

# Legend

- Double acting Air Valve
- Hydrant
- Sluice Valve
- Scour Valve
- Road gully
- Pumping Main marker post as per Section 3.5.22 IW Code
- Bulk Water (at 60m N. of bridge)
- Sewer connection inspection chamber
- Pumping Main rodding hatch box. See Note 9 on PL 05.
- Indicates direction of crossfall on roads and pavements
- Speed tables
- Typical sewer and manhole with manhole number
- Existing Watermains
- Proposed Watermains
- Existing Foul Sewer
- Proposed uPVC Foul Sewer
- Proposed uPVC Foul Sewer Lateral
- Existing uPVC Storm Sewer
- Proposed uPVC Storm Sewer
- Proposed 150 uPVC Storm Lateral
- Proposed 150mm ID and 80mm ID PE sewer pumping mains
- Proposed Connector pipe

## IRISH WATER CODES OF PRACTICE AND STANDARD DETAILS

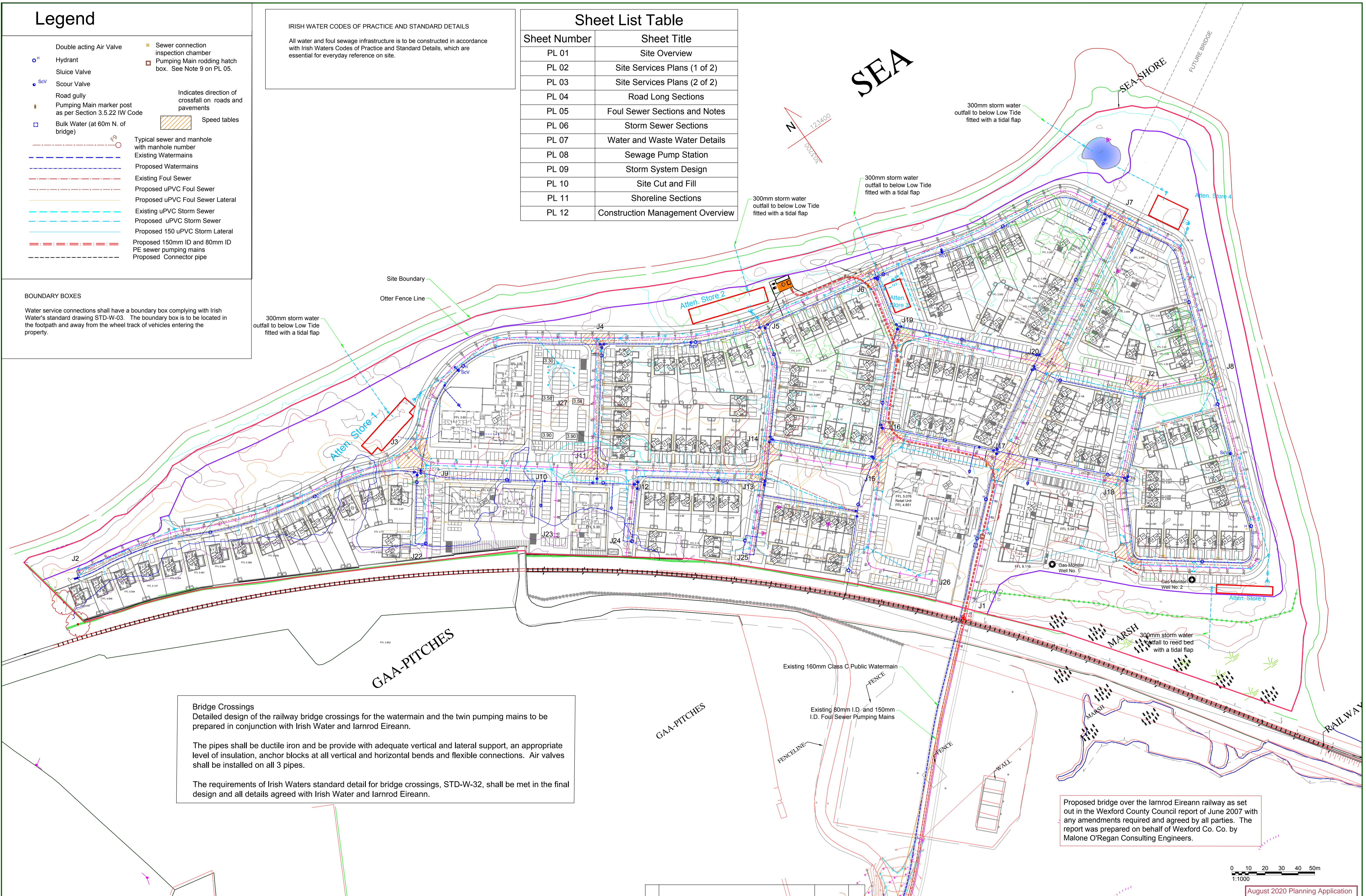
All water and foul sewage infrastructure is to be constructed in accordance with Irish Waters Codes of Practice and Standard Details, which are essential for everyday reference on site.

## Sheet List Table

Sheet Number	Sheet Title
PL 01	Site Overview
PL 02	Site Services Plans (1 of 2)
PL 03	Site Services Plans (2 of 2)
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PL 05	Foul Sewer Sections and Notes
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PL 07	Water and Waste Water Details
PL 08	Sewage Pump Station
PL 09	Storm System Design
PL 10	Site Cut and Fill
PL 11	Shoreline Sections
PL 12	Construction Management Overview

### BOUNDARY BOXES

Water service connections shall have a boundary box complying with Irish Water's standard drawing STD-W-03. The boundary box is to be located in the footpath and away from the wheel track of vehicles entering the property.

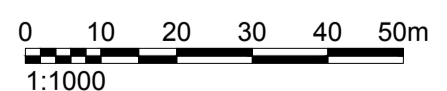


**Bridge Crossings**  
Detailed design of the railway bridge crossings for the watermain and the twin pumping mains to be prepared in conjunction with Irish Water and Iarnrod Eireann.

The pipes shall be ductile iron and be provide with adequate vertical and lateral support, an appropriate level of insulation, anchor blocks at all vertical and horizontal bends and flexible connections. Air valves shall be installed on all 3 pipes.

The requirements of Irish Waters standard detail for bridge crossings, STD-W-32, shall be met in the final design and all details agreed with Irish Water and Iarnrod Eireann.

Proposed bridge over the Iarnrod Eireann railway as set out in the Wexford County Council report of June 2007 with any amendments required and agreed by all parties. The report was prepared on behalf of Wexford Co. Co. by Malone O'Regan Consulting Engineers.



ALL DIMENSIONS ARE TO BE CHECKED ON SITE BEFORE COMMENCING AND AT ALL STAGES OF CONSTRUCTION

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No	Revision Description	Date	By

Project: RESIDENTIAL DEVELOPMENT PARK WEXFORD

Sub Project: Civil Engineering Drawings  
Title: SITE OVERVIEW

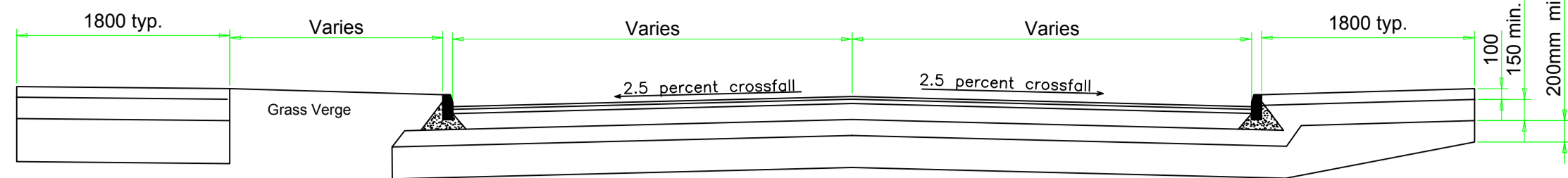
First Issue Date: July 2017  
Drawing No.: PL 01  
Design: AM  
Scale: 1:1000 on A1  
Revision: Status  
Planning

August 2020 Planning Application



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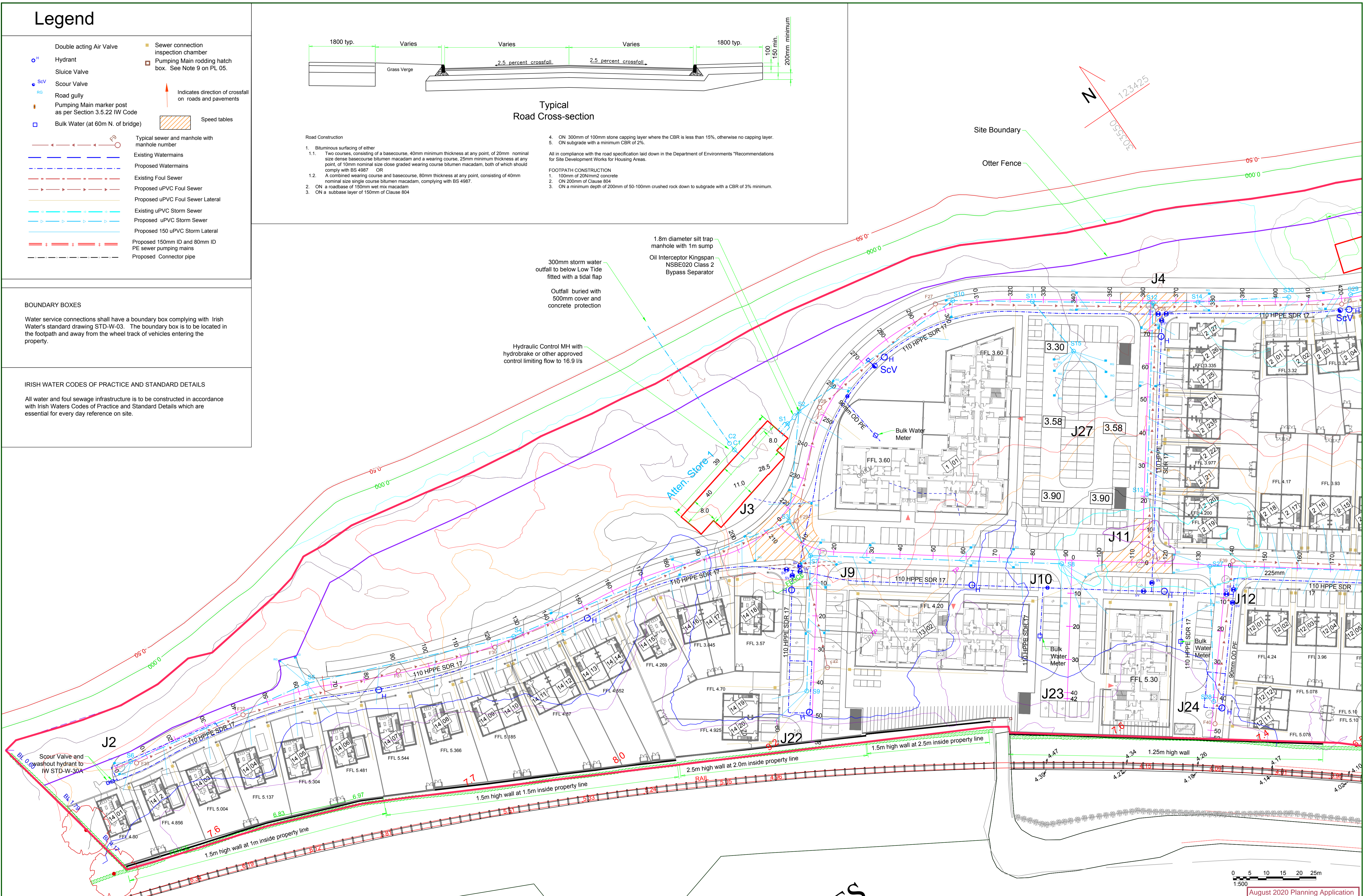


Typical Road Cross-section

- Road Construction**
- Bituminous surfacing of either
    - Two courses, consisting of a basecourse, 40mm minimum thickness at any point, of 20mm nominal size dense basecourse bitumen macadam and a wearing course, 25mm minimum thickness at any point, of 10mm nominal size close graded wearing course bitumen macadam, both of which should comply with BS 4987 OR
    - A combined wearing course and basecourse, 80mm thickness at any point, consisting of 40mm nominal size single course bitumen macadam, complying with BS 4987.
  - ON a roadbase of 150mm wet mix macadam
  - ON a subbase layer of 150mm of Clause 804
- FOOTPATH CONSTRUCTION**
- 100mm of 20N/mm<sup>2</sup> concrete
  - ON 200mm of Clause 804
  - ON a minimum depth of 200mm of 50-100mm crushed rock down to subgrade with a CBR of 3% minimum.
- All in compliance with the road specification laid down in the Department of Environments "Recommendations for Site Development Works for Housing Areas."

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**IRISH WATER CODES OF PRACTICE AND STANDARD DETAILS**  
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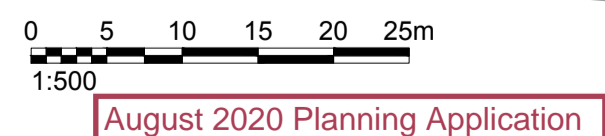
Client: William Neville & Sons Ltd. Rockfield House Spawell Road, Wexford

No	Revision Description	Date	By

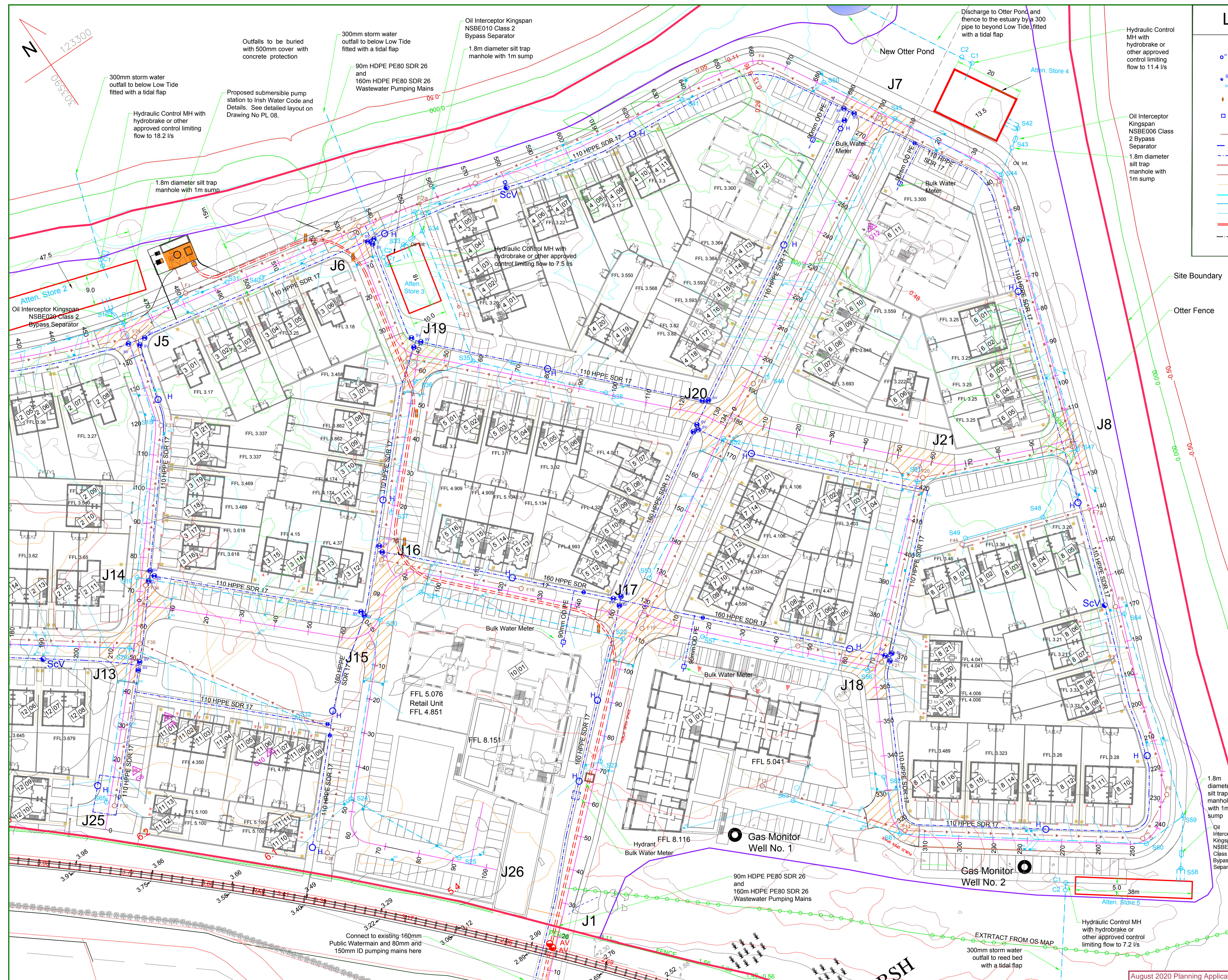
Project: RESIDENTIAL DEVELOPMENT PARK WEXFORD

Sub Project: Civil Engineering Drawings  
Title: SITE SERVICES PLANS (1 OF 2)

