Outline Plan Surface Water Management Plan

Athlone Link Road Phase 2 - Coosan Point to The Cresence

On behalf of **Westmeath County Council**

Prepared by

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Civil
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1. INTRODUCTION

PUNCH / CST Group Consulting Engineers were appointed by Westmeath County Council to provide detailed designs for the provision of Phase 2 of a new link road from Coosan Point to The Crescent, Athlone. The provision of the new link road will also provide additional parking areas within the CIE bus depot. The works will result in increased hard paved areas and increased surface water run-off to the storm water drainage network.

This Surface Water Management Plan has been prepared by PUNCH/CST Group Consulting Engineers to the environmental impact report.

The site location is shown in Figure 1.1. The purpose of this Surface Water Management Plan is to describe the methodology and control measures to be used in controlling surface water run-off from the construction site and associated works.

Given the scale of the proposed development, the duration of the construction stage and the proximity to the River Shannon to the west of the site, surface water runoff during the construction stage requires careful management and treatment to protect the river and surrounding environment from harmful substances and sediment arising during the construction of the development. The proposed measures are outlined in this report.

The Main Contractor will be required to prepare a detailed construction management plan for the project, taking into account this outline plan.

1.1 Site Description

1.1.1 Project Background

The majority of the site is currently undeveloped scrub land. There is a small portion of the site to the north-east that is currently used for bus servicing and parking. Phase 1 of the link road works were completed to the east of the site some years ago. The Athlone train station and car park is located to the north of the lands.

The lands generally fall from east to west. There are a number of shallow streams crossing through the lands. All of the streams converge and discharge via a stone culvert under Southern Station Road to the west of the works area.

Figure 1.1 shows the location of the proposed development.

1.1.2 Proposed Development

The proposed development will include the construction of Phase 2 of the link road from Coosan Point to The Crescent, provision of additional bus parking within the CIE lands, alterations to the signalised junction at Coosan Point and alterations to the alignment of the existing foul sewer that currently is within the area of the future bus parking.

The proposed works are outlined in a series of engineering drawings by PUNCH/CST Group Consulting Engineers.

Figure 1.1: Location of the proposed development (copyright Google)

2. INDICATIVE CONSTRUCTION PROGRAMME

It is estimated that the construction programme for the entire works associated with the proposed works will last approximately 12 months from the date of commencement. This estimation is based on the typical construction programmes for other similar developments that are currently underway. The Main Contractor will be required to prepare a detailed construction programme as part of their tender proposal.

3. SITE SETUP AND SECURITY

It is envisaged the works will be undertaken in two consecutive but separate projects. The link road will be constructed initially and immediately followed by the CIE bus parking. It is also envisaged that a single contractor will be appointed for both elements of the project.

The Main Contractor will be required to submit a site layout plan that will detail the proposed location of the site compound and associated welfare facilities. The site compound is likely to be located on lands to the west of The Crescent / Southern Station Road with direct vehicular access off Phase 1 of the Link Road project. The Main Contractor will ensure that the site compound will be serviced as required and will be secured with appropriate fencing/hoarding. The site compound will be used as the primary location for the storage of materials, plant and equipment, site offices and worker welfare facilities. As Project Supervisor Construction Stage (PSCS), the Main Contractor will be responsible for site security, and they shall ensure that the site and site compound are adequately secured at all times.

As with the other construction activities that are being carried out within the area, activities associated with the construction of compounds will be subject to restrictions to the nature and timing of operations so that they do not cause undue disturbance to neighbouring areas and communities.

The contractor's site layout plan will also include the site perimeter and the proposed detail with regards the hoarding and gate system.

4. SITE ACCESS

The Main Contractor will be responsible for site access/works activity and must ensure mud/debris is not allowed onto the adjacent public roadways. It is proposed that construction vehicles will access the Main Site via the N55 / R915 from the north of the lands. Please refer to Figure 4.1 Below

The Contractor must submit a detailed Construction Traffic Management Plan to the Local Authority for approval. Construction traffic movements will be fully coordinated to comply with the requirements of the agreed plan. Specifically, in relation to surface water management the Contractor will be required to provide wheel cleaning facilities, and regular cleaning of the main access road.

