



# Former Carless Oil Terminal, Old Kilpatrick Proposed Jetty Works

Marine Planning Statement  
March 2019  
For Malin Group Properties Ltd

## Document Control Sheet

**Project Name:** Carless Jetties

**Project Ref:** 38605-4511

**Report Title:** Marine Planning Statement

**Date:** March 2019

	Name	Position	Signature	Date
<b>Prepared by:</b>	Alasdair Adey	Principal Planner	AA	November 2018
<b>Reviewed by:</b>	Mark Johnston	Senior Associate	MJ	February 2018
<b>Approved by:</b>	Dougie McDonald	Director	DMcD	March 2019
<b>For and on behalf of Peter Brett Associates LLP</b>				

Revision	Date	Description	Prepared	Reviewed	Approved

This report has been prepared by Peter Brett Associates LLP ('PBA') on behalf of its client to whom this report is addressed ('Client') in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which PBA was appointed by its Client. This report is not intended for and should not be relied on by any third party (i.e. parties other than the Client). PBA accepts no duty or responsibility (including in negligence) to any party other than the Client and disclaims all liability of any nature whatsoever to any such party in respect of this report.

© Peter Brett Associates LLP 2019

## Contents

<b>1</b>	<b>Introduction .....</b>	<b>1</b>
1.1	Introduction .....	1
1.2	Site Location and Description .....	1
1.3	Proposed Marine Works .....	2
1.4	Purpose and Structure of this Report .....	3
<b>2</b>	<b>Marine Planning Policy .....</b>	<b>4</b>
2.2	Scotland's National Marine Plan (2015) .....	4
2.3	Clyde Regional Marine Plan .....	8
2.4	Summary Conclusions .....	8

## Figures

Figure 1-1 – Site Location Plan .....	1
Figure 1-2 – Existing Jetties Layout .....	2
Figure 1-3 – Location of Completed Heavy Lift Quay .....	3

## Tables

Table 2.1 – Relevant Policies within Scotland's Marine Plan (2015) .....	4
Table 2.2 – Summary Economic Benefits .....	6

## Appendices

Appendix A	Construction Sequence
------------	-----------------------

# 1 Introduction

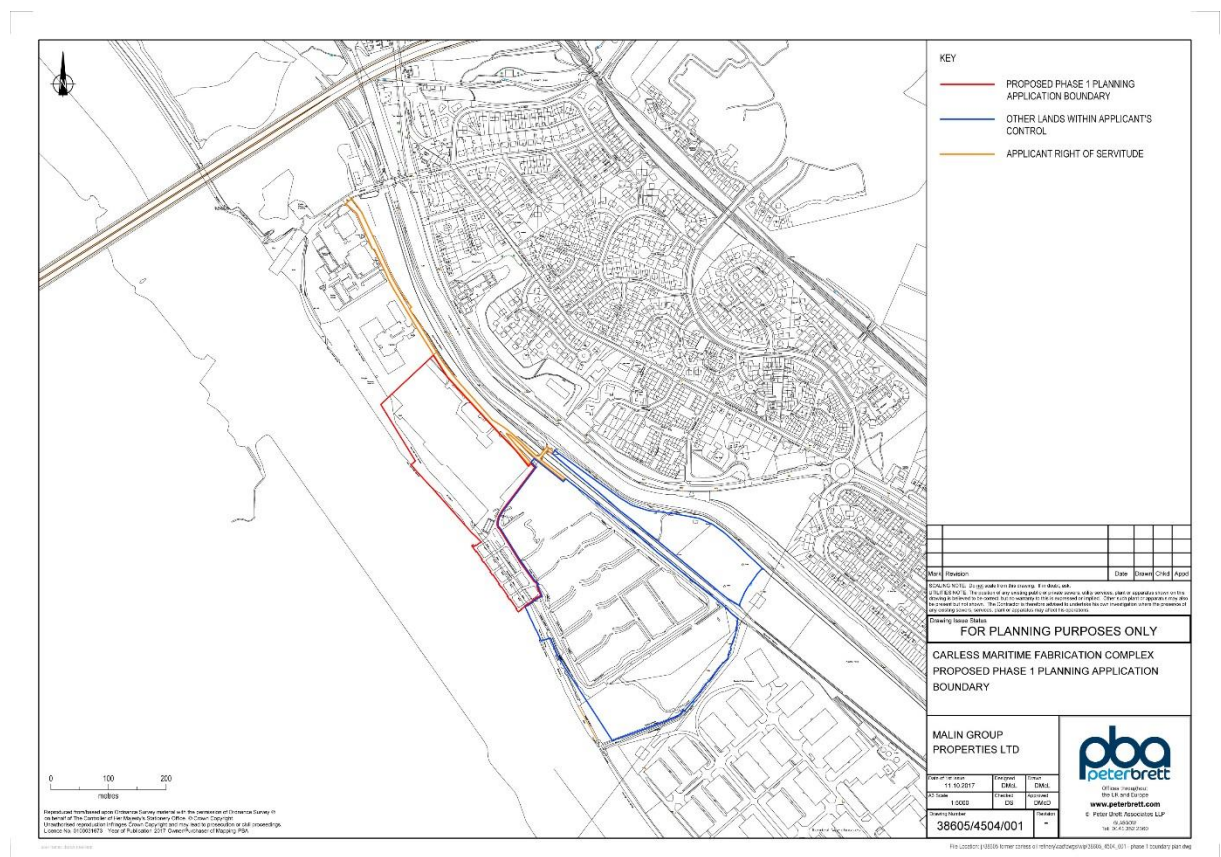
## 1.1 Introduction

- 1.1.1 This marine Planning Statement has been prepared by Peter Brett Associates (PBA) on behalf of Malin Group Properties Ltd to accompany a Marine Licence application for the marine elements associated with the proposed development of a Marine Fabrication Complex with associated infrastructure, landscaping and access at the former Carless Oil Terminal site, Old Kilpatrick.
- 1.1.2 The new heavy lift quay subject to this Marine Licence application is part of a wider redevelopment proposal comprising a marine fabrication complex, office accommodation, and associated access, hardstanding, landscaping and services.
- 1.1.3 Separate planning applications for the Marine Fabrication Complex and remediation works have been prepared and submitted to West Dunbartonshire Council as the relevant determining authority. This PAC report focuses on the consultation phase specifically associated with the marine elements of the proposal, notably a new heavy lift quay.

## 1.2 Site Location and Description

- 1.2.1 The site forms part of the Applicants landholding at the former Carless Oil Terminal in Old Kilpatrick, West Dunbartonshire. This is referred to as the 'wider Carless landholding'. A Site Location Plan is provided in **Figure 1-1** below.

Figure 1-1 – Site Location Plan



- 1.2.2 The site extends to approximately 4.88ha (inclusive of jetties) and is located on the north bank of the River Clyde, upstream and east of the Erskine Bridge. It is bounded to the north by a disused railway corridor, to the west by existing industrial premises, to the east by former oil terminal derelict land and to the south by the River Clyde.

- 1.2.3 The topography of the site is complex, comprising a relatively flat area of hardstanding at approximately 5m AOD and localised variations which reflect previous industrial uses within the site, as well as a sloping area of foreshore on the northern bank of the River Clyde.
- 1.2.4 Access to the site is taken from Erskine Ferry Road to the north west of the site.

### Relevant Site History

- 1.2.5 The site is located within a former Ministry of Defence strategic fuel depot that was operational in the first half of the 20th Century and suffered bomb damage during the Second World War.
- 1.2.6 The Applicant's landholding, including the site, was then used as an oil storage terminal before being decommissioned in 1992. Decommissioning and surface structure demolition works were then undertaken, although jetties protruding into the River Clyde, partial oil storage structures, areas of reinforced concrete hardstanding and extensive made ground remain on the site.

## 1.3 Proposed Marine Works

- 1.3.1 The site of the proposed marine works extends to approximately 2,400m<sup>2</sup> (0.24 hectares) and comprises an area of foreshore and seabed at the north bank of the River Clyde, upstream and east of the Erskine Bridge. The site is occupied by part of an existing jetty structure, which comprises linked jetties protruding approximately 30m from existing sheet piles at the foreshore south eastwards into the River Clyde. These jetties connect the with solid 'dolphin' structures which are fixed to the seabed.

Figure 1-2 – Existing Jetties Layout



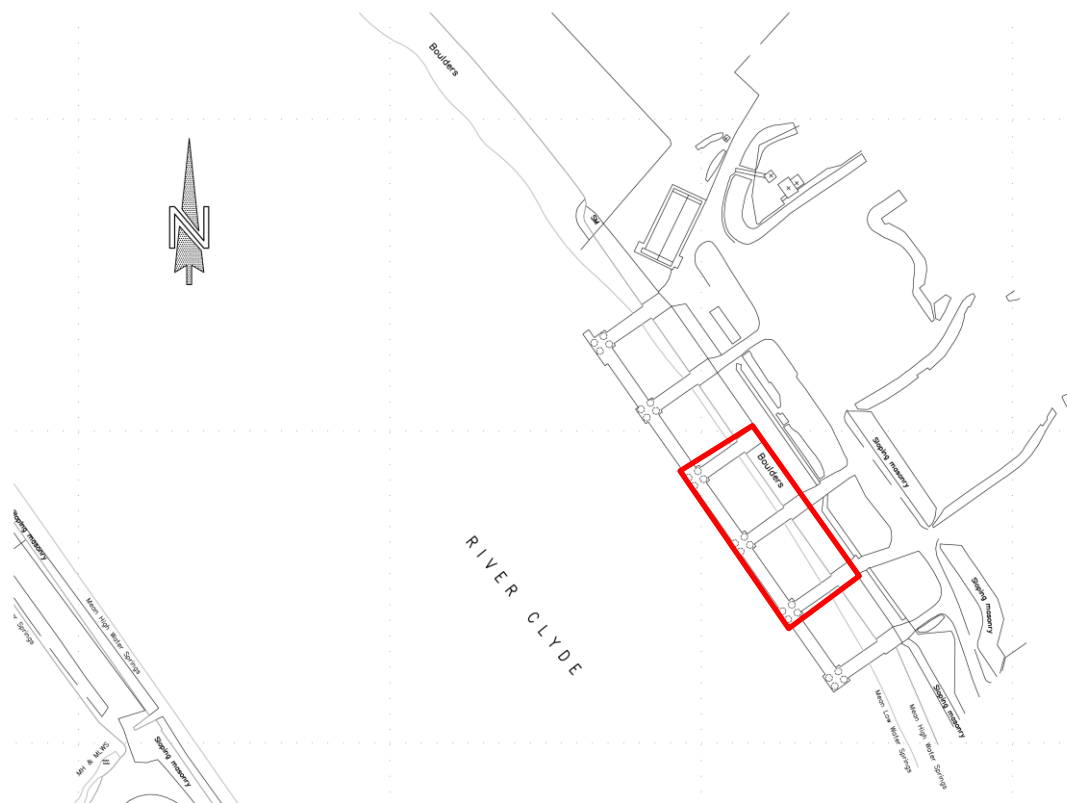
### Description of Works

- 1.3.2 The proposed jetty works are a sequential demolition existing jetty bays at Carless and construction of a new heavy lift quay.