First Issue Date	Design	Scale
July 2017	AM	1:500 on A1
Drawing No.	Revision	Status
PL 02		Planning







### Legend

<ul style="list-style-type: none"> <li>Double acting Air Valve</li> <li>Hydrant</li> <li>Sluice Valve</li> <li>Scour Valve</li> <li>Road gully</li> <li>Pumping Main marker post as per Section 3.5.22 IW Code</li> <li>Bulk Water (at 60m N. of bridge)</li> </ul>	<ul style="list-style-type: none"> <li>Sewer connection inspection chamber</li> <li>Pumping Main rodding hatch box. See Note 9 on PL 05.</li> <li>Indicates direction of crossfall on roads and pavements</li> <li>Speed tables</li> </ul>
<ul style="list-style-type: none"> <li>Typical sewer and manhole with manhole number</li> <li>Existing Watermains</li> <li>Proposed Watermains</li> <li>Existing Foul Sewer</li> <li>Proposed uPVC Foul Sewer</li> <li>Proposed uPVC Foul Sewer Lateral</li> <li>Existing uPVC Storm Sewer</li> <li>Proposed uPVC Storm Sewer</li> <li>Proposed 150 uPVC Storm Lateral</li> <li>Proposed 150mm ID and 80mm ID PE sewer pumping mains</li> <li>Proposed Connector pipe</li> </ul>	

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Project: RESIDENTIAL DEVELOPMENT PARK WEXFORD

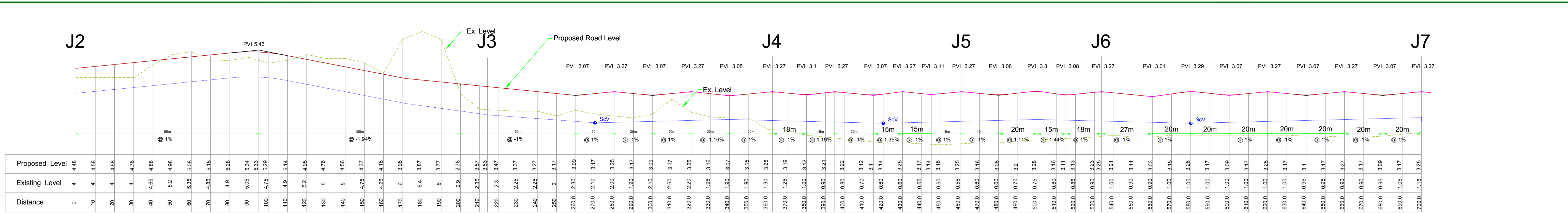
Sub Project: Civil Engineering Drawings

Title: SITE SERVICES PLANS (2 OF 2)

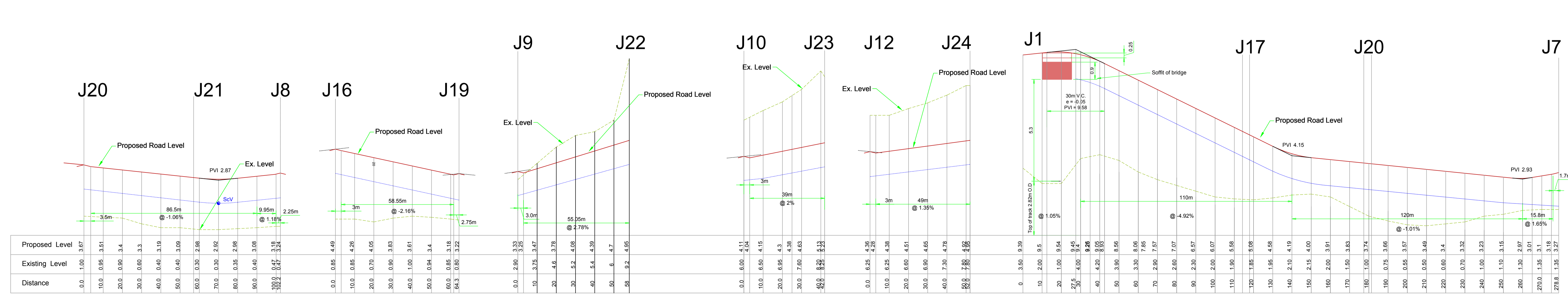
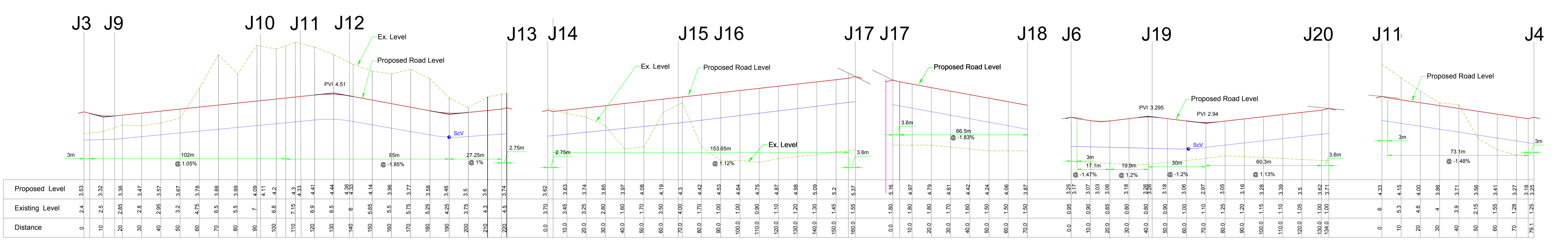
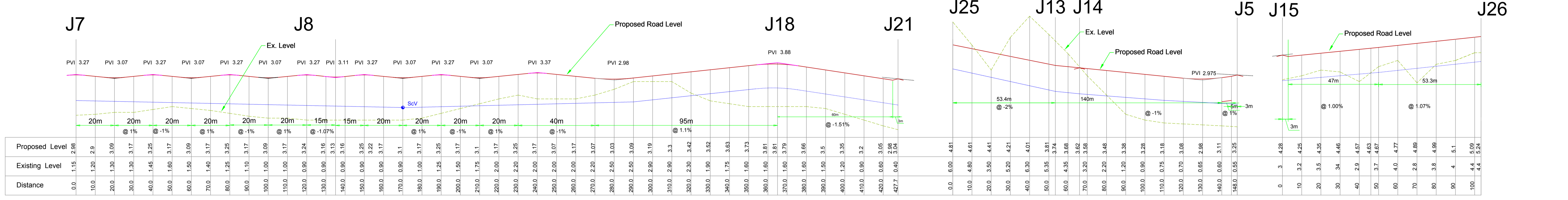
First Issue Date	Design	Scale
July 2017	AM	1:500 on A1
Drawing No.	Revision	Status
PL 03		Planning

August 2020 Planning Application





**Coast Road**



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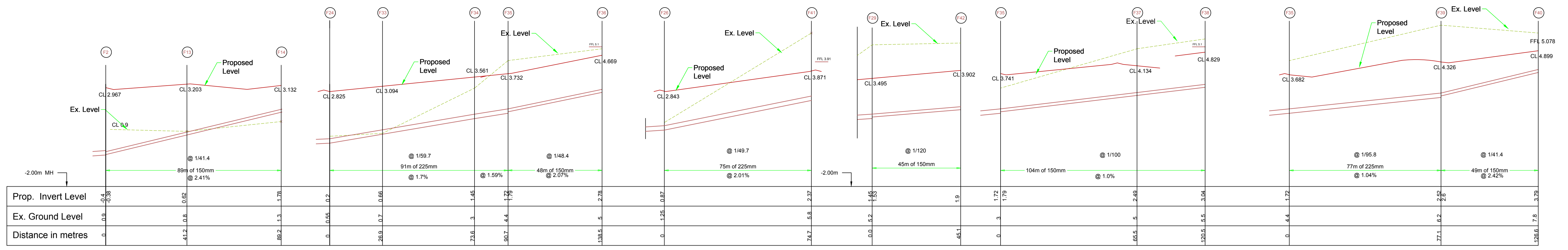
No	Revision Description	Date	By

Project: RESIDENTIAL DEVELOPMENT PARK WEXFORD

Sub Project: Civil Engineering Drawings  
Title: ROAD LONG SECTIONS

August 2020 Planning Application  
First Issue Date: July 2017  
Design: AM  
Scale: 1:1000H 1:100 V (A1)  
Drawing No.: PL 04  
Revision:   
Status: Planning



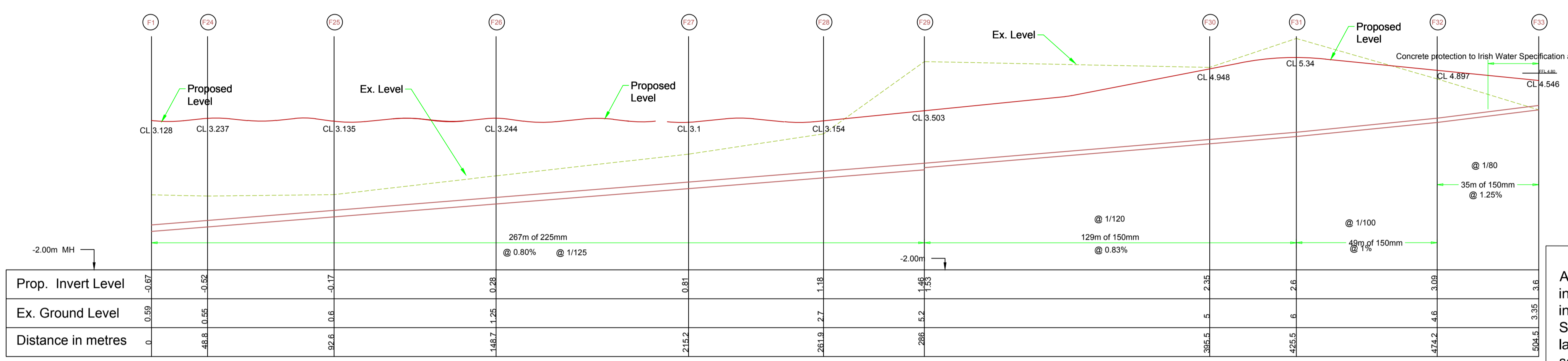


No of houses	Litres per day	Pipe (mm)	Min Slope used	Manning	v	Qmax	Qcap	Capacity	Velocity	Slope
			s %		m/s	l/s	l/s	l/s	l/s	inverse
Capacity check on most heavily load 150mm uPVC Pipe										
20	16,000	150	0.83	0.011	0.93	6	1.1	16	O.K.	v ok 120.5
Capacity check on most heavily load 225mm uPVC Pipe										
250	200,000	225	0.5	0.011	0.95	6	14	38	O.K.	v ok 200.0

### Standard Details for Water Networks

- Index Sheet
- Two wastewater rising mains are proposed from the pump station to the discharge manhole, a 90mm HDPE pipe for use until approximately a quarter of the site is developed and a 160mm HDPE for use thereafter. The pumping mains were installed from the existing sewer on Carcur road to just south of the railway line in 2009 in conjunction with Wexford County Council.
  - The rising mains are to be constructed of 90mm HDPE PE80 SDR 26 and 160mm HDPE PE80 SDR 26 pipes.
  - Polyethylene pipe and fittings for Wastewater shall comply with the requirements of IS EN 12201. Polyethylene fittings, including fusion joints and electro-fusion fittings, shall comply with the provisions of IS EN 12201 - Part 3.
  - Gravily sewer pipes shall be uPVC. Unplasticised PVC pipes and fittings shall comply with the provisions IS EN 1401 2009/2012. Pipes to be application area code "UD", stiffness Class Bk/m<sup>2</sup>. Provision for jetting shall be based on the WRC Sewer Jetting Code of Practice, June 1997. Pipes to be capable of resisting a maximum jetting pump pressure of 2.600psi (180 Bar) without damage. (Sewer diameters 150mm up to 450mm, Service Connections of 100mm diameter).
  - Customer connection and boundary box shall be in accordance with Irish Water's standard detail STD-W-03.
  - The external face of proposed manhole chambers are to be a minimum of 0.5m from the kerb line and the external face of sewers a minimum of 1m from the kerb line.
  - Tree and shrub planting in green areas adjacent to sewers are to comply with Irish Water's standard detail STD-WW-06A.
  - All wastewater elements are to comply with Irish Water's Code of Practice and with the current version of their standard details which are listed below.
  - Hatch box chamber shall be similar in construction to the CDS Wastewater air valve chamber detail (STD-WW-18) & 3.18.3 & 3.17.4 of the CDS Code of Practice for Wastewater Infrastructure (assume "hatch box" instead of "air valve" in the descriptions). Pipe work within chamber shall be Ductile Iron (refer to STD-WW-18 for "PE to DI Detail"). In the case of PE rising mains, the built-in pipework to the chamber walls shall be double flanged ductile iron. Stub flanges with backing rings shall be fitted at either end of the Ductile Iron chamber pipework. The internal dimensions of the chamber shall be sufficient to contain the hatch box & any associated pipework, & also allow any maintenance activities to be carried out. The proprietary flanged hatch box (with bolted & sealed inspection lid) shall comply with the requirements of IS EN 598.

All water and wastewater infrastructure is to be constructed in accordance with Uisce Eireann's Standard Details August 2016 or the latest revision thereof. The schedules below list the current standard details contained in these documents.

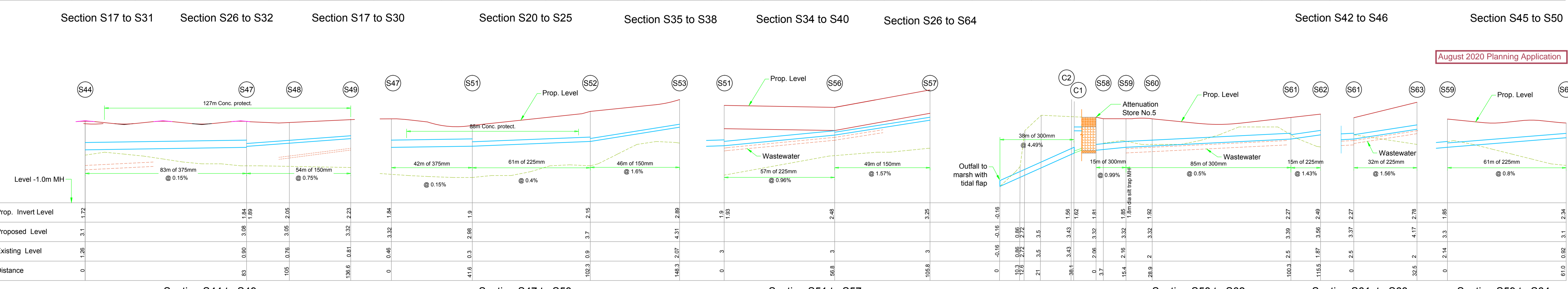
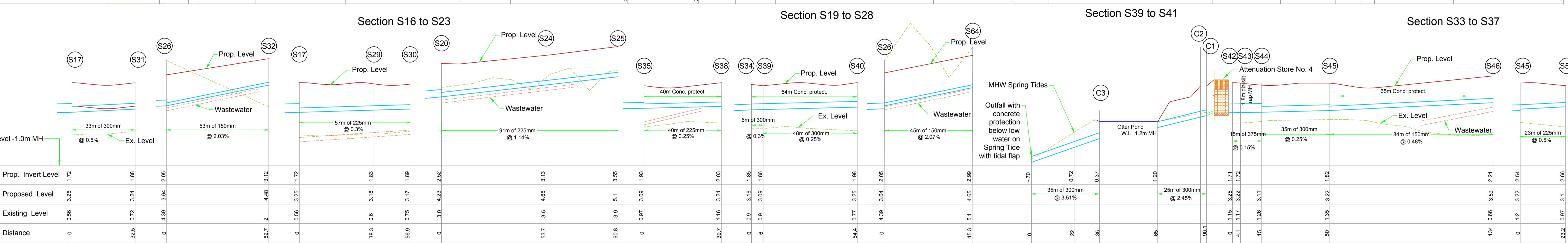
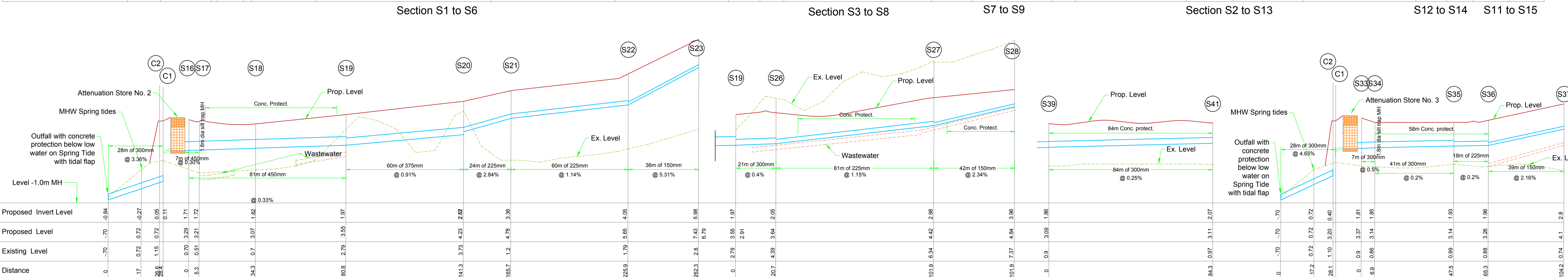
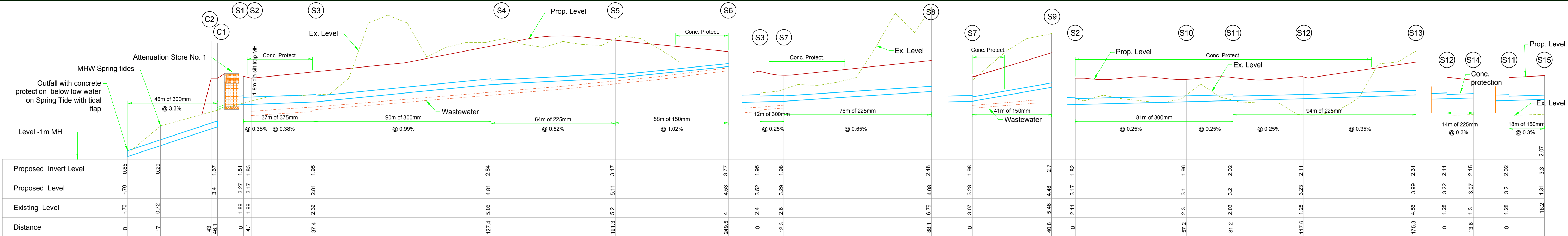


