GENERAL NOTES DRAWING 1

1. The drawings show the final condition only; stability during the temporary, construction stage is the responsibility of the contractor.
2. All variances in the existing structure from those assumed on the drawings to be reported to the structural engineer immediately. Further stripping of finishes may reveal additional areas of structure requiring remedial action. These are also to be reported to the structural engineer immediately.
3. All dimensions on drawings are approximate only. The contractor is responsible for taking accurate site dimensions, particularly in relation to steel fabrication.
4. The manufacturer's instructions and guidance on the use of any proprietary products used are to be strictly observed.
5. All concrete to be grade C35 unless noted otherwise.
6. All steel fabrication and erection to be to the National Structural Steelwork Specification. Weld procedures and welding operative qualifications to be strictly observed.
7. All steel to be grade S355 to BS EN 10025 unless noted otherwise.
8. CFW = Continuous Fillet Weld, FPBW = Full Penetration Butt Weld
9. The following steelwork to receive improved corrosion protection: parts of sculptures below ground level. These members to receive the following corrosion protection:

   - Prepare: blast clean to Sa2.5 of BS 7079 part A1

   - Primer: 75 microns DFT (dry film thickness) zinc-rich epoxy to BS 4652

   - Barrier: 100 microns DFT epoxy MIO

   - Finish: 50 microns DFT Acrylic/Urethane to artist's specification

   Zinc phosphates and other paints are NOT a suitable alternative to zinc-rich epoxy.

   Paint technical datasheets to be submitted to the structural engineer prior to steel fabrication and paint order.

   Any of the above paint specifications may be substituted with hot-dipped galvanising to BS EN ISO 146.
10. All standard bolts to be zinc-plated grade 8.8 unless noted otherwise.
11. All materials to be compatible with one another; contact between dissimilar metals is to be avoided.

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DRAWING REGISTER AND ISSUE SHEET **PROJECT No. 4243**
PAGE 1

JOB:	**Whisky Bottle Public Art**	DAY MONTH YEAR	23 11 2016					
No.	DRAWING TITLE	SIZE	REVISION					
	Structural Drawings							
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SK-F-02	Foundations	A3	-					
SK-F-03	Foundations	A3						
			-					
SK-WB-01	Artwork - sheet 1	A3	-					
SK-WB-02	Artwork - sheet 2	A3	-					
	General Notes							
GN-1	General Notes - Sheet 1	A4	-					

