

Drafting and Design Presentation Standards Manual (DDPSM)

Volume 3: Structural Drafting Standards
Chapter 6 – Supplementary Information

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1 Electronic Project Model

The background for the establishment of the Electronic Project Model (EPM) relates to an era when all bridge drafting was performed in 2D, and so the process described here may be redundant for 3D drafting, as a simple export of a suitable format file from a 3D model may be supersede the requirement.

EPM is a file drafted in 3D showing reference points on a structure and is to be used as a reference file for surveyors during bridge construction.

However, for structures produced in 2D, the process remains relevant. The following procedure outlines the method to produce the EPM using AutoCAD software. Transport and Main Roads recognises that projects may use alternative software to achieve the required deliverable.

1.1 File format

When the EPM is developed using AutoCAD, the datafile is to be supplied in AutoCAD format, and suitable for import into the end user's civil / survey software, for example, 12D, Terramodel and so on.

1.2 Coordinates and drawing units

All points shall be given an X, Y and Z coordinate value. All points are to be drawn in project coordinates These are real world coordinates in AutoCAD.

Drawing units for the EPM are to be in metres.

1.3 Electronic Project Model file name

The datafile name of the EPM shall be 'EXAMPLE_EPM_A', where 'EXAMPLE' is the name of the bridge and 'A' is the revision letter.

1.4 Title block and revision details

The project name, job number, region, date of original issue Revision A, and the consultant or business unit's contact details for the project manager are recorded in the title block and drawn in 'paper space' in the datafile, as shown in Figure 1.4.

Any amendment to the bridge design that affects the EPM is to be reflected in a new revision of the EPM, with the changes duly listed in the title block of the revised datafile.

Figure 1.4 – Example title block

Project Name: EXAMPLE CREEK BRIDGE
 Job No: 123/456/789
 District: NORTHERN
 Datum: GDA94

 IMPORTANT NOTE : PLEASE READ

The data contained in this EPM (electronic project model) is to be read in conjunction with the information supplied on the drawings

ELECTRONIC REVISION BLOCK FOR THE EPM

* REVISION *	DATE	* DESCRIPTION / REASON FOR REVISION *
* A	* 1 APRIL 2007	* ORIGINAL ISSUE
* B	*	*

 ***** Dept of Transport & Main Roads – Bridge Design *****
 ***** All queries about EPM files are to be directed to *****
 ***** Manager (Structural Drafting) – Bridge Design *****

1.5 Content of Electronic Project Model

The bridge components shall be drawn in ‘model space’ in the EPM and shall show enough detail to allow piles to be set out, and for the concrete works to be formed.

When the EPM is transferred into the surveyor’s software, AutoCAD layers transfer across into that software with the same layer name. Therefore, the distinct components for each structure shall be differentiated by being drawn in real world coordinates in appropriately named layers with the structure type code as a prefix in the layer names for each structure, ensuring easy identification of components. Layer naming is to be limited to a maximum of 24 characters.

The following table lists typical bridge components to be provided in the EPM.

Figure 1.5 shows the details required on an EPM.

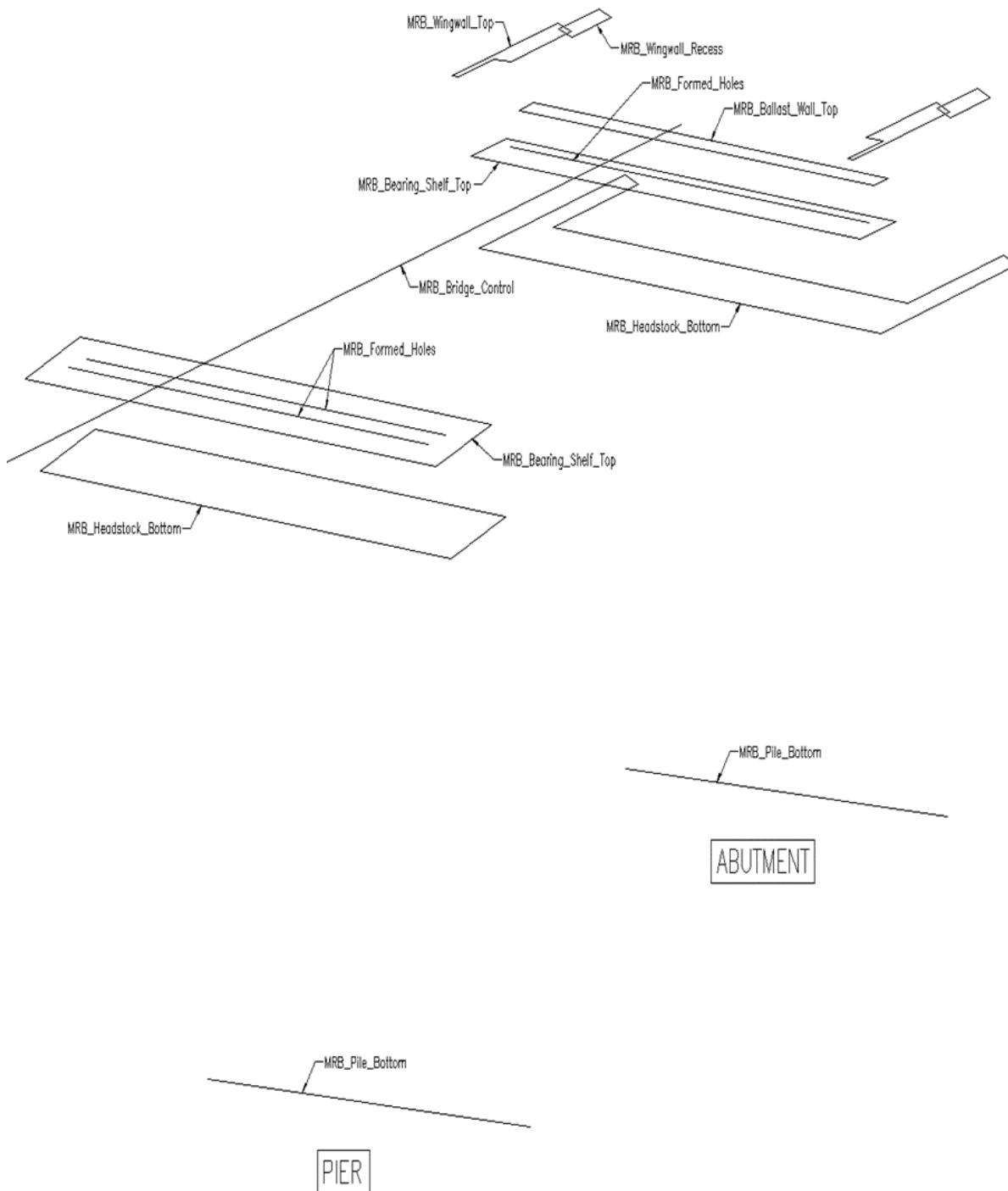
Note: The text shown in Figure 1.5 is for illustration purposes only.

Table 1.5 – Example contents of Electronic Project Model and AutoCAD layer names

Item	Software layer name	Description of component and how represented
Bridge control	BRxx_Bridge_Control	<p>Show all points on the bridge control at every abutment and pier at the top of road height.</p> <p>For bridges that are level or on a constant grade, draw a straight AutoCAD line between each point.</p> <p>For bridges with a vertical curve, a 'string' shall be imported into the EPM from 12D, with points at 1 m centres along the bridge control, plus points at the abutments and pier centrelines.</p>
Top of road surface at kerbs	BRxx_DWS	<p>The road surface is not usually part of the EPM unless specifically requested by the client.</p> <p>If required, draw a 'string' on both sides of the bridge where the top of the DWS intersects with the kerb / parapet. The 'string' shall have points at 1 m centres along the bridge control.</p>
Centre of piles	BRxx_Pile_Bottom	<p>For each pier or abutment, assuming the piles are equally spaced, then the only points to be shown are the 2 outer piles, with a single AutoCAD line drawn between the 2 points. The coordinate given shall be at the centre-bottom of the pile.</p> <p>When showing a row of piles under a pier or abutment that are equally spaced, the surveyor can divide this line equally to calculate the coordinates of the intermediate piles.</p> <p>If the piles are not equally spaced, a point for every pile shall be shown.</p>
Headstock soffit	BRxx_Headstock_Bottom	The outline at soffit of headstocks and wing walls.
Bearing shelf	BRxx_Bearing_Shelf_Top	The outline at top of headstock bearing shelves.
Ballast wall	BRxx_Ballast_Wall_Top	The outline at top of ballast walls.
Top of wing wall	BRxx_Wingwall_Top	The outline at top of wing walls.
Bridge traffic rail recess	BRxx_Wingwall_Recess	Bridge traffic barrier recesses in wing walls.
Bottom of column	BRxx_Column_Bottom	The outline at bottom of columns.
Bottom of stem	BRxx_Stem_Bottom	The outline at bottom of stems.
Pile cap soffit	BRxx_Pilecap_Bottom	The outline at soffit of pile caps.

