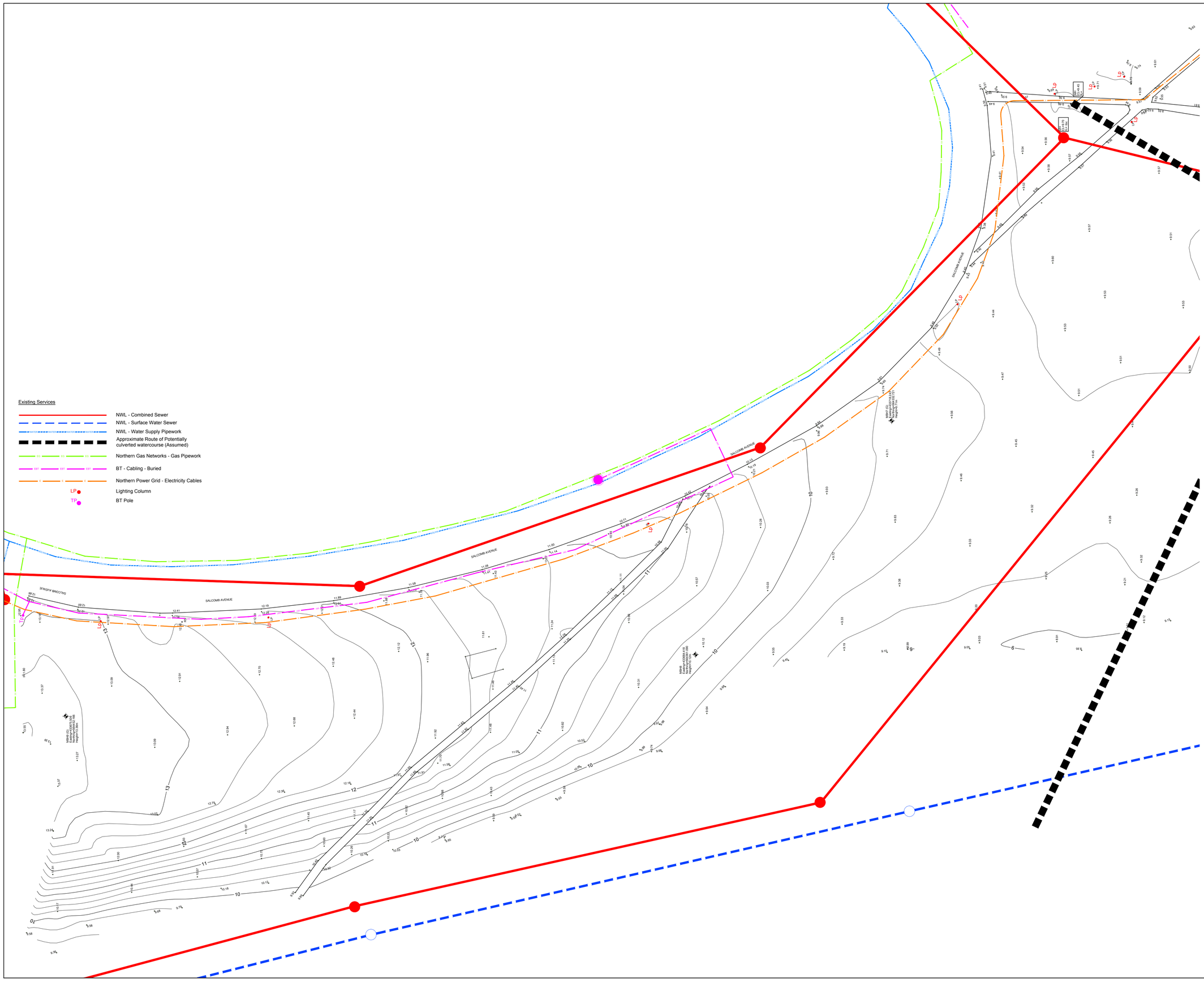
A1



Existing Services

- NWL - Combined Sewer
- NWL - Surface Water Sewer
- NWL - Water Supply Pipework
- Approximate Route of Potentially culverted watercourse (Assumed)
- Northern Gas Networks - Gas Pipework
- BT - Cabling - Buried
- Northern Power Grid - Electricity Cables
- LP Lighting Column
- TP BT Pole

Standard Notes

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G. The contractor is expected to cross check all drainage inverts prior to commencing work, this may involve completion of trial holes if invert levels have been interpolated.