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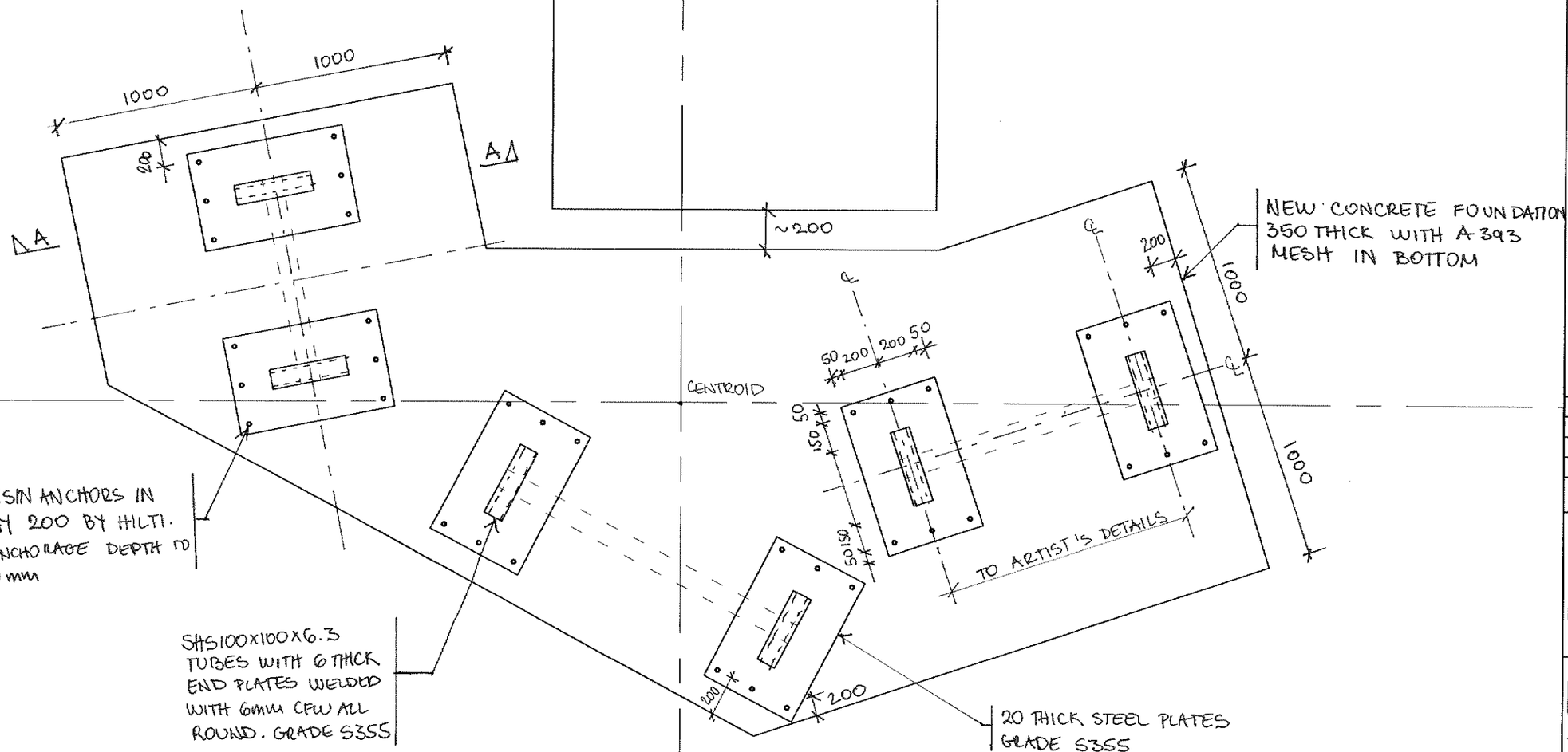
P - PRELIMINARY I - INFORMATION A - APPROVAL B - BUILDING REG'S T - TENDER C - CONSTRUCTION e -electronic only



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FOR GENERAL NOTES SEE GN-01 & GN-02

