

| LEGEND - PROPOSED | |
|----------------------------|---------------------|
| | KERB AND CHANNEL |
| | EDGE OF PATH |
| | FENCE |
| | W-BEAM BARRIER |
| | DESIGNATION LINE |
| LEGEND - EXISTING FEATURES | |
| | LEGAL BOUNDARY LINE |

IMPORTANT SERVICES NOTE

THE SERVICES SHOWN SHOULD BE CONSIDERED INDICATIVE ONLY AND ARE BASED ON RECORDS SUPPLIED BY THE UTILITY COMPANIES, PRIVATE SERVICES AND CONNECTIONS ARE NOT SHOWN.

THE CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL SERVICES ARE LOCATED/MARKED BY THE APPROPRIATE SERVICE AUTHORITY, OR THEIR OWN STAFF, PRIOR TO ANY SITE WORKS, AND FOR PROTECTING THESE SERVICES FOR THE DURATION OF THE SITE CONTRACT.

STREET LIGHT 7
NEW LUMINAIRE AND POLE

POLE: HOT DIPPED GALVANISED STEEL GROUND PLANTED ASSEMBLY OCTAGONAL POLE
LUMINAIRE: AEC TECHLIGHT ITALO 2 OF 3 STW 4_3.6m, 75W, LED, 350mA 4000K C/W DALI DIMMABLE CONSTANT CURRENT DRIVER MOUNTING HEIGHT: 10m
OUTREACH: 3m (MITRE TYPE) ARM TILT: 5°
SETBACK: N/A

STREET LIGHT 8
NEW LUMINAIRE ON RELOCATED OVERHEAD LINE POLE

POLE: EXISTING OVERHEAD LINE SECTIONAL STEEL POLE INSTALLED 2022
LUMINAIRE: AEC TECHLIGHT ITALO 2 OF 3 STW 4_3.5m, 65W, LED, 350mA 4000K C/W DALI DIMMABLE CONSTANT CURRENT DRIVER MOUNTING HEIGHT: 10m
OUTREACH: 3m (MITRE TYPE) ARM TILT: 0°
SETBACK: N/A

STREET LIGHT 5
NEW LUMINAIRE AND POLE

POLE: HOT DIPPED GALVANISED STEEL GROUND PLANTED ASSEMBLY OCTAGONAL POLE
LUMINAIRE: AEC TECHLIGHT ITALO 2 OF 3 STW 4_3.5m, 65W, LED, 350mA 4000K C/W DALI DIMMABLE CONSTANT CURRENT DRIVER MOUNTING HEIGHT: 11m
OUTREACH: 3m (MITRE TYPE) ARM TILT: 5°
SETBACK: N/A

STREET LIGHT 4
NEW STREET LIGHT LUMINAIRE AND POLE (JUSP)

POLE: JUSP (JOINT USE STREET LIGHTING POLE) WITH TRAFFIC LIGHT INTEGRATION
LUMINAIRE: AEC TECHLIGHT ITALO 2 OF 3 STW 4_5.6m, 112W, LED, 525mA 4000K C/W DALI DIMMABLE CONSTANT CURRENT DRIVER MOUNTING HEIGHT: 12m
OUTREACH: 3m (MITRE TYPE) ARM TILT: 5°
SETBACK: 1m FROM KERB ROAD

STREET LIGHT 8
NEW LUMINAIRE ON EXISTING POLE

POLE: EXISTING
LUMINAIRE: AEC TECHLIGHT ITALO 2 OF 3 STW 4_3.6m AEP, 76W, LED, 350mA 4000K C/W DALI DIMMABLE CONSTANT CURRENT DRIVER, C/W BACKLIT SHIELD
MOUNTING HEIGHT: 11.3m (EXISTING)
OUTREACH: 3m (EXISTING) TILT: 0°
SETBACK: AS EXISTING

STREET LIGHT 9
NEW LUMINAIRE ON EXISTING POLE

POLE: EXISTING
LUMINAIRE: AEC TECHLIGHT ITALO 2 OF 3 STW 4_3.5m, AEP 64W, LED, 350mA 4000K C/W DALI DIMMABLE CONSTANT CURRENT DRIVER, C/W BACKLIT SHIELD
MOUNTING HEIGHT: 11.3m (EXISTING)
OUTREACH: 3m (EXISTING) TILT: 0°
SETBACK: AS EXISTING

