

Installation Guide



1.0 Introduction

- This document describes the recommended procedure for the installation of FP McCann headwalls – the reinforced precast concrete headwall unit used in drainage outfalls.
- The precast concrete headwall is available in 11 standard sizes: small, medium, large, XL T1-4 and XXL T1-4; the latter two sizes are available with two piece extended toes, if required. Table 1 (overleaf) gives a summary of each size available. Gratings, handrails, baffle blocks, weir walls, stairs and ladders are also available for headwalls and are provided by FP McCann.

2.0 Disclaimer

- This document is produced by FP McCann as a 'recommended guideline document to the industry'.
- Its purpose is to aid contractors in the installation of the FP McCann precast concrete headwalls and headwalls with two piece extended toes. It is the responsibility of the contractor to ensure that the precast concrete headwall is carried out in accordance with the design specifications for the site.
- It is the responsibility of the contractor to install the precast concrete headwall safely in accordance with site conditions.

3.0 Receipt and Handling of Headwalls on Site

- Time and place of off-loading should be agreed before units arrive at site. For safety, all units are delivered in the upright position as installed. During delivery and off-loading, the units should be placed on 250mm skids to ensure no damage to the toe end. Units must be stored individually and not stacked.
- Off-loading should take place at the nearest hard standing area to the point of installation. An additional area for connecting the extended toe to the headwall is recommended.
- Off-loading must be carried out using appropriate lifting equipment. It is recommended that telescopic handlers, or equivalent, with forklift toes are used to off-load on-site; to prevent operatives from climbing onto the trailer. Each headwall section is supplied with 3 lifting anchors cast into the reinforcing in the floor and wall of the unit. Lifting loops are attached to these anchors and 3 legged adjustable chains (1 leg shortened) are used to transport on site, fix into position and for joining both halves. Each extended toe section has 2 cast-in anchors with 2 equal chains used to transport and joint.
- Carefully inspect units during off-loading to verify that products are undamaged and comply with order placed. Two types of check are required:

Visual: Inspect the headwall and/or extended toe for any sign of damage, including cracked or chipped concrete, or damage that could affect the performance.

Design: Check that the item received is the one ordered. Headwalls are a standard FP McCann product and are labelled with the following information:

- a. Headwall Size
- b. Pipe Type
- c. Pipe Diameter
- d. Production date
- e. Site / Customer Ref
- f. Customer Order No. (if applicable)

- All FP McCann products are stamped with the production date (this is a quality control procedure).
- Any Headwalls/Silt Traps/Extended Toes rejected should be labelled and stored separately with the discrepancies for each noted on the delivery docket and reported for further action.

4.0 Installation of Small, Medium and Large Precast Concrete Headwalls and Silt-Traps

The headwall is manufactured as a monolithic precast unit. FP McCann operates a quality management system accredited to ISO 9001 with all constituent products subject to regular quality inspection. The headwalls are manufactured to structural classes XD2 and XD3/4, depending on actual unit and use required.

- Cut and install the last section of pipe that the headwall will cover. Ensure that the pipe is fully fitted, leaving either the first (or last) section of pipe free from backfill to attach to the headwall.
- Excavate to formation level, place and compact a 300mm bed of 50mm clean drainage stone or similar free drainage aggregate.
- Check that the correct headwall has been brought to the installation point. Cross reference and check pipe connection diameter to that of the headwall. The movement of the headwall on-site must be undertaken in a manner that is safe and will not cause any damage to the unit in any way – the use of the cast-in lifting anchors fitted with loops and connected to equal length 3 legged chains is recommended.
- Place the headwall unit onto the bedded surface. It is essential that the headwall is positioned in the centre of the hole. Placing a shim at the bottom of the pipe to centre in position is recommended.
- Install the headwall onto the end of the pipeline.
- Using the appropriate grout or an epoxy resin, fill in the void between the reinforced concrete headwall and the pipe. This will ensure a firm fit. Backfill the pipe section between the headwall and embankment. It is recommended that 300mm surround of 50mm or similar free drainage aggregate is used to surround the headwall to ensure good groundwater drainage.