Rev.	Date	Amendment	By

Status: CONSTRUCTION

Project Title:
WHISKY BOTTLE PUBLIC ART

Drawing Title:
FOUNDATIONS

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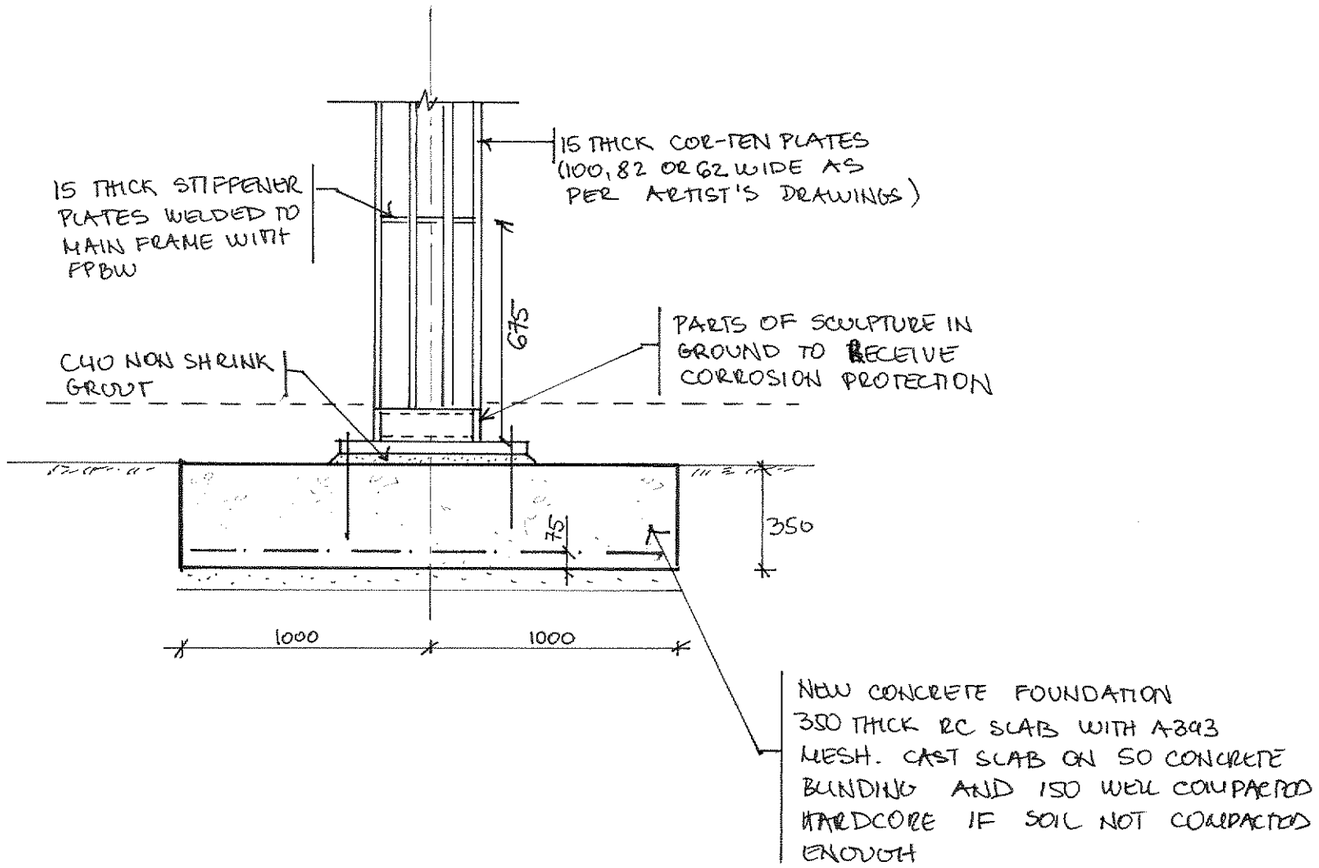
