

GENERAL NOTE

In cases of discrepancies between this general note and specific notes in the individual drawings, the latter shall prevail.

Manufacture and execution of concrete structures shall be in accordance with EN 13670, latest edition.

The drawings show the principles for reinforcement only and the contractor is expected to prepare bar bending schedules based upon these principles. Consequently, reinforcement belonging in the same layer may be shown off-set for clarity, as well as stirrups may be shown with different heights even though they shall have the same height.

All measurements are stated in millimeters [mm] whereas levels are in meters [m] acc. DVR90.

MATERIALS

		Enviromental effect	Cylinder strength f _{ck} [MPa]	Max aggregate [mm]	Concrete cover [mm]	Execution class	Water proofing	Exposure class
Blinding layer/soil replacement	P	8	32	-	EXC1	-		X0
Raw concrete	P	12	32	-	EXC2	-		XC1
Foundations and pits	A	35	32	30	EXC2	-		XC4, XS1, XF3, XA1
Foundations (Cooling Plant Building)	M	35	32	20	EXC2	-		XC2, XA1
Terrain slab (indoor)	P	35	32	10	EXC2	-		X0
Terrain slab and trenches (outdoor)	A	35	32	30	EXC2	-		XC4, XS1, XD1, XF3
Composite slab	P	35	32	10	EXC2	-		X0
Walls and columns (outdoor)	A	35	32	30	EXC2	-		XC4, XS1, XF3, XA1
Piles	A	35	32	30	EXC2	-		XC2, XS2, XA2

FT: Damp proofed concrete
VT: Water proofed concrete

Requirement for concrete composition for damp proofed concrete:

- Requirement for concrete composition equal to XC2
- Concrete filler content min. 375 kg/m³ concrete (definition acc. DS/EN 206 DK NA, 3.1.2.18)

Requirement for concrete composition for water proofed concrete:

- Requirement for concrete composition equal to XS2
- Concrete filler content min. 375 kg/m³ concrete (definition acc. DS/EN 206 DK NA, 3.1.2.18)
- Amount of cement+k-adds min. 300 kg/m³ concrete

Grouting of structures must be performed with non-shrinkable cement grout with a characteristic cylinder strength of min. 50 MPa.

All grouting to be performed acc. supplier instructions.

Reinforcement

Reinforcement shall be ribbed bars in accordance with EN 1992-1-1 with the following properties:

Characteristic yield strength: f_{yk} = 550 MPa

Ductility: ε_{yk} ≥ 5 %

Ductility: f_t/f_{yk} ≥ 1,08

All reinforcement shall be free of all loose mill scale and thoroughly cleaned to remove oil, grease or other harmful matters.

All reinforcement shall be accurately placed, securely fixed with soft annealed iron wire or clips. The concrete cover of the reinforcement shall be maintained by use of mortar blocks, reinforcement chairs, or other approved method.

If distances are denoted on reinforcement, they must be read as max distances between rebars.

If two structures connect, reinforcement from the least reinforced structure must be transferred min a bond length inside the adjacent structure, unless noted otherwise.

EMBEDDED ITEMS:

Care shall be taken that all embedded items are in position and securely fastened in place as per relevant drawings before pouring of concrete. Contractor shall refer to applicable mechanical, electrical and other relevant drawings for additional details regarding location of embedded items.

Arrangement of embedded items such as:

- Anchor bolts and anchors.
- Electrical conduits, apparatus and grounding conductors.
- Embedded structural steel for equipment and miscellaneous steel.
- Pipe sleeves, metal inserts, floor drains, trenches and ducts, etc.
- Starter rebars for column stiffener.

All embedded items shall be supported and protected from damage and exposure during construction.

TOLERANCES:

Unless more strict tolerances are denoted in DS/EN 1090-2 or elsewhere on drawings or ARB, the following tolerances apply:

Concrete cover: + 5mm
Foundations, dimensions: +/- 20mm
Foundations, locations: +/- 20mm
Concrete structures, dimensions: +/- 10mm
Concrete structures, locations: +/- 10mm
Distance between concrete surfaces: +/- 5mm
Levels: +/- 10mm

Embedded parts: acc. EN 13670 unless more strict requirements denoted elsewhere. More restrictive requirements may be specified for individual structures. For tolerances not listed above, reference is made to current EN 13670.