Item	Software layer name	Description of component and how represented
Top of pile cap	BRxx_Pilecap_Top	The outline at top of pile cap.
Formed holes where required for deck units	BRxx_Formed_Holes	<p>The coordinate and height shall be at the centre of the hole on the bearing shelf of the headstocks. Assuming the formed holes are equally spaced, the only points required are for the 2 outer holes with an AutoCAD line drawn between.</p> <p>The surveyor can divide this line equally to calculate the coordinates of the intermediate holes. If the holes are not equally spaced, a point for every formed hole shall be shown.</p>
Bearings	BRxx_Bearings	<p>The coordinate shall be at the centre of the bearing.</p> <p>If the bearing is located in a recess, the height given shall be at the bottom of the recess.</p> <p>If the bearing is located on pedestals, the height given shall be at the top of the pedestal.</p> <p>Assuming that the bearings are equally spaced and the height difference between them is constant, the only points that shall be shown are the 2 outer bearings. If the bearings are not equally spaced, or the height difference between them is not constant, then every bearing shall be shown.</p>

Figure 1.5 – Example content of Electronic Project Model



1.6 Checking content of Electronic Project Model

Before distributing to the user, the EPM created in AutoCAD is to be checked for:

- EPM units are in metres
- AutoCAD UCS is set to 'world'
- Ensure all items displayed in the EPM are on appropriate layers
- Bridge control coordinates, location, and span lengths

- Skew of abutment and pier centrelines
- Pile locations and dimensions
- Pile cap, column locations, and dimensions
- Headstock and wing wall locations and dimensions
- Formed holes and bearing recesses locations and dimensions
- Heights are to match those on the drawings, and
- Distance between formed holes on adjacent headstocks match the deck unit length (allowing for grade / Vertical Curve (VC) adjustment).

2 Preparation of steel schedules

The department uses a Fortran based program, Steel Schedule, to produce steel schedules. A copy of this program is available for use to assist in the development of steel schedules, however, the outputs should be checked for accuracy by the designer as the current version was last updated in 2012 or thereabouts.

Transport and Main Roads does not insist on consultants or contractors using this program, as other proprietary software is known to exist and may be more convenient.

Steel labelling conventions on drawings and within steel schedules are to match details shown on SD1043 *Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)* and lap details on SD1044 *Reinforcing Steel – Lap Lengths*.

Example inputs and outputs compliant with the Steel Schedule program are given in this chapter. A designer may use alternative software to produce a steel schedule or use a basic spreadsheet to produce the outputs required.

The minimum requirements of a steel schedule are that:

- each bar is called up in the steel schedule to match those detailed on the drawing and to match SD1043 *Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)* and SD1044 *Reinforcing Steel – Lap Lengths*
- each bar is to have a unique sequence number that distinguishes it on the drawings and matches the steel schedule
- each bar in the schedule is to contain a list of dimensions 'A' through to "F' and 'P' (Pin Diameter)
- each bar is to have the number of bars required and calculated cutting lengths and masses
- diagrams of any non-standard bar shapes with dimensions and calculated cutting lengths

- the schedule summary pages are to contain 'job lots' or 'packages' that synchronise with a logical construction program, for example, PILES, PILECAPS, COLUMNS, HEADSTOCKS, DECK – SPAN 1, DECK – SPAN 2 for each substructure element and superstructure element
- an overall summary of steel by bar diameters, and
- an overall mass of steel for the structure.

3 Using Steel Schedule

This section outlines the use of the department's Steel Schedule program, providing guidance on its features and application.

Figure 3 – Steel Schedule



Input data is entered into a text file in the format shown in Figure 3.16(b).

The program compiles the data and produces the schedule as a text file output containing:

- information that is required for the cutting and bending process
- total mass for each bar mark, and
- subtotal masses for minor elements of the project.

At the end of the schedule, a steel summary for each grade and diameter of bar is produced, plus a summary of masses for individual sections of the job as defined by specified subtotals.

3.1 Input considerations

The program does not calculate data for bar shapes other than those on SD1043 *Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)*, including any variation to the standard bar shapes as shown on SD1043 *Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)* with the prescribed hooks, legs, and cogs. These are to be treated as non-standard bars (refer to Section 3.10).

Except for some dimensions for variable bars (refer to Section 3.8), the program does not calculate data for bar shapes other than those on SD1043 *Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)*.

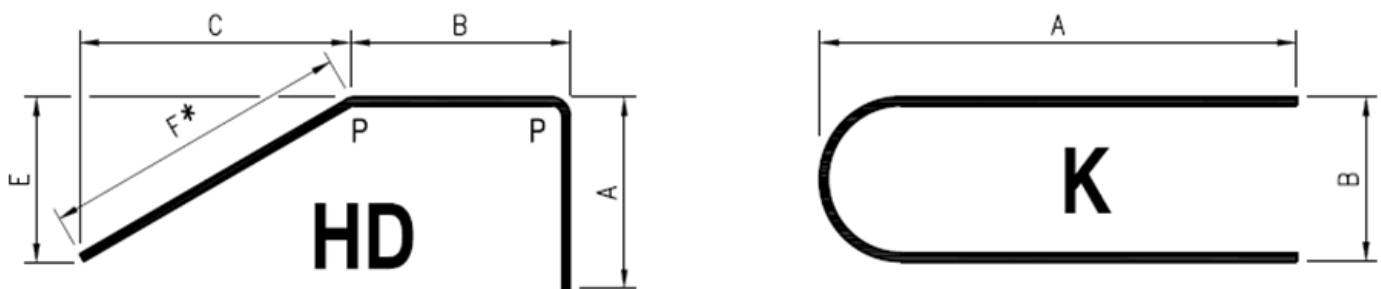
Using tabs when entering data or data input into the wrong columns will prevent the program running correctly.

3.2 Dimensions

All dimensions and pin diameters of the standard bars shown on SD1043 *Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)*, excluding those calculated automatically, are to be input in the data sheet. The program calculates the angle and value of those dimensions marked with an * where the bar has a bend to the shape.

Dimensions are taken from the outside extremities of bars. Values to the nearest millimetre.

Figure 3.2 – Example standard bar shapes shown on SD1043 Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)



3.3 Titles

The first 3 lines of the input data sheet will generate the title at the top of each output page.

This title has 2 sections - the General Title and the Job Number.

The general title usually occupies Columns 1 to 64, and the job number Columns 65 to 80.

The general title will appear centrally, and the job number in the top right-hand corner of the page.

If the title does not require 3 lines, the symbol “-” can be inserted in Column 1 of the remaining lines so that the first 3 lines on the input data sheet contain text; or the lines may be left blank.

3.4 Input data details

The coding sheet comprises 80 columns. The columns are as follows:

Table 3.4 – Columns on the coding sheet for bars

Column	Information sections	Input details for bars
1	Control letter Refer to Table 3.5	A blank in Column 1 indicates the remainder of that line refers to an individual bar.
2 and 3	Bar size	Use Column 3 (the right-hand column) for single digit values. Sizes in millimetres are as follows: <ul style="list-style-type: none"> • 10 mm diameter to 36 mm diameter • 6.3 mm and 8 mm hard drawn wire and bars to 20 mm, and • 25 mm and 28 mm square. Note: Use 6 mm for 6.3 mm diameter wire.
4 and 5	Bar shape	This is the letter that represent a bar shape on <i>SD1043 Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)</i> . Use Column 4 (the left-hand column) for single letters. Bars with other shape letters not as per <i>SD1043 Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)</i> are non-standard.
6 to 9	Bar sequence number	Except for variable bars, the sequence number is user information only, not used by the program, included as input coding so that it appears in the output.
10	Steel grade and type	This is the grade and type of steel used in the bar. If this column is left blank, steel grade and type will be assumed to be D500N. Other grades and types of reinforcing steel are: <ul style="list-style-type: none"> • R = Grade R250N • N or blank = Grade D500N • W = Plain hard drawn wire, and • Q = Square bars.

Column	Information sections	Input details for bars
11 to 28	Location of bar	A description of the location of the bar is input here. If a long statement is to be shown, the text can continue onto the next line by using control letter 'C' in Column 1. Bar details are entered in Columns 29 to 80 in free format, with each value separated by a space (refer to Figure 3.16(b)).
29 to 69	Dimensions of bar	All the dimensions of each bent length that comprises a bar shape as per SD1043 <i>Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)</i> . Columns 29 to 58 are used for Dimensions A to F (as 5 columns each), and 64 to 69 are for Dimension L, if required. Columns 59 to 63 are for pin diameter, if required. Input values for each letter to occupy the far right of that column.
70 and 71	Number of laps	These columns are for the number of laps for a bar that exceeds the maximum allowable length of 12 m, set as such for ease of transport. Use Column 71 for 1 to 9 laps, Columns 70 and 71 for 10+ laps.
72	Lap types	S denotes straight lap. H denotes hooked lap.
73 to 76	Length of lap	Input values to occupy the far right of these columns.
77 to 80	Number required	This is the number of bars required. Input values to occupy the far right of these columns.

