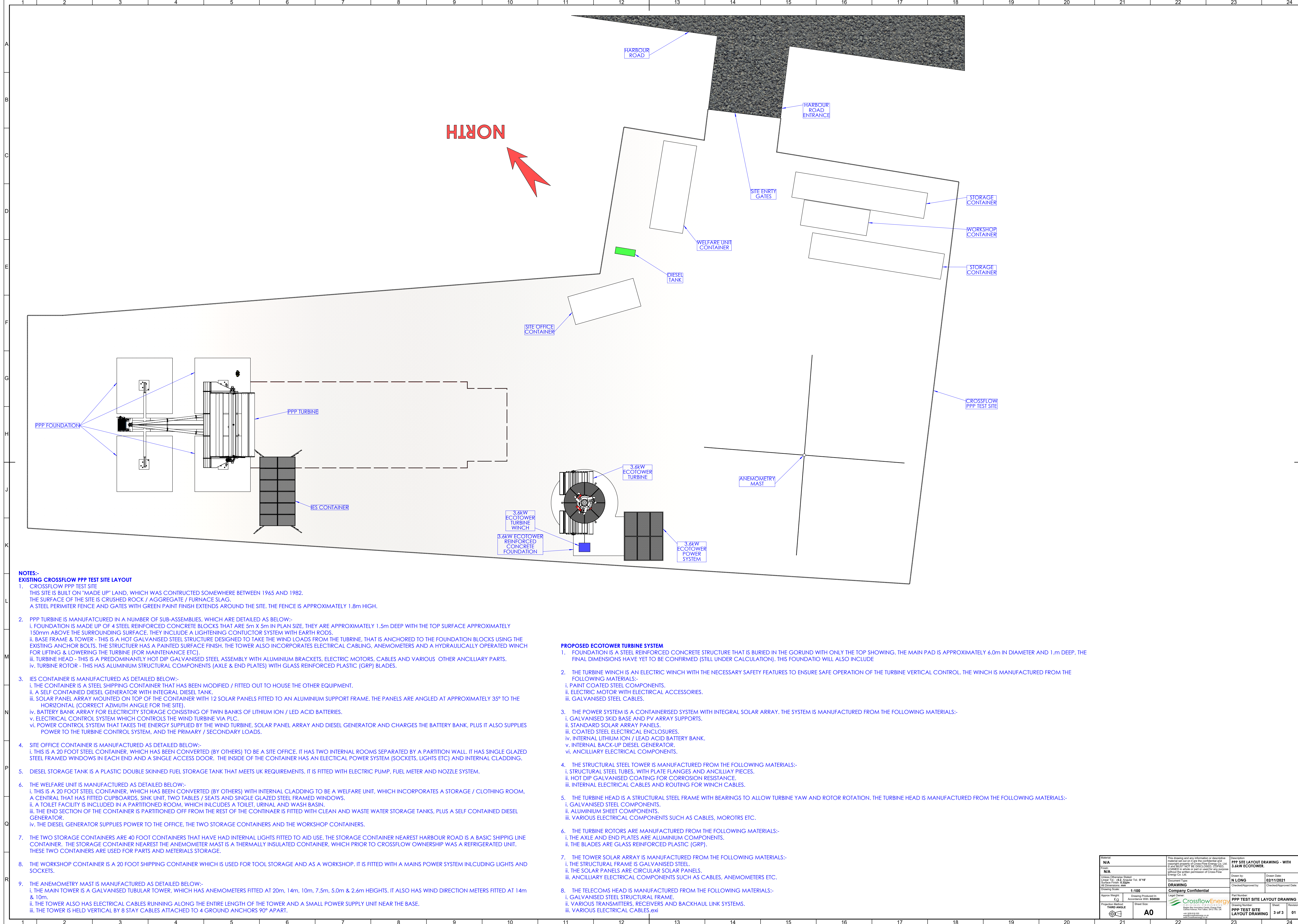




NOTES:-

EXISTING CROSSFLOW PPP TEST SITE LAYOUT

- CROSSFLOW PPP TEST SITE
THIS SITE IS BUILT ON "MADE UP" LAND, WHICH WAS CONTRUCTED SOMEWHERE BETWEEN 1965 AND 1982.
