



25 June 2026

City of Greater Geraldton
63 Cathedral Ave
Geraldton WA 6530

Job No: 26FCE1799
Your ref: PO00010893

Attention: Mr Geoffrey Burton

Dear Geoffrey,

Project: La Fiamma Sporting Club – Light Pole Inspection

Engineering Report

Introduction

The City of Greater Geraldton (CGG) operate and manage the La Fiamma Sporting Club light poles which provide lighting for the field. During a recent wind event, one of the four light poles was blown over. The cause of the pole failure was corrosion at the base of the pole. The remaining three poles have since been unbolted and lowered to ground. CGG wish to reattach the three remaining light poles until planned pole replacement can take place in the next 2-4 years. CGG have requested Flow Consulting Engineers (FCE) to perform the following:

- Perform an inspection of the three remaining light poles and footings.
- Provide a procedure to repair the remaining three light poles.
- Provide a procedure to reinstall the three poles on the existing footings.

Findings of Site Inspection

Site inspection and measurement was performed by Structural Engineer Mr Sam Omelaniuk from FCE. Inspections were completed on 5 June and 12 June 2026. For the purposes of this report the poles have been numbered from 1 to 4. The location of each pole is shown marked on site plan provided in Appendix A. Light pole 2 is the pole that failed and is no longer onsite.

Light Poles

The remaining three light poles are the same. The light poles do not currently have any floodlights installed on them. The poles are approximately 21m high. They are constructed from octagonal poles with 400mm width between flat sections and 4mm wall thickness. The base plate is 550x550x32mm thick with four M30 anchor bolts on an approximate 535mm PCD.

Structural Grout has been installed between the base plate and the footing. The grout has been constructed under the perimeter of base plate but not over the centre of the footing creating a well in the centre. No weep holes have been constructed in the grout to any water entering the pole to escape.

Condition of Light Poles

Photographs of the poles are provided in Appendix B. The condition of all three poles is similar. All poles have similar corrosion around the base of the poles at the connection to the base plate. The side wall has corroded through completely in some areas. The base plates have minor surface corrosion. The rest of the poles galvanised steelwork remains in good condition.

Condition of Footings and Anchor Bolts Following Sand Blasting

The anchor bolts, corroded nuts and steel pipe formwork have been sand blasted and primed to confirm condition as shown in Figure 11 to Figure 16 in Appendix B. The anchor bolts have corroded. In many cases the thread below the nut has corroded away as shown in Figure 16 in Appendix B. The worst-case anchor bolt corrosion was found to reduce the M30 anchor bolt diameter to 26mm as shown in Figure 15 in Appendix B.

Design Checks to Confirm Anchor Bolt Capacities

FCE have completed design checks in accordance with the following current Australian Standards to confirm the capacity of the remaining bolts:

- AS/NZS 1170.0:2002 Structural design actions.
- AS/NZS 1170.1:2002 Structural design actions.
- AS/NZS 1170.2:2021 Wind Actions.
- AS 4100:2020 Steel structures.

AS/NZS 1170.2:2021

Based on the current AS/NZS1170.2:2021 standard the structure has been design checked for the following requirements:

1. The Terrain Category at the site has been taken as 2.0. Cyclonic Region B2 Geraldton.
2. Importance level 2. Design life 50 years. Annual probability of exceedance 1:500.
3. Ultimate wind speed 57m/s (205km/h).

Anchor Bolts

The anchor bolts have been assumed fabricated from M30 Grade 8.8 bolts with a minimum yield strength of 830MPa.

Findings of Design Checks

The anchor bolts with a minimum reduced diameter of 26mm and minimum cross-sectional area of 530mm² will be adequate to support the poles in accordance with current Australian Standards.

Conclusions

The corrosion of pole and anchor bolts has been caused by water entering the pole and being trapped in the base of the pole due to failure to provide weepholes in the grout beneath the pole. The grout was trapping the water inside the pole. This is essentially a defective construction detail. A method to repair the pole and correct the pole drainage is provided below. Once repairs recommended below are completed the poles can be returned to service provided the poles are inspected every 2 years.

Recommended Procedure for Repairs***Preliminaries***

- All welding shall be completed in accordance with welding notes provided in Appendix C.
- All steelwork shall be surface treated in accordance with Appendix D.
- All repairs shall be completed in accordance with FCE Drawings provided in Appendix F.