3.5 Control of input and output

The program controls input and output by the control letters and numerals placed in Columns 1 to 4 as shown on the example input data sheet (refer to Figure 3.16(b)).

Control letters and their purpose are as follows:

Table 3.5 – Control letters and their purpose

Control column input	Purpose
'S'	Leaves a blank line in the output. 'S' is always on a line by itself.
'Blank'	Where nothing is entered in the first line, the remainder of the line contains information about a reinforcing bar.

Control column input	Purpose
'C'	Used for any special comments or for extending the location description. The comment is printed on the same line as 'C' and may occupy any part of the line from Columns 2 to 80. Input comment information is then listed on the output.
'H'	Used for creating sub-headings in the output page, and for dividing the steel schedule into major elements, for example, H Abutment A. 'H' controls can only be preceded by controls 'R', '\$' and 'P'; or the title of the job. The use of any other control or text on the preceding line will cause the program to malfunction.
'P'	Used to divide major elements, such as Abutment A, into a number of minor elements and to obtain a sub-total for these minor elements, for example, P subtotal footings.
'\$R1'	As 3 characters entered into first 3 columns. This control is a command for the program to copy data into separate files of a major element, including 'P' lines. These files can be recalled in total or in part to duplicate steel for other similar sections of the job. The '\$R' control should be on a line by itself preceding the major element to be copied. Up to 9 files can be created and identified by numerals 1 to 9 in Column 4 of the input data sheet.
'RT1'	As 3 characters entered into first 3 columns. Except for subheading, this control recalls and inserts all data in the file '\$R1'. This control is then followed by control 'H' and a new subheading.

Control column input	Purpose
'RP1'	<p>As 3 characters entered into first 3 columns.</p> <p>This control is used when only part of the data stored in the file '\$R1' is required to duplicate steel for another similar section of the job. This control is followed by control 'H' and a new major element subheading, followed by 'P' controls for minor elements conforming to those in the '\$R' file that are also to be duplicated. This process should incorporate variations as required for individual cases as described in items following. The number of minor elements in this new major element has to be equal to those in the '\$R' file.</p> <ul style="list-style-type: none"> • If all of the stored data in a minor element is required to be duplicated, the previous 'H' or 'P' control line is followed by the relevant 'P' • If the whole of the minor element is to be overwritten, the new data is written before the appropriate 'P' control • If some of the old minor element is to be altered, proceed as follows: <ul style="list-style-type: none"> – Control '+' followed on subsequent lines with the details of bars to be added for this section of the steel schedule, and – Control '-' on the same line, bar mark only. This process deletes those bars that are not required for this section.
'V'	Indicates linear variable bar (refer to Section 3.8).
'VF'	Indicates fanned variable bar (refer to Section 3.9).
'M'	Indicates reinforcing mesh (refer to Section 3.11).
'E'	<p>End of this job, but there is more data for another job to follow. A steel summary will be printed and the data on the next 3 lines will be taken as a title.</p> <p>Control 'E' is on a line by itself.</p>
'F'	Finish. There is no more input data. Control 'F' is on a line by itself.

3.6 Subtotals and summaries

Total mass for individual bar marks and mesh sheets occurs at the right-hand side of the output page.

Subtotals occur at the end of minor elements where each control 'P' was input on the coding sheet.

Summaries of steel by location and also by diameter, grade, and mesh type occur at the end of the steel schedule.

Summaries are by diameter and grade and provide the lengths and masses for the various bar diameters, as well as a total mass for the various grades for the whole job.

Summaries of mesh are by area in square metres and by mass for various mesh types, as well as a total mass of mesh for the whole job.

Summaries by location provide sub-totals for minor elements, as well as total mass for major elements.

3.7 Pin diameters

Pin diameters are required for all bar shapes, where 'P' is indicated on SD1043 *Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)*.

Refer to SD1043 *Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)* for details of minimum bends. Minimum pin diameter for galvanised bars is to be 5 x diameter for bars bent prior to galvanising, and 8 x diameter for bars bent after galvanising.

3.8 Variable bars

The program can calculate 2 types of variable bar – linear or fanned.

A set of linear variable bars are parallel to each other and at equal spacing.

A set of fanned variable bars are at equal spacing and placed on varying skew angles in a section, and the variation is a function of the cosine of the skew angle of each individual bar. Fanned bars are used in the skewed ends of sections where the general run of transverse reinforcement is placed square to the section, while the end few transverse bars are splayed in a fan to ensure that the end bar is parallel to the skewed end of the section.

A set of variable bars is represented by the first bar and the last bar of the set, entered on 2 consecutive lines on the coding sheet, starting with the control letter V in Column 1 of the first bar for linear arrangement, or VF for fanned arrangement.

Every bar in the set is assumed to have the same shape, diameter, steel grade and type, location description, lap details, and number required as this first bar.

The sequence number and dimensions corresponding to the last bar are input on the next line.

The program generates output data for the set of bars starting from the first bar with increasing sequence numbers until the sequence number corresponding to the last bar is reached.

Any particular identical dimensions input for the 2 extreme bars will also be the same for all the intermediate bars in the set. Only those particular dimensions that differ or the first bar to that for the last bar can have an incremental change.

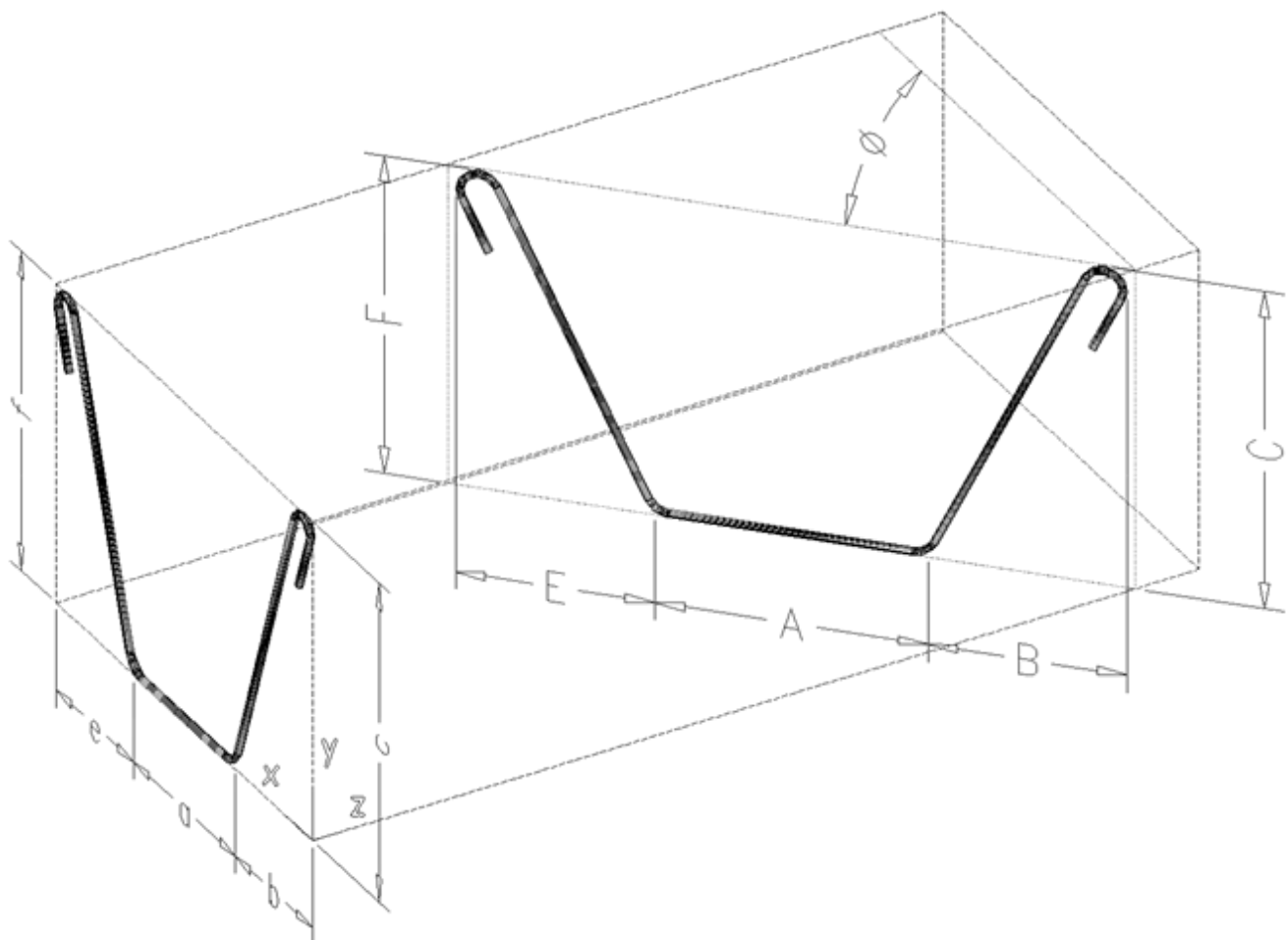
Dimensions of intermediate bars shown in the output are rounded to the nearest millimetre. The variable bar control works for both standard and non-standard bars.