### Standard Details for Wastewater Networks

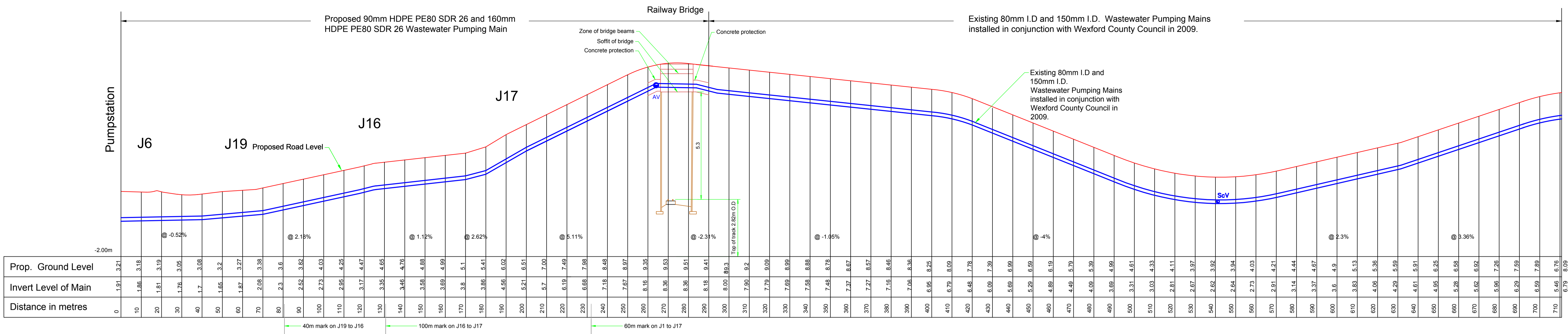
Index Sheet

Drawing No.	Drawing Title	Rev
STD-WW-01	Waste water service connection responsibility	1
STD-WW-02	Typical layout for sewer within new developments	1
STD-WW-03	Drain & service connection pipework	1
STD-WW-04	Typical sewer / service pipe connection	1
STD-WW-05	Typical service layout indicating separation distances	1
STD-WW-06	Restrictions on wastewater infrastructure adjacent to trees	2
STD-WW-06A	Restrictions on new trees/shrubs planting adjacent to sewers	0
STD-WW-07	Trench backfill & bedding	2
STD-WW-08	Concrete bed, haunch & surround to wastewater pipes	0
STD-WW-09	Blockwork manhole (<450mm dia.)	2
STD-WW-10	Pre-cast concrete manhole	2
STD-WW-11	In-situ concrete manhole	2
STD-WW-12	Backdrop manholes	2
STD-WW-13	Private side inspection chamber	2
STD-WW-14	Thrust blocks for rising mains (<200mm dia.)	1
STD-WW-15	Scour valve chamber (foul rising main <200mm dia.)	2
STD-WW-16	Sluice valve details for rising mains ductile iron (D.I.) pipe (<200mm dia.) (sheet 1 of 2)	3
STD-WW-17	Sluice valve details for rising mains polyethylene (P.E.) pipe (<200mm dia.) (sheet 2 of 2)	2
STD-WW-18	Air valve chamber (foul rising main <200mm dia.)	2
STD-WW-19	Duct chamber	2
STD-WW-20	Emergency overflow structure	1
STD-WW-21	Typical ditch/stream crossing for gravity main (sheet 1 of 2)	1
STD-WW-22	Typical ditch/stream crossing for rising main (sheet 2 of 2)	1
STD-WW-23	Typical bridge crossing for rising main (sheet 1 of 2)	1
STD-WW-24	Typical bridge crossing for rising main (sheet 2 of 2)	1
STD-WW-25	Security gate & fencing	2
STD-WW-26	Indicative pumping station layout	0
STD-WW-27	Flow meter chamber (foul rising main <200mm dia.)	2
STD-WW-28	Indicative submersible pumping station	2
STD-WW-28A	Indicative pre-cast concrete submersible pumping station	1
STD-WW-29	Rising main discharge manhole	2
STD-WW-30	Kiosk type 1 pumping station & wet kiosk (sheet 1 of 2)	2
STD-WW-31	Kiosk type 2 + 3 pumping station & wet kiosk (sheet 2 of 2)	2
STD-WW-32	Hardstanding area pumping station (permeable & impermeable)	1
STD-WW-33	Lamp bollard & lamp standard	1
STD-WW-34	Vent stack	1

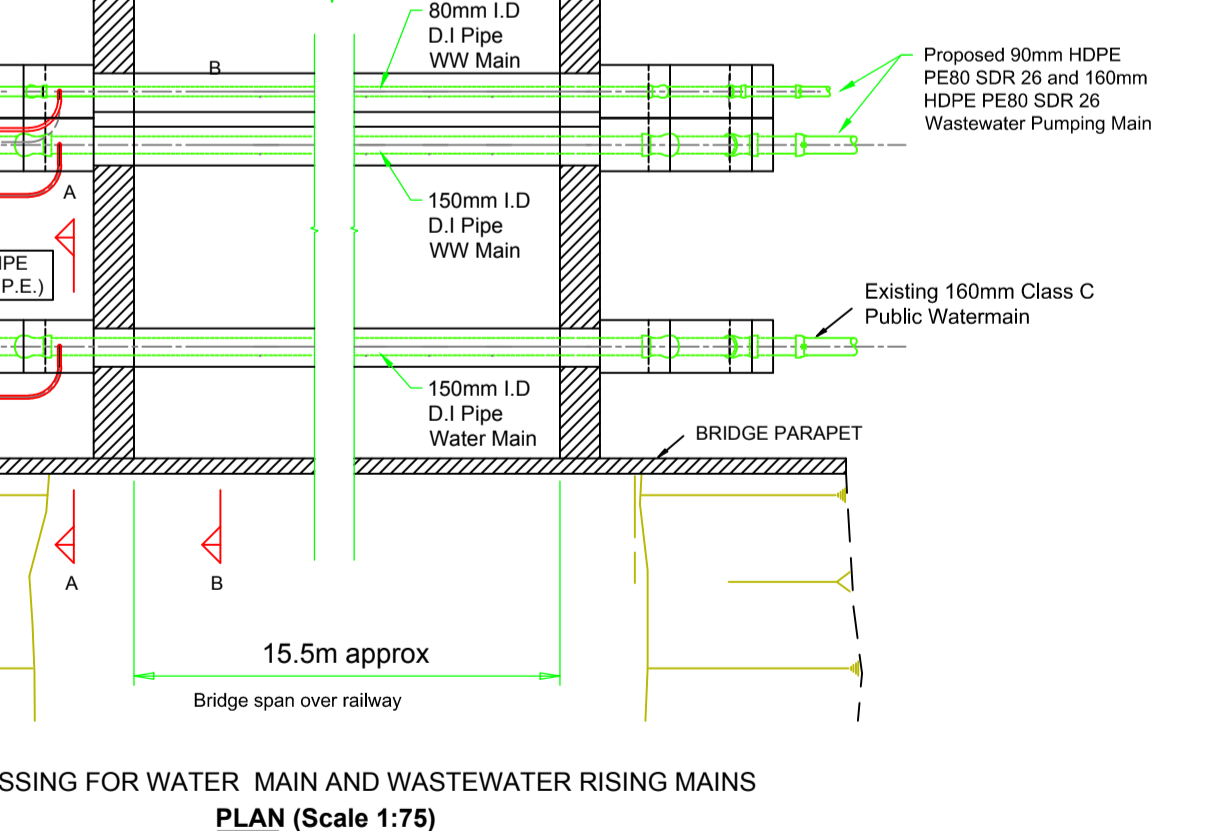
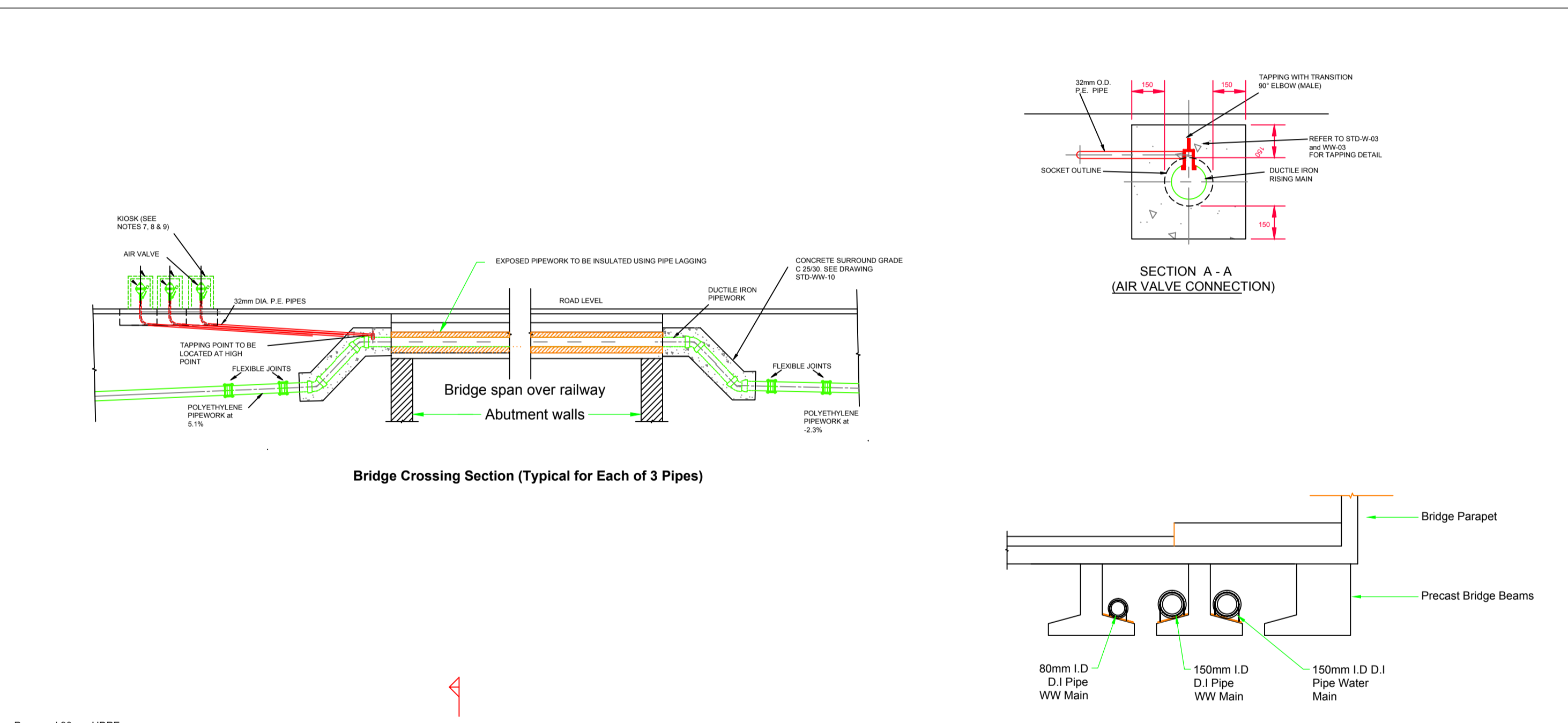




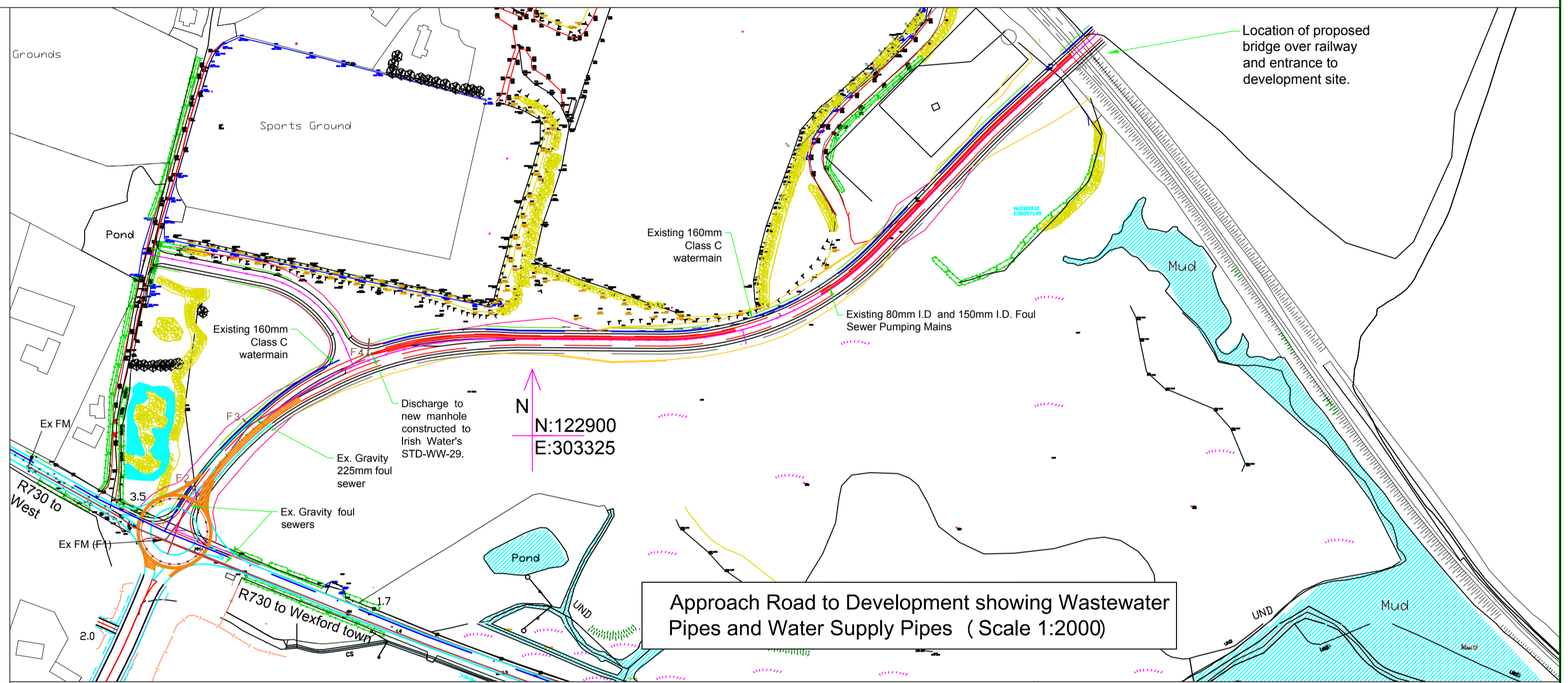




Longitudinal Profile of Wastewater Pumping Main from Pump Station to Discharge Manhole (1:1000H 1:100V on A1)



Bridge Crossing Details



Bridge Crossing Notes

- All dimensions in millimetres (mm) unless noted otherwise.
- At bridge crossing all pipework to be ductile iron in accordance with is en 545.
- O.D. refers to outside diameter of pipes or collars.
- Bends at respective crossings shall be indicated on the longitudinal section drawing.
- The developer is to seek advice from Irish Water as to whether a duplicate main is to be provided through the bridge crossing, if necessary the developer is to submit a design to Irish Water for review.
- Thrust blocks to be provided as per std-w-28 at all tees, bends, tapers, dead ends and pipes at steep slopes.
- The quality of the kiosk construction shall ensure that the following is achieved: (a) a thermal transmittance of 1.5w per m<sup>2</sup> k (b) a fire resistance (retention of stability, integrity and insulation) equivalent to class 2 of bs 476, when tested in accordance with bs 476 for a period exceeding 30 minutes.
- Kiosk (min. 600 high x 450 wide x 300mm deep) - to be constructed from thermosetting u.v. & weather resistant plastic powder coated & hot dipped galvanised mild steel (min. 4mm thickness) to be en 1461, stainless steel or non-metallic materials, such as glass reinforced plastic (grp), may be used as an alternative kiosk material, particularly in severe environments, subject to agreement with Irish Water. colour to be holly green bs 4800 14 c 39. kiosk to have hinged, lockable access door (hinges and locks to be stainless steel).
- The kiosk shall be located off the footpath so as not to impede pedestrians and positioned so as to facilitate safe access for maintenance personnel.
- All concrete to be in accordance with is en 206. 11. detail for pe watermain to be as per this detail. bridge crossing pipework to be di in both cases.
- Kiosk to be fitted with a vent stack to manufacturers detail in sensitive areas.
- In insensitive areas a vent stack is not required. louvre vent to be provided in kiosk.
- The location of the scour chamber must be reviewed by Irish Water & readily accessible by all operation & maintenance equipment, including a vacuum tanker.
- Detail for rising main for PE pipework to be as per this detail. Bridge crossing pipework to be ductile iron in both cases.