Project No.:	Drwg No.:	Rev.:
4243	SK-F-01	-



TYPICAL FOUNDATION & BASE CONNECTION
SECTION A-A

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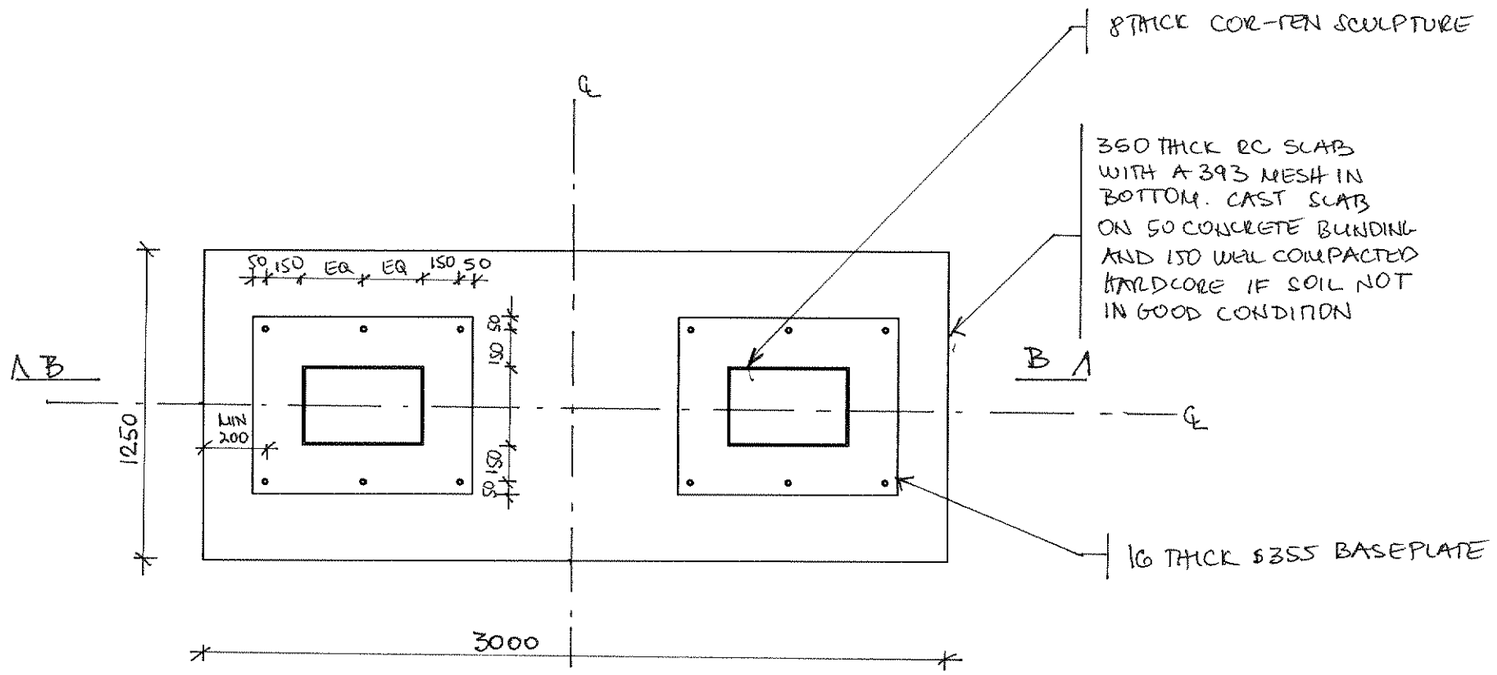

