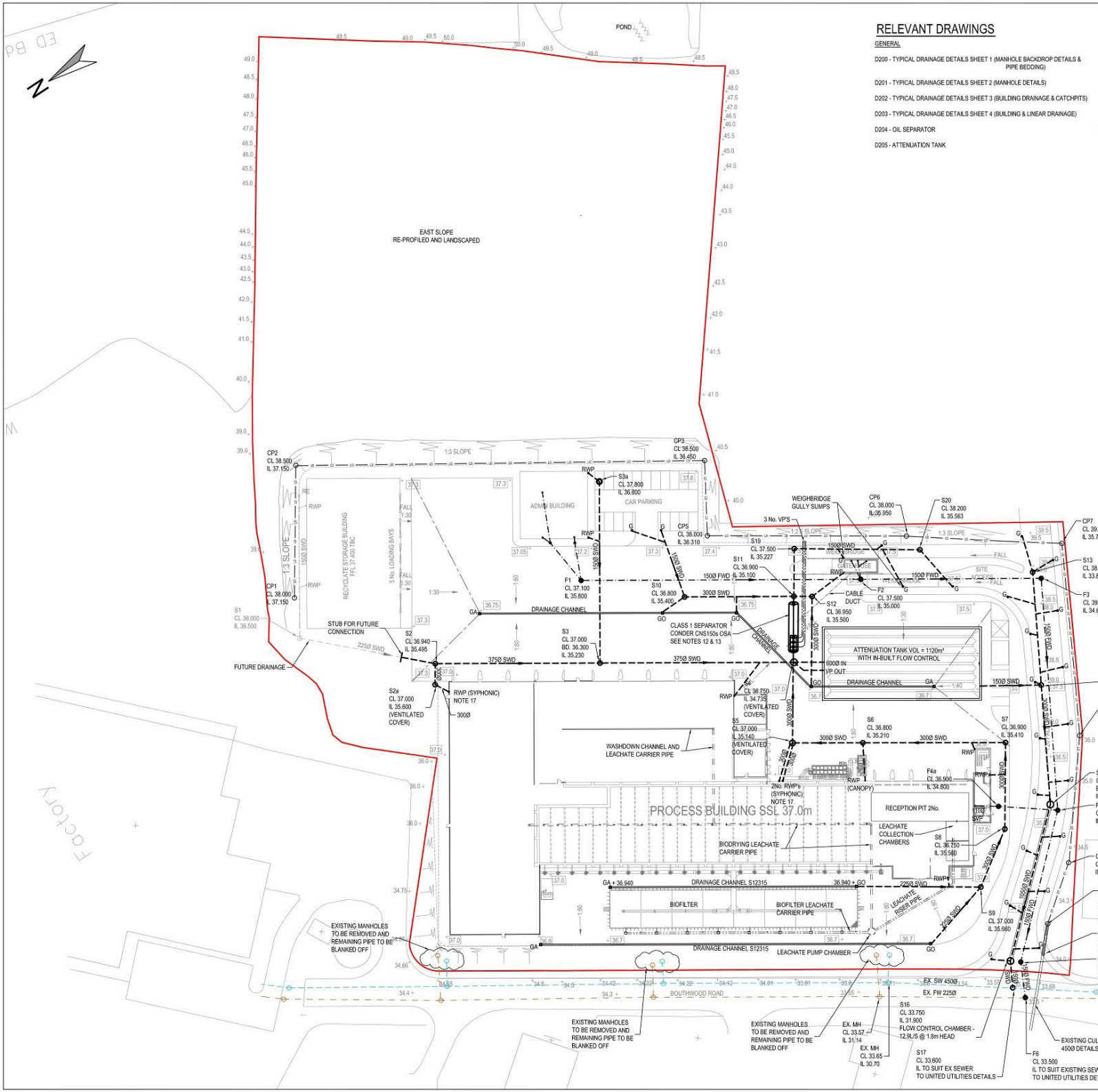

RELEVANT DRAWINGS

GENERAL

D200 - TYPICAL DRAINAGE DETAILS SHEET 1 (MANHOLE BACKDROP DETAILS & PIPE BEDDING)

D201 - TYPICAL DRAINAGE DETAILS SHEET 2 (MANHOLE DETAILS)

D202 - TYPICAL DRAINAGE DETAILS SHEET 3 (BUILDING DRAINAGE & CATCHPITS)

D203 - TYPICAL DRAINAGE DETAILS SHEET 4 (BUILDING & LINEAR DRAINAGE)

D204 - OIL SEPARATOR

D205 - ATTENUATION TANK

LEGEND

- EXISTING SURFACE WATER SEWER
- EXISTING FOUL WATER SEWER
- SITE BOUNDARY (RED LINE)
- S1 — SURFACE WATER DRAIN & MANHOLE
- F1 — FOUL WATER DRAIN & MANHOLE 100Ø UNLESS NOTED OTHERWISE
- CP1 — LAND DRAIN CATCHPIT AND DRAIN - 225Ø PERFORATED WHERE ACTING AS COLLECTOR. SOLID WHEN ACTING AS CARRIER
- LEACHATE DRAINAGE - DESIGN BY ECO DECO
- GA — GO — DRAINAGE CHANNEL - GATIC UNISLOT 300mm. REF: S12320 UNLESS NOTED OTHERWISE. COMPLETE WITH ACCESS / OUTLET BOXES
- RWP — RAINWATER PIPE
- G — GULLY 150Ø
- +37.0 — PROPOSED LEVEL
- 1 : 30 — SERVICE YARD FALL

IMPORTANT CDM / H&S NOTE

THE DESIGNERS WOULD DRAW THE READERS ATTENTION TO THE KEY RESIDUAL HEALTH AND SAFETY RISKS THAT HAVE NOT BEEN ELIMINATED FROM THE DESIGNS SHOWN ON THIS DRAWING BY THE DESIGN PROCESS. THESE KEY RESIDUAL RISKS ARE IDENTIFIED BELOW:

- WORKING BELOW A BODY OF WATER (POND)
- EXCAVATION BELOW PERCHED WATER TABLE
- WORKING ON A LIVE CULVERT (FLOODING/DROWNING.)

ANY CONSTRUCTION PERSONNEL INCLUDING OPERATIVES INTENDING TO CONSTRUCT THE DESIGNS SHOWN ON THIS DRAWING SHOULD ENSURE THAT THEY HAVE BEEN REGULARLY AND THOROUGHLY BRIEFED BY THE PRINCIPAL CONTRACTOR ON ALL HEALTH AND SAFETY MATTERS AND HAVE HAD SIGHT OF:

(1) THE FULL DESIGNERS AND CONTRACTORS RISK ASSESSMENTS AND RISK REGISTERS.
(2) THE DEVELOPED CONSTRUCTION HEALTH AND SAFETY PLAN.
(3) THE CONTRACTORS CONSTRUCTION METHOD STATEMENTS.

DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS

NOTES

GENERAL

1. DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT PROJECT DRAWINGS AND DOCUMENTS
2. ALL WORKS TO ADHERE TO THE RELEVANT CDM REGULATIONS, PROJECT RELATED CDM DOCUMENTATION AND HEALTH AND SAFETY RISK ASSESSMENTS
3. ALL DRAINAGE WORKS TO BE CARRIED OUT IN ACCORDANCE WITH BS EN 752 - DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS
4. ALL ADOPTABLE SEWERAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE "SEWERS FOR ADOPTION" - 6TH EDITION AND ADOPTING WATER COMPANY'S REQUIREMENTS AND SPECIFICATIONS.
5. EXISTING PUBLIC SEWER INFORMATION TAKEN FROM UNITED UTILITIES MAP OF PUBLIC SEWERS.
6. POSITION SIZE AND DEPTH OF ALL EXISTING SEWERS AND SERVICES SHALL BE ESTABLISHED PRIOR TO COMMENCEMENT ON SITE.
7. ALL COVERS IN TRAFFICKED AREAS TO HAVE D400 CLASSIFICATION
8. CONTRACTOR TO CHECK ALL LEVELS PRIOR TO COMMENCING WORKS AND REPORT ANY DISCREPANCIES TO THE DESIGN ENGINEER IMMEDIATELY.
9. ROAD GULLY AND RWP CONNECTIONS TO BE 150Ø.
10. ALL OTHER PIPEWORK 100Ø UNLESS NOTED OTHERWISE
11. FOR FURTHER NOTES REGARDING GROUND CONDITIONS / MANHOLE DETAILS / BEDDING DETAILS ETC REFER TO DRAWINGS D200, D201, D202 AND D203

OIL SEPARATOR

12. OIL SEPARATOR TO BE IN ACCORDANCE WITH PPG 3 (EA BOOKLET). I.E. COMPLETE WITH OIL LEVEL ALARM AND VENT PIPE ETC. CONCRETE SURROUND PROTECTION AS STRUCTURAL ENGINEER/ MANUFACTURERS RECOMMENDATIONS. FOR DETAILS REFER TO DRAWING D204
13. ELECTRICAL ENGINEER TO CONFIRM DETAILS DUCT ROUTES FOR SEPARATOR.

ATTENUATION TANK

14. ATTENUATION TANK TO BE HANDLED / INSTALLED / DECOMMISSIONED IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
15. FOR DETAILS REFER TO DRAWING D205
16. VENT PIPES (VP'S) TO BE 110Ø PIPEWORK AND TERMINATION POINTS AS SHOWN.

SYPHONIC ROOF DRAINAGE

17. SYPHONIC RWP's AND CONNECTIONS TO MANHOLES BY FULLFLOW GROUP LIMITED. RECEIVING CHAMBER TO HAVE VENTILATED COVER

SURFACE WATER FLOW CONTROLS

18. MAIN SITE DRAINAGE FLOW CONTROL ON OUTLET FROM ATTENUATION TANK
19. TOTAL SITE = MAIN SITE + ACCESS ROAD FLOW CONTROL CHAMBER = MHS16

LEACHATE DRAINAGE

20. LEACHATE DRAINAGE SHOWN IS INDICATIVE AND BY OTHERS. FOR DETAILS REFER TO ECO-DECO DRAWING. LEACHATE CONNECTED INTO 2No UNDERGROUND CHAMBERS AND DISPOSED OF OFF SITE BY TANKERS

0 5 10 15 20 25 m
SCALE 1:500

FOR APPROVAL

REV	DESCRIPTION	BY	CHK	APP	DATE
P2	ISSUED FOR APPROVAL	NGP	JSP	DB	23.07.10
P1	ISSUED FOR COSTING PURPOSES	NGP	JSP	AW	14.05.10

JSP

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Project:
SHANKS CUMBRIA
BARROW RESOURCE PARK

Drawing Title:
DRAINAGE LAYOUT

Scale @ A1	Drawn	Date	Checked	Date	Approved	Date
1:500	JSP	MAR 2010	JSP	MAY 2010	AW	MAY 2010

Project No.	Office	Type	Drawing No.	Revision
A060111	21	C	D100	P2

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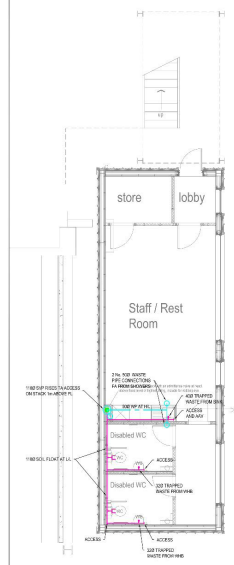
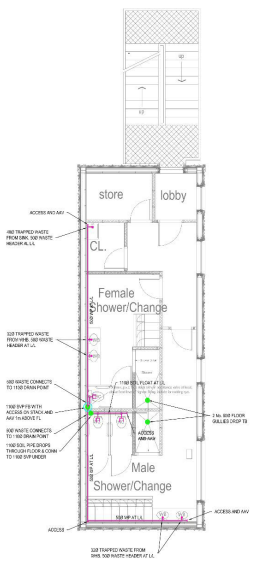
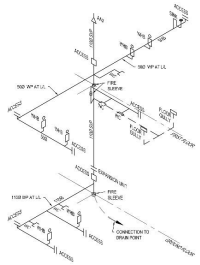


GROUND FLOOR



FIRST FLOOR



SCHEMATIC DIAGRAM

DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS

NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT PROJECT INFORMATION.
2. ALL ABOVE GROUND DRAINAGE TO COMPLY WITH BS EN 12056 - GRAVITY DRAINAGE SYSTEMS INSIDE BUILDINGS.
3. ALL DRAINAGE PIPEWORK ABOVE 40mm DIA. SHALL BE PROVIDED WITH FIRE COLLARS WHEREVER THE PIPEWORK PASSES THROUGH FIRE RATED STRUCTURE. THE RATING OF THE COLLAR SHALL BE EQUAL TO THE FIRE RATING OF THE STRUCTURE THROUGH WHICH THE PIPE PASSES.
4. ALL VERTICAL AND HORIZONTAL PIPEWORK SHALL BE SUPPORTED BY THE MANUFACTURERS RECOMMENDED PIPE SUPPORTS. SUPPORTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.
5. ACCESS POINTS SHALL BE PROVIDED APPROXIMATELY 1m ABOVE FFL AND AT CHANGES IN PIPE DIRECTION.
6. ABOVE GROUND DRAINAGE WILL BE TESTED BEFORE BEING ENCLOSED WITH PIPE DUCTING (WHERE APPLICABLE).
7. 32Ø TRAPPED CONNECTIONS TO WMB.
8. 40Ø TRAPPED CONNECTIONS TO SINKS.
9. 50Ø TRAPPED CONNECTIONS TO FLOOR GULLIES.
10. 110Ø CONNECTION TO MCTL.
11. ALL TRAPS SHALL BE ANTI-SYPHON WITH MIN. 50mm SEAL.
12. PIPE GRADIENTS TO BS EN 12056-2:2000 TABLE 5.
13. AIR ADMITTANCE VALVES IN ACCORDANCE WITH pr EN 12380 AND SIZE AS STATED IN BS EN 12056 ?