- Step 1 – Partial demolition of existing jetty structures
- Step 2 – Site clearance to allow piling works
- Step 3 – Piling Works
- Step 4 – Concrete works
- Step 5 – Finishing works

1.3.3 The proposed works are described in detail in the accompanying Construction Sequence document prepared by Arch Henderson (**Appendix A**). In summary terms, following the demolition of existing structures in the area outlined in red in Figure 1-2, construction works will result in a new heavy lift quay in the location shown in Figure 1-3

Figure 1-3 – Location of Completed Heavy Lift Quay



## 1.4 Purpose and Structure of this Report

1.4.1 This Marine Planning Statement provides an overview of marine planning policy relevant to the marine works associated with the wider proposal for the development of a Marine Fabrication Complex at the site.



## 2 Marine Planning Policy

2.1.1 This section provides an overview of the relevant marine planning policy together with an analysis of the proposals in this context. It considers National and regional marine planning policy and objectives.

### 2.2 Scotland's National Marine Plan (2015)

2.2.1 The Marine (Scotland) Act 2010 established new systems of marine spatial planning and marine licensing across Scotland's territorial waters and marine exclusive economic zone. The Carless site lies adjacent to the Forth & Clyde Canal which is a designated Scheduled Monument. The proposed development includes the demolition of existing structures and creation of a new heavy lift quay on the northern bank of the River Clyde. A marine licence application will be required to authorise the proposed marine works which form part of the proposed development, and this application will be determined in accordance with Scotland's National Marine Plan (SNMP) (2015) alongside other relevant considerations.

2.2.2 Chapter 4 of the SNMP sets out a core set of general policies applicable to all current, proposed and potential future marine activities. These policies consider the sustainability of proposed developments and marine activities. Chapters 6-16 of the Plan then sets out sectoral policies of relevance to specific development or marine activity sectors. Relevant policies from the Plan have been taken into account in the design of the proposed marine works. Specific policies of relevance to the proposed development are outlined in **Table 5.4** below, with further analysis of the highlighted items provided in the subsequent paragraphs.

Table 2.1 – Relevant Policies within Scotland's Marine Plan (2015)

SNMP Policies	Summary
GEN1 General Planning Principle	There is a presumption in favour of sustainable development and use of the marine environment when consistent with the policies and objectives of this Plan.
<b>GEN2 Economic Benefit</b>	<b><i>Sustainable development and use which provides economic benefit to Scottish communities is encouraged when consistent with the objectives and policies of this Plan.</i></b>
GEN5 Climate Change	Marine planners and decision makers must act in the way best calculated to mitigate, and adapt to, climate change.
GEN6 Historic Environment	Development and use of the marine environment should protect and, where appropriate, enhance heritage assets in a manner proportionate to their significance.
<b>GEN7 Landscape/seascape</b>	<b><i>Marine planners and decision makers should ensure that development and use of the marine environment take seascape, landscape and visual impacts into account</i></b>
<b>GEN8 Coastal process and flooding</b>	<b><i>Developments and activities in the marine environment should be resilient to coastal change and flooding, and not have unacceptable adverse impact on coastal processes or contribute to coastal flooding</i></b>
<b>GEN9 Natural Heritage</b>	<b><i>Development and use of the marine environment must:</i></b> <ul style="list-style-type: none"> <li><b><i>Comply with legal requirements for protected areas and protected species.</i></b></li> <li><b><i>Not result in significant impact on the national status of Priority Marine Features.</i></b></li> <li><b><i>Protect and, where appropriate, enhance the health of the marine area.</i></b></li> </ul>

SNMP Policies	Summary
GEN 11 Marine Litter	Developers, users and those accessing the marine environment must take measures to address marine litter where appropriate. Reduction of litter must be taken into account by decision makers.
<b>GEN12 Water Quality and Resource</b>	<b><i>Developments and activities should not result in a deterioration of the quality of waters to which the Water Framework Directive, Marine Strategy Framework Directive or other related Directives apply.</i></b>
<b>GEN13 Noise</b>	<b><i>Development and use in the marine environment should avoid significant adverse effects of man-made noise and vibration, especially on species sensitive to such effects.</i></b>
GEN14 Air Quality	Development and use of the marine environment should not result in the deterioration of air quality and should not breach any statutory air quality limits
GEN 17 Fairness	All marine interests will be treated with fairness and in a transparent manner when decisions are being made in the marine environment.
<b>GEN18 Engagement</b>	<b><i>Early and effective engagement should be undertaken with the general public and all interested stakeholders to facilitate planning and consenting processes.</i></b>
GEN19 Sound Evidence	Decision making in the marine environment will be based on sound scientific and socio-economic evidence.
GEN21 Cumulative Impacts	Cumulative impacts affecting the ecosystem of the marine plan area should be addressed in decision making and plan implementation.
Transport 1	Navigational safety in relevant areas used by shipping now and in the future will be protected, adhering to the rights of innocent passage and freedom of navigation contained in UN Convention on the Law of the Sea (UNCLOS). The extent of interference with existing or planned routes used by shipping, access to ports and harbours and navigational safety should be assessed when making a decision.
Transport 2	Marine development and use should not be permitted where it will restrict access to, or future expansion of, major commercial ports or existing or proposed ports and harbours which are identified as National Developments in the current NPF or as priorities in the National Renewables Infrastructure Plan (Map 10 and 11) such as the Clyde.
Transport 4	Maintenance, repair and sustainable development of port and harbour facilities in support of other sectors should be supported in marine planning and decision making.
Transport 5	Port and harbour operators should take into account future climate change and extreme water level projections, and where appropriate take the necessary steps to ensure their ports and harbours remain viable and resilient to a changing climate. Climate and sea level projections should also be taken into account in the design of any new ports and harbours, or of improvements to existing facilities.
Transport 6	Marine planners and decision makers and developers should ensure displacement of shipping is avoided where possible to mitigate against potential increased journey lengths (and associated fuel costs, emissions and impact on journey



SNMP Policies	Summary
	frequency) and potential impacts on other users and ecologically sensitive areas.
Transport 7	<p>Marine and terrestrial planning processes should co-ordinate to:</p> <ul style="list-style-type: none"> <li>• Provide co-ordinated support to ports, harbours and ferry terminals to ensure they can respond to market influences and provide support to other sectors with necessary facilities and transport links.</li> <li>• Consider spatial co-ordination of ferries and other modes of transport to promote integrated and sustainable travel options.</li> </ul>

## Policy GEN 2 – Economic Benefit

*Sustainable development and use which provides economic benefit to Scottish communities is encouraged when consistent with the objectives and policies of this Plan.*

- 2.2.3 The primary driver for the marine works in this location is the economic opportunity it affords. The proposed development by Malin Group at Carless will create long term skilled employment on this derelict site. The Carless site's principal quality from Malin's perspective is the presence of existing Jetties and the access they afford to the Clyde. The proposed works include the demolition of sections of the existing jetties and the construction of a new heavy lift Quay on piles in the area currently occupied by the 3<sup>rd</sup> and 4<sup>th</sup> cells of the existing 5 cell jetty structure – See Figure 1-3 above. The economic benefits of the overall redevelopment project (including land side works and fabrication hall) are set out in Chapter 16 of the ES and can be summarised as follows for the study area of West Dunbartonshire:

Table 2.2 – Summary Economic Benefits

Net construction jobs	120
Net Construction GVA	£6.1m
Net Operational Jobs	51
Net Operational GVA	£22.8m

- 2.2.4 The majority of the economic benefits accrue from the operation of the marine Fabrication Complex rather than the new jetties, however it is not possible to split the two as they are interdependent and both elements must be constructed to realise the economic potential of either element.
- 2.2.5 The proposals are considered to be compliant with Policy GEN2

## Policy GEN 7 – Landscape / Seascape

*GEN 7 Landscape/seascape: Marine planners and decision makers should ensure that development and use of the marine environment take seascape, landscape and visual impacts into account*

- 2.2.6 The accompanying ES includes, at chapter 14, a landscape and visual impact assessment that also addresses seascape in the form of views from the opposite side of the river. Viewpoints 4 and 5 are taken from the opposite bank of the river and will afford views of the new quay. Similarly, river users will also be able to see the new quay. In summary terms the proposals are considered beneficial

#### Extract from para 14.7.45 of the ES

*Views of the site from the River Clyde would be limited to the central and north-western extents of the Study Area, where the river allows long distance views between Newshot Island to the south-east and the Forth and Clyde Canal to the north-west. Vessels using the river would experience views of the marine works when in close proximity to the site, where the removal of the remnant jetty structures and introduction of the new jetty would represent a positive change.*

- 2.2.7 The proposals are considered to be compliant with Policy GEN7.