THE SURFACE OF THE SITE IS CRUSHED ROCK / AGGREGATE / FURNACE SLAG.
A STEEL PERIMETER FENCE AND GATES WITH GREEN PAINT FINISH EXTENDS AROUND THE SITE. THE FENCE IS APPROXIMATELY 1.8m HIGH.
- PPP TURBINE IS MANUFACTURED IN A NUMBER OF SUB-ASSEMBLIES, WHICH ARE DETAILED AS BELOW:-
i. FOUNDATION IS MADE UP OF 4 STEEL REINFORCED CONCRETE BLOCKS THAT ARE 5m X 5m IN PLAN SIZE. THEY ARE APPROXIMATELY 1.5m DEEP WITH THE TOP SURFACE APPROXIMATELY 150mm ABOVE THE SURROUNDING SURFACE. THEY INCLUDE A LIGHTENING CONDUCTOR SYSTEM WITH EARTH RODS.
ii. BASE FRAME & TOWER - THIS IS A HOT GALVANISED STEEL STRUCTURE DESIGNED TO TAKE THE WIND LOADS FROM THE TURBINE. THAT IS ANCHORED TO THE FOUNDATION BLOCKS USING THE EXISTING ANCHOR BOLTS. THE STRUCTURE HAS A PAINTED SURFACE FINISH. THE TOWER ALSO INCORPORATES ELECTRICAL CABLING, ANEMOMETERS AND A HYDRAULICALLY OPERATED WINCH FOR LIFTING & LOWERING THE TURBINE (FOR MAINTENANCE ETC).
iii. TURBINE HEAD - THIS IS A PREDOMINANTLY HOT DIP GALVANISED STEEL ASSEMBLY WITH ALUMINIUM BRACKETS, ELECTRIC MOTORS, CABLES AND VARIOUS OTHER ANCILLIARY PARTS.
iv. TURBINE ROTOR - THIS HAS ALUMINIUM STRUCTURAL COMPONENTS (AXLE & END PLATES) WITH GLASS REINFORCED PLASTIC (GRP) BLADES.
- IES CONTAINER IS MANUFACTURED AS DETAILED BELOW:-
i. THE CONTAINER IS A STEEL SHIPPING CONTAINER THAT HAS BEEN MODIFIED / FITTED OUT TO HOUSE THE OTHER EQUIPMENT.
ii. A SELF CONTAINED DIESEL GENERATOR WITH INTEGRAL DIESEL TANK.
iii. SOLAR PANEL ARRAY MOUNTED ON TOP OF THE CONTAINER WITH 12 SOLAR PANELS FITTED TO AN ALUMINIUM SUPPORT FRAME. THE PANELS ARE ANGLED AT APPROXIMATELY 35° TO THE HORIZONTAL (CORRECT AZIMUTH ANGLE FOR THE SITE).
iv. BATTERY BANK ARRAY FOR ELECTRICITY STORAGE CONSISTING OF TWIN BANKS OF LITHIUM ION / LED ACID BATTERIES.
v. ELECTRICAL CONTROL SYSTEM WHICH CONTROLS THE WIND TURBINE VIA PLC.
vi. POWER CONTROL SYSTEM THAT TAKES THE ENERGY SUPPLIED BY THE WIND TURBINE, SOLAR PANEL ARRAY AND DIESEL GENERATOR AND CHARGES THE BATTERY BANK, PLUS IT ALSO SUPPLIES POWER TO THE TURBINE CONTROL SYSTEM, AND THE PRIMARY / SECONDARY LOADS.
