



Comhairle Cathrach  
Bhaile Átha Cliath  
Dublin City Council



## New Pontoon Installation at Islandbridge

### Construction Methodology

Job No: 21036  
Date: Mar 2023



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# Contents Amendment Record

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**Title:** New Pontoon Installation at Islandbridge  
Construction Methodology

**Job Number:** 21036


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## 1 INTRODUCTION

### 1.1 Introduction

Malone O'Regan have been commissioned by Dublin City Council to prepare designs for a new pontoon which is to be located within the River Liffey at Islandbridge. The main purpose of the pontoon is to allow the several rowing clubs located on the River Liffey to access the lower reaches of the river, downstream of the existing weir.

This report has been prepared to outline the proposed methodology for the installation of the pontoon and construction of the various ancillary items including footpaths and access footbridges.

## 2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

### 2.1 Location

The pontoon is to be located alongside a small island in the middle of the River Liffey, approximately 100m downstream of the existing river weir at Islandbridge. Currently this island can be accessed on foot from the adjoining apartment complex to the east. Rowing boats currently use an existing slip on the southern side of the island. The slip is in poor condition, having been roughly formed using a number of sandbags filled with cement. From the slip, rowers carry their boats across the island and, from a cutout section of the bank, launch them into the lower section of the River Liffey. This current arrangement is dangerous due to the uneven ground across the island and the difficulty in accessing the lower reaches of the river.



Figure 2.1 – Site Location

### 2.2 Description of Works

The proposed structure is indicated on Malone O'Regan drawings 21036/100 to 102 inclusive.



It is proposed to construct a floating pontoon system within the River Liffey which will be accessed via a new concrete platform built out from the riverbank and connected to the pontoon by a new gangway. Steel piles will be driven through the river bed to support the proposed pontoon.

The concrete platform will be constructed using a number of precast caisson structures which will be filled with clean, crushed stone and topped with an insitu concrete deck slab. Rock fill placed against the side of the caissons and the riverbank will provide scour protection to the edges of the concrete platform.

The works also include the removal of vegetation on the approach to the pontoon and the construction of a new access walkway which will be used by rowers carrying boats between the upper and lower reaches of the River Liffey, either side of the existing weir at Islandbridge.

There is an existing footbridge located on the island which will need to be removed in order to facilitate the construction works. The structural arrangement of the bridge also needs to be modified to accommodate proposed changes to the adjoining ground levels. The bridge shall be temporarily removed and reinstated upon completion of the other works.

### **3 ROLES AND RESPONSIBILITIES**

This section sets out the roles and responsibilities of the principal parties involved in the construction of the proposed project. In addition, it outlines the lines of communication between the various parties. The responsibilities of the site staff are outlined below, and it is possible that some roles may overlap or be carried out by the same person.

#### *3.1 DCC Project Manager*

Dublin City Council (DCC), in conjunction with their appointed design team, will be responsible for the following:

- (a) Preparation of the works specification and design details.
- (b) Preparation of Preliminary Safety and Health Plan
- (c) Specification of the overall project programme;
- (d) Appointment of a suitably qualified Works Contractor
- (e) Liaison with Contractor;
- (f) Commentary and provision of information in relation to the Contractor's Construction Environmental Management Plan (CEMP) and Safety and Health Plan.
- (g) Coordination of the construction programmes

### 3.2 *Contractor's Project Manager*

The appointed Works Contractor will identify a Project Manager who will be the main point of contact for Dublin City Council and DCC's design team. The Contractor's project manager will be responsible for:

- (a) Preparation of site-specific works method statements, a Construction Environmental Management Plan (CEMP) and Safety and Health Plan.
- (b) Ensuring compliance with the method statements.
- (c) Implementation of the CEMP.
- (d) Implementation of the Safety and Health Plan
- (e) Management of the overall project programme;
- (f) Management of quality issues relating to the project;
- (g) Co-ordinating the construction teams;
- (h) Liaison with Dublin City Council and their representatives.

### 3.3 *Project Supervisor Construction Stage & Health and Safety Officer*

The Contractor will be appointed as the Project Supervisor Construction Stage (PSCS). The Contractor will be required to identify a suitably qualified Health and Safety Officer for the works who will report to the Contractor's project manager. Responsibilities will include the following:

- (a) Carrying out the duties of Health & Safety during construction;
- (b) Safety induction of all staff and personnel on site;
- (c) Implementing the contractor's Safety and Health Plan; and
- (d) Auditing the site for safety and health issues and keeping relevant records.
- (e) Providing the Project Supervisor Design Process (PSDP) with all information necessary for completion of the Project Safety File.

### 3.4 *Site Environmental Officer*

The Environmental Officer will be appointed by the Contractor and will report to the Contractor's Project Manager. He/ she will be responsible for the following:

- (a) Implementing the environmental requirements of the CEMP and updating it as necessary;
- (b) Management of all environmental aspects of the construction works;
- (c) Liaison with any site specialists (e.g. ecologist etc.);
- (d) Ensuring all relevant mitigation measures are implemented as required;
- (e) Ensuring all monitoring proposals are implemented as required;
- (f) Reviewing monitoring results;

- (g) Provision of Tool Box talks to Contractor's staff, subcontractors and site visitors as required;
- (h) Carrying out periodic environmental inspections;
- (i) Liaison with Dublin City Council and their representatives;
- (j) Auditing the construction works from an environmental viewpoint;
- (k) Maintaining regular contact and liaison with environmental specialists;
- (l) Producing update reports on environmental compliance;
- (m) Reporting on any non-compliances; and
- (n) Implementing measures for ensuring close out of non-compliances.

## 4 CONSTRUCTION METHODOLOGY

### 4.1 Advance works

It is anticipated that certain works will need to be completed by Dublin City Council in advance of the main construction works. These works are described below:

#### 4.1.1 Site Investigations

In order to design the piled supports for the pontoon it will be necessary to complete ground investigations in advance of the main contract. These ground investigations will include driving a single borehole to identify the nature of the underlying soils, the presence of rock and the nature of this rock. To ensure that the borehole provides information which is representative of the ground likely to be encountered during driving of the pontoon piles, the test borehole should be positioned as close to the pontoon location as possible. A number of options for the location of the test pile were considered:

##### Option 1 – Within OPW carpark

There is ready access to the Office of Public Works (OPW) car park on the southern side of the river and it is considered that a borehole could be driven here without any undue difficulty. However, the borehole would be at least 120m from the pontoon location and there is a significant risk that the ground conditions encountered would not be representative of those encountered when driving the pontoon piles.

##### Option 2 – Within grounds of adjoining apartment complex

There is vehicular access to the grounds at the rear of the adjoining Bellevue apartment complex and a borehole could be readily driven if permission from the property management company can be obtained. However, the borehole would be at least 30m from the pontoon location and there is a significant risk that the ground conditions encountered would not be representative of those encountered when driving the pontoon piles.

### Option 3 – From a barge

In theory it would be possible to complete test piling from a barge. However, initial discussions with site investigations companies has indicated that there would be significant costs attached to this proposal.

### Option 4 – On island

Driving a borehole on the island, immediately adjacent to the pontoon location, would provide representative ground conditions. However, access is limited. In order to access the northern section of the island with a drilling rig, a temporary crossing would need to be completed from the OPW carpark to the eastern section of the weir. It is anticipated that this temporary access would be similar to the main construction works access described in Section 4.2, Item 1 with stone-filled bags used to provide a platform for the rig to cross the shallower section of river at the eastern end of the weir. Tree root protection measures would be required to ensure that the existing trees are not adversely affected. A relatively small number of tree branches may need to be removed in order to set-up the rig. The rig can be positioned to minimise the amount of clearance works that would be required.

Following a review of the above options it is considered that Option 4 would provide the most accurate site information and this would be the preferred method for undertaking site investigations.

#### *4.1.2 Tree Clearance*

In order to provide construction access to the pontoon site and to construct the permanent walkway, it will be necessary to remove 5 no. trees as outlined in the Arboricultural Report prepared by Charles McCorkell. A further 5 no. poor quality trees are to be removed for arboricultural reasons. Under Section 40 of the Wildlife Act, it is an offense to destroy vegetation on uncultivated land during the bird nesting season which runs from the 1<sup>st</sup> March to 31<sup>st</sup> August each year. Depending on the timing of the works, it may therefore be necessary for Dublin City Council to complete tree clearance works in advance of the main construction works.

#### *4.2 Main Construction Works*

The works shall be carried out in a single phase but will include a number of separate work elements or tasks. The sequence of tasks is outlined below with the method of construction for each task described.

##### 1. Temporary River Crossing

A temporary causeway will be constructed to provide a crossing point for construction vehicles from the southern bank of the River Liffey as illustrated in Figure 4.1 below. Possible options for the construction of this temporary causeway include pre-filled stone

gabions or rock filled bags. Both of these products include lifting eyes / rings which means that they can be easily lifted into position and then removed upon completion of the works.

Some excavation and regrading of the existing riverbank on the southern side of the river will be required in order that construction vehicles can access the temporary causeway. During excavation of the riverbank, river protection measures will be implemented in accordance with the "Requirements for the Protection of Fisheries Habitat during Construction and Development" (Inland Fisheries Ireland, 2016). These measures will be detailed in the appointed Works Contractor's CEMP. Excavated material will be stored on site and protected prior to later use for reinstating the bank.

It is emphasised that the temporary river crossing has been designed such that it can be entirely removed upon completion of the works. The riverbank will also be restored to its pre-existing condition.

During a pre-planning meeting on 7<sup>th</sup> June 2022, DCC queried the continued operation of the mill race which runs alongside the Bellevue apartments as a result of the temporary river crossing. It is understood that the Mill Race is no longer in operation and the water which can be observed here actually flows from the Weir side of the Liffey and not from within the Bellevue Apartment Complex. In order to maintain the flow of water within the river, 2 no. 450mm diameter concrete pipes will be installed within the causeway.

