STEELWORK NOTES

1.0 GENERAL

1.1 **CERTIFICATION**
ALL TENDERERS (FABRICATORS) MUST HAVE DOCUMENTED CURRENT EVIDENCE OF HAVING FULFILLED 'STAGE 1' OF THE SCA CERTIFICATION PROCESS, INCLUDING A GAP ANALYSIS OF THE NECESSARY ACTIONS TO MEET THE REQUIRED CONSTRUCTION CATEGORY. THE SUCCESSFUL FABRICATOR(S) MUST SUBMIT DOCUMENTARY EVIDENCE OF CURRENT FULL CERTIFICATION TO THE RELEVANT CONSTRUCTION CATEGORY BEFORE WORK COMMENCES ON THE PROJECT. THE CERTIFICATION MUST BE MAINTAINED FOR THE DURATION OF THE PROJECT.

1.2 **CONSTRUCTION CATEGORY**
IN ACCORDANCE WITH THE REQUIREMENTS OF AS/NZS 5131 THE CONSTRUCTION CATEGORIES FOR THIS PROJECT ARE DEFINED IN THE TABLE BELOW

ELEMENT	IMPORTANCE LEVEL	SERVICE CATEGORY	FABRICATION CATEGORY	CONSTRUCTION CATEGORY
ALL STRUCTURAL STEELWORK UNO	IL3	SC2	FC1	CC3

1.3 **EXPOSED STEELWORK**
UNLESS NOTED OTHERWISE, ALL EXTERNAL STEELWORK AND CONNECTIONS AND/OR THOSE EXPOSED TO THE WEATHER SHALL BE HOT DIP GALVANISED IN THEIR ENTIRETY.
GALVANISING SHALL BE CARRIED OUT TO AS/NZS 4680 AND AS/NZS 5131, EXCEPT THREADED FASTENERS WHICH SHALL BE GALVANISED TO AS/NZS 1214.

1.4 **TREATMENT GRADES**
UNLESS NOTED OTHERWISE IN THE PROJECT DRAWINGS, FOR THE ELEMENTS ON THIS PROJECT, THE TREATMENT GRADES ACCORDING TO AS/NZS 5131 SHALL BE:

ELEMENT	TREATMENT GRADE
ALL PAINTED STRUCTURAL STEELWORK UNO	P2

1.5 **COATING QUALITY LEVEL**
THE COATING QUALITY LEVEL ASSESSED ACCORDING TO AS/NZS 5131 SHALL BE AS GIVEN IN THE TABLE BELOW.

ITEM	COATING QUALITY LEVEL (PC1, PC2)
EXTERNAL STEELWORK	PC2
INTERNAL STEELWORK	PC1

1.6 **SHOP DRAWINGS AND DIMENSIONS**
IF REVIEW OF SHOP DRAWINGS IS INCLUDED IN ENGINEER'S SCOPE OF WORK THEN BEFORE FABRICATION COMMENCES, THE CONTRACTOR SHALL SUBMIT TWO COPIES OF SHOP DRAWINGS TO THE ENGINEER FOR REVIEW OF ARRANGEMENT OF GENERAL STRUCTURAL ELEMENTS AND DESIGN INTENT.

ALL DIMENSIONS RELEVANT TO SETTING OUT AND SITE WORK ARE TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO WORK COMMENCING.

DO NOT SCALE DRAWINGS.

2.0 STRUCTURAL STEELWORK FABRICATION

2.1 **WORKMANSHIP AND QUALITY**
ALL STRUCTURAL STEELWORK SHALL BE FABRICATED IN ACCORDANCE WITH AS/NZS 5131.
ALL WORK ON THIS PROJECT SHALL BE UNDERTAKEN BY COMPETENT PERSONNEL. REQUIREMENTS AND EXAMPLES OF QUALIFICATIONS FOR COMPETENT PERSONNEL ARE CONTAINED IN AS/NZS 5131.
STEELWORK SHALL BE FABRICATED BY FABRICATORS CERTIFIED UNDER THE ASI 'NATIONAL STRUCTURAL STEELWORK COMPLIANCE SCHEME' (NSCS) FOR THE CONSTRUCTION CATEGORY(S) DEFINED IN SECTION 1.2

2.2 **TOLERANCES**
FABRICATION TOLERANCES SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131.
UNLESS NOTED OTHERWISE, THE TOLERANCE CLASS FOR FUNCTIONAL TOLERANCE SHALL BE CLASS 1 FOR CONSTRUCTION CATEGORIES CC1 & CC2 & SHALL BE CLASS 2 FOR CONSTRUCTION CATEGORIES CC3 & CC4 NOMINATED IN SECTION 1.2.

