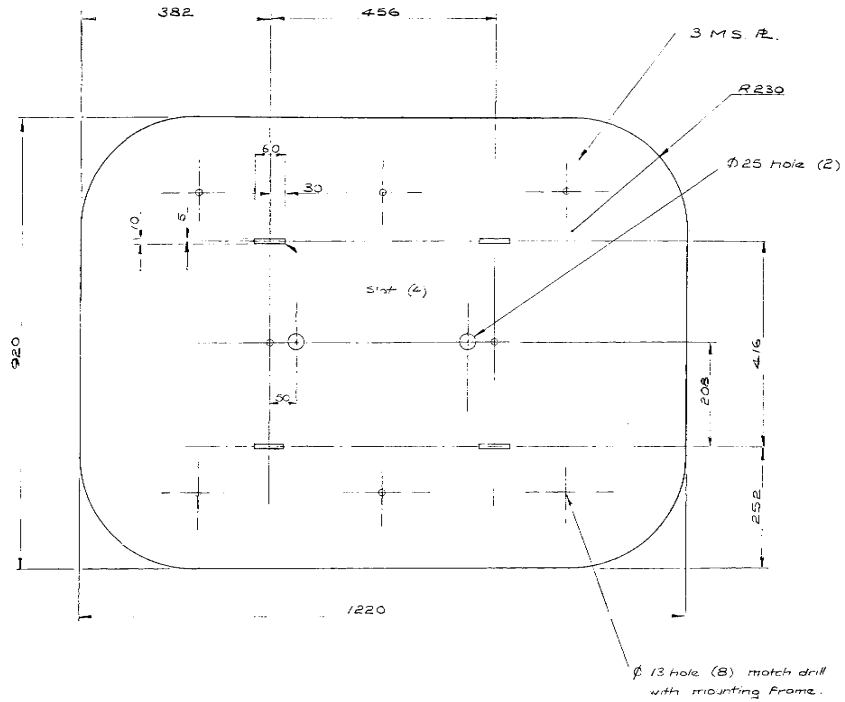
DETAIL MOUNTING BRACKET
4 OFF

Originally 374M 338-5

Scale	1:5, 1:2.		Design	Drawing	DEPARTMENT OF MAIN ROADS, TASMANIA
Date	Amendments	Prepared	C.V. Goodman.	S. Lipscombe. 2/4/1979	
		Checked			DERWENT RIVER BRIDGE – BRIDGEWATER.
		Supervision			RAIL LOCKING BAR & STOP MECHANISM.
		Recommended: Division Engineer Plant		Approved: Assistant Director	DETAILS – HYDRAULIC TANK.

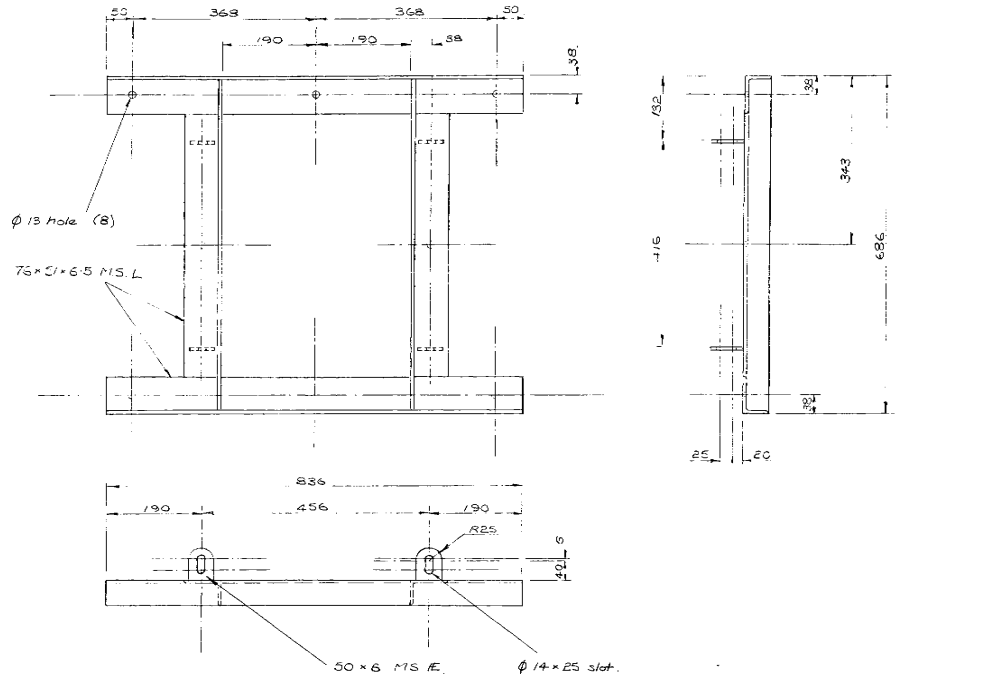
15
D7-59
Number of Sheets

DRG. NO. 374M 338 6

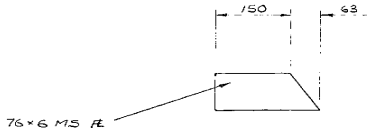


BACKING PANEL.

FINISH - MATT BLACK OVER COLD GALVANIZING



MOUNTING FRAME



LOWER MOUNTING BRACKET

2 OFF

38×38×6·5 M.S. L (2) × 800 long
cut to suit on assy on site.

UPPER MOUNTING

Originally 374M 338-6

Scale	Design Number		Design	Drawing	DEPARTMENT OF MAIN ROADS, TASMANIA	
1:5		Prepared		R&J 6.2.86	BRIDGEWATER BRIDGE	15
Date	Amendments	Checked			ADDITIONAL TRAFFIC SIGNALS	D7-60
		Supervision				Number of Sheets
		Recommended Division Engineer Plant		Approved Assistant Director		

BRIDGEWATER BRIDGE

D8- LIFT SPAN REDECKING & CONTROL & CATHODIC PROTECTION

TABLE OF CONTENTS

DEPARTMENT OF INFRASTRUCTURE, ENERGY AND RESOURCES

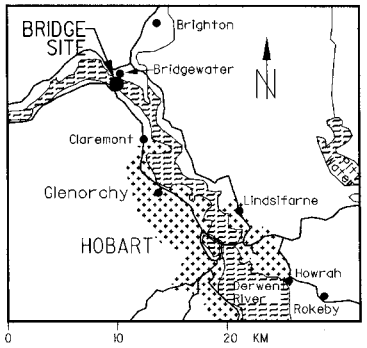
MIDLAND HIGHWAY

BRIDGEWATER

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER, TASMANIA

NEW STRESS LAMINATED TIMBER DECKING AND CROSS BEAM STRENGTHENING



LOCALITY PLAN

THE BRIDGE SITE IS APPROXIMATELY
20 Km FROM HOBART CITY CENTRE

SCHEDULE OF DRAWINGS

EXISTING BRIDGE

ORIGINAL - 1938
PREVIOUS DECK REPLACEMENT - 1979

NEW TIMBER DECK AND CROSS BEAM STRENGTHENING- 1999

DESIGN LOADING:

92 AUSTROADS T44 LIVE LOAD
BRAKING FORCES - NAASRA 1976
TRAFFIC BARRIERS NOT UPGRADED

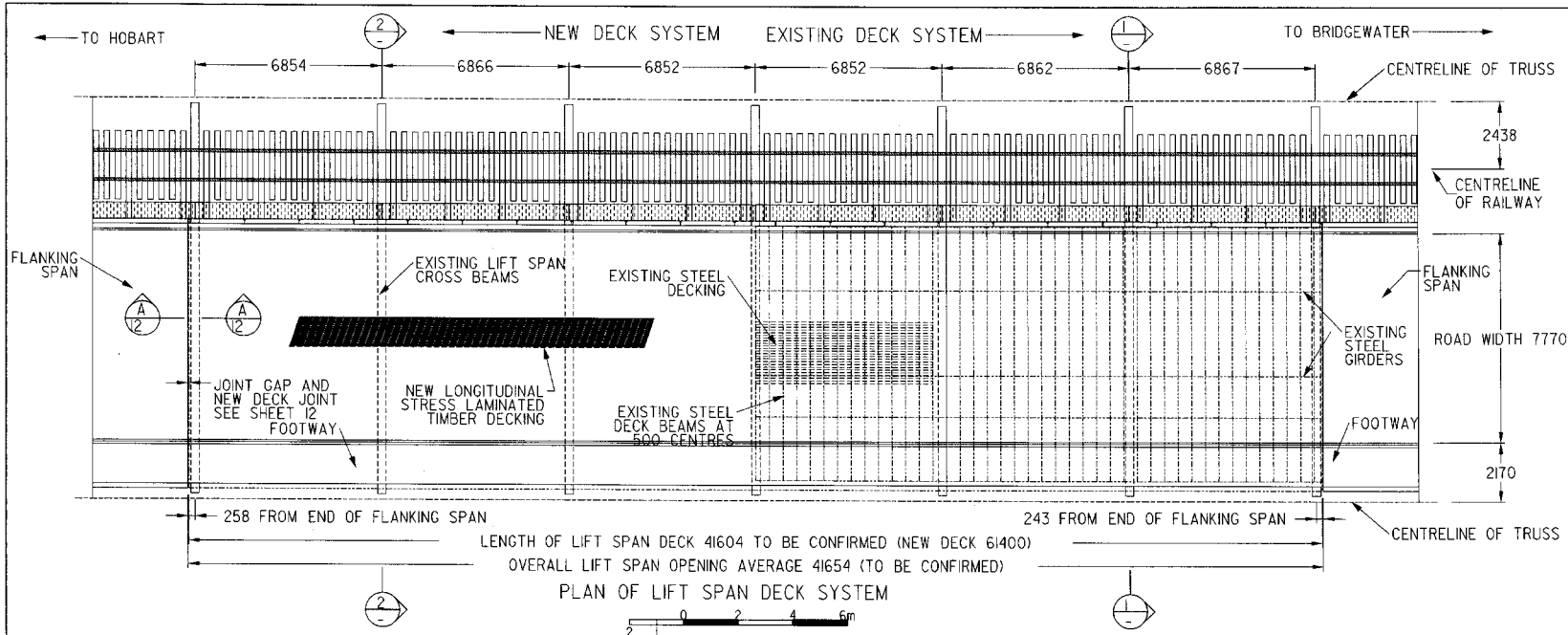
REGISTRATION OF PLANS

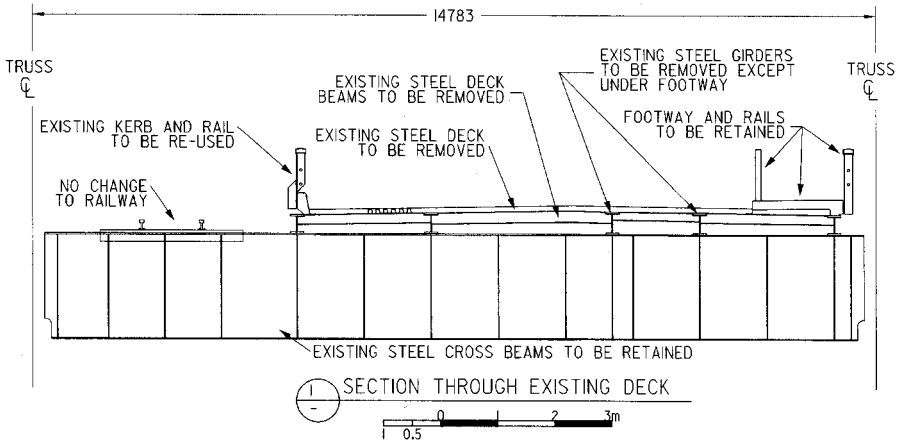
7 000 BC 7049

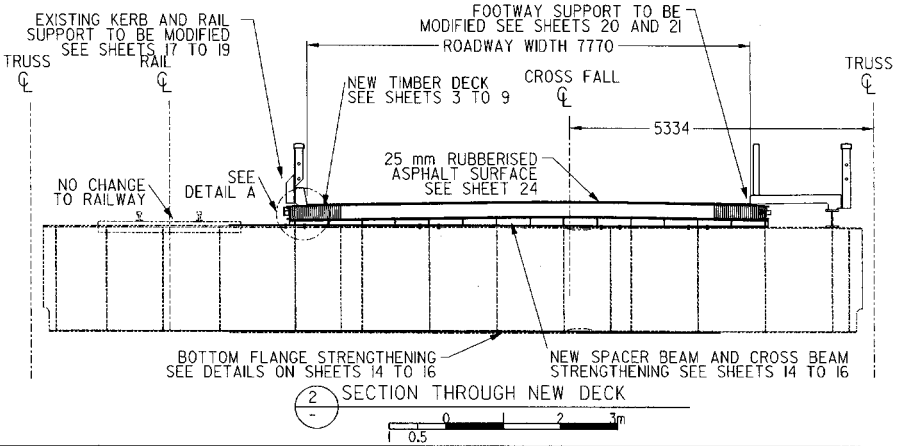
Raymond J. Taylor
MIEAust CPEng
Chartered Professional Engineer
Membership No. 1027811
The Institution of Engineers, Australia

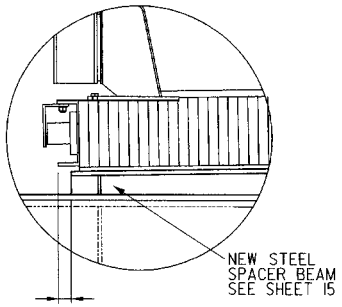
SHEET No 1 No. OF SHEETS 28

(DIER) 15 D8-01









DETAIL A - TRANSVERSE DECK POSITION

0 200 400 600
200 100

GENERAL NOTES

SCALES AS SHOWN
DIMENSIONS ARE IN MILLIMETRES EXCEPT THAT WHERE IMPERIAL MEASURE IS GIVEN IT SHALL BE CONSIDERED AS CONTROLLING.
ALL MATERIAL QUANTITIES SHALL BE AS SPECIFIED ON SHEET 28

THE EXISTING STEEL DECKING AND LONGITUDINAL STEEL GIRDERS UNDER THE ROADWAY ARE TO BE REPLACED WITH A NEW STRESS LAMINATED TIMBER DECK AS OUTLINED IN THESE DRAWINGS.

THE NEW STRESS LAMINATED TIMBER DECK IS TO BE CONSTRUCTED AS SPECIFIED ON SHEET 3. THE CONTRACTOR MAY CHOOSE ONE OF THE FOUR TIMBER LAMINATE OPTIONS OUTLINED ON SHEETS 5 THROUGH 9.

THE EXISTING STEEL CROSS BEAMS ARE TO BE STRENGTHENED AS AS SPECIFIED ON SHEETS 14 THROUGH 16.

THE EXISTING RAILWAY SIDE KERB AND RAILING SYSTEM IS TO BE REMOVED AND MODIFIED AS SPECIFIED ON SHEETS 17 TO 19.

THE EXISTING FOOTWAY AND RAILING SYSTEM IS TO BE LEFT IN PLACE AND MODIFIED AS SPECIFIED ON SHEETS 20 AND 21.

THE NEW TIMBER DECK IS TO BE PREFABRICATED OFF THE ROADWAY ON THE NORTHERN APPROACH TO THE BRIDGE AND THEN LAUNCHED INTO POSITION AS OUTLINED ON SHEETS 24 TO 27.

DURING THE REMOVAL OF THE OLD DECK AND INSTALLATION OF THE NEW DECK THE EXISTING FOOTWAY SHALL BE SUPPORTED AS SPECIFIED ON SHEETS 22 AND 23.

THE NEW DECK SHALL BE POSITIONED WITH REFERENCE TO THE RAILWAY SIDE OF THE BRIDGE AS SHOWN IN DETAIL A. VARIATION IN THE DECK WIDTH, WITHIN THE LIMITS GIVEN ON SHEET 3, SHALL BE ACCOMMODATED UNDER THE FOOTWAY.

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

GENERAL ARRANGMENT

DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153

Raymond J. Taylor
MIEAust CPEng
Chartered Professional Engineer
Membership No. 1027611
The Institution of Engineers Australia
IEAust 6/9/99 DATE

DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

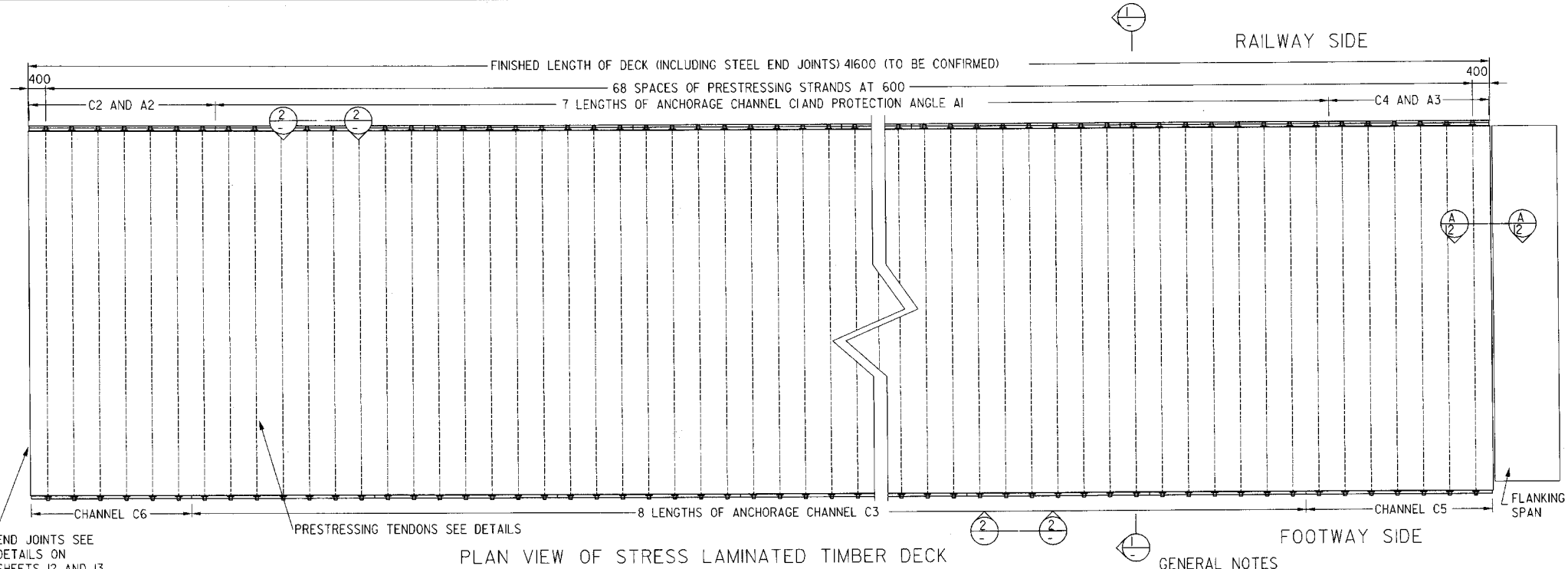
DRAFTING DATE
CHECKED DATE
APPROVED DATE

REFERENCE (CONTRACT / PLAN NO.)

(RTA) 7 000 BC 7049
(DIER) 15 D8-02

SHEET No. 2 | No. OF SHEETS 28

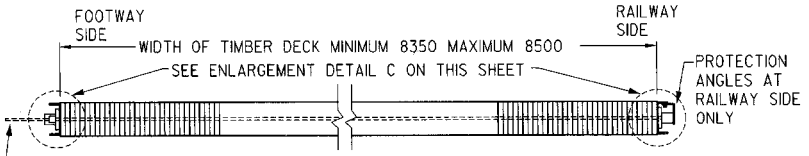
NO.	AMENDMENTS	CHECKED	DATE	APPROVED



PLAN VIEW OF STRESS LAMINATED TIMBER DECK

KERBS AND FOOTWAY NOT SHOWN

0 0.5 2 3m

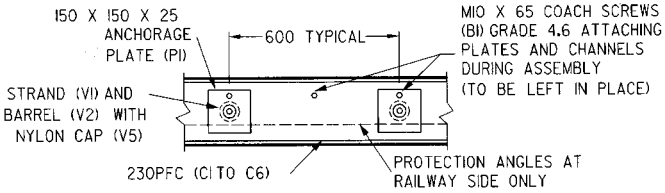


1 SECTION THROUGH DECK

0 400 800 1200

400 200

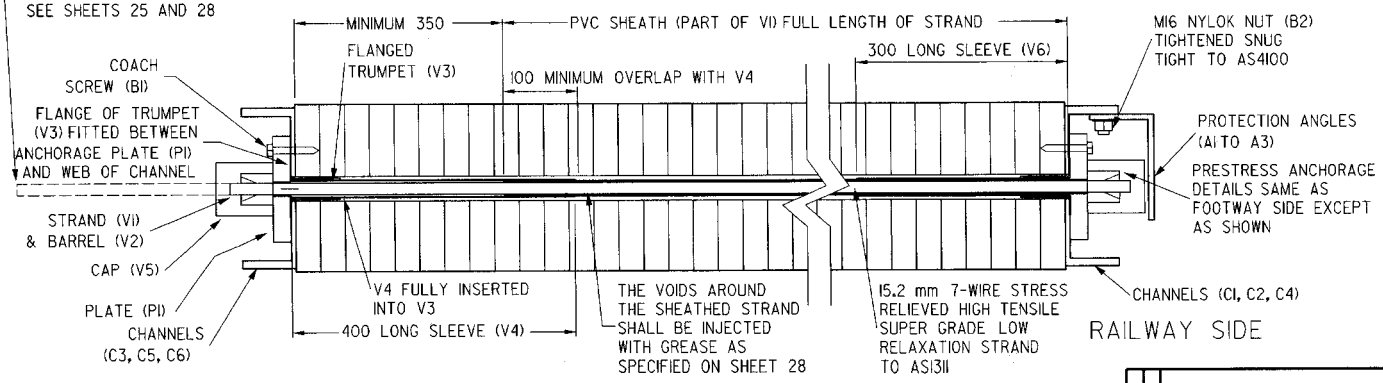
STRAND ON FOOTWAY SIDE IS NOT TO BE TRIMMED UNTIL AFTER RE-STRESSING SEE SHEETS 25 AND 28



2 ELEVATION OF PRESTRESSING ANCHORAGE

0 200 400 600

200 100



DETAIL C - SECTION THROUGH PRESTRESSING ANCHORAGES

0 80 160 240

80 40

GENERAL NOTES

SCALES AS SHOWN
DIMENSIONS ARE IN MILLIMETRES
THESE NOTES SHALL BE READ IN CONJUNCTION WITH THOSE ON SHEETS 4 TO 9 AND 28
EXCEPT FOR TIMBER LAMINATES ALL MATERIAL QUANTITIES SHALL BE AS SPECIFIED ON SHEET 28
ALL COMPONENTS SHALL BE PROTECTIVE TREATED IN ACCORDANCE WITH THE SPECIFICATIONS ON SHEET 28

EXCEPT AS NOTED ON THESE DRAWINGS THE ASSEMBLY AND STRESSING OF THE TIMBER DECKS SHALL BE IN ACCORDANCE WITH THE SPECIAL RTA FORMS 2381 AND 2115 (MARCH 12 1999).
ONLY ONE OF THE TIMBER LAMINATE OPTIONS SPECIFIED ON SHEETS 5 THROUGH 9 SHALL BE APPLIED.
WHERE NEW TIMBER IS TO BE USED, UNDER OPTIONS A OR B, ADDITIONAL MATERIAL FOR TESTING SHALL OBTAINED AS OUTLINED IN RTA FORM 2382 (JUNE 1995).
THE TIMBER STOCK HELD BY RTA, UNDER OPTIONS C OR D, HAS BEEN CERTIFIED BY TESTING AND A COPY OF THE CERTIFICATION SHOULD BE OBTAINED FROM THE PRINCIPAL.

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

STRESS LAMINATED TIMBER DECK - GENERAL

DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
Raymond Taylor 8/9/99 DATE

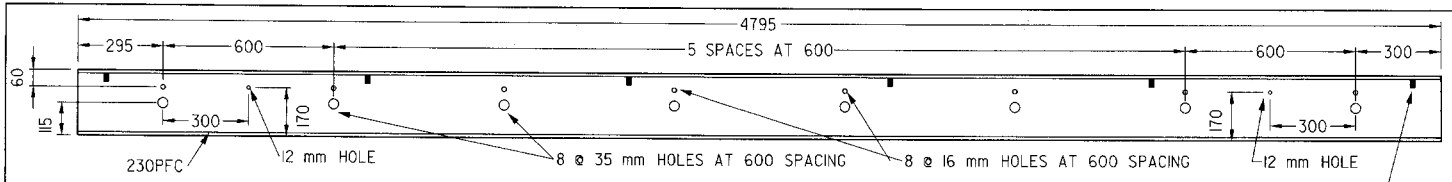
DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

DRAFTING
DRAFTING DATE
CHECKED DATE
APPROVED DATE

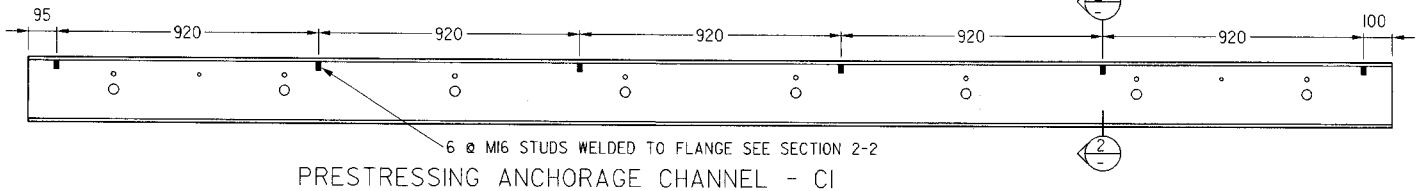
REFERENCE (CONTRACT / PLAN NO.)

(RTA) 7 000 BC 7049
(DIER) 15 D8-03

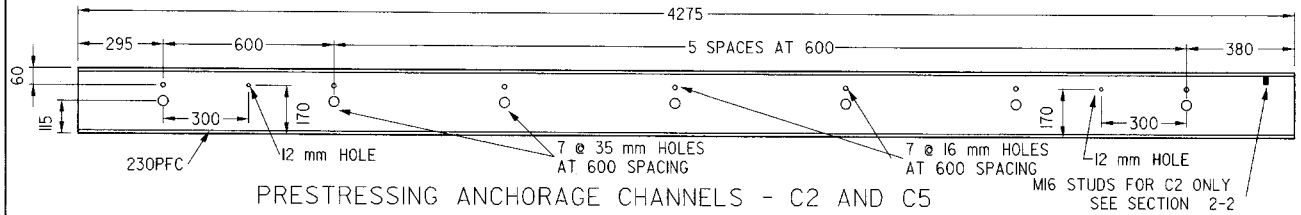
SHEET No. 3 | No. OF SHEETS 28



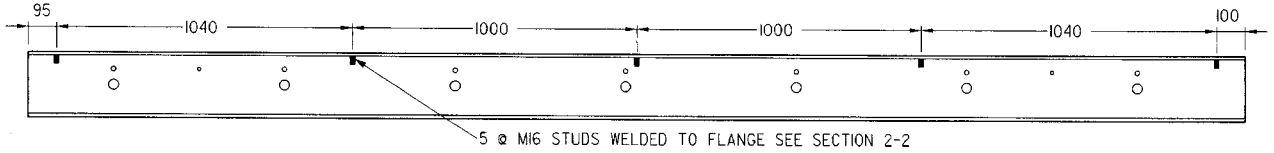
PRESTRESSING ANCHORAGE CHANNEL - C1



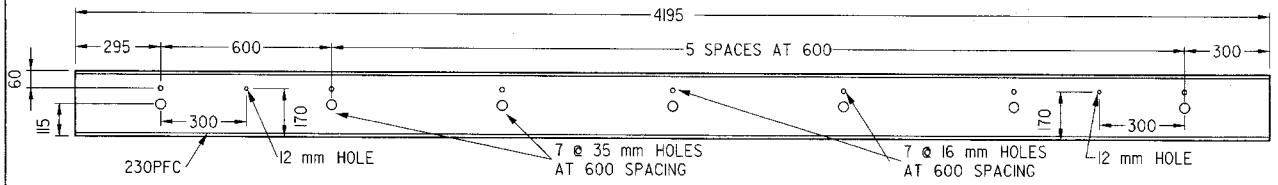
PRESTRESSING ANCHORAGE CHANNEL - C1



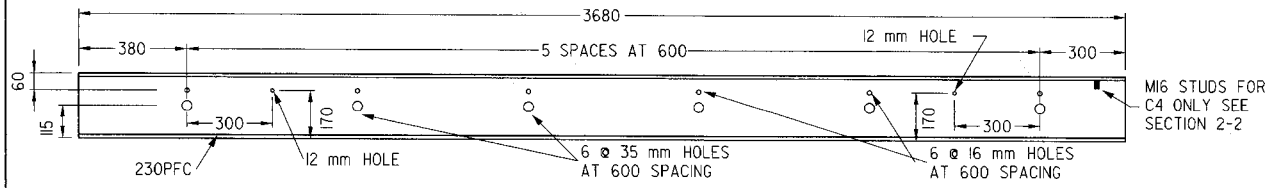
PRESTRESSING ANCHORAGE CHANNELS - C2 AND C5



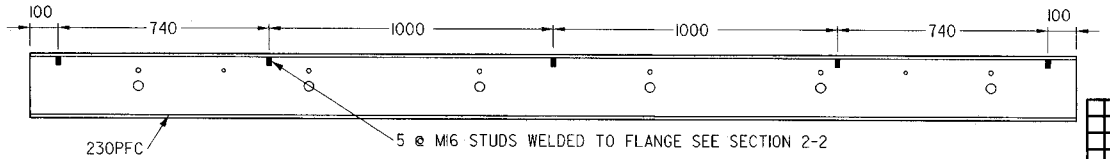
PRESTRESSING ANCHORAGE CHANNEL - C2 ONLY



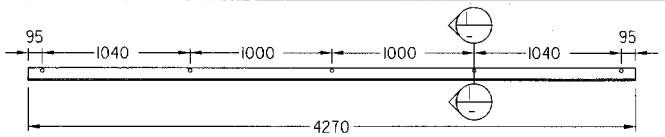
PRESTRESSING ANCHORAGE CHANNEL - C3



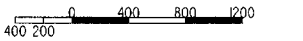
PRESTRESSING ANCHORAGE CHANNELS - C4 AND C6

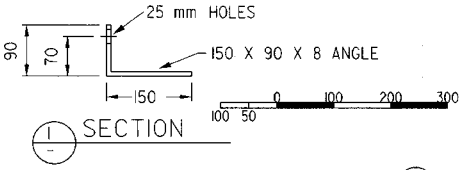


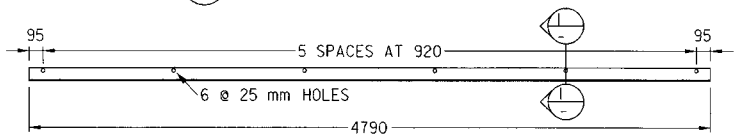
PRESTRESSING ANCHORAGE CHANNEL - C4 ONLY



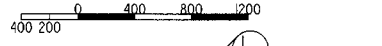
PROTECTION ANGLE - A2

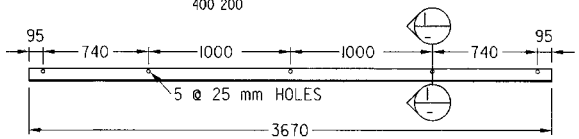




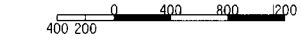


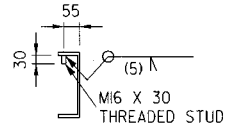
PROTECTION ANGLE - A1





PROTECTION ANGLE - A3





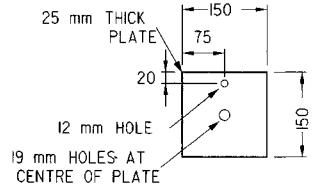
GENERAL NOTES

SCALE 200 100 0 200 400 600 EXCEPT AS NOTED

DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 3 AND 28
MATERIAL QUANTITIES SHALL BE AS SPECIFIED ON SHEET 28
STEEL PLATES (PL) SHALL BE TO AS3678 FOR GRADE 350
STEEL SECTIONS SHALL BE TO AS3679 FOR GRADE 300

ALL STEEL COMPONENTS SHALL BE PROTECTIVE TREATED IN ACCORDANCE WITH THE SPECIFICATIONS ON SHEET 28

WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH AS1554 PART 1



ANCHORAGE PLATE - P1

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

STRESS LAMINATED TIMBER DECK - STEEL FABRICATION

DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153

DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW

Raymond Taylor 8/9/99 DATE

CHECKED/RECOMMENDED DATE

ACCEPTED 3.9.99 DATE

DRAFTING

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

DRAFTING DATE

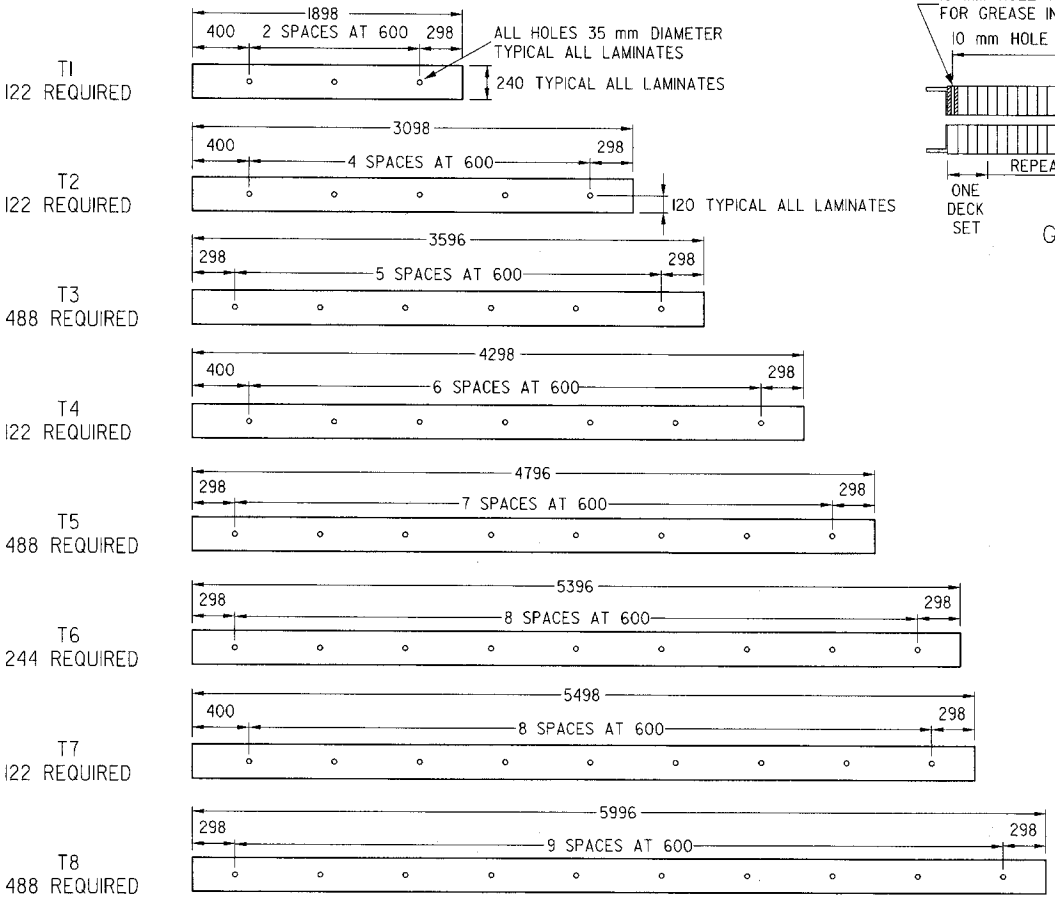
CHECKED DATE

APPROVED DATE

REFERENCE (CONTRACT / PLAN NO.)

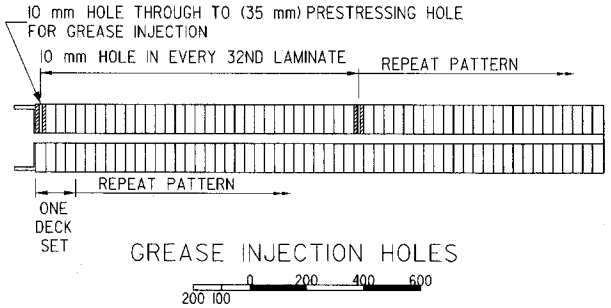
(RTA) 7 000 BC 7049
(DIER) 15 D8-04

SHEET No. 4 | No. OF SHEETS 28



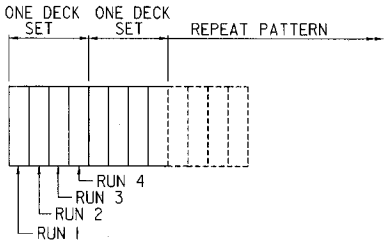
FABRICATION OF TIMBER DECK LAMINATES

400 200 0 400 800 1200

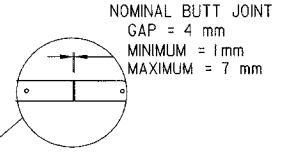


GREASE INJECTION HOLES

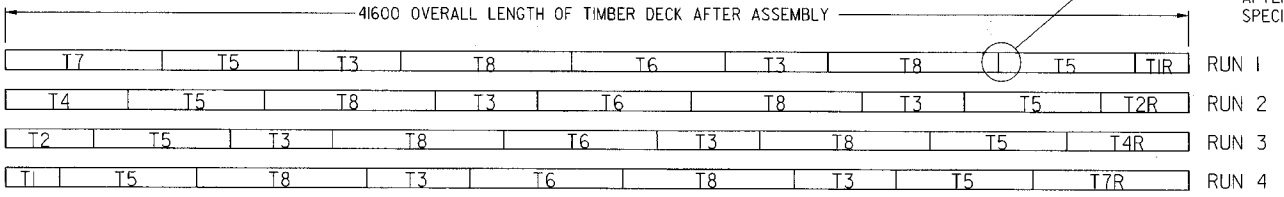
200 100 0 200 400 600



PARTIAL DECK SECTION - ASSEMBLY
NOT TO SCALE



THE BUTT JOINT GAP IS PROVIDED TO ALLOW FOR DIMENSIONAL VARIATIONS AND ASSIST IN THE ALIGNMENT OF THE PRESTRESSING HOLES. THE TOP AREAS OF THE BUTT JOINTS SHALL BE SEALED AFTER STRESSING OF THE DECK AS SPECIFIED ON SHEET 28



LAMINATE IDENTIFICATIONS ARE SPECIFIED IN THE FABRICATION DETAILS AND 'R' DESIGNATES MIRROR REVERSED FROM THE ORIENTATION SHOWN

TYPICAL LAMINATE LAYOUT FOR ONE DECK SET - OPTION A
NOT TO SCALE

GENERAL NOTES

SCALES AS SHOWN
DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 3 AND 28

ALTERNATE DECK LAMINATE OPTIONS

FOUR DIFFERENT LAMINATE FABRICATION AND ASSEMBLY OPTIONS ARE PROVIDED ON SHEETS 5 THROUGH 8. ONLY ONE OPTION SHALL BE USED. OPTIONS A OR B APPLY WHERE ALL NEW TIMBER IS TO BE OBTAINED. OPTIONS C OR D APPLY WHERE THE EXISTING TIMBER STOCK HELD BY THE ROADS AND TRAFFIC AUTHORITY OF NEW SOUTH WALES IS TO BE UTILISED.

TIMBER LAMINATES

ALL TIMBER LAMINATES SHALL BE 240 X 35 F27 HARDWOOD, SD2 DURABILITY CLASS 2 TO AS1720, AND SHALL BE KILN DRIED TO A MAXIMUM MC OF 15% PRIOR TO ANY FABRICATION. EXCEPT AS NOTED BELOW THE TIMBER SHALL BE IN ACCORDANCE WITH RTA FORM 2382 (JUNE 1995) INTERIM SPECIFICATION "TIMBER FOR BRIDGES, SUPPLY AND HANDLING" QUANTITIES SHALL BE AS SPECIFIED ON THIS SHEET

FABRICATION OF LAMINATES

LENGTH AND WIDTH TOLERANCE +/- 2 mm
THICKNESS OF LAMINATES SHALL BE GAUGED TO WITHIN +1.5/-.2 mm. ALL HOLES SHALL BE 35 mm DIAMETER AND SHALL BE LOCATED AT MID-DEPTH OF THE LAMINATES
HOLES SHALL BE WITHIN +/- 2 mm OF THE PRESCRIBED LOCATIONS

ASSEMBLY OF LAMINATES

EXCEPT AS NOTED ON THESE DRAWINGS THE ASSEMBLY AND STRESSING OF THE NEW TIMBER DECKS SHALL BE IN ACCORDANCE WITH THE SPECIAL RTA FORMS 2381 AND 2115 (MARCH 12, 1999). THE LAMINATE LAYOUT AND ORIENTATION SHALL BE AS SHOWN ON THIS SHEET WITH EACH DECK SET CONSISTING OF RUNS 1 TO 4 IN SEQUENCE AND REPEATED ACROSS THE WIDTH OF THE DECK. ADDITIONAL CONSTRUCTION NOTES ARE SPECIFIED ON SHEET 28.

GREASE INJECTION HOLES

GREASE INJECTION SHALL BE PERFORMED IMMEDIATELY AFTER THE DECK HAS BEEN STRESSED AS SPECIFIED ON SHEET 28. THE HOLES SHALL BE PLUGGED USING M12 X 75 COACH SCREWS (B14).

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

STRESS LAMINATED TIMBER DECK - OPTION A

DESIGN RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153

DESIGN CHECK GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED — DATE

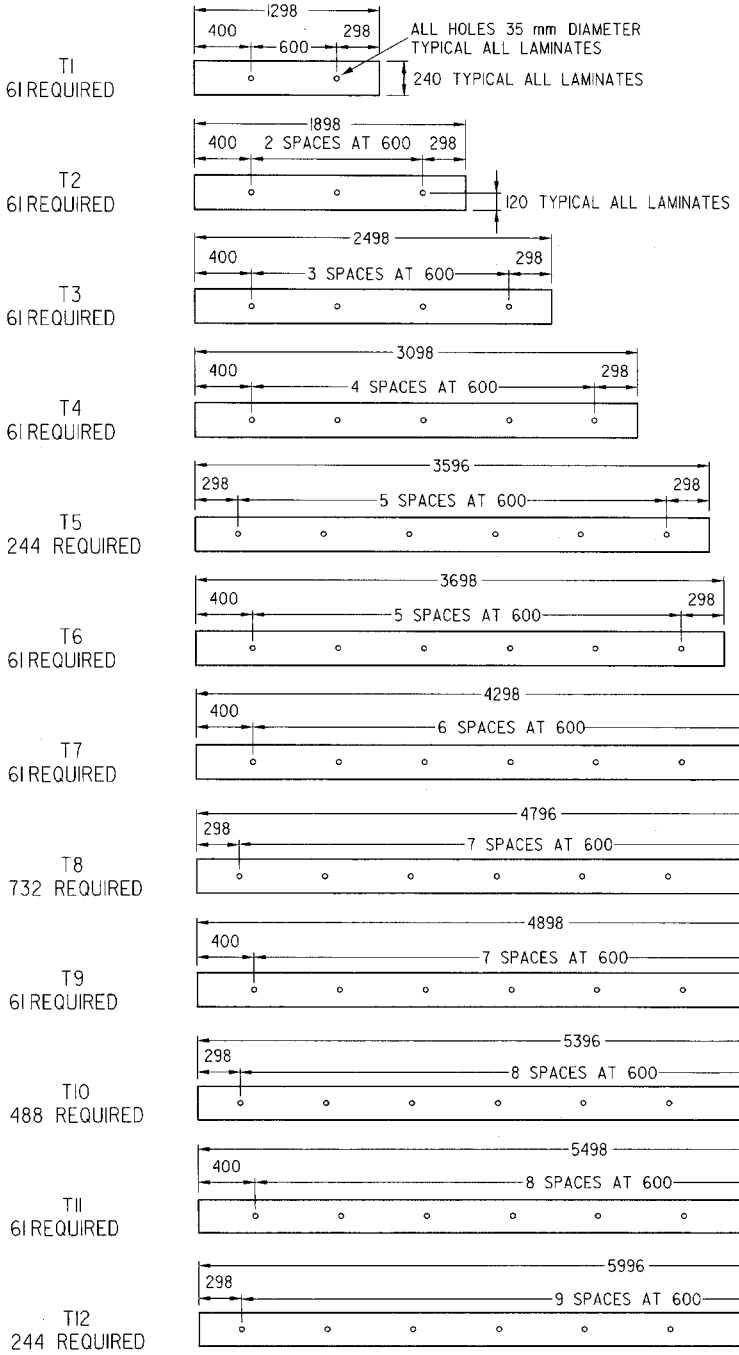
Raymond Taylor 8/9/99 DATE — ACCEPTED — DATE 3.9.99

DRAFTING — DATE
CHECKED — DATE
APPROVED — DATE

REFERENCE (CONTRACT / PLAN NO.)

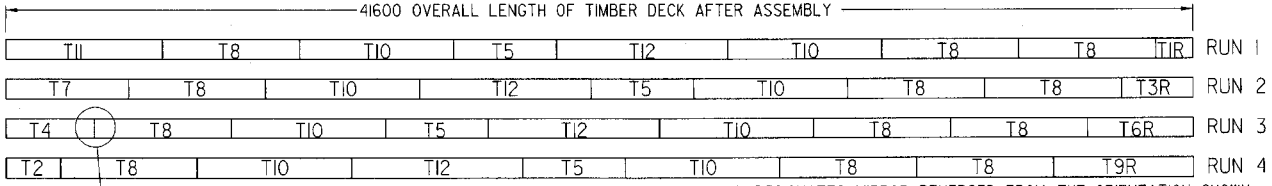
(RTA) 7 000 BC 7049
(DIER) 15 D8-05

SHEET No. 5 | No. OF SHEETS 28



FABRICATION OF TIMBER DECK LAMINATES - OPTION B

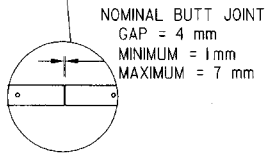
0 400 800 1200
400 200



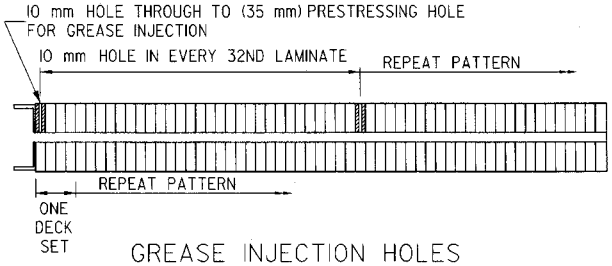
LAMINATE IDENTIFICATIONS ARE SPECIFIED IN THE FABRICATION DETAILS AND 'R' DESIGNATES MIRROR REVERSED FROM THE ORIENTATION SHOWN

TYPICAL LAMINATE LAYOUT FOR ONE DECK SET - OPTION B

NOT TO SCALE

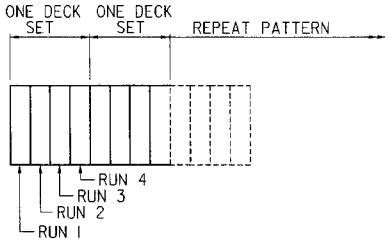


THE BUTT JOINT GAP IS PROVIDED TO ALLOW FOR DIMENSIONAL VARIATIONS AND ASSIST IN THE ALIGNMENT OF THE PRESTRESSING HOLES. THE TOP AREAS OF THE BUTT JOINTS SHALL BE SEALED AFTER STRESSING OF THE DECK AS SPECIFIED ON SHEET 28



GREASE INJECTION HOLES

0 200 400 600
200 100



PARTIAL DECK SECTION - ASSEMBLY

NOT TO SCALE

GENERAL NOTES

SCALES AS SHOWN
DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 3 AND 28

ALTERNATE DECK LAMINATE OPTIONS

FOUR DIFFERENT LAMINATE FABRICATION AND ASSEMBLY OPTIONS ARE PROVIDED ON SHEETS 5 THROUGH 8. ONLY ONE OPTION SHALL BE USED. OPTIONS A OR B APPLY WHERE ALL NEW TIMBER IS TO BE OBTAINED. OPTIONS C OR D APPLY WHERE THE EXISTING TIMBER STOCK HELD BY THE ROADS AND TRAFFIC AUTHORITY OF NEW SOUTH WALES IS TO BE UTILISED.