CONSTRUCTION JOINTS

Unless specified differently on the drawings, all construction joint surfaces must be made as rough acc. EN 1992-1-1. Joints in slab connections however must be made as indented acc. EN1992-1-1.

CLOSED STIRRUPS

At places with complicated or packed reinforcement, the closed stirrups (C-bars) can be replaced by double U-bars with lap length equal to full bond length in order to act as stirrups.

CONCRETE SURFACES (BO X-Y)

Unless specified otherwise in work descriptions or elsewhere, following surface requirement apply acc. Molio A24:

Structure	Visible horizontal BO	Visible vertical BO	Non-visible BO
Foundations	S-N	S-N	-
Terrain slab (indoor)	23	S-N	-
Terrain slab (outdoor)	43	S-N	-
Composite slab	23	S-N	-
Walls and columns (outdoor)	S-N	S-N	-
Casted connections	-	-	52

Surface type(X): S = Visible
I = Non-visible

Requirement level(Y):

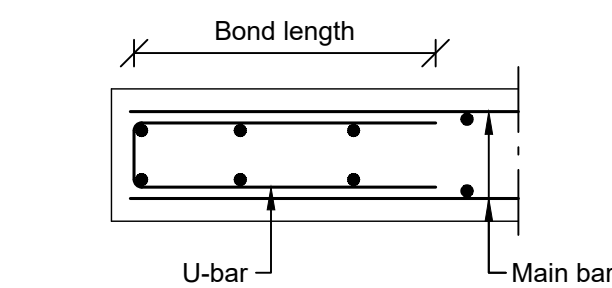
L = Low
N = Normal
S = Enhanced
P = Project specific (...)
G = Smooth
J = Even
R = Rough
F = Indented

GENERAL DETAILS AND PRINCIPLES

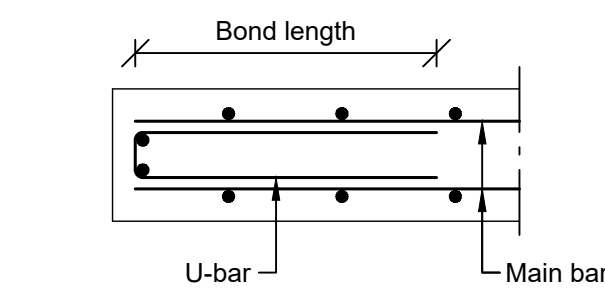
Slabs and walls

Type I

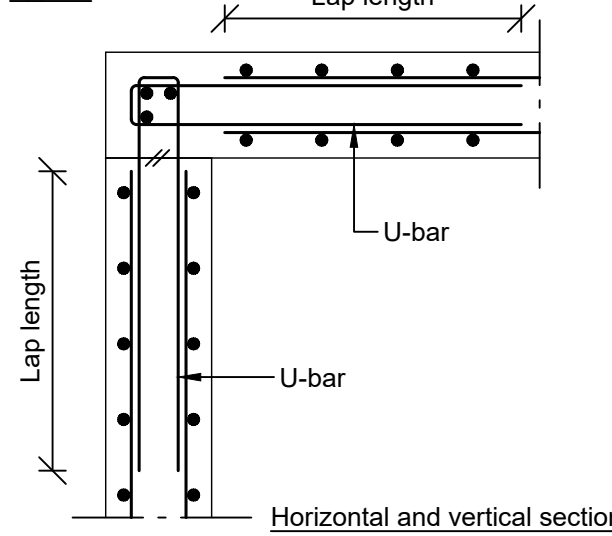
a) (Do not apply for beams)



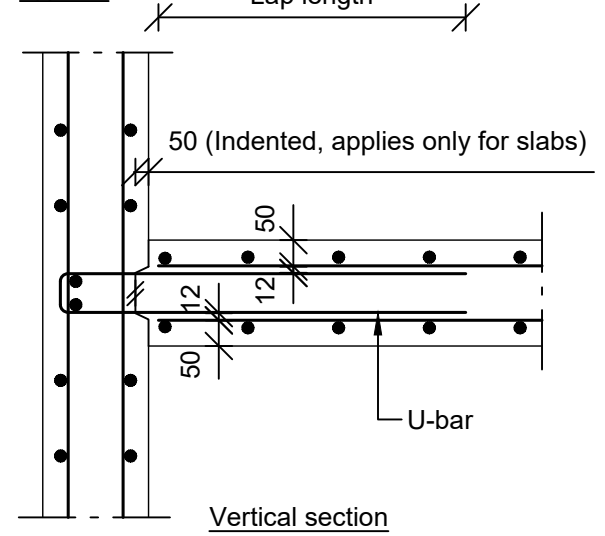
b) (Do not apply for beams)