Procedure for Repairs

The light pole repairs shall be completed in accordance with the following procedure:

1. The pole base plate and octagonal pole shall be sand blasted to 500mm above the base plate (exterior and interior).
2. 8 x 300mm high x 10mm steel plates shall be fully seal welded over corrosion affected areas of the octagonal pole base. Plates shall be notched at base to accommodate the existing pole to base plate weld. All plate edges shall be fully seal welded to prevent moisture ingress between the new plate and the base of the light pole.
3. Following completion of welding, all new and exposed steelwork shall be surface treated to 500mm above the base plate. Ensure both the interior and exterior surfaces of the pole and base plate are surface treated.
4. Surface treat anchor bolts in accordance with procedure provided in Appendix D.
5. The poles will need to be seated on spacers where the existing nuts cannot be removed. To provide a level bearing surface for the new spacers, FCE recommends the top surface of the footing be levelled prior to re-installation of the poles. Level surface of concrete with high strength low shrink structural grout such as SikaGrout 212HP (or similar approved grout) constructed in accordance with manufacturers specifications.
6. Reinstall lights on poles. FCE recommends if new lights are to be installed, the weight and cross sectional area profile of new lights to be no greater than the previously installed lights.
7. Reinstall poles and level using spacers shown on FCE Drawings in Appendix F. Once pole is plumb, tension new M30 Grade 8.8 galvanised nuts onto base plate. Tension to snug tight condition in accordance with AS4100. Confirm pole remains plumb following tensioning.
8. The installed poles shall be painted in bitumen paint to 500mm above base plate. FCE recommends SikaTite BE which is a heavy duty, highly flexible water based bitumen waterproofing membrane. spec for bituminous paint is provided in Appendix E.
9. Regrout between base plate and footing using high strength low shrink grout such as SikaGrout 212HP (or similar approved grout) in accordance with the drawing in Appendix F. Ensure weep holes are installed to allow water which enters the pole to drain.

Monitoring

FCE recommends annual monitoring of the poles be completed to confirm condition of pole steelwork every 2 years until pole replacement can be completed in 2-4 years' time. FCE would be happy to assist with inspections if requested.

If you have any queries in relation to the above information, please do not hesitate to contact Mr Lester Smith of this office on 9964 5459.

Yours faithfully

A handwritten signature in black ink, appearing to be 'Lester Smith', written in a cursive style.

Lester Smith

Engineering Manager

Attached: Appendix A to E.

Appendix A: Site Plan.



Appendix B: Photographs.



Figure 1: Light pole 1.



Figure 2: Light pole 1.

Figure 3: Light pole 1 footing.



Figure 4: Light pole 3.



Figure 5: Light pole 3.



Figure 6: Light pole 3 Footing.



Figure 7: Light pole 4.



Figure 8: Light pole 4.



Figure 9: Light pole 4 footing.



Figure 10: Light pole 2 footing.



Figure 11: Footing for pole 1 following sand blasting.



Figure 12: Footing for pole 2 following sand blasting.



Figure 13: Footing for pole 3 following sand blasting.



Figure 14: Footing for pole 4 following sand blasting.



Figure 15: Worst case corrosion of anchor bolts.



Figure 16: Worst case corrosion of anchor bolts under nut.

Appendix B: Welding Notes.

FCE make the following recommendations with regards to welding:

1. All welds and welding procedures shall comply with AS / NZS 1554.1.
2. Welds shall be category SP. Electrodes for SP welds shall have a nominal tensile strength of 480MPa.
3. Welding shall comply with AS / NZS 1554.1 as follows:
 - Unless otherwise noted all welds shall be fillet welds shall be:
6mm continuous for 12PL and less
8mm continuous for over 12PL to less than 20PL
10mm continuous for 20PL and over
(Welds to apply to the thinnest plate in the connection).
 - Welds shall be continuous, full seal welds.
 - Butt welds shall be complete penetration welds UNO.
 - Where a joint is required, all edges of steel faces in contact shall be welded.

Appendix D: Surface Treatment.