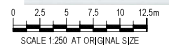
CALCULATION 1:
MELCOMBE STREET AND LAGGMOR ROAD INTERSECTION

CALCULATION 2:
SH1 AND LAGGMOR ROAD INTERSECTION

LEGEND:

- EXISTING LUMINAIRE AND POLE TO REMAIN
- EXISTING LUMINAIRE AND POLE TO BE REMOVED / RELOCATED
- EXISTING LUMINAIRE AND ARM TO BE REMOVED
- EXISTING POLE AND LUMINAIRE ON RELOCATED POSITION
- EXISTING POLE ON RELOCATED POSITION WITH LUMINAIRE TO BE UPGRADED
- EXISTING POLE ON RELOCATED POSITION WITH NEW ARM AND LUMINAIRE
- EXISTING LUMINAIRE TO BE UPGRADED
- NEW ARM AND LUMINAIRE ON EXISTING POLE
- NEW LUMINAIRE AND POLE
- NEW LUMINAIRE ON SIGNAL POLE
- NEW LUMINAIRE AND POLE TO BE INTEGRATED TO 'BELISHA' DISC POST (WITH LUMINAIRE MAINTENANCE FACTOR = 1)
- NEW ISOLUX CONTOUR
- NEW ISOLUX SPILL CONTOUR (WITH LUMINAIRE MAINTENANCE FACTOR = 1)

- NOTES:**
- REFER TO DRG 12560966-E200 FOR STREET LIGHTING NOTES AND SCHEDULE.
 - REFER TO DRG 12560966-E203 FOR STREET LIGHTING TABLES.
 - REFER TO DRG 12560966-E204 FOR ELECTRICAL NOTES AND STANDARD DETAILS.
 - FOR JUSP MOUNTED STREET LIGHT POWER CONNECTION, REFER TO WAKA KOTAHĪ SPECIFICATION FOR STREET LIGHT CONNECTION AT ELV TRAFFIC SIGNAL SITES - 1ST EDITION, EFFECTIVE 01/07/2022.



LAYOUT PLAN
SCALE 1:250

| Rev | Description | Checked | Approved | Date |
|-----|-------------------------|---------|----------|----------|
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Author: N. MACHIE Drafting Check: G. DOUGHERTY*
Designer: E. DAMES LITIGAR Design Check: G. CHIN*



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|---------|---------------------------------|
| Client | WAKA KOTAHĪ NZ TRANSPORT AGENCY |
| Project | TINWALD CORRIDOR IMPROVEMENTS |
| Status | CONSTRUCTION |

| | |
|---------------|------------------------------|
| Drawing Title | STREET LIGHTING PLAN SHEET 1 |
| Drawing No. | 12560966-E201 |
| Sheet | A1 |
| Revision | 1 |



ARCHIBALD STREET (SH1)

JOIN LINE - REFER DRG 12560966-E201

CALCULATION 2:
SH1 AND LAGMHOR ROAD INTERSECTION

JOIN LINE - REFER INSERT A

STREET LIGHT 1
NEW LUMINAIRE ON EXISTING POLE

POLE: EXISTING
LUMINAIRE: AEC TECHLIGHT ITALO 2 OF 3 STW
4.5-7m, 131W, LED, 525mA 4000K C/W DALI
DIMMABLE CONSTANT CURRENT DRIVER
MOUNTING HEIGHT: 11.3m (EXISTING)
OUTREACH: 3m (EXISTING) TILT: 0°
SETBACK: AS EXISTING

STREET LIGHT 3
NEW LUMINAIRE ON EXISTING POLE

POLE: EXISTING
LUMINAIRE: AEC TECHLIGHT ITALO 2 OF 3 STW
4.5-7m, 131W, LED, 525mA 4000K C/W DALI
DIMMABLE CONSTANT CURRENT DRIVER
MOUNTING HEIGHT: 11.3m (EXISTING)
OUTREACH: 3m (EXISTING) TILT: 5°
SETBACK: AS EXISTING

