79 Nelson Street
October 2017
21666

STRUCTURAL SPECIFICATION

FOR SEISMIC STRENGTHENING

AT

79 NELSON STREET, PETONE

FOR

G D C INVESTMENTS LTD

SILVESTER/CLARK CONSULTING ENGINEERS

October 2017

Silvester Clark Ltd
Consulting Engineers
153 Thorndon Quay
Wellington

Contents

DATES OF ISSUE

Issued For	Revision	Date	Written By	Checked By
Building Consent	A	02/10/2017	HN	IB

STRUCTURAL STEELWORK

A GENERAL & CODES

ST 1. GENERAL

Refer to the Conditions of Contract and to the Preliminaries Section which are binding on all sections. Protect from damage the work of the other trades; make good at own expense any such damage to work or material.

ST 2. STANDARD SPECIFICATIONS

Where any standard specifications are quoted they shall mean the current issue at time of tendering, and shall include any amendments thereto and any standards in substitution therefore.

All materials and workmanship shall comply with the following standards as appropriate contained in New Zealand or Australian Steels:

AS/NZS 1163:	*"Structural Steel Hollow Sections"*
AS/NZS 1594:	*"Hot-rolled Steel Flat Products"*
AS/NZS 3678:	*"Structural Steel – Hot-rolled Plates, Floorplates and Slabs"*
AS/NZS 3679:	*"Part 1: Hot-rolled Bars and Sections"*
	"Part 2: Welded I-sections"
NZS 3404:	*"Steel Structures Standard"*
AS/NZS 1252:	*"High Strength Steel Bolts with Associated Nuts and Washers for Structural Engineering"*
AS/NZS 1553:	*"Covered Electrodes for Welding"*
AS/NZS 1554:	*"Part 1: Welding of Steel Structures"*
	"Part 4: Welding of High Strength Quenched and Tempered Steels"
AS/NZS 1559:	*"Hot Dipped Galvanised Steel Bolts with Associated Nuts and Washers"*
AS/NZS 2312:	*"Guide to the Protection of Structural Steel Against Atmospheric Corrosion By the Use of Protective Coatings"*
AS/NZS 3750:	*"Paints for Steel Structures"*
AS/NZS 4680:	*"Hot-dipped Galvanised (zinc) Coatings on Fabricated Ferrous Articles"*
AS 1418:	*"Cranes, Hoists and Winches. Part 1, General Requirements"*
NZS 4711:	*"Qualification Tests for Metal-arc Welders"*

ST 3. TESTS

Tests of welds may be required by the Engineer to be carried out on any welds. In the event of such tests being ordered, and all welds being found to be satisfactory, then the costs of such tests shall be paid for as an extra to the contract. In the event of any welds not being approved as satisfactory, then the costs of the initial tests and of any subsequent testing whatsoever shall be borne by the structural steel subcontractor.

As a minimum, all welds shall be subject to 100% visual inspection in accordance with AS/NZS 1554.1.

ST 4. INSPECTION

The Engineer, or his representative, shall have access to the work at all reasonable times, and facilities shall be provided to enable him to inspect any part or stage of the work.

ST 5. WELDING SYMBOLS

Welding symbols used on the drawings are generally in accordance with NZS 5902 Part 2, Amendment No. 2.

B MATERIALS

ST 6. COMPLIANCE

All materials shall comply with the requirements of the relevant standard specifications.

Steel from other than New Zealand, Australian or British sources is unacceptable without prior approval. If requested, copies of the steel manufacturer's mill test certificates shall be provided.

ST 7. BORON CONTENT

The contractor is to submit for approval, by the structural engineer, documentation from the steel mill that indicates the boron content that will be in the steel provided. This documentation is to be included with the tender documents or prior to ordering steel work.

The contractor may not use steel obtained from another mill without approval from the structural engineer.

ST8. COLD FORMED STEEL PURLINS & GIRTS

Cold formed steel purlins labelled "DHS" shall be Dimond Hi-Span cold formed purlins with associated "Fastbrace" channel bridging.