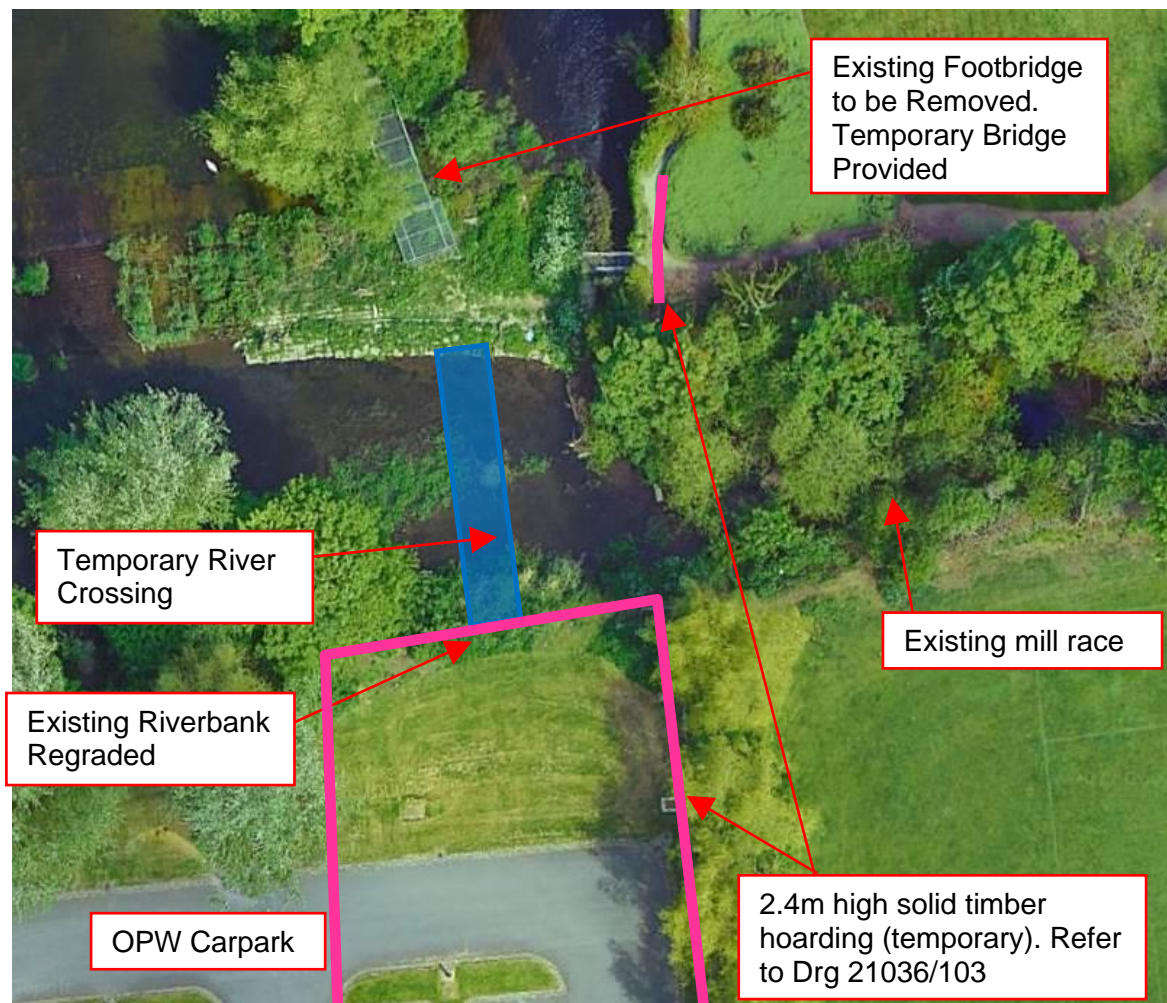




Figure 4.1 – Temporary Causeway



Figure 4.2 – Temporary Causeway Possible Construction Materials

## 2. Removal of Existing Footbridge / New Temporary Bridge

The existing footbridge indicated in Figure 4.1 has insufficient capacity to cater for regular construction traffic. The existing bridge will be removed and securely stored off site. It is noted that modifications are required to this bridge to ensure that it will tie-in with the proposed level of the new walkway (Refer to Task No. 15 below)

A temporary bridge crossing will be required to allow construction access to the pontoon location. This temporary bridge will be designed to suit construction traffic and can be supported off the concrete foundations to the existing bridge structure.

## 3. Security Hoarding

2.4m high solid timber hoarding will be provided required to prevent unauthorised access to the works site. The anticipated layout of this temporary hoarding is indicated on Drawing 21036/103 and in Figure 4.1.

## 4. Traffic Management

Traffic management measures are to be implemented on the southern approach to the works site. Measures to include barriers, fencing and signage. Refer to further details in Sections 8-11 (inclusive) of this report.

## 5. Site Clearance

As noted above, the southern bank of the river will need to be regraded to allow for construction access. Further vegetation clearance on the island will also be required to ensure construction vehicles can access the pontoon area. It is anticipated that construction of the new walkway will primarily involve the raising of existing ground levels

and there will be minimal excavation although there will still be a requirement to remove surface vegetation.

#### 6. Temporary Access Route

A temporary access route for construction vehicles will be required across the site. It is anticipated that this construction route will be formed using Clause 804 hardcore material. The hardcore material will be underlain with the Cellweb Tree Root Protection System (or approved equivalent) to reduced vertical load pressure on sub soils to tree roots, thereby preventing damage. Further information in relation to the Cellweb system is provided on Drawing 21036/102 and in Appendix B.

#### 7. Install Piles

It is anticipated that the pontoon will be supported from 2 no. tubular steel piles (to be confirmed following site investigations). Due to the limited access for piling plant it is proposed that piling operations will be completed from a barge within the river.

#### 8. Top Platform

The top platform is to be constructed using a number of precast concrete caisson elements. The caissons will be transported over land using the temporary construction route described above or alternatively they will be brought to the required location using a barge. In order to install the caissons, the existing riverbank will be locally dug-out using an excavator located on the island. Once the excavators have been set to the correct position and level they will be filled with clean crushed stone.

#### 9. Rock Armour

Rock armour will be placed to the side of the existing caissons to prevent future scour.

#### 10. Stone Gabions

Once the caissons have been set in position, additional stone fill material will be placed to the rear of the caissons. The stone fill will be restrained by stone gabions and additional rock armour.

#### 11. Concrete Platform Slab

A concrete slab is to be constructed above the filled concrete caissons to create a solid top platform. The concrete slab will have overall dimensions of 8.0m x 5.0m x 0.25m thick and can be constructed as a single concrete pour. The total volume of concrete is 10m<sup>3</sup> which can be supplied by a single truck delivery. Readymix concrete will be delivered to the site and unloaded at the southern side of the river. Small dumpers will be used to carry the wet concrete mix from the delivery truck to the slab location.

In order to construct the concrete slab, formwork will first be erected around the perimeter of the caisson structure. The formwork can be fixed tightly to the edges of the precast caissons and any gaps will be sealed to prevent loss of concrete.

## 12. Pontoon and Gangway.

An indicative methodology for delivery and installation of the pontoon and gangway structure has been provided by Inland and Coastal. A copy of this methodology is included in Appendix A. Inland & Coastal have indicated that the likely method for installation of the pontoon and gangway would be deliver these components to a DCC facility located on the northern bank of the River Liffey, immediately upstream of Islandbridge. Here the pontoon and gangway will be offloaded into the river and towed into position. Refer to Figure 4.3 showing the position of the unloading area and route to the works site.



Figure 4.3 – Installation of Pontoon and Gangway

## 13. Handrail

A handrail will be installed around the perimeter of the top platform.

## 14. Walkway

The temporary construction access described under Item 6 above will be removed. It is anticipated that the hardcore used to construct the temporary construction access will have become contaminated with dirt. This existing hardcore will be taken up and, if relatively clean, can be used as fill material for the concrete caissons.

Similarly, it is anticipated that the tree root protection system used for the temporary access will be damaged during the construction operations. It will therefore be taken-up and removed off site.

It is proposed to construct the new walkway using Dycel precast concrete mattress units (or approved equivalent) laid on a bed of clean stone hardcore material. Further information in relation to the proposed Dycel mattress units is provided on Drawing 21036/102 and in Appendix C. The hardcore will be underlain with the Cellweb Tree Root Protection System (or approved equivalent).

#### 15. Footbridge

As described in Item 2 above, the existing footbridge is to be removed at the commencement of the works. The footbridge will be taken off site and securely stored.

The new walkway is to be installed at a higher level than the existing ground. It will therefore be necessary to alter the existing footbridge to suit the new ground levels. The legs of the existing footbridge will be removed and replaced with new legs, designed to suit the new level and inclination of the footbridge.

The existing handrail on either side of the footbridge is very low and does not offer adequate edge protection. It will be removed and replaced with new 1.1m high handrailing which will run along the full length of the footbridge.

The Contractor will be required to submit fabrication drawings showing the proposed modifications to the footbridge for approval by the engineer prior to construction.

#### 16. Demobilisation.

Remove excess construction materials, fencing, signage etc.

### **5 ALTERNATIVE DESIGN SOLUTIONS CONSIDERED**

During a pre-planning meeting with DCC held on 7<sup>th</sup> June 2022, Malone O'Regan were asked to demonstrate that consideration had been given to alternative designs for the following elements of the works:

- The pontoon structure.
- The support structure to the pontoon.
- The material used to surface the walkway across the island (currently specified as Dycel precast concrete mattress units (or approved equivalent)).

#### Pontoon Structure

Malone O'Regan considered the use of a modular floating pontoon system instead of the ridged floating deck currently proposed. The modular system was discounted for the following reasons:

- Consideration was given to the fact that, when the pontoon is operational, rowers will be carrying a heavy 8-man boat overhead. A modular system would result in an unsteady and uneven surface. A solid platform will instead be required and the modular system was therefore discounted for health and safety reasons.
- The modular pontoon systems typically require a long-fixed edge to a quay wall for stability. This would have been difficult to provide without further invasive works and tree removal on the island.
- The site is also in a location which is subject to high flows in times of flood. The modular system is less robust than the solid deck option and would be more prone to damage from river debris.
- The variable river levels mean that a ramped access is necessary. Modular pontoons are not typically provided with a ramped access since they are often unable to carry the weight of the ramp section.

### Pontoon Support Structure

During the preliminary design stage, Malone O'Regan considered constructing a floating pontoon supported off piles driven within the footprint of the island. This option was discounted due to concerns about the robustness of such a system. This type of system can be found in canal locations and other benign locations where water flows are low and the risk of impact from floating debris is reduced. It was not considered that such a system would be sufficiently robust for this location within the River Liffey.

Malone O'Regan also considered the possibility of driving piled foundations to support the top platform as opposed to the caisson units now proposed. This option was discounted as the piles would have been exposed and susceptible to damage by debris in the river. The caisson units provide a more robust structure capable of withstanding impact caused by floating debris.

### Dycel Mattress Walkway

Malone O'Regan considered a number of materials from which to construct the walkway which runs across the island including in-situ concrete, timber boarding and gravel reinforced using Terram Bodpave or similar. These options were discounted for the following reasons:

**In-situ concrete:** The island is located in a tidal section of the River Liffey. The island can also become completely submerged during high fluvial flows. Pouring insitu concrete in such an environment would be difficult with a high risk of potential wash-out of concrete and pollution of the river. The Dycel system comprises precast concrete 'mattress' units which can be laid in place relatively quickly when river levels allow.

In addition, flat concrete surfaces tend to become slippery when they are wet or when they become covered with leaves, algae etc. The presence of voids within the Dycel mattress units helps to alleviate this problem and allows for better traction under foot. Refer to the image on Malone O'Regan drawing 21036/102. Dycel mattress units have



recently been successfully installed to create boat ramps for river rescue services on the River Boyne and Blackwater.

**Timber boarding:** The use of timber was discounted due to concerns about the surface becoming slippery as well as concerns about the durability of the timber in a situation where it will, on occasion, be submerged under flowing water. The use of timber boarding would generate additional maintenance in an area where access is difficult.

**Reinforced gravel:** This option was discounted due to concerns about the durability of the surface in an area where it will potentially be submerged under flowing water. Again, this type of surfacing would result in increased maintenance costs.

## 6 DESCRIPTION OF PLANT AND MATERIAL TO BE USED

It is anticipated that the principal items of plant and machinery will be as follows:

- 13t excavator
- 3t mini-digger
- Small dumper

Track mounted plant will be used to position the floating pontoon on the lower shore. The specification of track mounted plant will be confirmed once the contractor has been appointed.

Floating plant will be used to insert piles in the lower intertidal area. The specification for the floating plant will be confirmed once the contractor has been appointed.

## 7 CONSTRUCTION PROGRAMME

It is envisaged that construction of the proposed works will take approximately 4 months. The appointed Contractor will be required to complete a detailed programme covering all the main items of work laid out in a format which will permit progress of the various items to be tracked during the execution of the works.