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T1 030217 Issued for Tender KS DW

Rev	Date	Description	Drawn	Chkd

Project: SALCOMBE AVENUE, JARROW RESIDENTIAL DEVELOPMENT

Client: South Tyneside Homes

Architect: CEAD

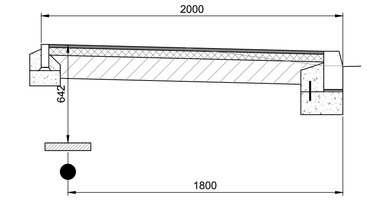
Title: EXISTING SERVICES

Scale	Drawn	Date
1:250	DW	DEC 16
Job Number	**Drawing Number**	**Rev.**
16134	C-GA-001	T1

CK21 Ltd.
Shakespeare House,
18 Shakespeare St,
Newcastle upon Tyne,
NE1 6AQ,
www.ck21.co.uk initial.surname@ck21.co.uk Telephone: (0191) 261 6312

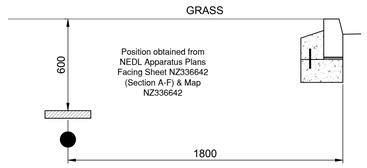
Status: TENDER

A1



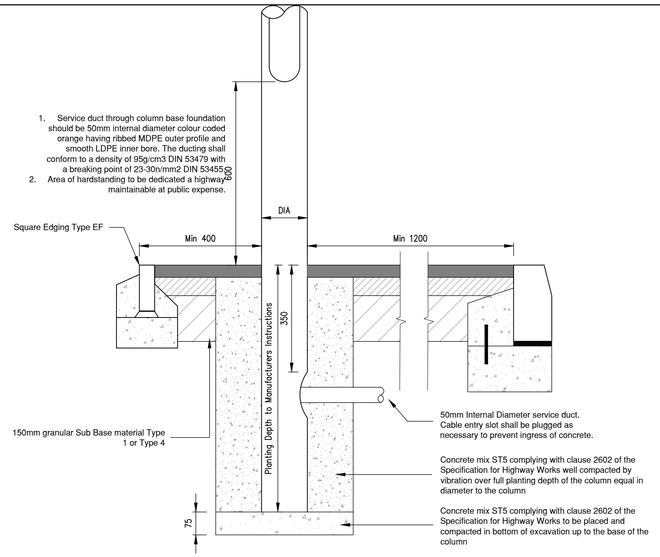
Proposed Cable Arrangement (A-F)

Scale 1:50



Existing Cable Arrangement (A-F)

Scale 1:50



ROAD LIGHTING COLUMN FOUNDATION DETAIL STANDARD INSTALLATION

SCALE 1:10

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- TP BT Pole

SALCOMBE AVENUE

Existing BT Pole to be retained. Layout could be amended to accommodate. However contractor to allow for diversion

Existing BT cable assumed to be at sufficient depth to avoid the need for lowering/protection. BT to confirm following trial pits

Existing Elec cable assumed to be at sufficient depth to avoid the need for lowering/protection. NEDL to confirm

Existing Elec cable to be lowered across extents of new access and road

Street lighting Column to be relocated to back of new kerbline (To be agreed with STC)

Street lighting Column to be relocated to back of new footpath/away from drive (See Detail)

Street lighting Column to be relocated to back of new footpath (See Detail)

Street lighting Column to be relocated to back of new footpath (See Detail)

3P APP

At Tender issue the scheme is subject to planning approval. As a result the technical approvals process can not commence until planning is awarded. The contractor should allow appropriate time within their programme to allow this process to be completed.

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Rev	Date	Description	Drawn	Chkd
T1	030217	Issued for Tender	KS	DW