TIMBER LAMINATES

ALL TIMBER LAMINATES SHALL BE 240 X 35 F27 HARDWOOD, SD2 DURABILITY CLASS 2 TO AS1720, AND SHALL BE KILN DRIED TO A MAXIMUM MC OF 15% PRIOR TO ANY FABRICATION. EXCEPT AS NOTED BELOW THE TIMBER SHALL BE IN ACCORDANCE WITH RTA FORM 2382 (JUNE 1995) INTERIM SPECIFICATION "TIMBER FOR BRIDGES, SUPPLY AND HANDLING" QUANTITIES SHALL BE AS SPECIFIED ON THIS SHEET

FABRICATION OF LAMINATES

LENGTH AND WIDTH TOLERANCE +/- 2 mm
THICKNESS OF LAMINATES SHALL BE GAUGED TO WITHIN +1.5/-.2 mm. ALL HOLES SHALL BE 35 mm DIAMETER AND SHALL BE LOCATED AT MID-DEPTH OF THE LAMINATES
HOLES SHALL BE WITHIN +/- 2 mm OF THE PRESCRIBED LOCATIONS

ASSEMBLY OF LAMINATES

EXCEPT AS NOTED ON THESE DRAWINGS THE ASSEMBLY AND STRESSING OF THE NEW TIMBER DECKS SHALL BE IN ACCORDANCE WITH THE SPECIAL RTA FORMS 2381 AND 2115 (MARCH 12, 1999). THE LAMINATE LAYOUT AND ORIENTATION SHALL BE AS SHOWN ON THIS SHEET WITH EACH DECK SET CONSISTING OF RUNS 1 TO 4 IN SEQUENCE AND REPEATED ACROSS THE WIDTH OF THE DECK. ADDITIONAL CONSTRUCTION NOTES ARE SPECIFIED ON SHEET 28.

GREASE INJECTION HOLES

GREASE INJECTION SHALL BE PERFORMED IMMEDIATELY AFTER THE DECK HAS BEEN STRESSED AS SPECIFIED ON SHEET 28. THE HOLES SHALL BE PLUGGED USING M12 X 75 COACH SCREWS (B14).

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

STRESS LAMINATED TIMBER DECK - OPTION B

DESIGN: RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153

DESIGN CHECK: GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW

CHECKED/RECOMMENDED — DATE

ACCEPTED 3.2.99 — DATE

DRAFTING — DATE

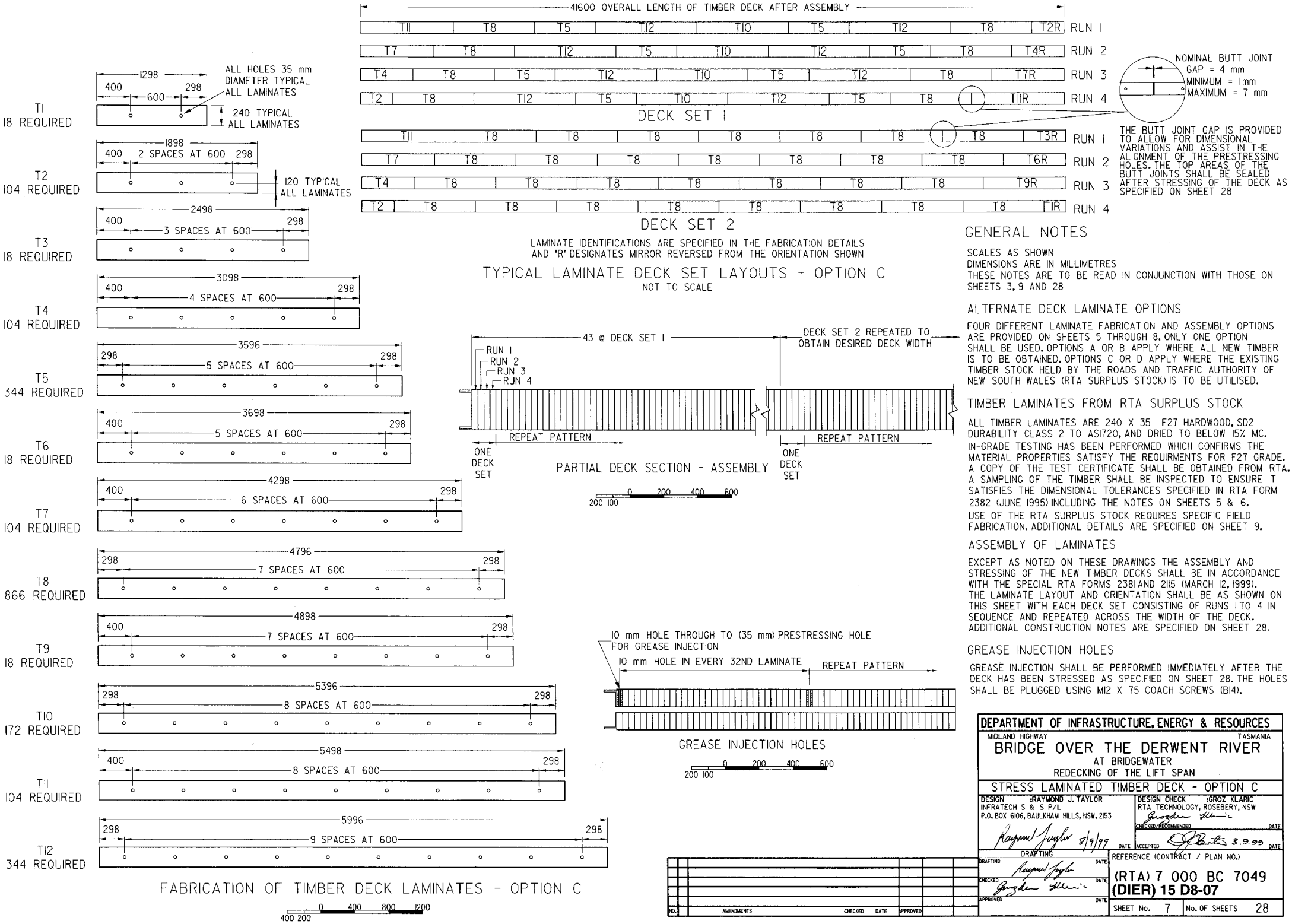
CHECKED — DATE

APPROVED — DATE

REFERENCE (CONTRACT / PLAN NO.)

(RTA) 7 000 BC 7049
(DIER) 15 D8-06

SHEET No. 6 | No. OF SHEETS 28



FABRICATION OF TIMBER DECK LAMINATES - OPTION C

LAMINATE IDENTIFICATIONS ARE SPECIFIED IN THE FABRICATION DETAILS AND "R" DESIGNATES MIRROR REVERSED FROM THE ORIENTATION SHOWN

TYPICAL LAMINATE DECK SET LAYOUTS - OPTION C

NOT TO SCALE

PARTIAL DECK SECTION - ASSEMBLY

GREASE INJECTION HOLES

GENERAL NOTES

SCALES AS SHOWN
DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 3, 9 AND 28

ALTERNATE DECK LAMINATE OPTIONS

FOUR DIFFERENT LAMINATE FABRICATION AND ASSEMBLY OPTIONS ARE PROVIDED ON SHEETS 5 THROUGH 8. ONLY ONE OPTION SHALL BE USED. OPTIONS A OR B APPLY WHERE ALL NEW TIMBER IS TO BE OBTAINED. OPTIONS C OR D APPLY WHERE THE EXISTING TIMBER STOCK HELD BY THE ROADS AND TRAFFIC AUTHORITY OF NEW SOUTH WALES (RTA SURPLUS STOCK) IS TO BE UTILISED.

TIMBER LAMINATES FROM RTA SURPLUS STOCK

ALL TIMBER LAMINATES ARE 240 X 35 F27 HARDWOOD, SD2 DURABILITY CLASS 2 TO AS1720, AND DRIED TO BELOW 15% MC. IN-GRADE TESTING HAS BEEN PERFORMED WHICH CONFIRMS THE MATERIAL PROPERTIES SATISFY THE REQUIRMENTS FOR F27 GRADE. A COPY OF THE TEST CERTIFICATE SHALL BE OBTAINED FROM RTA. A SAMPLING OF THE TIMBER SHALL BE INSPECTED TO ENSURE IT SATISFIES THE DIMENSIONAL TOLERANCES SPECIFIED IN RTA FORM 2382 (JUNE 1995) INCLUDING THE NOTES ON SHEETS 5 & 6. USE OF THE RTA SURPLUS STOCK REQUIRES SPECIFIC FIELD FABRICATION. ADDITIONAL DETAILS ARE SPECIFIED ON SHEET 9.

ASSEMBLY OF LAMINATES

EXCEPT AS NOTED ON THESE DRAWINGS THE ASSEMBLY AND STRESSING OF THE NEW TIMBER DECKS SHALL BE IN ACCORDANCE WITH THE SPECIAL RTA FORMS 2381 AND 2115 (MARCH 12, 1999). THE LAMINATE LAYOUT AND ORIENTATION SHALL BE AS SHOWN ON THIS SHEET WITH EACH DECK SET CONSISTING OF RUNS 1 TO 4 IN SEQUENCE AND REPEATED ACROSS THE WIDTH OF THE DECK. ADDITIONAL CONSTRUCTION NOTES ARE SPECIFIED ON SHEET 28.

GREASE INJECTION HOLES

GREASE INJECTION SHALL BE PERFORMED IMMEDIATELY AFTER THE DECK HAS BEEN STRESSED AS SPECIFIED ON SHEET 28. THE HOLES SHALL BE PLUGGED USING M12 X 75 COACH SCREWS (B14).

THE BUTT JOINT GAP IS PROVIDED TO ALLOW FOR DIMENSIONAL VARIATIONS AND ASSIST IN THE ALIGNMENT OF THE PRESTRESSING HOLES. THE TOP AREAS OF THE BUTT JOINTS SHALL BE SEALED AFTER STRESSING OF THE DECK AS SPECIFIED ON SHEET 28

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

STRESS LAMINATED TIMBER DECK - OPTION C

DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
Raymond Taylor 8/9/99 DATE

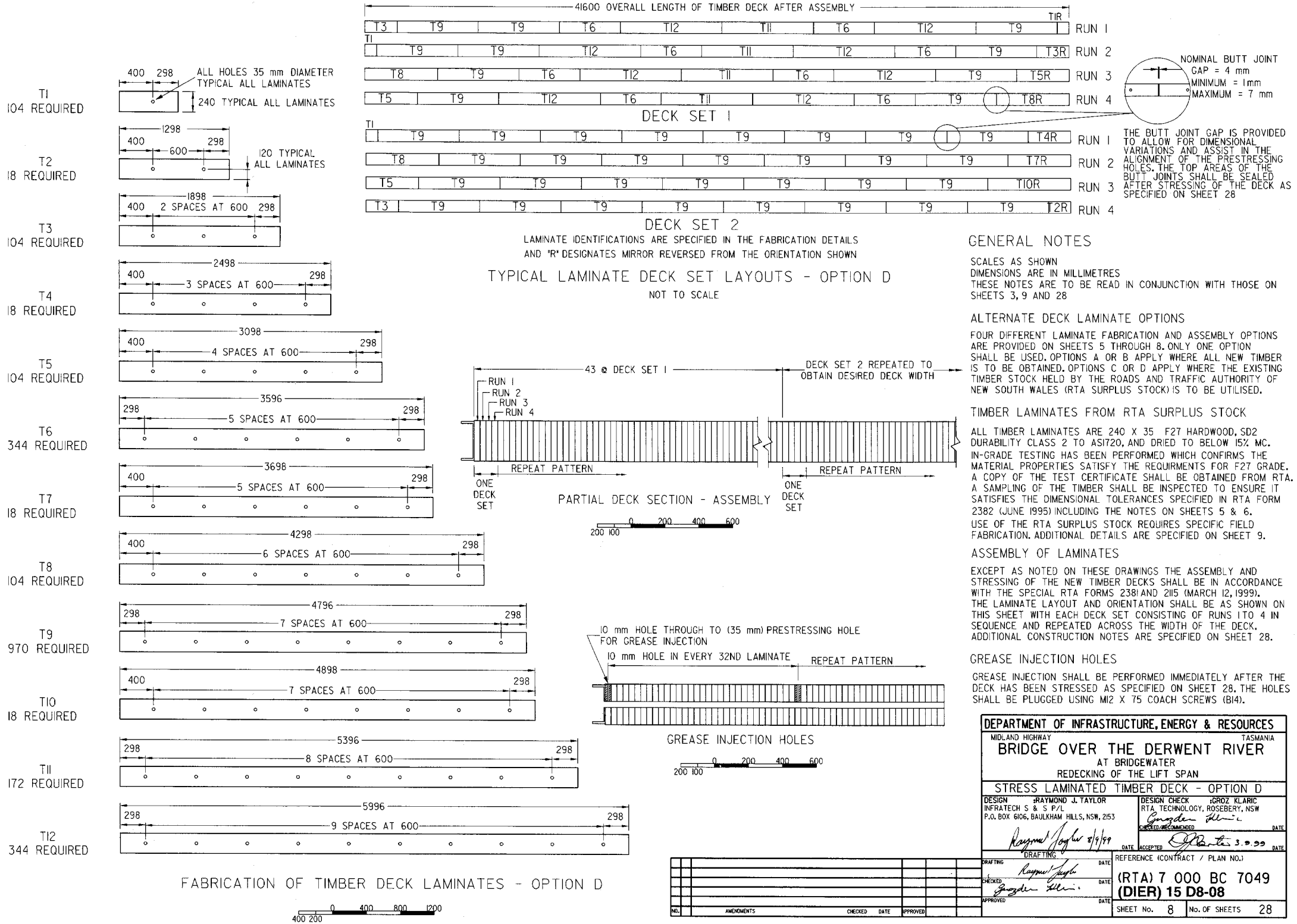
DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

DRAFTING
DRAFTING DATE
CHECKED DATE
APPROVED DATE

REFERENCE (CONTRACT / PLAN NO.)
(RTA) 7 000 BC 7049
(DIER) 15 D8-07

SHEET No. 7 | No. OF SHEETS 28

NO.	AMENDMENTS	CHECKED	DATE	APPROVED



GENERAL NOTES

SCALES AS SHOWN
DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 3, 9 AND 28

ALTERNATE DECK LAMINATE OPTIONS

FOUR DIFFERENT LAMINATE FABRICATION AND ASSEMBLY OPTIONS ARE PROVIDED ON SHEETS 5 THROUGH 8. ONLY ONE OPTION SHALL BE USED. OPTIONS A OR B APPLY WHERE ALL NEW TIMBER IS TO BE OBTAINED. OPTIONS C OR D APPLY WHERE THE EXISTING TIMBER STOCK HELD BY THE ROADS AND TRAFFIC AUTHORITY OF NEW SOUTH WALES (RTA SURPLUS STOCK) IS TO BE UTILISED.

TIMBER LAMINATES FROM RTA SURPLUS STOCK

ALL TIMBER LAMINATES ARE 240 X 35 F27 HARDWOOD, SD2 DURABILITY CLASS 2 TO AS1720, AND DRIED TO BELOW 15% MC. IN-GRADE TESTING HAS BEEN PERFORMED WHICH CONFIRMS THE MATERIAL PROPERTIES SATISFY THE REQUIRMENTS FOR F27 GRADE. A COPY OF THE TEST CERTIFICATE SHALL BE OBTAINED FROM RTA. A SAMPLING OF THE TIMBER SHALL BE INSPECTED TO ENSURE IT SATISFIES THE DIMENSIONAL TOLERANCES SPECIFIED IN RTA FORM 2382 (JUNE 1995) INCLUDING THE NOTES ON SHEETS 5 & 6.
USE OF THE RTA SURPLUS STOCK REQUIRES SPECIFIC FIELD FABRICATION. ADDITIONAL DETAILS ARE SPECIFIED ON SHEET 9.

ASSEMBLY OF LAMINATES

EXCEPT AS NOTED ON THESE DRAWINGS THE ASSEMBLY AND STRESSING OF THE NEW TIMBER DECKS SHALL BE IN ACCORDANCE WITH THE SPECIAL RTA FORMS 2381 AND 2115 (MARCH 12, 1999). THE LAMINATE LAYOUT AND ORIENTATION SHALL BE AS SHOWN ON THIS SHEET WITH EACH DECK SET CONSISTING OF RUNS 1 TO 4 IN SEQUENCE AND REPEATED ACROSS THE WIDTH OF THE DECK. ADDITIONAL CONSTRUCTION NOTES ARE SPECIFIED ON SHEET 28.

GREASE INJECTION HOLES

GREASE INJECTION SHALL BE PERFORMED IMMEDIATELY AFTER THE DECK HAS BEEN STRESSED AS SPECIFIED ON SHEET 28. THE HOLES SHALL BE PLUGGED USING M12 X 75 COACH SCREWS (B14).

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

STRESS LAMINATED TIMBER DECK - OPTION D

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

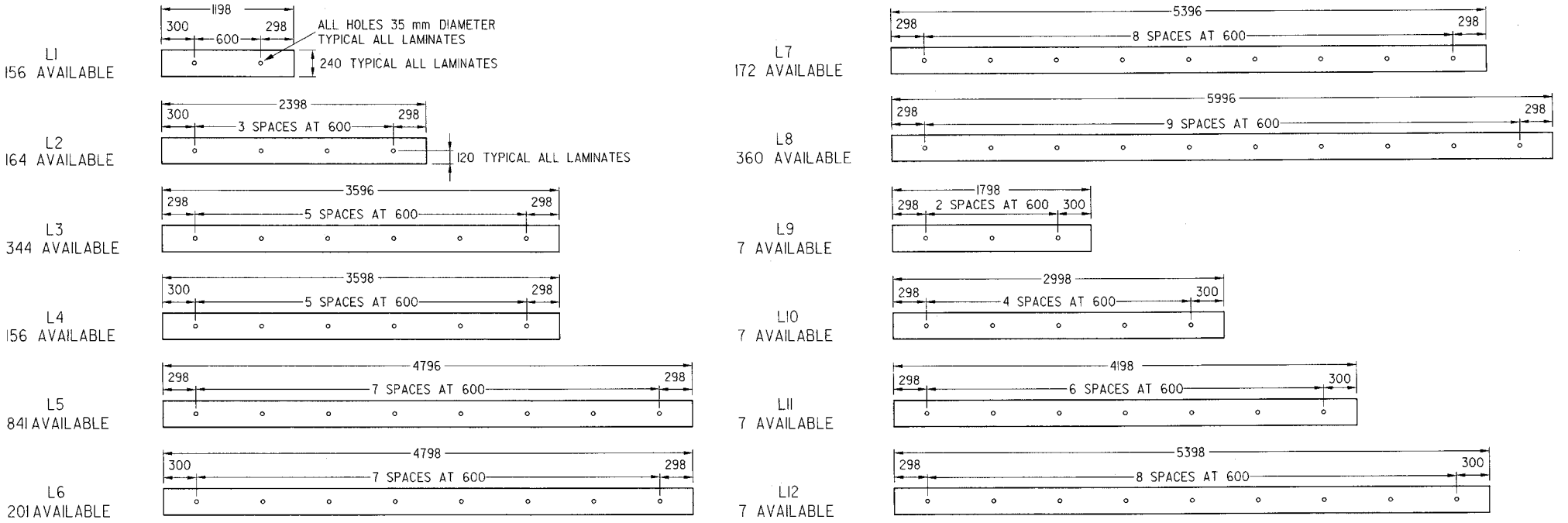
DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
Raymond Taylor 8/9/99
DATE

DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
Groz Klaric
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

DRAFTING DATE
CHECKED DATE
APPROVED DATE

REFERENCE (CONTRACT / PLAN NO.)
(RTA) 7 000 BC 7049
(DIER) 15 D8-08

SHEET No. 8 | No. OF SHEETS 28



EXISTING LAMINATE FABRICATION DETAILS OF RTA SURPLUS STOCK

THIS IS SUPPLIED FOR INFORMATION ONLY - THESE DETAILS ARE NOT FOR FABRICATION

0 400 800 1200
400 200

BRIDGEWATER		RTA SURPLUS STOCK			
LAMINATE IDENTIFICATION	QUANTITY REQUIRED	RTA IDENTIFICATION	QUANTITY TO BE USED	EXTRA REQUIRED	COMMENTS
T1	18	L2	11	0	REQUIRES ONE FIELD CUT
		L9	7		REQUIRES ONE FIELD CUT
T2	104	L2	104	0	REQUIRES ONE FIELD CUT
T3	18	L4	11	0	REQUIRES ONE FIELD CUT
		L10	7		REQUIRES ONE FIELD CUT
T4	104	L4	104	0	REQUIRES ONE FIELD CUT
T5	344	L3	344	0	T5 = L3
T6	18	L6	11	0	REQUIRES ONE FIELD CUT
		L11	7		REQUIRES ONE FIELD CUT
T7	104	L6	104	0	REQUIRES ONE FIELD CUT
T8	866	L5	841	0	T8 = L5
		L6	25		REQUIRES ONE FIELD CUT
T9	18	L6	18	0	100 mm SHORT SEE NOTES
T10	172	L7	172	0	T10 = L7
T11	104	L8	16	81	REQUIRES ONE FIELD CUT
		L12	7		100 mm SHORT SEE NOTES
T12	344	L8	344	0	T12 = L8

LAMINATE SCHEDULE USING RTA STOCK - OPTION C

LAMINATE IDENTIFICATION SEE SHEET 7

BRIDGEWATER		RTA SURPLUS STOCK			
LAMINATE IDENTIFICATION	QUANTITY REQUIRED	RTA IDENTIFICATION	QUANTITY TO BE USED	EXTRA REQUIRED	COMMENTS
T1	104	L1	104	0	REQUIRES ONE FIELD CUT
T2	18	L9	7	0	REQUIRES ONE FIELD CUT
		L2	11		REQUIRES ONE FIELD CUT
T3	104	L2	104	0	REQUIRES ONE FIELD CUT
T4	18	L10	7	0	REQUIRES ONE FIELD CUT
		L4	11		REQUIRES ONE FIELD CUT
T5	104	L4	104	0	REQUIRES ONE FIELD CUT
T6	344	L3	344	0	T6 = L3
T7	18	L11	7	11	REQUIRES ONE FIELD CUT
T8	104	L6	72	27	REQUIRES ONE FIELD CUT
		L8	5		REQUIRES ONE FIELD CUT
T9	970	L5	841	0	T9 = L5
		L6	129		REQUIRES ONE FIELD CUT
T10	18	L12	7	0	REQUIRES ONE FIELD CUT
		L8	11		REQUIRES ONE FIELD CUT
T11	172	L7	172	0	T11 = L7
T12	344	L8	344	0	T12 = L8

LAMINATE SCHEDULE USING RTA STOCK - OPTION D

LAMINATE IDENTIFICATION SEE SHEET 8

GENERAL NOTES

SCALES AS SHOWN
DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 7, 8 AND 28.

FIELD FABRICATION USING RTA SURPLUS STOCK

THIS SHEET PROVIDES THE FABRICATED DETAILS OF THE RTA SURPLUS STOCK OF 240 X 35 LAMINATES. THESE LAMINATES HAVE ALREADY BEEN SIZED AND DRILLED AS SHOWN.
THE LAMINATE SCHEDULE TABLES SHALL BE APPLIED DEPENDING ON THE OPTION (C OR D) CHOSEN.

SPECIAL NOTE FOR OPTION C

ALL OF THE LAMINATES IDENTIFIED AS T9 AND 7 PIECES OF THE T11 LAMINATES WILL BE SHORT 100 mm FOR THIER DESIGNATED APPLICATIONS. THESE SPACES SHALL BE FILLED WITH 100 mm LENGTHS OF LAMINATES FROM OTHER CUT OFF MATERIALS.

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER
REDECKING OF THE LIFT SPAN

STRESS LAMINATED TIMBER DECK - OPTIONS C AND D

DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW

Raymond Taylor 8/9/99 DATE — CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

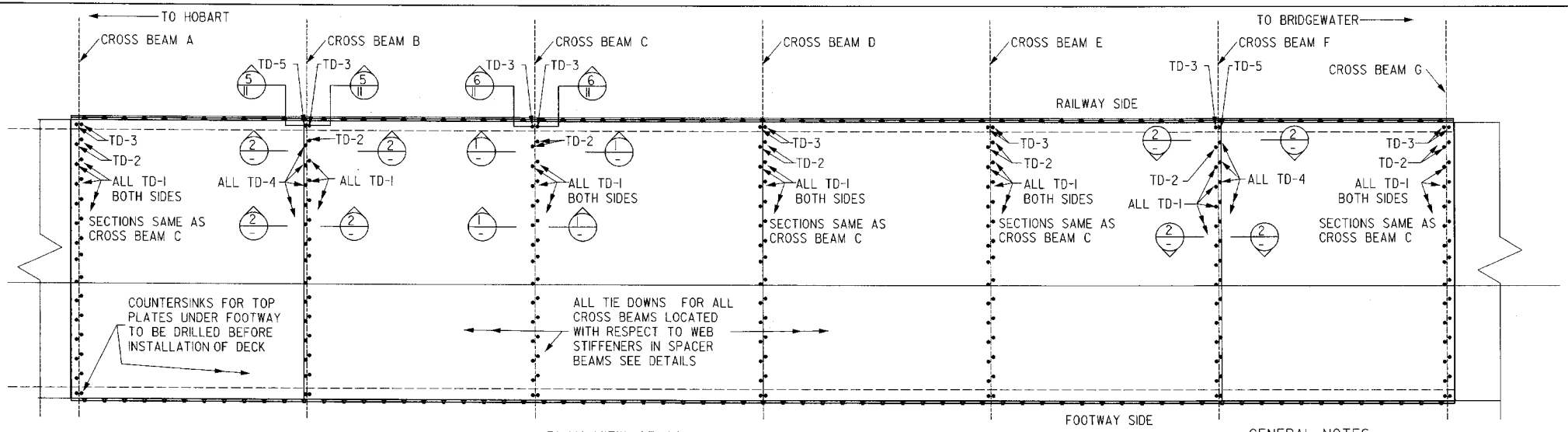
DRAFTING DATE
CHECKED DATE
APPROVED DATE

NO. AMENDMENTS CHECKED DATE APPROVED

REFERENCE (CONTRACT / PLAN NO.)

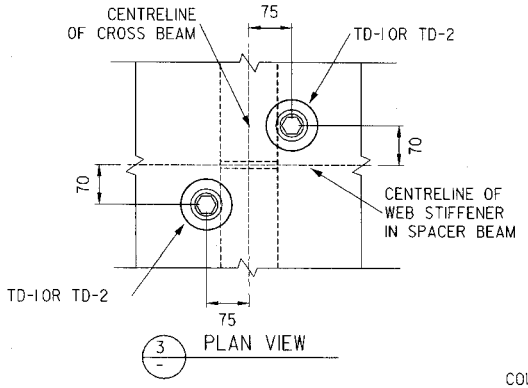
(RTA) 7 000 BC 7049
(DIER) 15 D8-09

SHEET No. 9 — No. OF SHEETS 28

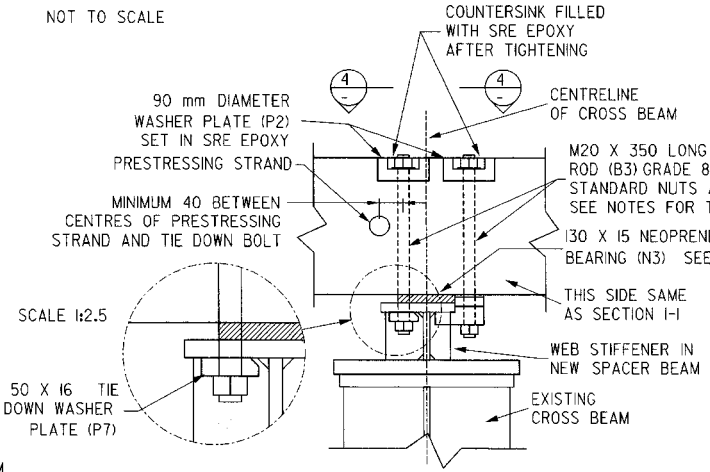


PLAN VIEW OF DECK TIE DOWNS

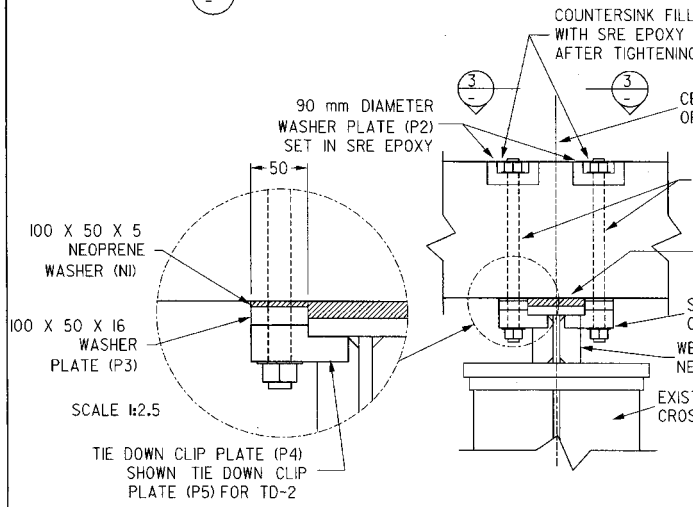
NOT TO SCALE



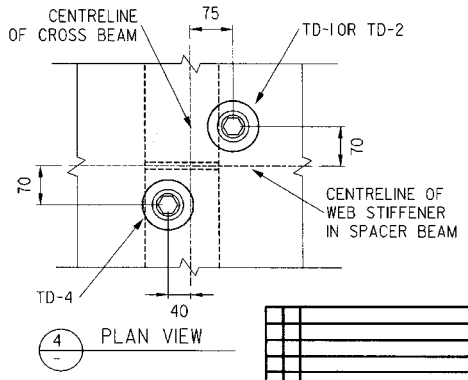
3 PLAN VIEW



2 TYPICAL TIE DOWN FOR TD-4



1 TYPICAL TIE DOWN FOR TD-1 (TD-2 AS NOTED)



4 PLAN VIEW

GENERAL NOTES

SCALE 100 50 0 100 200 300 EXCEPT AS NOTED

DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS II AND 28.
MATERIAL QUANTITIES AND PROTECTIVE TREATMENTS SHALL BE AS SPECIFIED ON SHEET 28.

UNLESS APPROVED OTHERWISE THE DECK SHALL BE INSTALLED IN ITS FINAL POSITION ON THE LIFT SPAN OF THE BRIDGE BEFORE ANY DRILLING OR REBATING OF THE TIMBER IS PERFORMED.
THE LOCATIONS OF THE PRESTRESSING STRANDS SHALL BE ACCURATELY AND CLEARLY MARKED ON THE TOP SURFACE OF THE TIMBER BEFORE ANY DRILLING IS PERFORMED.
EXCEPT AS MAY BE NOTED ON THESE SHEETS NO HOLES SHALL BE DRILLED WITHIN 70 mm OF ANY STRAND. WHERE DRILLING WITHIN THIS CLEARANCE IS ALLOWED THE CLEARANCE FROM THE PRESTRESSING STRAND SHALL BE CONFIRMED AND APPROVAL SHALL BE OBTAINED BEFORE DRILLING IS COMMENCED.
THE POSITION OF ALL TIE DOWNS IS GIVEN WITH RESPECT TO THE WEB STIFFENERS IN THE NEW SPACER BEAMS. THE CLIP PLATES (P4 TO P6) SHALL BE LOCATED AS CLOSE AS POSSIBLE TO THE SPACER BEAM

TIGHTENING OF TIE-DOWNS

ALL TIE DOWNS SHALL BE INSTALLED WITH 1½ THREADS PROTRUDING BEYOND THE BOTTOM NUT. AN APPROVED THREAD LOCKING FLUID SHALL BE APPLIED TO THE BOTTOM NUT, TIGHTENING SHALL BE PERFORMED AS OUTLINED ON SHEET II.

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

DECK TIE DOWNS - SHEET I

DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
Raymond Taylor 8/9/99 DATE

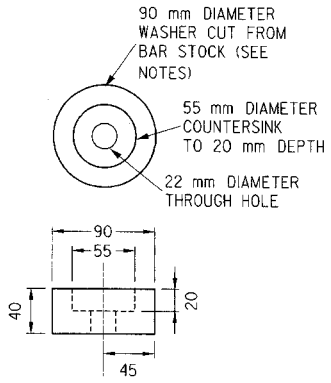
DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 30.9.99 DATE

DRAFTING
DRAFTING DATE
CHECKED DATE
APPROVED DATE

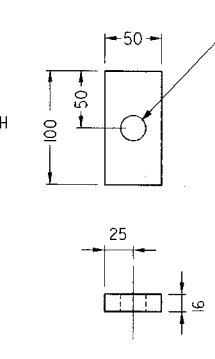
REFERENCE (CONTRACT / PLAN NO.)
(RTA) 7 000 BC 7049
(DIER) 15 D8-10

SHEET No. 10 | No. OF SHEETS 28

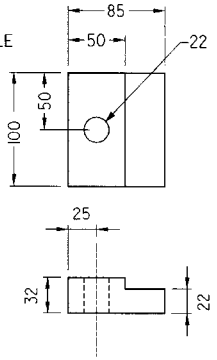
NO.	AMENDMENTS	CHECKED	DATE	APPROVED



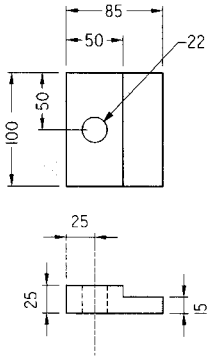
TIE DOWN WASHER PLATE P2



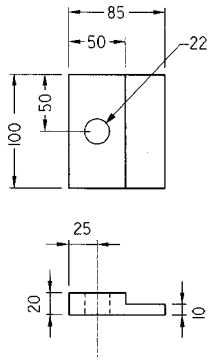
TIE DOWN WASHER PLATE P3



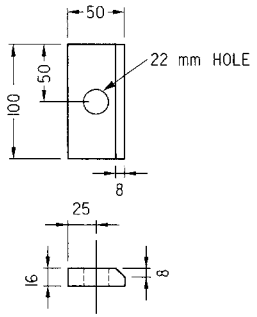
TIE DOWN CLIP PLATE P4



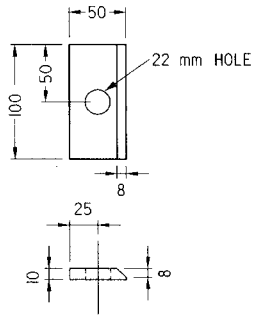
TIE DOWN CLIP PLATE P5



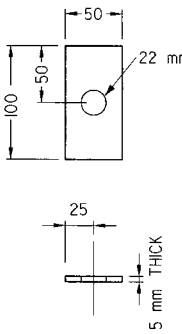
TIE DOWN CLIP PLATE P6



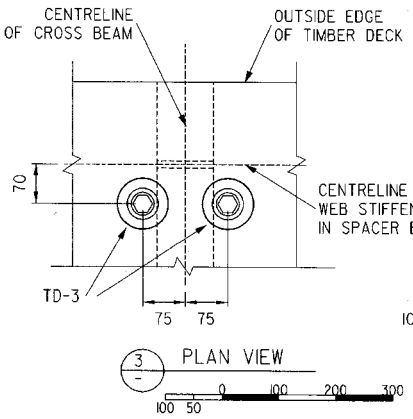
TIE DOWN WASHER PLATE P7

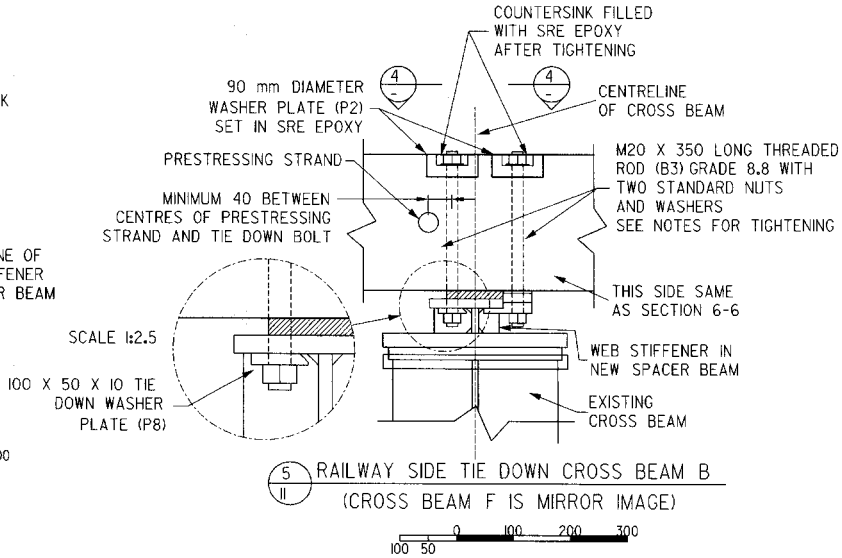


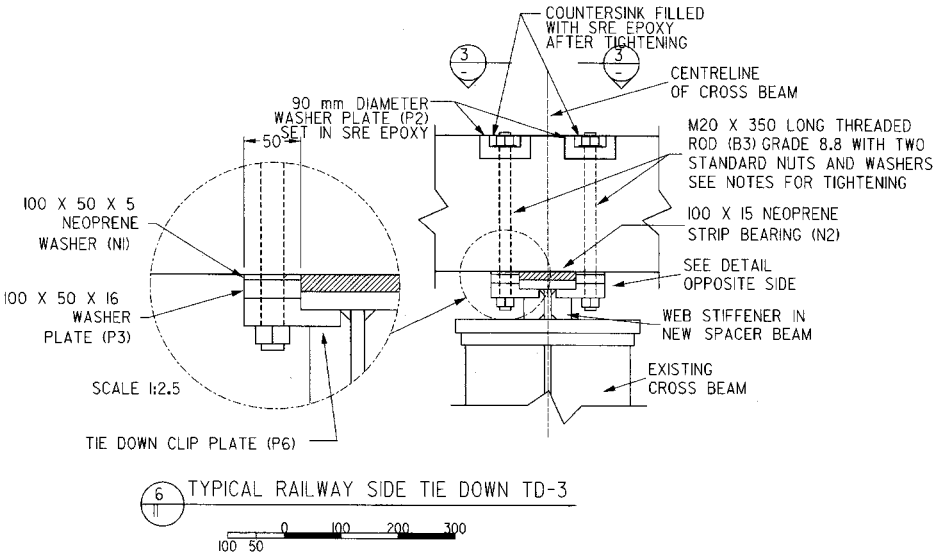
TIE DOWN WASHER PLATE P8

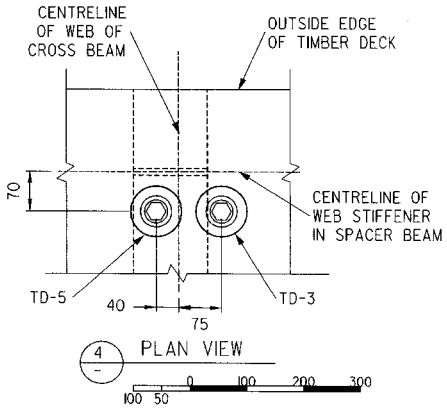


NEOPRENE TIE DOWN WASHER N1









GENERAL NOTES

SCALE 0 50 100 150 EXCEPT AS NOTED
50 25

DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 10 AND 28.
MATERIAL QUANTITIES AND PROTECTIVE TREATMENT SHALL BE AS SPECIFIED ON SHEET 28.

STEEL PLATES P4 TO P8 SHALL BE TO AS3678 FOR GRADE 350 AND WASHER PLATES P2 AND P3 SHALL BE TO AS3678 FOR GRADE 250.
WASHER PLATES P2 MAY BE CUT FROM ROUND BAR STOCK AND THE CUT SURFACES NEED NOT BE SMOOTH EXCEPT THAT THE THICKNESS SHALL BE WITHIN +/- 1.5 mm BETWEEN OPPOSING SIDES AND THE AVERAGE THICKNESS SHALL BE WITHIN +/- 2 mm OF THAT SPECIFIED.
NEOPRENE WASHERS N1 AND STRIP BEARINGS N2 AND N3 SHALL BE AS SPECIFIED ON SHEET 28.

TIGHTENING OF TIE DOWNS

TIE DOWNS SHALL BE INSTALLED WITH 1½ THREADS PROTRUDING BELOW THE BOTTOM NUT. AN APPROVED THREAD LOCKING FLUID SHALL BE APPLIED TO THE BOTTOM NUT. TIGHTENING SHALL BE PERFORMED FROM THE TOP AND THE EXCESS THREAD SHALL BE CUT AWAY AND THE TOP NUT SPOT WELDED TO THE ROD AND PLATE. THE CUT AND WELD AREAS SHALL BE PROTECTIVE FIELD TREATED IN ACCORDANCE WITH THE SPECIFICATIONS ON SHEET 28.

AT EACH CROSS BEAM THE TIE DOWNS SHALL BE TIGHTENED BEGINNING AT THE CENTRELINE OF THE CROSS FALL (HIGHEST LEVEL) AND WORKING TOWARDS THE EDGES ALTERNATING TO EACH SIDE. ALL TIE DOWNS ON ALL CROSS BEAMS SHALL BE SNUG BEFORE FINAL TIGHTENING IS APPLIED.
ALL TIE DOWNS EXCEPT TD-3 SHALL BE SNUG TIGHT TO AS4100.
TD-3 SHALL BE SNUG ONLY.

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

DECK TIE DOWNS - SHEET 2

DESIGN ‡RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
Raymond Taylor 8/7/99 DATE

DESIGN CHECK ‡GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

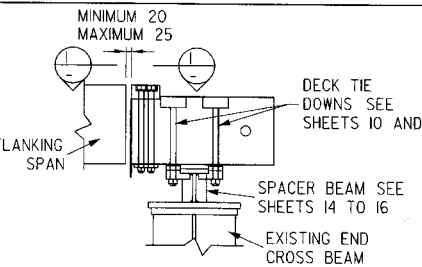
DRAFTING
DRAFTING DATE
CHECKED DATE
APPROVED DATE

REFERENCE (CONTRACT / PLAN NO.)

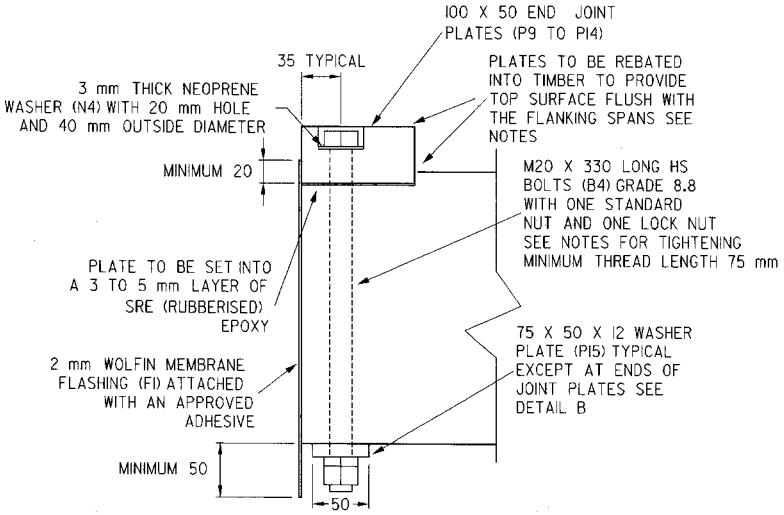
(RTA) 7 000 BC 7049
(DIER) 15 D8-11

SHEET No. II | No. OF SHEETS 28

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

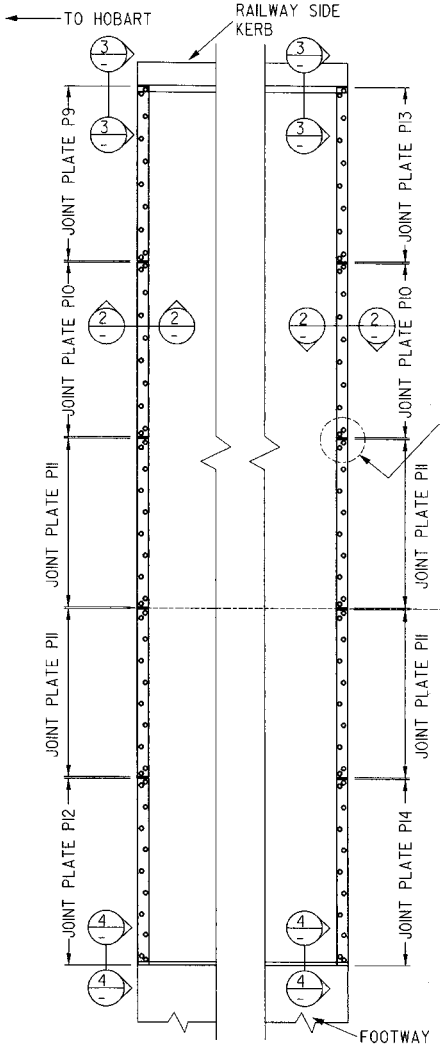


A/3 END DECK JOINT



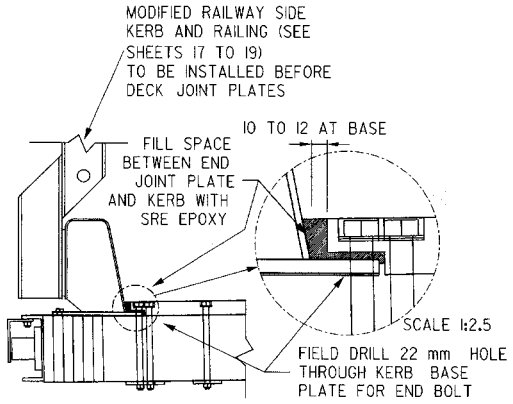
2/- TYPICAL DECK JOINT ATTACHMENT

SCALE 0 50 100 150 (50 25)

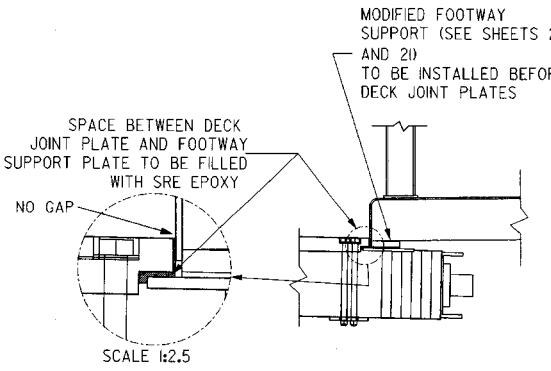


1/- PLAN VIEW OF END DECK JOINTS

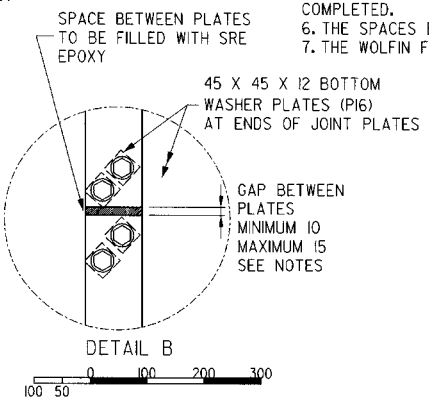
SCALE 0 50 100 150 (50 25)



3/- DECK JOINT ATTACHMENT AT KERB



4/- DECK JOINT ATTACHMENT AT FOOTWAY



DETAIL B

SCALE 0 100 200 300 (100 50)

GENERAL NOTES

SCALE 0 200 400 600 (200 100) EXCEPT AS NOTED

DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 13 AND 28.
MATERIAL QUANTITIES AND PROTECTIVE TREATMENT SHALL BE AS SPECIFIED ON SHEET 28.
NEOPRENE WASHERS (N4) SHALL BE AS SPECIFIED ON SHEET 28.

WORK TO BE COMPLETED BEFORE DECK JOINT INSTALLATION

THE DECK JOINT PLATES SHALL NOT BE FITTED UNTIL THE FOLLOWING WORK HAS BEEN COMPLETED:
1. THE DECK HAS BEEN INSTALLED ON THE LIFT SPAN AND TIED DOWN TO THE SUPPORTING CROSS BEAMS AS SPECIFIED ON SHEETS 10 AND 11
2. THE RAILWAY SIDE KERB HAS BEEN INSTALLED AS SPECIFIED ON SHEETS 17 TO 19
3. THE FOOTWAY SUPPORT HAS BEEN INSTALLED AS SPECIFIED ON SHEETS 20 AND 21.