Watermain Notes

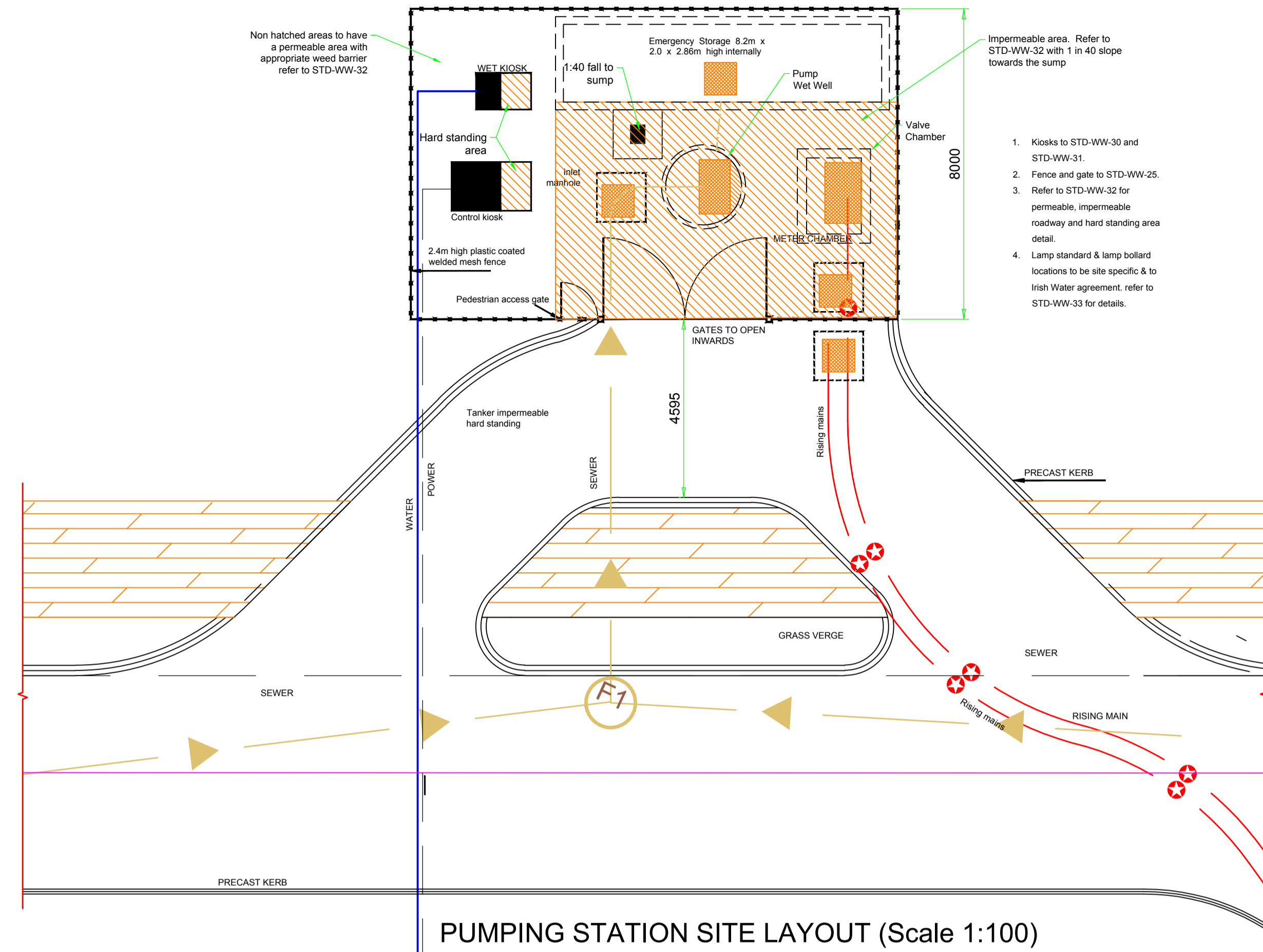
- 110mm and 160mm watermains are to be HDPE PE100 SDR 17.6 and comply with Section 2.7 of Irish Water's Code of Practice for Water Supply. Diameters as noted on the layout plans.
- They shall conform to IS EN 12201: Part 1 and Part 2 (Plastic Systems for Water Supply, Drainage and Sewerage Under Pressure - Part 1, General, and Part 2, Pipes) and I.S. EN 12201-3 (Plastic Systems for Water Supply, Drainage and Sewerage Under Pressure - Part 3: Fittings).
- A bulk water meter is to be installed in accordance with I.W.'s Standard Detail STD-W-26 as shown near the entrance to the site.
- A bulk water meter is to be installed in accordance with I.W.'s Standard Detail STD-W-26 as shown for each apartment block where a management company is being used.
- Meters for apartments and similar properties shall be installed internally within the premises in accordance with the Building Control Authority's requirements and subject to review by Irish Water as per section 3.15.2 of I.W.'s Code of Practice.
- Air valves shall be a minimum of 2m from any service connection.
- All commercial premises shall be supplied with water via a non-domestic meter. Where a manifold chamber is used each commercial unit shall have its own supply pipe and meter and stop valve. All meters in the manifold shall be tagged to indicate which property is supplied and any unused outlets are to be blanked off. See Section 3.15.3 of the Code of Practice for details.
- Where a manifold chamber is used to service apartments each dwelling unit shall have its own supply pipe and meter and stop valve. All meters in the manifold shall be tagged to indicate which property is supplied and any unused outlets are to be blanked off. See Section 3.15.3 of the Code of Practice for details.
- Customer connection and boundary box shall be in accordance with Irish Water's standard detail STD-W-03.

Standard Details for Water Networks

Drawing No.	Drawing Title	Rev
STD-W-01	Water service connection responsibility	0
STD-W-02	Typical layout for water mains within developments	1
STD-W-03	Customer connection & boundary box	3
STD-W-04	General pipe connections (sheet 1 of 7)	3
STD-W-05	General pipe connections (sheet 2 of 7)	2
STD-W-06	General pipe connections (sheet 3 of 7)	2
STD-W-07	General pipe connections (sheet 4 of 7)	1
STD-W-08	General pipe connections (sheet 5 of 7)	1
STD-W-09	General pipe connections (sheet 6 of 7)	1
STD-W-10	General pipe connections (sheet 7 of 7)	1
STD-W-11	Typical service layout indicating separation distances	1
STD-W-12	Restrictions on water infrastructure works adjacent to existing trees	2
STD-W-12A	Restrictions on new trees / shrubs planting adjacent to watermains	0
STD-W-13	Trench backfill & bedding	1
STD-W-14	Sluice valve for ductile iron (D.I.) pipe (<350mm dia.) (sheet 1 of 2)	3
STD-W-15	Sluice valve for polyethylene (P.E.) pipe (<350mm dia.) (sheet 2 of 2)	2
STD-W-16	On-line hydrant for ductile iron (D.I.) pipe (sheet 1 of 4)	2
STD-W-17	Off-line hydrant for ductile iron (D.I.) pipe (sheet 2 of 4)	3
STD-W-18	On-line hydrant for polyethylene (P.E.) pipe (sheet 3 of 4)	2
STD-W-19	Off-line hydrant for polyethylene (P.E.) pipe (sheet 4 of 4)	3
STD-W-20	On-line air valve for ductile iron (D.I.) pipe (sheet 1 of 4)	2
STD-W-21	Off-line air valve for ductile iron (D.I.) pipe (sheet 2 of 4)	3
STD-W-22	On-line air valve for polyethylene (P.E.) pipe (sheet 3 of 4)	1
STD-W-23	Off-line air valve for polyethylene (P.E.) pipe (sheet 4 of 4)	3
STD-W-24	Pressure reducing / sustaining valve (P.R.V. / P.S.V.) chamber	2
STD-W-25	Booster pump station arrangement	1
STD-W-26	Non Mech. Meter chamber (40 - 250mm dia.)	3
STD-W-26A	Mech. Meter chamber (40 - 250mm dia.)	0
STD-W-27	Marker posts / plates	2
STD-W-28	Water main thrust & support blocks	1
STD-W-29	Duct chamber	2
STD-W-30	Scour chamber & head wall arrangements	3
STD-W-30A	Washout hydrant	2
STD-W-31	Typical ditch / stream crossing for water main	1
STD-W-32	Typical bridge crossing for water main (sheet 1 of 2)	1
STD-W-33	Typical bridge crossing for water main (sheet 2 of 2)	1
STD-W-34	Security gate & fencing	2
STD-W-35	Pipe repair to existing mains	2
STD-W-36	Telemetry and wet kiosk	2
STD-W-37	Lamp bollard & lamp standard	1

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				<p>Title: WATER AND WASTE WATER DETAILS</p>	<p>Drawing No: PL 07</p>	<p>Revision: 1</p>





**NOTES**

The pump station and all related valve chambers and facilities shall comply with the detailed requirements of "Part 5 Pump Stations" of Irish Water's Code of Practice for Wastewater.

Some particular requirements are set out below and on this drawing.

A dedicated, metered, power supply to be provided to the pump station serving only the pump station equipment and associated plant;

Adequate site security lighting is provided to achieve 100 lux at ground level, with intensity adjustment appropriate for the site location, complete with photoelectric cell controller and over-ride control switch. Wash hand basin to be provided wet kiosk.

Detailed specification for the Boundary Fencing and gates to be as outlined in Section 5.6 of the Code

Alert system and call out emergency response to be provided in the event of plant breakdown or malfunction; The plant shall be provided with a telemetry outstation to transfer data from the pumping station to an Irish Water control centre. The data to be transferred to Irish Water Control Centre shall include at least the following:

- 5.8.1 Available/Run/Trip status for all pumps;
- 5.8.2 Status for all float switches;
- 5.8.3 Sump level;
- 5.8.4 Instantaneous flow;
- 5.8.5 Totalised flow;
- 5.8.6 Mains Power Failure;
- 5.8.7 UPS Fault/Healthy Status.

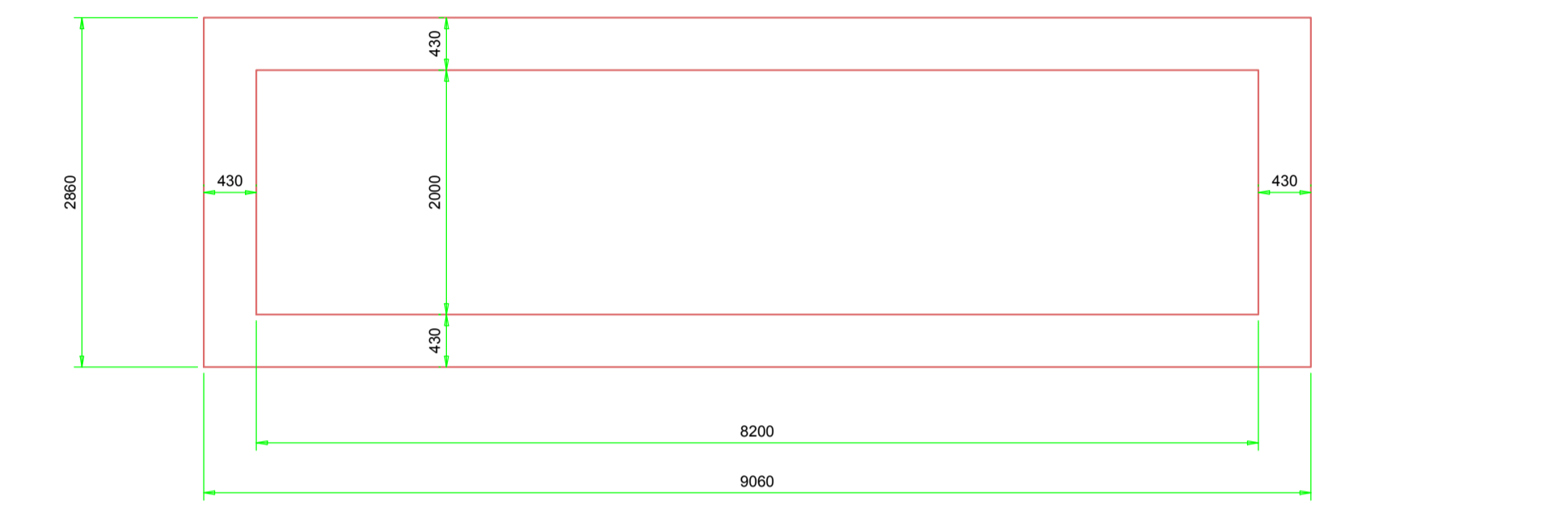
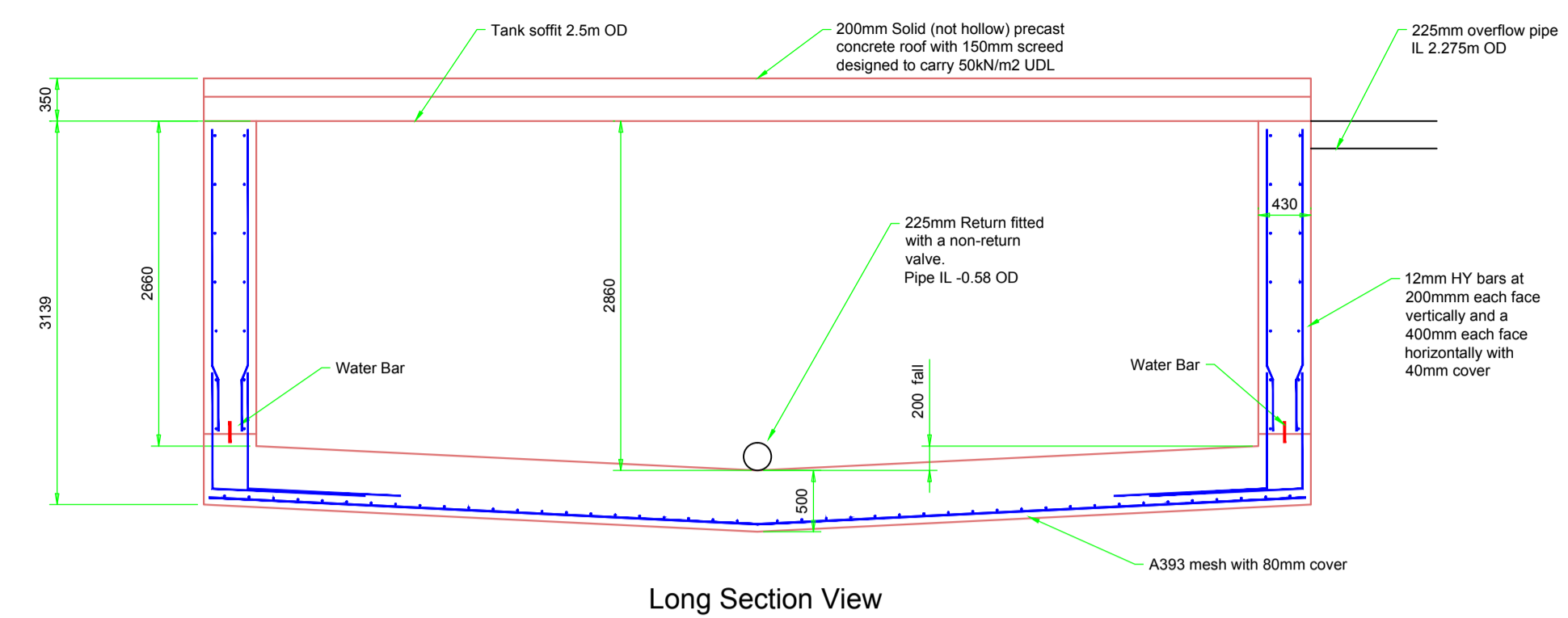
Surge analysis should be carried out and appropriate counter measures employed if necessary.

A hard wired low level float switch and high level float switch should be provided in each pumping station and these should be linked to the telemetry control system.