Purlins and bridging shall be manufactured from galvanised steel coil with a minimum yield strength conforming to AS/NZS 4600. All bolts for purlins shall be galvanised.

The design of all purlins shall comply with AS/NZS 4600 "Cold Formed Steel Structures".

Alternative purlin systems shall not be used without prior approval.

ST 9. BOLTS

All bolts shall be Grade 8.8. The tightening of the Grade 8.8 bolts shall be in accordance with Hera Connections document R100 Part 2.

ST 10. PAINTING SYSTEMS

Surface preparation and pretreatment of steel surfaces to be painted shall comply with the requirements of *** "Metal Finishing – Preparation and Pretreatment of Surfaces". All painting systems are to be by one manufacturer. The following system is approved for general use:

Primer - interior (dry) steelwork	Carboguard 504
Primer - exterior steelwork	Carbozinc 859 EZ2

C WORKMANSHIP

ST 11. COMPLIANCE

All workmanship shall comply with the requirements of the relevant standard specifications.

ST 12. FABRICATION

Check all dimensions on site before fabricating any part. Read the entire drawings to ensure all fixings have been provided for.

The steelwork shall be accurately fabricated so that all parts fit truly on assembly.

All similar parts shall be interchangeable. Fabrication shall be carried out in accordance with NZS 3404. All bolts shall be of such length that the threaded portion does not extend within the parts bolted, and washers shall be used to prevent the nuts from binding at the bottom of the threads.

If the structural steel subcontractor wishes to provide any additional splices other than those shown on the drawings to suit stock lengths or to suit preferred erection methods, such splices shall be full strength double vee butt welded and in any event the locations of any such proposed splices shall be submitted to the Engineer for approval prior to commencing work.

Radius sharp edges to a minimum 2mm radius.

ST 13. TOLERANCES

Unless otherwise stated on the drawings, all steel members shall be straight and free from twist. No surface shall deviate from a straight plane by more than 1mm over any 100mm and by more than 6mm overall. Any work required to straighten steel to comply with this requirement shall be carried out only after the approval of the Engineer and at the steelwork contractor's cost.

ST 14. WELDING

All welding shall be in accordance with sound modern practices and shall be in accordance with AS/NZS 1554 and shall be carried out by competent welders holding a certificate in accordance with the requirements of NZS 4711.

All burrs and sharp arrises shall be removed by grinding prior to welding commencing.

All hollow sections are to be sealed by a continuous seal weld all around.

The surfaces to be welded, and the surrounding material for a distance of at least 12mm from the prospective weld, shall be free from scale, dirt, grease, heavy rust, paint, or other surface deposit. Shearing, chipping, machining or machine gas cutting may cut fusion faces. Hand gas cutting may be substituted for machine gas cutting if the latter is impracticable and in such cases the cutter must be adequately guided so that the cut specified is clean and uniform. If the fusion face is rough, it shall be dressed by chipping, grinding and filling to the satisfaction of the Engineer. The gap between steel parts to be welded, and the form of fusion, shall be as shown

on the drawings. The steel parts to be welded shall be held securely in their relative position during welding.

Welding, other than track welding, may not be performed before the Engineer has been advised that the welds are ready for inspection and has, if he so chooses, inspected and improved the members prepared and tacked ready for welding. The Contractor shall prepare welds in groups as large as reasonably possible, and not less than 12 welds, for the Engineer's inspection at any one visit. The Engineer may require welds done in contravention of this clause, to be cut open for inspection, X-rayed or otherwise tested. Such work, and the making good therefore, shall be done at the Contractor's expense.

All slag shall be removed after making each welding run by light hammering and wire brushing, or by other approved methods.

The sequence of welding shall be such that distortion is minimised and any unavoidable distortion shall be corrected. The plant and operation thereof shall be such so as to ensure that:

(a) welds will be of good, clean metal, uniformly and continuously deposited; and
(b) the surface of the weld will have an even contour and the regular finish indicating adequate fusion with the parent metal. All joints are to be sealed by welding.

Welds showing more than minor undercutting will not be accepted, but must be made good to the satisfaction of the Engineer. Welds which show cavities, or incomplete fusion, shall be cut out and shall be re-welded to the satisfaction of the Engineer.