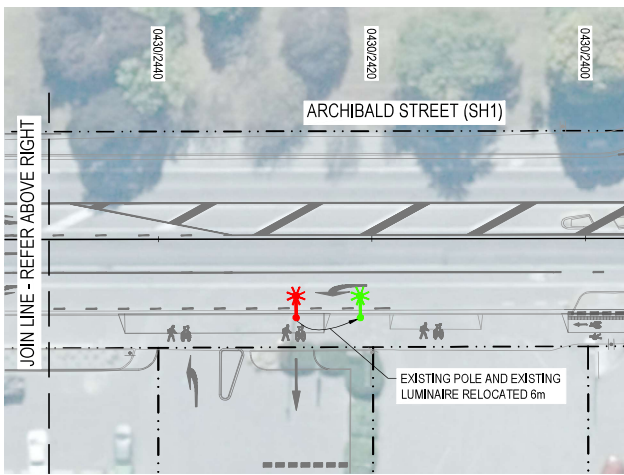
STREET LIGHT 2
NEW LUMINAIRE AND POLE

POLE: HOT DIPPED GALVANISED STEEL GROUND
PLANTED ASSEMBLY OCTAGONAL POLE.
LUMINAIRE: AEC TECHLIGHT ITALO 2 OF 3 STW
4.5-6m, 112W, LED, 525mA 4000K C/W DALI
DIMMABLE CONSTANT CURRENT DRIVER
MOUNTING HEIGHT: 11m
OUTREACH: 3m (MITRE TYPE) ARM TILT: 5°
SETBACK: ON EXISTING POLE LOCATION

TINWALD TAVERN

LIQUORLAND BOTTLESTORE

AGNES STREET



LAYOUT PLAN

SCALE 1:250

LEGEND - PROPOSED

- KERB AND CHANNEL
- EDGE OF PATH
- FENCE
- W-BEAM BARRIER
- DESIGNATION LINE

LEGEND - EXISTING FEATURES

- LEGAL BOUNDARY LINE

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LEGEND:

- EXISTING LUMINAIRE AND POLE TO REMAIN
- EXISTING LUMINAIRE AND POLE TO BE REMOVED / RELOCATED
- EXISTING LUMINAIRE AND ARM TO BE REMOVED
- EXISTING POLE AND LUMINAIRE ON RELOCATED POSITION
- EXISTING POLE ON RELOCATED POSITION WITH LUMINAIRE TO BE UPGRADED
- EXISTING POLE ON RELOCATED POSITION WITH NEW ARM AND LUMINAIRE
- EXISTING LUMINAIRE TO BE UPGRADED
- NEW ARM AND LUMINAIRE ON EXISTING POLE
- NEW LUMINAIRE AND POLE
- NEW LUMINAIRE ON SIGNAL POLE
- NEW LUMINAIRE AND POLE TO BE INTEGRATED TO 'BELISHA' DISC POST
- NEW ISOLUX CONTOUR
- NEW ISOLUX SPILL CONTOUR (WITH LUMINAIRE MAINTENANCE FACTOR = 1)

NOTES:

1. REFER TO DRG 12560966-E200 FOR STREET LIGHTING NOTES AND SCHEDULE.
2. REFER TO DRG 12560966-E203 FOR STREET LIGHTING TABLES.
3. REFER TO DRG 12560966-E204 FOR ELECTRICAL NOTES AND STANDARD DETAILS.
4. FOR JUSP MOUNTED STREET LIGHT POWER CONNECTION, REFER TO WAKA KOTAHĪ SPECIFICATION FOR STREET LIGHT CONNECTION AT ELV TRAFFIC SIGNAL SITES - 1ST EDITION, EFFECTIVE 01/07/2022.

0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

INSERT A
SCALE 1:250

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Author: N.MACHIE Drafting Check: G.DOUGHERTY*
Designer: E.DAMES LITIGAR Design Check: G.CHIN*