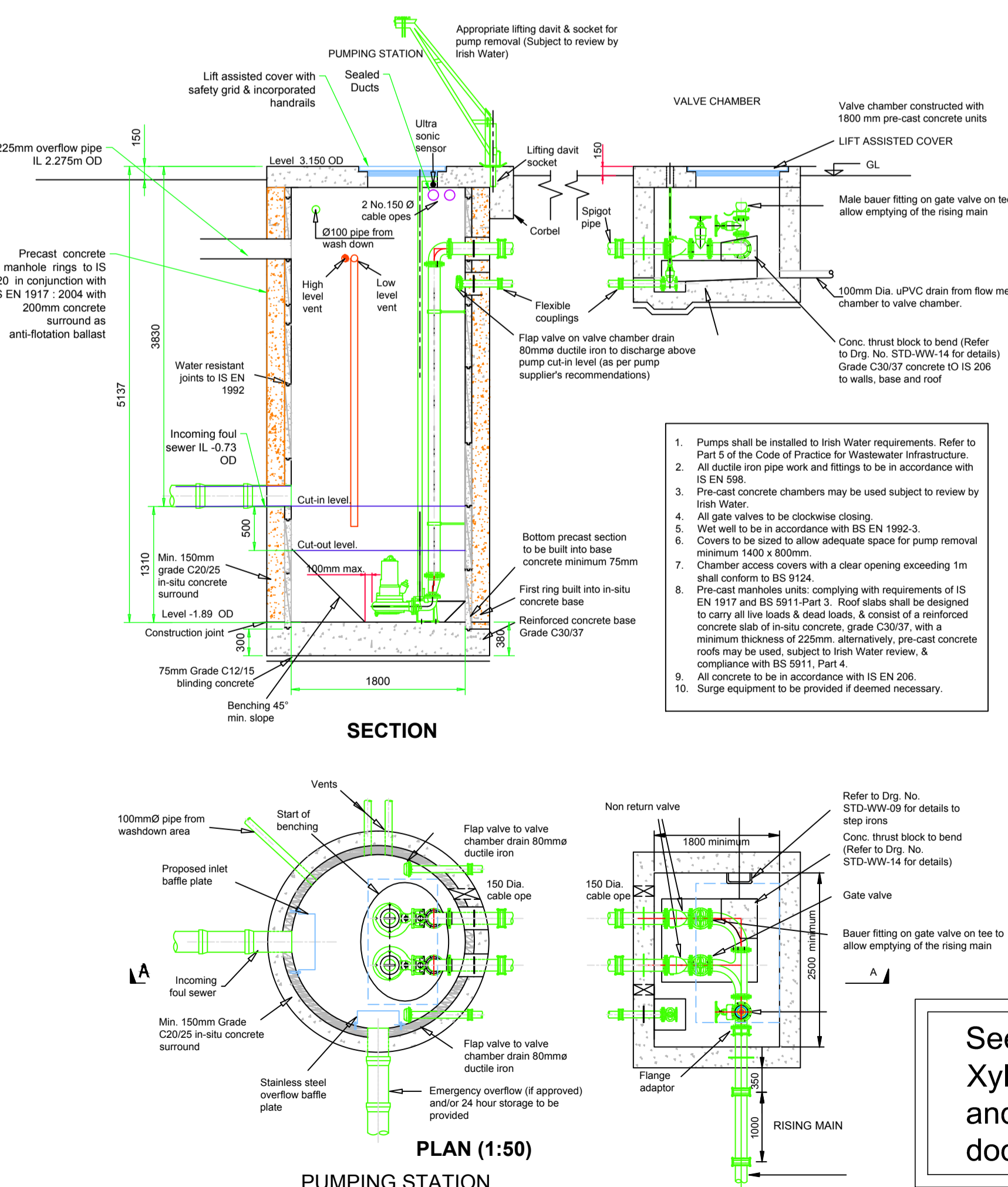
Provision should be made for isolating the incoming flow by means of a hand-operated valve or penstock. This unit should be located in a chamber upstream of the wet well and not in the wet well itself.

A 225mm diameter high-level overflow pipe, or a pipe to match the capacity of the incoming Sewer, shall be provided between the pump station wet well and the storage chamber if off line storage is provided. The return pipe feeding back to the pump station shall be a minimum of 225mm diameter and shall be fitted with a proprietary non-return valve at the wet well chamber.

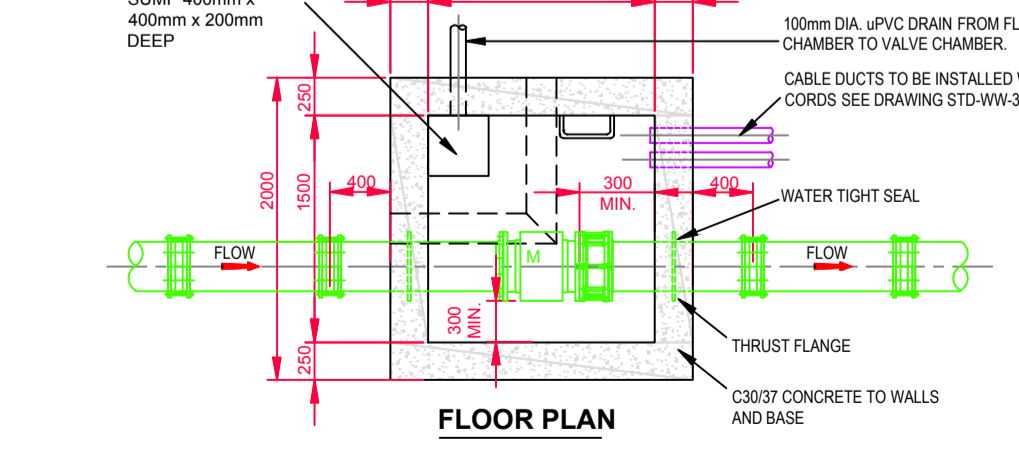
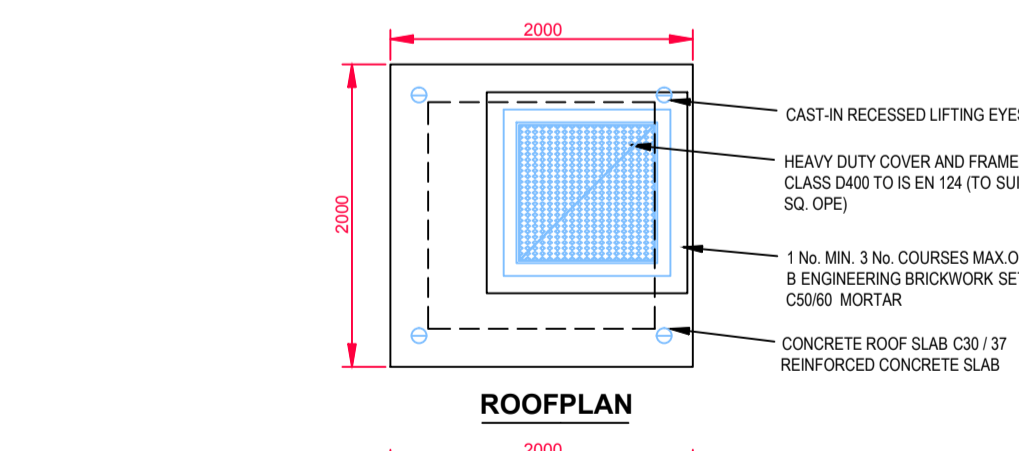
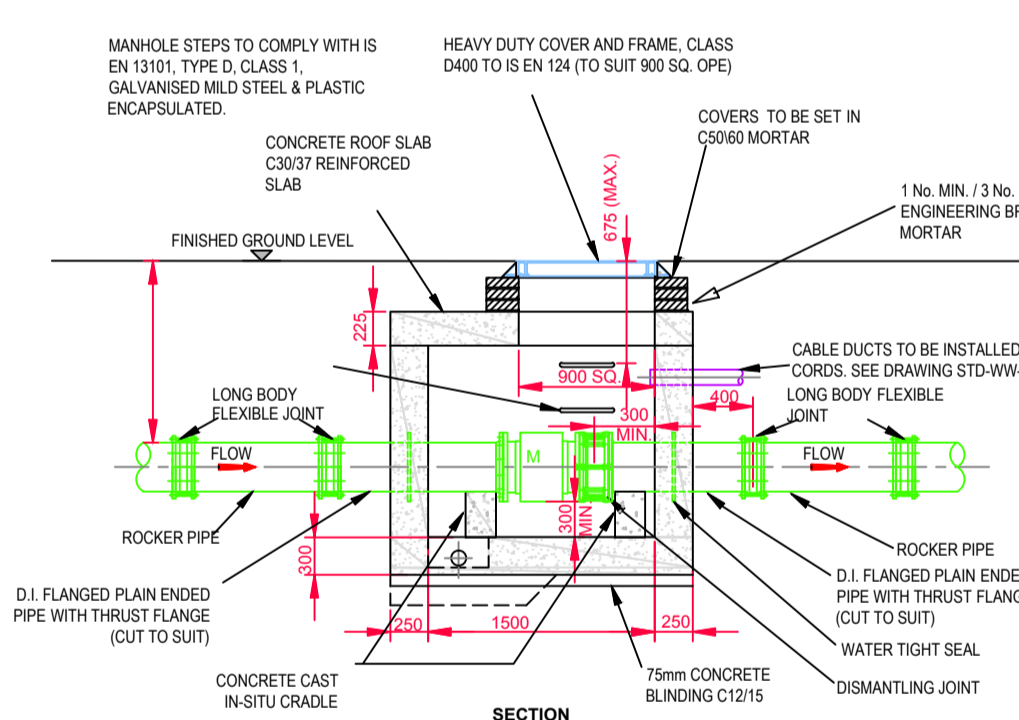
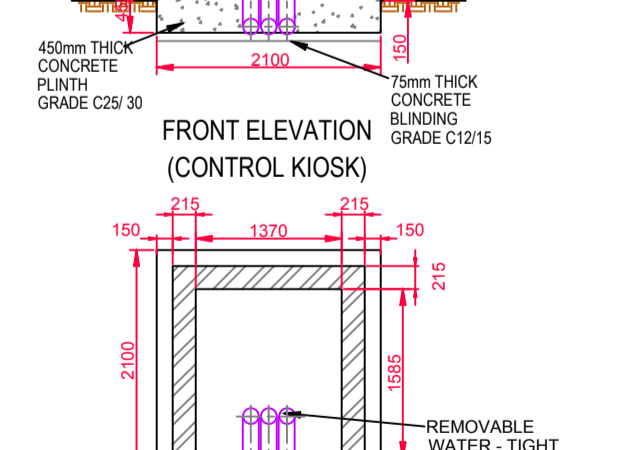
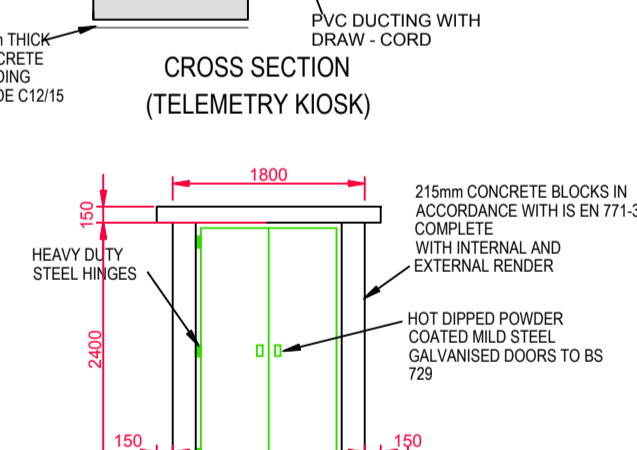
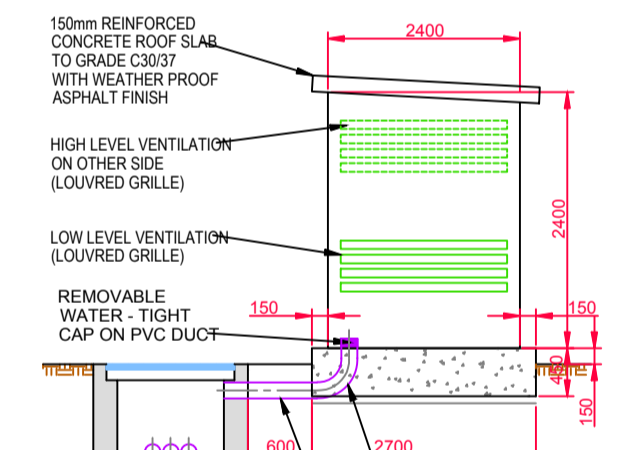
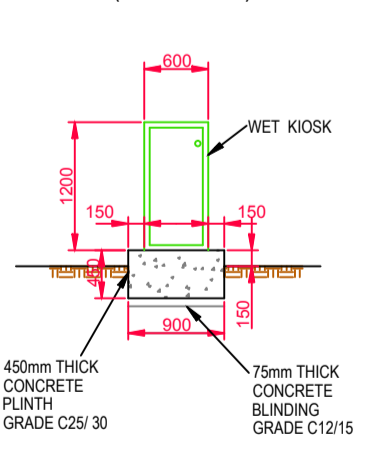
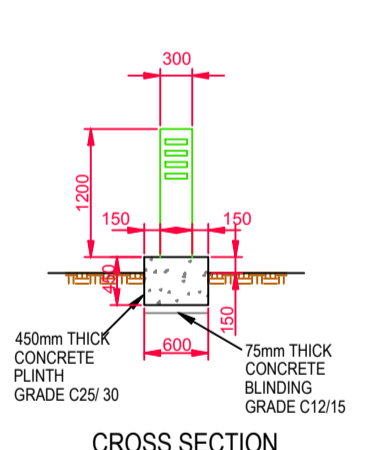
Flow meters shall be provided to measure and record the Wastewater flow being pumped forward through the Rising Main. Magnetic flow meters shall be provided with flow recorders linked to converters in the MCC panel of the control kiosk, complete with a digital display showing instantaneous and accumulated flow records



A 225mm diameter high-level overflow pipe, or a pipe to match the capacity of the incoming Sewer, shall be provided between the pump station wet well and the storage chamber if off line storage is provided. The return pipe feeding back to the pump station shall be a minimum of 225mm diameter and shall be fitted with a proprietary non-return valve at the wet well chamber.



- Control kiosk to be constructed from 215mm thick concrete blocks in accordance with IS EN 771-3, with smooth render finish internally and externally. Wet kiosks to be constructed from thermosetting U.V. & weather resistant plastic powder coated & hot dipped galvanised mild steel plate (minimum 4mm thick) to BS EN 1461. Alternative material, stainless steel in harsh environments, non-metallic (gr. polyester, etc.) may be allowed for wet kiosk subject to agreement with Irish Water.
- Kiosk to have single or double steel/ply doors with multiple locks to LPS 1175 SR4 or EN 1627 minimum double locks with bolts that engage into the sill & header as well as between the two leaves or leaf & frame, leading edge of leaves to have either rebated edges or fitted with astragals.
- Colour to be holly green BS 4800 14 C39. Interior finish to be white unless approved by Irish Water.
- The quality of kiosk construction shall ensure that the following is achieved:
  - a) a thermal transmittance of 1.5w per m<sup>2</sup> K.
  - b) a fire resistance (retention of stability, integrity and insulation, equivalent to Class 2 of BS 476, when tested in accordance with BS 478 for a period exceeding 30 minutes.
- Kiosk size to be adequate and approved by Irish Water.
- An IP rating of IP65 or equivalent.
- Cable ducting to be in accordance with BS 4860 and BS EN 1401.
- Electrical requirements to be in accordance with ESS specification.
- All exposed pipework to be adequately insulated with pipe lagging.
- All concrete to be in accordance with IS EN 206.
- Water tight seals are to be provided where ducting enters duct chambers and kiosks, all ducting to be installed with draw cords.
- The kiosk and purstation is located above the 1 in 200 floor level and allows for sea level rise as indicated by the OPW.



- Structural design and reinforcement detail to be provided by the developer and submitted to Irish Water for review.
- Pre-cast concrete roofs to be used, subject to Irish Water approval, & compliance with BS 5911, Part 4. 3 meter chamber shall be covered with approved heavy duty metal cover to IS EN 124 rating D400. Covers and frames shall be suitable for road and traffic conditions subject to review by Irish Water.
- 200mm all around, 150mm deep concrete plinth around covers in green areas.
- Pre-cast units completed with rubber sealing gasket between units, complying with the requirements of IS EN 1917 and BS 5911-Part 3, complete with 150mm concrete surround to be used. Concrete surround to be Grade C16/20 in accordance with IS EN 206.
- Ductile iron pipes and fittings to be in accordance with IS EN 598. PE pipes and fittings to be in accordance with IS EN 12201 2011. 7. Anti corrosion tape to be provided around all buried flanges.
- All chambers to be checked for uplift by the developer based on ground conditions within the site, should anti floatation measures be required they shall be subject to review by Irish Water.
- Flow meters require a minimum length of pipe on each side of the valve to be completely free of fittings, valves, reducer etc. as per the manufacturers instructions. 10. All concrete to be in accordance with IS EN 206.