FITTING OF DECK JOINT PLATES

THE PLATES SHALL BE LAYED OUT ON THE ENDS OF THE DECK IN THE ORIENTATION SHOWN ON THIS SHEET WITHOUT DRILLING OR REBATING UNTIL ALL PLATES HAVE BEEN FITTED.
PLATES P12 AND P14 SHALL BE TIGHT AGAINST THE FOOTWAY AS SHOWN IN SECTION 4-4. THE ENDS OF PLATES P9 AND P13 SHALL BE SPACED ABOUT 10 TO 12 mm FROM THE BASE OF THE RAILWAY SIDE KERB AS SHOWN IN SECTION 3-3.
THE INTERMEDIATE PLATES SHALL BE SPACED ACROSS THE WIDTH OF THE DECK TO PROVIDE A EQUAL GAP BETWEEN ALL PLATES.
THE PLATES SHALL THEN BE MARKED FOR LOCATION AND ALL HOLES SHALL BE DRILLED.
THE TOP SURFACE OF EACH PLATE SHALL BE CHECKED FOR ELEVATION WITH RESPECT TO THE ADJACENT FLANKING SPAN.
EACH PLATE SHALL BE REBATED INTO THE TIMBER DECK SO THAT THE TOP SURFACE WILL BE FLUSH WITH THE ROAD SURFACE OF THE FLANKING SPAN, IMMEDIATELY ADJACENT TO THE PLATE, ALLOWING FOR A THIN LAYER OF SRE EPOXY UNDER THE PLATE.

INSTALLATION AND TIGHTENING OF DECK JOINT PLATES

EACH PLATE SHALL BE INSTALLED USING THE FOLLOWING PROCEDURE. (IT SHOULD BE NOTED THAT A LIMITED TIME IS AVAILABLE BEFORE THE SRE EPOXY BEGINS TO CURE):

1. EACH PLATE SHALL BE "DRY FITTED" WITHOUT THE USE OF SRE EPOXY AND THE FOLLOWING CONDITIONS CHECKED:
   - TOP SURFACE LEVEL CHECKED AGAINST THE FLANKING SPAN (ALLOWING FOR EPOXY)
   - BOLT LENGTHS CHECKED FOR ADEQUATE THREAD LENGTH
   - WASHER PLATES CHECKED FOR CLEARANCE
2. ONLY ENOUGH SRE EPOXY SHALL BE MIXED FOR ONE PLATE AT A TIME AND AN EVEN LAYER SHALL BE APPLIED TO THE DECK SURFACE.
3. THE PLATE SHALL BE IMMEDIATELY PLACED IN POSITION AND ALL BOLTS, WASHERPLATES AND NUTS INSTALLED WITHOUT TIGHTENING.
4. IN SEQUENCE FROM ONE END TO THE OTHER, AND REPEATING FROM THE SAME END EACH TIME, ALL BOLTS SHALL BE TIGHTENED AS OUTLINED BELOW, EXCEPT THAT TIGHTENING SHALL STOP IF THE TOP SURFACE OF THE PLATE MATCHES THE ADJACENT FLANKING SPAN:
   - FINGER TIGHT
   - SNUG (1/4 TURN)
   - SNUG TIGHT TO AS4100
   - SNUG TIGHT + 1/4 TURN
5. IF THE TOP SURFACE OF THE PLATE MATCHES THE ADJACENT FLANKING SPAN BEFORE THE FINAL TENSIONING IS ACHIEVED THE SRE EPOXY SHALL BE ALLOWED TO FULLY CURE BEFORE TIGHTENING IS COMPLETED.
6. THE SPACES BETWEEN ADJOINING JOINT PLATES SHALL BE FILLED WITH SRE EPOXY
7. THE WOLFIN FLASHING SHALL BE ATTACHED TO THE ENDS OF THE DECK AS SHOWN IN SECTION 2-2.

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

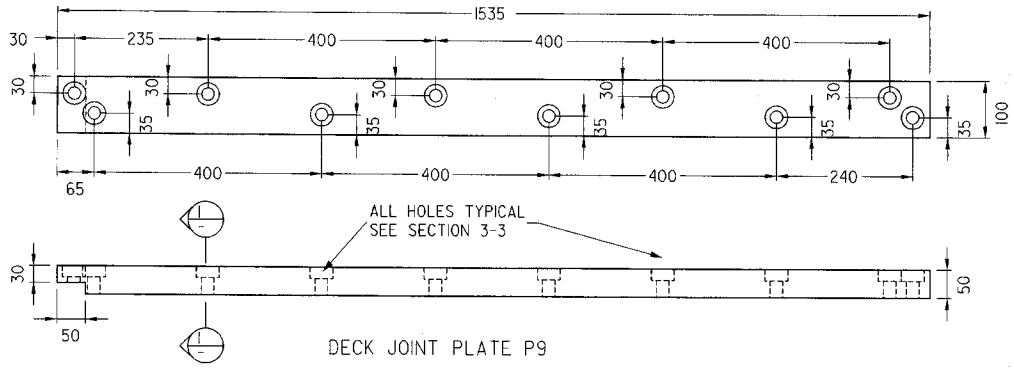
REDECKING OF THE LIFT SPAN

END DECK JOINTS - SHEET 1

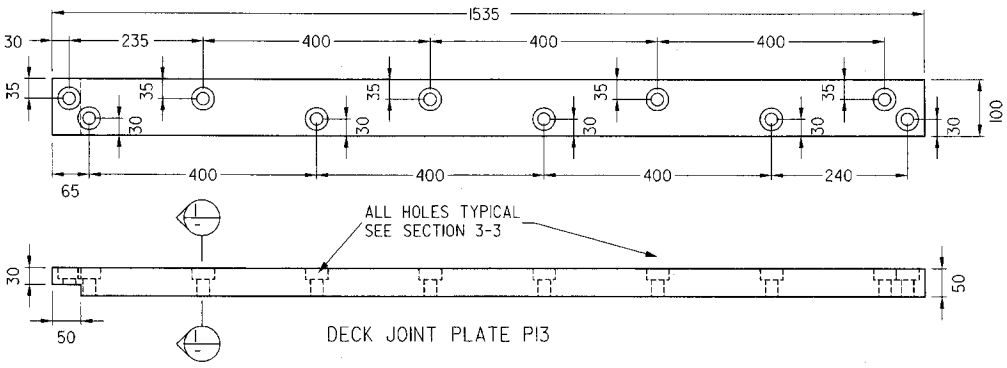
DESIGN	DESIGN CHECK
RAYMOND J. TAYLOR	GROZ KLARIC
INFRATECH S & S P/L	RTA TECHNOLOGY, ROSEBERY, NSW
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153	CHECKED/RECOMMENDED DATE
DATE 8/9/99	ACCEPTED 3.9.99 DATE

DRAFTING	REFERENCE (CONTRACT / PLAN NO.)
DRAFTING DATE	(RTA) 7 000 BC 7049
CHECKED DATE	(DIER) 15 D8-12
APPROVED DATE	SHEET No. 12 — No. OF SHEETS 28

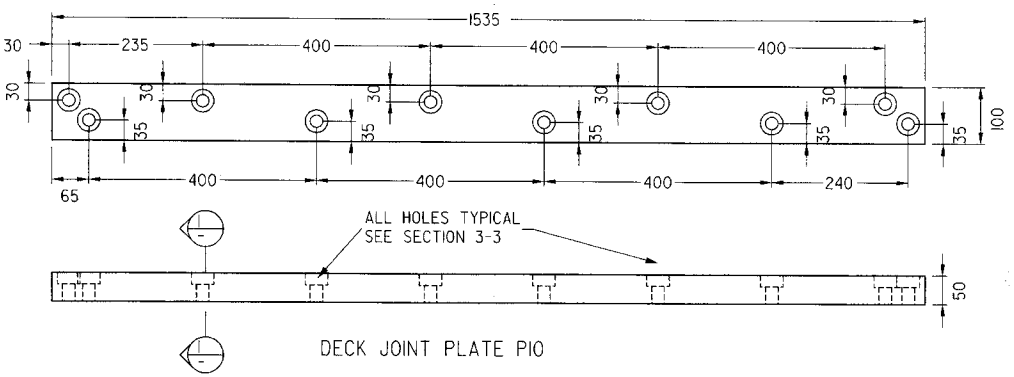
NO.	AMENDMENTS	CHECKED	DATE	APPROVED



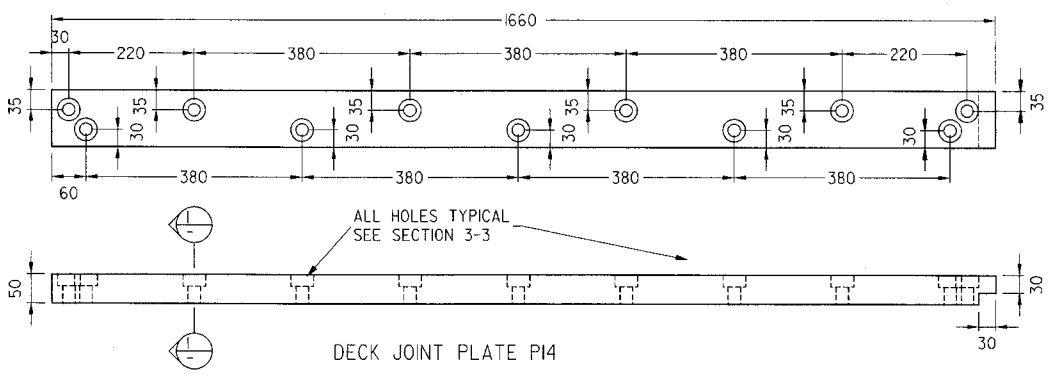
DECK JOINT PLATE P9



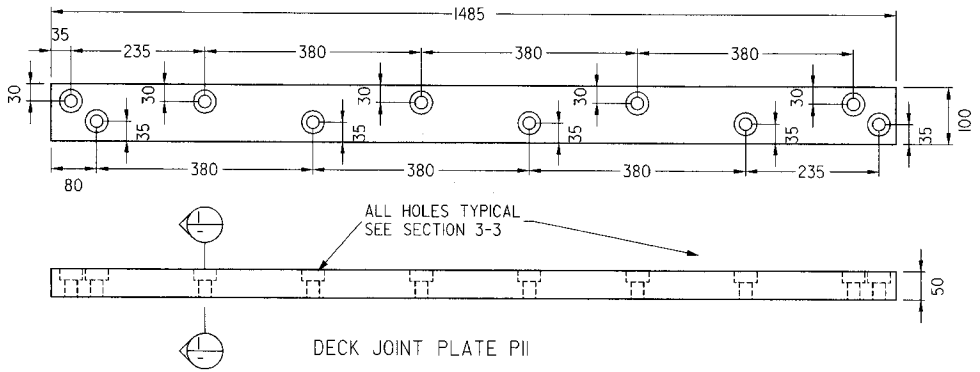
DECK JOINT PLATE P13



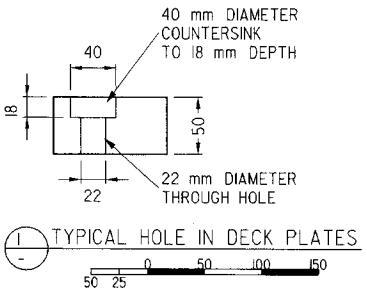
DECK JOINT PLATE P10



DECK JOINT PLATE P14

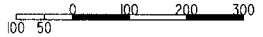


DECK JOINT PLATE P11



TYPICAL HOLE IN DECK PLATES

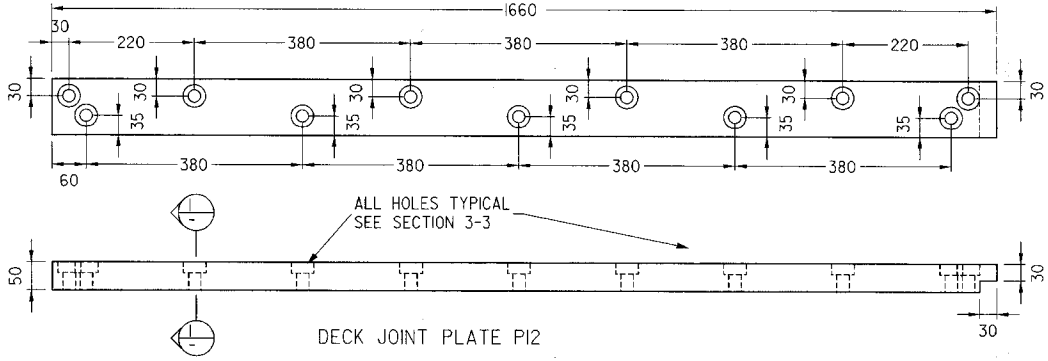
GENERAL NOTES

SCALE 

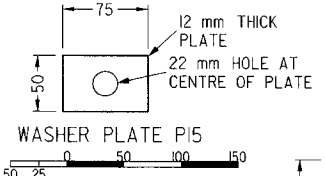
EXCEPT AS NOTED

DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 12 AND 28.
MATERIAL QUANTITIES AND PROTECTIVE TREATMENT SHALL BE AS SPECIFIED ON SHEET 28.

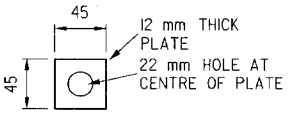
STEEL PLATE SHALL BE TO AS3678 FOR GRADE 250



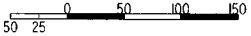
DECK JOINT PLATE P12



WASHER PLATE P15



WASHER PLATE P16



NO.	AMENDMENTS	CHECKED	DATE	APPROVED

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

END DECK JOINTS - SHEET 2

DESIGN: RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
DATE 8/9/99

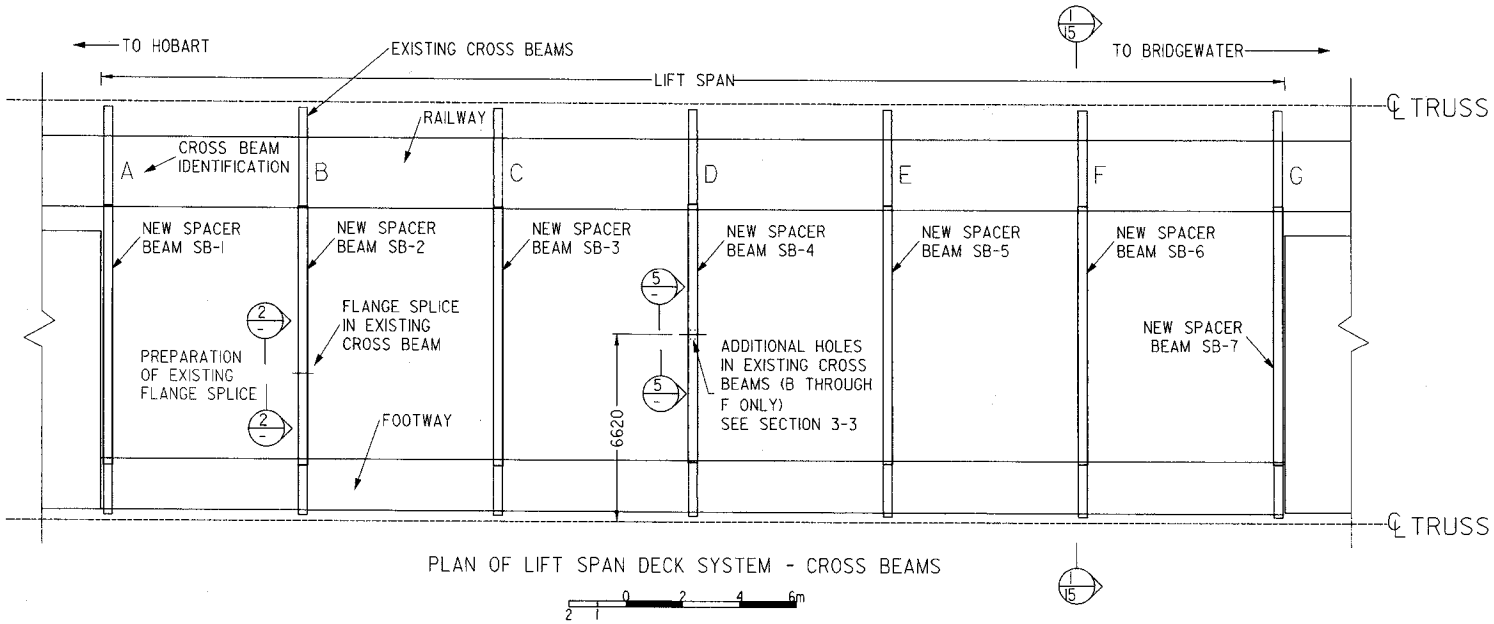
DESIGN CHECK: GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED — DATE
ACCEPTED 3.9.99 — DATE

DRAFTING — DATE
CHECKED — DATE
APPROVED — DATE

REFERENCE (CONTRACT / PLAN NO.)

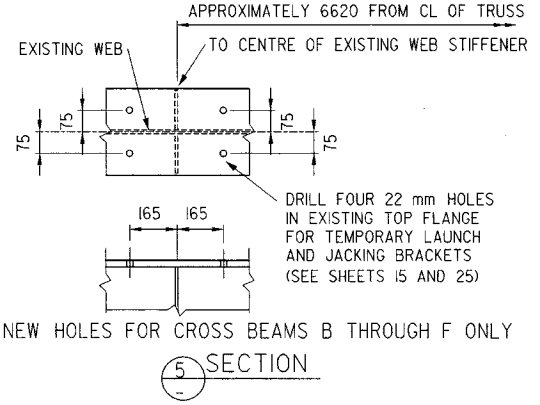
(RTA) 7 000 BC 7049
(DIER) 15 D8-13

SHEET No. 13 | No. OF SHEETS 28



PLAN OF LIFT SPAN DECK SYSTEM - CROSS BEAMS

0 2 4 6m



NEW HOLES FOR CROSS BEAMS B THROUGH F ONLY

5 SECTION

GENERAL NOTES

SCALE 0 100 200 300 EXCEPT AS NOTED
100 50

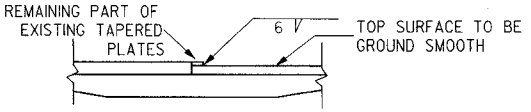
DIMENSIONS ARE IN MILLIMETRES EXCEPT THAT WHERE IMPERIAL MEASURE IS GIVEN IT SHALL BE CONSIDERED AS CONTROLLING. THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 15, 16 AND 28.

THE EXISTING CROSS BEAMS SHALL BE PREPARED FOR STRENGTHENING AS OUTLINED ON THIS SHEET. PREPARATION OF A CROSS BEAM, (AND STRENGTHENING AS OUTLINED ON SHEET 15), SHALL BE COMMENCED AS SOON AS THE EXISTING STEEL DECKING HAS BEEN REMOVED AND THE CROSS BEAM HAS BEEN EXPOSED.

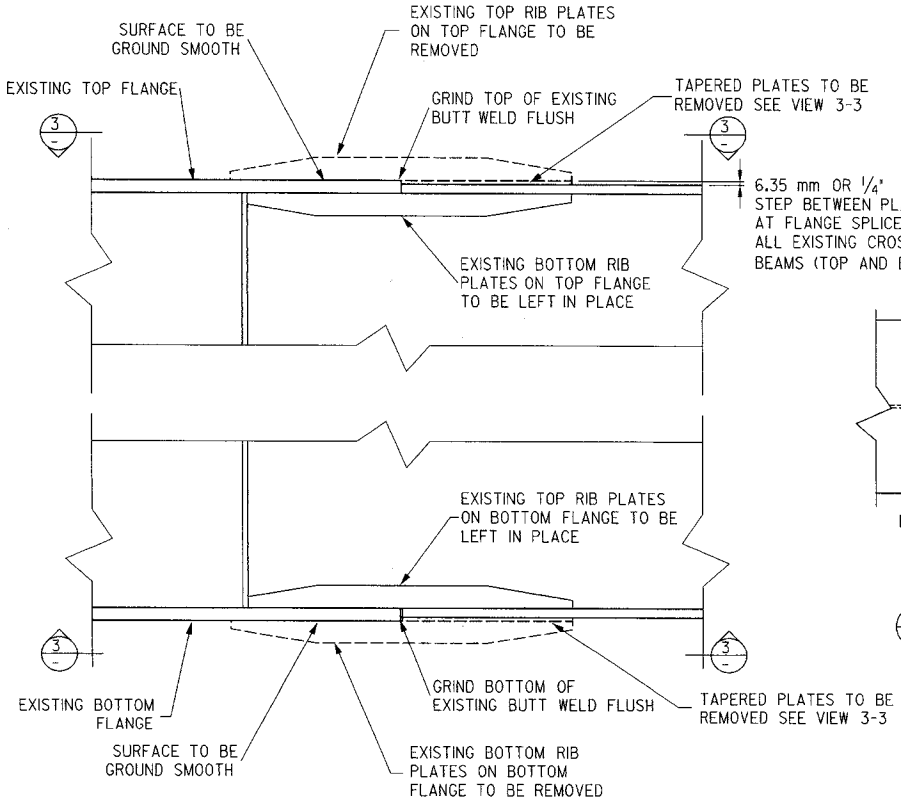
ANY EXISTING PROTRUSIONS OR ATTACHMENTS TO THE TOP FACE OR EDGES OF THE TOP FLANGE AND BOTTOM FACE OR EDGES OF THE THE BOTTOM FLANGE SHALL BE REMOVED.
LOOSE SCALE SHALL ALSO BE REMOVED FROM THESE SURFACES BY GRINDING USING AN APPROVED CONTAINMENT METHOD TO PREVENT CONTAMINATION OF THE ENVIRONMENT.

DURING THE CUTTING OF THE EXISTING TAPERED PLATES, AS SHOWN IN SECTION 3-3, CARE SHALL BE TAKEN NOT TO DAMAGE THE EXISTING FLANGE PLATE UNDERNEATH.

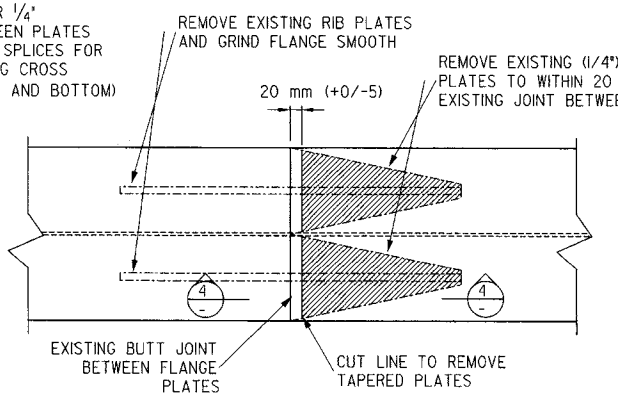
THE 6 mm FILLET WELD SHOWN IN SECTION 4-4 SHALL BE APPLIED TO SEAL THE EXPOSED INTERFACE BETWEEN THE TAPERED PLATES AND THE FLANGE PLATE.
THE WELD CATEGORY SHALL BE GP IN ACCORDANCE WITH AS1554 PART 1.



4 SECTION



2 SECTION - PREPARATION OF EXISTING FLANGE SPLICE



3 PREPARATION OF EXISTING FLANGE SPLICE

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

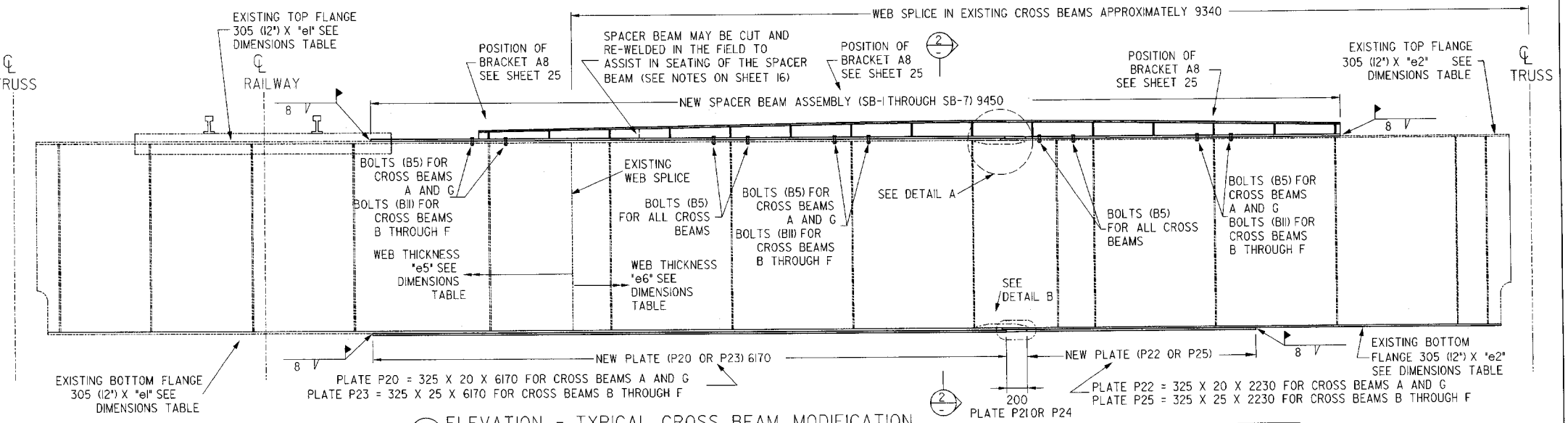
REDECKING OF THE LIFT SPAN

CROSS BEAM MODIFICATIONS - SHEET 1

DESIGN	DESIGN CHECK
±RAYMOND J. TAYLOR	±GROZ KLARIC
INFRATECH S & S P/L	RTA TECHNOLOGY, ROSEBERY, NSW
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153	CHECKED/RECOMMENDED DATE
DATE	ACCEPTED 3.3.99 DATE

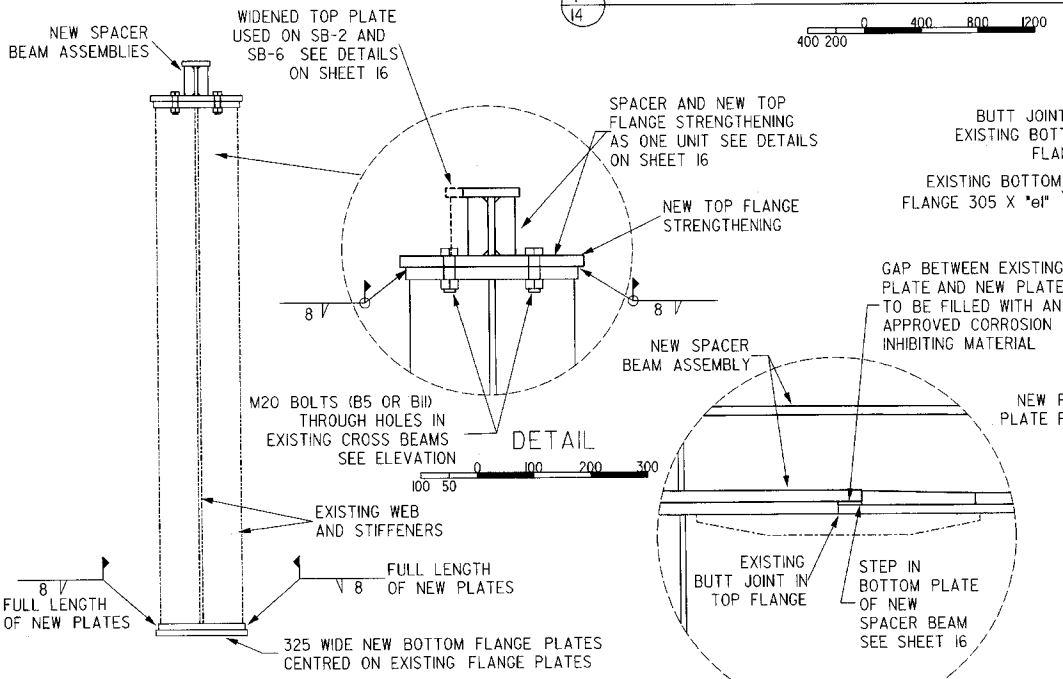
DRAFTING	REFERENCE (CONTRACT / PLAN NO.)
DRAFTING DATE	(RTA) 7 000 BC 7049
CHECKED DATE	(DIER) 15 D8-14
APPROVED DATE	SHEET No. 14 / No. OF SHEETS 28

NO.	AMENDMENTS	CHECKED	DATE	APPROVED



1/14 ELEVATION - TYPICAL CROSS BEAM MODIFICATION

0 400 800 1200
400 200

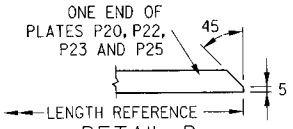


2/- SECTION - RAILWAY SIDE OF FLANGE SPLICE

0 200 400 600
200 100

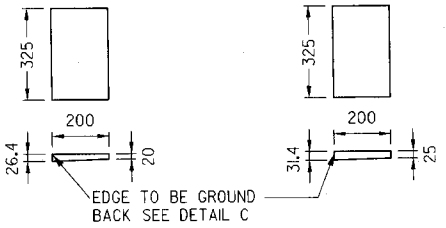
DETAIL A

0 100 200 300
100 50



DETAIL D

DETAIL B

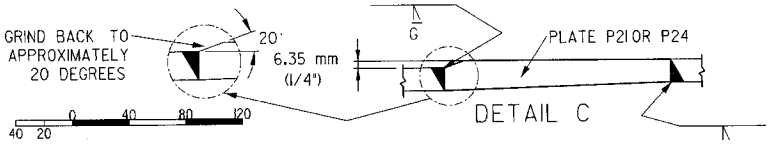


FLANGE PLATE P21

0 200 400 600
200 100

FLANGE PLATE P24

0 200 400 600
200 100



0 40 80 120
40 20

DETAIL C

GENERAL NOTES

SCALE 0 50 100 150
50 25 EXCEPT AS NOTED

DIMENSIONS ARE IN MILLIMETRES EXCEPT THAT WHERE IMPERIAL MEASURE IS GIVEN IT SHALL BE CONSIDERED CONTROLLING
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 14, 16 AND 28.
MATERIAL QUANTITIES AND PROTECTIVE TREATMENT SHALL BE AS SPECIFIED ON SHEET 28.
STEEL PLATES SHALL BE TO AS3678 FOR GRADE 250.
PLATES P20, P22, P23 AND P25 ARE FLAT PLATES REQUIRING PREPARATION ON ONE END ONLY AS SHOWN IN DETAIL D.

WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH AS1554 PART.
ALL BUTT WELDS SHALL DEVELOP THE FULL STRENGTH OF THE 250 GRADE STEEL.
THE 8 mm FILLET WELDS ALONG THE SIDES OF THE TOP AND BOTTOM FLANGES (SEE SECTION I-I) SHALL BE PERFORMED SIMULTANEOUSLY ON EACH SIDE TO MINIMISE DISTORTION.

BOLTS B5 AND B11 TO BE FULLY TENSIONED TO AS4100.

CROSS BEAM IDENTIFICATION SEE SHEET 14	e1	e2	e3	e4
CROSS BEAMS A AND G	22 (7/8")	16 (5/8")	11 (7/16")	9.5 (3/8")
CROSS BEAMS B THROUGH F	28.5 (1 1/8")	22 (7/8")	13 (1/2")	11 (7/16")

EXISTING DIMENSIONS TABLE

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

CROSS BEAM MODIFICATIONS - SHEET 2

DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
8/9/99 DATE

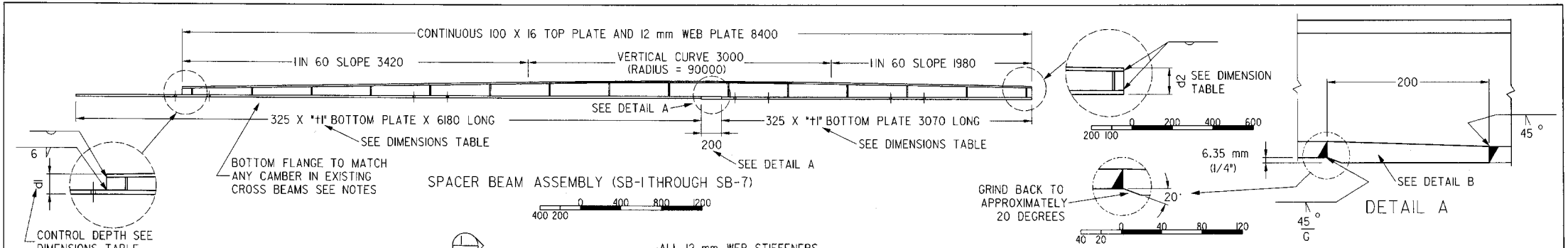
DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
DATE ACCEPTED 3.9.99 DATE

DRAFTING
DRAFTING DATE
CHECKED DATE
APPROVED DATE

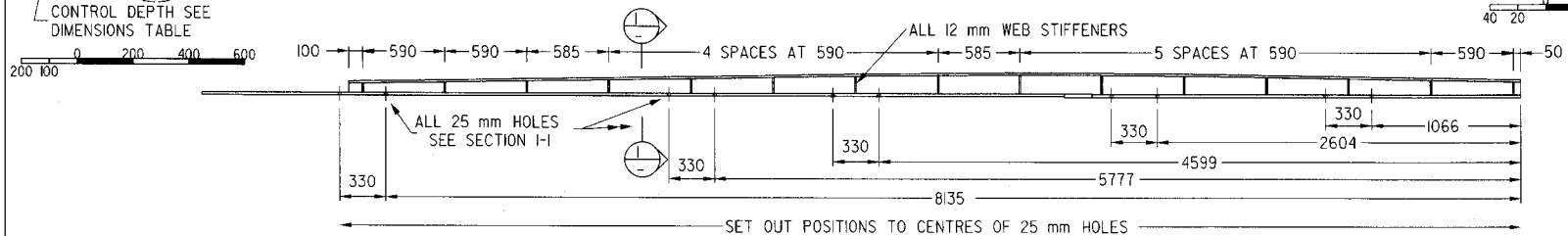
REFERENCE (CONTRACT / PLAN NO.)
(RTA) 7 000 BC 7049
(DIER) 15 D8-15

SHEET No. 15 No. OF SHEETS 28

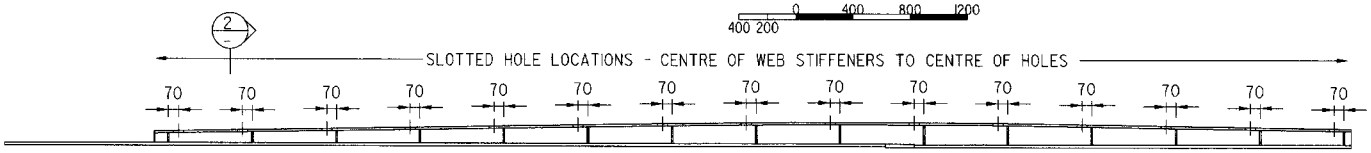
NO.	AMENDMENTS	CHECKED	DATE	APPROVED



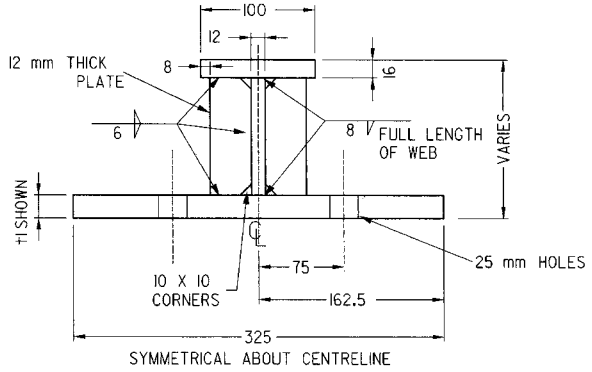
SPACER BEAM ASSEMBLY (SB-1 THROUGH SB-7)

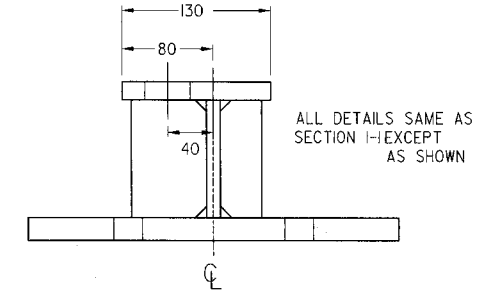


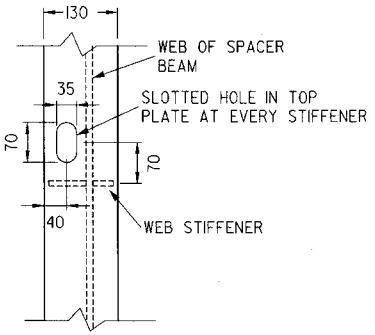
SPACER BEAM ASSEMBLIES (SB-1 THROUGH SB-7) LAYOUT OF WEB STIFFENERS AND 25 mm HOLES



2 SPACER BEAM ASSEMBLIES SB-2 AND SB-6 ONLY - LAYOUT OF 70 X 35 SLOTTED HOLES





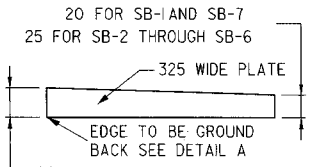


2 SPACER BEAM ASSEMBLY SB-6 SHOWN (SB-2 OPPOSITE HAND)

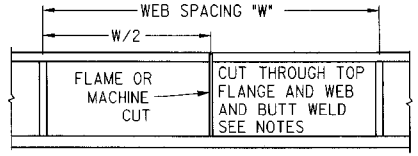
1 SPACER BEAM ASSEMBLIES SB1, SB3-SB5 & SB-7

ITEM	t1	t2	d1	d2*	CROSS BEAM SEE SHEET 14
SB-1	20	25	100	130	A
SB-2	25	30	85	115	B
SB-3	25	30	85	115	C
SB-4	25	30	85	115	D
SB-5	25	30	85	115	E
SB-6	25	30	90	120	F
SB-7	20	25	120	150	G

DIMENSIONS TABLE (* SEE NOTES FOR d2)



DETAIL B



DETAIL C - FIELD CUT OF SPACER BEAM

GENERAL NOTES

SCALE 0 50 100 150 (50 25) EXCEPT AS NOTED

DIMENSIONS ARE IN MILLIMETRES EXCEPT THAT WHERE IMPERIAL MEASURE IS GIVEN IT SHALL BE CONSIDERED CONTROLLING
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 14, 15 AND 28.
MATERIAL QUANTITIES AND PROTECTIVE TREATMENT SHALL BE AS SPECIFIED ON SHEET 28.
STEEL PLATES SHALL BE TO AS3678 FOR GRADE 250.

WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH AS1554 PART 1.
ALL BUTT WELDS SHALL DEVELOP THE FULL STRENGTH OF THE 250 GRADE STEEL.

IT SHOULD BE NOTED THAT THE DIMENSION "d2" IS DERIVED FROM THE CHANGE IN GEOMETRY OF THE TOP PLATE OF THE SPACER BEAM PLUS THE 1/4" STEP IN THE BOTTOM PLATES. THEREFORE "d2" IS ACTUALLY GREATER THAN "d1" BY 24 mm + 1/4" (OR EXACTLY 30.35 mm).

SEATING OF SPACER BEAMS AND FIELD CUTTING

THE BOTTOM FLANGE OF THE SPACER BEAMS SHALL MATCH ANY EXISTING CAMBER IN THE CROSS BEAMS IN ACCORDANCE WITH THE TOLERANCES SPECIFIED IN AS4100.
THE TOP FLANGE AND WEB OF THE SPACER BEAMS MAY BE CUT IN THE FIELD, AS SHOWN IN DETAIL C, TO RELIEVE DISTORTION AND ASSIST IN SEATING OF THE SPACER BEAM ON THE CROSS BEAM. THESE CUTS SHALL BE BUTT WELDED TO THE SATISFACTION OF THE SUPERINTENDENT. A MAXIMUM OF THREE CUTS SHALL BE ALLOWED IN EACH SPACER BEAM AND SHALL ALWAYS BE POSITIONED MIDWAY BETWEEN THE 12 mm WEB STIFFENERS.
NOTWITHSTANDING THESE NOTES THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING SATISFACTORY SEATING OF THE SPACER BEAMS ON THE CROSS BEAMS.

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

CROSS BEAM MODIFICATIONS - SHEET 3

DESIGN RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
DESIGN CHECK GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW

CHECKED/RECOMMENDED DATE

ACCEPTED 3.9.99 DATE

DRAFTING

DRAFTING DATE

CHECKED DATE

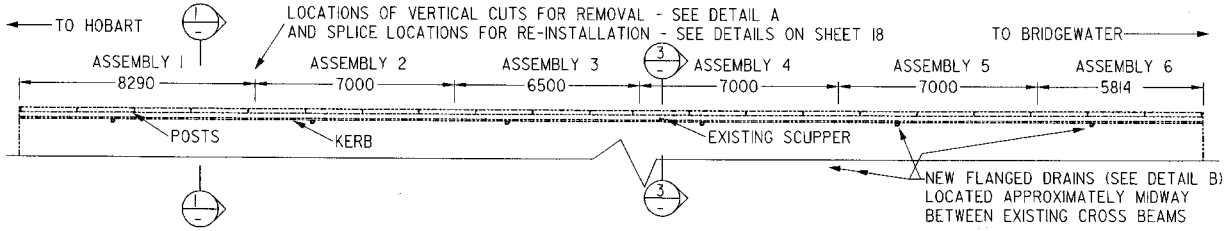
APPROVED DATE

REFERENCE (CONTRACT / PLAN NO.)

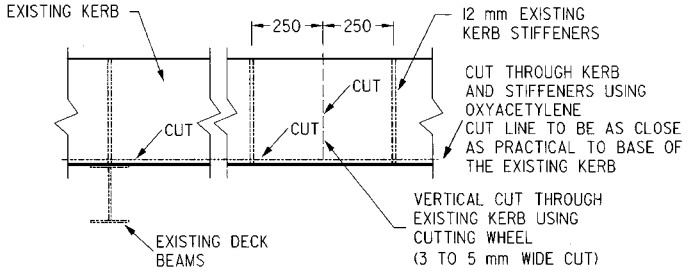
(RTA) 7 000 BC 7049

(DIER) 15 D8-16

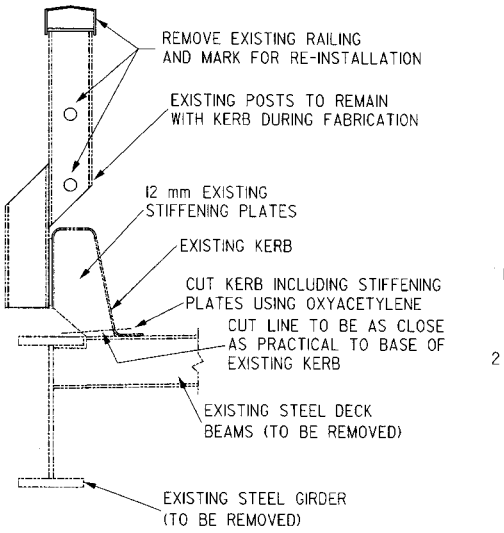
SHEET No. 16 | No. OF SHEETS 28



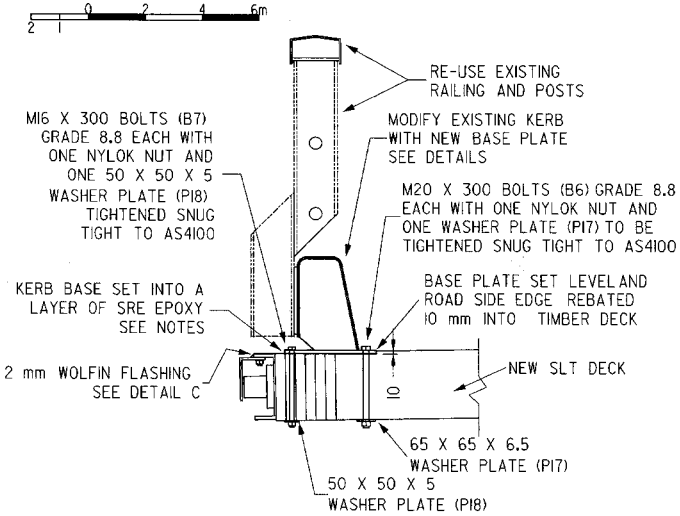
PLAN OF KERB ON RAILWAY SIDE - CUTTING LENGTHS FOR REMOVAL AND ASSEMBLY POSITIONS FOR RE-INSTALLATION



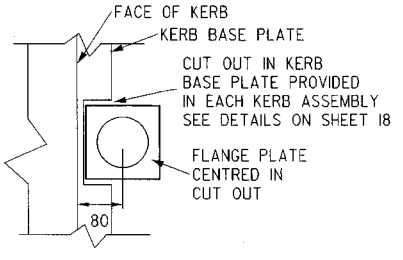
DETAIL A - CUTTING EXISTING KERB



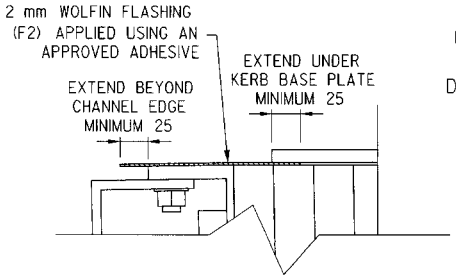
1 EXISTING (REMOVAL) OF KERB AND RAIL



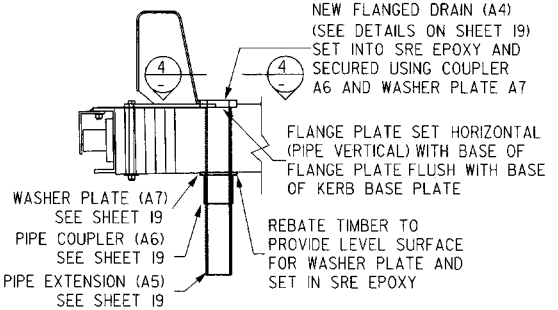
1 NEW (MODIFIED) KERB AND RAIL



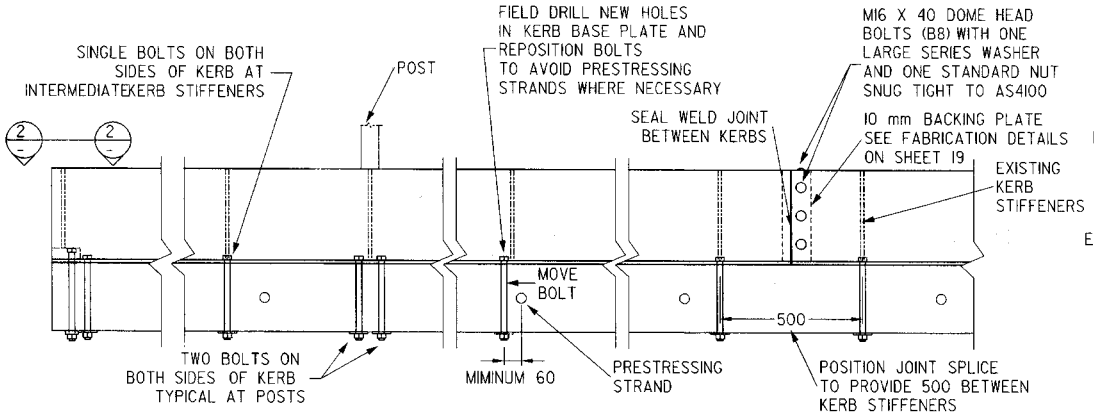
4 PLAN OF NEW FLANGED DRAIN



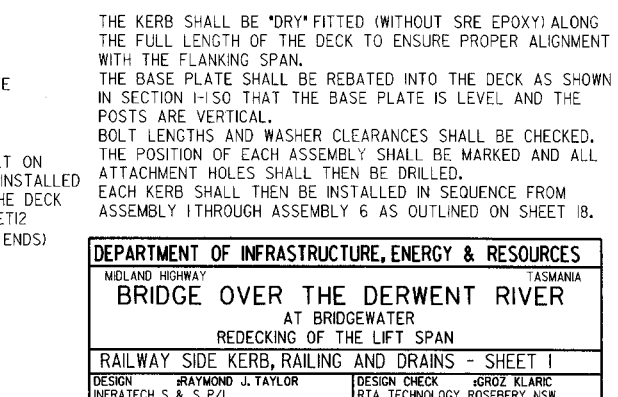
DETAIL C - DECK EDGE FLASHING F2



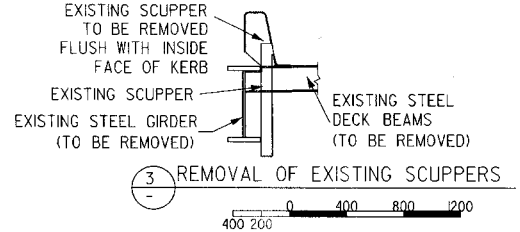
DETAIL B - ELEVATION OF NEW FLANGED DRAIN



ELEVATION OF TYPICAL KERB ATTACHMENT AND INSTALLATION DETAILS



2 PLAN OF END KERB DETAIL



3 REMOVAL OF EXISTING SCUPPERS

GENERAL NOTES

SCALE 0 200 400 600 EXCEPT AS NOTED
200 100

DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 18, 19 AND 28.
MATERIAL QUANTITIES AND PROTECTIVE TREATMENT SHALL BE AS SPECIFIED ON SHEET 28.