Client: WAKA KOTAHĪ NZ TRANSPORT AGENCY
Project: TINWALD CORRIDOR IMPROVEMENTS

Status: CONSTRUCTION Drawing No.: 12560966-E202 Status Code: S4

Drawing Title: STREET LIGHTING PLAN SHEET 2
Drawing No.: 12560966-E202
Rev: 1

| TABLE 2.2 VALUES OF LTP FOR CATEGORY V LIGHTING - AS/NZS 1158.1.1:2005 | | | | | | | | |
|--|---|--------------------------------------|---|----------------------------|--|---|---|-----------------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| LIGHTING SUBCATEGORY | LIGHT TECHNICAL PARAMETERS | | | | | | | |
| | FOR STRAIGHT SECTIONS, CURVES AND INTERSECTIONS | | | | | FOR INTERSECTIONS AND OTHER SPECIFIED LOCATIONS | | FOR ALL APPLICATIONS |
| | AVERAGE CARRIAGEWAY LUMINANCE (L) cd/m ² | OVERALL UNIFORMITY (U _o) | LONGITUDINAL UNIFORMITY (U _l) | THRESHOLD INCREMENT (TI) % | SURROUND VERGE ILLUMINANCE (E _v) % | POINT HORIZONTAL ILLUMINANCE (E _{ph}) | ILLUMINANCE (HORIZONTAL UNIFORMITY) (U _e) Cat V (U _e) | UPWARD WASTE LIGHT RATIO (UWLR) % |
| V3 | 0.75 | 0.33 | 0.3 | 20 | 50 | 7.5 | 8 | 3 |
| V4 ^b | 0.5 | 0.33 | 0.3 | 20 | 50 | 5 | 8 | 3 |

- THE CALCULATED VALUE FOR U_o MAY BE LESS THAN 0.33, PROVIDED CORRESPONDING VALUE FOR L IS 10% MORE ABOVE THE SPECIFIED MINIMUM, BUT SHALL IN NO CASE BE LESS THAN 0.31.
- V4 IS THE MINIMUM SUBCATEGORY RECOMMENDED FOR APPLICATION IN NEW ZEALAND.
- THE VALUES ARE MAINTAINED.
- COMPLIANCE IS ACHIEVED BY BEING GREATER THAN OR EQUAL TO THE APPLICABLE TABLE VALUE
- COMPLIANCE IS ACHIEVED BY BEING LESS THAN OR EQUAL TO THE APPLICABLE TABLE VALUE

| MAINTENANCE FACTOR BREAKDOWN | | | |
|--|-------------|--------------------------------|--------|
| FACTOR | REQUIREMENT | PARAMETERS | VALUES |
| LAMP LUMEN MAINTENANCE FACTOR (LLMF) | >= 0.90 | | 0.96 |
| LUMINAIRE ELECTRONIC FAILURE (LEF) | | | 0.99 |
| LUMINAIRE OPTIC DEPRECIATION FOR VISOR (LOVD) | | TOUGHENED GLASS | 0.99 |
| LUMINAIRE OPTIC DEPRECIATION FOR REFLECTOR (LODR) | | ALUMINIUM (BEHIND GLASS VISOR) | 1.00 |
| LUMINAIRE OPTIC DEPRECIATION FOR LENS (LODL) | | GLASS | 1.00 |
| LUMINAIRE MAINTENANCE FACTOR | | VISOR | 0.84 |
| MAINTENANCE FACTOR (MF): [MF = LLMF x LEF x LOVD x LODL x LMF] [NOTE: CAPPED TO 0.90 MAX, CALCULATED VALUE ROUNDED DOWN] | | | 0.79 |

| STREET LIGHT DESIGN TABLE | | | |
|---------------------------|---|------------|--------------------|
| LUMINAIRE | DETAILS | LAMP LUMEN | MAINTENANCE FACTOR |
| STREET LIGHT 5 & 6 | AEC TECHLIGHT ITALO 2 OF3 STW 4.3-5M, 65W LED, 350 mA 4000K C/W DALI DIMMABLE CONSTANT CURRENT DRIVER. | 9000 | 0.79 |
| STREET LIGHT 9 | AEC TECHLIGHT ITALO 2 OF3 STW 4.3-5M, AEP 64W LED C/W BACKLIT SHIELD, 350 mA 4000K C/W DALI DIMMABLE CONSTANT CURRENT DRIVER. | 8000 | 0.79 |
| STREET LIGHT 7 | AEC TECHLIGHT ITALO 2 OF3 STW 4.3-5M, 75W LED, 350 mA 4000K C/W DALI DIMMABLE CONSTANT CURRENT DRIVER. | 10630 | 0.79 |
| STREET LIGHT 8 | AEC TECHLIGHT ITALO 2 OF3 STW 4.3-5M AEP, 76W LED C/W BACKLIT SHIELD, 350 mA 4000K C/W DALI DIMMABLE CONSTANT CURRENT DRIVER. | 9570 | 0.79 |
| STREET LIGHT 2 & 4 | AEC TECHLIGHT ITALO 2 OF3 STW 4.5-6M, 112W LED, 525 mA 4000K C/W DALI DIMMABLE CONSTANT CURRENT DRIVER. | 15170 | 0.79 |
| STREET LIGHT 1 & 3 | AEC TECHLIGHT ITALO 2 OF3 STW 4.5-7M, 131W LED, 525 mA 4000K C/W DALI DIMMABLE CONSTANT CURRENT DRIVER. | 17590 | 0.79 |