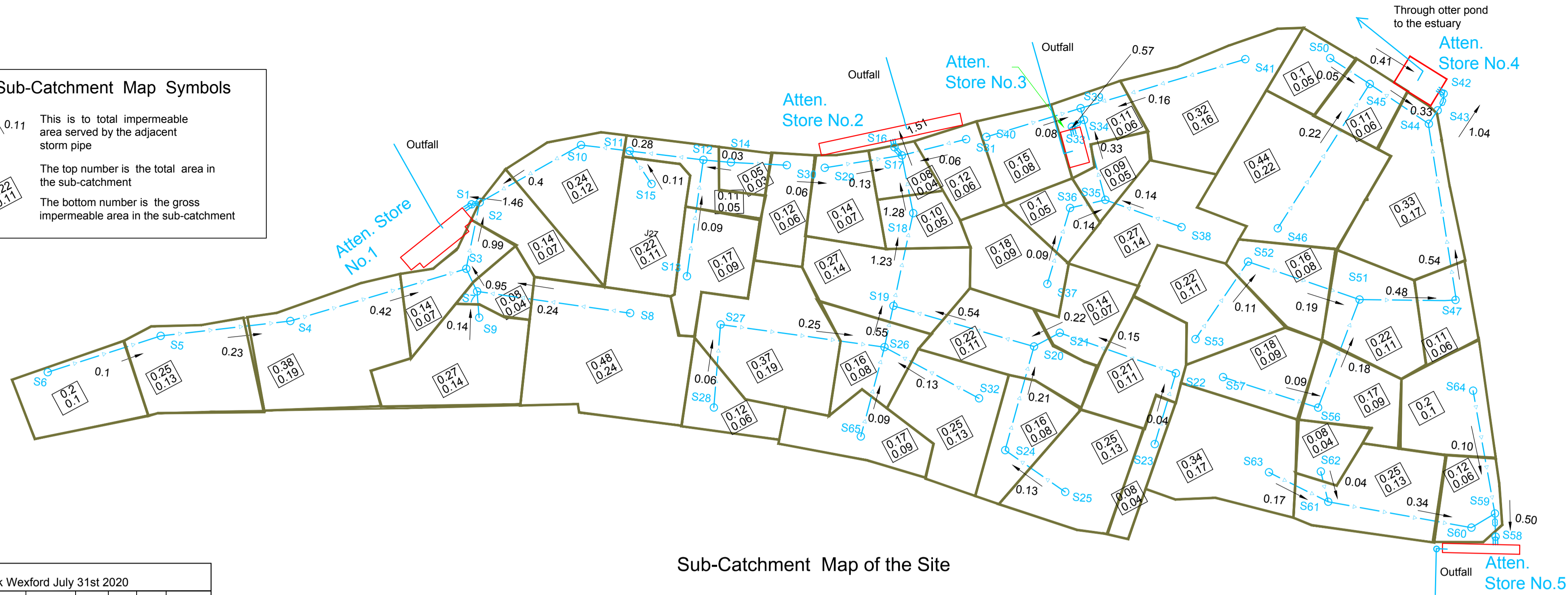
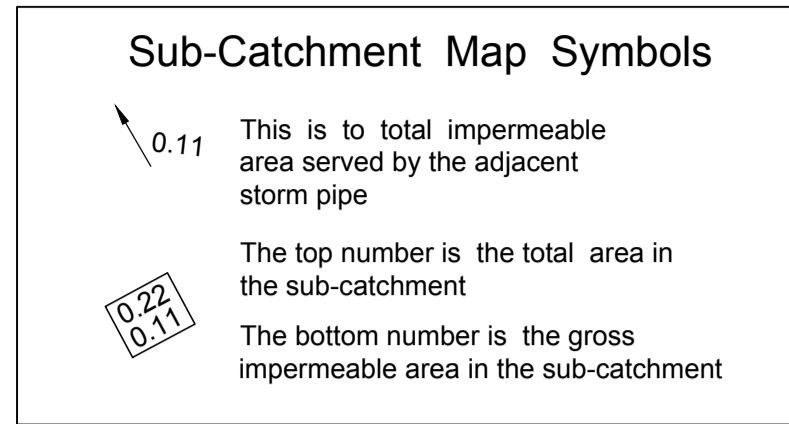
See accompanying Xylem (Flygt) pump and related documentation.

Note: All kiosk dimensions are minimum dimensions may be increased at final construction stage.

August 2020 Planning Application

ALL DIMENSIONS ARE TO BE CHECKED ON SITE BEFORE COMMENCING AND AT ALL STAGES OF CONSTRUCTION	Do Not Scale. Check for reduction/increase in plotting size	Arthur Murphy & Co. CIVIL & STRUCTURAL ENGINEERING	Address: Garryrichard Foulksmills Co. Wexford	Client: William Neville & Sons Ltd. Rockfield House Spawell Road, Wexford	Project: RESIDENTIAL DEVELOPMENT PARK WEXFORD	Sub Project: Civil Engineering Drawings	Title: SEWAGE PUMP STATION	First Issue Date: Nov 2018	Design: AM	Scale: 1:50 and 1:100 on A1
			Tel: 051 565 565	Email: arthur@ameng.ie				Drawing No: PL 08	Revision: Planning	Status: Planning

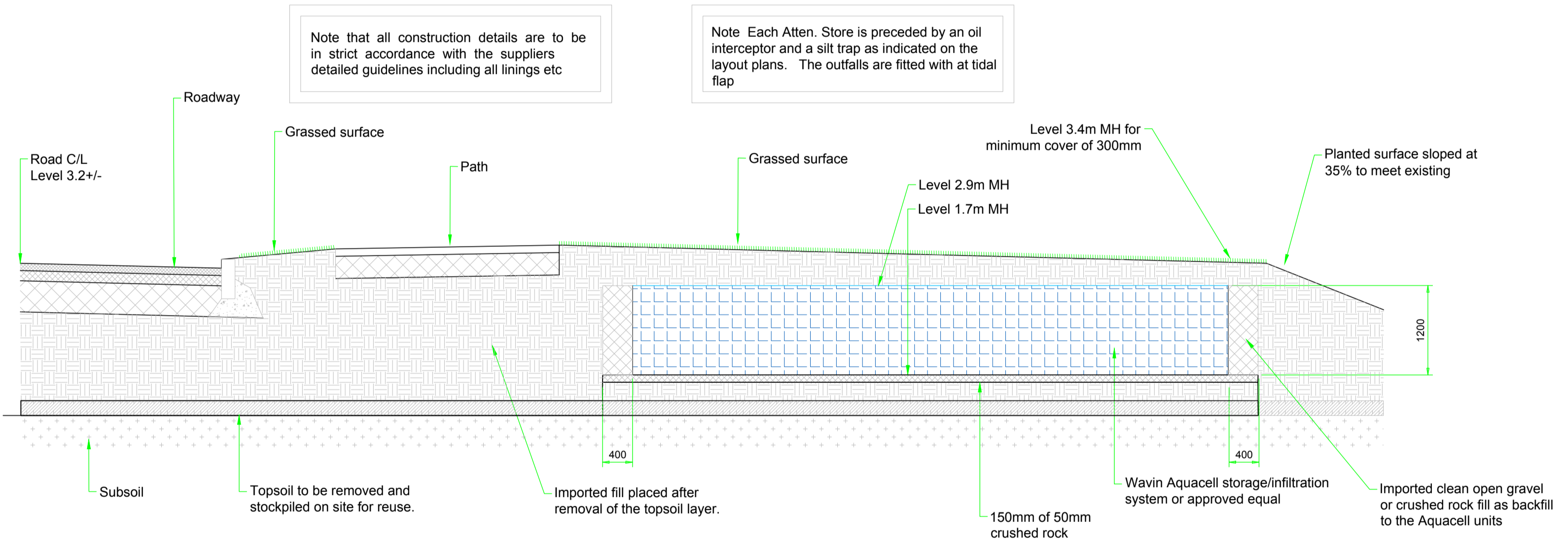




Sub-Catchment Map of the Site

**STORM SEWER CALCULATIONS Park Wexford July 31st 2020**

FROM	TO	t incr mins	Imperm A (ha)	L (m)	Tc min	I mm/hr	Pipe (mm)	s %	Manning n	V m/s	Qcap l/s	Qdes	
S8	S7		0.240	76	5.0	53	225	0.5	0.011	0.9	38	35	O.K.
S7	S3	1.34	0.420	12	6.3	47	300	0.25	0.011	0.8	57	54	O.K.
S9	S7		0.140	13	5.0	53	225	0.3	0.011	0.7	29	21	O.K.
S13	S12		0.090	58	5.0	53	225	0.35	0.011	0.8	31	13	O.K.
S12	S11	1.22	0.120	36	6.2	47	225	0.25	0.011	0.7	27	16	O.K.
S11	S10	0.90	0.280	24	7.1	43	300	0.25	0.011	0.8	57	34	O.K.
S10	S2	0.49	0.400	57	7.6	42	300	0.25	0.011	0.8	57	46	O.K.
S15	S11		0.110	20	5.0	53	225	0.3	0.011	0.7	29	16	O.K.
S14	S12		0.030	14	5.0	53	150	0.3	0.011	0.6	10	4	O.K.
S25	S24		0.130	37	5.0	53	225	1.14	0.011	1.4	57	19	O.K.
S24	S20	0.43	0.210	54	5.4	51	225	1.14	0.011	1.4	57	30	O.K.
S28	S27		0.060	42	5.0	53	150	2.34	0.011	1.6	28	9	O.K.
S27	S26	0.45	0.250	81	5.4	51	225	1.15	0.011	1.4	57	35	O.K.
S26	S19	0.94	0.550	22	6.4	46	300	0.4	0.011	1.0	72	71	O.K.
S32	S26		0.090	45	5.0	53	150	2.03	0.011	1.5	26	13	O.K.
S30	S29		0.130	37	5.0	53	225	0.3	0.011	0.7	29	19	O.K.
S29	S17	0.84	0.210	54	5.8	49	225	0.3	0.011	0.7	29	28	O.K.
S31	S17		0.060	32	5.0	53	300	0.5	0.011	1.1	81	9	O.K.
S38	S35		0.140	40	5.0	53	225	0.25	0.011	0.7	27	21	O.K.
S41	S39		0.160	48	5.0	53	300	0.25	0.011	0.8	57	24	O.K.
S40	S39		0.080	84	5.0	53	300	0.25	0.011	0.8	57	12	O.K.
S39	S34	1.73	0.240	6	6.7	45	300	0.3	0.011	0.9	63	30	O.K.
S50	S45		0.050	24	5.0	53	150	0.5	0.011	0.7	13	7	O.K.
S57	S56		0.090	49	5.0	53	150	1.57	0.011	1.3	23	13	O.K.
S56	S51	0.64	0.180	57	5.6	50	225	0.96	0.011	1.3	52	25	O.K.
S63	S61		0.170	33	5.0	53	225	1.56	0.011	1.7	66	25	O.K.
S65	S26		0.100	61	5.0	53	150	2.07	0.011	1.5	26	15	O.K.
S6	S5		0.10	58	6.0	48	150	1.02	0.011	1.0	18	13	O.K.
S5	S4	0.94	0.23	64	6.9	44	225	0.52	0.011	1.0	38	28	O.K.
S4	S3	1.11	0.42	90	8.0	40	300	0.99	0.011	1.6	114	47	O.K.
S3	S2	0.98	0.99	33	9.0	38	375	0.38	0.011	1.2	128	104	O.K.
S2	S1	0.47	1.46	7	9.5	37	450	0.38	0.011	1.3	208	149	O.K.
S23	S22		0.04	36	5.0	53	150	5.31	0.011	2.4	42	6	O.K.
S22	S21	0.26	0.15	60	5.3	52	225	1.14	0.011	1.4	57	22	O.K.
S21	S20	0.70	0.22	14	6.0	48	225	2.84	0.011	2.3	90	29	O.K.
S20	S19	0.10	0.54	72	6.1	48	300	0.91	0.011	1.5	109	72	O.K.
S19	S18	0.78	1.23	46	6.8	45	450	0.33	0.011	1.2	194	152	O.K.
S18	S17	0.63	1.28	29	7.5	42	450	0.33	0.011	1.2	194	150	O.K.
S17	S16	0.40	1.51	7	7.9	41	450	0.3	0.011	1.2	185	172	O.K.
S37	S36		0.09	39	5.0	53	150	2.16	0.011	1.5	27	13	O.K.
S36	S35	0.43	0.14	18	5.4	51	225	0.2	0.011	0.6	24	20	O.K.
S35	S34	0.50	0.33	41	5.9	48	300	0.2	0.011	0.7	51	44	O.K.
S34	S33	0.94	0.57	7	6.9	44	300	0.5	0.011	1.1	81	70	O.K.
S46	S45		0.22	17	5.0	53	225	0.48	0.011	0.9	37	33	O.K.
S45	S44	0.31	0.33	35	5.3	51	300	0.25	0.011	0.8	57	47	O.K.
S53	S52		0.11	46	5.0	53	150	1.6	0.011	1.3	23	16	O.K.
S52	S51	0.59	0.19	58	5.6	50	225	0.4	0.011	0.8	34	26	O.K.
S51	S47	1.14	0.48	42	6.7	45	375	0.15	0.011	0.7	80	60	O.K.
S47	S44	0.96	0.54	7	7.7	42	375	0.15	0.011	0.7	80	62	O.K.
S44	S42	0.16	1.04	7	7.9	41	450	0.15	0.011	0.8	131	119	O.K.
S62	S61		0.04	15	5.0	53	150	1.43	0.011	1.2	22	6	O.K.
S61	S60	0.20	0.34	71	5.2	52	300	0.5	0.011	1.1	81	49	O.K.
S60	S59	1.03	0.40	15	6.2	47	300	0.5	0.011	1.1	81	52	O.K.
S59	S58	0.22	0.50	7	6.5	46	300	0.99	0.011	1.6	114	64	O.K.



Typical Cross Section through Attenuation Store (Scale 1:50)

**Storm Water System.**

Wexford County Council requires attenuation facilities for all storm water, up to the 100 year design storm, before discharge to Wexford Harbour/Estuary. A standard storm water collection system is proposed with 5 attenuation storage facilities designed to this requirement. The permitted discharge is calculated based on the recommendations of the Greater Dublin Strategic Drainage Study.

The discharge pipes discharge to the estuary and are buried 500mm under the shore with concrete protection to below the low tide mark. Each outfall is to be fitted with a non-return tidal flap.

Each attenuation store is preceded by an oil interceptor and a silt trap as indicated on the layout plans.

Concrete attenuation tanks of the same depth and with 95% of the clear floor area required for the Aquacell system may be used if this should be preferred by Planning.

**Summary of Attenuation Details**

Gallery Number	No. 1	No. 2	No. 3	No. 4	No. 5
Total Area (ha)	2.746	2.946	1.22	1.85	1.17
Percentage impermeable area (%)	55	55	55	55	55
Impermeable Area (ha)	1.5103	1.6203	0.671	1.0175	0.6435
% of Imp. area contributing directly to the drainage system (Dublin GSS)	75	75	75	75	75
Impermeable area directly contributing to the Gallery (ha)	1.13	1.22	0.50	0.76	0.48
<b>Permitted Outflow (litres per second)</b>	<b>16.9</b>	<b>18.2</b>	<b>7.5</b>	<b>11.4</b>	<b>7.2</b>
<b>Attenuation Storage required</b>	<b>454</b>	<b>487</b>	<b>202</b>	<b>306</b>	<b>193</b>
Depth of Aquacell array	1.2	1.2	1.2	1.2	1.2
Plan Area of Aquacell system	398	427	177	268	170
Aquacell array length	39.0	47.5	18.0	20.0	34.0
Average width	10.2	9.0	10.0	13.5	5.0
Attenuation Storage provided	454	487	205	308	193

**SAMPLE STORM WATER ATTENUATION CALCULATIONS**

The calculations are based on the Greater Dublin Strategic Drainage Study.

The attenuation storage is to be provided in an attenuation tank as detailed here and the discharge is to be limited, by means of a Hydrobrake or approved alternative, to the calculated allowable discharge set out below.