- Start and completion date for all main activities
- Interdependencies between the various items
- Critical path

It is anticipated that delivery and installation of the pontoon and gangway by the specialist supplier will take 2 weeks. The Contractor's programme shall include this 2-week period within the final 3 weeks of the overall programme.

## 8 CONSTRUCTION ACCESS

Currently the only access onto the island is via a stepped pedestrian route from the rear of the adjoining Bellevue apartment complex. This route is too constrained to be viable as a construction access. Instead, it is proposed that construction access would be provided as follows:

### Primary Access Route

It is proposed that the primary access route would be from the southern side of the river via the OPW carpark located within the National War Memorial Gardens. The construction vehicle access route is indicated in Figure 8.1 below. Construction vehicles will use the existing access road between South Circular Road and the OPW carpark.



*Figure 8.1 – Primary Construction Vehicle Access Route*

The existing vehicular access to the OPW carpark will be maintained for the duration of the works.

In order to access the island from the southern side of the river, a temporary river crossing will need to be constructed. This temporary river crossing is described in Section 4.2 Item 1 of this report. The location of the temporary river crossing in relation to the OPW carpark is indicated in Figure 4.1 and on drawing 21036/103.

### Secondary Access Route

Due to the presence of trees and other vegetation on the island it would not be possible to carry some of the larger components across the island. This includes the units which comprise the pontoon and potentially the concrete caissons. A secondary access route along the River Liffey will therefore be required as indicated in Figure 4.3. These larger components will be delivered to a DCC facility located on the northern bank of the River Liffey, immediately upstream of Islandbridge. This area is identified as the 'Unloading Area' in Figure 4.3. From here, they will be carried by barge to the pontoon location or, in the case of the floating pontoon units, they will be towed into position. Refer to the sample method statement in Appendix A which has been prepared by Inland and Coastal to demonstrate how the pontoon units may be delivered to the required location.

### Construction Traffic Management Plan

The appointed Works Contractor will be required to provide a detailed Construction Traffic Management Plan (TMP) to detail how he intends to provide safe access to the works while maintaining existing pedestrian and vehicular traffic routes.

Construction traffic will be limited to the route indicated in Figure 8.1 and will also be restricted to certain times of day, with the aim of keeping disruption to existing traffic to a minimum and preserving public enjoyment of the adjoining OPW gardens. The appointed Works Contractor in his TMP will outline measures to manage construction traffic and to minimise disruption to the local area. At a minimum the TMP will be required to include the following measures:

- Construction traffic will be segregated from public traffic. The Contractor will provide adequate signage to allow the public to continue to use the western portion of the carpark..
- Daily construction programmes will be planned to minimise disruption by staggering deliveries to avoid trucks queuing at entry to the site compound. Movement of ancillary, maintenance and other site vehicles will be coordinated so as not to coincide with site deliveries.
- The Contractor will be required to promote travel by sustainable modes of transport.
- The appointed Works Contractor will coordinate deliveries to site so that they do not coincide with peak timings for background traffic including general morning 'rush hour' traffic from 8:00am to 9:00am and school closure between 1:30pm and 3:00pm.

#### Existing Vehicular Access to OPW Carpark

Currently public vehicular access to the OPW carpark is along the route indicated in Figure 8.1 above. This access will be maintained for the duration of the works. The appointed Works Contractor will be required to implement all necessary traffic management measures including directional / warning signage. These measures will be fully described in their TMP.

#### Existing Pedestrian Access to OPW Carpark / OPW Gardens

The existing access road between South Circular Road and the OPW carpark does not include formal footpaths on either side of the road. Instead, a rough path exists on the northern side of the road, separated from the carriageway by low hedging. Pedestrians are observed to use the carriageway instead of the path as it provides a stable walking surface.

It is proposed to provide temporary signage and barriers to encourage pedestrians to use the path for the duration of the works. The works are expected to take around 4 months to complete. The number of truck movements is expected to be modest with no more than 3-4 truck deliveries per day (refer to Section 10). Therefore, it is not expected that the works will have a significant impact on existing pedestrian access.



Figure 8.2 – Access Road Looking West Towards OPW Carpark

## 9 CONTRACTOR'S COMPOUND

In order to complete construction of the works, the appointed Contractor will require the use of a compound area. The compound will comprise material storage areas, short term staff welfare facilities and parking for site vehicles and plant. The compound site will remain in use for the duration of the works and will be secured using 2.4m high solid timber hoarding and surfaced fit for purpose. The Contractor's compound shall be located within the existing parking area on the southern side of the River Liffey. Drawing 21036/103 shows an indicative area for the compound within the OPW carpark, which has been sized based on the requirement to accommodate the aforementioned storage areas, welfare facilities, parking etc. An extract from this drawing is provided in Figure 9.1 below. The compound area has been kept to a minimum in order to avoid undue disruption to the ongoing operation of the National War Memorial Gardens and its car park.

The layout of the hoarding will prevent unauthorised access onto the temporary river crossing. The existing pedestrian access to the rear of the Bellevue Apartment Complex will also be closed-off with hoarding for the duration of the construction works. This access will be restored upon completion of the works.



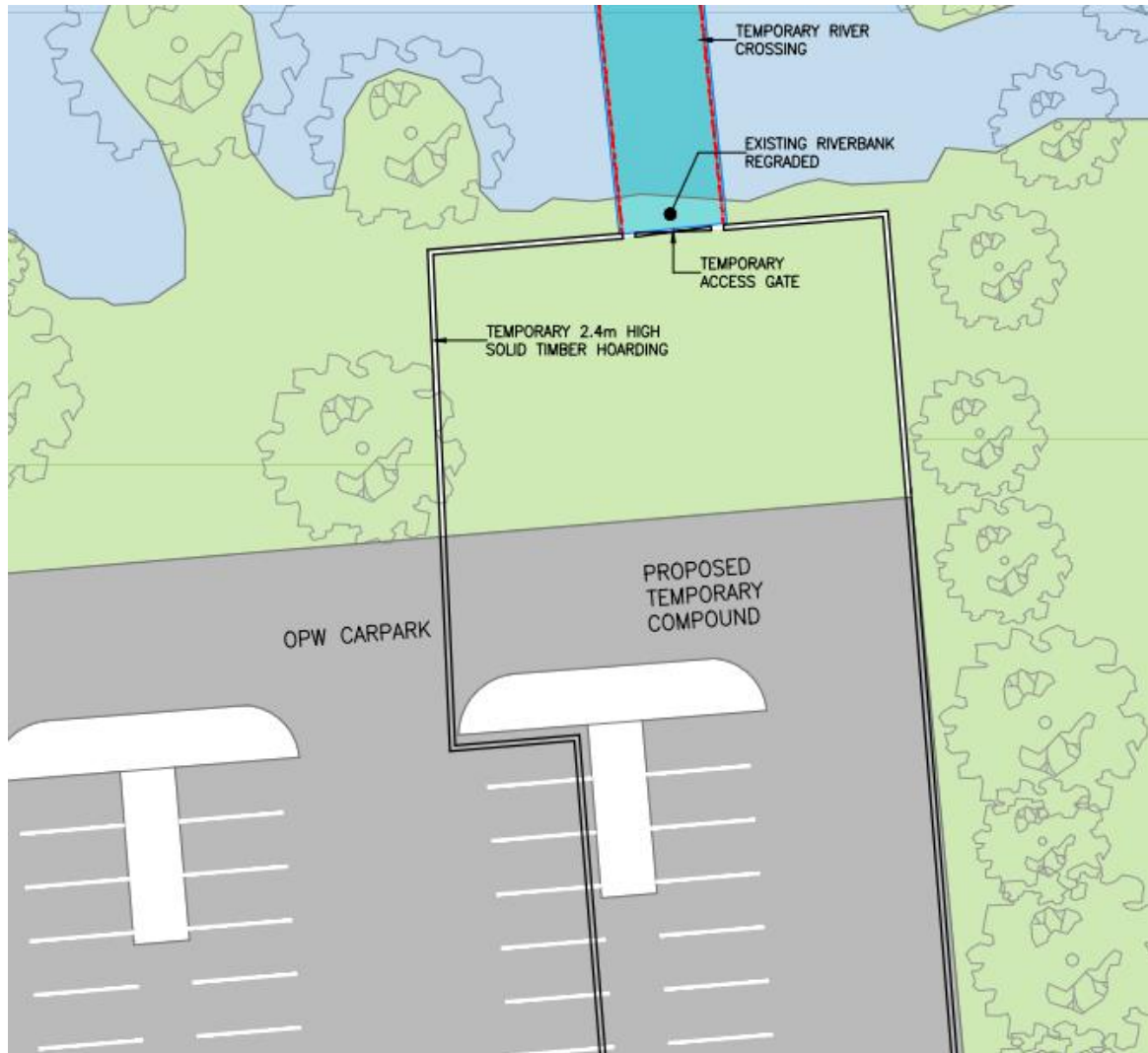


Figure 9.1 – Contractor’s Compound and Construction Access

The following measures will apply to the use of the compound area:

- The storage of fuels, other hydrocarbons and other chemicals within the contractor compound shall be in accordance relevant legislation and with best practice, in particular:
  - All fuel/ hydrocarbon/ chemical (fluid) storage areas shall be bunded to 110% of storage capacity.
  - Storage of these materials within the compound shall be organised so as to be as far away from all water bodies as is practicable.
  - The emergency response plan shall include arrangements for dealing with accidental spillage and relevant staff shall be trained in these procedures.
- All site compounds will be fenced off and a silt fence erected and maintained on the site boundary until construction completion, and
- All excess material and waste will be removed off site and reused or disposed of at a licensed facility. No stockpiles are to be retained on site.



- Further best practice pollution prevention control measures will be outlined within the Contractor's CEMP.

Following the completion of construction activities, all areas shall be reinstated to their pre-existing condition to the landowner's satisfaction. A photographic survey of the site shall be completed by the Contractor prior to commencement of the works and also following fully demobilisation from the site. Any damage caused by the Contractor shall be rectified by him at his own expense.

## **10 CONSTRUCTION SEQUENCING**

The Contractor is likely to first complete set-up of the construction compound and construct the temporary access to the island from the OPW carpark. Other early-stage activities are likely to include the installation of piles for the pontoon but these works would be completed from a barge within the river and would not require access via the OPW lands.

It is envisaged that the overall programme of works would be in the region of 4 months. The quantity of material to be delivered to site is generally quite small and it is estimated that there would typically be no more than 3-4 construction trucks delivering material to the site each day. This number may be higher during initial site set-up and when filling the caissons when 8-10 construction vehicles could be expected per day.

During a pre-planning meeting with the OPW on 7<sup>th</sup> June 2022, it was noted that the National War Memorial Gardens host ca. 400-500,000 visitors each year with many using the car park in question. The car park was also noted as being used during peak times for school drop offs with school children and disabled individuals often using the centre of the road as a stable footpath.

The appointed Works Contractor will therefore be required to coordinate deliveries to site so that they do not coincide with peak timings for background traffic including general morning 'rush hour' traffic from 8:00am to 9:00am and school closure between 1:30pm and 3:00pm.

