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Specification (Measurement)

**Transport and Main Roads Specifications
MRS65 Precast Prestressed Concrete Piles**

July 2017

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1 Introduction

This Specification applies to the transport and / or installation of precast, prestressed concrete piles.

This Specification shall be read in conjunction with MRS01 *Introduction to Specifications*, other Specifications as appropriate and the quality system requirements of the Contract.

This Specification forms part of the Transport and Main Roads Specifications Manual.

The demarcation between this Specification and MRTS73 *Manufacture of Prestressed Concrete Members and Stressing Units*, is that MRTS73 applies from manufacture of the piles to completion of loading of the piles on transport in the manufacturer's yard, irrespectively of where the piles are to be delivered. This Specification, MRS65 applies to the transport (potentially one or more phases of transport) of the piles, their stockpiling if required, and / or delivery to the pile driver. Essentially, this Specification MRTS65 applies from the time the piles are loaded onto transport in the manufacturer's yard, to driving of the piles in their final position. This includes transport, unloading, storage, lifting / moving at the job or elsewhere, pitching, driving, preparing the piles for incorporation into the project, and acceptance or rejection of the completed piles into the project.

2 Measurement of work

2.1 Standard Work Items

In accordance with the provisions of Clause 2.1.3 of MRS01 *Introduction to Specifications*, the Standard Work Items covered by this Specification are listed in Table 2.1.

Table 2.1 – Standard Work Items

Standard Item No.	Description	Unit of Measurement
Precast Prestressed Concrete Piles		
70701	Prestressed concrete piles, supply on Site, [<i>cross section size</i>] mm [<i>cross section shape</i>]	m
70702	Transport to Site and storage of prestressed concrete piles, ex works [<i>location</i>]	lump sum
70703	Handling and pitching of prestressed concrete piles, [<i>cross section size</i>] mm [<i>cross section shape</i>]	each
70704P	Driving prestressed concrete piles, [<i>cross section size</i>] mm [<i>cross section shape</i>] (Provisional Quantity)	m
70708	Setting up for preboring for prestressed concrete piles	lump sum
70709	Preboring for prestressed concrete piles	m
70710	Splicing of prestressed concrete piles	each
70711	Stripping of prestressed concrete pile head, [<i>cross section size</i>] mm [<i>cross section shape</i>]	each
70712P	Extension of prestressed concrete piles, [<i>cross section size</i>] mm [<i>cross section shape</i>] (Provisional Quantity, as directed)	m

Standard Item No.	Description	Unit of Measurement
70716P	Setting up for re-driving of prestressed concrete piles (Provisional Quantity, as directed)	each
70720	Monitoring the last 10 blows of the pile drive using a PM	each

2.1.1 Work Operations

Item 70701 Prestressed concrete piles, supply on Site, [cross section size] mm [cross section shape]

This item is used only where prestressed concrete piles are supplied by the Contractor.

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) manufacture of prestressed concrete piles
- c) transport to Site
- d) unloading at Site, and
- e) storage at Site.

Item 70702 Transport to Site and storage of prestressed concrete piles, ex works [location]

This item is used only where prestressed concrete piles are supplied by the Principal for collection by the Contractor at the place of manufacture. Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) taking delivery of piles at the location and by the mode nominated in the schedules
- c) securing piles on transporter
- d) transport to Site
- e) permits and police escort
- f) preparation of Site storage area, and
- g) unloading and storage of piles.

Item 70703 Handling and pitching of prestressed concrete piles, [cross section size] mm [cross section shape]

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) transferring pile from on Site storage to its aligned position in the driving rig
- c) provision and use of the driving rig, and
- d) retention of pile on line for driving.

Item 70704P Driving prestressed concrete piles, [cross section size] mm [cross section shape] (Provisional Quantity)

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) driving the pile
- c) provision and use of the pile-driving hammer
- d) provision and installation of a follower in cases other than those specified in Clause 7.13 of MRS65
- e) interruptions to the usual driving sequence caused by (d) above, and
- f) setting up for and re-driving piles which have lifted as a result of other driving operations.

Item 70708 Setting up for preboring for prestressed concrete piles

This item is used only where preboring is shown on the Drawings or directed by the Administrator.

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) provision and establishment on Site of plant and equipment required for preboring.

Item 70709 Preboring for prestressed concrete piles

This item is used only where preboring is shown on the Drawings or directed by the Administrator.

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) boring the hole (for piles of all sizes), and
- c) disposal of the excavated material.

Item 70710 Splicing of prestressed concrete piles

This item is used only where spliced piles are shown on the Drawings or directed by the Administrator.