**Extreme Rainfall Return Periods (Source - Met Eireann)**

Location: WEXFORD

**110 % of Maximum rainfall (mm) of indicated duration for the indicated return period.**

Duration	Return Period (years)				
	5	10	20	50	100
60 min	19	23	27	34	40
2 hour	24	29	34	43	50
4 hour	31	37	43	53	62
6 hour	36	42	49	60	70
12 hour	46	54	62	75	86
24 hour	58	68	78	93	107

**Site Details**

CALCULATION OF GREEN FIELD RUNOFF

Given a site area of 1.22 hectares

Area for calculation of AREA 50 ha (recommended minimum in Greater Dublin Study)

AREA in km2 0.5 km<sup>2</sup> (SAAR) 1163 mm

SOIL 0.4 for Silty (Intermediate) soils

Soil type at the site is aluvial Silt (Soil Map of Co. Wexford (National Soil Survey of Ireland))

QBAR rural for this AREA 0.31 m<sup>3</sup>/s = 0.00108 \* AREA<sup>0.89</sup> \* SAAR<sup>1.17</sup> \* SOIL<sup>2.17</sup>

QBAR per hectare 6.16 l/s

Permissible outflow will then be 7.5 l/s

Impermeable area 0.67 ha

% of impermeable area contributing to direct runoff to the drainage system 75 %

(Per Appendix E-2 Greater Dublin Strategic Drainage Study)

Impermeable area contributing to the the drainage system 0.50 ha

**RUNOFF VOLUME**

The runoff volume, in cubic metres, from the catchment for all the storms listed in the rainfall table above is set out below:

Duration	Return Period (years)				
	5	10	20	50	100
60 min	95	115	137	172	203
2 hour	122	146	173	214	251
4 hour	156	185	218	266	310
6 hour	179	213	249	303	351
12 hour	229	270	313	378	434
24 hour	293	342	393	470	536

**The allowable outflow and required storage for various durations are:**

Duration	allowable outflow	storage for	
		60 mins	100 yr storm
60 min	27 m <sup>3</sup>	176 m <sup>3</sup>	
2 hour	54 m <sup>3</sup>	197 m <sup>3</sup>	
4 hour	108 m <sup>3</sup>	202 m <sup>3</sup>	
6 hour	162 m <sup>3</sup>	189 m <sup>3</sup>	
12 hour	325 m <sup>3</sup>	109 m <sup>3</sup>	
24 hour	650 m <sup>3</sup>	0 m <sup>3</sup>	

The storage required on site for a 100 year storm would be 202 m<sup>3</sup>

**Aquacell Volume Calculations are as follows**

Gross Storage allowing for voids	212 m <sup>3</sup>	Soffit level of tank	2.9 m OD
Proposed Aquacell invert level	1.7 m OD		
Internal operational level	1.2 m OD		
Floor area of Aquacells	177 m <sup>2</sup>		
Nett Storage provided	202 m <sup>3</sup>		

**Alternative Tank Volume Calculations are as follows**

Volume of storage	202 m <sup>3</sup>	Soffit level of tank	2.9 m OD
Proposed invert level of tank	1.7 m OD	Depth of precast roof units	200 mm
Internal operational level	1.2 m OD		
Tank internal area ex. all walls	168 m <sup>2</sup>	Top of concrete	3.10 m OD
Storage provided	202 m <sup>3</sup>		

August 2020 Planning Application

ALL DIMENSIONS ARE TO BE CHECKED ON SITE BEFORE COMMENCING AND AT ALL STAGES OF CONSTRUCTION

Do Not Scale. Check for reduction/increase in plotting size

**Arthur Murphy & Co.**  
CIVIL & STRUCTURAL ENGINEERING

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Tel: 051 565 565  
Email: arthur@ameng.ie

Client: William Neville & Sons Ltd. Rockfield House Spawell Road, Wexford

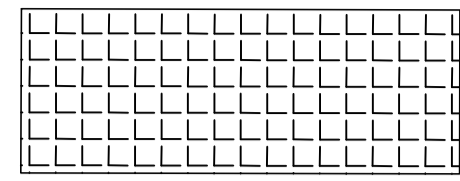
No	Revision Description	Date	By

Project: RESIDENTIAL DEVELOPMENT PARK WEXFORD

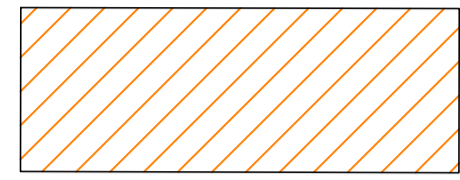
Sub Project: Civil Engineering Drawings  
Title: STORM SYSTEM DESIGN

First Issue Date: Dec 14, 2019  
Drawing No: PL 09  
Design: AM  
Scale: NTS  
Revision: Status  
Planning

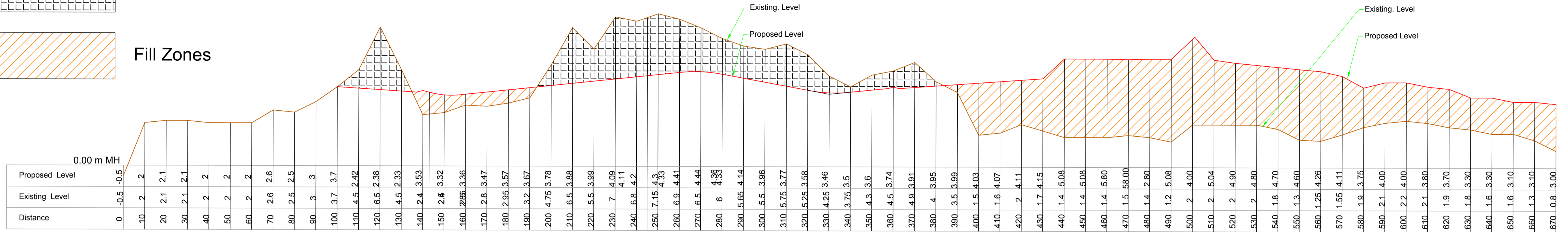




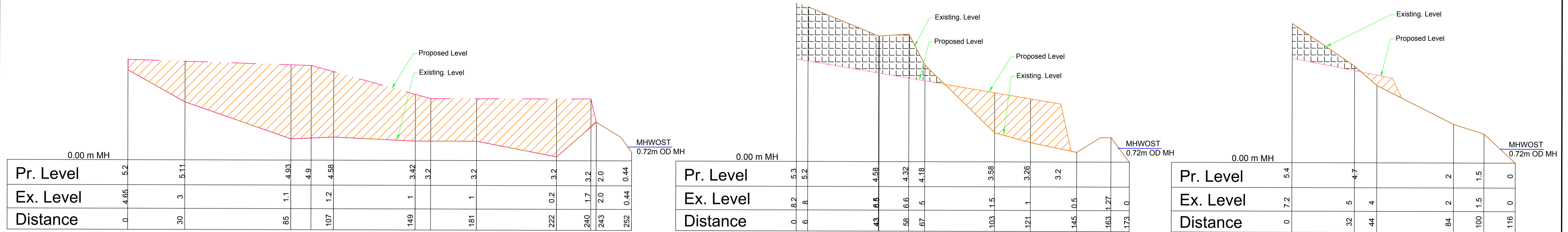
Cut Zones



Fill Zones



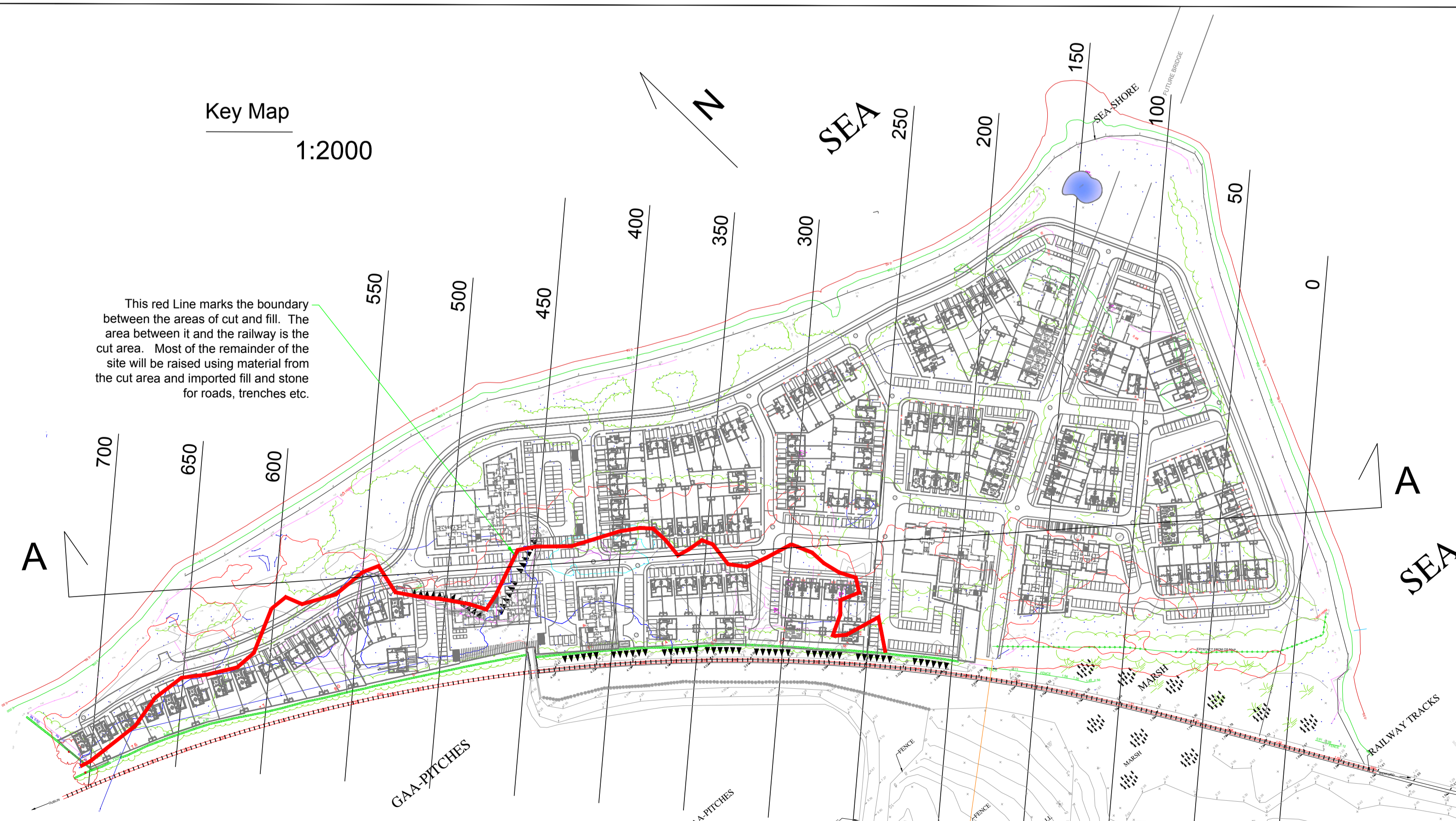
### Long Section AA Through Site 1:1000H 1:100V



Cross-Section at 200 1:1000H 1:100V

Cross-Section at 400 1:1000H 1:100V

Cross-Section at 600 1:1000H 1:100V



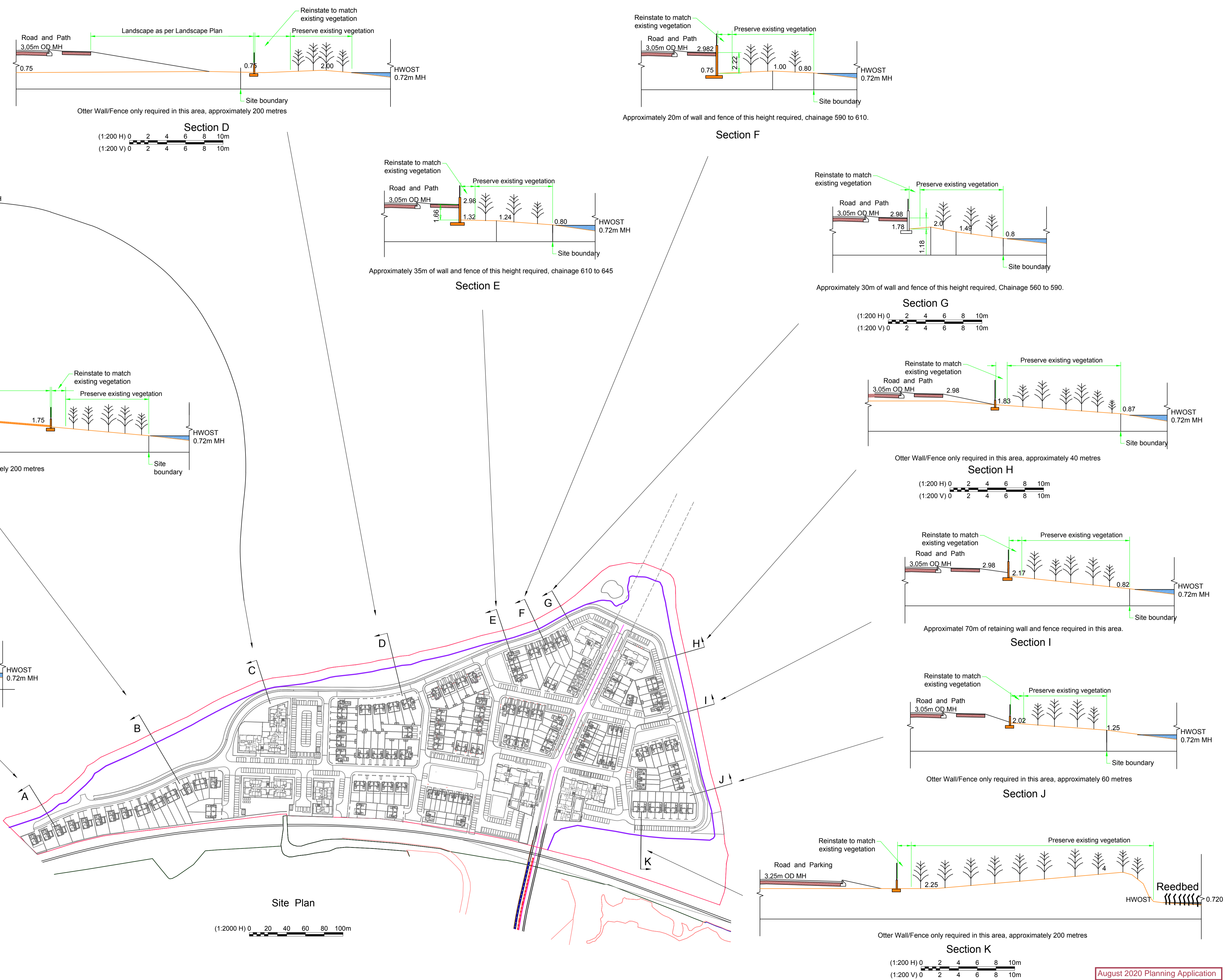
See Appendix C of the Engineering Report document for details of:

1. the cut and fill quantities
2. the nett volume of imported fill
3. a description of the fill
4. management of the fill
5. protection of the otter reserved area and
6. the settlement of site runoff to avoid silt gaining access to the estuary.

August 2020 Planning Application

<p>ALL DIMENSIONS ARE TO BE CHECKED ON SITE BEFORE COMMENCING AND AT ALL STAGES OF CONSTRUCTION</p>	<p>Do Not Scale. Check for reduction/increase in plotting size</p>	<p><b>Arthur Murphy &amp; Co.</b> CIVIL &amp; STRUCTURAL ENGINEERING</p>	<p>Address: Garryrichard Foulksmills Co. Wexford Tel: 051 565 565 Email: arthur@ameng.ie</p>	<p>Client <b>William Neville &amp; Sons Ltd.</b> Rockfield House Spawell Road, Wexford</p>	<p>Project <b>RESIDENTIAL DEVELOPMENT PARK WEXFORD</b></p>	<p>Sub Project Civil Engineering Drawings</p>	<p>First Issue Date</p>	<p>Design AM</p>	<p>Scale As Shown</p>
						<p>Title SITE CUT AND FILL</p>	<p>Drawing No. PL 10</p>	<p>Revision</p>	<p>Status Planning</p>





**Legend**

—	HWOSt	High water on Spring Tide
—	Existing Ground Line	Existing Ground Line
—	Proposed Ground Line	Proposed Ground Line
2.92	Levels (m OD MH)	Levels (m OD MH)

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**Arthur Murphy & Co.**  
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No	Revision Description	Date	By

Project: RESIDENTIAL DEVELOPMENT PARK WEXFORD

Sub Project: Civil Engineering Drawings  
 Title: SHORELINE SECTIONS

First Issue Date: July 2020  
 Design: AM  
 Scale: As Shown  
 Drawing No.: PL 11  
 Revision: Planning

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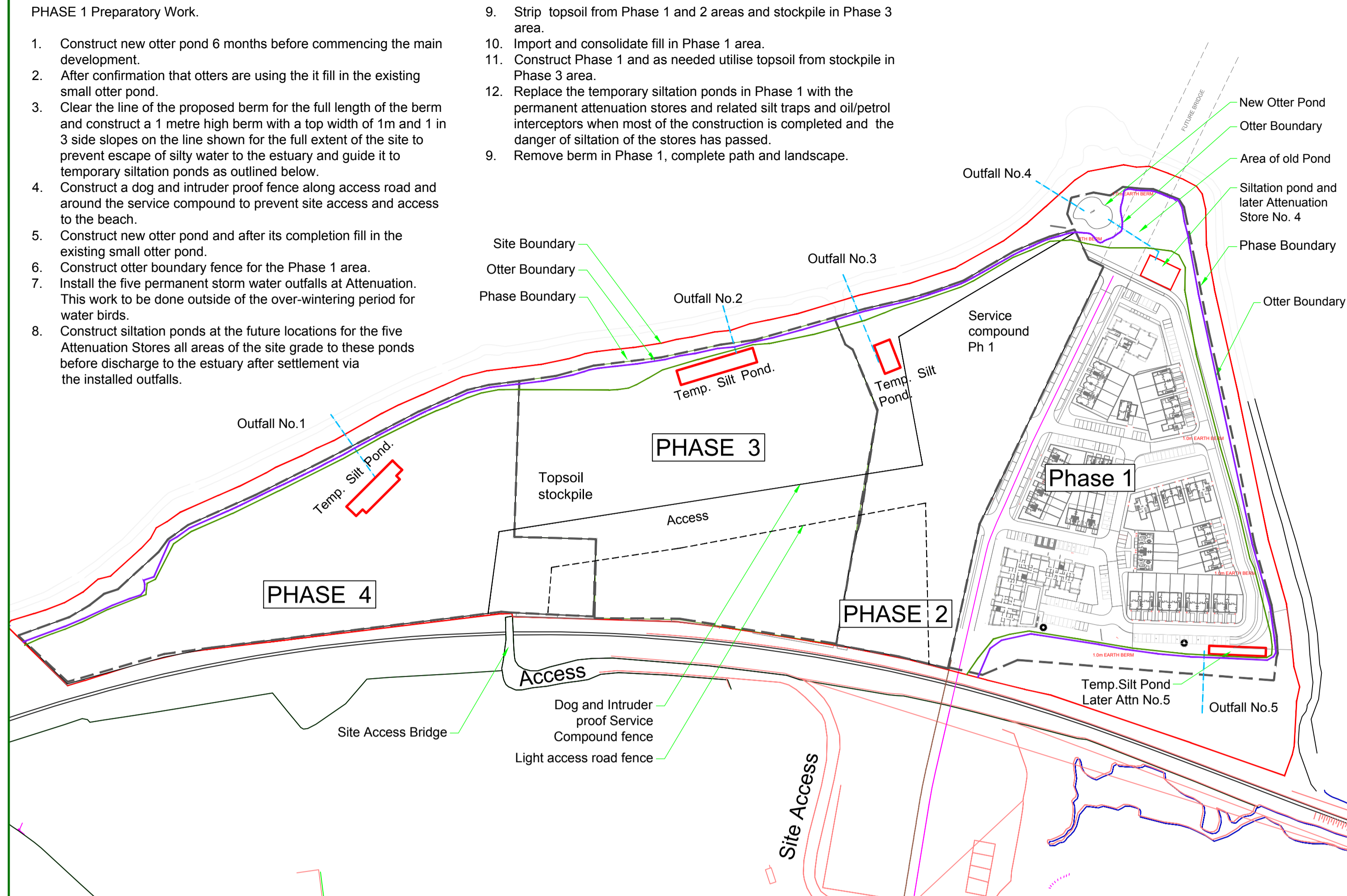


**PHASE 1 Preparatory Work.**

1. Construct new otter pond 6 months before commencing the main development.
2. After confirmation that others are using the fill in the existing small otter pond.
3. Clear the line of the proposed berm for the full length of the berm and construct a 1 metre high berm with a top width of 1m and 1 in 3 side slopes on the line shown for the full extent of the site to prevent escape of silty water to the estuary and guide it to temporary siltation ponds as outlined below.
4. Construct a dog and intruder proof fence along access road and around the service compound to prevent site access and access to the beach.
5. Construct new otter pond and after its completion fill in the existing small otter pond.
6. Construct otter boundary fence for the Phase 1 area.
7. Install the five permanent storm water outfalls at Attenuation. This work to be done outside of the over-wintering period for water birds.
8. Construct siltation ponds at the future locations for the five Attenuation Stores all areas of the site grade to these ponds before discharge to the estuary after settlement via the installed outfalls.