3.9 Fanned variable bars

Note: A set of fanned bars that transition from square to skew do not vary incrementally or equally in length change, rather the rate of change varies along the set for each bar.

A VE bar shape is used to demonstrate how the program is set up, however, the program works equally well for any shape you choose (refer to Figure 3.9(a)).

Figure 3.9(a) – Fanned variable VE shaped bar



VE bar with dimensions on square section parallel to x and y

Consider that the VE shaped bar, which has dimensions A, B, C, E and F, is to be placed at a skew angle \emptyset to the axis of the concrete member, and that the projection on the concrete cross-section of the bar dimensions are a, b, c, e and f. The program is set up to read in the projected dimensions a, b, c, e and f and the angle \emptyset , and calculates the bar dimensions A, B, D, E and F using the following formulas:

$$A = a / \cos \emptyset$$

$$*B = b / \cos \emptyset \quad C = c$$

$$*E = e / \cos \emptyset \quad F = f$$

* The skewed dimensions B and E are automatically adjusted in the program to accommodate the constant pin diameter of the hook so that uniform cover is maintained between the bar and the sloping side formwork.

For a series of skewed bars, where the skew changes from bar to bar in a fanned arrangement, the skew angles of the first and last bars in the set $\emptyset 1$ and $\emptyset 2$ are read in and the program calculates the skew angles of all the intervening bars.

Note that c and f are "vertical" dimensions not affected by the value of \emptyset , a, b and e are "horizontal" dimensions.

The program is general and works for any shape that is defined by a combination of "horizontal" and "vertical" dimensions. Therefore, it must be told each time which dimensions are to be considered variable and which are constant. This is done by encoding the word VARIABLE, followed by the names of the "horizontal" dimensions in the location field of the input data sheets, for example, for VE bars, VARIABLE ABE shows that a, b and e are to be divided by $\cos \emptyset$, while c and f are not.

The required data is a 3 line set similar to the V type linear variable bar sets:

Line 1	Columns 1, 2	VF	
Line 2	Column 1	[blank]	
	Columns 2, 3	Bar diameter	
	Columns 4, 5	Shape	
	Columns 6-9	Bar number of first bar in set	
	Columns 10	Grade	
	Columns 11-28	Location	
	Column 29	a b c e f pin dia No	Leaving out values for letters that are not required.
Line 3	Column 1	[blank]	
	Columns 2, 3	Bar diameter	
	Columns 4, 5	Shape	
	Columns 6-9	Bar number of last bar in set	
	Column 10	Grade	
	Columns 11-28	VARIABLE ABE	Indicates that dimensions A, B and E vary with the skew, C and F are constant.
	Columns 29-80	Ø1 Ø2	The skew angle in degrees of first and last bar in set.

If the bar number in line 3 is coded the same as the bar number in line 2, then only one bar is generated, and Ø1 and Ø2 should be entered with the same value. This is useful if all transverse bars in a section are parallel but skewed.

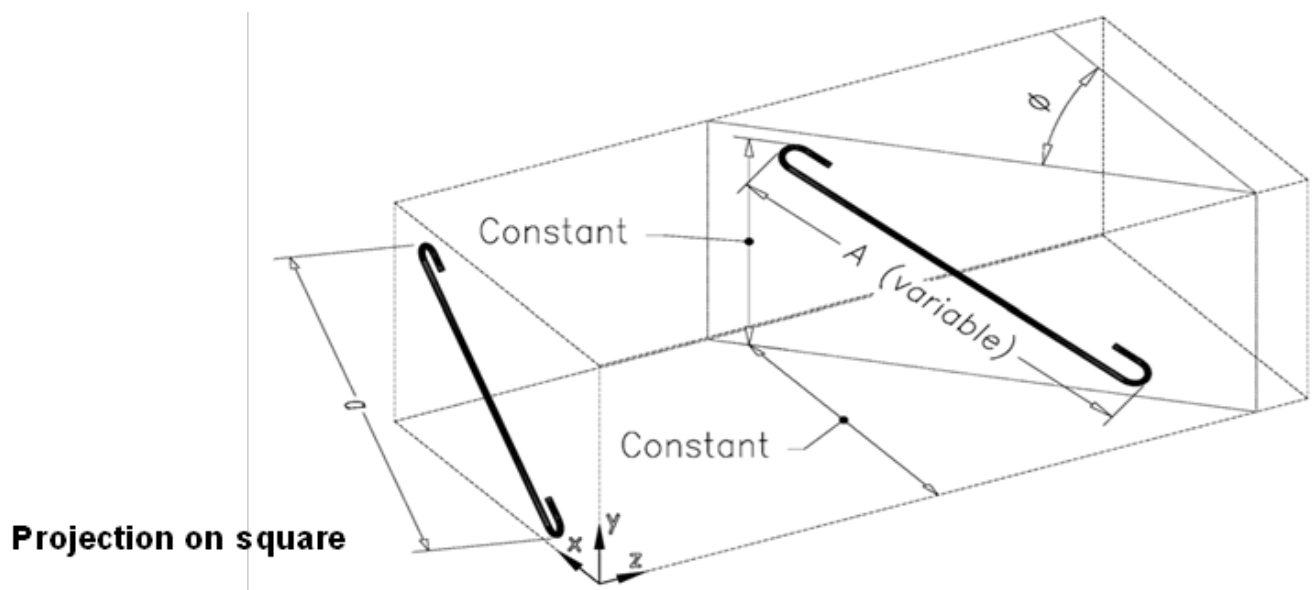
The following input data example shows a 16VE bar varying in skew by 45°. There are sixteen different bars with bar marks from 16VE62 to 16VEF77. There is 2 of each bar mark:

```

VF
16VE      62 RADIAL BARS      265 200 1400 200 1400 60 2
16VE      77 VARIABLE ABE    0 45
    
```

The only bar shape for which the fanned variable command does not work is one in which the required bar dimension is a slope length rather than horizontal and vertical, such as the C shaped bar. C bar without dimensions parallel to x and y axis cannot be solved by the steel program

Figure 3.9(b) – Fanned variable C shaped bar



3.10 Non-standard bars

Bars with shapes that differ from those shown on SD1043 *Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)* are non-standard bars; they are to have a shape letter or pair of letters different to those shown on SD1043 *Reinforcing Steel – Standard Bar Shapes Typical Details and Notes (Drawing 1 of 4 to Drawing 4 of 4)*. The appendix for non-standard bars is placed at the end of the reinforcing steel schedule.

The dimensions of the non-standard bar are to be input in the columns corresponding to the lettered dimensions shown on the drawing of the non-standard bar. The cutting length for these non-standard bars is calculated manually and that value entered in Column L, and the number of bars required entered in Columns 77 to 80. The program can then add the relevant quantities to the steel summary.

3.11 Reinforcing mesh

Details are entered after control M. Input information format is as follows:

Table 3.11 – Columns on the coding sheet for mesh

Column	Input details for mesh
1	Control letter M indicates reinforcing mesh
2 to 6	Fabric type and size
11 to 28	Description and or location
29 to 34	Length of sheet

34 to 40	Width of sheet
77 to 80	Number of sheets required

If the mesh is not a full standard sheet (6 m x 2.4 m), it may be necessary to add a diagram to the output sheet to define the orientation of the different wire sizes and cutting details. The program processes all types of mesh as listed below:

RL1218	RL1018	RL818
SL102	SL92	SL82
SL81	SL72	SL62
L12TM	L11TM	L8TM

The following input data example shows full sheets of SL81 mesh and half sheets of RL1218 mesh:

MSL81	MESH	6000	2400	2
MRL1218	MESH	3000	2400	4

3.12 Mass of reinforcement

Mass of reinforcement used in the program is industry standard.

3.13 Tolerances for scheduling reinforcement

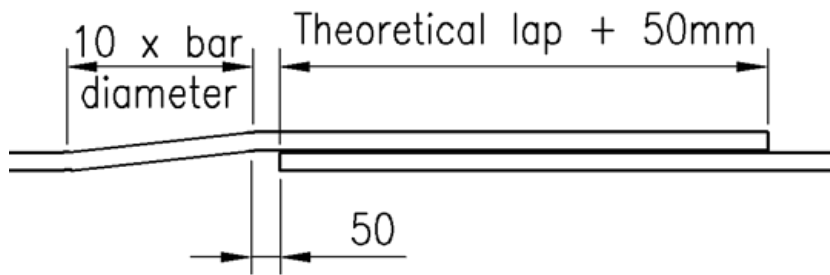
To prevent issues where reinforcement is theoretically correct but practically incorrect – caused by the cumulative effect of minor deviations in formwork dimensions, reinforcement cutting, bending, fixing, or other construction tolerances – the following allowances shall be added to the overall length of straight A-shaped bars:

- 25 mm for bar lengths up to 600 mm, and
- 40 mm for bar lengths over 600 mm.