5.0 Installation of XL & XXL Precast Concrete Headwall

The headwall is manufactured as a 2 piece precast concrete unit to be joined on-site by others upon installation. FP McCann operates a Quality Management System accredited to ISO 9001 with all constituent products subject to regular quality inspection. The headwalls are manufactured to structural classes XD2 and XD3/4, depending on actual unit and use required.

- Cut and install the last section of pipe that the headwall will cover. Ensure that the pipe is fully fitted, leaving a section of pipe free from backfill to accept the headwall.
- Excavate to formation level; this should be approx 750mm below the floor level of the headwall. Place and compact approx. 300mm bed of 50mm clean drainage stone or similar free drainage aggregate (compacted in 100mm layers), then place approx. 200mm of lean mix concrete, ensuring a level surface.
- Check that the correct headwall has been brought to the installation point. Cross reference and check pipe connection diameter to that of the headwall. The movement of the headwall on-site must be undertaken in a manner that is safe and will not cause any damage to the unit in any way – the use of the cast-in lifting anchors fitted with loops and connected to a standard set of 3 legged adjustable chains (1 leg shortened) is recommended.
- Place Part A of the headwall unit onto the bedded surface. It is essential that the headwall is positioned in the centre of the pipe and is levelled. Placing a shim at the bottom of the pipe to position is recommended.
- Clean the receiving jointing groove of Part A and place a 20mm bed of construction adhesive mortar (supplied with the units) onto the groove, ensuring a uniform bed.
- Clean the corresponding jointing surface of Part B and lift into position. Clean all excess mortar that is forced out when both halves are jointed. Using the appropriate grout or an epoxy resin, fill in the void between the reinforced concrete headwall and the pipe. This will ensure a firm fit. Backfill the pipe section between the head wall and embankment. It is recommended that 300mm bed of 50mm or similar clean drainage aggregate is used to surround the headwall to ensure good groundwater drainage.

6.0 Installation of Precast Concrete Headwalls with Extended Toes

The headwall is manufactured as a 2 piece precast concrete unit; the extended toe is a secondary unit to be connected to each half before installation. FP McCann operates a quality management system accredited to ISO 9001 with all constituent products subject to regular quality inspection. The headwalls are manufactured to structural classes XD2 and XD3/4, depending on actual unit and use required.

- Cut and install the last section of pipe that the headwall will cover. Ensure that the pipe is fully fitted, leaving a section of pipe free from backfill to accept the headwall.

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- Excavate to formation level; this should be approx 750mm below the floor level of the headwall. Place and compact approx. 300mm bed of 50mm clean drainage stone or similar free drainage aggregate (compacted in 100mm layers), then place approx. 200mm of lean mix concrete ensuring a level surface.
- Check that the correct headwall has been brought to the installation point. Cross reference and check pipe connection diameter to that of the headwall. The movement of the headwall on-site must be undertaken in a manner that is safe and will not cause any damage to the unit in any way – the use of the cast in lifting anchors fitted with loops and connected to a standard set of 3 legged adjustable chains is recommended for the headwall pieces. Two legged chains required for extended toe. Lifting anchors are designed for a vertical lift only with a maximum lift angle of 60°.
- Place extended toe for headwall unit on a hard standing level surface (ensuring that it is the correct toe for the headwall unit). Lower the headwall unit onto the toe to allow it to rest lightly on it. Then secure the threaded pins through the joint locations in the toes, starting with the side nearest the headwall joint and finishing with the middle pin(s). Ensure pins are secured tightly and fit nuts provided to the threaded end on the toe. Use sikadur 31, or similar approved, as per joint detail between the headwall and the extended toe.
- Place this half of the headwall unit & extended toe onto the bedded surface. It is essential that the headwall is positioned in the centre of the pipe and is levelled. Placing a shim at the bottom of the pipe to position it is recommended.
- Repeat stage 4 & 5 for other headwall half and extended toe.
- Clean the receiving jointing groove of Part A and install the fixing bolts (supplied with the units), then place a 20mm bed of construction adhesive mortar (supplied with the units) onto the groove, ensuring a uniform bed.
- Clean the corresponding jointing surface of Part B and lift into position, taking care to lower the unit into position vertically, ensuring that the fixing bolts enter the fixing sockets fully.
- The retaining nuts should then be screwed onto both fixing bolts and tightened fully, connecting both pieces of the unit together. Clean away any excess mortar that is forced out when both halves are jointed.
- Using the appropriate grout or an epoxy resin, fill in the void between the reinforced concrete headwall and the pipe. This will ensure a firm fit. Backfill the pipe section between the headwall and embankment. It is recommended that 300mm bed of 50mm or similar clean drainage aggregate is used to surround the headwall to ensure good groundwater drainage.