## **11 ASSESSMENT OF ALTERNATIVE ACCESS ROUTES**

Consideration was given to delivering all units to the site using a barge and removing the requirement for access from the OPW carpark. This option was discounted primarily on health and safety grounds. The island is located within the tidal reaches of the River Liffey and is submerged during high tides. The timing during which the island is submerged can be unpredictable as it is also dependent on rainfall and the volume of water coming down the river. It is therefore necessary to maintain a permanent access route to allow construction plant to be brought on to the island and be removed from the island as necessary during the course of the works. The access from the OPW carpark is also necessary to provide a reliable escape route for operatives working on the island.

etc.

## 12 MAINTENANCE

Throughout the design process, consideration has been given to future maintenance requirements, particularly given the restrictions on access. As noted in Section 5, the pontoon and its supporting structure have been designed to provide a robust design solution to best withstand fluctuations in river levels and river flows. The maintenance requirements associated with the pontoon are considered to be minimal and will be limited to periodic inspections to check for damage and wear of the pile rollers and roller brackets. In the event that rollers need to be replaced this can generally be completed with simple hand tools.

Similarly, the Dycel mattress units were selected due to their simple, robust nature. Maintenance will be limited to periodic inspections and removal of debris.

## 13 ENVIRONMENTAL REQUIREMENTS

The Contractor will be required to implement a number of environmental mitigation measures as detailed in the Ecological Impact Assessment report prepared by CAAS. These mitigation measures, which are summarised below, are the minimum requirements that will be incorporated into the contractor's Construction Environmental Management Plan (CEMP). The CEMP is to be prepared once all Contractors and Sub-contractors involved in construction activities on the site have been appointed and have agreed to the implementation of all Environmental Controls outlined in this "Environmental Requirements" section of the CMP."

### 1. Augmentation of existing habitats, as well as the removal of trees

- No vegetation will be removed during the breeding bird season (1<sup>st</sup> March to the 31<sup>st</sup> of August).
- No vegetation is removed beyond the minimum required to complete the task.
- Timing of works will be as brief as possible to minimise potential disturbance effects.
- Any vegetation removal or disturbance works that must take place during the breeding season should have a suitable qualified ecologist consulted prior to any works commencing and where required an Ecological Clerk of Works will be appointed to oversee works.
- A tree planting plan and tree removal plan will be prepared by a qualified arborist detailing appropriate native replacement planting that is suitable for the flood prone nature of the proposed site.

### 2. Water quality

- Ensure protection of the River Liffey by implementing best practice control measures during the construction phase.
- The design and implementation of a CEMP prior to commencement of site works will ensure there is no impact on water quality as a result of the small-scale construction phase.

### 3. Construction and Earthworks

- Dust and debris control measures be implemented where relevant.
- The design and implementation of a CEMP prior to commencement of site works will ensure there is no impact on water quality or the island itself as a result of the small-scale construction phase.

### 4. Lighting during construction

- Implementation of lights out hours when construction is not active on site (evening and night hours).
- The design and implementation of a CEMP prior to commencement of site works will ensure there is no impact for local light sensitive populations such as bats as a result of the small-scale construction phase.

### 5. Noise/vibration

- The establishment of best practice measures for minimising and reducing noise and vibration from construction should be detailed in a CEMP which will be designed and implemented prior to commencement of site works will ensure there is no impact due to noise and vibration to local wildlife populations.
- The Contractor will be required to undertake his works having due regard to Dublin City Council Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition

### 6. Invasive Species

- The establishment of best practices measures for the removal of and minimising the spread of the identified invasive species, Himalayan balsam and Japanese knotweed, during the construction phase will be detailed in the Invasive Species Management Plan, that is to be designed by a contracted specialist and carried out by the contracted specialist for the proposed development in agreement with Dublin City Council.
- The Invasive Species Management Plan will detail the timeline, treatment schedules, management schedules, and restriction zones in terms of time and space for the construction and arborists on site – and will communicate as such prior to any works taking place on the site.

### 7. Water quality for salmon rivers

- Ensure the protection of any salmon spawning sites upstream of the River Liffey by restricting the construction phase of the proposed development to the months of August-October and January. This shall be agreed prior to the commencement of any works with the invasive species specialists' timelines, and the arborist and construction team.

**APPENDIX A – SAMPLE METHOD STATEMENT FOR PONTOON DELIVERY**

**APPENDIX A – SAMPLE METHOD STATEMENT FOR PONTOON DELIVERY**





# **Inland and Coastal**

## *Marina Systems*

Project No.	<b>2111</b>		
Project Name	<b>2111 UCD Rowing Club</b>		
RAMS Title	<b>Installation of pontoons at Islandbridge</b>		
<b>Rev.</b>	<b>Date</b>	<b>Version Details</b>	<b>Revised by</b>
00	22/02/2022	Draft	VC
<b>Acceptance / Approvals</b>	<b>Name</b>	<b>Signature</b>	<b>Date</b>
Originator	Ali K. Kermani		22/02/2022
Reviewed by	VC		22/02/2022

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## 1 Description of the Works

### 1.1 Work Involved

The scope of works for the contract involves the following:

- Supply and Installation of 18x4m wide rowing pontoons
- Supply and Installation of 4x4m wide landing pontoons
- Supply and Installation of a 16x3m Gangway
- Towing of all items above to exact installation location
- Pulling up the shore end of the gangway for further connection to the quay wall

It is envisaged that the works will require using a teleporter (or small machine) to unload the pontoons from the delivery vehicles, and ICMS foreman needs to be present during the offloading process to safely unload the loads at the water treatment plant, and tow them into the exact installation location\*.

\* Supply of a teleporter or small machinery at the location of installation is Not part of this method statement and therefore not included as it will be done by others.

### 1.2 Site Address

Islandbridge Pontoon, Dublin

### 1.3 Duration of Works/Project

1Day Pontoon Towing, 2Days Installation

### 1.4 Proposed Start Date

T. B. C.

## 2 Construction Methodology (Next Page)

## 2.1 Work Site Set Up

1. All staff/operatives will be briefed on the extent and nature of the works and any special safety requirements identified within the body of this document upon arrival on site by the ICMS Site Supervisor
2. Each Operative/Supervisor will have read and signed this method statement. All workers will be made aware of the particular issues involved in this project.
3. ICMS will take control of a section of the area to complete the works. The work area will be cordoned off/manned to ensure that there will be no interference from the public. All operatives to wear life jackets while working over or next to water.

## 2.2 Access Requirements

1. All work to take place at the storage site and the installation site with pontoon units and step being unloaded using a teleporter (or small machine) / .
2. It is assumed that the nearby water treatment plant owned by the Dublin City Council will be used for offloading pontoons into water.
3. Pontoons will then be towed to the location.



## 2.3 Sequence of Works

1. The area on the land where the installation work is being undertaken is to be cordoned off and an exclusion zone set up. Signage is to be strategically posted warning of dangers associated with unauthorised persons entering the area.
2. The area on the waterside where the offloading / installation work is being undertaken is to be cordoned off with buoys and an exclusion zone set up.
3. Each operative, supervisor, or manager shall be fully site inducted in strict accordance with agreed site specific induction procedures prior to commencement of any works or role on site.

## **2.4 Teleporter (or small machine)**

1. A Teleporter (or small machine) will be used to offload the pontoons. The area in Water Treatment Plan where the offloading work is being undertaken is to be cordoned off and an exclusion zone set up.
2. The teleporter (or small machine) driver is responsible for the safe setting up and operation of the teleporter (or small machine) as per the manufacturer's instructions. A thorough inspection will be undertaken by the teleporter (or small machine) supplier prior to putting into use (A copy of this has to be available on site at all times). The driver must operate the teleporter (or small machine) within its duties, should the teleporter (or small machine) driver require the trailers to be repositioned he must contact the relevant ICMS crew foreman.
3. The Operator is responsible for ensuring that the appropriate lifting equipment is used for the required lifts.
4. The condition of lifting equipment must be continuously monitored by all ICMS Operatives and any concerns should be reported immediately to the relevant ICMS Forman, Safety Officer or Project Coordinator.
5. Generally, communication between the Slinger/signaller (Identifiable by Orange Hi Vis Vest) should be by way of hand signals, when this is not practical or appropriate hand held radios will be used.
6. All lifting activities must cease in high winds.

## **2.5 Deliveries**

1. The driver is responsible for the safety of the load until it arrives to site.
2. Prior to departure from ICMS yard the driver must check the load and report any non-conformity to the loading supervisor.
3. The driver has the authority to refuse to move the load if not satisfied the load is safe.
4. It is the responsibility of the driver to fix securing chains or straps and ensure they are properly tensioned.
5. When securing the load the driver must ensure that the units are adequately protected to prevent damage. Chain Guards may be used.
6. It will be the responsibility of the ICMS Supervisor to direct the loads to the appropriate location on the site.
7. On arrival to site it is responsibility of the driver to ensure safe access is available and to position the load in accordance with the Installation crew supervisor's direction.
8. The driver has the authority to refuse to position his vehicle in any location, which he deems to be unsafe. When in position the driver will remove the security chains or straps and responsibility for the load passes at that time to the ICMS Crew Foreman.

## **2.6 Offloading**

1. A visual inspection will be carried out by the ICMS Foreman to check for any defects before unloading each unit.
2. Offloading is carried out under the supervision of the ICMS Site Foreman.
3. The area will be barriered off/manned where the units are being offloaded.
4. While on the ground the slinger/signaller will attach an inertia reel to the teleporter (or small machine) hook and to his harness. This will provide fall protection while accessing the units on the trailer.
5. An ICMS slinger/signaller will access the trailer by a secured ladder. He will guide the teleporter (or small machine) directly over the pontoon unit that needs to be lifted into place.

6. Units may be offloaded only by certified chains and lifting equipment.
7. The slinger/signaller must ensure that the safety clip is closed on the hook before any lifting takes place.
8. The slinger/ signaller attaching the lifting attachment must signal to the teleporter (or small machine) driver to proceed with the lift when the lifting attachment has been securely attached. Where the teleporter (or small machine) driver has restricted view banking will be by two way radio.
9. The slinger/ signaller must ensure that nobody is walking or working underneath the path of the unit during the lift.
10. No one must ride on the units during the lift.
11. The slinger/signaller must be safely down from the trailer before the load can be lifted.
12. Tag lines are to be used to guide/control the loads while off-loading.

## **2.7 Pontoons**

1. Pontoon frames (decked) and the floats are delivered pre-assembled. Pontoon are delivered to the site on an articulated Lorry with 40ft trailers.
2. Pontoons are fully assembled on delivery, and are lifted into the water with slings or chains, using the teleporter (or small machine) , and then unhooked from the teleporter (or small machine) in the water. All works will be undertaken with the same care and attention as described above.
3. Pontoon units are to be delivered assembled to site on articulated lorries with 40ft trailers.
4. A number of assembled pontoons are lifted into the water with slings or chains, using the teleporter (or small machine) , and then unhooked from the teleporter (or small machine) in the water at each stage.
5. Every two frames are connected to each other side by side using a connecting H-beam, and end to end connections which comprise of M24 galvanised bolts with locknuts, through 50mm Ø rubber buffers.
6. When the pontoons are connected in the water, the gangway will be offloaded from the delivery vehicle on top of the connected pontoons.
7. The fully assembled pontoons with the gangway on top will be towed into the exact installation location.
8. When units arrive to installation location they are ready to be towed into position using the workboat.
9. The pontoons are towed to the exact location and secured to the pre-driven piles and anchored to the piles via a galvanized pile bracket and hard plastic buffers.
10. The shore side row of pontoons will be positioned so that the mooring piles will enter the pre-assembled pile guides on shore side pontoon units. All pontoons will be in position at this stage.