Tolerances are not applied to fitment bars because adequate construction tolerances are allowed for in the department's Technical Specifications MRTS70 *Concrete*, MRTS71 *Reinforcing Steel*, and MRTS73 *Manufacture of Prestressed Concrete Members and Stressing Units*.

50 mm of tolerance shall be added to the lap of cranked bars (refer to Figure 3.13).

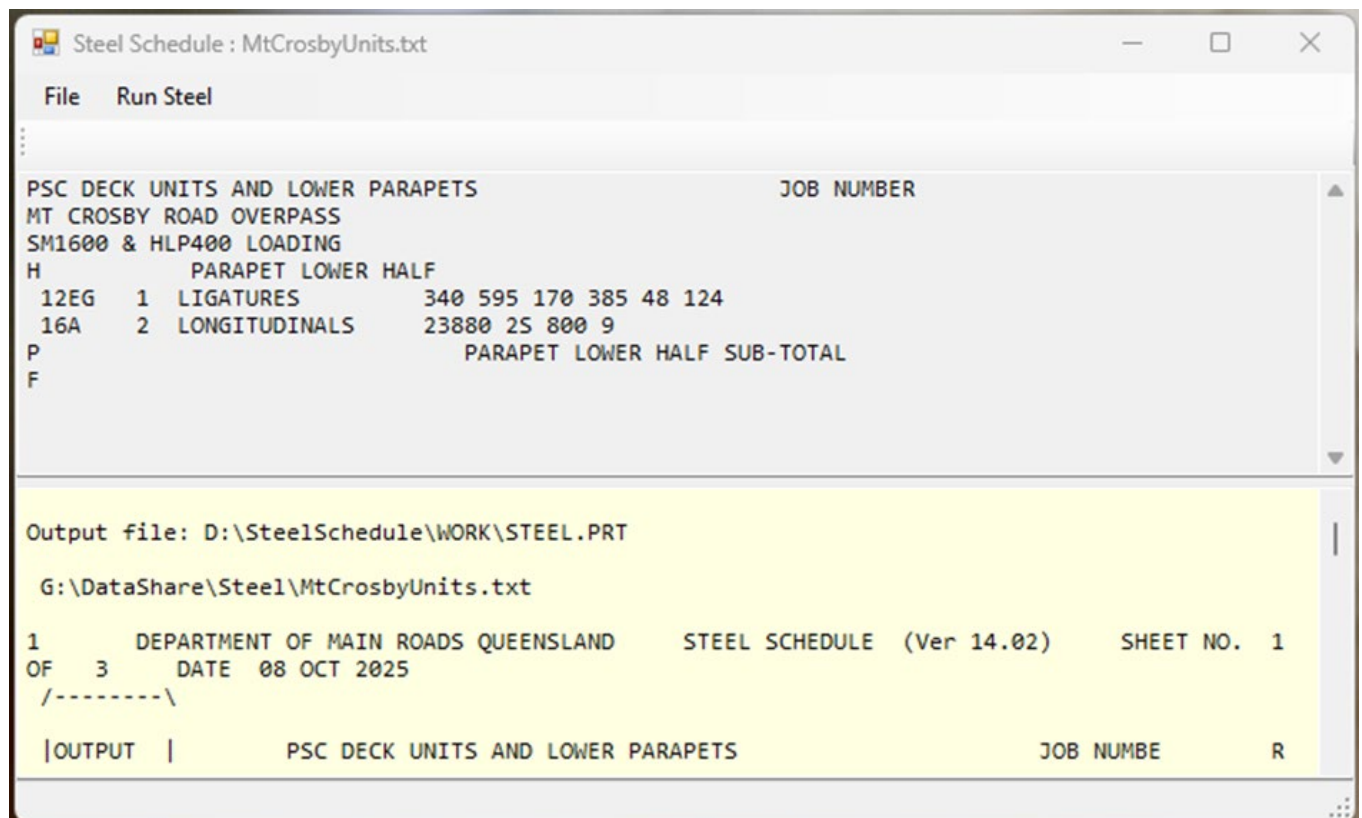
Figure 3.13 – Cranked bars



3.14 Printing steel schedule output

Output from the program is generated as a txt file by hitting the 'Run Steel' menu option.

Figure 3.14 – Example steel schedule dialogue box – ‘Run Steel’ menu option



3.15 Non-standard bar appendices

Non-standard bar shapes are to be attached as appendices to the steel schedule output as shown in Figure 3.15(a).