Project: SALCOMBE AVENUE, JARROW RESIDENTIAL DEVELOPMENT

Client: South Tyneside Homes

Architect: CEAD

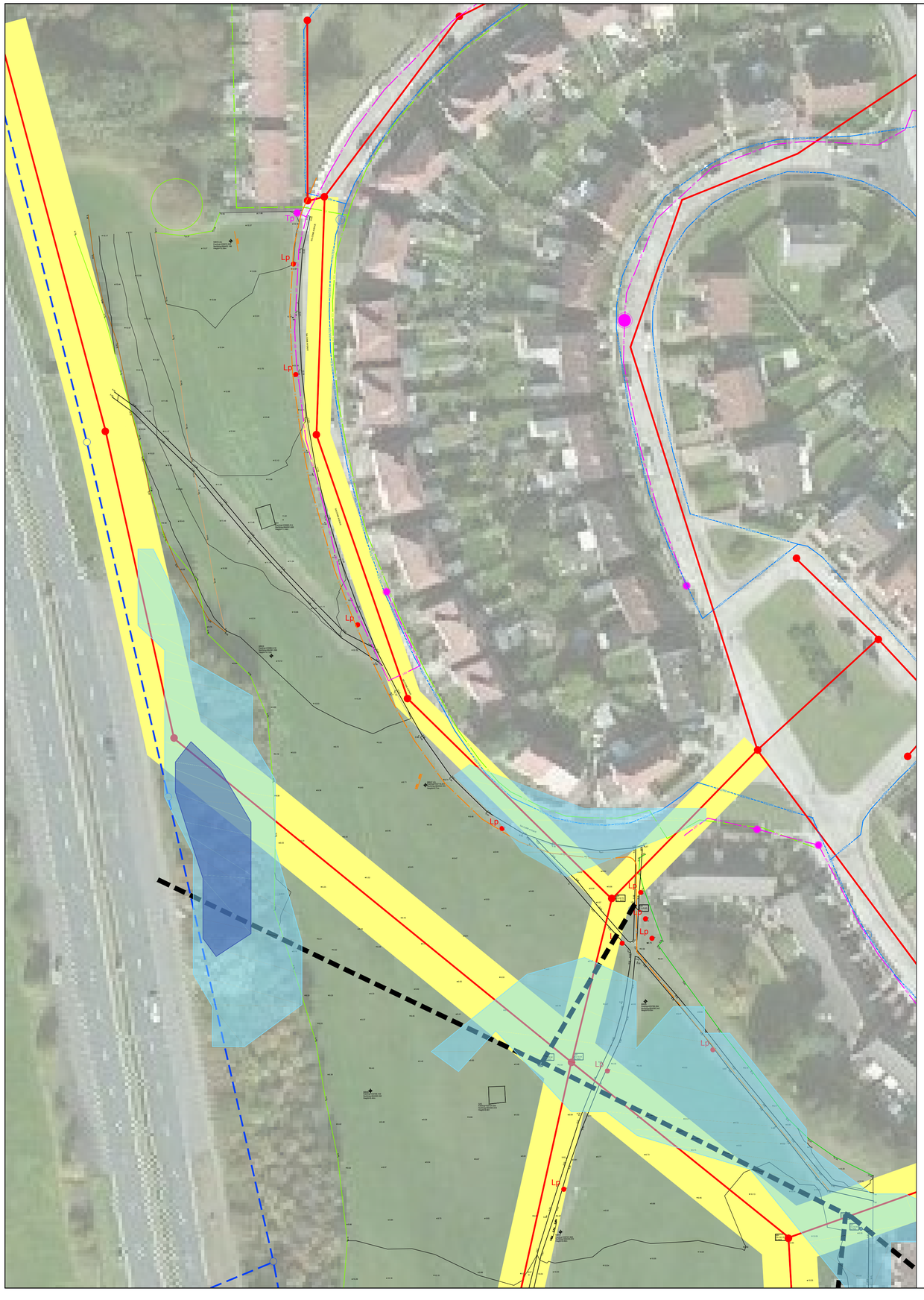
Title: PROPOSED SERVICE DIVERSIONS

Scale	Drawn	Date
1:250	DW	DEC 16
Job Number	**Drawing Number**	**Rev.**
16134	C-GA-002	T1

CK21 Ltd.
Shakespeare House,
18 Shakespeare St,
Newcastle upon Tyne,
NE1 6AQ,
www.ck21.co.uk initial.surname@ck21.co.uk Telephone: (0191) 261 6312

Status: TENDER

A1



Site Address
Salcombe Avenue, jarrow, South Tyneside
Nearest Postcode NE32 3SN
Easting 433683
Northing 564372
Nat Grid NZ336643

Legend :

The topographical information contained is based on the survey undertaken by CENTARA on behalf of DUNELM.

Existing Services

- NWL - Combined Sewer
- NWL - Surface Water Sewer
- NWL - Water Supply Pipework
- Approximate Route of Potentially culverted watercourse (Assumed)
- Northern Gas Networks - Gas Pipework
- BT - Cabling - Buried
- Northern Power Grid - Electricity Cables

Environment Agency - Flood Risk from surface water:

- LOW RISK - Below 300mm
- MEDIUM RISK - 300mm - 900mm
- HIGH RISK - Over 900mm

Trees

- Significant Mature Tree
- Tree line (Wood/Dene)

Geological & Geophysical Features

Overview

The below are extracts from the DUNELM Geotechnical & Environmental Phase 1 Desktop Study, Report No. D7716

Geology

The site is shown to be underlain by drift deposits comprising Pelaw Clay deposits. Glacial sands and gravels are present in the northwest corner of the site. In addition, the geological plan indicates an area of made ground through the centre of the site, in the area of the former stream/sewage pipe, indicated as Made ground/disturbed ground may also be encountered in the area of the embankments.
The solid geology underlying the site comprises Coal Measures strata. The strata dip towards the southeast. No coal seams are shown to outcrop in the vicinity of the site, however, due to the faulting on site and in the surrounding area, the shallowest coal seam beneath the site is considered to be an unnamed coal seam, up to 0.9m thick, recorded as banded.
An un-named fault is shown through the north of the site, with a downthrow to the north.
No significant ground hazards have been identified by the British Geological Survey as reported in the Groundsure Report.