## **2.8 Gangway**

1. The 16m x 3m Access Gangway will be delivered to site in separate pieces. The unit will arrive to site in three sections.
2. The gangway will be lifted from the delivery vehicles and placed on the existing quay structure for assembly. The sections will be bolted together using M24 galvanised bolts and locknuts. Once fully assembled, the gangway is then lifted and placed on top of the pontoons for further towage.
3. With fully assembled pontoons towed to the quay wall, the shore end of the Gangway will be lifted and put into position i.e. the plinth plate. The Gangway will be bolted onto the shore side plinth on the land end using suitable chemical/mechanical anchor bolts, and allowed to roll on the pontoon end \*.
4. When the gangway is fully installed, pontoons will be towed to be set into position as described in previous pages.

\* The method statement for using a teleporter (or small machine) at the location of installation is Not included in this method statement as the full craneage in the island will be done by others.

### 3 Project Personnel

Title	Name	Contact No.
Project Manager	Oliver Shortall	00353 57 9153963 00353 87 4196596
Operations Manager	Michael Conneely	00353 87 4159104
Safety Officer	Shannon McDermott	00353 86 0202595
Project Engineer	Brian Curley	00353 87 9816689

#### Installation Crew

Title	Name	Company
ICMS Supervisor	TBC	
ICMS Operative	TBC	
ICMS Operative	TBC	
ICMS Operative	TBC	
ICMS Operative	TBC	

#### 3.1 Competence and Training Requirements

*All ICMS Marina staff before work commences will have required adequate training to carry out their daily duties in a safe manner. As the project develops additional training maybe required for certain tasks to be carried out in a safe manner.*

*All ICMS staff and subcontractors have undergone the following training where applicable:*

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• ICMS Ltd Induction</li> <li>• Manual Handling</li> <li>• Abrasive Wheels</li> <li>• Working at Heights/Safety Harness Training</li> <li>• Forklift Training</li> <li>• Ladder Safety</li> <li>• Powerboat Cert. – ISA</li> <li>• Open Water Diving - PADI</li> </ul> | <ul style="list-style-type: none"> <li>• Safe Pass Course – SOLAS</li> <li>• Telescopic Handler - SOLAS</li> <li>• Slinger / Signaller – SOLAS</li> <li>• Mobile Access Tower – SOLAS</li> <li>• MEWP – IPAF or C&amp;G</li> <li>• Occupational First Aid</li> <li>• Slinger / Signaller - CPCS</li> <li>• Teleporter (or small machine) Supervisor - CPCS</li> </ul> |
|---|---|

## 4 Plant & Equipment

All equipment and tools brought onto site will be of sound construction and will meet the statutory requirements applicable to those tools or equipment. Refer to risk assessment specific control measures for tools and equipment.

All lifting gear is to be certified. Copies of the certificates are to be made available for inspection and forwarded to ICMS Precast before entering the site. Operators of all the plant will fill in weekly inspection sheets detailing any defects if any.

The following is a list of tools and equipment that will be required on site:

ICMS Van	Hand Tools	Electrical Tools
Teleporter (or small machine)	Work/Safety Boat	

### 4.1 Chemical Use – MSDS

The following chemicals maybe used in the duration of the works: (See Section 9 for a copy of the MSDS)

N/A		

## 5 Personal Protective Equipment (PPE)

All ICMS Marina staff are to wear the PPE as described in this section. All life jackets, safety harnesses, lanyards and inertia reels to be used for the necessary tasks. The life jackets are to be certified annually and the safety harnesses, lanyards and inertia reels are to be tested every six months. A documented inspection form is to be filled in every week for any faults if any. The users will carry out a visual inspection each time they are been used.

All ICMS operatives will be issued with, but not limited to, the following standard PPE:

Hard hat – BS EN 397	Gloves (Task specific) BS EN 388	
Hi Vis Vest – BS EN 471	Safety Glasses – BS EN 166	
Safety Boots – BS EN 388	Life Jackets – EN 396/1993	

Also available for task specific working:

Ear Plugs / Defenders	Inertia Reel	Dust Masks
-----------------------	--------------	------------

## 6 Emergency Plan

If an emergency does arrive, the ICMS Supervisor shall contact the following persons:

- Emergency Services, on 999 or 112 and request Fire Brigade, Police or Ambulance Services
- Project Manager

All accidents/incidents, near misses, unsafe acts, unsafe conditions and NCRs are to be reported to ICMS Precast Management and Safety Officer.

All incidents will be investigated as per [Q 040](#) Incident Investigation and documented on [QR 049](#) Incident Investigation Report.

NCRs will be dealt with as per [Q 016](#) Non Conformance & Continuous Improvement and documented on [QR 020](#) NC & CI Record.

## 6.1 Emergency Numbers

Emergency	Number	Information
Fire Brigade, Ambulance & Police	999/101	Ask for the emergency service you require (Ambulance, Fire Brigade or Police)
ICMS First Aider (On Site)		TBC
ICMS Office	00353 57 91 53963	Queen St. Banagher, Co. Offaly.
ICMS Safety Officer	00353 86 0202595	Shannon McDermott
ICMS Operations Manager	00353 87 4159104	Michael Conneely
Police Station	01 666 9700	High Road, Kilmainham, Dublin 8,
Hospital	01 795 9280	Bridgewater House, Bridgewater Business Centre, Conyngham Road, Islandbridge,

## 6.2 Recovering someone from water

- Never jump into the water to save someone
- First reach for the person, be sure to hold onto someone or something stable while you are reaching. Do not lean over the water while you are trying to save someone. Crouch or lie down to avoid being pulled into the water.
- If you cannot reach throw out a life ring with floating th rope to the person, such lifebuoys will be available on the pier.
- If you cannot reach or throw, use the safety boat to access the person, if it is safe to do so. Approach the victim slowly with no wake. Help the victim aboard the vessel.
- Call emergency services if you cannot reach, throw or access the person by safety boat
- If the person can be recovered from the water, keep the casualty warm and get medical attention as soon as possible.

## 7 Risk Assessment

<b>Title</b>	2111 UCD Rowing Club
<b>PREPARED BY</b>	Ali K. Kermani
<b>ISSUE DATE</b>	22/02/2022 (Draft Issue)
<b>GROUP AT RISK</b>	ICMS operatives, marina users, public
<b>RESPONSIBLE FOR CONTROLLING RISK</b>	ICMS site supervisor, Operations Manager, Safety Officer

### Risk Rating Matrix

Likelihood (L)		Severity (S)		Risk (R)		Evaluation Matrix						
1	Extremely Unlikely	1	Minor Injury (First Aid)	Very Low		Severity	5	M	M	H	C	C
2	Unlikely	2	Moderate Injury (Lost time)	Low			4	L	M	M	H	C
3	Likely	3	Serious injury	Medium			3	L	M	M	M	H
4	Extremely Likely	4	Major injury	High			2	V L	L	M	M	M
5	Almost Certain	5	Fatality	Critical			1	V L	V L	L	L	M
							1	2	3	4	5	
							Likelihood					

Potential Hazard	Hazard Consequence	Risk			Control Measures	Residual Risk		
		L	C	R		L	C	R
Site Supervision	•Injury to site operatives, visitors and property.	4	5	20	<ul style="list-style-type: none"> <li>•ICMS to have adequate supervision on site at all times.</li> <li>•Signage and fencing to place around works for the duration or work areas to be manned at all times.</li> <li>•Works to be coordinated with the client and other contractors on site.</li> </ul>	2	5	10
Offloading	•Multiple injuries and property damage	4	5	20	<ul style="list-style-type: none"> <li>• ICMS site foreman to liaise with the teleporter (or small machine) driver and ensure teleporter (or small machine) is set up correctly in accordance with teleporter (or small machine) manufacturers requirements.</li> <li>•Client to ensure ground is capable to take loads.</li> <li>•Steel pads to be used under riggers and sand.</li> <li>•Driver to hold current CSCS -----All lifts to be co-ordinated</li> </ul>	2	5	10

					<ul style="list-style-type: none"> <li>•All lifting gear to be checked up to date certification and filed</li> <li>•Tag lines to be used at all times.</li> <li>•No lifts in high winds</li> </ul>			
Unloading of Materials	•Multiple injuries and property damage	4	5	20	<ul style="list-style-type: none"> <li>•Delivery driver to unstrap load and identify materials to be unloaded.</li> <li>•Slinger/Signaller to guide teleporter (or small machine) when unloading materials.</li> <li>•Area to be made secure to stop access to the loading/unloading of materials</li> <li>•Ensure lifting equipment are tested and fitted for the purpose of the lift.</li> <li>•Ensure teleporter (or small machine) is correctly positioned relative to that lift point and its final destination</li> </ul>	2	5	10
Working at Heights when unloading	•Personal injury	4	4	16	<ul style="list-style-type: none"> <li>•All operatives to be 100% tied off when working at heights.</li> <li>•Ladder to be secured when access the trailers.</li> <li>•Operative to be tied off to inertia reel from teleporter (or small machine) block when on the trailer if no other edge protection is in place.</li> <li>•Harness, inertia reels and other such PPE to be checked prior to use and a recorded to be kept on file.</li> </ul>	2	4	8
Danger of falling plant or materials while lifting	•Multiple injuries and property damage	4	5	20	<ul style="list-style-type: none"> <li>•All lifts to be supervised.</li> <li>•All lifts to be secured by a qualified slinger/signaller.</li> <li>•Teleporter (or small machine) operator to lift material with in the teleporter (or small machine) s lifting capacity.</li> <li>•All operatives to stay outside lift radius of material been lifted.</li> <li>•Signage to be place around work area to warn persons of activities.</li> </ul>	2	5	10
•Installation of Pontoon •Working over and adjacent to tidal waters	•Personal injury / possible death	4	5	20	<ul style="list-style-type: none"> <li>•Operatives not to work alone where there is a risk of injury or drowning.</li> <li>•Fall protection must be in place.</li> <li>•Rescue equipment must be provided, maintained and easily accessible.</li> <li>•There must be prompt rescue of persons in danger of injury or drowning.</li> <li>•Approved buoyancy vest or life jackets must be worn, depending on the risk.</li> <li>•Communication or appropriate provisions must be made for access to medical assistance.</li> <li>•Life rings must have sufficient line to reach the water level below.</li> <li>•Regular checks to be carried out on weather conditions.</li> </ul>	2	5	10
Construction works interference with Harbour operation and personnel/ general public	•Multiple injuries and property damage	4	4	16	<ul style="list-style-type: none"> <li>•All works to be coordinated and agreed with the Client.</li> <li>•All works to be supervised on site.</li> <li>•Warning signs and temporary fencing to be place around the works.</li> <li>•Safe access routes to be agreed and set out for harbour operations and general public.</li> </ul>	2	4	8
Temporary access	•Multiple injuries	3	4	12	<ul style="list-style-type: none"> <li>•All temporary access routes to be agrees prior to work starting.</li> </ul>	1	4	4