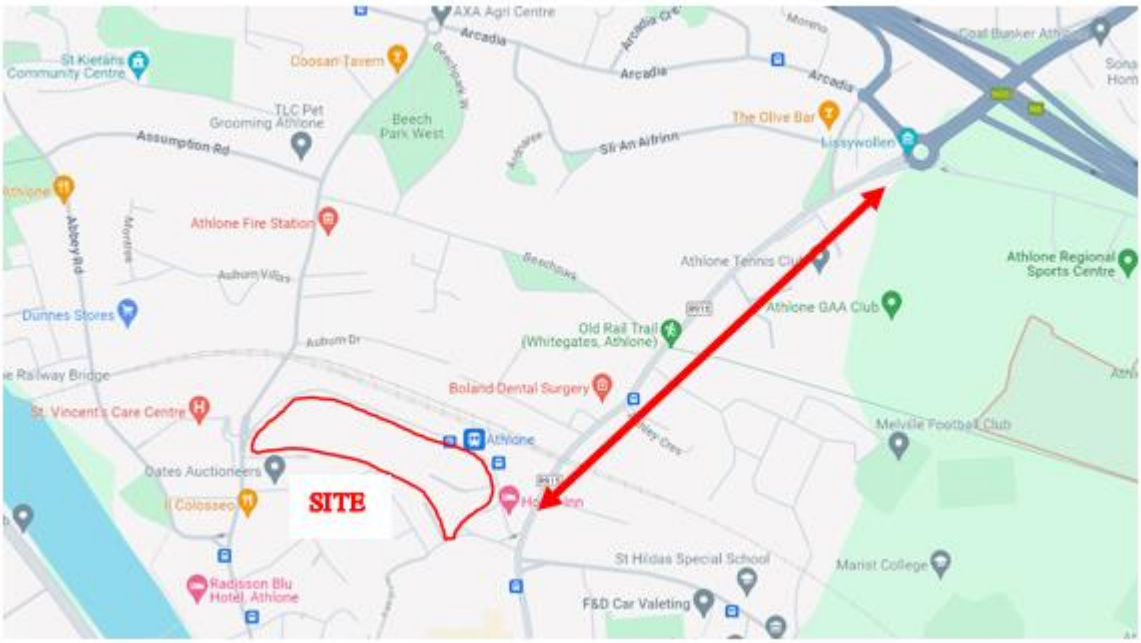

Figure 4.1 – Construction vehicle Access Route

5. MATERIAL STORAGE AND DELIVERY

The Main Contractor will ensure that all materials are adequately stored and secured in their Main Site compound to prevent spillage/leakage.

The Contractor will ensure the roads adjacent to the Main Site area are kept clean and free of debris.

6. EMERGENCY RESPONSE PLAN

The Main Contractor will prepare an Emergency Response Plan detailing the procedures to be undertaken in the event of a spill of chemical, fuel or other hazardous wastes, a fire, or non-compliance incident with any permit of license issues.

For management of emergencies occurring close to existing watercourses refer to Section 7.6 Site Management Control Measures.

7. SURFACE WATER MANAGEMENT ON SITE

This section of the report outlines the proposed measures to be implemented across the site in order to manage the surface water runoff. There are several proposed ways that surface water will be managed on site and each have their own specific uses and requirements which are detailed below. It is important that maintenance is carried out as frequently as is required so that these measures continue to be effective in the protection of the River Shannon during the full construction period of approximately 12 months.

7.1 Control of Sediment and Soil Erosion

The principle objectives in relation to sediment and erosion control during construction phase are:

- To keep exposed surfaces to an absolute minimum.
- To minimise the amount of runoff from the site.
- To plan the work so that it progresses from the low point towards the high point within each area of the works.
- To have efficient groundwork operations to ensure that fill is replaced as the soil material is removed.
- To ensure that any unacceptable material is removed and placed in controlled material deposition areas in an efficient manner.

