

10.0 INSITU CONCRETE

- 10.1 REINFORCED CONCRETE WORKS HAVE BEEN DESIGNED TO : BS EN 1992-1-1*2004 AND UK N.A AND BS EN1992-3:2006 AND UK N.A & BS 8102.
- 10.2 ALL CONCRETE FOR STRUCTURAL USE SHALL COMPLY WITH THE REQUIREMENTS OF BS EN 1992 PARTS 1, 2 & 3, BS EN 206-1, BS EN 206-2 AND BS 8500.
- 10.3 UNO, CONCRETE SHALL BE AS FOLLOWS USING THE PRESCRIPTIONS FROM THE NATIONAL STRUCTURAL CONCRETE SPECIFICATION CL 8.6:

LOCATION	GRADE	FINISH FORMED/UNFORMED
FOUNDATIONS AND GROUND BEAMS	C32/40	BASIC/BASIC
BASEMENT SLABS	C32/40	PLAIN/BASIC
GROUND FLOOR SLAB	C32/40	PLAIN/PLAIN
UPPER FLOOR SLABS	C32/40	PLAIN/PLAIN
RETAINING WALLS	C32/40	PLAIN/PLAIN
STAIRS AND LANDINGS	C32/40	PLAIN/PLAIN
EXTERNAL SLABS	C32/40	ORDINARY/BRUSHED

- 10.4 THE WORKS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH EXECUTION CLASS2 EXC2 TO BS EN 1990.
- 10.5 ALL CONCRETE IS TO BE FULLY COMPACTED.
- 10.6 REINFORCEMENT TO BE:
RIBBED BARS GRADE 500N/mm² (B500B)
FABRIC GRADE 500N/mm² (B500B)
- 10.7 MINIMUM LAP LENGTHS TO BE:
LOOSE BARS - 50 X SMALLEST UNO
A393 MESH - 500mm
A252 MESH - 400mm
A193 MESH - 300mm
USE FLYING END MESH WHENEVER POSSIBLE
- 10.8 LAPPING OF REBAR TO BE STAGGERED AS RECOMMENDED BY BS EN 1992.
- 10.9 REINFORCEMENT DETAILS ARE REFERENCED AS FOLLOWS:
36 H20-40-200-81-AB

ARRANGEMENT
LAYERING
SPACING
BAR MARK
DIAMETER OF BAR
STEEL GRADE
NUMBER OF BARS

10.10 ABBREVIATIONS RELATING TO REINFORCED CONCRETE:

AB	ALTERNATE BARS
ABR	ALTERNATE BARS REVERSED
B1	LOWEST BOTTOM LAYER
B2	SECOND BOTTOM LAYER
EF	EACH FACE
FF	FAR FACE
LLB	LONG LEG BOTTOM
LLT	LONG LEG TOP
NF	NEAR FACE
STG	STAGGERED
T1	HIGHEST TOP LAYER
T2	SECOND TOP LAYER

10.11 UNLESS NOTED OTHERWISE, THE MINIMUM COVER TO THE OUTERMOST REINFORCEMENT TO BE:

ELEMENT	COVER mm
ALL ELEMENTS CAST AGAINST EARTH FACE	75mm
FOUNDATIONS	50mm BOTTOM, 35mm SIDE
PILE CAPS	75mm BOTTOM, 35mm SIDE
GROUND SLAB	35mm AGAINST BLINDING
UPPER FLOOR SLABS	25mm
UPPER FLOOR BEAMS	25mm
COLUMNNS	25mm ALL FACES
WALLS	25mm ALL FACES

10.12 THE CONTRACTOR IS TO PROVIDE ALL NECESSARY FALSEWORK AND FORMWORK IN COMPLIANCE WITH BS EN 13670 SECTION 5.0 TO ACHIEVE THE SURFACE FINISHES AS SPECIFIED IN DRAWINGS AND SPECIFICATIONS. ALL TIMBER PRODUCTS TO BE SOURCED FROM FOREST STEWARDSHIP COUNCIL; FSC OR PROGRAM FOR THE ENDORSEMENT OF FOREST CERTIFICATION SCHEME PEFC.