Mining & Quarrying

The mining report indicates that the site may be underlain by workings in two coal seams, the shallowest being the Maudlin Seam at a depth of approximately 332m below ground level and a thickness of 0.58m.
At this depth and thickness, working in this seam are not considered to pose a significant risk to the development.
Based on the geological maps, the site is situated above the Wear Mouth Marine Band. Therefore, the shallowest coal seam beneath the site would be a thin unnamed coal seam and an unnamed seam up to 0.9m thick. Based on the vertical section, the coal would be at a depth of >15m below rock head.
Therefore, given the thickness of the seam at 0.9m, sufficient rock cover should be present to mitigate against workings in this seam, should they be present.
There are no recorded mine entries within 20m of the site.
No evidence has been found to suggest that the site has been affected by quarrying.

Landfills & Other Potential Gas Sources

The Groundsure Report indicates two recorded landfill sites located within 250m of the site, the closest being approximately 102m west of the site at NGR 433400, 563700. Whilst operational, authorized wastes included industrial, commercial and household waste. The landfill was active from 1950 to 1973.
Historical plans indicate that a pond 30m to the southwest of the site was backfilled prior to 1965.
Consequently there may be made ground at this location together with organic sediments that could represent a potential source of gas. In addition, the historical plans and geological plans indicate an area of made ground through the centre of the site, possibly associated with a former stream/drain present in this The nature of the infill is unknown, however this feature could represent a potential source of gas.

Radon Gas
In accordance with the procedure described in BRE Publication BR211 Radon: Guidance on Protective Measures for New Dwellings, no radon protection measures are required for new buildings on the site.

T1 030217 Issued for Tender KS DW

Rev	Date	Description	Drawn	Chkd

Project: PORLOCK, JARROW
RESIDENTIAL DEVELOPMENT

Client: South Tyneside Homes

Architect: CEAD

Title: ENGINEERING CONSTRAINTS PLAN

Scale	Drawn	Date
1:500	DW	DEC 16
Job Number	**Drawing Number**	**Rev.**
16124	C-GA-005	T1

CK21 Ltd.
Shakespeare House,
18 Shakespeare St,
Newcastle upon Tyne,
NE1 6AQ,
www.ck21.co.uk initial.surname@ck21.co.uk Telephone: (0191) 261 6312

Status: TENDER

A1

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Legend

- K1 - Half Battered Kerb (Refer to C-GA-104 for detail)
- K9 - Bullnosed Kerb (Refer to C-GA-104 for detail)
- C2 - Centre Stone (Refer to C-GA-104 for detail)
- E3 - Edging Kerb (Refer to C-GA-104 for detail)
- Adoptable Footway (Refer to C-GA-104 for detail)
- Public Carriageway (Refer to C-GA-104 for detail)
- Private Block Paved Driveway/Parking (Refer to C-GA-104 for detail)
- Private Flagged Footpath (Refer to C-GA-104 for detail)

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T1 030217 Issued for Tender KS DW

Rev	Date	Description	Drawn	Chkd

Project: SALCOMBE AVENUE, JARROW RESIDENTIAL DEVELOPMENT

Client: South Tyneside Homes

Architect: CEAD

Title: SURFACE FINISHES

Scale	Drawn	Date
1:200	DW	DEC 16
Job Number	**Drawing Number**	**Rev.**
16124	C-GA-102	T1

CK21 Ltd.
Shakespeare House,
18 Shakespeare St,
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10. Contractor to allow for all Sectional agreement fees within their proposal.
11. All connections to the existing sewer network must be done under a Section 106 application. To be completed and paid for by the contractor.

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12. Invert and cover levels of all adoptable manholes.
13. New gully positions and connections.
14. Position and depth of service ducts for water, gas, electric, BT, cable and street lighting, stating size and number of ducts.

Workmanship

1. All works are to be undertaken in accordance with the relevant local highways authority and/or drainage undertakers (as appropriate) specification and detailing.
2. It is the responsibility of the contractor to ensure that they have agreed with and liaised with the relevant authorities clerk of works prior to commencement. A suitable inspection regime should be agreed with the clerk of works covering the duration of the works.
3. Any amendments requested on site by the clerk of works, following technical approval of the drawings, resulting in additional works should be verified by the engineer and client or clients representative prior to commencement.

Discharge Rates

1. The pre development site is a greenfield site, measuring 0.38ha, with no obvious natural surface water outfall. the existing topography falls North/South and East/West. Existing overland flows are likely to run east into the wooded area and be blocked by the embankment of the adjacent A19.

2. Consideration of the surface water hierarchy has been undertaken.
- Review of the Site Investigation report, produced by Dunelm, Dec 16, confirms that the underlying strata is not suitable to accept infiltration.
- The closest natural watercourse is approx 300m to the north of the site, which considering the topography and existing built environment, is considered an unacceptable distance/level to connect to directly.
- A Pre development enquiry has been submitted to NWL, applying for consent to discharge into the surface water sewer that runs SOUTH/NORTH within the western boundary of the site.