THE DECK DRAINS SHALL NOT BE INSTALLED UNTIL AFTER ALL THE KERB ASSEMBLIES HAVE BEEN INSTALLED.

THE KERB SHALL BE "DRY" FITTED (WITHOUT SRE EPOXY) ALONG THE FULL LENGTH OF THE DECK TO ENSURE PROPER ALIGNMENT WITH THE FLANKING SPAN.
THE BASE PLATE SHALL BE REBATED INTO THE DECK AS SHOWN IN SECTION H-H SO THAT THE BASE PLATE IS LEVEL AND THE POSTS ARE VERTICAL.
BOLT LENGTHS AND WASHER CLEARANCES SHALL BE CHECKED.
THE POSITION OF EACH ASSEMBLY SHALL BE MARKED AND ALL ATTACHMENT HOLES SHALL THEN BE DRILLED.
EACH KERB SHALL THEN BE INSTALLED IN SEQUENCE FROM ASSEMBLY 1 THROUGH ASSEMBLY 6 AS OUTLINED ON SHEET 18.

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

RAILWAY SIDE KERB, RAILING AND DRAINS - SHEET 1

DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
Raymond Taylor 8/6/99
DATE

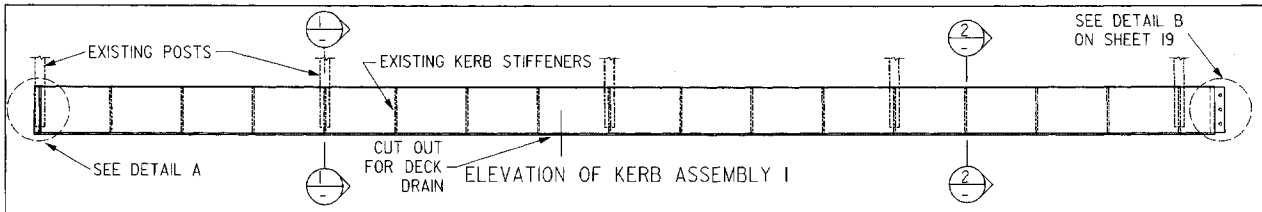
DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

DRAFTING
DRAFTING DATE
CHECKED DATE
APPROVED DATE

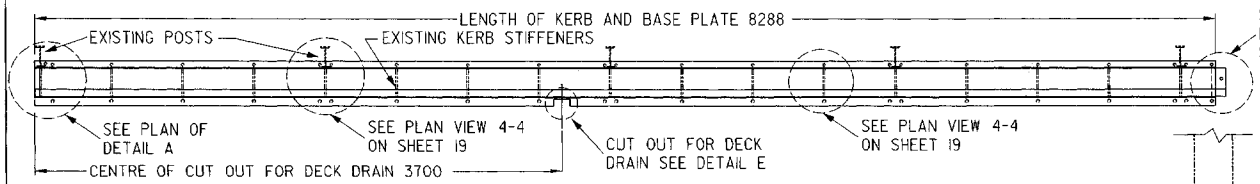
REFERENCE (CONTRACT / PLAN NO.)

(RTA) 7 000 BC 7049
(DIER) 15 D8-17

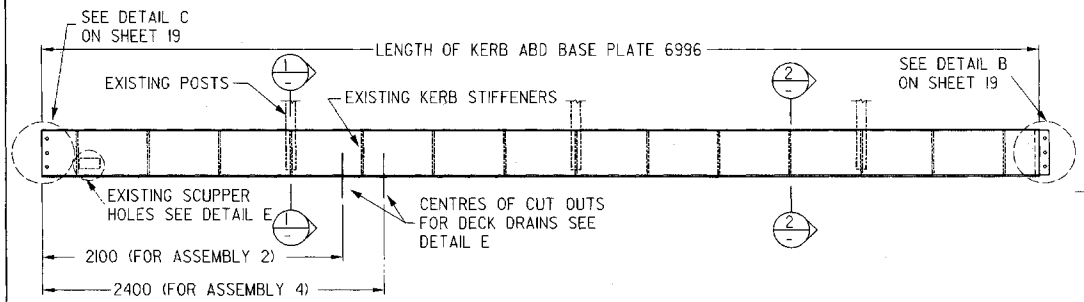
SHEET No. 17 | No. OF SHEETS 28



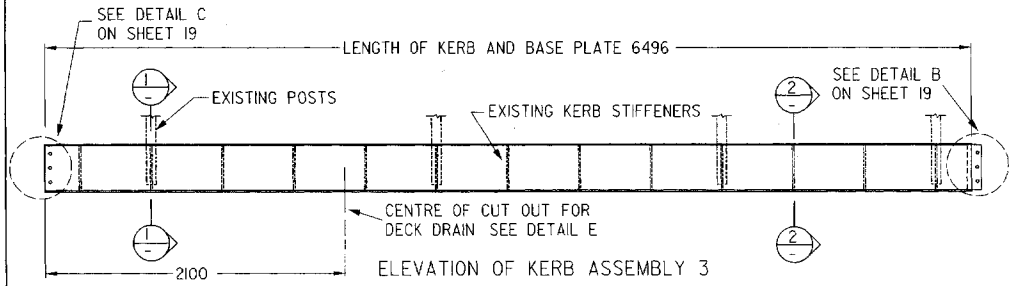
ELEVATION OF KERB ASSEMBLY 1



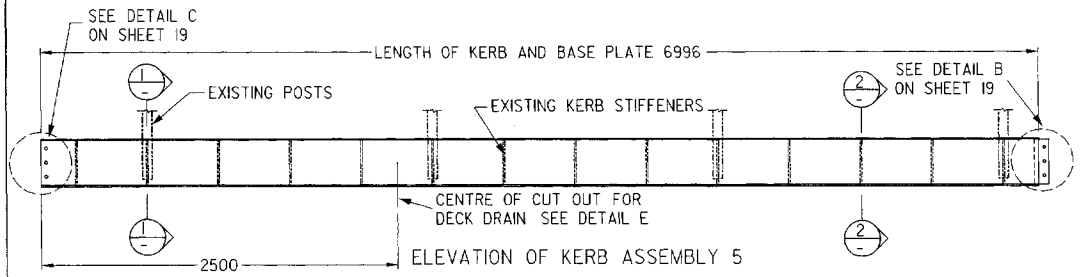
PLAN OF KERB ASSEMBLY 1



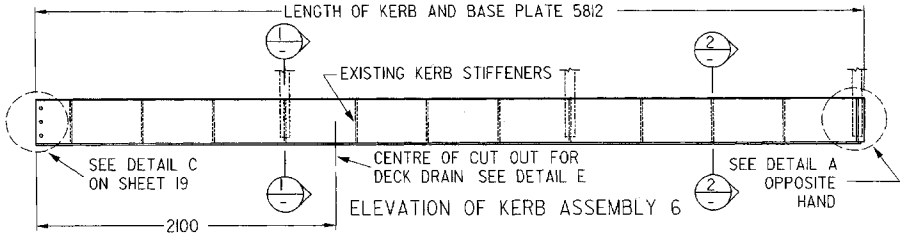
ELEVATION OF KERB ASSEMBLIES 2 AND 4



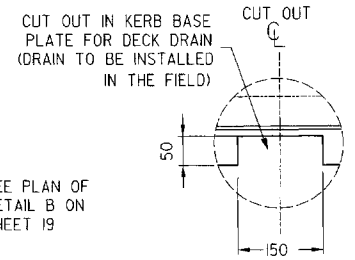
ELEVATION OF KERB ASSEMBLY 3



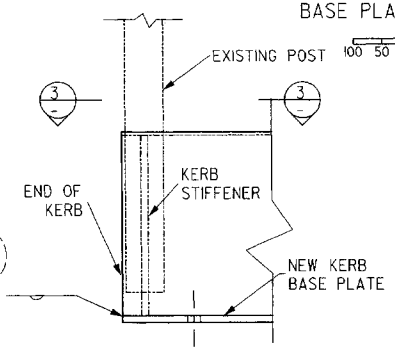
ELEVATION OF KERB ASSEMBLY 5



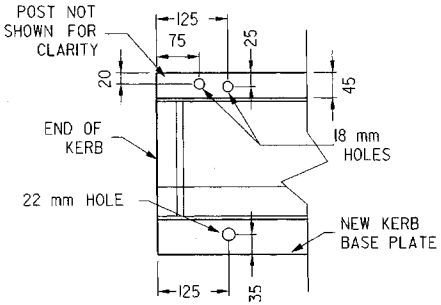
ELEVATION OF KERB ASSEMBLY 6



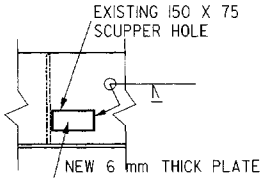
DETAIL E - CUT OUT IN KERB BASE PLATE FOR DECK DRAIN



DETAIL A - END OF KERB

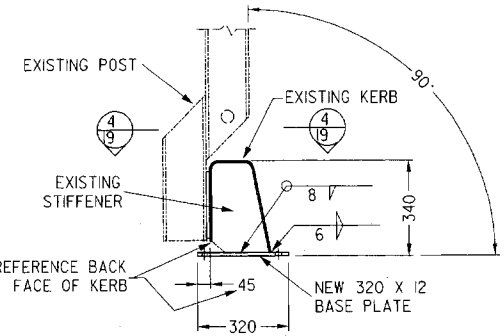


PLAN OF END KERB DETAIL A



NOTE: BACKING PLATE OR TABS MAY BE USED INSIDE KERB

DETAIL D - TYPICAL PATCHING OF EXISTING SCUPPERS



1 SECTION - KERB AT POST SHOWN

2 SECTION - KERB WITHOUT POST

GENERAL NOTES

SCALE EXCEPT AS NOTED

DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 17, 19 AND 28.
MATERIAL QUANTITIES AND PROTECTIVE TREATMENT SHALL BE AS SPECIFIED ON SHEET 28.
PLATES SHALL BE TO AS3678 FOR GRADE 250
WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH AS1554 PART 1.

INSTALLATION OF RAILWAY SIDE KERB ASSEMBLIES

EACH KERB ASSEMBLY SHALL BE INSTALLED USING THE FOLLOWING PROCEDURE. (IT SHOULD BE NOTED THAT A LIMITED TIME IS AVAILABLE BEFORE THE SRE EPOXY BEGINS TO CURE):

1. ONLY ENOUGH SRE EPOXY SHALL BE MIXED FOR ONE ASSEMBLY AT A TIME AND A THIN EVEN LAYER SHALL BE APPLIED TO THE DECK SURFACE.
2. THE EDGE OF THE WOLFIN FLASHING (F2) SHALL BE PLACED SO THAT IT WILL EXTEND 25 mm UNDER THE KERB BASE PLATE AS SPECIFIED ON SHEET 17. NO ADDITIONAL ADHESIVE SHALL BE APPLIED TO THE MEMBRANE UNTIL AFTER ALL KERB ASSEMBLIES HAVE BEEN INSTALLED.
3. THE ASSEMBLY SHALL BE IMMEDIATELY PLACED IN POSITION AND ALL BOLTS, WASHER PLATES AND NUTS INSTALLED WITHOUT TIGHTENING. THE WOLFIN MEMBRANE SHALL BE PUNCTURED USING A SHARP POINT TO ALLOW THE REAR BOLTS (B7) TO BE INSTALLED.
4. THE KERB SPLICE BOLTS (B8) SHALL ALSO BE INSTALLED AND LEFT IN LOOSE CONDITION UNTIL THE KERB HAS BEEN FULLY TIGHTENED AS OULTINED BELOW.
5. IN SEQUENCE FROM ONE END TO THE OTHER, AND REPEATING FROM THE SAME END EACH TIME, ALL BOLTS IN THE KERB BASES PLATE SHALL BE TIGHTENED AS OUTLINED BELOW
   - FINGER TIGHT
   - SNUG (1/4 TURN)
   - SNUG TIGHT TO AS4100

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER
REDECKING OF THE LIFT SPAN

RAILWAY SIDE KERB, RAILING AND DRAINS - SHEET 2

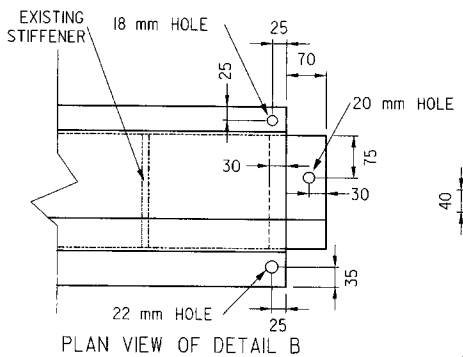
DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
Raymond Taylor 5/9/99 DATE

DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 7.9.99 DATE

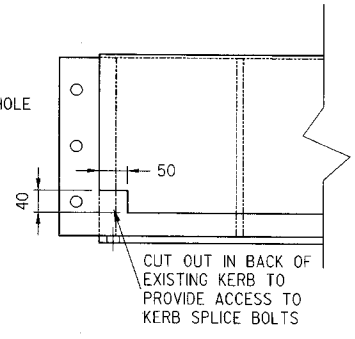
DRAFTING
DRAFTING DATE
CHECKED DATE
APPROVED DATE

REFERENCE (CONTRACT / PLAN NO.)
(RTA) 7 000 BC 7049
(DIER) 15 D8-18

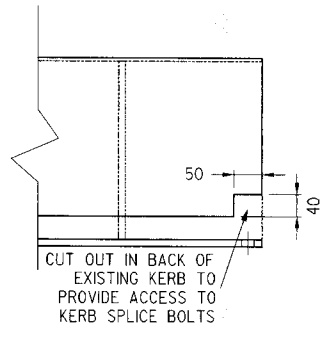
SHEET No. 18 | No. OF SHEETS 28



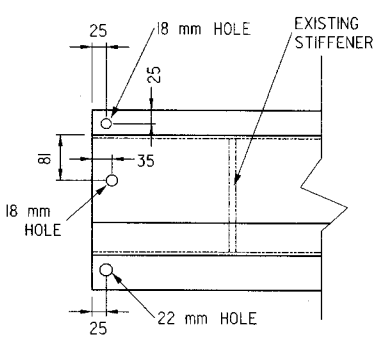
PLAN VIEW OF DETAIL B



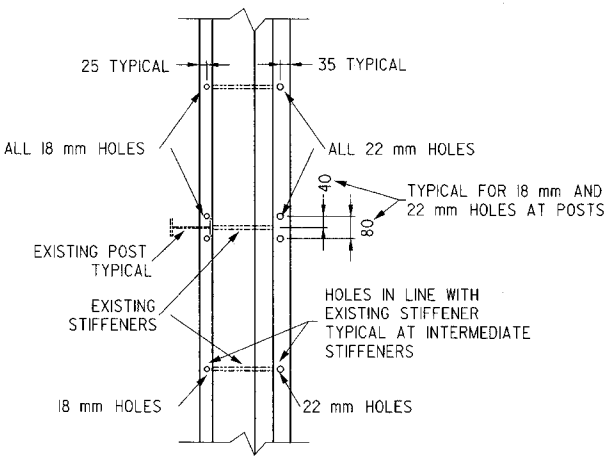
1 REAR VIEW OF DETAIL B



2 REAR VIEW OF DETAIL C

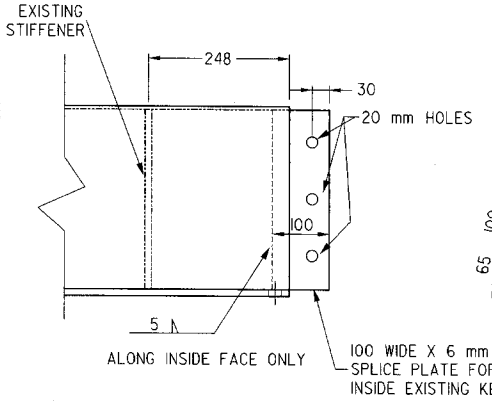


PLAN VIEW OF DETAIL C

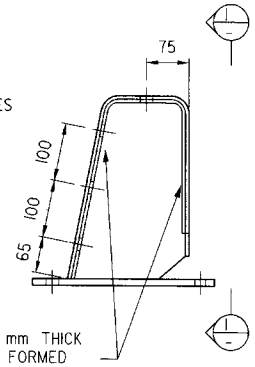


4/18 PLAN VIEW - TYPICAL KERB FABRICATION

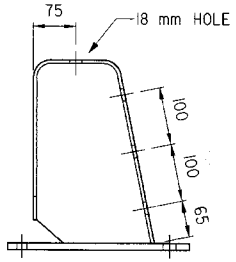
0 200 400 600
200 100



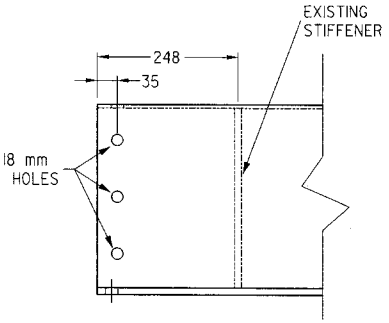
DETAIL B - TYPICAL KERB SPLICE



RH VIEW OF DETAIL B



LH VIEW OF DETAIL C



DETAIL C - TYPICAL KERB SPLICE

GENERAL NOTES

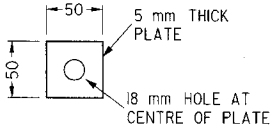
SCALE 0 100 200 300
100 50
EXCEPT AS NOTED

DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 17, 18 AND 28.
MATERIAL QUANTITIES AND PROTECTIVE TREATMENT SHALL BE AS SPECIFIED ON SHEET 28.

STEEL PLATES SHALL BE TO AS3678 FOR GRADE 250.

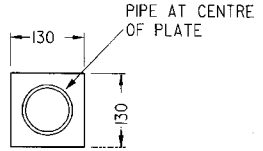
STEEL PIPE SHALL BE TO AS1450 FOR GRADE 350

WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH AS1554 PART 1.

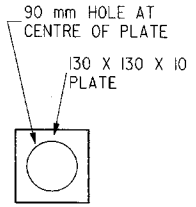


WASHER PLATE P18

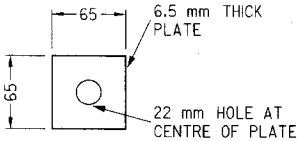
0 50 100 150
50 25



DECK DRAIN COUPLER A6
SCALE 1:5

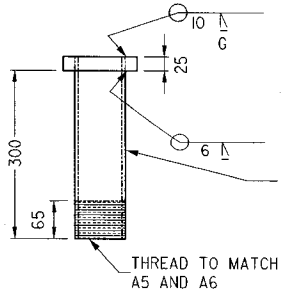


DECK DRAIN WASHER PLATE A7

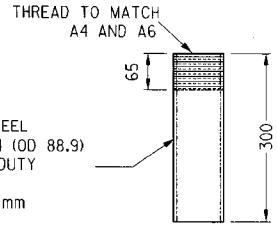


WASHER PLATE P17

50 25 0 50 100 150



NEW FLANGED DECK DRAIN A4



DECK DRAIN EXTENSION A5

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

RAILWAY SIDE KERB, RAILING AND DRAINS - SHEET 3

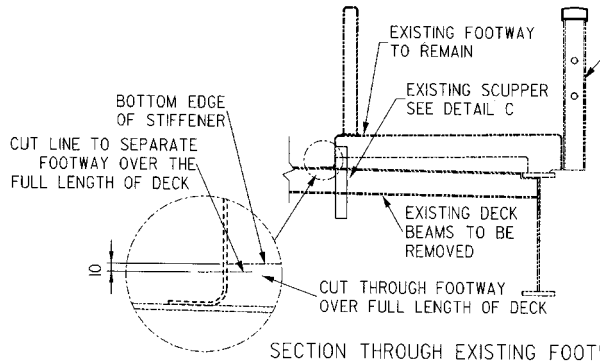
DESIGN: RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
DATE 8/9/99

DESIGN CHECK: GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

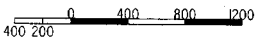
DRAFTING
DRAFTING DATE
CHECKED DATE
APPROVED DATE

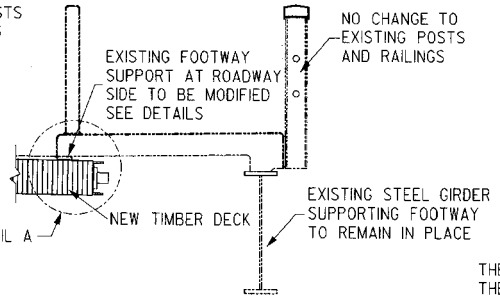
REFERENCE (CONTRACT / PLAN NO.)
(RTA) 7 000 BC 7049
(DIER) 15 D8-19

SHEET No. 19 | No. OF SHEETS 28

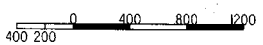


SECTION THROUGH EXISTING FOOTWAY



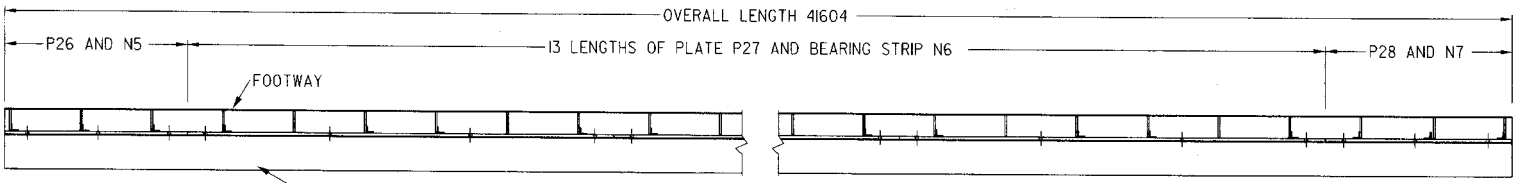


SECTION THROUGH MODIFIED FOOTWAY

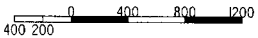


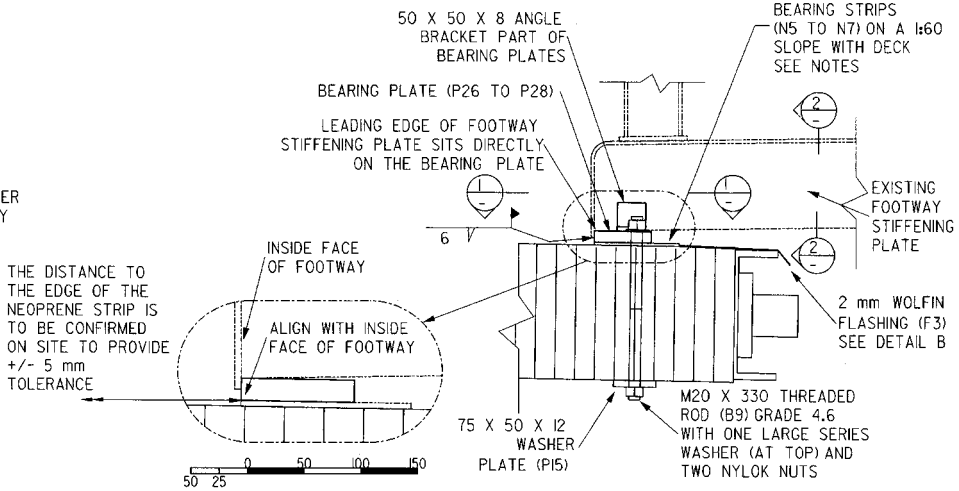
PLAN LAYOUT OF DECK DRAINS ALONG FOOTWAY SIDE

TO HOBART



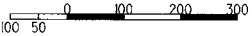
2 LAYOUT OF FOOTWAY BEARING PLATES AND NEOPRENE STRIPS





DETAIL A - FOOTWAY SUPPORT

GENERAL NOTES

SCALE 

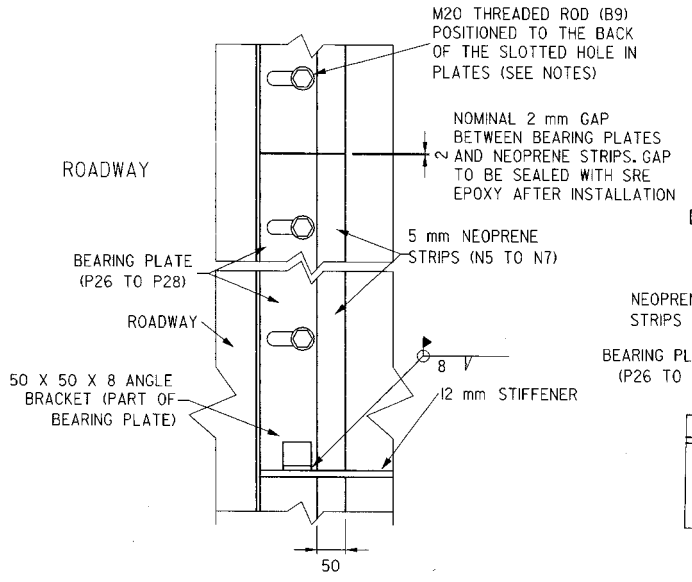
EXCEPT AS NOTED

DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 21 AND 28.
MATERIAL QUANTITIES AND PROTECTIVE TREATMENT SHALL BE AS SPECIFIED ON SHEET 28.
WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH AS1554 PART 1.

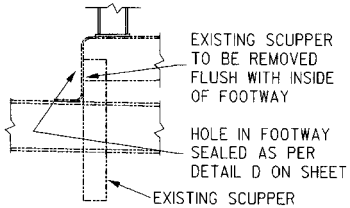
THE DECK DRAINS SHALL NOT BE INSTALLED UNTIL AFTER ALL THE FOOTWAY SUPPORTS HAVE BEEN INSTALLED.

THE NEOPRENE BEARING STRIPS N5 TO N7 SHALL BE INSTALLED, AS SPECIFIED ON THIS SHEET, BEFORE THE DECK IS INSTALLED. SITE MEASUREMENTS SHALL BE TAKEN TO CONFIRM THE EXACT LOCATION. THE NEOPRENE STRIPS SHALL BE INSTALLED ON A THIN LAYER OF SRE EPOXY SO THAT THE BEARING PLATES (P26 TO P28) ARE IN FULL CONTACT WITH THE STRIPS OVER THE FULL LENGTH.

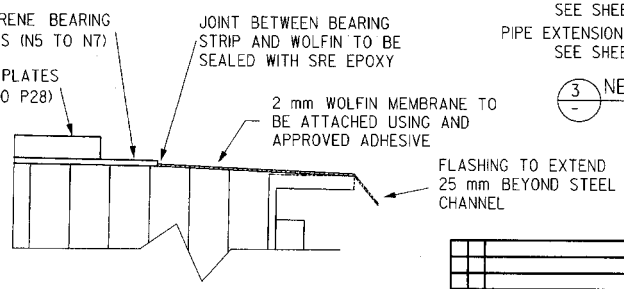
THE HOLES FOR THE BEARING PLATE TIE DOWNS (B9) SHALL BE DRILLED BEFORE THE DECK IS INSTALLED UNDER THE FOOTWAY. SITE MEASUREMENT SHALL BE TAKEN TO CONFIRM THE EXACT LOCATIONS. THE TIE DOWNS SHALL BE POSITIONED AT THE BACK OF THE SLOTTED HOLES IN THE PLATES AS SHOWN IN SECTION 1-1.



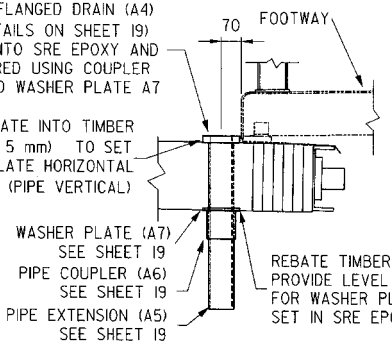
1 TYPICAL FOOTWAY ATTACHMENT



DETAIL C - REMOVAL OF EXISTING SCUPPERS



DETAIL B - EDGE FLASHING (F3)



3 NEW FLANGED DRAIN AT FOOTWAY

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

FOOTWAY MODIFICATIONS AND DRAINS - SHEET 1

DESIGN: RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
DATE 2/9/99

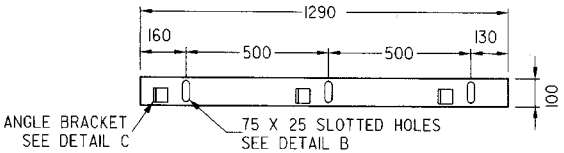
DESIGN CHECK: GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

DRAFTING
DRAFTING DATE
CHECKED DATE
APPROVED DATE

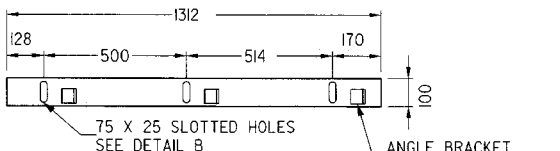
REFERENCE (CONTRACT / PLAN NO.)

(RTA) 7 000 BC 7049
(DIER) 15 D8-20

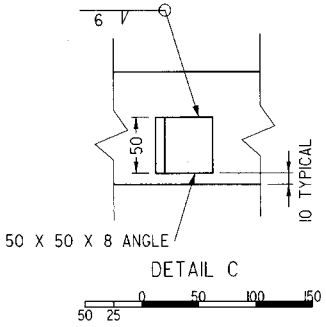
SHEET No. 20 | No. OF SHEETS 28

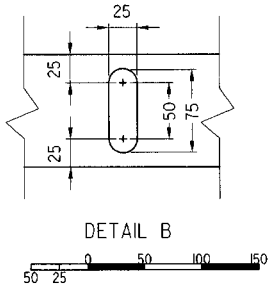


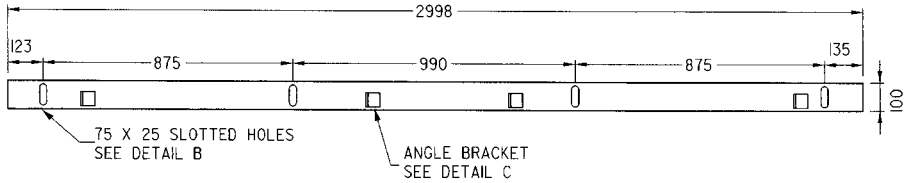
FOOTWAY BEARING PLATE P26



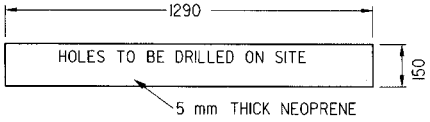
FOOTWAY BEARING PLATE P28



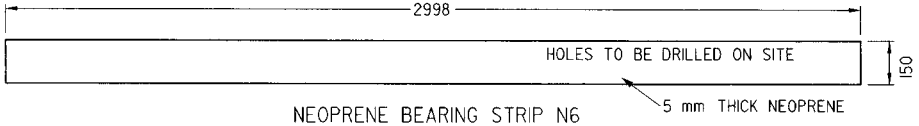




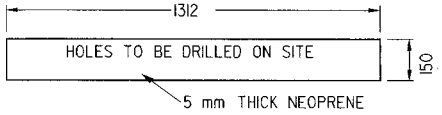
FOOTWAY BEARING PLATE P27



NEOPRENE BEARING STRIP N5



NEOPRENE BEARING STRIP N6



NEOPRENE BEARING STRIP N7

GENERAL NOTES

SCALE 0 200 400 600 / 200 100 EXCEPT AS NOTED

DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 20 AND 28.
MATERIAL QUANTITIES AND PROTECTIVE TREATMENTS SHALL BE AS SPECIFIED ON SHEET 28.

STEEL PLATE SHALL BE TO AS3678 FOR GRADE 250

STEEL ANGLE SHALL BE TO AS3679 FOR GRADE 300

WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH ASI554 PART 1.

NEOPRENE BEARING STRIPS N5 TO N7 SHALL BE AS SPECIFIED ON SHEET 28.

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

FOOTWAY MODIFICATIONS AND DRAINS - SHEET 2

DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
DATE 8/9/99

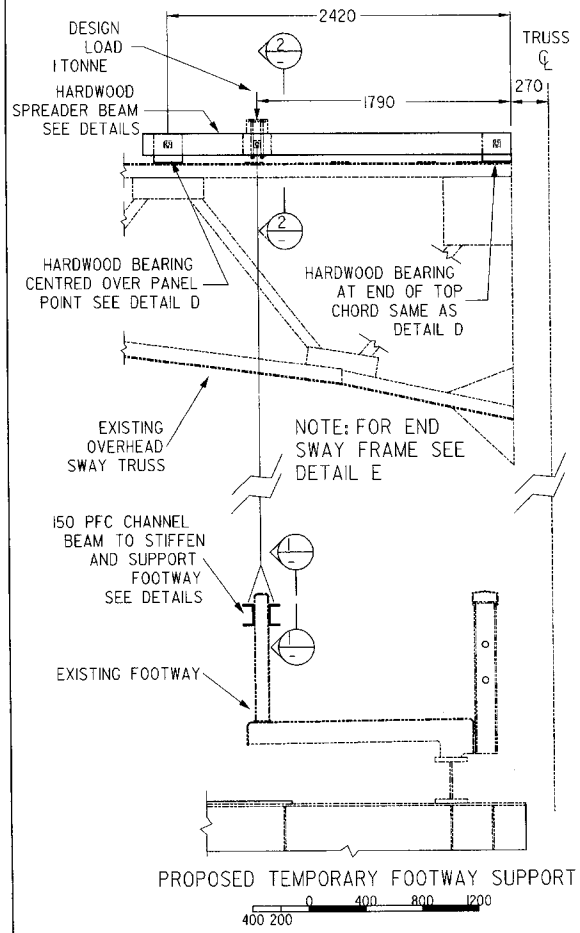
DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

DRAFTING
DRAFTING DATE
CHECKED DATE
APPROVED DATE

REFERENCE (CONTRACT / PLAN NO.)
(RTA) 7 000 BC 7049
(DIER) 15 D8-21

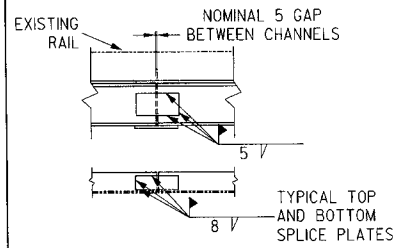
SHEET No. 21 | No. OF SHEETS 28

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

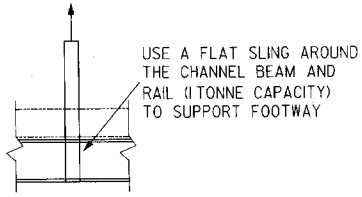


PROPOSED TEMPORARY FOOTWAY SUPPORT

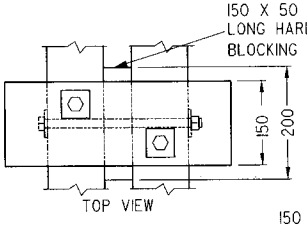
0 400 800 1200
400 200

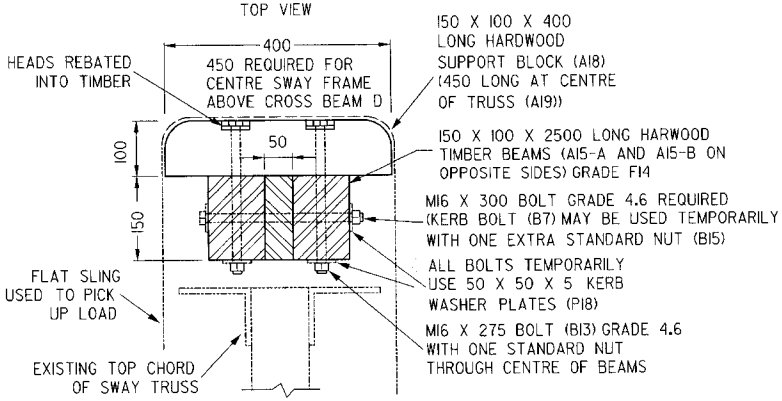


DETAIL B - CHANNEL SPLICE



DETAIL C - TYPICAL LIFT POINT

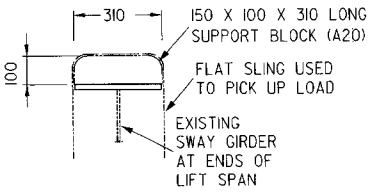




BLOCK TO BE LOCATED DIRECTLY ABOVE FOOTWAY RAILING

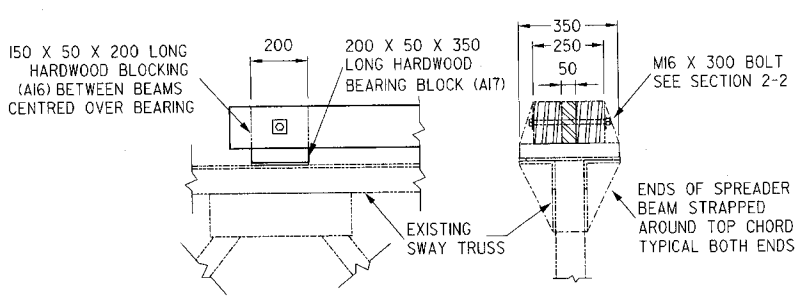
2 SECTION THROUGH SPREADER BEAM

0 100 200 300
100 50

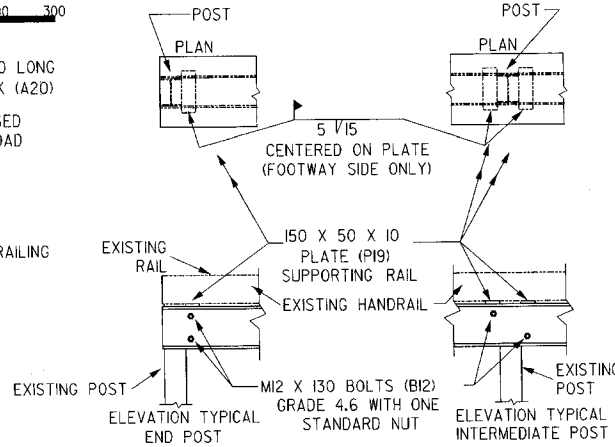


BLOCK LOCATED DIRECTLY OVER FOOTWAY RAILING

DETAIL E - END SWAY GIRDERS



DETAIL D - TYPICAL BEARING AND ATTACHMENT



DETAIL A - TYPICAL ATTACHMENT OF CHANNEL BEAM

GENERAL NOTES

SCALE 200 100 0 200 400 600 EXCEPT AS NOTED

DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 23 AND 27.
MATERIAL QUANTITIES AND PROTECTIVE TREATMENT SHALL BE AS SPECIFIED ON SHEET 28.

FOOTWAY SUPPORT

THE OVERHEAD SWAY BRACING OF THE EXISTING TRUSS IS CAPABLE OF CARRYING THE WEIGHT OF THE FOOTWAY DURING THE CONSTRUCTION.
THIS INCLUDES THE SAFE PASSAGE OF PEDESTRIAN TRAFFIC WHICH SHALL BE LIMITED TO ONE PERSON AT A TIME PLUS GOODS TO A COMBINED MAXIMUM OF 150 KG.
THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGNING THE METHOD OF ATTACHMENT BETWEEN EACH OF THE OVERHEAD SPREADER BEAMS (OR SUPPORT BLOCKS AT END SWAY GIRDERS) AND THE FOOTWAY CHANNEL SUPPORT BEAM EXCEPT THAT FLAT SLINGS SHALL BE USED AS SHOWN ON THIS SHEET.
EACH ATTACHMENT SHALL BE CAPABLE OF CARRYING UP TO 1.0 TONNE AND SHALL BE ADJUSTABLE TO +/- 30 mm UNDER LOAD.

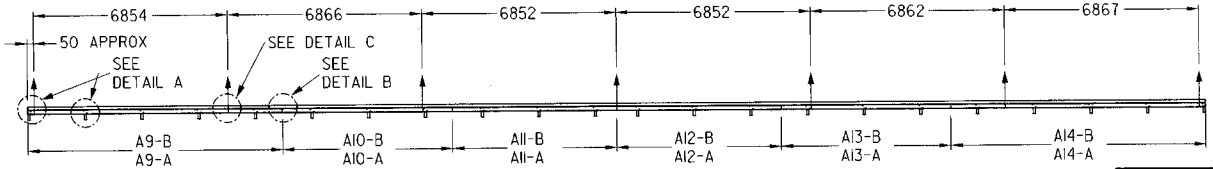
ALTERNATE FOOTWAY SUPPORT

THE CONTRACTOR MAY PROPOSE AN ALTERNATE METHOD OF TEMPORARILY SUPPORTING THE FOOTWAY.
THE DETAILS OF THE METHOD AND EQUIPMENT SHALL BE SUBMITTED FOR APPROVAL PRIOR TO CONTSRUCTION.

FABRICATION DETAILS FOR THE TIMBER SPREADER BEAM AND STEEL CHANNEL BEAM SHALL BE AS SPECIFIED ON SHEET 23.

FIELD WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH AS1554 PART 1.

LOCATIONS OF OVERHEAD BRACES (ASSUMED TO COINCIDE WITH CROSS BEAMS)



POSITIONS OF TEMPORARY CHANNEL BEAMS (#-A DESIGNATES FOOTWAY SIDE AND #-B IS ROAD SIDE)

1 ELEVATION-PROPOSED TEMPORARY CHANNEL SUPPORT BEAM FOR FOOTWAY

0 2 4 6m
2

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

TEMPORARY SUPPORT OF THE FOOTWAY - SHEET 1

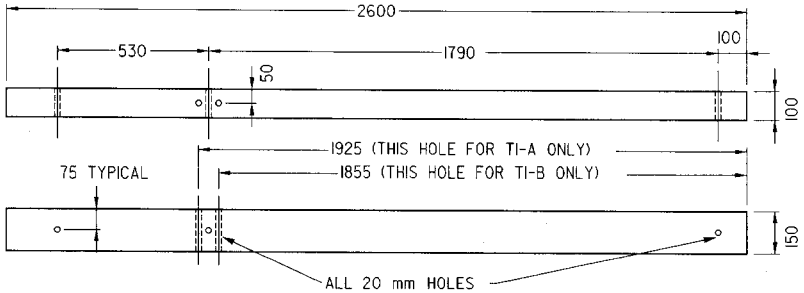
DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
DATE 8/1/99

DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

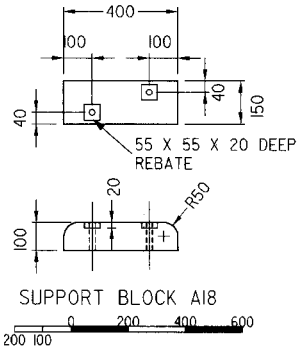
DRAFTING
DRAFTING DATE
CHECKED DATE
APPROVED DATE

REFERENCE (CONTRACT / PLAN NO.)
(RTA) 7 000 BC 7049
(DIER) 15 D8-22

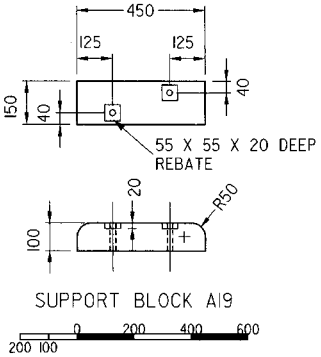
SHEET No. 22 | No. OF SHEETS 28



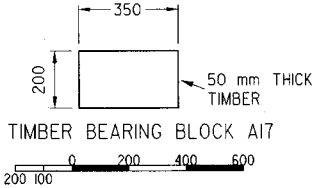
SPREADER BEAM A15 (A AND B)



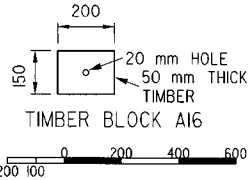
SUPPORT BLOCK A18



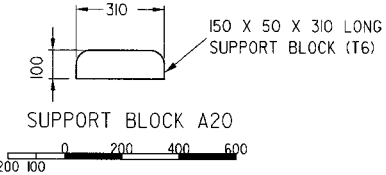
SUPPORT BLOCK A19



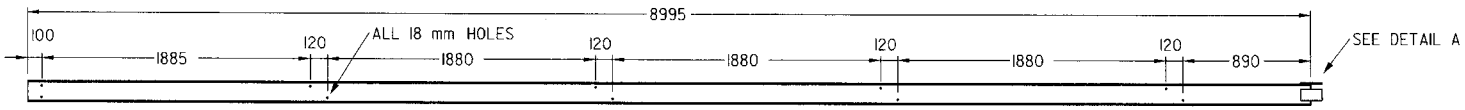
TIMBER BEARING BLOCK A17



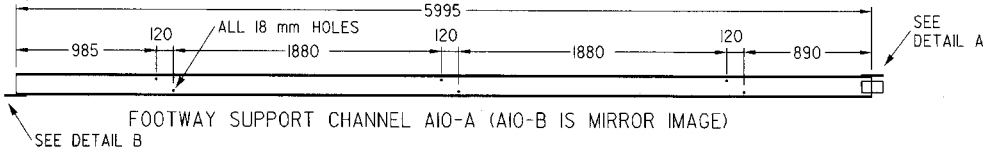
TIMBER BLOCK A16



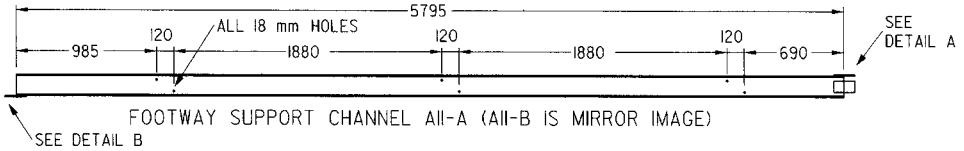
SUPPORT BLOCK A20



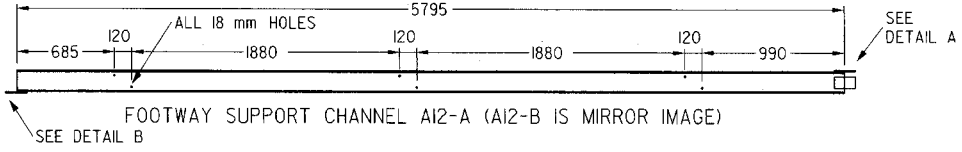
FOOTWAY SUPPORT CHANNEL A9-A (A9-B IS MIRROR IMAGE)



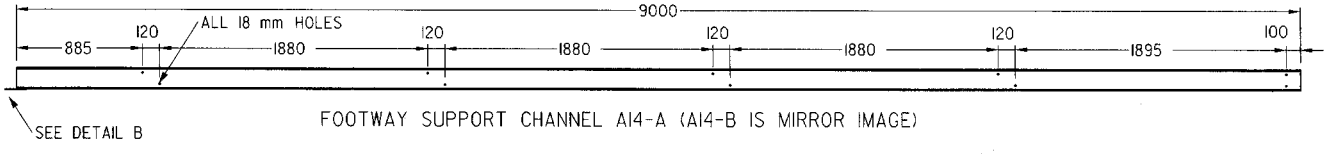
FOOTWAY SUPPORT CHANNEL A10-A (A10-B IS MIRROR IMAGE)



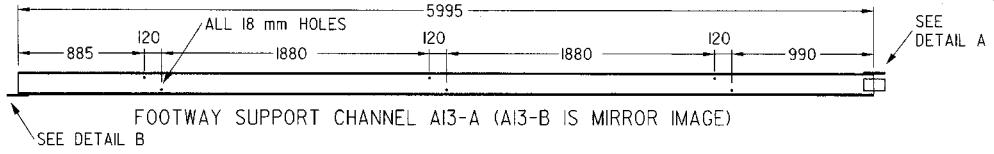
FOOTWAY SUPPORT CHANNEL A11-A (A11-B IS MIRROR IMAGE)



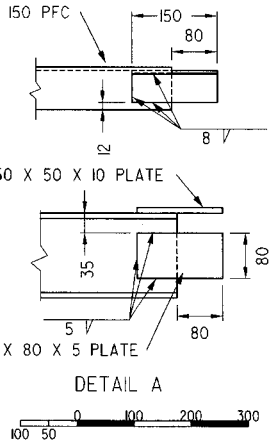
FOOTWAY SUPPORT CHANNEL A12-A (A12-B IS MIRROR IMAGE)



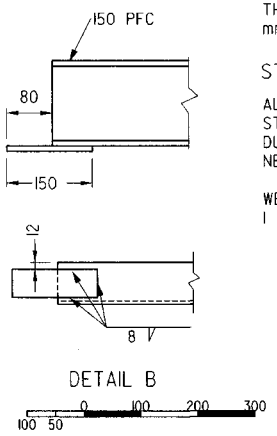
FOOTWAY SUPPORT CHANNEL A14-A (A14-B IS MIRROR IMAGE)



FOOTWAY SUPPORT CHANNEL A13-A (A13-B IS MIRROR IMAGE)



DETAIL A



DETAIL B

GENERAL NOTES

SCALE 0 400 800 1200 EXCEPT AS NOTED
400 200

DIMENSIONS ARE IN MILLIMETRES
THESE NOTES SHALL BE READ IN CONJUNCTION WITH THOSE ON SHEETS 22 AND 28.
MATERIAL QUANTITIES SHALL BE AS SPECIFIED ON SHEET 28.