Where the thickness of steel differs at butted joints by more than 1.5mm, the thicker side is to be ground to a one in 12 taper to match the thinner side.

The Contractor shall employ a competent welding supervisor or charge hand to ensure that the standard of workmanship and the quality of materials comply with this specification. The Engineer may, at his discretion, require test specimens to be made by each or any welder employed on the work. Such specimens are to be tested by an independent authority. All costs of such tests are to be borne by the Contractor.

Nelson studs shall be welded using purpose-made plant. Studs shall be welded to beams through the metal decking unless detailed otherwise.

ST 15. HOLES

Make all bolted connections in accordance with NZS 3404.

All holes in material greater in thickness than 16mm are to be drilled. Flame cutting of holes is forbidden. Holes shall be of diameter no greater than 2mm larger than the bolt diameter unless otherwise shown.

No holes shall be distorted or enlarged on site without prior notification and inspection by the Engineer.

ST 16. BOLTING

All snug tight bolts shall be installed with tapered washers when bearing on bevelled surfaces. The threaded portion of a bolt shall project through both ends of the nut by at least one thread after being tightened. The joined parts shall be firmly drawn together.

ST 17. STAGING, ETC

The Contractor shall provide staging and protection, as may be necessary, to enable the welders to perform properly and safely the welding operation.

ST 18. ERECTION

Care shall be taken to ensure that the fabricated sections are not overstrained in handling and that they are adequately braced and supported during site welding. The Engineer may require a sequence of erection to be submitted for approval. Such approval shall not relieve the Contractor of the responsibility for the true and accurate erection of the works.

The whole of the steelwork shall be finished true to line and level in a workmanlike manner. Any erection cleats are to be removed and holes filled with weld, then ground to a smooth, even surface.

ST 19. DRY PACKING

All spaces between base plates or wall plates and concrete work shall be filled with approved dry packing or non-shrink grout, unless shown otherwise on the drawings. This dry pack mortar shall be hammered in tight to completely fill the space.

ST 20. COOPERATION WITH CONCRETER

Steelworker shall check all concrete and fixing dimensions on the site before fabricating any steelwork affected by these dimensions.

ST 21. CLEANING

Before painting, all surfaces shall be free of oil and grease and then abrasive blast cleaned to AS 1627 Part 4 Class 2½. All surfaces must be clean and dry immediately before the application of the paint. Surfaces to be surrounded by concrete shall remain unpainted.

ST 22. PRIMING

Surfaces to be covered with concrete are to be primed only to a depth of 25mm below concrete surface.

Ensuring that the surface is properly cleaned, apply by airless spray, conventional spray, brush or roller, one coat of primer to a dry film thickness as recommended by the manufacturer. Leave unpainted 75mm either side of all areas where on-site welding is required, and leave for 48 hours to harden before transporting to site. All site contamination must be removed by suitable means after erection.

Damaged and on-site welded areas (including transport and erection damage) must be power tool disc prepared and patch primed with one coat of the same primer. This is to be applied at a sufficient rate to bring this coating to its original thickness.

Black bolts, nuts and washers must be degreased before coating. See under the Painting specification for any finishing coats.

ST 23. SHOP DRAWINGS

Shop drawings will be required and, before fabrication is commenced, two copies of these drawings shall be submitted to the Engineer for review.

These drawings shall provide complete details of each assembly in the steelwork, together with all information relative to their fabrication, surface treatment and erection. Each component and connection shall show the relevant work points. The review of shop drawings by the Engineer and permission to fabricate shall not relieve the Contractor of his responsibility for the accuracy of these drawings and for the correctness of the fabrication, setting out and erection of the steelwork. The cost of rectifying any errors shall be at the Contractor's sole expense. Two sets of the as-built drawings shall be provided to the Engineer.

ST 24. PRODUCER STATEMENTS

When the work is complete, the Contractor shall furnish a fully completed Producer Statement covering the work completed under this section of the specification. This Producer Statement does not relieve the Contractor of any responsibility in respect of the full completion and maintenance of the works.