#### Policy GEN 8 – Coastal Process and Flooding

*Developments and activities in the marine environment should be resilient to coastal change and flooding, and not have unacceptable adverse impact on coastal processes or contribute to coastal flooding.*

- 2.2.8 The proposed demolition of existing jetties and construction of a new quay in this location at Carless has been considered in a Flood Risk assessment that accompanies this application. It can be found in Chapter 8 of the ES, and the FRA is included in full as Appendix 8.2 of the ES.
- 2.2.9 The development as a whole (marine works and terrestrial works) has been modelled for flood risk purposes and a flood mitigation strategy discussed and agreed with SEPA in advance of the proposals being submitted for licence. A compensatory storage scheme has been designed and is outlined in the FRA. It comprises a total volume of 5,160m<sup>3</sup>.
- 2.2.10 The proposals are considered to be compliant with Policy GEN 8.

#### Policy GEN 9 – Natural Heritage

- 2.2.11 Of relevance to the determination of this proposal is Section A of Policy GEN 9.

*Development and use of the marine environment must:*

- (a) Comply with legal requirements for protected areas and protected species.*
- (b) Not result in significant impact on the national status of Priority Marine Features.*
- (c) Protect and, where appropriate, enhance the health of the marine area.*

- 2.2.12 The site is adjacent to the Inner Clyde SPA, SSSI and Ramsar site and is therefore a sensitive location with regard to Policy Section a). In support of the proposals, a full programme of ecological surveys including marine ecological surveys has been undertaken. This is reported in full in the EIA, which also identifies mitigation measures in the form of working practices and avoidance measures to reduce potential impacts on natural heritage. Chapters 9 and 10 of the ES cover terrestrial and marine ecology respectively.
- 2.2.13 There are no Priority Marine Features nearby that would be impacted by the proposals.
- 2.2.14 In general, the proposals will result in the cleaning up, via wider remediation works, of this section of the northern bank of the River Clyde. Importantly the wider redevelopment proposals include a programme of remediation (see planning application reference DC18/245) that is designed to sever potential contamination pathways for hydrocarbons to enter the Clyde from the Carless site. This will enhance the health of the marine area.
- 2.2.15 The proposals are considered to be compliant with Policy GEN 9.

#### Policy GEN 12 – Water Quality and Resource

*Developments and activities should not result in a deterioration of the quality of waters to which the Water Framework Directive, Marine Strategy Framework Directive or other related Directives apply.*

- 2.2.16 As part of this application, an assessment under the Water Framework Directive has been completed by ABPMer. This is included in full as appendix 7.2 of the ES. It concludes as follows:

*Based upon the information presented within this WFD assessment, it is concluded that the proposed development at Carless, specifically the proposed marine works, are not likely to have a permanent (i.e. non-temporary) effect on the status of WFD parameters that are significant at water body level. The proposed development is therefore not predicted to cause either deterioration to the current status of the Clyde Estuary – Inner (inc Cart) transitional water body or Clyde Estuary – Outer transitional water body, nor prevent these water bodies from achieving their future WFD objectives.*

- 2.2.17 The proposals are considered to be compliant with Policy GEN 12.

### **Policy GEN 13 – Noise**

*Development and use in the marine environment should avoid significant adverse effects of man-made noise and vibration, especially on species sensitive to such effects.*

- 2.2.18 The proposals have the potential to generate significant adverse effects as a result of the proposed piling activities. These have however been considered in full in the Marine Ecology Section of the ES (Chapter 10) and in the accompanying Underwater Noise Assessment at ES Appendix 10.3.
- 2.2.19 The Amrine Ecology conclusions note that with proposed mitigation in place, there are not expected to be any significant residual effects.
- 2.2.20 The proposals are considered to be compliant with Policy GEN 13

### **Policy GEN 18 – Engagement**

*Early and effective engagement should be undertaken with the general public and all interested stakeholders to facilitate planning and consenting processes.*

- 2.2.21 This has been the case throughout the preparation of the Applications for planning permission and for the Marine Licence. The proposals were the subject of a public exhibition in October 2018, and additionally stakeholder consultation including with statutory consultees was undertaken. A full review of pre-application engagement is provided in the accompanying Pre-Application Consultation (PAC) report prepared by PBA.
- 2.2.22 The proposals are considered to be compliant with Policy GEN 18

## **2.3 Clyde Regional Marine Plan**

- 2.3.1 The Scottish Government intends for marine planning to be implemented at a local level within defined Scottish Marine Regions, extending out to 12 nautical miles from MHWS level, through the adoption of Regional Marine Plans. The Clyde Marine Planning Partnership was constituted in February 2016 to prepare the Clyde Regional Marine Plan, although this has not yet been published. The preparation of the pre-consultation draft Clyde Regional Marine Plan including early stage work to inform the Sustainability Appraisal including Strategic Environmental Assessment (SEA) is scheduled to take place between February 2019 and April 2019. At the time of writing (Early March) the pre-consultation Draft is not yet available to review. Subject to the timing of its publication, this document may be considered where relevant in the determination of this application.

## **2.4 Summary Conclusions**

- 2.4.1 The proposed demolition of existing jetties and construction of a heavy lift quay in the Clyde is consistent with Scotland's National Marine Plan. The economic benefits of the proposals at Carless are significant, and the potential for adverse environmental effects has been managed throughout the design progress and through a strategy of embedded and further mitigation as reported in the Environmental Statement.

## Appendix A Construction Sequence

# Malin Marine Carless Jetty

---

## Indicative Construction Sequence

Prepared by:



142 St Vincent Street  
Glasgow , G2 5LA  
Tel: 0141 227 3060  
[www.arch-henderson.co.uk](http://www.arch-henderson.co.uk)  
[glasgow@arch-henderson.co.uk](mailto:glasgow@arch-henderson.co.uk)

Prepared For:



South Rotunda  
100 Govan Road, Glasgow, G51 1AY  
Tel: 0141 243 2242  
[www.malingroup.com](http://www.malingroup.com)  
[j.macsween@malingroup.com](mailto:j.macsween@malingroup.com)

## Document Information

---

<b>Project Number</b>	185016
<b>Project Name</b>	Carless Jetty Design Option
<b>Document Title</b>	Indicative Construction Sequence.docx
<b>Document Date</b>	28/09/2018
<b>Client</b>	Malin Marine Group
<b>Project Manager</b>	John McLaren
<b>Project Partner</b>	George Bowie

## Document Controls and Verification

Issue Date	Version	Notes	Prepared by:	Verified by:
28/09/2018	0.0	Draft for Comment	John McLaren	
11/10/2018	1.0	Updated	John McLaren	
18/11/2018	2.0	Updated	John McLaren	
04/12/2018	3.0	Revised for Open Construction	John McLaren	George Bowie
04/02/2019	3.1	PBA comment added		
14/02/2019	3.2	PBA Additional comments added	John McLaren	George Bowie

This document has been produced by Arch Henderson for:

It may not be used by any person for any other purpose other than that specified without the express written permission of Arch Henderson. Any liability arising out of use by a third party of this document for purposes not wholly connected with the above shall be the responsibility of that party who shall indemnify Arch Henderson against all claims costs damages and losses arising out of such use.

This report is published in good faith and considered accurate, based on available information, at the time of writing. Arch Henderson makes no claim, promise, or guarantee about the accuracy, completeness, or adequacy of the contents of this report if further information becomes available in the future. Furthermore, Arch Henderson accept no responsibility for the accuracy of any third party data used in the production of this report.



## Table of Contents

---

Document Information	1
Table of Contents	2
1.0 Introduction	3
2.0 Demolition and Site Clearance	3
3.0 Construction Sequence	5
Appendix A -Illustrations of Construction Sequence	7

## 1.0 Introduction

---

The following sequence is one possible sequence for the construction of the proposed new Carless Jetty, covering two bays within the existing jetty. This is a guide only, the contractor will undertake the construction to suit his own preferences for construction utilising his own plant. The contractor may decide to construct the works using marine based plant. The demolition and site clearance works will probably use some form of floating plant, however the construction sequence assumes the use of land based plant. The Construction Sequence for the proposed marine works is illustrated in Appendix A.

Sections of the existing jetty must be removed to allow the new jetty to be constructed following the completion of the Site Investigation (SI) and remedial works as necessary to address historic contamination within the footprint of the proposed marine works.

Condemned walkway structures which currently span between the abutments and the dolphins in the area of the works will be demolished along with sections of the dolphins and abutments required to construct the new works.

## 2.0 Demolition and Site Clearance

---

### **1 Site Set up and Partial Jetty Demolition**

The site set up including the delivery of all onshore plant will be via the Erskine Ferry Road as detailed in the Construction HGV route outlined in the Transport Assessment

Firstly the condemned walkways between dolphins and abutments within the jetty, at the location of the new jetty, will be demolished. In addition the tops of the dolphins and abutments, within the footprint of the new jetty, will be broken down as necessary to allow for the installation of the new concrete deck above the remnant structures. The demolished concrete will be processed for reuse as infill.

The demolition arisings will be brought ashore and moved to a location away from the riverside for processing and if necessary, removal from site

Preliminary works may be required to form a suitable access to the riverside for the construction plant. This may take the form of a bund and flat surface to support the cranes and other plant. The bund will be placed at the top of the existing embankment, above the high water mark.

Anticipated plant used

Crawler crane with the reach and capacity from the existing bank to the river side of the jetty (15 – 20Tonnes at a 15 - 20m reach)

Concrete breakers

Steel cutting gear

Concrete processing plant

Waste removal plant

Earth moving plant for the bund

## **2 Site Clearance**

After the demolition works are complete it will be necessary to remove all structures and any remaining debris within and around the envelope of the new jetty which may interfere with the piling works required to support the concrete jetty deck

The debris may include

- Existing tunnels and pipe ducts onshore along the frontage of the jetty not already removed under the terrestrial remediation
- The stones on the riprap slope protection
- Existing sheet piling
- Debris from the demolition
- Flotsam which has floated down the river and become trapped, including trees and other debris
- Discarded ropes cables chains and the like
- Detached fendering and rubbing strips

The extent of the works will be limited to the pile locations and where the jetty structure ties into the onshore components of the proposed marine fabrication complex.