Figure 3.15(a) – Example of steel schedule non-standard bars

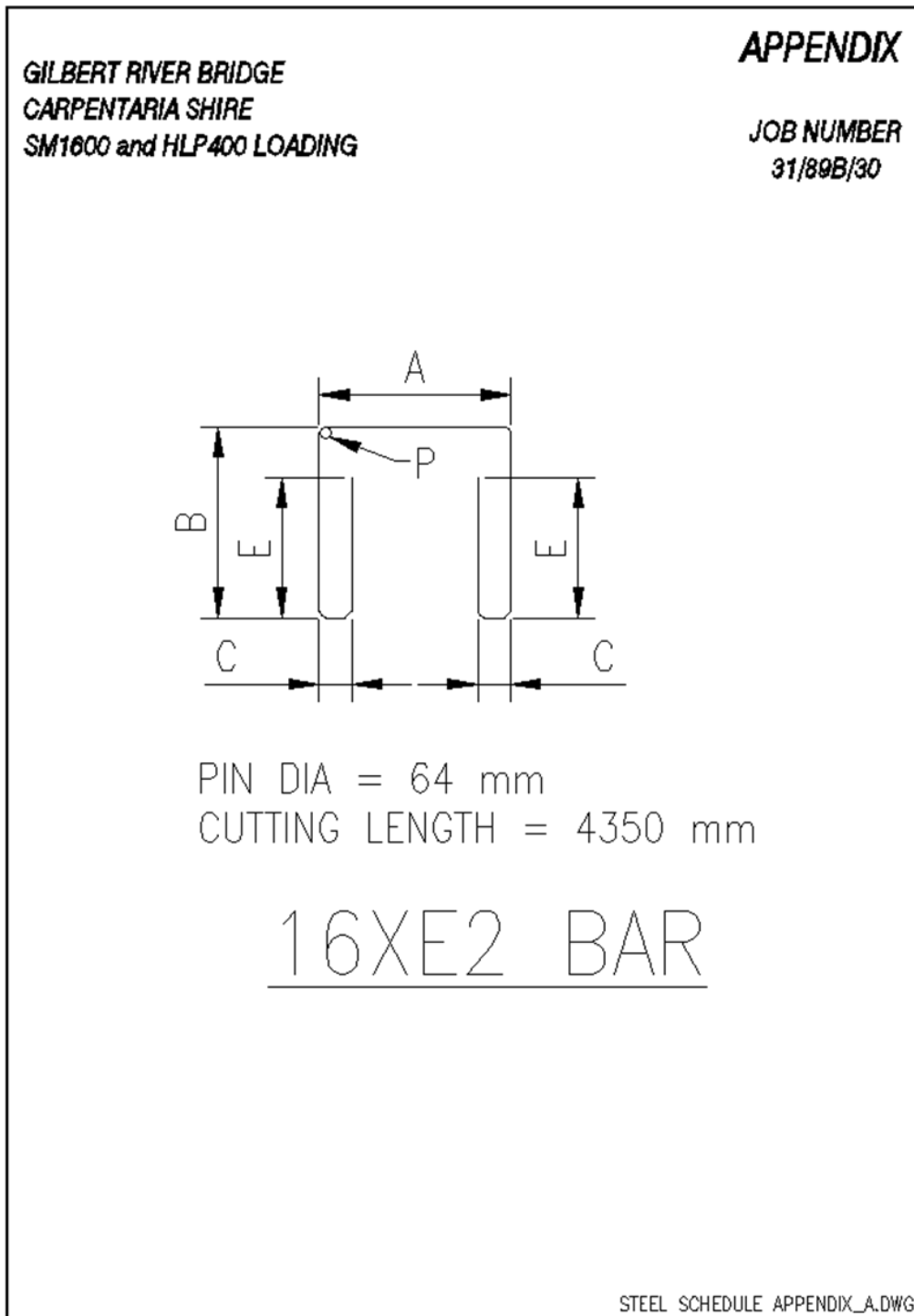


Figure 3.15(b) – Example of steel schedule input

```

LAME DUCK CREEK BRIDGE
EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN
SM1600 & HLP400 LOADING
JOB NUMBER
66/66F/33

$R 1
H      ABUTMENT A (DRG. No. 123455)
 24F   1  HEADSTOCK           800 600 60 120 4
 16F   2  HEADSTOCK           1750 400 40 80 4
V24D   3  HEADSTOCK           1870 500 120 2
 24D   6  HEADSTOCK           1670 500 120 2
 16S   7  HEADSTOCK           670 585 80 6
 16G   8  HEADSTOCK           500 160 470 80 2
 12A   9  BALLAST WALL         3900 2
 16K  10  BALLAST WALL         750 135 12
 16D  11  BALLAST WALL         675 220 80 26
C      BAR 16D14 TO BE HOT DIP GALVANISED TO AS/NZS 4680
24AT  12  HEADSTOCK EXTN      2300 50 20 3
C      BAR 24AT12 TO BE SUPPLIED AT ONE END ONLY WITH
C      APPROVED SCREWED COUPLERS. DIMENSION 'A' IS MEASURED FROM
C      CONSTRUCTION JOINT TO END OF BAR. THE ACTUAL BAR DIMENSION
C      WILL NEED TO BE ADJUSTED (LENGTHEN OR SHORTENED) TO SUIT
C      COUPLER SYSTEM USED. LENGTHENING OR SHORTENING OF THE BAR
C      TO CONFORM WITH MANUFACTURERS SPECIFICATIONS.
C      THREAD TYPE AND LENGTH MAY CHANGE DEPENDING ON SCREWED
C      COUPLER SYSTEM USED. THREAD TO CONFORM WITH MANUFACTURERS
C      SPECIFICATIONS.
16E   13  WINGWALL D/S         900 600 1100 80 1
16E   14  WINGWALL D/S         825 600 1100 80 1
16E   15  WINGWALL D/S         750 600 1100 80 1
12E   16  WINGWALL D/S         470 1200 1200 60 7
12E   17  WINGWALL D/S         470 500 500 60 9
16E   18  WINGWALL D/S         445 1900 1900 80 4
12EH  19  WINGWALL D/S         445 1460 160 1300 60 4
12E   20  WINGWALL D/S         445 500 500 60 4
12E   21  WINGWALL D/S         140 750 750 60 3
12A   22  WINGWALL D/S         1350 5
16D   23  WINGWALL D/S         1315 800 80 3
12F   24  WINGWALL U/S         1350 100 20 60 6
12S   25  WINGWALL U/S         600 200 60 3
32A   26  WINGWALL U/S         1400 4
12S   27  WINGWALL U/S         500 470 60 6
P
RT 1
H      ABUTMENT B (DRG. No. 123456)
$R 2
H      PIER 1 (DRG. No. 1234567)
 24F   1  HEADSTOCK           800 600 60 120 4
 16F   2  HEADSTOCK           1850 400 40 80 4
 24D   3  HEADSTOCK           1900 500 120 8
 16S   4  HEADSTOCK           590 695 80 7
 16E   5  HEADSTOCK           545 500 500 80 2
 24F   6  HEADSTOCK           800 750 75 120 4
    
```

```

P                                     PIER SUB-TOTAL
RT2
H           PIER 2 (DRG. No. 123457)
RP 2
H           PIER 3 (DRG. No. 123458)
+
 24F  7  HEADSTOCK           800 600 60 120 6
 16F  8  HEADSTOCK           1850 400 40 80 6
 24D  9  HEADSTOCK           1900 500 120 12
-24F  1
-16F  2
-24D  3
P                                     PIER 3 SUB-TOTAL
$R 3
H           KERBS SPAN 1      DRG NO 123458 & 123459
 16S  1  HORIZON             265 430 64 24
 16S  2  HORIZON             255 430 64 48
 16S  3  HORIZON             245 430 64 128
 20A  4  LONGIT              2230 12
 20A  5  LONGIT              1795 30
 20E  6  KERB ENDS           395 750 750 100 12
 20A  7  LONGIT              7950 20
 16A  8  LONGIT              7850 8
P                                     KERBS SUB-TOTAL
RT 3
H           KERBS SPAN 2      DRG NO 123458 & 123459
RT 3
H           KERBS SPAN 3      DRG NO 123458 & 123459
$R 4
H           RELIEVING SLAB AT ABUTMENT A (DRG NO 2256)
 24A  1  TRANSVERSE          10450 12
 16A  2  TRANSVERSE          10450 82
 16E  3  TRANSVERSE ENDS     225 600 600 64 54
 28A  4  LONGIT SIDES        5870 16
 16A  5  LONGIT TF           5870 40
 24A  6  LONGIT BF           5870 40
 16E  7  LONGIT ENDS         265 600 600 64 96
P                                     RELIEVING SLAB SUB-TOTAL
RT 4
H           RELIEVING SLAB AT ABUTMENT B (DRG NO 2256)
F

```

Figure 3.15(c) – Example of steel schedule output (the output example matches the input coding above)

```

DEPARTMENT OF MAIN ROADS QUEENSLAND      STEEL SCHEDULE (Ver 14.02)      SHEET NO.  1 OF  18      DATE  04 DEC 2024
/-----\
|OUTPUT |          LAME DUCK CREEK BRIDGE          JOB NUMBER
|CHECK  |          EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN      66/66F/33
|       |          SM1600 LOADING
|initials|
\-----/
Datafile = G:\DataShare\Steel\LAME_DUCK.txt
DIA SHAPE GRADE          A          B          C          E          F          PIN DIA          L          LAPS          BAR          NO          TOTAL MASS          DIAGRAM
      SEQ NO  LOCATION      MM          MM          MM          MM          MM          P          MM          MM          NO LGTH LENGTH REQD          (KG)
-----
*****
*          ABUTMENT A (DRG. No. 123455)          *
*****
24 F  1  HEADSTOCK          800          600          60          601          120          1400          4          20.4
16 F  2  HEADSTOCK          1750          400          40          400          80          2150          4          13.9
24 D  3  HEADSTOCK          1870          500          120          2315          2          16.9
24 D  4  HEADSTOCK          1803          500          120          2248          2          16.4
24 D  5  HEADSTOCK          1736          500          120          2181          2          15.9
24 D  6  HEADSTOCK          1670          500          120          2115          2          15.4
16 S  7  HEADSTOCK          670          585          80          2760          6          26.8
16 G  8  HEADSTOCK          500          160          470          475          80          955          2          3.1
12 A  9  BALLAST WALL          3900          3900          2          7.1
16 K 10  BALLAST WALL          750          135          1551          12          30.1
16 D 11  BALLAST WALL          675          220          80          858          26          36.1
          BAR 16D14 TO BE HOT DIP GALVANISED TO AS/NZS 4680
24 AT 12  HEADSTOCK EXTN          2300          50          20 THREAD DIAMETER          2300          3          25.1
          BAR 24AT12 TO BE SUPPLIED AT ONE END ONLY WITH
          APPROVED SCREWED COUPLERS. DIMENSION 'A' IS MEASURED FROM
NOTES: 1. FOR FURTHER DETAILS SEE DRAWINGS 1043 AND 1044.          2. LAP TYPE:- "S"=STRAIGHT LAP, "H"=HOOKED LAP.
          3. ALL REINF. STEEL TO BE ACRS CERTIFIED, GRADE D500N OR R250N TO AS/NZS 4671 [D500N Grade "Blank", R250N Grade "R"]

```

DEPARTMENT OF MAIN ROADS QUEENSLAND STEEL SCHEDULE (Ver 14.02) SHEET NO. 2 OF 18 DATE 04 DEC 2024

LAME DUCK CREEK BRIDGE
 EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN
 SM1600 LOADING

JOB NUMBER
 66/66F/33

DIA	SHAPE	GRADE	LOCATION	A	B	C	E	F	PIN	DIA	L	LAPS	BAR	NO	TOTAL MASS	DIAGRAM	
	SEQ	NO		MM	MM	MM	MM	MM	P	MM	MM	NO	LGTH	LENGTH	REQD	(KG)	
<p>CONSTRUCTION JOINT TO END OF BAR. THE ACTUAL BAR DIMENSION WILL NEED TO BE ADJUSTED (LENGTHEN OR SHORTENED) TO SUIT COUPLER SYSTEM USED. LENGTHENING OR SHORTENING OF THE BAR TO CONFORM WITH MANUFACTURERS SPECIFICATIONS. THREAD TYPE AND LENGTH MAY CHANGE DEPENDING ON SCREWED COUPLER SYSTEM USED. THREAD TO CONFORM WITH MANUFACTURERS SPECIFICATIONS.</p>																	
16	E	13	WINGWALL D/S	900	600	1100				80			2526	1	4.1		
16	E	14	WINGWALL D/S	825	600	1100				80			2451	1	4.0		
16	E	15	WINGWALL D/S	750	600	1100				80			2376	1	3.8		
12	E	16	WINGWALL D/S	470	1200	1200				60			2815	7	17.9		
12	E	17	WINGWALL D/S	470	500	500				60			1415	9	11.6		
16	E	18	WINGWALL D/S	445	1900	1900				80			4171	4	27.0		
12	EH	19	WINGWALL D/S	445	1460	160	1300	472		60			3167	4	11.5		
12	E	20	WINGWALL D/S	445	500	500				60			1390	4	5.1		
12	E	21	WINGWALL D/S	140	750	750				60			1585	3	4.3		
12	A	22	WINGWALL D/S	1350									1350	5	6.1		
16	D	23	WINGWALL D/S	1315	800					80			2078	3	10.1		