Type II

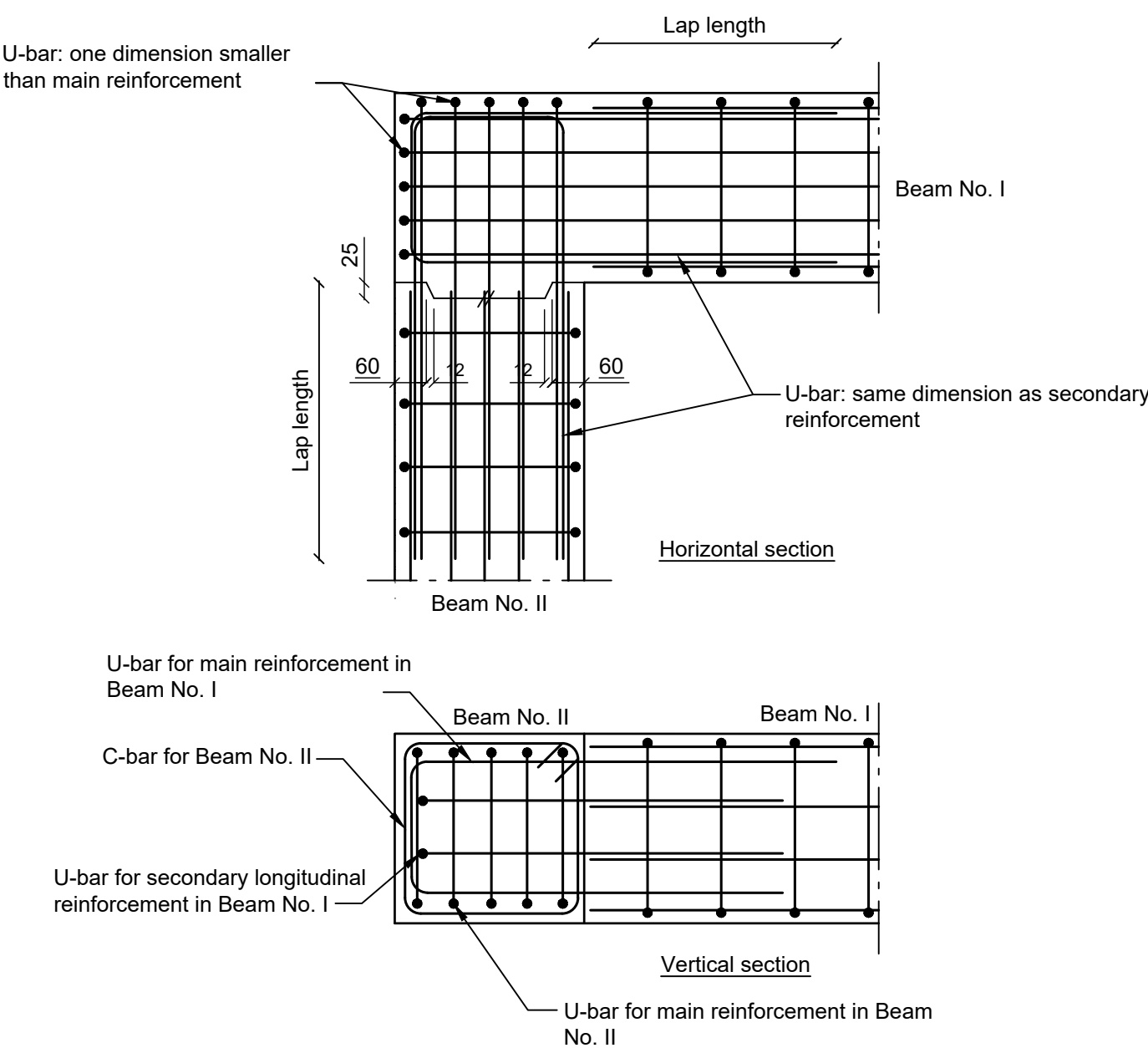


Type III



Beam connections

U-bar: one dimension smaller than main reinforcement



BOND AND LAP LENGTHS

Position of splices in the continuous reinforcement is not specified on drawings. Bond and splice lengths must be designed acc. EN 1992-1-1.

