

1.0 GENERAL

- 1.1. DO NOT SCALE DRAWINGS.
- 1.2. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
- 1.3. NOT REQUIRED.
- 1.4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING DIMENSIONS AND LEVELS ON SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION OR FABRICATION.
- 1.5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING OUT THE PROJECT ON SITE.
- 1.6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY AND INTEGRITY OF EXISTING STRUCTURES AND GROUND PROFILES WITHIN AND ADJACENT TO THE WORKS, FROM THE DATE OF TAKING POSSESSION OF THE SITE UNTIL PRACTICAL COMPLETION OF THE WORKS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, INSTALLATION AND MAINTENANCE OF ALL NECESSARY TEMPORARY WORKS TO COMPLY WITH THIS REQUIREMENT.
- 1.7. THE CONTRACTOR SHALL ENSURE THAT TOLERANCES ARE INTEGRATED AND CO-ORDINATED THROUGHOUT THE WORKS TO ENSURE THE EFFICIENT IMPLEMENTATION OF THE WORKS.
- 1.8. WHERE THE EXISTING WEATHERPROOF ENVELOPE IS PIERCED TO IMPLEMENT THE WORKS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT INGRESS OF WATER DOES NOT OCCUR DURING THE CONSTRUCTION PERIOD.
- 1.9 DEVIATIONS BETWEEN SITE DIMENSIONS, LEVELS OR EXISTING DETAILS TO THOSE SHOWN ON THE DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR COMMENT AND RESOLUTION.
- 1.10. PREPARATION, HANDLING AND APPLICATION OF THE PROPRIETARY PRODUCTS SHALL BE ALL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE PRODUCT MANUFACTURER, HEALTH AND SAFETY LEGISLATION AND THE SPECIFICATIONS AND DETAILS OF THE ENGINEER. WHERE CONTRADICTIONS OCCUR BETWEEN THESE REQUIREMENTS, REFERENCE SHOULD BE MADE TO THE ENGINEER FOR RESOLUTION.
- 1.11. WHERE SPECIFIC PROPRIETARY PRODUCTS ARE REFERENCED AN EQUAL PRODUCT APPROVED BY THE ENGINEER MAY BE SUBSTITUTED, UNLESS NOTED OTHERWISE.

2.0. FASTENERS AND CONNECTIONS – STEEL TO STEEL

- 2.1. ALL BOLTS SHALL BE M16 GRADE 8.8 TO BS 4190 UNLESS NOTED OTHERWISE.
- 2.2. ALL BOLTS SHALL BE SPUN GALVANISED FINISH IN ACCORDANCE WITH BS 7371.
- 2.3. ALL BOLTS SHALL BE SIZED IN LENGTH TO GIVE A MINIMUM EXTENSION BEYOND THE NUT OF THREE THREADS.
- 2.4. WHERE CONNECTIONS ARE MADE USING DISSIMILAR MATERIALS, ALL CONNECTIONS SHALL BE PROVIDED WITH NEOPRENE, 'TOP-HAT' WASHERS, SPRING WASHERS OR OTHER APPROVED BARRIER BETWEEN CONNECTOR AND MAIN MATERIAL, TO MINIMISE THE RISK OF BI-METALLIC (ELECTROLYTIC) CORROSION.
- 2.5. WHERE APPROPRIATE, TAPER WASHERS SHALL BE USED IN BOLTED CONNECTIONS.
- 2.6. WHERE A CONNECTION IS SUBJECT TO VIBRATION OR CYCLIC LOADING USE SHALL BE MADE OF LOCKNUTS, LOCKWASHERS OR SPRING WASHERS OR OTHER APPROVED METHODS AT LOCATIONS INDICATED ON THE DRAWING BY THE ENGINEER TO MINIMISE THE RISK OF LOOSENING OF THE CONNECTORS.

3.0. FASTENERS AND CONNECTIONS – STEEL TO CONCRETE OR MASONRY

- 3.1. THE PREFERRED METHOD OF FIXING STRUCTURAL FIXINGS INTO SOLID CONCRETE OR MASONRY WALLS SHALL BE THROUGH-BOLT FIXINGS UNLESS SPECIFIED OTHERWISE. WHERE THE THROUGH-BOLT FIXINGS CANNOT BE ACHIEVED RESIN ANCHOR FIXINGS SHOULD BE UTILISED UPON CONSULTATION WITH ENGINEER.
- 3.2. ALL RESIN ANCHORS INTO SOLID CONCRETE SHALL BE HILTI HIT-HY200 RESIN INJECTION SYSTEM WITH HIT-V-R STAINLESS STEEL ANCHOR COMPONENTS, OR EQUAL APPROVED, UNLESS NOTED OTHERWISE.
- 3.3. ALL RESIN ANCHORS INTO SOLID BRICKWORK OR OTHER SOLID MASONRY SHALL BE HILTI HIT-HY270 RESIN INJECTION SYSTEM WITH HIT-V-R STAINLESS STEEL ANCHOR COMPONENTS, OR EQUAL APPROVED, UNLESS NOTED OTHERWISE.