NOTES: 1. FOR FURTHER DETAILS SEE DRAWINGS 1043 AND 1044. 2. LAP TYPE:- "S"=STRAIGHT LAP, "H"=HOOKED LAP.
 3. ALL REINF. STEEL TO BE ACRS CERTIFIED, GRADE D500N OR R250N TO AS/NZS 4671 [D500N Grade "Blank", R250N Grade "R"]

DEPARTMENT OF MAIN ROADS QUEENSLAND STEEL SCHEDULE (Ver 14.02) SHEET NO. 3 OF 18 DATE 04 DEC 2024

LAME DUCK CREEK BRIDGE
 EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN
 SM1600 LOADING

JOB NUMBER
 66/66F/33

DIA	SHAPE	GRADE	LOCATION	A	B	C	E	F	PIN	DIA	L	LAPS	BAR	NO	TOTAL MASS	DIAGRAM
	SEQ			MM	MM	MM	MM	MM	P	MM	MM	NO	LGTH	REQD	(KG)	
12	F	24	WINGWALL U/S	1350	100	20	100			60			1449	6	7.9	
12	S	25	WINGWALL U/S	600	200					60			1837	3	5.0	
32	A	26	WINGWALL U/S	1400									1400	4	36.2	
12	S	27	WINGWALL U/S	500	470					60			2177	6	11.9	
ABUTMENT SUB-TOTAL											GRADE D500N BARS		394 KGS			

NOTES: 1. FOR FURTHER DETAILS SEE DRAWINGS 1043 AND 1044. 2. LAP TYPE:- "S"=STRAIGHT LAP, "H"=HOOKED LAP.
 3. ALL REINF. STEEL TO BE ACRS CERTIFIED, GRADE D500N OR R250N TO AS/NZS 4671 [D500N Grade "Blank", R250N Grade "R"]

DEPARTMENT OF MAIN ROADS QUEENSLAND STEEL SCHEDULE (Ver 14.02) SHEET NO. 5 OF 18 DATE 04 DEC 2024

LAME DUCK CREEK BRIDGE
 EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL – MORVEN
 SM1600 LOADING

JOB NUMBER
 66/66F/33

DIA	SHAPE	GRADE	A	B	C	E	F	PIN DIA	L	LAPS	BAR	NO	TOTAL MASS	DIAGRAM
SEQ NO	LOCATION		MM	MM	MM	MM	MM	P MM	MM	NO LGTH	LENGTH	REQD	(KG)	

CONSTRUCTION JOINT TO END OF BAR. THE ACTUAL BAR DIMENSION
 WILL NEED TO BE ADJUSTED (LENGTHEN OR SHORTENED) TO SUIT
 COUPLER SYSTEM USED. LENGTHENING OR SHORTENING OF THE BAR
 TO CONFORM WITH MANUFACTURERS SPECIFICATIONS.
 THREAD TYPE AND LENGTH MAY CHANGE DEPENDING ON SCREWED
 COUPLER SYSTEM USED. THREAD TO CONFORM WITH MANUFACTURERS
 SPECIFICATIONS.

16 E	13	WINGWALL D/S	900	600	1100				80		2526	1	4.1	
16 E	14	WINGWALL D/S	825	600	1100				80		2451	1	4.0	
16 E	15	WINGWALL D/S	750	600	1100				80		2376	1	3.8	
12 E	16	WINGWALL D/S	470	1200	1200				60		2815	7	17.9	
12 E	17	WINGWALL D/S	470	500	500				60		1415	9	11.6	
16 E	18	WINGWALL D/S	445	1900	1900				80		4171	4	27.0	
12 EH	19	WINGWALL D/S	445	1460	160	1300	472		60		3167	4	11.5	
12 E	20	WINGWALL D/S	445	500	500				60		1390	4	5.1	
12 E	21	WINGWALL D/S	140	750	750				60		1585	3	4.3	
12 A	22	WINGWALL D/S	1350								1350	5	6.1	
16 D	23	WINGWALL D/S	1315	800					80		2078	3	10.1	

NOTES: 1. FOR FURTHER DETAILS SEE DRAWINGS 1043 AND 1044. 2. LAP TYPE:- "S"=STRAIGHT LAP, "H"=HOOKED LAP.
 3. ALL REINF. STEEL TO BE ACRS CERTIFIED, GRADE D500N OR R250N TO AS/NZS 4671 [D500N Grade "Blank", R250N Grade "R"]

DEPARTMENT OF MAIN ROADS QUEENSLAND

STEEL SCHEDULE (Ver 14.02)

SHEET NO. 6 OF 18

DATE 04 DEC 2024

LAME DUCK CREEK BRIDGE
 EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN
 SM1600 LOADING

JOB NUMBER
 66/66F/33

DIA	SHAPE	GRADE		A	B	C	E	F	PIN	DIA	L	LAPS	BAR	NO	TOTAL MASS	DIAGRAM	
	SEQ		LOCATION	MM	MM	MM	MM	MM	P	MM	MM	NO	LGTH	REQD	(KG)		
12	F	24	WINGWALL U/S	1350	100	20	100			60			1449	6	7.9		
12	S	25	WINGWALL U/S	600	200					60			1837	3	5.0		
32	A	26	WINGWALL U/S	1400									1400	4	36.2		
12	S	27	WINGWALL U/S	500	470					60			2177	6	11.9		

ABUTMENT SUB-TOTAL											GRADE D500N BARS			394 KGS			

NOTES: 1. FOR FURTHER DETAILS SEE DRAWINGS 1043 AND 1044.

2. LAP TYPE:- "S"=STRAIGHT LAP, "H"=HOOKED LAP.

3. ALL REINF. STEEL TO BE ACRS CERTIFIED, GRADE D500N OR R250N TO AS/NZS 4671 [D500N Grade "Blank", R250N Grade "R"]

LAME DUCK CREEK BRIDGE
 EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN
 SM1600 LOADING

JOB NUMBER
 66/66F/33

DIA	SHAPE	GRADE	A	B	C	E	F	PIN DIA	L	LAPS	BAR	NO	TOTAL MASS	DIAGRAM
SEQ NO	LOCATION	MM	MM	MM	MM	MM	MM	P MM	MM	NO LGTH	LENGTH	REQD	(KG)	

*	PIER 2 (DRG. No. 123457)													*

24	F	1	HEADSTOCK	800	600	60	601		120		1400	4	20.4	
16	F	2	HEADSTOCK	1850	400	40	400		80		2250	4	14.6	
24	D	3	HEADSTOCK	1900	500				120		2345	8	68.3	
16	S	4	HEADSTOCK	590	695				80		2820	7	32.0	
16	E	5	HEADSTOCK	545	500	500			80		1471	2	4.8	
24	F	6	HEADSTOCK	800	750	75	751		120		1550	4	22.6	
										PIER SUB-TOTAL		GRADE D500N BARS		163 KGS

NOTES: 1. FOR FURTHER DETAILS SEE DRAWINGS 1043 AND 1044. 2. LAP TYPE:- "S"=STRAIGHT LAP, "H"=HOOKED LAP.
 3. ALL REINF. STEEL TO BE ACRS CERTIFIED, GRADE D500N OR R250N TO AS/NZS 4671 [D500N Grade "Blank", R250N Grade "R"]

DEPARTMENT OF MAIN ROADS QUEENSLAND STEEL SCHEDULE (Ver 14.02) SHEET NO. 9 OF 18 DATE 04 DEC 2024

LAME DUCK CREEK BRIDGE
 EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN
 SM1600 LOADING

JOB NUMBER
 66/66F/33

DIA	SHAPE	GRADE	LOCATION	A	B	C	E	F	PIN DIA	L	LAPS	BAR	NO	TOTAL MASS	DIAGRAM
	SEQ NO			MM	MM	MM	MM	MM	P	MM	NO LGTH	LENGTH	REQD	(KG)	

* PIER 3 (DRG. No. 123458) *															

24	F	7	HEADSTOCK	800	600	60	601			120		1400	6	30.6	
16	F	8	HEADSTOCK	1850	400	40	400			80		2250	6	21.9	
24	D	9	HEADSTOCK	1900	500					120		2345	12	102.4	
16	S	4	HEADSTOCK	590	695					80		2820	7	32.0	
16	E	5	HEADSTOCK	545	500	500				80		1471	2	4.8	
24	F	6	HEADSTOCK	800	750	75	751			120		1550	4	22.6	
										PIER 3 SUB-TOTAL		GRADE D500N BARS		214 KGS	

NOTES: 1. FOR FURTHER DETAILS SEE DRAWINGS 1043 AND 1044. 2. LAP TYPE:- "S"=STRAIGHT LAP, "H"=HOOKED LAP.
 3. ALL REINF. STEEL TO BE ACRS CERTIFIED, GRADE D500N OR R250N TO AS/NZS 4671 [D500N Grade "Blank", R250N Grade "R"]

DEPARTMENT OF MAIN ROADS QUEENSLAND STEEL SCHEDULE (Ver 14.02) SHEET NO. 12 OF 18 DATE 04 DEC 2024

LAME DUCK CREEK BRIDGE
 EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN
 SM1600 LOADING