TIMBER COMPONENTS

ALL TIMBER COMPONENTS SHALL BE F14 (GREEN) HARDWOOD TO AS 1720. DUE TO THE TEMPORARY NATURE OF THE APPLICATION THE TIMBER DOES NOT NEED SEASONING. THE COMPONENTS MAY BE ROUGH SIZED TO WITHIN +/- 2 mm OF THE SPECIFIED CROSS SECTIONS.
THE CONTRACTOR MAY UTLISE DRESSED MATERIAL SIZES EXCEPT THAT COMPONENT A16 SHALL HAVE A FINISHED THICKNESS OF 50 mm.

STEEL COMPONENTS

ALL STEEL PLATE SHALL BE TO AS3678 FOR GRADE 250 AND STEEL CHANNEL SHALL BE TO AS3679 FOR MINIMUM GRADE 300. DUE TO THE TEMPORARY NATURE OF THE APPLICATION THE STEEL NEED NOT BE PROTECTIVE TREATED.

WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH AS1554 PART 1

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

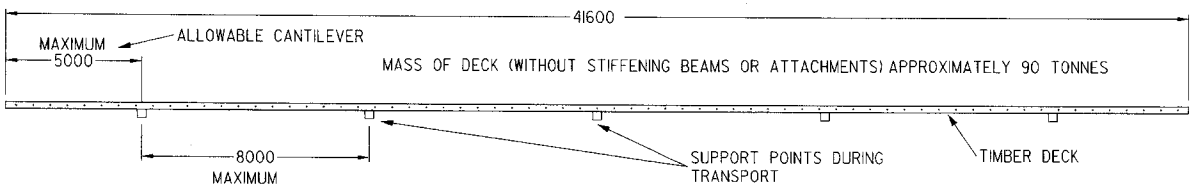
REDECKING OF THE LIFT SPAN

TEMPORARY SUPPORT OF THE FOOTWAY - SHEET 2

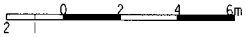
DESIGN	DESIGN CHECK
RAYMOND J. TAYLOR	GROZ KLARIC
INFRATECH S & S P/L	RTA TECHNOLOGY, ROSEBERY, NSW
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153	
DATE 8/5/99	CHECKED/RECOMMENDED DATE; ACCEPTED 3.9.99 DATE

DRAFTING	REFERENCE (CONTRACT / PLAN NO.)
DRAFTING DATE	(RTA) 7 000 BC 7049
CHECKED DATE	(DIER) 15 D8-23
APPROVED DATE	SHEET No. 23 — No. OF SHEETS 28

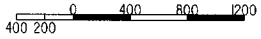
NO.	AMENDMENTS	CHECKED	DATE	APPROVED

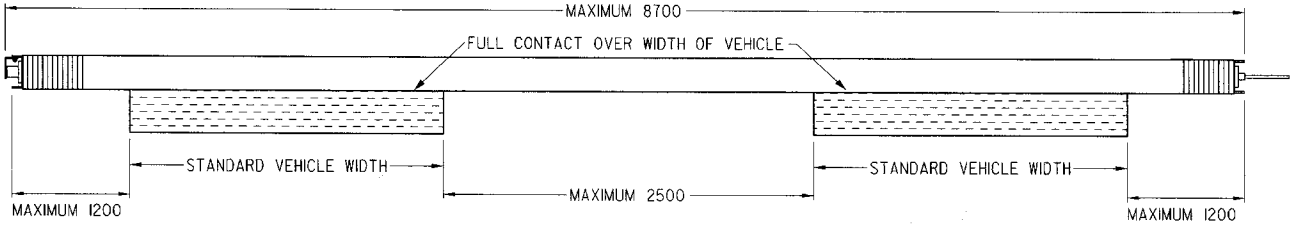


ALLOWABLE LONGITUDINAL SPACING OF SUPPORTS DURING TRANSPORT

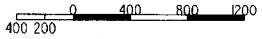


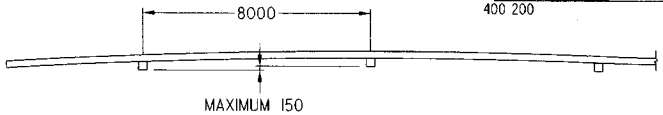
ALLOWABLE TRANVERSE SUPPORT DURING TRANSPORT



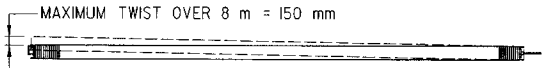


ALTERNATE TRANVERSE SUPPORT DURING TRANSPORT

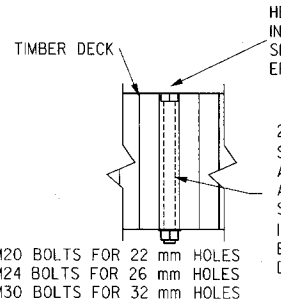




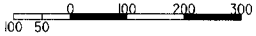
ALLOWABLE DIFFERENTIAL DISPLACEMENT DURING TRANSPORT

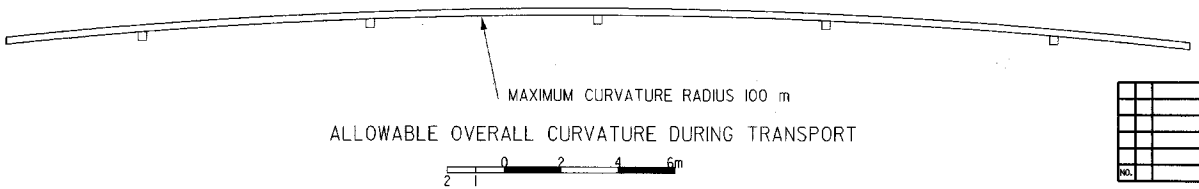


ALLOWABLE TWIST DURING TRANSPORT



PLUGGING OF TEMPORARY HOLES





ALLOWABLE OVERALL CURVATURE DURING TRANSPORT

GENERAL NOTES

SCALES AS SHOWN
DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 25 THROUGH 28.
THE TEMPORARY MATERIALS SHOWN ON THIS SHEET ARE NOT PROVIDED IN THE MATERIALS LIST ON SHEET 28.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGNING THE METHOD OF LOADING, TRANSPORT AND UNLOADING FOR THE NEW TIMBER DECK FROM THE ASSEMBLY AREA TO THE FLANKING SPAN READY FOR LAUNCHING.

NOTWITHSTANDING THE DETAILS PROVIDED ON SHEETS 24 THROUGH 27 THE CONTRACTOR SHALL ASSESS THE LAUNCHING AND INSTALLATION METHOD TO ENSURE THEY ARE ACCEPTABLE FOR HIS PURPOSES. THE DETAILS OF THE METHOD AND EQUIPMENT SHALL BE SUBMITTED FOR APPROVAL.

DECK SUPPORT DURING TRANSPORT

DURING LOADING, TRANSPORT AND UNLOADING THE DECK SHALL BE SUPPPORTED ALONG ITS LENGTH AT INTERVALS OF NOT MORE THAN 8 m WITH END CANTILEVERS OF NOT MORE THAN 5 m.

EXCEPT AS NOTED BELOW, EACH OF THESE SUPPORTS SHALL BE CONTINUOUS OVER THE WIDTH OF THE DECK EXCEPT THAT THE EDGE OF THE DECK SHALL NOT CANTILEVER MORE THAN 1.5 m. WHERE A STEEL BEAM IS USED, COMBINED WITH A SUPPORT VEHICLE WIDTH OF 3 m, THE RECOMMENDED MINIMUM SECTION PROPERTIES OF THE BEAM SHALL BE AS SPECIFIED ON THIS SHEET. A SINGLE SUPPORT VEHICLE WIDTH OF LESS THAN 3 m IS NOT RECOMMENDED IN ORDER TO MAINTAIN STABILITY.

WHERE TWO VEHICLES (SIDE BY SIDE) ARE USED THE TRANSVERSE SUPPORTS MAY BE PROVIDED IN TWO LENGTHS AS SHOWN ON THIS SHEET. THE DECK NEED NOT BE TRANSVERSLEY STIFFENED.

ADDITIONAL TEMPORARY DECK ATTACHMENTS FOR LIFTING

ATTACHMENTS FOR LIFTING DEVICES MAY BE INSTALLED BY DRILLING HOLES OF NOT MORE THAN 22 mm DIAMETER THROUGH THE TIMBER DECK. THESE HOLES SHALL NOT BE CLOSER THAN 100 mm TO ANY PRESTRESSING STRAND AND SHALL BE PLUGGED AFTER USE WITH AN M20 X 240 BOLT AS SHOWN ON THIS SHEET. THE LOCATION OF THESE HOLES SHALL NOT CONFLICT WITH PERMANENT ATTACHMENTS OR SUPPORTS.

ALLOWABLE DEFORMATIONS DURING TRANSPORT

THE NEW TIMBER DECK IS STRONG AND FLEXIBLE AND DOES NOT NEED TO BE TRANPORTED IN A LEVEL PLANE. DURING LOADING, TRANSPORT AND UNLOADING THE DECK CAN SUSTAIN DIFFERENTIAL AND TORSIONAL DEFORMATIONS WITHIN THE LIMITS SPECIFIED ON THIS SHEET.

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

LAUNCHING AND INSTALLATION - SHEET 1

DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
DATE 8/9/99

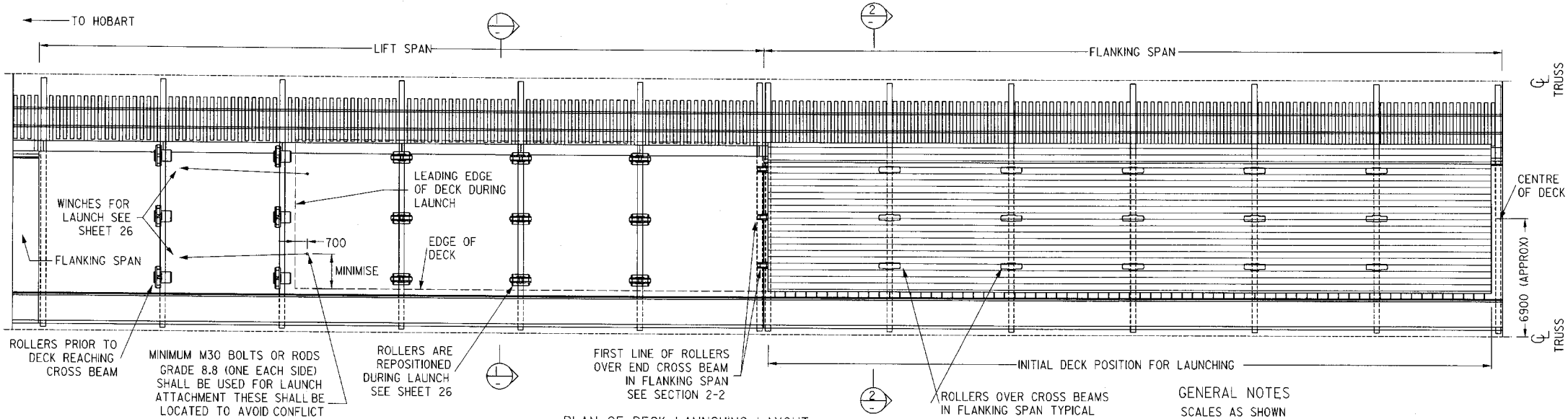
DESIGN CHECK :CROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

DRAFTING
DRAFTING DATE
CHECKED DATE
APPROVED DATE

REFERENCE (CONTRACT / PLAN NO.)

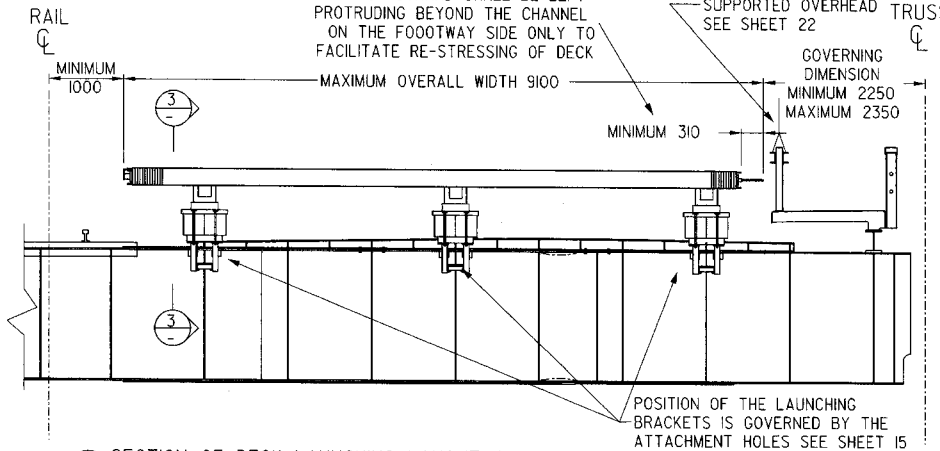
(RTA) 7 000 BC 7049
(DIER) 15 D8-24

SHEET No. 24 | No. OF SHEETS 28



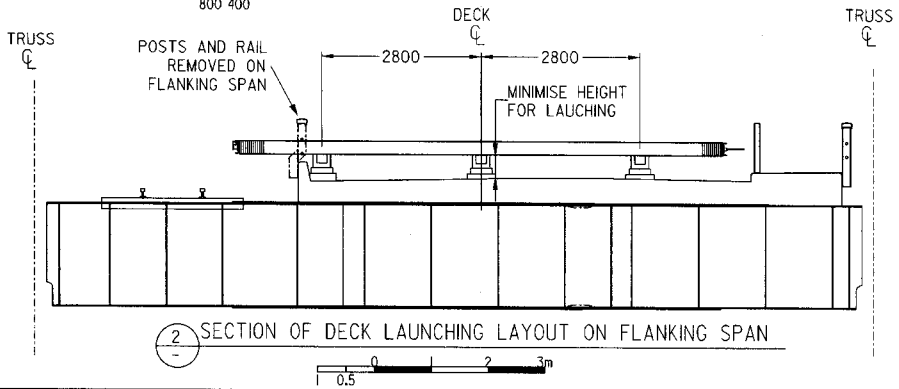
PLAN OF DECK LAUNCHING LAYOUT

NOT TO SCALE



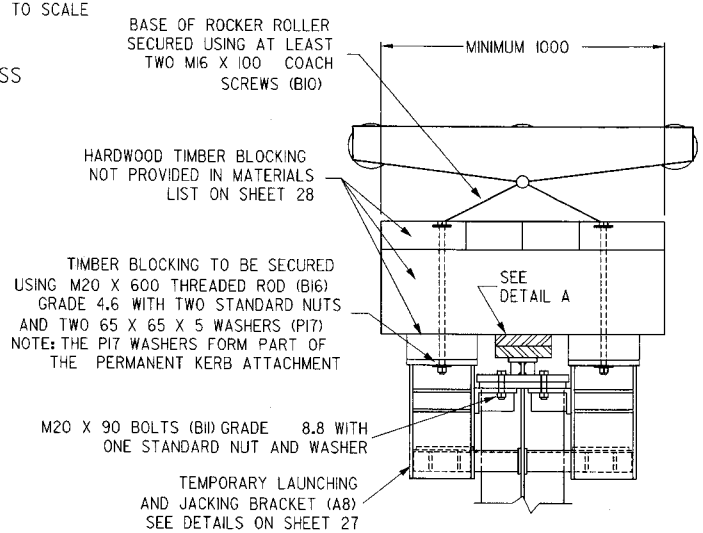
1 SECTION OF DECK LAUNCHING LAYOUT ON LIFT SPAN

800 400 0 800 1600 2400



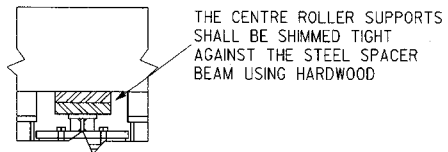
2 SECTION OF DECK LAUNCHING LAYOUT ON FLANKING SPAN

0.5 0 2 3m



3 ROCKER ROLLER ATTACHMENT ON LIFT SPAN

200 100 0 200 400 600



DETAIL A - FOR CENTRE ROLLER ONLY

200 100 0 200 400 600

GENERAL NOTES

SCALES AS SHOWN
DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 24 AND 26 THROUGH 28.
EXCEPT AS NOTED ON THIS SHEET THE MATERIAL QUANTITIES AND PROTECTIVE TREATMENT SHALL BE AS SPECIFIED ON SHEET 28.

DECK LAUNCH POSITION

THE TIMBER DECK SHALL BE TRANSPORTED TO THE FLANKING SPAN AS SPECIFIED ON SHEET 24.
THE DECK AND ROLLERS ON THE FLANKING SPAN SHALL BE POSITIONED AS SHOWN ON THIS SHEET.
THE DECK SHALL BE LAUNCHED AS SPECIFIED ON SHEET 26.

ROCKER ROLLERS ON THE LIFT SPAN

THE ROLLERS ON THE LIFT SPAN SHALL BE INSTALLED USING THE LAUNCHING AND JACKING BRACKETS A8 AS SHOWN IN SECTION 3-3. THESE ARE REQUIRED FOR CROSS BEAMS B THROUGH F ONLY. HARDWOOD TIMBER BLOCKING SHALL BE USED TO SET THE ROLLERS AT AN ELEVATION WHICH WILL MATCH THOSE ON THE FLANKING SPAN. THIS BLOCKING SHALL BE SECURED (AS ONE UNIT) TO THE BRACKETS AS SPECIFIED ON THIS SHEET. THE BLOCKING SHALL CONSIST OF AT LEAST TWO LAYERS OF TIMBER ORIENTED IN OPPOSITE DIRECTIONS.

ATTACHMENT HOLES FOR LAUNCHING

THE LAUNCH ATTACHMENT HOLES SHALL BE 32 mm DIAMETER FOR M30 BOLTS AS SPECIFIED ON THIS SHEET. THESE HOLES SHALL BE PLUGGED AFTER USE USING M30 X 250 BOLTS AS SHOWN ON SHEET 24.

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

LAUNCHING AND INSTALLATION - SHEET 2

DESIGN RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
DESIGN CHECK GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW

CHECKED/RECOMMENDED DATE

ACCEPTED 3.9.99 DATE

DRAFTING

DRAFTING DATE

CHECKED DATE

APPROVED DATE

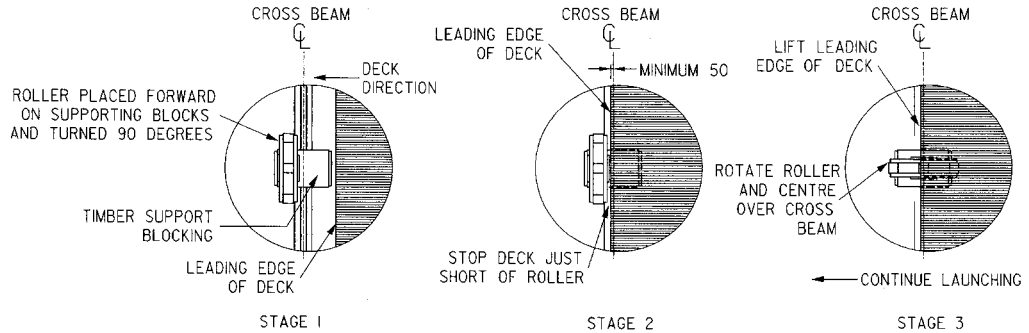
REFERENCE (CONTRACT / PLAN NO.)

(RTA) 7 000 BC 7049

(DIER) 15 D8-25

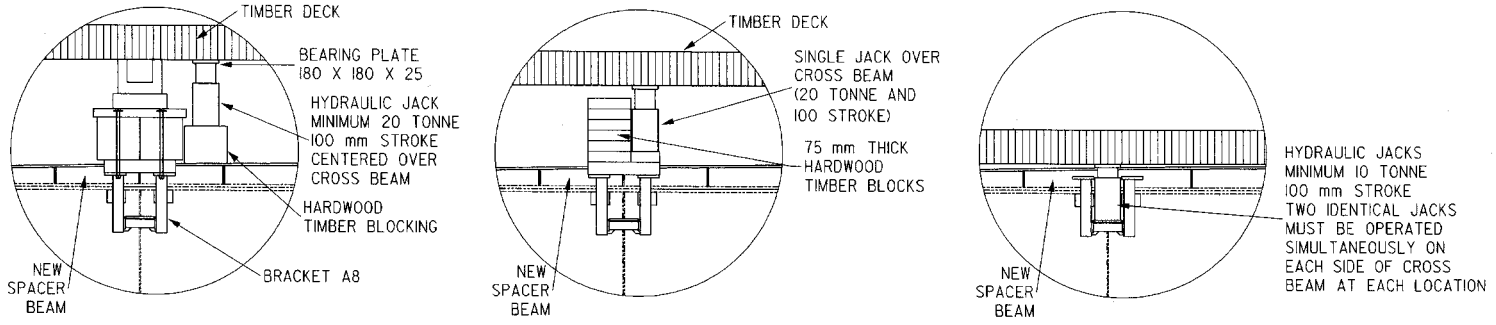
NO.	AMENDMENTS	CHECKED	DATE	APPROVED

SHEET No. 25 | No. OF SHEETS 28



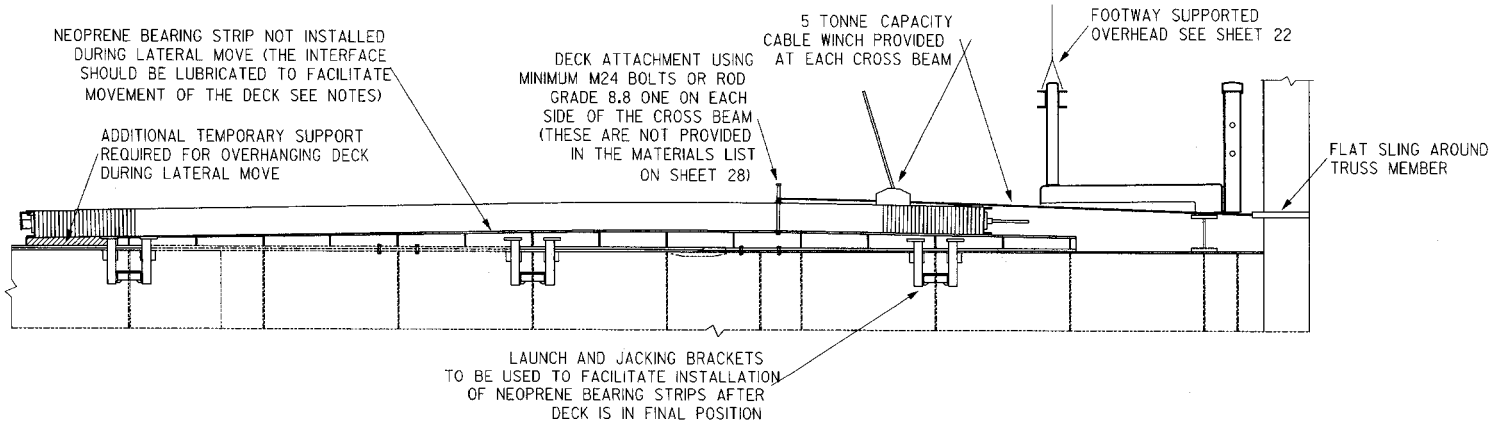
LAUNCHING OF DECK ONTO LIFT SPAN CROSS BEAMS

0 1 2 3m
0.5



LOWERING OF DECK ONTO LIFT SPAN CROSS BEAMS

0 400 800 1200
400 200



LATERAL MOVE OF DECK UNDER FOOTWAY TO FINAL POSITION

0 500 1000 1500
500 250

GENERAL NOTES

SCALES AS SHOWN
DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 23, 24, 27 AND 28
EXCEPT FOR THE LAUNCH AND JACKING BRACKET (A8) NONE OF THE TEMPORARY MATERIALS OR EQUIPMENT ARE PROVIDED IN THE MATERIALS LIST ON SHEET 28.

WINCHES FOR LAUNCHING

TWO WINCHES (5 TONNE CAPACITY) OR EQUIVALENT SHALL BE USED TO PULL THE DECK ONTO THE LIFT SPAN.
ATTACHMENT OF THE WINCHES TO THE DECK SHALL BE AS SPECIFIED ON SHEET 25.
THE PROPOSED METHOD AND EQUIPMENT DETAILS SHALL BE SUBMITTED FOR APPROVAL BEFORE THE BRIDGE IS CLOSED TO TRAFFIC.

ALLIGNMENT AND CLEARANCES DURING LAUNCH

ALL ROLLERS ON THE FLANKING SPAN SHALL BE PROPERLY ALIGNED TO ENSURE THAT THE DECK RUNS PARALLEL TO THE BRIDGE.
CLEARANCES AND ALIGNMENT SHALL BE CHECKED AFTER THE FIRST 3 m OF LAUNCH AND SUBSEQUENTLY AFTER THE LEADING EDGE OF THE DECK REACHES EACH CROSS BEAM.
IF NECESSARY THE ROLLERS MAY BE ROTATED SLIGHTLY TO ASSIST IN RE-ALIGNING THE DECK.
THE ALIGNMENT OF THE DECK SHALL BE CLOSELY CHECKED AT THE END OF THE LAUNCH.

POSITIONING ROLLERS AT CROSS BEAMS DURING LAUNCH

AT EACH CROSS BEAM THE LEADING EDGE OF THE DECK SHALL PASS AT LEAST 50 mm BEYOND THE CENTRE LINE OF THE CROSS BEAM.
THE LEADING EDGE OF THE DECK SHALL THEN BE LIFTED SLIGHTLY TO ALLOW THE REPOSITIONING OF THE ROLLERS AS SHOWN ON THIS SHEET.
THE LAUNCH CAN THEN CONTINUE TO THE NEXT CROSS BEAM.

LOWERING DECK ONTO CROSS BEAMS

THE LOWERING OF THE DECK SHALL BE PERFORMED IN STAGES AS SHOWN IN THE DIAGRAMS OF THIS SHEET.
EACH STAGE SHALL BE PERFORMED SIMULTANEOUSLY AT EACH OF THE THREE JACKING LOCATIONS ON A CROSS BEAM.
THE DECK MAY BE LOWERED AT ALL CROSS BEAMS SIMULTANEOUSLY OR AT ONE CROSS BEAM AT A TIME. REGARDLESS OF THE METHOD CHOSEN THE DIFFERENTIAL DISPLACEMENT OR DEFORMATION OF THE DECK SHALL NOT EXCEED THE LIMITS SPECIFIED ON SHEET 24.

LATERAL MOVE OF DECK TO FINAL POSITION

THE LATERAL MOVE OF THE DECK TO ITS FINAL POSTION UNDER THE FOOTWAY SHALL BE PERFORMED AS DETAILED IN THE DIAGRAM ON THIS SHEET.
THE NEOPRENE BEARING STRIPS (N2) SHALL NOT BE INSTALLED UNTIL AFTER THE MOVE IS COMPLETED. THE INTERFACE BETWEEN THE DECK AND THE CROSS BEAM SHOULD BE LUBRICATED. A THIN STRIP OF OILED TIMBER OR PLYWOOD (CONTINUOUS UNDER THE DECK) IS RECOMMENDED.
STOPS SHOULD BE FIXED TO THE TOPS OF THE CROSS BEAMS UNDER THE FOOTWAY TO PREVENT THE DECK FROM MOVING PAST THE DESIRED LOCATION. LOOSE SPACERS SHOULD BE USED BETWEEN THE ENDS OF THE DECK AND THE FLANKING SPANS TO MAINTAIN THE DESIRED GAP AT THE DECK JOINTS.
THE TEMPORARY HOLES FOR THE M24 BOLTS SHALL BE PLUGGED AFTER USE WITH M24 X 250 BOLTS AS SHOWN ON SHEET 24.

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

LAUNCHING AND INSTALLATION- SHEET 3

DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW

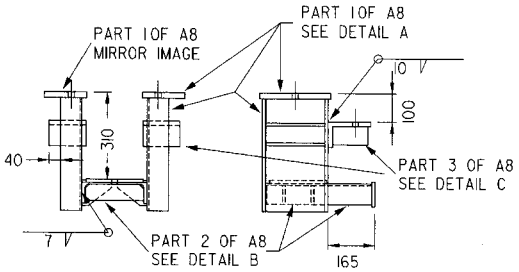
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE
DRAFTING DATE
CHECKED DATE
APPROVED DATE

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

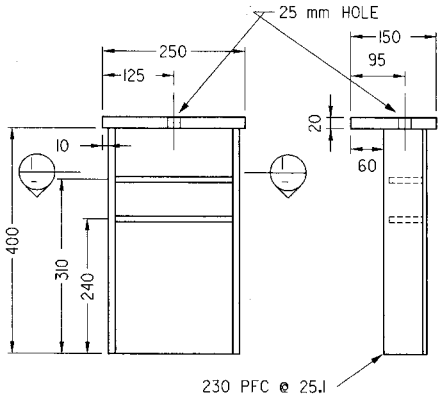
REFERENCE (CONTRACT / PLAN NO.)

(RTA) 7 000 BC 7049
(DIER) 15 D8-26

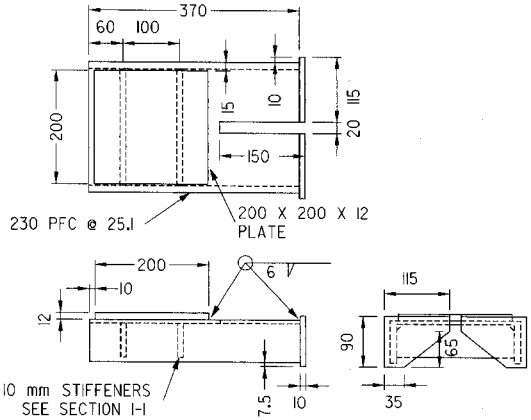
SHEET No. 26 | No. OF SHEETS 28



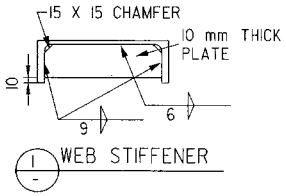
LAUNCH AND JACKING BRACKET A8



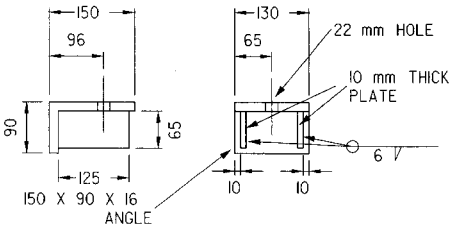
PART 1 OF BRACKET A8



PART 2 OF BRACKET A8



WEB STIFFENER



PART 3 OF BRACKET A8

GENERAL NOTES

SCALE 100 50 0 100 200 300 EXCEPT AS NOTED

DIMENSIONS ARE IN MILLIMETRES
THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THOSE ON SHEETS 24 TO 26 AND 28.
MATERIALS QUANTITIES SHALL BE AS SPECIFIED ON SHEET 28

ALL STEEL PLATE SHALL BE TO AS3678 FOR GRADE 250 AND STEEL CHANNEL SHALL BE TO AS1163 FOR MINIMUM GRADE 300. DUE TO THE TEMPORARY NATURE OF THE APPLICATION THE STEEL NEED NOT BE PROTECTIVE TREATED.

WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH AS1554 PART 1.

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER
REDECKING OF THE LIFT SPAN

LAUNCHING AND INSTALLATION- SHEET 4

DESIGN: RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
DATE 5/9/99

DESIGN CHECK: GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

DRAFTING
DRAFTING DATE
CHECKED DATE
APPROVED DATE

REFERENCE (CONTRACT / PLAN NO.)
(RTA) 7 000 BC 7049
(DIER) 15 D8-27

SHEET No. 27 | No. OF SHEETS 28

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

ITEM	DESCRIPTION	SHEET REF *	FABRIC SHEET *	QUANT REQ'D	EXTRA UNITS SUGG	TOTAL QUANT UNITS
PI	150 X 150 X 25 ANCHORAGE PLATES	3	4	138	0	138
P2	90 mm DIAMETER X 40 WASHER PLATES	10 &11	11	210	2	212
P3	100 X 50 X 16 WASHER PLATE	10 &11	11	210	2	212
P4	TIE DOWN CLIP PLATE	10	11	156	0	156
P5	TIE DOWN CLIP PLATE	10	11	12	1	13
P6	TIE DOWN CLIP PLATE	11	11	12	0	12
P7	TIE DOWN WASHER PLATE	10	11	28	1	29
P8	TIE DOWN WASHER PLATE	11	11	2	0	2
P9	100 X 50 X 1535 JOINT PLATE	12	13	1	0	1
P10	100 X 50 X 1535 JOINT PLATE	12	13	2	0	2
P11	100 X 50 X 1485 JOINT PLATE	12	13	4	0	4
P12	100 X 50 X 1660 JOINT PLATE	12	13	1	0	1
P13	100 X 50 X 1535 JOINT PLATE	12	13	1	0	1
P14	100 X 50 X 1660 JOINT PLATE	12	13	1	0	1
P15	75 X 50 X 12 WASHER PLATE	12 , 20	13	120	1	121
P16	45 X 45 X 12 WASHER PLATE	12	13	40	1	41
P17	65 X 65 X 6.5 WASHER PLATE (SEE NOTE)	17	19	114	2	116
P18	50 X 50 X 5 WASHER PLATE (SEE NOTE)	17	19	114	2	116
P19	150 X 50 X 10 TEMPORARY SUPPORT PLATE	22	N/A	42	2	44
P20	325 X 20 X 6170 BOTTOM FLANGE PLATE	15	15	2	0	2
P21	TAPERED BOTTOM FLANGE PLATE	15	15	2	0	2
P22	325 X 20 X 3070 BOTTOM FLANGE PLATE	15	15	2	0	2
P23	325 X 25 X 6170 BOTTOM FLANGE PLATE	15	15	5	0	5
P24	TAPERED BOTTOM FLANGE PLATE	15	15	5	0	5
P25	325 X 25 X 3070 BOTTOM FLANGE PLATE	15	15	5	0	5
P26	100 X 20 X 1290 BEARING PLATE	20	21	1	0	1
P27	100 X 20 X 2998 BEARING PLATE	20	21	13	0	13
P28	100 X 20 X 1312 BEARING PLATE	20	21	1	0	1
A1	150 X 90 X 8 PROTECTION ANGLE	3	4	7	0	7
A2	150 X 90 X 8 PROTECTION ANGLE	3	4	1	0	1
A3	150 X 90 X 8 PROTECTION ANGLE	3	4	1	0	1
A4	FLANGED DECK DRAIN	17 , 20	19	12	0	12
A5	DECK DRAIN EXTENSION PIPE	17 , 20	19	12	0	12
A6	DECK DRAIN COUPLER	17 , 20	19	12	0	12
A7	DECK DRAIN WASHER PLATE	17 , 20	19	12	0	12
A8	TEMPORARY LAUNCH & JACKING BRACKET	25	27	30	0	30
A9-A	150 X 75 PFC TEMPORARY SUPPORT BEAM	22	23	1	0	1
A9-B	150 X 75 PFC TEMPORARY SUPPORT BEAM	22	23	1	0	1
A10-A	150 X 75 PFC TEMPORARY SUPPORT BEAM	22	23	1	0	1
A10-B	150 X 75 PFC TEMPORARY SUPPORT BEAM	22	23	1	0	1
A11-A	150 X 75 PFC TEMPORARY SUPPORT BEAM	22	23	1	0	1
A11-B	150 X 75 PFC TEMPORARY SUPPORT BEAM	22	23	1	0	1
A12-A	150 X 75 PFC TEMPORARY SUPPORT BEAM	22	23	1	0	1
A12-B	150 X 75 PFC TEMPORARY SUPPORT BEAM	22	23	1	0	1
A13-A	150 X 75 PFC TEMPORARY SUPPORT BEAM	22	23	1	0	1
A13-B	150 X 75 PFC TEMPORARY SUPPORT BEAM	22	23	1	0	1
A14-A	150 X 75 PFC TEMPORARY SUPPORT BEAM	22	23	1	0	1
A14-B	150 X 75 PFC TEMPORARY SUPPORT BEAM	22	23	1	0	1
A15-A	150 X 100 X 2600 TEMPORARY TIMBER BEAM	22	23	5	0	5
A15-B	150 X 100 X 2600 TEMPORARY TIMBER BEAM	22	23	5	0	5
A16	150 X 50 X 200 TEMPORARY TIMBER BLOCK	22	23	15	0	15
A17	200 X 50 X 350 TEMPORARY TIMBER BEARING	22	23	10	0	10
A18	150 X 100 X 400 TEMPORARY TIMBER SUPPORT BLOCK	22	23	4	0	4
A19	150 X 100 X 450 TEMPORARY TIMBER SUPPORT BLOCK	22	23	1	0	1
A20	150 X 100 X 310 TEMPORARY TIMBER SUPPORT BLOCK	22	23	2	0	2
C1	230 X 75 X 4795 PFC ANCHORAGE CHANNEL	3	4	7	0	7
C2	230 X 75 X 4275 PFC ANCHORAGE CHANNEL	3	4	1	0	1
C3	230 X 75 X 4195 PFC ANCHORAGE CHANNEL	3	4	8	0	8
C4	230 X 75 X 3680 PFC ANCHORAGE CHANNEL	3	4	1	0	1
C5	230 X 75 X 4275 PFC ANCHORAGE CHANNEL	3	4	1	0	1
C6	230 X 75 X 3680 PFC ANCHORAGE CHANNEL	3	4	1	0	1
SB-1	FABRICATED STEEL SPACER BEAM	15	16	1	0	1
SB-2	FABRICATED STEEL SPACER BEAM	15	16	1	0	1
SB-3	FABRICATED STEEL SPACER BEAM	15	16	1	0	1
SB-4	FABRICATED STEEL SPACER BEAM	15	16	1	0	1
SB-5	FABRICATED STEEL SPACER BEAM	15	16	1	0	1
SB-6	FABRICATED STEEL SPACER BEAM	15	16	1	0	1
SB-7	FABRICATED STEEL SPACER BEAM	15	16	1	0	1
V1	15.2 mm PRESTRESSING STRAND X 10000	3	-	69	1	70
V2	THREADED ANCHORAGE BARREL FOR 15.2 STRAND	3	-	138	2	140
V3	PVC FLANGED TRUMPET	3	-	138	4	142
V4	25 mm X 400 PVC SLEEVE	3	-	138	4	142
V5	THREADED NYLON PROTECTIVE CAP	3	-	138	2	140
N1	100 X 50 X 5 NEOPRENE WASHER	10, 11	11	210	4	214
N2	100 X 15 X 8400 NEOPRENE STRIP BEARING MINIMUM LENGTHS 1500	10, 11		5	0	5
N3	130 X 15 X 8400 NEOPRENE STRIP BEARING MINIMUM LENGTHS 1500	10, 11	-	2	0	2
N4	40 mm DIAMETER X 3 mm NEOPRENE WASHER	12	-	102	8	110
N5	150 X 5 X 1290 NEOPRENE STRIP BEARING	20	21	1	0	1
N6	150 X 5 X 2998 NEOPRENE STRIP BEARING	20	21	13	0	13
N7	150 X 5 X 1312 NEOPRENE STRIP BEARING	20	21	1	0	1
F1	300 X 2 mm THICK X 9000 WOLFIN FLASHING	12	-	2	0	2
F2	180 X 2 mm THICK X 42000 WOLFIN FLASHING	17	-	1	0	1
F3	250 X 2 mm THICK X 42000 WOLFIN FLASHING	20	-	1	0	1
GREASE	KPXT GREASE (SEE NOTES)	3		400	LITRES	
EPOXY	SRE BITUMEN EPOXY (FINISHED VOLUME)	MULTIPLE		130	LITRES	

SHEET REF *	SHEET SHOWING APPLICATION	FABRIC SHEET *	SHEET SHOWING FABRICATION
QUANT REQ'D	NUMBER OF UNITS REQUIRED	EXTRA UNITS SUGG	SUGGESTED EXTRA UNITS
TOTAL QUANT UNITS	TOTAL QUANTITY OF UNITS	MAT GRADE	MATERIAL GRADE
STAND NUT	STANDARD NUT	STAND WASH	NORMAL SERIES WASHER
LARGE WASH	LARGE SERIES WASHER	NYLOK NUT	NYLOK NUT

NOTES ON MATERIALS

ALL BOLTS, THREADED ROD AND ASSOCIATED NUTS SHALL BE TO AS1111 FOR GRADE 4.6 OR AS1252 FOR GRADE 8.8 AS NOTED IN THE TABLE.
ALL BOLTS, COACH SCREWS AND ASSOCIATED NUTS AND WASHERS (EXCEPT AS NOTED BELOW) SHALL BE HOT DIP GALVANISED TO AS1214.
ITEMS B10, B12, B13, B15 AND B16 SHALL NOT BE PROTECTIVE TREATED.

ALL STEEL PLATES AND SECTIONS SHALL BE TO AS3678 AND AS3679 RESPECTIVELY FOR THE GRADES SPECIFIED ON THE (FABRICATION) SHEETS REFERENCED IN THE TABLE.
ALL STEEL PLATES AND SECTIONS (EXCEPT AS NOTED BELOW) SHALL BE HOT DIP GALVANISED TO AS1650. ALL EDGES TO BE PROTECTIVE TREATED SHALL BE ROUNDED TO A RADIUS OF 1.5 mm.
ALL STEEL PLATES AND SECTIONS FOR TEMPORARY USE SPECIFIED ON SHEETS 22 THROUGH TO 27 SHALL NOT BE PROTECTIVE TREATED.

PRESTRESSING STRAND SHALL BE 7 WIRE STRESS RELIEVED, HIGH TENSILE STEEL, SUPER GRADE, LOW RELAXATION TO AS1311 WITH ANCHORAGES TO AS1314. STRANDS SHALL BE GREASED AND SHEATHED BY THE MANUFACTURER AND THE MAXIMUM OUTSIDE DIAMETER OF THE SHEATH SHALL BE 19 mm.
THE PRESTRESSING PROTECTION SYSTEM SPECIFIED ON SHEET 3, USING ITEMS V3 THROUGH V6 HAS BEEN DEVELOPED BY VSL PRESTRESSING AUSTRALIA P/L IN CONJUNCTION WITH THE ROADS AND TRAFFIC AUTHORITY (NSW) AND THE CONSULTANT. THIS SYSTEM HAS BEEN DEVELOPED SPECIFICALLY FOR USE IN STRESS LAMINATED TIMBER DECKS AND IS AVAILABLE FROM VSL PRESTRESSING P/L. THE DETAILS OF ALTERNATE PRESTRESSING AND PROTECTION SYSTEMS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO CONSTRUCTION.

SRE EPOXY SHALL BE SEMI RIGID EPOXY RESIN JOINT SEALER "SRE/R" MANUFACTURED BY CTI.
TIMBER DECK LAMINATES SHALL BE AS SPECIFIED ON SHEETS 5 THROUGH 9.
THE GREASE FOR INJECTION INTO THE VOIDS AROUND THE SHEATHED STRANDS, AS SPECIFIED ON SHEETS 3, SHALL BE CASTROL APXT OR EQUIVALENT.
THE WOLFIN FLASHING SHALL BE 2 mm THICK AND ATTACHED TO THE DECK USING AN APPROVED COMPATIBLE ADHESIVE.
NEOPRENE STRIP BEARINGS AND WASHERS N1 TO N3 AND N5 TO N7 SHALL BE IN ACCORDANCE WITH RTA QA SPECIFICATIONS B280 "UNREINFORCED ELASTOMERIC BEARING PADS AND STRIPS" AS PROVIDED IN THE CONTRACT DOCUMENTS.
NEOPRENE WASHERS N4 MAY BE CUT FROM STANDARD NEOPRENE STRIP OR SHEET WHICH IS DESIGNATED AS SUITABLE FOR PETROL AND OIL APPLICATIONS.

GENERAL NOTES

THESE NOTES SHALL BE READ IN CONJUNCTION WITH THOSE ON ALL SHEETS AS WELL AS THE FOLLOWING ROADS AND TRAFFIC AUTHORITY (NSW) SPECIFICATIONS WHICH ARE CONTAINED IN THE CONTRACT DOCUMENTS:

RTA FORM 2382 "TIMBER FOR BRIDGES, STRESS LAMINATED TIMBER DECKS, SUPPLY AND HANDLING" (JUNE 1995)
RTA SPECIAL FORM 2381 "CONSTRUCTION OF STRESS LAMINATED TIMBER BRIDGE DECKS" (MARCH 12, 1999)
RTA SPECIAL FORM 2115 "STRESSING OF STRESS LAMINATED TIMBER BRIDGE DECKS" (MARCH 12, 1999).

ITEM	DESCRIPTION	MAT GRADE	SHEET REFER *	QUANT UNITS REQ'D	* OF NUTS/WASHERS WITH EACH UNIT: STAND NUT	LOCK NUT	STAND WASH	LARGE WASH	NYLOK NUT	EXTRA UNITS SUGG	TOTAL QUANT UNITS
B1	M10 X 65 COACH SCREW	4.6	3	176						6	182
B1	M24 X 520 THREADED ROD	4.6	5	16						1	16
B2	M16 NYLOK NUTS ONLY	4.6	3	52	1					0	52
B3	M20 X 350 THREADED ROD	8.8	10-11	210	2		2			2	212
B4	M20 X 320 HEX HEAD BOLT	8.8	12	102	1	1				2	142
B5 *	M20 X 75 HEX HEAD BOLT	8.8	15	80	1	1				0	80
B6	M20 X 300 HEX HEAD BOLT	8.8	17	114					1	0	114
B7	M16 X 300 HEX HEAD BOLT	8.8	17	114					1	1	115
B8	M16 X 40 DOME HEAD BOLT	8.8	17	20	1			1		0	20
B9	M20 X 330 THREADED ROD	4.6	20	58				1	2	1	59
B10	M16 X 100 COACH SCREW	4.6	25	30						2	32
B11 **	M20 X 90 HEX HEAD BOLT	8.8	15	60	1		1			1	61
B12	M12 X 130 HEX HEAD BOLT	4.6	22	44	1					1	45
B13	M16 X 275 HEX HEAD BOLT	4.6	22	10	1					0	10
B14	M12 X 75 COACH SCREW	4.6	5-8	552						8	560
B15	M20 STANDARD NUT ONLY	4.6	22	15						0	15
B16	M20 X 600 THREADED ROD	4.6	25	60	2					0	60

* MINIMUM THREAD LENGTH 50 mm
** MINIMUM THREAD LENGTH 75 mm

DECK ASSEMBLY AREA

THE STRESS LAMINATED TIMBER DECK SHALL BE ASSEMBLED AND STRESSED TOGETHER OFF THE ROADWAY ON THE NORTH SIDE OF THE BRIDGE. THE SITE SHALL BE DESIGNATED BY THE DEPARTMENT OF INFRASTRUCTURE, ENERGY AND RESOURCES.
THE ASSEMBLY BED SHALL BE DESIGNED TO SUPPORT 1.5 TIMES THE WEIGHT OF THE NEW TIMBER DECK (1.5 X 90 TONNES) IN ORDER TO ALLOW FOR THE NECESSARY MEN AND EQUIPMENT FOR ASSEMBLY AND STRESSING. THE ASSEMBLY BED SHALL HAVE SUPPORTS (CONTINUOUS ACROSS THE WIDTH OF THE DECK) WHICH ARE COINCIDENT WITH THE PERMANENT CROSS BEAM SUPPORTS AS WELL AS INTERMEDIATE SUPPORTS MIDWAY BETWEEN THESE. EACH OF THESE SUPPORTS SHOULD BE AT LEAST 10 m LONG TO ALLOW FOR THE ADDITIONAL WIDTH OF THE LOOSE ASSEMBLY OF LAMINATES BEFORE STRESSING. EACH SUPPORT SHALL HAVE A SMOOTH TIMBER BEARING STRIP OR A SMOOTH STEEL BEARING WITH A WIDTH OF AT LEAST 100 mm.