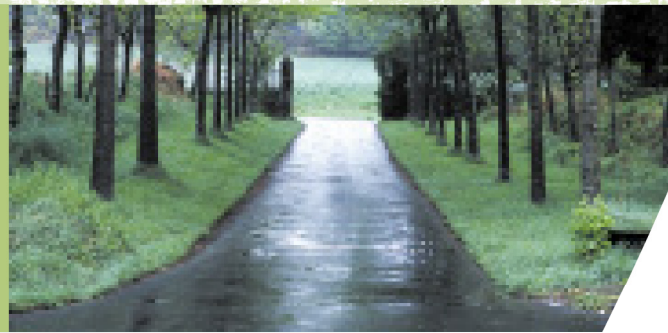
					<ul style="list-style-type: none"> <li>•Temporary access routes to be marked out and signage installed.</li> <li>•Flagmen to be in place directing deliveries when they arrive to site.</li> </ul>			
Out of hours works	•Personal injury	3	4	12	<ul style="list-style-type: none"> <li>•All works to be completed within the designated working hours.</li> <li>•No works to be carried out at the week end.</li> <li>•If additional hours are to be worked it is to be agreed and sufficient rest breaks to be given to the operatives.</li> </ul>	1	4	4
Noise pollution	•Personal injury	3	3	9	<ul style="list-style-type: none"> <li>•Staff working near plant for long periods of time to wear hearing protection.</li> <li>•Plant that is unusually noisy to be checked that exhausts are fitted correctly.</li> <li>•Tasks that cause a lot of noise are to be kept to a minimum.</li> </ul>	2	3	6
Emergency Situation	•Obstruction of emergency services	2	5	10	<ul style="list-style-type: none"> <li>•In the event of emergency all vehicular routes must be cleared immediately.</li> <li>•Plant must be parked in a safe area leaving clear access / egress routes for Emergency services</li> </ul>	1	5	5
Manual handling	•Injury to ICMS staff.	4	3	12	<ul style="list-style-type: none"> <li>•All operatives to have received manual handling training.</li> <li>•Walk ways to be kept clean, clear and lit</li> <li>•Use mechanical aids where possible, team lifting techniques to be used where mechanical aids cannot be used.</li> </ul>	2	2	4
Slips, Trips & Falls	•Personal Injury	3	4	12	<ul style="list-style-type: none"> <li>•Everyone on site is responsible for the tidiness of the site. This means that everyone must ensure that their work area is maintained in a clean and tidy manner, and that all waste and materials are removed and stored to their correct locations..</li> <li>•All ladders if required, on site must be securely tied or footed. All ladders must project 1m above the landing place. Broken/damaged ladders are not to be used on site and should be removed for repair or disposal by the person discovering such defects</li> <li>•A suitable barrier must be used to protect harbour wall edge if operatives are working in close vicinity</li> </ul>	2	2	4
Severe Weather Conditions	•Injury due to wind, poor visibility, Sea state.	4	5	20	<ul style="list-style-type: none"> <li>•Cut off limits for operations to be determined on site.</li> <li>•Weather conditions to be monitored constantly while on site.</li> </ul>	2	5	10



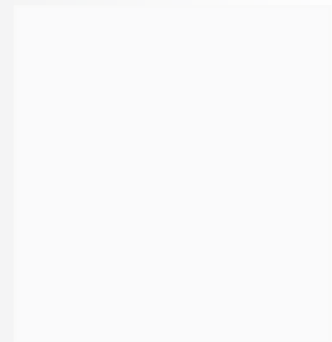
**APPENDIX B – PRODUCT INFORMATION (CELLWEB TREE ROOT PROTECTION)**



CellWeb TRP<sup>®</sup>



Tree Root Protection Guaranteed



# CellWeb TRP® System

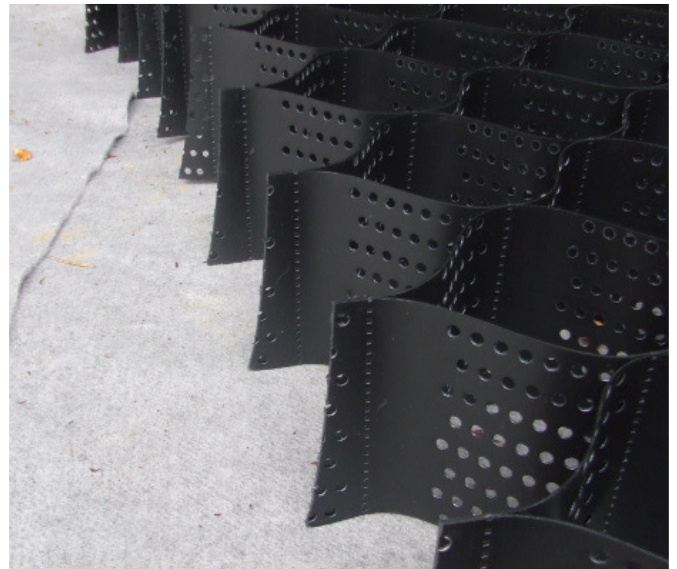
## Tree Root Protection System



## The Consequences Of Tree Root Damage During Construction

It is an offence to cut down, lop, uproot, top, wilfully damage or destroy a protected tree without authorisation. Trees can be protected under the Town and Country Planning Act 1990 and the Town and Country Planning (Trees) Regulations 1999. Trees are protected when they are the subject of Tree Preservation Orders (T.P.O) or within Conservation Areas, subject to certain exemptions. Retention and protection of trees on development sites is also secured through the use of planning conditions.

On a construction site all trees with a Tree Preservation Orders need to be managed in accordance with BS5837 2005 (Trees in relation to construction); failure to comply with these orders can be a costly affair as many parties have discovered.



Fishponds, Ketton

There are two offences which apply equally to trees protected by Tree Preservation Orders and those within Conservation Areas:

- Firstly, anyone who cuts down, uproots or wilfully destroys a tree, or who lops, tops or wilfully damages it in a way that is likely to destroy it is liable, if convicted in the Magistrates Court, to pay a fine of up to £20,000. If the person is committed for trial in the Crown Court, they are liable on conviction to an unlimited fine. The Courts have held that it is not necessary for a tree to be obliterated for it to be "destroyed" for the purposes of the legislation. It is sufficient for the tree to have been rendered useless as an amenity.
- Secondly, anyone who carries out works on a tree that are not likely to destroy it is liable, if convicted in the Magistrates Court, to a fine of up to £2,500. In addition to directly carrying out unauthorised works on protected trees, it is an offence to cause or permit such works.

Developers and building contractors are often completely unaware that 'compaction of soils within the Root Protection Area (RPA)' constitutes wilful damage to the tree. When vehicular or pedestrian access within the RPA is necessary, either for the construction operation or final site access, the effects of this activity must be addressed and the ground must be protected. When tracked or wheeled traffic movements are involved, the ground protection system should be designed by an engineer and take into account the loading involved.



Shelton Road, Shewsbury



# The Solution:

## Geosynthetics CellWeb TRP® System



## The Solution According to BS 5837:2012

“Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems .....

(BS 5837 2012 section 7.4.2 Note 1)

## The CellWeb TRP® Solution

CellWeb TRP® is the market leader in the United Kingdom and Ireland for tree root protection. CellWeb TRP® cellular confinement system protects tree roots from the damaging effects of compaction and desiccation, while creating a stable, load bearing surface for vehicular traffic. CellWeb TRP® complies with BS 5837:2005 and APN 1. It provides a no-dig solution, is tried and tested having been used successfully since 1998. It is the only tree root protection system which has been independently tested and it is the only tree root protection system which is guaranteed for 20 years. See page 6 for the full terms and conditions of the guarantee.



Fishponds, Ketton

## Field Trials

Geosynthetics Limited are the only company in the UK and Ireland to carry out live, completely independent field tests on the performance of a 3 dimensional cellular confinement system when used in a no-dig tree root protection system application. The results prove that CellWeb TRP® significantly reduces the compaction of sub-soils within the root growth limiting parameters established by K D Coder, ‘Soil damage from compaction’. University of Georgia. July 2000. A copy of the report is available upon request.

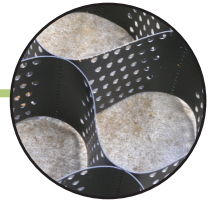
## CellWeb TRP® Product Guarantee

Geosynthetics Limited prides itself on a providing a reliable, consistent service; including technical advice, on site support and installation guidance. Geosynthetics Limited provides a 20 year guarantee for the CellWeb TRP® tree root protection system. This guarantee gives the client, the tree officer and arboricultural consultant the confidence that the designed system will perform as intended without damaging the health of the tree.

See page 6 for the full terms and conditions of the guarantee.



# CellWeb TRP® System

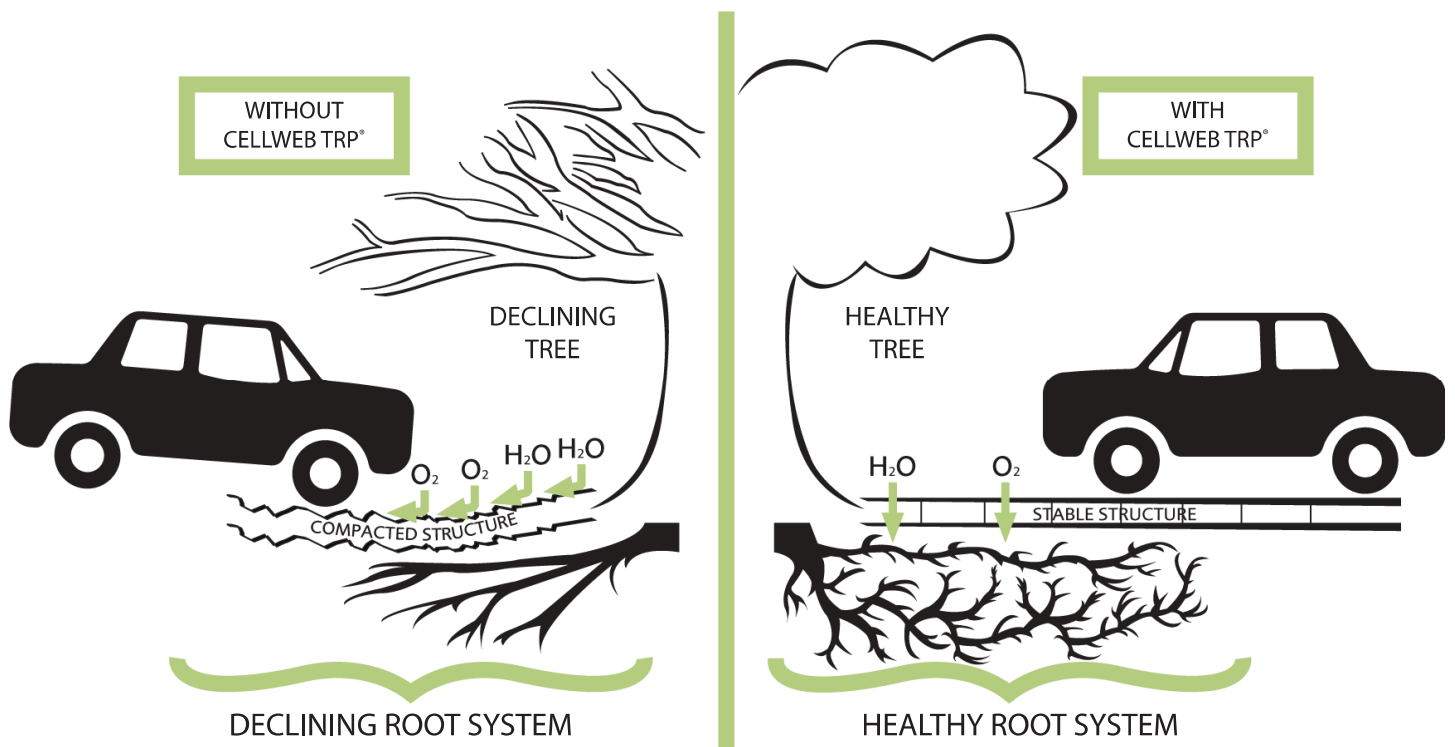


## How the System Works

### How CellWeb TRP® Works

CellWeb TRP® is a cellular confinement system that confines aggregate materials and makes them stronger, thus increasing the bearing capacity of the sub base materials. Research shows that CellWeb TRP® acts as a stiff raft to distribute wheel loads and reduce their magnitude at the base of the construction, thus maintaining the soil bulk density at levels that are suitable for tree root growth.