| STREET LIGHTING DESIGN CALCULATION SUMMARY - Cat V | | | | | | | |
|---|------------------|-------|---|---|--|-----------------------------------|------------------------|
| AREA | CALCULATION TYPE | UNITS | POINT HORIZONTAL ILLUMINANCE (E _{ph}) LUX | ILLUMINANCE (HORIZONTAL UNIFORMITY) Cat V (U _e) | POINT VERTICAL ILLUMINANCE (E _p) LUX | UPWARD WASTE LIGHT RATIO (UWLR) % | COMPLIANCE TO CATEGORY |
| CALCULATION 1 MELCOMBE ST & LAGMHOR ROAD INTERSECTION | ILLUMNANCE | LUX | 6.6 | 4.17 | N/A | 0 | V4 |
| CALCULATION 2 SH1 & LAGMHOR ROAD INTERSECTION | ILLUMNANCE | LUX | 7.6 | 3.85 | N/A | 0 | V3 |

NOTES:

- REFER TO DRG 12560966-E200 FOR STREET LIGHTING NOTES AND SCHEDULE.
- REFER TO DRG 12560966-E204 FOR ELECTRICAL NOTES AND STANDARD DETAILS.
- FOR JUSP MOUNTED STREET LIGHT POWER CONNECTION, REFER TO WAKA KOTAHI SPECIFICATION FOR STREET LIGHT CONNECTION AT ELV TRAFFIC SIGNAL SITES - 1ST EDITION, EFFECTIVE 01/07/2022.

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| Rev | Description | Checked | Approved | Date |
| Author | N.MACHIE | Drafting Check | G.DOUGHERTY* | |
| Designer | E.DAMES LITIGAR | Design Check | G.CHIN* | |

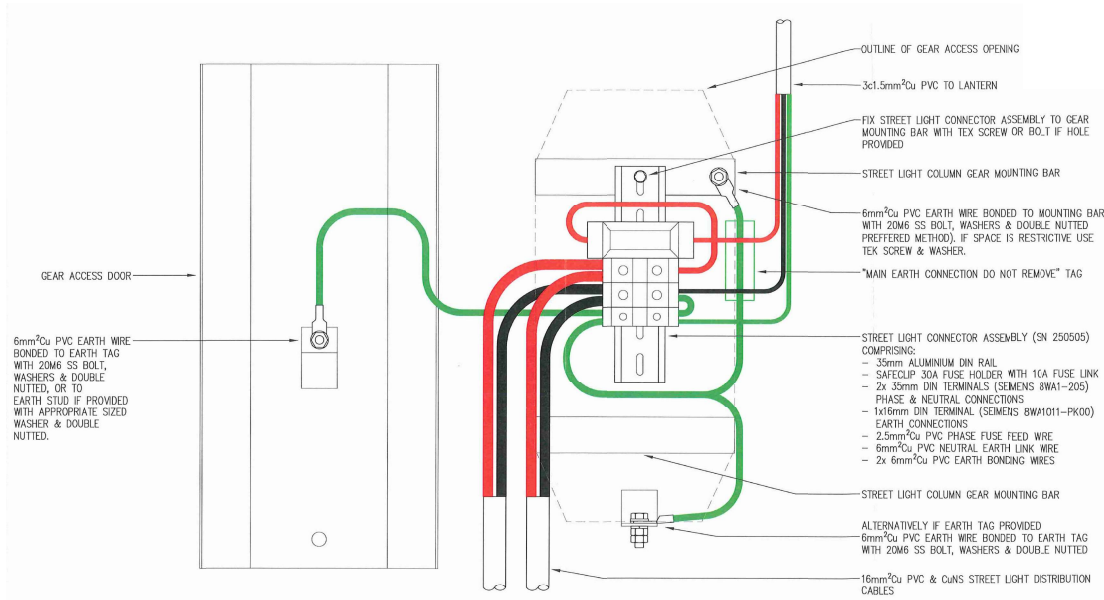


| | |
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| Client | WAKA KOTAHI NZ TRANSPORT AGENCY |
| Project | TINWALD CORRIDOR IMPROVEMENTS |
| Status | CONSTRUCTION |

| | |
|---------------|------------------------|
| Drawing Title | STREET LIGHTING TABLES |
| Drawing No. | 12560966-E203 |
| Rev | 1 |