3. It is proposed that the surface water run off generated by the proposed development will be attenuated on site and released to the receiving watercourse at equivalent greenfield runoff rates. The existing greenfield run off rates from the development area (excluding the non contributing soft landscaping areas) have been calculated as follows:

Methodology (IH124):
QBar = 0.95 l/s
1 in 1 year = 0.82 l/s
1 in 30 year = 1.67 l/s
1 in 100 year = 1.98 l/s

In accordance with best practice a minimum flow rate of 5 l/s will be applies to any site.Greenfield runoff calculations have been provided separately.

4. It is proposed to utilize SuDS in combination with a suitable flow control device to restrict and attenuate flows from site to the above rates.
A Bio-Retention basin has been selected as an appropriate method of SuDS to treat the proposed flows. Bioretention systems are shallow landscaped areas that can reduce runoff rates and volumes, and treat pollution through the use of engineered soils and vegetation. They are particularly effective in delivering interception and can also provide;
- attractive landscape features that are self irrigating and fertilizing
- habitat and biodiversity.

5. The system including the SuDS has been designed to accommodate the 100yr 360min storm event,without flooding, whilst ensuring that any flood volume from the critical 100 year event or as a result of system failure remains within the development boundary.

6. The SuDS Feature(s) will be maintained by the client (or management company) to ensure the performance of the drainage system is maintained throughout the design life of the development. A maintenance schedule will be provided separately.

7. The actual (at planning stage) calculated discharge rates into the receiving watercourse are as follows.

1 in 1 year = 4.2 l/s
1 in 30 year = 4.5 l/s
1 in 100 year = 4.5 l/s

These rates are derived from the Windes software model and include an allowance for 40% climate change. The windes calculations have been provided separately.

At Tender issue the scheme is subject to planning approval. As a result the technical approvals process can not commence until planning is awarded. The contractor should allow appropriate time within their programme to allow this process to be completed.

At time of issue the NWL Pre Development Enquiry response was still awaited. Drainage design may be subject to change following NWL comment/approval

At time of issue the Planning Approval was not received. Technical approval of the drainage scheme by the LLFA can only occur post planning. As a result the Drainage design may be subject to change pending STC LLFA comment/approval

Treatment

Reference to the CIRIA C753, The SUDS Manual (2015), section 26.7, details the method to determine the SUDS pollution mitigation indices.

To deliver adequate treatment, the selected SUDS components should have a total pollution mitigation index (for each containment type) that equals or exceeds the pollution hazard index (for each containment type)

Total SuDS mitigation index ≥ pollution hazard index

Table 1

Land Use	Pollution Hazard Leve	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2000	0.2000	0.0500
Individual Property Driveways, residential car parks, low traffic roads	Very Low	0.5000	0.4000	0.4000

Table 1 - based on Table 26.2 - Pollution hazard indices for different land use classifications

Table 2

Types of SUDS Component	Mitigation Indices TSS	Metals	Hydrocarbons
Bio-retention Basin	0.8	0.800	0.800
Total	0.8	0.800	0.800

Table 2 - based on Table 26.3 - Indicative SuDS mitigation indices for discharge to surface waters

Conclusion:
Reference to the above criteria confirms that the BIO-RETENTION BASIN alone provides sufficient SUDS mitigation from the new build residential scheme. Treating all sources in compliance with the requirements of CIRIA C753, The SUDS Manual (2016), section 26.7.

Manhole Number	Cover Level	Connections	Pipe: Code	Inverts	Diams Inv-soff	Manhole Size	Types: Manhole	Cover
Coordinates	Depth To Soffit							
S17	9.500	1	1 1.015	7.017	225			
	4.000 ASSUMED TBC	0	0 1.016	5.5 (tbc)	225	1200	A	675x675 D400
E. 433665.523 N. 564331.003								
S16	9.110	1 2	1 1.014	8.400	225			
	1.754	0	2 12.006	7.256	150			
E. 433684.161 N. 564335.222			0 1.015	7.131	225	1200	B	675x675 D400
S14	9.615	1	1 1.012	8.751	225			
	0.639	0	0 1.013	8.751	225	1350	E	1240x675 D400
E. 433693.780 N. 564341.283								
S12	10.430	2 1	1 10.001	8.970	225			
	1.360	0	2 1.010	9.533	225			
E. 433706.375 N. 564347.967			0 1.011	8.845	225	1350	E	1240x675 D400
S19	9.400	1	1 12.005	7.694	150			
	1.556	0	0 12.006	7.694	150	1200	B	675x675 D400
E. 433704.645 N. 564319.711								

SURFACE WATER MANHOLE SCHEDULE

Manhole Number	Cover Level	Connections	Pipe: Code	Inverts	Diams Inv-soff	Manhole Size	Types: Manhole	Cover
Coordinates	Depth To Soffit							
F1	9.500	1	1 F18.004	8.452	150			
	3.500 ASSUMED DEPTH	0	0 EXISTING	TBC	375	1500	A	675x675 D400
E. 433750.955 N. 564315.811								