LEGEND

- SOIL/WASTE PIPE DROP TO BELOW
- SOIL VENT PIPE (SVP) DROPS IN (FROM ABOVE) TO HVT.
- SOIL VENT PIPE DROPS FR A TO (TO BELOW)
- SOIL/WASTE PIPE AT HL IN CEILING VOID
- SOIL/WASTE PIPE AT LL

0 500 1000 1500 2000 2500 mm
SCALE 1:50

PRELIMINARY ISSUE

REV	DESCRIPTION	BY	CHK	APP	DATE
P1	FIRST ISSUE	NGP	JGP	AW	14.05.20

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Project:
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BARROW RESOURCE PARK

Drawing Title:
OFFICE POD
ABOVE GROUND
DRAINAGE LAYOUT

Scale @ A2	Drawn	Date	Checked	Date	Approved	Date
1:50	NGP	MAY 2020	JGP	MAY 2020	AW	MAY 2020

Project No.	Office	Type	Drawing No.	Revision
A060111	21	C	D110	P1

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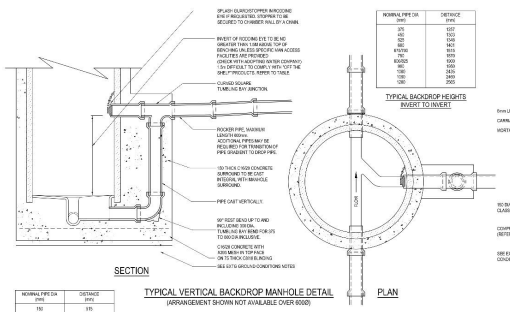


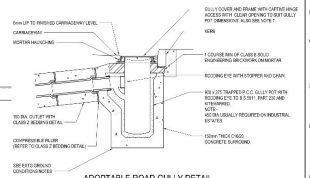
NOMINAL PIPE DIA (mm)	DISTANCE (mm)
150	315
225	695
300	865

TYPICAL BACKDROP HEIGHTS (REST BEND ASSUMED) INVERT TO INVERT

NOMINAL PIPE DIA (mm)	DISTANCE (mm)
375	1007
450	1303
525	1525
600	1695
675(750)	1815
750	2079
825(825)	1000
900	2325
1050	2475
1200	2489
1350	2505

TYPICAL BACKDROP HEIGHTS INVERT TO INVERT

TYPICAL VERTICAL BACKDROP MANHOLE DETAIL
(ARRANGEMENT SHOWN NOT AVAILABLE OVER 600Ø)



ADOPTABLE ROAD GULLY DETAIL

NOTES

1. ALL ADOPTABLE SEWERAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE "SEWERS FOR ADOPTION" - 6TH EDITION AND ADOPTING WATER COMPANY'S REQUIREMENTS AND SPECIFICATIONS.
2. POSITION SIZES AND DEPTH OF ALL EXISTING SEWERS AND SERVICES SHALL BE ESTABLISHED PRIOR TO COMMENCEMENT ON SITE.
3. HOTTO AND PRECAST CONCRETE UNITS SHALL HAVE SULPHATE RESISTING PORTLAND CEMENT TO BS 4027, UNLESS AGREED OTHERWISE WITH THE ADOPTING AUTHORITY.
4. PRECAST CONCRETE PRODUCTS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS 5911 AND BE HYDRAMARKED. CONCRETE PIPES TO BE CLASS 120.
5. VITRIFIED CLAY PIPES AND FITTINGS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS12920 AND BE HYDRAMARKED. PIPE CRUSHING STRENGTH TO BE CLASS 280. IN AGGRESSIVE ENVIRONMENTS CAREFUL CONSIDERATION TO BE GIVEN TO JOINTING SYSTEM.
6. MANHOLE COVERS AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 124 AND HAVE THE MINIMUM CLEAR OPENINGS AS DESCRIBED IN SEWERS FOR ADOPTION 6TH - 1ST DEEP FRAMES UNLESS OTHERWISE SPECIFIED. MAN-HOLE COVERS AND FRAMES TO BE OF A NON-ROCKING DESIGN AND HYDRAMARKED. CAST CLASS D400 IN VEHICULAR TRAFFICKED AREAS AND CAST CLASS B125 IN FOOTWAYS AND PEDESTRIAN AREAS.
7. GULLY GRATES AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 124 AND BE OF A NON-ROCKING DESIGN WITH CAPTIVE HINGE ACCESS AND BE HYDRAMARKED. LOAD CLASS D400 FOR USE IN VEHICULAR TRAFFICKED AREAS AND LOAD CLASS B125 IN FOOTWAYS AND PEDESTRIAN AREAS. NOTE: CLASS D400 ONLY REQUIRED IN LUCRATIVE TRAFFICKED AREAS eg. SUPA'S, BOARDS, CULDESACS, RESIDENTIAL CAR PARKING AREAS ETC.
8. CLASS Z OR CONCRETE SUBS PROTECTION DETAIL SHALL BE PROVIDED ON ALL PIPES LESS THAN 1.0M BELOW THE ROAD SURFACE IN LUCRATIVE TRAFFICKED AREAS AND THAN 0.6M BELOW THE TOTAL HEAD GULLY CONNECTIONS AND WITH AREAS OF DEEP ROOTING VEGETATION WHERE CLASS Z TRENCH BEDDING DETAIL IS USED. THE CONCRETE BED AND SURROUND SHALL BE DISCONTINUED AT EACH PIPE JOINT OVER THE FULL BED SECTION BY MEANS OF A SAWED COMPRESSIBLE FILLER. (SEE TABLE)
9. GRANULAR TYPE 1 SUB BASE TO BE IN ACCORDANCE WITH CL. 803 OF the SPECIFICATION FOR HIGHWAY WORKS 1986 AND LAID IN ACCORDANCE WITH CL. 803 OF the SPECIFICATION FOR HIGHWAY WORKS. FOR USE IN PIPE GRANULAR TYPE 1 SUB BASE WITHIN 300mm OF CROWN OF PIPE TO BE 40mm DOWN. LIMESTONE AGGREGATE NOT PERMITTED IF A PH OF 9 OR LESS IS LIKELY OR GROUNDWATER IS PRESENT.
10. SELECTED EXCAVATED MATERIAL SHALL BE OF A UNIFORM NATURE FREE FROM STONES LARGER THAN 50 mm. SUCH LUMPS LARGER THAN 75mm, TREE ROOTS, ORGANIC MATTER AND FROZEN SOIL (REFER TO DESIGN CLAUSE 2.46). MECHANICALLY COMPACTED SELECTED EXCAVATED MATERIAL TO BE COMPACTED IN LAYERS WITH A VIBRATORY ROLLER COMPLYING WITH METHOD 2 OR TRIALS OF CL 612 SPECIFICATION FOR HIGHWAY WORKS 1986.
11. BACKFILL (IN PROPOSED "TRAFFICKED AREAS"- TO BE TYPE 1 AS NOTE 9. BACKFILL (IN NON TRAFFICKED EXTERNAL AREAS) TO BE SELECTED EXCAVATED MATERIAL AS NOTE 10. IF REGARDED AS SUITABLE BY THE CONTRACT ADMINISTRATOR.
12. BACKFILLING AND REINSTATEMENT TO TRENCHES IN EXISTING PUBLIC HIGHWAYS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS AND SPECIFICATIONS OF THE HIGHWAY AUTHORITY, OR, IN THE ABSENCE OF SUCH SPECIFICATIONS, IN ACCORDANCE WITH THE NEW ROADS AND WORKS REGULATIONS 1992 AND RELEVANT PROVISIONS OF H.A.U.C. "SPECIFICATION FOR THE REINSTATEMENT OF OPENINGS IN HIGHWAYS" (JUNE 1992, BOTH UNDER SECTION 71 OF THE NEW ROADS AND STREET WORKS ACT 1991.
13. ANY HARDENING REQUIRED TO COMPRISE 16mm DIA SOLID STACKARDS WITH 75mm DIA DALLS AND 42.4mm x 6.0 12mm THICK RAILS, TUBULAR HANDRAILS, ALL ANCILLARIES (eg. BASE PLATES, SAFETY CHAINS) AS RECOMMENDED BY THE SUPPLIER AND AGREED WITH ADOPTING AUTHORITY. ALL STEELWORK TO BE GALVANISED IN ACCORDANCE WITH BS729. ALL STEELWORK TO BE GALVANISED IN ACCORDANCE WITH BS729. WELDED STEEL TO BE PAINTED WITH 2 No COATS OF GALVARREX.
14. THIS DRAWING TO BE READ IN ACCORDANCE WITH ALL OTHER RELEVANT ARB DRAWINGS, THIRD PARTY DRAWINGS, SPECIFICATIONS AND OTHER SUPPORTING DOCUMENTATION.

DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS

ADDITIONAL USEFUL NOTES

B1. THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, 'TEMPORARY AND PERMANENT SUPPORT' AND 'TEMPORARY AND PERMANENT DIVERSION WORKS, AS NECESSARY TO ALL EXTG SERVICES.

B2. THE CONTRACTOR SHALL ALLOW FOR ALL TRAFFIC MANAGEMENT IN CONNECTION WITH ROAD AND SEWER WORKS

B3. THE CONTRACTOR SHALL ALLOW FOR KEEPING SEWER TRENCHES AND EXCAVATIONS AS DRY AS PRACTICABLE BY PUMPING FROM TEMPORARY SUMPS, DEWATERING AND WELL POINTING AS APPROPRIATE. THE POINT AND METHOD OF DISCHARGE TO BE AGREED WITH THE RELEVANT AUTHORITY.

B4. CONTRACTOR TO TAKE BEARINGS TO PROTECT HIS OPERATIVES WITH RESPECT TO THE PRESENCE OF GAS IN SEWER TRENCHES AND MANHOLES THROUGH THE USE OF GAS MONITORING EQUIPMENT AND BREATHING APPARATUS AS REQUIRED.

B5. CONTRACTOR TO APPLY FOR SEWER PERMITS AND ROAD OPENING PERMITS AS NECESSARY FROM THE APPROPRIATE AUTHORITIES, PRIOR TO COMMENCING WORKS.

NOTES RE EXTG GROUND CONDITIONS

A1. MADE GROUND TO BE REMOVED DOWN TO VIRGIN GROUND, OR AS DIRECTED BY THE CONTRACT ADMINISTRATOR.

A2. THE CONTRACTOR MUST ALLOW FOR ALL COSTS ASSOCIATED WITH THE DISPOSAL OF ANY MATERIALS ENCOUNTERED THAT REQUIRE SPECIAL DISPOSAL ARRANGEMENTS ON ACCOUNT OF THEIR CLASSIFICATION IN ACCORDANCE WITH THE LAND FILL DIRECTIVE AND ANY ASSOCIATED LEGISLATION.

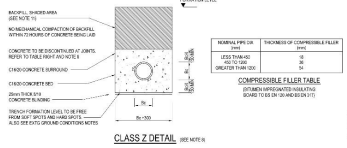
A3. ALL MATERIAL IMPORTED TO SITE FOR BACKFILLING PURPOSES SHALL BE CLASSIFIED AS INERT FILL IN ACCORDANCE WITH THE WASTE ACCEPTANCE CRITERIA.

A4. FORMATION LEVEL FOR MANHOLE DASESDDRAINAGE STRUCTURES AND PIPE TRENCHES TO BE STABLE AND OF A UNIFORM NATURE FREE FROM SOFT SPOTS AND HARD SPOTS. IN PEAT OR COHESIVE MATERIALS, HAND SHEAR VANE TEST GIVING A RESULT LESS THAN 40 KPA WOULD INDICATE SOFT SPOTS. IN CASE OF LOOSE OR VERY LOOSE GRANULAR MATERIALS ARE NOT CLASSIFIED AS SOFT SPOTS. SLINKING CONCRETE AND/OR STONE ANY BE USED AS DETERMINED ON SITE TO REMOVE WEAK TRENCH TO FORMATION LEVEL.

A5. WHERE SIGNIFICANT EXCAVATION IS REQUIRED FOR SOFT SPOTS, FILL MATERIAL TO BE PLACED AND COMPACTED IN LAYERS (SOMETIMES REFERRED TO AS SOFT GREEN DETAIL).

A6. EXAMPLES OF BAD GROUND COULD BE PEAT, RUNNING SAND, VARIOUS CRUMBLING ROCKS, SOFT CLAY OR SILT MATERIAL. THIS IS NOT AN EXHAUSTIVE LIST ANY GROUND CONDITIONS RESULTING IN THE POSSIBILITY OF THE SIDES OF THE TRENCH COLLAPSING OR THE BOTTOM OF THE TRENCH BEING THE PIPE COULD BE CONSIDERED AS BAD GROUND CONDITIONS. IF THE WORKS ARE CONSTRUCTED BELOW NORMAL GROUND WATER THIS COULD BE CONSIDERED AS BAD GROUND CONDITIONS. IN BAD GROUND CONDITIONS WHAPPRO THE GRANULAR MATERIAL SPECIFIED IN TABLE 1 OF BS 10175 MAY NOT BE SUITABLE. IN PARTICULAR, IF BAD GROUND THE DETAILS SHOWN ON THIS DRAWING MAY NOT BE SUITABLE