2.3 **STEEL MATERIALS**
2.3.1 **GRADES**
ALL STRUCTURAL STEEL MATERIAL SHALL CONFORM TO THE FOLLOWING TABLE UNO:

COMPONENT	TO CONFORM WITH AUSTRALIAN STANDARD	MINIMUM GRADE
HOT ROLLED STEEL SECTIONS	AS/NZS 3679.1: 7S102	300
PLATE	~~AS/NZS 3678:7S102~~	250
FLAT, SQUARE AND ROUND BAR	AS/NZS 3679.1: 7S102	300
HOLLOW SECTIONS	AS/NZS 1163: 7S102	
CIRCULAR (CHS)		C350L0
SQUARE (SHS)		C450L0
RECTANGULAR (RHS)		C450L0
WELDED BEAMS & COLUMNS	AS/NZS 3679.2: 7S102	300
SHEAR STUDS (COMPOSITE SLAB TO STEEL)	AS/NZS 1554.2	380
QUENCH & TEMPERED PLATE	AS1597	690
PURLINS & GIRTS	AS1397	450

C1

MEMBER SIZES SHALL BE AS SHOWN ON THE STRUCTURAL DRAWINGS. NO SUBSTITUTION IS PERMITTED WITHOUT APPROVAL IN WRITING FROM THE ENGINEER.
DOCUMENTATION SUPPLIED WITH MATERIALS AND COMPONENTS SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131.

2.3.2 LAMELLAR TEARING
JOINT DETAILS WHICH ARE SUSCEPTIBLE TO LAMELLAR TEARING (LT) ARE INDICATED ON THE PROJECT DRAWINGS AS 'LT SUSCEPTIBLE'. WITH THE SPECIFIC PLATE WITH HIGH THROUGH-THICKNESS STRESS NOTED. THE SPECIFIC PLATE IN JOINTS THAT ARE INDICATED AS 'LT SUSCEPTIBLE' SHALL BE SUPPLIED ULTRASONICALLY TESTED TO AS 1710 CLASS 1.

2.3.3 Z-PLATE REQUIREMENT
JOINTS THAT ARE DESIGNATED 'LT SUSCEPTIBLE' (SEE CLAUSE 2.3.2) AND FURTHER REQUIRE PLATE TO A NOMINATED Z-VALUE ARE INDICATED ON THE PROJECT DRAWINGS WITH A DESIGNATED Z-VALUE. THE PLATE USED FOR THESE JOINTS SHALL BE ORDERED TO THE DESIGNATED Z-VALUE.
UNLESS NOTED OTHERWISE WHERE THROUGH THICKNESS TENSILE FORCES ARE INDUCED IN MEMBERS OR CONNECTIONS IN THE FOLLOWING CASES, Z GRADE QUALITY STEEL GRADE Z35 TO AS/NZS 3678:2016 UNO IS REQUIRED:

- T (TEE) JOINTS: FILLET WELD THROAT THICKNESS > 35mm
- X (CRUCIFORM) JOINTS: ACROSS PLATE THICKNESS > 25mm
- L (CORNER) JOINTS: CROSS PLATE THICKNESS > 20mm

2.3.4 **SUPPLEMENTARY ULTRASONIC TESTING**
SUPPLEMENTARY ULTRASONIC TESTING TO AS 2207 AND AS/NZS 1554.1 IS REQUIRED FOR ALL PLATES 40mm THICKNESS AND OVER.

2.3.5 **STEEL QUALITY**
ALL STRUCTURAL STEEL SHALL BE SOURCED FROM MILLS WITH A RELEVANT JAS-ANZ ACCREDITED THIRD-PARTY CERTIFICATION SCHEME SUCH AS THE AUSTRALIAN CERTIFICATION FOR REINFORCING AND STRUCTURAL STEEL (ACRS) SCHEME. ALTERNATIVE SOURCING OF THIRD-PARTY CERTIFIED STRUCTURAL STEEL SHALL BE SUBMITTED FOR REVIEW AND MUST BE APPROVED PRIOR TO THE COMMENCEMENT OF PROCUREMENT.

2.3.6 **SPLICING OF STRUCTURAL MEMBERS**
ALL STRUCTURAL STEELWORK MEMBERS SHALL BE SUPPLIED IN A SINGLE LENGTH, EXCEPT WHERE OTHERWISE INDICATED WITH SPLICE LOCATIONS SHOWN ON THE STRUCTURAL DRAWINGS. SPLICES AT OTHER LOCATIONS SHALL BE APPROVED BY THE ENGINEER PRIOR TO FABRICATION COMMENCING.