The arisings from the site clearance will be screened, with material suitable for incorporation in the works being stored on site and the remaining material being either scrapped or removed from site in accordance with all regulatory requirements including through obtaining appropriate SEPA licences if required

Anticipated plant used

Crawler crane operating from shore

Floating crane barge (multi cat or similar)

Long reach excavators/ grabs

Waste disposal vehicles – dump trucks, flat bed lorries etc.

Possible dive team

Concrete breakers

Steel cutting gear

## 3.0 Construction Sequence

---

### 3 Piling works

The piling works will commence at the inshore end of one of the sides. Piles will be pitched and driven through piling gates using plant sitting at the top of the pitched slope. It is anticipated that this will be a large crawler crane with sufficient reach to place the piling frame pitch the piles and position the piling hammer on the top of the piles.

When all the piles within reach of the crane are pitched and driven, the driven piles will be braced together and a crane platform placed on the top of the installed piles. The crane will then move onto the platform and continue piling.

The piling will be carried out in rows. When the piles for the seaward end of the row is installed, the crane will be brought ashore to commence on the next row. This will continue until all piles are installed and temporarily braced.

It is anticipated that the piles will be delivered to the site by road, in transportable lengths, as detailed in the submitted Transport Assessment. The sections will be welded together on site prior to being incorporated into the works.

Anticipated plant used

Crawler crane(s) (15 – 20Tonnes at a 15 - 20m reach)

Piling hammers – both vibrating and impact

Piling gates

Pile transporters

### 4 Concrete works

It is anticipated that the deck structure will be a combination of both precast and insitu concrete. Where possible the soffits will be formed in precast units with the insitu concrete forming the continuity of the structure and the structural connections between the precast units. Both the precast and insitu concrete will be prepared off-site and delivered ready for installation.

The concrete works will carried out in reverse of the piling works. The works will commence at the outer end of the jetty working back to the start. The crane platform will be removed and the precast concrete pile cap/ crosshead units placed, with insitu concrete placed where necessary to form the connections. The deck will be supported by the crosshead beams. It is anticipated that the deck will be a combination of prestressed concrete bridge beams with an insitu concrete topping. The deck will be designed with a heavy lift area along the centre line of the deck (15m /wide).

As the deck is placed and the structure extends, the temporary bracing will be removed. The works will continue until the deck is complete and tied back into the onshore works.

Anticipated plant used

- Crawler cranes

- Precast concrete delivery wagons

- Concrete delivery wagons

- Concrete pumps

- Compressors with vibrating pokers

## **5 Finishing Works**

After the concrete works are complete, the fittings and furnishings will be installed, including handrailing bollards, safety ladders lighting area lighting and the like will be installed.

A cathodic protection system will be fitted to the piles

Anticipated plant used

- Divers support vessel

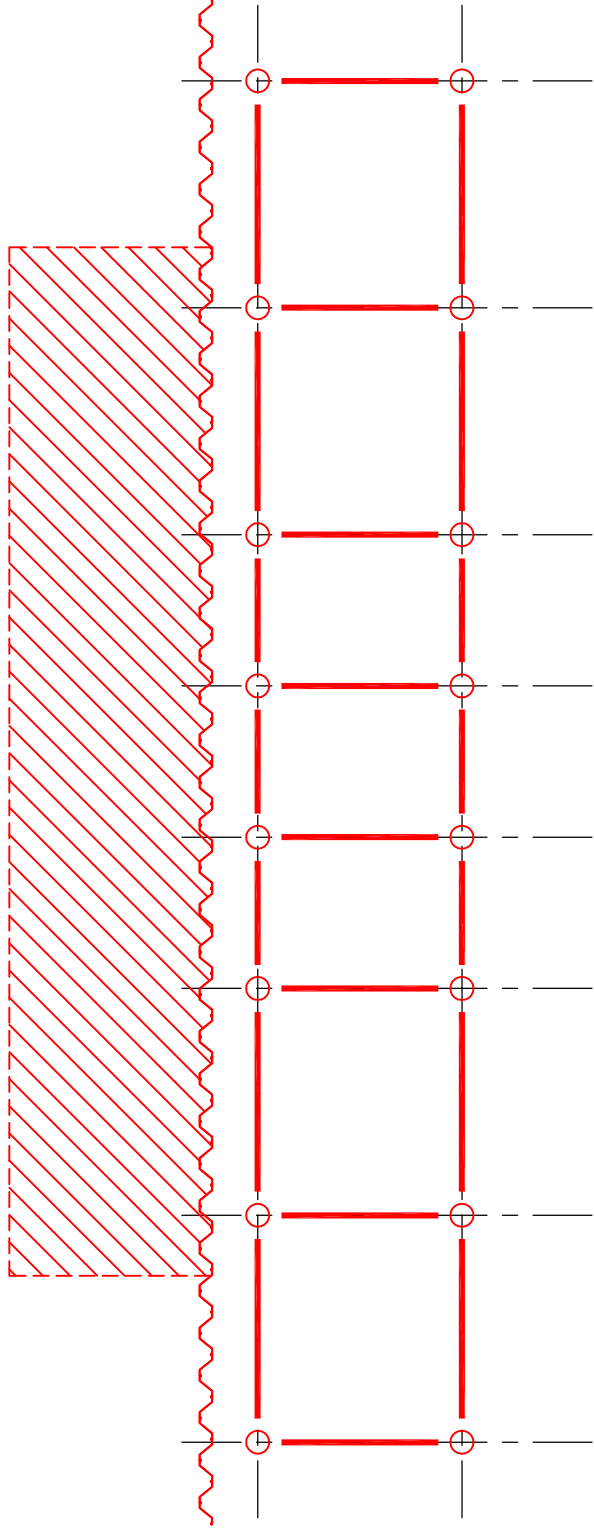
- Small site plant for lifting and moving

- Hand tools

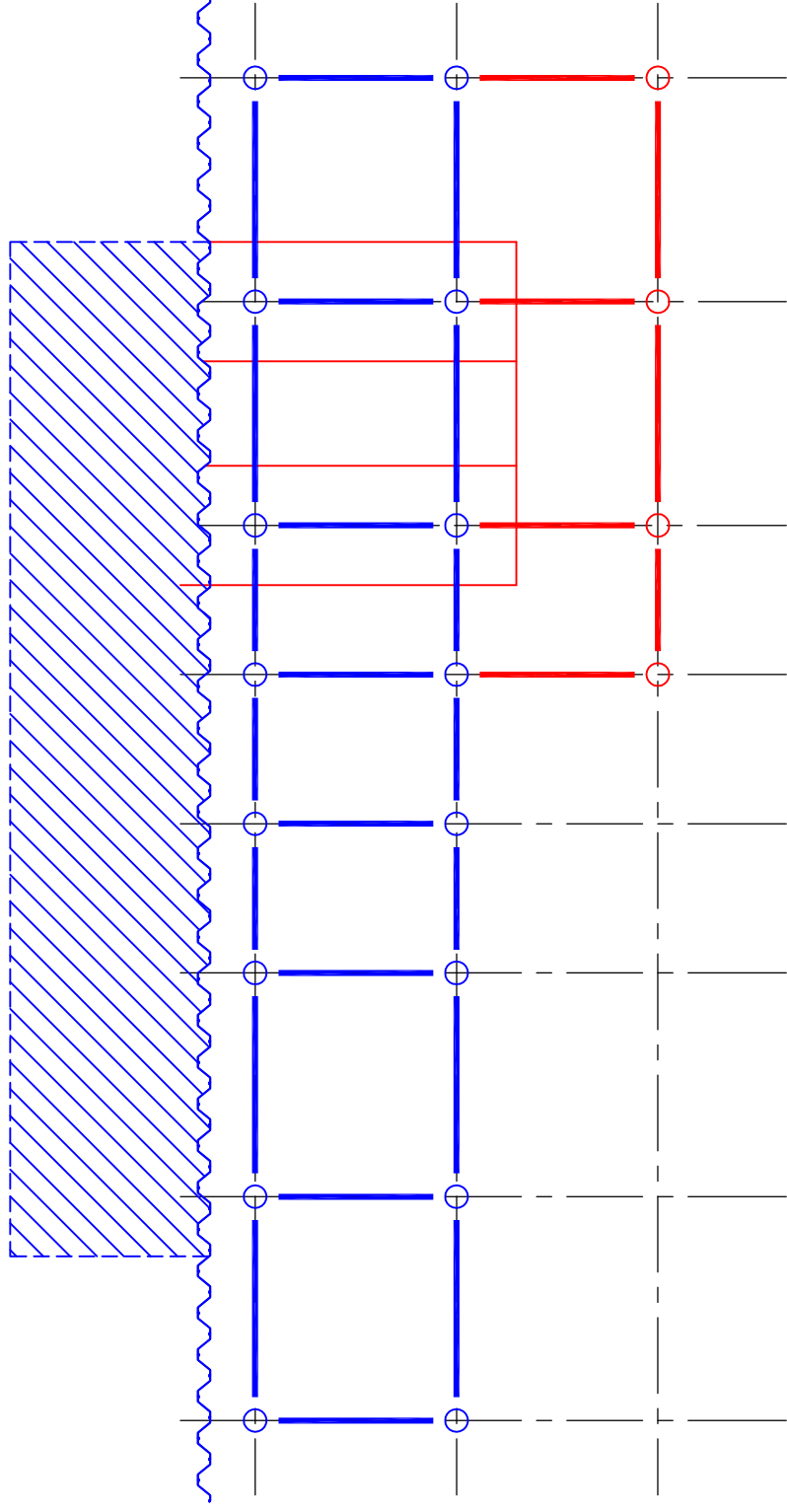
## Appendix A -Illustrations of Construction Sequence

