DRAWING NO. 123A90-DDL-ST-DD-90026 | REV. 05

1 – GENERAL NOTES :

1.1 – THE FOLLOWING GENERAL NOTES SHALL APPLY TO ALL STRUCTURAL DRAWINGS UNLESS NOTED OTHERWISE (U.N.O.).
1.2 – ALL DIMENSIONS ARE IN mm (U.N.O.).
1.3 – ALL ELEVATIONS SHOWN ON THE DRAWINGS ARE IN mm AND REFER TO CHART DATUM (CD).
1.4 – CHART DATUM ELEVATION : 0.00m – LAT : – 0.00m W.R.T. CD – MSL : +1.10m W.R.T. CD – HAT: + 2.20m W.R.T. CD.
1.5 – ALL DECK BEAMS SHALL BE FLUSH AT TOP OF STEEL (T.O.S) ELEVATION U.N.O.
1.6 – ALL CONSTRUCTION SHALL COMPLY WITH THESE NOTES AND THE COMPANY TECHNICAL STANDARDS AND SPECIFICATIONS.

2 – APPLICABLE SPECIFICATIONS :

ALL PROJECT SPECIFICATIONS AND IN PARTICULAR:
2.1 – EN ISO 19900 – GENERAL REQUIREMENTS FOR OFFSHORE STRUCTURES – 2019.
2.2 – EN ISO 19901 – SPECIFIC REQUIREMENTS FOR OFFSHORE STRUCTURES – PART 1 to 6.
2.3 – EN ISO 19902 – PETROLEUM AND NATURAL GAS INDUSTRIES – FIXED STEEL OFFSHORE STRUCTURES 2020.
2.4 – EN ISO 14122–Part 1 to 4 – SAFETY OF MACHINERY – PERMANENT MEANS OF ACCESS TO MACHINERY
2.5 – DNV–ST–0145 – OFFSHORE SUBSTATION.
2.6 – DNV–ST–0126 – SUPPORT STRUCTURES FOR WIND TURBINES.
2.7 – DNV–OS–C401 – FABRICATION AND TESTING OF OFFSHORE STRUCTURES.
2.8 – EEMUA Publication 158 – CONSTRUCTION SPECIFICATION FOR FIXED OFFSHORE STRUCTURES.
2.9 – 123A90–DDL–ST–SP–90018 – MATERIALS SPECIFICATIONS FOR TOPSIDE AND TP.
2.10 – 123A90–DDL–ST–SP–90118 – MATERIALS SPECIFICATIONS FOR FLANGE AND BOLTS.
2.11 – 123A90–DDL–ST–SP–90019 – STRUCTURAL FABRICATION SPECIFICATION.
2.12 – ISO14122–1 to 4 – SAFETY OF MACHINERY – PERMANENT MEANS OF ACCESS TO MACHINERY.

3 – HANDRAILS & GRATING & STAIRS & LADDERS :