2.4 **CUTTING, HOLING AND SHAPING**
ALL CUTTING, HOLING AND SHAPING OF STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131.
PENETRATIONS OR CUT-OUTS OTHER THAN THOSE SHOWN ON THE DRAWINGS SHALL NOT BE MADE WITHOUT PRIOR APPROVAL.

STEELWORK NOTES CONTINUED

2.5 **BOLTING**
ALL BOLTS SHALL BE GRADE 8.8/S BOLTS FOR SERVICE CATEGORY SC1 ELEMENTS UNO
AND GRADE 8.8/TB BOLTS FOR SERVICE CATEGORY SC2 ELEMENTS UNO
MINIMUM SIZE OF BOLTS TO BE M20 UNO

2.5.1 **BOLT DESIGNATION**

BOLTING DESIGNATION	METHOD OF INSTALLATION
4.6/S	COMMERCIAL GRADE 4.6 BOLTS TO AS 1111, TIGHTENED TO A SNUG TIGHT CONDITION TO AS/NZS 5131
8.8/S	HIGH STRENGTH STRUCTURAL BOLTS OF GRADE 8.8 TO AS/NZS 1252.1, TIGHTENED TO A SNUG TIGHT CONDITION TO AS/NZS 5131
8.8/TB	HIGH STRENGTH STRUCTURAL BOLTS OF GRADE 8.8 TO AS/NZS 1252.1, FULLY TENSIONED TO AS/NZS 5131 AS A BEARING JOINT
8.8/TF	HIGH STRENGTH STRUCTURAL BOLTS OF GRADE 8.8 TO AS/NZS 1252.1, FULLY TENSIONED TO AS/NZS 5131 AS A FRICTION JOINT

2.5.2 **BOLT QUALITY**
HIGH STRENGTH STRUCTURAL BOLTS SHALL BE VERIFIED TO AS/NZS 1252.2. THE DOCUMENTATION REQUIRED BY AS/NZS 5131, INCLUDING THE 'SUPPLIER DECLARATION OF CONFORMITY' (SDoC) SHALL BE PROVIDED.

2.5.3 **METHOD OF TENSIONING**
/TB AND /TF BOLT CATEGORIES SHALL BE INSTALLED USING EITHER THE PART TURN METHOD OR THE DIRECT TENSION INDICATOR METHOD (LOAD INDICATING WASHERS) TO AS/NZS 5131.
TYPE OF LOAD INDICATING WASHERS TO BE APPROVED BY ENGINEER PRIOR TO INSTALLATION AND TO BE INSTALLED TO MANUFACTURER'S INSTRUCTIONS.
MINIMUM BOLT LENGTH FOR TENSIONED BOLTS TO BE FOUR BOLT DIAMETERS

2.5.4 **CONTACT SURFACES IN TENSIONED CONNECTIONS**
FOR CONNECTIONS WHERE 8.8/TF BOLTS ARE SPECIFIED, A FRICTION COEFFICIENT OF 0.35 HAS BEEN ASSUMED FOR THE DESIGN. THE CONTACT SURFACES SHALL BE PREPARED ACCORDING TO AS/NZS 5131 AND BE FREE FROM PAINT, LACQUER OR OTHER APPLIED FINISHES UNLESS THE APPLIED FINISH HAS BEEN TESTED IN ACCORDANCE WITH AS/NZS 5131 APPENDIX C AND A FRICTION COEFFICIENT OF 0.35 OR HIGHER IS DETERMINED.

2.5.5 **BOLT FINISH**
ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIP GALVANIZED TO AS/NZS 1214.

2.6 **WELDING**
2.6.1 **WELDING CONSUMABLES**
WELDING CONSUMABLES SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 1554, BASED ON THE YIELD STRENGTH OF THE STEEL TO BE WELDED, AS DEFINED IN THE TABLE BELOW:

NOMINAL YIELD STRENGTH OF STEEL TO BE WELDED	TO CONFORM WITH AUSTRALIAN STANDARD
≤ 500MPa	AS/NZS 1554.1
> 500MPa; ≤ 690MPa	AS/NZS 1554.4

2.6.2 **WELD CONSUMABLE STRENGTH**

NOMINAL YIELD STRENGTH OF STEEL TO BE WELDED	NOMINAL TENSILE STRENGTH OF WELD METAL, F_{uw}(MPa)
ALL STEEL WITH GRADE ≤ 300MPa	~~490~~ C1
ALL STEEL WITH 300MPa < GRADE ≤ 450MPa	~~490~~
QUENCH & TEMPERED STEEL TO GRADE 690MPa	760