---



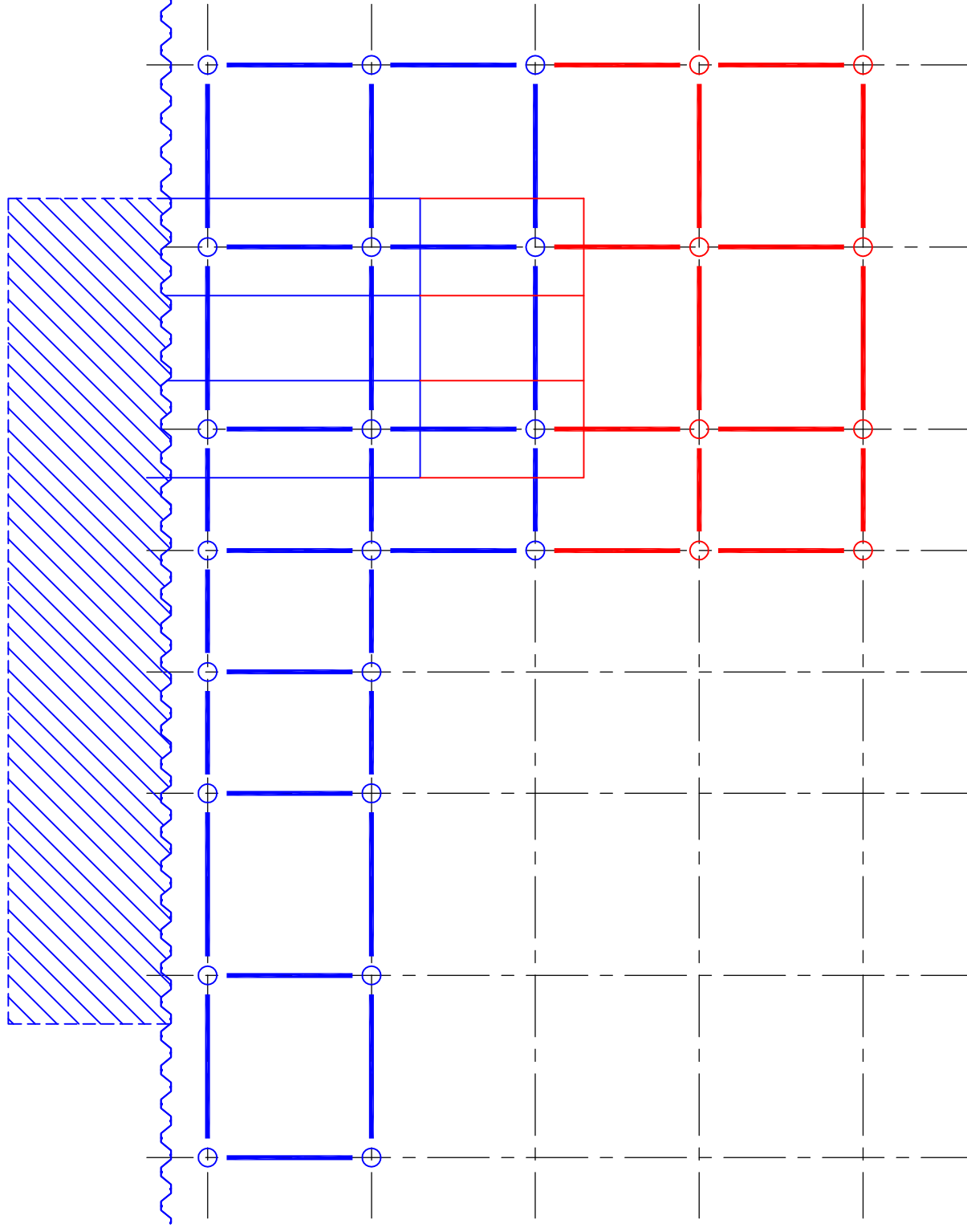


STAGE 1      PLACE SSP CONTAINMENT WALL  
FORM WORKING PLATFORM ON SHORE  
DRIVE SHOREWARD PILES c/w TEMPORARY BRACING



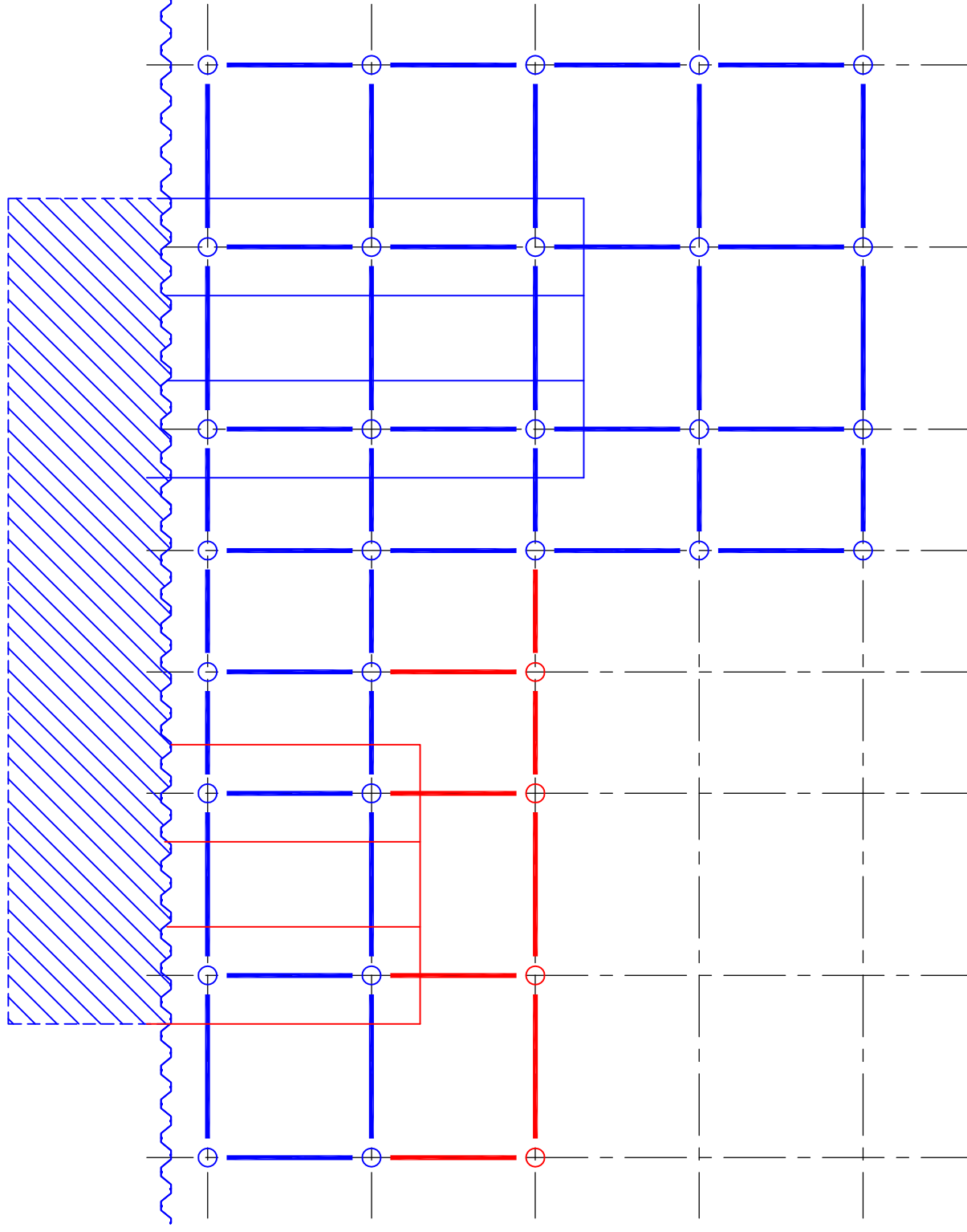
○ PREVIOUSLY DRIVEN PILES  
○ PILES DRIVEN THIS STAGE