The contractor is obligated to ensure that all reinforcement is spliced and anchored acc. DS/EN 1992-1-1.

The bond and splice lengths must be designed for full tension in the bars.

The following bond and splice lengths can be applied if nothing else is denoted on the drawings:

f _{ck} (MPa) \ φ (mm)	6	8	10	12	16	20	25	32
12	470	630	785	945	1260	1575	1965	2515
16	390	520	650	780	1040	1300	1625	2080
20	335	450	560	670	895	1120	1400	1790
25	290	385	480	580	770	965	1205	1545
30	255	340	425	510	685	855	1065	1365
35	230	310	385	460	615	770	965	1235
40	210	280	350	425	565	705	880	1130
45	200	260	325	390	520	650	815	1045
50	200	245	305	365	485	610	760	970
55	200	235	295	350	470	585	735	940
>60	200	225	285	340	455	570	710	910

The values apply for f_{yk} ≤ 550 MPa and for "good" bond conditions. For "poor" bond conditions acc. DS/EN1992-1-1 figure 8.2, the values must be increased by factor 1/0.7 - equal to 1.43.

Lap length is calculated as 1.5 x bond length.

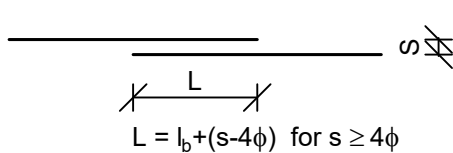
Laps not shown in drawings must be provided with required transverse reinforcement acc. DS/EN 1992-1-1.

Poor anchoring conditions are present the upper 300 mm in a structural element except for the lowest 250 mm which are always good acc. figure 8.2 in EN 1992-1-1.

The splice length can be reduced with the following factor acc. EN 1992-1-1 depending on number of lapped bars compared to the total cross section area of the reinforcement:

< 25 % 0,67
33 % 0,77
50 % 0,93
> 50 % 1,00

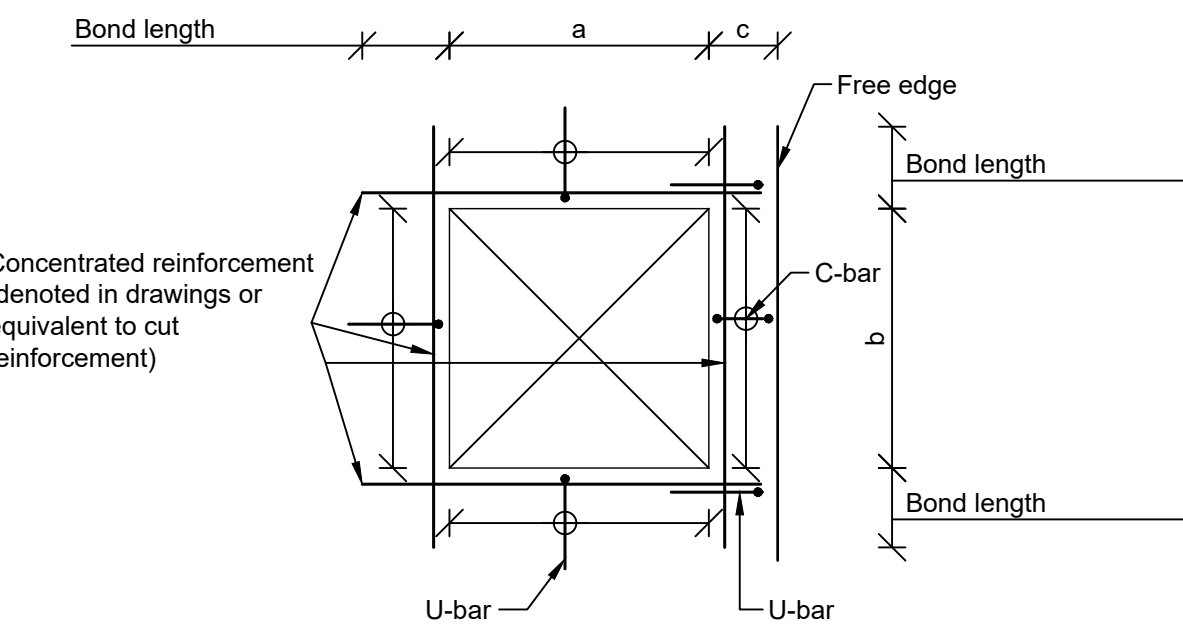
Increased lap length (φ ≤ 12 mm):



