STRUCTURAL DESIGN ASSUMPTIONS AND REFERENCES

1 ALL STRUCTURAL DESIGN SHALL COMPLY WITH THE STANDARDS SET FORTH IN THE 2013 ABU DHABI INTERNATIONAL BUILDING CODE (ADIBC).

2 APPLIED LOADINGS FOR ALL STRUCTURES ARE AS FOLLOWS:

I) WIND LOADING IN ACCORDANCE WITH ADIBC AND ASCE7
EFFECTIVE WIND SPEED, Ve = 45 m/s
SITE EXPOSURE - EXPOSURE C

II) SEISMIC LOADING IN ACCORDANCE WITH ADIBC.

III) SUPERIMPOSED DEAD AND LIVE LOADS IN ACCORDANCE WITH ADIBC OR AS PER LOAD
REQUIREMENTS SHOWN IN RELEVANT DESIGN CALCULATIONS.

3 ALL MANHOLES / CHAMBERS ARE DESIGNED USING THE FOLLOWING ASSUMPTIONS:

I) GROUNDWATER TABLE IS LOCATED AT FINISHED GROUND LEVEL.

II) NO PIPE THRUST FORCES ARE ACTING ON THE WALLS.

III) STABILITY SAFETY FACTORS:
-FLOATATION - 1.1
-SLIDING - 1.5
-OVERTURNING / ROTATION - 2.0
-BEARING PRESSURE - 1.0

IV) ALLOWABLE BEARING PRESSURES:
-DEEP STORMWATER MANHOLE (300-3000 DIA.) - 200 kPa
-SHALLOW STORMWATER MANHOLE, INLET AND CATCH BASIN - 100 kPa

V) SOIL SUBGRADE MODULUS - 8000 kN/m^3

VI) DEAD LOAD
-CONCRETE DENSITY - 24.0 kN/m^3
-SOIL DENSITY - 18.0 kN/m^3

VII) SUPERIMPOSED DEAD LOAD:
-COVER SLAB - 2.5 kPa
-BASE SLAB - 5.0 kPa

VIII) LIVE LOAD:
-COVER SLAB - 33.3 kPa
-BASE SLAB - 5.0 kPa

IX) MAXIMUM ALLOWED CRACK WIDTH TO BE 0.20 mm.

X) EARLY THERMAL AND SHRINKAGE CRACKING PARAMETERS:
-COEFFICIENT OF THERMAL EXPANSION, α - 0.00001
-FALL IN TEMP. BETWEEN PEAK OF HYDRATION AND AMBIENT TEMP., T1 - 33 °C
-FALL IN TEMP. DUE TO SEASONAL VARIATION, T2 - 17 °C

IF THE ABOVE ASSUMPTIONS ARE NOT SATISFIED, THE CONSULTANT SHOULD VERIFY THE DESIGN BASED ON THE ACTUAL VALUES.

A. GENERAL

A1 TECHNICAL SPECIFICATIONS OR SPECIFIC INSTRUCTIONS ON DRAWINGS TAKE PRECEDENCE OVER THESE NOTES.

A2 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL CIVIL GENERAL ARRANGEMENT AND OTHER RELEVANT DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT.

A3 ALL DISCREPANCIES SHALL BE REFERRED TO THE CONSULTANT FOR A DECISION BEFORE PROCEEDING WITH THE WORK.

A4 ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT AND CURRENT SPECIFIED STANDARDS AND THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES EXCEPT WHERE VARIED BY THE PROJECT SPECIFICATION AND/OR DRAWINGS.

A5 SET OUT DIMENSIONS AND LEVELS SHOWN ON THE DRAWINGS SHALL BE VERIFIED BY THE CONTRACTOR AND REFER TO MECHANICAL, ELECTRICAL AND CIVIL DRAWINGS. THE CONSULTANT SHALL BE NOTIFIED OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

A6 DIMENSIONS SHALL NOT BE OBTAINED BY SCALING FROM DRAWINGS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.

A7 THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STABILITY OF THE STRUCTURE AND ANY ASSOCIATED EXCAVATIONS UNTIL THEIR COMPLETION AND SHALL ENSURE THAT NO PART IS OVERSTRESSED BY EXCESSIVE CONSTRUCTION LOADS. THE CONTRACTOR SHALL PROVIDE TEMPORARY BRACING AND PROPPING AS REQUIRED.

A8 UNLESS NOTED OTHERWISE, ALL DIMENSIONS ARE IN MILLIMETRES (mm) AND ALL LEVELS ARE IN METRES (m) RELATIVE TO ABU DHABI PORT DATUM.