CONSTRUCTION OF TIMBER DECK

EXCEPT AS NOTED IN THE DRAWINGS AND THESE NOTES THE CONSTRUCTION OF THE DECK SHALL BE IN ACCORDANCE WITH RTA SPECIAL FORM 2381 (MARCH 12, 1999).
1. THE DECK SHALL BE ASSEMBLED IN DECK SETS AS SPECIFIED FOR THE SELECTED OPTION FROM SHEETS 5 TO 8.
2. ALL LAMINATES SHALL BE NAILED AS OUTLINED IN RTA SPECIAL FORM 2381 AND CARE SHALL BE TAKEN TO ENSURE THAT EACH LAMINATE REMAINS VERTICAL AND PROPERLY ALIGNED.
3. IT IS RECOMMENDED THE TOP SURFACE OF THE DECK BE MARKED FOR THE LOCATIONS OF THE FOLLOWING ITEMS AND NAILING BE OMITTED TO FACILITATE DRILLING FOR THOSE ITEMS:
- TIE DOWNS AT CROSS BEAMS (SHEET 10)
- KERB BOLTS (SHEET 17)
- DECK JOINTS BOLTS (SHEET 12)
- FOOTWAY SUPPORT BOLTS (SHEET 20)
- DECK DRAINS (SHEETS 18 AND 20)

4. THE ASSEMBLY OF THE DECK SHALL COMMENCE FROM THE RAILWAY SIDE AND THE STRANDS SHALL NOT BE INSTALLED UNTIL THE DECK IS FULLY ASSEMBLED.
5. THE GREASE INJECTION HOLES AS SPECIFIED IN RTA SPECIAL FORM 2115 SHALL BE DRILLED IN EVERY 32ND LAMINATE RUN (1120 SPACING) ALONG EACH STRAND AS WELL AS IN THE OUTSIDE LAMINATE AS SHOWN ON SHEETS 5 TO 8.
6. THE PRESTRESSING STRANDS, PROTECTION SYSTEM AND ANCHORAGES SYSTEM SHALL BE INSTALLED AS SHOWN ON SHEET 3.
7. STRESSING OF THE DECK SHALL BE IN ACCORDANCE WITH RTA SPECIAL FORM 2115 AND THE STRESSING NOTES ON THIS SHEET.
8. GREASING OF THE VOIDS USING THE HOLES SPECIFIED IN 5 ABOVE SHALL BE PERFORMED IMMEDIATELY AFTER THE STRESSING OF THE DECK IS COMPLETED AND THE HOLES SHALL BE PLUGGED IMMEDIATELY AS SPECIFIED ON SHEETS 5 TO 8 TO PREVENT MOISTURE FROM ENTERING THE DECK.
9. SITE MEASUREMENTS SHALL BE TAKEN TO CONFIRM THE LOCATION OF THE RAILWAY SIDE KERB AND FOOTWAY SUPPORT BEARING.
10. REBATING FOR THE RAILWAY SIDE KERB SHALL BE PERFORMED AS SPECIFIED ON SHEET 17, BUT NO HOLES SHALL DRILLED.
11. THE FOOTWAY SIDE NEOPRENE BEARINGS (N5 TO N7) SHALL BE FITTED AS SPECIFIED ON SHEET 20. THE HOLES FOR THE RODS (B9) SHALL BE DRILLED USING THE BEARING PLATES AS TEMPLATES.
12. NO ADDITIONAL DRILLING OR REBATING SHALL BE PERFORMED UNTIL THE DECK HAS BEEN LAUNCHED INTO PLACE.

STRESSING OF DECK

1. EXCEPT AS OUTLINED BELOW STRESSING SHALL BE PERFORMED IN ACCORDANCE WITH RTA SPECIAL FORM 2115.
2. STRESSING SHALL ONLY BE PERFORMED UNDER THE DIRECTION OF THE DESIGN ENGINEER OR HIS DELEGATE.
3. A MAXIMUM NUMBER OF STRANDS SHALL BE STRESSED SIMULTANEOUSLY SUCH THAT THE FULL LENGTH OF THE DECK IS STRESSED DURING THE INITIAL STAGES.
4. UNLESS APPROVED OTHERWISE AT LEAST 10 JACKS SHALL BE USED AND THEY SHALL BE EVENLY DISTRIBUTED ALONG THE FULL LENGTH OF THE DECK.
5. THE GEOMETRY OF THE DECK SHALL BE CHECKED AS SPECIFIED IN RTA SPECIAL FORM 2115 OR ADDITIONALLY AS DIRECTED BY THE SITE ENGINEER.
6. THE OVERALL WIDTH SHALL BE CHECKED FOR CONFORMANCE WITH THE REQUIREMENTS ON SHEET 3 AFTER THE INITIAL STRESSING HAS BEEN COMPLETED. THE MEASUREMENT SHOULD ALLOW FOR ANOTHER 50 mm OF DECK COMPRESSION TO COMPLETE THE RE-STRESSING REQUIREMENTS SPECIFIED IN RTA SPECIAL FORM 2115.

STRESSING NOTES

THE FOLLOWING SHALL BE OBSERVED FOR THE 15.2 mm PRESTRESSING STRANDS (FORCE PER STRAND):

1. MINIMUM ULTIMATE STRENGTH = 250 KN
2. MAXIMUM PERMISSIBLE (DESIGN) JACKING FORCE = 210 KN
3. DESIGN FORCE AFTER TRANSFER = 175 KN
4. MINIMUM STRAND FORCE = 100 KN

THE MINIMUM STRAND FORCE IS APPLICABLE FOR FUTURE LONG TERM MAINTENANCE. THE DECK SHALL BE RE-STRESSED WHEN THE RESIDUAL TENDON FORCES FALL TO THIS LEVEL.

PREPARATION AND INSTALLATION OF THE DECK

THE PROCEDURE FOR REMOVAL OF THE OLD DECKING, INSTALLATION OF SPACER BEAMS AND CROSS BEAM STRENGTHENING SHALL BE DESIGNED TO MINIMISE THE OVERALL ROAD CLOSURE PERIOD.
THE CONTRACTOR SHALL SUBMIT THE DETAILS OF THE PROPOSED METHOD AND EQUIPMENT, INCLUDING PROPOSED ROAD CLOSURE REQUIREMENTS, WITH THE TENDER SUBMISSION.
THE ROAD CLOSURE PERIOD AND QUALITY ASSURANCE PROCEDURE FOR WELDING OF THE CROSS BEAMS SHALL FORM PART OF THE TENDER ASSESSMENT PROCESS. NOTWITHSTANDING THESE PROCEDURES A MAXIMUM 48 HOUR CLOSURE TO TRAIN TRAFFIC SHALL APPLY. THE NEW DECK WILL CONFLICT WITH THE RAILWAY CLEARANCES DURING TRANSPORT, LAUNCH AND INSTALLATION. THE INSTALLATION, INCLUDING THE LATERAL MOVE UNDER THE FOOTWAY, IS TO BE COMPLETED WITHIN THE 48 HOUR WINDOW SPECIFIED ABOVE.

ADDITIONAL NOTES ON CROSS BEAM WELDING

PRIORITY SHALL BE GIVEN TO INSTALLING AND BOLTING THE SPACER BEAMS AND LAUNCHING BRACKETS AS SPECIFIED ON SHEET 15 TO FACILITATE LAUNCHING OF THE DECK. WELDING OF THE CROSS BEAMS AND BOTTOM FLANGE STRENGTHENING MAY BE PERFORMED DURING LAUNCHING AND INSTALLATION WITH THE FOLLOWING EXCEPTIONS.
1. NO SPACER BEAM OR BOTTOM FLANGE PLATE SHALL BE PARTIALLY WELDED WHEN THE DECK IS CANTILEVERED OVER THAT CROSS BEAM.
2. NO SPACER BEAM OR BOTTOM FLANGE PLATE SHALL BE PARTIALLY WELDED DURING THE PASSAGE OF TRAINS.
3. ALL WELDING SHALL BE COMPLETED BEFORE THE BRIDGE IS RE-OPENED TO ROAD TRAFFIC.

NO.	AMENDMENTS	CHECKED	DATE	APPROVED

DEPARTMENT OF INFRASTRUCTURE, ENERGY & RESOURCES

MIDLAND HIGHWAY — TASMANIA

BRIDGE OVER THE DERWENT RIVER

AT BRIDGEWATER

REDECKING OF THE LIFT SPAN

TABLE OF MATERIALS AND CONSTRUCTION NOTES

DESIGN :RAYMOND J. TAYLOR
INFRATECH S & S P/L
P.O. BOX 6106, BAULKHAM HILLS, NSW, 2153
DATE 8/9/99

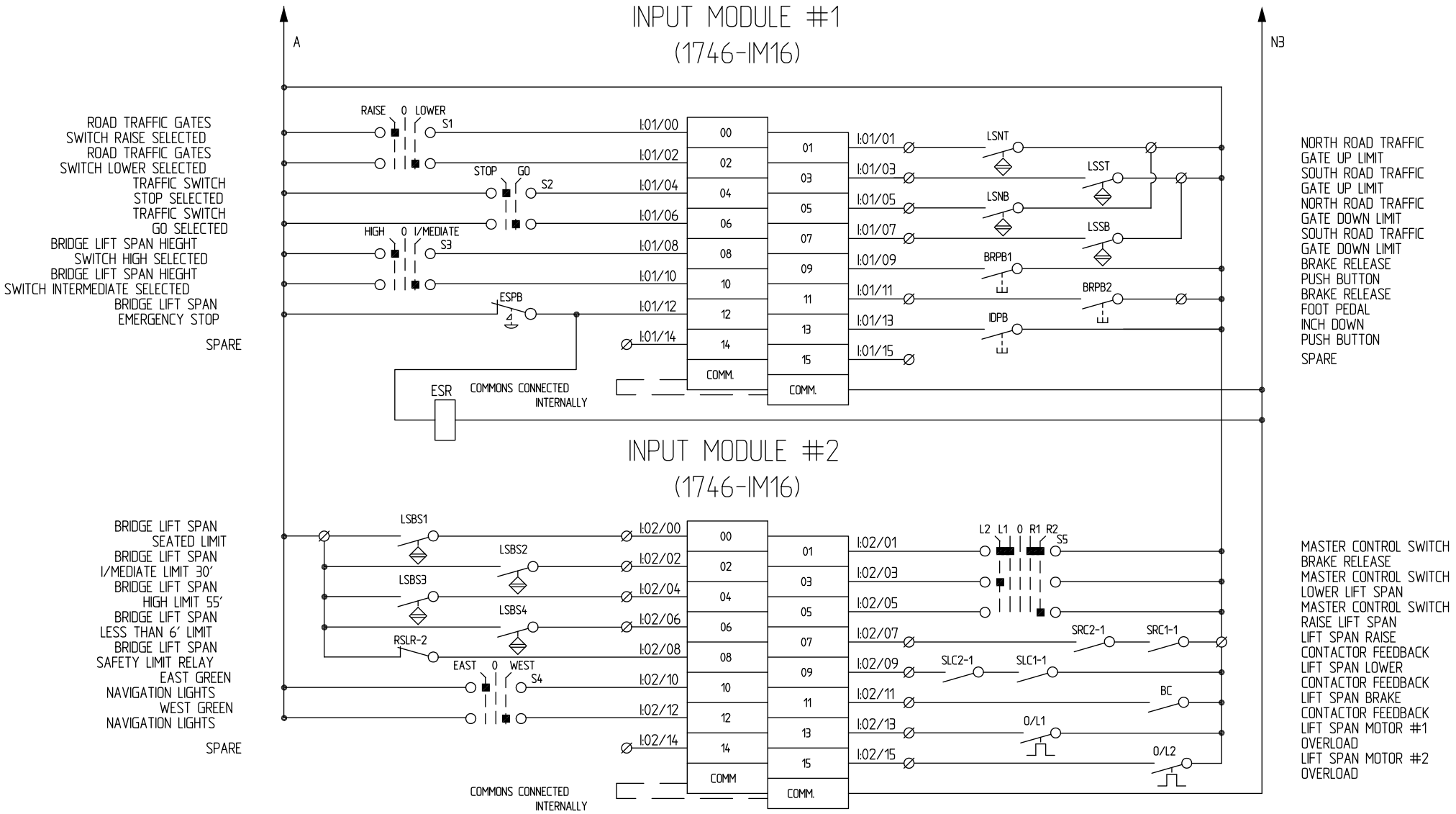
DESIGN CHECK :GROZ KLARIC
RTA TECHNOLOGY, ROSEBERY, NSW
CHECKED/RECOMMENDED DATE
ACCEPTED 3.9.99 DATE

DRAFTING DATE
CHECKED DATE
APPROVED DATE

REFERENCE (CONTRACT / PLAN NO.)

(RTA) 7 000 BC 7049
(DIER) 15 D8-28

SHEET No. 28 | No. OF SHEETS 28



R.J.HILL & ASSOCIATES PTY. LTD.
CONSULTING ELECTRICAL ENGINEERS
P.O. BOX 410
MOWBRAY HEIGHTS 7248
Ph. (003) 317444. FAX. (003) 319671.

REFERENCE DRAWING NOS.

AJ51C000 DRAWING INDEX

DISC No.

R.J. HILL & ASSOCIATES

PROCESS		DRAWN I.K.R	DATE 3/4/96
MAINTENANCE		CHECKED	
SAFETY		PASSED	
ENG. SUPT.		PROJ. ENG.	
		APPROVED	

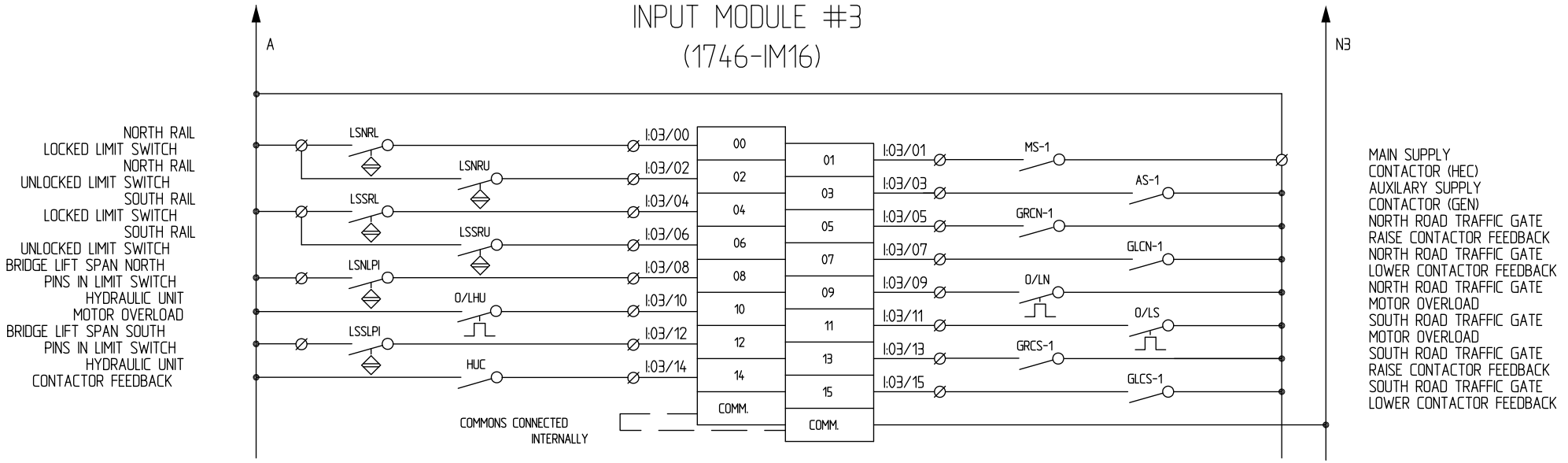
BRIDGEWATER BRIDGE
LIFT SPAN CONTROL
240 VAC PLC INPUT SCHEMATIC

SCALE

DRG.NO 15 D8-29

REVISION

INPUT MODULE #3
(1746-IM16)



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PROCESS		DRAWN I.K.R	DATE 3/4/96
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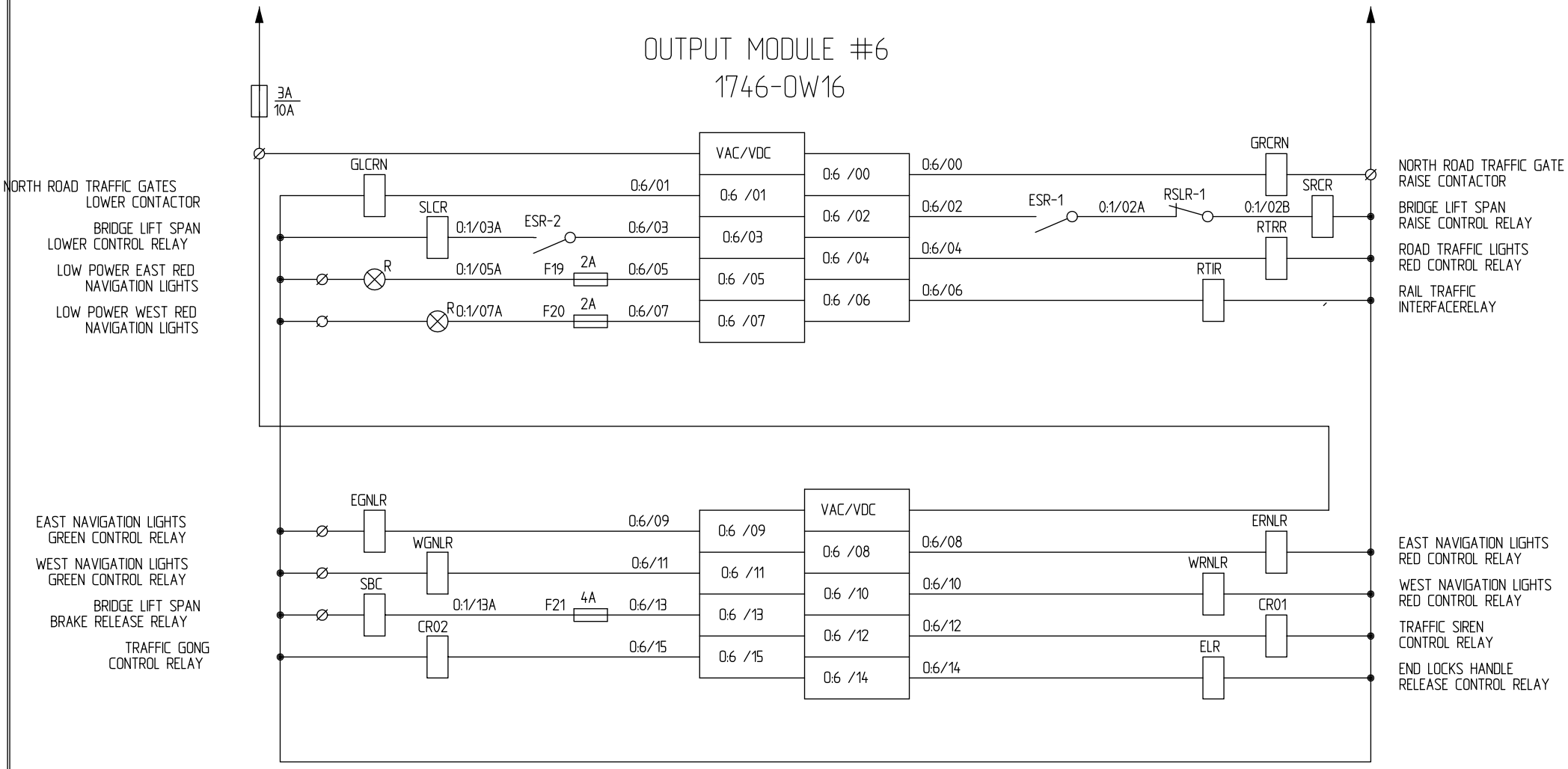
SAFETY		PASSED	
ENG. SUPT.		PROJ. ENG.	
		APPROVED	

BRIDGE WATER BRIDGE
LIFT SPAN CONTROL
240 VAC PLC INPUT SCHEMATIC

SCALE

DRG.NO 15 D8-30

REVISION



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MOWBRAY HEIGHTS 7248
Ph. (003) 317444. FAX. (003) 319671.

REFERENCE DRAWING NOS.

DISC No.

R.J. HILL & ASSOCIATES

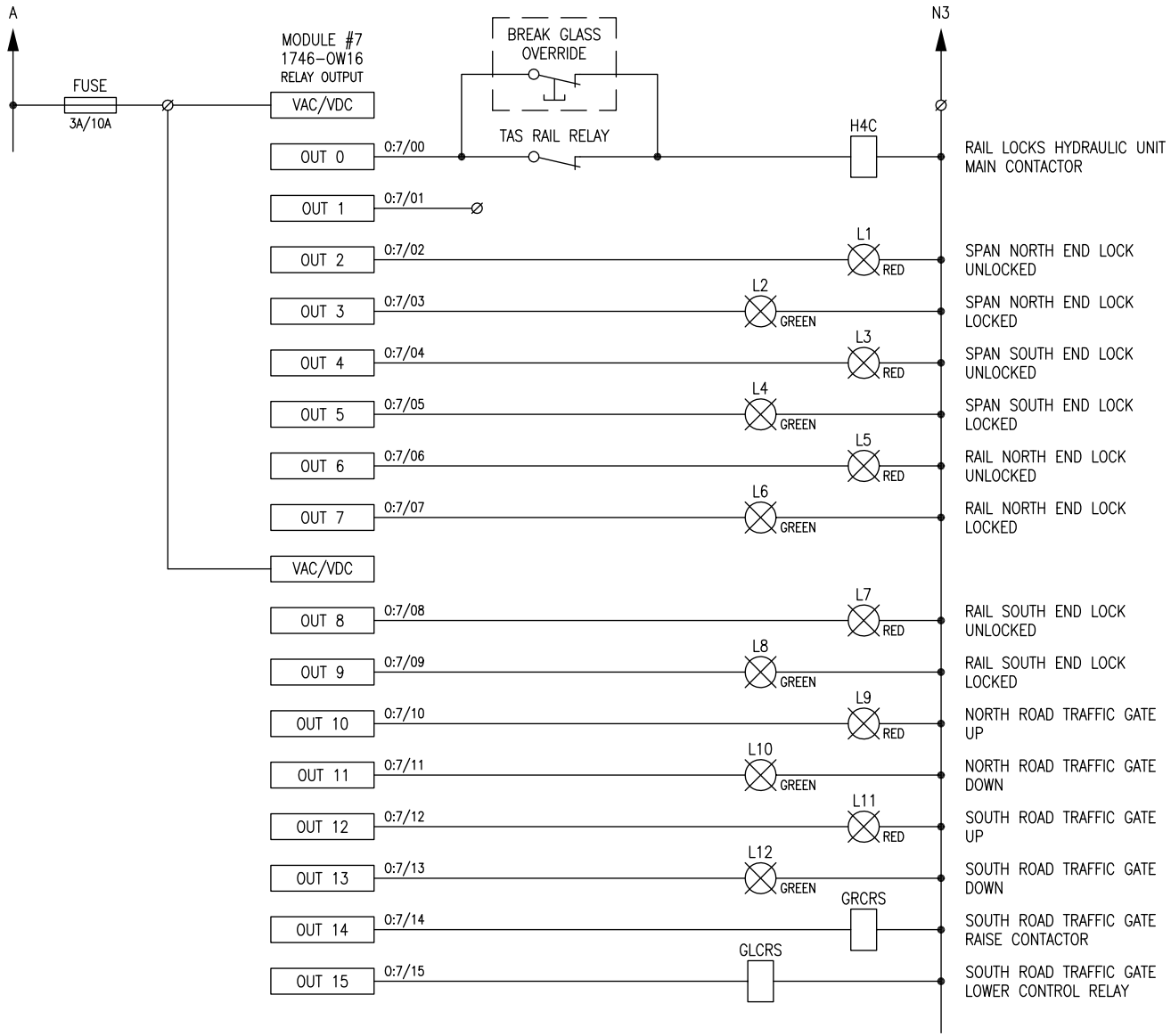
PROCESS		DRAWN IKR	DATE
MAINTENANCE		CHECKED	
SAFETY		PASSED	
ENG. SUPT.		PROJ. ENG.	
		APPROVED	

BRIDGEWATER DRIDGE
LIFT SPAN CONTROL
240 V AC PLC OUTPUT SCHEMATIC

SCALE

DRG.NO 15 D8-31

REVISION



RJH-H001 PLC INPUT MODULES 1 & 2 SCHEMATIC
RJH-H002 PLC INPUT MODULE 3 SCHEMATIC
RJH-H003 OUTPUT MODULE 6 SCHEMATIC
RJH-H005 240V CONTROL CIRCUIT SCHEMATIC
RJH-H006 MAIN SUPPLIES SCHEMATIC
RJH-H007 240V AC CONTROLS SCHEMATIC
RJH-H008 240V AC CONTROLS SCHEMATIC

D.M.P. 26.8.96

R.E.C. 26.8.96

A3

BRIDGWATER BRIDGE
LIFT SPAN CONTROL
240V PLC OUTPUT MODULE #7
SCHEMATIC DIAGRAM

15 D8-32
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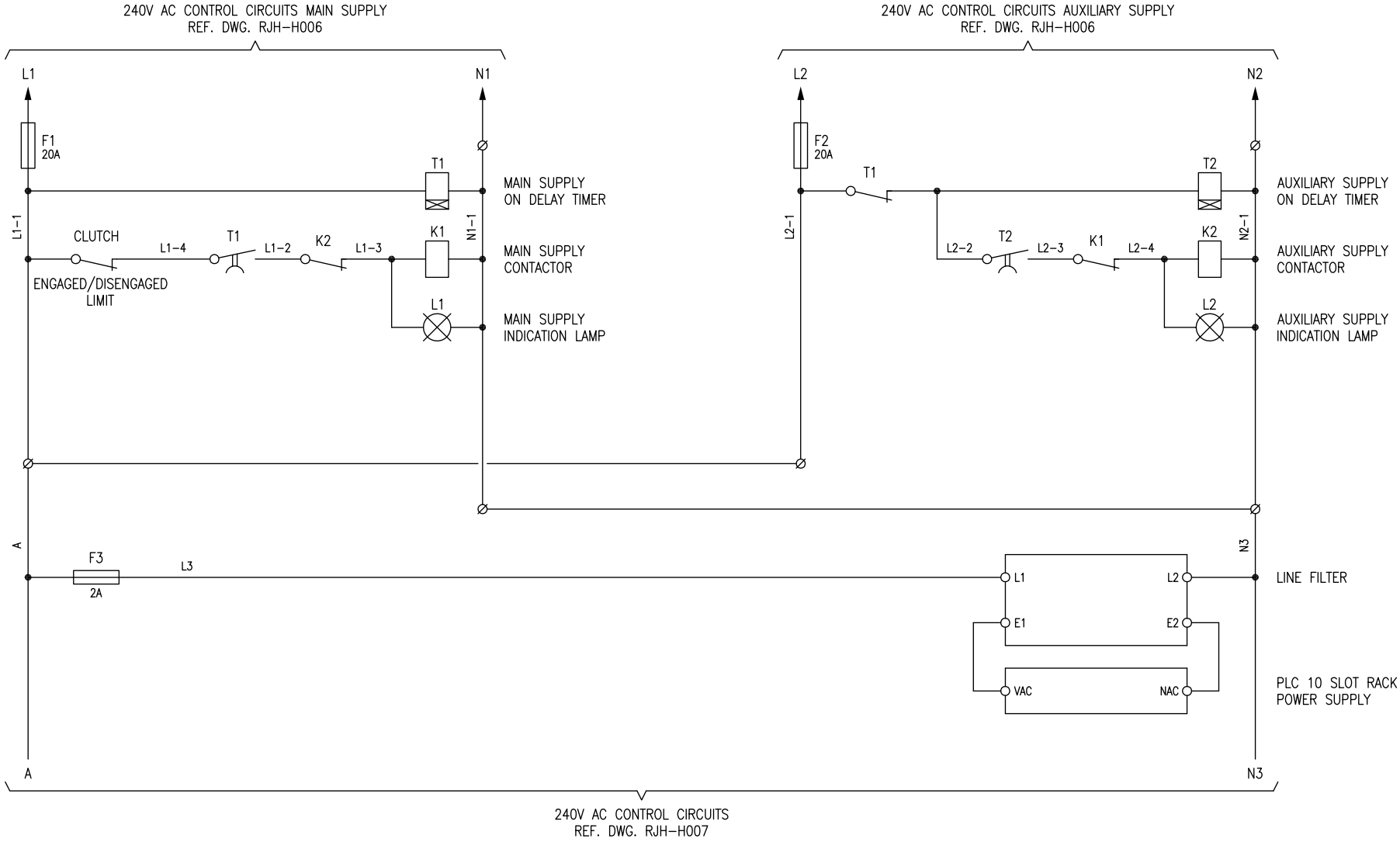

RJH-H001 PLC INPUT MODULES 1 & 2 SCHEMATIC
RJH-H002 PLC INPUT MODULE 3 SCHEMATIC
RJH-H003 PLC OUTPUT MODULE 6 SCHEMATIC
RJH-H004 PLC OUTPUT MODULE 7 SCHEMATIC
RJH-H006 MAIN SUPPLIES SCHEMATIC
RJH-H007 240V AC CONTROL CIRCUIT SCHEMATIC
RJH-H008 240V AC CONTROL CIRCUIT SCHEMATIC

D.M.P. 27.8.96

R.E.C. 27.8.96

A3

BRIDGEWATER BRIDGE
LIFT SPAN CONTROL
240V AC CONTROL CIRCUITS
SCHEMATIC DIAGRAM

15 D8-33
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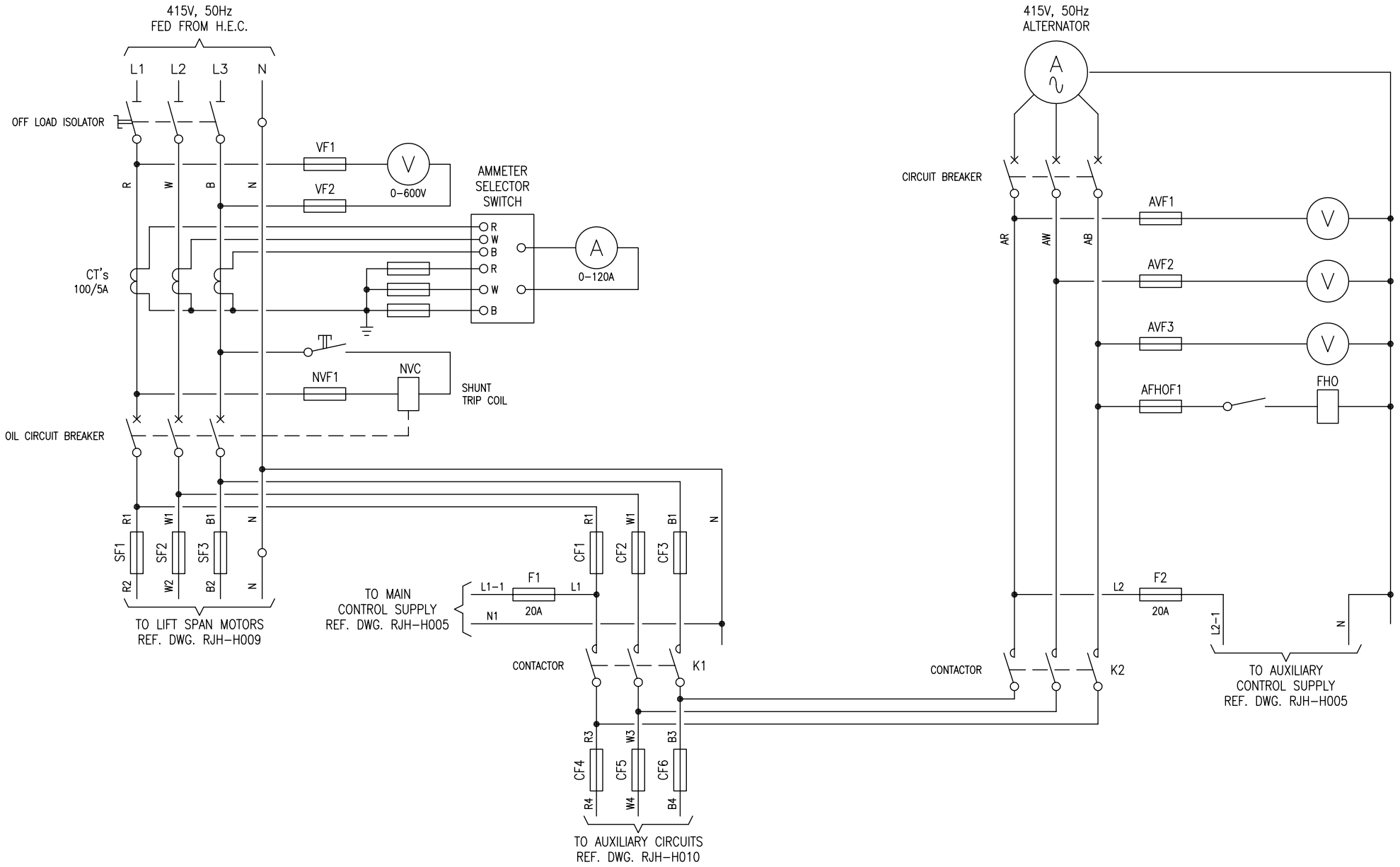
Xref logicRJH.dwg



RJH–H001 PLC INPUT MODULES 1 & 2 SCHEMATIC
RJH–H002 PLC INPUT MODULE 3 SCHEMATIC
RHG–H003 PLC OUTPUT MODULE 6 SCHEMATIC
RJH–H004 PLC OUTPUT MODULE 7 SCHEMATIC
RJH–H005 240V CONTROL CIRCUIT SCHEMATIC
RJH–H009 SPAN MOTORS SCHEMATIC
RJH–H010 AUXILIARY CIRCUITS SCHEMATIC

D.M.P. 26.8.96

R.E.C. 26.8.96

A3

BRIDGEWATER BRIDGE
LIFT SPAN CONTROL
MAIN SUPPLIES
SCHEMATIC DIAGRAM

15 D8–34
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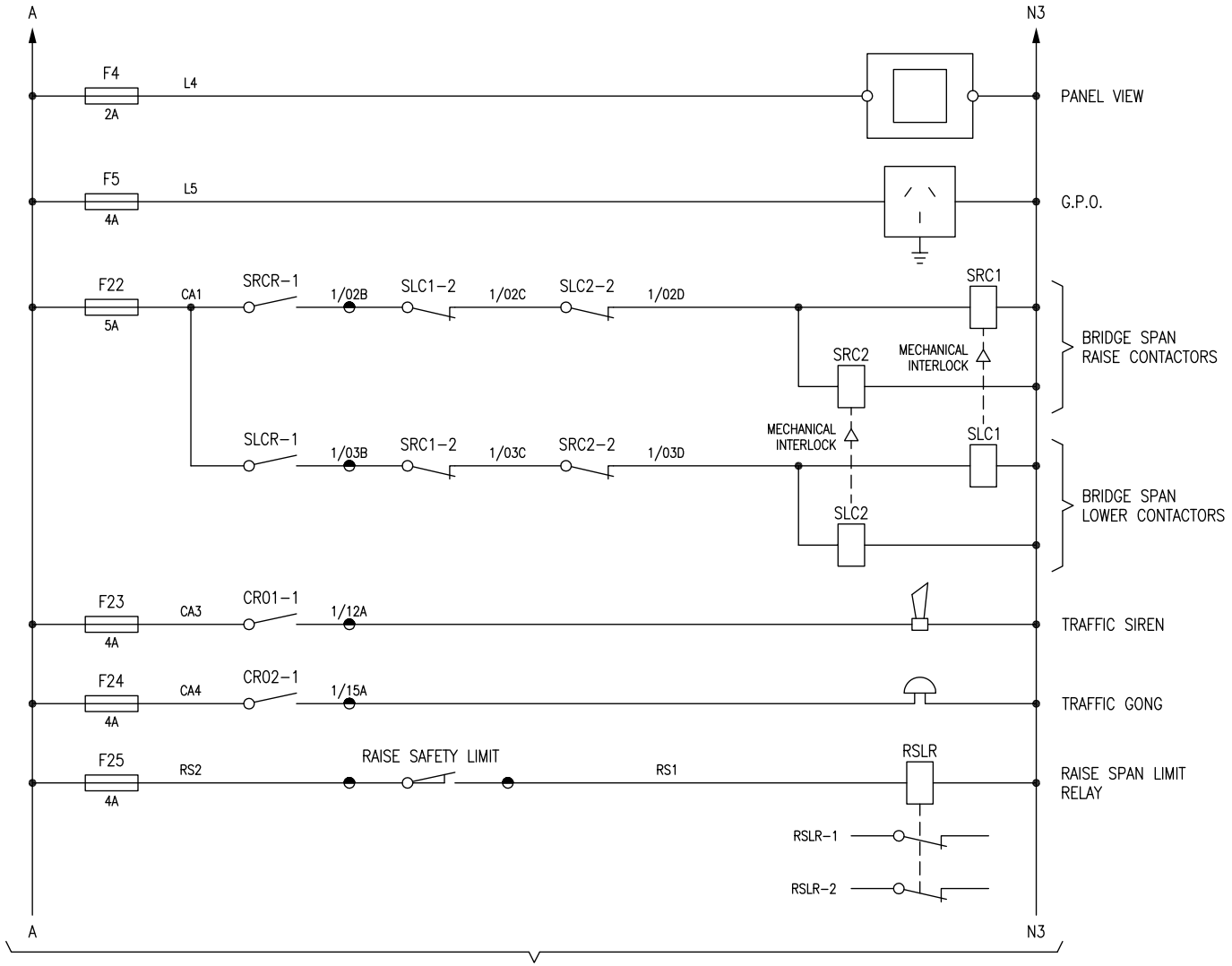
240V AC CONTROL CIRCUIT
REF. DWG. RJH-H005



240V AC CONTROL CIRCUIT
REF. DWG. RJH-H008

RJH-H001 PLC INPUT MODULES 1 & 2 SCHEMATIC
RJH-H002 PLC INPUT MODULE 3 SCHEMATIC
RJH-H003 PLC OUTPUT MODULE 6 SCHEMATIC
RJH-H004 PLC OUTPUT MODULE 7 SCHEMATIC
RJH-H005 240V AC CONTROL CIRCUIT SCHEMATIC
RJH-H006 MAIN SUPPLIES SCHEMATIC
RJH-H008 240V AC CONTROL CIRCUIT SCHEMATIC

D.M.P. 27.8.96

R.E.C. 27.8.96

A3

BRIDGEWATER BRIDGE
LIFT SPAN CONTROL
240V AC CONTROL CIRCUIT
SCHEMATIC DIAGRAM

15 D8-35
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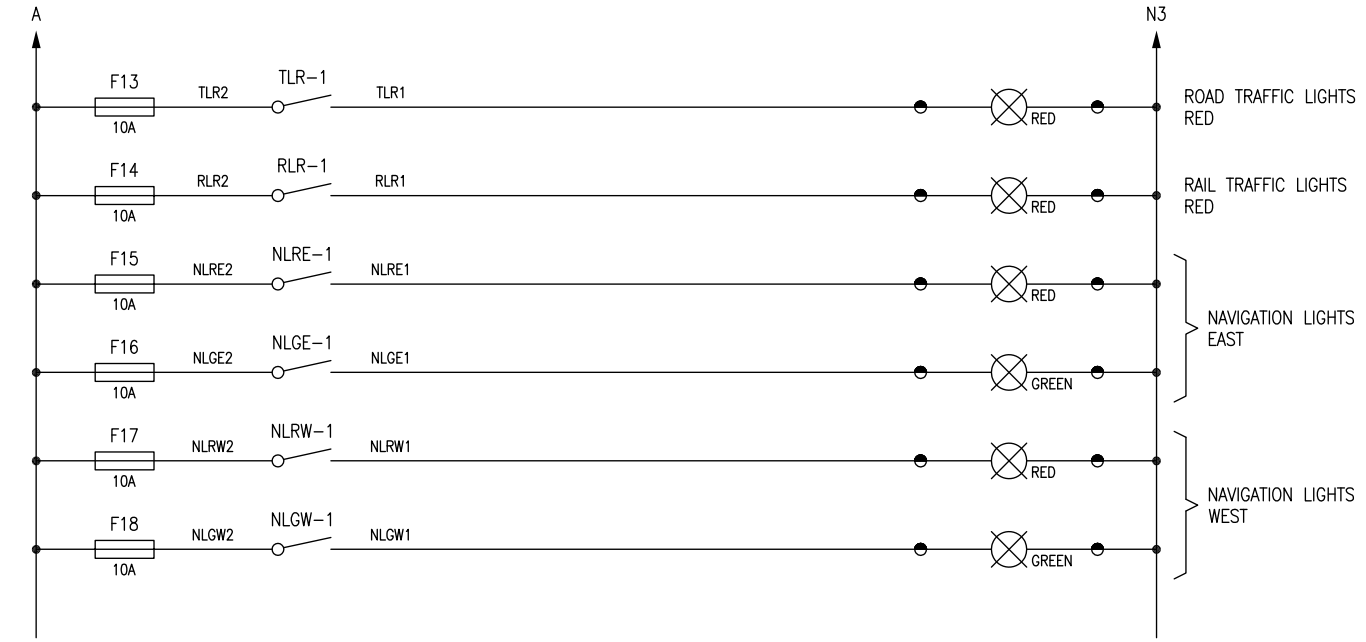
Xref loggraRevHobwg

240V AC CONTROL CIRCUIT
REF. DWG. RJH–H007



RJH–H001 PLC INPUT MODULES 1 & 2 SCHEMATIC
RJH–H002 PLC INPUT MODULE 3 SCHEMATIC
RJH–H003 PLC OUTPUT MODULE 6 SCHEMATIC
RJH–H004 PLC OUTPUT MODULE 7 SCHEMATIC
RJH–H005 240V AC CONTROL CIRCUIT SCHEMATIC
RJH–H006 MAIN SUPPLIES SCHEMATIC
RJH–H007 240V AC CONTROL CIRCUIT SCHEMATIC

D.M.P. 27.8.96

R.E.C. 27.8.96

A3

BRIDGEWATER BRIDGE
LIFT SPAN CONTROL
240V AC CONTROL CIRCUIT
SCHEMATIC DIAGRAM

15 D8–36
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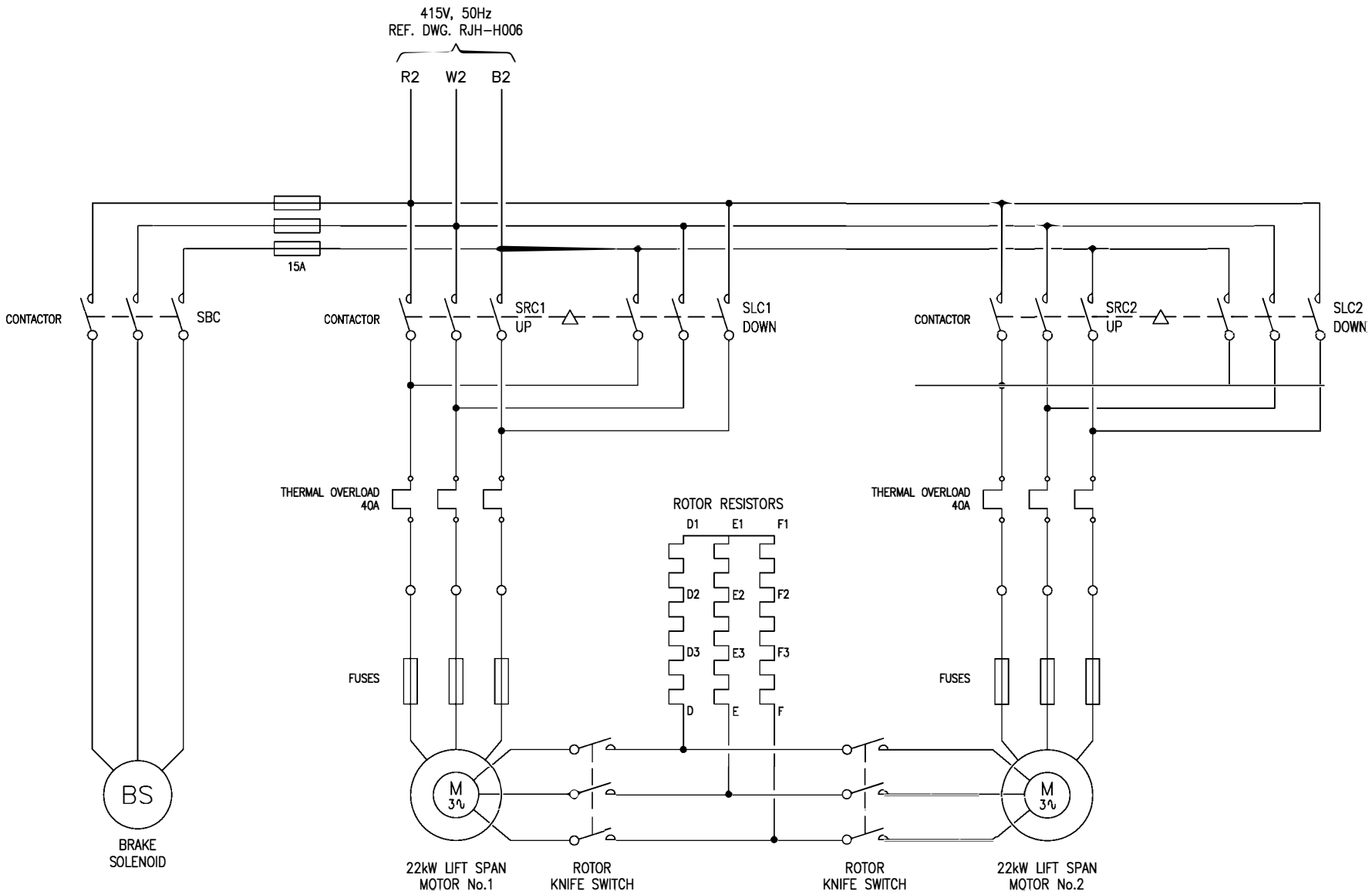


RJH-H006 MAIN SUPPLIES SCHEMATIC
RJH-H010 AUXILIARY CIRCUITS SCHEMATIC

D.M.P. 27.8.96

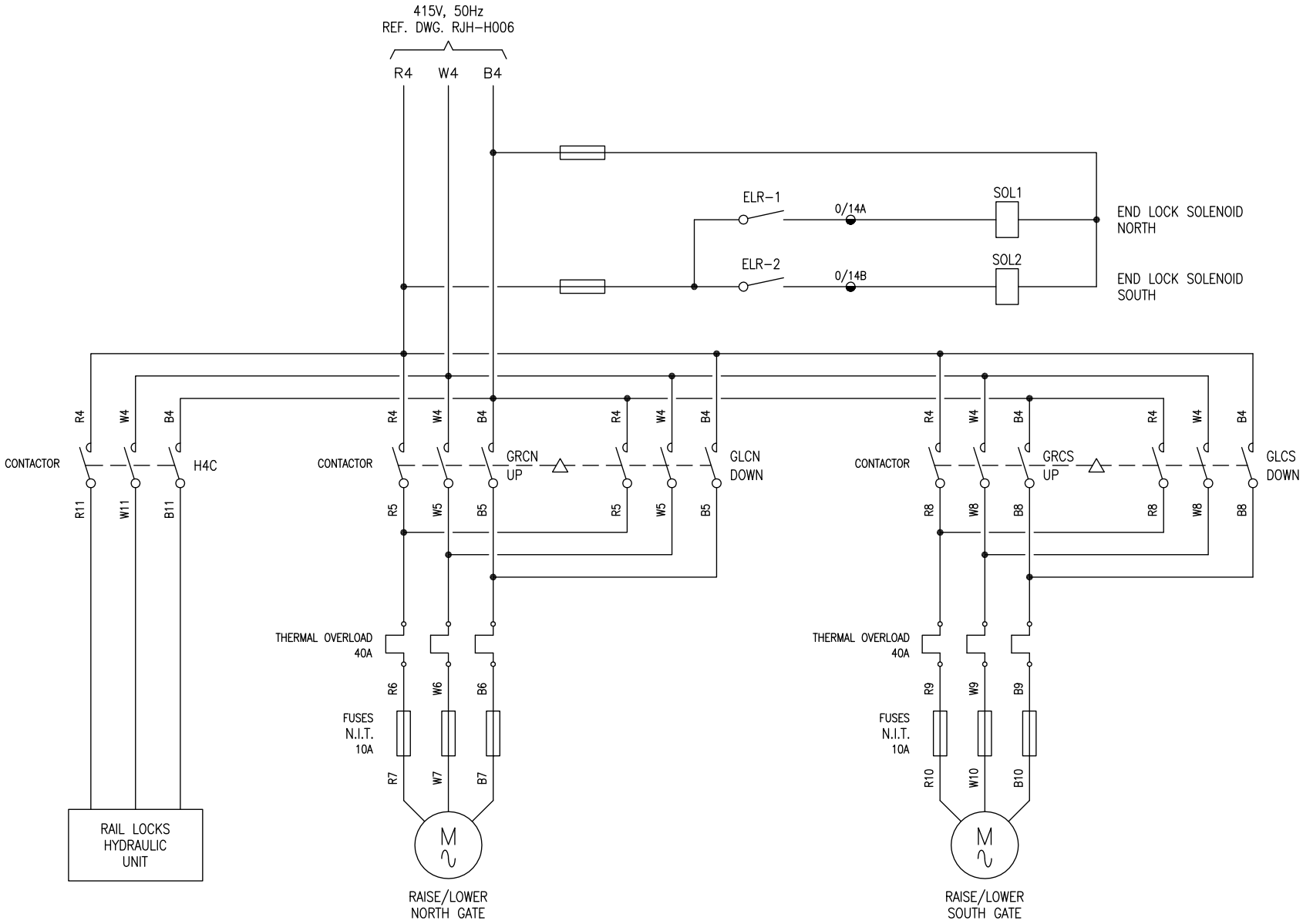
R.E.C. 27.8.96

A3

BRIDGEWATER BRIDGE
LIFT SPAN CONTROL
SPAN MOTORS
SCHEMATIC DIAGRAM

15 D8-37
0

Xref [illegible]