l_b = normal lap length for the smallest rebar.
φ = diameter of the smallest rebar.
s = cc-distance between the 2 spliced rebars.
L = increased lap length.

HOLES

Unless stated elsewhere, the reinforcement around holes must be performed as denoted below.



U-bars must be positioned along all edges. C-bars are used instead if c < bond length.

The concentrated reinforcement is transferred at least one bond length pass the hole, unless stated otherwise. If the required bond length cannot fit, U-bars are used instead.

Holes must not be performed unless clearly stated by the project material or the site management have given approval in any cases.

BENDING OF REBARS

All reinforcement shall be cut and bent in accordance with EN 1992-1-1. It must be documented that the applied rebars fulfill the requirements for bending applicability acc. DS/EN 10080, chapter 7.2.6. For reverse-bending of rebars, requirements stated in DS/EN 1992-1-1 and related standards must be fulfilled and it must be documented that requirements acc. DS/EN 10080 are still fulfilled.

Bend diameters: D = 4 x Ø for Ø ≤ 16mm
D = 7 x Ø for Ø > 16 mm, Ø = rebar diameter

All bending of rebars must be performed as cold bending. Hot bending and hot reverse-bending must be documented and only apply when approved by the site management in any cases.

FOUNDATIONS

The following applies unless noted otherwise:

- 50 mm of blinding layer to be placed below foundations, foundation beams and reinforced slabs.
- The blinding layer can be excluded, if the concrete cover is increased to 75 mm by lowering UF.
- When no structures are present on top of foundation, the top surface must have an inclination of 1:20 (in addition to measurements stated on drawings).
- Water shall be kept away from excavations which are ready for casting to ensure geotechnical conditions.

CUSHION EDGES

All out-going corners shall be chamfered 20x20 mm unless noted otherwise.

FREE HORIZONTAL SURFACES

All Free horizontal surfaces has to be made with a slope 1:40 leading towards the nearest pit or away from the building.

ADHESIVE ANCHOR

Adhesive/chemical anchors must as minimum posses similar technical properties as HILTI adhesive anchor type HIT-HY 200. Dimensions on anchors are shown on drawings.

Caution must be taken that no reinforcement is damaged when drilling holes for anchors.