7.0 Bespoke Solutions

- FP McCann understands that situations will arise when our standard headwall will not meet the specific design requirements of a particular contract and, if so, we will adapt our standard headwall to best suit your requirements.
- Where headwalls are installed in poor ground conditions there may be a need for an additional concrete toe to reduce the effect of sliding.

- **Small Headwall – 11.79 KN / unit**
- **Medium Headwall – 15.39 KN / unit**
- **Large Headwall – 30.13 KN / unit**

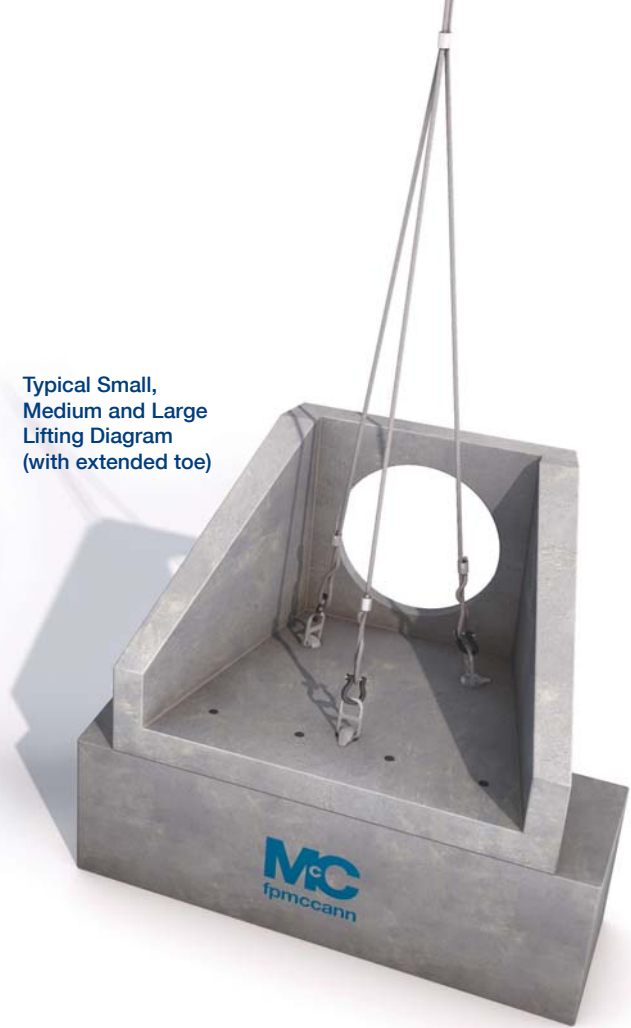
Headwall Range	Up to & including Pipe Sizes	Max Pipe O.D. mm	Approx. Weight (Kg)
HW Small 100	300	450	1100
HW Small 150	300	450	1390
HW Medium 100	450	630	1540
HW Medium 150	450	630	2020
HW Large 100	900	1130	3020
HW Large 200	900	1130	4740
HW XL-T1	1500	1800	Part A 4725 Part B 4725
HW XL-T2	1050	1260	Part A 4095 Part B 4095
HW XL-T3	675	885	Part A 3465 Part B 3465
HW XL-T4	375	505	Part A 2646 Part B 2646
HW XXL-T1	2100	2450	Part A 10,150 Part B 10,150
HW XXL-T2	1500	1800	Part A 9205 Part B 9205
HW XXL-T3	1050	1260	Part A 8421 Part B 8421
HW XXL-T4	525	675	Part A 6915 Part B 6915