7.2 Protection of Watercourses

The protection from pollution of water courses by construction works will be achieved through implementing avoidance measures:

- Site clearing, involving topsoil stripping progressed along with the groundworks and will not be carried over large areas ahead of groundworks.
- The excavated material will be deposited in material deposition areas. These areas are specifically chosen to avoid sediment entering adjacent water courses and minimise water quality impacts on water bodies.
- Suitable site management practices will always be implemented, and personnel made aware of the importance of the freshwater environment.
- The storage of oils, fuels, chemicals and hydraulic fluids are to be in secure areas within the site compound and at least 20m away from watercourses. Storage tanks are to have secondary containment provided by means of an above ground bund to capture any leaks.
- Foul drainage from all site welfare facilities will be either temporarily connected directly to existing foul drainage networks or tankered off site by a licenced contractor.
- Where construction works are to be carried out alongside streams and river channels, protection from silt load is to be implemented. This will be principally achieved through use of retaining grass buffer zones between the works and the water course. Where a minimum of 10m distance is not achievable silt fences will be employed as detailed below.
- No water is to be abstracted from the water courses for use on the construction site, to prevent impact on any wildlife.

- The use of concrete close to watercourses will be carefully controlled to avoid spillage. Washout of mixing trucks and plant is to be carried out in designated contained impermeable areas.
- All topsoil stripping close to sensitive areas will be scheduled to be carried out during dry weather and all stockpiling will be kept as far away as possible from the open water courses.

7.3 Silt Fencing

An effective measure in the control of silts and sediment leaving the site via the construction site's surface water runoff is the use of silt fencing strategically positioned downstream of the site. Silt fences are to be installed on the outer perimeter of construction material stockpiles and in all areas within 10m to any watercourse during the construction phase, to prevent runoff during heavy rainfall. This will include the erection of a robust silt fencing comprising of a woven polyethylene fabric fixed to posts in all areas within 10m of the any watercourse/stream adjacent to the works. This barrier coupled with some clean aggregate in front of the fence will prevent the egress of silt or toxic material towards the River Shannon, while allowing filtered surface water to pass through. A typical detail of this arrangement is shown in Figure 7.1 below. These silt barriers are to be installed in accordance with the manufacturers requirements and are to be assessed and maintained throughout the construction period. As flow paths of surface water may change throughout the phasing of the development, the positioning of the barriers will then have to be modified to ensure no runoff is permitted to leave the site without passing through this filtering system.

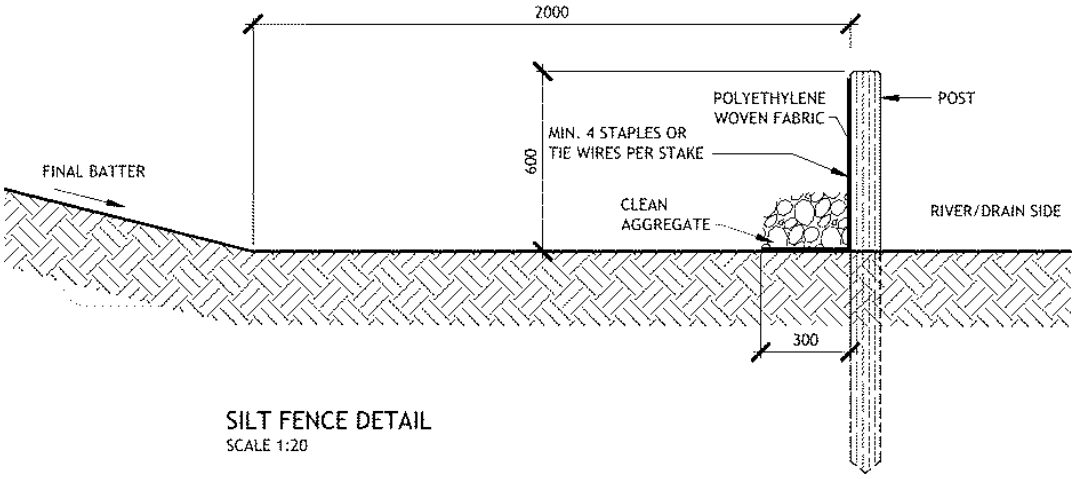

Figure 7.1: Typical Silt Fencing Detail

7.4 Wheel Wash Facilities

Wheel wash facilities are to be provided at all entrances/exits for the site. All construction vehicles leaving site will be required to drive through these wheel wash areas. A road sweeper will be made available as and when required. Site management will undertake a survey of the local roads twice a day to inspect for detritus. The surface water used in the washing process shall be collected at low points and recycled for further washing. Collection points for this runoff will include sumps for silt collection which are to be regularly monitored and cleared of silt. Water residue from the wheel wash at the main site access will be fed through a settlement pond, interceptor and then discharge to vegetation.