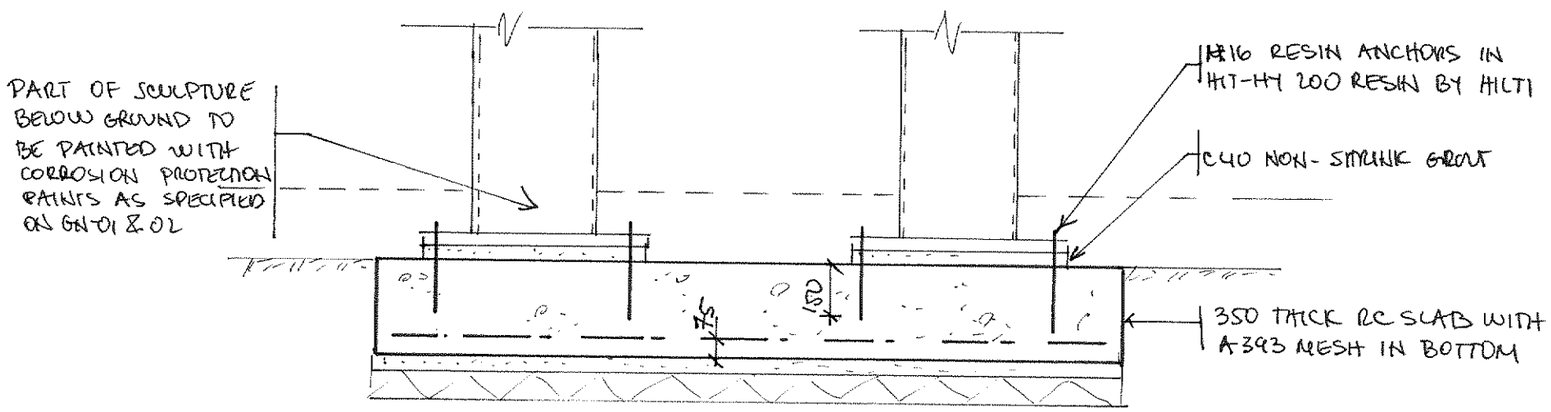

SECTION B-B

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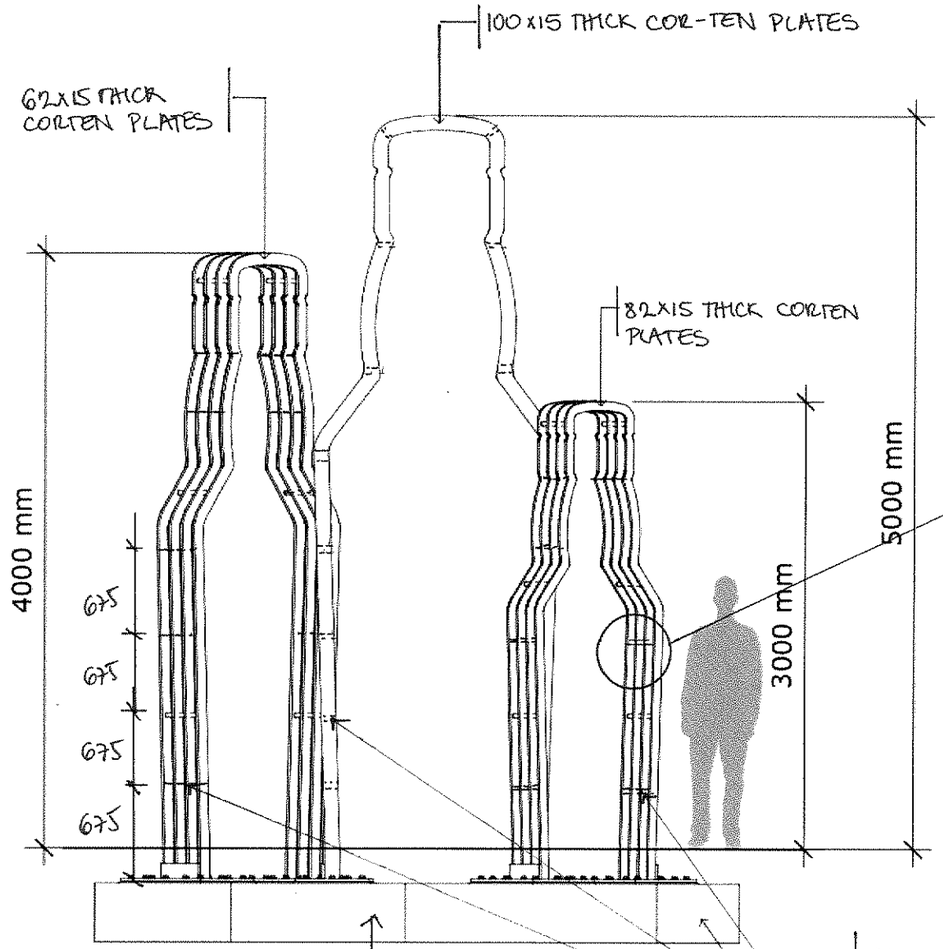

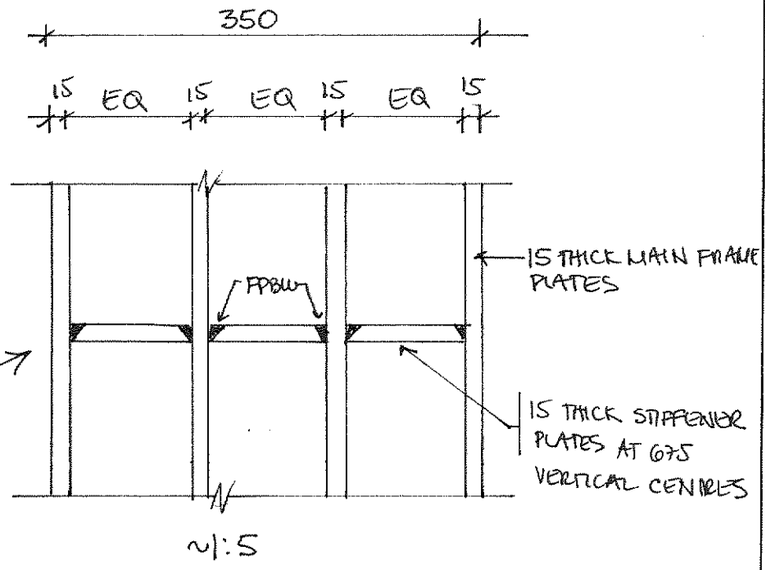

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FOR FOUNDATIONS REFER TO SK-F-01 AND 02

ALL SCULPTURES TO HAVE 15 THICK STIFFENER PLATES INSTALLED BETWEEN FRAME PLATES AT MAX 675 VERTICAL CENTRES.
WIDTH OF STIFFENER PLATES TO MATCH WIDTH OF MAIN FRAMES