CellWeb TRP® is used around the world to provide cost effective hard surface construction over tree roots and is the system of choice for Tree Officers and Arboriculturists. For more information on this subject see CellWeb TRP® Fact Sheet No 1.



### Water and Oxygen Transfer Through the CellWeb TRP® System

The CellWeb TRP® system is constructed using open aggregate infill and CellWeb TRP® has perforated cell walls. The pore spaces between the aggregate particles are greater than 0.1mm in diameter. This open structure is far more permeable than typical soils and allows the free movement of water and oxygen so that supplies to trees are maintained.

For more information on this subject see CellWeb TRP® Fact Sheet No 2.

# CellWeb TRP<sup>®</sup> and Pollution



## How CellWeb TRP<sup>®</sup> Deals With Catastrophic Oil Spills

### How CellWeb TRP<sup>®</sup> Deals With Pollution

Where possible a permeable pavement system should always be constructed above the CellWeb TRP<sup>®</sup> system. The effective removal of pollution from runoff by permeable pavements is well known. Worldwide research has shown runoff that has passed through permeable pavements has low concentrations of pollutants.

Small spills of oil will be dealt with within the joints between the paving blocks and in the aggregate used within the system. However, large catastrophic spills are a different matter.

For more information on this subject see CellWeb TRP<sup>®</sup> Fact Sheet No 3.



Castle Gardens



Ambleside Lake District



Harcourt Aboretum

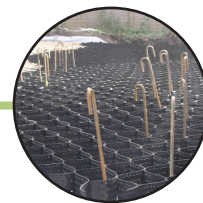
The Treetex<sup>®</sup> geotextile used in the CellWeb TRP<sup>®</sup> system has two functions. Treetex<sup>®</sup> separates the sub base aggregates from the soil beneath and it traps oil within its structure and allows it to degrade aerobically within the pavement construction. The structure, thickness and weight of Treetex<sup>®</sup> creates the perfect environment for this to happen. Most importantly tests prove that Treetex<sup>®</sup> will absorb 1.7 litres of oil per square metre, this is 4 times more effective than standard geotextiles.

Treetex<sup>®</sup> is an intrinsic part of the CellWeb TRP<sup>®</sup> system; and must be in conjunction with the CellWeb TRP<sup>®</sup> in order to guarantee the success of the system.

Please see page 6 for full details of the guarantee.

# Geosynthetics CellWeb TRP® System:

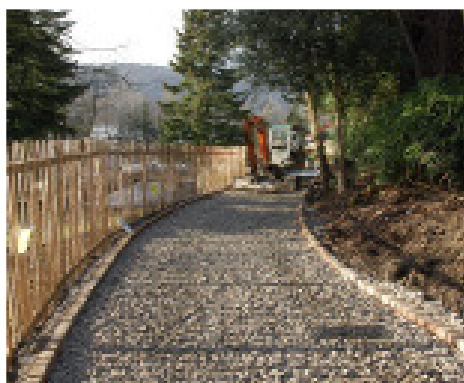
A Proven No Dig Solution



## Advice, Design and Product Selection

Geosynthetics Limited has been supplying the CellWeb TRP® system since 1998 and has vast experience in its application. No two contracts are the same and we understand the factors that need to be taken into account to specify the correct CellWeb TRP® product.

We provide a free consultation, design and advisory service to find the solution that is most cost effective and beneficial for your site. Our service includes product selection, engineering calculations, CAD drawings and full instructions to help you from project conception to completion.



Fallbarrow Park, Windermere:  
Prior to CellWeb TRP® Installation



Fallbarrow Park, Windermere:  
CellWeb TRP® Installation



Fallbarrow Park, Windermere:  
Completed CellWeb TRP® Installation

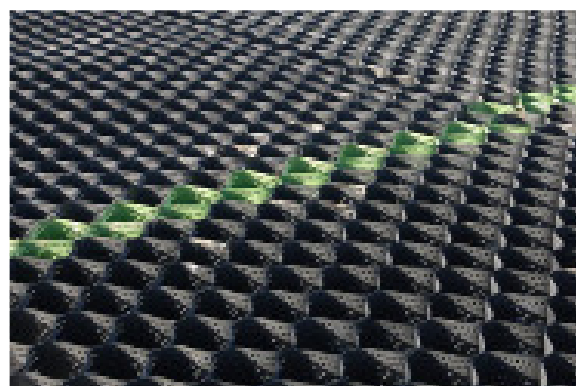
## Final Surfacing

The benefits of the CellWeb TRP® system can only be maintained if a suitably porous final surface is selected. An ideal surfacing is the Golpla grass reinforcement and gravel retention system, a visually attractive surface that has the advantage of being fully porous. Alternatives include block paviors, porous asphalts and loose or bonded gravel.

## Always Use CellWeb TRP®

The CellWeb TRP® system is the only research backed system of its kind in the UK with a 100% success rate. CellWeb TRP® has been specifically developed for the Tree Root Protection market. The system is supported by 15 years of data and thousands of installations making it the system of choice for the majority of Tree Officers and Arboriculturists in the UK.

CellWeb TRP® is uniquely identifiable. It is manufactured with a bright green panel on each side. When installed the green panels are laid adjacent, creating a green band across the construction.



Woodcock Hall, Yorkshire



# CellWeb TRP® Product Guarantee

We hereby guarantee CellWeb TRP® against the death of any tree caused by a failure of CellWeb TRP® which its installation was intended to protect for a period of 20 years starting from the date of this guarantee.

## Conditions of Guarantee

1. The details set out below must be correct in all respects.
2. We can only guarantee CellWeb TRP® where its installation has been carried out to high standards. Therefore our guarantee will only be applicable where:
  - (a) we have provided the designs in relation to the installation,
  - (b) the installation has been carried out by suitably proficient contractors,
  - (c) the installation has been carried out strictly in accordance with the installation specification/method statement available at the time of the installation,
  - (d) CellWeb TRP® has been incorporated into the installation above (and where specified as necessary, below) a Treetex® T300 Geotextile (or such updated replacement product as we may recommend), and
  - (e) the installation has been carried out using pins and panel staplers purchased from us or using similar products which are of the same or a higher quality.
3. If you experience any problems with the installation, you must tell us immediately. You must allow us onto the site at all reasonable times so that we can inspect the site and the installation to determine whether the CellWeb TRP® as failed.
4. As we need to determine whether the CellWeb TRP® has failed or whether the tree has been killed or damaged by another cause, you must not allow anyone else to examine the installation before we have the opportunity to inspect it as damage could be caused to the installation by any other inspection. If you do let third parties onto the site or you or your agents interfere with the installation this guarantee will lapse.
5. Your use of the surface and the traffic flow over the installation must be (and at all times have been) in accordance with the information provided to us at the time of the design of the installation. We can only provide designs based on the information you give to us and will have recommended the relevant CellWeb TRP® product according to that information.
6. This guarantee is for the benefit of the landowner of the site from time to time provided that you give us notice of the new owner on any transfer of ownership. We suggest you provide a copy of this guarantee to your solicitor when transferring the property.
7. Where a tree which was intended to be protected by the installation dies and we conclude that this was caused by a failure of CellWeb TRP® then we shall:
  - replace the dead tree with a tree as close to the dead tree (as available generally in the marketplace) as possible subject to a maximum replacement cost of £10,000; and
  - replace the CellWeb TRP® which has failed (but not any other part of the installation where the CellWeb TRP® has not failed) subject to a maximum replacement cost of £50,000.
8. Our total liability to you under the terms of this guarantee shall be limited to our obligations set out above and our liability to you for any other losses you may suffer is excluded to the fullest extent permitted by law. For the avoidance of doubt, we shall have no liability to you whatsoever for any damage to trees or a CellWeb TRP® installation caused by anything reasonably beyond our control, including for instance pollution.

Your Stockist is



sales: 01793 847 444

email: [info@ecomerchant.co.uk](mailto:info@ecomerchant.co.uk)

web: [www.ecomerchant.co.uk](http://www.ecomerchant.co.uk)

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# Cellweb - Tree Root Protection System

PROPERTY	TEST METHOD	Unit	VALUE			
Material	-	-	Virgin HDPE. Non thermally degraded			
Product Colour	-	-	Black with Green fascia strip			
Polymer Density	ASTM D 1505	g/cm <sup>3</sup>	0.935 - 0.965			
ESCR - Environmental Stress Crack Resistance	ASTM D 5397	Hours	> 400			
ESCR - Environmental Stress Crack Resistance	ASTM D 1693	Hours	6000			
Carbon Black Content	ASTM D 1603	% by weight	1.5% Minimum			
Nominal Sheet Thickness <sup>(1)</sup> Before Texturing	ASTM D 5199	mm	1.27 -5% , +10%			
Nominal Sheet Thickness <sup>(1)</sup> After Texturing	ASTM D 5199	mm	1.52 -5% , +10%			
Cell Height	-	mm	75	100	150	200
Seam Peel Strength	-	N	1065	1420	2130	2840
Cell Configuration	-	-	Standard		Large	
Width of Expanded Unit - Length x Width	-	mm	259 x 224		508 x 475	
Expanded Cell Area	-	cm <sup>2</sup>	289		1206	
Expanded Cell Size - Width x Length	-	m	2.56 x 6.52		2.56 x 13.72	
Expanded Panel Area	-	m <sup>2</sup>	16.7		35.14	
Seam Hang Strength	-	-	A 102mm welded joint supporting a load of 72.5kg for 30 days minimum or a 102mm welded joint supporting a load of 72.5kg for 7 days minimum while undergoing temperature change from 23° to 54° on a 1 hour cycle.			

Your stockist is:



sales: 01793 847 444

email: [info@ecomerchant.co.uk](mailto:info@ecomerchant.co.uk)

web: [www.ecomerchant.co.uk](http://www.ecomerchant.co.uk)

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# Cellweb® TRP Installation Guide



Step 1: Prepare Surface



Step 2: Lay out Treetex™



Step 3: Lay out Cellweb® TRP

- Cellweb® TRP is a NO DIG tree root protection measure and it is recommended that no excavation be performed without prior approval and guidance from the Local Authority Arboricultural Officer.
- Soil compaction from vehicles, machinery and materials is to be strictly prohibited during construction within Root Protection Areas (RPAs).
- Approval must be obtained from the Local Authority that the design and the method of construction is acceptable.
- Further information is available from the following two documents;
  - British Standard BS5837: 'Trees in Relation to Design, Demolition and Construction' (2012).
  - Arboricultural Advisory and Information Service: Practice note 12 – 'Through the Trees to Development' (APN12).