3.4. MINIMUM EMBEDMENT DEPTHS OF ANCHORS SHALL BE AS FOLLOWS: (UNO)

MATERIAL	ANCHOR DIAMETER	MINIMUM EMBEDMENT DEPTH (mm)
SOLID BRICK OR STONE	M10	90
SOLID BRICK OR STONE	M12	110
SOLID CONCRETE	M10	90
SOLID CONCRETE	M12	110
SOLID CONCRETE	M16	125
SOLID CONCRETE	M20	170
EMBEDMENT LENGTHS ARE STATED IN THE HILTI TECHNICAL LITERATURE		

- 3.5. WHERE A CONNECTION IS MADE BETWEEN DISSIMILAR METALS, ALL CONNECTIONS SHALL BE PROVIDED WITH NEOPRENE, 'TOP-HAT' WASHERS/SPRING WASHERS OR OTHER APPROVED BARRIER BETWEEN CONNECTOR AND MAIN MATERIAL, TO MINIMISE THE RISK OF BI-METALLIC (ELECTROLYTIC) CORROSION.
- 3.6. WHERE APPROPRIATE, TAPER WASHERS SHALL BE USED IN BOLTED CONNECTIONS.
- 3.7. WHERE A CONNECTION IS SUBJECT TO VIBRATION OR CYCLIC LOADING USE SHALL BE MADE OF LOCKNUTS, LOCKWASHERS, SPRING WASHERS OR OTHER APPROVED METHODS, AS INDICATED ON THE DRAWING BY THE ENGINEER, TO MINIMISE THE RISK OF LOOSENING OF THE CONNECTORS.
- 3.8. ALL RESIN ANCHORS, EXISTING AND PROPOSED, SHALL BE TESTED IN ACCORDANCE WITH 'CONSTRUCTION FIXINGS ASSOCIATION GUIDANCE NOTE : PROCEDURE FOR TESTING CONSTRUCTION FIXINGS' AND 'BS 5080 : PART 1 – STRUCTURAL FIXINGS IN CONCRETE AND MASONRY' OR MANUFACTURERS RECOMMENDATIONS.
- 3.9. THE TESTING RATE OF ANCHORS SHALL BE 5 NO. FIXINGS OR 2.5% OF THE TOTAL NO. OF FIXINGS OF EACH SIZE AND TYPE, WHICHEVER GIVES THE GREATER NUMBER. FOR SITUATIONS WHERE THERE ARE LESS THAN 5 NO. ANCHORS OF ANY TYPE OR SIZE THEN ALL ANCHORS SHALL BE TESTED. WHERE THE PROJECT SPECIFICATIONS DEViate FROM THIS TESTING FREQUENCY, THE PROJECT SPECIFICATIONS SHALL TAKE PRIORITY.
- 3.10. THE ENGINEER SHALL BE ADVISED A MINIMUM OF 48 HOURS IN ADVANCE TO AFFORD THE OPPORTUNITY OF WITNESSING THE TEST.
- 3.11. ALL TESTS SHALL BE CARRIED OUT TO THE FOLLOWING TEST LOADS: (UNO)

MATERIAL	ANCHOR DIAMETER	TEST LOAD (kN)
SOLID BRICK OR STONE	M10	3.0
SOLID BRICK OR STONE	M12	3.5
SOLID CONCRETE	M10	6.3
SOLID CONCRETE	M12	9.5
SOLID CONCRETE	M16	12.1
SOLID CONCRETE	M20	20
TEST LOAD IS BASED ON $1.0 \times N_{rec}$ ($f_{cc} = 33 \text{ Nmm}^2$) FOR SOLID BRICKWORK AND $1.0 \times F_{REC}$ ($f_{cc} = 30 \text{ Nmm}^2$) OBTAINED FROM THE HILTI TECHNICAL LITERATURE		

- 3.12. ALL TESTS SHALL BE DOCUMENTED WITH LOCATION SKETCHES AND UNIQUE REFERENCES FOR EACH BOLT TESTED, IN SUCH A MANNER THAT EACH TEST LOCATION CAN BE IDENTIFIED ON SITE FROM THE DOCUMENTATION.
- 3.13. ALL NUTS, BOLTS AND STUDDINGS USED IN CONNECTIONS TO POROUS MATERIALS SHALL BE STAINLESS STEEL.