RJH-H006 MAIN SUPPLIES SCHEMATIC
RJH-H009 SPAN MOTORS SCHEMATIC

D.M.P. 28.8.96

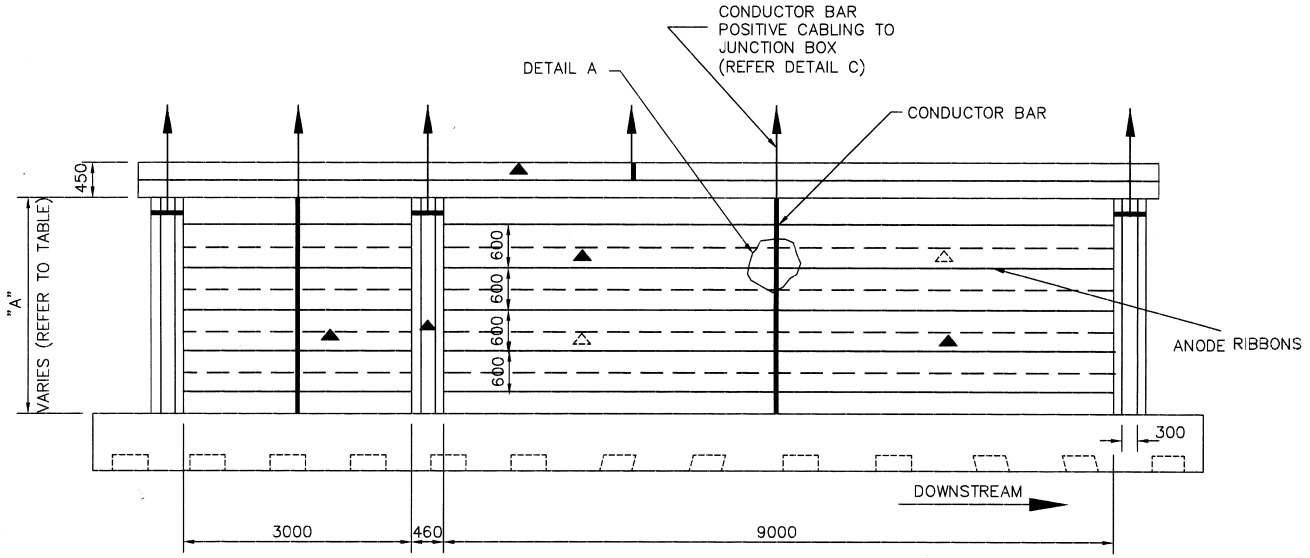
R.E.C. 28.8.96

A3

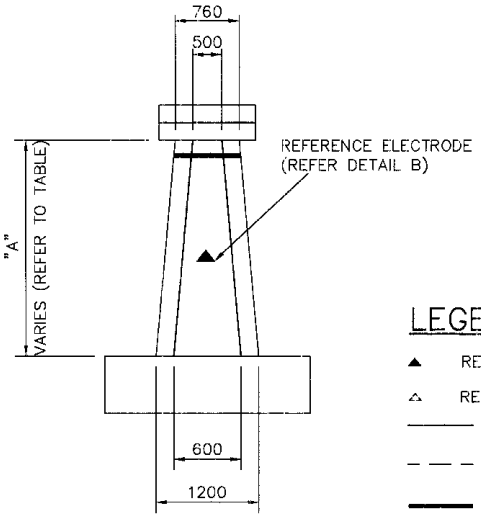
BRIDGEWATER BRIDGE
LIFT SPAN CONTROL
415V AC AUXILIARY CIRCUITS
SCHEMATIC DIAGRAM

15 D8-38
0

Xref



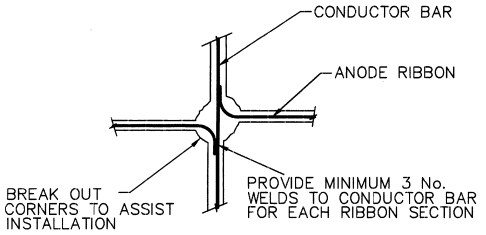
PIER No. 13



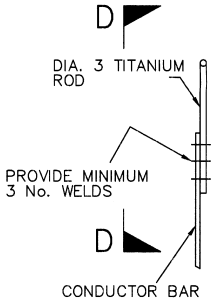
PIER No.	HEIGHT OF CURTAIN WALL "A"
1.	1.90m
2.	2.0m
3.	2.1m
4.	2.2m
5.	2.3m
6.	2.4m
7.	2.5m
8.	2.55m
13.	2.55m

LEGEND:

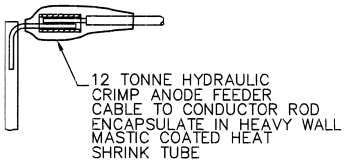
- ▲ REFERENCE ELECTRODE
- △ REFERENCE ELECTRODE OPPOSITE SIDE
- ——— ANODE RIBBON
- — — — ANODE RIBBON OPPOSITE SIDE
- ━━━ CONDUCTOR BAR
- ↑ CONDUCTOR BAR POSITIVE CABLING TO JUNCTION BOX



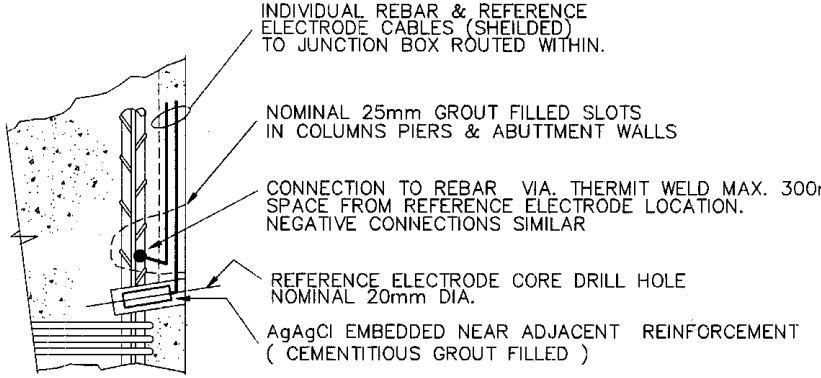
DETAIL A



DETAIL C



VIEW D–D



DETAIL B

TYPICAL REFERENCE ELECTRODE INSTALLATION

PIERS No. 1 TO 8 & 13 ZONING DETAILS

ZONE No.	DESCRIPTION	TOTAL No. ANODES	APPROX. LENGTH EACH ANODE (m)	CONDUCTOR BARS	APPROX. CONDUCT. BAR LENGTH (m)	NEGATIVE CONNECTIONS
1.	RAILSIDE WEST COLUMN	8.	2.5m	1.	1.5m	1.
2.	INTERMEDITE COLUMNS (NORTH/SOUTH)	8.	2.5m	2.	0.4m	2.
3.	ROADSIDE EAST COLUMN	8.	2.5m	1.	1.5m	1.
4.	RAILSIDE CURTAIN WALL (NORTH/SOUTH)	9.	3.0m	2.	2.5m	2.
5.	ROADSIDE CURTAIN WALL (NORTH/SOUTH)	9.	10.0m	2.	2.5m	4.
6.	PIER CAP	4.	2x15m 2x1.5m	2.	0.3m	2.

NOTE: ABOVE DETAILS RELATE TO PIER 13 (OTHER PIERS ARE SIMILAR)

NOTES:

1. NEGATIVE CABLE CONNNECTIONS REQUIRED AS PER TABLE.
2. STRUCTURE CONNECTIONS FOR POTENTIAL MONITORING ARE REQUIRED ADJACENT TO EACH REFERNCE CELL INSTALLATION.
3. MAXIMUM ANODE RIBBON SPACING ON CURTAIN WALL TO BE 600mm.
4. ANODE AND REFERENCE ELECTRODE POSITIONS ARE NOMINAL ONLY. ACTUAL POSITIONS ARE TO BE DETERMINED BY SITE ENGINEER DURING CONSTRUCTION.
5. REFERENCE ELECTRODES REQUIRED ON BOTH UPSTREAM AND DOWNSTREAM COLUMNS

NO.	BY	DATE	CHK'D	APPR.	REVISION	DRAWING NO.	REFERENCE DRAWINGS

DESIGNED D.Mc.C. | DRAWN T.C.T. | DATE 26-05-98 | CHECKED | APPR: ENG. PROJ. CLIENT | OFFICE MELBOURNE | SCALE N.T.S.

PREPARED BY WILSON WALTON INTERNATIONAL A.C.N. 054 016 303

CLIENT DEPARTMENT OF TRANSPORT TASMANIA

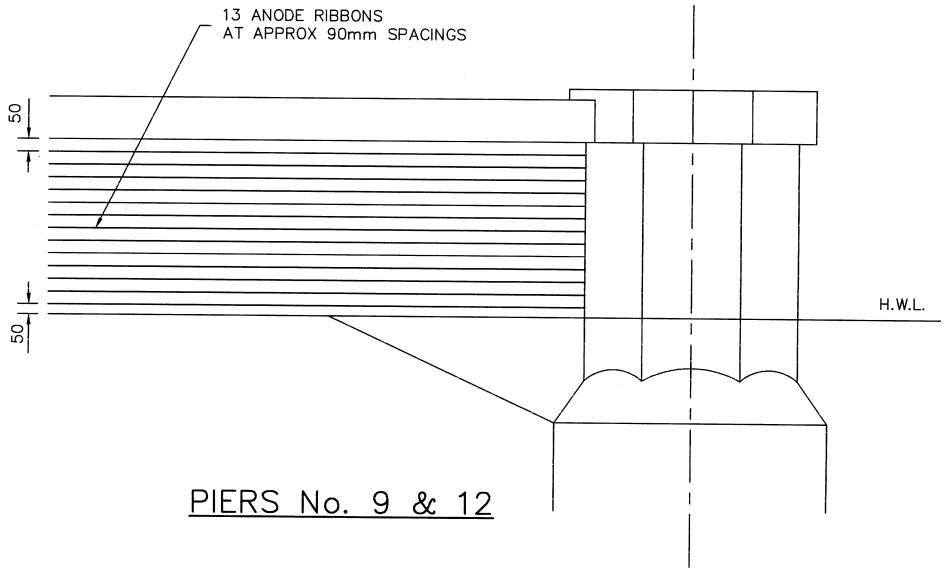
ACCEPTED FOR DoT SIGN: TITLE: DATE:

TITLE CATHODIC PROTECTION & ASSOCIATED WORKS DERWENT RIVER BRIDGE AT BRIDGEWATER
TYPICAL ARRANGEMENT FOR PIERS 1 TO 8 & 13

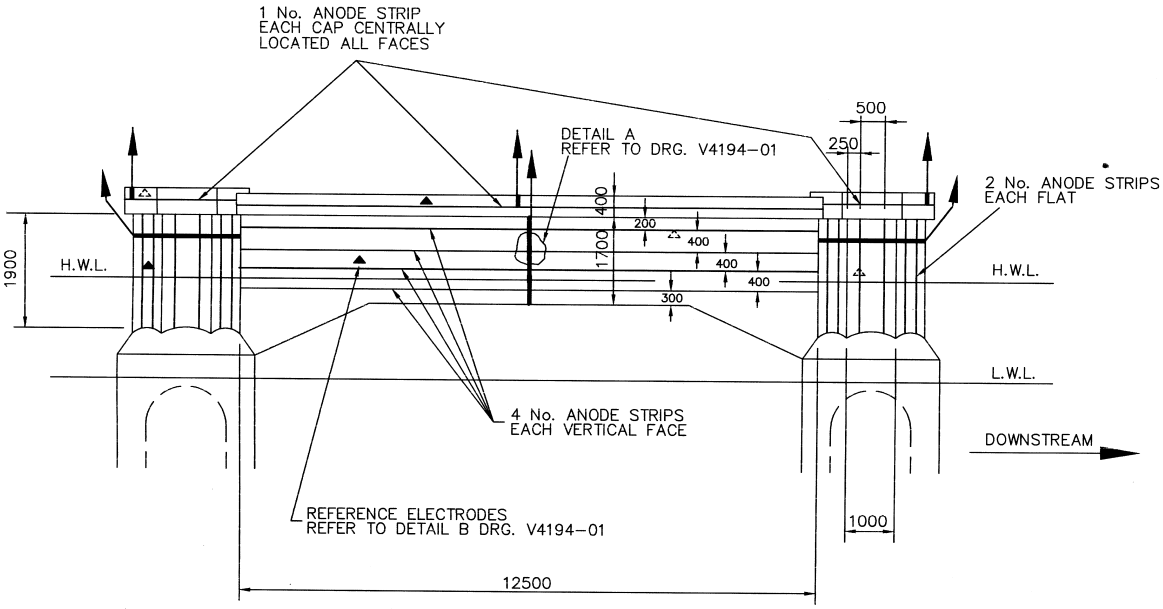
PROJECT NUMBER CONTRACT No 720

DRAWING NUMBER DIER 15 D8-39

REVISION 0



PIERS No. 9 & 12



PIERS No. 10 & 11

PIERS No. 10 & 11 ZONING DETAILS

ZONE No.	DESCRIPTION	TOTAL No. ANODE STRIPS	APPROX. LENGTH EACH ANODE (m)	CONDUCTOR BARS	APPROX. CONDUCT. BAR LENGTH (m)	NEGATIVE CONNECTIONS
1.	RAILSIDE OCTAGONAL CAP	1.	7.3m	1.	0.3m	1.
2.	ROADSIDE OCTAGONAL CAP	1.	7.3m	1.	0.3m	1.
3.	RAILSIDE OCTAGON	14.	2.0m	1.	7.5m	2.
4.	ROADSIDE OCTAGON	14.	2.0m	1.	7.5m	2.
5.	SOUTHSIDE VERTICAL CROSSBEAM FACE	4.	12.5m	1.	2.1m	2.
6.	NORTHSIDE VERTICAL CROSSBEAM FACE	4.	12.5m	1.	2.1m	2.
7.	CROSSBEAM CAP	2.	12.5m	2.	0.3m	2.

PIERS No. 9 & 12 ~~10 & 11~~ ZONING DETAILS

ZONE No.	DESCRIPTION	TOTAL No. ANODE STRIPS	APPROX. LENGTH EACH ANODE (m)	CONDUCTOR BARS	APPROX. CONDUCT. BAR LENGTH (m)	NEGATIVE CONNECTIONS
1.	RAILSIDE OCTAGONAL CAP	1.	7.3m	1.	0.3m	2.
2.	ROADSIDE OCTAGONAL CAP	1.	7.3m	1.	0.3m	2.
3.	RAILSIDE OCTAGON	14.	2.0m	1.	7.5m	2.
4.	ROADSIDE OCTAGON	14.	2.0m	1.	7.5m	2.
5.	SOUTHSIDE VERTICAL CROSSBEAM FACE	13.	12.5m	1.	2.1m	2.
6.	NORTHSIDE VERTICAL CROSSBEAM FACE	13.	12.5m	1.	2.1m	2.
7.	CROSSBEAM CAP	2.	12.5m	2.	0.3m	2.

LEGEND:

- ▲ REFERENCE ELECTRODE
- △ REFERENCE ELECTRODE OPPOSITE SIDE
- ANODE RIBBON
- CONDUCTOR BAR
- CONDUCTOR BAR POSITIVE CABLING TO JUNCTION BOX

NOTES:
1. 2 No. NEGATIVE CABLE CONNNECTIONS FOR EACH ZONE REQUIRED.
2. STRUCTURE CONNECTIONS FOR POTENTIAL MONITORING ARE REQUIRED ADJACENT TO EACH REFERNCE CELL INSTALLATION.
3. ANODE AND REFERENCE ELECTRODE POSITIONS ARE NOMINAL ONLY. ACTUAL POSITIONS ARE TO BE DETERMINED BY SITE ENGINEER DURING CONSTRUCTION.
4. CONDUCTOR BAR FOR EACH OCTAGON AND OCTAGON CAP ARE SEPARATE.
5. FOR PIERS No. 9 & 12 ALL DETAILS ARE AS PER PIERS 10 & 11 EXCEPT ADDITIONAL ANODE RIBBONS ON VERTICAL CROSS BEAM FACES AS SHOWN.

NO.	BY	DATE	CHK'D	APPR.	REVISION	DRAWING NO.	REFERENCE DRAWINGS

DESIGNED D.McC. | DRAWN T.C.T. | DATE 26-05-98 | CHECKED | APPR. ENG. | PROJ. | CLIENT

OFFICE: MELBOURNE
SCALE: N.T.S.

PREPARED BY: WILSON WALTON INTERNATIONAL A.C.N. 054 016 303

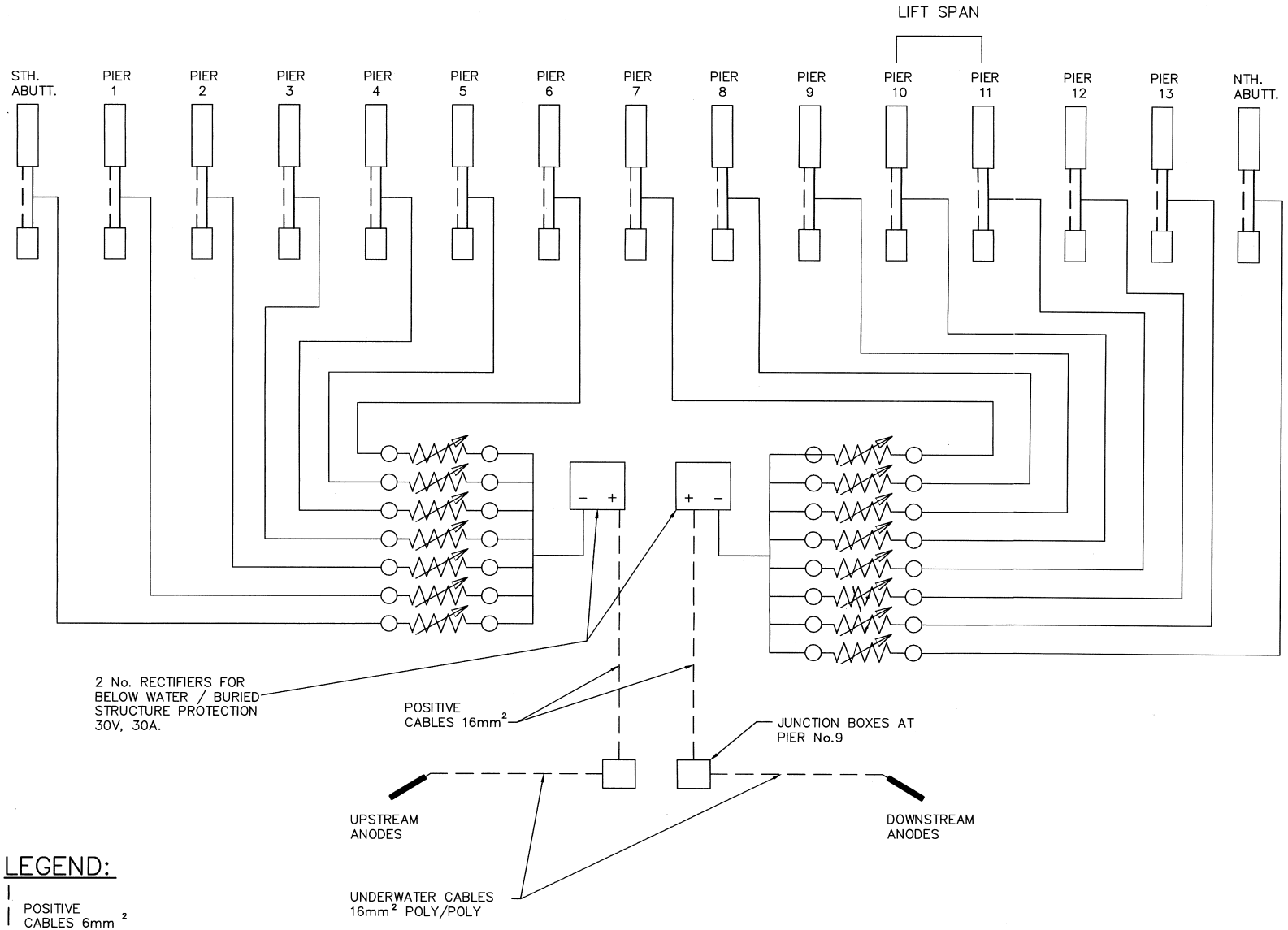
CLIENT: DEPARTMENT OF TRANSPORT TASMANIA
ACCEPTED FOR DoT
SIGNED
TITLE
DATE

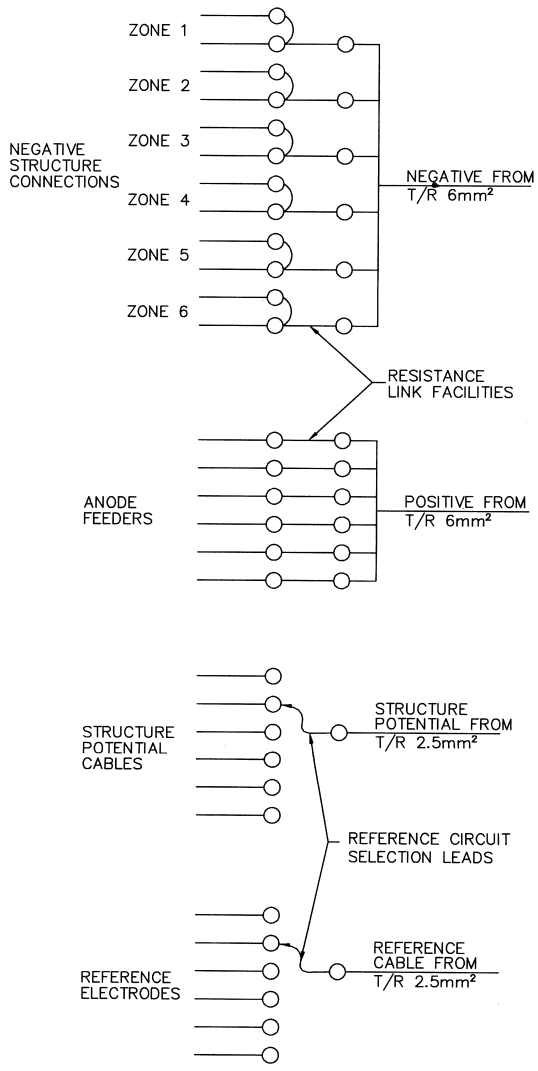
TITLE: CATHODIC PROTECTION & ASSOCIATED WORKS
DERWENT RIVER BRIDGE AT BRIDGEWATER
GENERAL ARRANGEMENT FOR PIERS 9 10 11 & 12

PROJECT NUMBER: CONTRACT No 720

DRAWING NUMBER: DIER 15 D8-40

REVISION: 0





LEGEND:

POSITIVE CABLES 6mm²

NEGATIVE CABLES 6mm²

VARIABLE BALANCE RESISTORS IN BOND BOX ADJACENT RECTIFIER

PIER RECTIFIERS

TYPICAL PIER/ ABUTMENT JUNCTION BOX ARRANGEMENT ABOVE WATER SYSTEM

NOTES:
1. UNDERWATER CABLES TO BE ADEQUATELY WEIGHTED AT INSTALLATION
2. EACH RESISTANCE LINK CIRCUIT TO INCLUDE CURRENT SHUNT IN SERIES
3. WATER SYSTEM ANODES TO BE LOCATED APPROX 50m UPSTREAM AND DOWNSTREAM OF STRUCTURE

NO.	BY	DATE	CHK'D	APPR.	REVISION	DRAWING NO.	REFERENCE DRAWINGS
1	T.C.T	2-6-98			GENERAL REVISIONS		

DESIGNED D.Mc.C. | DRAWN T.C.T. | DATE 26-05-98 | CHECKED | APPR. ENG. / PROJ. / CLIENT

OFFICE: MELBOURNE

SCALE: N.T.S

PREPARED BY: WILSON WALTON INTERNATIONAL
A.C.N. 054 016 303

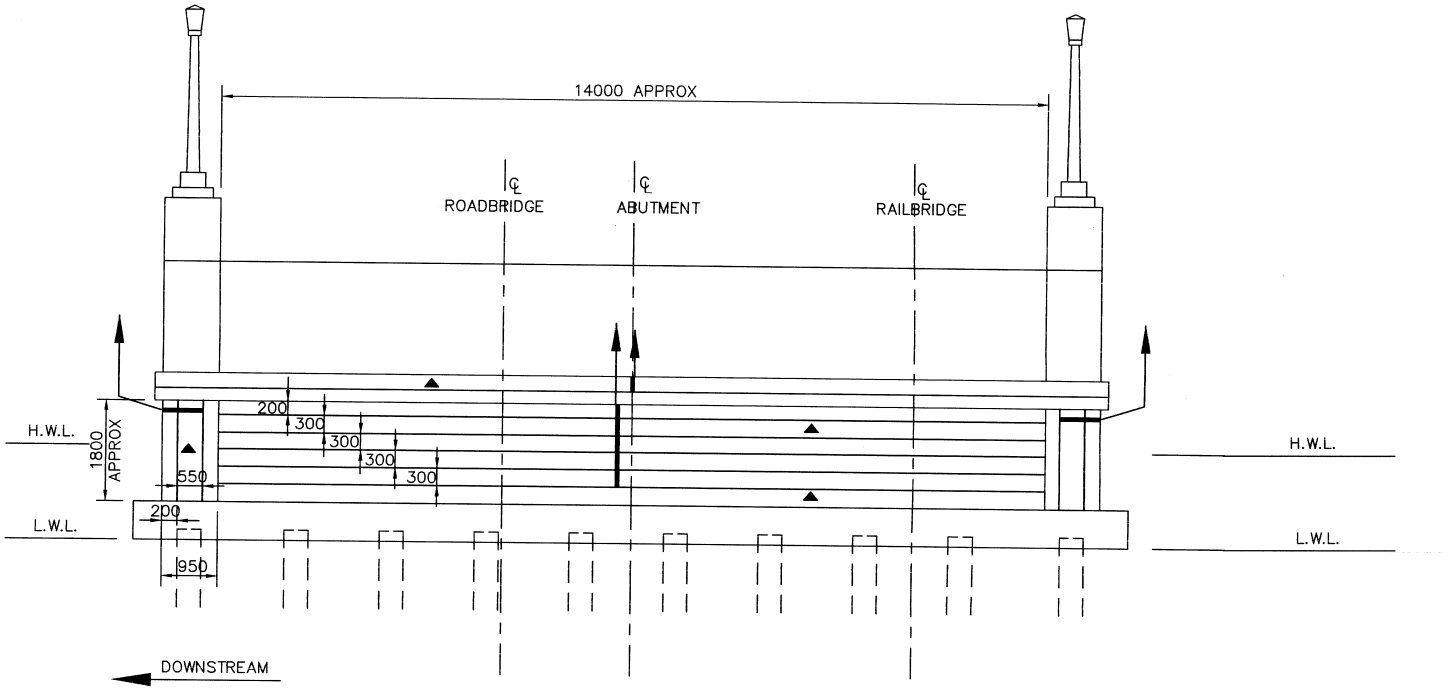
CLIENT: DEPARTMENT OF TRANSPORT TASMANIA
ACCEPTED FOR DoT
SIGNED ____ TITLE ____ DATE ____

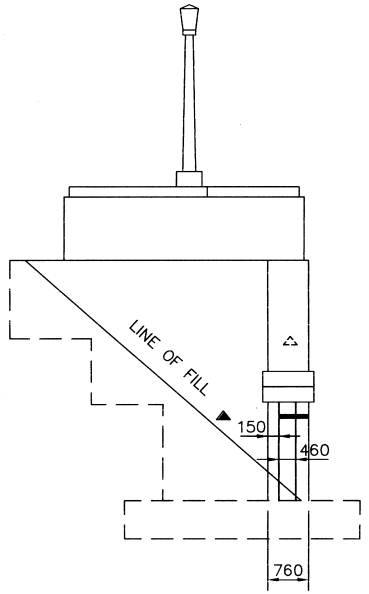
TITLE: CATHODIC PROTECTION & ASSOCIATED WORKS
DERWENT RIVER BRIDGE AT BRIDGEWATER
ELECTRICAL SCHEMATIC OF BELOW WATER/ BURIED STRUCTURE SYSTEM

PROJECT NUMBER: CONTRACT No 720

DRAWING NUMBER: DIER 15 D8-41

REVISION: 1





SOUTH ABUTMENT ZONING DETAILS

ZONE No.	DESCRIPTION	TOTAL No. OF ANODES	APPROX. EACH ANODE LENGTH (m)	CONDUCTOR BARS	APPROX. CONDUCT. BAR LENGTH (m)	NEGATIVE CONNECTIONS
1.	EAST COLUMN	4.	1.8m	1.	1.3m	1.
2.	WEST COLUMN	4.	1.8m	1.	1.3m	1.
3.	CURTAIN WALL	5.	14.0m	1.	1.6m	2.
4.	WALL CAP	1.	16.0m	1.	0.3m	2.

NORTH ABUTMENT ZONING DETAILS

ZONE No.	DESCRIPTION	TOTAL No. ANODE STRIPS	APPROX. EACH ANODE LENGTH (m)	CONDUCTOR BARS	APPROX. CONDUCT. BAR LENGTH (m)	NEGATIVE CONNECTIONS
1.	EAST COLUMN	4.	2.5m	1.	1.3m	1.
2.	WEST COLUMN	4.	2.5m	1.	1.3m	1.
3.	CURTAIN WALL	7.	14.0m	1.	2.3m	2.
4.	WALL CAP	1.	16.0m	1.	0.3m	2.

LEGEND:

- ▲ REFERENCE ELECTRODE
- ⚠ REFERENCE ELECTRODE OPPOSITE SIDE
- ——— ANODE RIBBON
- ═══ CONDUCTOR BAR
- ↑ CONDUCTOR BAR POSITIVE CABLING TO JUNCTION BOX

NOTES:
1. 2 No. NEGATIVE CABLE CONNNECTIONS REQUIRED FOR CURTAIN WALL AND WALL CAP.
2. STRUCTURE CONNECTIONS FOR POTENTIAL MONITORING ARE REQUIRED ADJACENT TO EACH REFERNCE CELL INSTALLATION.
3. ANODE AND REFERENCE ELECTRODE POSITIONS ARE NOMINAL ONLY. ACTUAL POSITIONS ARE TO BE DETERMINED BY SITE ENGINEER DURING CONSTRUCTION.
4. NORTH ABUTMENT SIMILAR BUT REQUIRES ADDITIONAL ANODE STRIPS PER ZONING DETAILS
5. AREAS NOT COVERED BY RIBBON ANODES PROTECTED BY BELOW WATER/ BURIED PROTECTION SYSTEM.

NO.	BY	DATE	CHK'D	APPR.	REVISION	DRAWING NO.	REFERENCE DRAWINGS

DESIGNED D.Mc.C. | DRAWN T.C.T. | DATE 26-05-98 | CHECKED | APPR: ENG. | PROJ. | CLIENT

OFFICE: MELBOURNE
SCALE: N.T.S

PREPARED BY: WILSON WALTON INTERNATIONAL
A.C.N. 054 016 303

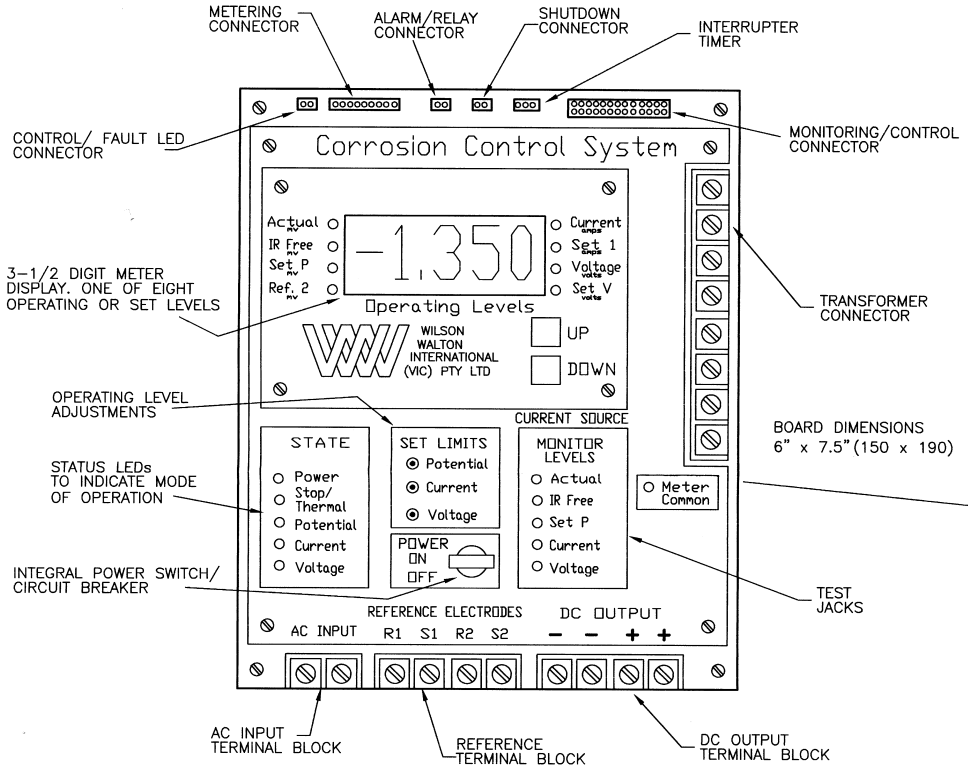
CLIENT: DEPARTMENT OF TRANSPORT TASMANIA
ACCEPTED FOR DoT
SIGNED ____ TITLE ____ DATE ____

TITLE: CATHODIC PROTECTION & ASSOCIATED WORKS
DERWENT RIVER BRIDGE AT BRIDGEWATER
GENERAL ARRANGEMENT FOR ABUTMENTS

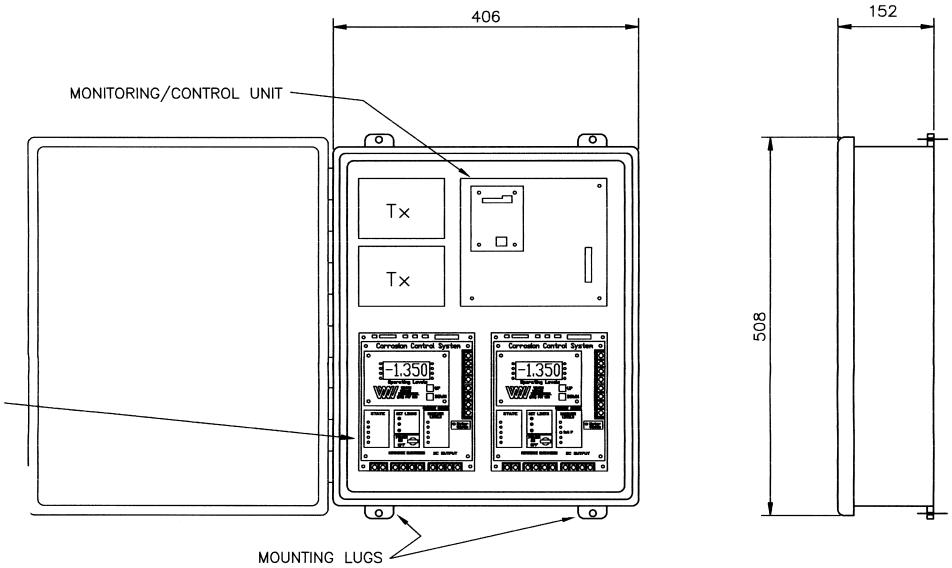
PROJECT NUMBER: CONTRACT No 720

DRAWING NUMBER: DIER 15 D8-42

REVISION: 0



ENCLOSURE NEMA4X (IP66) LOCKABLE



FRONT VIEW

SIDE VIEW

PHASED CURRENT SOURCE RECTIFIER (TYPE PCS2)

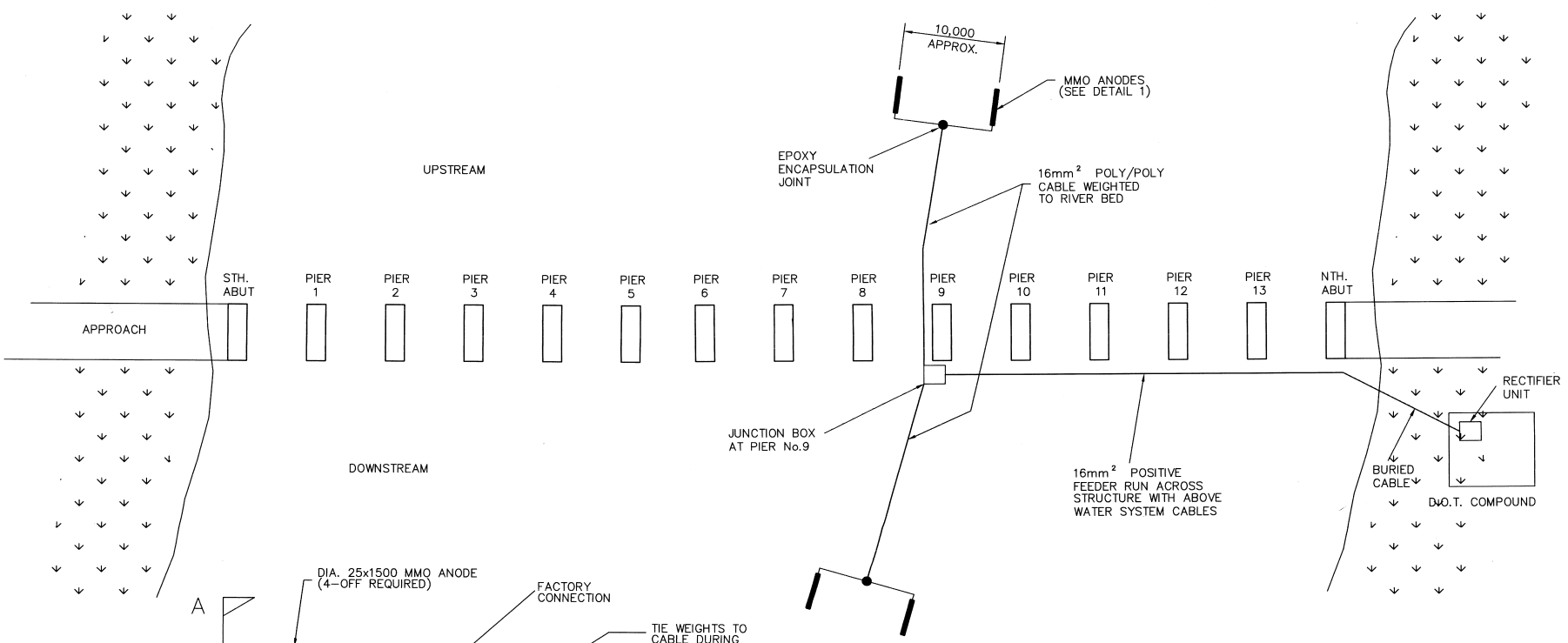
A.C. INPUT– 240V AC 1PH. 50Hz

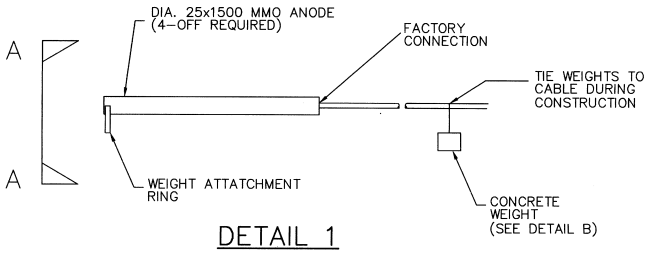
D.C. OUTPUT– 0–24V 0–2 AMPS

NO.	BY	DATE	CHK'D	APPR.	REVISION	DRAWING NO.	REFERENCE DRAWINGS

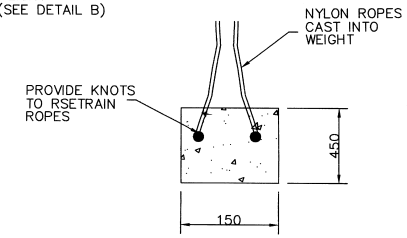
DESIGNED	D.Mc.C.	OFFICE	PREPARED BY
DRAWN	T.C.T.		WILSON WALTON INTERNATIONAL
DATE	26-05-98	MELBOURNE	A.C.N. 054 016 303
CHECKED			
APPR. ENG.		SCALE	MATERIAL DISCLOSED IN THIS DOCUMENT IS CONFIDENTIAL PROPRIETARY INFORMATION AND SHOULD NOT BE COPIED OR REPRODUCED IN ANY FORM OR GIVEN TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION.
APPR. PROJ.		N.T.S	
APPR. CLIENT			

CLIENT	DEPARTMENT OF TRANSPORT TASMANIA
	ACCEPTED FOR DoT
	SIGNED
	TITLE
	DATE
TITLE	CATHODIC PROTECTION & ASSOCIATED WORKS DERWENT RIVER BRIDGE AT BRIDGEWATER
	TYPICAL TRANSFORMER RECTIFIERS DETAILS
PROJECT NUMBER	CONTRACT No 720
DRAWING NUMBER	DIER 15 D8-43
REVISION	0





DETAIL 1



DETAIL B

VIEW A–A

NOTES:
1. ANODE TO STRUCTURE SEPARATION NOMINAL 50m.
2. CABLE WEIGHTS TO BE PROVIDED AT NOMINAL 5000mm CENTRES.
3. EPOXY ENCAPSULATION JOINTS TO BE MADE MINIMUM 24 HOURS PRIOR TO SUBMERSION.
4. REFER TO DRAWING No. V4194–03 FOR ELECTRICAL SCHEMATIC.

DESIGNED D.McC.	OFFICE	PREPARED BY WILSON WALTON INTERNATIONAL A.C.N. 054 016 303	CLIENT DEPARTMENT OF TRANSPORT TASMANIA	TITLE CATHODIC PROTECTION & ASSOCIATED WORKS DERWENT RIVER BRIDGE AT BRIDGEWATER	PROJECT NUMBER	DRAWING NUMBER	REVISION
DRAWN T.C.T.			ACCEPTED FOR DoT	BELOW WATER / BURIED CATHODIC PROTECTION SYSTEM LAYOUT	CONTRACT No 720	DIER 15 D8-44	0
DATE 26-05-98	MELBOURNE		SIGNED				
CHECKED			TITLE				
ENG.	SCALE		DATE				
PROJ.							

Department of Main Roads,
Tasmania

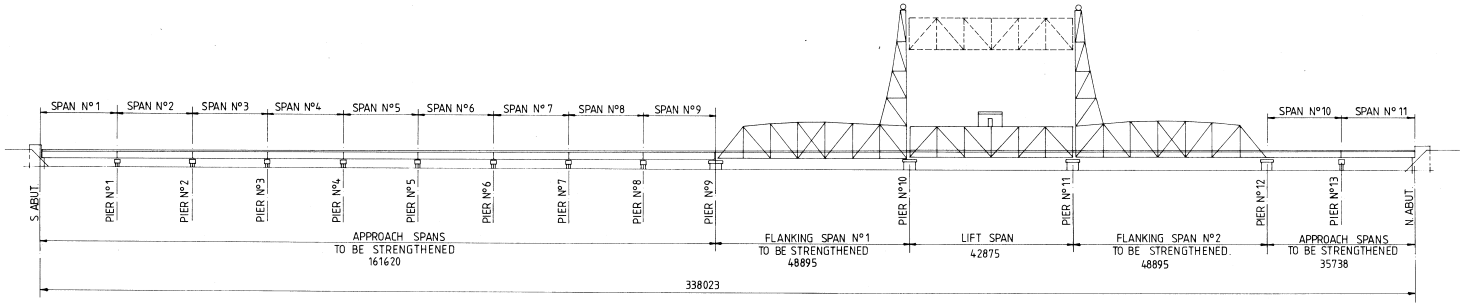
Derwent River Bridge at Bridgewater - Strengthening

Drawings

MAUNSELL

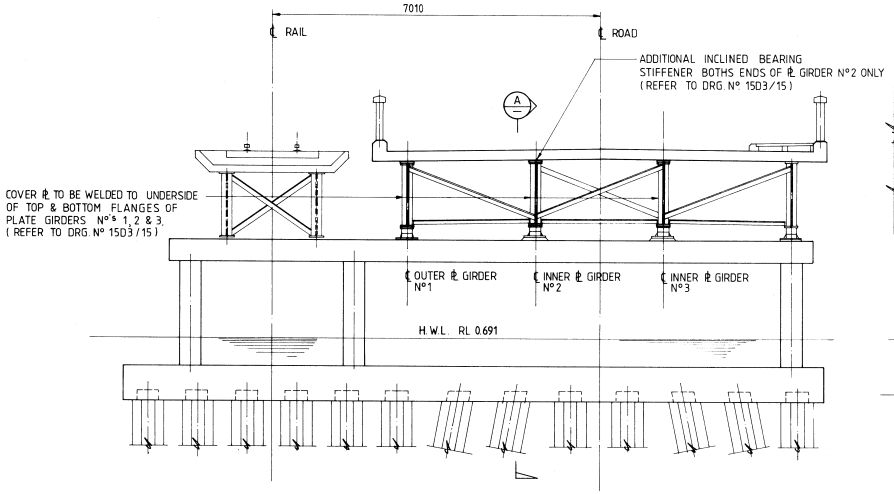
Maunsell & Partners Pty Ltd
Consulting Engineers & Planners

June 1987

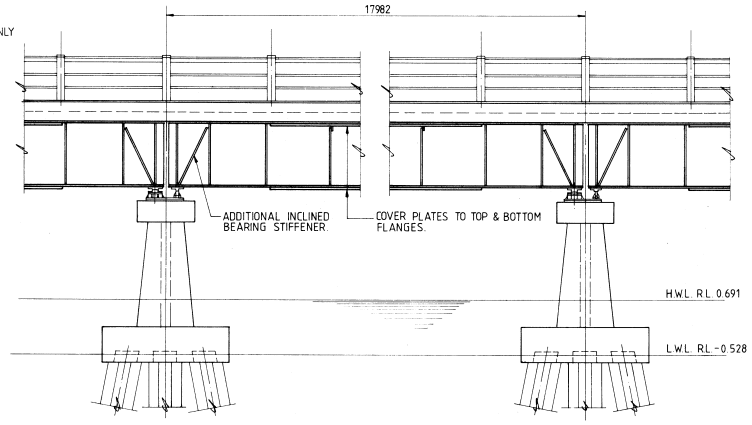


GENERAL ARRANGEMENT.
N.T.S.