## Installation Method

### 1. Prepare the Surface

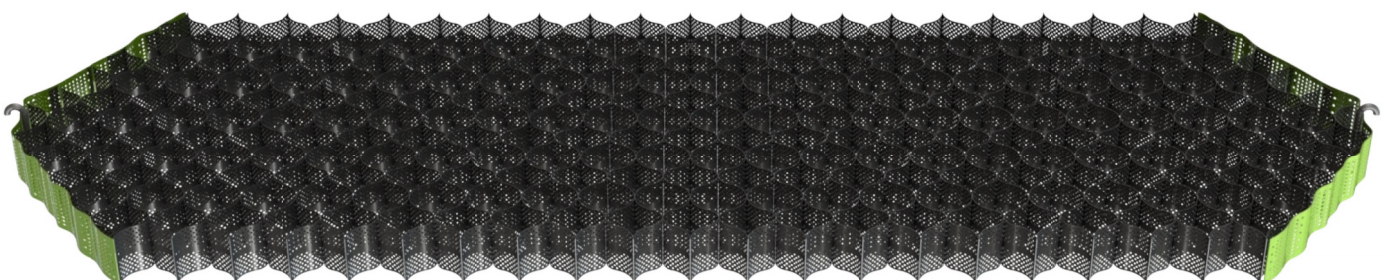
- Remove the surface vegetation using appropriate hand held tools or herbicide (see Note 1).
- Remove any surface rocks, debris and organic material.
- Create a level surface by filling any hollows with clean angular stone or sharp sand.
- Do not level off high spots or compact the soil through rolling.

### 2. Lay out the Treetex™ Non-Woven Geotextile

- Lay out the Treetex™ over the prepared area, overlaying the edges of the required area by 300mm.
- Overlap any joints by 300mm minimum or more, depending on soil structure (see Note 2).

### 3. Lay out the Cellweb® TRP Cellular Confinement System

- Lay out the collapsed Cellweb® TRP on-top of the Treetex™.
- Place one of the supplied J pins into the centre cell at the end of the panel and secure into the ground.



# Cellweb® TRP - Installation Guide

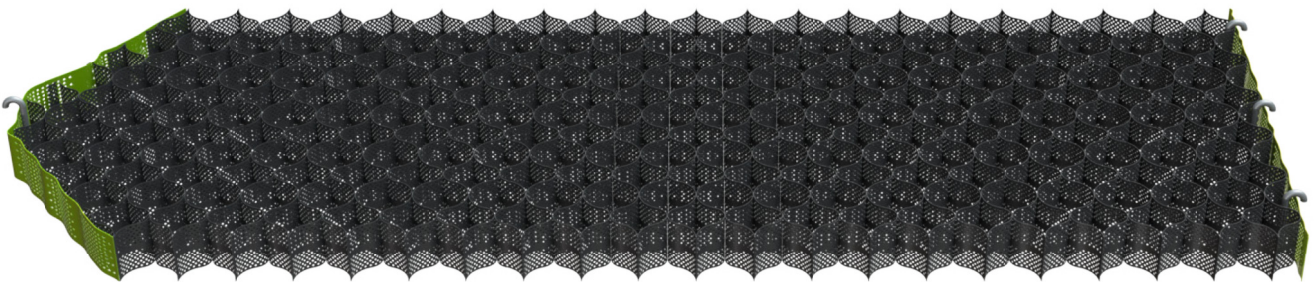


Step 3: Pinning Cellweb® TRP

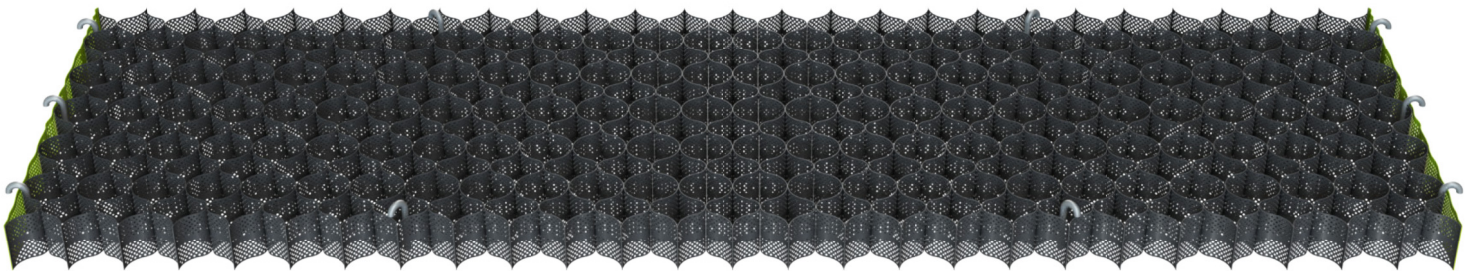


Step 3: Stapling Cellweb® TRP

- Pull out the Cellweb® TRP to its full 8.1m length and secure its length with another J pin.



- Now measure its width to 2.56m and secure in each of the corners with the J pins.
- Use 10 pins per panel to create a panel measuring 8.1m x 2.56m.



- This will produce a cell size of 259mm x 224mm which is the required cell diameter. Each cell must be fully extended and under tension.
- Staple adjacent panels together at each cell (see Note 3).
- If a curved path or shape is required, this should be cut when the Cellweb® TRP panel is pinned out to 8.1 x 2.56m, ensuring complete cells remain. Do not try to curve or bend the Cellweb® TRP panels into place.
- All cells must be fully opened to the required diameter.



# Cellweb® TRP - Installation Guide



Step 4: Clean Angular Stone



Step 5: Edge Restraints



Step 6: Surface Options

## 4. Infill the Clean Angular Stone

- The infill material must be a clean angular stone, Type 4/20mm or Type 20/40mm (see Note 4).
- Do not use M.O.T type 1 or crushed stone with fines for tree root protection.
- Infill the Cellweb® TRP cells with the clean angular stone, working towards the tree and using the infilled panels as a platform.
- No compaction is required of the infill. Do not use a whacker plate or other means of compaction.

## 5. Edge restraints

- Excavations for kerbs and edgings should be avoided within the RPAs.
- Where edging is required for footpath and light structures, a peg and treated timber board edging is acceptable
- Other options include wooden sleepers, kerb edging constructed on-top of the Cellweb® TRP system, plastic and metal edging etc.

## 6. Surface options

- Surfaces can include block paving, asphalt, loose gravel, grass and gravel retention systems (eg Golpla™), resin bound gravel, concrete etc.
- For Root Protection Areas this surface must be porous.

## NOTES

- 1. Herbicide:** According to BS5837:2012 "The use of herbicides in the vicinity of existing trees should be appropriate for the type of vegetation to be killed, and all instructions, warnings and other relevant information from the manufacturers should be strictly observed and followed. Care should be taken to avoid any damaging effects upon existing plants and trees to be retained, species to be introduced, and existing sensitive habitats, particularly those associated with aquatic or drainage features."
- 2. Geotextile:** We recommend the installation of a Treetex™ under the Cellweb® TRP, or under the sub-base, if installed. The overlapping between adjacent rolls of Geotextile should be: CBR > 3%: 300mm minimum, CBR between 1% and 3%: 500mm minimum. CBR ≤ 1%: 750mm minimum.
- 3. Staples:** Number of staples per join: 200mm: 5 staples. 150mm: 4 staples. 100mm: 3 staples. 75mm: 3 staples.
- 4. Granular Fill:** Open graded sub-base, clean angular stone Type 4/20 or Type 20/40. Please refer to BS7533-13:2009 and to the Design Manual for Roads and Bridges (DMRB), Volume 4 Geotechnics and Drainage, Section 1 Earthworks, HA44/91, Volume 7 – IAN 73/06 Design Guidance for road pavement foundations and Manual of Contract Documents for Highway Works (MCHW), Volume 1 Specification for Highway Works for the construction and maintenance of the fill material.

**APPENDIX C – PRODUCT INFORMATION (DYCEL 150 CONCRETE MATTRESS)**

## PRODUCT SPECIFICATIONS

Standard Dycel units are manufactured according to the following:

**Cement:** OPC BS EN197 - 1 : 2000

**Aggregates:** BS EN 12620 : 2002

**Concrete Mix Design:** BS8500 - 1 : 2002 Grade C50: Table 9

**Durability:** Very severe exposure to Table 5: BS8500 - 1 : 2002

**Sulphate Resistance:** Class 2, Table 7: BS8500 - 1 : 2002

**Minimum Cement Content:** 370 kg/m<sup>3</sup>

**Maximum Aggregate Size:** 10mm

**Density:** 2,300 kg/m<sup>3</sup> (2.600 and 2.900 kg/m<sup>3</sup> to special order)

**Freeze/Thaw:** When tested by the RILEM method in respect of exposure to repeated freeze/thaw pods cut from actual Dycel units show no loss of weight.

**Surface Finish:** "Type A" in accordance with BS EN 1992 - 1 - 1 - 2004.

## DELIVERY

Factory assembled panels are supplied in various lengths to suit individual applications. For hand laid situations, Dycel blocks are supplied palletised, facilitating off loading and site distribution. Loose blocks may also be supplied for on-site panel assembly. Delivery is normally in 25 tonne loads on articulated lorries, and any local restrictions with regard to lorry size should be made known at the time of placing the order.

## DIMENSIONAL TOLERANCES

Dimensional tolerances for standard Dycel units are based on the guidance given by BS EN 1992 - 1 - 1 - 2004, but because of the complex shape we have developed our own system of measurement for the three major axes. Any special requirements concerning dimensions should be made known by the Engineer at the precontract stage and accompanied by drawings.

## STANDARD DIMENSIONS & WEIGHTS

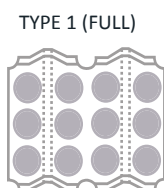
System Ref.	Thickness (mm)	Module Weight (kg)	Installed Weight (kg/m <sup>2</sup> )	Open Area (%)	Fill/m <sup>2</sup> (m <sup>3</sup> /m <sup>2</sup> )
Dycel 100	100	30	155	30	0.030
Dycel 101	100	42	215	Solid	-
Dycel 125	125	37	190	30	0.0375
Dycel 150	150	45	230	30	0.045
Dycel 151	150	62	315	Solid	-
Dycel 201	200	83	427	Solid	-
Dycel 220	220	80	410	16	0.035
Dycel 221	220	92	470	Solid	-
Dycel 301	300	127	648	Solid	-
Dycel 401	400	169	864	Solid	-

## BLOCK SIZES & TYPES

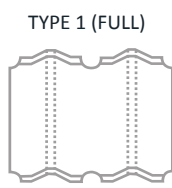
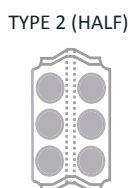
Block Reference	Length (mm)	Width (mm)	Coverage (no/m <sup>2</sup> )
Type 1 (Full Block)	480	400	5.1
Type 2 (Half Block)	240	400	10.2



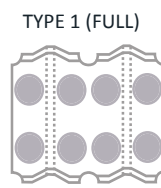
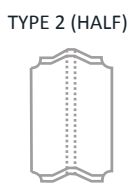
Dycel 100



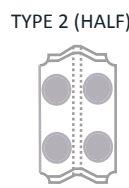
Dycel 100, 125 and 150



Dycel 101, 151, 201, 221, 301 and 401



Dycel 220



Dycel 151

Concrete products may suffer the temporary phenomenon of efflorescence. This is in no way detrimental to the performance of the material and responsibility cannot be accepted for its occurrence.