4.0. CONCRETE

- 4.1. UNLESS NOTED OTHERWISE ALL CONCRETE SHALL BE:
- CONCRETE GRADE: C28/35
MINIMUM CEMENT CONTENT: 330 kg.m³
- NOMINAL AGGREGATE SIZE: 20mm
MAXIMUM FREE WATER/CEMENT RATIO: 0.5
- 4.2. UNLESS NOTED OTHERWISE ALL REINFORCEMENT SHALL BE:
- (a) HIGH YIELD ($f_y = 460 \text{ N.mm}^2$) TYPE 2 DEFORMED BAR REINFORCEMENT TO BS 4449
(b) MILD STEEL ($f_y = 250 \text{ N.mm}^2$) PLAIN ROUND REINFORCEMENT BARS TO BS 4449
(c) WELDED STEEL MESH REINFORCEMENT TO BS EN 10080
(d) SCHEDULED AND DIMENSIONED TO BS 8666
- 4.3. ALL TOWER HOLDING DOWN BOLTS AND ANCHORAGE ASSEMBLIES, THEIR SETTING OUT AND ANY RELEVANT TEMPLATES SHALL BE SUPPLIED BY THE TOWER MANUFACTURER.
- 4.4. THE MAIN CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING OUT, FIXING AND CHECKING THE INSTALLATION OF THE TOWER ANCHORAGE ASSEMBLY IN ACCORDANCE WITH THE DETAILS SUPPLIED BY THE TOWER MANUFACTURER.
- 4.5. THE MIX DESIGN CERTIFICATE SHALL BE SUBMITTED TO THE ENGINEER, FOR THE OPPORTUNITY TO COMMENT, A MINIMUM OF 72 HOURS PRIOR TO COMMENCEMENT OF CASTING.
- 4.6. CONCRETE CUBE TESTING TO BE CARRIED OUT IN ACCORDANCE WITH BS 1881. THE RESULTS TO BE FORWARDED TO THE ENGINEER FOR EVALUATION.
- 4.7. ALL CONCRETE REINFORCEMENT AND CAST IN ITEMS SHALL BE POSITIVELY LOCATED IN POSITION PRIOR TO CASTING OF THE CONCRETE.
- 4.8. WHERE CONCRETE IS TO BE CAST AGAINST AN EXISTING CONCRETE SURFACE, THE EXISTING SURFACE SHALL BE SCABBLED TO REMOVE LAITENCE AND OTHER DELETERIOUS MATERIALS. SCABBLED SHALL EXPOSE THE AGGREGATE AND SOUND MATERIAL. A BONDING AGENT IS TO BE APPLIED TO THE SCABBLED SURFACE A MAXIMUM OF TWO DAYS BEFORE CASTING.
- 4.9. CONCRETE IN EACH BASE SHALL BE CAST IN A SINGLE CONTINUOUS OPERATION.
- 4.10. COVER TO REINFORCEMENT AS NOTED ON DETAIL DRAWING.
- 4.11. CONCRETE SHALL NOT BE CAST WHERE THE AMBIENT TEMPERATURE IS 2 DEGREES CENTIGRADE AND FALLING OR LESS THAN 2 DEGREES ON A RISING THERMOMETER.
- 4.12. FINISHES WHERE STATED SHALL BE :
- 4.12.1. FORMED FINISH – BASIC AS STRUCK.
4.12.2. WORKED FINISH – BRUSH FINISH.

5.0. STEELWORK

- 5.1. STRUCTURAL STEEL TO BE GRADE S275 MILD STEEL TO BS 4360
- 5.2. ALL WELDS TO BE MINIMUM 6mm FILLET WELD UNLESS NOTED OTHERWISE. WELDS AT TUBE TO TUBE CONNECTIONS TO BE FULL PENETRATION BUTT WELDS.
- 5.3. BOLTS TO BE GRADE 8.8 TO BS 4190, MINIMUM SIZE 16mm DIA U.N.O. BEARING SURFACES TO BE CLEAN GALVANISED.
- 5.4. ALL STEELWORK TO BE GALVANISED.
- 5.5. MINOR SITE ERECTION DAMAGE TO BE MADE GOOD WITH BRUSH APPLIED GALVAFROID.

ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE

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CONCESSION REQUIRED NO

A Issued for Construction DJF JTP 02.08.19

REV MODIFICATION BY CH DATE



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Site Address / Contact Details
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BROCK BARRACKS
OXFORD ROAD
READING, BERKSHIRE
RG30 1HW

Drawing Title: CONSTRUCTION NOTES

Purpose of Issue: CONSTRUCTION Dwg. Rev:

Drawing Number: 606 A

Surveyed By: JTP Original Sheet Size: A3 Pack Issue:

Drawn: DJF Date: 02.08.19 Checked: JTP Date: 02.08.19 A