Table 1
Headwall Range - Quick Reference Guide

Typical Small,
Medium and Large
Lifting Diagram
(with standard toe)



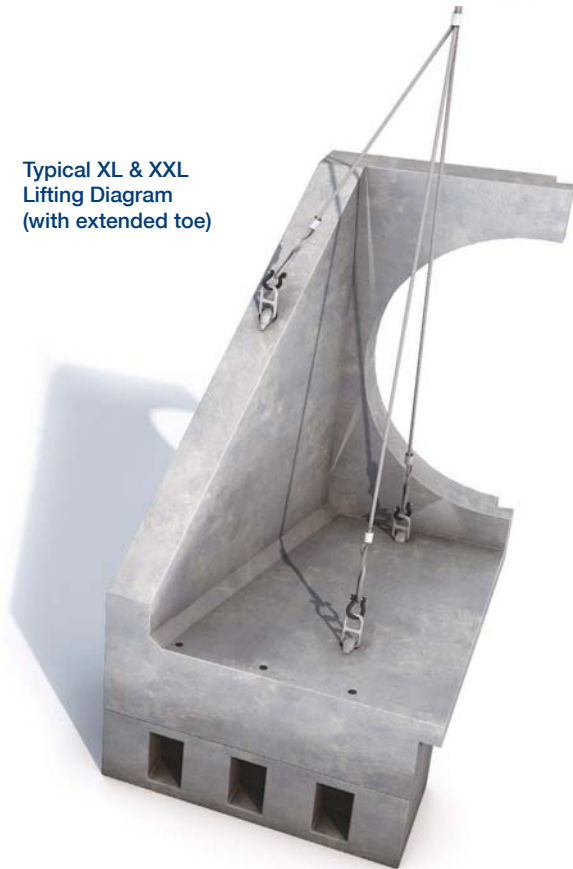
Typical Small,
Medium and Large
Lifting Diagram
(with extended toe)



Typical XL & XXL
Lifting Diagram
(with standard toe)

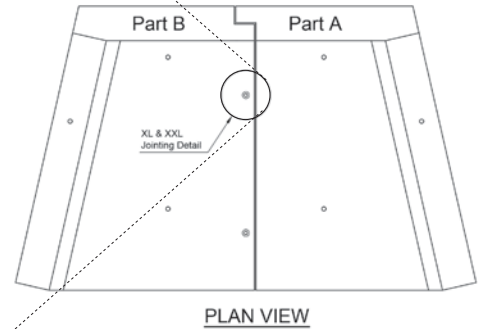
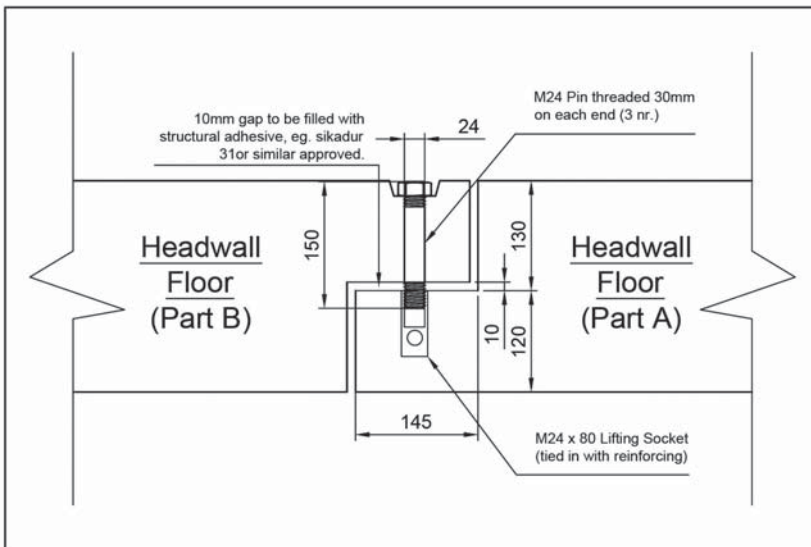


Typical XL & XXL
Lifting Diagram
(with extended toe)