2.6.3 **WELD QUALITY**

ELEMENT	WELD CATEGORY
SHOP WELDS IN MEMBERS SUBJECT TO CYCLIC LOADING AND IN LIFTING DEVICES (e.g. LIFTING LUGS)	F.P. UNO
SHOP WELDS IN PERMANENT BUILDING WORKS ELEMENTS & IN SPECIAL STRUCTURES AND TEMPORARY FALSE WORKS	S.P. UNO
SITE WELDS IN PERMANENT BUILDING WORKS ELEMENTS & IN SPECIAL STRUCTURES AND TEMPORARY FALSE WORKS	S.P. UNO

2.6.4 **NON-DESTRUCTIVE EXAMINATION**
THE EXTENT OF NON-DESTRUCTIVE EXAMINATION (NDE) SHALL BE AS DEFINED IN THE TABLES BELOW WHICH ARE BASED ON CLAUSE 13.6.2.2 OF AS/NZS 5131: 2016.

TYPE OF STRUCTURE	SERVICE CATEGORY	VISUAL	OTHER
STRUCTURAL MEMBERS SUBJECT TO CYCLIC LOADS AND IN LIFTING DEVICES (E.G. LIFTING LUGS)	SC2	100% VISUAL SCANNING 100% VISUAL EXAMINATION TO AS/NZS 1554	WELD CATEGORY FP JOINTS FOR SC2 100% ULTRASONIC EXAMINATION (UT) FOR BUTT WELDS TO AS/NZS 1554 PARTS 4 OR 5 AS APPROPRIATE 100% MAGNETIC PARTICLE EXAMINATION (MT) FOR FILLET WELDS TO AS/NZS 1554 PARTS 4 OR 5 AS APPROPRIATE
STRUCTURAL MEMBERS OR COMPONENTS WITH MEMBERS AND CONNECTIONS SUBJECT TO FATIGUE (CRANE SUPPORTING STRUCTURES, TEMPORARY WORKS, FALSEWORK)	SC2	100% VISUAL SCANNING. 100% VISUAL EXAMINATION TO AS/NZS 1554	WELD CATEGORY SP FOR SC2 25% MAGNETIC PARTICLE EXAMINATION (MT) FOR SHOP AND FIELD FILLET WELDS (100% IF DEFECTS ARE FOUND) 100% RADIOGRAPHIC OR ULTRASONIC EXAMINATION (UT) FOR SHOP OR FIELD BUTT WELDS
STRUCTURAL MEMBERS OR COMPONENTS DESIGNED FOR PREDOMINANTLY QUASI-STATIC ACTIONS ONLY (BUILDINGS, WAREHOUSES, STORAGE FACILITIES)	SC1	100% VISUAL SCANNING 10% VISUAL EXAMINATION FOR GF WELDS TO AS/NZS 1554 25% VISUAL EXAMINATION FOR SP WELDS TO AS/NZS 1554	WELD CATEGORY CP FOR SC1 2% MAGNETIC PARTICLE EXAMINATION (MT) FOR SHOP FILLET WELDS 25% MAGNETIC PARTICLE EXAMINATION (MT) FOR FIELD FILLET WELDS (100% IF DEFECTS ARE FOUND) 2% RADIOGRAPHIC OR ULTRASONIC EXAMINATION (UT) FOR SHOP BUTT WELDS 100% RADIOGRAPHIC OR ULTRASONIC EXAMINATION (UT) FOR FIELD BUTT WELDS
WELDS CONNECTING WEB TO FLANGE PLATE IN WELDED SECTIONS	SC1 & SC2	100% VISUAL SCANNING 100% VISUAL EXAMINATION TO AS/NZS 1554	WELD CATEGORY SP FOR SC1 10% MAGNETIC PARTICLE EXAMINATION (MT) FOR SHOP FILLET WELDS 25% MAGNETIC PARTICLE EXAMINATION (MT) FOR FIELD FILLET WELDS (100% IF DEFECTS ARE FOUND) 10% RADIOGRAPHIC OR ULTRASONIC EXAMINATION (UT) FOR SHOP BUTT WELDS 100% RADIOGRAPHIC OR ULTRASONIC EXAMINATION (UT) FOR FIELD BUTT WELDS
WELDS CONNECTING WEB TO FLANGE PLATE IN WELDED SECTIONS	SC1 & SC2	100% VISUAL SCANNING 100% VISUAL EXAMINATION TO AS/NZS 1554	ALL FLANGE TO WEB WELDS TO BE TESTED IN ACCORDANCE WITH AS/NZS 3679.2 IN ADDITION TO DESTRUCTIVE TESTS IN ACCORDANCE WITH AS/NZS 3679.2, 10% OF THE LENGTH OF THE FLANGE TO WEB WELD IS TO BE ULTRASONICALLY TESTED. IF DEFECTS ARE FOUND IN THESE TESTS, THEN 100% OF THE WELD IS TO BE TESTED

ALL DEFECTS TO BE REPAIRED IN ACCORDANCE WITH RELEVANT PARTS OF AS/NZS 1554

ALL TESTS TO BE PERFORMED BY A NATA (OR SIMILAR APPROVED) TESTING COMPANY.