STAGE 2    BUILD CRANE PLATFORM  
              DRIVE PILES  
              ADD TEMPORARY BRACING TO PILES

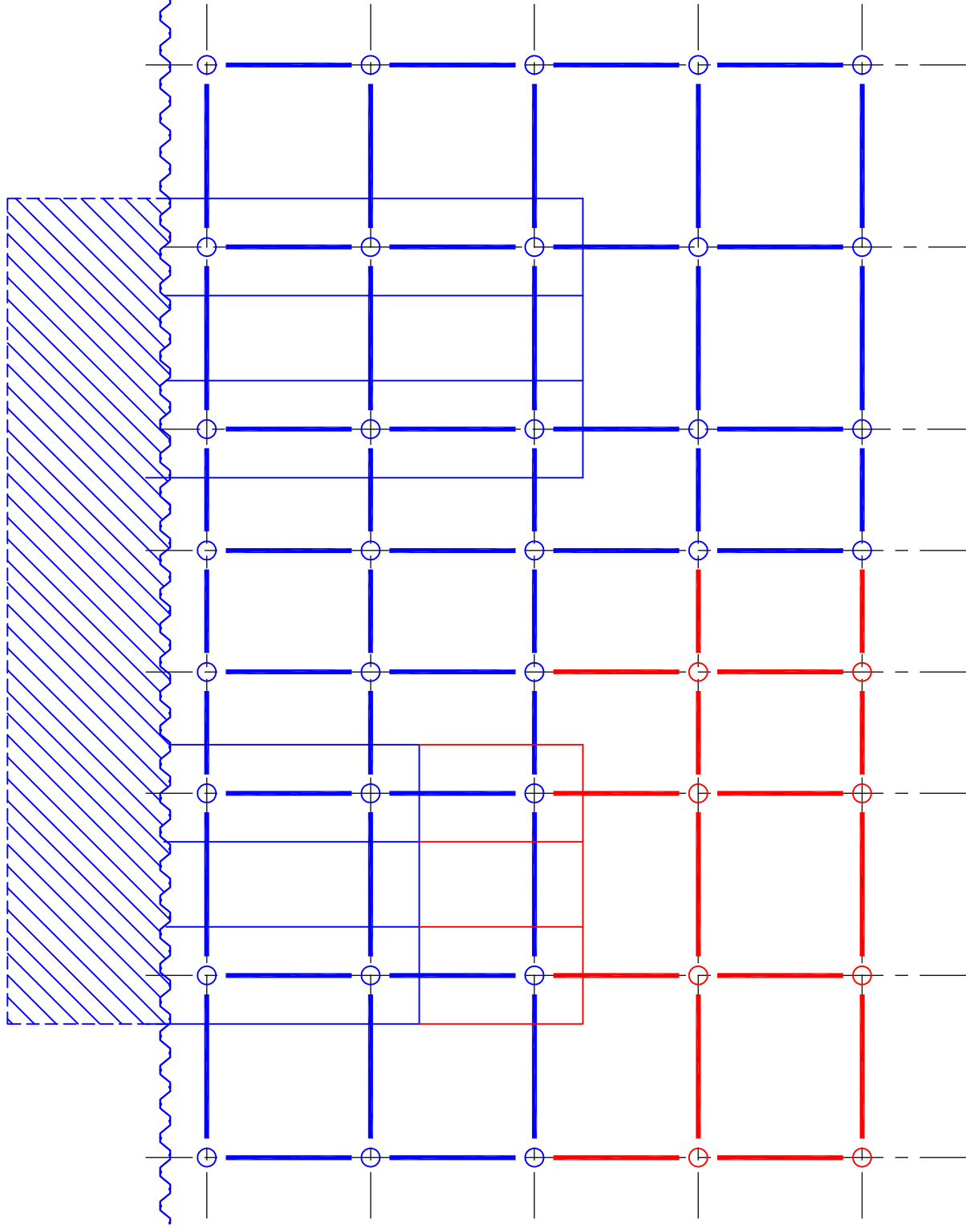


○ PREVIOUSLY DRIVEN PILES  
○ PILES DRIVEN THIS STAGE

STAGE 3    EXTEND CRANE PLATFORM  
              DRIVE PILES  
              ADD TEMPORARY BRACING TO PILES

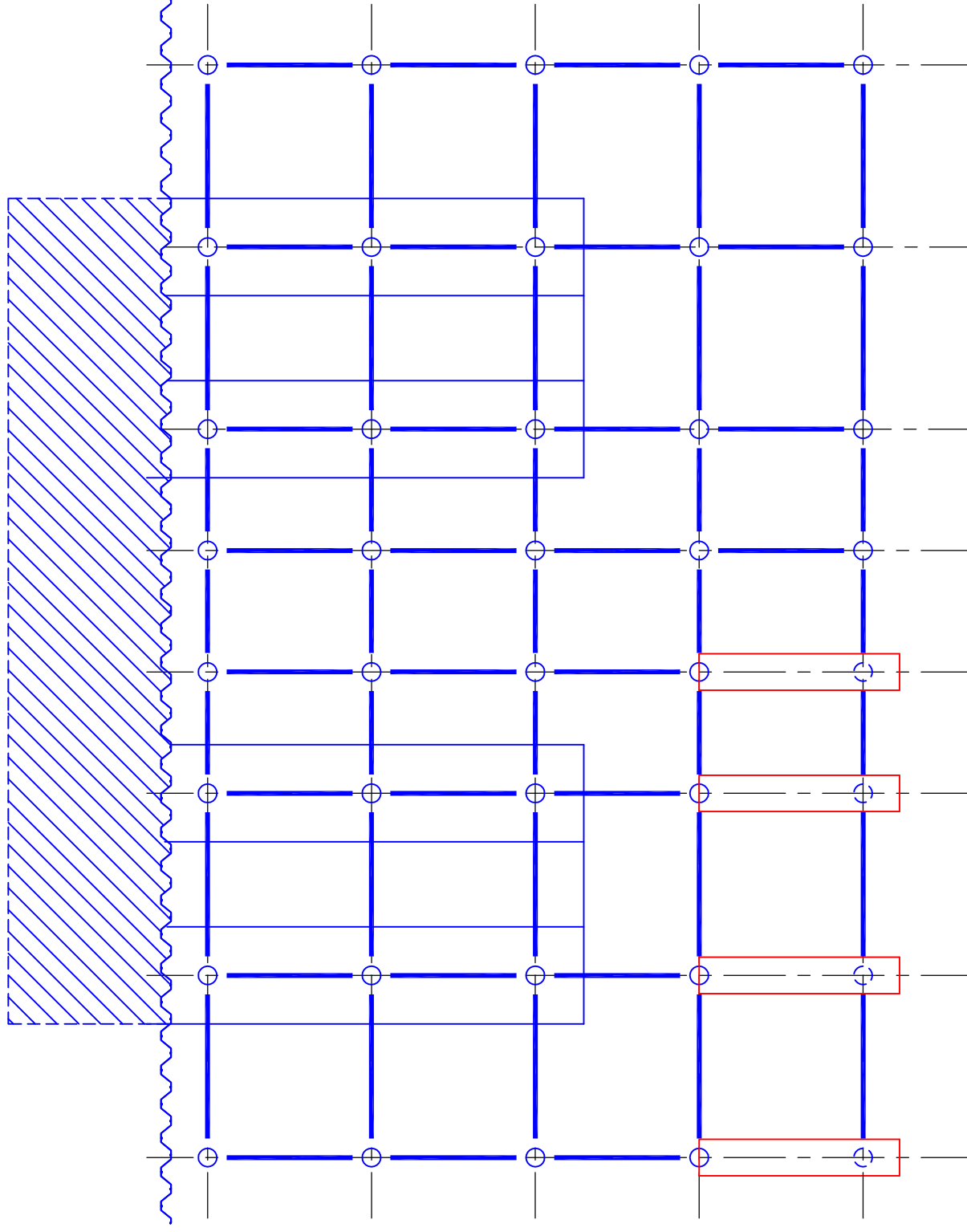


○ PREVIOUSLY DRIVEN PILES  
 ○ PILES DRIVEN THIS STAGE  
 STAGE 4 FORM CRANE PLATFORM No. 2  
 MOVE TO CRANE PLATFORM No. 2  
 DRIVE PILES AND ADD TEMPORARY BRACING TO PILES



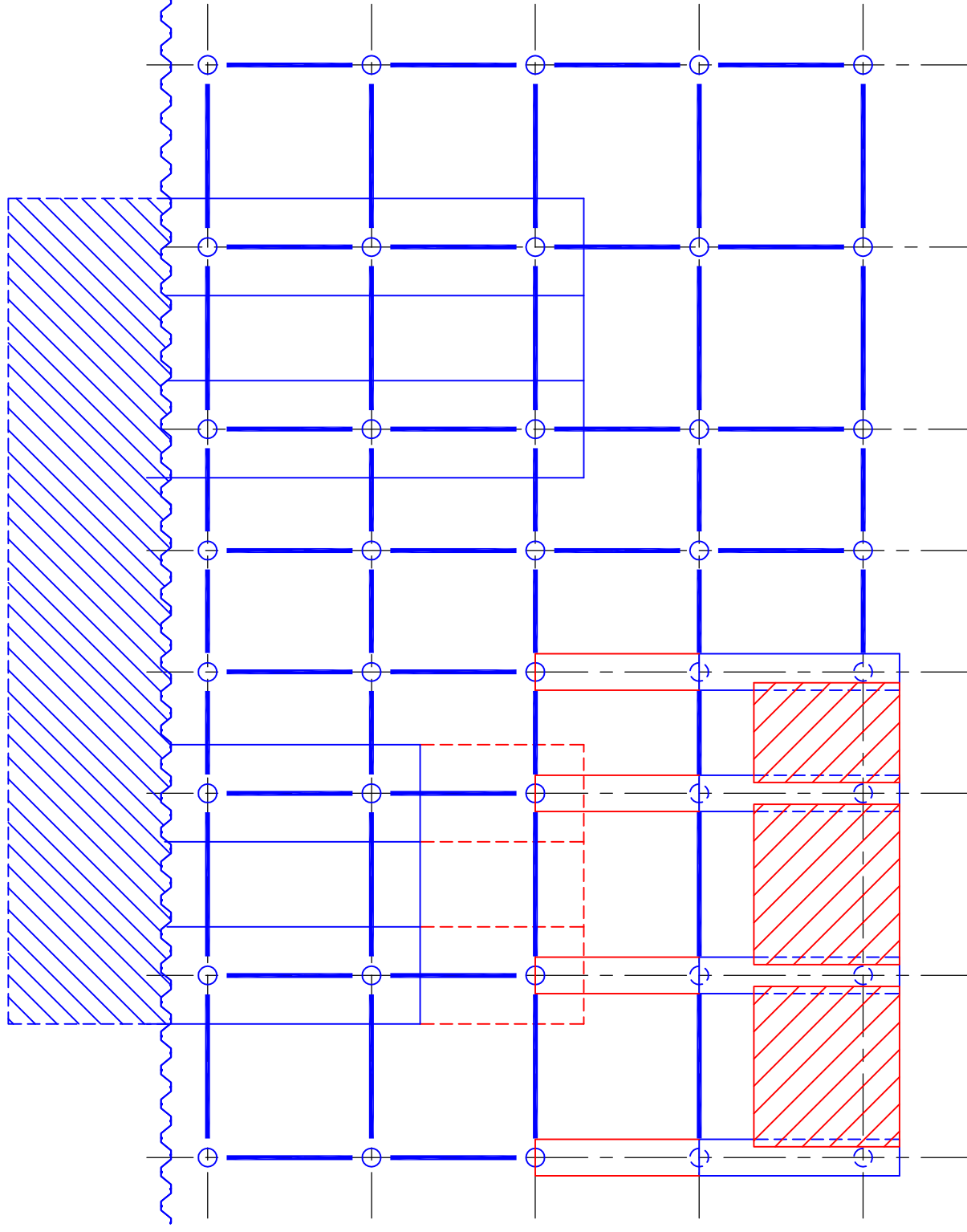
○ PREVIOUSLY DRIVEN PILES  
○ PILES DRIVEN THIS STAGE