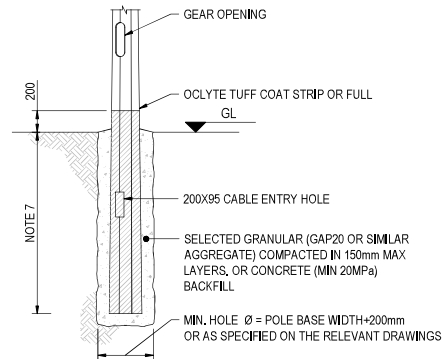
STREET LIGHTING NOTES:

1. LIGHTING DESIGNED TO AS/NZS 1158, NZTA M30 AND ADC REQUIREMENTS FOR STREET LIGHTING ASSOCIATED DOCUMENTS.
2. FOR STREET LIGHT TYPICAL DETAILS AND FOUNDATIONS, REFER TO NZTA M26.
3. OBTAIN A FULL SET OF UNDERGROUND LAYOUT PLANS FOR ALL SERVICES PRIOR TO DIGGING, LOCATE AND MARK UNDERGROUND SERVICES WHERE PRESENT, COORDINATE WITH NETWORK OPERATORS AND INSTALLERS FOR EXISTING AND NEW SERVICES.
4. TRENCHING FOR ALL UNDERGROUND SUPPLY CABLES TO BE CAREFULLY HAND DUG WITHIN 1m OF LOCATED UNDERGROUND SERVICES OR WITHIN 5m OF ANY POWER POLES. ALL WORKS TO COMPLY WITH RELEVANT NETWORK AUTHORITY REQUIREMENTS, ECP34 AND AS/NZS 3000:2018.
5. INSTALL LIGHTING COLUMNS TO MANUFACTURERS REQUIREMENTS, ESPECIALLY SHEAR BASE ASSEMBLIES.
6. ALL ELECTRICAL SUPPLY INSTALLATIONS TO BE DESIGNED AND CARRIED OUT BY THE NETWORK OPERATOR TO THE OPERATOR'S STANDARDS. STREET LIGHT CONTROL TO BE CONFIRMED WITH THE NETWORK OPERATOR.
7. THE INTERNAL CABLE BETWEEN THE TERMINAL BLOCKS AND THE LUMINAIRE SHALL BE CIRCULAR 2C 2.5mm² CU NEUTRAL SCREEN CABLE.
8. ELECTRICAL INSTALLATIONS TO COMPLY WITH AS/NZS 3000:2018.
9. ALL WORKS WITHIN THE DRIP LINE OF THE TREES AND ANY TREE TRIMMING TO BE DONE UNDER THE DIRECTION OF AN ARBORIST.
10. FOR JUSP MOUNTED STREET LIGHT POWER CONNECTION, REFER TO WAKA KOTAHI SPECIFICATION FOR STREET LIGHT CONNECTION AT ELV TRAFFIC SIGNAL SITES - 1ST EDITION, EFFECTIVE 01/07/2022.

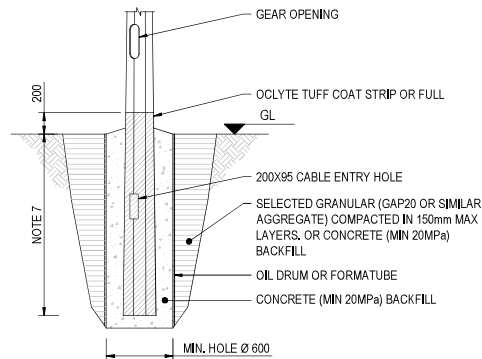


EA NETWORKS STREET LIGHT COLUMN TERMINATION, FUSING AND EARTHING DETAIL (REPRODUCED FROM LE0056)

NTS



COHESIVE SOILS - TYPE A
(TYPICALLY CLAY)



COHESIONLESS SOILS - TYPE B
(TYPICALLY SAND OR GRAVEL)

OCLYTE FOUNDATION DETAIL GROUND PLANTED FRANGBLE POLE TYPE

NTS

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Author: N. MACHIE Drafting Check: G. DOUGHERTY*
 Designer: E. DAMES LITIGAR Design Check: C. CHIN*



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| Project | TINWALD CORRIDOR IMPROVEMENTS |
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| | |
|---------------|---------------------------------------|
| Drawing Title | ELECTRICAL NOTES AND STANDARD DETAILS |
| Status Code | S4 |
| Drawing No. | 12560966-E204 |