WHERE THE EXTENT OF THE WELDING TO BE EXAMINED IS SPECIFIED TO BE LESS THAT 100%, THE NOMINATED PERCENTAGE OF WELD TYPE TO BE EXAMINED SHALL BE SELECTED TO ENSURE THAT A REPRESENTATIVE SAMPLE OF EACH WELD TYPE AND LOCATION IS EXAMINED.

FOR CONNECTED PLATES WITH A THICKNESS GREATER THAN 20mm A PORTION OF EACH MULTI-PASS BUTT WELD SHOULD BE EXAMINED ULTRASONICALLY TO DETERMINE WHETHER THERE ARE ANY TRANSVERSE CRACKS IN THE WELD MATERIAL.

IF DEFECTS ARE FOUND IN THE WELDS THEN 100% OF THE WELDS ARE TO BE TESTED.

STEELWORK NOTES CONTINUED

2.7 **MINIMUM CONNECTION DETAILING GUIDELINES**
UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS, CONNECTION DETAILS SHALL BE IN ACCORDANCE WITH THE FOLLOWING MINIMUM REQUIREMENTS:
a. CONNECTION CLEAT PLATES AND STIFFENER CLEAT PLATES ARE TO HAVE A THICKNESS TO BE EQUAL TO OR LARGER THAN THE WEB THICKNESS OF THE SUPPORTED MEMBER BUT NOT LESS THAN 10mm THICK.
b. ALL STEEL TO STEEL BOLTED CONNECTIONS SHALL BE MINIMUM TWO M20 GRADE 8.8/S BOLTS FOR SERVICE CATEGORY SC1 ELEMENTS UNO AND GRADE 8.8/TB BOLTS FOR SERVICE CATEGORY SC2 ELEMENTS UNO.
c. A MINIMUM OF TWO THREADS SHALL EXTEND PAST THE NUT.
d. ALL WELDS SHALL BE CONTINUOUS FILLET WELDS FOR SERVICE CATEGORY SC1 ELEMENTS UNO AND FULL STRENGTH FULL PENETRATION BUTT WELDS FOR SERVICE CATEGORY SC2 ELEMENTS UNO.
e. MINIMUM FILLET WELD SIZE WHERE SPECIFIED TO BE AS FOLLOWS UNO:

PLATE THICKNESS (mm) LESS THAN OR EQUAL TO	WELD SIZE (mm) SP GRADE & CONTINUOUS ALL ROUND
16	6
24	8
32	12

f. ALL MEMBERS' CENTREDOS AT JOINTS SHALL BE COINCIDENT UNO
g. ALL PURLIN CLEATS SHALL BE 8mm MINIMUM THICK.
ALL DETAILING WHERE NOT SPECIFICALLY SHOWN SHALL BE IN ACCORDANCE WITH THE AUSTRALIAN STEEL INSTITUTE (ASI) CURRENT EDITIONS OF THE 'DESIGN CAPACITY TABLES FOR STRUCTURAL STEEL' AND THE ASI STANDARDISED STRUCTURAL CONNECTION DETAILS CONTAINED THEREIN.
THE ENDS OF HOLLOW SECTION MEMBERS SHALL BE SEALED WITH NOMINAL THICKNESS PLATES AND CONTINUOUS SEAL WELDED UNLESS NOTED OTHERWISE.
IF HOLLOW SECTIONS ARE TO BE HOT-DIP GALVANIZED, VENT AND DRAINAGE HOLES SHALL BE PROVIDED CONFORMING TO THE REQUIREMENTS OF AS/NZS 5131 IN NON-VIEWABLE LOCATIONS.

2.8 **SURFACE TREATMENT AND CORROSION PROTECTION**
UNLESS NOTED OTHERWISE IN THE CONTRACTUAL DOCUMENTATION, THE MINIMUM SURFACE TREATMENT OF BOTH INTERNAL AND EXTERNAL STEELWORK SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131.
STRUCTURAL STEELWORK TO BE GALVANIZED SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131.

DESIGN LIFE OF STRUCTURE = 50 YEARS

DURABILITY (COATING LIFE TO FIRST MAJOR MAINTENANCE) = 10 YEARS

ATMOSPHERIC CORROSIVITY CATEGORY = C3 MEDIUM

BOLTS SHALL BE IN ACCORDANCE WITH SECTION 2.5.5

CAST IN FERRULES AND HOLDING DOWN BOLTS SHALL BE HOT DIP GALVANISED IN ACCORDANCE WITH AS/NZS 1214.