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) splicing of the pile, including supply of the splicing sleeve, supply and testing of the epoxy, actual splicing operation and delays to the piling operation consequent to the splicing operation, and
- c) disposal of waste material.

Item 70711 Stripping of prestressed concrete pile head, [cross section size] mm [cross section shape]

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) breaking back of concrete in pile head
- c) protection of pile against spalling below cut-off level

- d) cutting off excess pile and / or excess reinforcement above bond length, and
- e) disposal of waste material.

Item 70712P Extension of prestressed concrete piles, [cross section size] mm [cross section shape] (Provisional Quantity, as directed)

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) excavation, dewatering and backfill
- c) disposal of excavated material
- d) supply and placement of formwork
- e) supply and placement of reinforcement (including that required for bonding into cap), and
- f) supply and placement of concrete.

Item 70716P Setting up for re-driving of prestressed concrete piles (Provisional Quantity, as directed)

This item is used only where the Administrator directs that a pile requires re-driving after the original driving operation has been completed. This item shall not be used for re-driving piles which have lifted as a result of other driving operations. Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) re-positioning of driving equipment over pile, and
- c) removal of driving equipment on completion of re-driving.

Item 70720 Monitoring the last 10 blows of pile driving using a PM

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply on site and set up of the PM equipment
- c) monitoring the last 10 blows of the pile drive
- d) analysis of the data, and
- e) supply of the data and analysis in both digital and paper format to the Administrator.

3 Calculation of quantities

3.1 Natural ground surface level

The natural ground surface level shall be taken as the level determined from the contours shown on the Drawings unless agreed otherwise, in writing, by the Contractor and the Administrator, prior to commencing driving.

3.2 Pile driving

Pile driving shall be measured on the basis of the driven length of pile, which length shall be taken to be the axial length from the toe of the pile to the underside of the headstock or pile cap or to the natural ground surface level, whichever is the lower.

3.3 Preboring

Preboring shall be measured as the length along the hole axis from the level at the bottom of the hole, as shown on the Drawings unless otherwise directed by the Administrator, to the level of the underside of the pile cap or to natural ground surface level, whichever is the lower.

3.4 Extension of pile

Extension of pile resulting from authorised driving below the level shown on the Drawings shall be measured as the distance along the axis of the pile, between the top of the precast pile at completion of driving and the lowest level of the top of the pile. This would provide the reinforcement bond length shown on the Drawings without the need for extension.

4 Administration requirements

4.1 Prestressed concrete piles

4.1.1 Supply of prestressed concrete piles

Where listed in the Principal Supplied Materials List (Form C6827), prestressed concrete piles will be supplied by the Principal. Where not so listed, prestressed concrete piles shall be supplied by the Contractor.

4.1.2 Prestressed concrete piles supplied by the Principal

4.1.2.1 Supply location

Prestressed concrete piles supplied by the Principal will be made available at the point of delivery and by the transport mode shown in the Principal Supplied Material List (Form C6827).

4.1.2.2 Acceptance of piles by Contractor

The Contractor shall check the prestressed concrete piles for quantity and condition upon taking delivery and shall immediately report to the Administrator any defect or deficiency.

4.1.2.3 Damage to piles

In the event of any prestressed concrete pile sustaining damage after having been accepted by the Contractor, such as cracking or spalling, the pile shall be set aside until it has been inspected by the Administrator, who will decide whether it will be rejected, or repaired by the Contractor. The cost of repairs to damaged piles and the cost of replacing rejected piles shall be borne by the Contractor.

4.1.2.4 Pile Monitoring (PM)

In the event that a pile has been driven to design level or some other level and PM monitoring is undertaken and this indicates set has not been achieved, the pile will then be driven to the required set or some level as determined by the Administrator, at that time a full PM item is required and the data reported to the Administrator. Intermediate PM data need not be formally supplied to the Administrator.

4.2 No additional payment for compliance with MRTS65

No additional payment shall be made for compliance with the requirements of MRTS65, including but not limited to the following:

- a) Removal of ground material forced up between the piles during the driving operation (Clause 7.1 of MRTS65).

- b) Remedial measures required to accommodate out-of tolerance piles (Clause 7.4 of MRTS65).
- c) Dynamic testing of piles driven using an alternative hammer (Clause 7.5.3).
- d) Rectification of the damage or replacement of the pile where damage to piles is attributable to the Contractor's method for handling or driving (Clause 7.7 of MRTS65), and
- e) Monitoring of the set of the pile when the set has not as yet been achieved and further driving is required. Only the final PM is required. Any intermediate monitoring will not require reporting.

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