- SITE OFFICE CONTAINER IS MANUFACTURED AS DETAILED BELOW:-
i. THIS IS A 20 FOOT STEEL CONTAINER, WHICH HAS BEEN CONVERTED (BY OTHERS) TO BE A SITE OFFICE. IT HAS TWO INTERNAL ROOMS SEPARATED BY A PARTITION WALL. IT HAS SINGLE GLAZED STEEL FRAMED WINDOWS IN EACH END AND A SINGLE ACCESS DOOR. THE INSIDE OF THE CONTAINER HAS AN ELECTRICAL POWER SYSTEM (SOCKETS, LIGHTS ETC) AND INTERNAL CLADDING.
- DIESEL STORAGE TANK IS A PLASTIC DOUBLE SKINNED FUEL STORAGE TANK THAT MEETS UK REQUIREMENTS. IT IS FITTED WITH ELECTRIC PUMP, FUEL METER AND NOZZLE SYSTEM.
- THE WELFARE UNIT IS MANUFACTURED AS DETAILED BELOW:-
i. THIS IS A 20 FOOT STEEL CONTAINER, WHICH HAS BEEN CONVERTED (BY OTHERS) WITH INTERNAL CLADDING TO BE A WELFARE UNIT, WHICH INCORPORATES A STORAGE / CLOTHING ROOM, A CENTRAL THAT HAS FITTED CUPBOARDS, SINK UNIT, TWO TABLES / SEATS AND SINGLE GLAZED STEEL FRAMED WINDOWS.
ii. A TOILET FACILITY IS INCLUDED IN A PARTITIONED ROOM, WHICH INCLUDES A TOILET, URINAL AND WASH BASIN.
iii. THE END SECTION OF THE CONTAINER IS PARTITIONED OFF FROM THE REST OF THE CONTAINER IS FITTED WITH CLEAN AND WASTE WATER STORAGE TANKS, PLUS A SELF CONTAINED DIESEL GENERATOR.
iv. THE DIESEL GENERATOR SUPPLIES POWER TO THE OFFICE, THE TWO STORAGE CONTAINERS AND THE WORKSHOP CONTAINERS.
- THE TWO STORAGE CONTAINERS ARE 40 FOOT CONTAINERS THAT HAVE HAD INTERNAL LIGHTS FITTED TO AID USE. THE STORAGE CONTAINER NEAREST HARBOUR ROAD IS A BASIC SHIPPING LINE CONTAINER. THE STORAGE CONTAINER NEAREST THE ANEMOMETRY MAST IS A THERMALLY INSULATED CONTAINER, WHICH PRIOR TO CROSSFLOW OWNERSHIP WAS A REFRIGERATED UNIT. THESE TWO CONTAINERS ARE USED FOR PARTS AND MATERIALS STORAGE.
- THE WORKSHOP CONTAINER IS A 20 FOOT SHIPPING CONTAINER WHICH IS USED FOR TOOL STORAGE AND AS A WORKSHOP. IT IS FITTED WITH A MAINS POWER SYSTEM INCLUDING LIGHTS AND SOCKETS.
- THE ANEMOMETRY MAST IS MANUFACTURED AS DETAILED BELOW:-
i. THE MAIN TOWER IS A GALVANISED TUBULAR TOWER, WHICH HAS ANEMOMETERS FITTED AT 20m, 14m, 10m, 7.5m, 5.0m & 2.6m HEIGHTS. IT ALSO HAS WIND DIRECTION METERS FITTED AT 14m & 10m.
ii. THE TOWER ALSO HAS ELECTRICAL CABLES RUNNING ALONG THE ENTIRE LENGTH OF THE TOWER AND A SMALL POWER SUPPLY UNIT NEAR THE BASE.
iii. THE TOWER IS HELD VERTICAL BY 8 STAY CABLES ATTACHED TO 4 GROUND ANCHORS 90° APART.