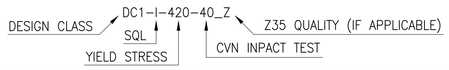
3.1 – STAIRS, HANDRAILS, LADDERS & STEEL GRATING TYPICAL DETAILS SHALL REFER TO STANDARD DRAWINGS 123A90–DDL–ST–DD–90035 TO 90039.
3.2 – ALL HANDRAILS SHALL BE FABRICATED FROM ø48.3x3.68 THK API 5L GRADE B PIPE OR EQUIVALENT. NO REDUCTION IN O.D. SHALL BE ACCEPTED BETWEEN THE STRAIGHT SECTION AND THE BEND.
3.3 – ALL SOCKETS FOR REMOVABLE HANDRAILS SHALL BE FABRICATED FROM ø70x9.52 THK API 5L GRADE B PIPE OR EQ,
3.4 – ALL HANDRAILS SHALL BE HOT DIP GALVANISED AND PAINTED IN ACCORDANCE WITH Norsok M–501 2022.
3.5 – ALL WELDS ON HANDRAILS SHALL BE GROUND SMOOTH BURRS AND SHARP EDGES SHALL BE REMOVED.
3.6 – PULTRUDED FIRE RESISTANT FIBRE REINFORCED PLASTIC (FRP) MAY BE USED ON TOPSIDE SUBJECT TO COMPANY APPROVAL. FRP MATERIAL : POLYESTER RESIN (INORGANIC FILLERS WITHOUT HALOGENS), MODULUS OF ELASTICITY 15000MPa, ULTIMATE STRESS 325MPa
3.7 – ALL STEEL GRATINGS SHALL BE 30x5 LOAD BEARING BAR SERRATED ON A MAXIMUM 30mm PITCH ABOVE PERMANENT WORKING AREA.
3.8 – ALL STEEL GRATINGS SHALL BE HOT DIP GALVANISED IN ACCORDANCE WITH Norsok M–501 2022.
3.9 – ALL STEEL ELEMENTS (HANDRAILS, GRATINGS, LADDERS) IN THE SPLASH ZONE SHALL BE HOT DIP GALVANISED AND PAINTED IN ACCORDANCE WITH Norsok M–501 2022.
3.10 – GRATING PANELS SHALL BE SUPPLIED WITH EDGING BARS AROUND PERIMETER & PENETRATIONS.
3.11 – ABOVE SPLASH ZONE, ALL FIXED STEEL GRATINGS SHALL BE FASTENED BY HILTI X–BT SYSTEM (ONLY APPLICABLE ON FIRST, SECONDARY OR NON–STRUCTURAL STEEL CATEGORIES WITH A THICKNESS ≥ 8mm) OR BOLTED CLAMPS.
3.12 – ABOVE SPLASH ZONE, ALL REMOVABLE STEEL GRATINGS SHALL BE FASTENED BY HILTI X–BT SYSTEM or HILTI S–BT SYSTEM (ONLY APPLICABLE ON FIRST, SECONDARY OR NON–STRUCTURAL STEEL CATEGORIES WITH A THICKNESS ≥ 8mm) OR BOLTED CLAMPS.
3.14  : INDICATES DIRECTION OF MAIN BARS OF GRATING.
3.15 – ALL STAIR TREADS SHALL BE FASTENED BY BOLTING OR WELDING.
3.16 – CONTINUOUS 150mm HIGH KICK PLATES SHALL BE PROVIDED AT EACH STAIR LEVELS.
3.17 – FOR ALL PENETRATION IN PLATING AND GRATING, A SURROUNDING KICK PLATE OF 100mm HEIGHT ABOVE GRATING x 6 THK SHALL BE PROVIDED.
3.18 – ALL STAIR TREADS MADE OF GALVANISED SERRATED GRATING TO BE PROVIDED WITH ANTI–SLIP NOISING.
3.19 – IF PRESENT DECK HATCHES, TEMPORARY VERTICAL STANCHIONS WITH SAFETY CHAINS SHALL BE PROVIDED.
3.20 – FABRICATION CONTRACTOR SHALL ENSURE THAT GRATING AROUND CUT–OUTS ARE ADEQUATELY SUPPORTED.
3.21 – STRUCTURAL STEEL WORK WELDS BENEATH PLATING OR GRATING SHALL BE GROUND FLUSH SO THAT THE PLATING OR GRATING BEARS UNIFORMLY ON THE SUPPORT STEEL.

4 – STEEL MATERIAL :

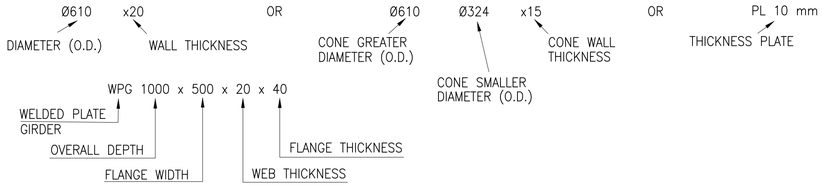
4.1 – ALL MATERIALS SHALL BE IN ACCORDANCE WITH SPECIFICATION 123A90–DDL–ST–SP–90018
4.2 – MINIMUM AREAS REQUIRING Z 35 STEEL SHALL BE CLEARLY IDENTIFIED ON DRAWINGS ▩ DENOTES Z35 STEEL MATERIAL (EN 10164).
4.3 – GEOGRAPHICAL ZONE: 1 – COLD SEAS
4.4 – MINIMUM AIR TEMPERATURE IN THE OFFSHORE AREA: –8.4°C. LAST TEMPERATURE IN AIR = –10°C.
4.5 – STEEL CATEGORIES AND IMPACT TOUGHNESS (TABLE 1) :