- 10.13 THE CONTRACTOR IS RESPONSIBLE FOR PROVISION AND SCHEDULING OF ALL SPACERS, STOOLS AND CHAIRS TO SUPPORT THE REINFORCEMENT AND PROVIDE THE SPECIFIED COVER.
- 10.14 THE REINFORCED CONCRETE DESIGN ASSUMES THE CONTRACTOR WILL DETERMINE AND ADOPT A POUR SEQUENCE AND JOINT LAYOUT THAT WILL MINIMISE THERMAL AND SHRINKAGE EFFECTS. THE POUR SEQUENCE TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

11.0 PRECAST CONCRETE FLOOR UNITS

- 11.1 THE UNITS ARE TO BE DESIGNED IN ACCORDANCE WITH BS EN 1992 USING LOADS PROVIDED.
- 11.2 THE ARRANGEMENT OF FLOOR UNITS SHOWN ON ENGINEER DRAWINGS ARE INTENDED TO BE INDICATIVE ONLY.
- 11.3 THE FINAL ARRANGEMENT AND SETTING OUT SHALL BE THE RESPONSIBILITY OF THE SUPPLIER.
- 11.4 FLOOR TO HAVE A MINIMUM FIRE RATING OF ONE HOUR
- 11.5 THE UNITS SHALL BE DESIGNED IN SUCH A MANNER AS TO PRECLUDE DIFFERENTIAL DEFLECTION BETWEEN ADJOINING UNITS. IN ADDITION, THE INDIVIDUAL UNITS SHALL BE DESIGNED TO THE FOLLOWING LIMIT OVERALL TOTAL DEFLECTION:-
 - SIMPLY SUPPORTED CONDITION= SPAN/250
 - CANTILEVER CONDITION = SPAN/125
- 11.5 ALL HOLES AND NOTCHES REQUIRED TO ACCOMMODATE STRUCTURAL STEEL ELEMENTS AND THEIR CONNECTORS AND ANY OTHER ARCHITECTURAL DETAILS OR SERVICES ROUTES OR FIXINGS SHALL BE SHOWN ON THE MANUFACTURERS SHOP DRAWINGS. THIS INFORMATION SHALL BE COLLATED BY THE SUB-CONTRACTOR FROM ALL RELEVANT STRUCTURAL, ARCHITECTS AND SERVICES DRAWINGS INCLUDING OTHERS SUB-CONTRACTORS' DRAWINGS.

12.0 STRUCTURAL STEELWORK

- 12.1 ALL STRUCTURAL STEELWORK HAS BEEN DESIGNED TO BS EN 1993 PART 1 UNO.
- 12.2 STEELWORK GRADES, UNLESS NOTED OTHERWISE TO BE AS FOLLOWS: GENERAL STEEL SECTIONS AND PLATES : S355 TO BS EN 10025 HOLLOW STEEL SECTIONS: HOT ROLLED S355 TO BS EN 10210.
- 12.3 THE WORKS ARE TO BE BUILT IN ACCORDANCE WITH BS EN 1090-2, EXECUTION CLASS 2 (EXC2) FOR BUILDINGS OR EXECUTION CLASS 3 (EXC3) FOR BRIDGES, BUILDINGS OVER 500M2 AND BUILDINGS OVER 15 STOREYS UNLESS OTHERWISE SPECIFIED IN OTHER PROJECT SPECIFICATIONS.
- 12.4 ABBREVIATIONS RELATING TO STRUCTURAL STEELWORK:

BW	BUTT WELD
CFW	CONTINUOUS FILLET WELD
CHS	CIRCULAR HOLLOW SECTION
EA	EQUAL ANGLE
FW	FILLET WELD
FPBW	FULL PROFILE BUTT WELD
FPFW	FULL PROFILE FILLET WELD
HD	HOLDING DOWN (BOLT)
PFC	PARALLEL FLANGE CHANNEL
RHS	RECTANGULAR HOLLOW SECTION
SHS	SQUARE HOLLOW SECTION
UB	UNIVERSAL BEAM
UEA	UNEQUAL ANGLE
UC	UNIVERSAL COLUMN
USFB	WESTOK ULTRA SHALLOW FLOOR BEAM
- 12.5 THE DESIGN OF ALL THE STEEL TO STEEL CONNECTIONS IS THE RESPONSIBILITY OF THE STEEL FABRICATOR. THIS SHALL INCLUDE ALL PLATES, WELDS, GUSSETS, BOLTS ETC WHICH ARE NECESSARY TO ACHIEVE THE CONNECTION. WHERE POSSIBLE, ALL CONNECTIONS SHALL BE ACHIEVED WITHIN THE DEPTH OF THE STEEL MEMBER AND AGREED WITH THE ENGINEER AND CA. THE CONNECTIONS ARE TO AVOID FINISHES ZONES.
- 12.6 WHERE SHOWN ON THE DRAWINGS M, S AND A DENOTE FACTORED MOMENT, SHEAR AND AXIAL FORCE RESPECTIVELY
- 12.7 WHERE NO LOADS ARE SHOWN ON THE DRAWINGS, BEAMS ARE TO BE DESIGNED FOR A FACTORED VERTICAL SHEAR OF 100KN AND A TIE FORCE OF 75KN (FOR THE ACCIDENTAL LIMIT STATE)
- 12.8 ALL BOLTS AND NUTS TO BE MINIMUM GRADE 8.8 TO BS EN 10898.
- 12.9 WELDS TO BE A MINIMUM 6mm PPFW.
- 12.10 THE CONTRACTOR IS TO ALLOW FOR CO-ORDINATION WITH OTHER CONTRACTORS WHOSE WORK INTERFACES WITH THE STEEL FRAME. THIS CO-ORDINATION MAY

- INCLUDE THE DESIGN, FABRICATION OF STEEL ELEMENTS, BRACKETS AND FIXES SPECIFIED BY OTHER CONTRACTORS AND NOT SHOWN ON R&P DRAWINGS.
- 12.11 ALL SLIMFLOR BEAMS ARE TO HAVE A CONTINUOUS 6.0mm FW BETWEEN THE BOTTOM PLATE AND THE UC SECTION WHEN USED IN CONJUNCTION WITH METAL DECKING. THE WELDS ARE TO BE 8.0mm WHEN USED IN CONJUNCTION WITH PC PLANKS.
- 12.12 UNO WITHIN THE R&P SPECIFICATION, CORROSION PROTECTION TO BE AS FOLLOWS:
 - EXTERNAL STEELWORK: GALVANISED TO 140 MICRONS
 - INTERNAL UNEXPOSED STEEL: BLAST CLEAN TO SA2 ½ AND APPLY AKZO NOBEL INTERCURE 200 TO MIN 75 MICRONS DFT

COMPOSITE STEELWORK

- 12.13 THE TOP SURFACES OF ALL STEEL BEAMS RECEIVING SITE WELDED SHEAR STUDS ARE TO BE LEFT UNPAINTED.
- 12.14 SHEAR STUDS SHALL BE 19 X 100 TYPE SD1 IN ACCORDANCE WITH BS EN ISO 13918.
- 12.15 THE CONTRACTOR SHALL CARRY OUT PROCEDURE TRIALS OF STUD WELDING AND BEND TESTING OF INSTALLED SHEAR STUDS.
- 12.16 COMPOSITE BEAMS ARE DESIGNED ASSUMING FULL LATERAL RESTRAINT FROM THE CONCRETE SLAB IN THE PERMANENT CONDITION. THE CONTRACTOR SHALL ASSESS THE REQUIREMENT FOR TEMPORARY STABILITY MEASURES DURING CONSTRUCTION AND PROVIDE THE NECESSARY MEASURES TO ENSURE STABILITY. PARTICULAR ACCOUNT SHALL BE TAKEN OF THE TORSIONAL STABILITY OF COMPOSITE EDGE BEAMS IN THE TEMPORARY CONDITION.