DRAWING LIST	
DRG N°.	TITLE
15D3 / 14	EXTENT OF STRENGTHENING FOR TYPICAL APPROACH SPAN
15D3 / 15	APPROACH SPAN STRENGTHENING — DETAILS
15D3 / 16	APPROACH SPAN UNLOADING FRAME



APPROACH SPAN — TYPICAL CROSS SECTION



NOTE: BRACING OMITTED FOR CLARITY.

SECTION A

GENERAL NOTES

STRUCTURAL STEEL.

1. ALL STRENGTHENING STEEL TO BE GRADE 250LO.
2. ALL TEMPORARY WORKS STEEL TO BE GRADE 250.

WELDING.

1. ALL WELDING TO BE S.P. CATEGORY IN ACCORDANCE WITH AS1554, PART 1.
2. ALL ELECTRODES FOR FILLET WELDS TO BE E48XX.
3. ALL FULL PENETRATION BUTT WELDS TO DEVELOP THE FULL STRENGTH OF 250LO STEEL.
4. ALL FILLET WELDS TO BE 6mm. U.N.O.

DIMENSIONS.

1. ALL KEY DIMENSIONS TO BE CHECKED ON SITE PRIOR TO STEEL FABRICATION COMMENCING.

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS

MAUNSELL DRAWING No. 17687—1001

DATE	AMENDMENTS	APPROVED

REFERENCE DRAWINGS

SCALES

LOADING T44

	DESIGN	DRAWING
PREPARED	R.I.P.	R.P.O'NEIL
CHECKED	B.K. Hollard	R.I.P.
SUPERVISED	R.I.P.	

LOCATION: MIDLAND HIGHWAY BRIDGEWATER

RECOMMENDED: DIVISION ENGINEER BRIDGES 4/4/97

ACCEPTED: ASSISTANT DIRECTOR 4.6.97

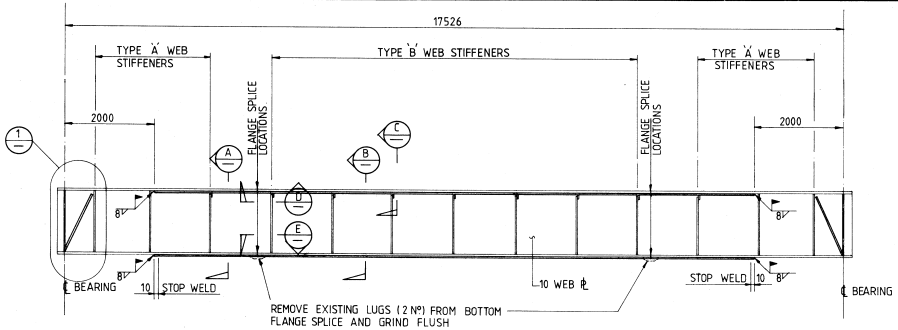
CONTRACT NUMBER

DEPARTMENT OF MAIN ROADS, TASMANIA

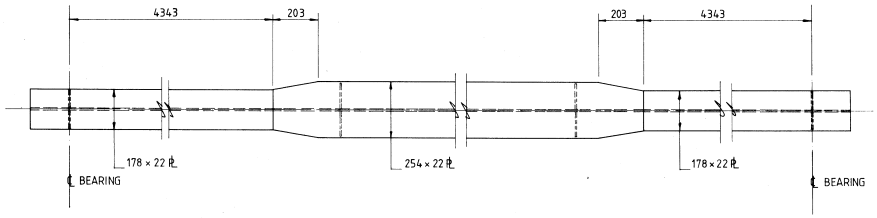
DERWENT RIVER BRIDGE
EXTENT OF STRENGTHENING FOR TYPICAL APPROACH SPAN

BRIDGE NUMBER 15D3

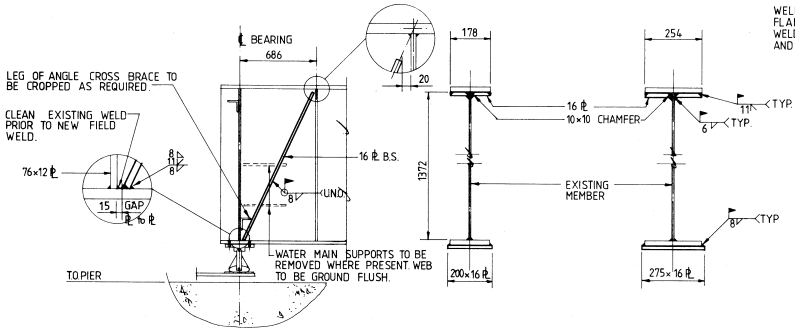
SHEET NUMBER 14



ELEVATION – APPROACH SPAN PLATE GIRDER STRENGTHENING (FOR LOCATIONS REFER DRG. Nº 15D3/14)
1:50 (BRACING OMITTED FOR CLARITY.)



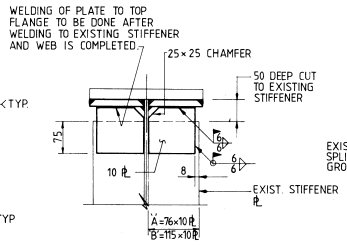
PLAN : EXISTING TOP FLANGE
1:10 BOTTOM FLANGE SIMILAR



DETAIL 1
1:20

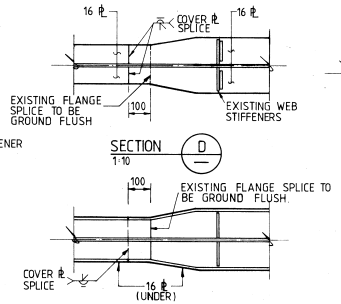
SECTION A
1:10

SECTION B
1:10



SECTION C
1:5

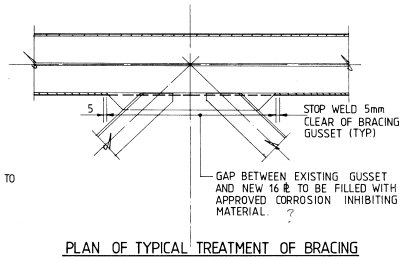
TYPICAL WEB STIFFENER REINSTATEMENT



SECTION D
1:10

NOTE: ALL WELDS TO BE GROUND IN LONGITUDINAL DIRECTION.

SECTION E
1:10



PLAN OF TYPICAL TREATMENT OF BRACING GUSSET (BOTTOM FLANGE)
(FOR LOCATION REFER TO DRG.Nº 15D3/1)

NOTES:

1. FOR GENERAL NOTES REFER TO DRAWING Nº 15D3/14.

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS

MAUNSELL DRAWING No. 17687—1002

DATE	AMENDMENTS	APPROVED

REFERENCE DRAWINGS

SCALES

LOADING T44

	DESIGN	DRAWING
PREPARED		
CHECKED		
SUPERVISED		

LOCATION: MIDLAND HIGHWAY BRIDGEWATER

RECOMMENDED: DIVISION ENGINEER BRIDGES 6/6/87

ACCEPTED: ASSISTANT DIRECTOR 9.6.87

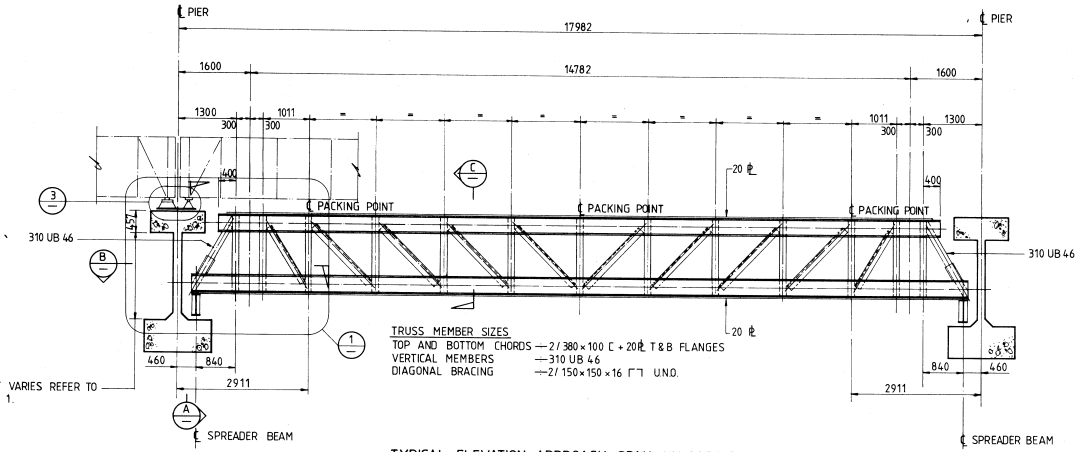
CONTRACT NUMBER

DEPARTMENT OF MAIN ROADS, TASMANIA

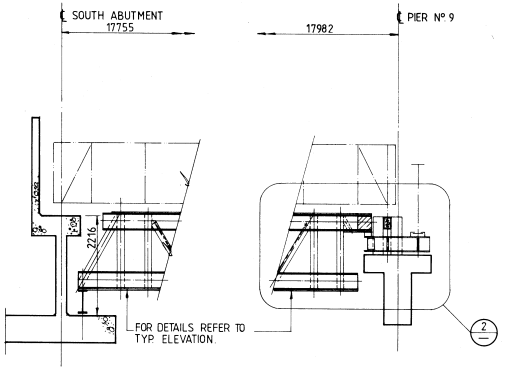
DERWENT RIVER BRIDGE
APPROACH SPAN STRENGTHENING—DETAILS

BRIDGE NUMBER 15D3

SHEET NUMBER 15



TYPICAL ELEVATION APPROACH SPAN UNLOADING FRAME
1·50

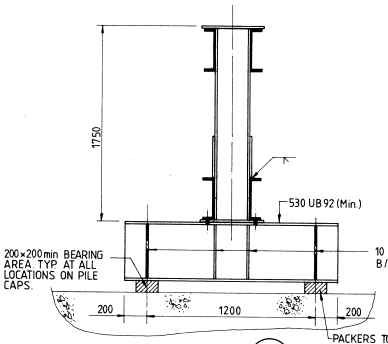


PART ELEVATION SOUTH ABUTMENT
1·50

NOTE: PIER Nº 12 SIMILAR

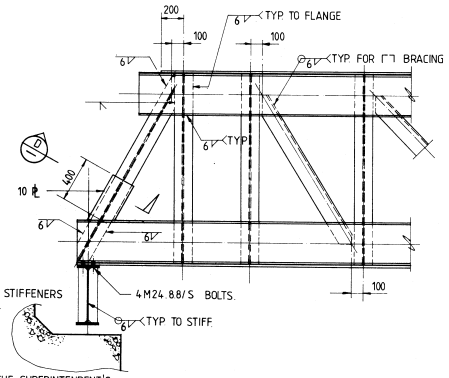
PART ELEVATION PIER Nº 9
1·50

PART ELEVATION NORTH ABUTMENT
1·50

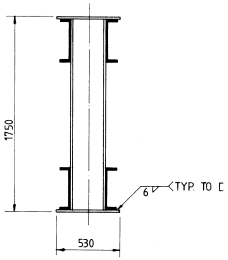


SECTION A
1·20

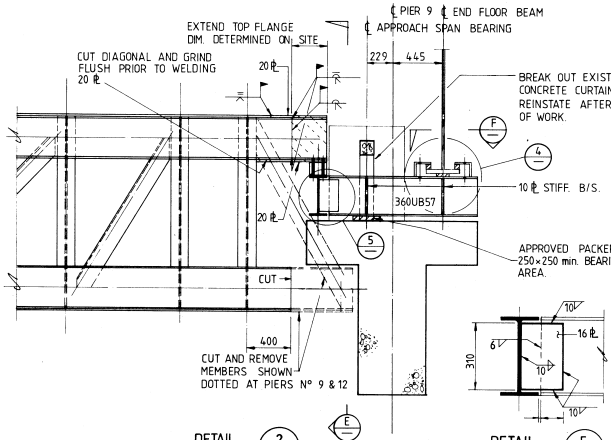
MAX. LOADS : 110 KN / BEARING (VERT.)
5 KN / BEARING (HORIZ)



DETAIL 1
1·20

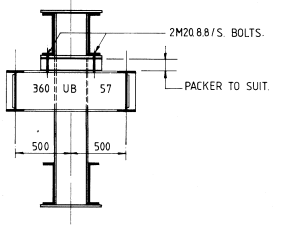


SECTION C
1·20



DETAIL 2
1·20

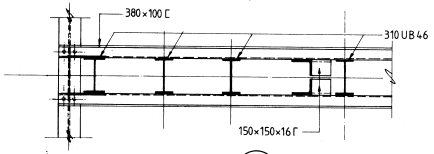
DETAIL 5
1·10



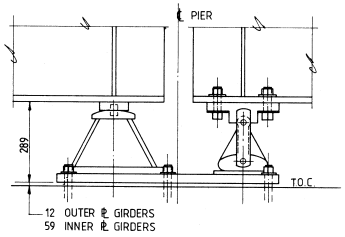
SECTION E
1·20

TABLE 1	
PIER Nº	HEIGHT OF WALL
1	1892
2	2019
3	2137
4	2235
5	2331
6	2410
7	2483
8	2543
13	2543

SECTION D
1·20

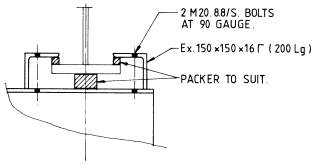


SECTION B
1·20

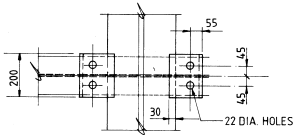


DETAIL 3
N.T.S.

TYP. ASSEMBLY OF BEARINGS ON PIERS 1 to 8 & 13



DETAIL 4



SECTION F

NOTES :

1. FOR GENERAL NOTES REFER TO DRG. Nº 1503 / 14.
2. MINIMUM JACK CAPACITY TO BE 400 KN.
3. JACKS SHALL BE LOCATED BETWEEN THE PACKING POINT AND THE CLOSEST TRANSVERSE WEB STIFFENER OF THE EXISTING ℄ GIRDER.
4. MAXIMUM ECCENTRICITY OF THE JACKS FROM THE ℄ OF THE PACKING POINT SHALL BE 200 mm.
5. ALL JACKS AND PACKS ARE TO BE POSITIONED CENTRALLY BELOW ℄ GIRDER WEB.
6. JACKS TO BE SYNCHRONISED TO ENSURE EQUAL LOADING DURING JACKING OPERATIONS BY HYDRAULIC LINKING OR OTHER APPROVED METHOD.
7. LOAD PER JACK PRIOR TO PACKING TO BE AS FOLLOWS — INNER ℄ GIRDERS (Nº's 2 & 3) 100 KN.
   OUTER ℄ GIRDER (Nº 1) 85 KN.
8. MINIMUM BEARING AREA OF JACKS AND PACKERS ON BOTTOM FLANGE OF ℄ GIRDERS TO BE 150mm x 150mm
9. METHOD OF PACKING AT GIRDER PACKING LOCATIONS AND LOCATION OF JACKING POINTS SHALL BE TO THE APPROVAL OF THE SUPERINTENDENT.

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS
MAUNSELL DRAWING No. 17687 — 1003

DATE	AMENDMENTS	APPROVED

REFERENCE DRAWINGS

SCALES

LOADING	DESIGN	DRAWING
T44		
PREPARED	Geoff Holland	R Rowden
CHECKED	RP Boulden	JH
SUPERVISED		

LOCATION: MIDLAND HIGHWAY BRIDGEWATER

CONTRACT NUMBER

RECOMMENDED: N Whicker 6/4/87 — DIVISION ENGINEER BRIDGES

ACCEPTED: 6.4.87 — ASSISTANT DIRECTOR

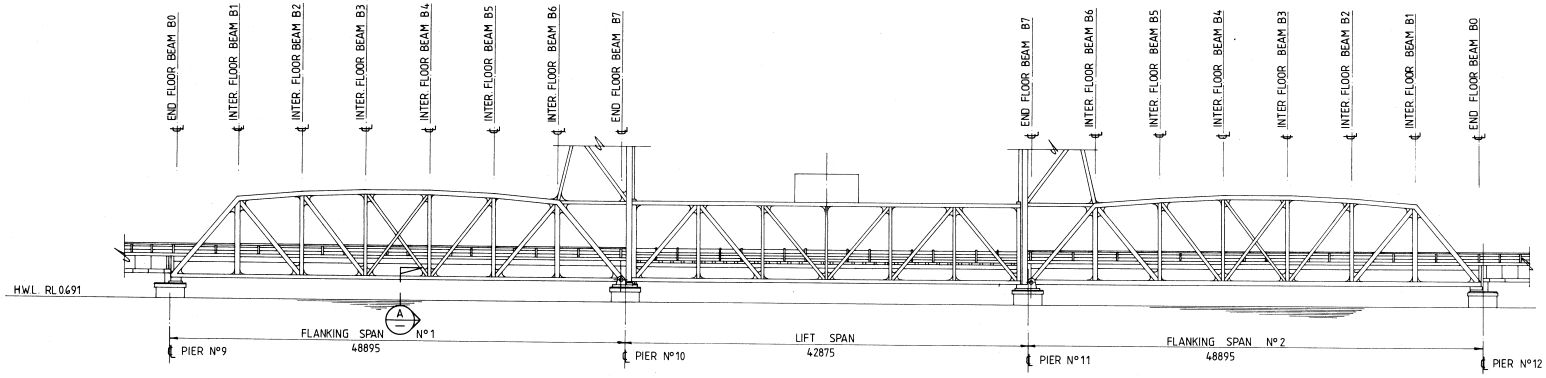
DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE

APPROACH SPAN UNLOADING FRAME

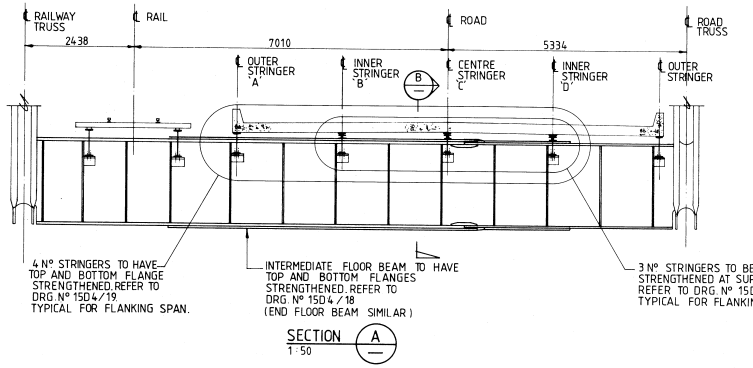
BRIDGE NUMBER 1503

SHEET NUMBER 16

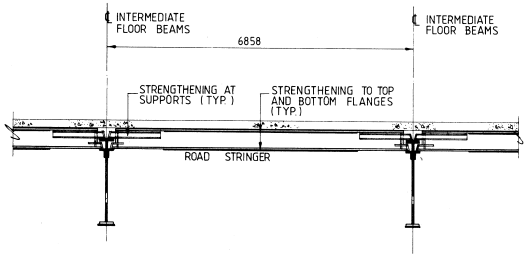


LIFTING AND FLANKING SPAN — GENERAL ARRANGEMENT
N.T.S.

DRAWING LIST	
DRG. N°.	TITLE
15D4/17	EXTENT OF STRENGTHENING FOR FLANKING SPANS.
15D4/18	FLOOR BEAMS : DETAILS OF STRENGTHENING.
15D4/19	STRINGERS : DETAILS OF STRENGTHENING.
15D4/20	FLANKING SPAN UNLOADING OF FLOOR BEAMS.
15D4/21	FLANKING SPAN STRINGER UNLOADING FRAME



SECTION A
1:50



SECTION B
1:50

TYP. ROAD STRINGER ARRANGEMENT

GENERAL NOTES:

STRUCTURAL STEEL
1. ALL STRENGTHENING STEEL TO BE GRADE 250L0
2. ALL TEMPORARY WORKS STEEL TO BE GRADE 250

WELDING
1. ALL WELDING TO BE S.P. CATEGORY IN ACCORDANCE WITH AS1554, PART 1
2. ALL ELECTRODES FOR FILLET WELDS TO BE E48XX
3. ALL FULL PENETRATION BUTT WELDS TO DEVELOP THE FULL STRENGTH OF 250L0 STEEL
4. ALL FILLET WELDS TO BE 6mm U.N.O.

DIMENSIONS
1. ALL KEY DIMENSIONS TO BE CHECKED ON SITE PRIOR TO STEEL FABRICATION COMMENCING

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS
MAUNSELL DRAWING No. 17687—1004

DATE	AMENDMENTS	APPROVED

REFERENCE DRAWINGS

SCALES: LOADING T44

	DESIGN	DRAWING
PREPARED		
CHECKED		
SUPERVISED		

LOCATION: MIDLAND HIGHWAY BRIDGEWATER

RECOMMENDED: DIVISION ENGINEER BRIDGES 4/6/87

ACCEPTED: ASSISTANT DIRECTOR

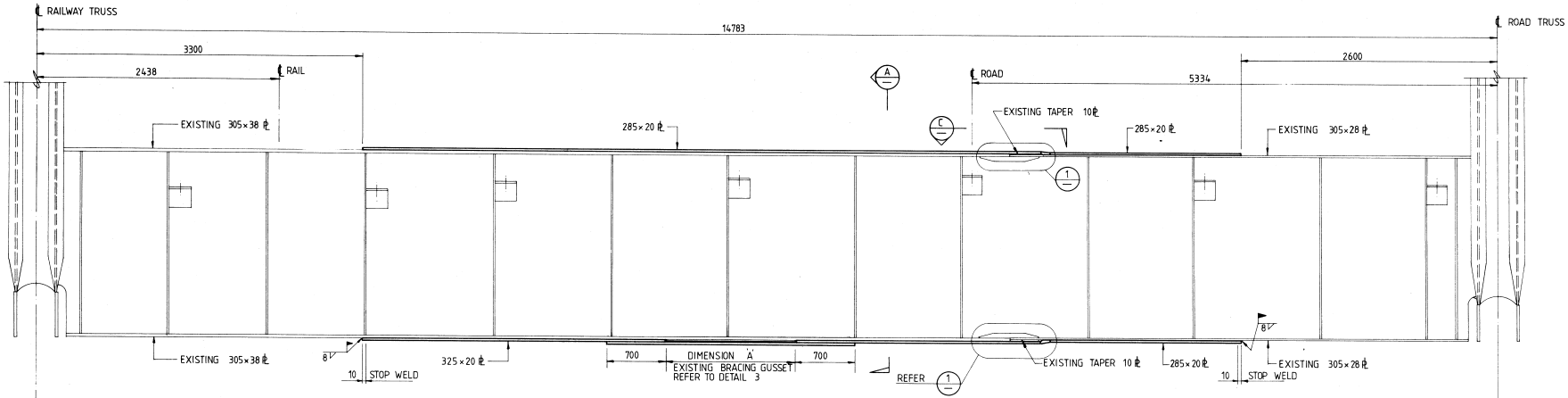
CONTRACT NUMBER

DEPARTMENT OF MAIN ROADS, TASMANIA

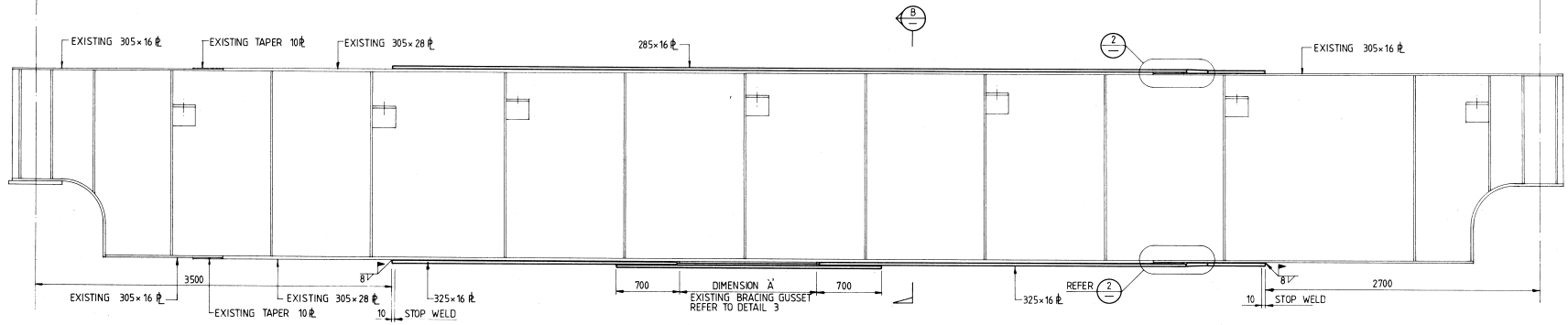
DERWENT RIVER BRIDGE
EXTENT OF STRENGTHENING FOR FLANKING SPANS

BRIDGE NUMBER 15D4

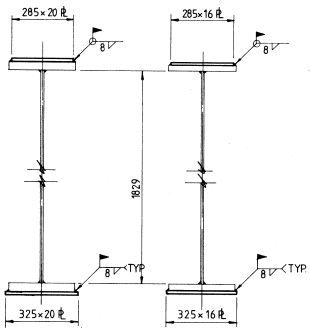
SHEET NUMBER 17



ELEVATION : FLANKING SPANS INTERMEDIATE FLOOR BEAM STRENGTHENING
1:20
(N°S B1 to B6)

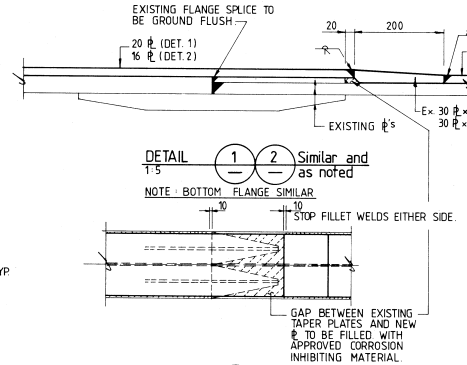


ELEVATION : FLANKING SPANS END FLOOR BEAM STRENGTHENING
1:20
(N°S B0 & B7)

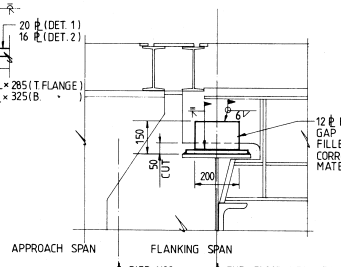


SECTION A
1:10

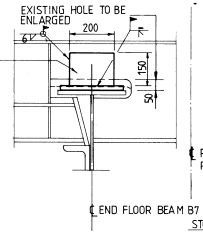
SECTION B
1:10



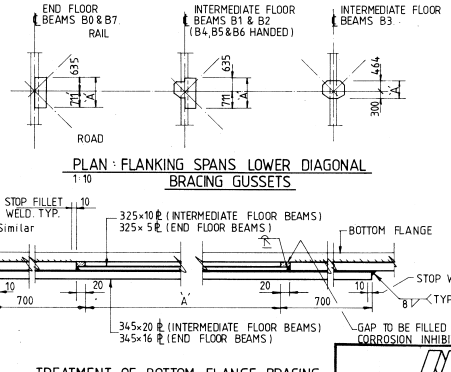
PLAN ON C
1:10



TREATMENT OF ROADWAY STRINGERS AT END FLOOR BEAM B0 LOCATIONS.
1:10



TREATMENT OF ROADWAY STRINGERS AT END FLOOR BEAM B7 LOCATIONS.
1:10



PLAN : FLANKING SPANS LOWER DIAGONAL BRACING GUSSETS
1:10

TREATMENT OF BOTTOM FLANGE BRACING GUSSET.

DETAIL 3
1:5

NOTES:
1. FOR GENERAL NOTES REFER TO DRG. 15D4 / 17

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS
MAUNSELL DRAWING No.
17687—1005

DATE	AMENDMENTS	APPROVED	REFERENCE DRAWINGS	SCALES	LOADING T44	DESIGN	DRAWING	
					PREPARED			
					CHECKED			
					SUPERVISED			

LOCATION: MIDLAND HIGHWAY BRIDGEWATER
CONTRACT NUMBER
RECOMMENDED: DIVISION ENGINEER BRIDGES 4/4/97
ACCEPTED: ASSISTANT DIRECTOR 4.4.97

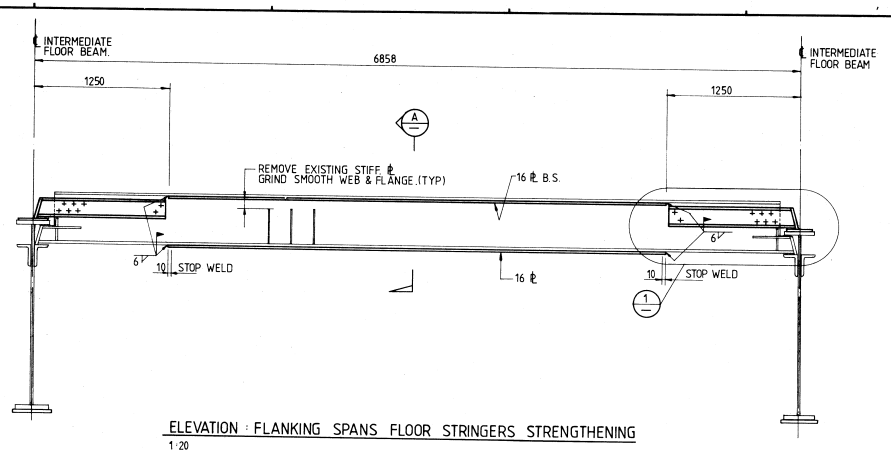
DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE

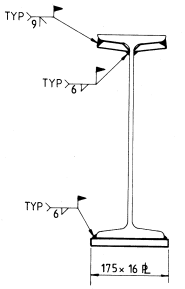
FLOOR BEAMS : DETAILS OF STRENGTHENING

BRIDGE NUMBER 15D4

SHEET NUMBER 18

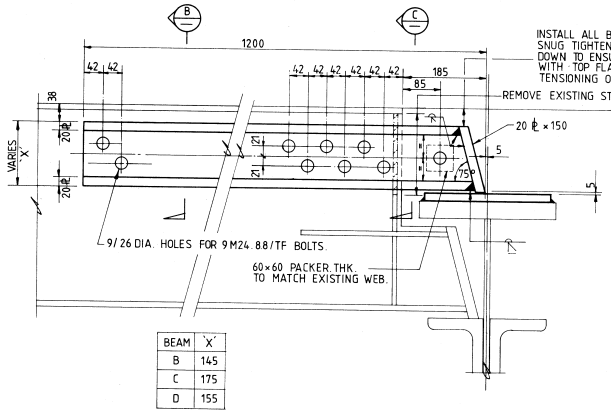


ELEVATION : FLANKING SPANS FLOOR STRINGERS STRENGTHENING
1:20



SECTION A
1:5

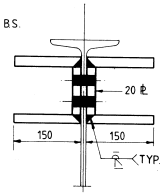
STRENGTHENING FOR STRINGERS A,B,C & D.
REFER DRG.N° 15D4/17



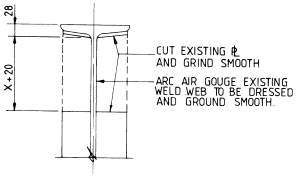
BEAM	'X'
B	145
C	175
D	155

DETAIL 1
1:5

STRENGTHENING FOR STRINGERS B,C & D.
APPLIES AT ALL INTERMEDIATE FLOOR BEAM LOCATIONS. REFER TO DRG. N°15D4/17



SECTION B
1:5



SECTION C
1:5

REMOVAL OF EXISTING STIFFENER

NOTES:

1. FOR GENERAL NOTES REFER TO DRAWING N° 15D4/17
2. ALL CONTACT SURFACES TO BE FASTENED WITH FRICTION GRIP BOLTS TO BE PREPARED AS DETAILED IN THE SPECIFICATION.

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS

MAUNSELL DRAWING No. 17687—1006

DATE	AMENDMENTS	APPROVED

REFERENCE DRAWINGS

SCALES

LOADING T44

	DESIGN	DRAWING
PREPARED	RP	R Rennell
CHECKED	Peter Holland	
SUPERVISED		

LOCATION: MIDLAND HIGHWAY BRIDGEWATER

RECOMMENDED: DIVISION ENGINEER BRIDGES 4/6/87

ACCEPTED: ASSISTANT DIRECTOR

CONTRACT NUMBER

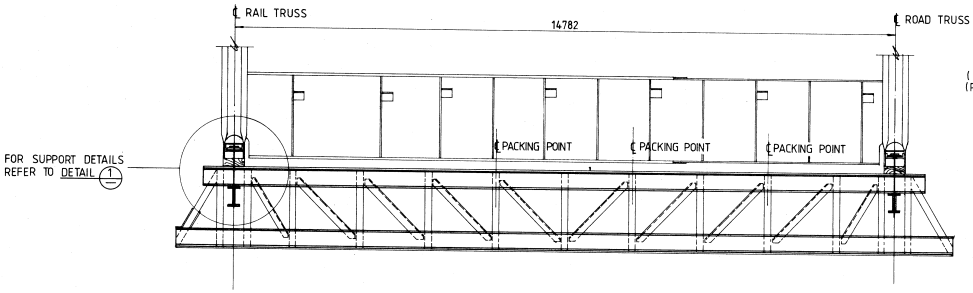
DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE

STRINGERS : DETAILS OF STRENGTHENING

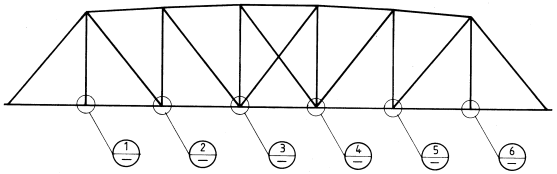
BRIDGE NUMBER 15D4

SHEET NUMBER 19

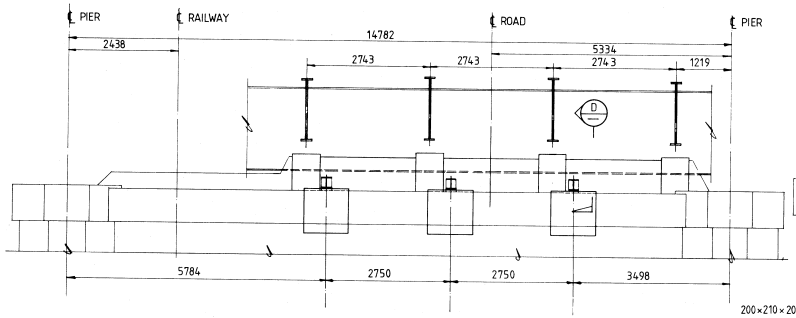


TYPICAL ELEVATION UNLOADING FRAME
INTERMEDIATE FLOOR BEAMS (FLANKING SPANS)

NOTE: FOR DETAILS OF FRAME REFER TO DRG. N° 15D3/16
FOR DETAILS OF FLOOR BEAMS REFER TO DRG. N° 15D4/18

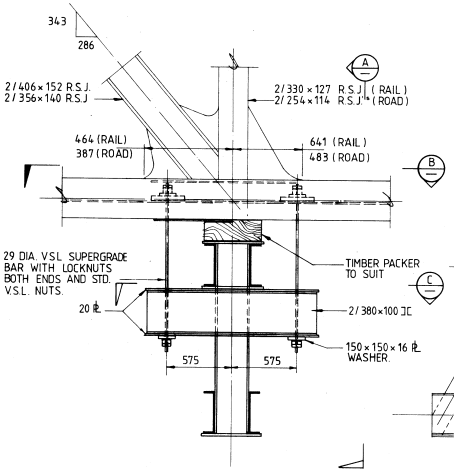


ELEVATION FLANKING SPAN RAIL TRUSS (ROAD SIMILAR)

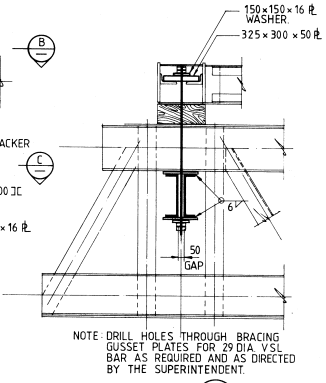


ELEVATION UNLOADING FRAME
END FLOOR BEAM PIER N°9 (FLANKING SPAN)

NOTE: FOR DETAILS OF FLOOR BEAMS REFER TO DRG. N° 15D4/18.
ARRANGEMENT AT PIERS 10 11 & 12 SIMILAR.

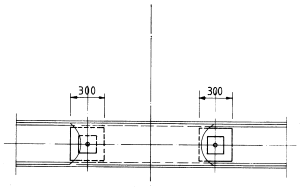


DETAIL 2 5 Similar



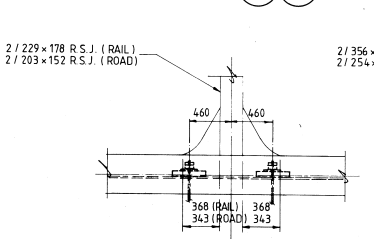
NOTE: DRILL HOLES THROUGH BRACING GUSSET PLATES FOR 29 DIA. V.S.L. BAR AS REQUIRED AND AS DIRECTED BY THE SUPERINTENDENT.

SECTION A



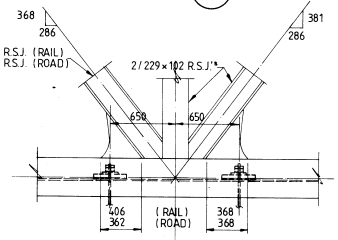
NOTE: VERTICAL MEMBERS NOT SHOWN.

SECTION B



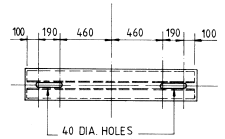
FOR ALL DETAILS REFER DETAIL 2 U.N.O.

DETAIL 1 6 Similar

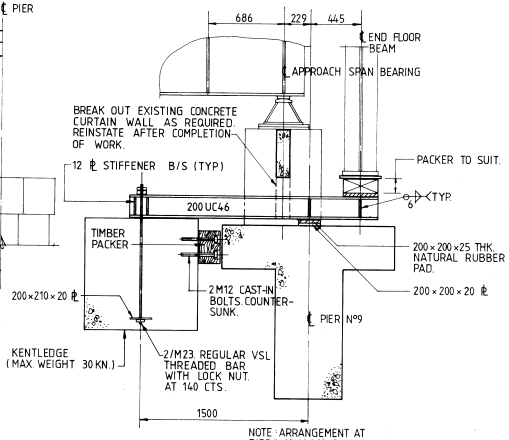


FOR ALL DETAILS REFER DETAIL 2 U.N.O.

DETAIL 3 4 Similar



SECTION C



NOTE: ARRANGEMENT AT PIERS 10 11 & 12 SIMILAR.

SECTION D

NOTE: RUBBER PADS TO HAVE A MAX. COMPRESSIVE STIFFNESS OF 400 KN/mm/metre length.

NOTES.

GENERAL.

1. FOR GENERAL NOTES REFER TO DRAWING N°15D4/17
2. JACKS SHALL BE SYNCHRONISED TO ENSURE EQUAL LOADING DURING JACKING OPERATIONS BY HYDRAULIC LINKING OR OTHER APPROVED METHODS.
3. ALL JACKS AND PACKS ARE TO BE PLACED CENTRALLY BELOW ℄ GIRDER WEBS.
4. METHODS OF PACKING AND LOCATION OF JACKING POINTS SHALL BE TO THE APPROVAL OF THE SUPERINTENDENT.
5. MINIMUM BEARING AREA OF JACKS AND PACKS SHALL BE 250mm × 250mm.

INTERMEDIATE FLOOR BEAMS.

1. JACKS SHALL BE LOCATED BETWEEN THE PACKING POINT AND THE CLOSEST TRANSVERSE WEB STIFFENER OF THE EXISTING PLATE GIRDER.
2. THE MAXIMUM ECCENTRICITY OF JACKS FROM THE ℄ OF THE PACKING POINT SHALL BE 200mm.
3. MINIMUM JACK CAPACITY 650 KN.
4. LOADS PER JACK PRIOR TO PACKING TO BE 200 KN.
5. VSL STRESSING BARS TO BE TENSIONED TO 300 KN. PRIOR TO JACKING OPERATION.

Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS

MAUNSELL DRAWING No. 17687—1007

DATE	AMENDMENTS	APPROVED

REFERENCE DRAWINGS

SCALES

LOADING T44

	DESIGN	DRAWING
PREPARED		
CHECKED		
SUPERVISED		

LOCATION: MIDLAND HIGHWAY BRIDGEWATER

CONTRACT NUMBER

RECOMMENDED: DIVISION ENGINEER BRIDGES 4/4/89

ACCEPTED: ASSISTANT DIRECTOR 4.4.89

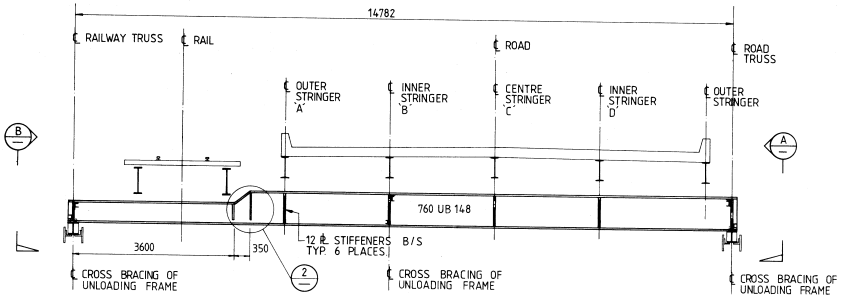
DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE

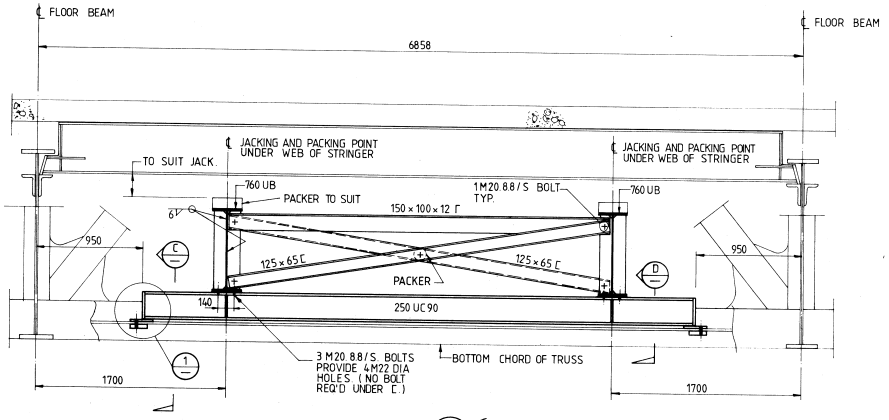
FLANKING SPAN UNLOADING OF FLOOR BEAMS.

BRIDGE NUMBER 15D4

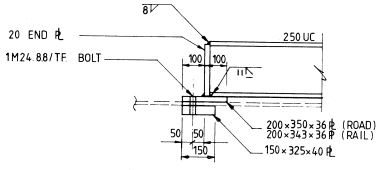
SHEET NUMBER 20



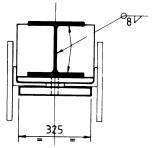
TYPICAL ELEVATION: FLANKING SPAN STRINGER UNLOADING FRAME
1:50 ROAD/RAIL TRUSS DETAILS OMITTED FOR CLARITY.



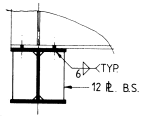
ELEVATION A B Similar
1:20



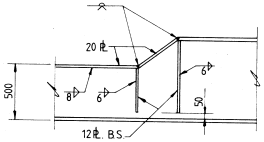
DETAIL 1
1:10



SECTION C
1:10



SECTION D
1:10
(SHOWING STIFFENER ONLY)



DETAIL 2
1:20

NOTES:

1. FOR GENERAL NOTES REFER TO DRAWING Nº 15D4/17.
2. MINIMUM JACK CAPACITY SHALL BE 100 KN.
3. JACKS SHALL BE SYNCHRONISED TO ENSURE EQUAL LOADING DURING JACKING OPERATIONS BY HYDRAULIC LINKING OR OTHER APPROVED METHOD.
4. LOAD PER JACK PRIOR TO PACKING SHALL BE AS FOLLOWS
   STRINGER 'A' — 25 KN.
   STRINGER B, C & D — 43 KN.
5. METHOD OF PACKING AT STRINGER PACKING LOCATIONS AND LOCATIONS OF JACKING POINTS SHALL BE TO THE APPROVAL OF THE SUPERINTENDENT.
6. ONLY ONE STRINGER TO BE SUPPORTED ON UNLOADING FRAME AT ANY TIME.
7. MINIMUM BEARING AREA OF JACKS AND PACKS ON BOTTOM FLANGE FLANGE OF STRINGER 150 mm x 150 mm.

MAUNSELL
Maunsell & Partners Pty Ltd
CONSULTING ENGINEERS & PLANNERS

MAUNSELL DRAWING No. 17687 – 1008

DATE	AMENDMENTS	APPROVED

REFERENCE DRAWINGS

SCALES

LOADING T44

	DESIGN	DRAWING
PREPARED		R Rovera
CHECKED		
SUPERVISED		

LOCATION: MIDLAND HIGHWAY BRIDGEWATER

CONTRACT NUMBER

RECOMMENDED: DIVISION ENGINEER BRIDGES 6/6/17

ACCEPTED: ASSISTANT DIRECTOR 9/6/17

DEPARTMENT OF MAIN ROADS, TASMANIA

DERWENT RIVER BRIDGE

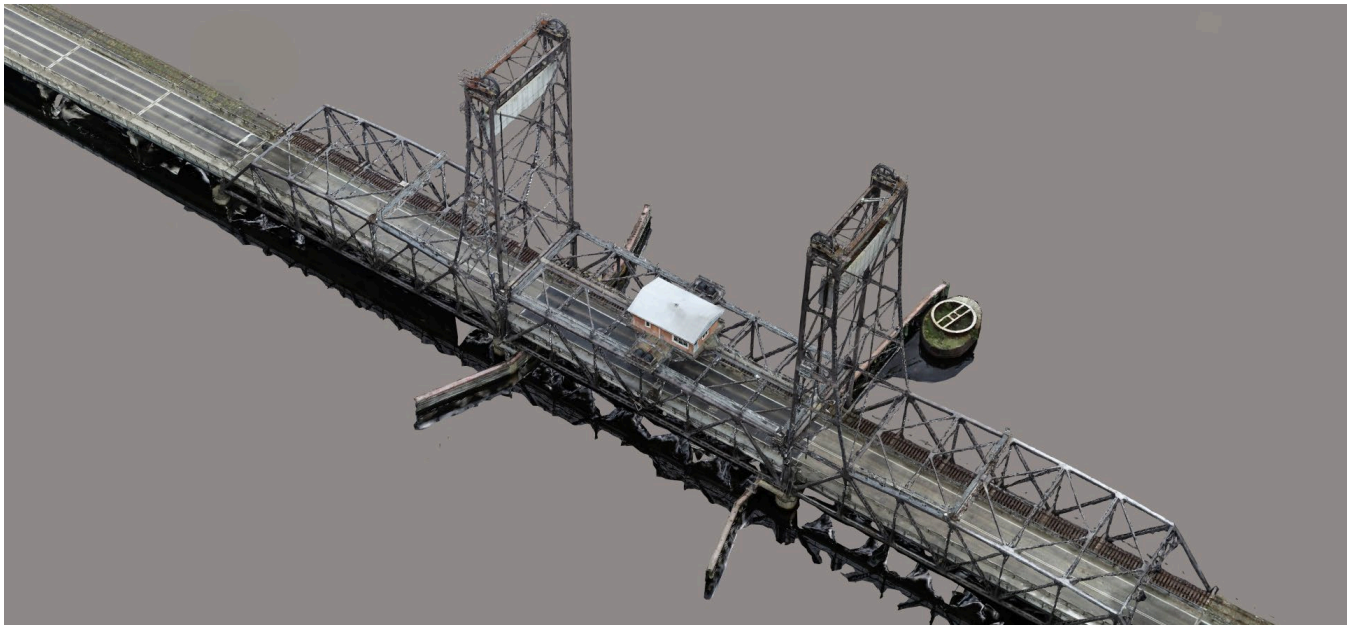
FLANKING SPAN STRINGER UNLOADING FRAME

BRIDGE NUMBER 15D4

SHEET NUMBER 21

Sample View 01 – Overview Bridgewater Bridge, looking south.

Sample View 02 – Overview Bridgewater Bridge, west elevation.



Sample View 03 – Aerial perspective of Bridgewater Bridge.

Sample View 04 – Overview Bridgewater Bridge, east elevation.

Sample View 05 – Perspective view of Bridgewater Bridge, looking north.

Sample View 06 – Bridgewater Bridge viewed from causeway to the north.