A9 PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL PRODUCE FULLY CO-ORDINATED DRAWINGS FOR REVIEW BY THE ARCHITECT AND THE CONSULTANT. THE DRAWING SHALL INCLUDE ALL CO-ORDINATED INFORMATION RELATED TO DUCTS, OPENINGS, CAST-IN FIXINGS AND PENETRATIONS. THE CONTRACTOR SHALL INCORPORATE ALL REQUIRED MEP ENGINEERING, DRAWINGS PRODUCED BY SPECIALIST AND ASSOCIATED TRADES.

A10 THE CONTRACTOR IS RESPONSIBLE FOR THE SAFETY OF THE WORKERS AT ALL TIMES, AND SHALL IMPLEMENT A SITE SAFETY POLICY IN ACCORDANCE WITH REQUIREMENTS.

A11 THE CONTRACTOR SHALL PROVIDE A GENERAL METHOD STATEMENT INDICATING DETAILS OF PHASING OF THE WORKS. THE METHOD STATEMENT SHALL PROVIDE THE CONTRACTOR'S PREFERABLE OPTIONS WHERE SUCH OPTIONS ARE AVAILABLE. THE CONTRACTOR ALSO SHALL SUBMIT A METHOD STATEMENT FOR ALL ELEMENTS OF WORK AND SHALL NOT PROCEED UNTIL CONSULTANT'S WRITTEN APPROVAL IS GIVEN.

A12 ALL ELEMENTS OF THE STRUCTURE DESIGNED BY THE CONTRACTOR SHALL BE SUBMITTED TO THE CONSULTANT FOR APPROVAL.

A13 FIRE RESISTANCE REQUIREMENTS FOR THE STRUCTURE ARE:
LOAD BEARING WALLS & COLUMNS.....: 2hrs.
FLOOR CONSTRUCTION INCLUDING BEAMS.....: 2hrs.
SHAFTS AND STAIRWAYS.....: 2hrs.

A14 ALL ASTERISKED DIMENSIONS (INDICATED THUS: 123*) SHALL BE CONFIRMED ON SITE AND REPORTED TO THE CONSULTANT FOR CONSIDERATION.

A15 THE CONTRACTOR SHALL PRODUCE SHOP DRAWINGS AND SCHEDULES AS NECESSARY FOR COMPLETION OF THE WORKS AND RECORD DRAWINGS OF THE AS-BUILT WORKS, (INCLUDING ELECTRONIC COPIES IN AUTOCAD DWG FORMAT), ALL FOR THE CONSULTANT'S APPROVAL.

A16 THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF
ABU DHABI MUNICIPALITY AND ALL RELEVANT STATUTORY BODIES.

B. CONCRETE

B1 ALL WORKMANSHIP AND MATERIALS SHALL COMPLY WITH ACI 318 AND REFERENCED CODES THEREIN.

B2 ALL CONCRETE SHALL BE PREMIXED BY A REVIEWED AND ACCEPTED SUPPLIER OR APPROVED SITE BATCHING PLANT.

B3 CEMENT IS GENERALLY TO BE ORDINARY PORTLAND CEMENT. BLENDED CEMENTS MAY BE USED IN PILING CONCRETE TO PROVIDE THE SPECIFIED DURABILITY REQUIREMENTS.

B4 FOR THE FOLLOWING AREAS THE CONCRETE SHALL BE AS NOTED BELOW. REFER TO SPECIFICATION FOR PERFORMANCE REQUIREMENTS.

I) - SUPERSTRUCTURE CONCRETE
SUSPENDED BEAMS & SLABS
- CONCRETE FOR SUB-STRUCTURE / FOUNDATIONS
BASEMENT ENVELOPE, RAFT, EXTERNAL WALLS &
THE ELEMENTS IN CONTACT WITH SOIL - VERY SEVERE EXPOSURE
- CONCRETE FOR CIVIL WORKS
(INCLUDING MANHOLES & CULVERTS)

CEMENT	MSRC
GRADE	C40/20
MIN. CEMENT CONTENT	420kg/m^3
MAX. W/C RATIO	0.42

II) BLINDING

CEMENT	MSRC
GRADE	C20
MIN. CEMENT CONTENT	250kg/m^3
MAX. W/C RATIO	0.50

* FREE WATER/CEMENT RATIO IS INCLUSIVE OF
ALL CEMENTITIOUS MATERIAL INCLUDING SILICA FUME.