			EN10025-3	ISO EN 19902:2020						
Design Class	**Complexity**	**SQL**	**Hot rolled bar**	**Plates and Welded Tubular**	**Sections**	**SMLS pipes**	**THK**	**CVN inpact test**	**Material Designation**	**List of Options (EN10225-1 to -4) & EN10025-3**
DC1 TP to monopile flange connection	High	I (Z properties)	EN 10025 S420 NL	NA	NA	NA	t > 50	-40	DC1-I-420-40_Z	1, 2, 3, 4, 6, 12, 18, 24, 30
DC1 Complex lift-nodes and element connection to topside, Lift points, main complex joints	High	I (Z properties)	NA	EN 10225 S420 QLO / ML	NA	NA	25 < t <= 50	-40	DC1-I-420-40_Z	2, 7, 8, 11, 12, 17, 18
							t > 50	-40		
DC2 simple joints, primary deck girders and beams of Topside and TP, column and diagonal to lift points, main columns, Davit crane support, Bolts	Low	II	NA	EN 10225 S420 QLO / MLO	NA	NA	t <= 12	0	NA	-
							12 < t <= 25	-20	DC2-II-420-20	2, 7, 8, 11 17 for t > 40mm
							25 < t <= 50	-40	DC2-II-420-40	
							t > 50	-40		
DC3 all other columns and diagonals, stiffeners, Secondary deck beams, Grillage and sea fastening	High	II	NA	EN 10225 S355 NLO / MLO	EN 10025 S355 MLO	EN 10225 S355 NLHHO / QLHHO API 5L X52	t <= 12	0	DC3-II-355-0 / DC3-II-X52-0	2, 7, 8 11 for plate 17 for t > 40mm
							12 < t <= 25	-20	DC3-II-355-20 / DC3-II-X52-20	
							25 < t <= 50	-40	DC3-II-355-40 / DC3-II-X52-40	
							t > 50	-40		
DC4 Equipment and vessel supports, modules supports, equipment fixing bolts	Low	III	NA	EN 10025 S355 J2	EN 10025 S355 J2	API 5L X52 EN 10210 S355 J2H	t <= 12	0	DC4-III-355-0 / DC4-III-X52-0 / DC4-III-X60-0	-
							12 < t <= 25	0		
DC5 floor plating, grating, Walkw ays, stairs, handrails	Any	IV	NA	EN 10025 S235 JR EN 10025 S275 J0 EN 10025 S355 J0	EN 10025 S235 JR EN 10025 S275 J0 EN 10025 S355 J0	API 5L Gr.B EN 10210 S235 JRH / EN 10210 S275 J0H / EN 10210 S355 J0H	t <= 12	10	DC5-IV-235-10 / DC5-IV-275-10 / DC5-IV-355-10 / DC5-IV-GRB-10	-
							12 < t <= 25	10		

4.6 – MATERIAL GRADE REFERENCE GIVEN IN TABLE 1 SHALL BE COMPLETED BY NOTCH IMPACT TOUGHNESS REQUIREMENTS AND Z35 QUALITY (IF APPLICABLE).
4.7 – MATERIAL TYPE SHOWN ON DRAWINGS WITHOUT A MATERIAL LIST SHALL BE SHOWN AS FOLLOWS:



4.8 – MEMBER SIZE SHOWN ON DRAWINGS WITHOUT A MATERIAL LIST SHALL BE SHOWN AS FOLLOWS:



4.9 – ALL TUBULAR WITH OD LOWER OR EQUAL TO 16" (406.4mm) ARE CONSIDERED AS SEAMLESS PIPES. ALL TUBULAR WITH OD GREATER THAN 16" (406.4mm) ARE CONSIDERED AS ROLLED PIPES.

5 – BOLTED CONNECTIONS (DC2) :

5.1 – THE BOLT PROPERTY CLASS FOR INTERFACES BETWEEN TP AND MONOPILE FOUNDATION SHALL BE DESIGNED WITH THE EQUIVALENT MAXIMUM BOLT PROPERTY CLASS OF 10.9, SEE ISO 898–1, IN ORDER TO AVOID THE RISK OF HYDROGEN EMBRITTLEMENT.
5.2 – MECHANICAL/LOCKING DEVICES OF NUTS SHALL BE PROVIDED FOR BOLTED CONNECTIONS BETWEEN STRUCTURAL MEMBERS PERTAINING TO DC1 AND DC2.

BOLT DIAMETER	CLEARANCE (mm)	HOLE DIAMETER (mm)
M64	6	70

5.3 – BOLT DESIGN ACCORDING TO DNVGL–ST–0126.