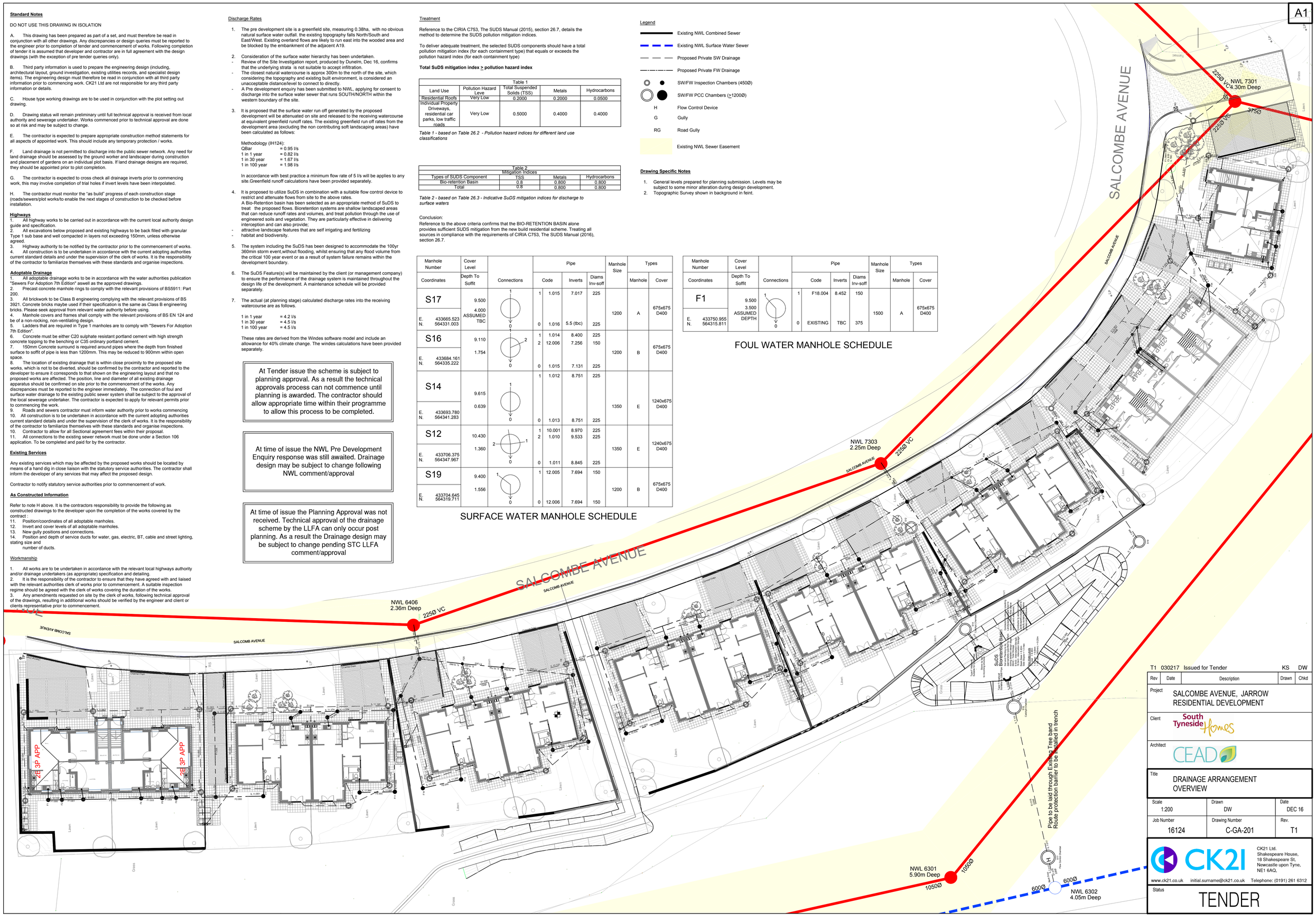
FOUL WATER MANHOLE SCHEDULE

Legend

- Existing NWL Combined Sewer
- Existing NWL Surface Water Sewer
- Proposed Private SW Drainage
- Proposed Private FW Drainage
- SW/FW Inspection Chambers (450Ø)
- SW/FW PCC Chambers (>1200Ø)
- H Flow Control Device
- G Gully
- RG Road Gully
- Existing NWL Sewer Easement

Drawing Specific Notes

1. General levels prepared for planning submission. Levels may be subject to some minor alteration during design development.
2. Topographic Survey shown in background in feint.