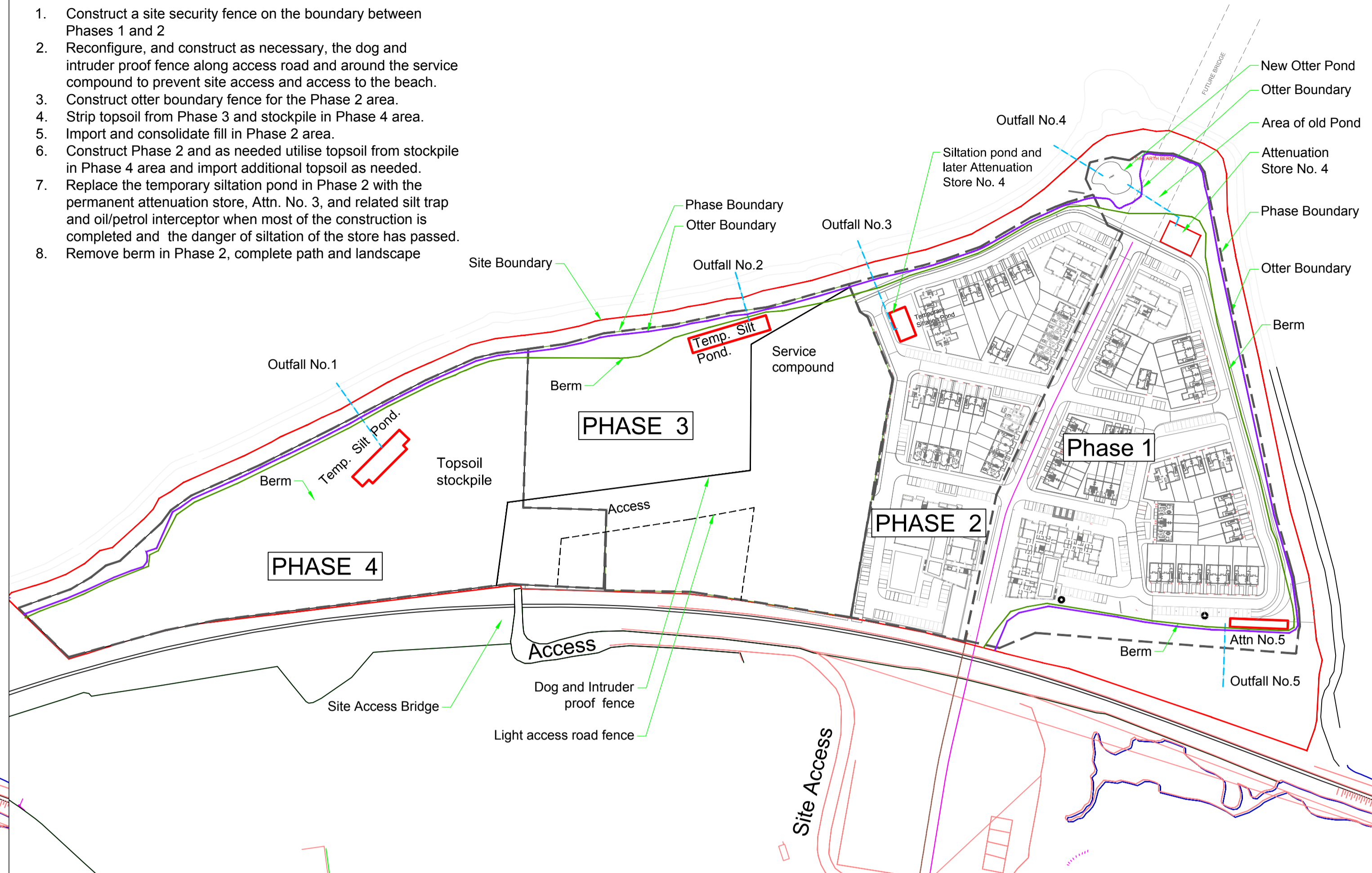
9. Strip topsoil from Phase 1 and 2 areas and stockpile in Phase 3 area.
10. Import and consolidate fill in Phase 1 area.
11. Construct Phase 1 and as needed utilise topsoil from stockpile in Phase 3 area.
12. Replace the temporary siltation ponds in Phase 1 with the permanent attenuation stores and related silt traps and oil/petrol interceptors when most of the construction is completed and the danger of siltation of the stores has passed.

9. Remove berm in Phase 1, complete path and landscape.



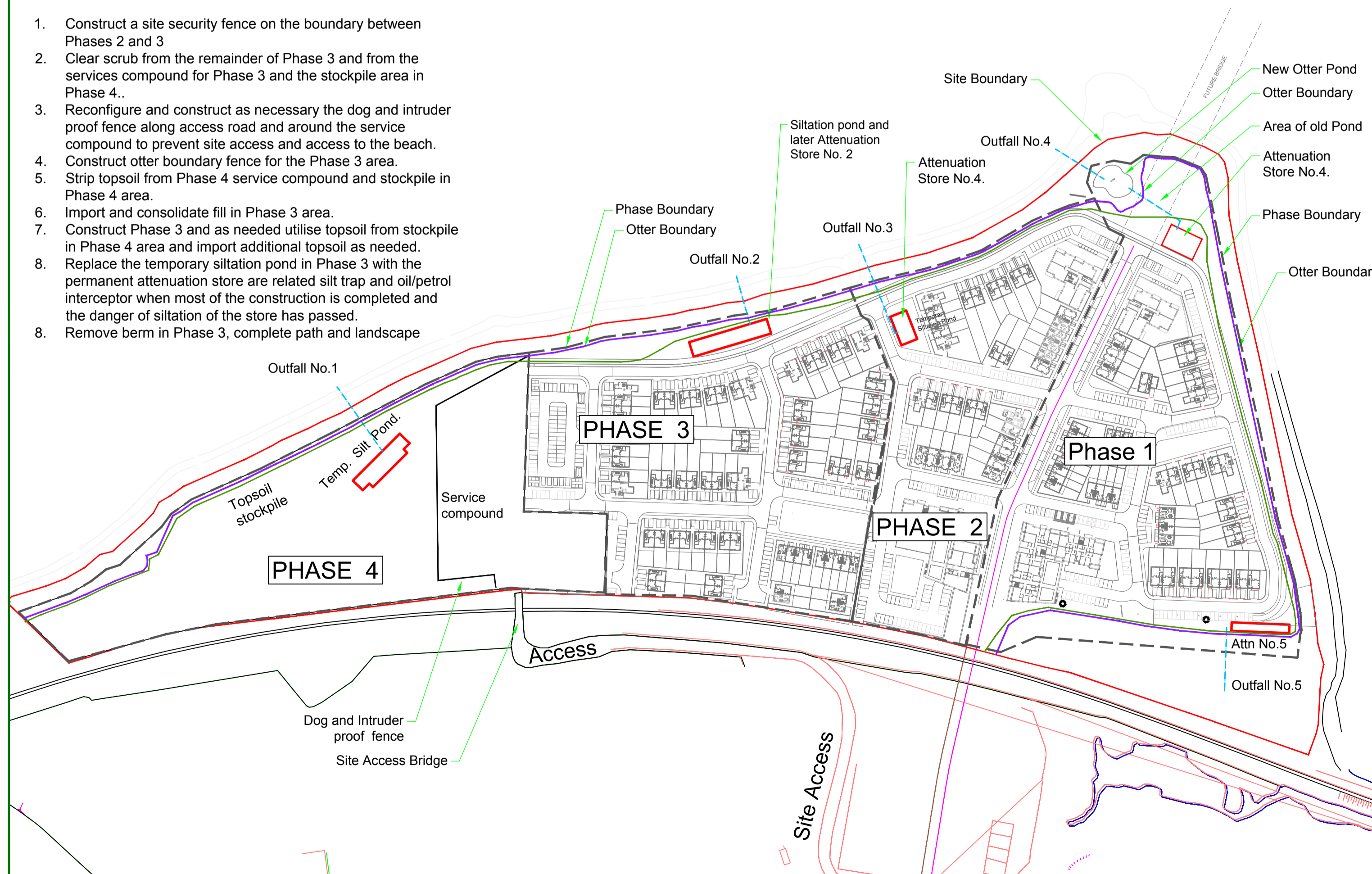
**PHASE 2 Preparatory Work.**

1. Construct a site security fence on the boundary between Phases 1 and 2
2. Reconfigure, and construct as necessary, the dog and intruder proof fence along access road and around the service compound to prevent site access and access to the beach.
3. Construct otter boundary fence for the Phase 2 area.
4. Strip topsoil from Phase 3 and stockpile in Phase 4 area.
5. Import and consolidate fill in Phase 2 area.
6. Construct Phase 2 and as needed utilise topsoil from stockpile in Phase 4 area and import additional topsoil as needed.
7. Replace the temporary siltation pond in Phase 2 with the permanent attenuation store, Attn. No. 3, and related silt trap and oil/petrol interceptor when most of the construction is completed and the danger of siltation of the store has passed.
8. Remove berm in Phase 2, complete path and landscape



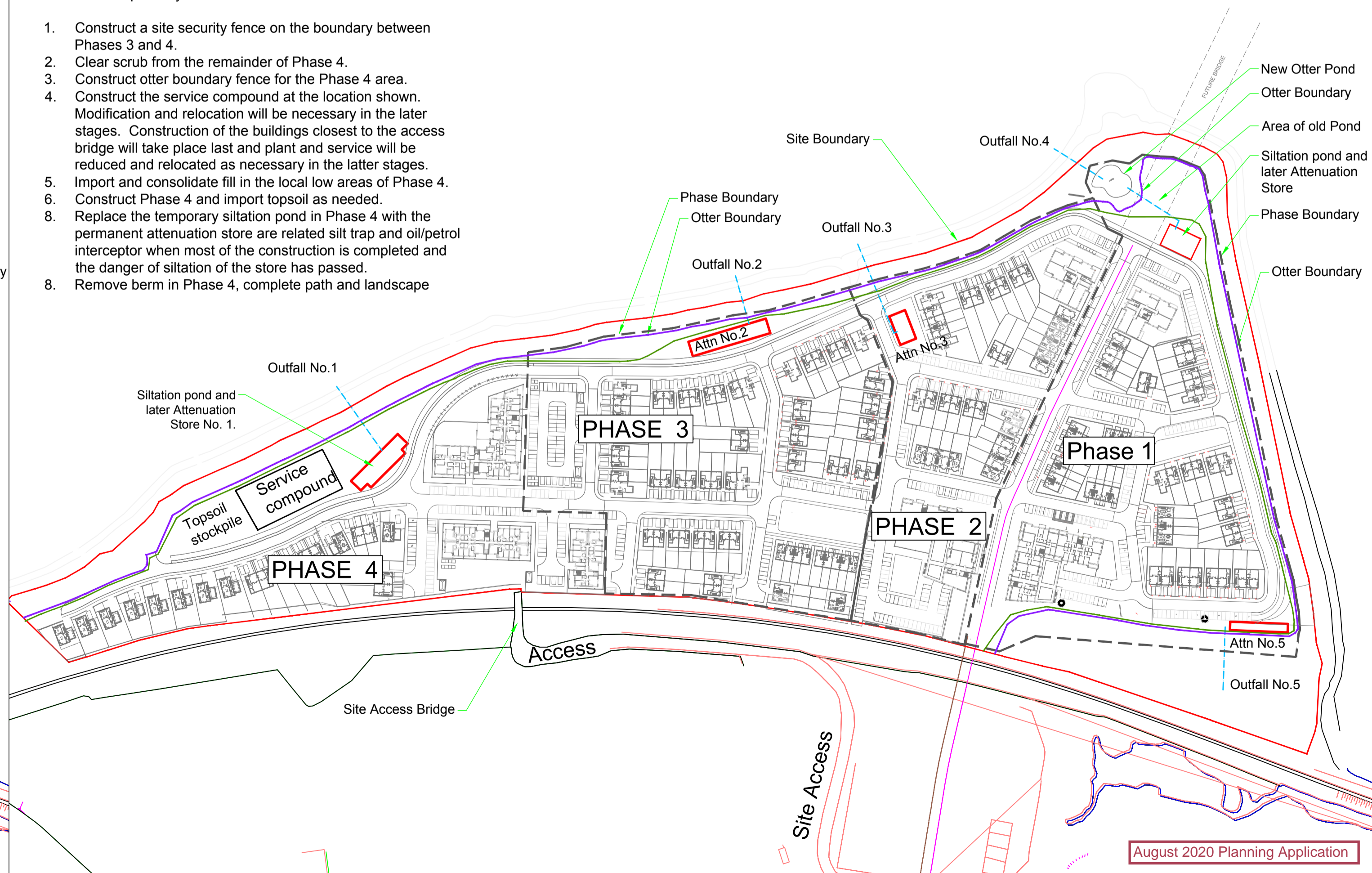
**PHASE 3 Preparatory Work.**

1. Construct a site security fence on the boundary between Phases 2 and 3
2. Clear scrub from the remainder of Phase 3 and from the services compound for Phase 3 and the stockpile area in Phase 4..
3. Reconfigure and construct as necessary the dog and intruder proof fence along access road and around the service compound to prevent site access and access to the beach.
4. Construct otter boundary fence for the Phase 3 area.
5. Strip topsoil from Phase 4 service compound and stockpile in Phase 4 area.
6. Import and consolidate fill in Phase 3 area.
7. Construct Phase 3 and as needed utilise topsoil from stockpile in Phase 4 area and import additional topsoil as needed.
8. Replace the temporary siltation pond in Phase 3 with the permanent attenuation store are related silt trap and oil/petrol interceptor when most of the construction is completed and the danger of siltation of the store has passed.
8. Remove berm in Phase 3, complete path and landscape



**PHASE 4 Preparatory Work.**

1. Construct a site security fence on the boundary between Phases 3 and 4.
2. Clear scrub from the remainder of Phase 4.
3. Construct otter boundary fence for the Phase 4 area.
4. Construct the service compound at the location shown. Modification and relocation will be necessary in the later stages. Construction of the buildings closest to the access bridge will take place last and plant and service will be reduced and relocated as necessary in the latter stages.
5. Import and consolidate fill in the local low areas of Phase 4.
6. Construct Phase 4 and import topsoil as needed.
8. Replace the temporary siltation pond in Phase 4 with the permanent attenuation store are related silt trap and oil/petrol interceptor when most of the construction is completed and the danger of siltation of the store has passed.
8. Remove berm in Phase 4, complete path and landscape



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Client

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No	Revision Description	Date	By

Project  
RESIDENTIAL DEVELOPMENT  
PARK  
WEXFORD

Sub Project  
Civil Engineering Drawings  
Title  
CONSTRUCTION MANAGEMENT OVERVIEW

First Issue Date  
05/08/2020  
Drawing No.  
PL 12

Design  
AM  
Scale  
1:2000 on A1  
Revision  
Status  
Planning