FCE suggest the following robust surface treatment for steelwork:

1. Surface Preparation - Oil and grease shall be removed by solvent cleaning in accordance with AS 1627 Part 1, Dry abrasive blast clean in accordance with AS1627 Part 4 to achieve a Class 2½ finish, with maximum surface profile height of 75 micron. The prime coat shall be applied prior to the appearance of flash rusting and no later than 4 hours from completion of the surface preparation. Mechanical cleaning instead of blasting may be accepted if contractor provides FCE with a procedure for approval prior to commencement of works.
2. First coat Interzinc 52 to DFT of 100 microns.
3. Second coat Intermediate High Build 2 pack Epoxy Interzone 954 to DFT of 500 microns. To ensure 500-micron coverage on corners and edges, the Interzone 954 should be applied in two coats.

Appendix E: Sika Data Sheets.



PRODUCT DATA SHEET

Sika® Tite BE

Heavy duty, highly flexible, water based bitumen waterproofing membrane

DESCRIPTION

Sika® Tite BE is a heavy duty, highly flexible, water based bitumen waterproofing membrane. Sika® Tite BE is suitable for permanent immersion and provides excellent adhesion to a wide range of substrates. Sika® Tite BE is fast drying, easy to apply and is designed for non-UV exposed applications.

USES

- Retaining walls
- Planter boxes
- Foundations and basement walls
- Damp proof sandwich membrane
- Ponds and water features
- Repairs on existing bitumen surfaces and membranes (Non-UV exposed)

CHARACTERISTICS / ADVANTAGES

- Fast drying
- Highly flexible- Class III membrane
- One part – No mixing
- Non flammable, Non hazardous
- Water based
- Suitable for permanent immersion
- Excellent adhesion to most substrates

APPROVALS / CERTIFICATES

AS/NZS 4020 : 2018 Products for use in contact with drinking water

PRODUCT INFORMATION

Composition	Water based bitumen
Packaging	4 Litre & 15 Litre plastic pails
Shelf life	12 months from date of manufacture in original, sealed containers, if the storage conditions are met.
Storage conditions	Store in dry, weatherproof environment, protected from direct sunlight at temperatures between +5°C and +25°C.
Colour	Black
Density	1.2kg/L

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020706301000000032

Dry film thickness	Minimum 1mm DFT (Dry film thickness) required 2x coats of 1 Litre per m2 are required to achieve a 1mm DFT
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APPLICATION INFORMATION

Consumption	1.0mm DFT- (Dry Film thickness): 7.5m2 per 15L pail 2m2 per 4L pail
Substrate temperature	+10 to +35 C
Substrate moisture content	Up to 5%
Substrates	Sika® Tite BE can be applied to the following substrates: ▪ Concrete ▪ Masonry ▪ Sand/cement screeds ▪ Fibrous cement sheeting ▪ Compressed fibrous cement sheeting ▪ Steel/Aluminium ▪ Timber posts
Curing time	Sika® Tite BE must be cured for at least 48 hours at 23°C (longer at lower temperatures.) Sika® Tite BE must be cured for a minimum 3 days before coming in contact with water or any form of backfill.
Drying time	Allow minimum 2 - 4 hours between coats at 23°C. Allow longer in adverse weather conditions. Drying time is dependent on ambient temperature and relative humidity.

BASIS OF PRODUCT DATA

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

FURTHER INFORMATION

- Safety Data Sheet (SDS)

IMPORTANT CONSIDERATIONS

LIMITATIONS

- Sika® Tite BE is not designed to stop a hydrostatic head of water pressure.
- Sika® Tite BE must not be used over damp, wet or contaminated substrates.
- Sika® Tite BE must not be applied if it is raining or if rain is imminent.
- Sika® Tite BE must not be applied directly over protective coatings.
- Sika® Tite BE must not be used as a trafficable, exposed or UV stable coating.
- Sika® Tite BE is not compatible with polyurethane or silicone sealants.
- In backfilling applications (planter boxes/retaining walls etc) allow a minimum of 3 days cure and use suitable protection layer prior to backfilling.
- In potable water applications a minimum of 3 cycles of fill and flush is recommended after of minimum 3 days cure.
- Do not apply where the substrate temperature is below 10°C or greater than 35°C.
- Contact Sika Technical Service for advice if further information is required.