A7. EXAMPLES OF UNUSUAL GROUND CONDITIONS COULD BE ROCK, FISSURED ROCK, ROCK WITH GEOLOGICAL FAULTS OR VARIABLE BEDDING. THIS IS NOT AN EXHAUSTIVE LIST. THE DETAILS SHOWN ON THIS DRAWING MAY NOT BE SUITABLE FOR THESE CONDITIONS



NOMINAL PIPE DIA (mm)	THICKNESS OF COMPRESSIBLE FILLER (mm)
LESS THAN 450	12
450 TO 1200	30
GREATER THAN 1200	54

COMPRESSIBLE FILLER TABLE
(EXTENDED IMPREGNATED HARDBOARD TO BS EN 120 AND BS EN 317)

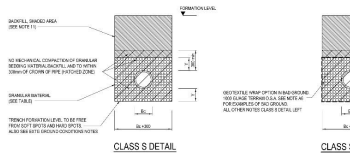
CLASS Z DETAIL (SEE NOTE 8)

RIGID PIPE TRENCH BEDDING DETAILS

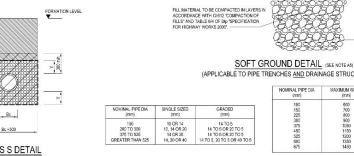
NOTES

A). Bc = OUTSIDE DIAMETER OF PIPE BARREL.

B). DIMENSION Y :-
SLIPPER JOINTED PIPES, MIN. 100mm OR 1/8Bc WHICHEVER IS THE GREATER. SOCKETED PIPE, MIN. 100mm OR 1/8Bc WHICHEVER IS THE GREATER UNDER BARRELS AND NOT LESS THAN 100mm UNDER OVER SOCKETS.



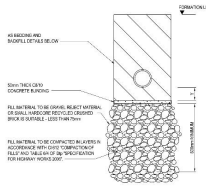
CLASS S DETAIL



CLASS S DETAIL
(GEOTEXTILE WRAP OPTION)

NOMINAL PIPE DIA (mm)	SINGLE SIZED (mm)	GRADED (mm)
100	10 (25 i.e.	14 TO 5
150 TO 300	10, 14 OR 20	14 TO 20 OR 20 TO 5
GREATER THAN 525	14 OR 40	14 TO 40 OR 20 TO 5
	14, 20 OR 40	14 TO 5, 20 TO 5 OR 14 TO 5

GRANULAR BEDDING MATERIAL
(AGGREGATES TO BS 882, AIR COOLED BLAST FURNACE SLAG TO BS 1047 AND LIGHTWEIGHT AGGREGATE TO BS 3797)
(SEE NOTE 5)



SOFT GROUND DETAIL (SEE NOTE 4A)
(APPLICABLE TO PIPE TRENCHES AND DRAINAGE STRUCTURES)

NOMINAL PIPE DIA (mm)	MAXIMUM WIDTH (mm)
150	700
225	750
300	800
380	900
450	1000
600	1150
750	1300
900	1450
1050	1600
1200	1750
1350	1900
1500	2050
1650	2200
1800	2350
1950	2500
2100	2650
2250	2800
2400	2950
2550	3100
2700	3250
2850	3400
3000	3550
3150	3700
3300	3850
3450	4000
3600	4150
3750	4300
3900	4450
4050	4600
4200	4750
4350	4900
4500	5050
4650	5200

MAXIMUM TRENCH WIDTHS
(EXCEEDANCE COULD COMPROMISE STRUCTURAL DESIGN OF PIPELINE)

IMPORTANT CDM / H&S NOTE

- IT IS DESIGNED TO COMPLY WITH THE DUTIES IN SECTION 2 TO THE HEALTH, SAFETY AND WELFARE OF THOSE THAT MAY BE AFFECTED BY THE WORKS. THE DESIGN ASSUMES THAT THE CONTRACTOR WILL ADOPT THE SAFE WORKING PRACTICES AND ADHERE TO THE RELEVANT HEALTH AND SAFETY LEGISLATION.
- **WORKING BELOW A BODY OF WATER OTHER THAN SEWAGE MAY BE HAZARDOUS**
- **WORKING IN A SEWAGE ENVIRONMENT MAY BE HAZARDOUS**

ANY CONSTRUCTION ITEM WHICH, INCLUDING OPERATIVES, IS CONSIDERED TO CONSTITUTE THE DESIGNER DESIGN OR TO BE DANGEROUS, SHALL BE DESIGNED, "ANY THEY MAY SEEK FEASIBILITY AND PROTOCOLS" SUBMITTED TO THE SUPERVISOR, CONTRACTOR OR ALL HEALTH AND SAFETY ACT CONTRACTORS MUST ADHERE TO THE ACT.

(1) THE PRINCIPAL CONTRACTOR AND CONTRACTORS HAVE ADDITIONAL DUTIES UNDER THE CDM REGULATIONS.
(2) THE DESIGNER DUTIES ARE TO ENSURE THE HEALTH AND SAFETY PLAN.
(3) THE CONTRACTORS CONTRACTOR'S METHOD STATEMENTS.

0 200 400 600 800 1000 mm
(SCALE 1:20)

REV	DESCRIPTION	DR	CHK	APP	DATE
P1	FIRST ISSUE	NCP	JJP	KP	14.10.14

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Drawing Title:
TYPICAL DRAINAGE DETAILS
SHEET 1

Scale @ A1	Drawn	Date	Checked	Date	Approved	Date
1:20	NCP	MAY 2010	JP	MAY 2010	JAK	MAY 2010

Project No.	Originator	Zone	Type	Discipline	Number	Status	Revision
A060111	21	C		D	D200		P1

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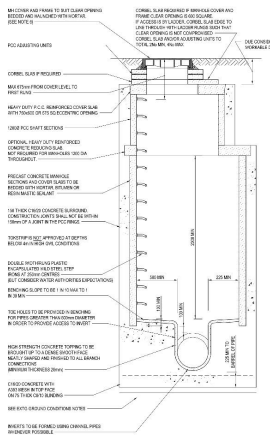
DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS

NOTES

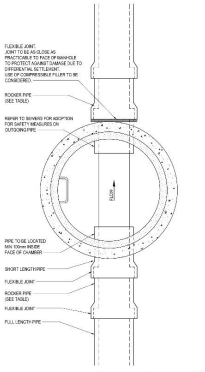
SEE SHEET 1 FOR NOTES

NOTES RE EXTG GROUND CONDITIONS

SEE SHEET 1 FOR NOTES

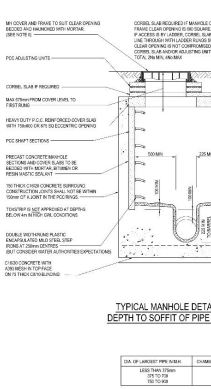


TYPICAL MANHOLE DETAIL - TYPE A
DEPTH TO SOFFIT OF PIPE 3000 TO 6000



NOMINAL SIZE	EFFECTIVE LENGTH (mm)
150 TO 600	600
600 TO 750	1000
OVER 750	1200

SHORT AND ROCKER PIPE LENGTHS TABLE
APPLICABLE TO ALL MANHOLE TYPES



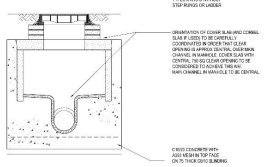
TYPICAL MANHOLE DETAIL - TYPE B
DEPTH TO SOFFIT OF PIPE 1450 TO 3000

DIA. OF LARGEST PIPE IN MH.	CHAMBER SECTION INT.DIM. (mm)
LESS THAN 375mm	1200
375 TO 675	1500
750 TO 900	1800

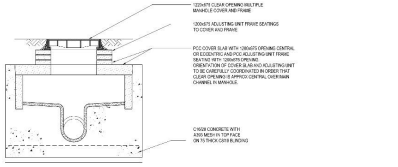
1200 PCC RING COMPLIES WITH EUROPEAN STANDARD BUT IS NOT CONFIRMED BY THE BRITISH STANDARD THEY MAY NOT BE ACCEPTABLE TO SOME AUTHORITIES

TABLE APPLICABLE TO MANHOLE TYPES A AND B

CHAMBER SIZES ARE MINIMUM REQUIRED. SEE LAYOUT FOR VARIATIONS, IF ANY.



TYPICAL MANHOLE DETAIL - TYPE E1 - 1200 DIA RINGS
DEPTH TO SOFFIT OF 1000 TO 1500
PIPEWORK LESS THAN 375 DIA



TYPICAL MANHOLE DETAIL - TYPE E2 - 1500 DIA RINGS
DEPTH TO SOFFIT OF 1000 TO 1500
PIPEWORK 375 DIA TO 700 DIA INCLUSIVE
OR SMALLER PIPEWORK WHEN LARGER CHAMBER
REQUIRED FOR MULTIPLE CONNECTIONS

0 250 480 600 800 1200 mm
SCALE 1:25

IMPORTANT CDM / H&S NOTE

THE DESIGNERS HAVE DRAWN THE ISSUES TO ATTENTION TO THE KEY RESIDUAL HEALTH AND SAFETY RISKS THAT HAVE BEEN ELIMINATED FROM THE DESIGN UNDERWAY IN THIS DRAWING BY THE DESIGN PROCESS. THESE ARE RESIDUAL RISKS AND ARE LISTED BELOW

WORKING BELOW A BODY OF WATER (POND)
EXCAVATION (BULK PROCESS) FOR TANK
WORKING ON A LIVE CLIENT FLOODING DRAINAGE

NOT CONSIDERED FOR ACCIDENTAL INCIDENTS EXISTING TO CONSTRUCT THE DESIGNS SHOWN ON THIS DRAWING IN ACCORDANCE THAT THEY HAVE BEEN ISSUED AND THEREFORE ACT BEFORE ANY PRINCIPAL CONTRACTOR ON ALL HEALTH AND SAFETY MATTERS AND MUST ACCEPT OF

(1) THE FULL DESIGNERS AND CONTRACTORS RISK ASSESSMENTS AND RISK REGISTERS.
(2) THE DEVELOPED CONSTRUCTION HEALTH AND SAFETY PLAN.
(3) THE CONTRACTORS CONSTRUCTION METHOD STATEMENTS

P1	FIRST ISSUE		NGP	JSP	AXP	14.02.13
REV	DESCRIPTION		BY	CHK	APP	DATE

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Project:
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BARROW RESOURCE PARK

Drawing Title:
TYPICAL DRAINAGE DETAILS
SHEET 2

Scale @ A1	Drawn	Date	Checked	Date	Approved	Date
1:30	NGP	FEB 2013	JP	FEB 2013	AXP	FEB 2013

Project No.	Office	Type	Drawing No.	Revision
A060111	21	C	D201	P1

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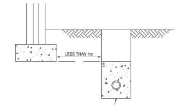
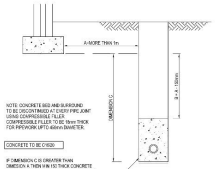
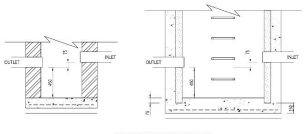


DRAIN TRENCH EDGE LESS THAN 1m FROM FOOTING/FOUNDATION EDGE



DRAIN TRENCH EDGE MORE THAN 1m FROM FOOTING/FOUNDATION EDGE

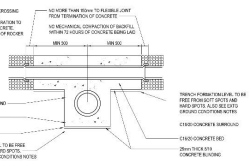
BEDDING DETAIL IN VICINITY OF FOOTINGS/FOUNDATIONS



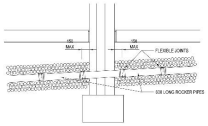
BASE DETAILS SHOW GEOMETRY OF CATCHPITS.
FOR ALL CONSTRUCTION DETAILS AND NOTES ETC REFER TO SHEET 2

TYPICAL CATCHPIT BASE DETAIL

NOTES:
THE DETAIL APPLIES TO PIPES CROSSING WITHIN 150mm OF EACH OTHER.
IT CAN BE USED WHERE THE SEPARATION TO FLEXIBLE PIPEWORK EXCEEDS 150mm, AND PIPEWORK CONCRETE TO BE CONSIDERED.



PIPE CROSSING DETAIL


450
MAX
450
MAX
FLEXIBLE JOINTS
B
B
B

DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS

NOTES

SEE SHEET 1 FOR NOTES

NOTES RE EXTG GROUND CONDITIONS

SEE SHEET 1 FOR NOTES

NOTES SPECIFIC TO THIS DRAWING

1. ALL BUILDING DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT BRITISH/EUROPEAN STANDARDS BS EN752, BRIBEN SUPPORTED BS8301 "BUILDING DRAINAGE", THE CURRENT BUILDING REGULATIONS AND THE LOCAL AUTHORITY BUILDING CONTROL OR NHSC SPECIFICATIONS AND REQUIREMENTS.
2. THIS DRAWING TO BE READ IN ACCORDANCE WITH ALL OTHER RELEVANT RPQ DRAWINGS, THIRD PARTY DRAWINGS, SPECIFICATIONS AND OTHER SUPPORTING DOCUMENTATION.
3. IN TRAFFICKED AREAS INCLUDING CIRCULATORY ROADS IN CAR PARKS CLASS D400 COVER AND FRAME TO BE USED. IN AREAS SUBJECT TO LIGHT, SLOW MOVING TRAFFIC CLASS C250 COVER AND FRAME TO BE USED. ALSO SEE SCHEDULE FOR DETAILS. FRAMES TO BE MINIMUM 100 DEEP. 150 IN TRAFFICKED AREAS IF AVAILABLE.