PROPOSED ECOTOWER TURBINE SYSTEM

- FOUNDATION IS A STEEL REINFORCED CONCRETE STRUCTURE THAT IS BURIED IN THE GROUND WITH ONLY THE TOP SHOWING. THE MAIN PAD IS APPROXIMATELY 6.0m IN DIAMETER AND 1.m DEEP, THE FINAL DIMENSIONS HAVE YET TO BE CONFIRMED (STILL UNDER CALCULATION). THIS FOUNDATION WILL ALSO INCLUDE
- THE TURBINE WINCH IS AN ELECTRIC WINCH WITH THE NECESSARY SAFETY FEATURES TO ENSURE SAFE OPERATION OF THE TURBINE VERTICAL CONTROL. THE WINCH IS MANUFACTURED FROM THE FOLLOWING MATERIALS:-
i. PAINT COATED STEEL COMPONENTS.
ii. ELECTRIC MOTOR WITH ELECTRICAL ACCESSORIES.
iii. GALVANISED STEEL CABLES.
- THE POWER SYSTEM IS A CONTAINERISED SYSTEM WITH INTEGRAL SOLAR ARRAY. THE SYSTEM IS MANUFACTURED FROM THE FOLLOWING MATERIALS:-
i. GALVANISED SKID BASE AND PV ARRAY SUPPORTS.
ii. STANDARD SOLAR ARRAY PANELS.
iii. COATED STEEL ELECTRICAL ENCLOSURES.
iv. INTERNAL LITHIUM ION / LEAD ACID BATTERY BANK.
v. INTERNAL BACK-UP DIESEL GENERATOR.
vi. ANCILLIARY ELECTRICAL COMPONENTS.
- THE STRUCTURAL STEEL TOWER IS MANUFACTURED FROM THE FOLLOWING MATERIALS:-
i. STRUCTURAL STEEL TUBES, WITH PLATE FLANGES AND ANCILLIARY PIECES.
ii. HOT DIP GALVANISED COATING FOR CORROSION RESISTANCE.
iii. INTERNAL ELECTRICAL CABLES AND ROUTING FOR WINCH CABLES.
- THE TURBINE HEAD IS A STRUCTURAL STEEL FRAME WITH BEARINGS TO ALLOW TURBINE YAW AND ROTOR ROTATION. THE TURBINE HEAD IS MANUFACTURED FROM THE FOLLOWING MATERIALS:-
i. GALVANISED STEEL COMPONENTS.
ii. ALUMINIUM SHEET COMPONENTS.
iii. VARIOUS ELECTRICAL COMPONENTS SUCH AS CABLES, MOTORS ETC.
- THE TURBINE ROTORS ARE MANUFACTURED FROM THE FOLLOWING MATERIALS:-
i. THE AXLE AND END PLATES ARE ALUMINIUM COMPONENTS.
ii. THE BLADES ARE GLASS REINFORCED PLASTIC (GRP).
- THE TOWER SOLAR ARRAY IS MANUFACTURED FROM THE FOLLOWING MATERIALS:-
i. THE STRUCTURAL FRAME IS GALVANISED STEEL.
ii. THE SOLAR PANELS ARE CIRCULAR SOLAR PANELS.
iii. ANCILLIARY ELECTRICAL COMPONENTS SUCH AS CABLES, ANEMOMETERS ETC.
- THE TELECOMS HEAD IS MANUFACTURED FROM THE FOLLOWING MATERIALS:-
i. GALVANISED STEEL STRUCTURAL FRAME.
ii. VARIOUS TRANSMITTERS, RECEIVERS AND BACKHAUL LINK SYSTEMS.
iii. VARIOUS ELECTRICAL CABLES.

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Drawing Scale: 1:100	Sheet Size: A0	Company Confidential		Drawing Number: PPP TEST SITE LAYOUT DRAWING	Revision: 3 of 3
Revision: 1	Revision: 1	Crossflow Energy Ltd		Revision: 1	Revision: 1