6 – BOLTED CONNECTIONS (DC4) :

6.1 – ALL BOLTED CONNECTIONS ACCORDING TO MATERIAL SPECIFICATION, DESIGN CLASS DC4.
6.2 – ALL BOLTED CONNECTION EXECUTION IN ACCORDANCE WITH ISO 898–1.
6.3 – ALL BOLT THREADS ARE ROLLED THREADS.
6.4 – NO THREAD ALLOWED AT THE SHEAR PLANE.
6.5 – ALL BOLTS TO BE SUPPLIED WITH WASHERS AND NUTS OF THE SAME MATERIAL.
6.6 – DOUBLE NUTS TO BE APPLIED FOR ALL DETACHABLE ITEMS, U.N.O. LOCTITE 243 TO BE APPLIED AT ALL OTHER POSITIONS, U.N.O.
6.7 – WASHERS SHALL HAVE ROUNDED/CHAMFERED EDGES TOWARDS COATED SURFACES.
6.8 – ALL BOLT LENGTHS ON DESIGN DRAWINGS ARE INDICATIVE LENGTHS. A BOLT SHALL PROTRUDE THE NUT BY A MINIMUM OF ONE FULL THREAD, IT IS PREFERRED TO HAVE NO MORE THAN FIVE THREADS PROTRUDING IF POSSIBLE. FABRICATOR IS RESPONSIBLE FOR SELECTING A SUFFICIENT BOLT LENGTH SIZE CONSIDERING THE FABRICATION AND ASSEMBLY PROCESS.
6.9 – ALL BOLTED CONNECTIONS: GRADE 8.8 HOT DIP GALVANIZED, UNO. IF SPECIFIED ON DESIGN DRAWINGS AS STAINLESS STEEL: GRADE A4–80, U.N.O.
6.10 – WHEN APPLIED IN CONTACT WITH DIFFERENT ALLOY METALS APPLY ISOLATION BETWEEN ALL CONTACT SURFACES TO PREVENT GALVANIC CORROSION. THE ISOLATION SHALL FULLY INSULATE ALL CONTACT AREAS (INCLUDING SHAFT, THREAD AND WASHER).
6.11 – PUNCHING OF HOLES NOT ALLOWED. FABRICATOR MAY REQUEST PUNCHING OF SPECIFIC HOLES PER TQ.
6.12 – WELDING OF BOLTS OR NUTS IS NOT ALLOWED, U.N.O.
6.13 – NO LUBRICATION SHALL BE APPLIED, U.N.O. FABRICATOR MAY REQUEST LUBRICATION OF SPECIFIC CONNECTIONS PER TQ;
6.14 – BOLT HOLE SIZE TO BE IN ACCORDANCE WITH TABLE 2, U.N.O.

NOMINAL BOLT or PIN SIZE	UNCOATED or HDG	COATED
M12	13.5	15
M16	18	20
M20	22	24
M24	26	28
M30	33	35
M36	39	41

6.15 – BOLT DESIGN ACCORDING TO DNVGL–ST–0126.

7 – PAINTING :

7.1 – ALL STRUCTURAL STEEL SHALL BE PAINTED IN ACCORDANCE WITH SPECIFICATION 123A90–DDL–MAT–SP–60006.
7.2 – DECK PLATING IN CIRCULATION AREA: FLAT PLATE TO BE USED WITH ANTI–SLIP PAINT.

8 – MISCELLANEOUS :

8.1 – SUPPORTS:
- FOR DESIGN CLASS DC5/SQL IV DOUBLE PLATE IS REQUIRED FOR CONNECTION TO SQL I & II CATEGORIES.
- ALL WELDS ON SQL I & II CATEGORY ELEMENTS SHALL COMPLY WITH A QUALIFIED WELDING PROCEDURE AND BE EXECUTED BY QUALIFIED WELDERS.
- NON STRUCTURAL COMPONENTS SUCH AS ALL SUPPORTS OF PIPING, CABLE TRAYS, LIGHTS, ETC. HIGHER THAN 100mm SHALL BE ADDRESSED AND WELDED AS STRUCTURAL ITEMS.