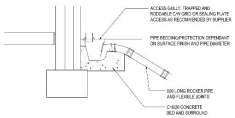
IMPORTANT CDM / H&S NOTE

THE DESIGNER BELOW CLIO DRAWS THE ATTENTION OF THE CDM DUTY HOLDER, HEALTH AND SAFETY ENGINEER THAT HAVE NOT BEEN ELIMINATED FROM THE DESIGN & WORKS ENTIRE DRAWING BY THE DESIGN PROCESS THESE ARE REGARDED, SAFE AND EXEMPTED BELOW:

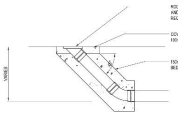
- **WORKING BELOW A BODY OF WATER (POND)**
- EXCAVATION BELOW PERCHED WATER TABLE
- WORKING ON A LIVE DRAINAGE / FLOOD WATERWAYS

AND CONSTRUCTION PROCESSES, INCLUDING GROUNDWORKS INTENDING TO CONTINUE TO BE DESIGNED BEYOND THE NO DRAWING BASELINE EVIDENCE THAT THEY HAVE BEEN REGULATED AND TECHNOLOGIES SUBMITTED BY THE PRINCIPAL CONTRACTOR ON ALL HEALTH AND SAFETY MATTERS AND HAVE NO SCARE OF:

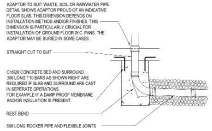
(1) THE FULL DESIGNERS AND CONTRACTORS RISK ASSESSMENTS AND NON REGRETTING
(2) THE DEVELOPED CONSTRUCTION HEALTH AND SAFETY PLAN
(3) THE CONTRACTORS CONSTRUCTION HEALTH AND SAFETY PLAN



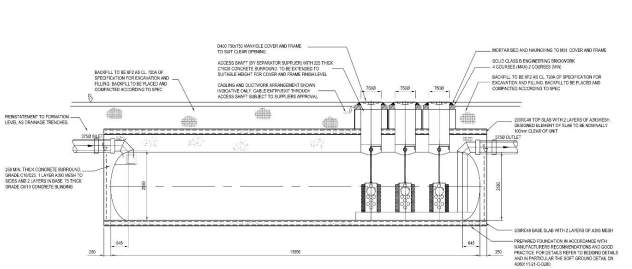
TYPICAL GULLY INSTALLATION WITH TRAP INCORPORATED IN APPLIANCE



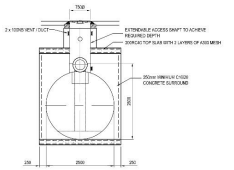
TYPICAL RODDING EYE DETAIL SUITABLE IN EXTERNAL NON TRAFFICKED AREAS


ADAPTOR TO SUIT WASTE, SOIL OR RAINWATER PIPE DETAIL SHOWS ADAPTOR PROJECT AN INDICATIVE DETAIL SHOWS ADAPTOR PROJECT AN INDICATIVE INSTALLATION AND MUST BE ADAPTED TO SUIT THE INSTALLATION AND MUST BE ADAPTED TO SUIT THE INSTALLATION AND MUST BE ADAPTED TO SUIT TH

DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY DIMENSIONS OR ERRORS



SECTION A - A



SECTION B-B

IMPORTANT COM / H&S NOTE

THE DESIGNER WOULD SUBMIT THE DESIGN & TESTS ON TO THE KEY RESIDUAL HEALTH AND SAFETY RISKS THAT MUST NOT BE INTERFERED FROM THE DESIGNED WORKS OR THING SHAPED BY THE DESIGN PROCESS THESE KEY RESIDUAL RISKS ARE CONTRIBUTED BY:

- WORKING BELOW A BODY OF WATER (POND)
- EXCAVATION BELOW PARG 6B WATER TABLE
- WORKING ON A SITE CONTAMINATED WITH CHEMICALS

ANY CONTRACTOR PERFORMING WORK, INCLUDING OPERATIVES AND WORKERS TO CONSTRUCT THE DESIGNED WORKS OR TO COMMUNICATE WITH THE DESIGNER THAT THEY HAVE RISKS REGULARLY AND THOROUGHLY VERIFIED BY THE PRINCIPAL CONTRACTOR ON ALL HEALTH AND SAFETY MATTERS AND MUST ADVISE THE DESIGNER:

(1) THE FULL DESIGNERS AND CONTRACTORS RISK ASSESSMENTS AND RISK REGISTERS.
(2) THE DESIGNERS CONSTRUCTION HEALTH AND SAFETY PLAN
(3) THE COST VALTORS CONSTRUCTION METHODS SATISFACTORY.

NOTES

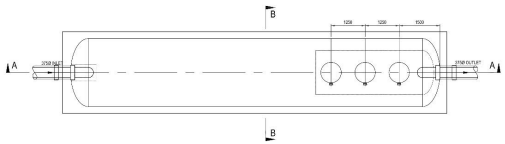
SEE SHEET 1 FOR NOTES

NOTES RE EXTG GROUND CONDITIONS

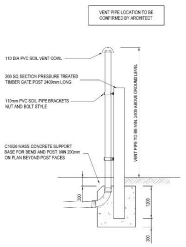
SEE SHEET 1 FOR NOTES

NOTES SPECIFIC TO THIS DRAWING

1. COMPLETE BUILT OF PIPEWORK DIRECTIONS AND ORIENTATION ON PLAN TO BE CHECKED AGAINST DRAINTERS AND AVAILABLE ORIENTATION OF SEPARATOR UPRIGHTS PRIOR TO ORDERING SEPARATOR
2. SEPARATOR TO COMPLY WITH THE ENVIRONMENT AGENCY PERFORMANCE STANDARD CLASS 1 INCLUDING THE FOLLOWING REQUIREMENTS:
   (1) PRODUCT DEVICE TO BE EMPLOYED GIVING AUDIO/VISUAL WARNING WHEN 50% OF HYDROCARBON LEVEL IS ATTAINED. SENSOR TO BE INSTALLED AND CALIBRATED BY COMPETENT TECHNICIAN. ACCEPTABLE ALARM TO BE IN REMOTE LOCATION AS NECESSARY AS RECEIVING PLC SLOPE WARDEN TO
   (2) SEPARATOR TO BE CONSTRUCTED OF INTRINSICALLY SAFE AND CERTIFIED TO AN EXPLOSION PROTECTION STANDARD AND CONFORM TO BS EN45 PART 1 AND BS EN 60079-10:1996;
3. ALL SEPARATOR CHAMBERS TO BE VENTED. VENTS TO BE MINIMUM 75mm DIA AND TO EXTEND 2.4m ABOVE GROUND LEVEL. NO MANHOLE/RING OF VENTS ENCLOSURE. LOCATION OF VENT TO BE AGREED WITH ARCHITECT. FLUSHT ROUTE OF CABLE DUCT. LOCATION OF CONTROL PANELS TO BE AGREED WITH ARCHITECT / CLIENT
4. THIS DRAWING TO BE READ IN ACCORDANCE WITH ALL OTHER RELEVANT WYG DRAWINGS, THIRD PARTY DRAWINGS, SPECIFICATIONS AND OTHER SUPPORTING DOCUMENTATION.
5. ALL WORKS TO ADHERE TO ALL RELEVANT CDM REGULATIONS, PROJECT SPECIFIC DOCUMENTATION AND HEALTH AND SAFETY RISKS ASSESSMENTS.
6. CONCRETE SURROUND TO SEPARATORS TO BE REINFORCED AS REQUIRED BY STRUCT. ANGLUM PLAN.
7. IN TRAFFICKED AREAS INCLUDING CIRCULATORY ROADS IN CAR PARKS CLASS D400 COVER AND FRAME TO BE USED. IN AREAS SUBJECT TO LIGHT, SLOW MOVING TRAFFIC CLASS C250 COVER AND FRAME TO BE USED. ALSO SEE SCHEDULE FOR DETAILS. FRAMES TO BE MINIMUM 100 DEEP. USE TRAFFICKED AREAS IF AVAILABLE.