THE BUILDING OWNER SHALL UNDERTAKE ALL NECESSARY CLEANING, MAINTENANCE AND REPAIR OF APPLIED COATINGS TO ENSURE ALL COATINGS AND PROTECTED STEELWORK REACH THEIR STATED DESIGN LIFE.

UNLESS NOTED OTHERWISE IN THE CONTRACTUAL DOCUMENTATION, THE CORROSION PROTECTION WHEN SELECTING A PAINT SYSTEM SHALL BE AS SPECIFIED IN THE TABLE BELOW:

DESIGNATION	LOCATION	PROTECTIVE COATING SYSTEM	AS/NZS2312.1 REFERENCE
INT1	INTERNAL STEELWORK - HIDDEN	ALKYD PRIMER SYSTEM	ALK1
INT2	INTERNAL STEELWORK - REQUIRING COLOUR FINISH	ALKYD PRIMER WITH ACRYLIC LATEX TOP COAT SYSTEM	ACL2
EXT1	INTERNAL/EXTERNAL STEELWORK - COLOUR NOT REQUIRED	SINGLE COAT SOLVENT BORNE INORGANIC ZINC SILICATE SYSTEM	IZS1
EXT2	EXTERNAL STEELWORK IN INDUSTRIAL ENVIRONMENT - MIO FINISH ACCEPTABLE	MICACEOUS IRON OXIDE (MIO) SYSTEM	EHB6
EXT3	EXTERNAL STEELWORK - COLOUR AND GLOSS FINISH REQUIRED	HIGH BUILD POLYURETHANE SYSTEM	PUR4

FIRE PROTECTION SHALL BE PROVIDED TO THE STEELWORK IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND SHALL BE COMPATIBLE WITH THE CORROSION SYSTEM USED ON THE STEELWORK.

2.9 **ARCHITECTURALLY EXPOSED STRUCTURAL STEELWORK**
ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS) SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131.
AREAS TO BE TREATED AS AESS AND THE AESS CATEGORY (1,2,3,4 OR C) ARE DESIGNATED ON THE PROJECT DRAWINGS.
ARCHITECTURALLY SENSITIVE CONNECTION DETAILS ARE INDICATED ON THE PROJECT DRAWINGS.
AESS COMPONENTS SHALL BE AESS 2 UNO.

2.10 **LIGHT GAUGE STEEL MEMBERS**
LIGHT GAUGE STEEL MEMBERS, COMPRISING PURLINS, GIRTS AND STRUCTURAL DECKING, SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131.

PURLINS AND GIRTS
1. PURLINS AND GIRTS TO BE GALVANISED STEEL TO AS2312.2 Z350 ZINC COATING
2. ALL PURLIN AND GIRT DETAILS SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION.
3. SERVICES SUPPORTED BY PURLINS MUST BE CONNECTED TO THE PURLIN WEB.
4. LAP ALL Z SECTION PURLINS AND GIRTS THE GREATER OF 15% OF THE SPAN OR 900mm.
5. BOLTING OF 100 TO 250 SERIES PURLINS AND GIRTS TO USE M12 GRADE 4.6 BOLTS. BOLTING OF SERIES 300 PURLINS AND GIRTS TO USE M16 GRADE 4.6 BOLTS. GRADE 8.8 BOLTS TO BE ADOPTED AS SPECIFICALLY NOTED ON PURLIN PLAN OR GIRT ELEVATIONS.
6. TO ENSURE A MAXIMUM SERVICE LIFE, PURLINS AND GIRTS SHOULD BE SUBJECT TO A REGULAR MAINTENANCE PROGRAMME INCLUDING INSPECTIONS, CLEANING OUT OF DUST AND DEBRIS AND WASHING DOWN WHERE POSSIBLE.

2.10.1 **ROOF, WALL AND EXTERNAL SOFFIT CLADDING**
2.10.1.1 **ROOF, WALL AND EXTERNAL SOFFIT CLADDING BY D&C CONTRACTOR**