METAL DECKING

- 12.17 THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF THE METAL DECKING TO SUPPORT THE TEMPORARY CONSTRUCTION LOADS WHICH SHALL INCLUDE THE WEIGHT OF THE WET CONCRETE AND AN IMPOSED LOAD OF 1.5 KN/m²
- 12.18 THE DECKING, ACTING WITH THE SLAB, SHALL BE DESIGNED TO SUPPORT, IN THE PERMANENT CONDITION, THE LOADS GIVEN ON DRAWINGS.
- 12.19 ALL SLABS ARE NORMAL WEIGHT CONCRETE ON METAL DECK U.N.O. ON THE DRAWINGS.
- 12.20 THE STRUCTURAL ARRANGEMENT HAS GENERALLY BEEN CONFIGURED ASSUMING THAT NO TEMPORARY PROPPING WILL BE REQUIRED TO THE METAL DECKING, HOWEVER PROPPING MAY BE REQUIRED IN CERTAIN AREAS, AS DETERMINED BY THE CONTRACTORS DESIGN.
- 12.21 THE CONTRACTOR SHALL FORM THE SLAB WITH THE SPECIFIED THICKNESS ABOVE ALL STEELWORK MEMBERS. THE TOP SURFACE OF THE SLAB SHALL THEN BE DEFINED AND FINISHED BY STRAIGHT LINES BETWEEN THESE POSITIONS. PERMISSIBLE DEVIATIONS IN THE CONCRETE TOP PROFILE SHALL BE MEASURED FROM THE SURFACE DEFINED ABOVE.
- 12.22 THE METAL DECKING IS TO BE AS SPECIFIED ON THE DRAWINGS OR EQUAL AND APPROVED. THICKNESS TO BE DESIGNED BY CONTRACTOR. LOCATIONS AS SHOWN ON DRAWINGS.
- 12.23 ALL METAL DECKING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- 12.24 THE CONTRACTOR IS TO SUPPLY AND INSTALL ALL EDGE TRIMS, FLASHINGS, CLOSURE PLATES, SUPPORT ANGLES ETC. REQUIRED AND ALL SEALING NECESSARY TO PREVENT GROUT LOSS. THIS INCLUDES ALL SUPPORT STEELWORK BEYOND THAT SHOWN ON THE ARUP DRAWINGS THAT THE CONTRACTOR CONSIDERS NECESSARY IN ORDER TO SUPPORT THE METAL DECKING.
- 12.25 THE CONTRACTOR IS TO ENSURE THAT THE THICKNESS OF THE EDGE TRIM IS ADEQUATE TO SUPPORT THE SLAB EDGE WHERE IT CANTILEVERS BEYOND THE TOP FLANGE OF THE BEAM. THE CONTRACTOR SHALL INCLUDE FOR ALL STEELWORK REQUIRED TO SUPPORT THEIR PARTICULAR DECKING. ALL EDGE TRIMS TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- 12.26 FABRICATION DRAWINGS ARE TO BE PREPARED BY THE CONTRACTOR FOR ALL AREAS OF METAL DECKING. THESE WILL SHOW ALL EDGE DETAILS AND ANY SPECIAL NOTCHES THAT MAY BE REQUIRED TO FIT AROUND PRIMARY ELEMENTS OF STRUCTURE. ANY ADDITIONAL PLATES OR SHELF ANGLES SHALL BE PROVIDED BY THE CONTRACTOR. THE DECKING DRAWINGS ARE TO BE BASED UPON THE STEEL FABRICATION DRAWINGS.