B5 UNLESS NOTED OTHERWISE, MINIMUM COVER TO ALL REINFORCEMENT (INCLUDING LINKS) SHALL BE AS FOLLOWS:

COVER IN RETAINING WALLS, FOUNDATIONS & BURIED SLABS:

MOST SEVERE EXPOSURE

FACES EXPOSED TO WATER	75mm
EXTERNAL FACES CAST AGAINST SOIL	75mm
EXTERNAL FACES CAST AGAINST FORMWORK	50mm
RAFT/ TOP FACE	50mm
SLABS	50mm
COLUMNS	50mm

B6 AGGREGATES SHALL BE FROM APPROVED SOURCES IN ACCORDANCE WITH THE SPECIFICATION.

B7 ALL PROPRIETARY FIXINGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B8 ALL CONCRETE SHALL BE COMPACTED USING A MECHANICAL VIBRATION PROCESS.

B9 CONCRETE SHALL BE CURED BY AN APPROVED MEANS IN ACCORDANCE WITH SPECIFICATIONS.

B10 FOR CLARITY, CHAMFERS ARE NOT SHOWN.

B11 FOR ADDITIONAL REBATES, REFER TO THE CIVIL DRAWINGS.

B12 FOR ALL FALLS IN SLAB, DRIP GROOVES, REGLETS, CHAMFERS ETC. REFER TO CIVIL DRAWINGS.

B13 FORMED SURFACES SHALL BE THE FOLLOWING FINISH TYPES AS DEFINED IN SPECIFICATIONS.

EXPOSED COLUMNS & WALLS : CATEGORY 1 (SUPERIOR)
ALL OTHER FORMED SURFACES : CATEGORY 3 (NORMAL)

B14 UNFORMED SURFACES SHALL RECEIVE THE FOLLOWING FINISH TYPES AS DEFINED IN THE SPECIFICATION.

BLINDING : FF (FLOATED)
SLABS (TO RECEIVE SCREED) : TF (TAMPED)
SLABS WITHOUT SCREED : PF (POWERFLOAT)

ALL AREAS TO RECEIVE A POWERFLOATED OR BRUSHED FINISH SHALL HAVE AN APPROVED SURFACE HARDENER AND DUST INHIBITOR APPLIED UNLESS THE CONSULTANT APPROVES OTHERWISE.

B15 CONSTRUCTION JOINTS:

I) HORIZONTAL CONSTRUCTION JOINTS SHALL NOT BE MADE IN BEAMS, UNLESS SHOWN ON THE DOCUMENTS OR REVIEWED AND APPROVED BY THE CONSULTANT.
II) VERTICAL CONSTRUCTION JOINTS MAY BE MADE ONLY AT MIDSPAN OF BEAMS OR SLABS UNLESS OTHERWISE NOTED OR SHOWN OR DIRECTED AND THEIR LOCATION SHALL BE REVIEWED AND APPROVED BY THE CONSULTANT ADHERE TO DESIGN DETAILS.

B16 OPENINGS, SLEEVES AND EMBEDDED DUCTS:
I) NO SLEEVES SHALL BE PLACED VERTICALLY OR HORIZONTALLY THROUGH BEAMS UNLESS REVIEWED AND APPROVED BY THE CONSULTANT.

II) NO OPENINGS SHALL BE MADE IN FLAT PLATE COLUMN STRIPS EXCEPT AS SHOWN ON TYPICAL DETAILS AND PLANS OR UNLESS REVIEWED AND APPROVED BY THE CONSULTANT. SEE TYPICAL DETAIL ALSO.

III) LOCATE CONDUITS AND PIPES IN CENTRE OF SLABS WITH 30 CLEAR SPACE BETWEEN. NO HOLES TO BE MADE IN SLAB WITHOUT APPROVAL OF CONSULTANT

B17 PROVIDE CAMBER TO SLABS AND BEAMS AS NOTED ON PLANS AND/OR DETAILS. CAMBER BOTH UNDERSIDE AND TOP OF CONCRETE TO MAINTAIN THE SLAB AND BEAM DEPTH SHOWN ON THE DRAWINGS UNLESS OTHERWISE NOTED OR SHOWN.

B18 CONCRETE PROTECTIVE COATINGS SHALL BE AS PER SPECIFICATIONS.

C. REINFORCEMENT

C1 ALL REINFORCEMENT SHALL BE EPOXY COATED HIGH YIELD DEFORMED TYPE 2 GRADE 460N/mm2 BARS TO ACI 318.