7.5 Surface Water Settlement Ponds

As an additional precaution soiled runoff from the construction areas of the main site is to be passed through temporary sediment ponds. These ponds will collect the construction site storm water runoff during rain events, allowing the sediment particles to settle within the basin, preventing it from entering watercourses. The ponds allow treated water discharge from the pond at high level. The flow of surface water from the pond will be limited to allow for longer settlement periods within the ponds and to also protect the construction site from being affected from periods of heavy rainfall by containing the increased volume of surface water. Refer to Figure 7.2 for a typical Settlement Pond detail. Sump units to be provided which will convey surface water runoff via a combination of gravity drains and pumped rising mains to proposed surface water settlement ponds.

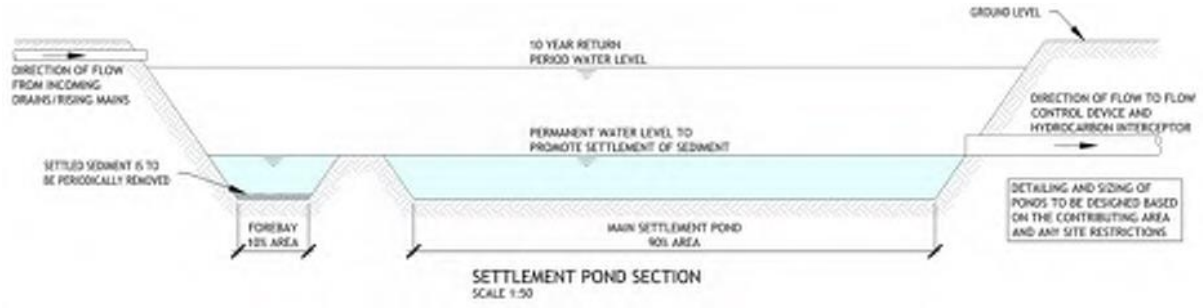

Figure 7.2: Typical Settlement Pond Detail

7.6 Site Management Control Measures

Any materials stored on site shall be done so in a safe manner. Any hazardous construction materials shall be stored appropriately. Any fuels or chemicals on site will be stored within double sealed tanks with bunds to prevent any seepage of same into the groundwater or towards the River Shannon. A fuel filling point shall be set-up on site with all plant to be brought to this point for filling. All fuels and chemicals required to be stored on site shall be clearly marked.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, shall take place in a designated area (or where possible off the site) which will be away from surface water gullies or drains. An adequate supply of spill kits and hydrocarbon adsorbent packs shall be stored in this area. All relevant personnel shall be fully trained in the use of this equipment. Guidelines such as 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001) shall be complied with. Emergency contact numbers for the Local Authority Environment Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident. Site personnel will be trained in the importance of preventing pollution and the mitigation measures described here to ensure same. The site manager will be responsible for the implementation of these measures.

Other measures to mitigate surface water impacts during construction will include:

- Progressive re-vegetation of landscape areas to minimise exposed areas of runoff.
- Construction activities will be confined within the necessary construction area(s) of each phase.

- Mulching, retention of vegetation, and topsoil for final site landscaping works.
- Regular inspection and maintenance of silt fences and settlement ponds. They will be inspected on at least a daily basis for the duration of works, and a record of these inspections will be maintained. Following rainfall events inspection of erosion control measures and removal of collected material shall be undertaken. Replacement of any damaged equipment shall be performed immediately.
- Monitoring of water quality from settlement ponds as appropriate.

7.7 Surface Water Drainage following Construction

Following the completion of construction works in each phase, the operational stage stormwater drainage measures will come into effect.

For the operational phase of the development, it is proposed to outfall to an existing drain located to the west of the CIE expanded bus parking area. A new surface water sewer network shall be provided for the proposed development which will be entirely separated from the foul water sewer network. All surface water run-off from existing roof areas and hardstanding areas are to be collected by a gravity pipe network.

All storm water run-off from hard paved surfaces will be collected via trapped gullies, thereby ensuring removal of detritus and floating contaminates.

As part of the SuDS design there will be an attenuation system incorporated into the proposed stormwater drainage design. The CIE drainage will pass through an attenuation storage tank and a petrol Interceptor. The interceptors will be subject to regular maintenance / cleaning to ensure suitable operation is maintained long term. A hydrobrake provided downstream of the attenuation system will limit forward flow to existing run-off rates as per the Development Plan requirements.