ECOLOGY, HEALTH AND SAFETY

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Safety Data Sheet (SDS) containing physical, ecological, toxicological and other safety-related data.

APPLICATION INSTRUCTIONS

SUBSTRATE PREPARATION

All surfaces to be waterproofed must be firm, clean, dry, structurally sound and smooth. All grease, oil, wax, curing compounds, dust, loose material, laitance and other contaminants must be removed. The substrate surface must be continuous, all projections and rough spots should be dressed off to achieve a level surface. Sika® Tite BE can be mixed with sand and cement or pre-bagged mortar mix to form a screed to falls or patching render with improved adhesion and tensile properties.

Sheeting

Fibrous cement sheeting must be fixed in accordance with the manufacturer's installation directions.

Concrete

Concrete must be allowed to cure for 28 days and cement render and sand and cement screeds must be allowed to cure for 7 days prior to the application. Surfaces must be even and smooth, imperfections repaired with a suitable Sika® MonoTop repair mortar.

Priming

Dry porous substrates must be primed using a dilute 1 part Sika® Tite BE to 3 parts water, work well into the substrate to ensure adequate penetration, avoid

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ponding. Allow to dry prior to general application. If moisture is present, allow for application of Sikalastic Moisture Seal, refer to PDS for application rates.

MIXING

Single component, ready to use undiluted, prior to application thoroughly mix using a mechanical mixer to produce a homogenous liquid.

CLEANING OF EQUIPMENT

Remove liquid coating immediately with a dry cloth, clean tools and equipment with water while the material is still wet. Cured coating can only be removed mechanically.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the declared data for this product may vary from country to country. Please consult the local Product Data Sheet for the exact product data.

LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

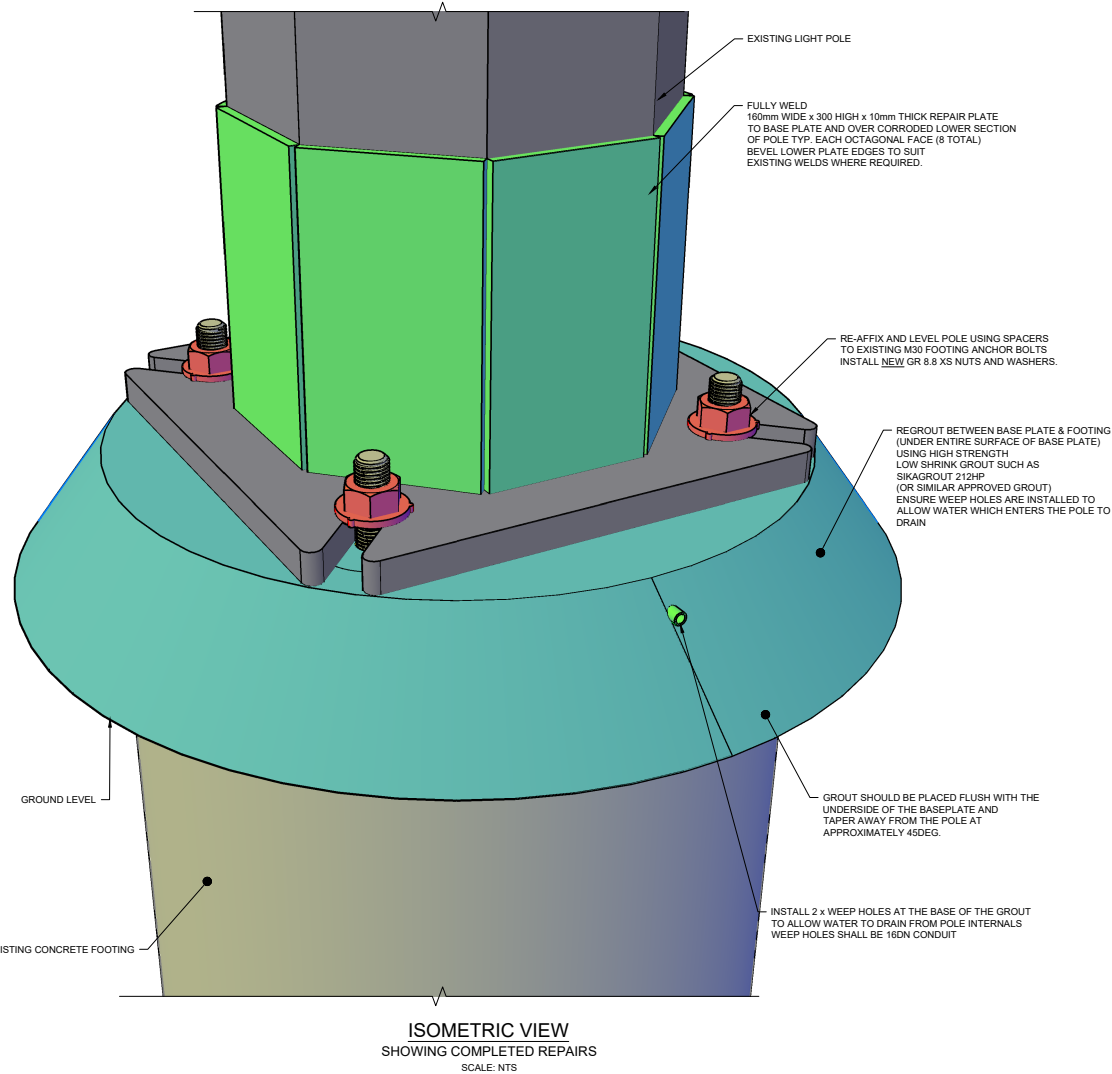
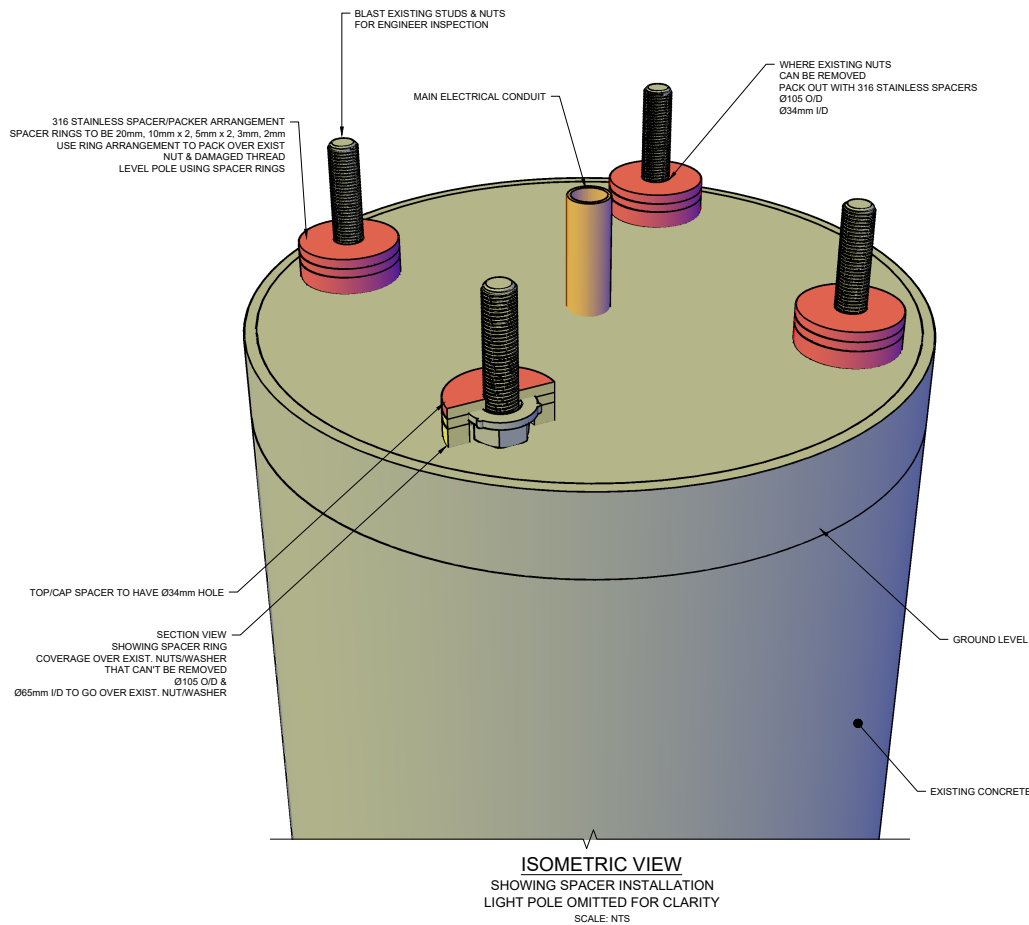
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Appendix F: Drawings.