13.0 STRUCTURAL TIMBER

- 13.1 THE DESIGN OF THE STRUCTURAL TIMBER SHALL BE IN ACCORDANCE WITH BS EN 1995.
- 13.2 ALL STRUCTURAL TIMBER TO BE STRENGTH CLASS C24 UNO.
- 13.3 THE STRUCTURAL DRAWINGS SHOWS THE SIZES OF ALL PRIMARY TIMBERS.
- 13.4 REFER TO THE ARCHITECT'S DRAWINGS FOR THE SIZES OF SECONDARY MEMBERS.
- 13.5 ALL PLYWOOD TO BE CANADIAN DOUGLAS FIR; SERVICE CLASS 1.0.
- 13.6 ALL STRUCTURAL PLYWOOD SHEETS ARE TO BE SUPPORTED ALONG ITS ENTIRE PERIMETER. THE TIMBER SUB-CONTRACTOR IS TO PROVIDE ALL ADDITIONAL NOGGINS AND TIMBERS TO ENSURE THIS. EACH SHEET IS TO HAVE A 1.0mm GAP AND SECURED WITH 10MM DIA X 50MM LONG SCREWS:
 - AT 150mm C/C TO THE PERIMETER
 - AT 300mm C/C TO INTERNAL TIMBERS
- 13.7 THE TIMBER SUBCONTRACTOR IS TO PROVIDE ALL NECESSARY JOIST HANGERS, FIXING PLATES, STRAPS, TRUSS CLIPS ETC FOR TIMBER TO TIMBER AND TIMBER TO STEEL CONNECTIONS.
- 13.8 SOLID NOGGINS TO BE PROVIDED AT THIRD POINTS ALONG THE SPAN OF ALL JOISTS.
- 13.9 PROVIDE DOUBLED UP JOISTS OR NOGGINS BENEATH ALL PARTITIONS.
- 13.10 ALL DOUBLED UP TIMBERS TO HAVE M12 BOLTS AT 300mm C/C.
- 13.11 PROVIDE 30X5.0X1000mm GMS STRAPS TO TIES WALLS TO FLOORS PARALLEL AT 1200mm CENTRES MAX.
- 13.12 PROVIDE 30X2.5X1000mm VERTICAL GMS STRAPS AT 1200mm MAX TO ALL ROOF TIMBERS.
- 13.13 THE CONTRACTOR SHALL ARRANGE FOR ALL EXISTING TIMBERS TO BE INSPECTED AT THE BEGINNING OF THE WORKS BY A SPECIALIST FOR ROT AND INFESTATION AND RECOMMEND ANY TREATMENT FOR PRESERVATIVE TREATMENT OR OTHER REPAIR AND REPLACEMENT. ALL PROPOSALS TO BE AGREED WITH THE ENGINEER.
- 13.14 WHERE ENCOUNTERED, ALL EXISTING NOTCHES SHALL BE REPAIRED USING C16 TIMBER WEDGES, TIGHTLY PACKED AND SCREWED.
- 13.15 ALL SERVICE HOLES SHALL PASS THROUGH THE CENTRE OF ANY JOIST AT 0.125 OF JOIST DEPTH AND 500MM FROM THE ENDS.


14.0 STRUCTURAL MASONRY

- 14.1 THE DESIGN AND CONSTRUCTION OF STRUCTURAL MASONRY STRUCTURES SHALL BE TO BS EN 1996.
- 14.2 UNO ALL BLOCKWORK SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 7.5 N/mm². MORTAR TO BE: CLASS (III) COMPRESSIVE STRENGTH M4 (4.0N/mm² @ 28 DAYS) PROPORTIONS – 1:1.5 TO 6 CEMENT: LIME: SAND OR 1:5 ½ TO 6 ½ MASONRY CEMENT : SAND
- 14.3 CLASS B ENGINEERING BRICKWORK TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 50N/mm² AND M12 MORTAR
- 14.4 ALL STONWORK INCLUDING, SUPPORT, TIES, REPAIRS ETC IS BY OTHERS.
- 14.5 ISOLATION SLEEVES TO BE USED AT THE JUNCTION BETWEEN ALL CARBON STEEL AND MILD STEEL.
- 14.6 ALL BED-JOINT REINFORCEMENT IS TO BE INSTALLED IN STRICT ADHERENCE WITH THE MANUFACTURER'S REQUIREMENTS.
- 14.7 REPAIRS TO EXISTING MASONRY WITHIN PERIOD PROPERTIES TO BE WITH CLAY BRICKWORK HAVING A COMPRESSIVE STRENGTH OF 10.0N/mm² AND 1:2:9 CEMENT-LIME-SAND MORTAR.
- 14.8 ALL SECONDARY WIND POSTS, PARAPET POSTS ETC THAT ARE SHOWN ON THE ENGINEERS DRAWINGS ARE TO BE SET OUT BY THE ARCHITECT.

GENERAL NOTES:

1. Do not scale this drawing in either paper or digital form. Use figured dimensions only.
2. All 'Ross & Partners' drawings to be read in conjunction with all relevant Architect's drawings and any discrepancies reported to all relevant parties.
3. This drawing is to be read in conjunction with other 'Ross & Partners' drawings and 'Ross & Partners' Structural Specification documents and any discrepancies reported to all relevant parties.
4. Setting out will be in accordance with the Architect's dimensions and as discussed and agreed between Client, Contractor and the Architects and any discrepancies reported to all relevant parties.
5. For General Notes refer to drawings:
 - 2012-RP-XX-XX-FN-S-001
 - 2012-RP-XX-XX-FN-S-002
 - 2012-RP-XX-XX-FN-S-003

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