1.1. ROOF, WALL & EXTERNAL SOFFIT CLADDING ARE BY D&C CONTRACTOR UNLESS NOTED OTHERWISE
1.2. THE D&C CONTRACTOR SHALL ENSURE THAT THE CLADDING AND THE CLADDING FIXINGS HAVE SUFFICIENT CAPACITY TO WITHSTAND ALL LOADS, INCLUDING WIND LOADS, FOR THE PURLIN AND GIRT SPACINGS AND SIZES, INCLUDING PURLIN AND GIRT CLEATS, SHOWN ON THE DRAWINGS.
1.3. PURLIN AND GIRT SPACINGS SHOWN ON THE DRAWINGS ARE MAXIMUM SPACINGS AND ARE TO BE AMENDED IF REQUIRED TO SUIT THE SELECTED CLADDING.
1.4. THE D&C CONTRACTOR SHALL PROVIDE A CERTIFICATE BY A REGISTERED PROFESSIONAL ENGINEER CERTIFYING THAT THE CLADDING, CLADDING FIXINGS AND PURLINS AND GIRTS ARE CAPABLE OF RESISTING THE DESIGN LOADS IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS AND THAT THE CLADDING HAS BEEN INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

2.10.1.2. **MAINTENANCE OF ROOF, WALL AND EXTERNAL SOFFIT CLADDING**
2.1. THE ROOF, WALL AND EXTERNAL SOFFIT CLADDING TOGETHER WITH THE FIXINGS, FLASHINGS AND RAINWATER GOODS SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

2.11 **MECHANICAL AND CHEMICAL ANCHORS**
MECHANICAL AND CHEMICAL ANCHORS SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131.

STEELWORK NOTES CONTINUED

3.0 STRUCTURAL STEELWORK ERECTION

3.1 **GENERAL**
STRUCTURAL STEELWORK ERECTION SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131.

3.2 **CAMBER**
ALL MEMBERS HAVING A NATURAL CAMBER WITHIN THE STRAIGHTNESS TOLERANCE SHALL BE ERECTED WITH THE NATURAL CAMBER UP.

3.3 **TOLERANCES**
ERECTION TOLERANCES SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131.
THE TOLERANCE CLASS FOR FUNCTIONAL TOLERANCES SHALL BE CLASS 1 UNO.

3.4 **POST-INSTALLED ANCHORS**
THE INSTALLATION OF MECHANICAL AND CHEMICAL ANCHORS SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131
SITE TESTING SHALL BE PERFORMED ON MECHANICAL AND CHEMICAL ANCHORS TO VALIDATE CORRECT INSTALLATION (PROOF TESTING). A MINIMUM TEST SAMPLE POPULATION SHALL BE THREE SPECIMENS OR 2.5% OF THE TOTAL RELEVANT ANCHOR POPULATION, WHICHEVER IS GREATER. IF A SINGLE FAILURE IS RECORDED, THE MINIMUM TEST SAMPLE POPULATION SHALL BE INCREASED TO SIX TEST SPECIMENS OR 5% OF THE TOTAL RELEVANT ANCHOR POPULATION, WHICHEVER IS GREATER. IF TWO OR MORE TEST SAMPLES FAIL, ALL ANCHORS IN THE RELEVANT ANCHOR POPULATION SHALL BE TESTED.
THE 'TEST SAMPLE POPULATION' IS DEFINED AS A GROUP OF ANCHORS REPRESENTATIVE OF THE RELEVANT ANCHOR POPULATION, HAVING THE SAME TYPE OF ANCHOR, THE SAME BASE MATERIAL (THAT HAS NOT EXPERIENCED DIFFERENT ENVIRONMENTAL EXPOSURE), SAME INSTALLATION METHOD AND SAME INSTALLATION PERSONNEL. WHERE ANY OF THESE VARIABLES CHANGE, THIS GROUP OF ANCHORS SHALL BE CONSIDERED A SEPARATE ANCHOR POPULATION.
100% OF POST INSTALLED ANCHORS THAT ARE IN PERMANENT TENSION, TENSION ANCHORS INDICATED ON THE DRAWINGS & ANCHORS FORMING PART OF FALL ARREST SYSTEMS, SHALL BE PROOF TESTED.
ALL SITE TESTING OF POST-INSTALLED ANCHORS SHALL BE UNDERTAKEN ACCORDING TO THE REQUIREMENTS OF AUSTRALIAN ENGINEERED FASTENERS AND ANCHORS COUNCIL (AEFAC) TECHNICAL NOTE – SITE TESTING GUIDELINES VOLUMES 1 TO 4.
THE TESTING OF POST INSTALLED ANCHORS SHALL BE PERFORMED BY A REGISTERED TESTING AUTHORITY (RTA) WHOSE TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

3.5 **CONNECTION TO FOOTINGS**
FOOTING BOLTS SHALL MEET THE REQUIREMENTS OF AS/NZS 5131.
MATERIALS USED FOR GROUTING UNDER STEEL BASE PLATES AND BEARING PLATES SHALL MEET THE REQUIREMENTS DEFINED IN AS/NZS 5131.