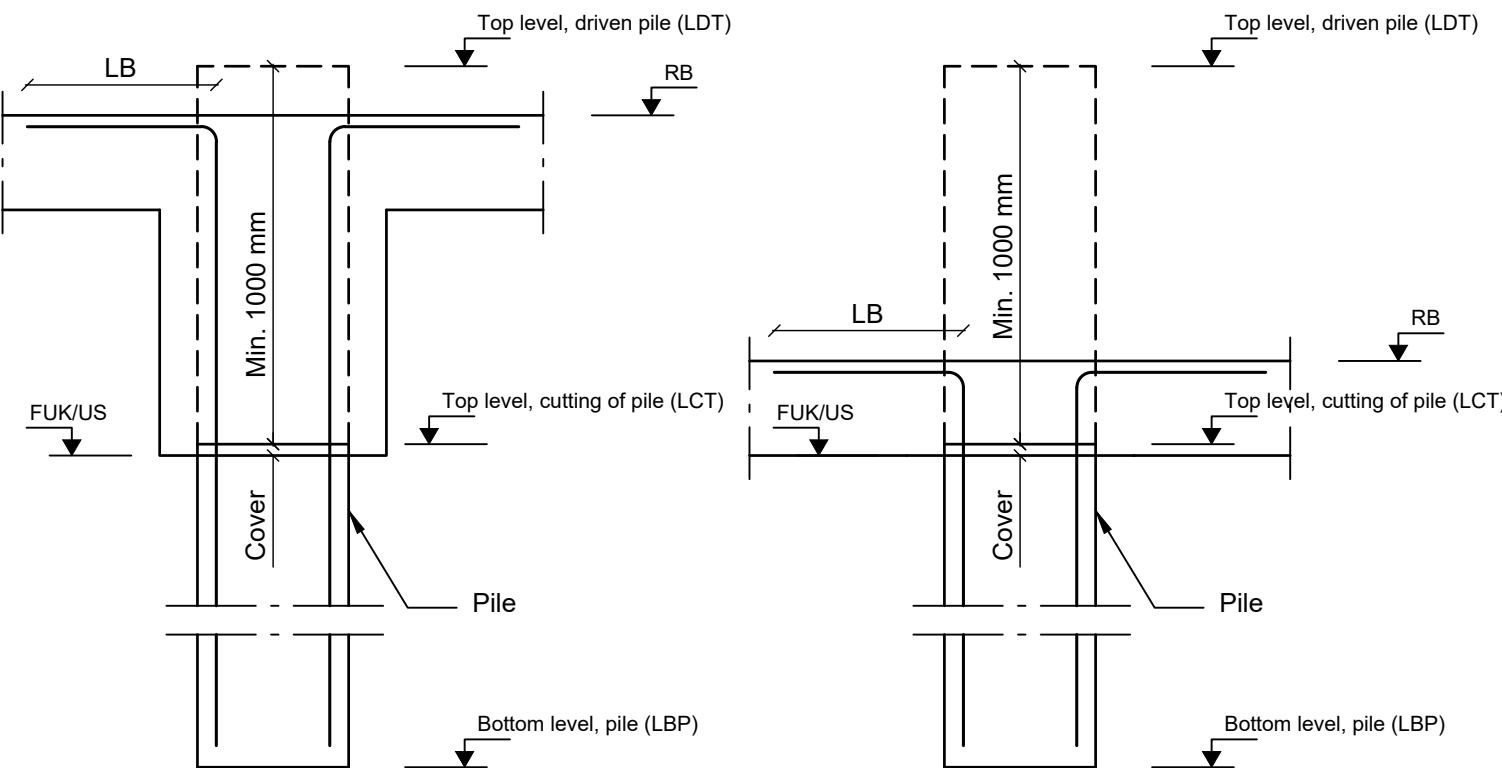
RECESSES

All recesses for pipe penetrations must be casted after the installation of pipes unless stated other wise.

PILING WORKS

The piling works must follow the general requirements specified on drawings for Piles and associated work descriptions.

The following principle must be applied for all piles unless noted otherwise:



PRINCIPLE SECTION IN BEAMS

PRINCIPLE SECTION IN SLABS

LEGENDS

GEOMETRY

RB : Level to top site concrete [TH] OK : Level to top site, e.g. hole
FK : Level to casting form [UH] UK : Level to bottom site, e.g. hole
FG : Level to top site future floor CL : Center line
FT : Level to future terrain R : Radius
SOK : Level to top site base h : Height of a subject, e.g. hole or beam
FOK : Level to top site foundation t : Thickness of concrete
FUK : Level to bottom site foundation b : Width
GUK : Level to bottom site raw concrete foundation l : Length
d : Debth

REINFORCEMENT

Yxx : Rebar, diameter xx mm IS : On inner site
BR : In both ways NS : On nearest site
BS : At each face FS : On furthest site
OS : Top site ⊕ : Reinforcement outlet
US : Bottom site : Rebar
IM : At the middle : Change in rebar
YS : At the outer site
U-bar : U-shaped bar
L-bar : L-shaped bar
C-bar : C-shaped bar

SIGNATURER, MV.

Concrete in-situ, section : Visible contours
Concrete element, section : Hidden contours
Blinding layer : Grid lines
Raw concrete : Joints
Existing structure : Existing structure
Grouting : Threaded bar in insert
Masonry : Chemical anchor or injected rebar
Lightweight concrete blocks : Sealant tape, type I
Steel : Sealant tape, type II
Single lightweight concrete block : Hole
Capillary breaking layer/ insulated layer : Recess, depth (d) denoted
Soft insulation : Section similar to Section A
Hard insulation : Section similar to Section A
Wood, cross section : Section similar to Section A
Glue laminated timber : Section similar to Section A

Project Name: Rise of the Phoenix

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AVISTA Green		Status: For tender	Format: A1	Rev.:
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