PLAN



SECTION THROUGH VENT PIPE AND SUPPORT

(SCALE 1:50)

0 500 1000 1500 2000 2500 mm

SCALE 1:50

REV	DESCRIPTION	BY	CHK	APP	DATE
P1	FIRST ISSUE	MSP	JSP	AW	14.05.15

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Project:

SHANKS CUMBRIA
BARROW RESOURCE PARK

Drawing Title:

SEPARATOR GENERAL ARRANGEMENT

Scale @ A1	Drawn	Date	Checked	Date	Approved	Date
1:50	MSP	FEB 2015	JSP	MAY 2015	AW	MAY 2015

Project No.	Office	Type	Drawing No.	Revision
A060111	21	C	D204	P1

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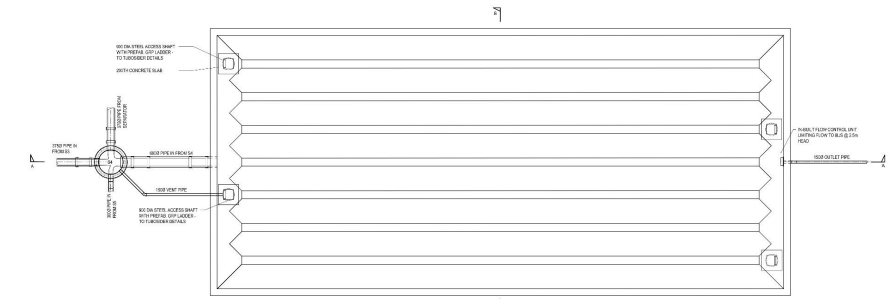
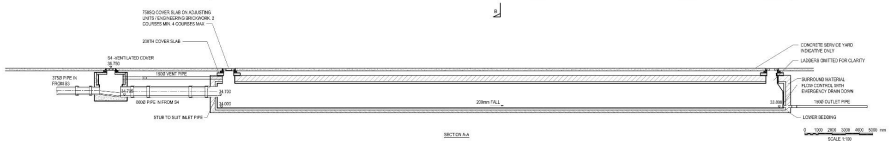
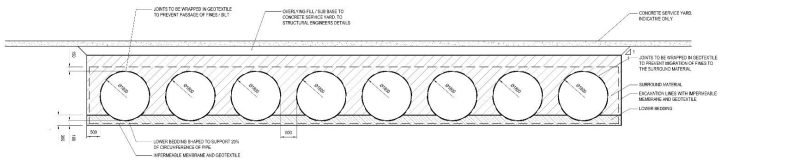




SECTION A-A



SECTION B-B

TANK VOLUME	865m³
SURROUND MATERIAL	255m³
TOTAL VOLUME	1120m³

LOWER BEDDING MATERIAL	CLEAN, SINGLE SIZE ANGULAR MATERIAL FROM WITHIN THE RANGE 10mm TO 20mm
SURROUND MATERIAL	CLEAN, SINGLE SIZE ANGULAR MATERIAL FROM WITHIN THE RANGE 20mm TO 70mm - ACHIEVING 30% VOIDS RATIO

DO NOT SCALE: CONTRACTOR TO CHECK ALL DEMENSIONS AND REPORT ANY DIMESIONS OR ERRORS

NOTES

GENERAL

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. A060111-21-C-D010 AND ALL OTHER RELEVANT DRAWINGS INCLUDING DETAILS ON D200, D201, D202, D203 AND D204
2. ALL WORKS TO ADHERE TO ALL RELEVANT CDM REGULATIONS. PROJECT RELATED CDM DOCUMENTATION AND HEALTH AND SAFETY RISK ASSESSMENTS
3. REFER TO DRAWING D200 FOR NOTES REGARDING EXISTING GROUND CONDITIONS AND GUIDANCE FOR TREATMENT OF POOR GROUND

TANK

4. TUBOSIDER TWIN STORE SYSTEM WITH PERMEABLE JOINTS TO OPTIMISE STORAGE IN SURROUND MATERIAL. EXCAVATION LINED WITH A GEO-SYNTHETIC CLAY LINER (GCL) TO PROVIDE A WATER TIGHT STRUCTURE
5. TANK TO BE HANDLED / INSTALLED / MAINTAINED IN STRICT ACCORDANCE WITH THE MANUFACTURERS INSTALLATION PACK AND ANY OTHER GUIDANCE AND SUPPORTING DOCUMENTATION
6. TANK DETAILS HAVE BEEN DEVELOPED BY WYG IN CONJUNCTION WITH THE TUBOSIDER DESIGN TEAM
7. REFER TO DRAWING A060111-21-C-D010 FOR ADDITIONAL NOTES.
8. SURROUND MATERIAL PROVIDES ADDITIONAL ATTENUATION VOLUME IN THE 30% VOIDS RATIO OF THE GRANULAR MATERIAL
9. TANK VOLUME:
   - TANK STORAGE PROVIDED BY STEEL TUBES = 865m³
   - SURROUND MATERIAL = 255m³
   - **TOTAL STORAGE VOLUME = 1120m³**

FLOW CONTROL

10. TANK HAS INBUILT VORTEX FLOW CONTROL UNIT AT OUTFALL - PROVIDED BY TANK MANUFACTURER. LIMITING DISCHARGE TO 8LS @2.5m HEAD

PRELIMINARY ISSUE

P1	FIRST ISSUE		NGFT	SSP	AW	14.05.10
REV	DESCRIPTION		BY	CHK	APP	DATE

SSP

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Project:

SHANKS CUMBRIA
BARROW RESOURCE PARK

Drawing Title:

ATTENUATION TANK
GENERAL ARRANGEMENT
TUBOSIDER

Scale @ A1	Drawn	Date	Checked	Date	Approved	Date
AS SHOWN	SSP	MAR 2010	SSP	MAY 2010	AW	MAY 2010

Project No.	Office	Type	Drawing No.	Revision
A060111	21	C	D205	P1

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