STAGE 5    EXTEND CRANE PLATFORM No. 2  
COMPLETE PILING  
COMPLETE TEMPORARY BRACING TO PILES



STAGE 6    COMMENCE PLACING CROSSHEADS  
              COMMENCE REMOVAL OF TEMPORARY BRACING TO PILES





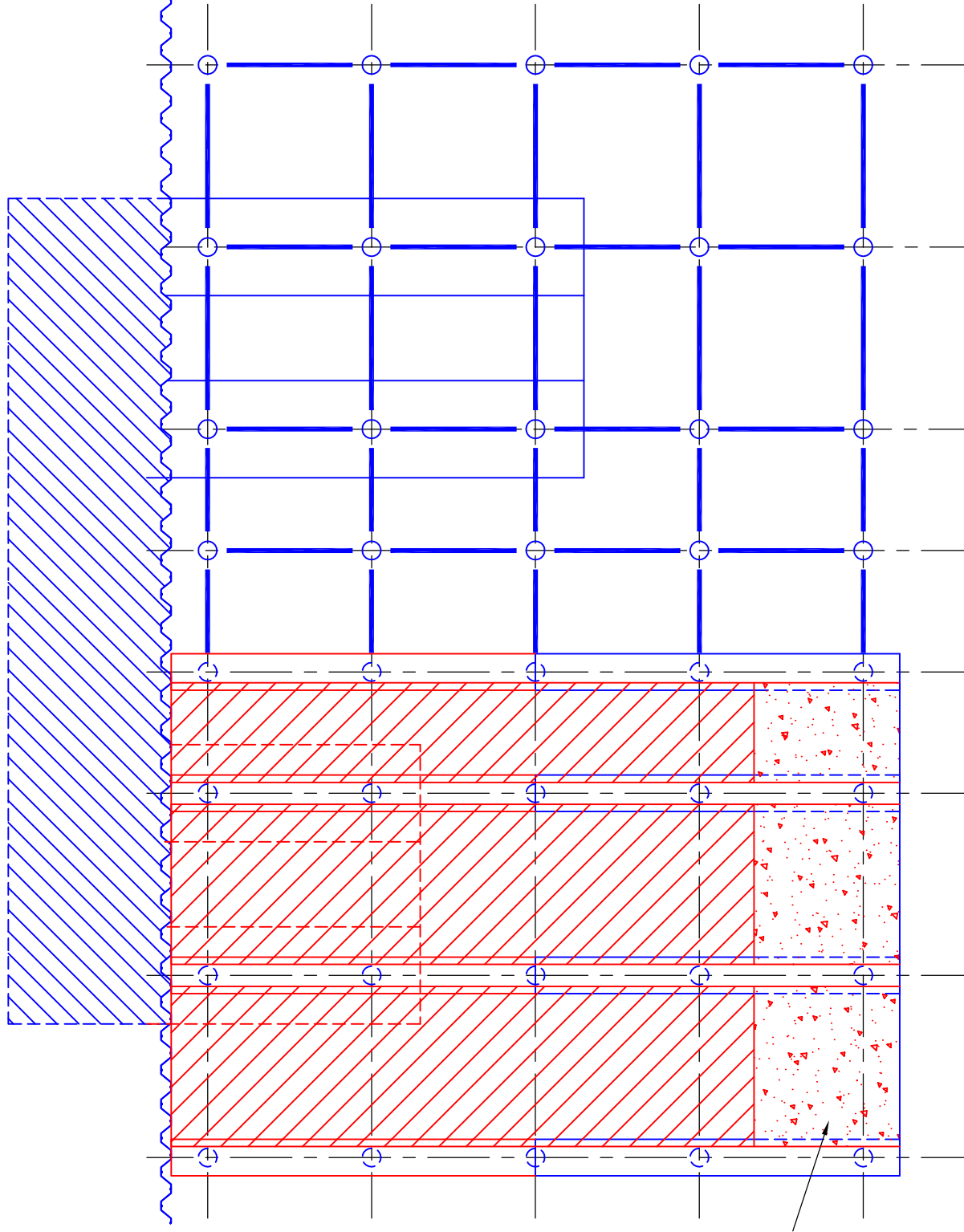
STAGE 7

REMOVE CRANE PLATFORM

EXTEND CROSSHEAD

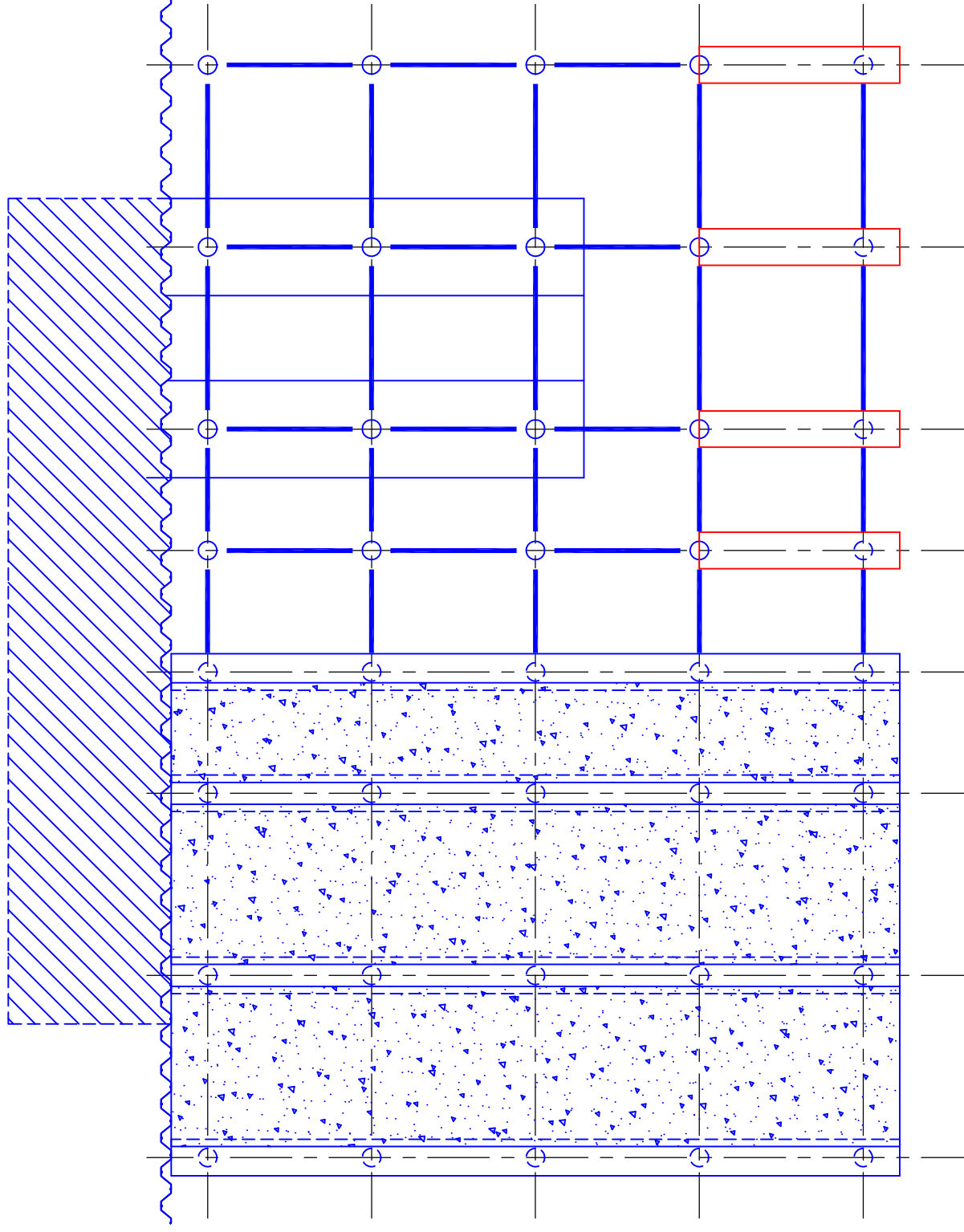
COMMENCE PLACING DECK UNITS

CONTINUE REMOVAL OF TEMPORARY BRACING TO PILES



STAGE 8

- REMOVE CRANE PLATFORM
- CONTINUE CROSSHEAD INSTALLATION
- CONTINUE PLACING PC DECK UNITS
- CONTINUE REMOVAL OF TEMPORARY BRACING TO PILES
- COMMENCE PLACING INSITU CONCRETE TO DECK