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Status: CONSTRUCTION

Project Title:
WHISKY BOTTLE PUBLIC ART

Drawing Title:
ARTWORK - SHEET 1

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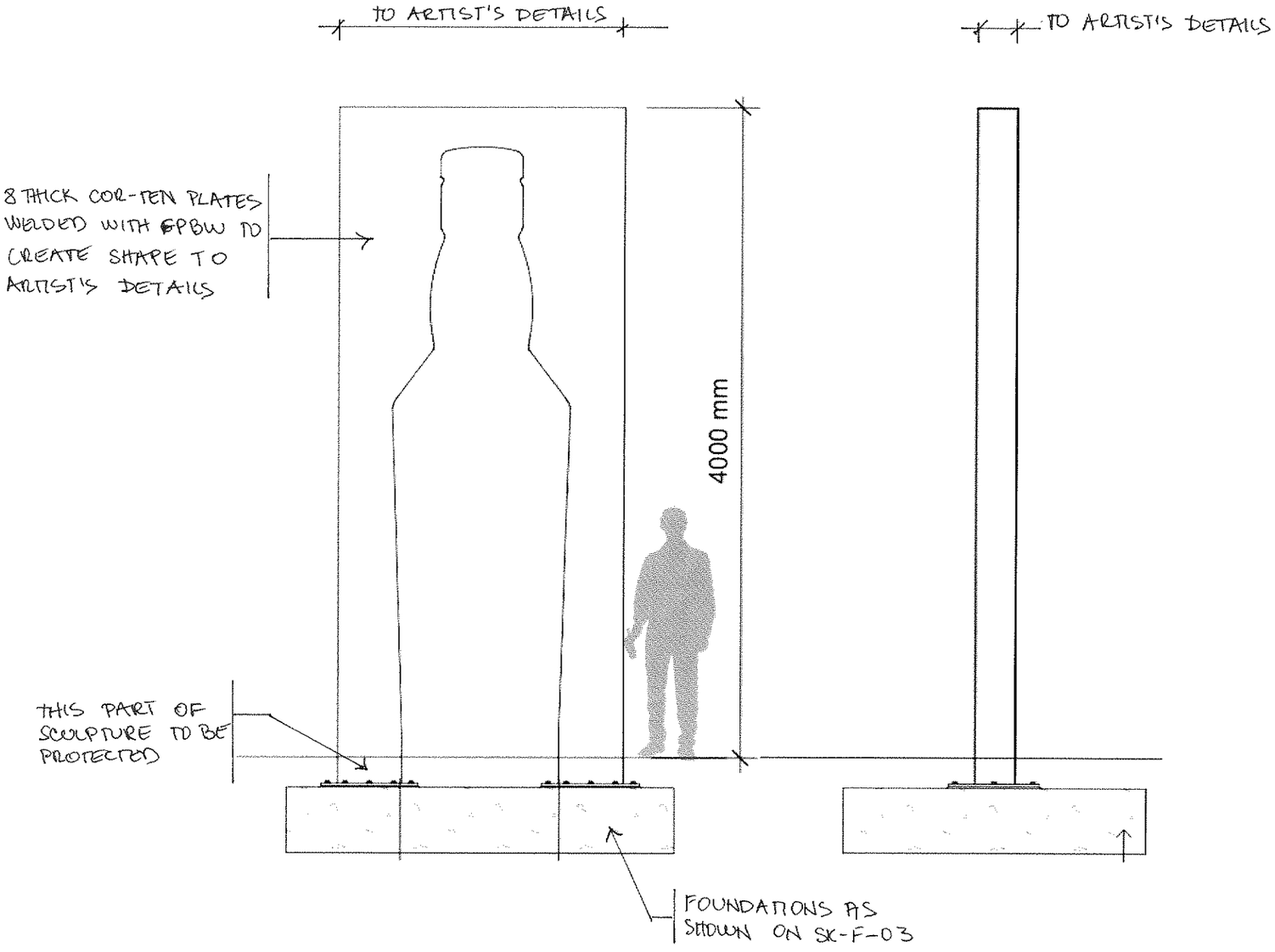
4243	SK-WB-01	-



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Status: CONSTRUCTION

Project Title:
WHISKY BOTTLE PUBLIC ART

Drawing Title:
ARTWORK - SHEET 2

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Project No.:	Drwg No.:	Rev.:
4243	SK-WB-02	-

Old School Fabrications

Whisky Bottle Public Art

Rosebank Distillery

Structural Report

ENTUITIVE

Old School Fabrication

Whisky Bottle Public Art
Rosebank Distillery

Structural Report

November 2016

ENTUITIVE

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Registered address: 149A Southampton Way, London, SE5 7EW

Project Number: 3234

1. CONTENTS

Page

2. SCOPE AND GENERAL INFORMATION

Entuitive were asked to design super and sub-structures of four public art sculptures which are to be installed in the grounds of the Rosebank Distillery.