T1 030217 Issued for Tender KS DW

Rev	Date	Description	Drawn	Chkd

Project: SALCOMBE AVENUE, JARROW RESIDENTIAL DEVELOPMENT

Client: South Tyneside Homes

Architect: CEAD

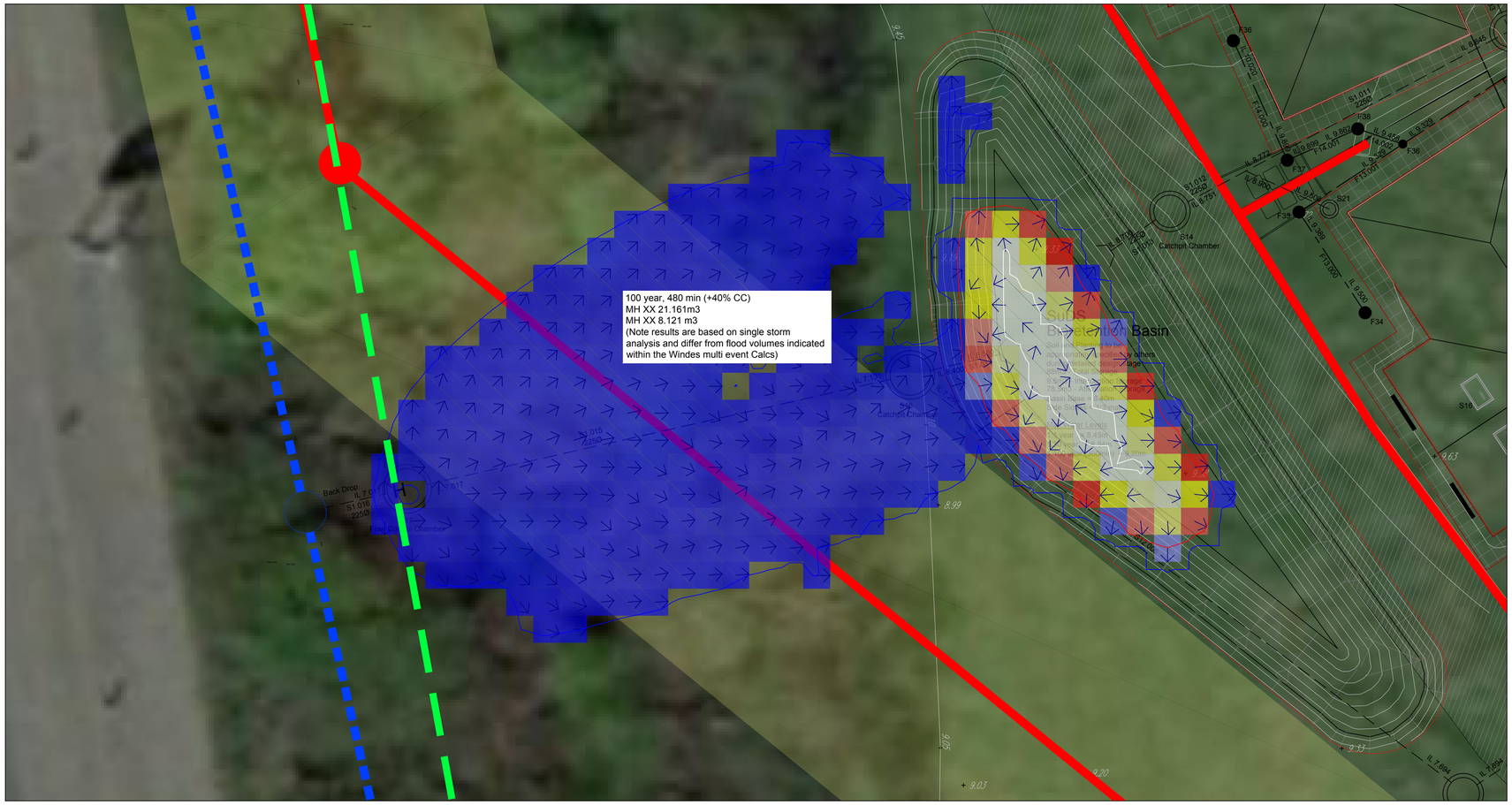
Title: DRAINAGE ARRANGEMENT OVERVIEW

Scale	Drawn	Date
1:200	DW	DEC 16
Job Number	Drawing Number	Rev.
16124	C-GA-201	T1

CK21 Ltd.
Shakespeare House,
18 Shakespeare St,
Newcastle upon Tyne,
NE1 6AQ.
www.ck21.co.uk initial.surname@ck21.co.uk Telephone: (0191) 261 6312

Status: TENDER

A1



Post Development - Critical Event - Flood Flow Analysis - 100yr 480min + 40% climate change

Standard Notes

DO NOT USE THIS DRAWING IN ISOLATION

A. This drawing has been prepared as part of a set, and must therefore be read in conjunction with all other drawings. Any discrepancies or design queries must be reported to the engineer prior to completion of tender and commencement of works. Following completion of tender it is assumed that developer and contractor are in full agreement with the design drawings (with the exception of pre tender queries only).