3.6 **CAST-IN COMPONENTS**
ALL BOLTS, NUTS AND WASHERS, INCLUDING HOLD DOWN BOLTS, CAST-IN FERRULES AND MASONRY ANCHORS ARE TO BE HOT-DIP GALVANIZED UNLESS NOTED OTHERWISE. ALL GALVANIZED COMPONENTS TO BE CAST INTO CONCRETE MUST BE PASSIVATED.

3.7 **ERECTION SEQUENCE METHODOLOGY**
WHERE ASSESSED AS REQUIRED FROM THE RISK PLANNING WORKSHOPS, SUBMIT THE ERECTION SEQUENCE METHODOLOGY (ESM) FOR APPROVAL.
THE STRUCTURAL ENGINEER HAS DESIGNED THE WORKS TO BE STABLE ON COMPLETION OF ALL STRUCTURAL ELEMENTS OF THE WORKS, INCLUDING MEMBERS, CONNECTIONS, SUPPORTING STRUCTURAL ELEMENTS, BRACING ELEMENTS AND THE LIKE. THE CONTRACTOR AND/OR HIS SUBCONTRACTORS ARE RESPONSIBLE FOR ENGAGING A TEMPORARY WORKS ENGINEER TO ADVISE ON, AND CERTIFY THE TEMPORARY STABILITY AND SUPPORT (BOTH VERTICALLY AND LATERALLY) OF ALL STEELWORK DURING CONSTRUCTION/ERECTION/TRANSPORTATION, INCLUDING DEVELOPING ERECTION METHODOLOGIES FOR SAME, UNTIL FULL ERECTION OF ALL STRUCTURAL ELEMENTS OF THE WORKS IS COMPLETED.THE TEMPORARY WORKS ENGINEER SHALL ENSURE THAT THE METHODOLOGY AND ERECTION SEQUENCE DOES NOT RESULT IN ADVERSE LOCKED IN STRESSES, OR THE TEMPORARY OVER-STRESSING OF ANY ELEMENTS.

3.8 **PROPRIETARY ITEMS**
PROPRIETARY ITEMS (E.G. PURLINS, ROOF/WALL SHEETING, FERRULES) SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

3.9 **GROUTING UNDER BASE PLATES**
DO NOT GROUT UNDER ANY BASE PLATE OR ADJACENT STEELWORK WHERE STEELWORK WELDING OR ALIGNMENT IS INCOMPLETE.

4.0 STRUCTURAL STEELWORK INSPECTION, TESTING AND CORRECTION
INSPECTION, TESTING AND CORRECTION SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131.
INSPECTION AND TEST PLANS (ITP) SHALL BE PREPARED, AS LISTED IN THE TABLE BELOW.

ITEM	ITP
MATERIALS & COMPONENTS	REQUIRED
PREPARATION & ASSEMBLY	REQUIRED
WELDING	REQUIRED
MECHANICAL FASTENING	REQUIRED
SURFACE TREATMENT	REQUIRED
PAINT COATINGS	REQUIRED
GALVANIZED COATINGS	REQUIRED
ERECTION	REQUIRED

5.0 PARTICULAR REQUIREMENTS
THERE ARE NO ADDITIONAL OR PARTICULAR REQUIREMENTS.

6.0 SECONDARY STEELWORK
6.1 THE STEELWORK SHOWN ON THE PROJECT STRUCTURAL STEELWORK DRAWINGS IS LIMITED TO THE MAIN STRUCTURAL FRAMING ELEMENTS OF THE BUILDING.
ALL STEELWORK THAT IS NOT REQUIRED TO SUPPORT, STABILISE OR TO ENSURE THE INTEGRITY OF THE MAIN STRUCTURAL FRAMING ELEMENTS OF THE BUILDING IS CONSIDERED TO BE SECONDARY STEEL AND UNLESS NOTED OTHERWISE IS NOT INCLUDED IN THE PROJECT STRUCTURAL DRAWINGS.
6.2 SECONDARY STEELWORK INFORMATION AND DETAILS SHOULD BE OBTAINED FROM OTHER CONSULTANTS UNLESS INCLUDED IN THE STRUCTURAL DRAWING PACKAGE.
6.3 SECONDARY STEELWORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING;
- STEELWORK FOR CEILING AND WALL CLADDING SYSTEMS
- FACADE FRAMING SYSTEMS
- DOOR AND WINDOW FRAMING SYSTEMS
- PLANT AND EQUIPMENT SUPPORT
- NON- LOADBEARING PARTITIONS
- SIGNAGE SUPPORT STEELWORK
- HANDRAILS AND BARRIER SYSTEMS
- LIGHTING SYSTEMS
- FALL ARREST SYSTEMS
- ACCESS WALKWAYS
- INTERNAL FITOUT
- PROPRIETAR