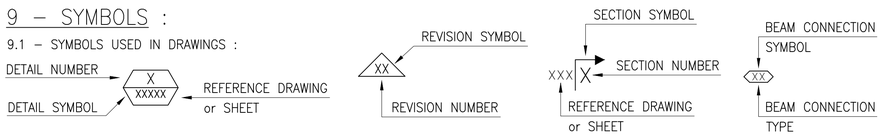
8.2 – SEA–FASTENING MEMBERS SHALL BE WELDED TO MAIN STRUCTURE WITH DOUBLER PLATES.
8.3 – DRAINS SHALL BE PROVIDED EVERY 25 m2 AT EACH PLATED DECK .
8.4 – WEB STIFFENERS :
- ALL BEAMS SUPPORTING EQUIPMENT AND VESSELS SHALL BE PROVIDED WITH WEB STIFFENERS AT THE SUPPORT POINTS OF THE EQUIPMENT AND VESSELS.
- ALL GIRDERS OR BEAMS SHALL BE PROVIDED WITH WEB STIFFENERS SPACED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AISC CODES.

8.5 – CLOSURE PLATES :
- ALL BOX GIRDERS (INCLUDING DOUBLE ' I ' BEAMS ASSEMBLED AS BOX SECTION AND HOLLOW SECTIONS) SHALL BE PROVIDED BOTH ENDS WITH CLOSURE PLATE (5mm THK MINIMUM) FULLY WELDED, TO REMAIN WATERTIGHT.

8.6 – CONTRACTOR SHALL SEAL OFF AREAS FORMING WATER TRAPS, OR INACCESSIBLE FOR BLASTING AND PAINTING WITH MINIMUM 5mm THK PLATE AFTER ALL NECESSARY NDT REQUIREMENTS HAVE BEEN FULFILLED AND ACCEPTED BY COMPANY.
8.7 – DOUBLER PLATES SHALL BE ROLLED WITH TWICE THEIR THICKNESS, OR 50mm MAX, ALL AROUND THE DIMENSION OF INCOMING BRACE FOOT PRINT AND SHALL HAVE 50mm RADIUS AT CORNERS U.N.O.

9 – SYMBOLS :

9.1 – SYMBOLS USED IN DRAWINGS :



10 – ABBREVIATIONS :

10.1 – ABBREVIATIONS USED IN DRAWINGS :

C/C	=	CENTRE TO CENTRE
℄	=	CENTERLINE
CD	=	CHART DATUM
DIA.	=	DIAMETER
DWG.	=	DRAWING
EL.	=	ELEVATION
I.D.	=	INSIDE DIAMETER
H.A.T.	=	HIGEST ASTRONOMICAL TIDE
L.A.T.	=	LOWEST ASTRONOMICAL TIDE
M.S.L.	=	MEAN SEA LEVEL
mm	=	MILLIMETRES
m	=	METRES
NS/FS	=	NEAR SIDE/FAR SIDE
N.T.S.	=	NOT TO SCALE
O.D.	=	OUTSIDE DIAMETER
MIN	=	MINIMUM
M TON	=	METRIC TONS
RAD.	=	RADIUS
REF.	=	REFERENCE
REQ'D	=	REQUIRED
STD.	=	STANDARD
STIFF.	=	STIFFENER
TBA	=	TO BE ADVISED
TBC	=	TO BE CONFIRMED
THK.	=	THICKNESS
T.O.G.	=	TOP OF GRATING
T.O.P.	=	TOP OF PLATE
T.O.S.	=	TOP OF STEEL
TYP.	=	TYPICAL
U.N.O.	=	UNLESS NOTED OTHERWISE
W.P.	=	WORKING POINT
WRT	=	WITH RESPECT TO
WT	=	WALL THICKNESS

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
05	22/09/25	SPS	AB	CGI	AS–BUILT (ASB)
04	05/11/24	SGR	AB	DLS	ACCEPTED FOR CONSTRUCTION (AFC)
03	02/07/24	SGR	AB	DLS	ACCEPTED FOR CONSTRUCTION (AFC)
02	17/04/24	SGR	AB	DLS	ACCEPTED FOR CONSTRUCTION (AFC)
01	31/01/24	SGR	AB	DLS	ACCEPTED FOR CONSTRUCTION (AFC)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
STANDARD DRAWINGS
GENERAL NOTES

CONTRACT NO./TITLE CW–I–WP4–2023–05/HOLLANDSE KUST NOORD WIND PARK		SCALE NTS	
DRAWN SPS	CHECKED A.BALZAROTTI	APPROVED CGI	DATE 22/09/25
A1	DRAWING NO. 123A90–DDL–ST–DD–90026	SHEET 001	REV. 05

File Name : 123A90–DDL–ST–DD–90026 REV.05.dwg