C2 ALL STARTER BARS AND BENT OUT BARS SHALL BE SURVEYED AND LOCATION CONFIRMED IN AS-BUILT CONDITION, PRIOR TO PLACING COLUMN/WALL REINFORCEMENT. CONTRACTOR SHALL SUBMIT AS-BUILT DRAWINGS OF STARTERS AND BENT OUT BARS AND REPORT ANY DISCREPANCIES TO THE CONSULTANT PRIOR TO PLACING COLUMN/ WALL REINFORCEMENT.

C3 REINFORCEMENT IS SHOWN DIAGRAMATICALLY ON DRAWINGS. WHERE REINFORCEMENT IS ASSIGNED LAYER NUMBERS, FOR LAYER CONFIGURATION REFER TO STANDARD DETAILS.

C4 SUPPORT ALL REINFORCEMENT ACCURATELY AND SECURELY ON APPROVED CHAIRS PRIOR TO PLACING CONCRETE.

C5 WELDING AND/OR SITE CUTTING OF REINFORCING SHALL NOT BE PERMITTED UNLESS REVIEWED AND ACCEPTED IN WRITING BY THE CONSULTANT.

C6 LAPS SHALL BE IN ACCORDANCE WITH TABLE BELOW BASED ON THE DIAMETER OF THE SMALLER BAR AT LAP LOCATION.

C7 LAPS SHALL BE IN ACCORDANCE WITH TABLE BELOW

LAPS

LAP LENGTH / REINFORCEMENT TYPE	GRADE 460 TYPE 2 DEFORMED BAR	GRADE 460 FABRIC	GRADE 460 TYPE 2 EPOXY COATED DEFORMED BAR
A. LAPS ON TOP SURFACE OF BEAMS AND SLABS WHERE COVER IS LESS THAN 2 x BAR DIA.	50 DIA	38 DIA	75 DIA
B. LAPS IN THE CORNERS OF COLUMNS, WHERE COVER IS LESS THAN 2 x BAR DIA.	50 DIA	38 DIA	75 DIA
C. LAPS WHERE THE CLEAR DISTANCE BETWEEN ADJACENT LAPS IS LESS THAN 75mm.	50 DIA	38 DIA	75 DIA
D. WHEN BOTH 'A' OR 'B' AND 'C' APPLY, LAPS TO BE MIN.	70 DIA	54 DIA	105 DIA
E. ALL OTHER TENSION/ COMPRESSION LAPS.	35 DIA	27 DIA	55 DIA

C8 THE CONTRACTOR IS RESPONSIBLE FOR PROVISION OF, AND SCHEDULING OF CHAIRS, SPACERS ETC. FOR THE SUPPORT OF REINFORCEMENT.

C9 ALL STARTER BARS SHALL HAVE A MINIMUM EMBEDMENT EQUIVALENT TO THE STRAIGHT TENSION EMBEDMENT LENGTH CORRESPONDING TO THE SIZE OF THE BARS. STARTER BARS FROM WALLS TO SLABS SHALL HAVE A MINIMUM EMBEDMENT OF 600mm INTO THE WALLS AND SLABS UNLESS OTHERWISE NOTED OR SHOWN.

C10 PROVIDE STARTER BARS TO WALLS AND COLUMNS SIMILAR IN NUMBER, SIZE AND SPACING TO THE VERTICAL STEEL IN THE WALL OR COLUMN ABOVE UNLESS OTHERWISE NOTED OR SHOWN.

C11 SHAPE CODE SHALL BE TO ACI 315 SPECIFICATION FOR BENDING DIMENSIONED AND SCHEDULING OF REINFORCEMENT FOR CONCRETE.

C12 INSERTS SHALL BE PROVIDED AS NECESSARY, INCLUDING SUPPORT FOR MASONRY AND SERVICES. REINFORCEMENT SHALL BE ADJUSTED TO SUIT. PLASTIC TAPE SHALL BE USED TO PREVENT CONTACT OF DISSIMILAR METALS.

C13 THE CONTRACTOR SHALL SUBMIT PROPOSALS FOR SPACERS, CHAIRS, ETC. FOR THE CONSULTANT'S APPROVAL.

C14 CONTRACTOR SHOULD COMPLY WITH ACI 318

C15 REINFORCEMENT DETAILING SHALL COMPLY WITH THE REQUIREMENTS OF ADIBC.

NOTES:

REFERENCE DRAWINGS AND DOCUMENTS

No.	REVISIONS	APP'D	DATE

CLIENT

TITLE
STANDARD DRAWINGS
STORM WATER WORKS

DRAWING TITLE
STRUCTURAL STANDARD NOTES
SHEET 1

DRAWN	-	SCALE	NTS
CHECKED	-	DATE	-
APPROVED	-	SIZE	A1
PROJECT No.	-	DWG. No.	1003