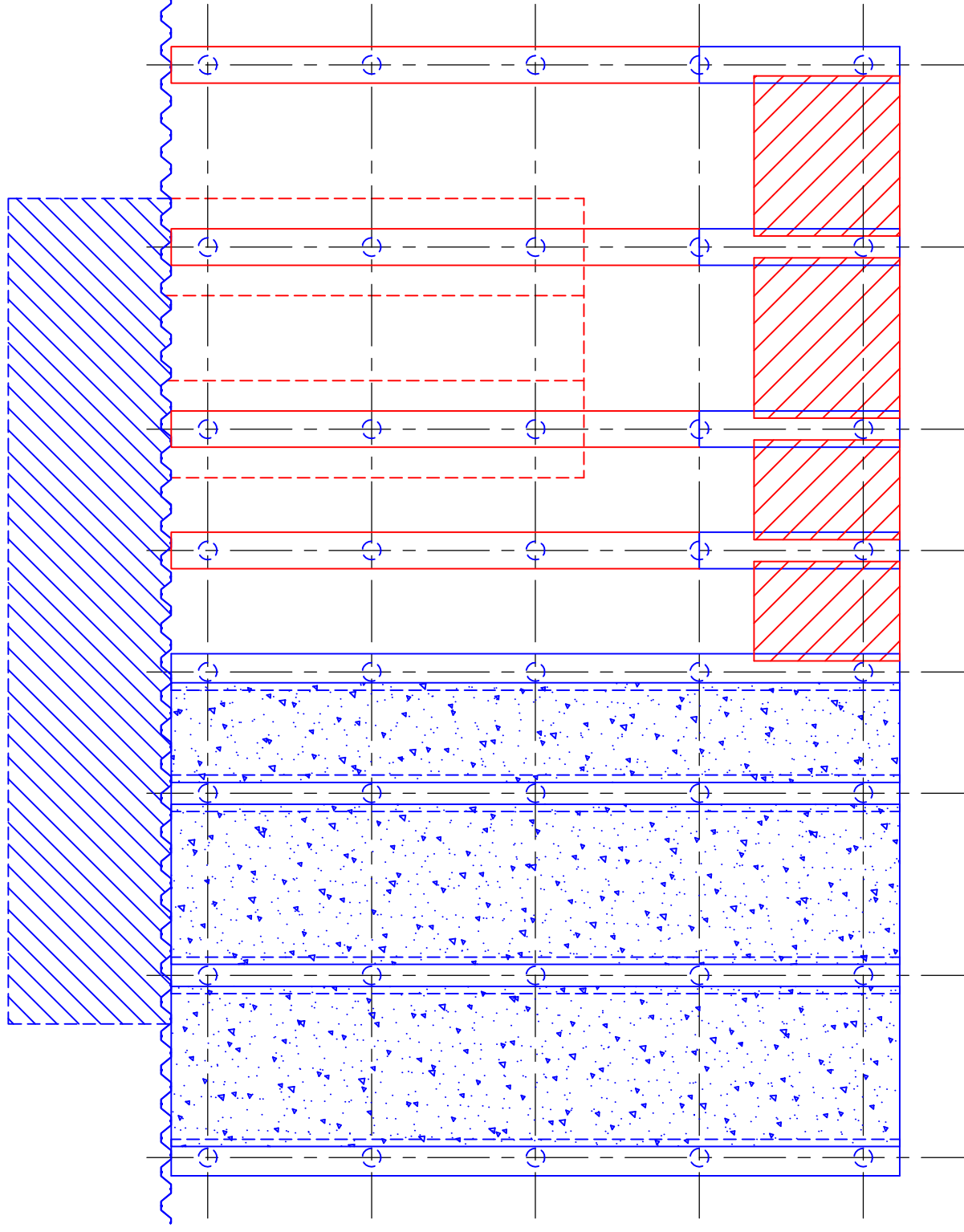


STAGE 9

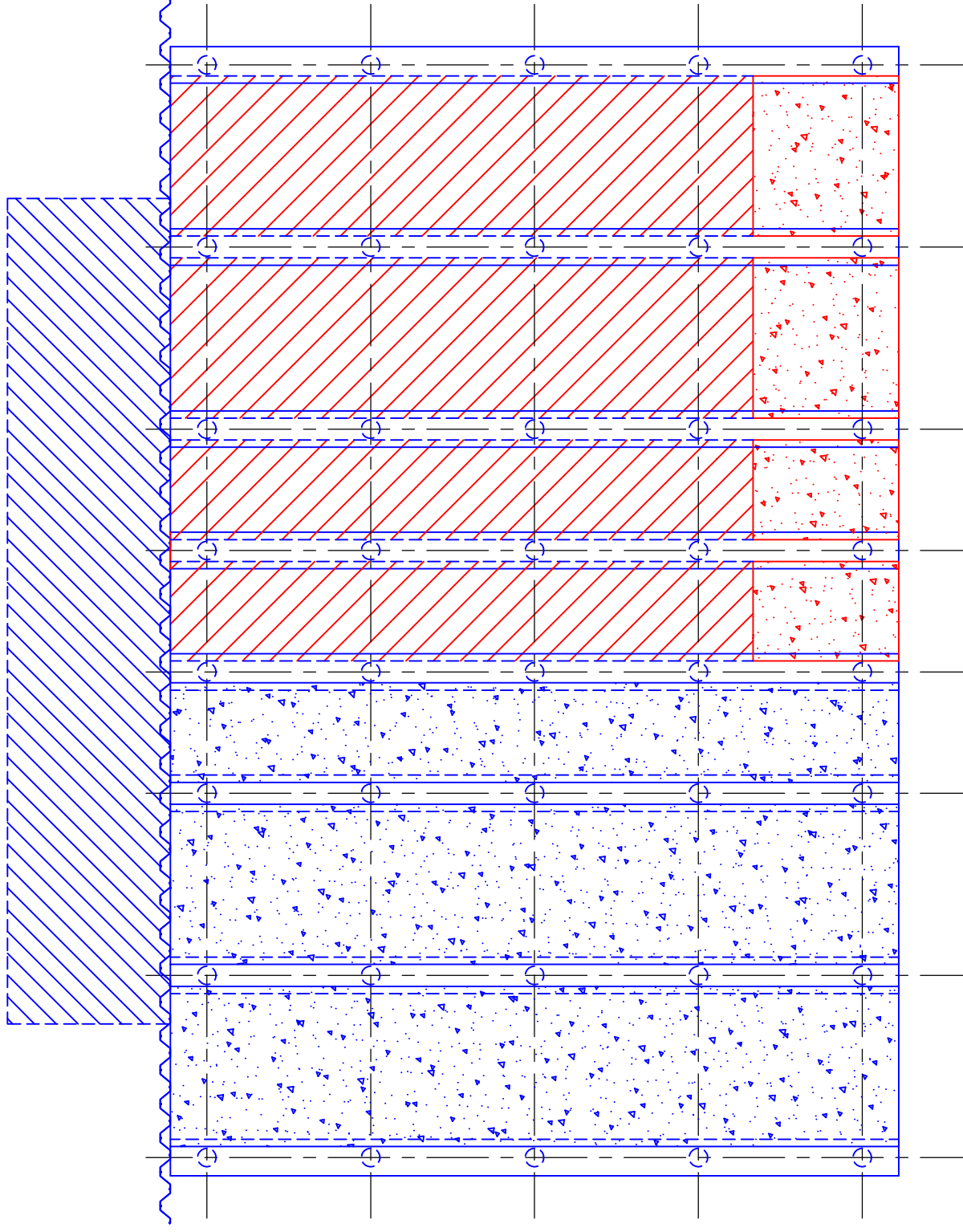
MOVE TO CRANE PLATFORM No. 1

CONTINUE CROSSHEAD INSTALLATION

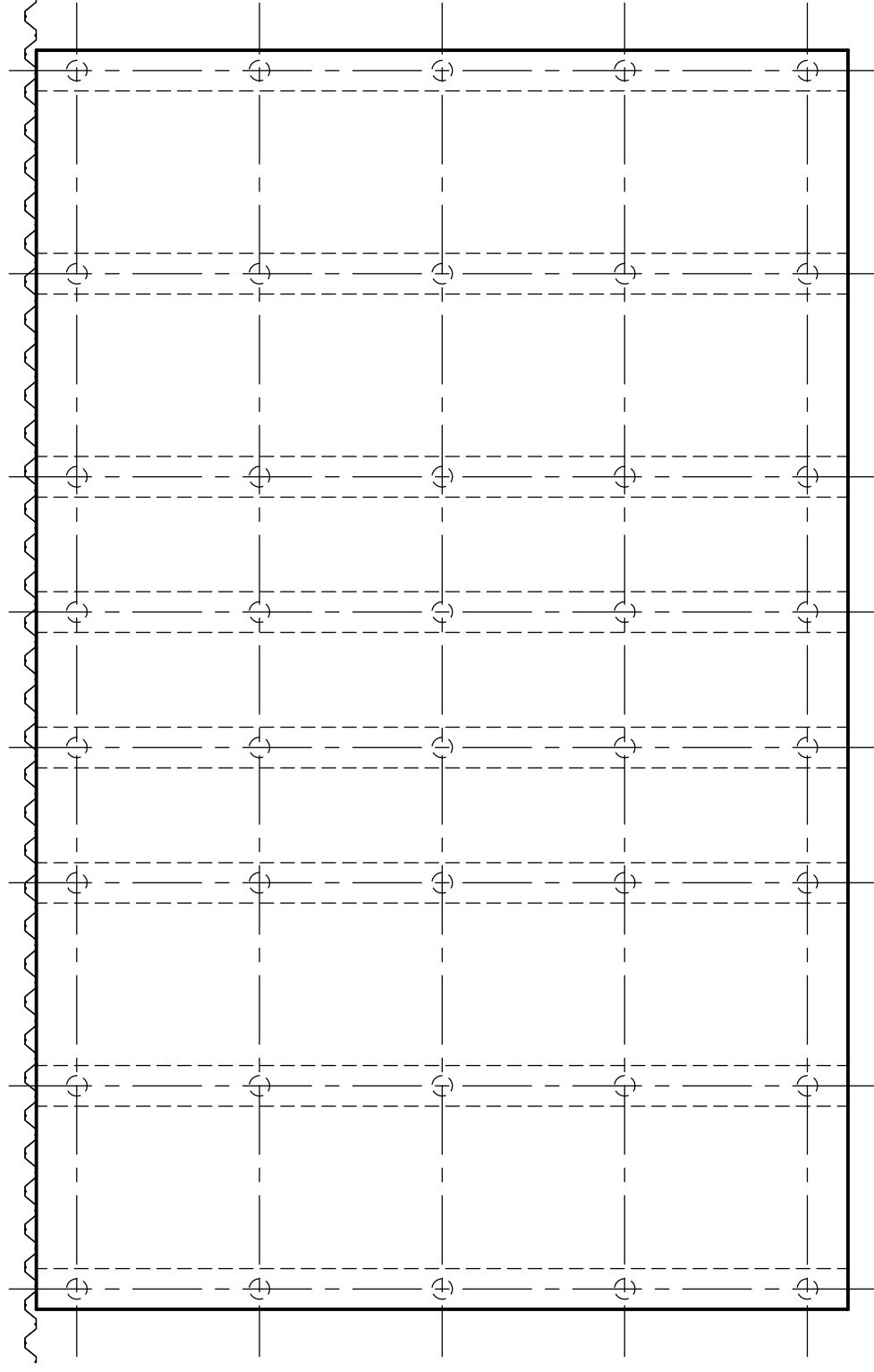
CONTINUE REMOVAL OF TEMPORARY BRACING TO PILES



STAGE 10 REMOVE CRANE PLATFORM No. 1  
COMPLETE CROSSHEAD INSTALLATION  
COMPLETE REMOVAL OF TEMPORARY BRACING TO PILES  
PLACE PC DECK UNITS



STAGE 11    PLACE REMAINING PC DECK BEAMS  
                  PLACE INSITU CONCRETE DECK



STAGE 12 JETTY COMPLETE