The sculptures will be between 3m and 5m high, made from COR-TEN steel and installed at 2 different locations along the canal in Falkirk. There are two types of sculptures. The first type is created from steel plate frames (100mm by 15mm thick COR-TEN plates for 5m high, 82mm by 15mm thick COR-TEN plates for 4m high and 62mm by 15mm thick COR-TEN plates for 3m high). The second type is created as a solid box made from 8mm thick COR-TEN sheets.

We have based or design on the drawings provided by Old School Fabrications which show the four sculptures and setting out details for the one close to the canal banks.

3. MATERIALS

COR-TEN steel plates are all assumed to have the following mechanical and physical properties:

Young's Modulus = 205 GPa
Yield stress = 355 MPa
Density = 78 kN/m³

Concrete foundations are all assumed to have the following mechanical and physical properties:

Concrete grade C35
Density = 24 kN/m³

4. LOADING

The design wind speed was assumed as a site specific wind speed of 35.67m/s (80mph) which equates to a wind pressure of 1.05kN/m². This is based on the gale wind forces with the return period of 50 years.

We have also considered a less onerous wind load which is based on the wind forces with the return period of 1 year. The site specific wind speed in this case was 19.8m/s (45mph) which equates to a wind pressure of 0.31kN/m² (0.35kN/m² was used).

The analysis was undertaken for the following load:

- Self weight of the sculpture
- Horizontal point load from people leaning on the sculpture (we applied two very heavy point forces of 100kg (1kN) acting at 1.1m above ground in each direction
- Extreme wind forces – gale forces from the wind load that can happen once in 50 years. We have also taken into account drag forces and the drag factor considered was 2.
- Maximum estimated expected forces that can happen once a year (this is from the wind blowing at 45mph).

5. CONCLUSIONS

All four sculptures are modelled in the Oasys GSA software and the results are as the following:

The 5m high sculpture should be constructed form 100mm wide by 15mm thick plates installed in four rows and connected together with 15mm high by 100mm wide stiffener plates installed at 675mm centres. The plates are cut to form a bottle shape and at the bottom the sculpture has two 20mm thick base plates which are used to fix it to the foundations.

Similarly, 4m high sculpture is constructed form 820mm wide by 15mm thick plates installed in four rows and connected together with 15mm high by 820mm wide stiffener plates installed at 675mm centres. These plates are also cut to form a bottle shape and at the bottom the sculpture has two 20mm thick base plates which are used to fix it to the foundations.

The 3m long sculpture is constructed the same way but from 62mm wide steel plates.

The solid sculpture is constructed form 8mm thick COR-TEN sheets and at the bottom it has 16mm thick steel base plates to connect it to the foundations.

Under the extreme wind load the sculptures are expected to deflect as the following:

- 5m high – about 50mm (H/100)
- 4m high – about 32mm (H/125)
- 3m high – about 20mm (H150)
- Solid sculpture – naturally stiff as it deflects about 1mm

One should bear in mind that the deflections are serviceability issues and are related to the perception of an end user, i.e. would the public be worried if they see the sculpture moving a certain amount in gale wind. We think these deflections to be appropriate for the given load condition.

Under the more realistic wind load with the return period of 1 year the sculptures are expected to deflect as the following:

- 5m high – about 18mm (H/278)
- 4m high – about 14mm (H/285)
- 3m high – about 7mm (H/430)
- Solid sculpture – naturally stiff as it deflects less than 1mm

These deflections sit well within the guidance limits given in the British Standards so we consider them appropriate and acceptable.

It is also important to consider corrosion protection of the sculptures especially of the pats located bellow the finish level. The sculpture should be painted as specified in the general notes to extend it's design life but we have considered that the thickness of the COR-TEN plates used will have a natural resistance to provide a lifespan of at least 25 years.

Sanja Buncic
dipl.ing.gradj. CEng MIStructE
Entuitive
23rd November 2016