JOB NUMBER
 66/66F/33

DIA	SHAPE	GRADE	A	B	C	E	F	PIN DIA	L	LAPS	BAR	NO	TOTAL MASS	DIAGRAM	
SEQ NO	LOCATION	MM	MM	MM	MM	MM	P	MM	MM	NO LGTH	LENGTH	REQD	(KG)		

*	KERBS SPAN 3		DRG NO 123458 & 123459					*							

16 S	1	HORIZON	265	430					64		1770	24	68.8		
16 S	2	HORIZON	255	430					64		1750	48	136.0		
16 S	3	HORIZON	245	430					64		1730	128	358.5		
20 A	4	LONGIT	2230								2230	12	67.6		
20 A	5	LONGIT	1795								1795	30	136.1		
20 E	6	KERB ENDS	395	750	750			100			1803	12	54.7		
20 A	7	LONGIT	7950								7950	20	402.0		
16 A	8	LONGIT	7850								7850	8	101.7		
-----			KERBS SUB-TOTAL					GRADE D500N BARS					1325 KGS		

NOTES: 1. FOR FURTHER DETAILS SEE DRAWINGS 1043 AND 1044. 2. LAP TYPE:- "S"=STRAIGHT LAP, "H"=HOOKED LAP.
 3. ALL REINF. STEEL TO BE ACRS CERTIFIED, GRADE D500N OR R250N TO AS/NZS 4671 [D500N Grade "Blank", R250N Grade "R"]

DEPARTMENT OF MAIN ROADS QUEENSLAND STEEL SCHEDULE (Ver 14.02) SHEET NO. 13 OF 18 DATE 04 DEC 2024

LAME DUCK CREEK BRIDGE
 EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN
 SM1600 LOADING

JOB NUMBER
 66/66F/33

DIA	SHAPE	GRADE	A	B	C	E	F	PIN DIA	L	LAPS	BAR	NO	TOTAL MASS	DIAGRAM
SEQ NO	LOCATION	MM	MM	MM	MM	MM	P	MM	MM	NO LGTH	LENGTH	REQD	(KG)	

* RELIEVING SLAB AT ABUTMENT A (DRG NO 2256) *														

24 A	1	TRANSVERSE	10450								10450	12	456.5	
16 A	2	TRANSVERSE	10450								10450	82	1387.3	
16 E	3	TRANSVERSE ENDS	225	600	600			64			1358	54	118.7	
28 A	4	LONGIT SIDES	5870								5870	16	465.4	
16 A	5	LONGIT TF	5870								5870	40	380.1	
24 A	6	LONGIT BF	5870								5870	40	854.7	
16 E	7	LONGIT ENDS	265	600	600			64			1398	96	217.3	

RELIEVING SLAB SUB-TOTAL										GRADE D500N BARS		3880 KGS		

NOTES: 1. FOR FURTHER DETAILS SEE DRAWINGS 1043 AND 1044. 2. LAP TYPE:- "S"=STRAIGHT LAP, "H"=HOOKED LAP.
 3. ALL REINF. STEEL TO BE ACRS CERTIFIED, GRADE D500N OR R250N TO AS/NZS 4671 [D500N Grade "Blank", R250N Grade "R"]

DEPARTMENT OF MAIN ROADS QUEENSLAND STEEL SCHEDULE (Ver 14.02) SHEET NO. 14 OF 18 DATE 04 DEC 2024

LAME DUCK CREEK BRIDGE
 EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN
 SM1600 LOADING

JOB NUMBER
 66/66F/33

DIA	SHAPE	GRADE	LOCATION	A	B	C	E	F	PIN DIA	L	LAPS	BAR	NO	TOTAL MASS	DIAGRAM
SEQ NO				MM	MM	MM	MM	MM	P	MM	NO LGTH	LENGTH	REQD	(KG)	

* RELIEVING SLAB AT ABUTMENT B (DRG NO 2256) *															

24	A	1	TRANSVERSE	10450								10450	12	456.5	
16	A	2	TRANSVERSE	10450								10450	82	1387.3	
16	E	3	TRANSVERSE ENDS	225	600	600			64			1358	54	118.7	
28	A	4	LONGIT SIDES	5870								5870	16	465.4	
16	A	5	LONGIT TF	5870								5870	40	380.1	
24	A	6	LONGIT BF	5870								5870	40	854.7	
16	E	7	LONGIT ENDS	265	600	600			64			1398	96	217.3	

RELIEVING SLAB SUB-TOTAL										GRADE D500N BARS		3880 KGS			

NOTES: 1. FOR FURTHER DETAILS SEE DRAWINGS 1043 AND 1044. 2. LAP TYPE:- "S"=STRAIGHT LAP, "H"=HOOKED LAP.
 3. ALL REINF. STEEL TO BE ACRS CERTIFIED, GRADE D500N OR R250N TO AS/NZS 4671 [D500N Grade "Blank", R250N Grade "R"]

DEPARTMENT OF MAIN ROADS QUEENSLAND STEEL SCHEDULE (Ver 14.02) SHEET NO. 15 OF 18 DATE 04 DEC 2024

LAME DUCK CREEK BRIDGE
 EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN
 SM1600 LOADING

JOB NUMBER
 66/66F/33

STEEL SUMMARY BY LOCATION

 * ABUTMENT A (DRG. No. 123455) *

 ABUTMENT SUB-TOTAL GRADE D500N BARS 394 KGS

TOTAL . . . BARS 393 KGS

 * ABUTMENT B (DRG. No. 123456) *

 ABUTMENT SUB-TOTAL GRADE D500N BARS 394 KGS

TOTAL . . . BARS 393 KGS

 * PIER 1 (DRG. No. 1234567) *

 PIER SUB-TOTAL GRADE D500N BARS 163 KGS

TOTAL . . . BARS 163 KGS

 * PIER 2 (DRG. No. 123457) *

 PIER SUB-TOTAL GRADE D500N BARS 163 KGS

TOTAL . . . BARS 163 KGS

 * PIER 3 (DRG. No. 123458) *

 PIER 3 SUB-TOTAL GRADE D500N BARS 214 KGS

DEPARTMENT OF MAIN ROADS QUEENSLAND STEEL SCHEDULE (Ver 14.02) SHEET NO. 16 OF 18 DATE 04 DEC 2024

LAME DUCK CREEK BRIDGE
 EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN
 SM1600 LOADING

JOB NUMBER
 66/66F/33

STEEL SUMMARY BY LOCATION

TOTAL . . . BARS		215 KGS	

*	KERBS SPAN 1	DRG NO 123458 & 123459	*

KERBS SUB-TOTAL		GRADE D500N BARS	1325 KGS

TOTAL . . . BARS		1327 KGS	

*	KERBS SPAN 2	DRG NO 123458 & 123459	*

KERBS SUB-TOTAL		GRADE D500N BARS	1325 KGS

TOTAL . . . BARS		1327 KGS	

*	KERBS SPAN 3	DRG NO 123458 & 123459	*

KERBS SUB-TOTAL		GRADE D500N BARS	1325 KGS

TOTAL . . . BARS		1327 KGS	

*	RELIEVING SLAB AT ABUTMENT A	(DRG NO 2256)	*

RELIEVING SLAB SUB-TOTAL		GRADE D500N BARS	3880 KGS

TOTAL . . . BARS		3879 KGS	

*	RELIEVING SLAB AT ABUTMENT B	(DRG NO 2256)	*

DEPARTMENT OF MAIN ROADS QUEENSLAND STEEL SCHEDULE (Ver 14.02) SHEET NO. 17 OF 18 DATE 04 DEC 2024

LAME DUCK CREEK BRIDGE
EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN
SM1600 LOADING

JOB NUMBER
66/66F/33

STEEL SUMMARY BY LOCATION

RELIEVING SLAB SUB-TOTAL	GRADE D500N BARS	3880 KGS
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TOTAL . . . BARS	3879 KGS
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DEPARTMENT OF MAIN ROADS QUEENSLAND STEEL SCHEDULE (Ver 14.02) SHEET NO. 18 OF 18 DATE 04 DEC 2024

LAME DUCK CREEK BRIDGE
 EXAMPLE SHIRE ANONOMOUS HIGHWAY MITCHELL - MORVEN
 SM1600 LOADING

JOB NUMBER
 66/66F/33

STEEL SUMMARY BY DIAMETER AND GRADE

GRADE D500N BARS	(MM)	10	12	16	20	24	25	28	32	36	40
MASS/METRE		0.632	0.910	1.619	2.528	3.640	3.854	4.955	6.471	8.190	10.112
LENGTH (METRE)		0.000	194.000	4127.000	784.000	885.000	0.000	188.000	11.000	0.000	0.000
MASS (KG)		0.00	176.98	6681.14	1981.29	3220.29	0.00	930.75	72.48	0.00	0.00
TOTAL MASS		13062.92 KG			13.063 TONNE						

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| GRAND TOTAL MASS          13062.92 KG          13.063 TONNE |
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