Please refer to PUNCH/CST Group Drainage Layout 120278-501 for further information.

8. AREA SPECIFIC METHOD STATEMENTS FOR THE WORKS

PUNCH / CST Group Consulting Engineers were appointed by Westmeath County Council to provide detailed designs for the provision of Phase 2 of a new link road from Coosan Point to The Crescent, Athlone. The provision of the new link road will also provide additional parking areas within the CIE bus depot. The works will result in increased hard paved areas and increased surface water run-off to the storm water drainage network.

8.1 Site Description

During this time the greatest risk to surface water quality is generated from run-off from open excavations early on in the construction process, prior to the operation of the piped surface water networks constructed for the development. The lands generally fall towards the existing surface water outfall to the west of the lands.

To minimise risk of contamination of this outfall and downstream network the works will commence from the proposed access off The Cresent. Only minimal areas will be stripped of soil in any single operations. Upon achieving formation level each area will be immediately covered in clean stone. This will ensure rainfall does not wash silts off the site and construction vehicles have a clean surface to track over. A single spoil heap will be formed for the temporary storage of excavated material from the site. Surplus excavated material will be removed off site to resister tip sites as soon as possible in order to further limit the need for onsite storage of excavated material. The lands between the construction site and the outfall location will be undisturbed with the existing vegetation remaining in place. All pumped rainfall that enters the excavations will be dealt with as per the procedure above. Any overland flows resulting from extreme unforeseen rainfall will passage the grassed/vegetation areas. The vegetation will slow overland flows and separate suspended silts prior to rainfall arrival at the outfall culvert.

The completion of the internal drainage and roads will be prioritised, thereby achieving a sealed road surface and trapped drainage network as early in the operation as possible. The drainage network incorporates storm water attenuation with the intention of achieving zero increase in discharge flows on the receiving water course.

8.2 CIE Bus Station and Parking

The construction of the Bus parking area is envisaged to take approximately 2-3 month to complete. During this time the greatest risk to surface water quality is generated from run-off from open excavations for the attenuation system early on in the construction process and wider paved surface area as the project progresses. The final connection of gullies to the piped surface water networks will not be achieved until completion of the project here. The lands generally fall towards the existing surface water outfall to the west of the lands. Only minimal areas will be stripped of soil in any single operations, commencing with excavations for the attention system. Upon achieving formation level each area will be immediately covered in clean stone. This will ensure rainfall does not wash silts off the site and construction vehicles have a clean surface to track over. All excavated material in this area will be removed off site to registered tip locations. Excavated material will be removed off site to tip as soon as possible in order to limit the need for onsite storage of excavated material. The works will be programmed such that the existing vegetation between the ongoing works area and the outfall will remain in place. All pumped rainfall that enters the excavations will

be dealt with as per the procedure above. Any overland flows resulting from extreme unforeseen rainfall will passage the grassed/vegetation areas. The vegetation will slow overland flows and separate suspended silts prior to rainfall arrival at the outfall culvert.

The drainage network incorporates storm water attenuation and vortex flow control with the intention of achieving zero increase in discharge flows on the receiving water course. Additionally trapped road gullies and hydrocarbon interceptors are to be installed to ensure no hydrocarbons are permitted to depart the site and enter the streams that ultimately lead to the River Shannon.

8.3 Risk Mitigation

The following Construction Industry Research and Information Association (CIRIA) best practice guidance will be adhered to:

- CIRIA C648 – Control of Water Pollution from Linear Construction Projects: Technical Guidance
- CIRIA C649 – Control of Water Pollution from Linear Construction Projects: Site Guide
- CIRIA C753 – The SUDS Manual.
- CIRIA C698 – Site handbook for the construction of SUDS
- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters Inland Fisheries;
- (2005). Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes.

9. CONCLUSION

This report has set out the outline management techniques to be provided by the contractor to manage surface water at the proposed developments for the full duration of the phased construction stage. The Main Contractor will be required to prepare a detailed construction management plan for the project, taking into account this Surface Water Management Plan.

No residual impact to the River Shannon or its tributaries will result.

Note:
In the event of the need for a deviation from the Surface Water Management Plan, no further work will be done until agreement has been reached and recorded in writing between the client and the contractor on the method of work to be followed in the new circumstances.

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