DRAWINGS TO BE READ IN CONJUNCTION WITH FCE REPORT: 26FCE1799

- Flow Consulting Engineer



1. ALL DIMENSIONS TO BE CHECKED ON SITE PRIOR TO FABRICATION.
2. ALL STEELWORK TO BE IN ACCORDANCE WITH AS 4100:2020 STEEL STRUCTURES STANDARD CURRENT EDITION WITH AMENDMENTS.
3. ALL WELDING TO BE IN ACCORDANCE WITH AS/NZS 1554 AS FOLLOWS:
 - b. WELDS SHALL BE CATEGORY SP. ELECTRODES FOR SP WELDS SHALL HAVE A NOMINAL TENSILE STRENGTH OF 480MPa.
 - c. UNLESS OTHERWISE NOTED ALL WELDS SHALL BE FILLET WELDS AND BE:
 - 6mm CONTINUOUS FOR 12PL AND LESS
 - 8mm CONTINUOUS FOR OVER 12PL TO LESS THAN 20PL
 - 10mm CONTINUOUS FOR 20PL AND OVER(WELDS TO APPLY TO THE THINNEST PLATE IN THE CONNECTION).
 - c. WELDS SHALL BE CONTINUOUS, FULL SEAL WELDS.
 - d. BUTT WELDS SHALL BE COMPLETE PENETRATION WELDS U.N.O.
 - e. WHERE A JOINT IS REQUIRED, ALL EDGES IN CONTACT WILL BE WELDED.
4. ALL STEELWORK SHALL BE SURFACE TREATED. A ROBUST SURFACE TREATMENT FOR STEELWORK IS PROVIDED AS FOLLOWS:
 - a. SURFACE PREPARATION - OIL AND GREASE SHALL BE REMOVED BY SOLVENT CLEANING IN ACCORDANCE WITH AS 1627 PART 1, DRY ABRASIVE BLAST CLEAN IN ACCORDANCE WITH AS1627 PART 4 TO ACHIEVE A CLASS 2½ FINISH, WITH MAXIMUM SURFACE PROFILE HEIGHT OF 75 MICRON. THE PRIME COAT SHALL BE APPLIED PRIOR TO THE APPEARANCE OF FLASH RUSTING AND NO LATER THAN 4 HOURS FROM COMPLETION OF THE SURFACE PREPARATION.
 - b. INTERZINC 52 TWO COMPONENT, METALLIC ZINC RICH EPOXY PRIMER TO DFT OF 75 MICRONS. ALLOW OVERNIGHT DRY.
 - c. SECOND COAT INTERMEDIATE HIGH BUILD 2 PACK EPOXY INTERZONE 954 TO DFT OF 500 MICRONS. TO ENSURE 500-MICRON COVERAGE ON CORNERS AND EDGES, THE INTERZONE 954 SHOULD BE APPLIED IN TWO COATS.
5. ALL STEEL PLATE SHALL BE FABRICATED FROM AS/NZS 1594 OR AS/NZS 3678 GRADE 250MPa HOT ROLLED STEEL PLATE.
6. REMOVE ALL BURS AND SHARP EDGES.
7. ALL BOLTS SHALL BE TENSIONED TO SNUG TIGHT CONDITION IN ACCORDANCE WITH AS4100.
8. ALL BOLTS SHALL BE GRADE 8.8/S GALVANIZED BOLTS WITH MINIMUM TENSILE STRENGTH OF 830MPa AND MINIMUM YIELD STRENGTH OF 660MPa U.N.O.

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CLIENT CGG CITY OF GREATER GERALDTON			DRAWN CHECKED DATE				AMENDMENT DETAILS				PROJECT												
			A TN LS 16.06.26	ISSUED TO ACCOMPANY REPORT 26FCE1799				CITY OF GREATER GERALDTON GERALDTON LA FIAMMA SPORTS LIGHTING POLE REPAIRS															
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