B. Third party information is used to prepare the engineering design (including, architectural layout, ground investigation, existing utilities records, and specialist design items). The engineering design must therefore be read in conjunction with all third party information prior to commencing work. CK21 Ltd are not responsible for any third party information or details.

C. House type working drawings are to be used in conjunction with the plot setting out drawing.

D. Drawing status will remain preliminary until full technical approval is received from local authority and sewerage undertaker. Works commenced prior to technical approval are done so at risk and may be subject to change.

E. The contractor is expected to prepare appropriate construction method statements for all aspects of appointed work. This should include any temporary protection / works.

F. Land drainage is not permitted to discharge into the public sewer network. Any need for land drainage should be assessed by the ground worker and landscaper during construction and placement of gardens on an individual plot basis. If land drainage designs are required, they should be appointed prior to plot completion.

G. The contractor is expected to cross check all drainage inverts prior to commencing work, this may involve completion of trial holes if invert levels have been interpolated.

H. The contractor must monitor the "as build" progress of each construction stage (roads/sewers/plot works/to enable the next stages of construction to be checked before installation.

Highways

1. All highway works to be carried out in accordance with the current local authority design guide and specification.
2. All excavations below proposed and existing highways to be back filled with granular Type 1 sub base and well compacted in layers not exceeding 150mm, unless otherwise agreed.
3. Highway authority to be notified by the contractor prior to the commencement of works.

Adoptable Drainage

1. All adoptable drainage works to be in accordance with the water authorities publication "Sewers For Adoption 7th Edition" aswell as the approved drawings.
2. Precast concrete manhole rings to comply with the relevant provisions of BS5911: Part 200.
3. All brickwork to be Class B engineering complying with the relevant provisions of BS 3921. Concrete bricks maybe used if their specification is the same as Class B engineering bricks. Please seek approval from relevant water authority before using.
4. Manhole covers and frames shall comply with the relevant provisions of BS EN 124 and be of a non-rocking, non-ventilating design.
5. Ladders that are required in Type 1 manholes are to comply with "Sewers For Adoption 7th Edition".
6. Concrete must be either C20 sulphate resistant portland cement with high strength concrete topping to the benching or C35 ordinary portland cement.
7. 150mm Concrete surround is required around pipes where the depth from finished surface to soffit of pipe is less than 1200mm. This may be reduced to 900mm within open space.
8. The location of existing drainage that is within close proximity to the proposed site works, which is not to be diverted, should be confirmed by the contractor and reported to the developer to ensure it corresponds to that shown on the engineering layout and that no proposed works are affected. The position, line and diameter of all existing drainage apparatus should be confirmed on site prior to the commencement of the works. Any discrepancies must be reported to the engineer immediately. The connection of foul and surface water drainage to the existing public sewer system shall be subject to the approval of the local sewerage undertaker. The contractor is expected to apply for relevant permits prior to commencing the work.
9. Roads and sewers contractor must inform water authority prior to works commencing

Existing Services

Any existing services which may be affected by the proposed works should be located by means of a hand dig in close liaison with the statutory service authorities. The contractor shall inform the developer of any services that may affect the proposed design.

Contractor to notify statutory service authorities prior to commencement of work.

As Constructed Information

Refer to note H above. It is the contractors responsibility to provide the following as constructed drawings to the developer upon the completion of the works covered by the contract :

1. Position/coordinates of all adoptable manholes.
2. Invert and cover levels of all adoptable manholes.
3. New gully positions and connections.
4. Position and depth of service ducts for water, gas, electric, BT, cable and street lighting, stating size and number of ducts.

Drawing Specific Notes

1. General levels prepared for planning submission. Levels may be subject to some minor alteration during design development.
2. Topographic Survey shown in background in feint.

Legend

- Development Boundary
- Existing NWL Combined Sewer
- Existing NWL Surface Water Sewer
- Proposed Private SW Drainage
- Proposed Private FW Drainage
- SW/FW Inspection Chambers (450Ø)
- SW/FW PCC Chambers (>1200Ø)
- H — Flow Control Device
- G — Gully
- RG — Road Gully
- Existing NWL Sewer Easement

Flood Flow

- Depth 10 - 100mm
- Depth 101 - 300mm
- Depth 301 - 600mm

Rev	Date	Description	Drawn	Chkd
T1	030217	Issued for Tender	KS	DW

Project: SALCOMBE AVENUE, JARROW RESIDENTIAL DEVELOPMENT

Client: South Tyneside Homes

Architect: CEAD

Title: FLOOD FLOW ANALYSIS CRITICAL EVENT (100yr 480min)

Scale	Drawn	Date
1:200	DW	DEC 16

Job Number	Drawing Number	Rev.
16124	C-GA-211	T1

CK21 Ltd.
Shakespeare House,
18 Shakespeare St,
Newcastle upon Tyne,
NE1 6AQ,
www.ck21.co.uk initial.surname@ck21.co.uk Telephone: (0191) 261 6312

Status: PRELIMINARY