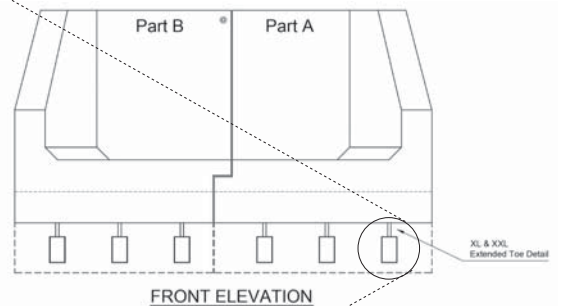
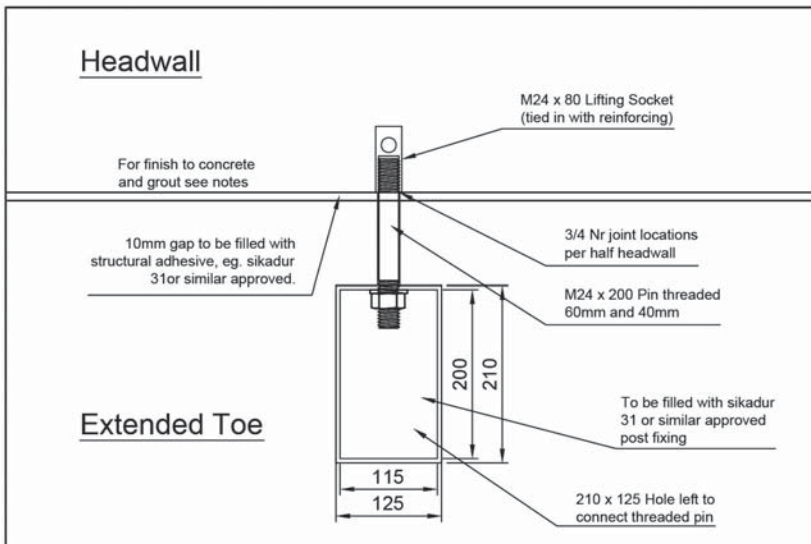


Lifting Diagrams

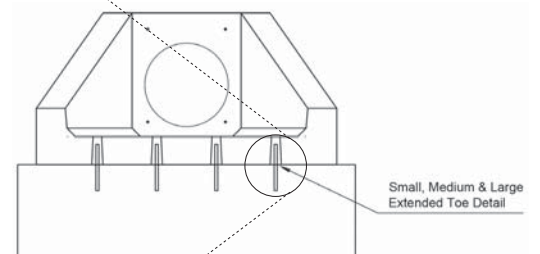
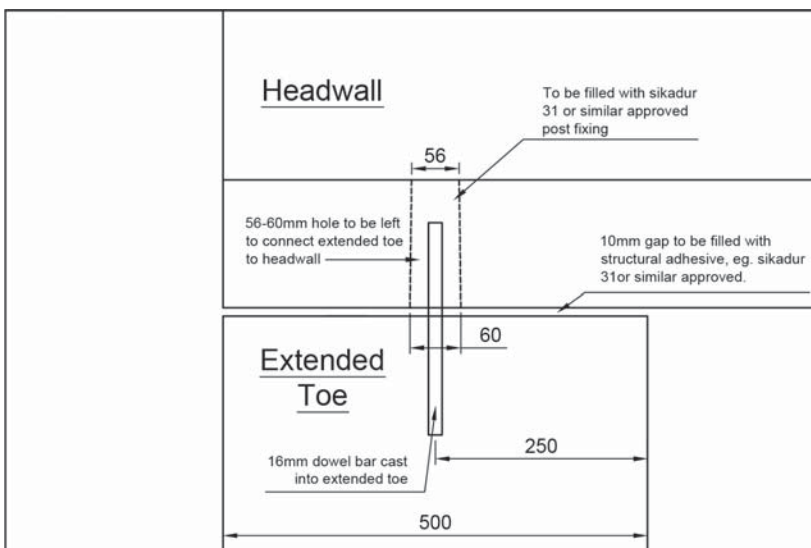
Jointing Details



XL & XXL Jointing Detail



XL & XXL Extended Toe Detail



Small, Medium & Large Extended Toe Detail